



INTEGRATED DISTRICT DEVELOPMENT PLAN

KOLLAM

PERSPECTIVE PLAN



DISTRICT PLANNING COMMITTEE, LOCAL GOVERNMENTS, SPECIAL TECHNICAL ADVISORY COMMITTEE - KOLLAM,
DEPARTMENT OF TOWN AND COUNTRY PLANNING - GOVERNMENT OF KERALA



DRAFT
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Volume I



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SPECIAL TECHNICAL ADVISORY COMMITTEE, KOLLAM
DEPARTMENT OF TOWN AND COUNTRY PLANNING, GOVERNMENT OF KERALA

INTEGRATED DISTRICT DEVELOPMENT PLAN
FOR KOLLAM (Draft)

VOLUME- I
Perspective Plan

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MESSAGE

Comprehensive development with social justice is the declared agenda of the Government. Development becomes comprehensive when the economic, social and physical dimensions are integrated. Equal accessibility to opportunities for all sections of the society will ensure social justice. Accessibility to opportunities shall be guaranteed to the present society, considering the ability of the future generation to meet their needs as well. Such a development ought to be achieved in a democratic manner for which people's participation in development is inevitable. In order to fulfil the Government's commitment towards decentralized planning, the People's Planning Campaign movement was introduced in our State during the Ninth Five Year Plan. Efforts were made in successive Five Year Plans to strengthen decentralization. District planning has become the most important link in the whole system of decentralized planning because this is the cutting edge of administration. The present system of decentralized planning needs to be perfected by giving adequate emphasis to district planning which in turn is the constitutionally envisaged function of the District Planning Committees.

The pilot project of preparation of Integrated District Development Plan and Local Development Plans for each Local Government, taken up by the District Planning Committee, Kollam with the Department of Town and Country Planning as nodal agency is highly noteworthy in this respect. This has to be viewed as a natural progression of decentralized planning. The viable methodology of preparation of local plans and district plans with the involvement of people, elected leaders and experts, piloted and validated at Kollam has gained nationwide acceptance.

Kollam District of Kerala now owns the pride of having a total Plan for its development and the District Planning Committee of Kollam has become the pioneer in fulfilling the constitutionally mandated responsibility of being the planning authority of the district. The success of any plan lies in its implementation. I am sure that District Planning Committee of Kollam will succeed in this regard too.

Thiruvananthapuram

Paloli Mohamed Kutty
Minister for Local Self Government
Government of Kerala

FOREWORD

The 74th Amendment Act of the Constitution of India, mandated District Planning Committee to prepare a draft development plan for the district. As per Article 243 ZD of the Constitution, the District Planning Committee shall consolidate Panchayat / Municipality Plans in the district and prepare a draft development plan for the district as a whole. The Article specifies that while preparing draft development plan, due regard shall be given to matters of common interest between panchayats and municipalities including spatial planning, sharing of water and other physical and natural resources, the integrated development of infrastructure and environmental conservation. The Constitution stipulates to consult such institutions and organizations decided by the State while preparing the District Development Plan. The District Planning Committee, Kollam, wanted to fulfil its Constitutional obligation and to have comprehensive development of the District with the participation of local governments in the district. This led to the important initiation towards preparation of an Integrated District Development Plan (IDDP) for Kollam along with Local Development Plans (LDP) for each and every local governments in the district in an integrated manner. The entire process was implemented with the involvement of people, local governments, line departments, NGOs etc. The Department of Town and Country Planning gave technical support for Plan preparation besides coordinating the entire process.

It is of no doubt that this methodology of plan preparation qualitatively strengthens the Decentralized Planning Process. The planning process is 'top-down'- 'grass root-up' wherein data collection and preliminary analysis of the collected data is performed at local level and integrated regional development vision (development concept) is formulated at the district level. Thus multilevel integration between Plans (between different Local Plans, Local Plans and District Plan and between sectors) is achieved avoiding duplication of development proposals formulated at different levels of administration namely at Village(*Grama*) Panchayat/Municipality, Block (intermediate) Panchayat, District Panchayat levels and even State or National level. Over and above the process succeeded in blending technical dimension and local wisdom in the preparation of Development Plans.

Integrated District Development Plan, Kollam tries to achieve planned development of the district through optimum utilization of resources, both natural and man made, ensuring conservation of environment. This is a plan for and by all development partners of the district and it specifies the role of each local government in the integrated development of the district. The Plan provides objective and direction to all development sectors meanwhile identifying their linkages.

The IDDP, Kollam envisages a population of 29.36 lakhs for the district by 2021- an addition of 3.50 lakhs to the present population. Development needs of the future population in each sector - be it physical, economical or social - are addressed in the Plan. The Plan identifies agriculture, animal husbandry, fisheries and mining & geology as the potential development sectors of the district. Six development zones namely Bio reserve zone, Agro development zone, Agro allied development zone, Special development zone, Multi functional zone and Aqua bio reserve zone are demarcated with most suitable activities in each zone. The midland area of the district is earmarked as the Agro development zone and the environmentally sensitive regions in and around Ashtamudi kayal and Paravur-Nadayara kayal are designated as Bio reserve zone of the District. A rational distribution of facilities is proposed to be achieved in the district through a well established hierarchy of settlements. A connectivity plan ensuring proper connectivity between settlements also form part of the Plan. Based on this development structure of the district sectoral details were worked out giving due respect to inter sectoral linkages. Thus the IDDP, Kollam is a comprehensive plan for the development of the district. The Plan encompasses all features of a district plan envisaged by the Constitution.

The District Planning Committee of Kollam is proud to be the pioneer in preparing such a Development Plan. The consistent efforts of members of DPC, Kollam, local governments, District Collectors, members of the Special Technical Advisory Group for IDDP and the Department of Town and Country Planning, in particular their Kollam District Office, in making the endeavor a success need to be appreciated.

Here is a Plan, not only 'for the people' but 'by the people and of the people'. The success of the Plan depends on how far people own the Plan and co-operate in implementation of the Plan. I seek united efforts of central, state and local governments as well as the private and corporate sector for realizing the development vision of IDDP Kollam. I submit this comprehensive plan before the people of Kollam as their means for achieving optimum development of the district.

Adv. K. Somaprasad
Chairman

District Planning Committee, Kollam
Kerala State

PREFACE

As part of People's Plan, Kerala succeeded in developing and operationalising a viable methodology of decentralized participatory planning. This path-breaking innovation has now been adopted nationally and the Planning Commission recommended an analogous methodology to be followed by all States in the preparation of the XIth Five Year Plan.

In spite of the pioneering nature of decentralized planning, it must be admitted, the development priorities were set and development options chosen on the basis of perceptions and negotiations among the stakeholders under the leadership of elected local governments and not on the basis of analysis. To start with it was good enough.

Now that decentralization in Kerala has entered the institutionalization phase, time is ripe for upgrading the quality of planning, moving on to analysis of development data and trends, with people and their representatives in the centre stage, assisted by officials and experts, leading to a vision emerging from a deep understanding of the developmental situation and potential.

In this respect, Kollam has conducted an important experiment, crafted patiently and meticulously by a team of top quality professionals from the Town and Country Planning Department, in partnership with enlightened political leadership of Local Governments. Under the leadership of the District Planning Committee (DPC) and with the involvement of all the Local Governments in the district, officials from the Development Departments, co-ordinated by the District Collector in his capacity as the Member Secretary of the DPC, pooled in all available data, filled up gaps through primary collection and analyzed them to study spatial development patterns. Utilizing the techniques of spatial planning and the tools of information technology detailed analysis of the current situation both sectoral and cross-sectoral was carried out and mapped and the trends were projected into the future.

The collective spatial patterns of different sectors of development at the district level, shows the gaps as well as the potential. Analysis was enriched by the involvement of elected leaders and local resource persons which gave the all important people-dimension to the whole process. Through a cross fertilization of expert opinions and people's ideas, policies and strategies for the immediate future emerged. Based on further consultations, plans and projects began to take shape springing organically from the understanding of the development past and the prospects of development future. Priorities were dictated by people's preferences of course limited by availability of resources, resulting in the detailed execution plan.

The whole process took a long time being a path-breaking venture. Intense discussions and debates and even doubts and criticisms informed each stage, often delaying the process but resulting in greater understanding and stronger ownership at the end. Thus only after a series of trials and errors the IDDP emerged. The most important features can be summed up as follows:-

- A deep shared understanding of development patterns of the past and potential for the future based on objective analysis of all available data.
- The understanding cut across development sectors and departmental domains and resulted in a holistic development concept or vision and this perspective guided the choice of strategies for the future and plans to realize them.

IDDP is made robust by the strong organic linkages connecting each step to the previous and next one. The commitment and enthusiasm of officials and elected leaders of Kollam has resulted in the development of a viable methodology of participatory spatial planning, theoretically sound and practically valid. Now that the core features of the methodology are revealed in the document, it is easy to upgrade or modify or adapt them for different geographical, developmental and political regions.

Thiruvananthapuram

S.M. Vijayanand
Principal Secretary
Local Self Government Department
Government of Kerala

ACKNOWLEDGEMENTS

The Integrated District Development Plan, Kollam is a long range comprehensive plan for the development of the district. Through preparation of IDDP, the District Planning Committee of Kollam has become the first ever DPC in the Country to own a District Development Plan prepared as envisioned by the Constitution. This path-breaking venture has become a model in participatory district planning in a spatial platform. The methodology adopted has proven to be theoretically sound and practically valid for the preparation of district and local plans in line with 73rd and 74th Constitutional Amendments and is easily replicable elsewhere in the country.

The Department of Town and Country Planning is deeply thankful to people's representatives, officials, experts and above all the people of Kollam who worked for materializing the Plan. The District Planning Committee, Kollam need to be specially acknowledged for the sustained efforts to fulfil their constitutionally mandated responsibility of having a development plan for the district. The support given by Sri. Paloli Mohamed Kutty, Minister for Local Self Government Department, throughout the period was invaluable. Sri. S.M. Vijayanand IAS, Principal Secretary, Local Self Government Department was always ready to help and advice. We are deeply indebted to him for his inspiring and invaluable support in materializing this Plan. Adv. K. Somaprasad, Chairman District Planning Committee, Kollam was the driving force behind the capacious task. The Plan preparation gained momentum on the initiative of Adv. P. Aisha Potti MLA, former Chairperson, DPC Kollam, who took keen interest at all stages. Smt. K. Devaki, former Chairperson of DPC also extended all supports. All members of the DPC actively took part in the planning process as Chairpersons of 'Sub committees of Special Technical Advisory Committee of DPC for preparation of IDDP'. Sri. B. Ajayakumar and Sri. George Mathew who played anchor roles as Chairmen of 'Spatial planning sub committee' during their respective tenures need to be specially acknowledged. The District Collectors of Kollam, during the period, in their capacity as the Member Secretary of the DPC, played crucial role in co-ordinating the entire task. Special acknowledgements are due to Sri.B.Srinivas, IAS former District Collector of Kollam for immense support rendered in putting the task in track and to Sri.A. Shajahan IAS, present District Collector of Kollam for the support extended during the completion period. The whole hearted cooperation extended by all the line departments was a determined in the event. The efforts of both official and non official members of the Special Technical Advisory Committee for IDDP need to be reckoned with gratitude at this juncture without which integration of sectors would have been out of question.

The untiring efforts of Sri. Jacob Easow as District Town Planner, Kollam and presently in his capacity as Senior Town Planner of the State Project Cell for the project was really an inspiration. Sri. K.Devarajan, Sri. S. Ajayakumar, Sri.J.Jayakumar, Sri. C.J. Poulose and Sri. P.Anilkumar as District Town Planners of Kollam during the period also contributed in this endeavor. Smt. P.R. Ushakumari, Town Planner, Sri. S. Ajay Kumar and Sri. K. Baiju, Deputy Town Planners exerted sustained efforts during the entire period. Members of the Spatial Analysis Team for IDDP and officials of Kollam District Office of the Department are also to be acknowledged. The officials of the IDDP-LDP Project Office took consistent efforts for the plan preparation among whom Smt. M.V. Shari and Smt. Jinumole Varghese, Assistant Town Planners need special mention. The Department also acknowledges the support and guidance rendered by the members of the State Level Steering Committee and Department Level Technical Implementation Committee.

The project of preparation of IDDP-LDP is a joint project of DPC, Kollam and the local governments in the district. All the local governments of Kollam district need to be specially acknowledged for being part and parcel of the project. It is hoped that they will exert continued effort and complete their local development plans in a time bound manner.

Eapen Varughese

Chief Town Planner

Department of Town and Country Planning

Government of Kerala

Thiruvananthapuram

PROLOGUE

The report of the Integrated District Development Plan for Kollam is presented in two volumes viz. Volume I and Volume II. The report has two sections: 'Section 1 - Methodology of Preparation of Local Development Plans and Integrated District Development Plan' and 'Section 2 - The Integrated District Development Plan for Kollam'.

Volume I comprises of

- Section 1: Methodology of Preparation of Local Development Plans and Integrated District Development Plan
- Part of Section 2 : Perspective Plan.

Volume II comprises of

- The remaining part of Section 2: Execution Plan.

Perspective Plan include

- Settlement analysis comprising analysis of population, occupational structure, land use, functional character of settlements, hierarchy of settlements, hierarchy of nodes and urban profile.
- Sectoral analysis comprising detailed analysis of various development sectors including production, service, social and economic sectors.
- Spatial analysis which analyses the spatial patterns evolved based on settlement studies, study of resources, study of social aspects and from environmental studies.
- Goals and objectives and the District Development Concept.
- General and sectoral development policies and strategies.

The above are detailed in Chapters 2 to 33 of Volume I.

Execution Plan include

- Development proposals with priorities, phasing and agencies involved with costing.

The above are detailed in Chapters 34 to 50 of Volume II.

A Concise Report of the Integrated District Development Plan for Kollam is also given as Volume III.

THE TEAM

1. Apex body- District Planning Committee, Kollam
 - I Adv. K. Somaprasad (Chairman)
 - I Sri. A. Shajahan, IAS, District Collector, (Member Secretary)
 - I Sri. N.S.Prasannakumar
 - I Sri. S.Subash
 - I Sri. Kollayil Sudevan
 - I Smt. J.Chinchu Rani
 - I Sri. P.B.Sathyadevan
 - I Sri. K.Sethumadhavan
 - I Adv. C.P.Sudeesh Kumar
 - I Adv. George Mathew
 - I Adv. Sabitha Beegum
 - I Sri. A.Manmadhan Nair
 - I Adv. S.Venugopal
 - I Smt. Jayadevi Mohan
2. Nodal Agency
 - I Department of Town and Country Planning
3. Special Technical Advisory Committee
(Details – Appendix 27 A)
 - I Agriculture
 - I Irrigation
 - I Watershed Development & Land Use
 - I Animal Husbandry and Dairy Development
 - I Fisheries
 - I Industries, Co-operation, Trade & Commerce
 - I Health
 - I Drinking Water & Sanitation
 - I Infrastructure, (Roads, Bridges, Housing)
 - I Forest, Environment, Mining & Geology
 - I Education
 - I Social Welfare and Women & Child Development
 - I Poverty Alleviation & Rural Development
 - I Power & Tele Communication
 - I Scheduled Caste / Scheduled Tribe Development
 - I Tourism, Culture Sports & Youth Affairs
 - I Human Resource Development
 - I Finance
4. Spatial Analysis Team
(Details – Appendix 27 B)
5. Other Officials involved in the preparation of IDDP
(Details - Appendix 27 C)
6. Supporting Staff of Office of the Town Planner, Kollam
(Details - Appendix 27 D)
7. Supporting Staff from other offices of Town and Country Planning Department
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ABBREVIATIONS

ADB	- Asian Development Bank
AIDS	- Acquired Immune Deficiency Syndrome
APL	- Above Poverty Line
B.Ed.	- Bachelor of Education
BMW	- Bio Medical Waste
BOD	- Biochemical Oxygen Demand
BP	- Block Panchayat
BPL	- Below Poverty Line
CADA	- Command Area Development Authority
CD	- Credit Deposit
CEMS	- Continuous Emissions Monitoring Systems
CESS	- Centre for Earth Science Studies
CFC	- Chlorofluorocarbon
CFI	- Composite Functional Index
CFL	- Compact Fluorescent Lamp
CFSS	- Cattle Feed Subsidy Scheme
CFT	- Child Friendly Toilet
CHC	- Community Health Centre
CI	- Concentration Index
CO	- Carbon Monoxide
CO ₂	- Carbon dioxide
COB Scheme	- Coconut Development Board Scheme
CWRDM	- Centre for Water Resource Development and Management
DFEIC	- District Forestry Extension and Information Centre
DTPC	- District Tourism Promotion Council
ECG	- Electro Cardiogram
ECO	- Electro-Catalytic Oxidation
EDC	- Eco Development Committee
EEZ	- Exclusive Economic Zone
EHV	- Extra High Voltage
ETP	- Effluent Treatment Plant
G.O.	- Government Order
GIS	- Geographic Information System
GP	- Grama Panchayat
GPS	- Global Positioning System
Ha	- Hectare
HIV	- Human Immunodeficiency Virus
HS	- High School
HSS	- Higher Secondary School
HUDCO	- Housing and Urban Development Corporation
HYV	- High Yielding Variety
ICDP	- Intensive Cattle Development Programme
ICDS	- Integrated Child Development Services
IDDP	- Integrated District Development Plan
IHDP	- Intensive Habitat Development Programme
IMR	- Infant Mortality Rate
INM	- Integrated Nutrient Management
IRE	- Indian Rare Earth
IT	- Information Technology
ITC	- Industrial Training Centre
ITI	- Industrial Training Institute
IWEP	- Integrated Women Empowerment Programme
JBIC	- Japan Bank of International Cooperation

JP	- Jilla Panchayat
KAU	- Kerala Agriculture University
KFC	- Kerala Financial Corporation
KFDC	- Kerala Forest Development Corporation
KIP	- Kallada Irrigation Project
KLDC	- Kerala Land Development Corporation
KMFR Act	- Kerala Marine Fisheries Regulation Act
KMML	- Kerala Minerals and Metals Limited
KSEB	- Kerala State Electricity Board
KSLUB	- Kerala State Land Use Board
KSRTC	- Kerala State Road Transport Corporation
KSWTD	- Kerala State Water Transport Department
KTDC	- Kerala Tourism Development Corporation
KV	- Kilo Volt
LDP	- Local Development Plan
LI	- Lift Irrigation
LLA	- Local Level Analysis
LPCD	- Litres Per Capita per Day
LPS	- Lower Primary School
LSGI	- Local Self Government Institution
LSGIs	- Local Self Government Institutions
MAP	- Management Action Plan
MCS	- Minor Conveyance System
MDA	- Mass Drug Administration
MI	- Minor Irrigation
MLD	- Million Litres per Day
MMR	- Maternity Mortality Rate
MOU	- Memorandum of Understanding
MPEDA	- Marine Product Export Development Agency
MSL	- Mean Sea Level
MSW	- Municipal Solid Waste
MT	- Metric Tonne
MU	- Million Units
MW	- Mega Watt
NABARD	- National Bank of Agriculture and Rural Development
NATPAC	- National Transportation Planning and Research Centre
NCB	- Northern Clay Belt
NFS	- Non Farm Sector
NGO	- Non Governmental Organisation
NH	- National Highway
NH ₃	- Ammonia
NHDP	- National Highways Development Project
NHED	- Nutrition and Health Education
NHG	- Neighbourhood Group
NOx	- Nitrogen oxides
NPE	- National Policy on Education
NPS	- Non Priority Sector
NSDP	- Net State Domestic Product
NSS	- National Sample Survey
NWDP	- National Watershed Developmental Programme
OPD	- Out Patient Department
OPS	- Other Priority Sector
PACS	- Primary Agricultural Co-operative Society
PCARDB	- Primary Co-operative Agriculture and Rural Development Bank
PCI	- Per Capita Income
PCRWSS	- Protection of Catchments of Reservoirs in Water Supply Schemes

PG	- Post Graduate
PHC	- Primary Health Centre
PHD	- Public Health Division
PM	- Particulate Matter
PRIs	- Panchayat Raj Institutions
PVC	- Polyvinyl Chloride
PWD	- Public Works Department
RAIC	- Regional Artificial Insemination Centre
RMO	- Resident Medical Officer
RNTCP	- Revised National TB Control Programme
RRB	- Regional Rural Bank
RWSS	- Rural Water Supply Scheme
SAMIS	- Service Area Monitoring and Information System
SAT	- Spatial Analysis Team
SC	- Scheduled Caste
SCB	- Southern Clay Belt
SCR	- Selective Catalytic Reduction
SFCK	- State Farming Corporation of Kerala
SH	- State Highway
SIDCO	- Small Industries Development Corporation
SNCR	- Selective Non-Catalytic Reduction
SOx	- Sulphur oxides
Special TAC	- Special Technical Advisory Committee
SSI	- Small Scale Industries
SSLC	- Secondary School Leaving Certificate
ST	- Scheduled Tribe
T.S. Canal	- Trivandrum – Shornur Canal
TCPO	- Town and Country Planning Organisation
TEAP	- Tsunami Emergency Assistance Programme
TEPS	- Thenmala Eco Tourism Promotion Council
TRKL	- Tourist Resorts Kerala Limited
TSVS	- Theera Samrakshana Vanavalkarana Samithy
TTI	- Teacher Training Institute
UNICEF	- United Nations International Children's Educational Fund
UPS	- Upper Primary School
VCB	- Vented Cross Bar
VHSC	- Vocational Higher Secondary Course
VIL	- Velocity of Internal Lending
VOC	- Volatile Organic Compounds
VSS	- Vana Samrakshana Samithy
WHO	- World Health Organisation
WHO	- World Health Organisation
WSS	- Water Supply Scheme
WTTC	- World Travel and Tourism Council



Chapter 1

Methodology of Preparation of Local Development Plans and Integrated District Development Plan

1. Introduction

As per Article 243 ZD of the Constitution, every State shall constitute a District Planning Committee (DPC) to consolidate Grama Panchayat / Municipality plans in the District and to prepare a Draft Development Plan for the District as a whole. It also specifies that while preparing the Development Plan, due regard shall be given to matters of common interest between the Grama Panchayats and Municipalities, including spatial planning, sharing of water and other physical and natural resources and the integrated development of infrastructure and environmental conservation.

As per section 175 of the Kerala Panchayat Raj Act, a long-range development plan for each Grama Panchayat is to be prepared giving importance to spatial planning. As per section 51 (3) of the Kerala Municipality Act, 1994 the Municipal Corporations shall

prepare a long-range Master Plan and submit it to the District Planning Committees. This clearly indicates why spatial planning is regarded as the essential tool in any planning process.

Therefore, steps were taken to introduce spatial approaches into the system so that a Development Plan is prepared at every local self government institution level in order to strengthen the process through a comprehensive rather than a piece-meal approach. The Development Plans prepared for the Local Self Government Institutions are termed as Local Development Plans (LDP) and Development Plan prepared for the district as a whole is termed as an Integrated District Development Plan (IDDP).

District Planning Committee (DPC) of Kollam has taken up an initiative in this regard. The DPC has conceptualized a project for the preparation of Integrated District Development Plan for the District

and Local Development Plans for all the Local Self Government institutions of the District with the technical support of the District office of the Town and Country Planning Department. The project was submitted before the State Government and Government gave approval to start the project in the District as a pilot project [G.O(Ms)/62/03 Planning, Thiruvananthapuram Dt: 01-08-03].

2. Components of LDP

The Local Development Plan consists of:

- I A Perspective Plan for 15-20 years, comprising of
 - ™ A Policy Plan
 - ™ Spatial strategies for optimum utilization of resources
 - ™ Infrastructure plan
- I An Execution Plan for 5 years, comprising of
 - ™ Strategy for development – incorporates physical, social and economic dimensions
 - ™ General land use plan

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- ™ Infrastructure plan
- ™ Sectoral strategies for integrated development
- ™ Development code

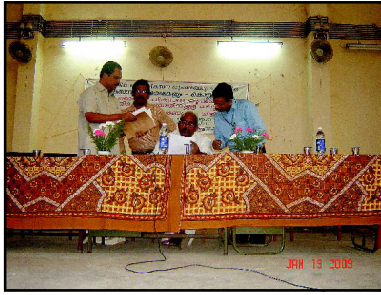
3. Components of IDDP

The Integrated District Development Plan consists of:

- I A Perspective Plan for 15-20 Years
 - ™ Settlement pattern giving hierarchy and functions of settlements
 - ™ District level policies and strategies for integrated development
 - ™ Regional infrastructure plan
- I An Execution Plan for 5 Years
 - ™ Strategy for integrated development
 - ™ Transportation network
 - ™ Location criteria for services and facilities
 - ™ Specific projects to be implemented at block and local levels

4. Concept of the Plan preparation process

The process of preparation of these two plans (LDP and IDDP) is sequentially linked and the plans are prepared in an integrated manner. Draft Local Development Plans are prepared first. Then, the Integrated Development Plan for the District is prepared. Afterwards, the Draft Local Development Plans are modified and finalized based on the Sanctioned Integrated District Development Plan (Figure 1.1).



Release of the Guideline for the preparation of LDP on 19.01.2009

Clearly, the process starts with the collection of data and moves almost in parallel for both the plans up to the analysis stage. The data and the results of the analysis for the preparation of LDP for each Local Self-Government Institution is an input for the preparation of Integrated District Development Plan. Later on, based on suggestions and proposals of the Sanctioned Integrated District Development Plan, the Local Development Plans are modified and finalized. Actually the concept of this process is based on a combination of top-down and grass-root approach wherein policies and strategies flow down wards, while plans, programmes and projects are conceived and implemented at grass root level which can be integrated to obtain the desired spatial pattern at higher levels at any given point of time (National Commission on Urbanization, 1988).

5. Organizational Set Up for the Preparation of LDP and IDDP

District Planning Committee (DPC), constituted under 74th Constitutional Amendment Act, is the apex body for the preparation of these Development Plans with the Department of Town and Country Planning acting as the nodal agency (Figure 1.2). A coordination committee is formed at district level consisting mainly of elected political heads of Local Self Government Institutions (LSGIs), for activating the preparation of LDP in each LSGI.

For the preparation of LDP, respective Grama Panchayat Committee /Municipal Council is the apex body. Eleven Working Groups, namely agriculture, industries, poverty reduction and social security, schedule caste and tribe, health, education, infrastructure, environment, financial resources and watershed development, will be attending the data collection and the brief analysis of the collected data for the LDP. Working Groups consists of elected representatives, government officials, NGOs etc. A core committee of selected members of these Working Groups viz. Spatial Integration Committee (SIC) is constituted for each LSGI. This committee has a key role in the preparation of LDP and has the overall responsibility right from data collection to report writing. Therefore a graduate engineer is

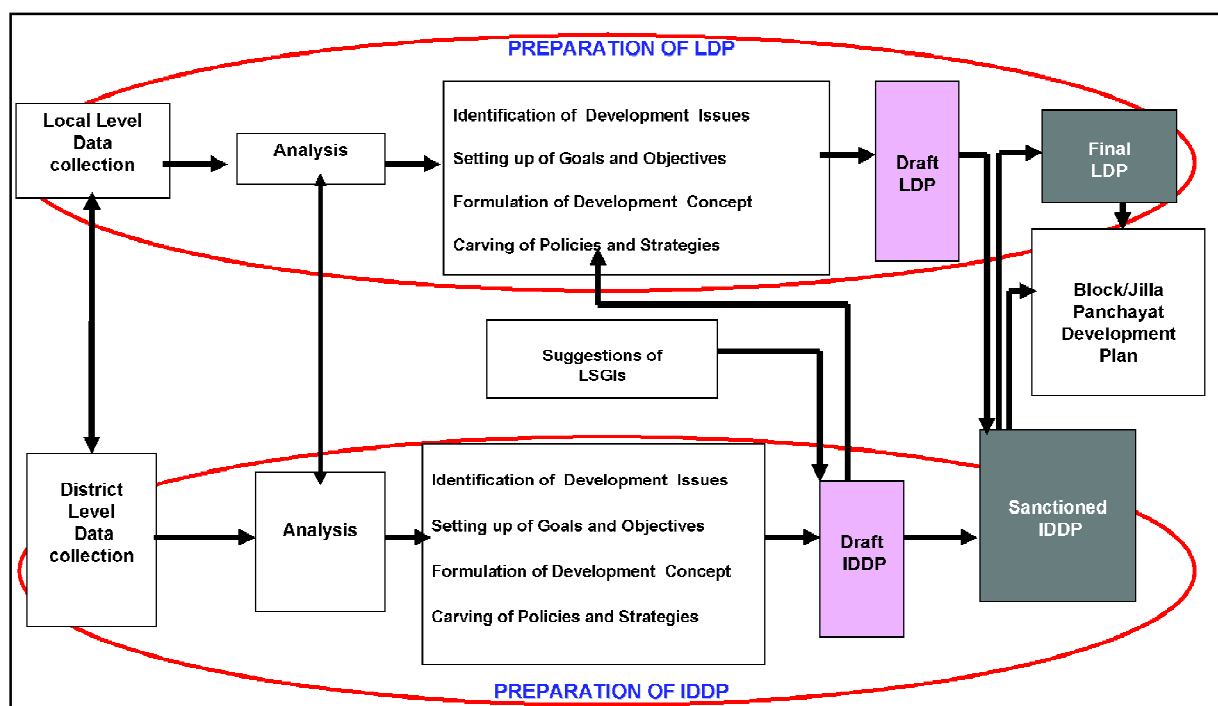


Fig. 1.1 General planning process for preparation of LDPs and IDDP

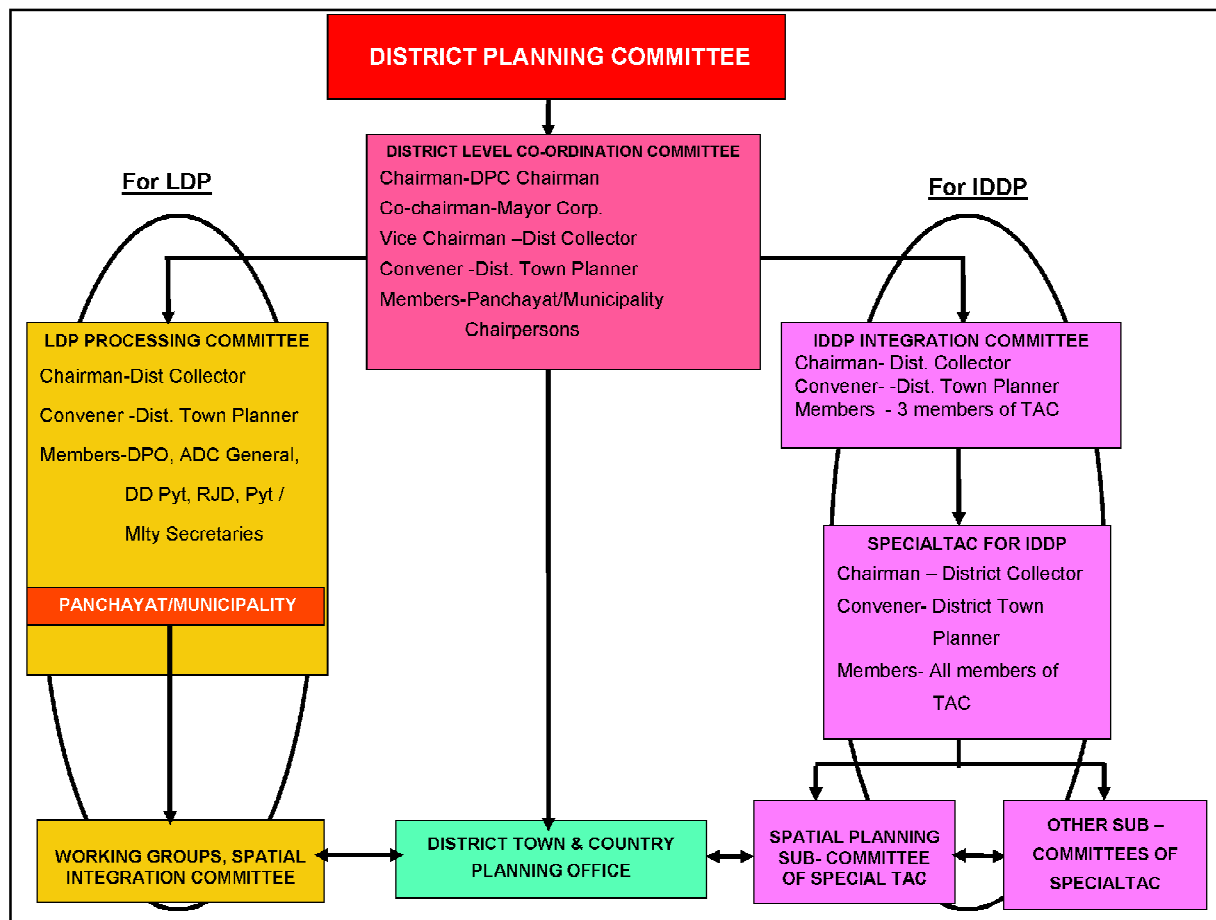


Fig 1.2 Organisational Setup for preparation of IDDP and LDP

appointed by the respective LSGI to assist the SIC who is designated as Engineering Trainee. In addition to that a Resource Person for each LSGI has to be identified to act as a spokesman of spatial planning. In order to coordinate the process of preparation of LDP at District level, an LDP Processing Committee is functioning with the official heads of LSGIs as members (Secretaries) under the chairmanship of the District Collector.

For the preparation of IDDP, the District Level Technical Advisory Committee (DLTAC) is specially constituted. This Special TAC has 19 Sub committees with a DPC member as Chairman, District Level head of line department as Convener and other officials, retired officials, NGO's, representatives of research and educational institutions etc. as members. The Sub Committees of Special TAC are 1. Agriculture 2. Irrigation 3. Watershed Development and Land Use 4. Forest, Environment, Mining and Geology 5. Animal Husbandry and Diary Development 6. Fisheries 7. Industries, Co- operation, Trade and Commerce 8.

Infrastructure (Roads, Bridges, Housing) 9. Health 10. Drinking Water and Sanitation 11. Education 12. Finance 13. Social Welfare, Women and child development 14. Poverty Alleviation and Rural Development 15. Power and Tele Communications 16. Scheduled Caste and Schedule Tribe Development 17. Tourism, Culture, Sports and Youth Affairs 18. Human Resources Development and 19. Spatial Planning.

Spatial Planning Sub Committee of Special TAC is the key committee of the whole project of preparation of LDP and IDDP and act as the implementation committee of the project. A core committee (IDDP integration Committee) is also constituted from Special TAC for validation of suggestions of the Special TAC.

A Spatial Analysis Team (SAT) is constituted with planners from the Town and Country Planning Department as members. The technical support of the Department for the preparation of LDP and IDDP is given through the SAT. SAT members are associated with the spatial analysis of each LSGI and they are also

members of the Special TAC constituted for the sectoral studies. SAT is also entrusted with task of preparing manuals, hand outs, methodology of analysis etc. needed to smoothen the process of spatial analysis of both LDP and IDDP.

At the State Level, a Steering Committee headed by the Chief Town Planner, functions in Town and Country Planning Department for the monitoring of both the LDP and IDDP. State Level Expert Committee chaired by Government Secretary of LSGD (Urban) with the Chief Town Planner as Convener monitors the project at the State level and gives directions for the preparation of LDP and



State Level Expert Committee meeting on 17.10.2005

1



Land use map handing over function

IDDP. Other members of this Committee are Member Secretary of State Planning Board, Government Secretary LS GD (Rural), and Four expert members nominated by the Government.

6. Preparation of the Plans

A. Preparation of Draft LDP

1. Data collection is done by each Grama Panchayat/ Municipality. Physical Survey and Socio-economic Survey are the two primary surveys and are conducted through local surveyor trainees selected by respective LSGI under the supervision of the engineering head of LSGI and engineering trainee after receiving technical training from Town and Country Planning Department. Secondary data collection is entrusted with the Working Group of the respective LSGI. Discussions of working groups with the stakeholders are a special activity for data collection. In order to ensure grass-root level participation, a Grama/Ward Sabhas are conducted at LSGI level and the suggestions are compiled.

2. Physical Survey is done in cadastral maps (scale 1:5000) and fed into Arc Geographic Information System (GIS) format. The Socio-Economic survey is carried out by systematic sampling technique with 10% sample. Both primary and secondary data are systematically compiled in formats and entered in Microsoft Access and finally linked to the GIS. Further, all existing planning documents like development reports, five year plan documents, Grama/ Ward Sabha suggestions, summary of discussions with stakeholders etc., are compiled in systematic formats.

3. Two analyses are done using the above data. Analysis done by the Spatial Integration Committee is named as Local Level Analysis mainly for

finding local development requirements with emphasis on people's aspirations. The analysis done by the Town and Country Planning Department is named as Spatial Analysis mainly for finding the development issues with emphasis on synergic spatial linkages.

4. An integrated finding of both the analysis will result in identification of development issues, followed by planning concept, policies and strategies and finally Draft LDP, which are formulated jointly by Town and Country Planning Department and Spatial Integration Committee. The findings from the IDDP analysis is another input for the identification of development issues of the LDP. Simultaneously analysis and findings of Draft LDP will be an input for the preparation of IDDP.

B. Preparation of IDDP

There are basically four main stages involved in the preparation of an Integrated District Development Plan. They are:

1. Preparatory Works
 - = Preparation of the base map of the district
 - = Preparation of checklist for secondary data collection and collections of other relevant materials, etc.
2. Data Collection and Compilation
 - = District level secondary data collection through Special TAC and various departments.
 - = Data Compilation and feeding the data into the computer and linking with the Spatial data in GIS format
3. Analysis

In the preparation of IDDP also, two types of analyses are done: (a) Sectoral analysis done by various Sub Committees of Special TAC and (b) Spatial Analysis done by the Department of Town and Country Planning. Analyzing the past trend



Spl. TAC General body meeting on 24.01.05 at Jilla Panchayat



Discussion of Agricultural Sub committee of Special TAC, IDDP-LDP Project Office

of development of the sector, study of present scenario, identification and prioritization of problems and potentials, identifications of solutions of problems and enhancement of potentials, evaluation of ongoing/ committed projects and programmes, formulation of sectoral policies and suggestions, etc. are some of the assignments in the Sectoral analysis.



Inaguration of Workshop on sectoral analysis by Hon. Labour Minister Sri. P.K. Gurudasan, 27.07.2006

Whereas the study of the settlements with respect to population, population distribution, hierarchy of settlements, land use analysis, occupational structure are included in the spatial analysis. The spatial analysis is done by the Spatial Analysis Team using GIS.

4. Plan Formulation

The analysis is followed by identification of development issues, setting up of goals and objectives, developing planning concept and formulating policies and strategies. A report incorporating the analysis, findings, concept, development policies and sectoral programmes and projects is prepared namely Draft Preliminary IDDP. At the stage of identification of development issues and formulation of planning concept, general direction of growth of the district will be arrived. Based on this general direction of growth, the development policy of each sector is formulated and the strategies carved from sectoral policy will act as a



Presentation of Development Concept before District Collector, DPC and Special TAC 30.09.06, Guest House, Kollam

guideline for identification of the sectoral proposals.

Draft Preliminary IDDP will be presented before an Expert Committee whose members shall be persons invited by the DPC and the general body of the Special TAC and IDDP Integration Committee, who shall finalize the plan. Further Special TAC will detail proposals based on the validations of the IDDP Integration Committee and thus Preliminary IDDP will be formulated. The Preliminary IDDP will again be discussed among the public through a Development Seminar conducted at the district level and modified if required and the modified plan will be placed before the DPC for approval. The plan approved in the DPC will be the draft IDDP. Finally the Draft IDDP will be forwarded to the Government for sanctioning.

C. Preparation of Final LDP

Processes involved for the final LDP are given below:

- = Modification of draft LDP based on sanctioned IDDP.
- = Modification of the Draft LDP based on the development seminar.
- = Sanctioning of LDP by the DPC

7. Uniqueness

The preparation of LDP and IDDP is having the following uniqueness.

- = Both LDP and IDDP are prepared based on spatial planning approach. This ensures integration of various development sectors over a space (An LSGI in the case of LDP and District as a whole in the case of IDDP). The integration of various sectors is performed taking into account the specialties in social, physical and economic aspects of the space, over which the sectors are integrated. This

ensures the best and optimum utilization of land, the most valuable resource in the planning area.

- = Both IDDP and LDP are prepared based on top down grass root up approach. The data collection, analysis and local level proposals are carved at the grass root level which is later modified, if necessary, based on the policies deriving at a higher level i.e. at the district level while preparing the IDDP. At the same time the policies at the higher level are formulated taking in to account the proposal at the lower level (LSGI level).

- I All the development partners like technocrats, politicians, NGO's, Government Departments, common man and other decision makers are involved in the process of preparation of LDP and IDDP.

- I State of the art technology – GIS, GPS, satellite imagery to name a few – are utilized in the preparation of LDP and IDDP.

- I The beauty of the decentralized planning system is also seen in the funding pattern adopted for the project of preparation of LDP and IDDP. The project was initiated by DPC, Kollam conceiving as a joint project of all the LSGIs of the district. All LSGIs of Kollam district allocated fund for the project from their Tenth and Eleventh



Workshop on LDP on 23.01.2008, YMCA, Kollam

Five Year Plan allocation.

8. Kollam Experience

The process of preparation of IDDP and LDP started in Kollam District in August, 2003. The first one and half years of the project was spent for conducting training programmes for the various stakeholders of the project and primary data collection at the Grama Panchayat and Municipality level. Training programme was conducted for about 12000 stakeholders ranging from



Inaugural training programme for SIC members on 20.10.2003, Chittumala, Kollam

DPC members to NGO's at the Grama Panchayat level. This created awareness about the process of preparation of LDP and IDDP among the stakeholders which is inevitable for the success of the project. As a part of the primary data collection, land use survey on survey number basis (cadastral level) was conducted in the 69 Grama Panchayats and 3 Municipal councils of the District. Socio-Economic survey was conducted in about 70000 units comprising households and other



Training programme to resource persons of LSGIs, 29.12.03 and 30.12.03, TMV Hall, Kollam

occupancies of the district. GPS survey was conducted in all the LSGIs of the District (presently there are 71 Grama Panchayats). Both land use data and socio-economic data were entered in to the computer format for analysis in GIS.

As a part of the preparation of LDPs, two model LDPs that of Paravoor Municipality (urban) and Pooyappally (rural) Grama Panchayat prepared and reports on Local Level Analysis of majority of (68 out of 72) the LSGIs have been prepared. A Guideline (Govt. Circular No. 71810/2008/LSGD dated 29.11.2008) for the preparation of remaining LDPs has also been prepared.

Regarding the preparation of IDDP, both the Perspective Plan and the Execution Plan and an Executive Summary have been completed and District Planning Committee has approved the Integrated District Development Plan (Draft) report on the meeting held on 06.06.2009.



Chapter 2

History and Regional Setting

Kollam is a southern coastal district of Kerala situated approximately 70 Km north of Thiruvananthapuram. During the 19th Century, Kollam was one of the most developed industrial and commercial centers of the State having a rich history. In this chapter the historical background and the physical setting of the District with respect to the near by important settlements are described.

1. Historical Background

Kollam is a historically important place from the ancient period itself and had direct trade relations with foreign countries. Arabs, Chinese, Phoenicians, Greeks and Romans traded with Kollam from time before Christ. There is a difference of opinion among the historians about the origin of the name Kollam. However the most accepted version is that the name originated from word 'Kolam' which means

in Sanskrit, the pole in which the traditional ferries were tied and hence it can be presumed that the word Kollam stands for port town. Kollam has got its historical importance because of its trade relationship with foreign countries, variety of agricultural produces and as an administrative capital.

Kollam had trade relation with China from the ancient period itself. There had been numerous buildings constructed in Chinese style in Kollam. The present Chinnakkada itself was a Chinese settlement then known as "Chinnakkadai". It is believed that the names 'China chatty', 'China Bharani' and 'China vala' are examples of the relationship that Kollam had with China.

The beginning of 'Kolla varsham' (traditional calendar) is a proof to the importance got to Kollam during the ancient period. As per the historians, it was the

Travancore King Udaya Marthanda Varma who began the 'Kollavarsham'. This traditional calendar has got its name Kollavarsham because it started from Kollam.

Another era in the development of Kollam started with entry of Portuguese in the trade relationship with Kollam in 1503. Pepper was the main agricultural product exported from Kollam to Portugal. The Portuguese constructed a port at Tangassery in Kollam.

In 1661, the Dutch defeated the Portuguese and established their base here. They constructed churches and altars in various parts of the District. It was Raja Marthanda Varma who defeated Dutch at Kulachal in 1741 and that was the end of the traditional relationship of Dutch with Kollam. Kollam became a part of Venad under Raja Marthanda Varma.

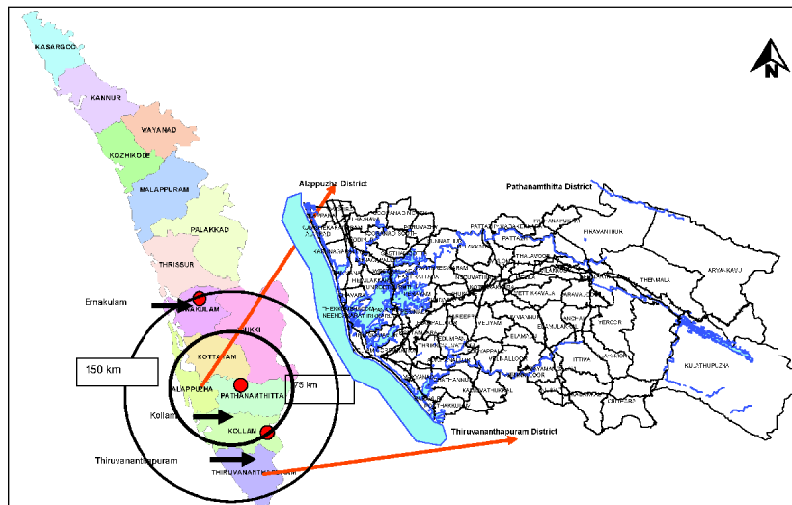


Fig 2.1 : Regional setting of Kollam District

The modern history of Kollam begins from this period. It was during the dynasty of Marthanda Varma, the first land survey was conducted in Kollam. During this period, big ware houses were constructed along with the construction of the canal connecting Edava Kayal, Paravur Kayal and Ashtamudi Kayal.

During the period of Veluthampi Dalava, Kollam was the administrative Capital of

was raised to the status of a Junction. The construction of a new Civil Station was also completed in this year. In 1921, Kollam became a Municipality and in 2000 it was upgraded into the status of a Corporation annexing the surrounding 4 Grama Panchayats.

2. Regional Setting

Kollam is situated on the south west coast of Kerala between 9° 28' and 8° 45'

Thiruvananthapuram, the capital of Kerala and 155 Km south to Ernakulam, the commercial capital of the State. Kollam is connected to Ernakulam and Thiruvananthapuram by both Road and Rail. Fig 2.1 shows the regional setting of Kollam District.

3. Connectivity

The district has comparatively good regional connectivity due to the two National Highways (NH-47 and NH-208) having a length of about 135-km within the district, and the railway route network with Kollam as the railway junction. Another new National Highway (NH – 220) is proposed from Kollam to Theni in Tamilnadu. Earlier, water way was the major transport mode of the district due to the presence of T.S canal, backwaters, Kallada River, Ithikkara River and Achankovil River. Due to encroachment and silting, the T.S canal is presently not in use. But with the declaration of section of West Coast canal between Kottapuram and Kollam as National Waterway No.3, it is expected that this waterway also will get importance in due course of time. Fig 2.2 shows the regional connectivity of the District.

Broadly, the transport network structure in the district has two major corridors, with road and railway routes running parallel to each other. First, is the North-South Corridor connecting Thiruvananthapuram and Alappuzha, running parallel to coastline and passing through Kollam. The second corridor runs through center of the district and connects Kollam to Shenkottah and acts as a main spine of traffic movement in the district. Chinnakkada is the first order commercial node of the District whereas, Punalur, Kottarakkara, Karunagappally are the second order commercial centers of the District.

4. Conclusion

It can be concluded that Kollam District is connected to other parts of the State and the Country through two modes of transport, rail and roads. The waterway, which was once the major mode of transport of the district, is in an abandoned state now. The nearest airport of the district is the International airport at Thiruvananthapuram at a distance of 71 km.

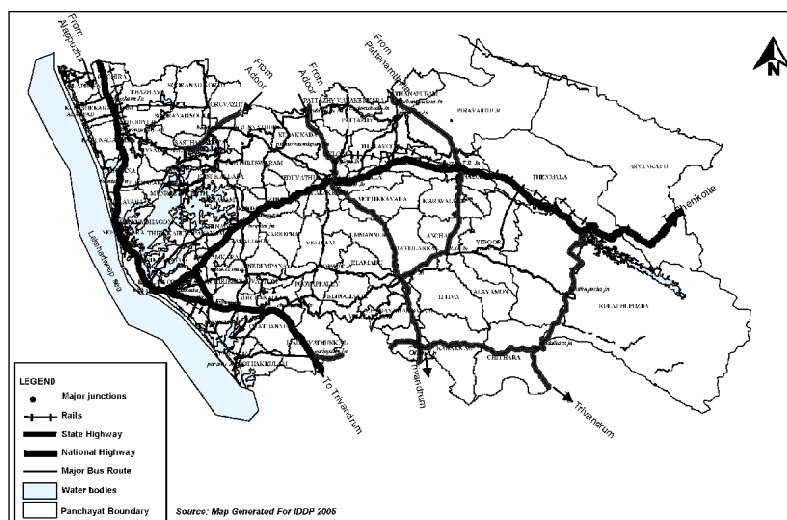


Fig 2.2 : District map showing the road and rail net work, important junctions etc.

Travancore and till 1830 Kollam was the capital of Travancore.

The Kollam-Shenkottah Railway line opened in 1904, gave big boost to the commercial and industrial development of Kollam. With the opening of Kollam - Ernakulam line in 1958, the Town Station

latitude and 76° 28' to 77° 17' north longitude. Kollam District is bounded on the north by Alappuzha and Pathanamthitta districts, east with Western Ghats bordering Tamil Nadu, South by Trivandrum District and west by Lakshadweep Sea.

It is placed 71 Km North to



Chapter 3

Profile of the District

In this chapter the District is described for its physiography, administrative divisions, general land utilization pattern, socio economic aspects, and physical features.

1. Administrative divisions

The District has five taluks; namely Kottarakkara, Kunnathur, Pathanapuram, Karunagapally and Kollam. The spatial distribution of the taluks is shown in Figure 3.1.

The villages coming under each Taluk is given in Annexure -1. The name of the Taluk and Taluk head quarters are shown in Table 3.1.

The District has 13 block Panchayats, two municipal councils and one Corporation. The name of the block Panchayats, block head quarters and block wise distribution of the population are shown in Table 3.2. The spatial distribution of the Block Panchayats are shown in Figure 3.2.

The 13 Block Panchayats are divided in to 71* Grama Panchayats, the list of which is given in Annexure 2 and the spatial distribution is shown in Figure 3.3.

(* Though during the year 2005, Chathannur and Kadackal Grama Panchayats were divided and two Grama Panchayats viz. Chirakkara and Kummil

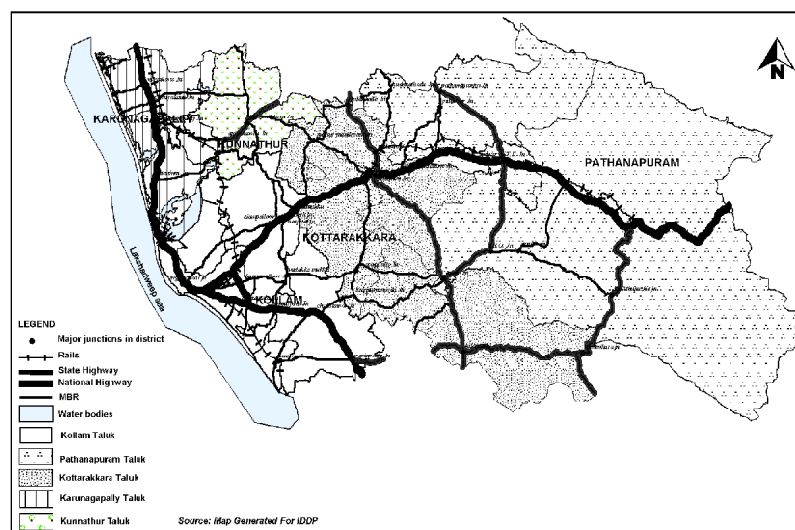


Fig. 3.1: Taluks - Kollam District

Table 3.1: Taluks and Taluk head quarters

Name of Taluk	Taluk Head Quarters
Karunagapally	Karunagapally Jn.
Kunnathur	Sasthamcotta Jn.
Pathanapuram	Pathanapuram Jn.
Kottarakkara	Kottarakkara Jn.
Kollam	Taluk Office Jn., Kollam

were formed respectively and the number of Grama Panchayats was increased from 69 to 71. Since data pertaining to the newly formed Grama Panchayats are not available, only 69 no. of Grama Panchayats are taken for the study purpose.)

2. Topography and physical features

Physiographically, the district has five



Fig 3.3: Spatial Distribution of the Grama Panchayats/ Municipalities

Table 3.2.: Block Panchayats and their head quarters

Sl.No	Name of Block Panchayat	Population 2001	Locations of Block Panchayat Head Quarters	Name of the Grama Panchayat where Block Panchayat HQ situated
1	Chittumala	125680	Chittumala	East Kallada
2	Kottarakkara	166828	Kottarakkara	Kottarakkara
3	Vettikkavala	190011	Vettikkavala	Vettikkavala
4	Itthikkara	208430	Chathannoor	Chathannoor
5	Mukhathala	172605	Mukhathala	Thrikkolvattom
6	Anchalumoodu	62964	Anchalumoodu	Thrikkadavoor
7	Pathanapuram	164903	Pidavur	Thalavoor
8	Anchal	219553	Agasticode	Anchal
9	Chadayamangalam	222058	Elavakkodu	Chadayamangalam
10	Oachira	130589	Changankulangara	Oachira
11	Karunagapally	154920	Edakkulangara	Thodiyoar
12	Chavara	164397	Chavara	Chavara
13	Sasthamcotta	154679	Cinemaparampu, Poruvazhy	Sasthamcotta

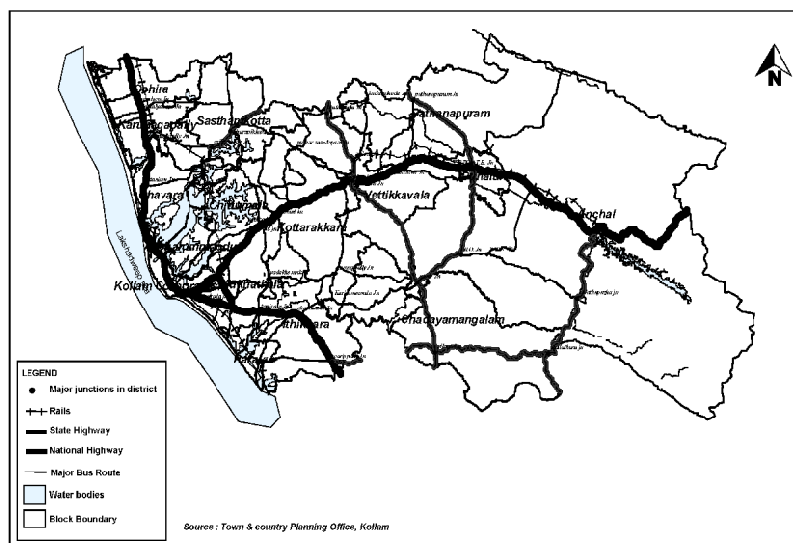


Fig. 3.2 :Block Panchayats - Kollam District

divisions including low land, mid land, mid-up land, up land and high lands, (Figure 3.4). Kottarakkara Taluk lies completely in the midland region whereas Kunnathur and Pathanapuram taluks lie in high land and up land regions.

Karunagapally and Kollam taluks lie in midland and low land regions. The district level analysis of topography and relief reveals that over 10% of the district lies in the low lands and 39% of the total district lies in the mid lands and the mid-up land consist of 28%. The up land consists of about 18% of the total geographical area of the District. Over 7% of the district falls under high land. Anchal block largely constitutes the high land and up land category. This block also covers the maximum forest area of the district and the density of population is also very less in the high lands.

Physical features of the District is comprised of Natural Sub-Divisions, Climate, Mountains, Rivers & Lakes and backwaters.

a) Natural Sub-Divisions:

The Kollam district may be categorized as the most representative districts of the State as it possesses most of the natural assets that the State has. The region has one large backwater (popularly called as Ashtamudi Kayal), dense forests, reserve forests and three rivers (Itthikkara Arr, Kallada river and Achankovil River).

b) Climate :

The district has a tropical humid climate with an oppressive summer and plentiful rainfall. The hot season March to May is followed by South West Monsoon from June

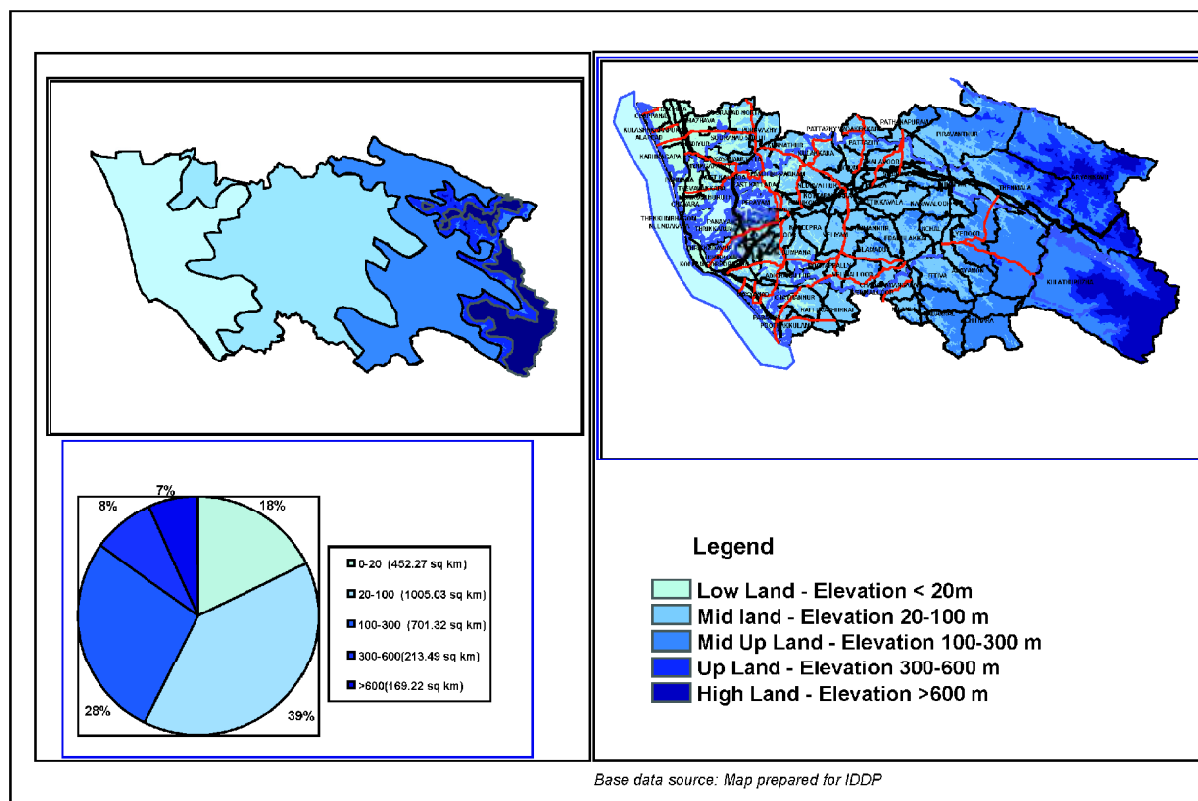


Fig 3.4 : Physiographical divisions of the District

to September. October - November form the post monsoon or retreating monsoon season. The period from December to February is the North West monsoon, with the rains associated with it easing by about the end of December and the temperature of the period being generally high.

c) Mountains :

The Western Ghats which separate the district from the Tamil Nadu consist of several ridges and hill plateaus which diminish in altitude towards the coast. The chief hill-ranges in this district are Kulathupuzha hills, Aryankavu hills, Achankoil hills and Sabarigiri hills. The altitudes of peaks in these hills vary from 1500 M. to 1900 m.

d) Rivers :

The Achankoil River which is a tributary of Pamba, the Kallada river and the Ithikkara river are the three important

rivers in Kollam. Figure. 3.5 shows these rivers.

The Achankoil River originates from Achankoil hills and flows through Kunnathur Taluk in Kollam district and flows through Mavelikara, Thiruvalla and Karthikappally in Alleppey district. It joins with Pamba River near Viyapuram. It is 112 Km. long and is navigable for 64 Km. length. It also affords facilities for irrigation. The Kallada River flows through Pathanapuram, Kunnathur, Kottarakkara and Kollam taluks. It falls into Ashtamudi kayal a little north of Kollam Corporation. Its length is 112 KM of which 40 KM is navigable. The Ithikkara River (length 48 KM) rises in the hills near Madatharakkani and flows through Pathanapuram, Kottarakkara and Kollam taluks falls into the Paravur Lake.

e) Lakes & Backwaters :

The coast of the District is fringed with lakes. Canals have been constructed to link up the lakes. Paravur Kayal is small, but deep. The Ashtamudi kayal is 16 KM. long and 14 Km. wide at the extreme points, its area being 50 sq.km. There is also a smaller fresh water lake at Sasthamkotta in Kunnathur Taluk.

3. Regional Land use

The land use pattern exhibits the

characteristics of the district in terms of its growth, development and activity pattern. It also indicates indirectly the extent of land

Table 3.3 : Kollam District: Land Use Pattern by Category, 1998-2001 (Area in Ha)

Type of land use	Total area (sqkm)	%
Agriculture	992.75	39.33240887
Residential	712.76	28.23930269
Commercial	8.55	0.338748019
Industrial	8.35	0.330824089
Public and semi public	29.83	1.1818542
Park and opens pace	8.84	0.350237718
Transportation	24.34	0.964342314
Railway	1.76	0.069730586
Vacant	33.86	1.341521395
Water bodies	105.88	4.194928685
Forest	536.48	23.63232964
Total	2524	100

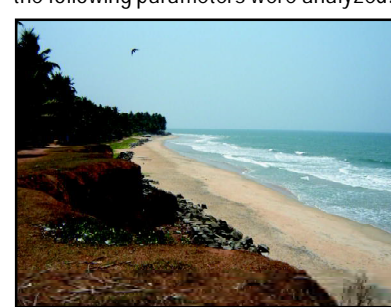
available for future development. The land utilization pattern of Kollam district is broadly classified under the categories listed in Table 3.3.

4. Socio-Economic Aspects

In the case of socio-economic aspects the following parameters were analyzed.



Hill valley, Thenmala



Paravoor coastal stretch

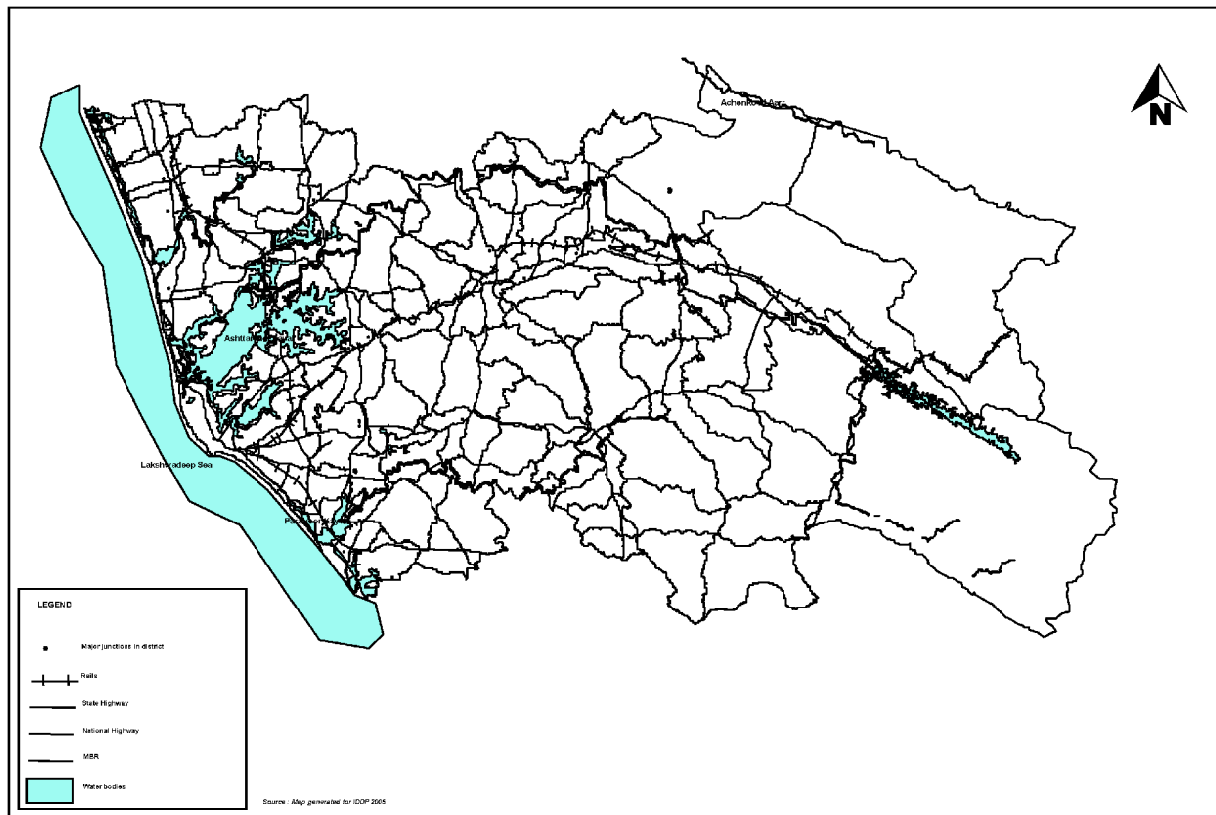


Fig. 3.5 : Spatial Distribution of the water bodies of Kollam District

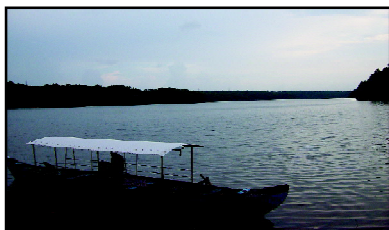


Kollam coastal area

- = Literacy rate (1991 and 2001);
- = Share of Work force (1991 and 2001);
- = Net State Domestic Product (1998) and
- = Per capita Income (1998).

a) Literacy Rate (1991-2001)

As per 2001 census, Kerala is the most literate state in India having a literacy rate of 90.92%. Inter-district analysis within



Sasthamcotta lake

Kerala reveals that the highest literacy is recorded in Kottayam district (95.9%) and the lowest is recorded in Palakkad district (84.3%). The literacy rate of Kollam is 91.49%, which is above state average. It occupies 8th position among the other districts

b) Share of Work force (WPR) (1991 and 2001)

The work force participation ratio (WPR) in Kerala has increased from 34.75% to 35.93% during 1991 to 2001. Kollam district recorded over 32% of WPR in 2001, which is below the state average and ranked at 10th position.

c) Net State Domestic Product (NSDP)

NSDP district wise distribution as factor cost shows that the Ernakulam district continues to have highest income at Rs.116944 lakhs in 2004-05 (Quick estimate at current prices), while lowest net domestic product was recorded in Wayanad district (Rs.210874 lakhs). The NSDP of Kollam district was Rs.703019 lakhs (7.86% of total NSDP of State) in 2004-05 and is ranked 5th in the State.

d) Per Capita Income (PCI)



Ashtamudi backwater

The per capita income of Kollam has increased from Rs.22230 in 2002-03 to Rs.26193 in 2004-05 with annual growth rate of about 8.2%. Compared to state average the PCI is below the state average (i.e., Rs.27048).

5. Conclusion

The physiography of the district deserves special mention as it has all the three divisions, namely high land in the eastern part of the district, mid land in the central area and low land on the western side adjacent to the Lakshadweep sea. The district has about 30% of its geographical area as forest mainly seen in the eastern part of the district



Chapter 4

Population

The Population parameter serves as the base in all the development endeavors. One of the objectives of all sorts of planning is providing maximum good for the maximum number of people. Hence it is imperative to analyze the population by studying the following parameters - size of population, its growth rate, population density, population concentration pattern migration details and population projection – which is described in this chapter.

1. Population size

Total population of Kollam district as per 2001 census is 2585064, which is 8.11% of the total population of the State and the District is placed in the 7th position as far as population size is considered.

A comparison of total population of the districts surrounding the Kollam district is shown in Figure 4.1.

The figure shows that when compared to the surrounding districts, Kollam is placed in the second position in population. The population size of only Thiruvananthapuram district is higher than that of Kollam.

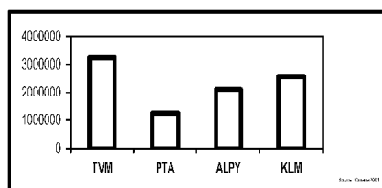


Fig 4.1 : Population size – Comparison with surrounding districts

The decadal variation in the size of population of the District over the last three decades is shown in Figure 4.2.

From the figure, it is clear that though there is an increase of about 2.5 lakhs population per decade from 1971 to 1991, the increase of population over the last decade is only 1.75 lakhs indicating a decline in the population growth rate of the district.

2. Growth rate of population

The distribution of the growth rate of population among the districts of Kerala in 1991 and 2001 is shown in Figure 4.3.

It can be seen that there is decline in the population growth rate of all the districts when compared to the previous decade (1991). The northern districts (Kasargode,

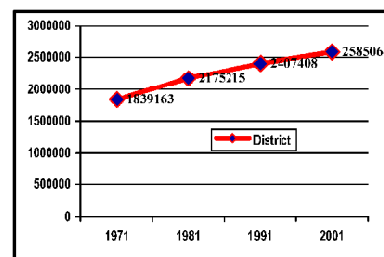


Fig 4.2 : Population size – temporal variation

Kannur, Wayanad, Kozhikkode, Malappuram and Palakkad) show higher population growth rate in 1991 and 2001.

Decadal growth rate of population of Kollam district is 7.38% as per 2001 census which is less than the average growth rate of 9.42% of the State. Among the surrounding districts of Kollam, only Thiruvananthapuram shows a higher growth rate of 9.78 % (Figure 4.4).

The temporal variation of the population growth rate of the district and its comparison with the State figures are shown in Figure 4.5. The figure shows that, the population growth rate of the district as well as that of state is declining.

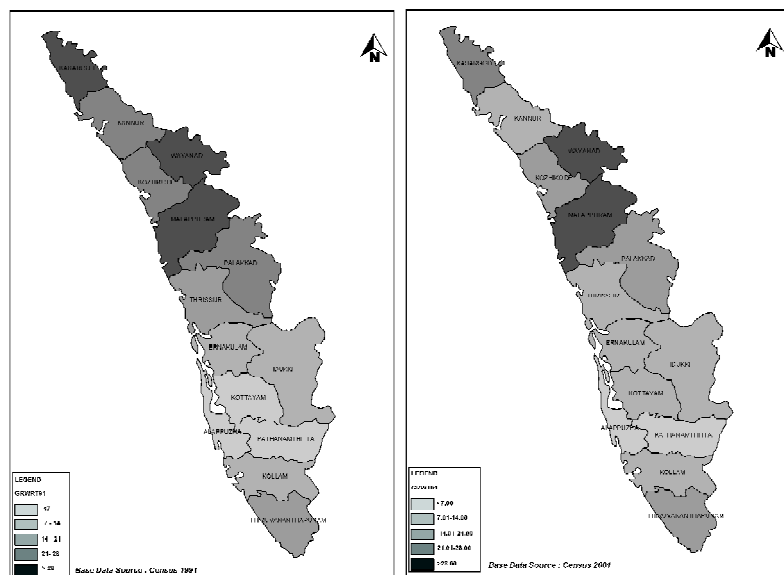


Fig. 4.3 : District wise distribution of population growth rate 1991 - 2001

The spatial distribution of the growth rate of population during last three decades is shown in Figure 4.6.

From the Figure 4.6 it is clear that the growth rates of population of all the local bodies of the district are declining from 1981 to 2001.

During 1981, the LSGIs in the coastal

plains and high land eastern region (Kulathupuzha, Thenmala, Aryankavu, Piravanthur and Yeroor) of the District had high population growth rate in the range of 15-21%, where as the LSGIs in central region shows a population growth rate of 12-15% only. The high population growth rate in coastal plains and high land eastern

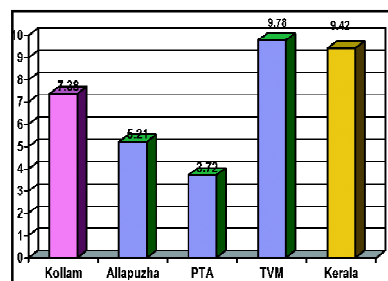


Fig 4.4 : Population growth rate comparison with surrounding districts

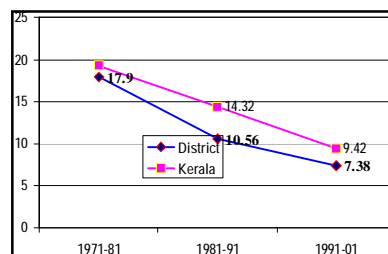


Fig 4.5 : Population growth rate Kollam-Temporal variation.

region may be due to the increase in fishermen population in the coastal region and migration of plantation laborers in to the eastern region from Tamilnadu. In other words this indicates the strength of

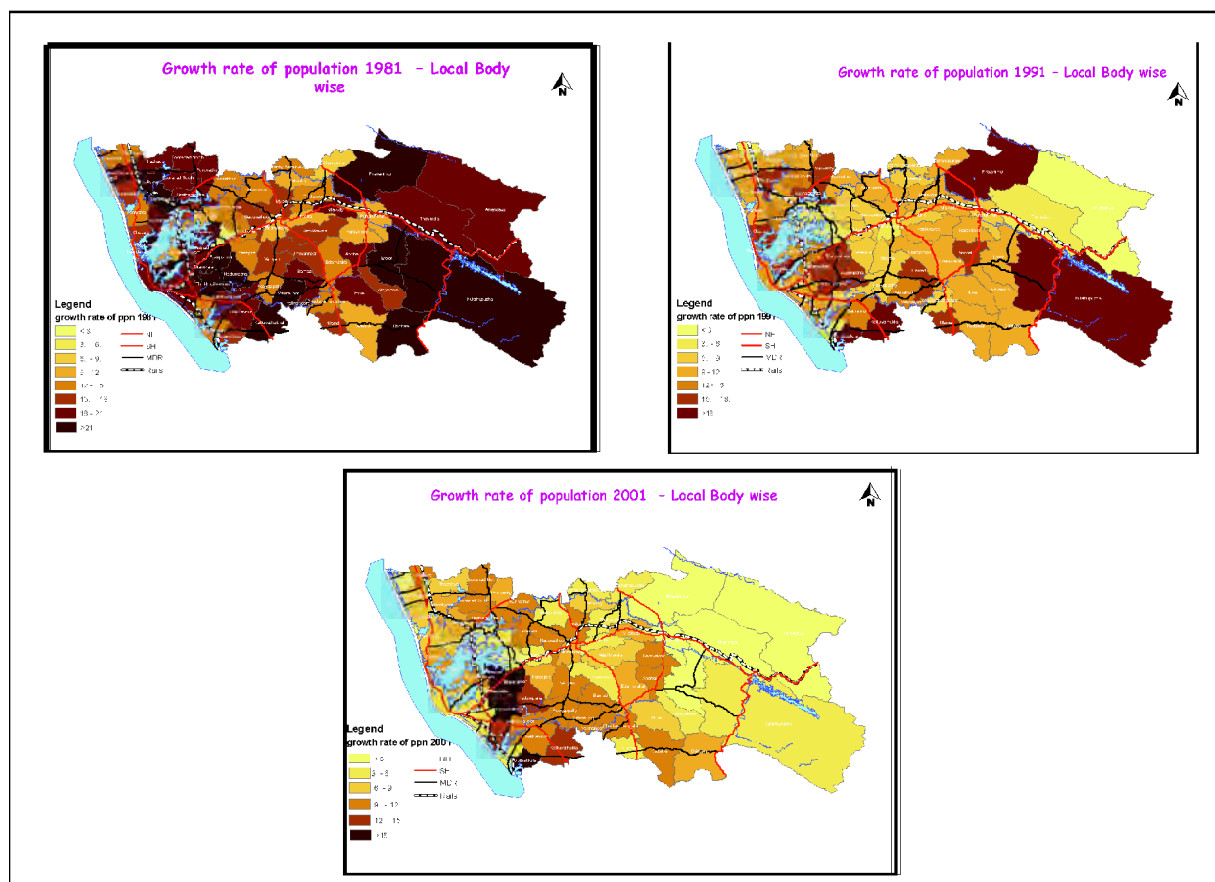


Fig 4.6 : Growth rate of population -LSGI wise distribution 1981, 1991, 2001

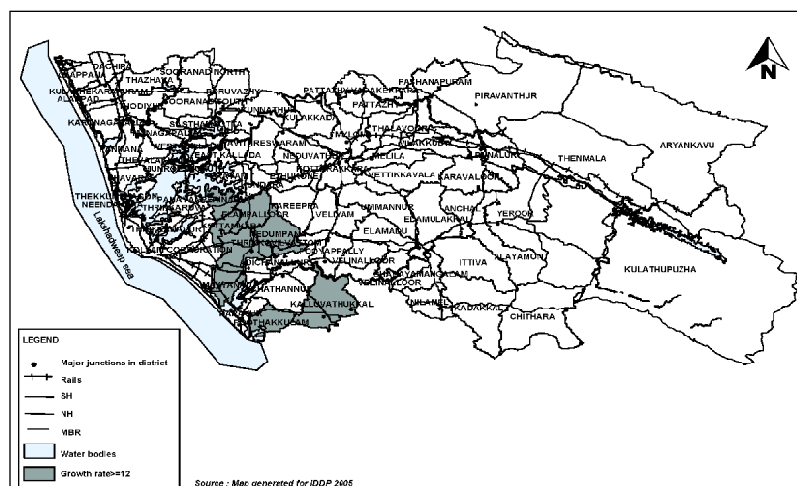


Fig 4.7: Local bodies with highest Growth rate of population

the economic base once existed in these region.

The spatial distribution of the growth rate of population during 1991 shows that the growth rate in the eastern region is comparatively (when compared to previous decades) less, (reduced to 11.45% from 18.21%) indicating possible reduction in the migration of Tamil laborers, due to declining of plantation works in the eastern region. This in turn indicates the weakening of the economic base of this area. It is to be noted that the population growth rate of the eastern region shows a further decline from 1991 to 2001 and is the lowest in the district now.

The spatial distribution of the growth rate of population during 2001 shows a definite spatial pattern. The population growth rate of eastern high land of the district shows the lowest growth rate of about 3%. The coastal region shows a growth rate of 6-9%, whereas the central region shows a population growth rate of 9 to 15%. The growth rate of population in the LSGIs adjacent to the urban local bodies (especially Kollam corporation and Paravoor municipality) shows higher growth rate (Figure 4.7) indicating possible out migration from the urban areas. At the same time, three Grama Panchayats (Mantrothuruth, Yeroor, and Aryankavu) show negative population growth rate indicating decline in the absolute population figures.

It can be seen that the population growth rate pattern of the Grama Panchayats in the central region (Kunnathur, Kulathupuzha, Pavithreswaram, Ezhukone, Kareepra,

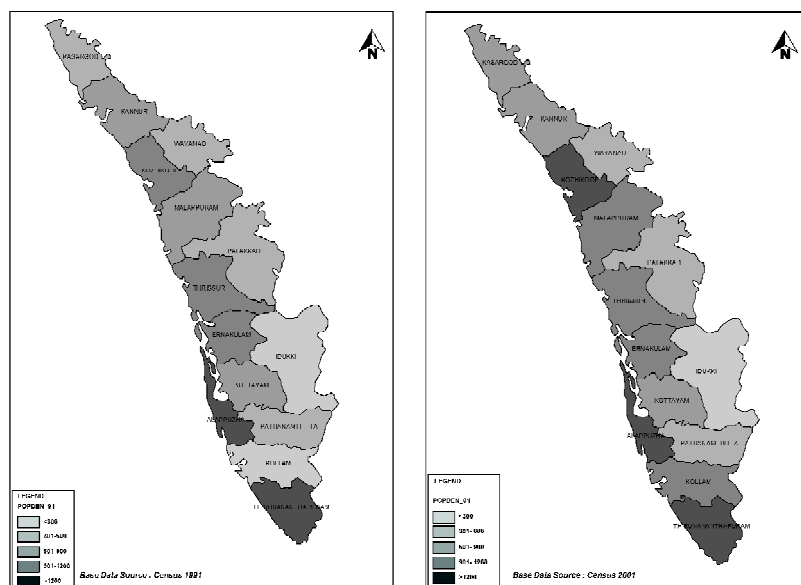


Fig 4.8 : District wise distribution of population density 1991, 2001

Veliyam, Pooyappally, Velinalloor, Elamadu, Ummannoor, Chadayamangalam, Nilamel, Ittiva, Kadackal, Alayamon, Anchal, Karavalloor, Vilakkudi, Melila, Thalavur, Pattazhy, Pattazhy Vadakkekara, Pathanapuram) of the district shows the same growth rate in the range of 9 to 15% from 1981 to 2001. This may be due to the fact that these areas depend on agriculture from early periods itself and there is not a sudden decline in the economic base of these local bodies.

3. Population density

Gross population density and net population density of the district are analyzed. Thus population density is calculated by dividing the total population with the geographical area, whereas the net population density is calculated by taking net area which is calculated by

subtracting the un-inhabitable areas like water body, forest, paddy and rubber plantation etc. from the geographical area.

Gross Population Density

A comparison of the gross population density among the districts in the State in 1991 and 2001 is shown in Figure 4.8.

It can be seen that, except in the Southern districts the gross population density increases during 1991-2001. The coastal districts show higher gross population density in 1991 as well as in 2001. The gross population density in the three southern districts, Thiruvananthapuram, Kollam and Alappuzha are the maximum.

The average gross population density

of Kollam is 1038 pp.sq. km. which is higher than the state average of 819 pp sq. km. The comparison of the population density with the surrounding districts is shown in Figure 4.9.

The gross population density of Kollam is less than those of Thiruvananthapuram and Allapuzha and greater than that of Pathanamthitta district.

The LSGI wise distribution of the gross population density of Kollam district is shown in Figure 4.10. It shows a clear distinction between the gross population density in the coastal region, central region and the eastern high land regions of the district. The gross population density of the LSGIs in the Coastal belt Panchayats are the highest (in the range of 3000- 6000 pp.sq.km.), whereas the gross population density of the central region is in the range

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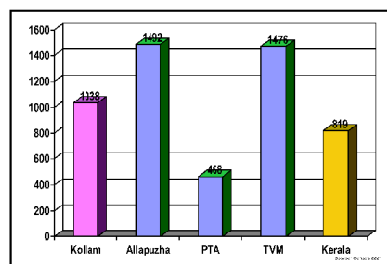


Fig 4.9 : Gross population density - Comparison with surrounding districts

of 1500- 3000 and that of the eastern hill region is less than 750 pp.sq.km.

Based on the range of population density, LSGIs of the district can be grouped into five as shown in Table 4.1.

Seven Grama Panchayats in the eastern high land region fall within the lowest density range group with minimum of 72 in Aryankavu Grama Panchayat whereas five coastal LSGIs including

Table 4.1 : Grouping of Local Bodies based on the range of gross population density

Range of Gross Population Density (ppn/sqkm)	Local Bodies	Range of Gross Population Density (ppn/sqkm)2	Local Bodies3
< 750	Alayamon	1500-2250	Perinad
	Ariankavu		Kizhakkallada
	Kulathupuzha		Kundara
	Thenmala		Chathannur
	Yeroor		Nedumpana
	Chithara		Poothakkulam
	Piravanthur		Clappana
750-1500	Punalur Municipality	2250-3000	Mynagappally
	Anchal		Thodiyoar
	Edamulackal		Ezhukone
	Karavallur		Kottarakkara
	Thirikkaruva		Elampallor
	Chadayamangalam		Oachira
	Elamadu		Thazhava
	Ittira		Vilakkudy
	Kadakkal		Karunagappally
	Nilamel		Panayam
	Velinalloor		Paravoor
	Thekkumbhagom		Thrikkadavur
	Mundrothuru		Panmana
	Perayam		Thevalakkara
>3000	Adichanalloor	>3000	Mayyanadu
	Kalluvathukkal		Thrikkovilvattom
	Kareepra		Kulasekharapuram
	Neduvathoor		Kollam Corporation
	Poooyappally		Chavara
	Veliyam		Neendakara
	Pathanapuram		Alappad
	Pattazhy Vadakkekara		Kottamkara
	Pattazhy Thekkekkara		
	Thalavur		
	Kunnathur		
	Poruvazhy		
	Sasthamkotta		
	Sooranad North		
	Sooranad South		
	West Kallada		
	Kulakkada		
	Melila		
	Mylom		
	Pavithreswaram		
	Ummannoor		
	Vettikkavala		

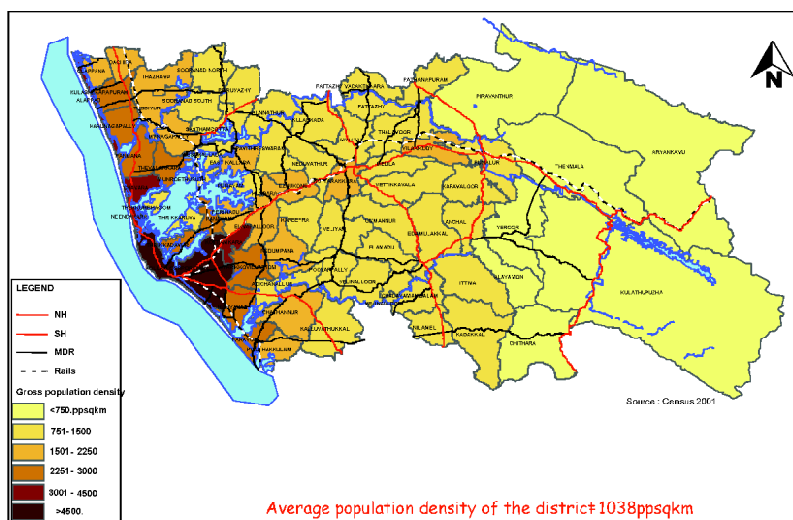


Fig 4.10: Distribution of Gross population density (2001 census) – Local Body wise

Kollam Corporation falls within the highest population density range with maximum of 6309 at Kollam Corporation. Majority of the

LSGIs (36 No.) falls within the population density range of 750-1500 pp.sq.km. The remaining LSGIs falls within the range of 1500- 3000 pp.sq.km.

Net Population Density

The average net population density of the district is calculated as 2347 pp.sq.km. The spatial distribution of the net population density is shown in Figure 4.11.

Highest net population density range is shown (5000-7000) in the coastal plains. Lowest net population density is seen in the eastern high land region (less than 1000 pp.sq.km.) But the net population density in around Anchal Grama Panchayat and Pattazhy Vadakkekara Grama Panchayat is showing highest values. This may be due to the concentration of population in a few residential pockets of these Grama Panchayats; the major land use of these Grama Panchayats is being rubber plantation.

4. Sex ratio

Sex ratio of Kollam district is 1075, which is higher than the State value of 1058 and less than that of Pathanamthitta and Alleppey (Figure 4.12).

A higher value of sex ratio could mean that there is out migration of male (for jobs etc.) population from district.

The sex ratio in the age group of 0-5 (Figure 4.13) of the district is 965 which is less than that of the average value of the sex ratio of the State.

The change in the sex ratio (0-5 age group) between the maximum and minimum value of the surrounding districts is less (968-955) than the general value of sex ratio (1094-1058), indicating that at birth,

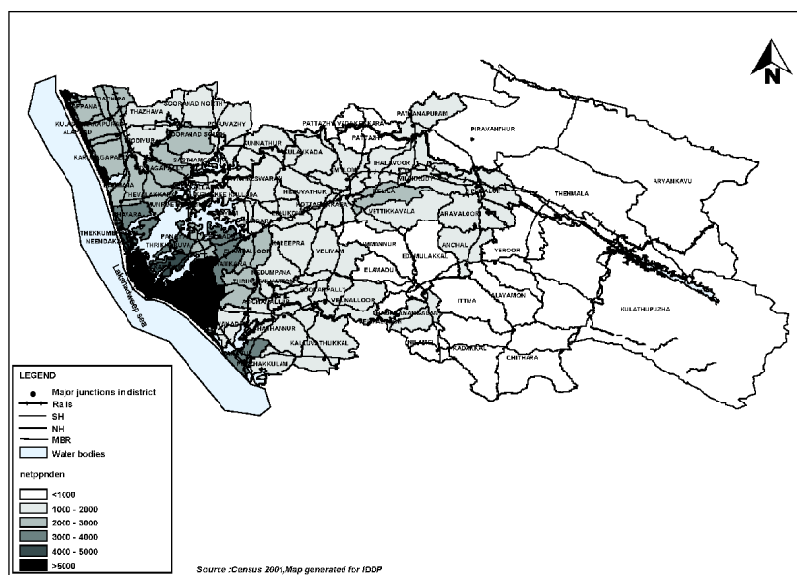


Fig 4.11: Distribution of net population density (2001 census) – Local Body wise

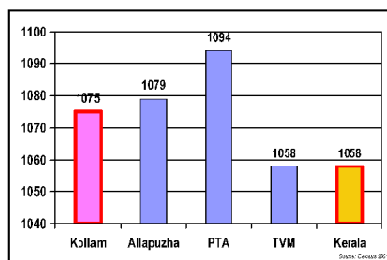


Fig 4.12: Sex ratio -2001

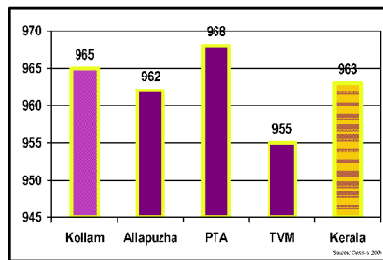


Fig 4.13: Sex ratio –age group 0-5

the sex ratio is more or less uniform irrespective of the districts, but it changes later due to the migration pattern.

5. Population concentration pattern

The population concentration pattern is derived by calculating the cumulative population after arranging the LSGIs in the descending order of net residential density

(total population / habitable area obtained by subtracting the area of water bodies, forest paddy and other un-inhabitable areas from the ward area).

The population concentration pattern of the district is shown in Figure 4.14. It shows 2/3rd of the total population of the district is concentrated in 31.57% of the

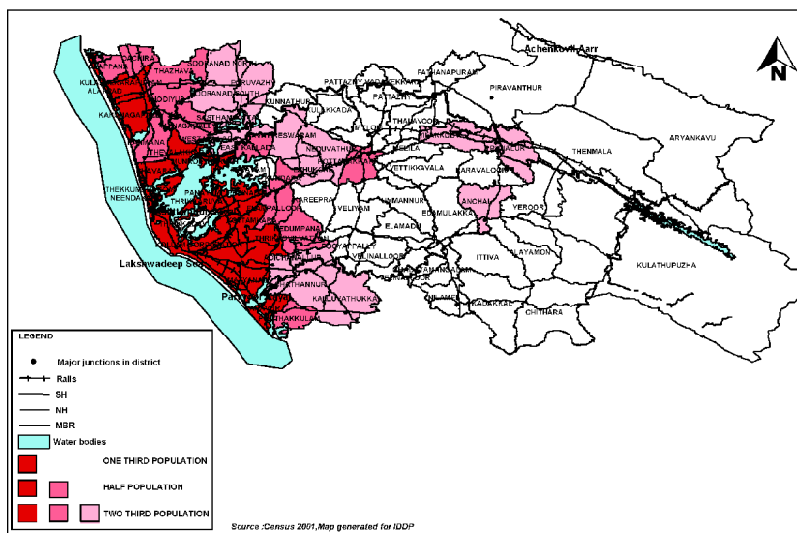


Fig 4.14: Population Concentration Pattern

area of the district. Population is concentrated in the coastal local bodies and local bodies adjacent to it.

6. Migration Details

The data collected through the socio economic survey of all the LSGIs of the district is analyzed to assess the migration pattern of population of the district. The analysis shows that 1.87% of the total families of the district are migrated within the last five years. Of the total migrated families, 12.02 % are migrated from places out side the district and 87.98% are migrated from places within the district. The % break up of the places from where they migrated is given in the table below (Table 4.2).

The study of out migration shows that at least one member out of the 2.04% of the total families of the district has out migrated. The place to which they have migrated is shown in Figure 4.15.

It can be seen that the out migration of people from the district is the maximum towards the Middle East.

7. Population Projection (Trend based)

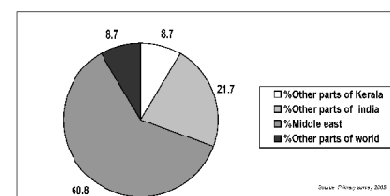


Fig 4.15: Out migration

The population projection for 2011 and 2021 of the District and all the local LSGIs are made assuming that same trend in the population growth continues. The population is projected by two methods – Decreasing rate method and Apportionment method and average of the two is taken to arrive at the population figures in 2011 and 2021.

A. Decreasing rate method:

The population growth rate of 2011 and 2021 are calculated assuming that the same percentage of decrease in population growth prevails as that of 2001 for the succeeding two decades.

Based on the population growth rate calculated, the population of the District is projected for 2011 and 2021 and the same is shown in Table 4.3.

B. Apportionment method:

In the apportionment method the ratio of the District population to the State population is found out and the same is projected to the next two decades

Table 4.2 : Migration

% Within LSGI	% Outside LSGI but within Dist	% Out the Dist but within state	% From Tamilnadu	% Other parts of India	% Outside India
52.99	34.9	9.74	1.84	0.53	0

Source: Primary survey- 2005

4

Table 4.3 : Projected District Population – Decreasing rate method

Year	Total population	Population Growth rate	% Decrease in Population Growth rate
1971	1,839,163		
1981	2,175,525	18.29	
1991	2,407,566	10.67	-41.68047941
2001	2,585,208	7.38	-30.82219107
2011	2718733	5.16	-30
2021	2817027	3.62	-30

assuming the change in the ratio during 2001 -2011 and 2011-2021 is same the value as that during 2001-2011. In order to find out the projected population in 2011 and 2021, the projected population of the State during the same years are needed. The detail of the population projection of Kerala is elaborated in the Annexure 3.

The projected population of the District

based on the apportionment method is shown in Table 4.4.

The projected total population by the two methods differs slightly. The average of these two is taken as the population figures of Kollam District. This is shown in Table 4.5.

So it can be concluded that the total population of Kollam District will be 2706490 and 2784429 on 2011 and 2021 respectively based on trend based projection.

8. Conclusion

The population density of Kollam (1038 pp sq km) is higher than the state average value of 819 pp.sq.km. But when compared to the surrounding three districts, population density of Kollam is less than

that of Alapuzha and Thiruvananthapuram. It can be stated that the population density of Kollam is not a high one but one that is placed in the medium level. The point to be noted is that, growth rate of population is significantly declining for the last three decades and hence it can be presumed that there won't be much increase in the gross population density of the district in future if the present trend continues. The population concentration pattern and local body wise distribution of the gross population density shows that there is concentration of population in some parts of the District. The coastal Local bodies and local bodies adjacent to it show maximum population density and majority of the total population of the district is concentrated in the coastal belt and midland regions adjacent to coastal belt. Three distinct zones can be earmarked based on the distribution of the gross population density. The eastern high land region of the district shows the least gross population density value of less than 450 population/sq km. The local bodies in the mid land region is having a gross population density range of 1500-3000 population/ sq km. The highest population density is seen in the coastal belt of the district which falls in the range 3000- 6000 population / sq km. It can be presumed that though the population growth rate is declining, majority of the additional future population will be distributed among those local bodies which shows the highest population concentration presently. It is projected that the population of the District will be increased by 1.21 lakhs and 0.78 lakhs in the succeeding decades, 2001-11 and 2011-2021 respectively.

Table 4.4 : Projected District Population – Apportionment method

Year	Total Population Kerala	Total Population Kollam district	Ratio of District population to Sate Population	Change in the ratio
	x	y	y/x	
1971	21347375	1,839,163	0.0862	
1981	25453680	2,175,525	0.0855	-0.0079404
1991	29098518	2,407,566	0.0827	-0.0319588
2001	31841374	2,585,208	0.0812	-0.0187123
2011	33817196	2,694,248	0.0797	-0.0187123
2021	35198589	2,751,830	0.0782	-0.0187123

Table 4.5: Final Projected Population figures of the District

Year	Total population as per decrease rate method	Total population as per apportionment method	Average population figures
2011	2718733	2,694,248	2706490
2021	2817027	2,751,830	2784429



Chapter 5

Occupational Structure

In this chapter the existing economic base of the District based on the occupational structure of the District as per census 2001 is studied. The change that has happened in the economic base of the district over a period of time is also probed into. Then the probable number of workers in the coming decades (2001-2011 and 2011-2021) is projected.

1. Work force of the District

The work force of a place is usually indicated by work force participation rate (WPR) which is the ratio of total workers (main and marginal) to the total population of the place generally expressed as a percentage. As per census 2001, the work force participation rate of Kollam District is 32%. That means, out of the total population of 25.85 lakhs, 8.3 lakhs people are workers.

The total workers are further divided into main and marginal workers. For the district, main workers constitute 25% of the total population and marginal workers

constitute 7% of the total population. This is shown in Figure 5.1 and 5.2.

The number of total workers and the main workers over a period of time are shown in the Table 5.1 and Figure 5.3. The graph shows that, though the total workers are gradually increasing over last three decades (from 1981 to 2001), the number of main workers shows decreasing trend in between 1991 and 2001 indicating a dim picture about the current economic development of the District. Even though

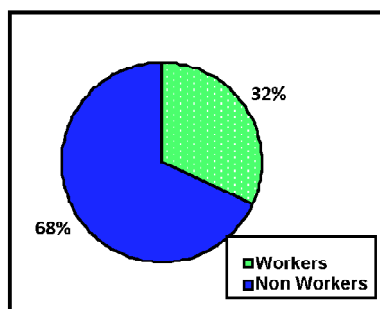
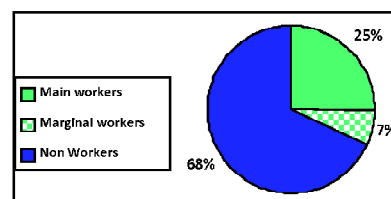


Fig 5.1: Work force participation rate



Source : Census 2001

Fig 5.2: Main workers

the number of total workers of the district shows increase in figures during 1991-2001, the growth rate of the workers during this period (growth rate is 6.7%) is below the growth rate of the total population (Growth rate of total population is 7.38%) of the same period. This indicates that the employment opportunity is not increasing in proportion to the growth of population. This may be due to the shrinking of economic base of the district.

Table 5.1: Number of workers

Workers	1981	1991	2001
Total workers	727,133	772,923	828,566
Total Main workers	580,230	672,712	654,823

Source: Census 1981, 1991 and 2001

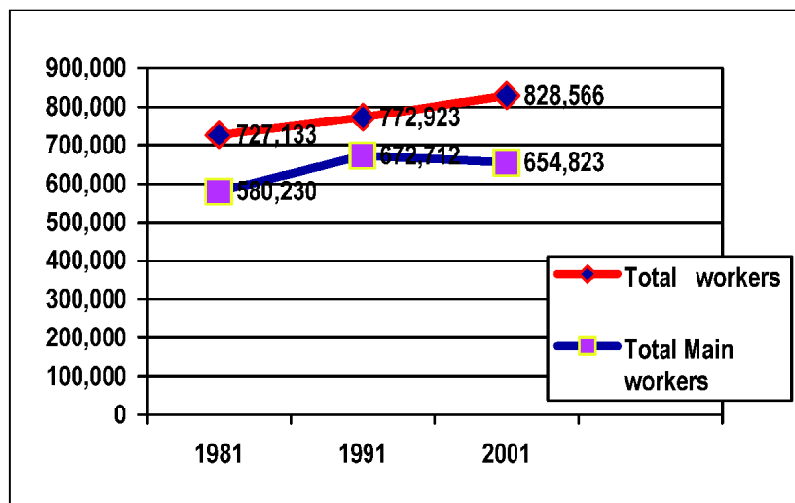


Fig. 5.3 : Temporal variation of total workers and total main workers

2. Spatial Distribution of the major class of workers

The concentration index [number of workers of a particular class of workers in a local body / total number of workers]/

concentration index of agricultural laborers local body wise.

From the figure it is clear that agricultural laborers are concentrated in the mid and high land region.

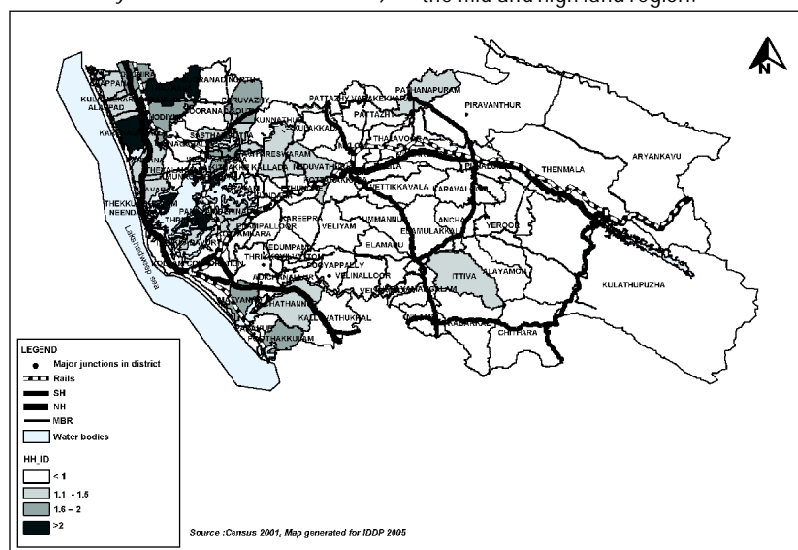


Fig 5.4 : Spatial distribution of the concentration index of HH industrial workers

(number of workers of the same class of workers in the district / total number of workers in the district)] of the four classes of workers viz: House hold industrial workers, Cultivators, Agricultural laborers and Other workers are calculated for each LSGI (see Annexure 4) and its spatial variation is analyzed. Concentration index gives an idea about where a particular class of workers is concentrated in the district.

Figure 5.4 shows the variation of the concentration index of house hold industrial workers. From the figure it is clear that the house hold industrial workers are concentrated in the coastal low land region.

Figure 5.5 shows the variation of the

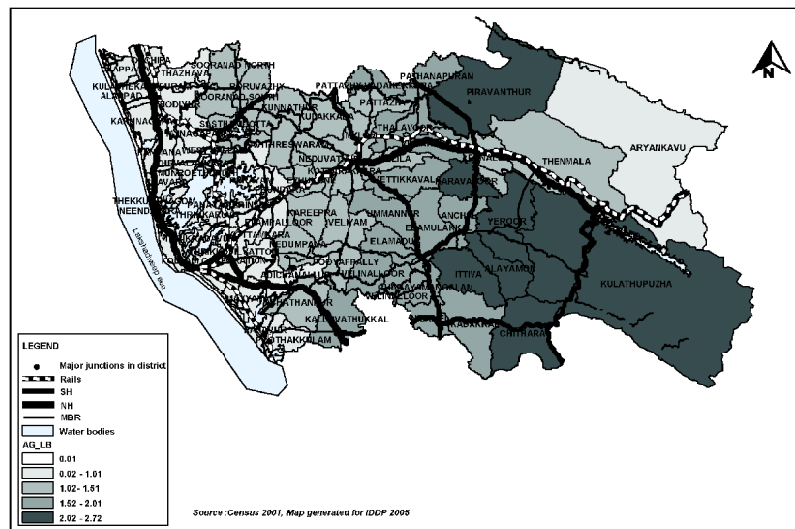


Fig 5.5 : Spatial distribution of the concentration index of Agricultural laborers



Person engaged in industrial work - Kollam

The Figure 5.6 shows LSGI wise variation of the concentration index of cultivators and the distribution pattern of it shows that cultivators are concentrated in the mid and high land region of the district.

The result of the analysis is shown in Table 5.2 as the name of local self government institutions where particular types of workers are more concentrated.

3. Occupational structure

As per census 2001, the main workers are classified into four categories viz. cultivators, agricultural laborers, household industrial workers and other workers. The other workers category includes the primary sector workers like fishermen, workers engaged in mining and plantation work. Occupational structure of Kollam district as per 2001 census is shown in Figure 5.7 and Table 5.3.

A comparison of the occupational structure of districts surrounding Kollam District is shown in Figure 5.8.

The percentage of the agriculture labours and cultivators together constitute 17%, 12%, 13%, 30% of the total workers in Kollam, Thiruvananthapuram, Alapuzha and Pathanamthitta district respectively (Fig 5.7 and 5.8). The total

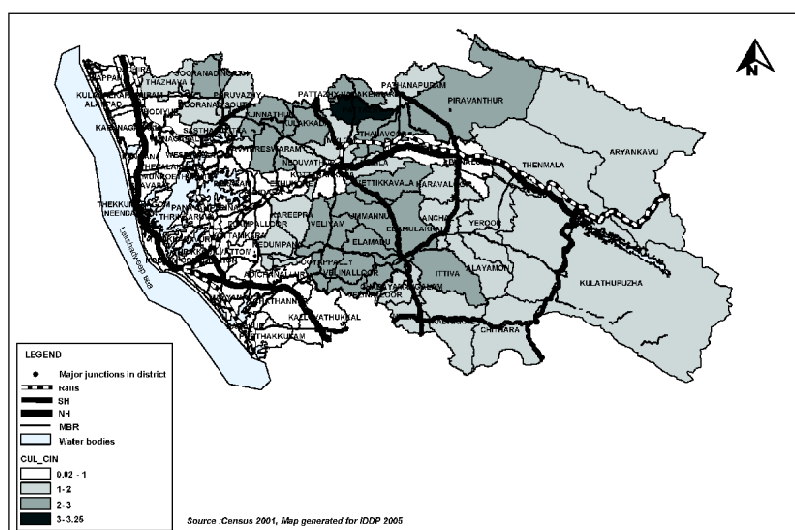


Fig 5.6 : Spatial distribution of the concentration index of Cultivators

Table 5.2: Concentration Pattern of Workers

LSGIs when House hold industries workers are concentrated (Con Index > 1.5)	LSGIs where Agriculture workers are concentrated (Con Index > 1.5)	LSGIs where Cultivators are concentrated (Con Index > 1.5)
Thrikkaruvu	Alayamon	Alayamon
Thekkumbhagom	Anchal	Edamulackal
Mundrothuruthu	Edamulackal	Karavalloor
Poothakkulam	Karavalloor	Yeroor
Karunagappally	Kulathupuzha	Chadayamangalam
Thodiyoor	Yeroor	Elamadu
Mayyanadu	Chadayamangalam	Ittva
Oachira	Chithara	Kadakkal
Thazhava	Elamad	Nilamel
Poruvazhy	Ittva	Velinalloor
West Kallada	Kadakkal	Neduvathoor
	Nilamel	Pooyappally
	Velinalloor	Veliyam
	Kalluvathukkal	Pattazhy Vadakkekkara
	Pathanapuram	Pattazhy Thekkekkara
	Pattazhy Vadakkekkara	Piravanthur
	Piravanthur	Thalavur
	Thalavur	Kunnathur
	Vilakkudy	Poruvazhy
	Ummannoor	Sooranad
	Vettikkavala	Sooranad
		kulakkada
		Melila
		Mylom
		Pavithreswaram
		Ummannoor
		Vettikkavala

percentage of agricultural laborers and cultivators of Kollam district is second among the neighboring districts.

The cultivators and agricultural laborers constitute only 17 % of the total main workers whereas the lion's share of the main workers (81%) belongs to the other workers category (See Fig 5.7). As mentioned earlier, other workers category will include some of the primary workers

like fishermen, workers engaged in mining and plantation works. Assuming that 20 % of the total workers belong to this primary worker category, one can say that, even then 61% of the total workers engage themselves in tertiary activity. This finding poses a contrast against the national figures where more than 60% of the total workers are engaged in primary activities. This is a clear indication of the declining trend of the

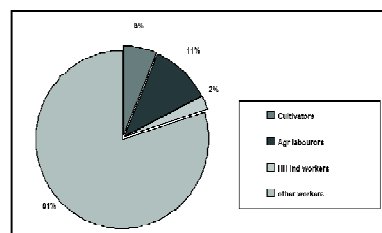


Fig 5.7 : Classification of Main workers

Table 5.3: Workers Classifications- District

Cultivators	Agr laborers	HH industrial workers	Other workers
42,102	73083	15855	524049

Source: Census 2001

primary sector in Kollam District.

4. Occupational structure – Variation in urban and rural area.

The Table 5.4 shows the four-fold category of workers in the urban and rural area of the District. The same values are depicted in pie diagram shown in Figure 5.9.

The above table shows that the share of cultivators and agricultural laborers are 3% and 21% in urban area and rural area respectively. Also the share of household industrial workers is the same at 2% in both the urban and rural areas. This indicates that as far as the workers classification is considered, almost all the workers (95%) in urban area depends on the tertiary sector for their livelihood. Household industrial sector share, in both



Fisherman at net repairing - Vady

urban and rural areas, is as low as 2% of the total main workers and in the case of rural area, more than 50% (Assuming the primary workers in the other workers category is about 20%) of the total workers engage in tertiary activities. This implies that even in rural area, the primary sector is on the decline.

5. Occupational structure – Temporal Variation

The number of various categories of workers from 1981 to 2001 in the district is

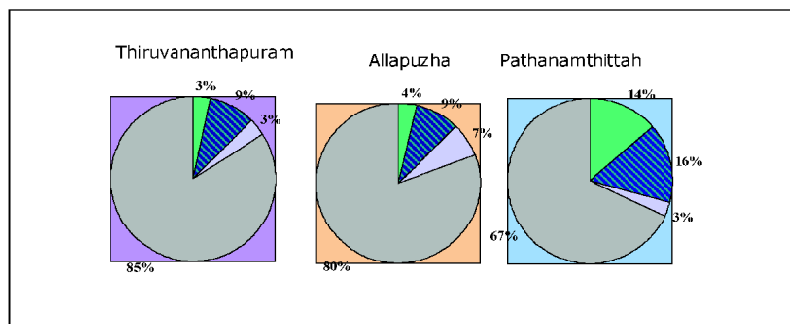


Fig 5.8: Occupational structure of the surrounding districts

Table 5.4: Workers Classification – Urban and Rural area

	Cultivators		Agricultural laborers		HH industrial workers		Other workers		Total	
	Persons	%	Persons	%	Persons	%	Persons	%	Persons	%
Urban	680	0.57	2449	2.06	2468	2.08	113192	95.29	118789	100
Rural	41426	7.72	70634	13.17	13387	2.5	410857	76.61	536304	100

Source : Census 2001

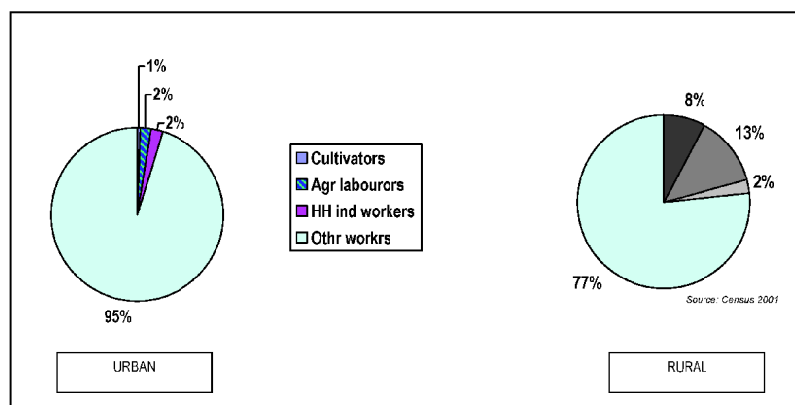


Fig 5.9 : Classification of the Main workers in – Urban area and rural area

Table 5.5: Four fold Workers classification

	Cultivators	Agr laborers	HH ind workers	Others
1981	84726	129982	19753	289175
1991	108331	145961	12502	408799
2001	42106	73083	15855	524049

Source: Census 2001

shown in Table 5.5.

Cultivators and agricultural laborers show drastic decrease in total numbers (a decrease of approximately 50%) during the period from 1981 to 2001, whereas the other workers show an increase of 81%. This is a clear indication of the weakening of the primary sector, mainly the agricultural one, in the District.

Figure 5.10 and Table 5.6 show the variation of the number of different category of workers in the urban area from 1981 to 2001. There is significant increase in the category of other workers during this period, at the same time cultivators and agricultural labourers are on the decline.

The Fig 5.11 and Table 5.7 show the variation of different category of

workers in the rural area during the period from 1981- 2001. The pattern of change in the number of workers in different category shows that the rural area also exhibits the same pattern as that of the urban area. This indicates that the primary sector activity, mainly the agricultural activity is on the decline in the rural area of the District. The back bone of any economy of a region is the production sector, the decline of which will have effects in multiple faces like self sufficiency, economic stability etc. of a region.

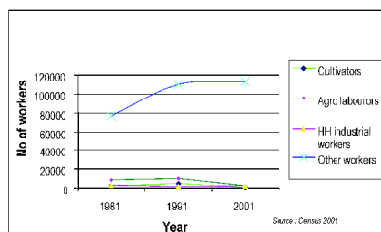


Fig 5.10: Variation in the number of different category of workers in urban area

Table 5.6: Number of various categories of workers in urban area

Year	Cultivators	Agri Labours	H H ind Workers	Others
1981	2015	8325	3374	76398
1991	5018	9867	1452	108706
2001	680	2449	2468	113192

Source: Census 2001

Comparison of the changes in the occupational structure of the district in urban and rural areas are shown in Fig 5.12.

The above figure clearly indicates that the percentage of workers engaged in primary sector in rural areas is alarmingly

decreasing whereas the percentage of workers in the other workers category is increasing. This has resulted in the dilution of the rural nature of the rural area of the

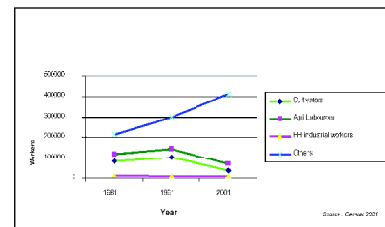


Fig 5.11 : Variation in the number of different category of workers in rural area

Table 5.7: Number of various category of workers in rural area

Year	Cultivators	Agri Labours	H H ind Workers	Others
1981	82711	121657	18379	212777
1991	103313	143794	11050	299093
2001	41426	70634	13387	410857

Source: Census 2001

district as far as the occupational structure is considered. Also the industrial activity in the urban area is on the decrease, but at the same time workers in other workers category is increasing. This has resulted in the narrowing down of the boundary, distinguishing the character of rural and urban areas.



Woman engaged in thread weaving - Veliyam

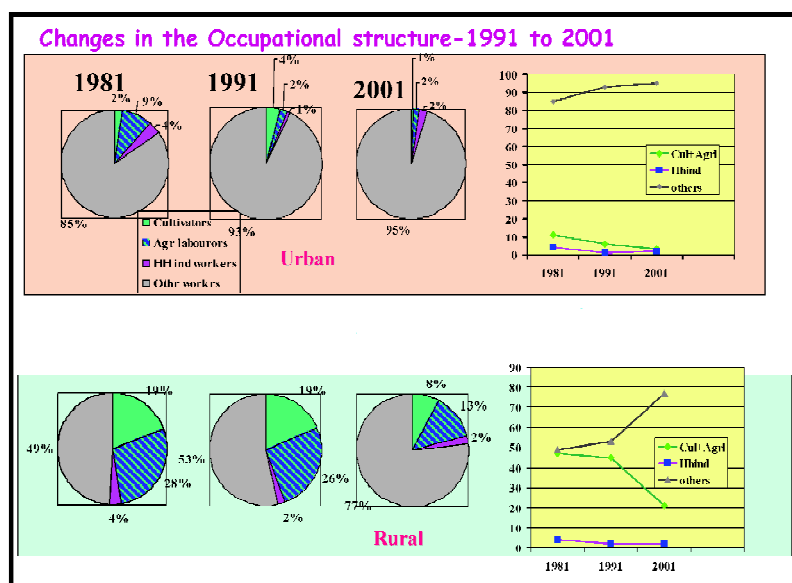


Fig 5.12 : Changes in the occupational structure of the district in urban and rural area

6. Projection of Occupational structure (Trend based)

Occupational structure of an area determines whether an area is urban or rural. As per the projection made earlier in this chapter the total urban population of the District is expected to be increased to 694619 and 1104816 in 2011 and 2021 respectively. Manifestly, this will be reflected in the occupational structure of the area also. Before projecting the possible occupational structure of the District, it is essential to arrive at the Work Force Participation rate (WPR) during 2011 and 2021. WPR of the District over a time period is shown in Figure 5.13 and Table 5.8.

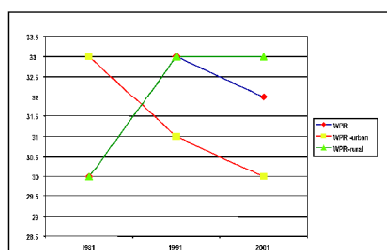


Fig 5.13: Temporal variation of WPR

From this it is clear that WPR of the urban area is decreasing over the period is less than that of the rural area indicates



Women engaged in cashew peeling

Table: 5.8: Value of WPR

	1981	1991	2001
WPR	30	33	32
WPR-urban	33	31	30
WPR-rural	30	33	33

an upside down picture about the number of job opportunities created in urban and rural areas against the popular belief that urban area creates more job opportunities.

This trend has to be reversed from the point of view of environmental and economical sustainability of a region. Other wise there will be migration of people from urban to rural areas resulting in the possible destruction of the resources like agricultural area, water bodies and environmentally sensitive areas in the rural area for residential purpose and thus destroying the agro economic base of the District.

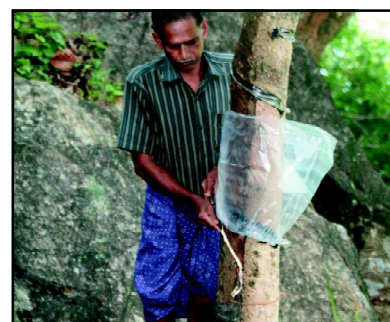
It is accepted that a WPR of 40 % indicates a well off society as far as the job opportunities are concerned. The present WPR is only 32% and attaining a WPR of 40% by two decades is very difficult. In these circumstances it is assumed that by 2021 the WPR of the District will be a moderate figure of 36%. Assuming a uniform increase in the WPR, the projected WPR of the District is shown in Table 5.9 and Figure 5.14.

The number of workers based on the projected WPR is given in the Table 5.10.

In order to arrest the trend of migration

Table: 5.9 : Projected Value of WPR

Year	1981	1991	2001	2011	2021
WPR	30	33	32	34	36



A man engaged in rubber tapping- Veliyam

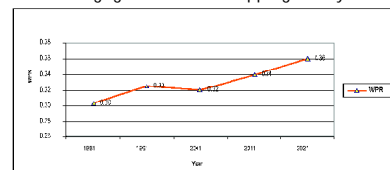


Fig: 5.14: Projection of WPR

Table 5.10: Number of workers projected

Year	1981	1991	2001	2011	2021
WPR	30	33	32	34	36
Population	2175525	2407566	2585208	2706490	2784429
Workers	661086	783500	828845	920206	1002394

Table 5.11: Projection of workers in urban and rural areas

Year	Urban rural break up of total workers		WPR total
	Urban WPR	Rural WPR	
1981	32.60%	30%	30%
1991	30.90%	32.90%	33%
2001	30%	32.50%	32%
2011	33%	34.30%	34%
2021	36%	36%	36%

of people from urban to rural area, it is assumed that the WPR in both urban and rural areas attain the same value of 36% and accordingly the number of workers in urban and rural area are projected and given in Table 5.11.

7. Conclusion

The analysis of the occupational structure of the District shows a very alarming situation about the economic base of the district. The production sector including the agriculture and industrial sector shows a declining trend in the district. The only sector, which shows growth, is the service sector. More than 50% of the urban population depends on the service sector for their livelihood. It is observed that rural area of the district is also slowly withdrawing from the primary sector and has started depending more on the service sector. The boundary distinguishing the character of rural and urban areas is narrowing down. If this trend in the change in the occupational structure of the district is considered, there won't be any distinction in the occupational structure whether it is in an urban or rural area.



Chapter 6

Land Use

Land use of an area is indicated by the predominant activity be it agriculture, residential, commercial, industrial etc, there. Hence the analysis of the existing land use is inevitable to understand the predominant economic activities of an area as well as the availability of vacant land for future economic activities.

1. Land use break up of Kollam District

Total area of the district is 2524 Sq km. The land use map of the district is shown in Figure 6.1.

The breakup of the land use of the District is shown in Table 6.1 and Figure 6.2.

The district consists of 993 sq km of agricultural land and 712 sq km of residential land.

Two 'natural' land uses viz: water body and forest also has a significant share (105.58 and 596.48 sq km respectively) in the total land use of the district.

The major share of the total land of the District coming under three major uses– Agricultural land (40%), residential land (29%) and forest land (24%). The glaring aspect of the land use analysis is that the district is blessed with potential resources such as agricultural land and forest.

2. Concentration pattern of land use

The concentration pattern of a land use gives an idea about where that particular land use is concentrated within the District. The concentration pattern of a land use can be ascertained by the concentration index of that land use which is calculated as follows.

$$\text{Concentration Index of a land use in a local body} = \frac{(\text{Area of that land use in a Local Body}) / (\text{Total area of the Local Body})}{(\text{Area of that land use of the District}) / (\text{Total area of the District})}$$

The Concentration Index value may be greater than one, equal to one or less

than one. Gramapanchayats/ Municipalities with Concentration Index greater than one indicates that the land use under consideration is concentrated more in those Grama Panchayat area than other local bodies in the district.

Four major land uses viz: commercial, industrial, agricultural and forest – relevant to the production sectors are analyzed here.

2.1 Commercial land use

Figure 6.3 shows the distribution of the concentration index of the commercial land use. From the figure it is clear that the concentration index of the commercial land use in urban LSGIs and in those LSGIs along the major transport corridors are higher than that in other LSGIs.

The list of LSGIs with concentration index of commercial land use is given in Annexure 5 and the list of LSGIs with high concentration of commercial land use (i.e. concentration index of commercial land use

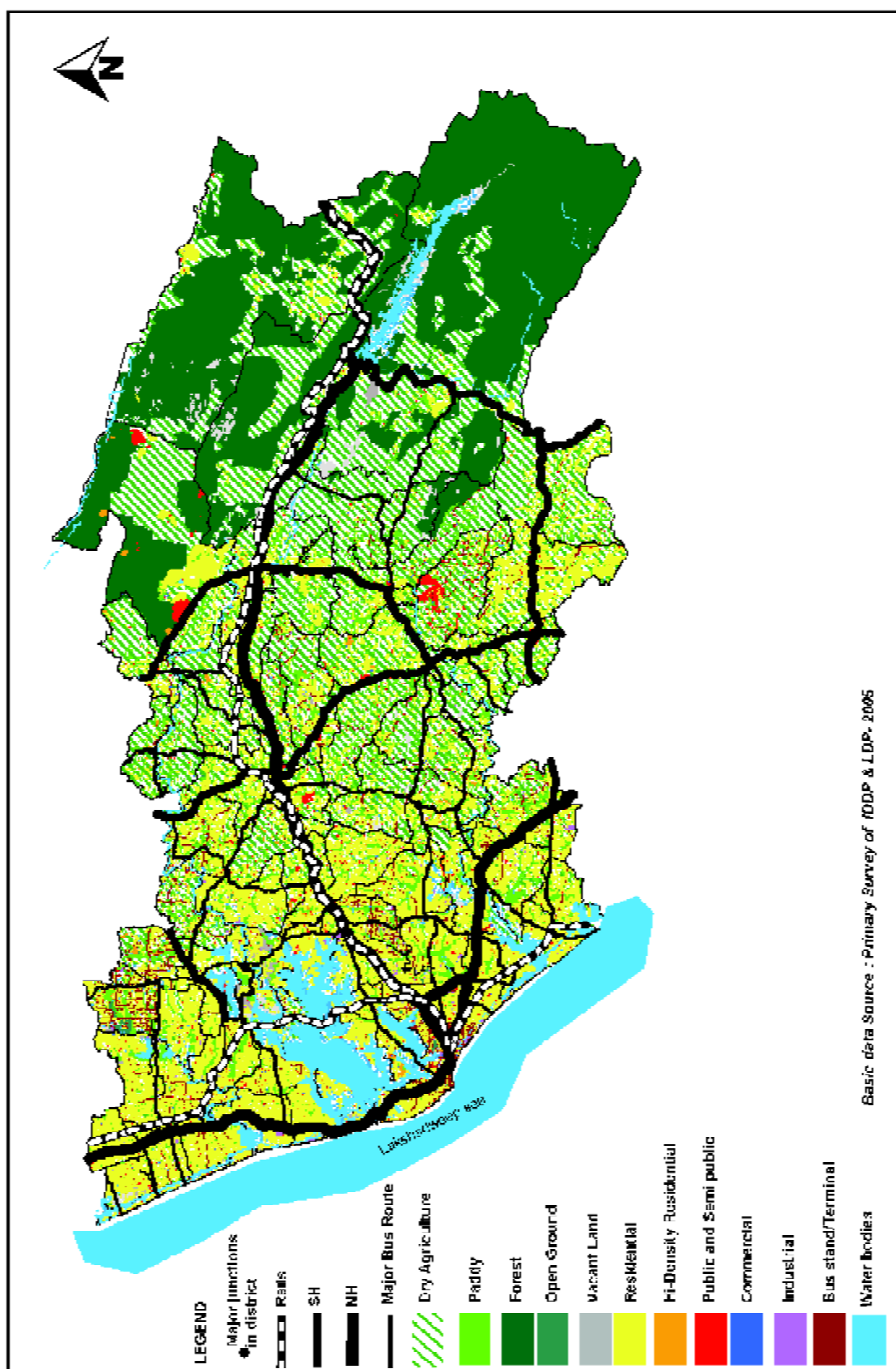


Fig. 6.1: Land use map - Kollam District



Commercial area - Chinnakkada

Table 6.1: Land use breakup - Kollam District

Type of land use	Total area (sqkm)	%
Agriculture	692.75	35.32
Residential	112.05	25.24
Commercial	8.55	0.34
Industrial	8.35	0.33
Public and semi public	29.83	1.18
Park and open space	8.34	0.25
Transportation	24.34	0.96
Railway	1.78	0.07
Vacant	32.80	1.34
Water bodies	105.88	4.19
Forest	596.48	23.63
Total	2524	100.00

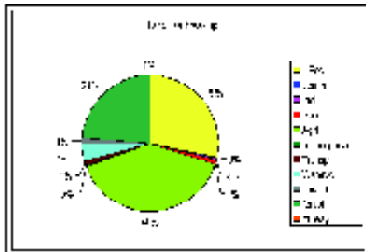


Fig 6.2 : Percentage of land use breakup greater than one) is shown in Table 6.2.

2.2 Industrial land use

The distribution of concentration index of industrial land use is shown in Figure 6.4. The figure shows that the Concentration of Industries (as per the land use) is in and around Kollam Corporation. The list of LSGIs with concentration index of industrial land use is given in Annexure 5 and the list of LSGIs with high concentration of industrial land use (i.e. concentration index of industrial land use greater than one) is shown in



Kerala Minerals and Metals Ltd. - Chavara

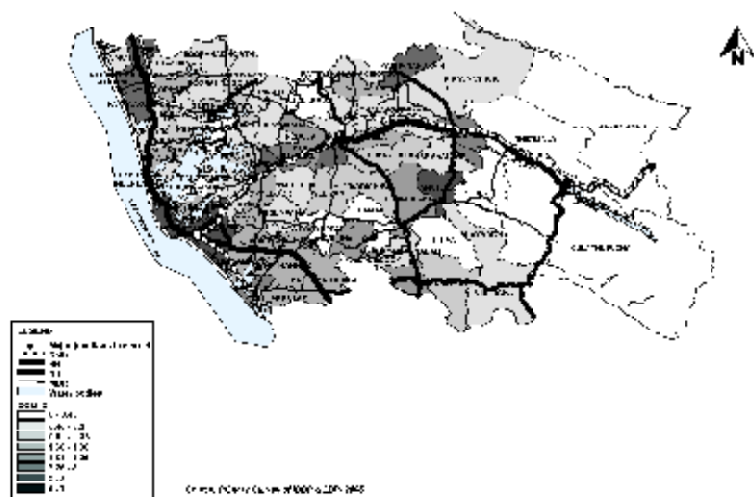


Fig 6.3 : Distribution of concentration index of commercial land use

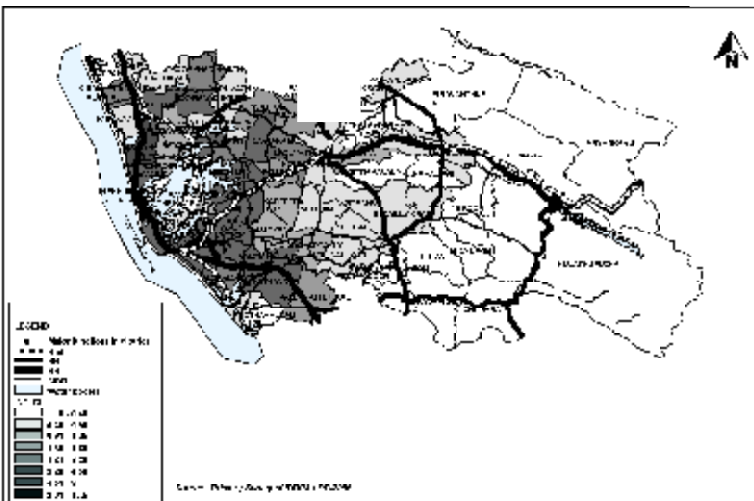


Fig 6.4: Distribution of concentration - Index of industrial land use

Table 6.2.

2.3 Agricultural land use

The concentration pattern of agricultural land use (Figure-6.5) shows

that agricultural area of the District is mainly concentrated in the central region of the District.

The list of LSGIs with concentration

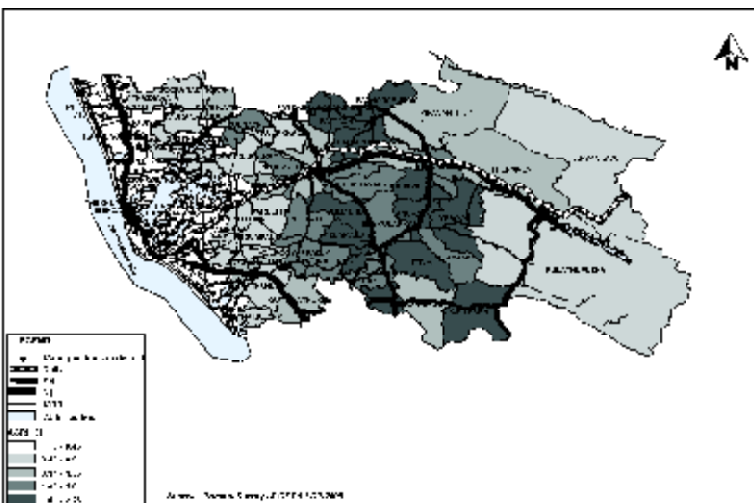
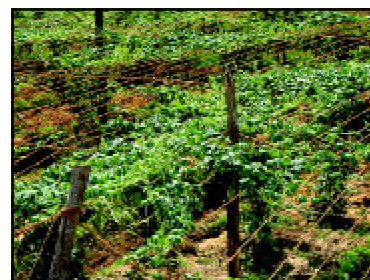


Fig 6.5: Distribution of concentration - index of agricultural land use

Table 6.2: LSGI wise major activity (As per land use analysis)

Sl No	Name of the Panchayat	Concentration Index(greater than 1)			
		Commercial	Industrial	Agriculture	Forest
1	Adichanad	P	P		
2	Aryankavu			P	
3	Bardol	P		P	
4	Athakkadu				P
5	Chelavannur			P	
6	Chelavannur	P	P		
7	Chelavannur	P	P		
8	Chelavannur			P	
9	Chelavannur			P	
10	Chelavannur	P		P	
11	Chelavannur			P	
12	Chelavannur	P	P		
13	Chelavannur	P	P		
14	Chelavannur	P	P	P	
15	Chelavannur	P	P	P	
16	Chelavannur			P	
17	Chelavannur		P		
18	Chelavannur	P			
19	Chelavannur		P		
20	Chelavannur	P	P		
21	Chelavannur		P		
22	Chelavannur	P			
23	Chelavannur		P		
24	Chelavannur	P	P		
25	Chelavannur				P
26	Chelavannur	P	P		
27	Chelavannur		P	P	
28	Chelavannur	P	P	P	
29	Chelavannur	P	P	P	
30	Chelavannur	P	P	P	
31	Chelavannur	P	P	P	
32	Chelavannur	P	P	P	
33	Chelavannur	P	P	P	
34	Chelavannur	P	P	P	
35	Chelavannur	P	P	P	
36	Chelavannur	P	P	P	
37	Chelavannur	P	P	P	
38	Chelavannur	P	P	P	
39	Chelavannur	P	P	P	
40	Chelavannur	P	P	P	
41	Chelavannur	P	P	P	
42	Chelavannur	P	P	P	
43	Chelavannur	P	P	P	
44	Chelavannur	P	P	P	
45	Chelavannur	P	P	P	
46	Chelavannur	P	P	P	
47	Chelavannur	P	P	P	
48	Chelavannur	P	P	P	
49	Chelavannur	P	P	P	
50	Chelavannur	P	P	P	
51	Chelavannur	P	P	P	
52	Chelavannur	P	P	P	
53	Chelavannur	P	P	P	
54	Chelavannur	P	P	P	
55	Chelavannur	P	P	P	
56	Chelavannur	P	P	P	
57	Chelavannur	P	P	P	
58	Chelavannur	P	P	P	
59	Chelavannur	P	P	P	
60	Chelavannur	P	P	P	
61	Chelavannur	P	P	P	
62	Chelavannur	P	P	P	
63	Chelavannur	P	P	P	
64	Chelavannur	P	P	P	
65	Chelavannur	P	P	P	
66	Chelavannur	P	P	P	
67	Chelavannur	P	P	P	
68	Chelavannur	P	P	P	
69	Chelavannur	P	P	P	
70	Chelavannur	P	P	P	
71	Chelavannur	P	P	P	
72	Chelavannur	P	P	P	
73	Chelavannur	P	P	P	
74	Chelavannur	P	P	P	
75	Chelavannur	P	P	P	
76	Chelavannur	P	P	P	
77	Chelavannur	P	P	P	
78	Chelavannur	P	P	P	
79	Chelavannur	P	P	P	
80	Chelavannur	P	P	P	
81	Chelavannur	P	P	P	
82	Chelavannur	P	P	P	
83	Chelavannur	P	P	P	
84	Chelavannur	P	P	P	
85	Chelavannur	P	P	P	
86	Chelavannur	P	P	P	
87	Chelavannur	P	P	P	
88	Chelavannur	P	P	P	
89	Chelavannur	P	P	P	
90	Chelavannur	P	P	P	
91	Chelavannur	P	P	P	
92	Chelavannur	P	P	P	
93	Chelavannur	P	P	P	
94	Chelavannur	P	P	P	
95	Chelavannur	P	P	P	
96	Chelavannur	P	P	P	
97	Chelavannur	P	P	P	
98	Chelavannur	P	P	P	
99	Chelavannur	P	P	P	
100	Chelavannur	P	P	P	

P-Predominant



Vegetable cultivation - Pooyappally

index of agricultural land use is given in Annexure 5 and the list of LSGIs with high concentration of agricultural land use is given in Table 6.2.

2.4 Forest land

The concentration pattern of forest shows (Figure 6.6) that forest area of the District is mainly concentrated in the eastern part of the District.

Total area of active forest land of the district is 597 sq km which is about 24% of the total area of the district.

The forest land of the district is concentrated in five local bodies; Kulathupuzha, Piravanthur, Thenmala, Alayamon and Aryankavu. The forest land is seen in the high land and upland regions of the district.

From the above analysis of the concentration index of land use, the LSGIs where the major economic activity (only surface cover activity) of the district is concentrated, can be identified and it is shown in Table 6.2.

2.5. Analysis of Agricultural land use

The agricultural land use is analyzed further considering the four main crops - Paddy, Rubber, Tapioca and Coconut of the district. The total agricultural area of the district is 993 sq km. The break up of the agricultural land use of Kollam District is shown in Table 6.3 and Figure 6.7.

The spatial distribution of the agricultural land use is shown in Figure

Table 6.3: Break up of Agricultural land use, Kollam District, 2005

Type	Area(sqkm)	%
Paddy	139.02	14
Rubber	558.08	56
Tapioca	19.86	2
Coconut	69.51	7
Others	208.53	21
Total	993	100

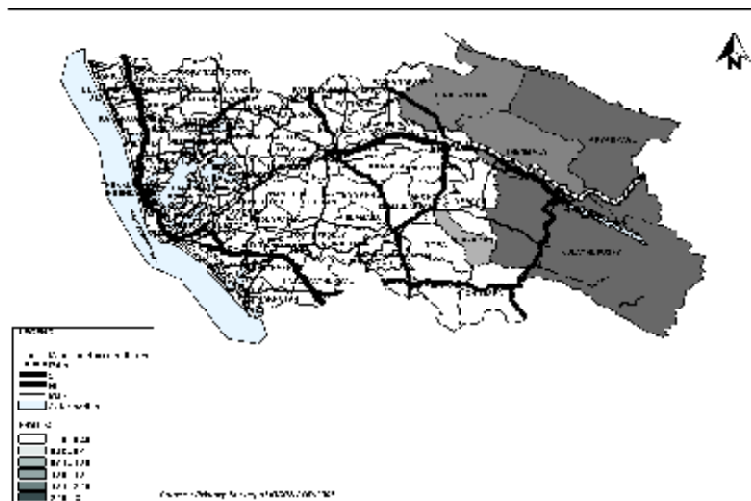


Fig 6.6: Distribution of concentration - index of forest land use

Table 6.4 : List of LSGIs where major agriculture activity of the district are concentrated

Paddy & Coconut	Rubber	Rubber and Other crops
Chappana	Peruvazhy	Pravanthur
Chachira	Gesthamocla	Thenma a
Thazhava	Scoranad South	Aryanikavu
Alappad	Pattazhy Wadakkakkara	Kulathupuzha
Thodiyur	Kunnathur	Yeroor
Karunagappally	Kulakkada	Chithara
Kulasekharapuram	Meduvathur	
Myngappally	Ezhukone	
Scoranad North	Pavittreswaram	
Thevalakkara	Poooyappally	
Panniana	Chadayamangalam	
Perayam	Kelluvattukkal	
Chavara	Velinjloor	
Thekkumbhagam	Ecarnulakkal	
West Kallada	Earnadu	
East Kallada	Urmanur	
Asendakara	Melilla	
Perinad	Myrm	
Thrikkaruva	Kottarakkara	
Thrikkadavur	Thalavur	
Kollam Corporation	Pattazhy	
Munrothur	Pethanapuram	
Elamalloor	Pravanthur	
Kollamkara	Thenma a	
Mayarad	Yeroor	
Chathanoor	Ayayam	
Parav...	Kulathupuzha	
Poothakkulam	Kedakkal	
Acidiana loor	Chithara	
Thrikkovilattom	Nilamel	
Kareepra	Archal	
Adumpara	Keravallur	
	Ittave	

6.8. The figure shows that paddy and coconut are concentrated in the low land coastal region (Table 6.4). Rubber and tapioca are concentrated in the mid and

mid up land (Table 6.4) and the up land region (Table 6.4) mainly consists of the rubber and other crops like oil palm, pepper, pineapple etc.

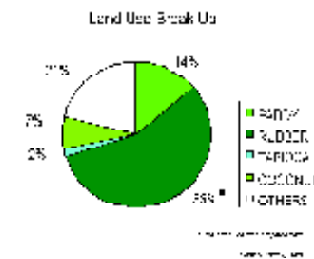
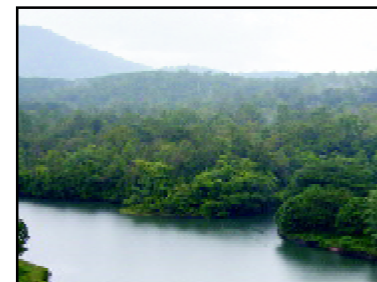


Fig 6.7 : Break up of agricultural land use

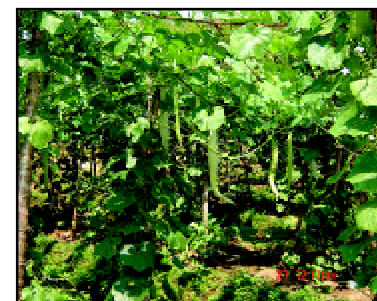
3. Activity zones

In the above paragraphs, the area of concentration of the major land uses in the District is delineated taking each land uses



Reserve Forest - Thenmala

separately. By combining the concentration pattern of the major land uses spatially and by analyzing the resulting pattern, area of specialization (based on the existing land



Vegetable cultivation - Pooyappally

use) activity can be delineated.

Figure 6.9 shows the areas where concentration index of both commercial and industrial land uses are greater than one.



Urban activity - Chinnakkada

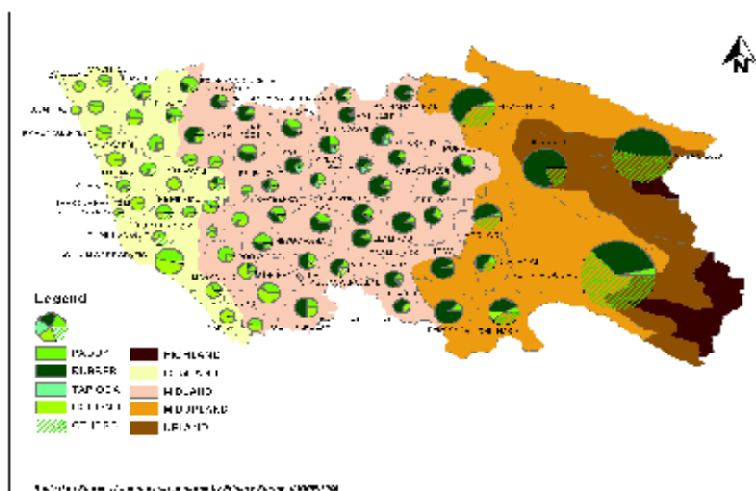


Fig 6.8: Spatial distribution of various types of agricultural land use



Coconut cultivation - Pooyappally

The figure shows a concentration of the commercial and industrial land use (i.e. main urban land use) of the district.

Figure 6.10 depicts the concentration

of agricultural land use against the concentration of commercial and industrial land use concentration pattern. From the



Mini industrial estate - Pooyappally

figure it is clear that a distinction is there in between the area of concentration of both agricultural and the industrial and



Paravoor market

commercial land use.

Figure 6.11 shows the concentration of all the four major land uses together. From the figure, the area of Specialization based on the land use analysis can be delineated. The area of concentration of



Commercial activity - Paravur

both commercial and industrial land use can be named as urban activity area.

Thus the district can be divided into three district zones (Figure 6.12) based on the

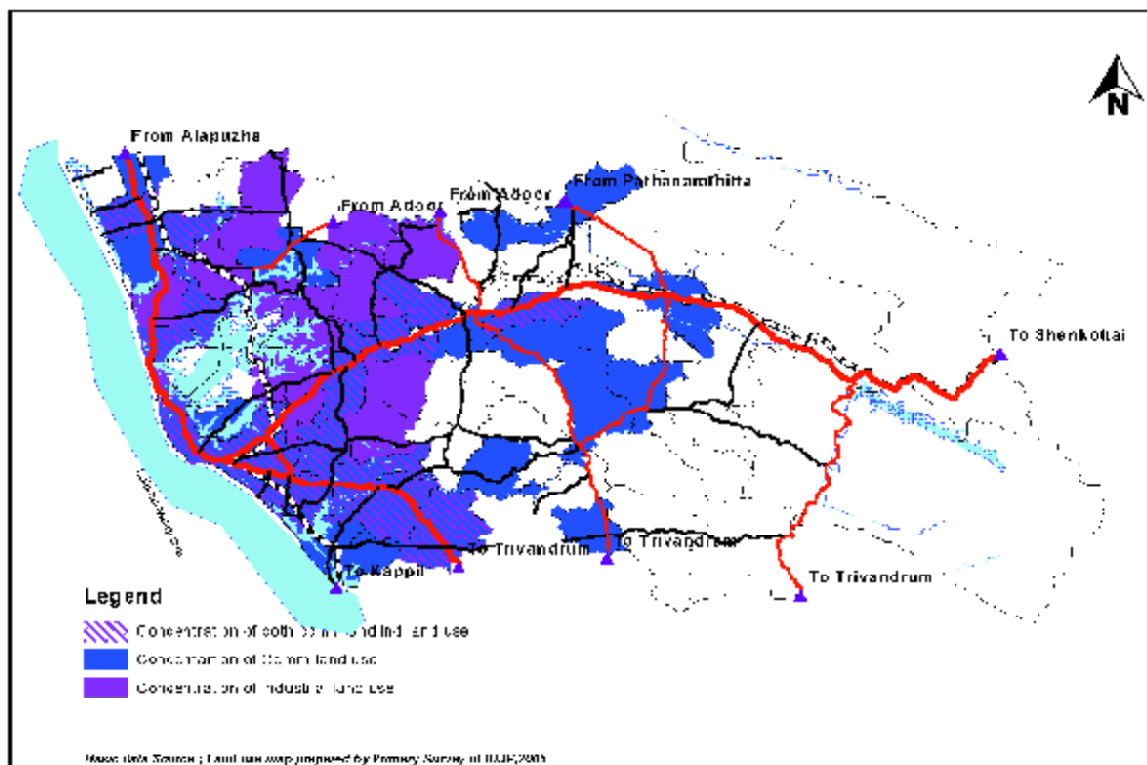


Fig 6.9 : Distribution of concentration index of both commercial and industrial land uses

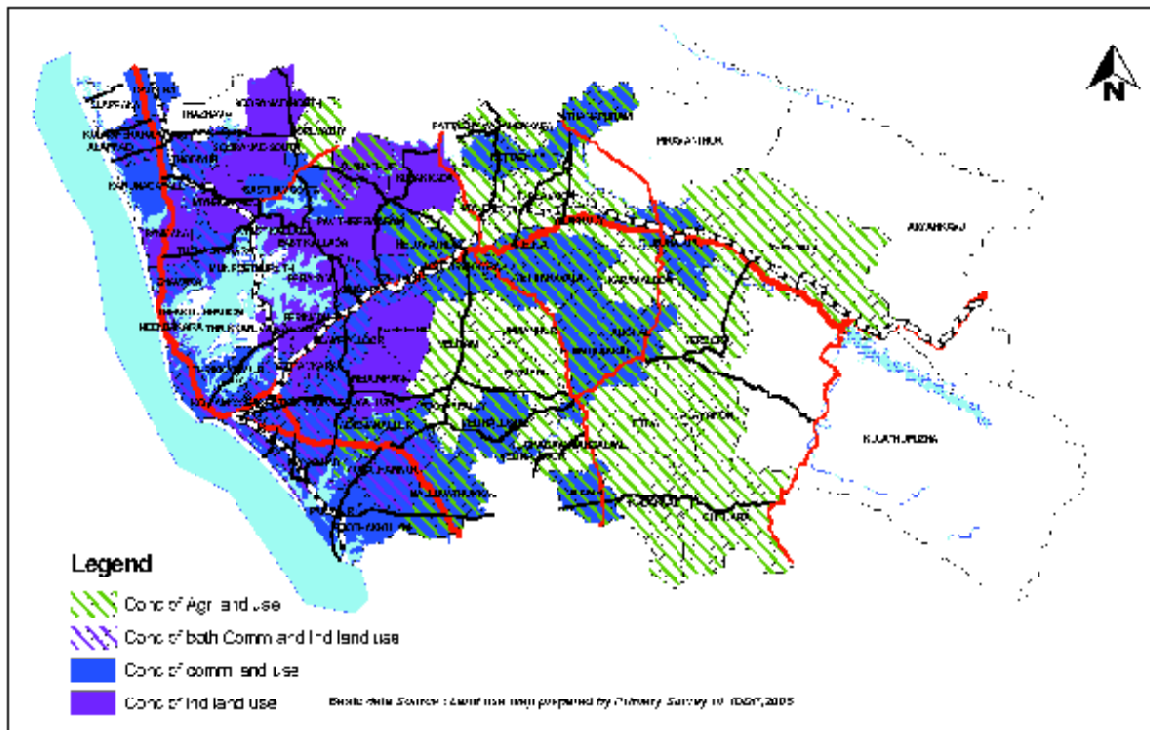


Fig 6.10 : Concentration pattern of agricultural, commercial and industrial land uses together

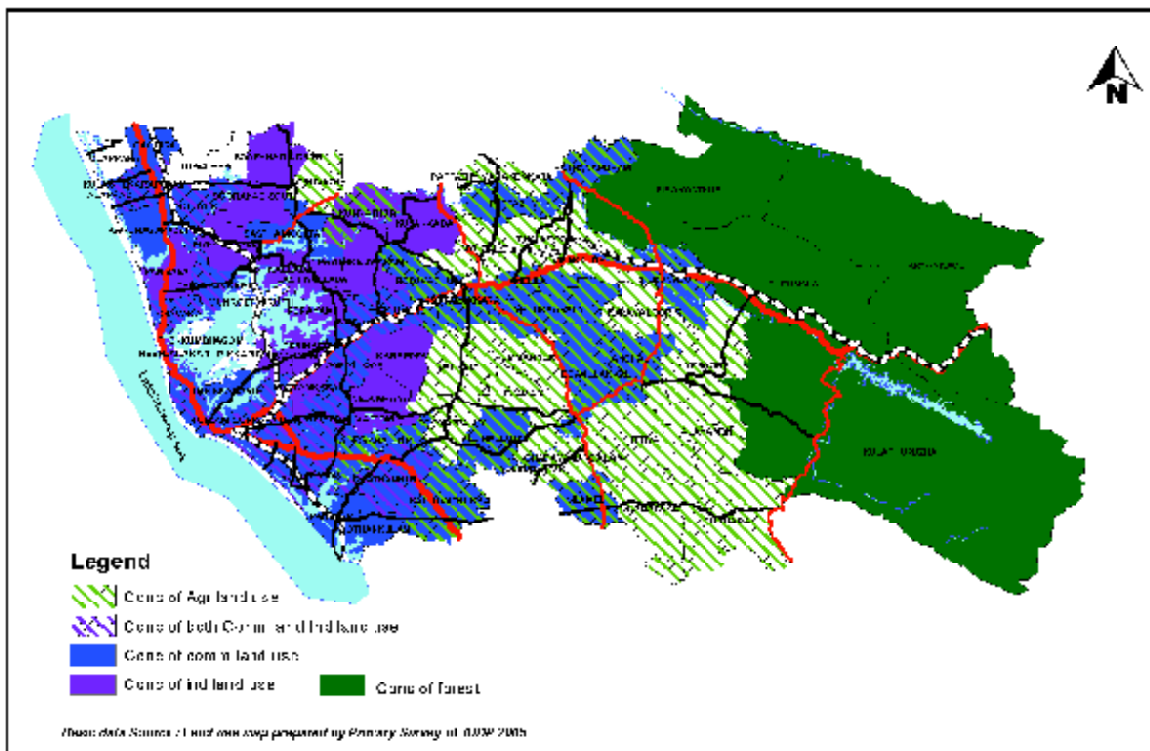


Fig 6.11: Concentration pattern of agricultural, commercial, industrial and forest land uses together

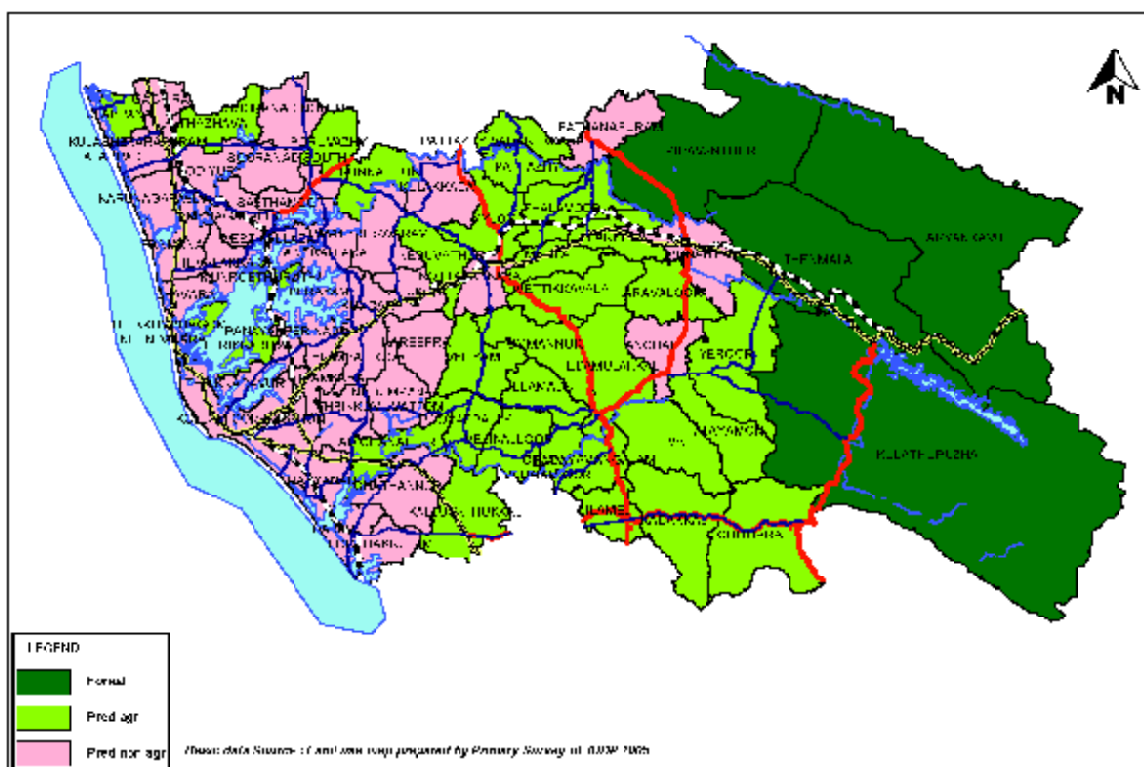


Fig 6.12 : Concentration pattern of non agricultural, agricultural and forest landuse

Table 6.5 : Activity Zones of the District

Sl.No	Name of local body	Activity Zone	Sl.No	Name of local body	Activity Zone
1	Puthadiyur	Urban	1	Pattanam	Agriculture
2	Pattanam Municipality		2	Pattanam	
3	Mayanad		3	Pattanam	
4	Chattannur		4	Pattanam	
5	Chattannur Corporation		5	Pattanam	
6	Thiruvattar		6	Pattanam	
7	Thiruvattar		7	Pattanam	
8	Thiruvattar		8	Pattanam	
9	Thiruvattar		9	Pattanam	
10	Thiruvattar		10	Pattanam	
11	Thiruvattar		11	Pattanam	
12	Thiruvattar		12	Pattanam	
13	Thiruvattar		13	Pattanam	
14	Thiruvattar		14	Pattanam	
15	Thiruvattar		15	Pattanam	
16	Thiruvattar		16	Pattanam	
17	Thiruvattar		17	Pattanam	
18	Thiruvattar		18	Pattanam	
19	Thiruvattar		19	Pattanam	
20	Thiruvattar		20	Pattanam	
21	Thiruvattar		21	Pattanam	
22	Thiruvattar		22	Pattanam	
23	Thiruvattar		23	Pattanam	
24	Thiruvattar		24	Pattanam	
25	Thiruvattar		25	Pattanam	
26	Thiruvattar		26	Pattanam	
27	Thiruvattar		27	Pattanam	
28	Thiruvattar		28	Pattanam	
29	Thiruvattar		29	Pattanam	
30	Thiruvattar		30	Pattanam	
31	Thiruvattar		31	Pattanam	
32	Thiruvattar		32	Pattanam	
33	Thiruvattar		33	Pattanam	
34	Thiruvattar		34	Pattanam	
35	Thiruvattar		35	Pattanam	
36	Thiruvattar		36	Pattanam	
37	Thiruvattar		37	Pattanam	
38	Thiruvattar		38	Pattanam	

land use analysis- urban activity area, agricultural area and forest resource area. The area of specialization of each local body of the district is given in Table 6.5.

4. Conclusion

The Spatial Distribution of the land use shows a clear demarcation between the various land uses –non-agricultural activity area, agricultural activity areas and forest land of the district which makes it possible to assign definite development character to each region. Non-agricultural area of the district is seen concentrated in the low land and a portion of the mid land region, whereas the forest area has a concentration in the eastern part of the district. Regarding agricultural area, it is seen that most of the agricultural area is concentrated in the mid land and high land region of the district. In the agricultural area, there exists definite pattern of distribution of the major crops of the district. Paddy and coconut are concentrated in the low lying coastal region, rubber and tapioca are concentrated in the mid and mid up land. And the up land region is mainly covered by rubber and other crops like oil palm, pepper, pineapple etc.



Chapter 7

Functional Character of Settlements

The function of a settlement is the major activity within the settlement, be it agricultural and allied activity (rural) or secondary sector and tertiary sector activities (urban activities). Here an attempt is made to determine the major function of a settlement by studying the major land use and the average plot size within the settlement.

1. Character of Settlements

With the unique settlement pattern existing in Kerala, the function of a settlement cannot be limited to the usual classification of urban or rural area. There exists a character exhibiting a combination of the two which needs to be explored. Analysis based on land use and plot size (Methodology explained in Annexure-6)

shows that there exists semi urban and semi rural character in settlements in addition to the urban and rural character. An area can be classified as Semi Urban, if there exists (or likely to introduce) both urban and rural activities but the predominant activity is urban. If the predominant activity is rural, it is classified as a semi rural area. The function of all the

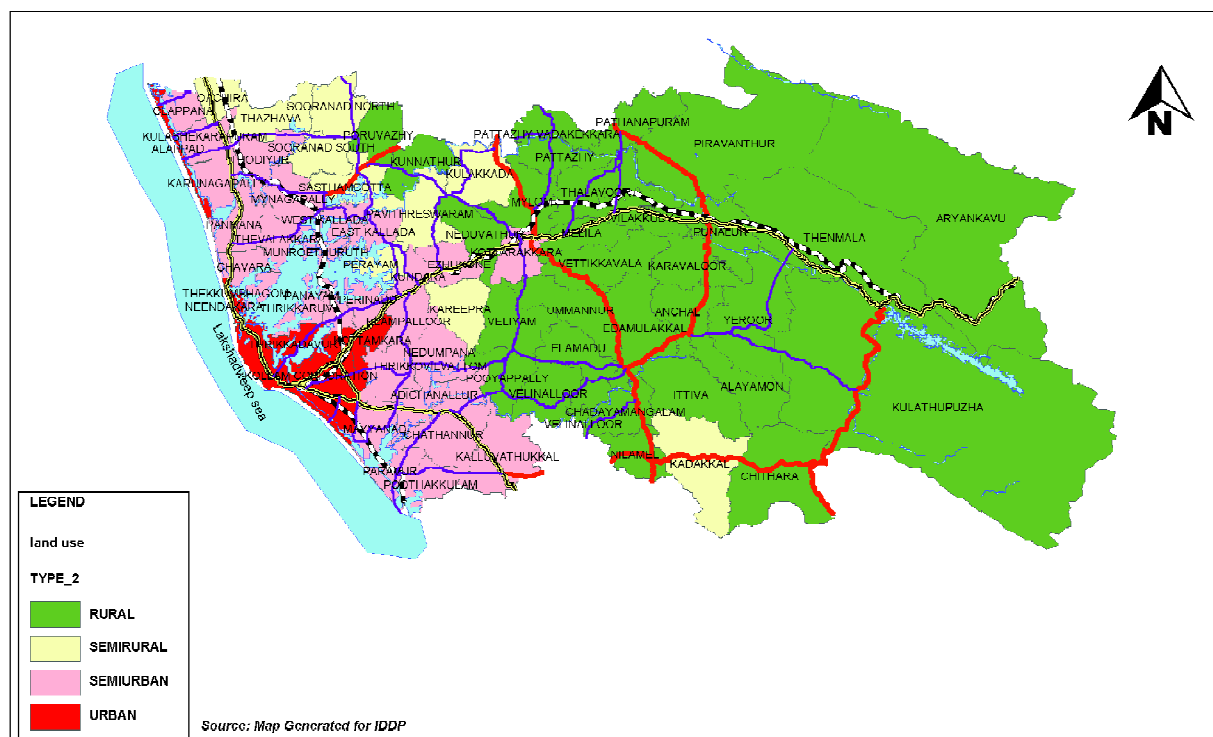


Fig 7.1 : Functional classification of settlements

Table 7.1: Functional Character of local bodies

SI No	Name of local body	Character	SI No	Name of local body	Character
1	Adichanalloor	Semi Urban	37	Pooyappally	Semi Rural
2	Alayamon	Rural	38	Poruvazhy	Semi Rural
3	Anchal	Rural	39	Punalur (M)	Rural
4	Arienkavu	Rural	40	Sooranad North	Semi Urban
5	Chathannur	Semi Urban	41	Sooranad South	Semi Urban
6	Chavara	Semi Urban	42	Thalavur Grama Panchayat	Rural
7	Clappana	Semi Urban	43	Thekkumbhagom	Semi Urban
8	Elamad	Rural	44	Thenmala	Rural
9	Elampalloor	Semi Urban	45	Thevalakkara	Semi Urban
10	Ezhukone	Semi Urban	46	Thodiyoar	Semi Urban
11	Kalluvathukkal	Semi Urban	47	Thrikkadavoor	Urban
12	Kareepra	Semi Rural	48	Thrikkaruva	Urban
13	Karunagappally Grama Panchayat	Semi Urban	49	Thrikkovilvattom	Semi Urban
14	Kizhakkekallada	Semi Urban	50	Ummannoor	Rural
15	Kottamkara	Urban	51	Velinalloor	Rural
16	Kottarakkara Grama Panchayat	Urban	52	Veliyam	Rural
17	kulakkada	Semi Rural	53	Vettikkavala	Rural
18	Kulasekharapuram	Semi Urban	54	Vilakkudy	Semi Rural
19	Kundara	Semi Urban	55	West Kallada	Semi Urban
20	Kunnathur	Rural	56	Yeroor	Rural
21	Melila	Rural	57	Poothakkulam	Semi Urban
22	Mundrothuruth	Semi Urban	58	Kadakkal	Semi Rural
23	Mylom	Semi Rural	59	Karavaloar	Rural
24	Mynagappally	Semi Urban	60	Neendakara	Urban
25	Mayyanadu	Semi Urban	61	Sasthamkotta	Semi Urban
26	Nedumpana Grama Panchayat	Semi Urban	62	Piravanthur	Rural
27	Neduvathor	Rural	63	Kulathupuzha	Rural
28	Panayam Grama Panchayat	Semi Urban	64	Chithara	Rural
29	Panmana	Semi Urban	65	Thazhava	Semi Urban
30	Paravoor Municipality	Semi Urban	66	Kollam (M Corp.)	Urban
31	Pathanapuram	Rural	67	Edamulackal	Rural
32	Pattazhy	Rural	68	Chadayamangalam	Rural
33	Pattazhy Vadakkekara	Rural	69	Nilamel	Rural
34	Pavithreswaram	Semi Rural	70	Oachira	Semi Urban
35	Perayam	Semi Rural	71	Elamad	Rural
36	Perinad	Semi Urban	72	Alappad	Semi Urban

settlements of the District derived based on the methodology are shown in Figure 7.1 and Table 7.1.

2. Conclusion

The spatial distribution of the settlements based on its character shows

a clear demarcation in the pattern of the settlements in four categories. Kollam Corporation and its adjacent LSGIs shows the urban character.

The semi urban character is shown by other LSGIs in the coastal belt. LSGIs

in the midland and high land region of the District exhibit rural character. Semi rural character is seen in a few LSGIs placed as a transition zone in-between the LSGIs with semi urban and rural character.



Chapter 8

Hierarchy of Settlements

In this chapter the existing hierarchy of settlements (LSGIs) based on the number and order of facilities is assessed and the suggested hierarchy of settlements is identified mainly based on their locational importance.

1. Existing Hierarchy of settlement

Composite Functional Index (CFI) method is used to find out the hierarchy of settlement. The CFI of a settlement is assessed based on the number and presence of the following types of facilities in the settlement.

1. Educational facilities
2. Health Facilities
3. Markets
4. Facilities in Agriculture and allied sector
5. Physical infrastructure facilities
6. Transportation facilities

The weightage of each of these facilities in the District and CFI index calculated based on this is given in the Annexure- 7 and 8 respectively.

CFI is plotted against the number of settlements to find out the hierarchy of

settlement in the District. The graph, so obtained is shown in Figure 8.1. While plotting the graph, Kollam Corporation is not taken into account because of its very high CFI, which will make the graph difficult for assessing the hierarchy of the lower order settlements. Therefore Kollam Corporation is made as the first order settlement of the District and in the graph only second order and other lower order settlements are depicted.

From the graph it is obtained that there are 3 second order settlements, 18 third order settlement, 50 fourth order settlements

in the District. The name of the settlements in various hierarchies as identified above is listed in Annexure 9.

When Kollam Corporation is taken as the first order settlement, the settlements of the District can be classified in to four orders as follows.

- I order settlement
1. Kollam Corporation
- II order settlement
1. Kottarakkara
 2. Punalur
 3. Karunagappally
- III order settlement

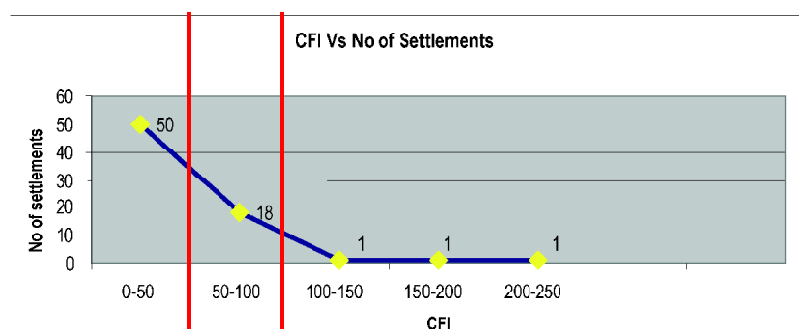


Fig 8.1: CFI Vs Frequency graph

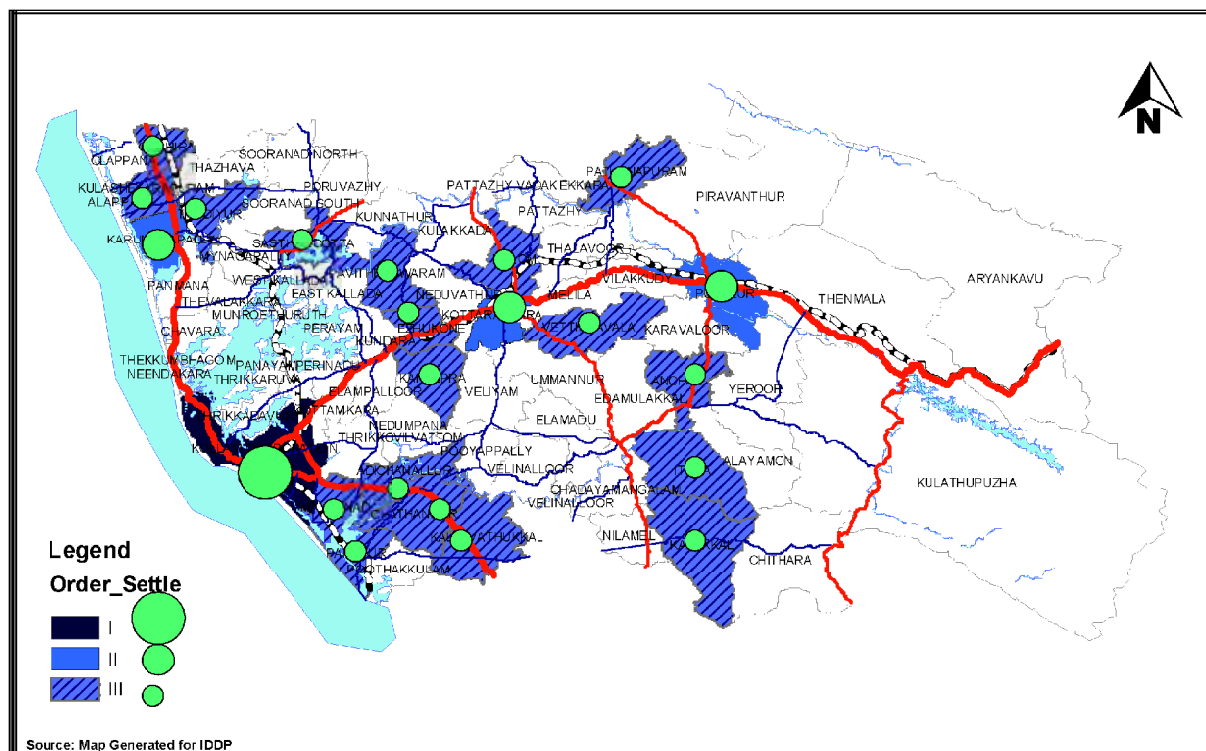


Fig 8.2 : Spatial Distribution of settlements of different hierarchies

1. Adichanalloor
2. Kadackal
3. Mylom
4. Paravur Municipal Council
5. Anchal
6. Thodiyur
7. Chathannur
8. Mayyanadu
9. Pathanapuram
10. Pavithreswaram
11. Aryankavu
12. Ezhukone
13. Thevalakkara
14. Kulasekharapuram
15. Kottamkara
16. Vettikkavala
17. Ittiva
18. Oachira
19. Sasthamcotta

IV order settlement

IV order settlements are given Annexure 9.

The spatial distribution of the settlements is shown in the Figure 8.2. The first order settlement is at the meeting point of two National High ways NH-47 and NH-208. All other settlements (up to the third order), except Pooyappally and Thevalakkara, are situated adjacent to either National Highway or State High way.

2. Suggested hierarchy of settlements – methodology adopted

The methodology adopted to identify the proposed hierarchy is explained here. The concept as per the Crystallor's Central Place theory in identifying the proposed hierarchy of the settlements is that the spatial distribution of settlements of various hierarchies should be centrally located (as far as possible) with respect to the service area or service population. Theoretically speaking, there will be one first order settlement serving the entire region (District). The service area of a settlement is hexagonal in shape as per the Crystallor's theory. But practically in case of Kollam the service area of the first order settlement (Kollam Corporation being the only one) cannot be taken as hexagonal but it is actually the entire district which may even extent outside. This limits the identification of the second order settlement by Crystallor's Central Place theory.

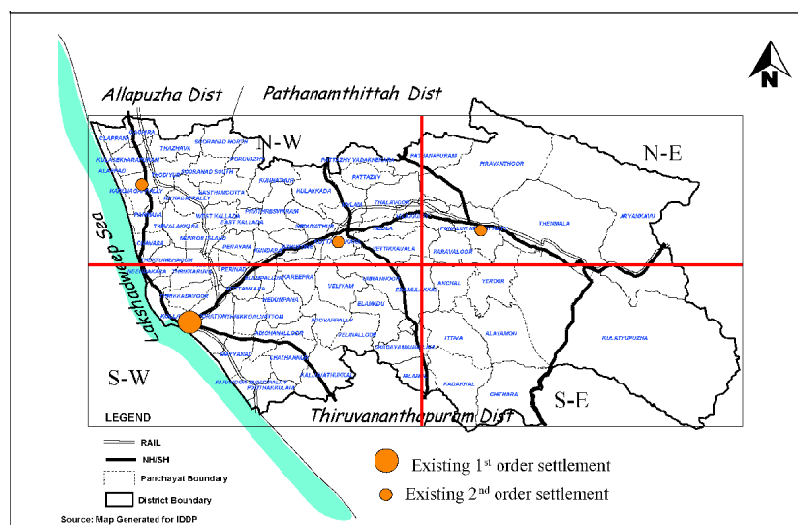
The Crystallor's Central Place theory stipulates that the lower order settlements are placed at the vertices of the hexagonal shaped service area of the higher order settlement. But here the service area of the first order settlement is the entire district and hence it is assumed that there are at

least four second order settlements one from each of the sub regions (North-East division, North-West division, South-West division and South-East division) of the district. The service area of the second order settlements is delineated by drawing the perpendicular bisectors to the straight line connecting the second order settlements. This area may form a hexagon or part of hexagon in shape. The vertices of the hexagon determine the location of the next lower settlements i.e. the third order settlement. The service area of the third order settlement can be delineated as hexagonal in shape. The remaining settlements of the District are assumed to be having the lowest order, i.e. the fourth order.

3. Suggested hierarchy of settlements –Procedure adopted

Identification of Second Order Settlements

While assessing the proposed hierarchy of settlements of the District after 20 years (based on the method explained earlier), the existing hierarchy of the settlements, especially of those settlements with higher order, cannot be changed altogether. The existing hierarchy of the settlements in Kollam District shows that the

Fig 8.3: Existing 1st and 2nd order settlements

settlements here falls under four hierarchies viz. I order settlement, II Order settlements, III order settlements, and IV Order settlements. Those settlements in the first two orders as per the existing hierarchy of settlements are taken as such. This means that, in the proposal also, the first order settlement is invariably taken as Kollam Municipal Corporation and Punalur Municipal Council, Kottarakkara and Karunagappally are taken as the II order settlements.

The first order settlement and the second order settlements are marked in the District map using GIS and it is shown in the Figure 8.3.

From the figure it is clear that there are no second order settlements from the South-East and South-West divisions of the region. Crystallor's theory (As per the theory the lower order settlements will be placed at the vertices of the hexagonal service area of the higher order) cannot be applied here as the entire district is assumed as the service area of the first order settlement (Kollam Corporation). And hence a second order settlement is identified from the South-East and South-West division based on the following criteria

- I Administrative status of the settlements
- I Centrality
- I Connectivity
- I Existing hierarchy

(The methodology to assess the relative values of centrality and connectivity is shown in Annexure-10).

That settlement with maximum preferred values in the above criteria in each of the

division is taken as the second order settlement from the division (See Annexure 11). Accordingly Chathannur from the S-W division and Anchal from the S-E division are identified as the second order settlements.

The second order settlements are ;

1. Karunagappally
2. Kottarakkara
3. Punalur
4. Chathannur
5. Anchal

The spatial distribution of the second order settlements are given in Fig 8.4.

Inorder to identify the service area of each of the second order settlements, perpendicular bisectors are drawn (in accordance with the Crystallor's theory) from the line joining nearest second order settlements and the polygon formed with center as the second order settlements are

taken as the service area of the second order settlement under consideration (see Figure 8.5).

Usually a higher order settlement fulfills the second order needs of the surrounding settlements. That is the first order settlements usually function as second order settlement also. And hence, though the service area of the second order settlements are delineated as described above, this has to be readjusted taking into account of the service area of the first order settlement, when it functions as a second order settlement. The line joining the first order settlement and the second order settlements (Karunagappally and Chathannoor) are bisected and the bisector is extended to meet the service area polygon of Kottarakkara to get the service area of Karunagappally, Kottarakkara (modified) and Kollam.

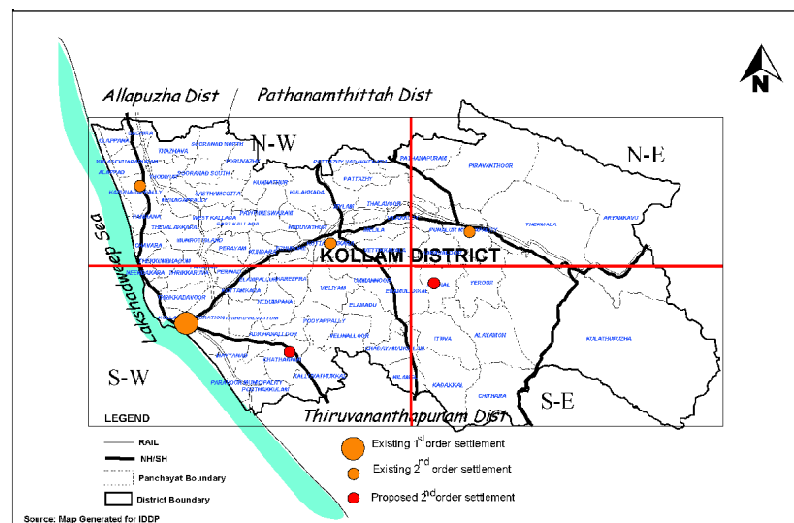
The adjusted service area (service settlements) of the second order settlements is shown in Figure 8.6.

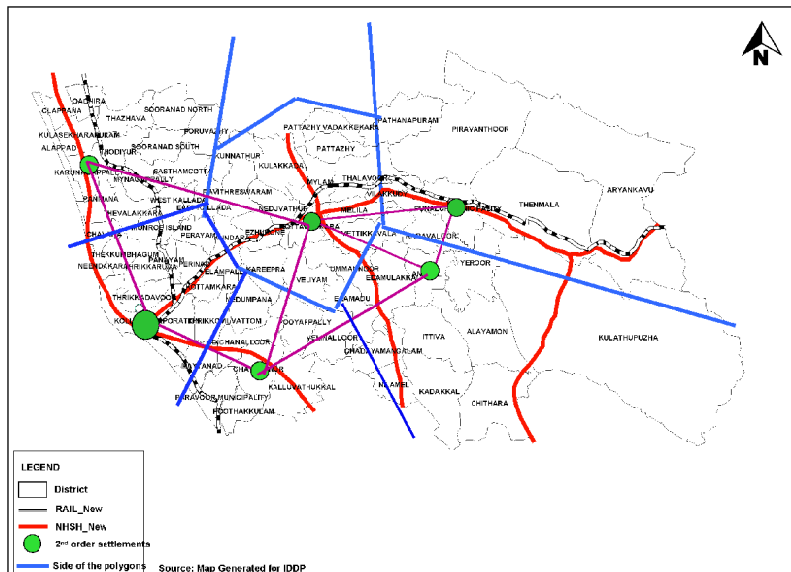
The service settlements of various second order settlements and the population served is given in Annexure 12.

It can be inferred that by 2011 itself Karunagappally would be holding a population greater than 50000 not much behind is Kottarakkara. Not even a Municipal Council now, special attention should be given to these LSGIs in terms of their land use planning.

Identification of Third Order Settlements

As per Crystallor's theory, the lower order settlements will fall in the vertices of

Fig 8.4: Projected 2nd order settlements

Fig 8.5 : Service area of 2nd order settlements

the hexagonal service area of the higher order settlements. This means that the third order settlements will be those settlements, coinciding with the vertices of the hexagonal service area of the second order settlements. Here only in the case of Kottarakkara, a service area with almost hexagonal in shape is formed (Figure 8.6). The settlements falling in the vertices of the polygon are Kunnathur, Pathanapuram, Velinallur, Vettikkavala, Elampallur and Perayam GPs. These settlements can invariably be taken as the third order settlements. But Elampallur and Perayam are closely placed GPs and hence instead of these two settlements, one settlement i.e., Kundara in between these two is taken as the third order settlement. And also instead of Kunnathur, Sasthamkottah is taken as the third order settlement after comparing the physical development and facilities in these two GPs. Theoretically the service

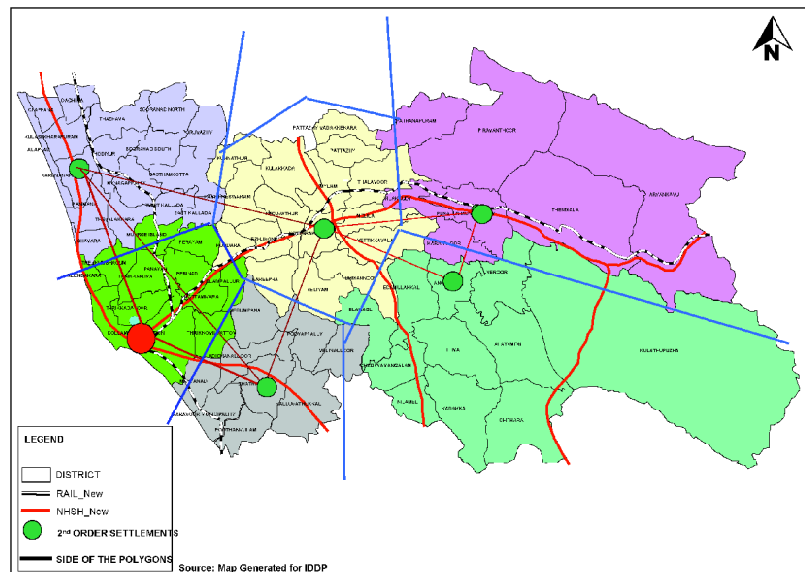


Fig 8.6 : Service area (service settlements) of 2nd Order settlements (adjusted)

area of each of these third order settlements will be uniform and hexagonal in shape. As per Crystallor's theory the higher order

settlements will function as the lower order settlements as well. And hence Vettikkavala is ignored because it is closely placed to the two second order settlements; Koattarkkara and Punalur. The service area of the higher order settlements is also hexagonal in shape.

The third order settlements (including the higher order settlement) and their service areas so delineated are shown in Figure 8.7. But from the Figure 8.7, it is clear that some area of Karunagappally sub region Anchal, and Punalur regions are unserved by any of the third order settlements necessitating the identification of new third order settlements from these sub regions. It is to be noted that the population in the Anchal and Punalur sub

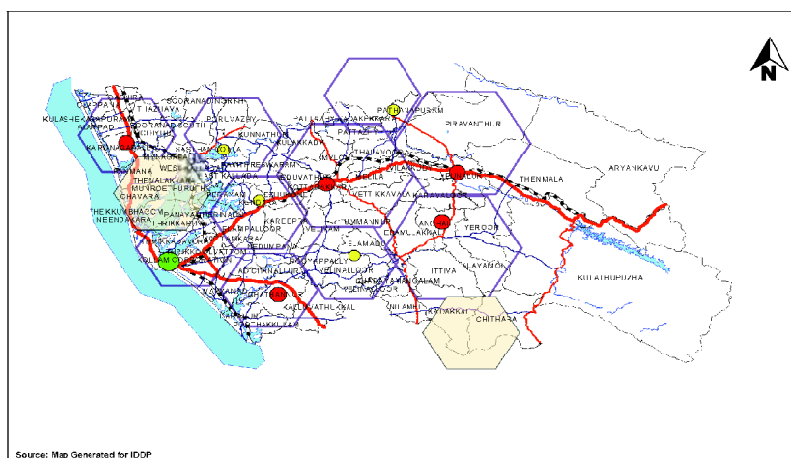


Fig 8.7 : Service area of third order settlements (adjusted)

regions are very less compared to the coastal area in which Karunagappally sub region falls. But the Punalur and Anchal sub regions comprise a large extent of area necessitating the selection of at least one-third order settlement from this area. Kadakkal, Nilamel and Chithara are the far most settlements from Anchal. And hence one third order settlement from the missing area of Karunagappally sub region and one from among Kadakkal, Nilamel and Chithara is selected taking the following criteria :

- I Centrality
- I Connectivity
- I Existing hierarchy

Based on these criteria Chavara and Kadakkal are selected. In the remaining areas in Anchal and Punalur sub regions,

Table 8.1: Suggested Hierarchy of Settlements

Order of the settlement	Sl.No	Name of the settlement	Order of the settlement	Sl.No	Name of the settlement
I	1	Kollam Corporation	IV	25	Edamulakkal
II	1	Anchal		26	Nilamel
	2	Chathanoor		27	Kunnathur
	3	Kottarakkara		28	Viakudy
	4	Punalur Municipality		29	Ummannoor
	5	Karunagappally		30	Pennadu
III	1	Kadakkal		31	Clammadu
	2	Velinalloor		32	Thirukadavoor
	3	Chavara		33	Chithara
	4	Pathanapuram		34	Alayamon
	5	Kundara		35	Neduvathoor
	6	Sasthamcottah		36	Thalavoor
IV	1	Paravur Municipality		37	Pannana
	2	Mayyanadu		38	Nedumpana
	3	Adichanallor		39	Yeroor
	4	Thevalakkara		40	Alappadi
	5	Pavithreeswaram		41	Sooranad South
	6	Thodiyoor		42	Poruvazhy
	7	Kulasekharapuram		43	Pattazhy vadakkelkara
	8	Ittva		44	Elampalloor
	9	Mylom		45	Sooranad North
	10	Ezhukone		46	Thekkubagham
	11	Oachira		47	Kizhakkokallada
	12	Kalluvathukkal		48	Poothakkulam
	13	Kareepra		49	Thirkaruva
	14	Kottamkara		50	Perayam
	15	Thirukovilattom		51	Thazhava
	16	Vettikkavala		52	Pravanthoor
	17	Kulakkada		53	Mandrothuruthu
	18	Aryankavu		54	Panayam
	19	Pooypally		55	West Kallada
	20	Thenmala		56	Pattazhy
	21	Kulathupuzha		57	Melila
	22	Chadayamangalam		58	Karavallor
	23	Veliyam		59	Needakara
	24	Mynagappally		60	Clappana

it is assumed that Anchal and Punalur (both second order settlements) will function as third order settlements of the sub region catering the needs of Thenmala, Aryankavu and Kulathupuzha.

The third order settlements are ;

1. Chavara
2. Kadakkal
3. Velinalloor
4. Pathanapuram
5. Kundara
6. Sasthamkotta

The spatial distribution of the third order settlements and the service area are shown in Figure 8.8. The Service settlements of III order settlements is shown in Annexure 13. The suggested hierarchy of settlements are shown in Table 8.1 and in Figure 8.9.

4. Character of higher order settlements

By the term character of a settlement, it means whether it possess urban nature, semi urban nature, and semi rural or rural nature as given in Chapter 7. The character of the higher order settlements is summarized in Table 8.2.

Anchal is the only second order settlement, which is rural in character. Being proposed as a second order settlement of the District, Anchal is proposed to be upgraded as a settlement of urban in character by 2021.

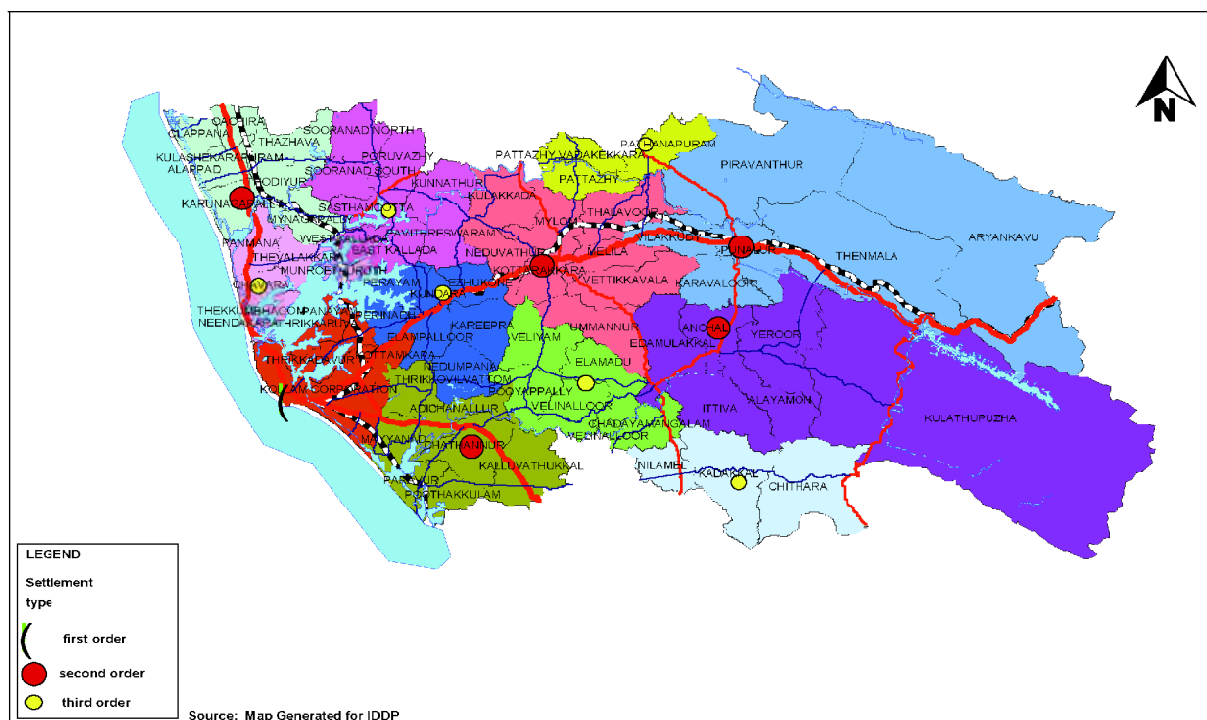


Fig 8.8 : Service settlements of the third order settlements

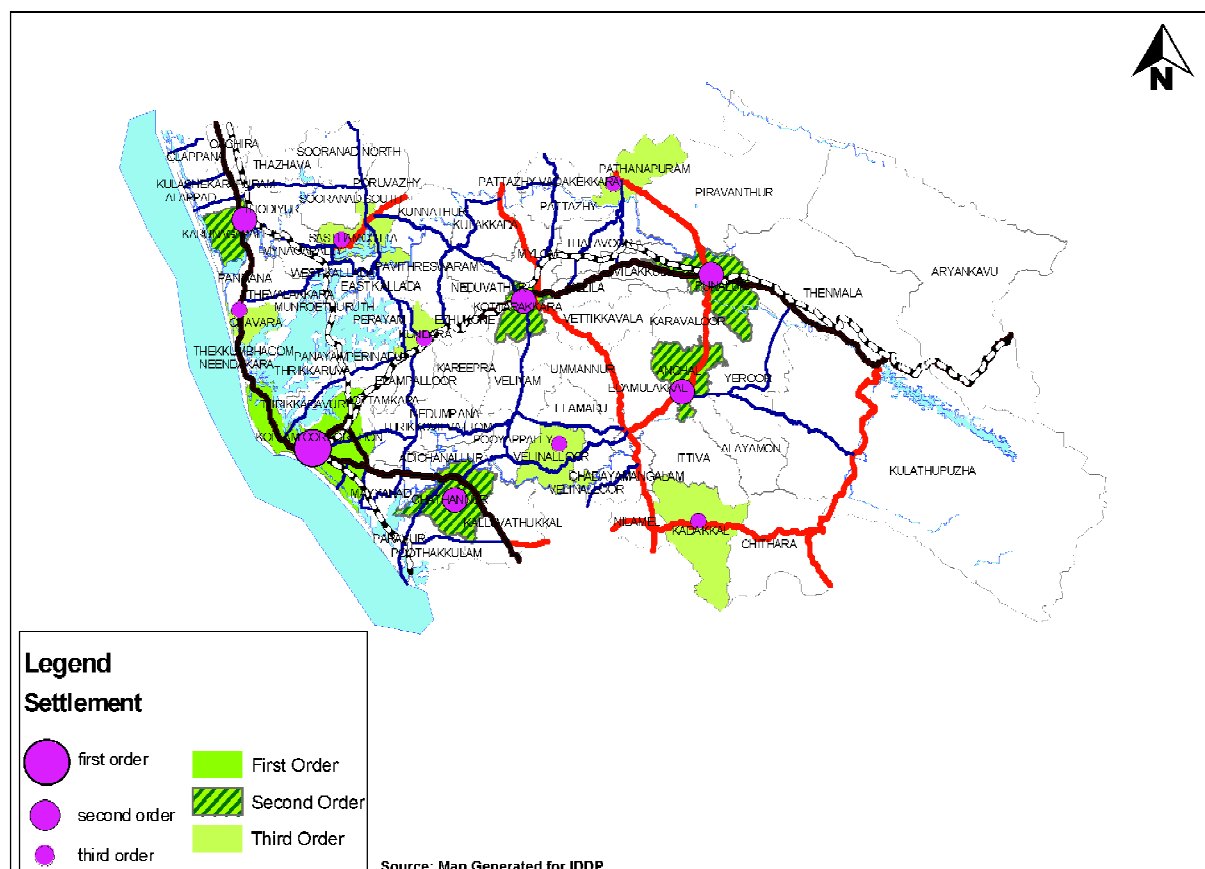


Fig. 8.9: Suggested hierarchy of settlements

Table 8.2: General character of the higher order settlements

Order of settlement	Name	Character of settlement
1	KOLLAM CORPORATION	Urban
2	KARUNAGAPALLY	Semi Urban
2	KOTTARAKKARA	Urban
2	ANCHAL	Rural
2	CHATHANNOOR	Semi urban
2	PUNALLOOR	Rural
3	CHAVARA	Semi Urban
3	KADAKKAL	Semi Rural
3	VELINALLOOR	Rural
3	PATHANAPURAM	Rural
3	SASTHAMCOTTAI	Semi urban
3	KUNDARA	Semi Urban

5. Conclusion

The study of the suggested hierarchy of settlement of the district shows that Kollam Corporation is the highest order settlement in the District and Punalur Municipality is a second order settlement as expected. Kottarakkara, Karunagappally, Anchal and Chathanloor are the other four 2nd order settlements. Kottarakkara Grama Panchayat and Karunagappally prove to be the existing second order settlements in contrary to the present order of administrative set up where in a Municipality like Paravur is not included in the second order.



Chapter 9

Hierarchy of Nodes

In the Kerala context where urban rural continuum persists, each LSGI is having at least one node. The agglomeration of activity area around one or more (adjacent) road junctions which act as commercial centre of an LSGI is termed here as a node. The node need not be confined fully within an LSGI area and in most of the cases its service area goes beyond the boundary of the LSGI within which it is located. In certain cases the nodes may be located at the meeting point of the boundary of one or two LSGIs. This means that the nodes have an entity independent of the LSGI area which necessitates a separate study. In this chapter the hierarchy of nodes and urban rural growth centers of the District are identified.

1. Existing hierarchy of nodes

The hierarchy of a node is indicated by the extent of activity taking place in the node. The extent of activity is measured by a proxy indicator denoted by the hierarchy of roads meeting at that place (the methodology is explained in Annexure 14).

A list of the nodes within the Kollam District is given in the Table 9.1.

The hierarchy of the nodes in the

descending order of weightage is shown in Figure 9.1. Accordingly the nodes (selected) of the Kollam District can be categorized into five.

I order node – Kollam Corporation

II order nodes

1. Kottarakkara
2. Karunagapally
3. Punalur – KSRTC jn

III order nodes

1. Mukkada
2. RO junction
3. Kottiyam
4. Pathanapuram
5. Ayur
6. Pooyapally
7. Paripally

IV order Nodes

1. Paravur

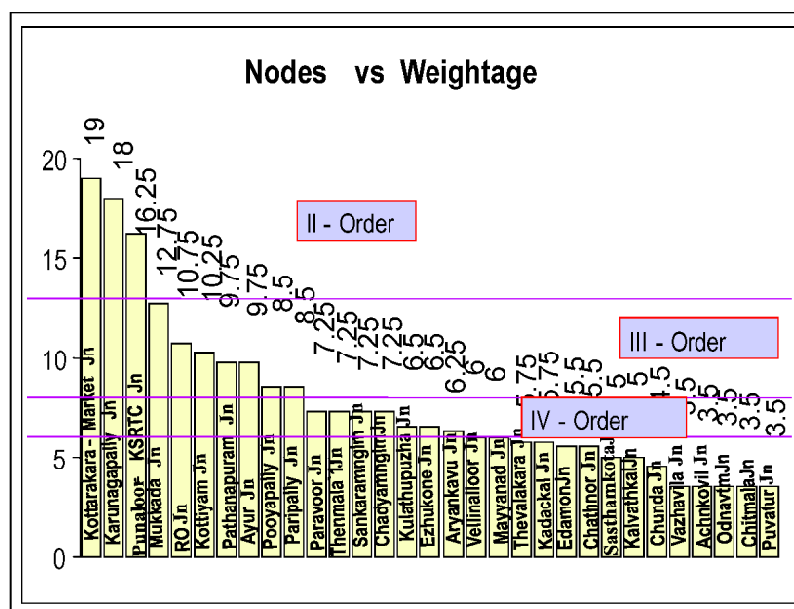


Fig. 9.1: Nodes with hierarchy

Table 9.1: List of nodes in Kollam District

Sl. no	NAME OF LSGI	NODES
1	Kollam corporation	Chinnakkada
2	Kottarakara	Pulamon&Market
3	Karunagapally	Karunagapally Jn
4	Punaloor Municipality	Punaloor
5	Kundara	Muikkada Jn
6	Anchal,Alayamon	RO Jn
7	Adichanallor,Mayanad, Thrikkovilattom	Kottiyam Jn
8	Edamulekkal	Ayur Jn
9	Pooypally	Pooypally Jn
10	Kalluvathukkal	Paripally Jn
11	Pathanapuram	Pathanapuram Jn
12	Oachira	Vavakavu Jn
13	Paravoor Municipality	Paravoor Jn
14	Chavara and Panmana	Shankramangalm Jn
15	Chadayamangalam	Chadayamangalm Jn
16	Ithemala	Ithemala Jn
17	Oachira	Palimukku Jn
18	Ezhukone	Ezhukone Jn
19	Kulathupuzha	Kulathupuzha Jn
20	Aryankavu	Aryankavu Jn
21	Vellinallor	Kariganoor Jn
22	Mayyanad	Mayyanad
23	Thevalakkara	Thevalakkara Jn
24	Kadakkal	Kadakkal
25	Thenmala	Edamon Jn
26	Chathanoor	Chathanoor Jn
27	Kalluvathukkal	Kalluvathukkal Jn
28	Gasthamkotta	Gasthamkotta Jn
29	Ittva	Chunda Jn
30	East Kallieda	Chittumala Jn
31	Veliyam	Odanavattom
32	Karavallor	Vazhavila Jn
33	Kulakkada	Pooavoor Jn
34	Aryankavu	Achenkovil Jn

2. Thenmala
3. Sankaramangalam (Chavara)
4. Chadayamangalam
5. Kulathupuzha
6. Ezhukone
7. Aryankavu

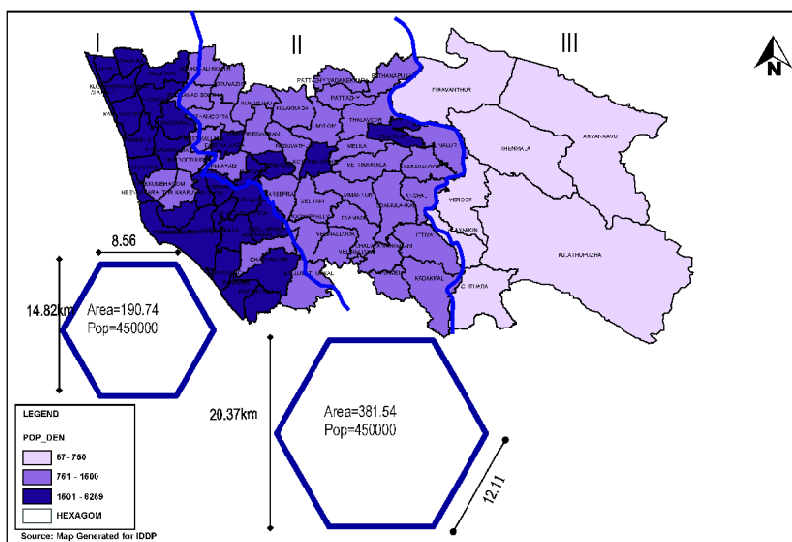


Fig 9.3: Size of service area polygon in different area

V order nodes- All the remaining nodes selected for the study are included in the category of V order junctions.

The spatial distribution of the nodes are shown in Figure 9.2

2. Suggested hierarchy of nodes

The suggested hierarchy of nodes is derived taking into account

- ✓ The population distribution
- ✓ Centrality with respect to the service area
- ✓ Existing hierarchy of the nodes

2.1. Suggested I order node

The first order node is invariably taken as Chinnakkada which serves the entire district.

2.2. Suggested II order nodes

The second order nodes have to fulfill the functions of a city centre mentioned in the Town and Country Planning Organization (TCPO), Govt. of India guidelines for commercial facilities.

As per TCPO guidelines, city centre has to cater a population of 3 lakhs. But

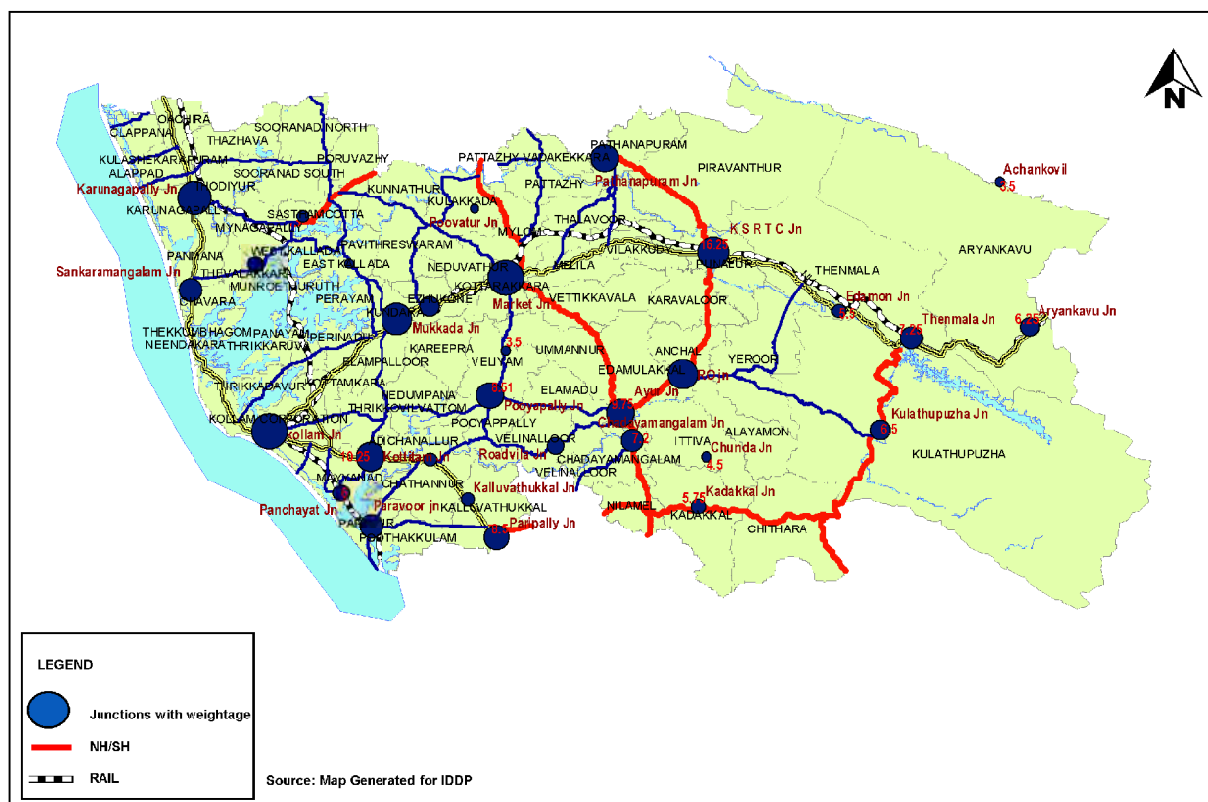


Fig 9.2 : Spatial Distribution of Rural Nodes (Existing)

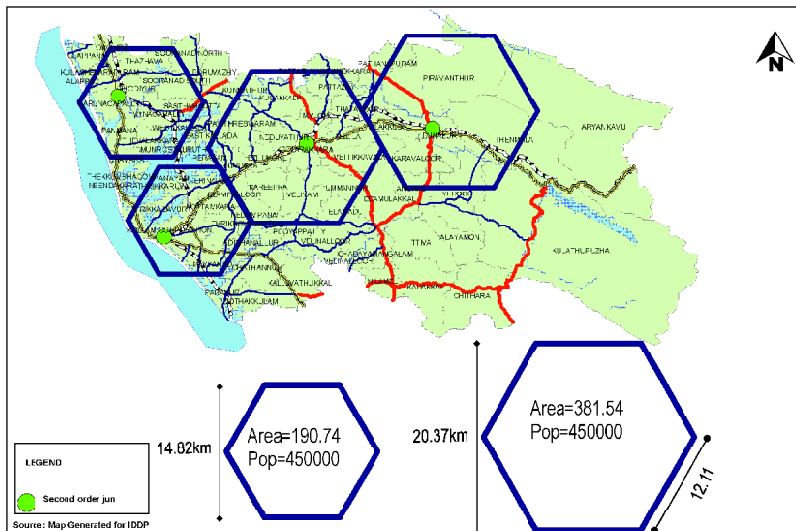


Fig 9.4: Service area of existing second order nodes

due to dispersed settlement in the district, the service population of the II order nodes is taken as 4.5 lakhs.

The service area is assumed to have a hexagonal shape, the area of which is determined by taking into account the population density of the service area and the population to be served. Since the population density in the low land region, mid land region and high land region of the district differs, area of hexagon in each

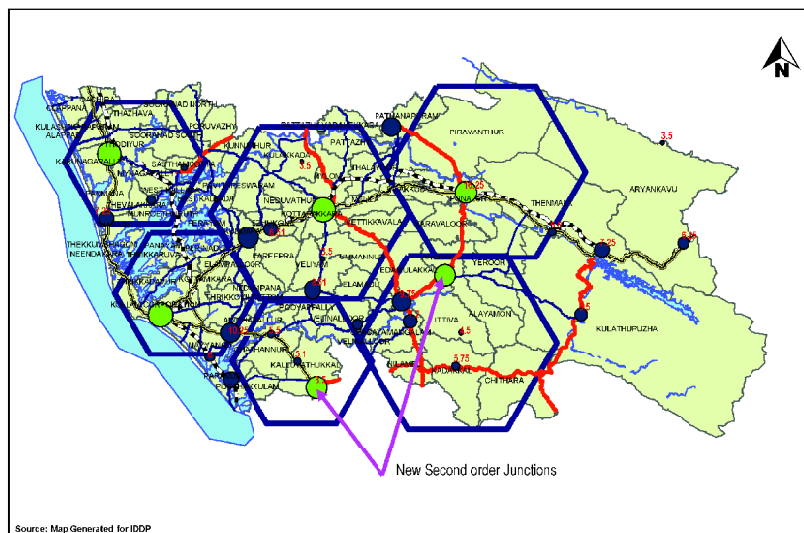
Existing IInd order Node - Punalur

Fig 9.5: Modified second order nodes

of these regions varies (Figure 9.3). However due to the very big size of the hexagon in the high land region because

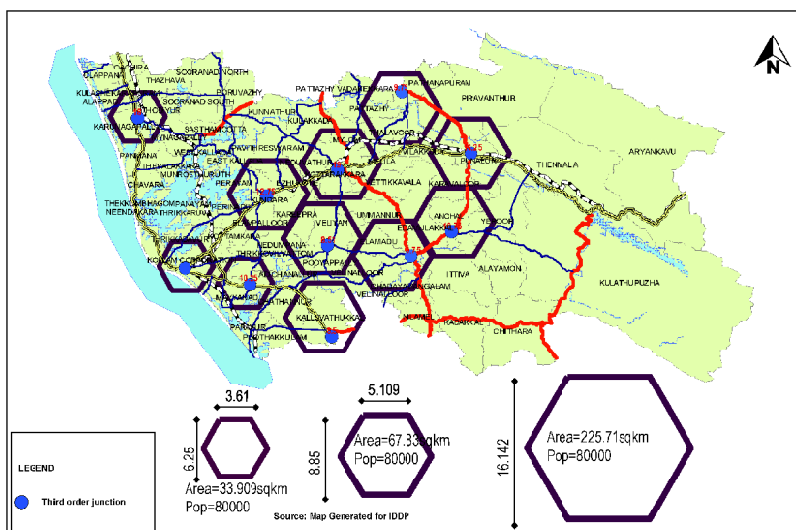


Fig 9.6: Service area of existing third order nodes



Existing II order Node - Kottarakkara

of low population density, the hexagon taken for the mid land region is considered in the high land also.

The service area of the existing second order nodes are shown in Figure 9.4. From the figure it is clear that the eastern and south eastern part of the district is not served by a second order settlement.

The Anchal and Paripally, two prominent nodes in the region, are selected as the second order (proposed) nodes for these regions (Figure 9.5). The second order nodes of the district are Karunagapally, Kottarakkra, Punalur, Anchal and Paripally.

2.3. Suggested III order nodes

The third order nodes have to fulfill the functions of a community centre mentioned in the TCPO guidelines for commercial facilities. As per TCPO guidelines community center has to cater a population of 40000. But due to dispersed settlement in the district, the service population of the III order nodes is taken as approximately 80,000. As explained earlier, service area of third order nodes with hexagonal in shape is derived for each region.

The existing third order node with their

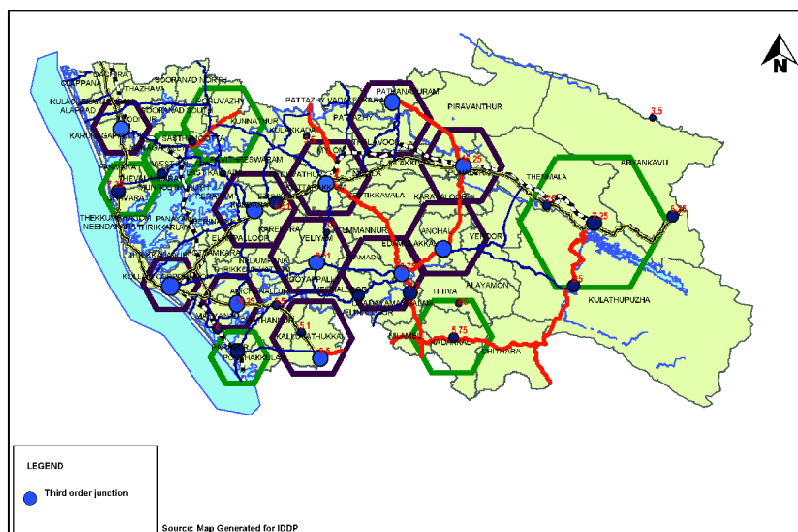
Fig 9.7: Service area of existing and suggested 3rd order nodes

Table 9.2: Hierarchy of nodes (proposed)

Order of the Node	Name of the Node
I	Chinnakkada
II	Karunagappally
	Kottarakkara
	Anchal
	Punalur
	Parippally
III	Sasthamcotta
	Chavara
	Thevalakkara
	Kundara
	Kottiyam
	Paravur
	Kadackal
	Thenmala
	Pathanapuram
	Pooypappally
	Ayoor



Fig 9.8: Hierarchy of nodes (Suggested)

service area is shown in Figure 9.6.

The unserved area shows the necessity of a third order node there and the modified situations with new third order nodes are shown in Figure 9.7.

The third order nodes are Sasthamkottah, Chavara, Thevalakkara, Kundara, Kottiyam, Parvur, Kadakkal, Thenmala, Pathanapuram, Velinallur and

Ayur.

The suggested hierarchy of nodes is shown in Table 9.2 and Figure 9.8.

3. Conclusion

The study shows that, obviously Chinnakkada and surrounding area is the 1st order nodes of the District acting as a commercial centre serving the entire District. Karunagappally, Kottarakkara,

Punalur, Anchal and Chathannur are the suggested 2nd order nodes, serving the surrounding population and potential growth centers of the District. The next order growth centers may be Kadakkal, Chathannur, Kottiyam, Sasthamcotta, Chavara, Thevalakkara, Kundara, Thenmala, Pathanapuram, Velinallur, Paravur and Ayur.



Chapter 10

Urban Profile

In this chapter the trend of urbanization of Kollam District is assessed and is compared with the level of Urbanization of the State so as to ascertain the position of the District in the State scenario.

1. Trend of Urbanization –Kerala

At the turn of the 21st century, Kerala had a population of 63.96 lakhs, of which 59.42 lakhs were in its rural areas as per Census 2001. This constituted 92.89 per cent of the total population of the state. At the end of the 20th century the total population in Kerala has increased to 3.18 crores (31838619) of which rural population is 2.35 crores. This means that the rural population constitutes about 74 % of the total population in 2001. The population figures of the State as per census 2001 are shown in the Table 10.1.

There is an increase of about 400% in the total population of Kerala within a century. During this period rural population has increased by 300 %. Rural population content in Kerala has declined from 92.89%

Table. 10.1: Population figures (2001) of Kerala at a glance

	2001			
	Person	Males	Females	Growth rate of total population
Total	31838619	15468664	16369955	9.42
Rural	23571484	11450785	12120699	10.05
Urban	8267135	4017879	4249256	7.64

to 74% of the total population within a century. This is the general scenario on the trend of urbanization in Kerala that has happened in a century.

What was the urbanization trend in the immediate past? The population figures of the last three decades are analyzed here

(see Table 10.2).

There is a steady decline in the population growth rate over the last three decades. Population growth rate was 19.24% in 1981, and it reduced to 9.42% in 2001. During the period 1981-91 population of 36.45 lakhs were added to

Table 10.2: Trends of population growth of Kerala - 1981-2001

Year	Total population	Growth rate of total population	Growth rate in urban population
1981	25453680	19.24	37.64
1991	29098518	14.32	60.97
2001	31838619	9.42	7.64

Table 10.3: Trends in urbanization of Kerala - 1981-2001

Year	Total population	Total urban population	Percentage of urban population	Growth rate of total population	Growth rate in urban population
1981	25453680	4771275	18.74	19.24	37.64
1991	29098518	7680294	26.39	14.32	60.97
2001	31838619	8267135	25.97	9.42	7.64

the previous decades population, whereas during the period 1991-2001, population of only 27.4 lakhs were added within the next decade. The growth rate of urban population of Kerala over the last three decades shows that it is fluctuating. Over the last two decades, (1971-81 and 1981-91) the growth rate in urban population was on the rise, i.e., 37.64% in 1981 and 60.97% in 1991 (Table 10.3).

But the urban population growth rate has drastically declined to 7.64% in 2001 with a decrease of 87.5 % over the preceding decadal urban population growth rate. At the same time the growth rate in total population has decreased from 14.32 % to 9.42% only with a decrease rate of 34.2%. This indicates that over the last three decades there is spread effect of population into the rural area. This is an indication to the planners to take the planning of rural areas seriously than before and subsequently address the reasons for the spread effect of population to rural areas.

2. Census urban areas in Kollam District

As per the 2001 census, the population of Kollam District is 2,585,208, which constitutes about 8.12 % of the total population of the State. Of the total population of the Kollam district, 465978 is urban

population. That is 18% of the total population of the District is in the census urban area of the District. There are four urban areas, Kollam Corporation, Paravur Municipality, Punalur Municipality and Neendakara out growth, in the District. The census urban area of Kollam District is shown in the Figure 10.1.

3. Urban population content (existing)

The process of urbanization of an area can be assessed in relation to its urban population content. The urban population content of Kerala state is 26%, whereas

that of the District is 18%. On comparing the urban content of all the 14 Districts of the State, it can be seen from Table 10.4 that Kollam District is positioned in the 8th rank based on the Census classification.

4. Decadal variation in urban population content Vs Urban area

The Table 10.5 shows the decadal variation in the urban content of Kollam District. The figure show that urban content of the population has increased from

Table 10.5: Decadal variation in the Urban Population of Kollam District from 1971 to 2001

Year	Total Population	Urban Population	Percent of Urban Population
1971	1,839,163	189,903	10.33
1981	2,175,525	337,153	15.5
1991	2,407,566	446,036	18.53
2001	2,585,208	465,978	18.02

Table 10.4 : District wise percentage of urban population

Population 2001					
District	Urban	Rural	Total	% Urban	Urban Content Rank 2001
Kannur	1212898	1196058	2408956	50.3	1
Ernakulam	1477085	1628713	3105798	47.6	2
Kozhikode	1101157	1777974	2879131	38.2	3
Idiappuram	1091661	2142695	3234356	33.8	4
Alappuzha	621457	1487703	2109160	29.5	5
Thrissur	839433	2134799	2974232	28.2	6
Kasaragod	233700	970378	1204078	19.4	7
Kollam	465978	2119230	2585208	18	8
Kottayam	299808	1653838	1953646	15.3	9
Palakkad	356575	2260907	2617482	13.6	10
Idiappuram	123798	1110218	1234016	10	11
Idiappuram	356170	3269301	3625471	9.8	12
Idiappuram	57593	1071628	1129221	5.1	13
Wayanad	29612	751007	780619	3.8	14

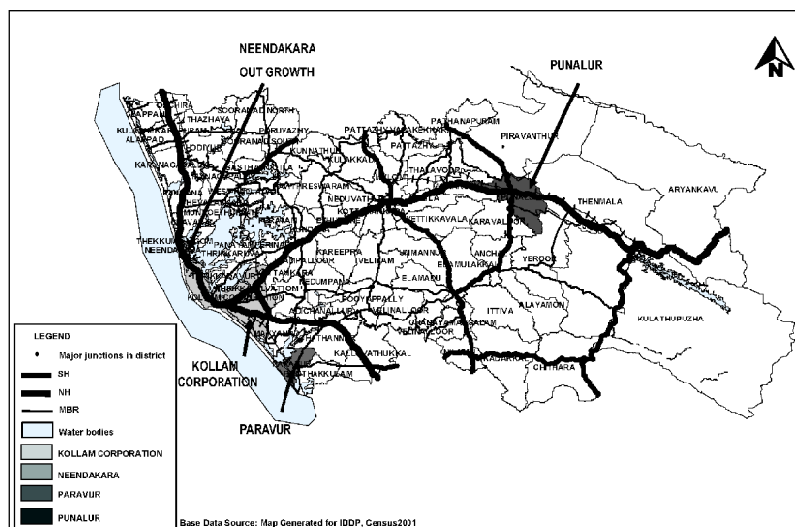


Fig 10.1: Census urban area of the District

10.33% to 18.02% over a period of 4 decades. It is to be noted that the variation during the decade is not uniform.

There is a steep increase (From 10.33 % to 15.50 %) in the urban content of the total population for a period from 1971 to 1981. The urban area of the district during this period (1971-1981) shows an increase of 23.9 sq km (some settlements surrounding the, then Kollam Municipality had been classified as urban area as per the 1981 Census). The sudden surge in the urban population during this period may mainly be due to this factor. A slight decrease in the urban population noted during the period from 1991 to 2001 though there is no change in the extent of urban

area of the district. This is a clear indication of out migration of people from the urban area during this period.

The increase in urban areas of the District as indicated in the corresponding year's census figures is shown the Figure 10.2. In 1971 the extent of urban area in Kollam District was 35.3 sq km, which was increased to 73.65 sq km in 1991. The increase of urban area of the district was not uniform from 1971 to 2001, but the increase was high during the period from 1971 to 1981 and from 1981 to 1991. There is no increase of urban area during the last decade, i.e. during the period 1991 – 2001.

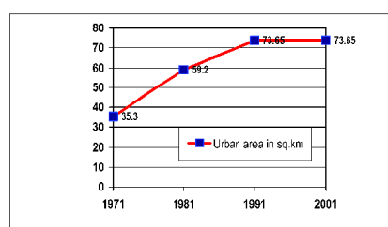


Fig 10.2: Extent of urban area of the District

It can be summarized that, during 1971 - 1991 urban population has increased by 145 % against an increment of 109 % in the extent of urban area. This indicates that there is an increase in the population in the existing urban areas rather than the additional population of the newly annexed urban areas until 1991. But after that (1991-2001) there is a decrease in the urban content of the population with no addition to the urban area. This is an indication of the decrease of the population from the existing urban areas.

5. Growth rate of urban population

The graph (Figure 10.3) shows the decadal variation in the urban population of Kollam District from 1971 to 2001. The total Urban population of the District has increased from 189903 to 465978 in a period of four decades. The variation

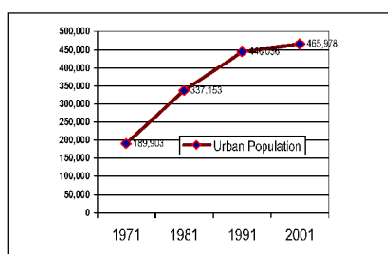


Fig 10.3: Total Urban population during various decades

during this period was not uniform. A steady increase in the urban population is observed from 1971 to 1991, but during the period from 1991 to 2001 there is comparatively less increase in the urban population.

Figure 10.4 shown below depicts the growth rate of urban population against the growth rate of population over the last two decades in the District. When the population growth rate of the District has declined from

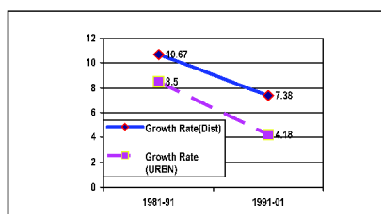


Fig 10.4: Urban Population Growth Rate-Comparison with District

10.67 to 7.38, the urban population growth rate has declined from 8.5 to 4.18 during the same time period (1981 to 2001), indicating a possibility of out migration of population from the urban areas of the District. Had there been no migration of population from the urban areas, there would have been at least the same growth of population in the urban areas as that of 7.38 (the average growth rate of the total population of the District).

This is a pattern of urban growth in contrary to the popular belief that there is in-migration of people to the urban area. This is not an isolated case of Kollam District. The trend of urban population of the State also shows the same pattern of shrinking urban population growth rate

figures during 1981 to 2001.

Table 10.6 compares the growth rate of urban population of the State and the District. This shows that there is a huge decline in the growth rate of urban population of Kerala; more or less the same Table 10.6: Growth rate of urban population – Comparison with state

	1981-91	1991-01
Kerala	60.89	7.69
Kollam	8.5	4.18

pattern is seen here in Kollam also.

The Figure 10.5 depicts the population growth rate of various local bodies of Kollam district. It is clear from the picture that the growth rate of population of the urban areas of Kollam district (Paravur Municipality, Punalur Municipality and Kollam Corporation) is less than that of the surrounding Grama Panchayat indicating out migration of people from the urban area to the rural areas.

6. Urban settlements – From 1971 to 2001

The number of urban settlements of the district has been increasing from 1971 to 1991 (Table 10.7). In 2001, Kollam municipality has been upgraded to Kollam Corporation, adding the adjoining four urban settlements. Thus there is decrease in the total number of urban settlement of district compared to the previous decade. But area wise there is no increase from 1991 to 2001 in the urban area.

Similar to the general trend of the State, the District also shows a declining trend in the level of urbanization, which is measured in terms of the total population

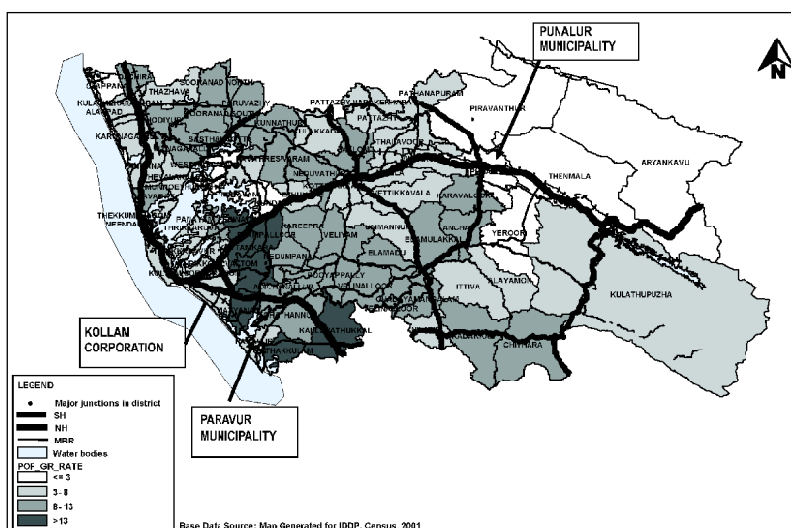


Fig. 10.5: LSGI wise Population Growth Rate (2001)

Table 10.7: Urban settlements in different period of time

Census year	Total number of Urban area	Municipal corporation	Municipal Towns	Non municipal towns	Urban out growth	Total area (sq km)
1971	4		1	2	1	35.3
1981	6		2	3	1	59.2
1991	10		3	5	2	73.65
2001	4	1	2		1	73.65

residing in the (census) urban areas. In fact, Kollam District shows a lesser level of urbanization than the State. This is evident from the fact that growth rate of urban population in the State is 7.69 during 1991-01 whereas that of the District is only 4.18 during the same period. And also, the level of urbanization shows a declining trend in the District over a time period. Growth rate of urban population during 1981-91 was 8.58 and it has declined to 4.18 during 1991-01 indicating the declining trend of urbanization in the District.

Analysis of the population figures in urban and rural area of the District shows that there exists a distinction in the growth of population in urban and rural areas. Within the District, urban areas shows a lower growth rate of population whereas the rural areas surrounding the urban areas show a significantly higher growth rate, indicating possible out migration of people from the urban areas to the surrounding rural settlements.

7. Future urbanization profile of the District

The analysis of the occupational structure of the District shows that the production sectors- i.e., the agriculture and industrial sector, shows declining trend in the district. More than 50% of the total urban population depends on the service sector for their lively hood. It is observed that rural area of the district is also slowly withdrawing from the primary sector and started depending more on the service sector. Because of this shift in the occupational structure some of the rural areas will be having more than 75% of the male workers in the non-agricultural category in the near future and hence will fall in the category of census urban. Hence there may be significant increase in the urban population as well as in the extent of urban areas of the District in the future, though the urban population content of the existing urban areas show a decreasing trend. In the following paragraphs, the future urban local bodies are delineated based on the three fold census classification

as per census 2001, and the result are further iterated with the factors like impact of future urban development projects, grade of the local bodies and hierarchy of settlements.

Criteria-1: Census urban area

A study on the existing occupational structure in various settlements of the District will put light on those settlements likely to become census urban shortly. The workers of each settlement which are classified into four fold classification as per census 2001 are divided into the following nine categories based on the workers classification in the 1991 census.

1. Main Cultivators
2. Main Agricultural Laborers
3. Livestock, Forestry, Fishing, Hunting, Plantation, Orchards, and allied activities
4. Mining and Quarrying
5. Manufacturing, Processing, Servicing and repairs in Household industries
6. Manufacturing, Processing, servicing and repairs in other than household industries
7. Trade and commerce
8. Transport storage and Communications
9. Others

The methodology adopted for the extrapolation to get the nine fold classification of workers in 2001 based on the workers classification in census 1991 is described briefly here. The only two types of workers included in both 1991 and 2001 census are the cultivators and agricultural laborers. The remaining two types workers in the 2001 census, House hold industrial workers and other workers are added together and this total is divided into 7 classes of workers in the same proportion as these 7 classes of workers as there in the 1991 census. Then the number of male workers in manufacturing, processing, servicing and repairs in House hold industries, manufacturing, processing, servicing and repairs in other than house hold industries, trade and commerce, transport, storage and communication and

others are added to calculate the percentage of male workers in non-agricultural activities in each of the local bodies of the District. The details are shown in Annexure-15. In order to avoid the possibility of error, i.e. exclusion of some of the actual urban area, the extrapolation of the data on classification of workers based on 1991 census, the local bodies with nonagricultural male workers more than 70% (instead of 75%) is taken for the study. Based on this, there are 20 Grama Panchayats identified in the District, which are satisfying the three-fold census classification to be termed as urban. The list of which is given here.

1. Adichanallur
2. Chathanur
3. Mynagappally
4. Clappana
5. Thazhava
6. Thevalkkara
7. Thrikkadavur
8. Karunagappally
9. Kottarakkara
10. Kottamkara
11. Kulasekharapuram
12. Kundara
13. Mayyanad
14. Oachira
15. Panmana
16. Perinad
17. Poothakkulam
18. Thodiyoor
19. Thrikkaruva
20. Thrikkovilvatom

The classification of an area into urban depending 9 fold classifications of workers obtained out of a mere extrapolation of the census 2001 data based on the previous decades data can't be taken as very accurate. Though it gives a near accurate picture about the trend of urbanization, some other factors like the extent of physical and economic development, future urban development projects and existing hierarchy of settlements also need to be considered.

Criteria 2: Grade of Local Self Government Institutions

The grading of LSGIs is given comparing their physical and economical development. So here in the absence of direct data to assess the physical and economic development, the grade of Grama Panchayat can be taken as a proxy indicator to measure the physical and

economic development of the LSGI.

Out of the 20 Grama Panchayats listed based on criteria one, 18 are Special grade Grama Panchayats, and Mynagapally and Thodiyoor are first grade Grama Panchayats. These two Grama Panchayats are excluded from the selected LSGIs and the list of LSGIs after the exclusion of these LSGIs is noted below.

1. Adichanallur
2. Chathannur
3. Clappana
4. Thazhava
5. Thevalkkara
6. Thrikkadavur
7. Karunagappally
8. Kottarakkara
9. Kottamkara
10. Kulasekharapuram
11. Kundara
12. Mayyanad
13. Oachira
14. Panmana
15. Perinad
16. Poothakkulam
17. Thrikkaruva
18. Thrikkovilvattom

Before finalizing the future urban local bodies of the District, perspective urban development Projects of the District and its impact are also to be studied.

Criteria: 3: Projects enhancing urbanization

The perspective in urban development of the District shows that the major urban development projects envisaged in the District as of now are the Thankassery port and the Neendakara port. The upgradation of these ports will be a boon for those industries of the District, which either export their products or import raw materials. The cashew, fishing and mineral sector, of the district will be benefited out of the proposed upgradation of the port.

The fish processing industry is concentrated in Kollam Corporation, Chavara and Neendakara Grama Panchayats. The only two industries in the District which process the sea sand to extract minerals are Indian Rare Earths and KMML both situated in Panmana Grama Panchayat. The spread of the cashew factories are mainly confined to the Grama Panchayats situated in the midland of the District. Due to the upgradation of the ports, it can be assumed that industrial activity in the District will be boosted up.

The development in the industrial sector in turn will enhance the commercial activity and activities in other service sectors. However it can be summed up that though the proposed port enhances the overall industrial activity of the District, the process of urbanization due to this will be mainly confined in Kollam Corporation, Chavara, Neendakara and Panmana Grama Panchayats.

It is to be noted that Chavara, Neendakara (others have already been included in the list) are not included in the list of the probable urban local bodies of the District. These two are Local bodies adjacent to the Kollam Corporation and hence the developments in Kollam Corporation have direct influence on the developments in these local bodies. So these local bodies need to be considered while listing the future urban local bodies. After the inclusion of these two local bodies the number of local bodies in the select list is increased to 20.

1. Adichanallur
2. Chathannur
3. Clappana
4. Thazhava
5. Thevalkkara
6. Thrikkadavur
7. Karunagappally
8. Kottarakkara
9. Kottamkara
10. Kulasekharapuram
11. Kundara
12. Mayyanad
13. Oachira
14. Panmana
15. Perinad
16. Poothakkulam
17. Thrikkaruva
18. Thrikkovilvattom
19. Chavara
20. Neendakara

The proposed Kollam-Kottappuram National water way is expected to enhance the commercial and industrial activity of the District in general, and that of those Local bodies through which the national water way passes. But the impact of the National water way in the District on a major scale will be mainly confined to the local bodies adjacent to the waterway. The waterway passes through Paravur Municipality, Mayyanad Grama Panchayat and Kollam Corporation. The Paravur Municipality and Kollam Corporation are the existing urban

local bodies of the District and Mayyanad Grama Panchayat is already included in the list of the probable future urban local bodies of the District.

Criteria: 4: Hierarchy of settlement

The hierarchy of the above 20 local bodies in the overall context of the District are also to be taken in to account before finalizing the local bodies with urban character, because the hierarchy of local body is an indicator on the type and number of facilities in the local bodies. The Annexure 8 shows the hierarchy of the settlements and according to this out of the 20 local bodies listed above, the following are in the category of local bodies having the lowest hierarchy.

1. Clappana
2. Thazhava
3. Perinad
4. Poothakkulam
5. Thrikkaruva

These five local bodies are to be excluded from the list of the selected list of likely urban Local bodies. The final list of the probable urban local bodies is given below.

1. Adichanallur
2. Chathannur
3. Thevalkkara
4. Thrikkadavur
5. Karunagappally
6. Kottarakkara
7. Kottamkara
8. Kulasekharapuram
9. Kundara
10. Mayyanad
11. Oachira
12. Panmana
13. Thrikkovilvattom
14. Chavara
15. Neendakara

Clearly the above local bodies define the future urban profile of the District.

The study of the proposed hierarchy of settlement of the District places Anchal Grama Panchayat as a second order settlement. A second order settlement is supposed to be an urban settlement and hence Anchal Grama Panchayat is also included in the list of probable future urban local bodies of the District.

The likely future urban profile of the district evolved is shown in the Table 10.8 and the same is shown in Figure 10.6

8. Urban profile

All the 16 local bodies listed as

Table 10.8: Future urban profile of the district

Sl No	Existing Urban local bodies	Future probable urban local bodies
1	Kollam Corporation	Karunagappally
2	Paravur Municipality	Kottarakkara
3	Punalur Municipality	Neendakara
4		Chavara
5		Adichanallur
6		Kulasekharapuram
7		Kundara
8		Mayyanad
9		Oachira
10		Thevalakkara
11		Panmana
12		Thrikkadavur
13		Kottamkara
14		Chathannur
15		Thrikkovilattom
16		Anchal

probable future urban local bodies can't be expected to attain the urban character in next decades (2011 and 2021). Only some of these will attain urban character by the next decade and the remaining will attain the urban character in the succeeding decades. The growth rate of population can be taken as the deciding criteria by how fast a local body attains urban nature.

The pattern of growth rate of population among the local bodies of the District as per Census 2001 shows that the growth rate is the highest among those local bodies adjacent to the Kollam Corporation. And hence it can be presumed that those Local bodies adjacent to the Kollam Corporation and those along the National high way can be assumed to attain the urban status in the next 10 years and the remaining Local bodies to become so within the next 20 years. In the study of the hierarchy of settlements, Kottarakkara, and Karunagapally are positioned next to Kollam corporation. So these two local bodies can be assumed to attain urban nature in the first phase itself. That means Karunagapally, Kottarakkara, Kottamkara, Neendakara, Thrikkadavur, Mayyanad and Chathannur will attain the status of urban local bodies in the next 10 years where as all the other 9 local bodies will attain the urban status within the next 20 years. This is shown in Table 10.9.

Table 10.9 : Urban profile – Phasing

Sl. No.	In the next 10 years	In the next 20 years
1	Karunagapally	Kulasekharapuram
2	Kottarakkara	Thevalakkara
3	Neendakara	Chavara
4	Thrikkadavur	Kundara
5	Mayyanad	Adichanallur
6	Kottamkara	Oachira
7	Chathannur	Panmana
8		Thrikkovilattom
9		Anchal

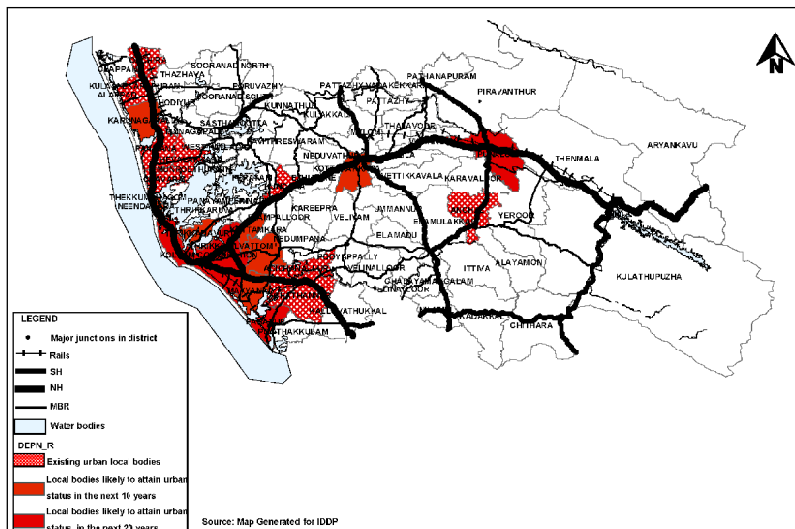


Fig 10.6: Future urbanization profile – Kollam District

Table 10.10: Facilities in general to be provided

Order	Name of the settlement	Projected Administrative status	Facilities
1	KOLLAM CORPORATION	Urban Local body	Higher order urban and rural facilities
2	KARUNAGAPALLY	Urban Local body	Higher order urban and rural facilities
2	KOTTARAKKARA	Urban Local body	Higher order urban and rural facilities
2	ANCHAL	Urban local body	Higher order rural facilities and lower order urban facilities
2	CHATHANOOR	Urban Local body	Higher order urban and Lower order rural facilities
2	PUNALLOOR	Urban Local body	Higher order urban and Lower order rural facilities
3	THEVALAKKARA	Urban Local body	Lower order urban facilities
3	KADAKKAL	Rural local body	Lower order rural facilities
3	VELINALLOOR	Rural local body	Lower order rural facilities
3	VETTIKAVALA	Rural local body	Lower order rural facilities
3	PATHANAPURAM	Rural local body	Lower order rural facilities
3	SASTHAMCOTTAH	Rural local body	Lower order rural functions
3	KUNDARA	Urban Local body	Lower order urban facilities

9. Functions (Suggested) to be performed by various higher order settlements.

The functions to be performed by various higher order settlements are derived based on its order, administrative status, character of the settlements and the service area. It is summarized in Table 10.10.

All the other Local Bodies act as basic service centers.

10. Conclusion

From the above study it can be

concluded that the level of urbanization of the State shows a declining trend in general. Kollam District shows even a less level of urbanization when compared to the State average. And also, the level of urbanization shows a declining trend within the District. The urban areas of the district show lower growth rate of population, whereas the rural areas surrounding the urban areas show a significantly higher growth rate indicating a possible out migration of people from the urban areas to the surrounding rural settlements.



Chapter 11

Agriculture

This chapter analyses the existing status and development issues of Agricultural sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on the temporal aspects. The third part probes into the development issues pertaining to the sector and finally the fourth part contains the analysis of ongoing programs and projects.

1. Analysis of Existing Status

The total extent of land under cultivation in the district is 2,18,267 hectares during 2004-2005. Paddy, coconut, rubber, pepper, banana, tapioca, mango and cashew are some of the extensively cultivated crops. Small and marginal farmers constitute more than 95% of the farming community and the average per family holding size is 0.21 hectare. Most of the large holdings are found to be

concentrated in the eastern part of the district and marginal holdings towards coastal area.

1.1 Physical Status

1.1.1 Cropping Pattern

Based on area, production and productivity of various crops cultivated in Kollam, 25 crops have been identified as the principal crops. With respect to the area of cultivation, coconut has the maximum share (32% of total cultivated area) in the district, followed by rubber (31%) whereas the area of cultivation under paddy is very less (6%) compared to coconut and rubber. Area, production and productivity of important crops are given in Table 11.1 and the percentage share of area of cultivation of principal crops is shown in Figure 11.1.

Food crops comprise only 18% whereas the commercial crops accounts for 82%. Among food crops Rice (36%) and Tapioca (28%) are the main crops

and in the case of commercial crops, Coconut (40%) and Rubber (38%) are the main crops.

The 25 crops, found as principal crops in the district (Table.11.1) are classified as major crops, sub major crops and minor crops based on area of cultivation and revenue generated. The crops classified as major crops are Coconut, Rubber and Pepper. Banana, Rice, Tapioca and Arecanut are the sub-major crops and the remaining crops are classified as the minor

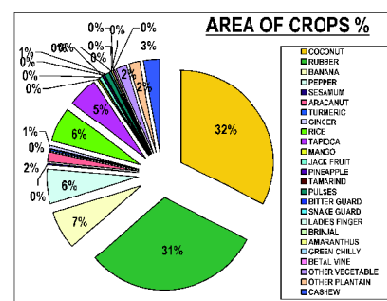


Fig. 11.1: Percentage areas of Crops

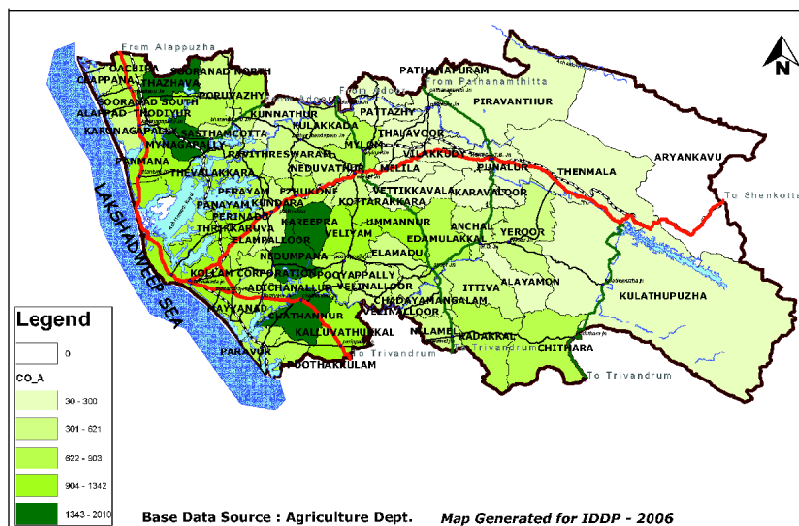


Fig.11.2 : LSGI wise distribution of area under coconut cultivation (Ha)

11

crops. It is noticeable that all the three major crops identified are commercial crops. In addition to the above crops, other significant crops like cashew, sesamum, vegetables, etc are also taken for analysis. Table 11.1 : Area, Production and Productivity of important crops in Kollam

Crops	Area(Ha)	Production(MT)	Productivity (No/Kg per ha)
Rice	9622	29293	2854
Coconut	50320	281	5672
Banana	9584	90074	9268
Tapioa	7774	124476	10127
Pepper	9689	5295	464
Rubber	48087	83267	1214
Cashew	2252	1410	606
Mango	767	3710	4301
Vegetables	2234	8153	5747

Major crops

Coconut (*Cocos nucifera*)

Coconut, which plays a vital role in furthering the economy of Kerala tops in area of cultivation both at State and District levels. In the State coconut is cultivated in 9 lakhs hectares (41% of net cropped area) of which the share of Kollam District is 8%. In the case of production of coconut the share of Kollam District is about 7%. The total area under cultivation of coconut in the district is 50320 hectares of which coastal areas have a prominent place in production as well as area under cultivation.

Maximum area under cultivation of coconut is in Chathanthoor Grama Panchayat (2010 ha) followed by the Grama Panchayats of Nedumpana, Mynagappally (1600 ha each), Thazhava (1525 ha) and Kareepra (1520 ha) (Figure11.2).

Coconut production is maximum in Chathanthoor Grama Panchayat followed by Thazhava which can be considered to be in coastal area. The highest productivity

shows randomization throughout the district. Pooyappally Grama Panchayat ranks first with 9400 nuts / ha per year followed by Piravanthur with 8000 nuts / ha per year. However these two areas are not in the coastal belt.

Rubber (*Haevia braziliensis*)

The eastern region of Kollam district has dominance in rubber cultivation compared to other areas. Kollam has a share of 8% of the rubber production in the State. In Kollam District, the extent of land under cultivation of rubber in various Local Self Government Institutions decreases from the eastern region to the western coast (Figure11.3). Thenmala Grama Panchayat ranks first in area (3793 ha) followed by the Grama Panchayats of Aryankavu (3200 ha) and Chithara (3193 ha).

Production of raw rubber is also maximum in Thenmala with 7586 MT

followed by Aryankavu with 6400 MT.

Pepper (*Piper nigrum*)

Kollam has a share of 5% of the pepper production of the State. Pepper cultivation is very much concentrated in the eastern belt. Chithara ranks first in area under cultivation (Figure11.4) with 1450 hectares followed by Aryankavu (1332 ha) and Kulathupuzha (1210 ha). In the case of production, Aryankavu ranks first with an annual production of 799 MT followed by Chithara with a production of 653 MT. This shows the potential of Aryankavu in pepper cultivation. Productivity of pepper in the district is 600 Kg/ha and which is much more than the state average of 327 Kg/ha.

Sub Major Crops

Banana (*Musa spp*)

Kollam has just 3% share of production as well as area of cultivation of banana in the State.

Area under cultivation of banana is maximum in Ummannur Grama Panchayat (550 Ha) followed by Kadakkal (524 ha) (Figure11.5). Banana production is maximum in Kadakkal (5240 MT) followed by Ummannoor (4455 MT). However, Banana productivity is maximum in Chadayamagalam (21000 Kg/Ha) followed by Nilamel. This is very high compared to the State average of 7910kg/ha.

Paddy (*Oryza sativa*)

In Kerala, paddy is cultivated in an area of 3.47 lakh hectares with a production of 7.71 lakh tons and a productivity of 2162 kg/ha which is higher than the national average of 1930 kg/ha. As far as Kollam District is concerned, the area under paddy

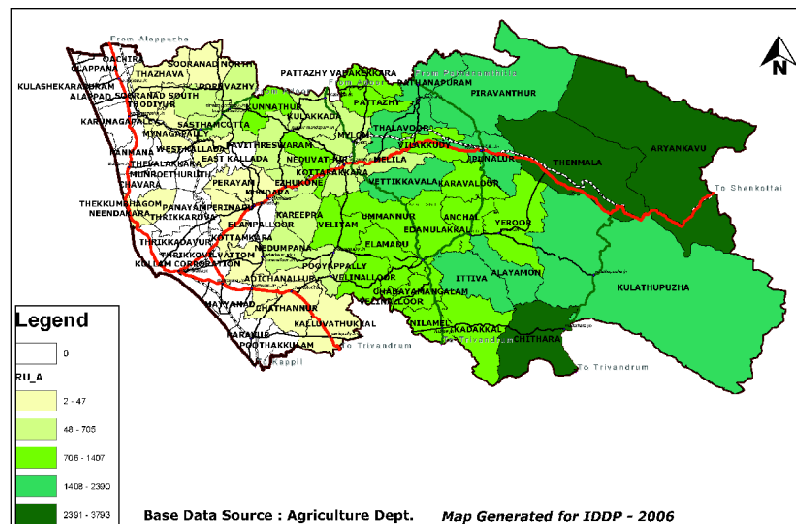


Fig.11.3: LSGI wise distribution of production of rubber cultivation (Ha)

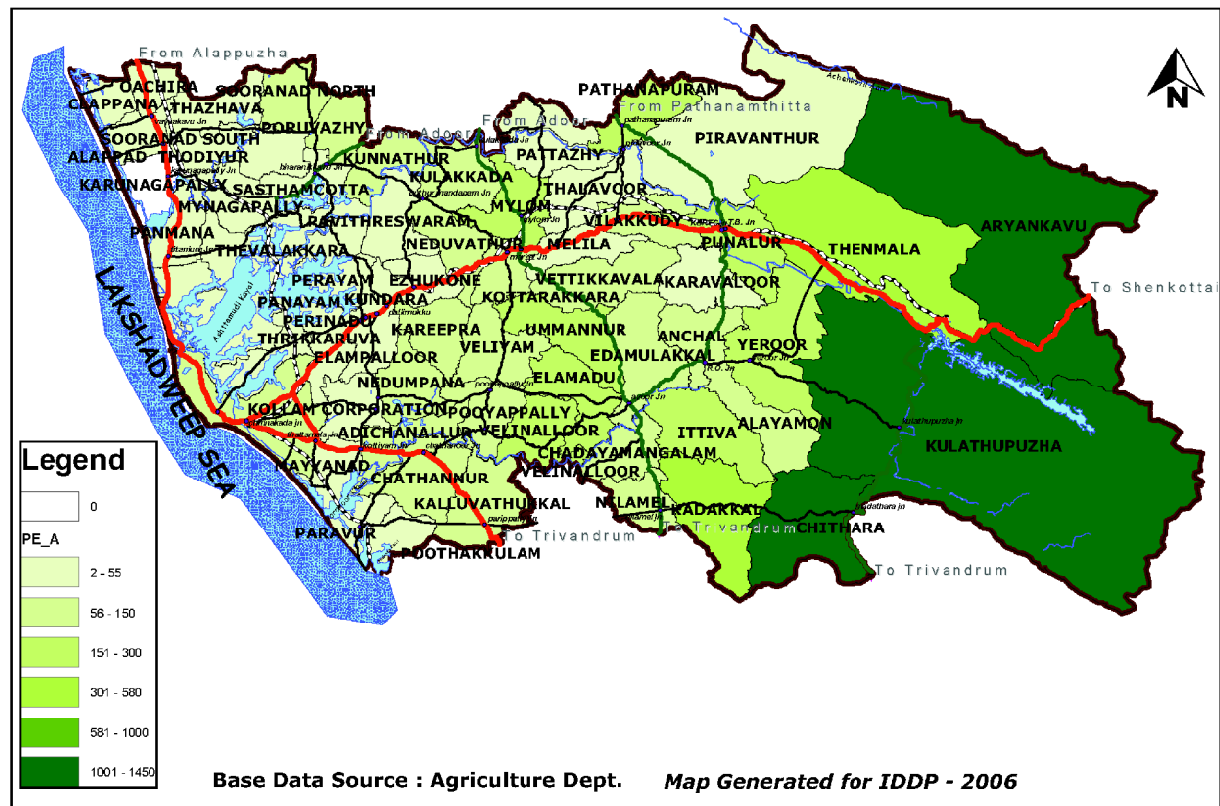


Fig.11.4 : LSGI wise distribution of area under pepper cultivation (Ha)

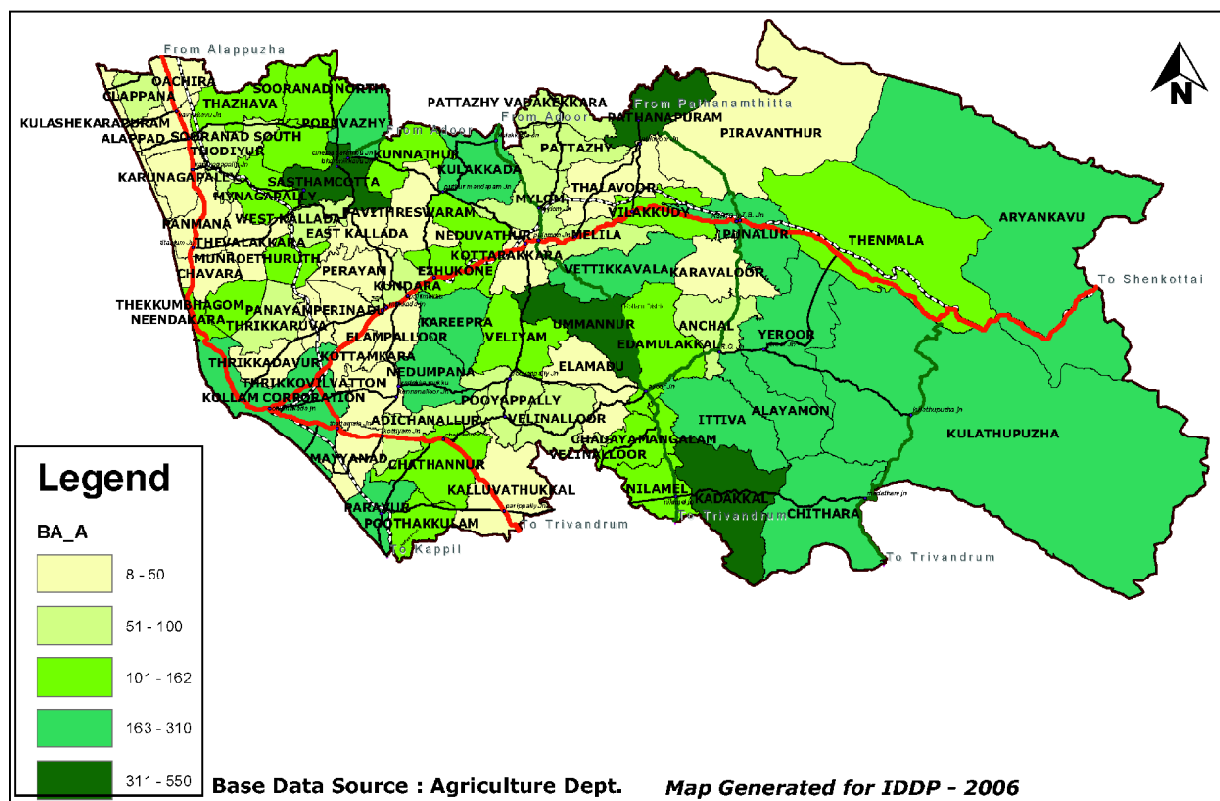


Fig.11.5 : LSGI wise distribution of area under banana cultivation (Ha)

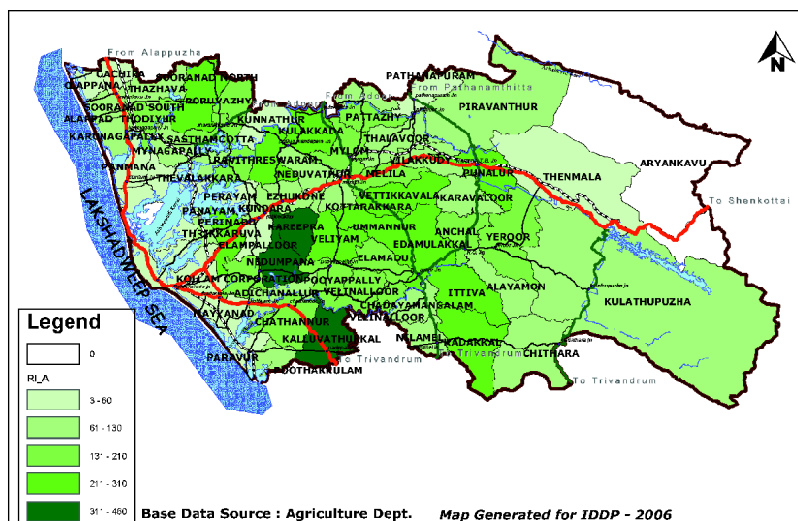


Fig 11.6: LSGI wise distribution of area of paddy cultivation (Ha)

cultivation is 11054 ha out of the total cropped area of 218267 ha, accounting to only 6% of the total. Area under cultivation of paddy is more in the mid land area of the district. In the coastal areas of the district, even though having more land area suitable for paddy, these are left fallow by the farmers due to non profitability of cultivation. Kareepra Grama Panchayat in Kottarakkara Block has the maximum paddy area (460 Ha) followed by Nedumpuna and Kalluvathukkal Grama Panchayats in Chathannoor Block (400ha each) as shown in Figure 11.6.

Kareepra Grama Panchayat produces the maximum quantity of rice to the tune of 1380 MT followed by Sooranad North with a production of 1023 MT. The productivity of rice is 5600 Kg/ha in Adichanalloor Grama Panchayat in Chathannoor blocks which is well above the State average of 1984 kg/Ha.

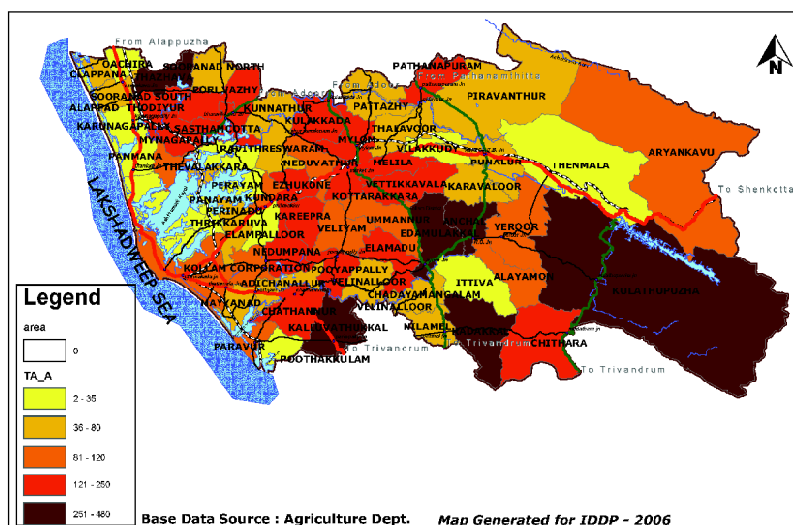


Fig 11.7.: LSGI wise distribution of area in hectares of tapioca cultivation

Tapioca (*Manihot esculentus*)

Kollam accounts for 23% of the state share of tapioca production and 24%

share in the case of area of cultivation. The area under cultivation of tapioca is maximum in Kadakkal Grama Panchayat (480 Ha) followed by Kulathupuzha (360 Ha) and Kalluvathukkal (310 Ha) (Figure 11.7). The production is maximum in Kadakkal Grama Panchayat (10656 MT) followed by Anchal (6300 MT). Tapioca productivity is maximum in Poothakulam (25000 Kg/Ha).

Arecanut (*Areca catechu*)

Kollam contributes a share of 2% to the area and 5% to the production of Arecanut in the State. Area under cultivation of arecanut is maximum in Kulathupuzha Grama Panchayat (636Ha) (Figure 11.8) where as its production is maximum in Chithara (3244 MT) followed

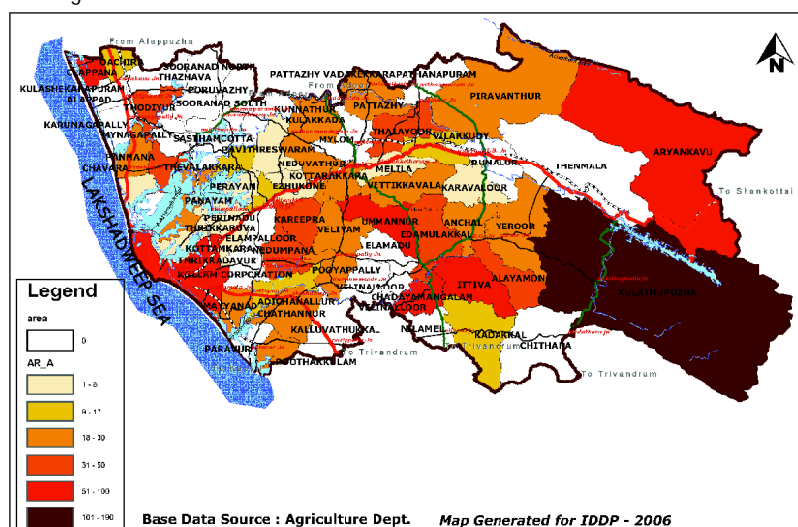


Fig 11.8.: LSGI wise distribution of area in hectares of arecanut cultivation

by Kulathupuzha (760 MT). However arecanut productivity is maximum in Vettikkavala Grama Panchayat (6200 Kg/ Ha) which is very high compared to the State average of 1090kg/ha.

Other significant crops

Cashew (*Anacardium occidentale*)

Cashew is one of our important foreign exchange earners with maximum farm price among other crops cultivated in the district. Besides, cashew processing industry provides direct employment to about 2.25 lakhs persons in the State. The share of Kollam in the production of raw cashew in the state is only 3%.

The area under cultivation (Figure 11.9) and production of cashew are maximum in Veliyam Grama Panchayat, being 180 ha and 126 MT respectively. Productivity is maximum in Alayamon and Karavalloor Grama Panchayats (1200 kg/

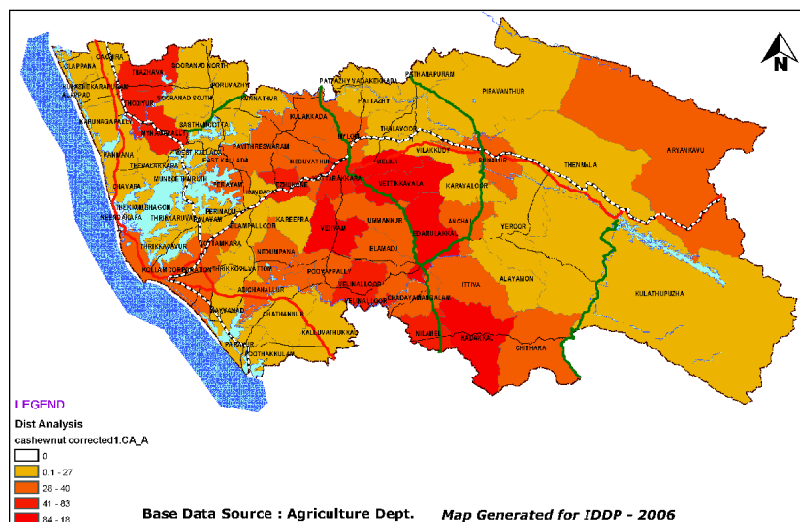


Fig 11.9 : LSGI wise distribution of area under cashewnut cultivation (Ha)

ha each). Govt of India declared Kollam as a "Centre of Excellence" since Kollam ranks first in processed cashew export.

Pineapple (*Ananas cosmosus*)

Kollam has only 4% share of pineapple production in the State with a share of 5% in the area of cultivation.

The area under cultivation of pineapple is maximum in Aryanakavu Grama Panchayat (163 ha) followed by Thenmala (15 ha) and Anchal (13 ha) (Figure 11.10). Pineapple production is maximum in Aryankavu (3423 MT) followed by Anchal (273 MT). However, the productivity is maximum in the Grama Panchayats of Kulathupuzha, Edamulackal, Aryanakavu and Alayamon (21 MT / ha each).

Sesamum (*Sesamum indicum*)

In Kerala, next to coconut, sesamum is

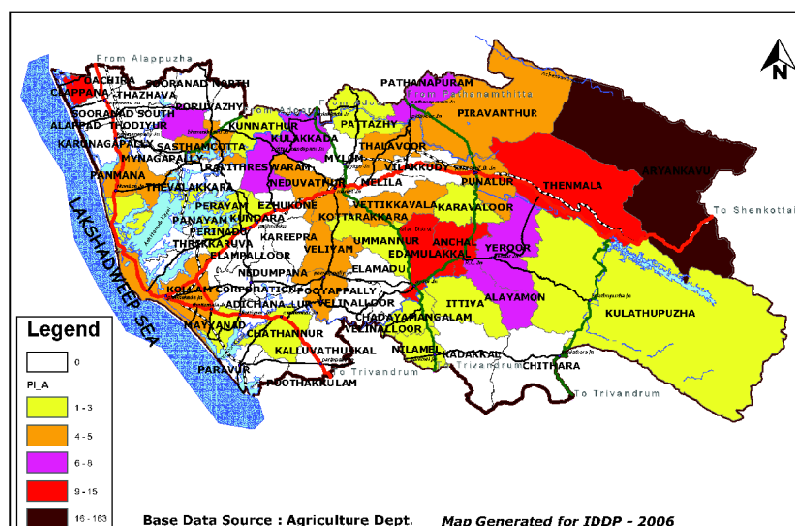


Fig 11.10 : LSGI wise distribution of area under pineapple cultivation (Ha)

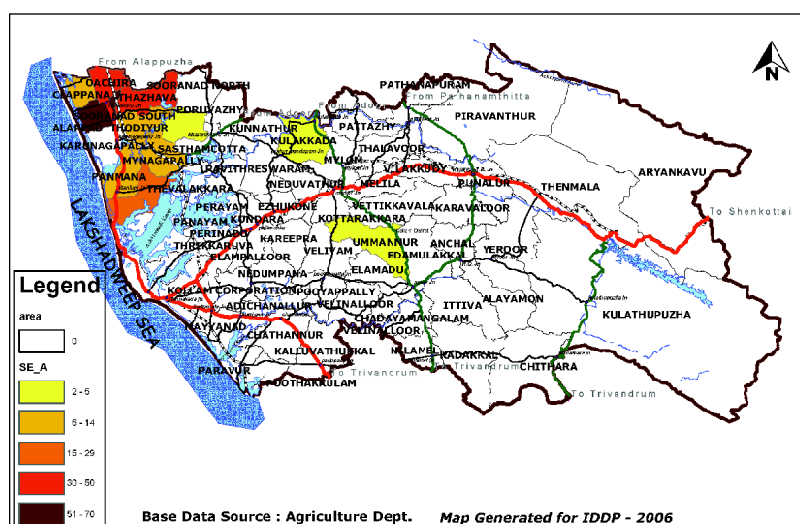


Fig 11.11.: LSGI wise distribution of area under sesamum cultivation (Ha)

the largest grown oil seed crop. The sandy coastal belts of Alappuzha and Kollam districts popularly known as 'Onattukara' is the most important centre of sesamum production in the State. Kollam has 30% share in sesamum production and 15% share in the area of cultivation of sesamum of the State.

Area under cultivation of sesamum is maximum in Kulasekharapuram (70 ha) followed by Oachira (50 ha) and Thazhava (40 ha) (Figure 11.11). Sesamum production is highest in Kulasekharapuram Grama Panchayat (49 MT) followed by Thazhava (28 MT). Sesamum productivity is maximum in Grama Panchayats of Kulasekharapuram and Thazhava (700 kg/ ha).

Vegetables

India is the second largest producer of vegetables in the world, next to China, and the production here accounts for about 15% of the global vegetable production.

The current production level is over 71 million MT per annum and the total area under vegetable cultivation is around 6.2 million hectares, which is about 3% of the total area under cultivation in the country.

Kollam district is not self sufficient in vegetable production and depends mainly on the neighbouring districts of Tamil Nadu for meeting the additional requirement. Snake gourd is the most imported vegetable from Tamil Nadu, the annual quantity being about 800 MT. The present area under vegetable cultivation in the district is about 1235 Ha and the main crops

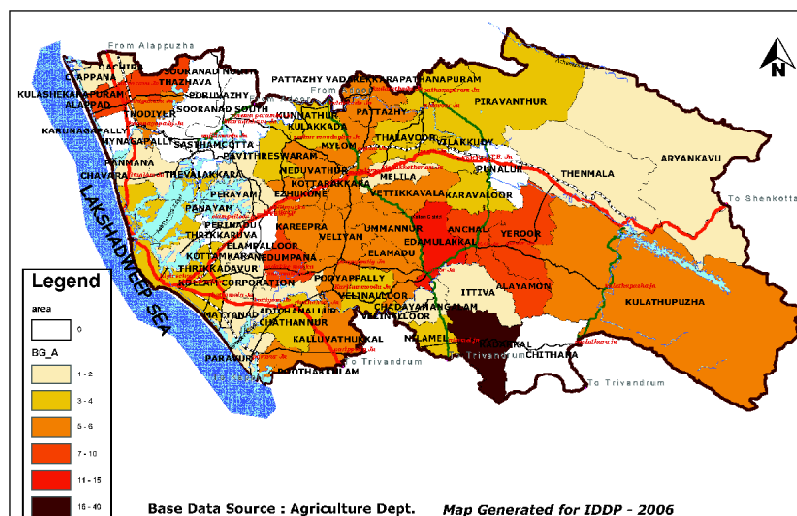


Fig. 11.12 : LSGI wise distribution of area under bitter gourd cultivation (Ha)

cultivated are bitter gourd, brinjal, chillies, amaranthus.

Bitter gourd (*Momordica charantia*)

Bitter gourd is a fast growing, warm season, climbing annual, native to South Asia. Kollam district contributes 6% of the state bitter gourd area (Figure 11.12).

In Kollam district maximum area under bitter gourd cultivation is in Kadakkal Grama Panchayat (40 Ha), followed by Edamulakkal (15 Ha) and Nedumpna (10 Ha). The production is maximum in Chithara Grama Panchayat (3244 MT) followed by Kulathupuzha (760 MT) whereas the productivity is highest in Nedumpna Grama Panchayat (12 MT/Ha).

Brinjal (*Solanum melongena*)

Area under cultivation of brinjal is highest in the Grama Panchayats of Mylom and Kadakkal (10 Ha each) followed by Pavithreswaram and Kulakkada (5 Ha

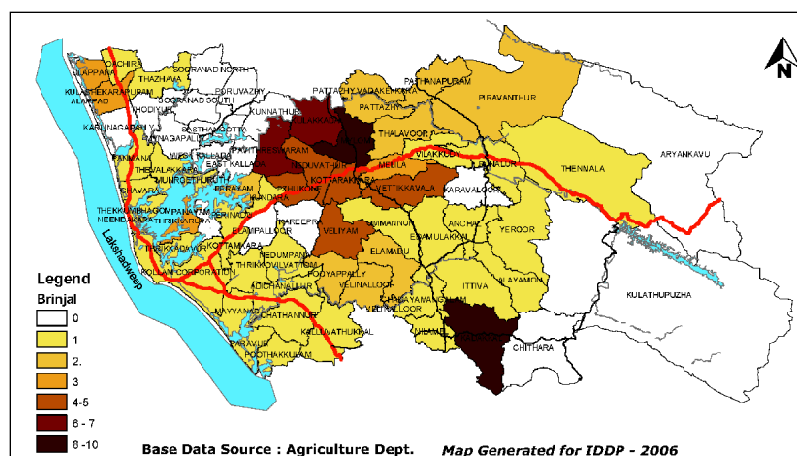


Fig. 11.13 : LSGI wise distribution of area under brinjal cultivation (Ha)

each) (Figure 11.13). Production is highest in Mylom (150MT) followed by Pavithreswaram (84 MT) and productivity is highest at Vettikkavala (15 MT/Ha).

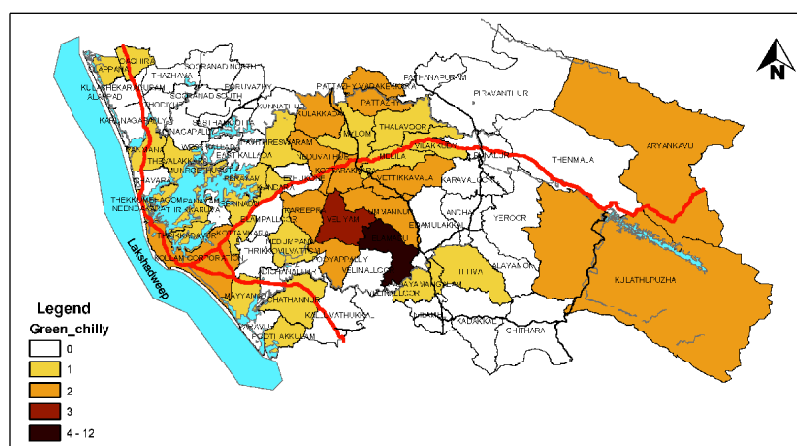


Fig. 11.14 : LSGI wise distribution of area under chilli cultivation (Ha)

Chillies (*Capsicum annum*)

Kollam contributes 22% share of the chilly cultivation area in the state and there is very good potential for chilly cultivation in the district.

Both the area under cultivation (Figure 11.14) and production of chilly are maximum in Elamadu Grama Panchayat (12 Ha and 26 MT) followed by Veliyam (3 Ha and 7 MT). However, the productivity is highest (2500 kg/ha) in Vettikkavala Block area.

Amaranthus (*Amaranthus spp*)

There is great demand for organically cultivated amaranthus. The share of Kollam district with respect to area under amaranthus cultivation is 12% of the total

for the State.

Area under cultivation of Amaranthus in the district is maximum in Kadakkal Grama Panchayat (47 Ha) followed by Thazhava (20 Ha) (Figure 11.15). Production is maximum in Kadakkal (470 MT) followed by Mylom (168 MT). The highest productivity of 14 MT/Ha is at the Grama Panchayats of Vettikkavala, Umannur, Pavithreswaram and Mylom.

Other vegetables

Other vegetables like Cowpea, Bottle guard, Ash guard etc. are also cultivated in the district in lesser extents in almost all the LSGIs. However any concentration of area under cultivation of these vegetables is not observed in the district.

1.1.2 Floriculture

The climatic condition in Kollam District is congenial for the cultivation of flowering plants like orchids and Anthuriums.

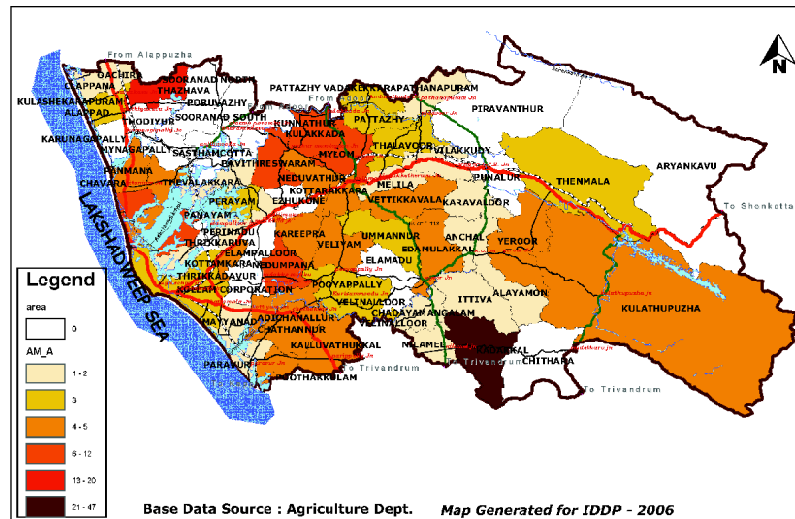


Fig 11.15 : LSGI wise distribution of area under amaranthus cultivation (Ha)

Flowers have good demand in domestic and international markets. Flori clubs have been established in potential Grama Panchayats. The maximum number of clubs (Figure 11.16) are situated in Kollam Corporation (25 numbers.) followed by Karunagapally Grama Panchayat (3 numbers.). Establishing collection centers and marketing facility is essential to ensure regular income to the growers. Good quality planting materials of Orchid and Anthurium varieties having demand in the international market have to be made available to the growers.

1.1.3 Sericulture

Sericulture, or silk production, from the moth, *Bombyx mori* (L.), has a long and colorful history unknown to most people. Although there are several commercial species of silkworms, *B. mori* is the most widely used and intensively studied, and techniques for its rearing are the most improved.

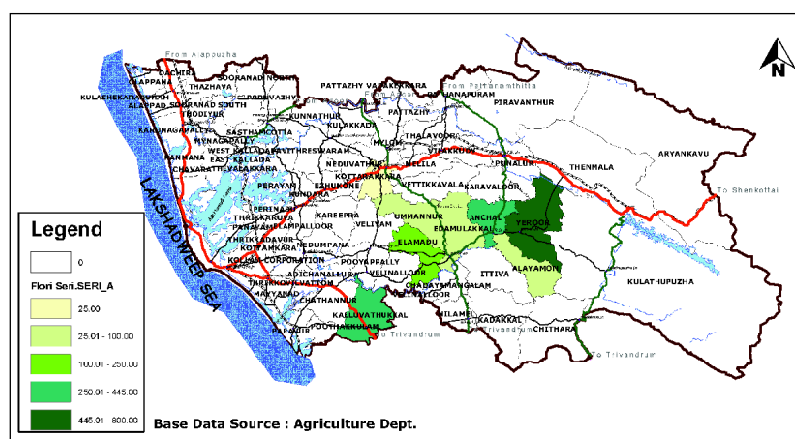


Fig11.17: LSGI wise distribution of seri culture area

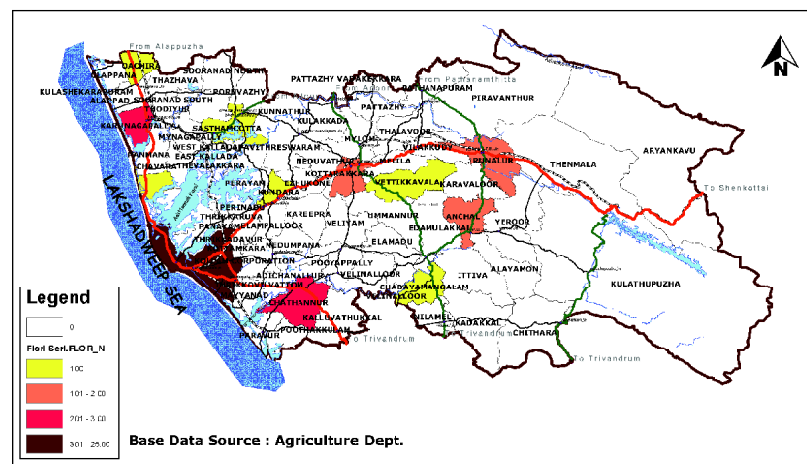


Fig.11.16: LSGI wise distribution of floriculture clubs

Though India is the second largest silk producer in the World after China, it grabs just 5% of the global silk market, since the bulk of Indian silk thread and silk cloth are consumed domestically. Silk worms are reared on Mulberry leaves and as such it is necessary to undertake mulberry

cultivation in additional areas of the district.

Here area under mulberry (Figure 11.17) is maximum in Yeroor Grama Panchayat (800 ha) followed by Kalluvathukkal (445 ha.) and Anchal (350 ha). Silk production under the brand name 'Keral Silk' and 'Seri Silk' was undertaken on an experimental basis and encouraged by the results, silk weaving, fabric production and export-oriented activities were being envisaged in the Tenth Plan.

1.1.4. Agricultural infrastructure

Farm machineries

Tractors
Present availability of tractors in the district is 70 numbers. Maximum at Thrikkovilvattom (7) followed by Ummannoor (5) (Figure 11.18). Since

ploughing with draught animals is dispensed by the farmers the present availability of tractors could not meet the demand. More advanced tractors suitable to the undulating topography of the district are to be evolved. Tractors with multi utilization devices suited to the Kerala farming systems and which satisfy the needs of the locality are to be developed. Power tillers, Winnowers, Threshers

The availability of power tillers in the district is 251 numbers, most of them are subsidized partially or fully by Government either through Agricultural Department or local body. Along with the power tillers the Government and Local Bodies have distributed winnowers and threshers to institutions as well as to individuals. There are a total of 309 threshers and 191 winnowers in the district under the ownership of Agricultural Dept., Co-

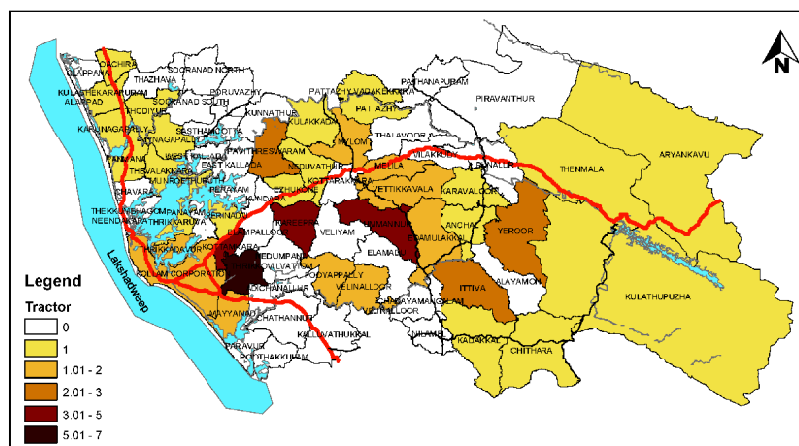


Fig 11.18 : LSGI wise distribution of agricultural infrastructure -Tractors

operatives, farmer groups, individuals etc. Actually the paddy cultivation in Kollam District can be sustained by utilization of such modern equipments only. Hence the future scenario of paddy cultivation in the District will depend on the extent of modernization that can be achieved.

Maximum number of power tillers are available at the Grama Panchayats of Kadakkal, Chadayamangalam and Ummannoor (15 no). Maximum number of Winnowers are in Oachira Grama Panchayat (26numbers.) followed by Elamadu (20 numbers.) Availability of labourers during harvesting and processing of paddy is a major problem. Paddy threshers solve the problem to a certain extent. Kunnathur Grama Panchayat uses the maximum number of threshers, about 38 numbers. On the whole about 310 threshers are used in the district. **Plant Protection (PP) Equipments (Hand sprayers, Power sprayers etc.)**

Power sprayers, hand sprayers, blowers and fogging machines are the

main plant protection equipments used in the district. Hand sprayers are the most commonly used equipment for PP measures. There are 3733 hand sprayers and 160 power sprayers available in the

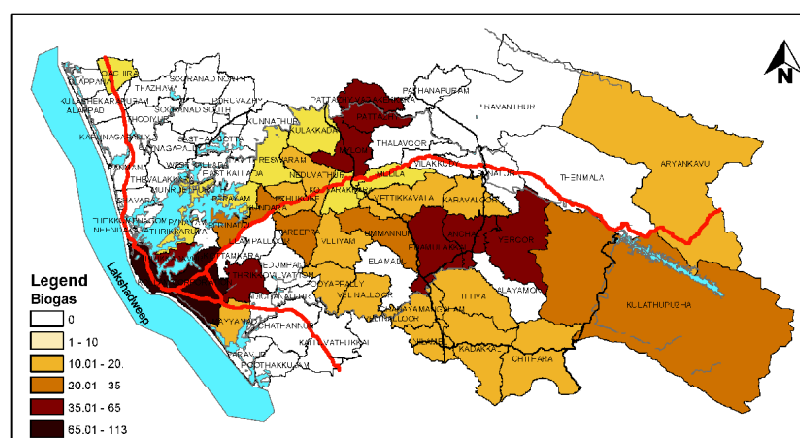


Fig. 11.19. : LSGI wise distribution of Biogas Units

district, owned by Agricultural Dept., LSGIs and farmers groups. Kalluvathukkal Grama Panchayat and Paravoor Municipality top in having hand sprayers and power sprayers respectively. These

are the equipments used to spray insecticides and chemicals in field crops. Kalluvathukkal Grama Panchayat has the maximum number of hand sprayers (262) followed by Chithara Grama Panchayat (214) are having maximum Numbers. Maximum number of power sprayers are in Paravur Municipality (25numbers.) followed by Alayamon Grama Panchayat (11numbers.)

Pump sets

Even though Kerala is blessed with more than 3000 mm annual precipitation the summer months are dry and only lift irrigation system help to survive the crops in garden lands, Pump sets are the main device for lift irrigation in the district. Most of the farmers use this system to irrigate their crops. Mostly the farmers use low HP pump sets. Presently 43988 pump sets are in use in the district. Kalluvathukkal

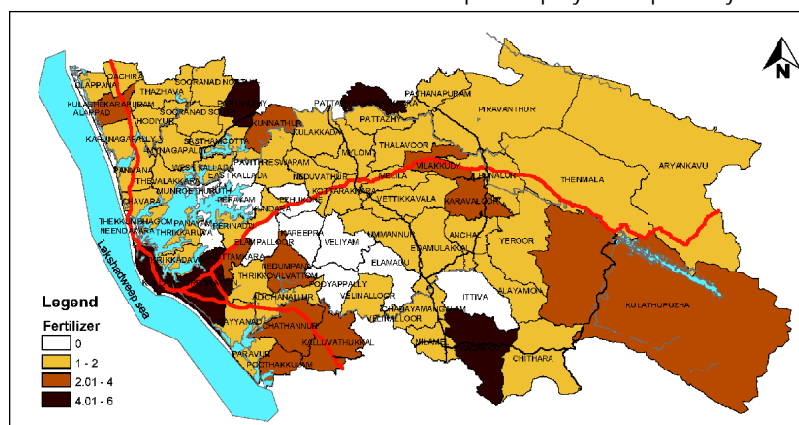


Fig 11.20: LSGI wise distribution of Co-operative fertilizer depots

Grama Panchayat with 4258 numbers is having the highest number of pump sets followed by in Kadakkal Grama Panchayat with 2600 pumpsets.

Other Infrastructures

Biogas units: One of the sources of non conventional energy is bio gas. A bio gas unit provides not only fuel but also high quality manure. Kollam Corporation followed by Mylam Grama Panchayat is having largest number of biogas units (Figure 11.19) as on 2006.

Greenhouses: Green houses are constructed for growing ornamental plants in controlled conditions. As on 2006, concentration of Green houses is more in Kollam Corporation.

Fertilizer depots: Availability of Co-operative fertilizer depots in LSGs of Kollam District is as given in Figure 11.20.

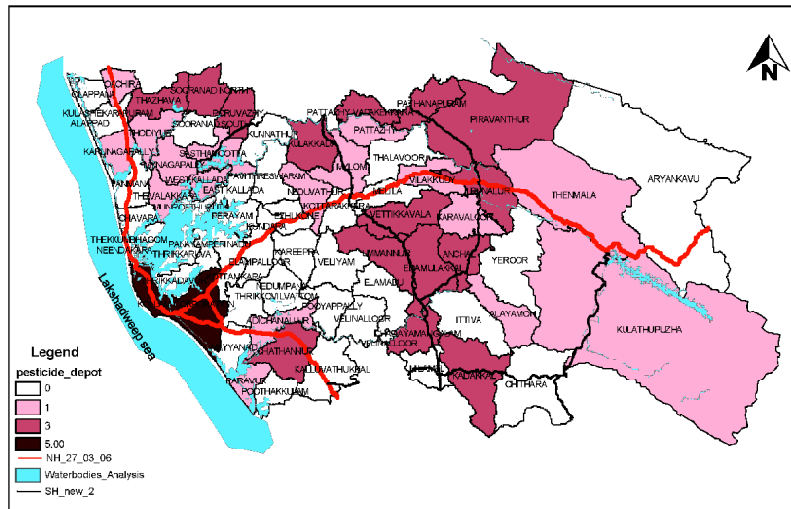


Fig 11.21. LSGI wise distribution of private pesticide depots

Poruvazhy Grama Panchayat with 6 depots tops the list. There are no Co operative fertilizer depots in some of the LSGIs in the mid land area. Private fertilizer depots are found to be maximum in Mylom Grama Panchayat (12 numbers.) In some of the LSGIs in the mid land area, there are no private fertilizer depots also.

Pesticide depot: Highest number of Co- operative Pesticide depots are in Kottarakara Grama Panchayat (8 numbers.) as shown in Figure 11.21. Highest numbers of private pesticide

generated from agriculture sector in Kerala state and that the share of agricultural sector is steadily increasing in the district.

As shown in Figure 11.23, in case of crop wise revenue generation in Kollam,

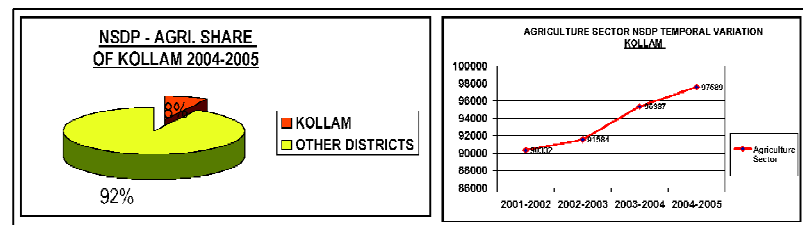


Fig. 11.22. : Net State Domestic Product-Agriculture share and temporal variation

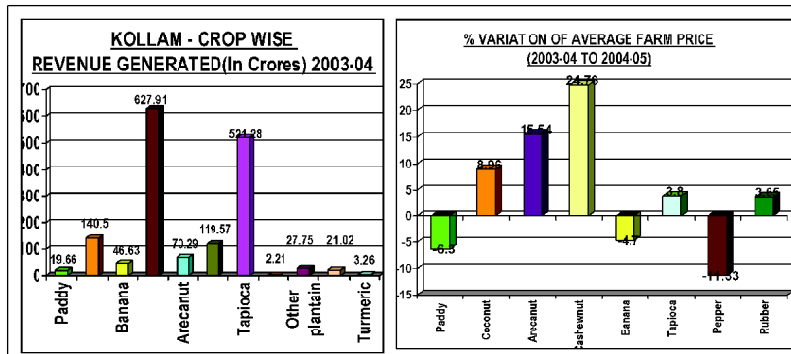


Fig. 11.23 : Crop wise revenue generation and average farm price in Kollam

depots are in Corporation (5 numbers.) There are no pesticide depots in some of the LSGIs.

1.2 Economic Status

The revenue generated is analyzed based on the Net State Domestic Product (NSDP). In Kollam District, 66% of NSDP at constant prices in 2003-2004 was generated by agricultural sector (Economic Review 2005).

Figure 11.22, shows that the NSDP of Kollam district is 8% of the revenue

maximum revenue is generated from Rubber followed by Tapioca and Coconut.

At State level, the percentage variation of average farm price from 2003-04 to 2004-05 of major crops shows that cashew, arecanut and coconut show maximum positive variation. With improved productivity and value addition, this potential can be enhanced to a greater extent. So, among commercial crops, rubber and coconut are the major crops in the district, and have the potential to accrue

maximum revenue.

1.3. Social Status

1.3.1 Workers Classification

In Kollam only 17% of the Main Workers are from the Agricultural sector as shown in Figure 5.7 of Chapter 5. Among them 6% are cultivators and 11% are agricultural labourers.

1.3.2 Wage Rate

The wage rate is yet another factor looked into in the social status. The wage rate varies in different Grama Panchayats in the ranges of Rs.125 to Rs.200/-for men and Rs.100 to Rs.175/- for women. However Ezhukone, Kareepra, Neduvathoor and Pooyapally Grama Panchayats have the highest wage rate for men (Rs.200/-). The wage rate for men is lowest in the Grama Panchayats of Aryancavu, Pavithreswaram, Sooranadu North and Sooranadu South. Ezhukone, Kareepra, Neduvathoor and Pooyapally

Grama Panchayats have the highest wage rate for women also (Rs.175/-). The wage rate for women is lowest in the Grama Panchayats of Kulathupuzha, Aryancavu, Thenmala, Pavithreswaram and Melila.

2 Overall Development Trend

To study the development trend of agricultural sector in the district, the temporal variation of share of NSDP of Agriculture in NSDP of the district, and also that of the area, production and productivity of the principal crops in the district are analysed.

The Primary sector NSDP at Current prices of both State and Kollam are showing an increasing trend (Figure 11.24).

The agricultural sector NSDP of both State and Kollam are also showing an increasing trend (Figure 11.25). The crop wise analysis of various crops is discussed here.

In the case of rice, there is alarming trend (Figure 11.26) of reduction in all three aspects in paddy cultivation in the

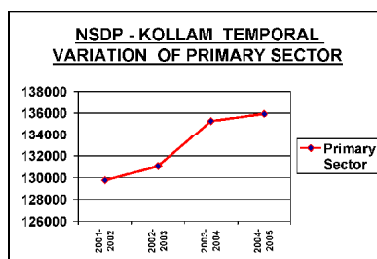
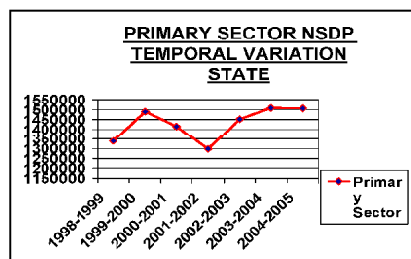


Fig 11. 24 : Temporal variation of NSDP (Primary sector) of State and Kollam

District. Low investment in rice cultivation is due to the fact that it is labour intensive and profitable compared to other crops. Also drudgery is more in paddy cultivation, hence scarcity of labour is experienced for field work and wage rate is high. In Kollam district rice is mainly cultivated in problem areas like sandy tracts of Onattukara region, clayey soils of Kottarakkara region where the scope for increasing productivity is very less unless

women groups in the district have come forward for cultivation of banana on commercial basis.

In the case of Rubber, all the three aspects are increasing due to good climatic

aspects are increasing (Figure 11.30). Increasing area is because climate is good for growing pepper successfully especially in eastern tracts of the district.

For Tapioca, area and production are decreasing whereas productivity is increasing. Reduction in area could be due to conversion of area to more profitable crops like Rubber.

Even though the revenue from agricultural sector is showing an increasing trend, the crop wise trend reveals that commercial crops are devouring the food crops and thus there is not much increase in production and productivity of food crops.

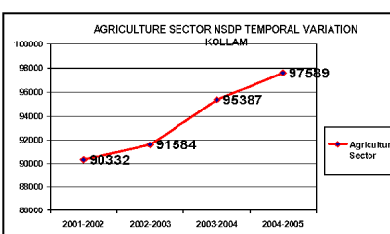
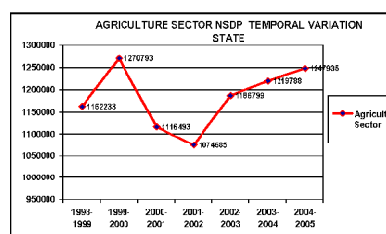


Fig 11. 25 : Temporal variation of NSDP (Agriculture sector) of State and Kollam

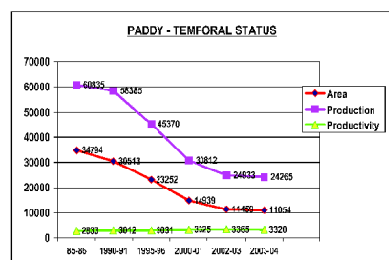


Fig. 11. 26 : Paddy - Temporal status

there is a break through in technology on rice production.

In the case of Coconut, there is marginal decrease in area whereas production and productivity are increasing moderately (Figure 11.27). Low productivity experienced in many of the Local Self Government Institutions is mainly due to incidence of root wilt disease, bud rot, mite pest attack, red palm weevil, high percentage of senile and unproductive palms and lack of proper care and management.

In the case of Banana, all the three aspects are increasing (Figure 11.28). The reason could be that recently large no of

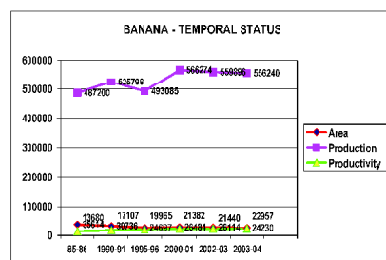


Fig.11. 28 : Banana - Temporal status

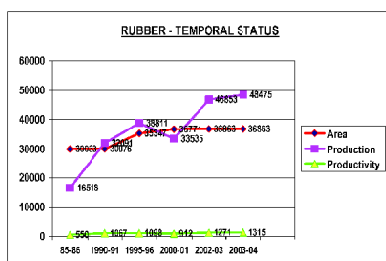


Fig. 11. 29 : Rubber- Temporal status

conditions, slope suitability and present export value (Figure 11.29).

In the case of Pepper, all the three

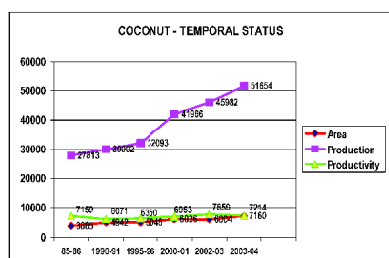


Fig. 11. 27 : Coconut - Temporal status

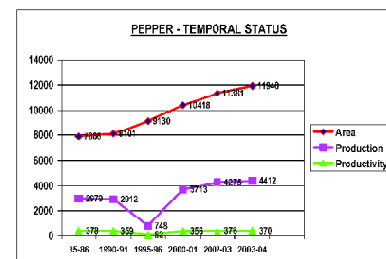


Fig. 11. 30 : Pepper- Temporal status

Over the years, there is a tendency to shift from food based to commercial based crops (Figure 11.31), complying with the change in economy, in particular the change in money value in the global economic conditions. Figure 11.31 showing polynomial trend lines of area of food and commercial crops from 1986-2004, clearly indicates a shift in cropping pattern from food to commercial crops over the years.

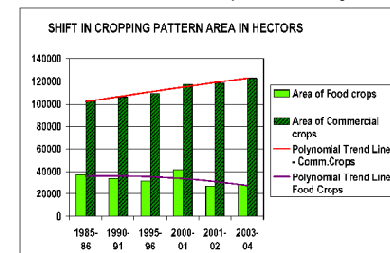


Fig. 11. 31 : Shift in cropping Pattern
3 Development Issues

Development issues pertaining to selected major, sub major and minor crops and the issues pertaining to the existing marketing system are discussed in this part.

3.1 Crop wise Issues

The Strength, Weakness, Opportunities and Threats of major crops are briefed here under.

Paddy Strengths

Continuous stretches of paddy land are available in the middle belts of the district

and these have to be conserved for their ecological importance. The major paddy growing areas in the district are the Grama Panchayats of Kareepra, Kalluvathukkal (Local Level Analysis Report of Kalluvathukkal reveals that there is potential for paddy due to availability of water for elas and other irrigation facilities), Nedumpana (Local Level Analysis Report of Nedumpana reveals that there is potential for paddy due to Water Shelter Programme), and Sooranad North (Local Level Analysis Report of Sooranad North reveals that there is potential for paddy due to availability of water, as well as storage and processing facilities). On an average, more than 300 ha of paddy cultivation is prevalent in the Grama Panchayats during both Virippu and Mundakan seasons. Third crop paddy (Puncha) can be profitably cultivated in Chittumala chira (400 ha) in East Kallada (The Local Level Analysis Report of East Kallada reveals that there is potential for paddy due to availability of water sources and Onamblam canal), Polachira ela (600 ha) in Chathannur Grama Panchayat (As per the Local Level Analysis Report of Chathannur Grama Panchayat there is potential for paddy due to availability of water) and Thazhava (The Local Level Analysis Report of Thazhava reveals that there is potential for paddy due to availability of water and KIP canal, Thazhava Vattakkayal etc.).

Paddy cultivation can be revived on Group farming basis by co-ordinating the activities of registered Padasekhara samithies existing in all paddy-growing areas. All inputs required for promoting paddy, such as seeds of HYV's, fertilizers and pesticides including bio fertilizers, bio control agents etc. are available in almost all Local Self Government Institutions.

As mentioned in the analysis of existing scenario of irrigation sector (Article 1 of Chapter 12), KIP has ayacut area of 32272 Ha in the district distributed in 40 Grama Panchayats and Paravur Municipality. Further, water is being distributed through all the canals of KIP except Poovattoor distributary and tail ends of Paravur and Pulamon distributaries. Thus the existence of a wide network of KIP canals, water reservoirs (Vattakkayal, Pallickal River, Chittumala Chira, Paravur kayal etc) and irrigation tanks (Thalakkulams) in most padasekharams can facilitate irrigation to

a large extent.

Weaknesses

In Kollam district the area of paddy has declined from 14510 ha in 1995 to 10087 ha in 2003-04 and the productivity has declined from 2488 kg per ha to 2223 kg/ha in the same period as mentioned in Article 2. The main reason for this decline is conversion of wetland to garden land due to the high land value for garden land. The reasons for reduction in productivity are low organic matter content in the paddy fields, non adoption of scientific practices, pest and disease infestation, lack of farming practices on group basis and climatic adversities such as frequent drought and floods. Many paddy fields are subjected to salt water intrusion and poor water management infrastructure which also make the cultivation risky.

Puncha cultivation in kayal lands was not undertaken in the last 7 to 10 years due to various problems connected with the management of stagnation water, flooding, salt-water intrusion etc. Water stagnation in many padasekharams resulting due to seepage from KIP canals also makes the paddy cultivation impossible. Majority of irrigation and drainage canals (especially KIP canals) are damaged which is another hindrance. Non completion of bottleneck works and damaged PVC pipes laid for minor conveyance system in most of the reaches are identified as a problem by the irrigation sector also. (Article 3.1 of Chapter 12).

Non adoption of scientific agricultural practices such as cultivation of HYV's of same duration, timely application of required quantity of fertilizers, integrated pest management, intercropping operations etc. has caused serious set back to the sector. In Adichanalloor Grama Panchayat even though area under paddy is very low, productivity is high meanwhile the situation is vice versa in Nedumpana and Kalluvathukkal Grama Panchayats.

In Kollam district paddy is mainly cultivated in problem areas like sandy tracts of Onattukara region, clayey soils of Kottarakkara region where the scope for increasing productivity is very less.

Lack of proper mechanization, even though labour for paddy cultivation is scarce, is a major hurdle in successful paddy cultivation. More over farmers are denied better market price for their produce for want of adequate marketing and

procurement facility.

Opportunities

There is scope for increasing the production by cultivation of HYV's in more areas. In addition paddy lands, which are kept fallow, can be brought under cultivation by maintenance of existing irrigation and drainage canals and operation of shutters especially in the Grama Panchayats of Thenmala, Yeroor, Kadakkal, Nilamel, Neendakara, Kizhakke Kallada, Kareepra, Perayam, Karunagapally, Chathannoor, Veliyam, Clappana, Kulasekharapuram, Sasthamkotta, Vettikkavala etc.

There is ample scope for increasing substantially the area and production of paddy in the district by introduction of large-scale mechanization as a solution to scarcity of labour, since paddy is a labour intensive crop.

Other opportunities include organic farming in paddy, cultivation of medicinal varieties of paddy like Njavara, cultivation of scented rice like Basmati, Jeerakasala etc. Opening up more avenues for export of paddy, developing a proper procurement system etc. are also required simultaneously. Similarly value addition of the produce must also be done so as to ensure better income generation.

Threats

Drudgery is more in paddy cultivation. Hence scarcities of labour and for high wage rate are threats. The average farm price of paddy shows negative variation of -7 rupees in a single year, from 2003-04 to 2004-05. There is low investment in rice cultivation since rice cultivation is highly labour consuming and less remunerative and hence the farmers prefer to keep their paddy land as fallow.

Removal of clay for manufacture of bricks and tiles makes the land unsuitable for cultivation. More over, cultivation of more remunerative crops like Banana, Rubber etc. in paddy land and also conversion of paddy lands for housing and industrial purposes are serious threats.

In many Grama Panchayats like Thenmala, Veliyam, Vettikkavala etc. paddy lands are situated below the level of KIP canals and the leakage from the canals hinders the cultivation in these areas. Also cultivation of other crops like Tapioca, Banana etc. intermittently in paddy fields causes difficulty for irrigation and drainage of excess water from fields.

Further the Local Level Analysis Report of Thenmala Grama Panchayat point out that there is threat for paddy fields from animals. In case of Veliyam, sliding of canal banks is a major threat.

Coconut Strengths

The productivity of coconut is on par with the state figures and is in fact, higher in many of the Grama Panchayats. Moreover there has been no discernible decline in the area, production and productivity of the crop over the past 12 years neither at state level nor at district level.

The coastal belt of the District, from Paravur to Kulasekharapuram and adjoining areas of Thazhava, Karunagappally, Oachira, Thodiyur etc., even though low in soil organic matter content, is ideal for coconut cultivation. As per the Local Level Analysis Report of Thazhava, the existence of Krishi Bhavan supports the sector's development. In the eastern belt the soil is having good fertility. As such the entire district, except forest region, is blessed with ideal soil and climate congenial for coconut. This is also evident from the crop suitability study of the Soil Survey Department (Article 1.2.10 of Chapter 13) wherein it is stated that coconut cultivation is suitable in all soil series except Mylom, Nedumpara and Channapetta.

Coconut is the traditional crop of Keralites from time immemorial and the entire population in the district have know how in cultivating the crop. Coir based industrial units can be developed along with as they provide employment to large number of people.

Weaknesses

Lack of sufficient quantity of good quality coconut seedlings for new and under planting is a major problem. The major coconut areas in the district are the Grama Panchayats of Chathannur, Nedumpana, Kareepra, Mynagappally and Thazhava with more than 1500 ha under the crop. However the productivity of the crop is highest in the Grama Panchayats of Pooyappally, Karunagappally and Piravanthur, but the area under the crop is considerably less in these LSGs. This is mainly due to negligence in crop management in these areas. As per the Local Level Analysis Report of Chathanoor Grama Panchayat, the major weakness

with respect to coconut cultivation is the lack of HYV seeds.

The crop is having severe pest and disease infestations like root wilt and yellowing. Adverse climatic conditions like drought also contribute to the decline in productivity. This is corroborated in the Local Level Analysis Reports of the Grama Panchayats of Thazhava, Mynagappally and Nedumpana which pose wide spread disease infestations as problem in coconut cultivation. The main drawbacks in coconut cultivation are the lack of assured remunerative price to the farmers, high cost of cultivation when compared to neighboring states, and non-adoption of scientific management practices such as scientific spacing, manuring based on soil test data, irrigation and IPM measures. Non availability of labour for plant protection and harvesting is also a major problem.

There is no well-developed procurement and marketing system for coconut.

Opportunities

There is immense scope for export of coconut products by adopting proper value addition, product diversification and marketing strategy since all part of the coconut plant can be put to use. Significant quantity is consumed domestically also. As the crop is raised mainly on homestead basis, there is opportunity for integrating activities of Kera Samrakshana Samithies and Co-operative agencies like SCB's, Kerafed etc. for post harvest handling and value addition. Organic cultivation and biological and physical pest management can be adhered to.

Considering the demand for tender coconut during summer months there is tremendous scope for cultivation of varieties suited for the purpose. Apart from being immensely nutritive this will be a suitable alternative to artificially flavored soft drinks which are hazardous to health.

Threats

Incidence of root wilt disease and pests like Eriophid mite, Red palm weevil etc. pose serious threats to coconut cultivation. Recently in coastal areas of Alappad and Karunagappally the coconut palms have been developing yellowing of leaves on a large scale. This is upheld in the Local Level Analysis Reports of the Grama Panchayats of Alappad, Karunagappally

and Chavara which states that there is wide spread disease infestations.

In Chavara area industrial pollution from Kerala Minerals and Metals Ltd. is identified as the reason for yellowing of coconut palm to a certain extent. Replacement of coconut cultivation with rubber which is more remunerative is also a major threat.

Rubber

Strengths

Rubber is cultivated in an area of 478402 ha in Kerala, which is about 83% of total rubber cultivation in the country. The annual state production of rubber is 655134 MT. The present area under rubber cultivation in Kollam district is 48087ha with a production 83267 MT. The productivity at state and district levels are 1437 kg/ha and 1730 kg/ha respectively. Increasing trend in area, production and productivity is observed every year. Kollam has a share of 8% of both area and production of rubber and rubber tops in revenue generation in the district among various crops.

Most of the rubber producing areas in the district are in the eastern belts. The Grama Panchayats of Thenmala, Aryankavu and Chithara each have more than 3000 ha. under rubber cultivation. As per the Local Level Analysis Report of Thenmala, there is increase in cropping area of rubber. As per the Local Level Analysis Report of Chithara, the existence of Krishi Bhavan supports the sector's development. Maximum production is in the Grama Panchayats of Aryankavu and Thenmala (more than 6000 MT), whereas the productivity is highest in Nilamel Grama Panchayat (about 3000 kg/ha).

Presently farmers are getting a fair price for the product, thanks to the rise in demand for natural rubber in the international market.

Weaknesses

High fluctuation in the price of natural rubber is a major weakness. Public protest against extending the area of rubber cultivation by filling up of paddy lands is yet another weakness.

Opportunities

Possibility of generation of additional revenue from rubber plantations through apiculture, pineapple border planting, inter cropping banana during initial years of planting etc. can be explored.

Threat

Frequent fluctuation in price of natural rubber in the international market

Banana**Strengths**

Banana is the world's largest cultivated herb. In Kerala it is cultivated in an area of 110871 ha. The annual production is 839961 MT and productivity is 7600 kg/ha. The crop is raised in an area of 5878 ha in Kollam district with a production of 43587 MT per year and the productivity is 7476 kg/ha. The district contributes a share 3% of both the state's area and production. Production and productivity of banana shows an increasing trend in the district.

The crop is raised both as a pure crop as well as an intercrop in garden land. It is also grown in paddy fallows, which is more profitable.

Both the area and production of Banana in the district is highest in Ummannur and Kadakkal Grama Panchayats whereas the productivity is highest in Chadaya-mangalam and Nilamel Grama Panchayats.

As per the Local Level Analysis Report of Nilamel Grama Panchayat the potential is due to the existence of Krishi Bhavan and the increase in agro products. As per the Local Level Analysis Report of Kadakkal Grama Panchayat the Grama Sabha observes that the presence of agricultural land, existence of thodu, thalakkulam, thadayina etc. are the reasons behind the potential for banana cultivation here. As per the Local Level Analysis Report of Chadayamangalam Grama Panchayat the Grama Sabha attributes the increased potential to the existence of Krishi Bhavan and Ithikkara River.

Weaknesses

The most remunerative types like Red banana, Njali poovan, Nendran etc. are not extensively cultivated due to insufficient availability of quality planting materials.

Export potential and value addition measures are not exploited. Low price for bunches at the peak times of harvest due to the lack of proper collection, storage, packing and marketing facilities are experienced.

Opportunities

Banana is a crop having high export potential. Organically cultivated banana and its bi-products have good demand in export market.

Threats

Attack of pseudo stem weevil is the major threat in banana cultivation. High cost of bamboo for staking the plants increases the cost of cultivation.

Pepper**Strengths**

Kerala accounts for 98% of the national area under Pepper, the king of spices. The crop is raised in 216440 ha in the state and the annual production is 68362 MT. The average productivity is 327 kg/ha. In Kollam district, the area under pepper is 11305 ha and annual production is 3301 MT with average productivity of 600 kg/ha.

The crop is very much concentrated in the eastern belt with the Grama Panchayats of Chithara, Aryankavu, and Kulathupuzha leading with more than 1200 ha each. Aryankavu and Chithara account for the maximum production with 799 MT and 653 MT respectively. The productivity of 600 kg/ha in Kollam district is much more than the state average of 327 Kg/ha.

As per the Local Level Analysis Report of Chithara, the potential for pepper is due to the support of Krishi Bhavan. As per the Local Level Analysis Report of Kulathupuzha, the potential is due to the existence of KLD Board. As per the Local Level Analysis Report of Aryankavu, there is potential for pepper in the Grama Panchayat.

There is ample scope for increasing cultivation of pepper as intercrop in the district and the production can be substantially increased by scientific management and rehabilitation of existing senile and unproductive vines.

The scope for value addition of pepper is tremendous. It can be used as white pepper, pepper in brine, oleoresin extraction, organic spice, powdered pepper etc. Organically cultivated pepper has much demand in the international market.

Weaknesses

Most of the existing plantations are not scientifically managed. High yielding variety and shade loving variety coverages are less in the district.

Even though there has been a gradual increase in the area under the crop over the past decade, corresponding increase in production has not been achieved as the productivity fluctuates due to various

reasons, the principal one being adverse climatic conditions, especially drought occurrence and incidence of diseases like quick wilt and pests.

High fluctuation in the market price leads to non-adoption of agronomic practices by the farmers. Presence of pesticide residues and microbial contaminations in processed pepper due to unhygienic processing and handling at farmer level are obstacles in the export of pepper.

Opportunities

There is ample scope for area expansion by intercropping and rehabilitation of old pepper plantations. Adoption of scientific practices in increasing the productivity of the crop will enhance production.

The export potential has to be tapped by increasing the area under organic pepper cultivation and maintaining the intrinsic quality of the produce through clean handling and processing so as to compete with other pepper producing countries like Indonesia, Vietnam, Thailand etc. which produce lesser quality pepper compared to Indian Pepper but at lower cost.

Threat

Severe incidence of pest and disease in the pepper growing tracts are major threats in production and productivity of the crop. Product is fetching low price in the international market. Unhygienic processing of pepper is one of the threats in getting fair price in the foreign market.

Cashew**Strength**

Kollam is the centre of cashew industry in the state. As per the sectoral analysis by industrial sector (Article 1.1.4 of Chapter 16) the processing activities of Cashew are almost concentrated in Kollam. The crop is cultivated in 86376 Ha in the state with an annual production of 65655 MT of raw cashew nuts with average productivity of 737 Kg per hectare. At the district level, the area coverage is 4404 Ha, the production is 3218 MT per year and the average productivity 731Kg per Ha. Major portion of cashew cultivation in the district is in the mid up land areas. Veliyam Grama Panchayat has the maximum area under cashew as well as the highest production in the district. However, the productivity is maximum in Alayamon and Karavalloor Grama Panchayats.

As per soil suitability studies (Article 1.2.10 of Chapter 13), cashew cultivation is most suitable in Nedumangadu, Ummannur and Varkala soil series present in the mid land area of Kollam District.

Weaknesses

Over the past twenty years, there has been a sharp decline in the area, production and productivity of cashew both at state and district levels, leading to a stagnation of the cashew industry.

The cultivation of cashew is mostly on homestead basis and there is no commercial cultivation. The existing trees are mostly local varieties, old and senile with low production capacity. Scientific management practices are rarely followed and the crop is mostly neglected.

Cashew processing industry is finding it extremely difficult to maintain the present level of capacity utilization because of the lower availability of local raw cashew nuts.

Opportunities

There are chances for increasing productivity through adoption of scientific practices, high density planting etc. Area expansion can be done by planting high yielding varieties in waste lands, fallow lands, public places, lake sides, Grama Panchayat lands etc. Additional income from land can be generated by inter cropping of pineapple, banana etc with cashew. Immense demand for value added products in the foreign market is a positive point.

Threats

Pest and disease attack, low market price, etc are the main threats in this sector.

Tapioca

Strength

The climate is ideal for cultivation of tapioca in the entire district and the district accounts for a very good share of 23% both in area and production of the state. Varieties having less than 6 months duration can be successfully cultivated in wet lands.

Weakness

Cultivation of tapioca in the district is not industry oriented. Absence of organized procurement and marketing systems have resulted in the closure of starch producing industries in the district.

Opportunities

A wide range of value added products such as cassava flour, Chips, sago, glucose etc. can be made from tapioca

tubers. There is also scope for production of methyl alcohol, bio diesel etc. from tapioca.

Threat

Reduction in area due to switching over to more profitable crops like rubber is a threat. Rodent attack is another major threat.

Floriculture

Non-availability of quality planting materials and the non organized set up for procurement and marketing are the major weaknesses.

Vegetables

Strengths

Women groups, Haritha sanghoms and other voluntary groups taking ardent interest in vegetable cultivation is an encouraging factor for increasing area of cultivation. Increased awareness on consumption of safe and pesticide free vegetables opened avenues for the cultivation and marketing of organic vegetables. Existence of paddy fallows in the district is a positive factor in increasing production of vegetables.

Weaknesses

The present production in the district is around 11,000 MT only. There is huge gap between the consumption and production levels of vegetables.

Among the various vegetables, items like onion, potato, carrot, cabbage, beans etc cannot be cultivated in the district due to unfavorable climate and soil type. Other items like cucurbits, brinjal, chillies, amaranthus etc are raised mostly on homestead basis and commercial cultivation is scarce.

There is no organized infrastructure for collection, marketing and storage of vegetables. This severely affects the quality of the produce available to the consumers and also which inflict heavy loss due to lack of storage facilities, pests and rodents resulting in uneconomic returns to the producers.

Opportunities

There is potential to cultivate traditional vegetables in rice fallows during third crop season and to undertake cultivation of the other items such as cabbage, carrots, capsicum, potato etc. in climate controlled Polyhouses using suitable artificial substratum. This ultra tech cultivation should be employed in the production of traditional items also in course of time so as to

overcome the problem of land availability.

Similarly, organic cultivation must be followed as pesticide residues in vegetables are one of the major health hazards prevailing. Moreover, organically raised vegetables will also fetch foreign revenue.

Medicinal Plants

Strengths

Conserved biodiversity in eastern forests of the district is a rich source of medicinal plants. Analysis by Forest sector (Article 1.3 of Chapter 20A) reveals that rich kind of medicinal plants are also present in various divisions of Kollam District as listed in Appendix 20A-I C. Number of ayurvedic medicine preparing units in the district is in need of good quality medicinal plants. There is an increasing trend among public to resort to ayurvedic medicine over modern medicines.

Weaknesses

Only 7% of raw materials are obtained from cultivated sources. Almost 70% of the collection of medicinal plants involves destructive harvesting, since out of the annual consumption, 50% is from roots, 15% from fruit/seed, 12% from wood, 9% from the whole plant, 7% from the bark or stem, 4% from leaves and 3% from flowers.

Opportunity

Large-scale cultivation of medicinal plants has to be taken up to meet the ever-increasing demand. Though the medicinal and aromatic industry is in need of large quantity of raw materials, large-scale commercial cultivation is yet to catch up.

Herbal health tourism offers extensive possibilities for earning foreign exchange.

Threat

Many of the plants used in traditional medical treatment are becoming extinct in their natural habitat. Deforestation plays a major role in this.

Native and Location Specific Crops

Apart from the commercial crops and food crops, the District is the habitat of many minor crops and flora which are being used by the people. Crop trees like Jack, Tamarind, Garcinia, etc are essential part of native diet. Minor tubers and millets and pulses also contribute to the food security. Also Sesamum plays an important role in the healthy living of human being. It is specifically grown in Onattukara region during 3rd crop paddy fallows. So these crops also have good potential in

the district.

3.2 Issues in the Marketing system

The major issues identified in the present system of agricultural marketing in Kollam district are the following.

1. Financial constrains

The project involving processing and value addition and other marketing activities require massive finance. Government will not able to provide total financial support or assistance to such projects.

2. Supply driven market rather than demand driven

In our district, the agricultural commodities are produced not according to demand of the market except for some seasonal vegetables and banana produced to cater the demand of Onam festival season. Whatever commodities produced by the farmers are being pumped into the market without any value addition which always create glut situation and huge loss to the farmers. At present there are no mechanisms to inform farmers on potential future demand of a particular commodity.

3. Narrow focus on agricultural marketing extension system

Extension support on agricultural marketing in our district is virtually met. Suitable market extension systems have to be developed for proper functioning of available markets.

4. Weak research extension linkage

The dissemination of research finding in marketing to the common farmers is not being done due to lack of sufficient research facilities in agricultural marketing in the concerned research stations and KAU. Whatever value addition recommendations provided has been accepted by the farmers. Most value addition research projects developed are of no use to farmers since the project costs are not at his reach. Research station should develop simple, viable and low cost value addition and agro processing techniques that can be successfully taken up by farmers and farmer groups. Such recommendations can be easily disseminated to the farmers through agricultural marketing extension system.

5. Inability to access market demand

The common farmer and the average processor of our state are quite unaware of the demands of the actual consumer of the end produce. There is no feed back

mechanism to pump this information to the farmers, so that he can plan and produce the commodity according to the demand of his consumer.

6. Weak mechanism for private sector involvement

Agro processing, value addition and marketing of major commodities of the state are being handled in a most primitive and conventional manner. Involvement of private companies in this field will increase the demand of the product and subsequently increase the farmer's income. There is much scope for massive private investment in the development of infrastructural facilities in the marketing field.

7. Inadequate communication network

Inadequate modern communication network and the ineffective use of information technology are the other handicaps in the maintenance demand for our commodities. In future the marketing of agricultural commodities can only be developed by the effective use of these media.

4. Agencies Involved

Principal Agricultural Office is the apex agency in implementing agriculture development activities in the district. The major activities include planning organizing, executing and monitoring of agriculture development programmes and projects, implementation and monitoring of central and state sponsored schemes, district level administration of the various offices of the agriculture department, supporting agricultural extension activities through various extension methods and mass media, support to LSGs in programme planning, implementation evaluation, enforcement of seed act ,essential commodities act etc in maintaining the quality of seeds, seedlings, manures, pesticides chemicals, fertilizers etc. There are 13 Block level offices (Assistant Director's office) and Krishi Bhavans in all the Local bodies in the district under the Principal Agricultural Office.

Major activities of Supporting Institutions of the Dept. of Agriculture are as follows.

District farm, Anchal

Designated as model Demonstration farm and produces planting materials including seedlings of Pepper, Fruit plants, Cashew and Banana and vegetable seeds.

State seed farms

Kottarakkara -Produces foundation seed and certified seed of paddy and vegetable seeds.

Kadakkal- Produces paddy seeds, pepper cuttings and vegetable seeds.

Coconut nursery, Karunagapally

Produces coconut seedlings and vegetable seeds.

Cashew farm Kottarakkara

Progeny orchard maintaining stock of Kanaka Madakkathara and Anakayam varieties.

Soil Testing Laboratories

1. District soil testing lab Kollam: Analyse soil samples and give recommendations to farmers.

2. Mobile soil testing Laboratory Kollam: Conduct off campus soil test campaigns in the field and gives spot recommendations.

Agmark Grading Laboratory : issues Agmark certificate to packers for coconut oil, honey etc.

Parasite Breeding Station : Produces and liberates parasites for the control of coconut leaf caterpillar.

Engineering service : Office of the Asst. Executive Engineer, Kollam takes care of the farm mechanization and engineering programmes of the department in civil and mechanical works.

Other supporting agencies include Sericulture (Agricultural Officer), Kerala Agro Industries Corporation (Branch-Kottarakkara), Krishi vignana kendra – Sadanandapuram(KAU), AIDCO-Kollam, Extension training Centre –Kottarakkara, Sangamithri-Apex body –marketing (Karunagapally), Plantation corporation, Rehabilitation Plantations Ltd. Oil palm India LTD., Rubber Board, District Soil Conservation Office ,Kollam and District Soil Survey Office ,Kollam.

5. Ongoing projects and programmes

5.1 Programmes of Physical Nature

5.1.1 Schemes for Overall Development

1. Agri Export Zone

As a part of new initiative, Government of India have accorded sanction for establishment of an agri export zone in the State covering nine districts extending from Thiruvananthapuram to Palakkad for promoting export of ethnic vegetables, banana, pineapple and their value added products.

This includes area expansion for

- I Banana @ Rs 15000/ha for 100 ha
- I Vegetables @Rs 5000/ha for 150 ha
- Productivity improvement programme for vegetable and fruits for 100 ha
- I IPM @1500/ ha for 250 ha

Table 11.2 : Agri Export zone coverage

Name of block	Fruit	Vegetable	IPM	Productivity Improvement
Oachira	2	15	17	5
Karunagappally	3	10	13	3
Chavara	2	2	4	1
Kollam	0			
Eravipuram				
Chathannoor	15	15	30	10
Kundara				
Sasthamkotta	15	15	30	15
Kottarakkara	10	15	25	15
Vettikavala	10	15	25	10
Chadayamangalam	23	23	48	23
Anchal	10	25	35	11
Punaloor	10	15	25	7

The coverage is given in Table 11.2.

2. Agri Export Zone for Medicinal plants

The objectives are

- I To conserve endangered species
- I To promote export market penetration and niche marketing
- I Identify constraints and provide necessary support
- I Educate people about importance of conserving medicinal plants to generate additional income to weaker section of society

The components are given in Table

Table 11.3 : Export zone for medicinal plants -Details

Components	Physical	Financial Rs Lacs
Training to farmers	1	0.256
Training and education of person or groups from wild sources	3	2.25
Demonstration of medicinal plants in KIBs & blocks	33	
Area expansion	35	
Raising medicinal garden in educational institution	10	0.56
Minikit	2500	2.5
Formation of co operatives and mobilization of funds	1	1
Establishing nurseries	1	1.25
Processing unit	4	12

11.3.

3. National Watershed Development Programme (NWDP) for rain fed areas [Macro Management]

The National Watershed Development Project taken up from 1991-'92 onwards will be continued for organizing integrated watershed management activities in selected watershed.

- I Livelihood support for non-land based activities
- I Development of natural resources
- I Production enhancement activity
- I Convergence of other activities

4. Agricultural marketing

- I Sangamithri

Table 11.4 : NWDP - Area (Ha) and No. of beneficiaries

Sl. No.	Name of Watershed	Area	Number of beneficiaries
1	Perumouza SW	2500	550
2	Pazhangalam	2800	500
3	Neelamthazham	2300	350
4	Nedumpang	3500	675
	Mylam SW		
5	Nellila	2500	425
6	Palliccal	4500	550
7	Kottarakkara	3800	350
8	Kunnakkara	4200	500
9	Kizhakeelheruvu	5200	665
10	Kanikom	5400	675
	Muttara		
11	Muttara	1094	390
12	Vallam	1265	475
13	Nellikunnam	942	4500
14	Plapelly	756	550
15	Thrikanamangal	1834	550

- I Rural market , Karunagappally

5.1.2 Development of crops

1. Sustainable development of rice

Table 11.5: Sustainable development of Rice - Project details

Name of Scheme	Estimated cost	Targeted no. of beneficiaries	Present stage	Level of scheme	Type of Project	Category of scheme
RICE Fallow land cultivation	@5000/ha	400ha	Completed	State level	State	Area oriented

A farming system approach for the rice crop development is envisaged in the scheme in which a package of measures including cropping pattern capable of making rice production more attractive by reducing the cost of inputs, providing infrastructure and adopting modern farming technologies through Group Farming Samithies / Paddy Development Agencies. Table 11.5 gives Project details. The fallow

Table 11.6 : Sustainable development of rice - Fallow land details

Name of block	Fallow (Area in Hectares)
Oachira	
Karunagappally	11.4
Chavara	25
Kollam	
Eravipuram	
Chathannoor	25
Kundara	
Sasthamkotta	50
Kottarakkara	
Vettikavala	70
Chadayamangalam	50
Anchal	55
Punaloor	75

land details are given in Table 11.6.

2. MOU rice development

MOU Rice development includes

- I Biofertilizers-2000 ha
- I Location specific demonstration plot-2480 ha

Table 11.7: MOU rice development - Details

Name of block	Bio fertilisers (Area in Hect.)	Demonstration Plots (Area in Hect.)
Oachira	50	50
Karunagappally	30	30
Chavara	20	20
Kollam	10	
Eravipuram	70	100
Chathannoor	250	500
Kundara	40	40
Sasthamkotta	150	200
Kottarakkara	330	180
Vettikavala	350	450
Chadayamangalam	250	350
Anchal	200	300
Punaloor	250	260

The details are given in Table 11.7.

3. CDB scheme for coconut

CDB Scheme is for integrated farming in coconut holdings. The main objective of the scheme is to enhance income from coconut by following an integrated farming system approach in the existing coconut

Table 11.8: CDBC details

Name of Scheme	Targeted no. of beneficiaries	Present stage	Level of scheme	Type of Project	Category of scheme
CDB Scheme for integrated farming in coconut holdings.					
Demonstration plots- 1 Year	250 Ha	Completed	State level	Centrally sponsored	Area oriented
2nd year	175	Completed	State level	Centrally sponsored	Area oriented
Organic manure units	20 units	Completed	State level	Centrally sponsored	Area oriented
Cut and removal of palms	2500 no	Completed	State level	Centrally sponsored	Area oriented
Coconut based farming system	2500 Nos	Completed	State level	Centrally sponsored	Area oriented
Coconut seed procurement					

holdings (Table 11.8).

4. Area expansion through inter-cropping of spices

The project includes intercropping of pepper in coconut and arecanut gardens as an area expansion programme (Table

Table 11.9 : Intercropping of Spices-details

Name of scheme	Estimated Cost	Targeted No. of Beneficiaries	Present Stage	Level of Scheme	Type of Project	Category of scheme
SPICES Area expansion of pepper (Area expansion through intercropping)	11 Lakhs	Area 100 Ha	Completed	State Level	State	Area Oriented

11.9).

5. Cashew demonstration plot

The project objective is to scientifically cultivate cashew in selected plots as a demonstration (Table 11.10).

6. Central assistance for floriculture, medicinal and mixed crops

The objective is to give assistance to encourage floriculture, medicinal and mixed crops in the district (Table 11.11).

7. Assistance for organic cultivation-Vegetable

Table 11.12 gives the details for assistance for organic vegetable cultivation.

Table 11.10 : Cashew demonstration plot - Details

Name of Scheme	Targeted no of beneficiaries	Present stage	Level of scheme	Type of Project	Category of scheme
Karunagappally	5	Completed	State level	State	Area oriented
Vettikavala	7				
Punaloor	10				

Table 11. 11 : Central assistance for Floriculture, medicinal and mixed crops

Name of Scheme	Targeted no of beneficiaries	Present stage	Level of scheme	Type of Project	Category of scheme
Orchid/anthodium	1600		Mixed 25 cent	Central	Area oriented
Bush jasmin	320	Completed	State level	Central	Area oriented
Loose flower	400				
Medicinal	200	Completed	State level	Central	Area oriented
Mixed	240	Completed	State level	Central	Area oriented

Table : 11.12 : Assistance for organic vegetable cultivation

Name of Scheme	Estimated cost	Targeted no of beneficiaries	Present stage	Level of scheme	Type of Project	Category of scheme
1.Assistance for organic cultivation						
Vegetable	Financial target 2.50 lakhs	Physical target - 25 ha.	Completed	State level	State	Area oriented

8. Nagarathil oru nattinpuram

The rapid urbanization and the need to tackle economic and nutritional security for the inhabitants has led to a growth in attention for urban agriculture. Urban agriculture is an integral part of the urban ecological and economic system covering backyard gardens, sheltered vegetable production, roof cultivation, rain water harvesting, waste water recycling, organic waste recycling, backyard poultry, ornamental fisheries etc.

The outlay will be utilized for the following purposes.

- I Distribution of planting materials
- I Establishment of vermin compost units

- I Establishment of Earthworm Nursery
- I Publicity and awareness
- I Supply of garden implement kit
- I Green house cultivation and cultivation in roof and
- I Azolla cultivation

Suitable tie ups with KAU and Indian Institute of Horticulture Research will be established for technical collaboration for implementing the component on Polyhouse cultivation. Table 11.13 gives the details.

5.1.3. Infrastructure Development

1. Planting material production programmes

The objective is to produce planting materials required for the district in the departmental farms (Table 11.14).

Table 11.13 : Nagarathil Oru Nattinpuram - Project details

Name of Scheme	Targeted no of beneficiaries	Present stage	Level of scheme	Type of Project	Category of scheme
Nagarathil oru nattinpuram (KOLLAM Corp.)					
Vermi compost	2500 nos.	Completed	State level	State	Area oriented
Awareness class	200	Completed	State level	State	Area oriented
Garden implements	1455	Completed	State level	State	Area oriented
Hand sprayer	500	Completed	State level	State	Area oriented

2. Fertiliser and quality control programmes

In this integrated nutrient management system includes

Model INM farm

- I Physical target -20
- I Financial target 1.10 lakhs
- Strengthening of Soil / Fertiliser / Pesticides Testing and Bio-fertiliser Labs

I Fertiliser-350

I Pesticides-140

I Organic manure-50

I Bio-fertiliser-50

I Soil samples-30000

3. National biogas and manure management programme

The objective of the scheme is to popularize biogas energy as a source of alternate and natural energy source. This is proposed to be achieved through training courses and by giving subsidy for setting up of biogas units (200 Numbers.).

4. Pest control programmes

Integrated Pest Management System includes

- I Maintenance of light traps
- I Mobile agro-clinics
- I Rapid action force

5. Farm mechanisation

This includes Small farm mechanisation and agricultural engineering services in which there are

- I Adoption of new suitable equipments / machineries and its popularisation (Rs. 2 Lakhs)
- I Mechanisation of padaseghara samithy (Rs 1.00 lakhs)
- I Drip irrigation-(0.50lakhs)-Rate 11250/ha.

6. Crop damage relief programmes

Crop insurance

The crop insurance fund created at the State level is intended to provide compensation to the insured 24 major crops, in the event of damage due to natural calamities. The outlay is for meeting the government contribution for crop insurance fund scheme. Compensation will be given for loss of insured crops due to natural calamities like drought, storm, cyclone, flood, landslip, forest fire, sea erosion, earthquake and lightning.

National Agriculture Insurance Scheme (NAIS)

The National Agricultural Insurance Scheme was introduced by the Govt. of India in 1999-2000 replacing the

Table 11.14. : Planting material production programmes - Details

Name of Scheme	Estimated cost	Present stage	Level of scheme	Type of Project	Category of scheme
PLANTING MATERIAL PRODUCTION PROGRAMMES	Rs 6.32 lakhs	Completed	Agricultural farms	State	Area oriented
WCT	45241		Item		QTY
TxD	6422		Mango		900
DxT	1396		sapota		1500
Segregants	1644		Guava		1500
Ginger	700 kg		jack		2500
Turmeric	2700		Plantain suckers		3650
			Nendran		1850
			vegetable seeds		590 kg
			Pineapple sucker		100
			Ornamental plants		7200
			Minor tubers		6200
			Minor fruits		3000
			Vanilla		1000
			Pepper		4.5 lakhs

Comprehensive Crop Insurance Scheme (CCIS). The scheme is being implemented by the National Insurance Corporation. The crops covered under this scheme are paddy, banana, tapioca, ginger, turmeric and pineapple. This scheme benefits all farmers, both loanee and non-loanee. Insurance will be provided for risks viz. natural fire and lightening, storm, hailstorm, cyclone, typhoon, tempest, hurricane, tornado, flood, inundation and landslide, drought, dry spells, pests, diseases etc.

Contingency programme to meet natural calamities

Under contingency programme compensation will be provided to the major crops, in the event of damage due to natural calamities. Small and marginal farmers, who suffer total crop loss, are eligible for seeds / seedlings, on free of cost.

7. Promotion of organic farming

- Assistance for organic cultivation- Vegetable
 - Physical target -25 ha.
 - Financial target 2.50 lakhs
- Awareness training to farmers
 - Physical target -25
 - Financial target 2.50 lakhs
- District level seminars
 - Physical target -1
 - Financial target- 1.00 lakhs

8. Human resource management

Skilled training to youth enrolled in one lakh youth programme and Training to micro level planning and project preparation to KB officers

- Physical target -2.numbers.
- Financial target 0.075 lakhs
- Training to master farmers
- Physical target -6 numbers.
- Financial target 0.81 lakhs

9. Public participation in agricultural production programme

This includes

- Farmers Day (Chingam-1) (Rs.0.925 lakhs)
- Karshaka Awards
- District level and Grama Panchayat level Karshika Vikasana Samithies (Rs.0.37 lakhs)
- District level seminars (Rs.0.05 lakhs)
- District level Interface (Rs.0.3 lakhs)

10. Grading of agricultural commodities

With an outlay of Rs.0.50 lakhs its objectives are

- Assessing the quality of the farm produces which are marketed
- Fixing grades of commodities
- Facilitate export of agricultural commodities.

11. Agricultural marketing

- Sangamithri
- Rural market , Karunagappally

12. Women in agriculture

The scheme is to motivate and

mobilise women farmers through a group approach. These groups would form an effective network for channelising agricultural development programme. The targeted women groups will be trained in relevant technologies and would be given required agricultural inputs, during the project period. The components are Trainings-30 No, Demonstration-30, SWIP-100, Mahila goshti-1 and Study tour-1. The outlay is 12.65 lakhs.

5.2 Evaluation of projects and programmes

One of the major problems in paddy cultivation was keeping field as fallow due to various reasons. The scheme on fallow land cultivation brought 400 Ha of fallow land under cultivation.

Major problems in coconut cultivation in coastal area are incidence of pest, disease, low productivity due to poor application of organic manures and fertilizers, non scientific agricultural practices etc. The CDB demonstration scheme implemented in Alappad Grama Panchayat has solved the problems to a greater extent. This model has to be extended to other Grama Panchayats also.

The major problems faced in vegetable, banana and other fruit cultivation are non availability of quality planting materials. The scheme "planting material production programme" is handicapped due to insufficient infrastructure in the govt. farms. Decentralized production centres have to be established.

Waste management and availability of organic manure are the major problems faced in the urban areas. The scheme "Nagarathil oru Nattinpuram" solves this problem to a greater extent. Converting organic waste to manure by vermin composting is an innovative idea.

The establishment of Sangamithri and rural market has solved the problem of marketing of agricultural commodities to a certain limit. More number of rural markets along with proper collection centers and retail outlets are to be established. A three tier system will help the farmers for getting higher price for their commodities.

Organic farming is one of the avenues in Indian agriculture in connection with export and health. The scheme on "organic farming" promotes the concept of organic farming and provides awareness among



Fallow land- Pooyappally

farmers. This scheme has to be extended to other areas also. Efforts are on to designate organic villages in the district in Mylom, Edamulakkal and Kareepra Grama Panchayats.

Kollam district, especially its eastern tract, is highly potential for the cultivation of medicinal plants. The new scheme on medicinal and aromatic plants under Agri export zone provides awareness on

cultivation of medicinal plants among farmers. Area expansion scheme should be extended to more areas.

Scarcity of labour and high labour cost is the main constraints in agricultural production. The viable solution for this is mechanization. The scheme on "Small farm mechanisation" helped the farmers to solve this problem. But location specific farmer friendly equipments are to be developed.

Farmers should get the machines at reasonable cost.

6. Conclusion

In the analysis of Agriculture sector, the existing cropping patterns, crop status including floriculture, infrastructure and labour issues were analysed with the support of GIS generated spatial distribution maps. From the SWOT analysis it is found that there is ample scope for the productivity improvement and value addition in agricultural sector. However, while analysing the development trend certain critical issues in the production and productivity of a number of food crops are observed. Therefore strategies have to be evolved to resolve the key issues in this sector. Future strategies for attaining self sufficiency in certain crops and economic development in agriculture sector can be evolved in thrust areas based on spatial analysis and district development concept



Chapter 12

Irrigation

This chapter analyses the existing status and development issues of Irrigation Sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the Overall Development Trend of the sector based on the temporal aspects. The third part probes into the development issues pertaining to the sector and the fourth part contains an evaluation of ongoing and committed projects.

1. Analysis of Existing Status

Irrigation is the basic supporting activity for agricultural development. Even though increasing the drinking water availability by replenishing the ground water table, generation of power from the reservoirs constructed for irrigation purpose, flood modulation in the rivers etc are additional benefits, the one and only objective of irrigation is agricultural development. The extent of irrigation is assessed based on the irrigation potential created and the irrigation potential utilized.

The term "Irrigation potential created" in a particular area indicates the ultimate

irrigation potential created if the entire infrastructure required for supplying water to that particular area is completely utilized. In Kerala the area sown comes to 2.25 Million hectare only. But in our neighboring states of Andhra, Karnataka and Tamilnadu the area sown are 11.02 M.Ha, 10.38 M.Ha and 6.58 M.Ha respectively (Fig. 12.1). In case of the net area irrigated also Kerala is far behind the neighboring states.

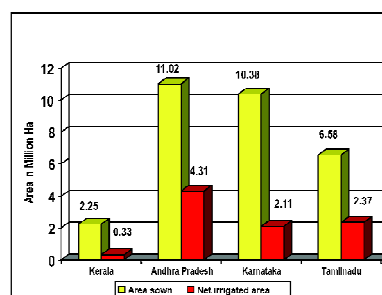


Fig. 12.1: Irrigation Potential created – Comparison of Kerala with Southern States

The net area irrigated of Kerala is only 0.33 M.Ha while that of Andhra, Karnataka and Tamilnadu are 4.31 M.Ha, 2.11 M.Ha and 2.37 M.Ha respectively. Also when we take the irrigated area as a percentage

of area sown Kerala is lagging behind with 14.67% compared to Andhra, Karnataka and Tamilnadu with 39.11%, 20.33% and 36.02% respectively.

Regarding the potential created through M.I. schemes Kollam district is in the midway among 14 districts with seven districts having lower potential created and six districts having higher potential created (Fig. 12.2). Potential created is maximum in Alleppey district (28196 Ha) and Wynad district is having the minimum (3292 Ha). Potential created for Kollam district is 8912 Ha. Percentage of irrigated area to the agricultural area is higher in Alleppey district (26.1%). It is low in Malappuram district (1.39%). Percentage of irrigated area in

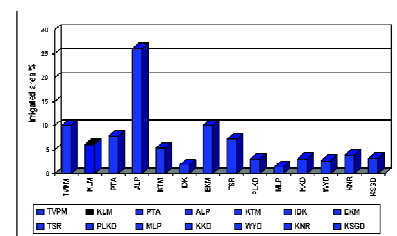


Fig. 12.2 : Irrigation Status-M.I-Comparisons of Districts

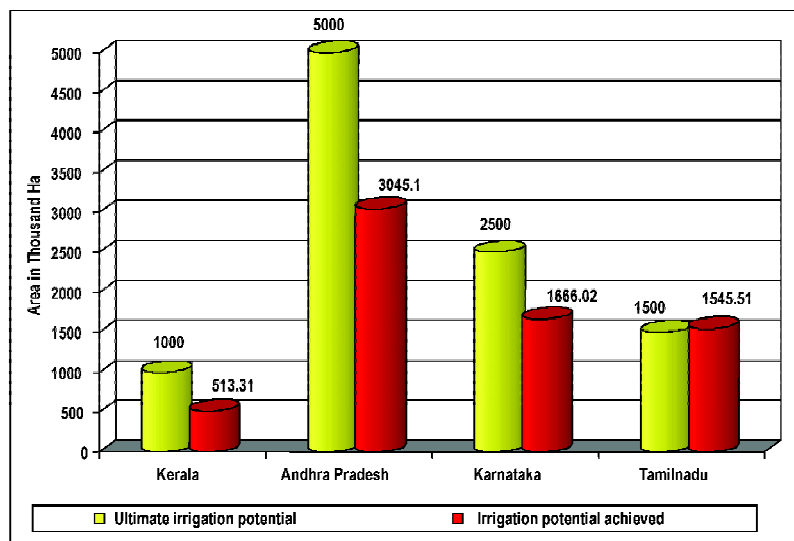


Fig. 12.3: Utilization of irrigation potential – Comparison of Kerala with Southern States

Kollam district is 6.17% ranking sixth from the highest.

The utilization of ultimate irrigation potential for Kerala is only 51%. Utilisation of ultimate irrigation potential in the national level is 56% while that of Andhra, Karnataka and Tamilnadu are 61%, 67% and 103% respectively. These statistics reveal that Kerala is far behind in agriculture, creation of irrigation potential and utilization of the potential (Figure 12.3).

In Kollam out of the 58% area under agriculture, only 31% is irrigated area. From the Figure 12.4 and Table 12.1. It can be seen that out of the total irrigated

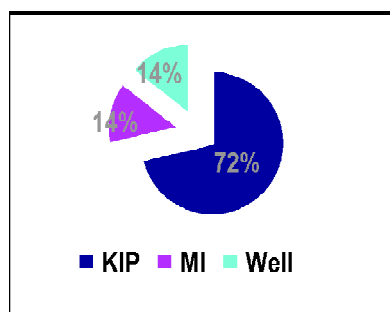


Fig 12.4 : Irrigated area by type

Table 12.1: Irrigated area in Hectares

Sl. No.	Irrigation Type	Irrigated Area in Ha.
1	Minor Irrigation	6492
2	KIP	32272
3	Irrigation using wells	6507
	Total	45271

area of 45271 Ha, 72% is irrigated by the Kallada Irrigation Project (KIP).

Details of Kallada Irrigation Project (KIP)

The Kallada Irrigation and Tree Crop Development Project is the largest irrigation

project in Kerala. The gravity masonry dam across Kallada River having a storage capacity of 487.92 Million Cubic Metres is at Parappan near Thenmala in Kollam District. A weir constructed 5 km downstream of the reservoir diverts the water, let out from the dam to the Right and Left bank Main canals to irrigate a net area of 53514 Ha having composite cultivation of crops like Paddy, Coconut, Banana, Arecanut, Cashew, Pepper, Ginger, Pulses, Vegetables etc: This project is proposed as a Tree crop development project, which is the first project as such in Kerala, to ensure the distribution of water to Tree crops. Main Components of the project are

- I A gravity masonry Dam across Kallada River at Parappan near Thenmala and a saddle Dam at Pallamvetty.
- I A pickup weir at Ottakal 5km down stream from the reservoir.
- I The left and right bank main canals, their

branches, distributories and minors.

- I The left and right bank main canals, their The minor conveyance system consisting of PVC pipes, hydrants and flexible hoses starting from spouts of main canals, branches distributories and minors.

Kallada Irrigation Project is having an ayacut of 53514 Ha of which 32272 Ha is in Kollam district. Kollam Corporation, Punalur Municipality and 29 Grama Panchayats are having no ayacut area of KIP. The ayacut area of 32272 Ha is distributed in Paravoor Municipality and 40 Grama Panchayats of Kollam district. Out of the total ayacut area of 32272 Ha in Kollam district, irrigation potential is created in 30427 Ha. Potential yet to be created are that of Paravoor distributory (1212 Ha), Poovattoor distributory (514 Ha) and Pulamon distributory (119 Ha). Water is being distributed through all the canals except Poovattoor distributory and tailends of Paravoor and Pulamon distributaries. The ayacut area of KIP in Kollam district along with the canals is shown in Figure 12.5.

When the spatial distribution of irrigated area of various LSGs in the district is compared as a percentage of total irrigated area of the district, it is seen that irrigated area is more or less concentrated in the mid land area. Highest percentage of irrigated area is in Chathannur Grama Panchayath (4.19%) followed by Nedumpana (3.42%) and Sasthamcotta (2.99%). Grama Panchayaths of Alappad, Clappana, Pattazhy North and Oachira are not at all irrigated (Figure 12.6).

The major crops irrigated in the State in general and in Kollam as well, are paddy,

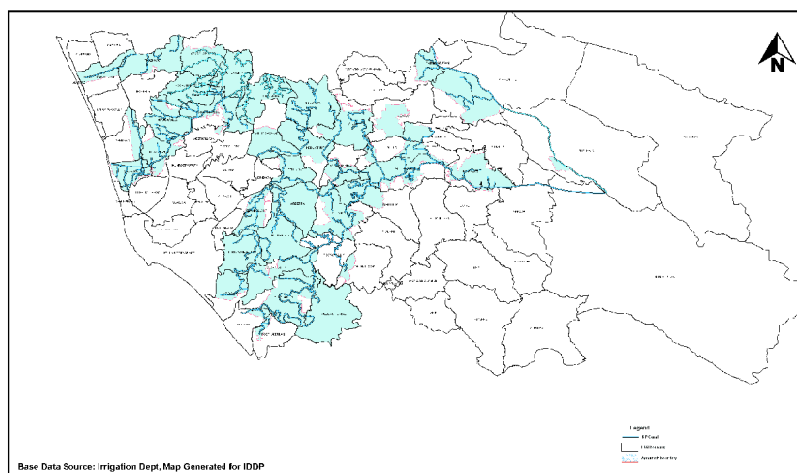


Fig. 12.5: KIP Canals and Ayacut areas of Kollam District

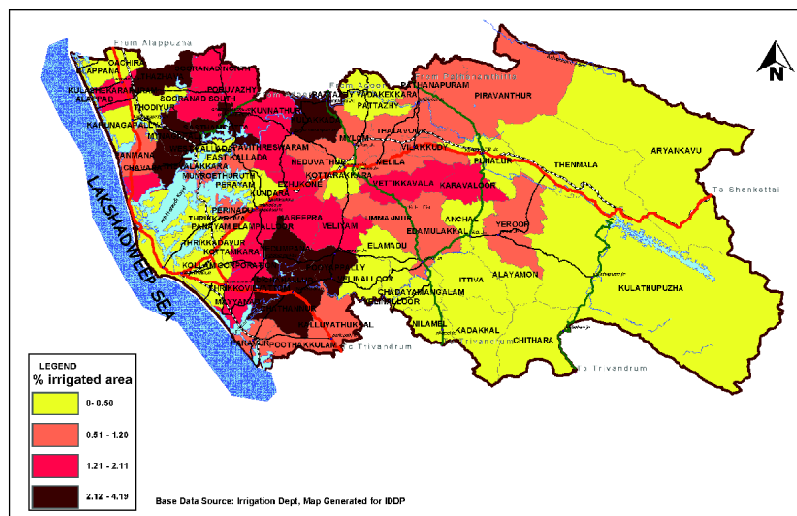


Fig. 12.6: Percentage of irrigated in LSGIs of Kollam District area to the total irrigated area of the District

coconut and banana. When we compare the crop wise irrigation, while in the State both paddy and coconut are irrigated more or less equally, in Kollam coconut is irrigated more (52%) as shown in Figure 12.7.

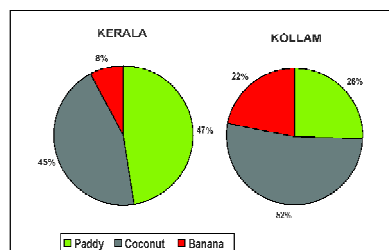


Fig. 12.7: Crop wise irrigation in Kerala and Kollam

The percentage if irrigated area under Paddy is less in the district compared to that of the whole state (Kerala-47%, Kollam-26%). The percentage of irrigated area under Coconut and Banana are higher in the district (Coconut: Kerala-45%, Kollam-52%, Banana: Kerala -8%, Kollam -22%). Other irrigated crop in the district is Vegetables.

2. Overall Development Trend

The ayacut area of KIP in Kollam district is 32272 Ha. Potential created in Kollam district upto 2000 March is 15611 Ha. Potential created in the subsequent years and cumulative potential is given in the Table 12.2. Potential created during the period except 2002-2003 is very low. In the year 2005-2006, potential created in Kollam district is only 186 Ha.

Regarding the creation of potential trend can be considered positive since efforts were made to create potential in the

whole ayacut area, even though potential is yet to be created in 1845 Ha.

But regarding the utilisation of potential, which is vital for the development of agriculture, the situation is standstill (as shown in Table 12.2) considering the period from 2000-2001 as per the records of KIP. The present situation of the area where potential is said to be utilised earlier is also pitiable. In the Minor Irrigation sector also potential creation and utilisation during the period is meager. Hence the overall trend considering creation and utilisation of potential is extremely negative.

Table.12.2: Trend of Potential created and cumulative potential

No.	Year	Potential created during the year (Ha)	Potential created Cumulative (Ha)	Potential utilised Cumulative (Ha)
1	2000-2001	1093	16704	11705
2	2001-2002	790	17494	11705
3	2002-2003	12242	29736	11705
4	2003-2004	325	30061	11705
5	2004-2005	180	30241	11705
6	2005-2006	186	30427	11705

3. Development Issues

3.1 Problems

The main problem is that agriculture itself is declining day by day. Agricultural land is being transformed for non-agricultural uses. The wet lands, which play a major role against the depletion of water table, are being filled up and are utilized either for non agricultural use or for cultivation of dry land crops. Assuring irrigation water to the fields where there is cultivation today is a positive approach against further conversion of land use.

Kallada Irrigation Project, Minor Irrigation and well irrigation are the main

irrigation streams, of which 72% of the share is that of KIP. Hence the non completion of the 9 bottleneck works of KIP and delay in the commissioning of the project is main problem. The 9 bottleneck works to be completed are

1. Poovathoor Distributory - Rly crossing
2. Poovathoor Distributory - Connecting works of Rly crossing
3. Paravoor Distributory - Balance work-21417-22980 m and Lifting
4. Kottappuram Minor – works of two reaches
5. Balance works of Mavilayil Distributory
6. Balance works of Vazhamuttom Distributory
7. Balance works of Chamavila minor
8. Balance works of Kizhakkekara minor
9. Balance works of West Kallada Distributory-0-3510m

Underground PVC pipes laid for Minor Conveyance System are damaged in most of the reaches. Command area works are yet to be completed. Even though water is let out through canals, a practice of utilizing water for agriculture is yet to be developed. A uniform crop period and time is not practiced for paddy in the ayacut area. Hence distribution of water becomes difficult.

Lack of maintenance and paucity of funds creates problems in the proper functioning of schemes like VCB etc. Ponds are not seen utilized for the development of agriculture. Awareness of the essentiality of irrigation is seen to be very low among agriculturists. Cost of implementing irrigation facility does not tally with the benefits obtained. The motor pumps and accessories are very old. There are 8 L.I stations at Sooranad North which are installed in 1958. Hence they need frequent repairs. Lack of sufficient permanent operating staff creates problem in the proper functioning of L.I. schemes. Canals carrying water to field are not properly maintained.

3.2 Potentials

The storage capacity of dam at Parappur is 487.92 Mm³ which is a great potential for the district. If this is utilized fully income from agriculture can be considerably increased. Developing new L.I. Schemes in the Grama Panchayats by

the sides of Kallada, Pallickal and Ithikkara rivers will create new potentials. There is good potential for tapping ground water in many parts of the district. There is also scope for rain water harvesting. However the actual utilization of the potential is highly dependent on the degree of accessibility of water to the farmer.

4. Agencies Involved

The major agencies involved are the Irrigation Dept. entrusted with KIP, Major irrigation and Minor irrigation works and the LSGIs. Kallada Irrigation Project deals with construction and maintenance and distribution of water for irrigation through left and right bank canals of KIP. Minor Irrigation deals with all minor irrigation works such as lift irrigation, VCB, protection of streams and ponds, NABARD works etc. LSGIs deal with minor irrigation works. Major Irrigation works are not directly linked with supply of water for irrigation and they are dealing with protection of river banks, anti-sea erosion works etc.

5. On going and Committed Projects

Main on-going works of KIP consists of 9 bottleneck works, which are essential for the commissioning of KIP. Paucity of funds, non utilization of available funds specifically for completion of bottlenecks and lack of coordination of various departments are the reasons for the delay in completing the works. Funds are to be separately provided for the completion of the bottleneck works and it should be stipulated that the funds should be utilized for the completion of these works only. Strict time limit is to be enforced for the completion of these works. Co-ordination of other departments (Railways and Water Authority) at higher level is essential for expediting such works.

There are 23 works under Major and Minor Irrigation which are at various stages. They are distributed in 16 Grama Panchayats. Two works are of Major Irrigation and 11 works are of Minor Irrigation. There are two Block Panchayat works and Jilla Grama Panchayat is having 8 works.

6. Evaluation of On going and Committed Projects

The on-going and committed projects are essential for providing irrigation to the agricultural lands. But in order to solve all the identified problems separate



Ottakkal weir - Thenmala

programmes are needed. The problems can only be solved with a combined effort of various departments such as Irrigation, Agriculture, Soil conservation, LSG etc with participation of the beneficiaries. In case of KIP on completion of 9 on-going works, the project can be fully commissioned. Separate programmes are needed for other identified problems. Agriculturists and officials should join hands to solve the problems.

6.1 Evaluation of K.I.P

Kallada Irrigation project is also an existing project in the district. The Cultivable Command Area of the project is 53514 Ha and is spread out in three districts Kollam, Pathanamthitta and Alappuzha. The Cultivable Command Area of KIP in Kollam district is 32272 Ha. The year wise potential created is given in Table 12.1. It can be seen from the table that the project is showing a growing trend from 1984-85 onwards except in the years 1986-87 and 1998-99 regarding the creation of potential.

The present stage of progress of the project is given below.

Dam/Head Works

The construction of Dam/Head works was fully completed even before 1988. An Auxiliary Spillway in the right flange of the dam was constructed during 2002.

Left Bank Canal System

The Left Bank Canal system is having 3 branches and 29 distributaries. The length of LB Main Canal is 56.016 Km. It is having 61.727 Km of branches and 246.947 Km distributaries. The main canal as well as branches are fully completed. Pulamon, Paravur, Poovattoor and Pallimon are the only distributaries to be completed.

LB Main Canal was commissioned on 30-06-1992.

Right Bank Canal System

The Right Bank Canal system is having 3 branches and 44 distributaries. The length of RB Main Canal is 69.752 Km. It

is having 59.173 Km of branches and 279.639 Km distributaries. The main canal as well as branches of RB canal system are also fully completed. Vazhamuttom and Mavilayil are only distributaries to be completed.

RB Main Canal was commissioned on 24-05-1986.

Benefits

The project is beneficial to 92 villages of 9 Taluks namely Kollam, Kottarakkara, Kozhenchery, Kunnathoor, Karunagappally, Karthikappally, Adoor, Pathanapuram and Mavelikkara.

The Cultivable Command Area of the project is 53514 Ha (Net). The intensity of irrigation is 151%. Thus the ultimate Irrigation Potential of the project is 80579 Ha. Drinking water problem, which was acute in many areas of the basin, was solved due to increased water availability in the existing water sources.

Other Benefits

- I Irrigation water recharges ground-water and rural water supply schemes become more effective and efficient.
- I 15 MW of power is being generated from July 1994.
- I Flood modulation is effectively done in the downstream areas of the basin.
- I The network of canal bank roads through out the ayacut is now the main basis of rural transportation.
- I The assets created viz. KIP campus, buildings etc are now utilized by other departments also for offices, colleges etc.

Specific Problems

- I Water is distributed from each spout through PVC pipes laid underground since loss of water can be nullified by this system. This type of Command Area Development work known as Minor Conveyance System is adopted for the first time in India in this project. But as per the instructions of World Bank the works of canals as well as the works of Minor Conveyance System was executed simultaneously. Since canal works in the upper reaches were not completed it was not possible to distribute water through them. Idling of the system for years created a feeling that the system is not useful. Hence the owners of the land through which the pipes were laid did not pay any interest to protect or preserve the pipes. The pipes were broken while digging pits for various

purposes such as construction of houses, planting rubber etc. Moreover the Brass valves for the regulation of water were stolen. Thus when the canal was ready for water distribution the Minor Conveyance System was damaged in most places. Hence the system is to be rectified for the proper functioning of the project.

- I Canal is to be completed in some reaches due to various reasons. Water can be distributed to these canals only after the completion of these bottlenecks. These bottlenecks include works to be taken up by Railways and Water Authority also.

Optimization of the Project

Kallada Irrigation Project is envisaged to irrigate 53514 Ha of cultivable land. In order to achieve the goal the following measures are to be taken.

- I The Minor Conveyance System is to be rectified so that water can be distributed through all the hydrants. Agriculture in the garden lands is possible only if water reaches to all the hydrants.
- I The reaches where the work is yet to be finished is to be completed urgently.
- I At present water is distributed through all the completed canals and before water distribution every year a water calendar for the distribution of water is prepared by the project. But practically implementation of this water calendar becomes difficult since there is no coordination in the agricultural activities. Hence when water is required in some parts of the ayacut of a particular canal, in some other parts of the same canal letting out water to that area will adversely affect the crops. The problem can be tackled only with the coordination Irrigation department, Agriculture department and farmers. Educating the farmers to select crops and plan the agricultural activities according to the irrigation water availability and ensuring

water to their crops once the agricultural activities are turned to irrigation water is most important.

- I Water users committees are to be formed for each spout and the control of water beyond the spouts may be entrusted to them. Associations are to be formed for each canal as an apex body of all the spout level committees. All the farmers should be well informed about the days in which their canals will be opened and closed.

- I The Local Self Governments intervention can hold a lot in the optimization by building a strong rapport between agriculturists and departments.

7. Conclusion

Overall it is seen that the irrigation sector in Kollam District is having good potential which is kept under utilized. So, effective measures have to be taken up to improve the sector in the district through proper utilization of the resources and solving the issues. Minor Conveyance System is to be rectified for optimizing the use of available water. Bottleneck works are to be completed urgently for utilizing the created potential. The reason for the non completion of 9 bottlenecks and delay in commissioning of KIP is paucity of funds, non utilization of available funds specifically for completion of bottlenecks and lack of coordination of various departments. Funds have to be separately provided for the completion of the bottlenecks alone. Also strict time limit has to be enforced. High level co-ordination of other departments for expediting such works will have to be conducted. Most of the PVC pipes laid underground for MCS are damaged. As per the norms of the World Bank, command area works were done before commissioning of canals. If these works were done after the completion of the canals as usual, MCS works would not

have been this much damaged. Formation and functioning of the Water Users Association was not effective since water was not let out through the canals when the associations were formed. Newly formed CADA division should take up rectification of MCS also. Where agriculturists are badly in need of water for irrigation, pilot project for rectification of MCS of one distributory should be initiated. Possibility of tapping of ground water potential may be looked into in the district except in Kottarakkara block. Rain water harvesting may be popularized by which water availability can be increased locally. Judicious selection of different types of irrigation is also important.

There is sufficient storage in the reservoir. But it is not utilized for agriculture. Water is available in the canals, but not in the right place, right time and right quantity. Damaged MCS, non uniform pattern of cultivation and lack of maintenance of canals are main reasons for this. Effective command area works is to be done. Agriculturists should be educated to follow uniform pattern regarding crop period, seeds etc to ensure uniform water distribution pattern. Canals are to be properly maintained with people's participation.

Effective distribution of water is not at all possible due to lack of maintenance of L.I schemes, VCB, Check dams, leading channels etc. Paucity of funds leads to lack of maintenance. Non availability of water and less profitable crops lead to conversion of agricultural land to non agricultural use. Assuring availability of water by proper maintenance with beneficiary participation, can to an extent, help in non- conversion of agricultural land. Beneficiaries shall be entrusted with the maintenance, only when the cost is affordable to them. Sufficient funds should be provided for maintenance by the department when cost is high.



Chapter 13

Watershed Development

This chapter analyses the existing status and development issues of Watershed Development sector in the District. The chapter is structured into three parts. The first part contains the analysis of the existing status of Watersheds as well as Soils in the District. The second part probes into the development issues pertaining to the sector and finally the third part briefs the evaluation of ongoing and committed projects and programmes.

1. Analysis of Existing Status

Kollam District is located between 9°28' to 8°45' North Latitude and 76°28' to 77°17' South Longitude. Total geographical area of the district is 251838 hectares. The district is bounded by Arabian Sea in the West, Western ghats in the East, Thiruvananthapuram district in the South and Alapuzha and Pathanamthitta districts in the North. The largest fresh water lake of Kerala, the Sasthamcotta Lake, is in the district. The rivers traversing the district are Ithikkara, Kallada, Pallickalthodu, Achenkoil, Vamanapuram and Ayirur. The districts have a tropical humid climate with a mean annual temperature of 22.5°C to 32.8°C and mean

relative humidity of 76.8% to 80%. The average annual rainfall is 2352 mm.

1.1. Physical Status of Watersheds

A watershed is an area from which run off, resulting from precipitation flows past a single point into a large stream, river, lake or an ocean (Figure 13.1).

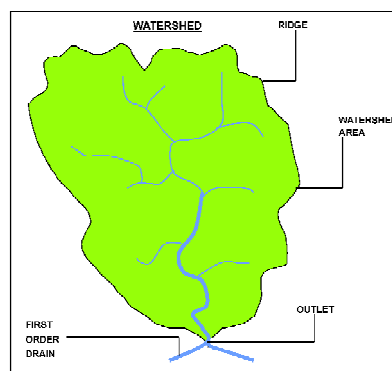


Fig. 13.1. : Watershed - A schematic diagram

Apart from the abstract factors that the watershed experiences, it is comprised of land, water and biomass. Certain delicate balances are maintained in the ever varying interactions among the environmental factors that each individual watershed is exposed to sustain the well

being of it. Every watershed has to be identified as a unique watershed ecosystem. These balances are jeopardized due to disproportionate and irrational interventions of the watershed community. Man spearheads and thus watershed deterioration begins. This basically inflicts upon the water cycle. This has resulted in drinking water scarcity, agricultural drought, fall in farm production, denial of hydel power generation, crisis in industries and ecological problems. Main reasons are topography, intensity and duration of rainfall, land use pattern and population.

Watershed development is an integration of technology within the natural boundary of a drainage area for optimum development of land, water and plant resources to meet the basic minimum needs of people in a sustained manner. A developed watershed provides food, fuel, fibre, fodder, fruits, drinking water and employment. Thus scientific water management approach is the only tool to develop a watershed.

1.1.1 Taxonomy of watersheds

Watersheds are classified in terms of size into:

- I Macrowatersheds – having areas >

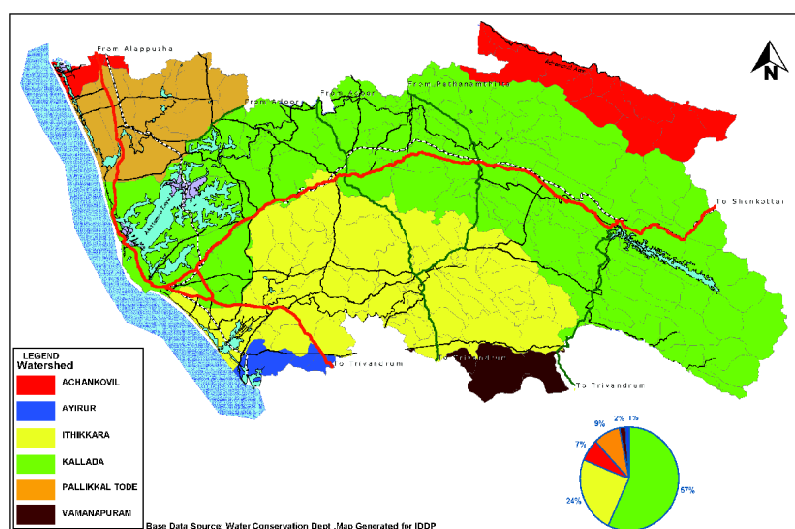


Fig. 13.2: LSGI wise distribution of watersheds in Kollam District

50000 ha.

- I Subwatersheds – having areas between 10000 to 50000 ha.
- I Milliwatersheds – having areas between 1000 to 10000 ha
- I Microwatersheds – having areas between 100 to 1000 ha
- I Miniwatersheds – having areas < 100 ha

Watershed has become an acceptable unit of planning for optimum use and conservation of soil and water resources. For proper planning and implementation in a year or two, the size of a viable watershed may be in between 500 to 5000 ha.

1.1.2 Major Watersheds in Kollam District

Kollam district is comprised of: -

1. Ithikkara watershed
2. Kallada watershed
3. Pallickalthodu watershed
4. Achenkoil watershed
5. Ayirur watershed (portions)
6. Vamanapuram watershed (portions)

Kallada watershed is the largest watershed in the district covering an area of 1426.95 sq. km contributing 57% of the total watershed area of the district (Figure 13.2).

Ithikkara Watershed Location and extent

Ithikkara watershed lies between 8° 45' to 9° 05' North latitude and 76° 35' to 77° 05' East longitude and is spread over the districts of Thiruvananthapuram and Kollam. The watershed has a total area of 65972 ha covering 21 villages, spread over 32 Grama Panchayats, 7 blocks and two districts. The area of the watershed in Kollam district is 60960 ha covering 24%

area of the district (Figure 13.3).

Physiography

Elevation: The Ithikkara River emerges from the low hills situated near Madathara at about 240 m above MSL and from Onthupacha at about 220 m above MSL and exit to Paravoor Kayal near Mayyanad. The general elevation ranges from 436m to 81m in the upper region, 25 to 70m in the middle region and less than 3m in the lower region.

Slope : The slope of the area ranges from gently sloping to moderately steeply sloping. Dominant slope groups are furnished in Table 13.1.

Table 13.1: Dominant slope groups in Ithikkara watershed

Upper region	Middle region	Lower region
Gently sloping (3-5 %)	Gently sloping (3-5 %) to moderately steeply sloping (10-15 %)	Gently sloping (3-5 %)

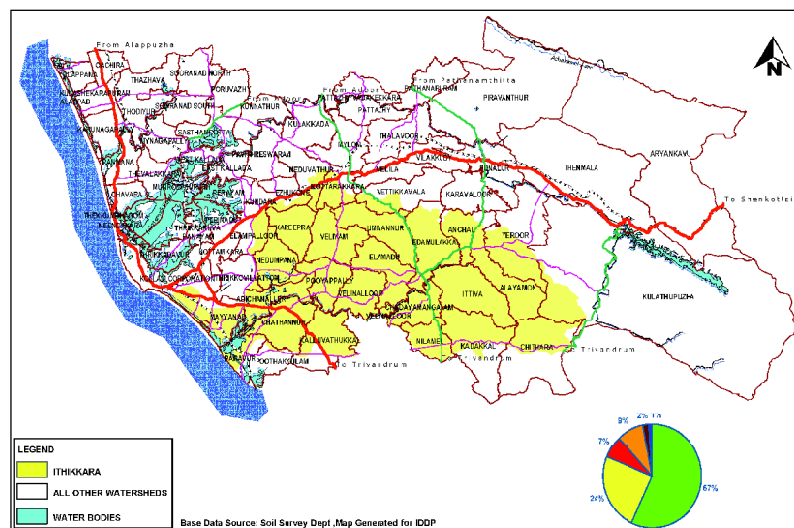


Fig. 13.3. : LSGI wise distribution of Ithikkara Watershed

Shape: The shape of the watershed is almost triangular with its base in the West. The length width ratio is 2:1.

Geology: The major geological formation is Archean formation.

Drainage and water resources: The major river draining through the watershed is the Ithikkara river which has a length of 56 Km. The river has its origin from the low hills situated near Madathara and from Onthupacha and flows into the Paravoor Lake. The river is west flowing and its major tributaries are Pallimon Aar and Vattaparambu thodu. Other tributaries are Kall Arr, Man Ar, Kulanji thodu, Kadavarathu thodu Eravil thodu, Kochuchithrakal thodu and Vattom thodu. The drainage pattern is dendritic.

The major surface water resource is the Ithikkara River, which has a total annual yield of 761 Mm³ and annual utilizable yield of 429 Mm³.

Watershed delineation: The Ithikkara watershed is delineated into 25 sub watersheds and 53 micro watersheds.

Soils: Soils of the watershed vary in their depth, texture, internal drainage and degree of erosion. The salient attributes of the soils occurring in physiographic regions of the watershed are furnished in Table.13.2.

Land use/land cover: The land use/land cover of the area can be broadly

Table.13.2.: Salient attributes of soils occurring in Physiographic region of Ithikkara

Characteristics	Upper region	Middle region	Lower region
Texture	Gravelly clay with moderate surface gravelliness	Gravelly clay with moderate surface gravelliness	Gravelly clay
Depth	Deep (100-150 cm) to very deep(>150 cm)	Very deep(>150 cm)	Very deep(>150 cm)
Drainage	Well drained	Well drained	Well drained
Erosion status	Moderate	Moderate	Moderate

Source: Watershed Atlas by Land Use Board

grouped into agricultural land, forest land, water bodies and others.

Kallada Watershed

Location and extent

The Kallada watershed which is the largest in Kollam lies between 8°40' to 9°15' North latitude and 76°30' to 77°20' East longitude and is spread over the districts of Thiruvananthapuram, Kollam and Pathanamthitta (Figure.13.4). The

which has its origin in Ponmudi Ranges at about 1067 M above MSL.

Slope: Slope of the watershed ranges from nearly level to steeply sloping. Dominant slope groups are furnished below in Table 13.3.

Shape: Shape of the watershed is almost rectangular with length width ratio of 3:1.

Geology: Major geological formation

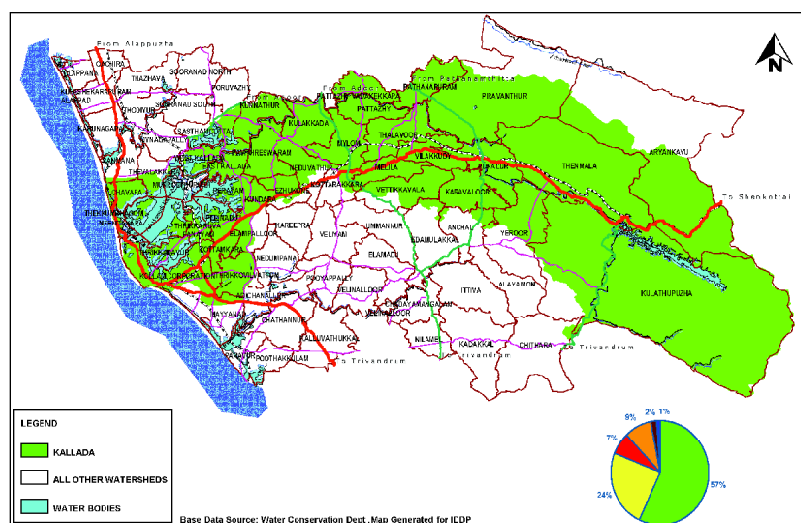


Fig. 13.4.: LSGI wise distribution of Kallada Watershed

Table 13.3.: Dominant slope groups in Kallada Watershed

Upper region	Middle region	Lower region
Nearly level (0-1 %) to steeply sloping (15-30 %)	Gently sloping (3-5 %) to moderately steeply sloping (10-15 %)	Level (0-1%) Gently sloping (3-5 %)

Source: Watershed Atlas by Land Use Board

watershed has a total area of 161885 ha covering 38 villages, spread over 46 Grama Panchayats, 11 blocks and three districts. The area of the watershed in Kollam district is 142695 ha covering 57% area of the district.

Physiography

Elevation: Kallada River is formed by three rivers, Kulathoopuzha, Chenduruni and Kalthuruthy. The Kulathupuzha river is formed by the confluence of Pongumalaiar which has its origin in Karimali Kadakkal in Pavanasam range at about 1758 M above MSL, Sirikalar river which has its origin in Sirikala hills at about 1372 M above MSL and the Changaliar

is Archean formation.

Drainage and Water resources: The major river draining through the watershed is the Kallada river which has a length of 121 Km. River is West flowing

Table 13.4 : Salient attributes of soils occurring in Physiographic region of Kallada Watershed

Characteristics	Upper region	Middle region	Lower region
Texture	Loamy, Gravelly, clay with coherent material at 100-150 cm	Gravelly clay with moderate surface gravelliness and clay with coherent material at 100-150 cm	Clay to Gravelly clay
Depth	Deep (100-150 cm) to very deep (>150 cm)	Deep (100-150 cm) to very deep (>150 cm)	Very deep (>150 cm)
Drainage	Well drained to imperfectly drained	Well drained	Well drained to imperfectly drained
Erosion status	Slight to severe	Moderate to severe	Slight to moderate

and has numerous tributaries including major and minor ones. They are Kulathupuzha aar, Chenthuruni aar, Chittar, Kalthuruthy, Muttathupara, Njanduthode, Vangapparathode, Urular, Aruviar, Parappar and Thenmalai aar. The drainage pattern appears to be dendritic to parallel. The river has a total annual yield of 2770 Mm³ including the yield of Palikkal thode. The river is perennial in nature. The annual utilizable yield of Kallada river and Palikkal thode is 1368 Mm³. The river has major and minor tributaries numbering to thirty nine.

Watershed delineation: The Kallada watershed is divided into 51 sub watersheds and 114 micro watersheds.

Soils: Soils of the watershed vary in their depth, texture, internal drainage and degree of erosion. The salient attributes of the soils occurring in physiographic regions of the watershed are furnished in Table 13.4.

Land use/land cover: The land use/land cover of the area can be broadly grouped into agricultural land, forest land, water bodies and others.

Palikkal Thodu Watershed

Location and Extent

The Palikkal thodu watershed lies between 9°00' to 9°15' North latitude and 76°25' to 76°50' East longitude and is spread over the districts of Kollam, Pathanamthitta and Alappuzha districts (Figure 13.5). The watershed has a total area of 32664 ha covering 18 villages, spread over 26 Grama Panchayats, 7 blocks and three districts. The area of the watershed in Kollam district is 21618.5 ha covering 9% area of the district.

Physiography

Elevation : The Palikkal thode emerges from the South Eastern portion of the watershed near Nedumon at about 140 M above MSL and flows in to the Kozhikodu kayal near Karunagapally at less than 4 m above MSL. The general

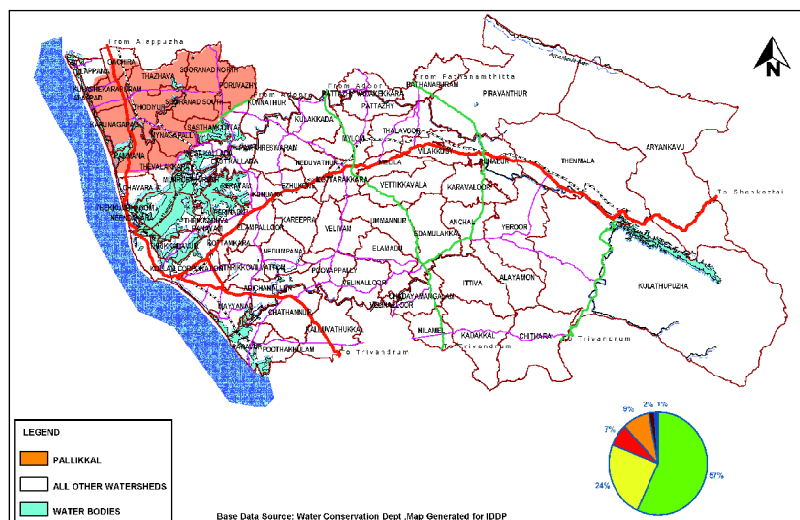


Fig.13.5: LSGI wise distribution of Pallikkal Thodu Watershed

elevation ranges from 140 m to 87 m in the upper region, 40 m in the middle region to less than 4 m in the lower region.

Slope: Slope of the watershed ranges from nearly level to gently sloping. Dominant slope groups are furnished below in Table 13.5.

Table 13.5: Dominant slope groups in Pallikkal Thodu Watershed

Upper region	Middle region	Lower region
Gently sloping (3-5 %)	Nearly level (0-1 %)	Very gently sloping (1-3 %)

Source: Watershed Atlas by Land Use Board

Shape: Shape of the watershed is almost triangular with length width ratio of 2:1.

Geology: Major geological formation is Archean formation.

Drainage and Water resources: The major river draining through the watershed is the Palikkal thode which has a length of 42 Km. The river has westerly course. Its tributary is Paitikalai thode. The drainage pattern appears to be dendritic to parallel.

The combined total yield and the total annual utilizable yield of rivers Kallada and Palikkal thode are 2770 Mm³ and 1368 Mm³ respectively. The river is perennial in nature. The area is covered by various water bodies like Kayamkulam kayal, Kozhikkottu kayal, Vattakayal, Valumel punja, Vaiyankara chira, Puthuchira and Vallikunnattu chira.

Soils: Soils of the watershed vary in their depth, texture, internal drainage and degree of erosion. The salient attributes of the soils occurring in physiographic regions of the watershed are furnished in Table 13.6.

Land use/Land cover: Land use / Land cover can be broadly grouped in to agricultural land and water bodies. Nearly 100 percent of the upper region is agricultural land which is predominantly under mixed agricultural / horticultural crops. Nearly 100 percent middle region

is agricultural land.

The lower region consists of agricultural land and water bodies.

is agricultural land. The lower region consists of agricultural land and water bodies.

Achenkovil Watershed

Location and extent

The Achenkovil watershed lies between 9°00' to 9°20' North latitude and 76°20' to 77°20' East longitude and is spread over the districts of Kollam, Pathanamthitta and Alappuzha districts (Figure 13.6).

The watershed has a total area of 134040 ha covering 50 villages, spread over 56 Grama Panchayats, 14 blocks and three districts. Area of the watershed in Kollam is 17752.2 ha covering only 7% area of the district.

Physiography

Elevation: The Achenkovil River emerges from Aruvithalai hills of Konni at about 1626 m above MSL and flows westwards and finally joins with the Pamba river at Veeyapuram near Paipad. The general elevation ranges from 85 m to 1626 m in the upper region, 10 to 75 m in the middle region and less than 1 m in the lower region.

Slope: Slope of the watershed ranges from nearly level to steeply sloping.

Table 13.6 : Salient attributes of soils occurring in Physiographic region of Pallikkal Thodu Watershed

Characteristics	Upper region	Middle region	Lower region
Texture	Gravelly clay	clayey	sandy
Depth	very deep(>150 cm)	very deep(>150 cm)	very deep(>150 cm)
Drainage	Well drained	Moderately well drained	Moderately well drained to excessively drained
Erosion status	moderate	slight	slight

Source: Watershed Atlas by Land Use Board

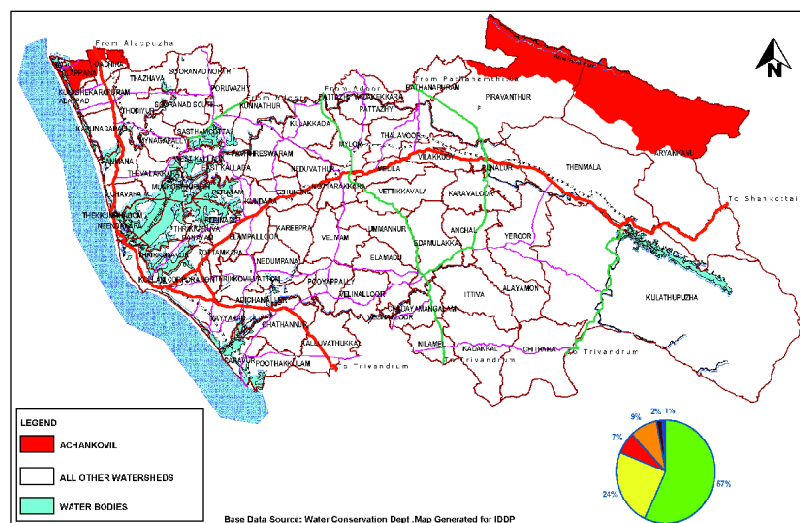


Fig.13.6: LSGI wise distribution of Achenkovil Watershed

Table 13.7: Dominant slope groups in Achancovil Watershed

Upper region	Middle region	Lower region
Moderately sloping (5-10 %) to steeply sloping (15-30 %)	Nearly level (0-1 %) to moderately sloping (5-10 %)	Very gently sloping (1-3 %) to gently sloping (3-5 %)

Source: Watershed Atlas by Land Use Board

Dominant slope groups are furnished in Table 13.7.

Shape: Shape of the watershed is almost rectangular with length width ratio of 4:1.

Geology: Major geological formation is Archean formation.

Drainage and water resources: The major river draining through the watershed is Achenkoil river which has a length of 128 Km. The river is west flowing and has numerous tributaries. The Achenkoil river has a total annual yield of 2287Mm³ and annual utilizable yield of 1249 Mm³.

Watershed delineation: The Achankoil watershed is divided into 47 sub watersheds and 87 micro watersheds.

Soils: Soils of the watershed vary in their depth, texture, internal drainage and degree of erosion.

The salient attributes of the soils occurring in physiographic regions of the watershed are furnished in Table 13.8.

Land use/land cover: The land

Ayirur Watershed

Location and extent

The Ayirur watershed lies between 8° 40' to 8° 50' North latitude and 76° 40' to 76° 50' East longitude and is spread over the districts of Thiruvananthapuram and

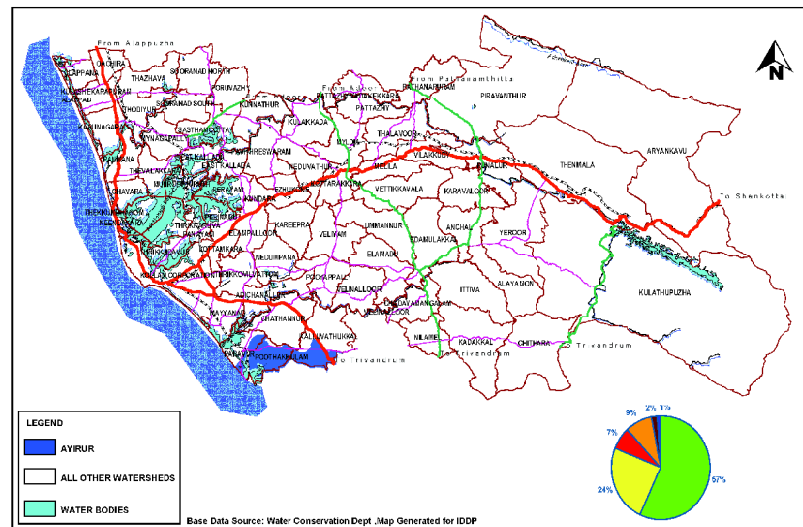


Fig.13.7 : LSGI wise distribution of Ayirur Watershed

Table 13.8 : Salient attributes of soils occurring in Physiographic region of Achancovil Watershed

Characteristics	Upper Region	MiddleRegion	Lower Region
Texture	Gravelly Clay with moderate surface gravelliness	Gravelly Clay with moderate surface gravelliness	Gravelly Clay
Depth	Deep(100-150 cm) to very deep(>150 cm)	very deep(>150 cm)	very deep(>150 cm)
Drainage	Well Drained	Well Drained	Well Drained
Erosion Status	Moderate	Moderate	Moderate

Source: Watershed Atlas by Land Use Board

use/land cover of the area can be broadly grouped into agricultural land, forest land, water bodies and others. The vegetative cover consists of both natural vegetation (forest) and agricultural lands.

The upper region of the watershed consists of forest land and agricultural land. Nearly 60% of the upper land is covered by forest plantation and 5% by degraded forests. The middle region comprises of agricultural lands under mixed agricultural/ horticultural plantation interspersed with narrow valleys where semi-aquatic crop paddy is grown. Nearly 40% of the middle region is under double cropped paddy. The lower region of the watershed is occupied by agricultural land and water bodies.

Kollam. The watershed has a total area of 12429 ha covering 7 villages and 8 Grama Panchayats. The area of the watershed in Kollam district is 2868.8 ha covering only 1% of the area of the district (Figure 13.7).

Physiography

Elevation: General elevation ranges from 122m to 85m in the upper region, 60m in the middle region to less than 2m in the lower region.

Slope: Slope of the watershed ranges from nearly level to gently sloping.

Shape: Shape of the watershed is almost triangular.

Water resources: Major water bodies are Nadayara kayal, Killimukkan kayal and Paravoor Lake.

The salient attributes of the soils occurring

in physiographic regions of the watershed are furnished in Table 13.9.

Land use/Land cover: The upper regions and middle regions of the watershed is mainly occupied by agricultural lands and the lower regions is mainly occupied by agricultural land and water bodies.

Vamanapuram Watershed

Location and extent

The Vamanapuram watershed lies

Table13.9 : Salient attributes of soils occurring in Physiographic region of Ayirur Watershed

Characteristics	General soil characteristics
Texture	Gravelly clay
Depth	Very deep (>150 cm)
Drainage	Well drained
Erosion status	Moderate

Source: Watershed Atlas by Land Use Board

between 8° 35' to 8° 50' North latitude and 76° 40' to 77° 15' East longitude and is spread over the districts of Thiruvananthapuram and Kollam (Figure 13.8). The watershed has a total area of 766890 ha covering 31 villages and 33 Grama Panchayats. The area of the watershed in Kollam district is 5942.7 ha covering only 2% of the area of the district.

Physiography

Elevation: General elevation ranges from 76m to 1717m in the upper region, 45m in the middle region to less than 4m in the lower region.

Slope : Slope of the watershed ranges from gently sloping to moderately steeply sloping.

Shape: Shape of the watershed is almost elliptical with a length width ratio of 2:1.

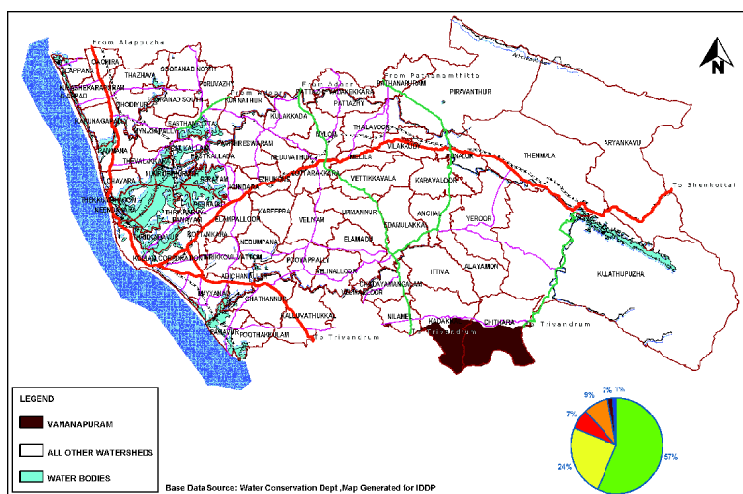


Fig.13.8 : LSGI wise distribution of Vamanapuram Watershed

Water resources: Major River is the Vamanapuram river which has 13 tributaries.

The salient attributes of the soils occurring in physiographic regions of the watershed are furnished Table 13.10.

Land use/Land cover: Upper region Table 13.10: Salient attributes of soils occurring in Physiographic region of Vamanapuram Watershed

Characteristics	General soil characteristics
Texture	Gravelly clay
Depth	Deep to very deep (100-150 cm to >150 cm)
Drainage	Well drained
Erosion status	Moderate

Source: Watershed Atlas by Land Use Board

consists of agricultural land, forest land and waste land. Middle region is occupied by agricultural land, forest plantation and degraded forests. Lower region is mainly covered by agricultural land and water bodies. Among the six watersheds of Kollam district viz, Ithikkara, Kallada, Pallickalthodu, Achenkoil, Ayirur and Vamanapuram, major area is occupied by Kallada watershed covering about 57% of the area of the district. Vamanapuram and Ayirur watersheds occupy only 2% and 1% of the area of the district respectively. A combined chart showing all the details of watersheds are given in Appendix 13-1.

1.2 Physical Status of Soil

1.2.1 Major soil series

The major soil series of the district are Channapetta, Kallada, Mannar, Mylom, Mynagappally, Nedumangadu, Nedumpara, Palode, Ummannur and Varkala (Figure 13.9).

Among the ten soil series, Palode soil

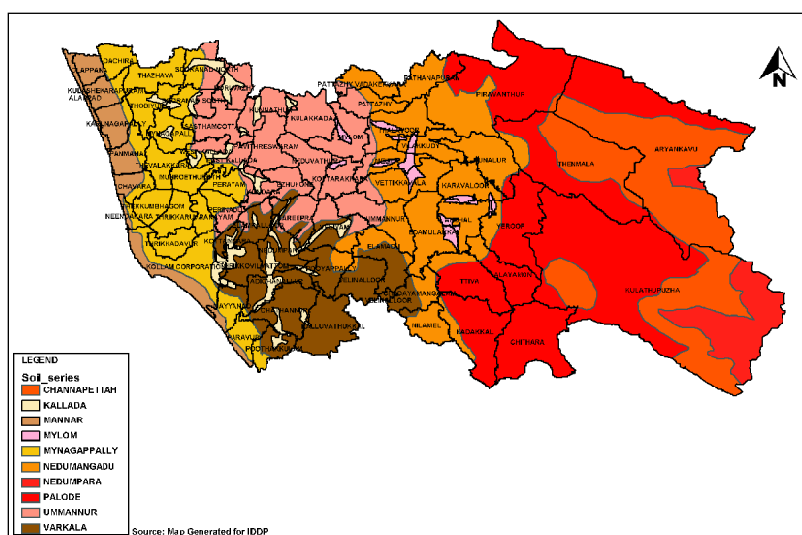


Fig.13.9: Major soil series of Kollam district

series is having the largest area in the district covering 28% of the total area. Mylom series is having the least area covering only 1% of the total area.

Yeroor, Piravanthoor, Alayamon, Aryankavu, Kulathoopuzha and Thenmala have moderately deep soils.

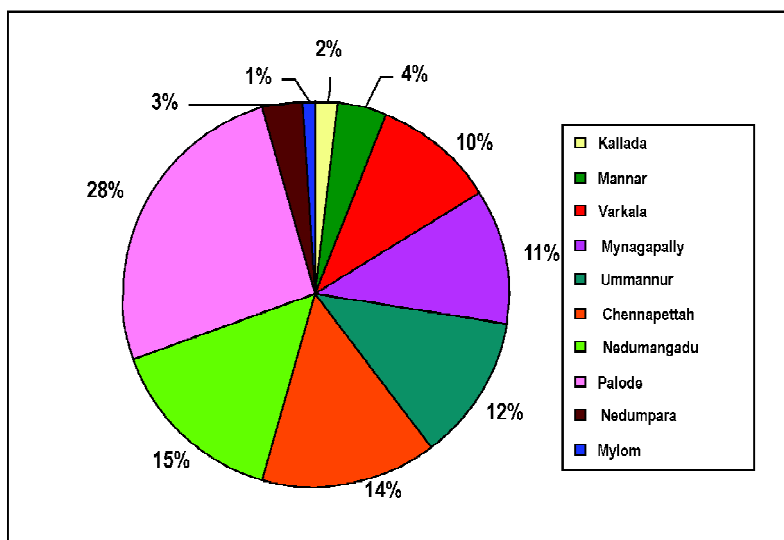


Fig 13.10: Area in percentage of soil series

1.2.4 Slope

Slope ranges of the district are 1-3%, 3-10%, 5-25%, 10-33%, 25-33% and >50%. Coastal areas of the district are having the lowest slope range. Slope increases towards the eastern part of the district and the maximum slope is in the upland areas of the district i.e., Kulathoopuzha and Aryankavu.

1.2.5 Drainage

Majority of the area in the district is well drained. Only Mylom series area is imperfectly drained which constitutes only 1% of the total area.

1.2.6 Erosion of soil

Erosion status ranges from slight to severe. Slight erosion is observed only in the low lying areas of the district. Majority of the area is having moderate erosion as evident from Figure 13.11. Portions of Kulathoopuzha, Aryankavu and Thenmala Grama Panchayats are having severe erosion. Further, being Ramsar sites,

Kallada and Mylom soil series. About 37% of the area is under classes 3 and 4. About 17% of the area in the district comes under class 5 i.e., land belonging to the soil series of Channapetta and Nedumpara having high slopes.

1.2.8 Land capability

The different land capability classes in the district are class II, III, IV, VI and VIII. Class II is having good cultivable land, class III is having moderately good cultivable land, class IV is having lands that are suited to occasional or limited cultivation, class VI is having lands that are well suited for grazing/ forestry and they require minimum tillage and class VIII is having lands that are suited only for wild life and recreation. In the district, the Mylom and Kallada series constitute good cultivable land under class II, majority of the area comes under class III and the Nedumpara series and portions of Kulathupuzha and Aryankavu comes

under class VIII.

1.2.9 Soil water availability

Soil water availability is classified as low, medium and high. About 93% of the area in the district is having medium availability of soil water. Only 3 % of the area is having high availability of soil water i.e. Mylom and Kallada series which are also having good cultivable lands. Mannar series is having low soil water availability mainly along the coastal areas of the district.

1.2.10 Soil Fertility

Soil fertility is the inherent ability of the soil to supply plant nutrients in a sustained manner. Status of soil nutrients like N, P and K are classified as low, medium and high.

Nitrogen status (N – status) is expressed as organic carbon (%). N status in the district is medium (0.51-1.5%) for majority of the area and high (1.5-2.5%) in Channapetta and Nedumpara series.

Phosphorous status in the district is also high (24.1-34.5%) in Channapetta and Nedumpara series and low in Varkala and Mylom series (0-10%). Most of the area is having medium Phosphorous availability (10.1-24%).

Potassium status in the district is also high (27.6-39.5%) in Channapetta and Nedumpara series and low in Varkala series (0-11.15%). Majority of the area in the district is having medium K availability (11.6-27.5%).

1.2.11 Crop suitability

Crop suitability for the different soil series (Figure 13.13) in the district is as follows:

- I Mynagapally- coconut and intercrops
- I Mannar- coconut, banana, vegetables and pepper

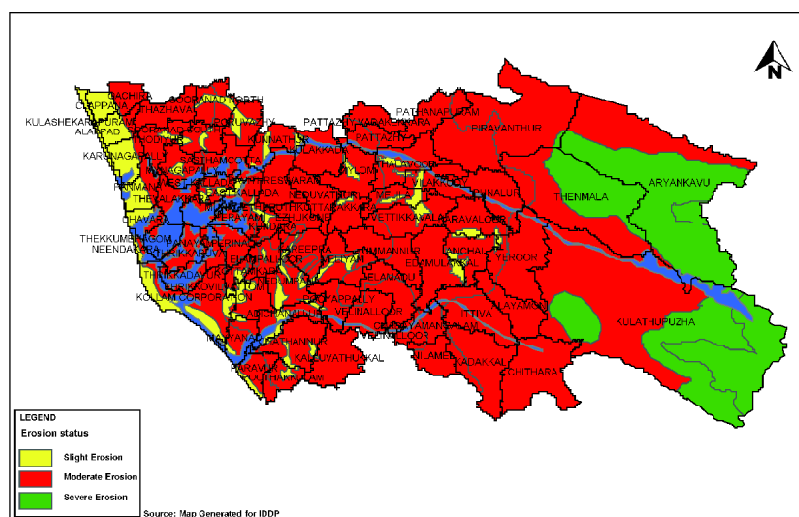


Fig.13.11: Erosion status of Kollam district

erosion in Astamudi Kayal and Sasthamcotta Lake are also to be considered.

1.2.7 Land Irrigability

Land irrigability is interpreted in terms of classes. In the district, we have classes 2, 3, 4 and 5 (Figure 13.12). Class 2 land have moderate limitations for sustained use under irrigation, class 3 have severe limitations for sustained use under irrigation, class 4 have very severe limitations for sustained use under irrigation and class 5 are temporarily not suitable for irrigation. Only 3% of the area of the district is under class 2 i.e., land belonging to

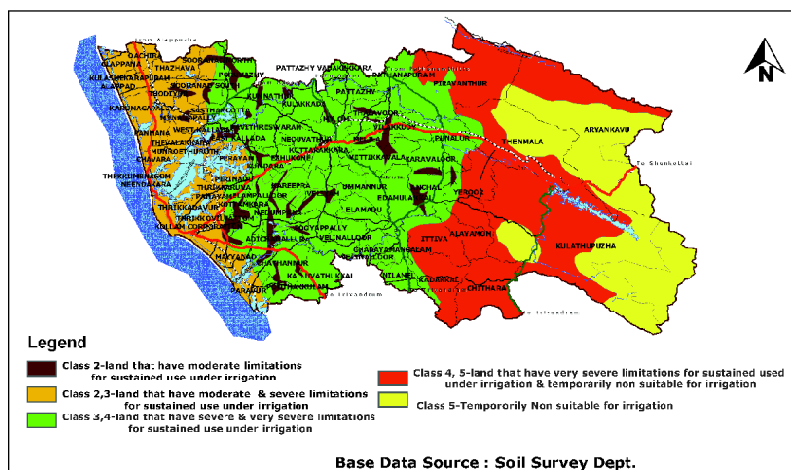


Fig.13.12 : Land irrigability status of Kollam district

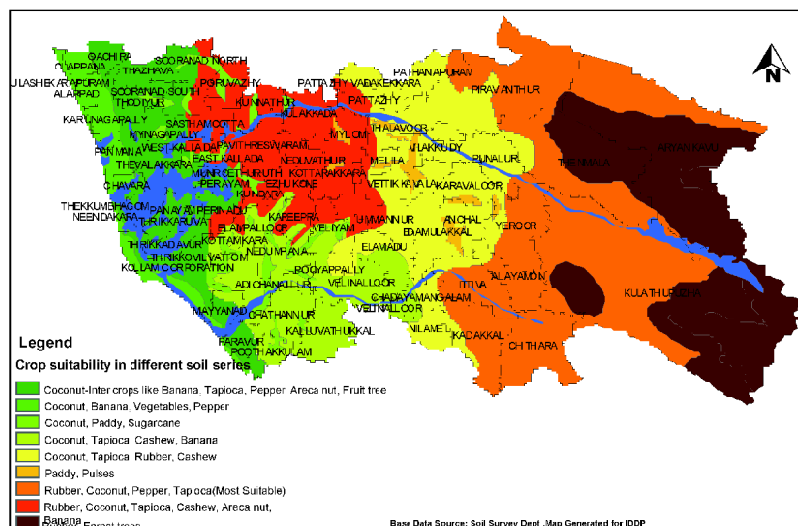


Fig.13.13: Crop suitability in different soil series in Kollam District

- I Kallada- coconut, paddy and sugarcane
- I Varkala- coconut, tapioca, cashew and banana
- I Nedumangadu- rubber, coconut, tapioca, cashew, arecanut and banana
- I Mylom- paddy and pulses
- I Palode- rubber, coconut, pepper, tapioca
- I Ummannur- rubber, coconut, tapioca, cashew, arecanut and banana
- I Nedumpara and Channapetta- rubber and forest trees
- I All major soil series except Mylom, Nedumpara and Channapetta are suitable for coconut cultivation. Towards the eastern part of the district mostly rubber is recommended

2. Development Issues

2.1 General Issues

Regarding Watershed development and Soil conservation the general issues identified are as follows.

- I Agricultural drought in crop lands.
- I Lack of awareness in soil and water conservation.
- I Stream bank erosion along the prominent drainage courses.
- I Drainage problems of Paravoor lake.
- I Silting up of rivers
- I Fallowing of cultivable land.
- I Land conversion.
- I Degradation of forests.

2.2 Problems

The location specific development problems are as follows.

- I Achenkoil and Kottavasal in Pathanapuram taluk, Kulathoopuzha

and Channapetta in Anchal block have shown indications of landslips and landslides.

- I Severe scarcity of drinking water in the district during summer.
- I Alarmingly increasing soil erosion in the district. Rates of soil erosion in the district are <15 tonnes/ha/year (108290 ha), 15-30 tonnes/ha/year (42812 ha), 30-40 tonnes/ha/year (62960 ha) and >40 tonnes/ha/year (37776 ha).
- I Stream bank erosion along the river courses.
- I Depletion of water level in Sasthamcotta Lake.
- I Pollution of Ashtamudi lake.
- I Indiscriminate sand extraction in West Kallada.

3. Potentials

The major potentials identified are as follows.

- I In situ moisture conservation.
- I Increased infiltration rates.
- I Augmentation of ground water table.
- I Protection of fertile top soil.
- I Increased yield of agricultural crops.
- I Watershed management.
- I Generation of rural and urban employment.
- I Increase in homestead income.
- I More area brought under cultivation.
- I Ensure proper drainage.
- I Prevention of flooding in lower areas.
- I Reclamation of water logged areas.

4. Analysis of Ongoing and Committed programmes

Various agencies involved are Soil Survey Department for identification and

delineation of projects and Soil Conservation Department for projectisation and implementation. Other agencies are KLDC, KSLUB, CESS, CWRDM, PRIs, NGOs etc.

The ongoing projects of Soil Conservation Department are listed below. The ongoing projects of the district are under the sponsorships of State / Central Government and NABARD. The On going and Committed projects and Programmes are given in Appendix 13-11. The ongoing projects of the district covers portions of Kalluvathukkal, Chathannoor, Nedumpana, Elampalloor, Kottankara, Kareepra, Kundara, Perayam, Ezhukone, Pavithreswaram, Sasthamcotta, Kulakkada, Neduvathoor, Edamulakkal, Anchal, Alayamon, Chadayamangalam, Karavalloor and Chithara Grama Panchayats.

Ongoing programmes of Soil Survey Department are :

- I Updation of detailed soil survey at Grama Panchayat level.
- I Identification and delineation of watersheds.
- I Preparation of watershed maps.
- I Preparation of soil survey reports and interpretative maps.
- I Profile study of soils.
- I Location specific soil surveys.
- I Soil sample collection and analysis.
- I Research oriented programmes.

The committed projects covers portions of the Grama Panchayaths of Oachira, Poruvazhy, Sooranad South, Pavithreswaram, East Kallada, Perayam, Kareepra, Veliyam, Pooyapally, Chathannoor, Kalluvathukkal, Elamad, Chadayamangalam, Ummannur, Kottarakara, Melila, Vilakudy, Edamulakkal, Alayamon, Chithara, Pathanapuram, Piravanthoor and Thenmala. The details of on going and committed Projects and programmes are given in Appendix 13-2.

5. Evaluation of Ongoing and Committed Programmes

As a result of soil and water conservation works executed, in situ moisture conservation resulted from increased infiltration, thereby a rise in the groundwater table is noticed which solved water scarcity problem to a certain extent. Soil erosion is prevented thereby fertile top soil is protected to a greater extent. This has increased agricultural yield and income to farmers. Stream bank protection

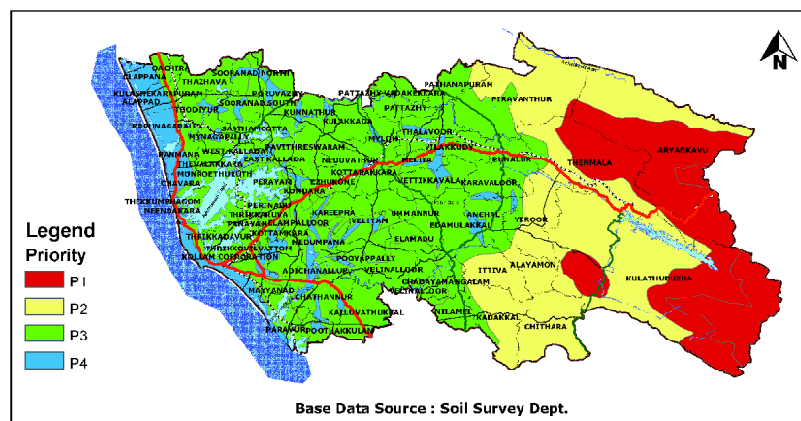


Fig.13.14 : District soil conservation priority map.

works using structural and vegetative means protected streams, prevented flooding of cultivated areas and facilitated easy flow of water. Works executed in waterlogged areas have resulted in effective drainage.

The project PCRWSS, Sasthamcotta has resulted in reduced silt yield. Silt yield of Sasthamcotta has reduced from 50 tonnes/ha/year to 20 tonnes/ha/year within a period of 14 years. Implementation of Management Action Plan of Ashtamudi and Sasthamcotta has resulted in control of soil erosion in the catchment areas.

6. Conclusion

As per the analysis it can be concluded that through planned intervention almost all the development issues identified can be solved.

During the course of soil survey, details regarding erosion, intensity of the soils in the area etc., are collected and priority classes are assigned to select the lands for carrying out soil conservation works on priority basis depending on the severity of the problem.

Intensity of soil erosion affects the productivity of the soils, which can be restored by timely adoption of proper conservation measures. Apart from soil erosion intensity, other factors like slope of the area, present state of cultivation, management practices adopted etc. are

taken into consideration for arriving at soil conservation priority.

Based on soil conservation priority, district can be classified into four priority areas, P1, P2, P3 and P4 as shown in Figure 13.14.

Priority 1 Areas (P1) are the areas which require urgent soil conservation measures and are characterized by steep to very steep slopes, sparse vegetation and faulty cultivation practices. Complete 'A' horizon and up to 75% of 'B' horizon is lost in these soils. These are the areas with > 50% slope i.e. portions of Kulathupuzha, Aryankavu and Thenmala Grama Panchayats. For land slide prone areas, graded bunding, Afforestation, wattling and works for safe disposal of drainage are recommended. Also stone pitched contour bunding, bench terracing, gully plugging, stream bank protection, check dams, construction and conservation of ponds, protection of side walls and vegetative measures are recommended.

Priority 2 Areas (P2): P2 areas where Susceptibility to erosion is relatively high need immediate soil conservation measures. This area is generally characterized by steep slopes, thin vegetation and unscientific agricultural practices. Fertile 'A' horizon and 25% of 'B' horizon are lost in these soils. Covers portions of 25-33% slope in the district i.e.,

portion of Grama Panchayaths of Kulathupuzha, Chithara, Kadakkal, Ittiva, Piravanthur, Aryankavu and Pathanapuram. Works recommended are stone pitched contour bunding, contour farming, strip cropping, cover cropping, stream bank protection, trenching, check dams and fodder planting.

Priority 3 Areas (P3 areas) : Partially protected lands need low cost technology to protect the entire land from further deterioration. These lands are located on gently to moderately sloping lands having good vegetative cover. 75% of the 'A' horizon is lost. Here erosion has not reached an alarming stage. Covers midland areas of the district having slope ranges of 3-10, 5-25 and 10-33%. Works recommended are earthen bunds with vegetative cover, stone pitched contour bunding, mulching, cover cropping, stream bank protection, check dams and fodder planting.

Priority 4 Areas (P4 Areas) : The valleys and low lying areas including paddy lands are grouped under this; Opening of proper drainage channels is the main soil conservation measures practiced before commencing any cultivation in these lands. Covers low land areas with 1-3% slope. For waterlogged areas, construction measures for effective drainage are recommended. Cover cropping, intercropping, rain water harvesting, trenching, mixed cropping and fodder planting are also recommended. The resources analysis, in particular, that for Agriculture can be done considering the Soil priority mapping. The specific recommendations for the district are protection of Sasthamcotta Lake which is the main drinking water source in the district, protection of Ashtamudi kayal, protection of landslide prone areas, projects for waterlogged areas and watershed development projects for overall development integrating various sectors in the district n



Chapter 14

Animal Husbandry and Dairy Development

This chapter analyses the existing status and development issues of Animal Husbandry and Dairy Development sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status, second part is the Overall Development Trend of the sector based on temporal aspects, third part probes into the Development Issues pertaining to the sector and finally the fourth part contains the analysis of ongoing programs and projects.

1. General Analysis

Animal Husbandry and Dairy Development Sector is of vital importance in generating additional employment opportunities and supplementing incomes of small and marginal farmers. The majority of livestock population in the state is concentrated in villages. Mostly peasants and agricultural labourers are engaged in cattle rearing and allied activities. Hence any development in this sector will strengthen the rural economy. About 10% of the gross domestic product is contributed by this sector.

Milk, egg and meat are the principal

primary products of animal husbandry in Kerala. This sector can also contribute its share to the industrial development of the state by way of supplying industrial raw materials like bacon, hide, skin etc.

The study of this sector is attempted by conducting initially General Analysis which includes Physical Status, Economic Status and Social Status.

1.1 Physical Status

In the physical status of the sector existing scenarios in livestock, poultry,

dairy, fodder cultivation, infrastructure and marketing facilities are analyzed.

1.1.1 Livestock

The total live stock population in Kollam district as per 17th quinquennial census 2003 is 2,67,977. Total live stock population of Kerala State during the same period was 34,81,396. Comparing to other districts, Kollam ranks 7th position constituting 7.7% of the total live stock population in Kerala state (Figure 14.1).

In Kerala, the highest live stock

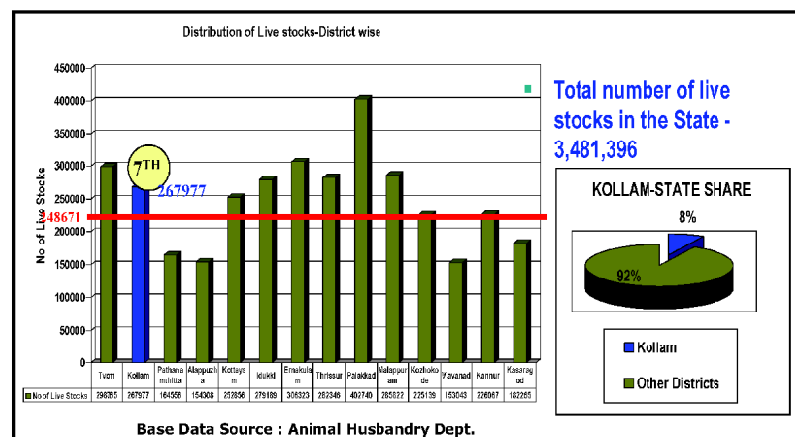


Fig. 14.1: Live stock population in Kollam - Comparison with other Districts

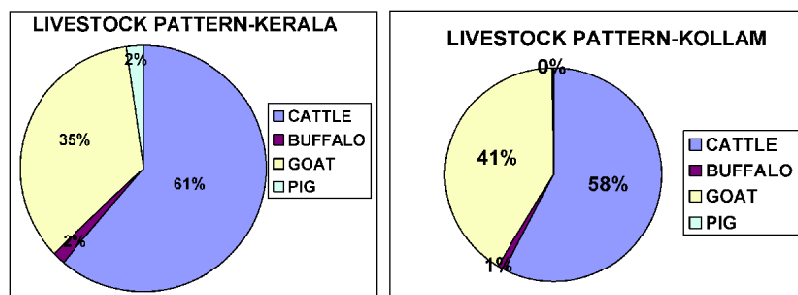


Fig.14.2 : Livestock population in Kollam - Comparison with other districts

population is at Palakkad constituting 12% of live stocks and lowest in the districts of Wayanad and Alapuzha with only 4% of the livestock. Kollam has a share of 8% in the States total Live Stock strength.

The main species of live stocks found in Kollam District are

1. Bovines (cattle and Buffaloes)
2. Ovines and Caprines (Goats and Sheep)
3. Swine (Pigs)
4. Equines

The pie chart (Figure 14.2) shows the livestock pattern of Kollam District and Kerala.

1.1.1.1 Cattle

Cattle and Buffaloes are coming under 'Bovines'. In Kollam district the total number of Bovines as per 17th Quinquennial Census 2003, is 1, 57,898 which is 59% of total live stock population in the District. In Kerala, Bovines contributes 63% of total live stock. Of the total number of Bovines, the number of cattle is more compared to Buffaloes. Cattle constitute 98% (155077) of Bovines in Kollam District. The situation is almost similar in the case of State where the percentage of cattle out of the total population of cattle, crossbreed species

constitute 95 % where as that of indigenous cattle is only 5%. All over Kerala the indigenous cattle population is very low comparing to crossbreed cattle population. In Kerala the crossbreed cattle population is 82% of total cattle population. In Kollam the Eastern region

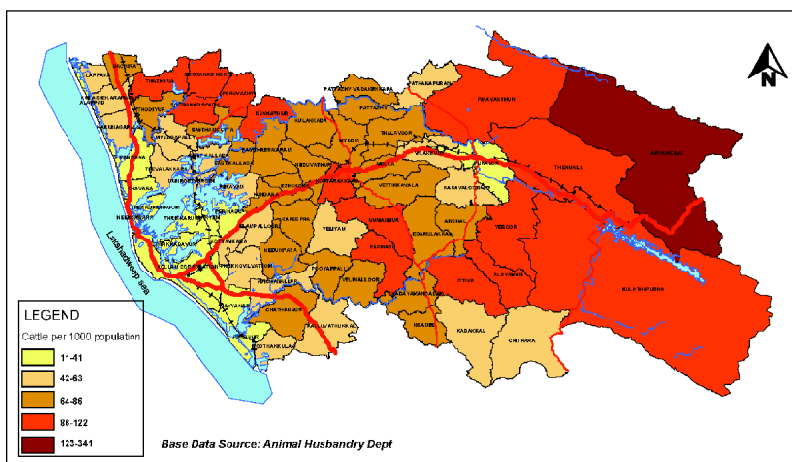


Fig.14.4 : Number of cattle per 1000 population

is having more percentage of cattle compared to the western region. Cattle population is concentrated more towards the LSGIs like Pirvanthoor, Aryankavu, Kulathupuzha, Thenmala, Chithara, Yeroor, Chathannur, Thazhava,

Ummannoor, Kollam Corporation etc. (Figure 14.3). This may be due to the vast area available there. These LSGIs cover 50% of the area of Kollam District.

Cattle per 1000 population shows (Figure 14.4) a concentration in the eastern tract while cattle per square kilometer shows a concentration in the North-West and central areas of Kollam district.

1.1.1.2 Buffalo

The total number of Buffaloes in Kollam District is 2821, which constitute only 2% of the total bovine population of the district.

In case of buffaloes, both buffalo per 1000 population and buffaloes per Sq.Km shows a concentration in the North-West

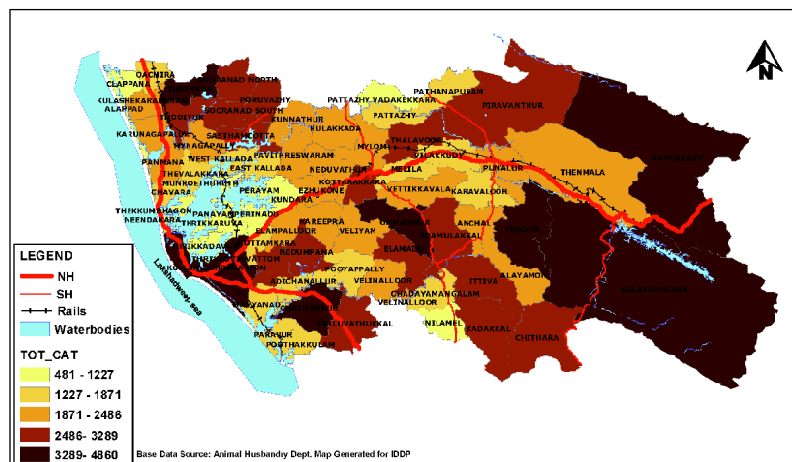


Fig.14.3 : LSGI wise distribution of cattle population

part of the district. Buffaloes are mainly seen where water bodies are present like the Grama Panchayats of Karunagapally, Kunnathur, Sasthamcottah, Mayyanad and Kollam Corporation.

1.1.1.3 Goat

Goats and sheep are the species coming under Ovines and Caprines. The total number of Ovines and Caprines in Kollam District is 1, 09,055. Share of Ovines and Caprines in the District is 41% of the total live stock population, where as in the case of Kerala, the contribution is 35%. Number of Goats in Kollam district is higher compared to other districts in the State. Goats are reared in the District for meat, milk and skin. Popular breed available is Malabari. Goat rearing is practiced by middle and lower middle class people as subsidiary occupation. Goat population in the District as per 2003 census was

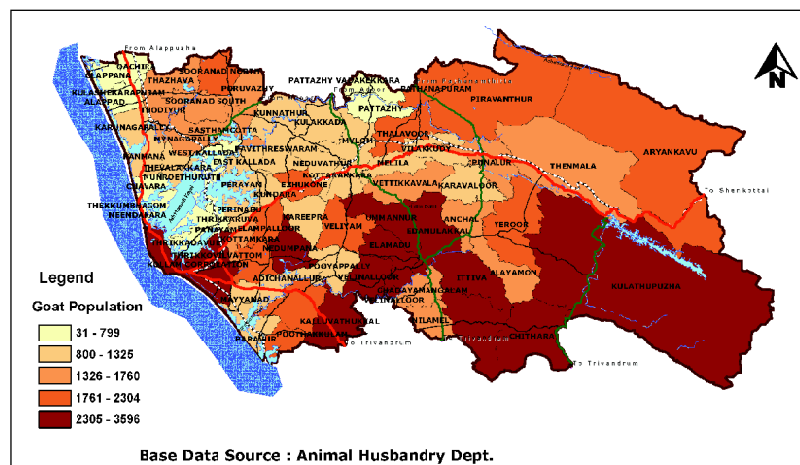


Fig.14.5: LSGI wise distribution of goat population

111015.

Figure 14.5 shows the population of goats in LSGIs of the district. The goat population in the LSGIs is high towards the south-eastern parts of the district. This is mainly due to the abundant area available there for grazing of goats.

1.1.1.4 Other animals

The total number of Swines (Pigs) in Kollam district as per the Quinquennial census 2003 is 986, which constitute 0.36% of total live stock population of the district. The total population of pigs in Kerala is also very less compared to total live stock population of the state which comes to 2%.

The species coming under equines are Horses and Ponies, Mules and Donkeys. The number of equines in Kollam is negligibly small (only 38) as in the case of Kerala (1069.)

Though Canines (Dogs) do not contribute much in the economy of Animal Husbandry sector, the study on its strength and distribution is important to analyze the development issues in this regard. As per 17th Quinquennial census, the total number of dogs in Kollam district is 1,45,686, of which the domestic dogs accounts 1,10,227 and others accounts 35,459.

A few other species of animals are also enumerated in the district in the 17th Quinquennial census including Elephant (124), Rabbits (7163) and Cats (58962).

One of the very interesting information regarding elephants in the district is that Kollam ranks first among other districts in the state regarding number of elephants.

1.1.2 Poultry

Poultry consist of fowls, ducks and other birds. Total number of poultry in

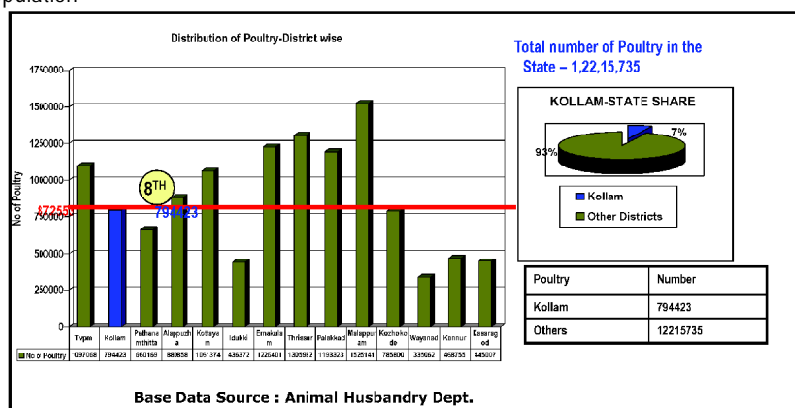


Fig.14.6: Poultry population in Kollam District – Comparison with other districts

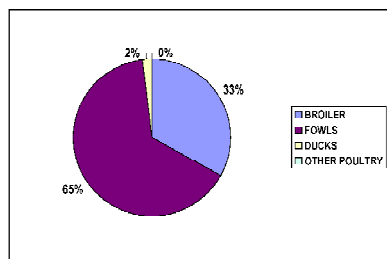


Fig.14.7: Percentage of type of poultry

on commercial lines in the district. Layers are mostly reared under backyard system in the district. Small units of about 200 to 300 birds are common in the district. It is seen that while poultry per 1000 population is concentrated in the mid land and eastern regions, poultry per sq.Km is concentrated in the coastal and mid land regions of the district (Figure 14.8).

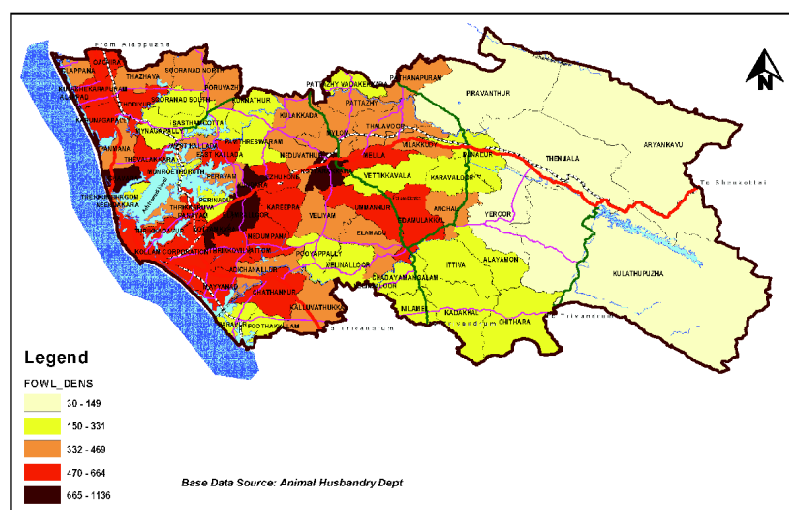


Fig.14.8 : LSGI wise distribution of poultry per 1000 population

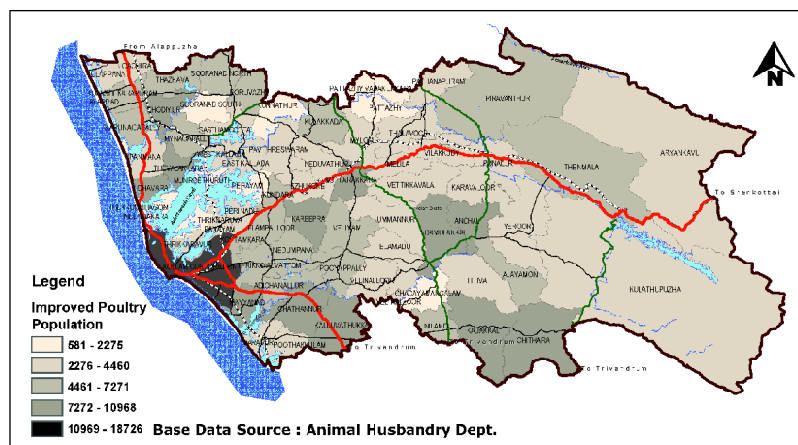


Fig.14.9 : LSGI wise distribution of improved poultry population

Population of poultry is very sparse compared to the requirement of the region. The district has a population of 267 birds per 1000 people, i.e. only 273 birds per kilometer on an average. There is not at all an organized layer farm in the district. Duck production in the district is confined to certain areas and only 28 ducks are available per 1000 people in the district. The high cost of production of eggs in Kerala and the heavy influx of cheaper eggs from the neighboring states remain the major hurdle towards commercialization of poultry industry in the district. The climatic condition is also not highly conducive for establishment of larger units. The district still depends heavily on the traditional system of backyard poultry rearing. In order to achieve self sufficiency in egg production, this backyard system of poultry rearing has to be strengthened. Number and productivity of the birds in the district has to be enhanced. Non-availability of quality chicks is the major crisis regarding poultry

rearing. There is not at all any hatchery in the district producing crossbreed layer chicks. Buffalo breeding farm, Kuriyottumala and egger nurseries in the district are marketing partly grown chicks

big players. But the district still depends on import of broiler birds from other states to meet requirement of meat.

1.1.2.1 Fowls

Fowls are again classified as Desi poultry and improved poultry. In Kollam District the population of Desi poultry is only 49% of total fowls where as in the case of state, it is 70 %. Population of desi poultry is less when compared to the improved poultry. LSGIs wise Distribution of improved poultry shows that they are mainly seen in the mid land parts of the district (Figure 14.9).

1.1.2.2 Ducks

Comparing to other districts, Kollam ranks 2nd in duck rearing. Duck population in Kollam district is 72135.

In the District, ducks are confined to few areas viz., the Grama Panchayats of



Fig.14.10 : LSGI wise distribution of duck population

in the district, but it is far in short of demand. Small scale broiler farms are available in the district functioning in commercial lines and in integration with

Chavara, Munroe Island, Bhoothakulam, Thodiyoor, Kulasekharapuram, Thazhava, Pavithreswaram etc (Figure 14.10). The ducks are reared mainly for eggs and meat. Mostly, ducks are reared in groups of few thousands by a set of nomads. Besides, small units of around 20 to 25 are also reared in homesteads along with other agricultural activities.

Other birds like quails, turkey etc. are negligibly small in number in Kollam district, as well as in the State.

1.1.3 Comparative Analysis

When we compare the human population and cattle population of various Panchayats we can ascertain those areas where people are available to take up the business (Figure 14.11). There are around 61 cattle in one sq Km of the district. Some areas are having less as shown. Here there is more possibility for rearing cattle.

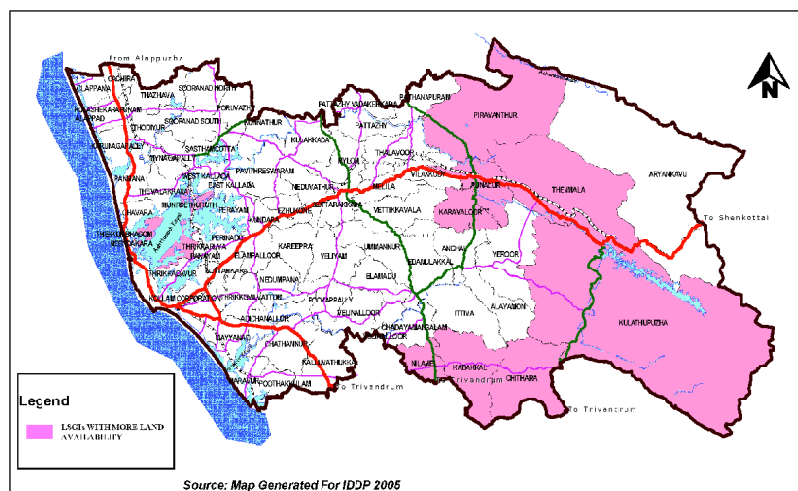


Fig.14.11 : Comparison of cattle strength with land availability

The district has 60 cattle per 1000 people. But the areas shown in Figure 14.12 are having lesser number of

on 2004.)

1.2.1 Milk

Comparing the economy generated

out of the three major animal products i.e. milk, meat and egg, the major contribution is from the milk sector not only in the case of the district but also for the state and the country. Being the most important animal produce, an in depth study of milk sector is very much essential. The present status of this sector with respect to land use pattern of Kollam district is analysed here.

Milk is having high nutritious value and it is a complete food with all the essential nutrients required for all age groups. Meat is a source of high protein but it is very cheap. Manure which is obtained as a byproduct from this sector is environment friendly and unavoidable in agriculture. It also provides energy as gobar gas. Work force is cheap as compared to any other sector. Hide is having high export value.

Dairy industry in India plays a very significant role in the international level with the highest percentage (15%) of production of milk, producing 88082000 MT during 2003-04. There is significant

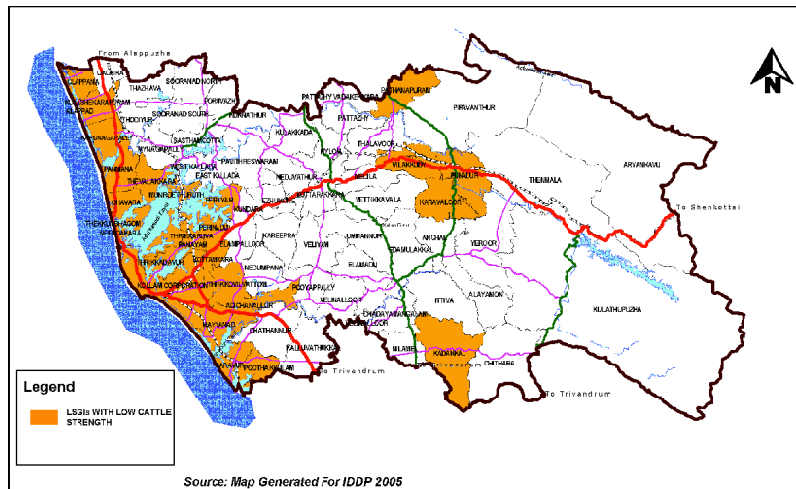


Fig.14.12 : LSGs with low cattle strength

animals.

The District Average is 11 buffaloes per ten thousand of human. The areas in Figure 14.13 are having less population.

There are around one buffalo per sq Km of the district. Some areas are having lesser density as given in Figure 14.14.

The District Average is 42 goats per thousand population. The areas having lesser goat population are given in Figure 14.15. There are around 43 goats in one sq Km of the district (Figure 14.15). Some areas are having lesser density as given in Figure 14.16.

The District average is 267 Fowls per 1000 human population. Local Self Government Institutions with low fowl population are shown in Figure 14.17.

LSGs with low poultry consumption are given in Figure 14.18.

1.2 Production Status

Animal husbandry sector provides milk, meat, egg, manure, hide and work force. The major economy generating animal wealth is milk, meat and egg. Changes in per capita availability of milk, meat and egg are given in Figure 14.19.

Unlike other animal products, for marketing milk, there exists organized marketing structure in the district as well as in the state. In Kerala there are 3243 dairy Co-operatives including 2341 Anand pattern societies functioning under KCMMF. Besides the societies functioning under the co-operative sector, 4 societies viz. Malanadu, Nirmalgram, PDDP Perambra and PDDP Kalady are working

under charitable institutions.

MILMA represents more than seven lakh farmers who have organized 2634 Anand pattern cooperative societies (as

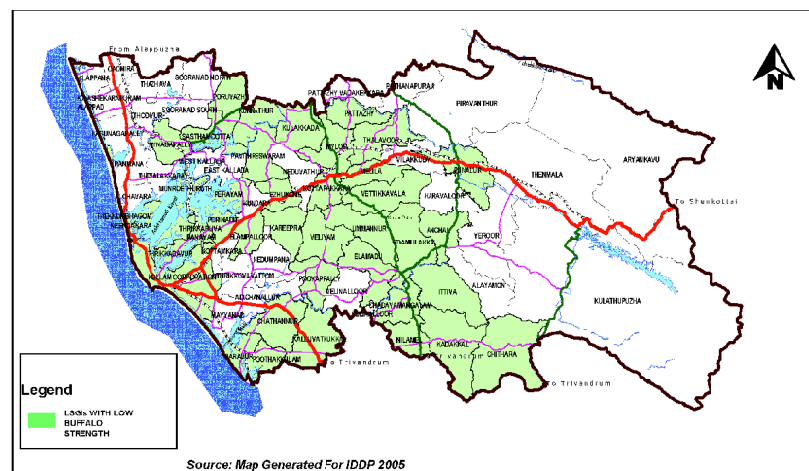


Fig.14.13 LSGs with low buffalo strength

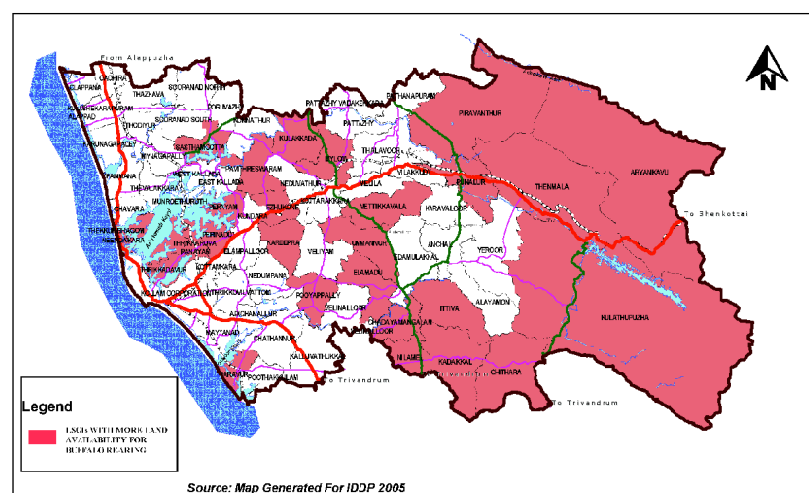


Fig.14.14 : Comparison of buffalo strength with land availability

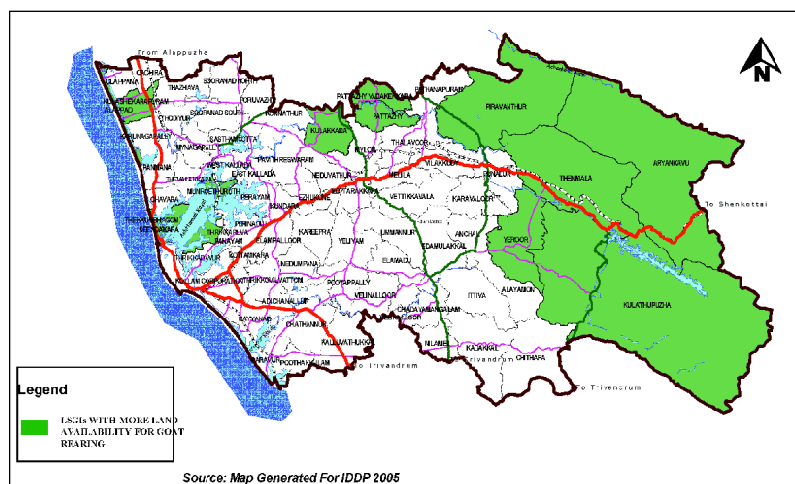


Fig.14.15 : Comparison of goat strength with land availability

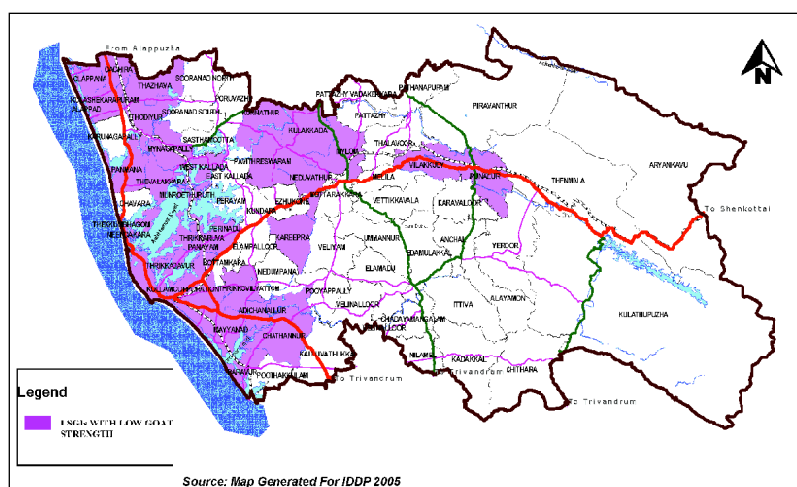


Fig.14.16 : LSGs with low goat strength

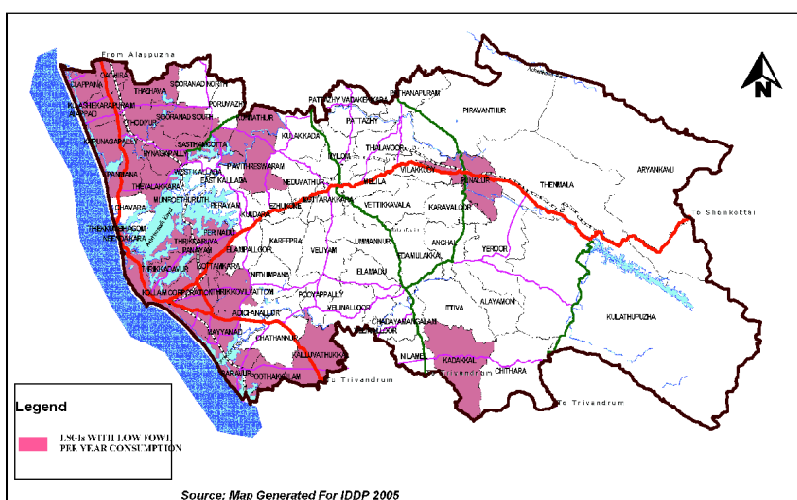


Fig.14.17 : LSGs with low fowl consumption

interstate differences in the production of milk. As shown in Appendix 14-1, Uttarpradesh ranks first among the states producing 18.1% and Assam being the last producing 0.82% of the country's milk production. Contribution of Kerala is only 2.39 %.

The milk production in the state has been on a more or less steady state for the last few years. This is mainly because of the enhancement in productivity due to rearing of crossbred animals. The role played by our breeding centres in this regard is exemplary.

Status of milk production in Kerala for the last ten years (Figures in '000 tonnes) is given in Table 14.1.

During 2003-04, the total milk produced in Kollam district was 266.63 MT which reduced to 256.71 MT during 2004-05.

Though India is the largest milk producing country in the world, the per capita availability of milk here is as low as 231gm/ day during 2003-04 which is quiet below the world average of 285 gm/day.

In the case of Kerala State, the per capita availability of milk is only 173 gm/ day which is the lowest value among the four South Indian states. Andra Pradesh ranks 1st among Southern States, producing 238 gm/day. This is not even comparable with Punjab which has 368gms/day in 2003-2004 which has gone up to 943gms/day in 2005-2006.

India is the largest milk producing nation (84.6million ton).The sector provides employment to 9.8 Million people in principal status and 8.6 Million people in subsidiary status accounting to 5% of the total work force of the country. Dairying is an important income generating activity and source of mass employment to the rural population. Animal Husbandry sector contributes 22% of the total out put of agricultural and allied sectors. 60% of the livestock farming labor is provided by women. More than 90% of the works related to care of animals is rendered by womenfolk of the family. In rural India, 90% of the households uses crop residues and cow dung cakes for cooking. The per capita milk availability is about 214 grams per day as against the recommended requirement of 250 grams. The average annual growth in milk production is about 5.6%.

Animal husbandry sector plays very crucial role in Kerala economy. This sector is important in alleviating rural poverty and unemployment. Most farmers are marginal and small scale – hence strengthening this sector will alleviate rural poverty. Women plays major role in cattle rearing, milching, health care, and marketing. Out of the 55 lakhs households, 32 lakhs are engaged in Animal Husbandry activity for supplementing their income. 82% of our cattle are crossbred with high genetic potential.

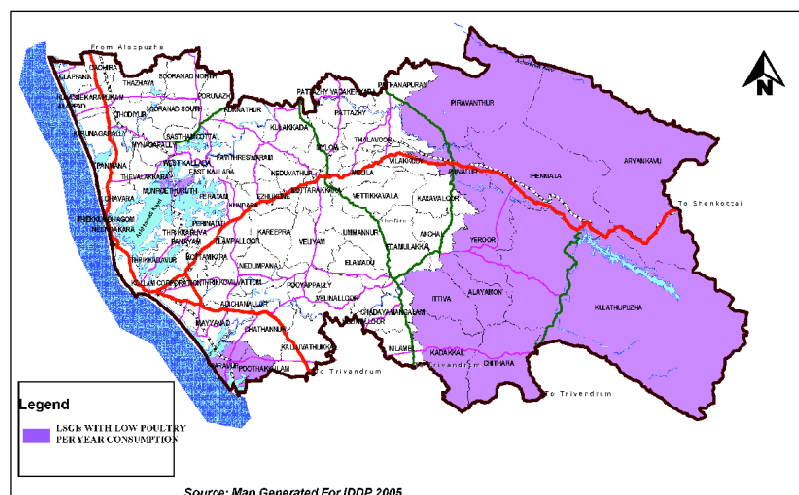


Fig.14.18: LSGIs with low poultry consumption

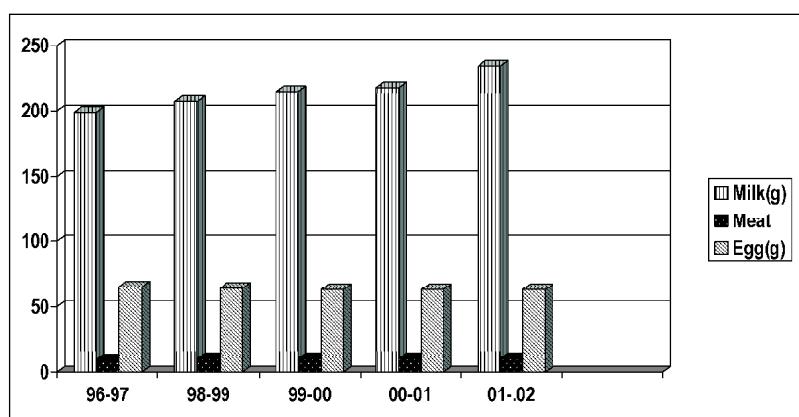


Fig.14.19 : Trend in percapita availability of milk, meat and eggs

Table.14.1. Status in milk production in Kerala

Year	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Production (1000 tonnes)	2343	2420	2532	2605	2718	2419	2111	2025	2063	2119

The daily average milk production in the district is around 7.03lakh litres. The total production of milk during 2004-05 is 256.71 Lakh liters. Percentage of milk

production is high towards the western parts of the district. There was an increase in the production compared to the milk production in 1991. This may be due to

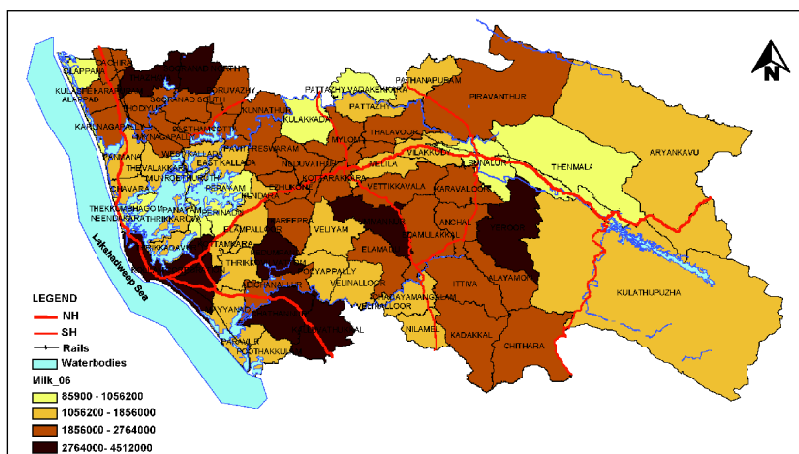


Fig.14.20: LSGI wise distribution of milk production 2005

the improved breeding facilities and availability of crossbred animals with high productivity. The Figure 14.20 depicts LSGI wise distribution of milk production in 2005. Milk production has been improved compared to the 1991 production.

1.2.2 Meat

In Kollam district, under authorized sector meat from cattle, buffaloes, goat, poultry and others are produced. Total meat production in the district during 2004-05 is 35428 MT which constitutes 41% meat production in the state (86893MT).

Out of the total meat produced, meat from poultry, cattle and buffaloes contribute the major shares with 35%, 33% and 27% respectively. In the case of State also, poultry, cattle and buffaloes contribute maximum to the meat production. Trend in meat production during the last 4 years is as shown in Table 14.2

Table.14.2: Trend in species wise production of meat

Species	2001-2002	2002-2003	2003-2004	2004-2005
Cattle	24278	25897	29863	33181
Buffalo	10394	8637	8620	9846
Goat and Sheep	6208	6276	6696	6677
Pig	1830	1994	2484	4485
Total	41710	42804	47663	54189
Total Poultry meat	47893	52611	39327	32704
Total meat production including unorganized sector	172823	181023	182316	195271

1.2.3 Egg

India ranks 4th in egg production and 19th in broiler production. The annual egg production is about 35 billion. The annual growth rate is 8-10% in egg and 12-15% in broiler industry. Poultry provides employment to about 1.5 million people. The annual per capita consumption in India is only 33 eggs and 630 grams of poultry meat. This is much lower as compared to the world average of 124 eggs and 5.9 kg meat. The National Committee on Human Nutrition in India has recommended per capita consumption of 180 eggs (about one egg every two days) and 10.8 kg meat. In 1970's Kerala was self sufficient in egg and was exporting egg to other states. Now the egg production is sufficient to meet only 25% of the internal demand. Backyard poultry rearing is unique in Kerala and is the major source of egg. Kerala is the 6th largest state in poultry population (270 lakhs). 1.8% of the total state income is from poultry. Commercial layer farming is not practiced in Kerala due to high cost of

production and inability to compete with cheaper egg and meat from nearby states. The average annual egg production is 2000 million.

Egg production in the district is 156.6 million/year. Total production of broiler meat from the private farms is around 9.50 lakhs kg/year. The trend in egg production during the last four years is given in Table 14.3.

1.2.4 Hide

Tanning industry is not developed in the state. This may be due to the high population density prevailing all over the state. The situation is similar in the district as well. But skin for hide is produced more here because Kollam has a share of 41% of meat production in the State.

Tanning has lots of environmental problems and thus not much taken up in developed countries. Such a trend is seen in the state and the district.

1.3 Health Status

The health status is very important for animal as well as human population. A healthy human society status can be achieved only with a healthy animal status. Various diseases of livestock and poultry are discussed here.

Outbreak of epidemics and zoonotic diseases affects the economy of animal husbandry activities badly. The details of outbreaks of contagious diseases in the State as per Disease Surveillance Report of Animal Husbandry Dept. 2002 are depicted in the Table 14.4.

Report of the Joint consultation on emerging zoonotic diseases, 3-5 May 2004, Geneva, Switzerland says that "more than three quarters of the human diseases that are new, emerging or re-emerging at the beginning of the 21st century are caused by pathogens originating from animals or from products of animal origin." This raises major concern regarding animal health and the quality of animal products.

1.3.1 Contagious diseases

The incidence of diseases occurring due to infectious agents is discussed here. Sporadic incidence of Anthrax is recorded in the district. Haemorrhagic septicaemia

Table.14.3. Trend in species wise production of egg

Species	2001-02	2002-03	2003-04	2004-05
Fowls	19243.6	12475.5	11704.6	10948.6
Ducks	774.28	993.43	1063.57	1025.54
Total eggs	20017.9	13468.9	12768.1	11974.2

is the other major bacterial disease incurring loss to the cattle population. Foot and Mouth disease is the most dreaded viral disease with sporadic incidence all over the district. PPR is the major emerging disease for the goat population. Contagious pleuropneumonia and tetanus are the other diseases prevalent among goats.

1.3.2 Production diseases

These are diseases among animals in production due to various deficiencies and metabolic abnormalities. These occur during the peak production period of cows resulting in heavy loss to the farmers. These diseases, like milk fever (hypocalcaemia), hypomagnesemia, downer cow syndrome etc are common in the district. The incidence of these diseases can be reduced by adopting special management practices.

1.3.3 Zoonotic diseases

These are the diseases transmitted

poultry rearing are concerned. Because of the low level of grain production in the State the availability of raw materials for cattle feed are limited in the district. The State as well as the district depends heavily on neighbouring States for the supply of cattle and poultry feeds. There are no organized feed factories in the district. In Kottiyam there is a new factory in government sector for poultry feed production.

Cost of feed is heavily influencing the cost of production. The cost for feed should be reduced using new technological breakthroughs.

1.4.2 Fodder

The total area under fodder cultivation in the district is only 823 Hect, out of which 776 Hect. is at rural areas and 47 Hect. is at urban areas (Panchayat Level Statistics-2006). In spite of various efforts made for increasing the fodder production in the district, as in the case of state, no

Table.14.4.: Trend in disease wise out break, attacks and deaths

Sl. No.	Disease	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	Anthrax										
	Outbreaks	3	4	0	0	0	11	10	0	2	3
	Attacks	4	52	0	0	0	463	463	0	6	4
	Deaths	4	3	0	0	0	22	21	0	5	4
2	Black quarter										
	Outbreaks	2	3	3	3	1	2	0	0	1	1
	Attacks	24	124	300	3	1	2	0	0	1	1
	Deaths	22	5	22	3	1	1	0	0	1	1
3	Haemorrhagic Septicemia										
	Outbreaks	4	9	3	8	4	9	9	2	4	8
	Attacks	265	123	5	29	308	121	56	27	170	23
	Deaths	214	38	5	10	22	10	64	0	31	12
4	Foot and Mouth disease										
	Outbreaks	149	481	159	79	232	475	804	48	49	470
	Attacks	3072	8713	3714	2253	189	14214	19205	212	1026	9918
	Deaths	241	164	31	17	6753	0	1178	0	344	814
5	Rinder pest										
	Outbreaks	2	2	0	0	0	0	0	0	0	0
	Attacks	15	19	0	0	0	0	0	0	0	0
	Deaths	13	4	0	0	0	0	0	0	0	0

from animals to human beings. Major epidemics of the human in the twentieth century have been of animal origin. The knowledge about the zoonotic diseases help us to control these emerging diseases. Diseases are spread by different animals. Anthrax, Bovine Spongiform Encephalopathy, Tuberculosis, Leptospirosis and Brucellosis are the main diseases acquired from cattle. Rabies and Leptospirosis are spread from dogs. Psitacosis and Avian Flu are the diseases acquired from poultry.

1.4 Infrastructural status

1.4.1 Feed

Cattle and poultry feeds are the major inputs required as far as livestock and

remarkable achievements could be made in this field. In addition to this, with the shift in the cropping pattern of the district from paddy to other dry crops like rubber, coconut etc, the availability of straw for feeding cattle also decreased considerably. In Kollam district, Kalluvathukkal, Chathannur, Kollam Corporation, Nedumpna, Thazhava, Ochira and Kulasekharapuram are the Local Self Government Institutions having highest production of fodder (Figure 14.21).

1.4.3 Markets

The meat and egg produced in Kollam district is sold through local markets in the

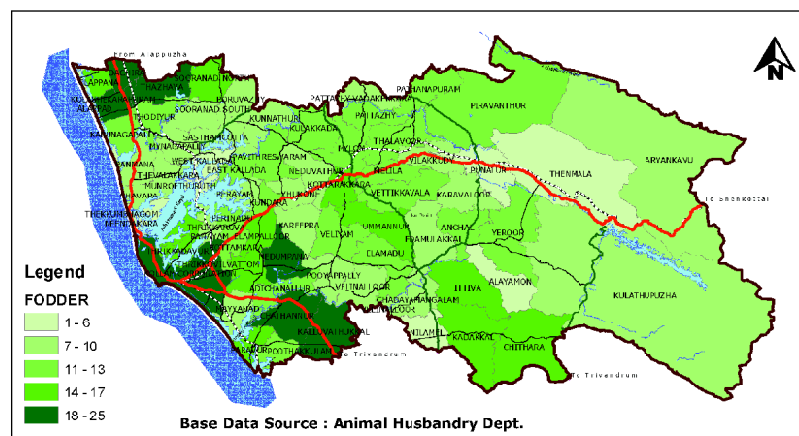


Fig.14.21 : LSGI wise distribution of area under fodder cultivation in 2005

district. Just like all over Kerala, an organized marketing system for meat and egg does not exist in Kollam district also. As a result unauthorized slaughter houses cum markets sell low quality and disease bearing livestock products. Majority of animals are brought from neighboring State.

Table 14.5 lists the major livestock

Corporation (KSPDC) supplies day old chicks and feed to the farmers and also assist in the marketing of broilers. Broiler chicks are produced by the KSPDC from Kudappanakunnu hatchery. The only turkey breeding farm in the state is located in the District at Kureepuzha. This farm is produces and distributes turkey to different parts of the district. Fodder slips are freely

Table.14.5. Important livestock markets in the distribution

Sl.No.	Location	Days in which Market conducted	Average No. of animals marketed / market days
1	Paruthiyara	10 th of Malayalam month	80-100
2	Anchal	15 th and 30 th of Malayalam month	750-950
3	Chengamanad	9 th of Malayalam month	40-60
4	Mulavana	7 th of Malayalam month	100-125
5	Paripally	Sunday	25-35
6	Karunagapally	1 st , 4 th , 7 th , 14 th , 20 th and 27 th of Malayalam month	800-1000
7	Vayyankara	5 th , 7 th , 25 th of Malayalam month	600-900
8	Puthur	First and last Tuesday of every month	50-75
9	Kunnikode	25 th of Malayalam month	120-150
10	Kannanalloor	29 th Malayalam month	200-300

markets in Kollam District.

Out of the 10 important live stock markets, Paruthiyara, Anchal, Mulavana, and Kannanalloor deals with cattle, buffaloes and goats (Figure 14.22) .

The Kerala State Poultry Development

distributed to the farmers from the Kuriottumala farm. The District Goat rearing farm at Kuriottumala has breeding facilities and is producing kids for distribution.

1.4.4 Institutional

The organizational set up of various

institutions supporting the activities is discussed here.

1.4.4.1 Dairy Plants, Chilling Plants and Milk societies

There is a MILMA dairy in Kollam district with pasteurization and chilling facilities. The capacity of the dairy is 100000 LPD. In addition, two private dairy plants namely A-One milk products, Patharam and KCA Milk Products, Umayanalloor with a capacity of 80000 LPD and 40000 LPD respectively are functioning in Kollam district. The MILMA dairy caters to the entire district of Kollam and part of Pathanamthitta. A recent development in the dairy sector is the successful embryo transfer operation undertaken by MILMA.

There are 5 chilling plants in the district having 1000 litres capacity each, at the following localities:

1. Kundara
2. Thalavoor
3. Kizhakketheruv- Kottamkara
4. Chavara South.
5. Ayoor

Distribution of Dairy Plants, Chilling Plants and Milk Societies in Kollam District is shown in Figure 14.23.

Milk societies and milk routes are present in Kollam District. The milk societies are seen concentrated towards the western parts of the district. The eastern parts of the district are not properly covered by milk societies. Moreover the distance from the farthest point to the Kollam dairy is 90 Km. The cost of transportation of milk from the production centre to the chilling plants can be reduced if more chilling plants are established at the eastern parts of the district.

1.4.4.2 Breeding centres

The Buffalo Breeding Farm, Kuriottumala started functioning as Dry-stock Farm in 1961. It was renamed in 1981 as Buffalo Breeding Farm. In 2003 diversification process started with rearing of rabbit, quail and goat in addition to buffaloes. In the same year training for farmers was also started in the farm campus. The farm had 288 acres of landed property. Out of this 100 acres has been used to rehabilitate Adivasis, 25 acres to house Engineering College and 1.5 acres given for Water Authority. This farm is the highest income generating farm.

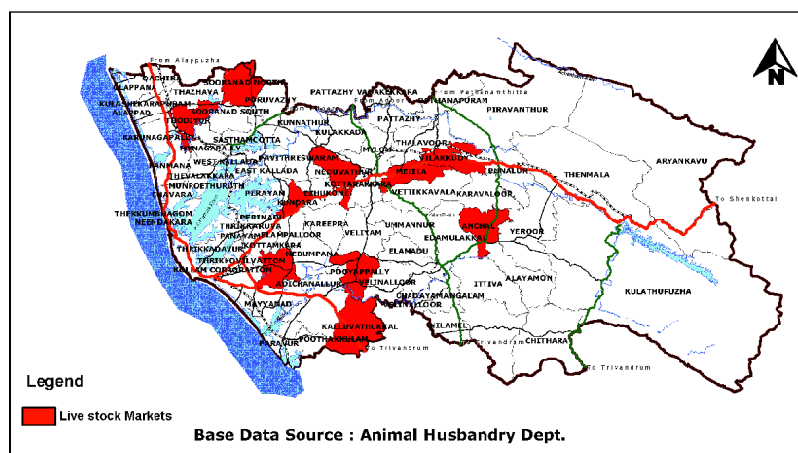


Fig.14.22: LSGI wise distribution of livestock markets in the district

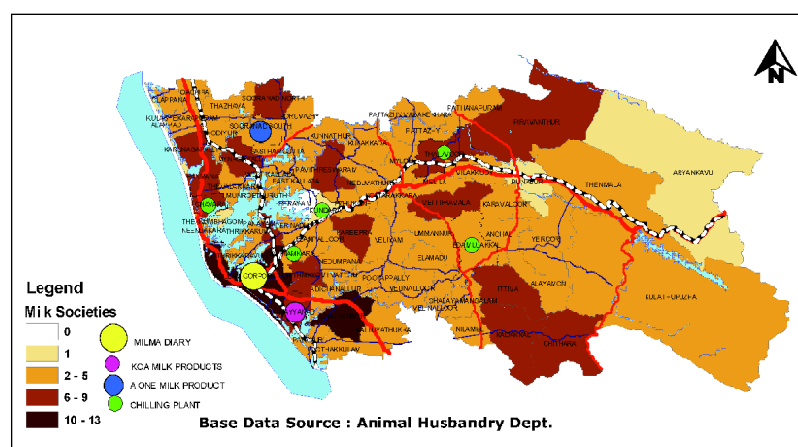


Fig.14.23 : LSGI wise distribution of milk societies and locations of dairy and chilling plants

It provides residential training program for Kudumbasree members. More area in the farm is utilized for fodder production. Major portion of funds is from Kollam Jilla Panchayat.

Activities in the Buffalo Breeding Farm is given in Table 14.6.

farmers. The district has 283 milk collection societies which are functioning mainly in the cooperative sector and to a lesser extent in the private sector. More than 70% of these societies are affiliated to milma and are situated along nine milk routes of Paripally, Thevalakkara, Cheriya,

Table.14.6.: Activities in the buffalo breeding farm

	02 - 03	03 - 04	04 - 05	05-06 (Est)
Milk Production (Litres)	19000	22935	87694	101000
Area Fodder (Acres)	4	20	30	40
Fodder Prodn (MT)	38	123.8	587.5	800
Trainees			997	1500
Income (Lakh Rs.)	10.32	12.41	52.39	85

Regional Poultry Farm, Kureepuzha, Kollam is the one and only Turkey Farm in the State. The farm is rearing unique varieties of broad breasted large white and broad breasted bronze turkey parent stocks and supplies turkey poults to the farmers both in and out of the state. The farm also provides Hatching Eggs to the

Clappana, Nediavila, Poruvazhy, Puthoor, Kottarakara and Kundara. These societies collect a total of 93047 litres of milk per day. An equal quantity of milk is procured by the private traders also. The MILMA dairy has pasteurization and chilling facilities.

Figure 14.24, shows the number of milk

societies functioning in each Grama Panchayat/Municipality. When compared with the number of cattle, the number of societies in the Grama Panchayats in the eastern parts of the district which are rich in milk population, are not up to the mark. This poses a question on the marketability of the milk produced in these areas.

1.4.4.3 Hospitals

Veterinary institutions of Animal Husbandary Department comprise of lower level breeding centres namely ICDP sub centres, veterinary dispensaries and veterinary hospitals extending health care facilities to the livestock and poultry. All the panchayats are having these institutions.

These are centres providing facilities for artificial insemination to cattle and giving first aid treatment. Figure 14.25 shows the distribution of ICDP Sub Centres, Figure 14.26 shows the distribution of veterinary dispensaries and Figure 14.27 shows the distribution of veterinary hospitals.

Veterinary hospitals are the referral institutions manned by Assistant Director.

1.4.4.4 Input centres

There are 7 major input centres of animal husbandry and dairy sector (Figure 14.28). The input centres include Dairy training institute, District Veterinary Centre, Milma dairy, Regional Poultry Farm-Kureepuzha, Buffalo Breeding Farm-Kuriottumala; LMTC Poultry Farm-Kottiyam, Kerala Livestock Development Board- Kulathupuzha and the poultry farm at Kottiyam owned by the Kerala state poultry development corporation.

1.4.4.5 Society for Prevention of Cruelty to Animals (SPCA)

The society is carrying out the functions such as Animal welfare activities, awareness against cruelty to animals, Animal Birth Control (ABC) Programme; Elephant Squad and Emergency elephant care unit, Tsunami relief Activity, Ambulatory Services (4 wheeler and 3 wheeler), Elephant centres at Mylom and Velinalloor, Rehabilitation of Monkeys / Python / Cobra, care to migratory birds, conducting flower show, pet show etc.

1.5 Economic status

1.5.1 Production in terms of Net State Domestic Product

Live stock production system of India has been mostly unorganized. Recently live stock keeping have assumed increasing significance due to the active

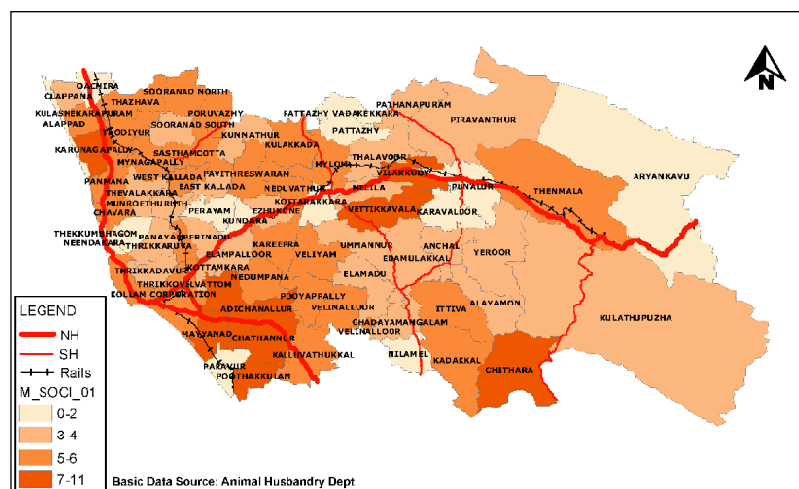


Fig.14.24 : LSGI wise distribution of milk societies

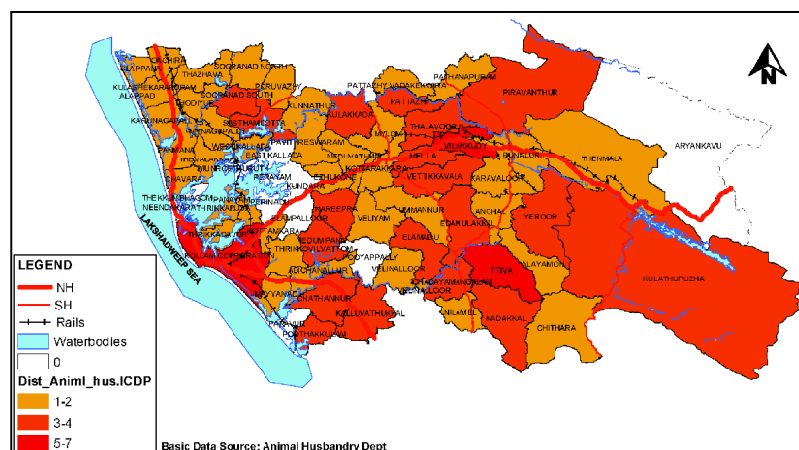


Fig.14.25 : LSGI wise distribution of ICDP sub centers

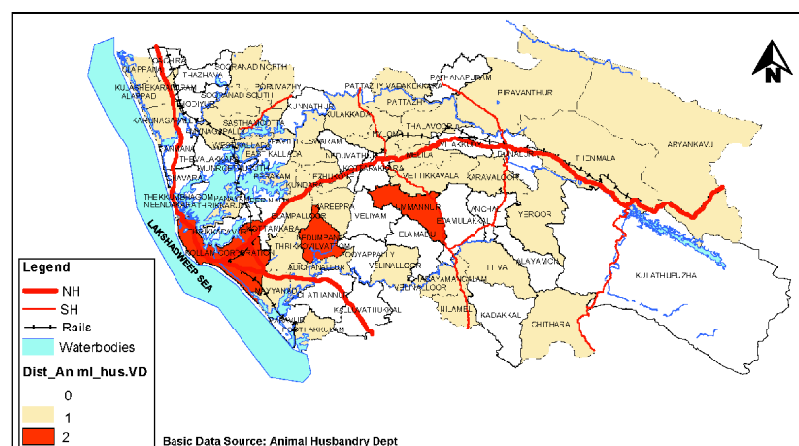


Fig.14.26 : LSGI wise distribution of veterinary dispensaries

involvement of Government. As per economic review 2005 more than 70% of the rural households in India depend on livestock farming for supplementary income. As per Central Statistical Organization (CSO) estimates, the contribution of live stock sector to Indian economy during 2002-03 at current price was about 1560-1580 billion Rupees

contributing 6.19% to the GDP of India. The Net State Domestic Product (NSDP) at factor cost (2002-03 to 2004-05) at current prices as per economic review, 2005 is Rs. 80116.12 and that of agriculture sector alone is Rs. 12197.88 crores. The Gross value of income from major crops is Rs. 9436 crores. Hence the contribution of animal husbandry sector is approximately

Rs. 2761.88 crores. The contribution of Animal Husbandry sector in the NSDP during 2003-2004 is about 3.5%, which is low, compared to the Indian economic scenario. Coming to the District, the NSDP at factor cost by industry of origin (2002-03 to 2004-05) at current price is Rs.6340.59 crores, which is about 7.9% of total NSDP. Also the contribution of agricultural sector in the total NSDP of Kollam is 15.00%. However the contribution of Animal Husbandry alone in the Agricultural sector is not available though Animal Husbandry plays an important role in the economy of Kollam District. Milk and Egg production in India and Kerala over the years is given in Table 14.7.

1.5.2 Consumption pattern

The consumption pattern as per National Sample Survey, in India over the years clearly shows (Table 14.8) the shift in consumer preference. It is evident that the share of expenditure on grains is reducing and the expenditure on milk, meat and egg is rising.

In a stage where the food security of the state is under question it is high time to pay much attention to Agricultural and allied activities in the state. As far as agriculture is concerned, the major constraint towards rejuvenation of the activities is the lack of availability of enough land. In this circumstance, it is worth mentioning here that animal husbandry is the major sector which can contribute much to the food security of the state with limited availability of land and resources within a short span of time. The demand for meat, milk and egg, the major produces of animal husbandry sector, goes on increasing day by day. Table 14.8 shows that there is a shift to spend more on milk, meat and egg compared to grains, over the years from 1972 to 2000. There is every possibility that the trend will continue as the health consciousness among the public increases.

1.5.3 Credit Pattern

As per the potential linked credit plan of NABARD, 2005-06, the Ground Level Credit flow of Dairy sector was declining from 2001-02 to 2003-04. The ground level credit flow for dairy sector is expected to improve during 2004-05 by special efforts on the part of CBs keeping in view the decision of GOI to double the credit delivery within next 3 years. The ground

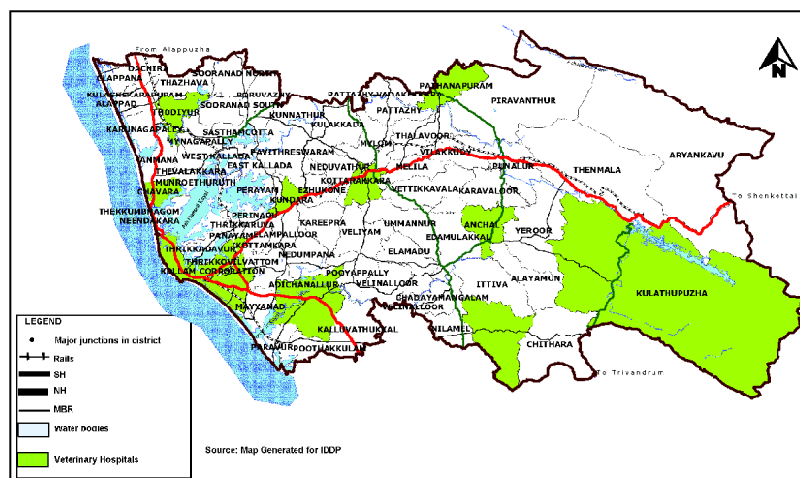


Fig.14.27 : LSGI wise distribution of veterinary hospitals

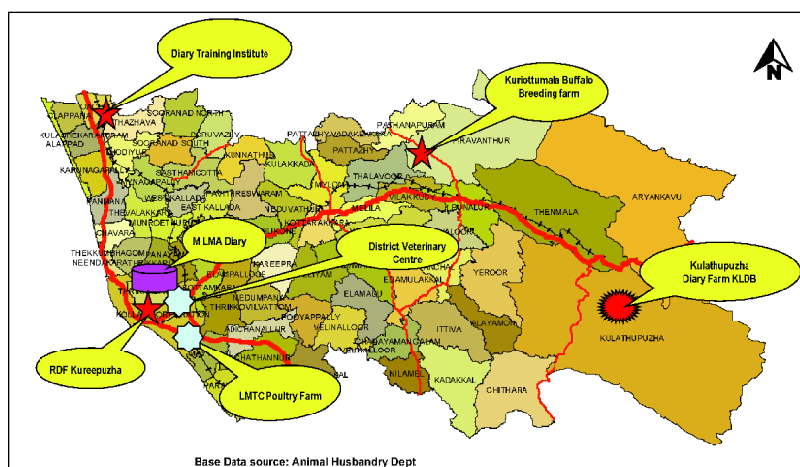


Fig.14.28 : Location of major input centres in district

level credit flow during 2004-05 is estimated as 571.45 crores.

In poultry sector, the ground level credit flow is from 2001-02 to 2003-04 (Table 14.9). It is expected that during 2004-05 also there will be considerable increase in the Ground level credit flow and the estimated credit flow is Rs. 203.21 lakhs. The estimated credit flow for the development of sheep, Goat, Pig and Rabbit during 2004-05 is Rs.246.36 lakhs from Banks (Com Bank, DCCB and LDB). During the period from 2001-02 to 2003-04, the credit flow was decreasing but it is estimated that the credit flow will increase from 158.83 to 246.36 during 2004-05.

1.6 Social Status

Majority of the dairy farmers are unorganized. They belong to economically weaker sections of the society. Livestock farming require daily attention and is considered as a tied up business. Poultry farming (layer) is done as a subsidiary operation by many. Broiler farming is done

Table.14.7. Milk and Egg production in India and Kerala over the years

Year	Milk Production (Lakh Tonnes)					Egg Production (Million Numbers)				
	India	% change over previous year	Kerala	% change over previous year	% contribution of Kerala	India	% change over previous year	Kerala	% change over previous year	% contribution of Kerala
2	3	4	5	6	7	8	9	10	11	12
1993-94	606	-	20.01	-	3.3	24167	-	1844	-	7.3
1994-95	638	5.28	21.18	5.84	3.3	25975	7.4	1916	3.9	7.2
1995-96	663	3.91	21.92	3.49	3.3	27284	5.03	1987	3.7	7.3
1996-97	683	3.02	22.58	3.01	3.3	27492	0.76	2024	1.86	7.4
1997-98	705	3.22	23.43	3.76	3.3	28400	3.3	2033	0.44	7.2
1998-99	752	6.67	24.2	3.29	3.2	29476	3.79	2044	0.54	6.9
1999-00	781	3.86	25.25	4.34	3.2	30449	3.3	2054	0.48	6.3
2000-01	810	3.71	26.05	3.17	3.2	36833	20.31	2034	-0.97	5.6
2001-02	848	4.69	27.18	4.34	3.2	39100	6.73	2002	-1.57	5.1
2002-03	873	2.95	24.2	-10.96	2.8	40300	3.07	1347	-32.7	3.3
2003-04	911	4.35	21.11	-12.76	2.3	43100	6.94	1277	-5.2	3

by middle class people. Livestock Farmers are not viewed by the society with dignity. The recognition to the farmers in the animal husbandry sector is to be improved and programmes are to be designed accordingly.

2. Overall Development Trend

As per the quinquennial live stock census data, all types of live stock have

been showing a declining trend in Kerala after 1996 though the 10th plan strategy of Kerala is formulated giving due importance for up gradation of standards of supporting infrastructures, stock up gradation and increasing production through scientific and better management. In Kollam district, also the number of total live stock is showing declining trend (Table 14.10).

During 1996, the total live stock population in the district was 45,7669 which reduced to 26,7977 during the year 2003. One of the reasons for such a drastic change may be due to the attitude of people to keep less number of highly productive crossbreed animals rather than maintaining less productive indigenous animals. The decline in rate of population in the state during the period from 1996-2000 was about 30% as against 23% in the case of District which reduced to 17% at the end of 2003. The declining rate for the state during 2000-2003 periods is about 20%, slightly above the district average. Livestock Profile of Kollam district for the last few years is shown in the table and the temporal variation of cattle and goats is shown in the Figure 14.29.

It is clear that cattle population in declining rapidly. Buffalo and Goat population are also decreasing and pig population is almost constant. The rate of decrease of these species in the district as

well as state is shown in figure. While the temporal variation is analyzed it is found that the rate of decrease of indigenous cattle population is high comparing to that of crossbreed cattle recording 70% decline during 2000-2003. The milk production is maximum during the Rainy and Winter Seasons. However over the years the production is showing a declining trend

Table.14.8 : Consumption pattern in India in terms of expenditure in food products

Year (NSS Rounds)	Expenditure on food grains		Expenditure on Fruit & Vegetables		Expenditure on Milk, Meat, Egg & Fish	
	Rural	Urban	Rural	Urban	Rural	Urban
1972-73 (27th Round)	63.1	42.02	10.15	9.92	13.44	19.53
1977-78 (32nd Round)	58.01	40.83	9.95	10.67	16.17	21.67
1983 (38th Round)	55.34	38.75	11.43	12.01	16.01	21.66
1987-88 (43rd Round)	47.81	33.16	12.66	13.83	18.59	23.23
1993-94 (50th Round)	44.78	31.63	14.4	14.99	20.25	24.13
1999-2000 (55th Round)	44.11	31.81	14.48	15.59	20.37	24.53

Table.14.9: Species wise credit flow

Species	2001-2002	2002-2003	2003-2004	2004-2005
Fowls	19243.57	12475.45	11704.57	10948.83
Ducks	774.28	993.43	1063.57	1025.54
Total eggs	20017.85	13468.88	12768.14	11974.17

Table.14.10 : Trend in live stock population

Sl. No.	Live stock	1987	1996	2003
1	Cross bred (Ten thousands)	18.5	20.3	14.8
2	Non descript (Thousands)	12.4	7.3	0.66
3	Buffalo (Thousands)	11.5	8.9	3.2
4	Goat (Ten Thousands)	18.3	17	11.1
5	Pig (Hundreds)	3.11	13.48	10.34
6	Poultry (lakhs)	13.8	24.1	6.5
7	Duck (Ten Thousands)	6.1	7.8	7.2

(Figure 14.29). The total production is also coming down drastically.

The per capita consumption of egg in the district is 80 per head. The demand for eggs in the district is 750 million per

an increasing incapability to meet the demand of meat, milk and egg internally, three major issues may be raised on a wider background. First one is the declining trend of animal population in the district. Others are the increasing cost of inputs of production and the flooding of cheaper products from the neighboring states. On a detailed investigation, it can be seen that all these three have formed a vicious cycle one promoting the other thus intensifying the crisis of internal food security of the state. Decreasing trend of the population, increase in cost of production, narrow margin of profits, the labour oriented nature of business in the sector, low productivity and emerging zoonotic diseases are the

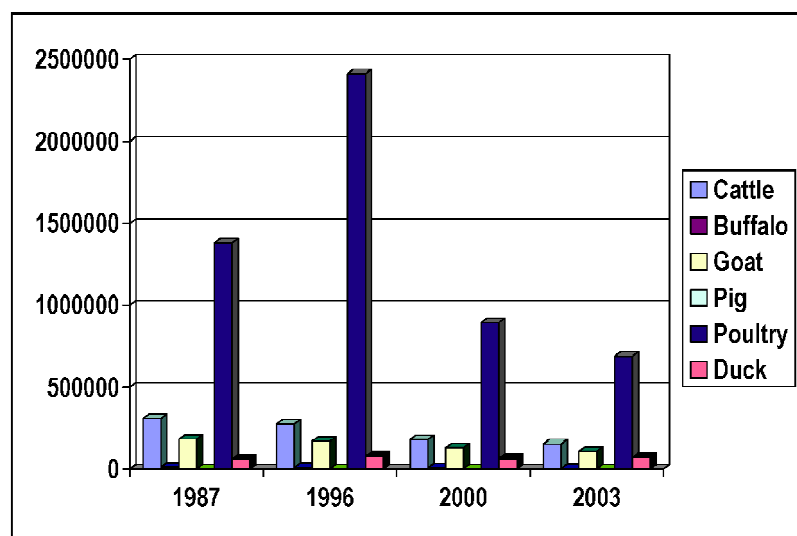


Fig.14.29 : Temporal variation of live stock population

year. To meet the demand, the eggs are being imported from the neighboring states such as Tamilnadu, Karnataka and Andhra Pradesh. The inflow of eggs from other states is estimated to be 600 million per year.

3. Development Issues

3.1 Development Problems

When we go through constraints that the sector faces, against the back drop of

main contributing factors for the recession in the animal husbandry sector.

Kollam is also facing problem of non-availability of enough land for fodder production. The present production of fodder is estimated to be sufficient to meet only half the requirement of the district. A close perusal of the facts and figures shows that cattle population and milk production is high from the areas with a better coverage

of fodder. This necessitates a deliberate intervention to enhance fodder production in the region. The agricultural crisis has also badly affected the animal husbandry sector in the district. Animal rearing activities, which were developed as subsidiary to agricultural activities from day old, faced a heavy blockade consequent to the decreasing agricultural activities. We are facing a heavy shortage of roughages including straw and hay. Bringing straw from other districts or from outside the state roots heavy financial burden to the farmers. Above all there is the ever increasing cost of cattle feed. Cattle feed is not compounded in the district. Kerala Feeds and MILMA are the major suppliers of cattle feed in the public sector. A major share is handled by private players, which poses major concerns regarding quality of the feed.

A pricing system, entirely independent of the cost of production, has put the whole burden of these crises on the shoulders of farmer and the profit, already a scanty one, has at times approached nearly null making dairying a non-lucrative occupation for the farmer. Adding to all these, is the heavy influx of milk and milk products, cheaper in price and most of the time cheaper in quality also, from outside the state. As we have not developed a quality based pricing system, the milk produced internally could not compete with the cheaper milk brought in from the neighbouring States.

All these have alienated the dairy farmers from the sector.

Coming to the marketability of milk one society is functioning per 477 cattle in the district. But the societies in the eastern parts of the district cater to the demand of a larger area. The Grama Panchayat of Perayam doesn't have a milk society at all. Lack of adequate number of milk societies in the eastern parts of the district and lack of sufficient number of chilling plants are the major hurdles regarding marketability of milk.

The relatively lesser number of breeding centres in the eastern part of the district and the subsequent reduction in the productivity of the animals in the region is a problem to be addressed immediately. Another matter worth mention here is the lack of proper awareness among the farmers on the scientific management practices of crossbreed animals. The subsequent mismanagement causes under

production among the otherwise highly potent germplasm of cattle available in the region.

Coming to goats, the district has 42 goats per 1000 human population. That means around 43 goats are present per square kilo meter area in the district. Lack of enough grazing land is the major problem here also. Slaughtering goats at an early age, irrespective of whether male or female, is the major cause of the decreasing number of goats in the district. Buffalo Breeding Farm, Kuriyottumala is the major centre for supply of kids in the district. Non-availability of quality kids is the major problem regarding goat production. An organized marketing system with a standardized pricing pattern does not exist in the district.

3.2 Development Potentials

The district has got excellent infrastructural facilities to support further development of the sector. It has got veterinary health care and breeding facilities in all the nuke and corners of the district. Also it has got an excellent marketing network of milk societies throughout the district. Regional Poultry Farm, Kureepuzha is the one and only turkey farm in the state. Buffalo Breeding Farm, Kuriyottumala is the most profitable farm of the department in the state. The Kudumbasree training centre, BBF, Kuriyottumala and LMTC, Kottiyam are offering excellent training programmes for the interested farmers in the district. All the infrastructural facilities to promote animal husbandry activities is presently available up to a certain extent in the district. The need of the hour is to make use of the idle land and idle man power available in some of the panchayats to promote animal husbandry activities.

Another point worth mentioning is the increasing quality consciousness among the public regarding the food materials they consume. The demand for organic food products is very high. It is clear that quality of milk, meat and egg and their processed products will count much in the coming years and the demand of quality products will be very high. This will promote a condition highly conducive for animal husbandry activities in the region. Same is the case of eggs. People have got affinity towards the brown shelled eggs produced in the farmer's premises, a system which is semi-organic by default. This will definitely

improve the prospects of backyard system of rearing poultry. Quality consciousness among the public about meat and meat products is also on the rise. This inturn will promote scientific slaughter houses thus promoting the industry of meat and meat products.

Apart from all these there exists a sector of pet animals and pet birds growing with high pace. Demand for fancy birds, dogs, cats etc are on a hike and this offers ample employment opportunities for the interested people.

Animal husbandry sector offers plenty of employment opportunities which is expected to witness a boom in the recent future. With regard to the food security of the state also, it is high time to pay more attention on enhancement of animal products in the region.

4. Agencies Involved

All the activities coming under the sector is co-ordinated by the Department of Animal Husbandry. The department has a well established network of veterinary dispensaries and animal breeding centres distributed through out the district. The major agencies coming under animal husbandry department are as detailed below. (Table 14.11) The department in the district is headed by the District Animal Husbandry Officer. He is assisted by Deputy Director (Animal Husbandry) and a veterinary surgeon.

Table.14.11: Type of institutions in Kollam

Sl. No.	Type of Institutions	Numbers
1	Animal Husbandry Office	1
2	District Veterinary centre	1
3	Veterinary Poly Clinic	2
4	Veterinary Hospitals	23
5	Veterinary dispensary	52
6	ICDP Office	1
7	AI Centres	146
8	RAIC office	4
9	CFSS District Office	1
10	CFSS Circle Offices	5
11	ADCP Office	1
12	DFZ Unit	1
13	RPF	1
14	BBF	1
15	RP Vigilance Unit	1
16	RP Check Post	1
17	Regional Clinical lab	1
18	Embryo Transfer Lab	1

District veterinary centre which is situated at Thevally is headed by the Chief Veterinary Officer. This institution is acting as the referral hospital. The Regional Clinical Laboratory is functioning associated with the District Veterinary Centre. The lab has the unique

provision for diagnosis of rabies using most modern diagnostic facilities. In addition, the District Veterinary Centre is equipped with mobile veterinary hospital, X ray unit and well equipped operation theatre.

Cattle Breeding Activities in the district is co-ordinated by the ICDP office. It is headed by the Project Officer. Four Regional Artificial Insemination Centres are functioning in the district to co-ordinate the breeding activities at the regional level. Under the RAICs 146 ICDP sub-centres are functioning to bring service at the farmer's door step. In addition 62 private AI Centres are functioning in the district.

A Regional Poultry Farm is functioning at Kureepuzha in Kollam. It is concentrating on rearing unique varieties of Turkey parent stock. Buffalo Breeding Farm, Kuriyottumala acts as a major egg nursery unit meeting the demand of partly grown chicks in the district up to a certain extent. About 800 to 900 female chicks are supplied every week from the farm. There are 96 broiler outlets in the private sector in the district and their total production of broiler meat is estimated to be 40% of the actual requirements. The Buffalo Breeding Farm also acts as a major source of input in the district by supplying quality kids, rabbits and quail chicks to the needy farmers of the region.

A Livestock Management Training Centre and an Embryo Transfer Lab are functioning in the district based at Kottiyam.

Calf Feed Subsidy Scheme (CFSS) is successfully implemented in the district with co-operation from the local self government institutions and milk producers' co-operatives. The scheme has an office at Kottiyam headed by Assistant Director (CFSS). The scheme is operationalized in the district based on four circles, viz. Sasthamcotta, Kadakkal, Kottiyam and Kottarakkara. A Disease Free Zone Unit and a Rinderpest Vigilance Unit are functioning in the district based at Punalur with an objective to act as a check against incidence of major epidemics among cattle in the district.

The institutions under the Department of Dairy Development has a distribution as depicted below in Figure 14.30.

The dairy department has got a network of Dairy Extension Offices spread across the district. A dairy training institute

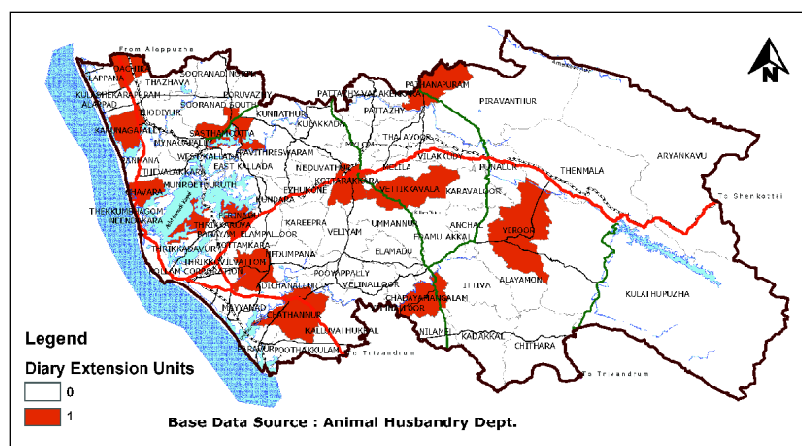


Fig.14.30 : LSGI wise distribution of dairy extension units in 2005

is located at Ochira so as to extend the technological knowhow to the needy farmers of the district.

The Regional Co-operative milk Union has got a well established network of more than 300 societies in the district. This includes 256 primary APCOS societies and 65 traditional primary societies. 5 chilling plants are functioning in the district. Milma dairy at Thevally is the major centre for milk processing. In addition A-One milk products, Patharam and KCA milk products, Umayanallor function associated with the sector from the private side.

Ten cattle markets and 58 slaughter houses are functioning in the district. Society for Prevention of Cruelty to Animals is also active in the district. They have been making timely interventions in the animal welfare activities of the district. Kerala Livestock Development Board, which plays a key role in the cattle breeding activities in the state, has a regional office at Kulathupuzha. Kerala State Poultry Development Corporation, which has got a key role to play in the poultry development activities of the state, has also got a regional farm at Kottiyam, in Kollam district. This ensures the availability of the chicks and feed for the district.

5. Ongoing and Committed Projects and Programmes

5.1 Special livestock breeding programme

Calf feed subsidy programme under special livestock breeding programme has been implemented by animal husbandry dept. since 1976 to increase productivity in the dairy sector is giving excellent result. From 1997 onwards it is being implemented through the local bodies. The

objectives of the project is to provide extension support, adequate health and insurance coverage and good quality feed at subsidized price to growing crossbreed female calves of below poverty line farmers for a period of 28 months or still its first calving whichever is earlier.

Objectives: - Reducing the age at calving of crossbreed heifers is the major objective. Usually heifers attain puberty beyond 2 years. Through scientific feeding and management practices it can be reduced 15-18 months. Age at first calving can be reduced to below 2.5 years thus making dairying more profitable. Scientific feeding, management, fodder production, disease control and awareness programmes will help in achieving this goal.

Physical achievement: - 1500 animals have already been enrolled in this scheme and the enrollment is continuing to attain the target of this year.

5.2 Animal disease control project (GOREKSHA)

Goreksha is a comprehensive project, with basic mission of making livestock in kerala disease free for the economic gain of farmers through productivity enhancement and international trade as well as human safety.

Objectives: - The major objective of the project is to control the incidence of foot and mouth disease in the state gradually resorting to a combination of activities like mass vaccination, animal movement control, outbreak management, continuous monitoring, education of farmers etc. The project also undertake epidemiological studies, disease surveillance in the state, training of technicians in the in various aspects of disease control and create / strengthen disease diagnostic facility in the state.

Physical achievement: - Under this project 195148 animals has been vaccinated against foot and mouth disease and Kollam district is having second position in attaining the target.

5.3 GOREKHA

State wide programme implemented by Kerala livestock development board in collaboration with state animal husbandry dept.

Objectives :- Objectives of the project are to collect baseline information on performance of animals assessing current production situation, assist farmers in making management decision to improve the productivity of their animals , establish long term genetic improvement programme, identify elite animals ,and to help farmers in culling decision and buying of animals.

5.4 Assistance to state for control of animal diseases

The scheme envisages the control of major animal diseases by providing strategic immunization cover, strengthening of important diagnostic laboratories and biological production centers, take up disease surveillances, monitoring and forecasting, information communication campaign and equipping of technicians.

5.5 Calf clinics

As per records about 2 lakhs of crossbreed calves are being produced each year in Kerala. But among this only 30% is achieving good productivity. Nutrition deficiency and improper management practice adapted during growing stage is the main reason for this. As a remedial measure for this calf clinic will be organized. Calves having age between 1 and 8 months will be selected for this project and will be given mineral mixture, vitamin A supplement, de-wormers during the growing stage. Vaccination against serious contagious diseases will be given from time to time. This project is going to be implemented in selected 15 LSGIs of Kollam district.

5.6 Infertility camps

Adult animals which are not conceiving even after 3-4 artificial insemination will be identified and will be given detailed check up and adequate treatments by the experts in the field. By this project productivity of the animals can be increased and animals that will not conceive can be eliminated from the herd so that economic loss for maintaining the unproductive animals can be avoided. The scheme will be implemented through all the veterinary

institution of the state. Plan fund allocation of Rs.2, 80,000/- is provided.

5.7 Promotion of backyard poultry rearing

Aim of the project is to increase the internal egg production of our state, to make the household self sufficient in egg production and to overcome protein deficiency. Plan fund allocation of Rs.56,000/- is provided.

5.8 Propagation of Malabari breed and establishment of satellite units

Aim is to setup small breeding units in selected areas so as to propagate malabari breeds among farmers. The scheme will be implemented in selected 3 Panchayats.

5.9 Piggery production

Aim of the scheme is to increase the internal meat production of our state. Plan fund allocation of Rs. 25000/- is provided.

5.10 Promotion of backyard duck rearing

Aim of the project is to increase the internal egg production of our state, to make the household self sufficient in egg production and to overcome protein deficiency, to uplift the rural poor etc. 500 farmers who are below poverty line will be benefited through the scheme. Plan fund allocation of Rs. 1,00,000/- is provided.

6. Evaluation of Ongoing and Committed Projects and Programmes

Special Livestock Breeding Programme is the flagship project of Department of Animal Husbandry in the district. This specifically aims to support the farmers in rearing the calves up to the productive age under strict scientific management practices such that the calves reach the productive life at a sufficiently early age. The project definitely improves the quality of animals and the genetic potential of the animal can be explored to the maximum extent. Bringing up maximum number of animals under the coverage of the scheme will help to check the declining trend of cattle population in the district. This along with the calf clinics will be a supporting hand to the farmers to raise the calves born in their premises up to the adulthood. This is of particular significance since the cattle born and brought up in the state seem highly acclimatized to the conditions of the state. The infertility camps organized pay attention to the animals suffering from reproductive disorders. The high cost of

infertility treatment estranges farmers from proper fertility management of otherwise highly productive animals. The project extends a helping hand towards identifying and solving the fertility problems of the cattle of the district and to eliminate the problem animals from the district herd.

The department has got a handful of programmes to protect the livestock of the district from major contagious diseases. The Goreksha project and ASCAD project specifically aims to keep the region free from major diseases like Foot and Mouth Disease, Ranikhet Disease etc. The Goreksha project aims to document the productive and reproductive status of the animals in the district.

In order to promote Goat rearing activities in the district, malabari goat satellite units are going to be established so as to propagate the malabari breed of goat in the district. Establishment of pig rearing units in the district will be a step ahead to achieve self sufficiency in meat production. Implementation of backyard poultry units and duck units will enhance the production of egg and meat in the district.

All these projects are expected to enhance the number and productivity of livestock in the district. Enhancement of production and productivity of the livestock along with the establishment of a disease free zone in the region will definitely enhance the prospects of animal husbandry sector in the district. Majority of the livestock and poultry holdings are done by rural poor. This highlights the necessity of strengthening the sector on socioeconomic reasons also. Apart from providing subsidiary income the availability of nutritious livestock and poultry products are ensured to the rural poor of the society. This increases the living standard and the health status of the weaker sections of the society.

7. Conclusion

Intervention in the farming systems of the state is highly necessitated in the present agricultural scenario of the state where both food security and food safety are at peril. The facts and figures mentioned so far clearly depict the present livestock scenario of the state. A detailed examination makes it clear that there is enough space for developmental activities so as to make the region self reliant in terms of livestock and livestock products. Strengthening of the existing livestock in quality and quantity is the need of the hour. The supporting infrastructure facilities

including health care and marketing network have to be strengthened in par with that. Ensuring steady supply of quality inputs at reasonable rates and development of a pricing system based on cost and quality is highly essential for the subsistence of the sector. Advanced disease surveillance programmes, better insurance coverage schemes, modern plants manufacturing and marketing milk and meat products etc. have to be established in the district so as to convert it into a hub of animal husbandry activities.

The suggestions regarding strengthening of the sector can be divided into infrastructural projects, livestock strengthening projects, production augmentation projects and health projects.

In the dairy sector, betterment of the germplasm and enhancement of the number and productivity of animals is the key point. Breeding policy of the state has to be revised at periodic intervals so as to make available better germplasm to the farmers. Fodder production has to be promoted and quality control of cattle feed has to be ensured. Larger commercial dairy units may be promoted in the region so as to get hold of a leap in the field of milk production. Better credit facilities at low interest rate have to be made available to the farmers. Local inputs and local marketing have to be promoted at government level and networks in this regard may be established at the local level.

In the poultry sector efforts are to be made for the strengthening of the backyard system of poultry rearing by ensuring steady supply of quality chicks and feed at affordable rates. Efforts may be made to establish commercial layer units in the district. Rearing of other birds like duck, quail, turkey, etc. have to be promoted.

Quality consciousness among the public regarding meat and meat products has to be improved. Modern abattoirs, meat processing plants etc have to be established and beef cattle production and broiler production have to be promoted in the existing scenario so as to ensure self sufficiency in meat production. Allied activities like dog breeding, fancy bird rearing, rabbit rearing, elephant keeping etc have to be promoted for the development of the animal husbandry sector.



Chapter 15

Fisheries

This chapter presents the analysis of Fisheries sector in the District which is structured into four parts. The first part contains the analysis of Existing Status, the second part includes Overall Development Trend, the third part includes Development Issues and finally the fourth part contains the analysis of Ongoing and Committed Projects.

1. Analysis of Existing Status

Kerala is one of the leading marine fish producing state in the country. On an average 5.7 lakh tones of marine fish is produced annually by the State which accounts for 24 per cent of the national fish production. The potential marine fish resource of the South West Coast of India comprising Kerala, Karnataka and Goa has been revalidated as 13.16 lakh tones. Out of this the Maximum Sustainable Yield (MSY) of inshore region is computed to be 9.50 lakh tones. Of this Kerala's share has been estimated as 5.71 lakh tones. The total resource potential of the state within the continental shelf area is 7.5 lakh tones.

The ancient harbour town of Kollam,

the once capital of Venad, has been in prominence in the Indian history as a trading centre. The Portuguese and Chinese were engaged in trade at Kollam. The District has a geographical area of about 2500 sq. km. The comparatively narrow continental shelf sprawls over an area of about 3500 sq. km. Kollam has a rich fisheries heritage, sanctified with 37 Kilometer coastlines and an Exclusive Economic Zone (EEZ) extends up to 200 nautical miles far beyond the continental shelf. Even though Kollam constitutes barely 6.3%, of the total coastal line of 590 kms of Kerala, it is in the vanguard of fisheries sector with respect to the fishing, processing and culture.

Kollam occupies a leading position in fisheries scenario of the State and is first among the districts in India to introduce mechanization of boats. The launching of Indo-Norwegian projects in 1952-53 paved the way for the far-reaching mobilization in the socio-economic conditions of the district. The per capita income of the fishermen has been

augmented in a long way with the introduction of new types of gears (fishing implements including nets, traps etc.). Neendakara fishing harbour, one of the largest fisheries harbour in the country, the coastal roads links major landing centers and the occurrence of the phenomenon 'chakara' along the coastal line have contributed to the growth of fisheries sector in the district to a great extent.

Kollam district is abundantly rich with marine, brackish water and fresh water resources. These water bodies inhabit a wide variety of aquatic fauna and flora and the district occupies one of the foremost positions in the aquatic biodiversity. The long coastal line and the extensive inland waters of the district have brought people belonging to different ethnic groups in contact with fishing. There is not much difference between them in their income and standard of living. In educational social or cultural standards, these groups are almost identical. Overall backwardness is the hallmark of fishermen community. They are in the group of subsistence economy

and indebtedness in the normal aspects of their life. The fishermen in the district constitute of a weaker section of the community as in other districts of the state. Majority of them settled in and around coastal areas in the marine villages. They are already isolated from the main stream of development due to historical, geographical and physiological characters. The present social and economic conditions of the fishermen are very pathetic.

1.1 Physical Status

Fisheries sector in the district consists of both Marine and Inland fisheries. Hence the analysis of physical status of the sector includes analysis of water resources, fishery resources, human resources, fishing fleet etc of these two areas of fishing and analysis of infrastructure facilities.

1.1.1 Marine fishing Sector

Kerala coastal line constitutes approximately 10 percent of India's total coastal line. This coastal line of 590 Km. has a continental shelf of nearly 40035 Sq.Kms. the area within the 18m depth range accounts for 5000 Sq.Km. the area between 18-73m is approximately 25000 Sq.Km. and 73-182 is the balance area. The profile of the shelf is with uniform gradient up to 80m depth and thereafter the slope appears more. The South-West coastal region has certain unique features which influence the fishery fluctuations of the important commercial species to a great

extent. The area is subjected to two monsoons viz. the south – west monsoon and the north- east monsoon. The south-west monsoon coincides with the period of upwelling and phytoplankton bloom which results in a large number of fish and crustaceans in the area.

Water Resources: Kollam district is blessed with immense water resources of both marine and inland waters.

The marine water resource covers an area of about 3500 sq km, which is far greater than geographical area of Kollam District. This area can be categorized in to 3 zones namely, inshore, off shore and Deep Sea. Kollam has enormous inland water resource which fall under categories viz. back waters and estuaries, mangrove swamps, prawn filtration fields, rivers and streams, reservoirs and check dams, irrigation tanks, private and public ponds, mud and granite quarries, fresh water lakes, holly ponds, water falls, etc.

When we consider the Water Resources for fishing activities, the state have exclusive economic zone (EEZ) of 590 Km Length and 200 nautical mile width of which 37 Km Length of EEZ belong to Kollam (Figure 15.1). However, Maximum utilization is only in 50m depth i.e. around 22 Km from the Coastal line.

Fishery Resources: In case of fishery resources, marine waters offer lucrative fishery. South – west monsoon coupled with northwesterly winds and the oceanic

current causes upwelling along the coast brings the nutrient rich deep waters to the surface, which flourishes the primary production and followed by a good fishery. Kollam coast have major fisheries of the sardines, mackerels, anchovies, soles, sharks and rays. On an average 1.5 lakh tones of marine fish is produced annually by the district which accounts for about 24 per cent of the State's total marine fish production. Out of the total fish catches, about 66 per cent is from mechanical sector followed by the motorized sector contributing 27 per cent and the artisan sector contributing 7 per cent. The over all pelagic fishes constitute 56 per cent of the total marine landings while the demersal fishes constitute 22 per cent, crustaceans 17 per cent and mollusks 5 per cent. The Indian oil sardine (*Sardinella longiceps*) recorded an all-time high landing of 0.3 lakh tones during the past year.

Human Resources: When we analyze the human resources, the fishing population in Kollam is estimated to be about 1.37 lakh, of which 1 lakh is from the marine sector. Maximum concentration of fisher folk is in Kollam Corporation (36923 no.) followed by Alappad (29938 nos.). However the number of active fishermen in the marine sector is only about 20000. Almost an equal number of people are presently engaged in fishery related activities such as vending, processing and marketing etc. Fishing and allied activities

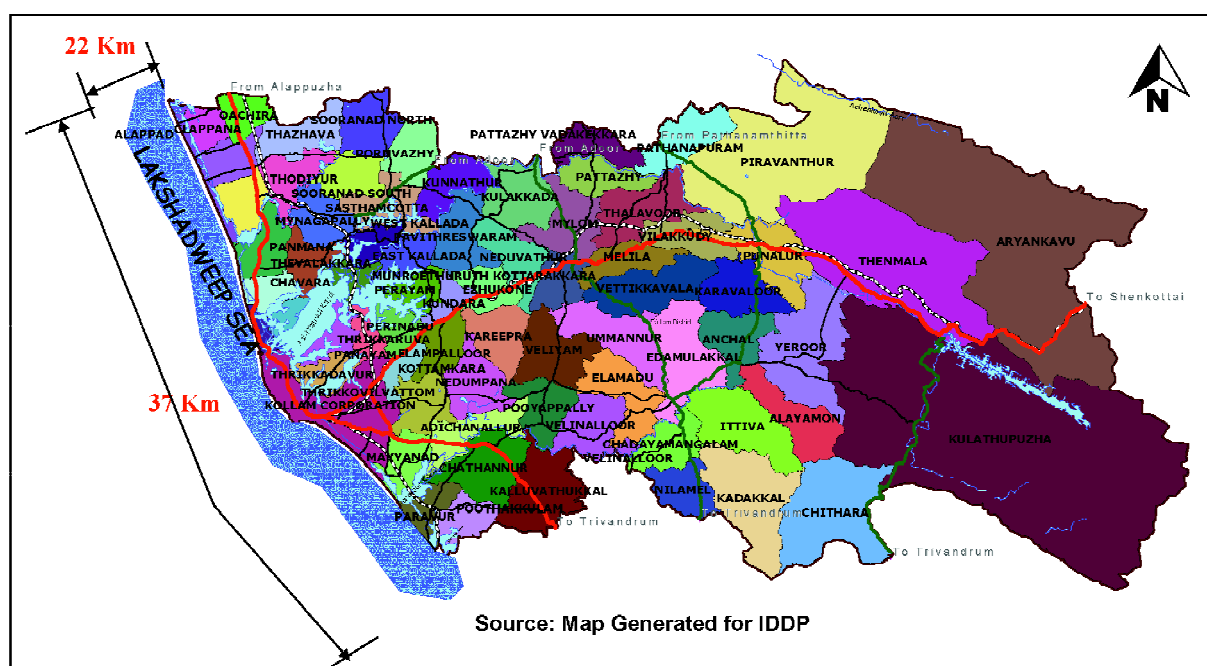


Fig 15.1: Marine water resources (Exclusive Economic Zone) in Kollam district

continue to be a way of life of vast majority of people belonging to the poor sections in the coastal area of the District.

Fishing fleet: The fishing fleet is categorized into 3 types namely, mechanized, motorized and non-motorised. Trawlers, gill-netters and purse seiners come under the category of mechanized boats, where engine power is also used for fishing. The total number of mechanized boats (consists of both wooden and steel trawlers only) operating in Kollam district is enumerated as 1157 Nos, which accounts 25.5 per cent of the State's total.

Motorised craft include Plywood canoes, Plank built canoes, Dugout canoes and Catamaran, which use power only for propulsion through outboard motors (OBM) and Inboard engine fitted vessels (inboard vallom). A total of 73 numbers of IBM vessels are operated from Kollam base. Of these 70 are of wooden make and 3 having steel body. The number of the OBM range of motorized fishing craft is estimated around 3000. There are 3 main types of non-motorized traditional crafts, namely, catamaran, dug out canoes and plank built canoe.

1.1.2 Inland fishing Sector

Water Resources: Water resources for inland fishing include both brackish and fresh water systems. In Kerala the brackish water resources includes the lower reaches of rivers, the brackish water lakes, the back waters the adjacent low lying fields and mangrove swamps. It was estimated that Kerala had a total area of about 65000 ha of brackish water available for effective use of brackish water aqua culture.

A unique feature of Kollam is the occurrence of four interconnected backwaters (kayals), viz. Kayamkulam Kayal, Ashtamudi Kayal, Paravur Kayal and Edava – Nadayara Kayal. These backwaters are inter-connected by the T.S. canal. Besides this the District is abundant with salt waterlogged areas in the Grama Panchayats of Alappadu, Clappana, Kulasekharapuram, Karunagappally, Panmana, Chavara, Thevalakkara, Thekkumbhagam, West Kallada, East Kallada, Munruthuruthu, Perayam, Mayyanad, Adichanalloor, Chathanoor, Bhoothakkulam and in Paravur Municipality which have vast potential for aquaculture. In the brackish water sector there are about

9000 ha of brackish water area are available of which 1000 ha is suitable for the development of brackish water aquaculture.

In case of fresh water resources, the district is endowed with 3 rivers (Pallickal, Kallada and Ithikkara), innumerable irrigation tanks, reservoir, streams and waterfalls, private and public ponds, quarry ponds and water-logged paddy fields. Besides these, fresh water lakes like Sasthamkottah and Cheloor kayal are there, from which the drinking water supply of the District is met with. The highland area of the District had the specialty of cold-water resource. The total area of fresh water resource in the district is about 11000 hectares.

Fishery Resources : Fishery Resources include brackish water fishery resources, Fresh water fishery resources and Cold water Fishery resources.

Estuaries and backwaters have saline waters and only those fishes, which can withstand changes in salinity, thrive best. The brackish water fishery resources consist of 75 species of which 57 are fish, 6 shrimp, 1 prawn, 5 crabs and 6 bivalves. 20 species were identified as commercially important. Some species of sardine and anchovies, mullets, catfishes, perches, pearl spot, prawns, oysters, mussels, crabs and clams are the most common.

The rivers, rivulets, streams, etc., originating from the Western Ghats are well known for their richness of bio diversity including fresh water fish species. Altogether 210 primary fishes (excluding the marine migrants) are found in the inland waters, of which 53 species are endemic. Majority of these fish species have ornamental value also. Today Western Ghats are recognized as one of the 25 "biodiversity hotspots" in the world.

The high land waters of the district have cold water and that can sustain only the so called cold-water fishes, and hence have a fishery different from that of the plains. Thenmala reservoir, Kulathupuzha River, Palaruvi, and many other streams and rivulets are the home ground of such fishes. Commercially important fishes include *Salmo* sp., *Tor* sp., *Schizothorax* sp. *Acrossochilus* sp, *Puntius* sp., etc.

Human Resources: In case of inland fishing sector, the total fisher folk population, who are making their

livelihood from the inland waters of the District comes around 0.37 lakh, which accounts 15 per cent of the State's total. The active fishermen of the inland sector are estimated as 0.09 lakh, which is about 16 per cent of the state's total.

Fishing fleet : In the inland sector the fishing fleet is not organized as that in the marine sector. Here only non-motorized/traditional types of vessels are operated. Plank built canoes and dug out canoes are the common crafts. Catamarans were occasionally operated in the Paravur backwater. Cast nets, Drag nets, Gillnets, Crab traps, dive fishing, clam fishing, oyster fishing, etc, are practiced with these crafts.

Fresh water fish farming is not so organized as that of shrimp farming. At present there are only less than 10 private fresh water farm with a total extent of 5.8 hectares. The number of private brackish water shrimp farms in the district is 256 with maximum concentration at Manrothuruth (256 nos) followed by Adichanallur. Oyster mussel farms are concentrated in Thekkumbhagam with 78 numbers out of the total 105 farms, followed by Neendakara with 21 numbers. There is 1 clam farm in Thekkumbhagam and two crab farms each in Thrikkaruva and Neendakara. There are 8 society farms in the district with maximum concentration in West Kallada (4 nos) and 3 government farms in Alappad. The total number of integrated farms in the district is 7 with maximum concentration of 3 in West Kallada.

1.1.3 Infrastructure facilities

Fish landing centers: The fish caught by the traditional fisherman are landed all along the coast usually on open beach. This has neither jetties nor other facilities. But 13 fishing harbours were commissioned and as the 90 % of the traditional sector gradually shifted to motorised sector, it is important to construct modern type fish landing centers. Thus fisheries department has already constructed 36 fish landing centers and has proposed to construct 50 more centres all along the Kerala coast. Of this Kollam district harbour has 3 landing centres, 4 mechanized boats and 7 landing centres for motorized and trade signed sector. In inland sector no such facility is available with public sector. Many of the present inland boat landing centers are organized

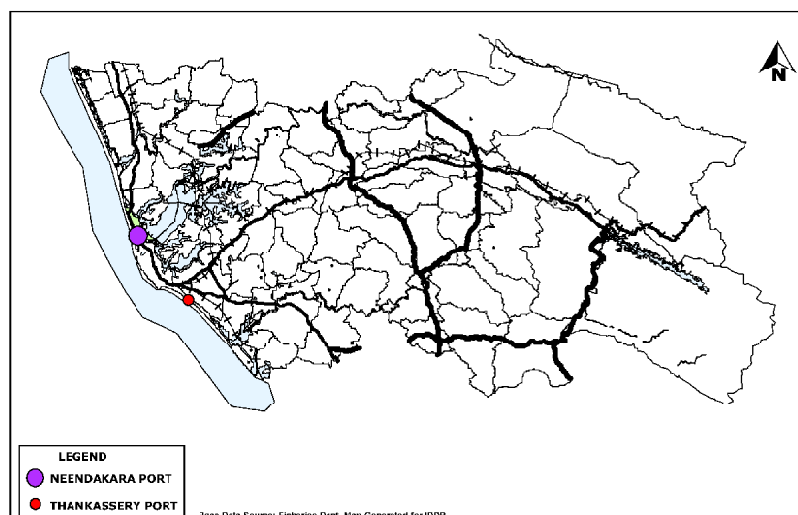


Fig 15.2: Location of sea ports

and managed by Temples/Churchs and/ or by fishermen societies.

Fishing harbours: The state had a total of 13 fishing harbours of which 3 are located in the district namely Thankassery, Neendakara and Azheekal harbours. Of this Thankassery fishery harbour is exclusively for moterised country craft.

Sea ports: Two out of the 4 sea ports in the state are located in the district, one at Neendakara and other at Thankassery. Thankassery port was commissioned recently and the infrastructure facilities are to be provided here. At present Neendakara port is not engaged in work due to many reasons. The locations are shown in Figure 15.2.

Boat building Yards: There are 74 number of boat building yards in the district with maximum concentration in Kollam Corporation (26 nos.) followed by Munroethuruth Grama Panchayat (19 nos.), as shown in Figure 15.3. Other than Mayyanad, Kollam corporation and West

Kallada, the average number of workers per unit is 15 where as it is maximum at West Kallada with 10-25 workers per unit. Both in Kollam Corporation and Mayyanad Grama Panchayat the number of workers per unit is below 6.

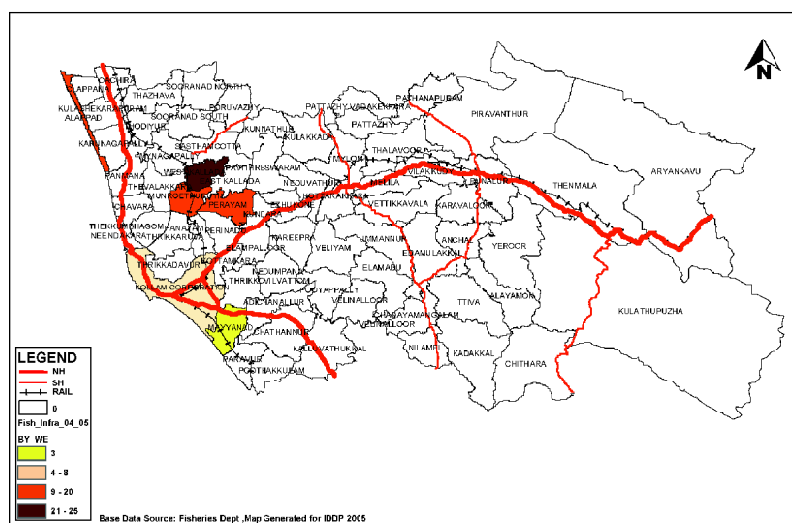


Fig 15.3 : LSGI wise distribution of number of boat building yards

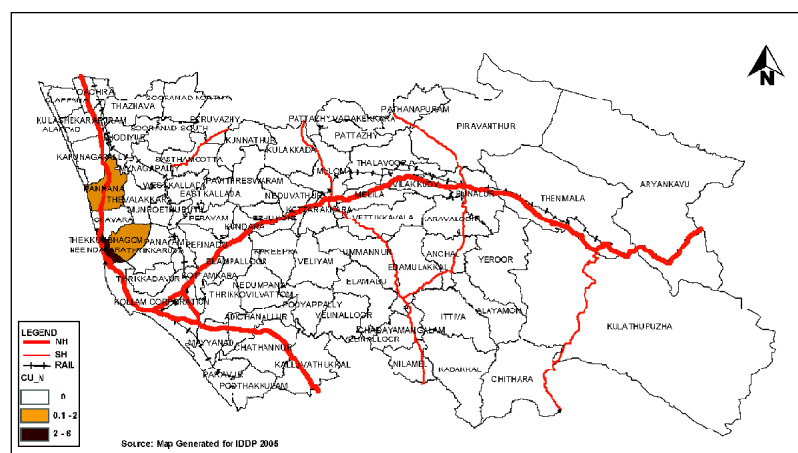


Fig 15.4 : LSGI wise distribution of area of curing yards

Curing and drying yards: Mechanization of the fishing fleet in early 60's augmented the fish production in a considerable way which aroused the need for setting up of different types of fish preservation units in and around the major landing centers. Curing yards are one such type.

Maximum area of such curing yards is at Neendakara Grama Panchayat (8.5 acres), Drying yards are used for sun drying of fishes. These sun-dried products are used for both edible products and for feed making industry. In the Grama Panchayats of Thankassery, Sakthikulangara and Neendakara this practice gives earnings to a great number of fisher women. Maximum number of drying units is in Kollam Corporation (Figure 15.4).

Fisheries roads: Roads form a vital link in the movements of fish and fishery products and establish connectivity with fishing harbours, landing centers and markets. With this in view, fisheries

department constructed many fishery roads in the coastal belt of the District (Figure 15.5). The maximum length of fisheries roads is in Alappadu (8 Kms.) followed by Kollam Corporation (4 Kms.)

Peeling sheds: Peeling sheds are the major preprocessing facility. The Mechanization scheme introduced by the Indo Norwegian Project paved the way to an organized seafood industry in the District. As a part, Peeling sheds are set up in and around the Neendakara fishing harbour and near the banks of Ashtamudi Estuary.

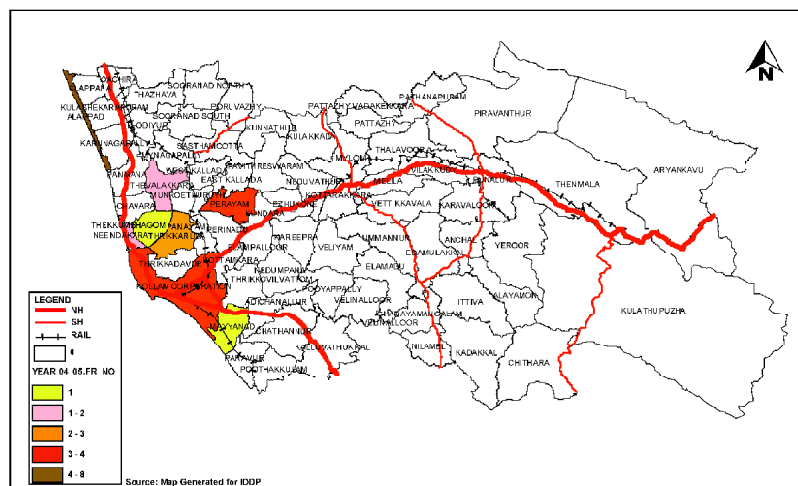


Fig 15.5 : LSGI wise distribution of Number of fisheries roads in Kollam district

Ice plants: Ice is one of the cheapest and readily available fish preservative. So it is no wonder that the ice factories are cumulated near the fish landing centers of the district. Kollam Corporation, Paravur Municipality and the Grama Panchayats of Neendakara, Chavara, Karunagappally, Eravipuram, Mayyanadu are the main centers of ice plants.

Depuration units: For the improvement of the quality of the shell fish meat the process of depuration is highly essential. For this purpose such units are set up near the major shellfish resources viz, Neendakara and Thekkumbhagom.

Chitin-Chitosan plant: The Chitin-Chitosan plant at Neendakara owned by Matsyafed manufactures good quality chitin and chitosan, which is used by the pharmaceutical and cosmetic industries.

Hatcheries and fish seed farms: There are 5 shrimp/scampi hatcheries and two fresh water fish seed farms in the District. Of the 5 shrimp hatcheries 2 are owned by government agencies. No fish seed farm is working under Government sector.

Fish markets: There are 273 fish markets in the district. The maximum number of fish markets are in Kollam corporation (16 nos) followed by Thrikkovilvattom Grama Panchayat (12 nos).

Fish booths: The supply of quality fish and fishery products to the consumers of the distant areas always pose risk because it is one of the most perishable commodities. In order to tackle this problem and to cater a new direction of fish marketing, fish booths are set up in many parts of the District.

Ornamental fish trading units:

Aquarium keeping is picking up as a hobby among the peoples of the District. This can be evident from the coming up of new ornamental fish trade units in each nuke and corner of the District. Kollam corporation area has the top rank in this respect.

Net and accessories sales shops: Kollam Town area, Sakthikulangara and Neendakara area are provided with great many net and accessories sale shops. This can be correlated with the concentration of fishing and allied activities in this zone.

Kerosene, Diesel / Petrol Bunks: There are two numbers of kerosene bunks and diesel/petrol bunks functioning in the district; each in Kollam Corporation and Neendakara Grama Panchayat.

Craft gear stores: 602 number of craft gear stores are found in the district with maximum concentration in Kollam Corporation (408 nos.) followed by Mayyanad (141 nos.).

1.2 Economic Status

1.2.1 Revenue Generated

The fisheries sector contributes 9.7 per cent to the primary sector product of the

state during 2003-04. The Net State Domestic Product at factor cost by industry of origin for the Year 2003-2004 (at constant price) shows that Kollam district has 22% share of the revenue generated from fishing sector in Kerala state. Also the share of fishing sector in the NSDP at constant prices of Primary sector in the district is 21% as shown in Figure 15.6.

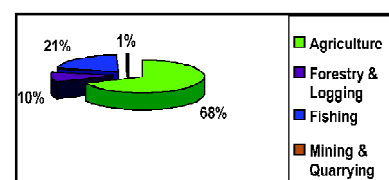


Fig 15.6: Sector wise share of NSDP - Kollam

1.2.2 Production in Marine fisheries

The total fish production of the state during 2004-05 was 6.78 lakh tones (with a value of 3224.06 crore rupees) of which marine fish landings alone was 6.02 lakh tones. During the same period the total marine fish landings in Kollam was 1,45,908 (about 24% of State share) which was the highest quantity among other districts.

Out of the total fish landings during 2003-04 of the state, nearly 46% is Sardine (Chaala), followed by Mackerel (Ayala) comprising 7%. In the case of district, as per the latest available data (2002-03), 36% of Marine fish caught is Sardine (Chaala) followed by Perches (Chemballi) comprising 13% (Figure 15.7).

1.2.3 Production in Inland fisheries

During 2002-03, the total Inland fish Landings (Production in Tonnes) in Kerala was 75036 in which the share of the district was 12 % (8997 Tonnes) and is in the 4th

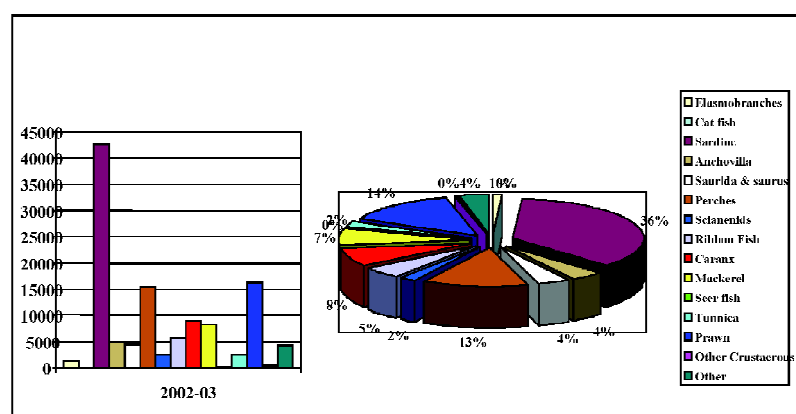


Fig 15.7 : Marine fisheries Kollam - Species wise fish landings (2002 - 2003)

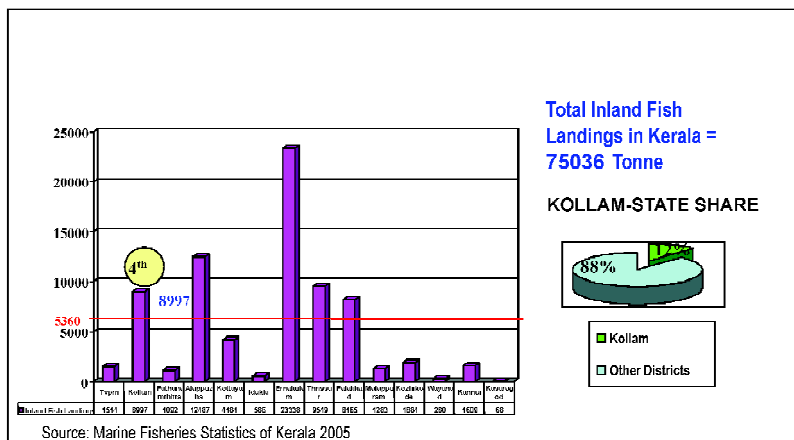


Fig 15.8 : Inland fish landings (2002 – 2003) - Comparison with other districts and share of Kollam place among the districts of the state (Figure 15.8).

In the inland fish landings in Kollam, 56% is from capture fisheries and 44% from aqua culture. Species wise, prawn contributes the maximum share (22%) in the inland fish landings of the state followed by Tilapia (10%). Where as in the case of district, Labeo rohita contributes the maximum (15%), which is from Aqua culture followed by Tilapia (13%) as shown in Figure 15.9. Prawn is only 7%. In Labeo rohita landings, Kollam is well above state average and is in the 3rd Place in 2002 – 03 and contributes 22% of State share. Also in the case of prawn landings, Kollam is below state average and is in the 4th Place in 2002–03 and contributes only 4% of state share (Figure 15.9).

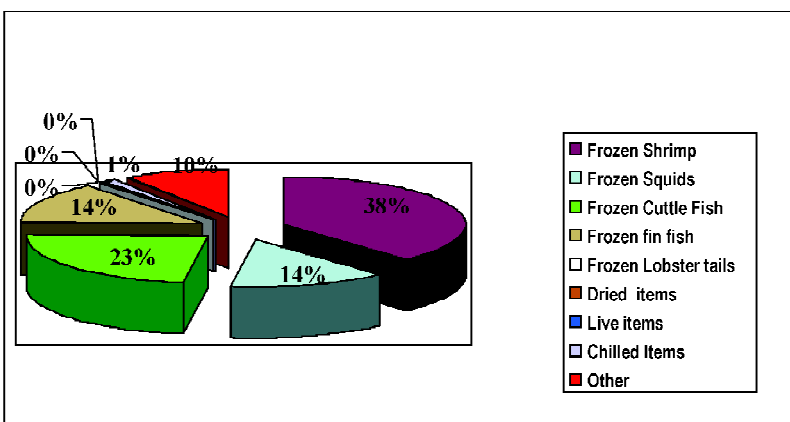


Fig.15.10: Export of marine products in Kollam - Quantity in tonnes (2003-2004)

districts of the State in the export of marine products.

The marine products exported from the state during 2005-06 were 97311 tonnes valued at 1257.65 crores constituting 19

the living conditions of most fishermen habitats in the district continue to be deplorable. Compelled by the 'way of life', fishermen live very close to the sea in small closely built huts. Often these houses are prone to the threats of the vagaries of nature. The assignment of title deeds for the land occupied by fishermen beyond the cadastral survey is a problem to be solved. This is a clear indication that the wealth generated in fisheries sector through various developmental programmes has not percolated to the ultimate toilers.

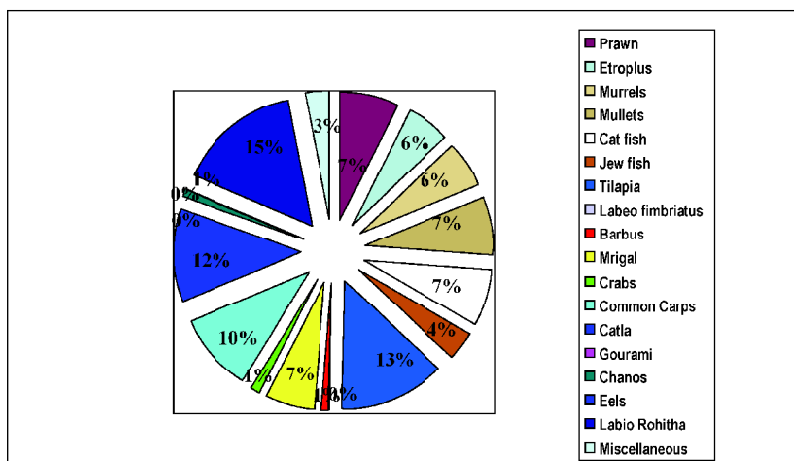


Fig 15.9 : Inland Fisheries, Kollam – Species wise fish landings (2003)

1.2.4 Export

The fishing industry is making priceless contribution to our exports and thus plays a critical role in preserving our foreign exchange reserve. Kollam has a very dominant position among the marine

percent in terms of volume and 18 percent in terms of value to Indian marine products export. Species wise export of frozen shrimp is maximum (38%) followed by frozen Cuttle Fish (23%). Value wise also frozen shrimp is first among other exported

1.4 Pollution Status Analysis

Existing waste generation from Harbour (details of quantity) is given in Table 15.1. The organic wastes from Neendakara Fishing Harbour is collected weekly by certain people and who get it dried, packed and transported to Tutucorin, Mandapam and Rameswaram in Tamilnadu where it is processed and the end products are used in manufacturing fish meal, Chicken feed etc. 2 drying units are working at Sakthikulangara and in the 'Thuruth' near

Table.15.1: Nature and quantity of waste in ports

Sl. No.	Name of Port	Panchayat	Nature of waste		Quantity
			Organic	Inorganic	
1	Neendakara Fishing Harbour	Neendakara	Fish waste, Trash fish, Squilla crab, Prawn waste, jelly fish, echinoderms, Molluscs, Human waste, etc.	Plastic, Net and Gear debris consumable wastes, soil, Shanku and other molluscan shells, gastropod dirty water	2000 Kg per day
2	Sakthikulangara Harbour	Kollam Corporation	- do -	-do-	2000 Kg per day
3	Vady landing centre	Kollam Corporation	Trash fish, Jelly fish prawn dirty water, etc.		100 Kg/day
4	Moothakkara	Thankassery Fishing Harbour			50 Kg/day
5	Thankassery	Thankassery Fishing Harbour			500 Kg/day

Chavara South. The inorganic waste from Sakthikulangara Harbour is washed away and finally reaches in the sea itself. The shanks and other shells from Vady landing centre are washed and packed and transported to Tutucorin where it is used for making ornaments. In case of Thankassery, waste from areas near Collectorate is dumped in the harbour bay. Distribution of no. of water pollution threatening units shows that the concentration is in Kollam Corporation (3 nos.) followed by Munroethuruth (2 nos.).

In case of Fish /Prawn Waste from Industrial Units, Chitosan Plant Neendakara (Under Matsyafed) using Squilla wastes, Prawn waste etc. collected from Harbour / peeling sheds as raw material waste generation is 1000 Kg/ day. Presently the liquid waste is dumped into back waters.

In case of Solid and Liquid Fish /Prawn Waste from Processing Units using Prawn, Fish, Squids etc. as raw materials, waste generation is 2000 Kg/ day/ Unit. Presently the waste is dumped into back waters.

In general as far as pollution aspect is considered, the following inferences are made.

- I The harbour related activities contribute deterioration of coastal water quality and its environment
- I Load of pollution generated from the operation of boats and vessels are tremendous
- I The rapidly expanding aquaculture industry have a number of social and environmental side effects
- I Fish processing units are more prevalent in our mostly littoral state. Like other industrial processes, the fish processing also generates wastes in the form of liquid and solid
- I The liquid waste mainly consists of organic waste like blood, body fluids etc, along with waste from other industries

and solid waste consists of discarded body organs like head of the fish, fins, scales, guts and intestinal parts etc.

1.5 Carrying Capacity Analysis

The carrying capacity is analysed based on potential utilisation in marine, inland and backwaters.

Potential utilization-Marine

As per "Facts and Figures", Dept. of Fisheries, Kerala, 2000, maximum potential yield with in the EEZ (Exclusive Economic Zone) is 3.9 million tonnes of fish. Out of this 2.21 million tonnes is within the continental shelf area, and 1.69 million tonnes is at deep sea. Continental shelf area of Kollam consists of 2170 sq km up to 70 m and 719 sq km within 70-180m. From the above zone, the potential yield is 184000 tonnes and current yield is 95500 tonnes. This means Marine fishing, in particular, deep sea fishing is under exploited.

At the same time there is over exploitation in the coastal belt. Theoretically there are four types of over fishing.

Economic Over fishing (Fishing not economically viable due to operation of more units than required). Even though landings are not adversely affected economic over fishing sets in and then there is a tendency to increase the effort-pressure such as reduction in mesh size and increase the overall dimension of the gear. This situation automatically leads to gradual reduction in the average size of fish/prawn caught.

Size Over fishing - Clashes among different sectors of fisheries and reduction in the average size of fin and shell fish caught are signs of economic and size-over fishing. If size-over fishing is allowed beyond limits such as catching all before they reach the size at first maturity, so as not to give them a chance to spawn at least once, then recruitment – over fishing will

set in and the result would be that there will not be any fishery resources worth mentioning for immediate exploitation.

Growth Over fishing - The redeeming feature of tropical fishery resources is their short life span, fast growth, continuous spawning and high fecundity. That is how the marine fishery resources could withstand the heavy pressure exerted on them, day in day out by, the ever increasing number of fishing crafts and improved methods of fishing. Unless this unbridled growth in the effort-pressure is controlled, there is every chance of depletion of valuable resources.

Recruitment Over fishing - The consequences of excessive fishing pressure on limited resources are the economic over fishing leading to size over fishing, growth over fishing and recruitment over fishing.

The Kalawar Committee, 1980 has, recommended limiting the number of mechanized boats to 1145 to optimise the demersal fish production from the grounds lying between 20 and 50 m depth and to limit the number of motorised crafts in the traditional fishing grounds to between 2,200 and 2,700 for the State of Kerala.

Presently, in Kollam there are about 3144 nos. of motorized and 2620 nos. of non-mechanized crafts are operating. Narrow regions of near shore waters, rich in marine fauna, have been intensively exploited by more than 3000 mechanized boats comprising trawlers, gill netters and purse-seiners. Thus there is clear case of over fishing activities going on in the District. It can be said that we are now in the Growth Over Fishing Stage.

Potential utilization - Inland:

When we analyse potential water resources for fish /shrimp culture which are presently kept idle, it can be seen that both area and number wise, the fish culture paddy which is kept idle (73% and 64% respectively) is maximum. Spatial distribution of total area of ponds kept idle shows maximum no. of ponds kept idle is in Thodiyoor Grama Panchayat (164 nos.) followed by Thazhava (60 nos.). Maximum area of ponds kept idle is also in Thodiyoor Grama Panchayat (247.27acre) followed by Adichanalloor (143.45 acre). In the spatial distribution of Grama Panchayat ponds kept idle, only six LSGIs are there and maximum no. of Grama Panchayat

ponds kept idle is in Thrikkaruva (10 nos.) followed by Kareepra (8 nos.). Maximum area of Grama Panchayat ponds kept idle is in Kareepra (4.35 acre) followed by Thrikkaruva Grama Panchayat (0.61 acre). In the spatial distribution of private ponds kept idle, maximum no. kept idle is in Alappad (49 no.) followed by Thrikkaruva (9 nos.). Maximum area of private ponds kept idle is also Alappad (21.26 acre) followed by Thrikkaruva (1.30 acre). In the spatial distribution of no. of quarry/water holds kept idle, maximum no. is in Kunnathur (16 no.) followed by Pavithreswaram and Pathanapuram (7 nos.). Maximum area of quarry/water holds kept idle is in Pavithreswaram (100 acre) followed by Nedumpna (72 acre). In case of paddy fields, maximum no. kept idle is in Thodiyoor (164 no.) followed by Thazhava (55 nos.). Maximum area of paddy fields kept idle is in Thodiyoor (247 acre) followed by Mynagappally (150 acre).

Overall it can be seen that, there is under utilisation of fresh water resources for inland fish production.

Potential utilization-Backwaters:

In case of backwaters the following observations are made.

- I About 830 Nos. of stake nets and 117 Nos. of china nets are the registered fixed engines in the district.
- I A huge number (more than 3000) of unlicensed china nets are operating in the backwaters of the district.
- I Different types of licensed and unlicensed gears are presently operating in back waters.
- I Encroachments of back water-reclamation of back waters for non-fishery projects are badly damaging the eco system.

It can be seen that there is over exploitation of back water resources.

2. Overall Development Trend

The overall development trend is analysed in both Marine and Inland fisheries sector.

2.1 Marine Fisheries

The trend of development in the marine sector is analysed based on the following criteria.

- I Fishermen Population
- I Fish Landings
- I Export

Fishermen Population

Total fishermen population of the district is steadily increasing (from 94401 numbers in 1998-99 to 99890 numbers in 2003-04).

However the over all active fishermen population of the district decreased from 20531 numbers in 1998-99 to 18428 numbers in 2003-04 as given in Figure 15.11.

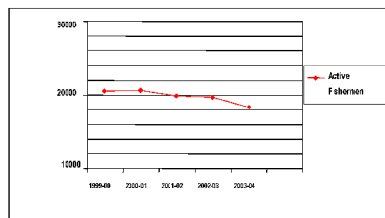


Fig.15.11. : Trend in Marine active fishermen population (1999 – 2004)

Fish Landings

Marine fish landings in the state as well as the district show an increasing trend. In Kollam marine fish landings had increased from 62222 tones to 1,45,911 during the period from 2001-02 to 2003-04 as given in Figure 15.12.

Species of fishes like Elasmobranches, cat fish, anchovies, perches, caranx, mackerel, seerfish etc. show diminishing trend where as over the years Sardine (Chaal) shows an increasing trend in Kerala and in Kollam. Mackerel (Ayala)

shows slightly increasing trend in state as well as district. Prawn shows rather steady trend in state as well as district.

Export

Though the export of marine fish in terms of quantity is increasing in the state, in Kollam the export of marine fish had reduced from 16328 tonnes to 15323 tonnes during the period from 2002-03 to 2003-04 as given in Figure 15.13.

As in the case of state, export of frozen shrimp (maximum exported species) is increasing in the district. However, the value of export in Kollam is increasing from 189.72 crores to 219.826 crores from the period from 2001-02 to 2003-04 as given in Figure 15.14.

In a nutshell, over the years Marine Fisheries Sector shows increasing trend. Specifically,

- I Sardine is increasing, Prawn shows steady trend, Mackerel is decreasing
- I Export quantity is decreasing and Export Value is increasing

2.2 Inland Fisheries

The trend of development in the inland sector is analysed based on the following criteria.

- I Fishermen Population
- I Fish Landings

Fishermen Population

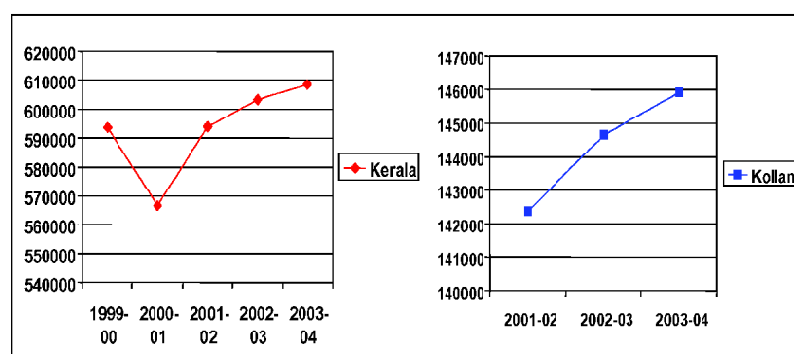


Fig.15.12. : Overall trend of marine fish landings – State and District comparison

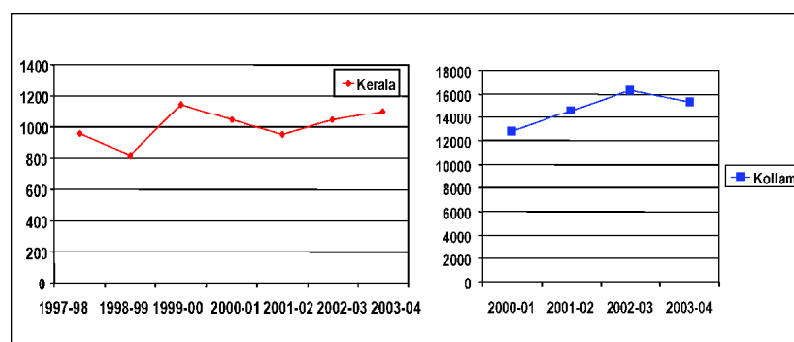


Fig.15.13.: Overall trend by quantity (tonnes) of Marine fish export – State and District comparison

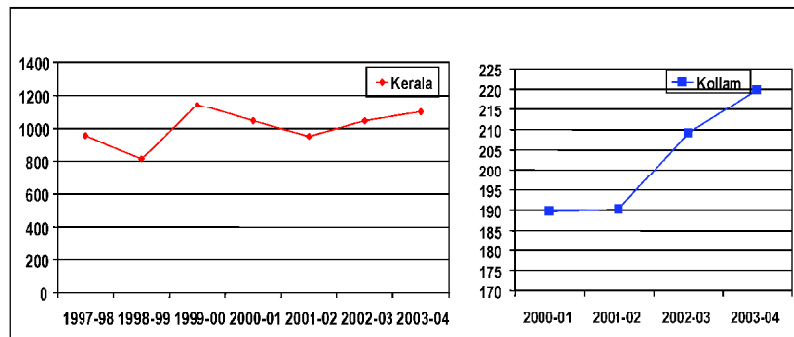


Fig.15.14. : Overall trend of marine fish export by value (crores) – State and District comparison

The total population of fishermen engaged in inland fishing in the district during the period 2000-01 was 35770. This had slightly increased to 36574 during 2002-03.

Fish Landings

Inland fish landings show a declining trend in Kerala and Kollam. In Kollam it had reduced from 10201 to 8997 during 2000-01 to 2002-03 as given in Figure 15.15.

Species wise, Labeo Rohita and Tilapia

- and in Growth over Fishing Stage.
- Foreign vessels sweeps out the entire fishery stock of the deep seas and inshore waters without facing any restrictions which will exhaust the present stock
- No control over construction of new crafts and mesh size of the gears.
- Ineffective KMFR Act implementation
- Lack of marine patrolling
- Stationary gears makes hindrance to the entry of marine fishes towards

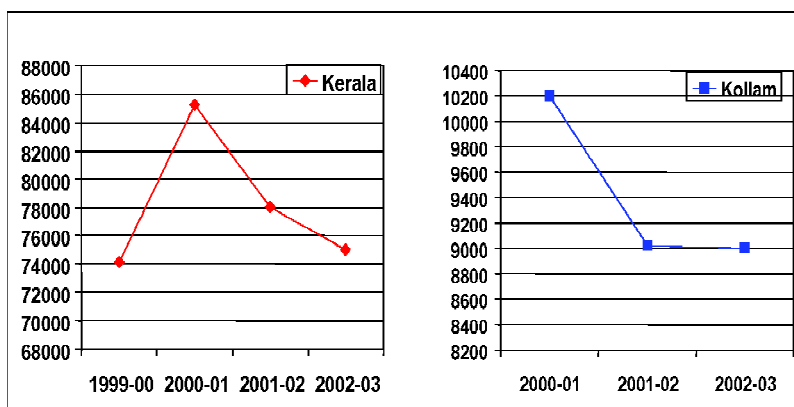


Fig.15.15 : Overall trend of inland fish landings– State and District comparison

show increasing trend where as Prawn and Etroplus (Karimeen) are declining.

Over the years, Inland Fisheries Sector shows declining trend. Specifically

- I Prawn and Karimeen are decreasing
- I Aquaculture species like Labeo Rohita is increasing
- I Tilapia, a natural species shows increasing trend

3. Development Issues

3.1 Problems

3.1.1 Problems - Marine

The main problems associated with marine fisheries sector are as follows.

- Over exploitation of fisheries wealth from inshore (upto 50 – 70 m depth)

- back waters reducing production
- Under exploitation of deep sea resources
- Absence of Coral Reefs

3.1.2 Problems - Inland

Lack of quality fish seed is the major hurdle in the development of inland aquaculture in the district. Other problems include,

- Depletion of fishery resources in inland waters
- Over exploitation
- Lack of a comprehensive inland fisheries act
- No control over construction of new crafts and mesh size of the gears.

- Stationary gears makes hindrance to the entry of marine fishes towards back waters which affect the productivity of back waters
 - Due to continuous tidal effect the depth of the back water is being lost due to silting and sedimentation, which results in poor productivity and dredging is the only solution
 - Spread of fish/shrimp diseases.
 - Depth of water bodies getting reduced
 - Under utilisation of back waters for edible Oyster culture
 - Construction of dams, barriers and their hindrances.
- #### 3.1.3 Problems on Infrastructure Facilities
- As the number of crafts is not regulated, unit craft production is not on the safe side.
 - At present, there is no fuel bunk inside of the harbour for the easy accessibility for the fishermen.
 - No welfare measures for the workers engaged with the craft construction industry.
 - Absence of cold storage facilities in landing centres. At present there is no sufficient cold storage facility for their catching provided.
 - Lack of fish marketing strategies both in inland and marine.
 - No training programme conducted for the workers of the peeling shed for hygienic handling of the product.
 - Lack of usage of GPS in fishing crafts.
 - Annual maintenance of the fishery roads is not regularly conducted.
 - No wage pattern for the workers and technicians engaged in the processing industry.
 - No sufficient diseases monitoring system in the field of brackish water prawn farming suggesting need for PCR Lab.
 - Scarcity of kerosene to satisfy the demand.
 - Shortage of guide lights.
 - Lack of testing facilities for quality shrimp seed.
 - Lack of Coastal Aquaculture Training Programmes.
 - Lack of Coral reefs construction.
 - Training for Fishermen in Scuba diving.
 - Lack of devises for preserving catches using Marine ice.

18. Lack of a Fisheries Research Institute

3.1.4 Socio economic Problems of Fishermen

1. Strengthening of Fishermen Co-operative Societies
2. Lack of employment opportunities for fisher women
3. Lack of insurance – shrimp-fish culture
4. Problems in getting possession certificate for the inhabitants in puramboke area
5. Practicing and propagation of forbidden methods of fishing (Thopum – Padal)
6. Shortage of loan facilities and micro credit
7. Problems in fishermen housing
8. Lack of sea rescue facilities
9. Lack of nurturing of SHGs registered in fisheries sector- Ornamental fish culture
10. Lack of orientation programmes for fishermen in the field of deep sea fishing, organized back water and fresh water aqua culture programmes

3.1.5 Environmental Pollution Problems

1. The fishermen has no responsibility for hygienic management of the landing centres and hence the present unhygienic condition
2. All the landing centres especially in the back waters are in dilapidated condition and requires hygienic standards
3. All the Fish Markets in the District are unhygienically maintained through out the year
4. Shrinking of back water due to sedimentation and human interference
5. Accident prone areas in estuaries due to lack of dredging
6. Environmental and Ecological problems arising due to destruction of mangroves.
7. Pollution hazards in fresh and back water bodies

3.2 Potentials

3.2.1 Marine Fisheries

1. Very high potential for Deep Sea Fishing ie, beyond 200m depth.
2. Construction of artificial reef along coastal waters
3. Scope for the establishment of micro enterprises for value added products and employment of fisher women
4. Development of Ornamental Fisheries

through SHGs

5. Propagation of farming of non conventional varieties clams, mussels, crabs, corals, edible oysters and perl oyster – marine water
6. Potential for mangrove forestation

3.2.2 Inland Fisheries

1. The back waters are not really exploited for its potential for species like Crab, Mussel and Oyster and for Brackish Water Farming.
2. In the field of fresh waters major water bodies are not utilized for pen culture by fishermen group and thus the productivity remains under utilized.
3. Ornamental fish culture is negligible at present and the requirements are currently met from Chennai. There is immense potential - value at rupees more than 750 crores / year - and F.F.D.A has taken the initiation
4. Development of Tourism Fisheries
5. Development of integrated farming practice
6. Development of Reservoir Fisheries

4. Agency wise On going and Committed Projects and Programmes

The major agencies involved in the development of fishing sector are MPEDA, EIA and CMFRI under Central Government and Department of Fisheries under State Government. The other agencies under the State Govt. include MATSYAFED, FIRMA, BFFDA, FFDA, SAF, MATSYA BOARD, COASTAL DEVELOPMENT AGENCY, and HED.

Major activities of the various agencies are as follows. The On going projects and programmes of the major agencies are given in Appendix 15-1.

4.1 The Marine Product Export Development Agency (MPEDA)

1. Schemes for introduction of new technology modernization of seafood industry
2. Schemes for augmenting export production
3. Schemes for development of capture fisheries
4. Development of ornamental fisheries
5. Assistance extended for the promotion of chill fish export
6. Assistance of marketing and market promotion activities etc.

4.2 Department of Fisheries

1. Implementation of KMFR ACT

2. Sea ranching
3. Open water ranching
4. Development of social infrastructure in fisherman inhabited areas
5. Reservoir fisheries
6. Savings cum relief schemes
7. National Fishermen Welfare Fund – Housing scheme
8. Diesel subsidy etc
9. Special packages schemes

4.3 MATSYAFED

1. Developmental Activities
2. Employment Generation Programmes
3. Women Employment Programmes
4. Commercial Activities
5. Welfare Activities
6. Agriculture Activities
7. Extension and Mass Communication Activities

4.4 Fisheries Resource Management Society (FIRMA)

1. Production after estimation program of mangrove
2. Special Programme of Ashtamudi Lake
3. Conservation of fishery resources

4.5 Brackish Water Fish Farmers Development Agency (BFFDA)

1. Brackish water agriculture
2. Mussel / Oyster Farming
3. Seed production unit
4. Training to farmers
5. Subsidy linked assistance

The agency is coming under the control of Jilla Panchayat for implementing various programmes. The chairperson of the agency is the Jilla Panchayat President.

4.6 Central Marine Fisheries Research Institute (CMFRI)

1. The CMFRI is a Central Government fisheries institution located at Cochin, which comes under ICAR, Govt. of India. At present the institute is conducting M.F.Sc course and in-service course to departmental and other NGO personals

4.7 Export Inspection Agency (EIA)

EIA is the agency for providing necessary certificates for exporting items including fish and fish products.

4.8 Fish Farmers Development Agency (FFDA)

1. Fresh water agriculture including Macsobractirum
2. Training to farmers
3. Subsidy linked assistance

The agency is also coming under the control of Jilla Panchayat and the

chairperson of the agency is the Jilla Panchayat President.

4.9 Society For Assistance to Fisher Women (SAF)

1. Women Empowerment programme
2. Welfare activities
3. Vocational training programmes
4. Saving activities

4.10 Kerala Fishermen Welfare Fund Board (MATSYA Board)

1. Group insurance
2. Pension to fishermen
3. Financial assistance to death of fishermen
4. Financial assistance for treatment of chronic diseases
5. Pension to widows of active fishermen
6. Cash award to students
7. Financial assistance of marriage of daughters of fishermen
8. Other welfare measure of fisher folk etc.

4.11 Harbour Engineering Department (HED)

1. Construction of fishing harbours
2. Construction of landing centres
3. Construction of roads and other infrastructure facilities in fishermen inhabited areas

4.12 Coastal Development Agency (CAD)

1. Developmental activities

2. Welfare measures, Housing schemes etc.

5. Evaluation of Ongoing and Committed Programmes

In the case of production in marine sector, problem of over exploitation is controlled by the on going programmes like implementation of trawl ban, Implementation of KMFR Act and Sea Ranching. The issue of foreign vessels sweeping out all the fishery stock has to be strictly taken care of. Presently Beyond 22 Km, there is no control for state Govt. Coast guard is entrusted by Govt. of India for patrolling. Though presently there is no control over construction of new crafts and mesh size of the gear. Provisions are given in fisheries policy –2004 and the State Govt. has to issue proper orders. Though there is KMFR Act and Back water patrolling, marine and Kayal patrolling are not effective which needs to be strictly implemented. Implementation of existing rules in inland waters to solve the issue of stationary gears making hindrance to the entry of marine fishes towards backwaters is ineffective. MPEDA is presently taking care of the issue of under exploitation of deep sea resources. More effective measures are required in this respect. At present there is no scheme for developing

coral reefs.

6. Conclusion

In general the fishing sector is one of the potential development sectors in the district which can be further enhanced by certain location specific corrective measures. The identified problems also have to be tackled. Issues like over exploitation can be taken care of by strict implementation of existing Act, imparting total fishing holiday for a particular period, encouraging deep sea fishing, construction of artificial reefs, control over construction of new crafts and mesh size of the gears, mandatory registration of crafts and gears, cancellation of registration of old crafts (say more then 15yrs) etc. All boat building yards need to be registered with the fisheries dept. and prior permission shall be insisted for constructing new crafts. The issue of stationary gears making hindrance to the entry of marine fishes towards backwaters, can be tackled through people's participation, providing alternate employment to the stakeholders and dredging of backwater for smooth entry of tidal waters. Altogether the fisheries sector with such a high potential in the district has to concentrate on exports with due consideration to resource conservation and fisher folk welfare.



Chapter 16

Industries

This chapter analyses the present scenario of Industrial Sector in the District, which was once renowned for its industrial base. The chapter is structured into four parts. The first part contains the analysis of existing status of industrial sector, the second part deals with the overall development trend, the third part includes the development issues and finally the fourth part briefs the analysis of on going and committed projects and programmes.

1. Analysis of Existing Status

1.1 Physical Status

About 2,76,368 number of industries consisting of both small scale, large and medium industries have so far registered in the state. Out of these, about 10 % of industries (26913 numbers) are registered in Kollam district. The number of large and medium scale industries in the district and state (31 and 719 respectively) is negligibly small comparing to the number of small scale industries. Industries in the district consist of large and medium industries, small scale industries, traditional industries, industries in co-operative sectors and I.T industries. Out of the total industries

registered, maximum number of industries are located in Kollam Corporation (3933 numbers) and concentration of industries are in the coastal belt of the district. The present status with respect to number of workers engaged, value of production and their spatial distribution across all the LSGIs in the District are explained below.

1.1.1 Large and Medium Industries

The large and medium industries registered in the district consist of industries in public and cooperative sector (17 nos)

and private industries (14 nos). The public and co-operative sector consists of 2 central govt. industries, 9 state owned industries, 2 industries in cooperative sector and 4 Public Ltd. Companies. Kundara Grama Panchayat has maximum concentration (5 nos.) of Large and Medium industries (Figure 16.1).

They are generally concentrated in and around the urban centres of the District and follows the major traffic corridors (Figure 16.2). Out of the 17 number of

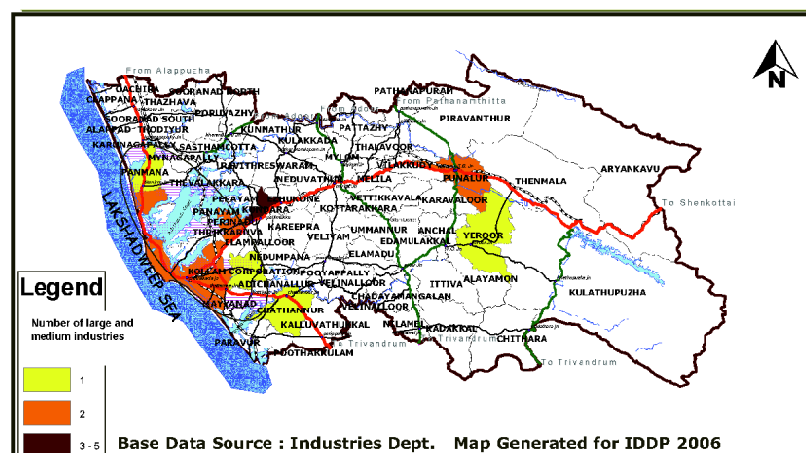


Fig.16.1: LSGI wise distribution of number of large and medium industries

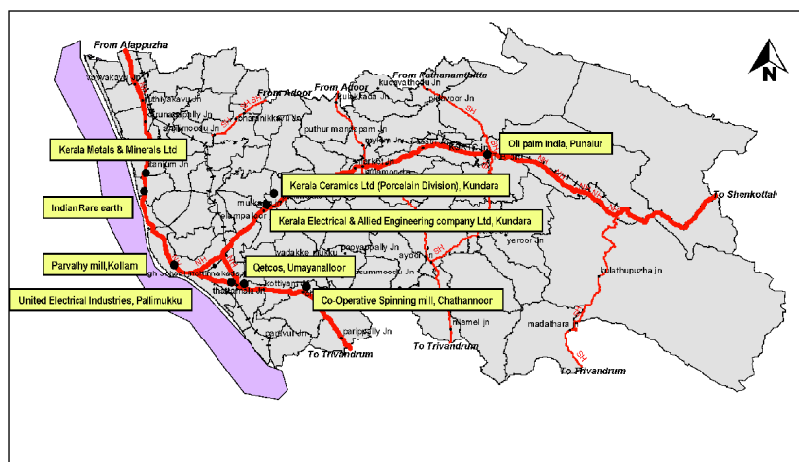


Fig.16.2: Locations of large and medium industries functioning in the district

industries registered as large and medium industries in public and co-operative sector, the number of functioning units is only 9 and the remaining units have closed due to various reasons.

Major Large and Medium Industries functioning in Kollam District are listed in Table 16.1.

nos.) followed by Punalur Municipality (970 nos.). The least number of units are registered in Aryankavu Grama Panchayat (107 nos.). It is seen that concentration of SSI units is generally in urban centres (Figure 16.4.).

Category wise 18% (maximum share) of the total SSI units registered are food

based industries (Figure 16.5). The second largest share is for forest based and engineering based industries (17% each). The share of textile industries is 13%.

As in the case of total number of SSI units, category wise also maximum number of industries had registered in Kollam Corporation. In the case of textiles, rubber, chemical, engineering, electronic and I.T based industries, Punalur municipality is in the second place and in the case of cement based industries Chathanmoor Grama Panchayat comes in the second position. Apart from Kollam Corporation and its west, Rubber based industries are concentrated in the East and South-East portions of the District. Second highest concentration for plastic based industries is in Karunagapally. In Kulathupuzha, Thenmala and Thrikkovilvattom second highest concentration for forest product based SSI units are seen. Agro based industries are concentrated in Paravur municipality other than Kollam Corporation. In general, it may be inferred that SSI units are mainly concentrated in the urban areas and along coastal belt of the district.

The total investment in SSI sector is 11470 lakhs in which 38% of the investments are made in Land and 36% is for plant and machineries. Investment on buildings accounts only 26% (Figure 16.6).

SSI investments made in land are concentrated in Corporation and Kareepra Grama Panchayat and SSI investments made in buildings are concentrated in Corporation area.

In the case of number of exporting units in SSI Sector in the State, Kollam is just below the State Average and stands 7th, compared to other districts. Kollam has a

Table.16.1 : Details of large and medium type industries functioning in Kollam

Sl.No	Name of unit	Location	Product	Annual installed capacity	Total investment in Lakhs	No. of workers
1	United electrical Industries	Pallimukku	Motor, Moto control and gears	30,000 motor, 45,000 motor controls, 45000..	1229.28	4000
2	Qetcos	Umayanallor	Lathe Machine	300 no's	100	100
3	Parvathy mills	Kollam Corporation	Mill cloth	25000 metres	831.68	1327
4	Co-operative spinning mill	Chathanmoor	Cotton yarn	24960 bundles	933	750
5	Kerala Electrical and Allied engineering company Ltd	Kundara	Alternators, castings, grade castings	1100 No of alternators 1500 metre of castings	127.8	500
6	Kerala ceramics ltd (Porcelain Division)	Kundara	Ceramic plates, Bowls etc.	Not available	1032	250
7	Oil Palm India	Punalur	Crude plam	40000 mt	2500	890
8	Indian Rare earths	Chavara	Ilmenite, Rutile, Sillimanite, Zircon etc.	2 Lakh MT	500	1500
9	Kerala Metals and Minerals	Panmana	Titanium dioxide pigment	40000 MT	6500	2000

1.1.2 Small Scale Industrial Units

The total no. of registered SSI units in the district is 26882 which are about 10% of total SSI units in Kerala. Kollam stands in the 5th position compared to other districts as shown in Figure 16.3. Ownership of about 97 % SSI units registered is proprietary. Out of the total registered units 22% are closed units. Among the working, 3% have registered as sick units and among the sick units only 31% is revived.

Maximum number of SSI units is registered in Kollam Corporation (3631

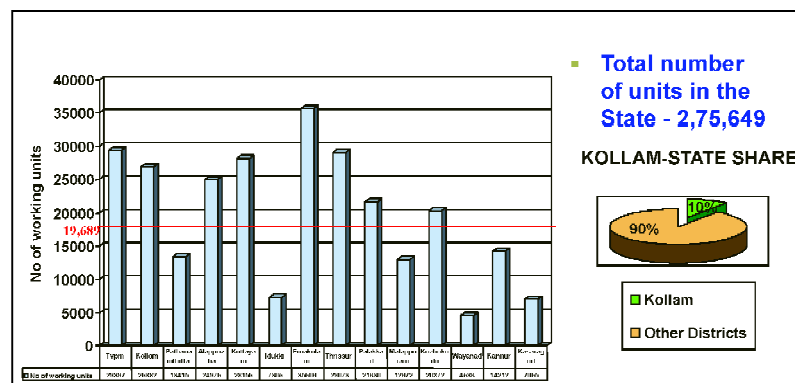


Fig.16.3: Registered SSI units – comparison with other districts and share of Kollam



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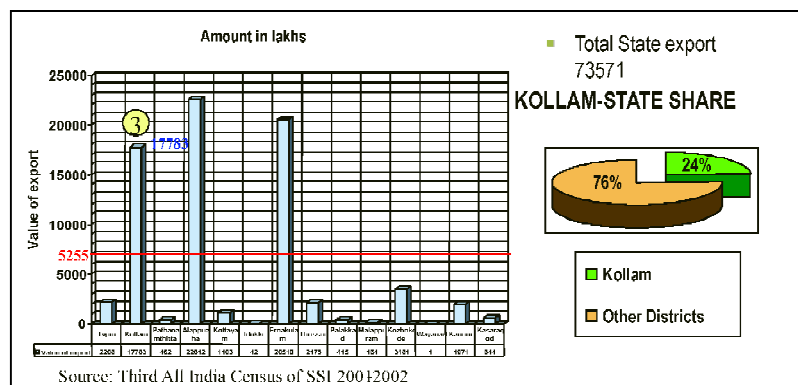


Fig.16.8: Export value in SSI sector-Comparison with other districts and share of Kollam



Handloom unit - Paravur

units are concentrated in Kollam Corporation (24 nos.) followed by Mayyanadu Grama Panchayat (12 nos.) where as the co-operative handloom units are concentrated in the Corporation (5 nos.) followed by Chathannor Grama Panchayat (3 nos.) as shown in Figure 16.9.

1.1.3.2 Coir

There was a past golden era for coir industry in Kollam District but today these industries are under severe crisis and struggling for existence. About 50000 families in the District are living depending upon this Industry. This industry is mostly concentrated in the coastal Grama Panchayats under both Co-operative and private sectors. The LSGIs having focus on coir industry are Grama Panchayats of Thrikkaruva, Thrikkadavoor, Manroe Island, Chavara, Panmana, Karunagappally and Paravoor Municipality. There are 120 coir Co-operative societies and 3567 private coir manufacturing units within the district.

All the coir co-operative societies registered are not fully functional at present due to various reasons. Only 70 units are (that too partially) operational. Maximum concentration of co-operative societies (15 nos.) is in Thrikkaruva Grama Panchayat.

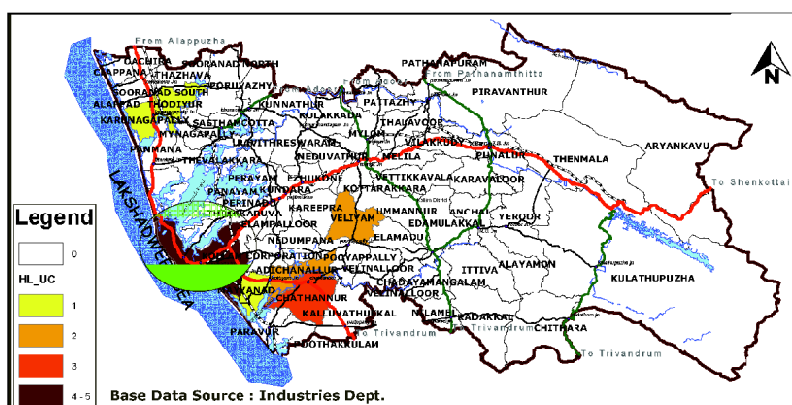


Fig.16.9: LSGI wise distribution of handloom (Co-operative) industries

Remaining units are almost evenly distributed along the coastal belt and the Ashtamudi Kayal region of the district (Figure 16.10).

The total production of coir co-operative societies is 5224 Quintals with maximum production in Thrikkaruva and Panmana Grama Panchayats (860 Quintals each) followed by Kollam Corporation. Total value of production in coir co-operative sector is 1619 Lakhs. Though Thrikkaruva Grama Panchayat is producing maximum quantity of coir, maximum revenue is generated in MunroeThuruth Grama Panchayat (725

lakhs). The total investment in coir co-operative sector is 1132 Lakhs with maximum in Panmana Grama Panchayat (290 lakhs) followed by Thrikkaruva G.P (200 lakhs).

Out of 3567 private coir units in the district, Manroe Thuruth Grama Panchayat has maximum concentration of 670 nos. Remaining private coir units are more or less concentrated along the coastal belt and Ashtamudi Kayal region. Against 5224 Quintals of production in coir co-operative sector, the total production of private coir units is 29810 Quintals which is about 5

times higher. As in the case of coir co-operative societies, maximum production is in Thrikkaruva Grama Panchayat (7750 Quintals) followed by Kollam Corporation. The investment in private coir manufacturing sector is 2148 Lakhs with maximum investment (395 lakhs) in Panmana Grama Panchayat. Percentage of coir workers show that 63% is in private sector and 37% in co-operative sector. Out of 45710 workers in private sector Munroe Thuruth Grama Panchayat has max. concentration (3355 nos.) followed by Thevalakkara and Chavara. Out of 26757 workers in Cooperative sector

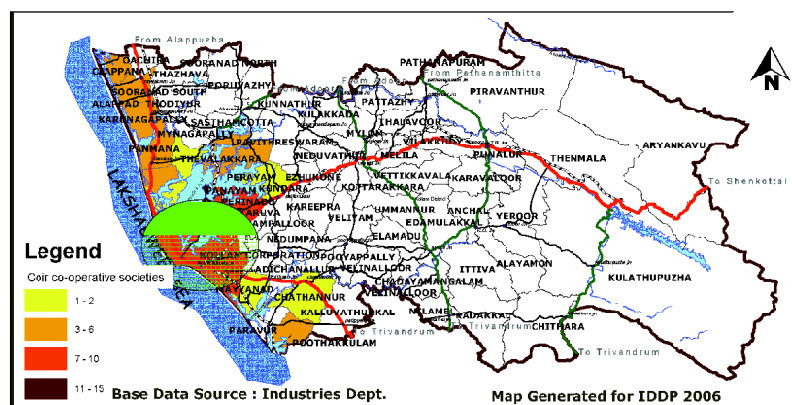


Fig.16.10: LSGI wise distribution of Coir co-operative societies

Thrikkaruva Grama Panchayat has maximum concentration (4888 nos.) followed by Perinad and Panayam. The coir workers are more or less concentrated along the coastal belt and Ashtamudi Kayal region.

1.1.4 Cashew Industries

The processing activities of Cashew Industry of Kerala are almost centralized in Kollam. About 2.5 lakh workers are employed in about 500 cashew factories in Kollam District. There are two major Government undertaking under cashew sector viz. The Kerala State Cashew Development Corporation (KSCDC) established in 1968 and cashew workers Apex Co-operative Societies (CAPEX) established in 1984. There are 70 cashew factories under KSCDC and 10 under CAPEX. Among the export of Agricultural Commodities, cashew ranks third in the Country.

50% of raw cashew nuts are produced in Kerala and 50% is imported from various African Countries such as Ivory cost, Ganiabasavo, Khana and Nigeria. Average value of imported cashew per year is Rs. 1400 crores. Although export of cashew Kernels is increasing fast we are pushed back in raw cashew production. Total number of cashew processing industries in the district is 411 in which 377 units (91%) are in private sector, 27 units in Public sector and 7 units in the Cooperative sector (Figure 16.11).

Maximum number of cashew based industries are concentrated in Kollam Corporation (59 no.). Generally cashew industries are concentrated in the mid land region especially in those Grama Panchayats along the side of NH 208 (Figure 16.12).

1.1.5 Khadi Units

Khadi and Village Industries Board have a major role in the Industrial Development of Kollam district. There are 1672 Khadi units in the district. Out of the total Khadi units, maximum share (27%) is for Food based industries followed by Mineral (19%) and Agro-Forest based industries and engineering based industries (17% each) as shown in Figure 16.13.

Maximum number of Khadi units, irrespective of types of industries, are concentrated in Kollam Corporation (154 no.) followed by Chavara Grma Panchayat

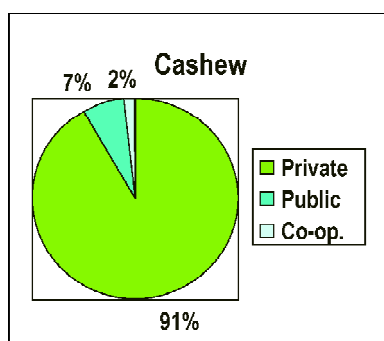


Fig.16.11. Sector wise percentage of cashew processing industries

(102 nos). Generally Khadi units are concentrated in mid land region (Figure 16.14). Category wise, maximum number

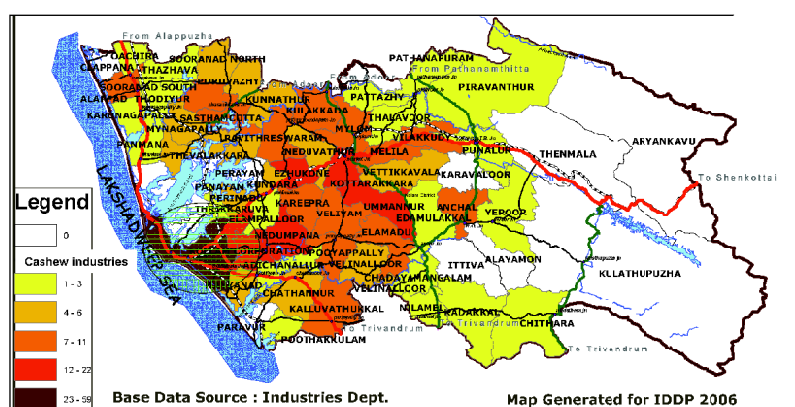


Fig.16.12: LSGI wise distribution of cashew industries



Khadi industry - Thazhava

of mineral and food based Khadi industries are concentrated in Chavara Grama Panchayat and textile based Khadi units are in Thazhava Grama Panchayat. All other categories of Khadi units are concentrated in Kollam Corporation.

1.1.6 Industries in Co-operative sector

In co-operative sector of the district, 261 industries including 231 units in the general category and 30 handicraft units are registered. However the number of units that are functioning is only 127 (47%). 29 units are yet to be started and remaining units are either under the process of liquidation or not functioning due to various reasons.

Among the working units Kollam Corporation has maximum concentration of 28 numbers. Remaining units are unevenly distributed in the West and Central region. However the pattern of distribution generally follows traffic and railway corridors (Figure 16.15).

Among the working industries in co-operative sector 26 units are run by SC/ST categories and 33 by women. The remaining units (68 nos) are in the general category. This means that 46% of the Industrial co operatives are for the weaker sections (Figure 16.16). Co-operative societies run by SC/ST category are maximum in Clappana (5 no.) followed by

Kottarakkara and Thazhava (3 no each.). In the case of co-operative societies run by women, maximum concentration is in Kollam Corporation.

1.1.7 Industries in I.T Sector

In Kollam I.T sector is not flourished so far. About 40 number of IT units are registered in the district. Besides Government has started an IT park at Kundara. However the district is selected for propagating Akshaya projects in the state. About 166 number of Akshaya projects have been opened in the district, of which the maximum units are in Kollam Corporation. Generally urban areas accommodate more number of units (Figure 16.17).

1.2 Economic Status

The share of secondary sector in the NSPD of the district is 23%. The corresponding share of state is 22%.

The share of secondary sector in the Net State Domestic Product of both Kollam district and state are steadily increasing.

During 2004 -2005, the share of Kollam District in the secondary sector of the State is 8%. In the secondary sector of the

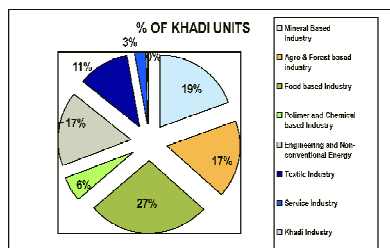


Fig. 16.13: Percentage of Khadi units by type

district, the maximum share of NSDP (40%) is from manufacturing sector which is 10% more compared to the state. Out of the total share of NSDP of manufacturing sector in

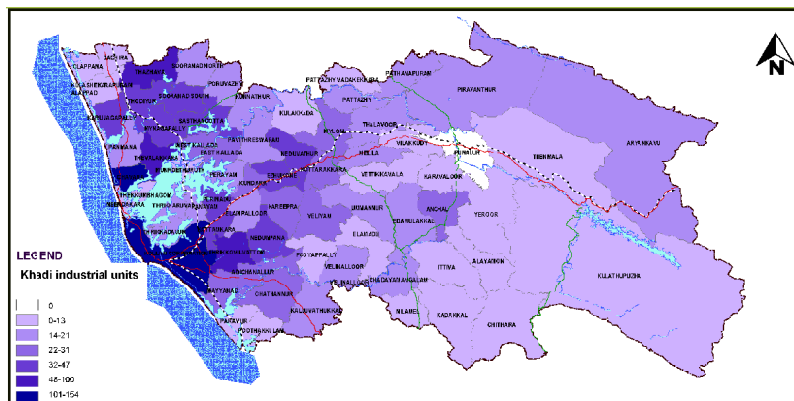


Fig.16.14: LSGI wise distribution of total number of Khadi industrial units

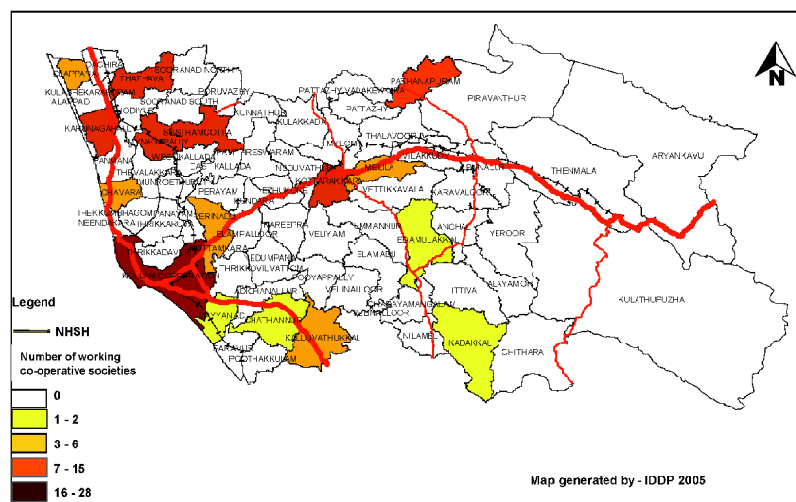


Fig.16.15: LSGI wise distribution of Number of working co-operative societies

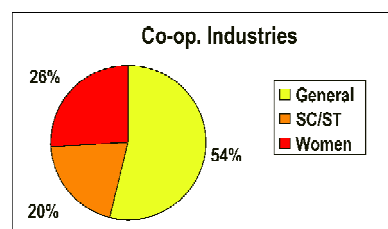


Fig.16.16: Category wise percentage of co operative industries

secondary sector of state, 11% is that of Kollam.

However, the share of manufacturing sector in the State shows a steady trend after a drastic fall, while Kollam district shows a declining trend after steadying for the last two years.

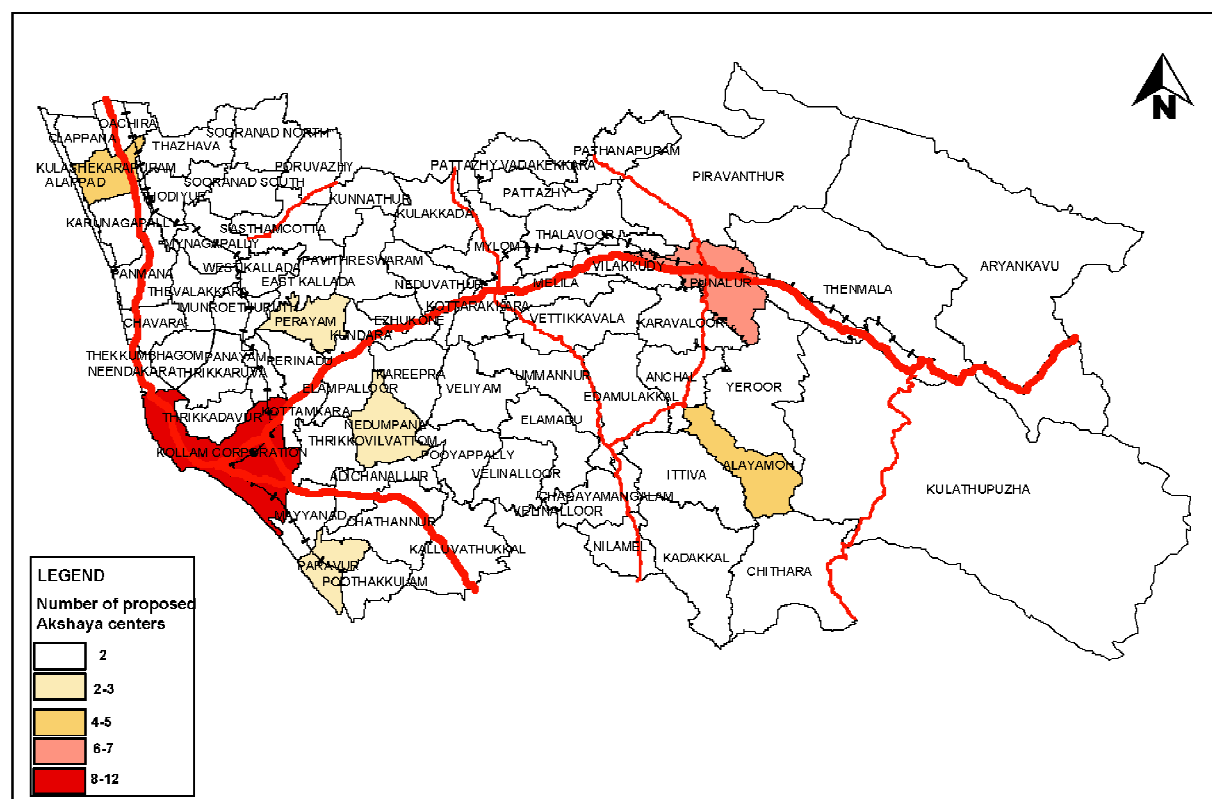


Fig.16.17: LSGI wise distribution of number of proposed Akshaya centers

1.3 Social Status

Household industrial workers constitute only 2% of the total workers. However there can be a good percentage of industrial workers in the 81% other workers.

Workers trend over the years show that the number of household industrial workers increasing in 2001 after a sharp decrease in 1991. While other workers show a steady increasing trend in the previous years.

Except I.T sector (Data on workers not available) the total number of workers in the industrial sector is about 3,20,433 in which the major share is that of traditional industries employing about 2,68,366 workers. Among the traditional industries cashew industries provide the maximum employment of 1,68,371 immediately followed by coir sector with 72467 employment including 26757 workers in coir co-operative sector. Thrikkaruvu Grama Panchayat has maximum concentration of workers (4888 nos.) in coir co-operative sector followed by Perinad and Panayam. Corporation has max.(30825 nos) number of Cashew workers. Cashew industries are more or less concentrated in the mid land region especially in the Grama Panchayats along NH 208.

The number of workers in Khadi sector is 17928 and that of handloom is about 9600. The maximum number of Khadi workers is in Chavara Grama Panchayat.

Employment opportunities in SSI sector of the district is 40250 which is below the state average and stands 10th among the Districts. Kollam has a share of only 4% in the employment in SSI sector in the state. Out of the total workers in SSI sector in Kollam 78% are male. The share of unskilled workers in the total workers in SSI sector is 37% where as that of skilled workers is 39 %. In the case of large and medium industries the total workers engaged is 11317 and in the co-operative sector about 500 workers are engaged. Thus on analyzing the social aspects of industrial sector it is found that out of the total workforce of the district about 39% of workers are from industrial sector.

2. Overall Development Trend

Analyzing the trend of number of SSI units it is seen that there is steady decline in the agriculture, food, fisheries and animal

husbandry based industries (Figure 16.18). In the case of fisheries and Animal Husbandry based industries, the number of new registrations had declined to nil by 2004.

It is seen that there is steady decline in the plastic, forest, and textile based industries also. In the case of forest based industries, registration of unit had declined to nil by 2004. The number of registrations of rubber based industries increased during 2002-03 to 2003-04 but came down by 2004-05.

It is seen that there is steady decline in chemical, engineering and cement based industries. In the case of cement based industries the number of registrations has declined to 6 by 2005.

It is seen that there is steady decline in the number of building material, bricks and

tiles, minerals and other industries (Figure 16.19). In case of minerals based industries the number of registrations has declined to nil by 2004.

Electronics units increased during 2002-03 - 2003-04, but came down by 2004-05 to a mid range. So far, the only industry which has shown increase over the last four years is Information Technology based. However such industries constitute only 1% of the SSI units in Kollam. It is also showing a declining trend as of lately (Figure 16.20).

It is seen that there is an average Growth Rate of 26% from 2001 to 2005 which is not a good sign of development (Table 16.2). Also major categories like Agricultural, Forest, Animal Husbandry and Fishing are showing a growth rate below 10%. A positive trend is shown by IT based

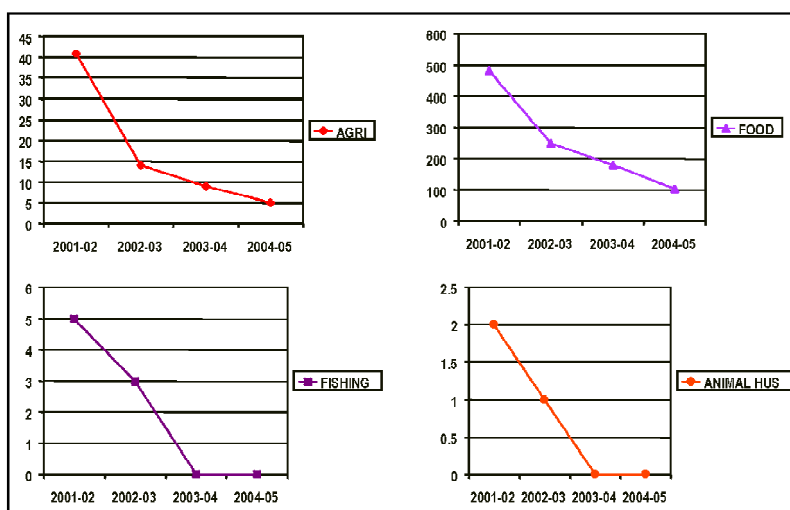


Fig.16.18: Trend in number of agriculture, food, fisheries and animal husbandry based SSI units

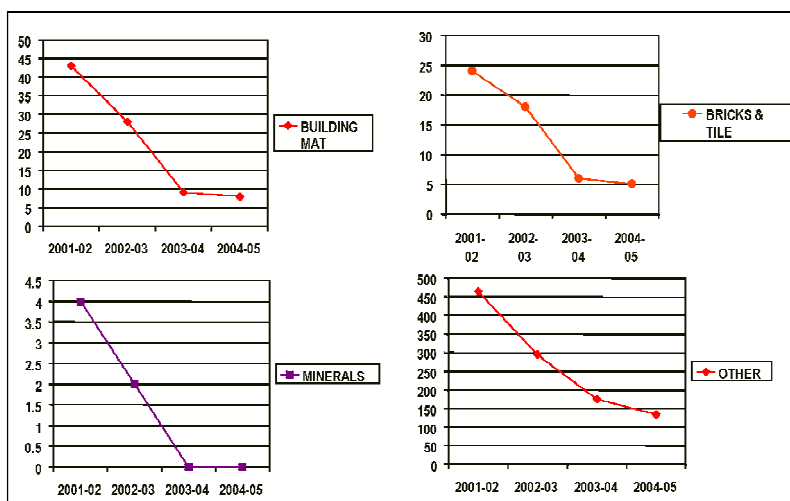


Fig.16.19: Trend in number of building material, bricks and tiles, minerals based and other SSI units

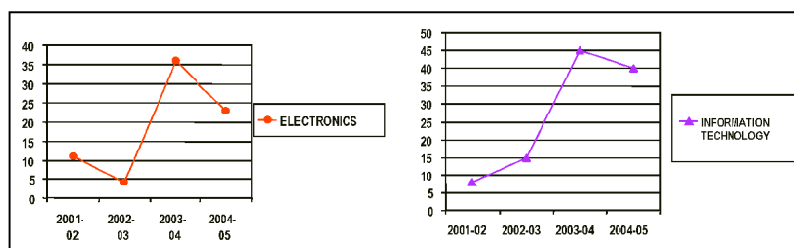


Fig.16.20: Trend in number of Electronics and Information Technology based SSI units

and other industries. However other categories are declining steadily.

By 2003-2004 there is considerable reduction in Production value of Handloom cloths with Kalluvathukkal coming down to the level of Corporation and Paravur Municipality.

Hence considering all the above it can be generally assessed that there is a declining trend as far as the industrial sector of the district is concerned.

3. Development Issues

3.1 Problems

The development problems identified in different types of industries are briefly described below.

SSI Units

Closure of SSI units

The working of existing SSI units in general in the district is not satisfactory. Statistics shows that 22 % of the SSI units in the district are either closed or not working. Out of the closed units only 50 % can be revived either by the effort of the entrepreneur or by the assistance of government. The remaining units are closed for ever resulting in wastage of huge

investments made in land, building and machineries. A number of units are struggling hard for existence 3% of such units are registered as sick. Among those sick units only 31% can be revived. The reason for the closure and sickness is mainly marketing problems, change of technology, high cost of production and high interest rate of bank loans.

Concentration of SSI units

It is a general phenomenon that the SSI units are generally concentrated in urban centers and along major traffic corridors. The reasons are spatial disparity of rural areas, lack of awareness of schemes and incentives and lack of entrepreneurs who can invest in industries.

The geographical structure of an area also attributes to concentration of certain type of industries in a particular locality.

1) Agro based Industries

The concentrations of agro based industries are very low in eastern belt of the District. The number of agro based industries in Aryankavu Grama Panchayat is very negligible i.e. only 2.

Spatial disparity of rural areas,

improper resource utilization, lack of storage facilities and lack of working capital are the reasons for this trend. Also as per Article 1.1 of Chapter 20A; Forest, Piravanthur, Kulathupuzha, Thenmala and Aryancavu are covered by forest land.

2) Food processing units

In the case of food processing industries the picture is as the same as agro based industries. The number of units in Aryankavu Grama Panchayat is only meager.

The reason for this is more or less same as above. In addition, lack of awareness of the various schemes of the government departments and agencies among entrepreneurs and management issues are also problems.

3) Plastic based industries

The number of plastic based industries is very meager in eastern belt compared to other urban centres. Huge investment and lack of potential entrepreneurs in rural areas are the main problems.

4) Forest based industries

New wood based industries are not being registered in the district for the last 3 years due to the ban issued by the Supreme Court. So, there is a general declining trend in the case of Forest based industries not only in Kollam District but also in the state as a whole. This is also evident from the declining commercial and industrial production of forest resources as per Article 2.1.1 and 2.1.2 of Chapter 20A; Forest.

5) Animal Husbandry based units

Eastern belt shows a declining trend in the case of Animal Husbandry based units. Spatial disparity of rural areas and lack of utilization of innovative techniques in processing are the main reasons for this scenario. Also as per Article 3.1 of Chapter 14: Animal Husbandry, the Animal strength compared to land availability is much lower in the eastern belt.

6) Textile based industries

Irrespective of the geographical area textile based industries show a declining trend through out the District. Improper marketing, unhealthy market competition lack of working capital and management issues are the problem identified.

7) Chemical based industrial units

Eastern areas of the district show a very low number of such industrial units. The growth rate of Chemical based industrial units is 25 %. Spatial disparity of

Table.16.2: Category wise growth rate of SSI units

SL.NO	CATEGORY	NO. OF UNITS REGISTERED - 2001	NO. OF UNITS REGISTERED - 2005	GROWTH RATE
1	Agricultural based	955	1024	7.23
2	Food Processing	2840	3854	35.7
3	Rubber based	289	346	19.72
4	Cement based	314	426	35.67
5	Plastic based	238	273	14.71
6	Forest product based	3638	3656	0.49
7	Animal husbandry	172	175	1.74
8	Textile based	1955	2757	41.02
9	Chemical	988	1235	25
10	Engineering	2993	3582	19.68
11	Electronics	269	343	27.51
12	Minerals	189	195	3.17
13	Building materials	355	443	24.79
14	I.T Based	156	264	69.23
15	Bricks and Tiles	361	414	14.68
16	Fishing Industry	113	121	7.08
17	Others	576	2059	257.47
	TOTAL	16728	21077	26

rural areas, high capital investment and pollution problems are the main reasons.

8) Engineering based units

Growth rate of engineering based units is also very low in the Eastern belt of the District ie, only 19.68 %. Power shortage, lack of involvement of banks, high cost of raw materials, lack of skilled workers and lack of working capital are the main reasons.

9) Electronic based industrial units

The number of such units are also very low in eastern areas of the district besides showing a declining trend. The growth rate is only 27.51 %. Spatial disparity of rural areas, improper marketing and low profit generation are the main reasons for this state of affairs.

10) Mineral based industrial units

The growth of such units shows a declining trend through out the district. High capital investment, changing technology and restrictions imposed etc. are reasons for this trend. As per Article 2 of Chapter 20 C, there is declining trend for heavy mineral extraction in the district.

11) Building materials based industries

Eastern belt shows a low number of industries. The growth rate is only 24.79 %. The main reasons for this trend are, power problem, crusher unit management issues and labour problems.

12) Bricks and Tiles manufacturing units

Coastal belt shows a declining trend. The growth rate is only 14.68 %. Shortage of raw materials; lack of working capital, management issues and lack of skilled workers are the main problems faced by this category. As per Article 1.1.2.10 of Chapter 20C.; Mining and Geology, there is availability brick clay in the northern and southern parts of the district and as per Article 1.1.2.12, there is availability of

laterite in the area immediately towards east of coastal belt. Further with respect to revenue generation, there is increasing trend from the previous year for Brick clay, laterite and granite as per Article 2 of Chapter 21.B Mining and Geology.

13) Fish based industries

The number of such units in eastern belt is very low which is quite natural. However the growth rate in general is only 7.08 %. Reduction of catches in inland and pollution are the main problems. As per Article 2.1 of Chapter 15: Fisheries, there is declining trend of active marine fishermen population. As per Article 2.2 of Chapter 15, there is declining trend on inland fish catches. Further as per Article 2.2 of Chapter 15, there are pollution issues persisting in the fisheries sector.

In general the critical LSGIs as far as SSI units are considered are Aryankavu, Edamulakkal, Anchal and Yeroor (Figure 16.21).

Large and Medium Industries

The major problems identified are lack of working capital, management issues, labour issues, improper resource utilization, improper marketing, lack of involvement of financial institutions, changing technology, unhealthy market competitions and power shortage problems.

Handloom

The handloom sector in this District is facing crisis for the last several years. The efforts made by the State and Central Government to save the Industry have not succeeded yet. There are 38 handloom societies in the District with a total membership of about 9000. Out of the above the number of workers actually engaged in weaving is only below 1000. There is considerable reduction in

Production value of handloom cloths. Over the period of 4 years the production value came down to negative growth rate.

The major problems identified are low volume of sales of handloom cloths, huge stock of finished goods in the societies resulting in the blockage of working capital, non adoption of modern designs, production of conventional type of fabrics only such as Kaily, Mundu, Thorth, etc., lack of working capital, workers not getting regular employment, huge cash credit arrears by the societies with District Co-operative Bank, delay in getting rebate from Government, scarcity of expert weavers, huge ESI/PF arrears due by the societies, managerial inefficiency of the Board of Directors, dropout of weavers from handloom sector due to low wages, lack of production of export oriented items and unhealthy market competitions (from power loom sector).

Coir

One of the major traditional industries of Kollam is Coir industry. About 50000 families in the District are living depending upon this Industry. There are 120 coir co-operative societies registered in the District out of which only 100 are working. The major problems faced by this industry are stiff competition from neighboring states, import of artificial yarn from Sri Lanka., import of coir fiber from Pollachi, non utilization of the husks, retting of husk by scientific method not proved to be successful, high cost of production of yarn, huge stock of yarn held by Marketing Federation, failure of de-fibering mills at Nedungolam and Kuzhiyam, mis-utilization of funds, inefficient management of the societies (Committee members of the societies are generally sympathizers instead of workers), scarcity of raw material (Coconut Husk), non-availability of fine quality fibre, lack of working capital, scarcity of expert workers in spinning, low wages and lack of training to workers. Also as per Article 3.1 of Chapter 11; Agriculture, there is no well-developed procurement and marketing system for coconut.

Cashew

The major problems faced by this industry are shortage of raw materials, labour issue, lack involvement of financial institutions, changing technology, market competitions (from foreign countries), low outturn and lack of training to workers. This

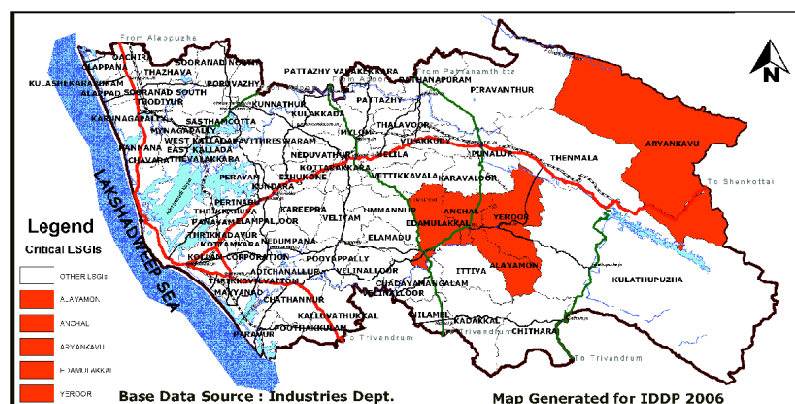


Fig.16.21: Small Scale Industries – Critical LSGIs

is also emphasized in Article 3.1 of Chapter 11; Agriculture, while stating that over the past twenty years, there has been a sharp decline in the area, production and productivity of cashew both at the state and at district levels, leading to stagnation of cashew industry.

Khadi

The major problems faced by this industry are improper resource utilization, improper marketing and lack involvement of financial institutions, changing technology and unhealthy market competitions.

Industrial Cooperatives

Total number of Co-operative Societies registered is 261. Out of this working societies are 127. Though there are about 7800 members in the working societies, the number of members got employment is only around 500. Most of the societies registered are either dormant or not started work. The major problems facing this industry are management issues, low volume of production, lack of working capital, improper resource utilization, lack of effective supervision, improper marketing, and lack involvement of financial institutions and changing technology.

3.2 Potentials

1. There is ample scope for starting new industries where infrastructure facilities are provided by Jilla Panchayat. 30 new units with a project cost not below Rs. 5 lakhs each can be started in the following Mini Industrial Estate already constructed and ready for allocation.

I Thalavoor.	10 Units.
I Piravanthoor	10 units
I Pooyappally	10 units.
2. The newly inaugurated Marketing Complex near Karbala Junction, Kollam by District Panchayat can be utilized for the sales of products manufactured by SSI units in this District.
3. The black sand available in plenty in the costal areas of Chavara, Panmana and Karunagappally can be scientifically utilized for starting new ventures in SSI sector.
4. Kollam District has some deposit of clay which can be utilized for manufacturing glazed tiles and sanitary equipments. As per Article 3.2 of Chapter 21 B; Mining and Geology the existing quantum of China clay in the district is sufficient for the smooth functioning of the existing Clay industries at least for another decade with the present status of extraction.

5. At present there is a tendency to avoid the use of artificial and chemical products to keep environment pollution free. These opportunities can be utilized by us by manufacturing products of Coir, Handloom, Screw pine Mat, Bamboo, reed etc; These eco friendly products can attract foreign market.
6. The Eastern parts of Kollam is abundant in the production of Rubber. The possibility of starting rubber based industries in these areas shall be explored.
7. The District is blessed with the presence of small islands in Ashtamudy Lake which provides ample potential for Tourism Industry. By the development of tourism a proportional progress in handicrafts sector also can be expected.
8. At present the coconut shells are being utilized as fuel. This can be utilized for industrial purpose. Government agencies like SISI, DIC, KINFRA etc; shall give technical advice to interested entrepreneurs.
9. The scope for starting new SSI units for the manufacture of milk based products is very high in this district.
10. Cluster Development Programmes can be developed in food processing, wood based industries, clay based industries, dairy, bamboo based products etc.

4. Agencies Involved and their Activities

1. District Industries Centre, Kollam
 - a. Implementation of State Government and Government of India Schemes.
2. Commercial Banks in Kollam District.
 - a. Distribution of loan to SSI units.
 - b. Distribution of loans to self employed youth for starting new service/business/ industrial units.
3. Kerala Financial Corporation, Kollam.

Distribution of loans to setting up of SSI units.
4. District Panchayat, Kollam
 1. Distribution of financial assistance to Kudumbasree and SHG Group for starting SSI units.
 2. Providing infrastructure for starting new SSI units
 3. Conducting training programmes and exhibitions.
 4. Financing coir co-operatives
5. Kerala Khadi and Village Industries Board.
 1. Distribution of loan and subsidy for starting new SSI units.

2. Establishment of Khadi production units at various parts of the District.

6. Small Industries Service Institute- Trissur.

Providing technical know how, training etc, to entrepreneurs.

7. Kerala State Small Scale Industries Association- Kollam.

Taking up the problems of industrialists before District Industries Centre, Government etc. and helping them to solve the problems.

8. Hantex

Marketing of Handloom products.

9. District Co-operative Bank, Kollam

Financing Handloom Societies.

10. Handloom Development Committee

Organizing Handloom Exhibition.

11. Handloom workers Welfare Fund Board

Distribution of pension, scholarships and the other assistances to handloom workers.

12. Coir Project Office, Kollam

The main activity is implementation of state Government and Central Schemes

13. Coir workers Welfare Fund Board – Alappuzha

Implementation of welfare schemes of coir workers such as disbursement of pension and other assistances.

14. Coir Board Ernakulam

Research and Development in Coir Sector

15. Kollam District Co-operative Bank.

Financing coir Co-operative societies and SSI units under coir Sector

5. Ongoing and Committed Projects and Programmes

5.1 Large and Medium Industries

Qet-cos Umayanalloor: A proposal for the establishment of Tool Room with the assistance of Government of India with an investment of Rs.9 crores is pending with state Government.

5.2 SSI Units

Projects and programmes in SSI sector are implemented through District Industries Centre, Kerala Khadi and Village Industries Board and Kollam District Panchayat. The ongoing projects and programmes under these agencies are given in Appendix 16 - I. The details are given as follows.

1. Cluster Development Programme

Objective: This scheme envisages the formation of product specific clusters of industrial units which involve the creation

of common corporate entities. Such entities can take up activities like bulk sourcing of raw materials, mutual credit guarantee for sourcing loan, common brand creation, marketing, common facility service centers, quality testing facilities etc and thereby enjoy economics of production and contribute to economic development.

Achievements: In Kollam following clusters are identified and the formation is in progress.

- Cashew cluster – Kollam corporation
- Bamboo and Reed - Pathanapuram
- Garments - Kollam and nearby Grama Panchayats
- Wood based Industries – Punalur
- Clay based Industries – Kottarakkara

2. Sick Unit Revival Programme

Objective : This scheme is proposed to provide assistance to potentially viable but sick units for rehabilitation. A unit will be regarded as potentially viable if it can sustain profitability by implementing the relief packages over a predetermined time frame.

Achievements: 35 units have been identified and registered as sick out of which assistance under the scheme was distributed for 22 units for the revival.

3. State Investment Subsidy

Objective: The Scheme is for providing subsidy on investments made by small scale units. Units are eligible for subsidy when new units are established and also when existing units undertakes expansion, modernization and diversification. Such units are eligible for 10 to 15% subsidy for their investment in land, building and machinery.

Achievement: During 2005-06 an amount of Rs. 5005250/- was disbursed to 54 Industrial Units.

4. Margin Money Loan (MML)

Objectives: All new registered SSI units other than those categories of industries specifically excluded by Government shall be eligible for assistance under this scheme. The scheme is to assist deserving entrepreneurs in setting up of new small scale Industrial units by way of loan to raise the required equity insisted by financial institutions. Rupees 2.5 lacs will be the maximum limit of MML.

Achievement: During 2005-06 an amount of Rs. 1.225 Crores was disbursed to 100 units for establishing new industrial units.

5.3 Traditional Industries

5.3.1 Handloom

Projects and programmes in Handloom sector are implemented through District Industries Centre, Hantex and Handloom Development Committee, Kollam. Ongoing Projects and Programmes under these agencies are given in Appendix 16 - I. The details are given below.

1. Government Share Participation (GSP)

Objectives: There is provision for granting Government Share Participation to Handloom Co-operative Societies for working capital purpose and also for creating fixed assets. There are three types of Handloom Co-operative Societies (1) Primary Handloom Societies, (2) Factory Type Handloom Societies/ Societies with collective weaving centre/ work shed established by NCDC and (3) SC/ST Handloom Societies.

As per the latest rule 1st category of societies are eligible for GSP @ two times of the fully paid up share capital collected from members. In the case of 2nd category, maximum limit is 3 times of the fully paid up share capital collected from members. In the case of SC/ST societies maximum limit is 5 times of the fully paid up as share capital from members.

Achievement: During 2005-06 an amount of Rs. 2,69,500/- was disbursed to 4 Handloom societies.

2. Modernization of factory type HWICS

Objective : This Scheme is intended for the modernization of factory type handloom societies having common work shed constructed with Government or NCDC assistance to produce value added, demand oriented handloom products and for providing facilities for the production of power loom cloth. Assistance under this scheme is as Margin Money for working capital loan. The maximum amount admissible to a society shall not exceed Rs. 5 lakhs. Subject to a maximum of 25% of the working capital calculated @ Rs. 18,000/- per loom fixed by NABARD which ever is less.

Achievement : During 2005-06 an amount of Rs. 5,25,000/- was disbursed to 9 societies.

3. Exhibition Grant

Objective: This scheme is to promote marketing of handloom produced by

societies which are participating in exhibition come sales with prior sanction of General Manager, District Industries Centre. Maximum eligibility for a society is Rs. 5,000/- or 10% of the sales proceeds which ever is less.

Achievement : An amount of Rs. 2,90,876/- was disbursed to 24 Handloom societies during 2005-06.

4. Rebate

Objective : For effective marketing there is a provision for granting rebate @ 20% to handloom cloths during festive seasons. This provision attracts consumers to purchase handloom products.

Achievement : During 2005-06 an amount of Rs 5,80,368/- was disbursed to 32 handloom societies.

5. Marketing Incentive

Objective : The objective of the scheme is to provide suitable market motive to attract buyers towards Handloom goods. The assistance can be used for giving rebate/discount on sales of Handloom cloths. The assistance is shared by Central and State Government in the rate of 50:50.

Achievement : An amount of Rs. 2,36,149/- was disbursed to 27 societies during the year 2005-06.

6. Contributory Thrift Fund

Objectives : This scheme is introduced for the welfare of Handloom weavers. Weaver should be a member of the society for a period of one year on the date of admission. He/she should be a regular buyer of raw materials from the society and supplier of finished goods to the society and have earned a minimum average wages equivalent to his/her 180 day's wages from the society. 8% of the wages earned by the weaver should be subscribed to the fund. The Central and State Governments also contribute 4% each (total 8%) of the wages earned by the weaver per annum to this fund. General Manager, DIC can sanction temporary advances to the weavers who enrolled in the fund for medical treatment of the subscriber or family members, to meet expenses in connection with education and marriage of children, for purchase of land, for construction of house etc.

Achievement : An amount of Rs. 94,285/- was disbursed to 180 weavers of 8 Handloom Societies during 2005-06.

7. Work shed/Housing Scheme

Objectives : The aim of the scheme is to provide assistance to the weavers for construction of work shed/House cum work shed. The beneficiary weaver shall have no house cum work shed with minimum convenience, shall have his/her own land and shall earn at least 50% of his/her income from handloom weaving. Maximum grant allowed for work shed is Rs. 7000/- and house cum work shed is Rs. 18,000/-

Achievement : During 2005-06 only Rs. 10,500/- being 50% grant disbursed to 3 beneficiaries.

8. Bunkar Bima Yojana

Objective: The basic objective of the Bunkar Bima Yojana is to provide enhanced insurance cover to the handloom weavers, in the event of natural as well as accidental death and also higher sum is assured in case he opts for add on Group Insurance Scheme.

Achievement: During 2005-06 363 weaver members of 14 Handloom societies enrolled in this scheme.

9. Health Insurance Scheme (ICICI Lombard)

Objective: This scheme aims at financially enabling the weaver community to access the best of health care facilities in the country. This scheme is to cover not only the weaver but also his / her spouse and two children.

Achievement: 514 members of 22 handloom societies have enrolled in the scheme during 2005-06.

5.3.2. Coir

Projects and programmes in Coir sector are implemented through Coir Project Office, Kerala Coir Workers Welfare Fund Board and Coir Board, Ernakulam. The Ongoing Projects and Programmes under these agencies are given in Appendix 16 - I. The details are given below.

1. Sick Unit Revival Grant.

This is a scheme for the revival of sick Coir Co-operative societies. The financial assistance under this scheme is 100 % grant.

During 2005-2006 an amount of Rs.17,38,500/- was disbursed to 25 coir co-operative societies in the District.

2. Production and Marketing Incentive

This scheme is for assisting coir co-operatives to increase their production and sales. The assistance is 100% grant.

During 2005-2006 an amount of Rs. 7,55,973/- was disbursed to 45 coir co-operative societies in the District.

3. MDA for the sale of Coir and Coir Products.

Marketing is one of the main problems which adversely affect the working of coir Co-operative societies. Government has introduced this scheme for expanding the marketing of coir and coir products.

During 2005-2006 an amount of Rs. 5,05,565/- was disbursed to 45 coir co-operative societies in the District.

4. Model Coir Gramam

This scheme is for establishing a Model Coir Gramam. The proposed activities under this programme are defibering, coir spinning production of coir mats and mattings, coir geo textiles, pith utilization and marketing of coir products etc.

5. Mahila Coir Yojana

This is a combined project implemented by Coir Development Department, Coir workers Welfare Fund Board and Coir Board. The objective of the scheme is to train women to manufacture coir yarn in conventional type of rats attached with ¼ HP Motor. Training to 2451 women was given under this scheme and distributed rats free of cost.

In addition to the above grant Rs. 10,000/- was disbursed to 94 Coir workers for the repair of their houses.

5.4 Cashew

The processing activity of cashew industry in Kerala is almost concentrated in Kollam. The establishment of Cashew Development Corporation and Capex has helped the cashew workers to a great extent in getting employment and reasonable wages. The main activity of these agencies include processing of raw cashew purchased both from outside and within the Country by which cashew sector will get more employment with reasonable wages. The private sector also has an important role to play in the Cashew sector.

5.5 Khadi

One of the main scheme of Khadi Board is Rural Employment Generation Programme (REGP). The Board is directly financing Khadi Industries by way of sanctioning grant @ 25% of project cost and recommending for loan from scheduled banks and KFC. Also there are about 600 registered match industries in this district under Khadi. Tile industries in

the district started with the financial assistance of Khadi Board are already closed. The reason for closure is low internal market and the enforcement of Mining and Geology Act 1967 and Land Utilization Act. Khadi Grama Board Federation and All Kerala Cottage Industries Fed at Ramankulangara and Ready Made Garment unit at Nedumpana are the major institutions sponsored by Khadi Board. Jilla Panchayat, Kollam has provided financial assistance for the establishment of Ready Made Garment unit at Nedumpana.

5.6 Industries in Co-operative sector

One of the schemes for the development of Industrial Co-operative Societies is Govt. share participation. This assistance is sanctioned against the paid up share capital collected by each society. In addition, managerial subsidy and rent grant are also being sanctioned to eligible societies.

5.7 I.T Industries

There is an investment subsidy scheme for the development of I.T Industry in the State. The subsidy @25% for the investment on land, buildings and equipments is sanctioned compared to 15 to 20% of SSI.

6. Evaluation of Ongoing Projects and Programmes

Evaluation of ongoing projects and programmes is done based on the capability of solving problems and enhancing the potentials.

6.1 Large and Medium Industries

Even though there is a declining trend in general, there is scope for progress in the case of United Electrical Industries, Kollam, as they have diversified their products and increased the turn over and presently the company is working on profit.

6.2 SSI Units

1. Low working capital

One of the problems facing SSI sector is shortage of working capital. For solving this problem there are two schemes one is Margin Money Loan from Industries Department and another is working capital facility from Banks. There is a provision to sanction up to Rs. 2.50 lacks for new SSI units. This scheme is very much attractive for new entrepreneurs since the rate of interest is only 6% per annum.

Under CGTFS, SSI units are eligible

for availing loan up to Rs 5 lakhs without security. But the benefit of this scheme is not getting to eligible SSI units as most of the scheduled banks are not entertaining applications from SSI units.

2. Management Issues

The reason for sickness of certain industries in this district is lack of proper management.

Under PMRY, scheme two weeks training for all beneficiaries are being given from DIC on all relevant subjects before starting the ventures. But there is no scheme at present for giving training to the managerial persons of existing units.

3. Labour Issues

At present the closure of SSI units due to labour problems are comparatively reduced than previous years. The existing system under labour department is sufficient to solve the problems arising at times. The present climate is suitable for starting new ventures in industrial sector.

4. Improper Resource Utilization

One of the main problems for the slow growth of industrialization in this District is non-utilization of resources. For example rubber cultivation is abundant in certain parts of the district like Kottarakkara and Pathanapuram Taluks. But the rubber produced in this district is not being utilized for starting units using rubber as raw material. Most of the rubber produced in this district is transported to other districts. Only 50% of the available resources like rubber, clay, coconut, coconut husk etc. are being utilized for industrial purposes. At present there is no scheme to promote proper utilization of resources available in this district.

5. Improper Marketing

In most of the SSI units in the district a huge quantity of finished products are stocked in dump for want of sufficient demands. Products are manufactured by the units without understanding the talents and interests of the consumers. Moreover due to stiff competition from internal and external markets SSI products such as garments, electrical and electronic products etc are not finding good acceptance in the markets.

Though District Panchayat and District Industries Centre jointly had conducted several exhibitions to overcome these problems they are not sufficient to solve the problem.

6. Involvement of Financial Institution

Financial institutions have a major role in the industrialization of an area. A proper monitoring by the financial institutions is absolutely necessary for watching the sickness of an industry. Industry can be survived only if remedial measures are taken at initial stage of sickness.

7. Changing Technology

Production in most of the old SSI units is through conventional methods. Technology is developing fast and this has to be reflected in the manufacturing process also. The present schemes are not capable to overcome this problem.

8. Other reasons

There are also other reasons such as lack of entrepreneurial culture, scarcity of power, shortage of sufficient land, discontinuance of departmental schemes, absence of Common Facility Centres, delay in getting clearances and licences, sickness of industrial units etc. to the slow growth of industrializations in the district.

The scheme of District Panchayat to start Mini Industrial Estates in various Grama Panchayats has proved to be a success in the case of providing infra structural facilities for starting new industries.

The introduction of Single Window Clearance Board in the District Industries Centre, Kollam is very much helpful to entrepreneurs to get clearances from various other departments and agencies.

One of the major scheme of Industries Department is Sick Unit Revival Programme which provides financial assistances to SSI units through Banks and Department. If properly implemented, this scheme will benefit to hundreds of sick units in the District. Cluster Development Programme launched by Industries Department shows a positive approach to accelerate the growth of industries like bamboo and reed, garments, wood based industries, milk based units etc.

The discontinuance of departmental schemes such as Women Industries Programme and Harijan Development Programme is a major blow to Industrial Sector. There are no creative schemes at present to solve problems like, high interest rates of financial institutions, scarcity of power, absence of Common Facility Centres etc.

But the major schemes of department

including State Investment Subsidy Scheme helped in attracting entrepreneurs and supported development of industries in the District.

9. General Evaluation Statement of Projects and Programmes of SSI units

In general, the present schemes are partially capable to solve the existing problems and for enhancing the identified potentials.

6.3 Traditional Industries

6.3.1 Handloom

1. Low Volume of Sales

The main problem faced by this industry is in marketing. The absence of productions with new design and fashion, high cost of product compared to mill cloth etc are the main reasons for this.

Government has introduced various schemes such as rebate, Marketing Incentive and DDHPY for the promotion of this industry. While rebate and marketing incentive are for promoting sales the DDHPY scheme is introduced for the development of value added products with new design and fashions.

Though the above schemes have saved the industry from severe crisis, a full fledged remedy for the problems are not yet evolved.

2. Rebate Dues from Government

At present the societies are not getting the rebate dues from Government at time. Inordinate delay in sanctioning rebate adversely affects the working of the societies.

3. Cloth Value from Hantex Pending

Most of the cloths manufactured by the societies are marketed through Hantex. But the value of the cloth is not paid by the Hantex regularly. Lakhs of rupees are still pending to be paid to societies by Hantex. There is no effective system for monitoring this aspect at present.

4. Other problems

Other problems faced by this industry include workers not getting regular employment, huge ESI/PF arrears, managerial inefficiency etc. The present schemes are not capable for solving the above problems.

5. DDHPY Scheme

This is a Government of India Scheme, implemented to save the industry from the present crisis. The objective of the scheme is to train the weavers in manufacturing new value added items of modern designs.

The scheme has been implemented in 30 societies in the district and products like shirting, furnishing cloth, sari etc are being produced. Marketing of these products by giving a brand name to the products is intended.

6. Schemes of District Panchayat

District Panchayat, Kollam is also taking efforts to save handloom industry. Funds are provided in the budget for giving training to weavers in selected societies.

7. Handloom Development Committee

A handloom development committee is functioning in the district under Kollam District co-op. Bank. Exhibition sales at various centres in Kollam District are being conducted by this committee.

8. General Evaluation of the Projects and Programmes

In general, it can be seen that, there are schemes of State and Central Government to save the Industry. But effective implementation of the existing schemes will help the industry to a certain extent only.

6.3.2 Coir

1. Coir Production in other States

Once Kerala had monopoly in coir industry. But today the scene has changed and other states take Tamil Nadu, Karnataka and Andhra Pradesh have started production of coir fibre and coir yarn.

2. Artificial Products in the Market

Coir products are now replaced by other products made out of artificial fibre. For example plastic yarn is now available every where which has more strength and durability. The present schemes are not sufficient to find a remedy to this problem.

3. Shortage of Raw-Materials

50% of the available raw materials are not utilised for industrial purpose. We are depending upon the fibre produced at Pollachi for the production.

Though the Department had introduced a scheme for establishing de-fiberizing mills in different parts of the District the same has not succeeded.

4. Other Problems

High cost of production, discontinuance of retting activity, low make of finished products, scarcity of expert workers, failure of mechanization etc;

5. Potentials

The Regional Office of Coir fed is situated in Kollam Corporation area. The coir yarn produced by the societies can be marketed through this office.

Perumon High Tech Park is functioning at Panayam Grama Panchayat. Training in the manufacturing of Geo Textiles is going on there. Since Geo textiles can be used for prevention of soil erosion there is good prospects for this product.

6. General Evaluation Statement of Project and Programmes of Coir Sector

New schemes according to the identified problems shall be prepared and implemented on a time bound basis so that the existing potentials can also be enhanced. In addition, the existing schemes should be implemented effectively.

6.4 Cashew

The present schemes are not capable to solve the problem of scarcity of raw material and in increasing the cashew cultivations.

6.5 Khadi

The Rural Employment Generation Programme (REGP) is helpful in solving the problems of the Khadi Industries in this District. In the case of match industries many are closed due to stiff competition from the products of Tamil Nadu. There is no concession of excise duty for man made matches and at present there is no scheme to solve this problem. Also at present Khadi Board has no alternative schemes to solve the problem of Tile Industries.

6.6 Industries in Co-operative sector

Even though there is Govt. share participation in Industrial Co-operative Societies, this is not properly utilized mainly due to management problems.

6.7 I.T Industries

The Investment Subsidy Scheme for the development of I.T Industry is taking up the industry towards a progressive direction and there is ample scope for starting new industries.

7. Conclusion

In case of SSI units, the present scheme of providing loan up to Rs 5 lakhs without security by commercial banks under CGTF scheme shall be implemented in the district widely with the co-operation of Banks. In plant training programme for the management persons of existing units and new units shall be conducted on a continuous basis. A separate scheme for utilization of our resources shall be formulated. The Rubber produced in the Eastern part of the District shall be utilized for industrial purpose in this District. The

agricultural products like jack fruit, mango, banana etc. can be utilized as raw material for new SSI units. Traditional products shall be replaced by value added items which attract customers, diversification of products by up-gradation and changing technology shall be implemented for producing consumer friendly products. The unused land available at Aryenkavu, Edamulakkal, Kulathoopuzha etc. shall be acquired for establishing Industrial Estates and Industrial Parks. The discontinued schemes such as Women Industries Programme and Harijan Development Programme shall be reintroduced. Industrial units shall be provided with power connection with reduced rate even for the 1st 5 years from the date of inception. There are a number of industrial units in the Industrial Development Plot at Mundakkal which are not functioning for the last several years. These plots were allotted to industrialists at reduced rates. These plots shall be resumed from the present owners and re-allotted to new entrepreneurs for starting SSI units.

Industrial units like Aluminium Industries, Travancore Chemicals (in Kundara Grama Panchayat), Travancore Plywood, Punalur Paper Mills (at Punalur), Premo Pipe Factory (in Chavara) etc are closed. The land building machinery etc. are lying idle for the past several years. Steps have to be taken to utilize these existing facilities by starting new large and medium industries. A common facility service centre, similar to the CFSC at Changanassery, shall be established somewhere in the middle of the District so that all SSI units in the District can utilize the service. On a study of projects submitted by the LSGIs especially Blocks/ Grama Panchayats, it was noted that no feasible projects under Industrial sector was included under plan proposals. LSGIs shall earmark adequate plan funds exclusively for Industrial Sector.

One of the remedial measures to save Coir Industry is to reduce the cost of production. The reason for high cost of production is the high values of coir fibre imported from Pollachi. If adequate fibre is produced locally, the cost can be reduced considerably. At present 50% of husk produced in this district is not utilized for industrial purposes. A new scheme for collecting husk from house holds, through the Kudumbasree units, and distributing the

same to small scale producers and co-operative societies shall be introduced. Defibreing mills shall be established.

Another problem facing this industry is exodus of workers to other categories due to unemployment in this sector. The new generation is not coming forward in coir sector. Even the children of coir workers are abstaining from this field due to unhygienic condition of the nature of work. Mechanization is the only remedy to solve this problem. Though government have started 15 mechanised coir manufacturing units in Kollam, Chavara, Clappana, Thrikkadavoor, Thrikkaruva, Chavara, Kundara, Poothakulam, Perinadu with an investment of more than 3 crores, the scheme came to a failure. The low quality of products manufactured and the frequent breakdown of machines are the main reason for this failure. The existing mechanized rolls shall be replaced by worker friendly and quality assured machines. Coir Board shall replace the existing machines with new machines, so that the quality of products can be increased. The present schemes of government are only for assisting coir co-operative societies. Private small scale producers have no incentives to start coir manufacturing units. Sale investment subsidy for private sector shall be introduced in coir sector also as in the case of SSI sector. MML from Industries Department and bank loan from commercial banks shall be provided to private industrial units. Cluster Development Programmes shall be introduced in coir concentrated areas like

Thevalakkara, Mantrothuruthu, Chavara, Thrikkaruva, Kulasekharapuram and Karunagappally.

A consortium can be registered for managing collection and distribution of raw-materials to small scale produces. Coir Workers in this district have expertise only in making coir yarn. So no products like coir mats and matting are manufactured in this District. Training programmes for workers shall be introduced in the manufacture of mats and mattings so that they can set up self employed units.

In case of Handloom, steps shall be taken by Government to distribute Rebate dues to the societies within one month from the date of submission of application. Steps shall be taken to pay the cloth value to societies within two month from the date of supply. Permanent exhibition centre shall be established at the heart of the city with rebate to handloom clothes. Revitalization scheme for factory type societies shall be re introduced for assisting the societies for payment of ESI/PF dues. Raw materials like yarn, dyes etc. shall be distributed to societies at subsidized rates. An institute for Handloom Training and Technology shall be established at Kollam as the same at Kannur. Government may issue direction to all Government Departments, Hospitals and Public sector undertakings that clothes required shall be purchased only from Handloom societies.

A Sick Unit Revival Programe (SURP) may be formulated for the revival of sick units under Khadi Sector. A project for

manufacturing of value added Khadi products may be implemented in the Khadi units directly owned by Khadi Board.

At present we are importing 50% of the total raw cashew from foreign countries which can be avoided if sufficient cashew nuts are produced here itself. Cashew cultivation should be encouraged not only in Kollam District but also in other districts. Value added products out of processed cashew nuts shall be manufactured.

In the case of Co-operative Sector, appropriate training programmes may be introduced to train the committee members of industrial co-operative societies. In case of Large and Medium Industries, closed units such as Kundara Ceramics, Punalur paper mill etc. can be revived.

In general, it can be seen that there are so many problems faced by the sector. But these problems vary from place to place. For example there are plenty of lands available in the Eastern part of the District for starting new industries. But other infrastructural facilities such as building, power, and transportation facilities are not available in such places. But in urban areas where power, transportation etc. are available there is scarcity of land. The financial institutions shall have to play a very important role in the development of the sector. Another problem is lack of awareness among the entrepreneurs about the departmental schemes. Developing entrepreneurship among youth especially college students is absolutely necessary



Chapter 17

Health

This chapter analyses the existing status and development issues of Health sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on temporal aspects. The third part probes into the development issues pertaining to the sector and finally the fourth part contains an evaluation of ongoing and committed projects and programmes.

1. Analysis of Existing Status

The analysis of existing status of Health sector in the district includes analysis of Health indicators, Disease pattern and Health care infrastructures including major health care systems viz. Allopathy, Homoeo and Indian Systems of Medicine.

1.1 Health indicators

The status of health sector of a place is indicated by the health indicators of that area.

Table.17.1: Health indicators - Comparison with National and State averages

Aspect	Kollam -2002	Kerala -2002	India -2002
Birth rate	15.39	17.2	25.4
Death rate	4.56	6.4	8.4
IMR	14	10	66
Maternal mortality rate	0.8	0.8	4.37
Life expectancy -male	67	70	64.1
Life expectancy - female	72	73.62	65.6

The internationally accepted health indicators are

- Birth rate
- Death rate
- Infant Mortality Rate (IMR)
- Maternal Mortality Rate (MMR)
- Life Expectancy Rate -male
- Life Expectancy Rate- female

A comparison of the health indicators of Kollam district with that of the State and the Nation is given in Table.17.1.

From the table it is clear that the health status of the district is well above the National and State figures.

While analyzing the LSGI wise variation

of two critical health indicators viz MMR and IMR within the district, the MMR values in the Grama Panchayats of Oachira, Ithikkara, Anchal, Chadayamangalam and Chittumala blocks are greater than the district average indicating low health status in these areas. This points out to the necessity of increased attention to be given to health workers in these regions (Figure 17.1).

The LSGI wise distribution of the IMR shows that its values in the Grama Panchayats of Oachira, Karunagapally, Anchal, Chavara and in Kollam Corporation and surrounding LSGIs are greater than the district average value of 5.59 indicating low health status in these regions with respect to the IMR values (Figure 17.2).

A clearer picture about the health status of various places of the district can be obtained, if local body wise variation of both IMR and MMR are considered

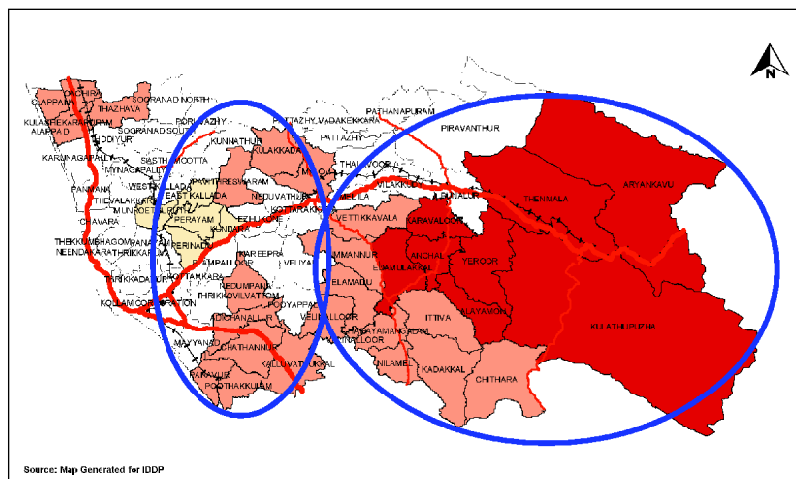


Fig.17.1: LSGs having Maternal Mortality Rate above the District average (>0.4)

together. This is shown in Figure 17.3.

According to this the district can be classified in to three regions, that is, those regions where both the health indicators are above the district average, regions with one of the indicators above district average and regions with both the indicators less than the district average.

Figure 17.3 shows that in Anchal and Oachira Block Panchayats, both the health indicators show values higher than the district average. This indicates that health status of these two Block Panchayats, based on these two health indicators is the least in the district. Whereas the health status based on these indicators of the Block Panchayats of Anchallummod, Sasthamkottah, Vettikkavala and Pathanapuram, and that of Punalur Municipality are highest. This figure also shows that the health status of the coastal stretches and eastern hilly regions of the district are lower than the middle region of the district.

Gross population density distribution (See Fig. 4.10) of the district shows that

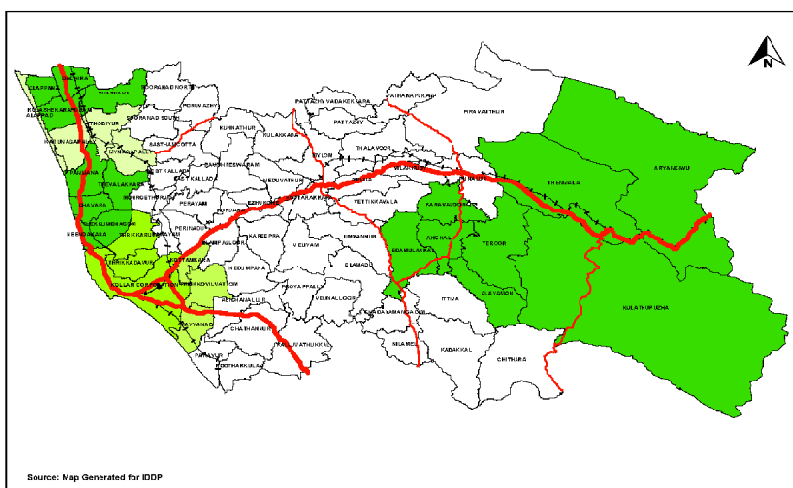


Fig.17.2: LSGs having of Infant Mortality Rate above the District average (IMR>5.59)

the coastal stretches of the district are having the highest population density. The high population density and related environmental pollution may be a reason for the low health status in this region. Regarding the low health status in the

eastern region of the District, it may be due to the absence of sufficient health facilities in these regions.

1.2 Disease pattern

The disease pattern of a place depicts the major diseases in a place and its spatial distribution. Though there may be variation in the types of diseases occurring from place to place, the presence of almost all major diseases occurring in the State is seen in Kollam also. However there is no disease specific to the district like filariasis in Alapuzha.

1.2.1 Major diseases

Major diseases occurring in the district are

- Respiratory infection
- Diarrhoeal diseases
- Pneumonia
- Hepatitis
- Typhoid
- Hyper tension
- Heart disease
- Mental disease
- TB
- Cancer
- Leptospirosis
- Dengue
- Malaria

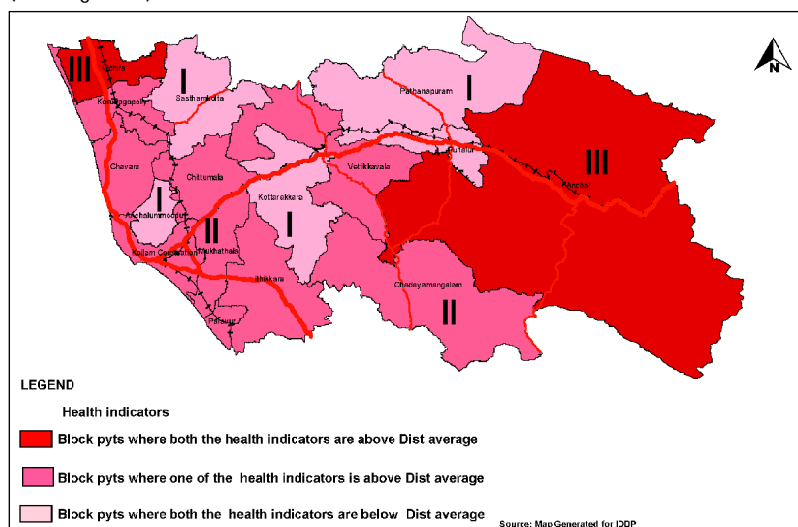


Fig.17.3: Categorisation of Block Panchayats based on health indicators

The occurrence rate of a disease is indicated by its prevalence rate which is a measure of the number of incidents of a disease in 1000 persons. The prevalence rate of seven major diseases in the district and its comparison with the state is shown in Table 17.2. The comparative study shows that the prevalence rate of the seven diseases in the district shows more or less the same pattern as that of the state. The prevalence rate of the respiratory infection

Table.17.2. Prevalence Rate of Major Diseases – Kerala and Kollam

SI No:	Diseases	Prevalence rate/1000	Prevalence rate/1000 Kollam)
1	Respiratory infection	248	225
2	Diarrhea diseases	15.43	15
3	Hyper tension	14.33	10-11
4	Heart disease	3.85	8
5	Mental disease	2.83	1
6	TB	0.67	0.398

is the highest and that of TB is the lowest among the seven major diseases. Respiratory disease is having the maximum prevalence rate (87%) in the district (Figure 17.4).

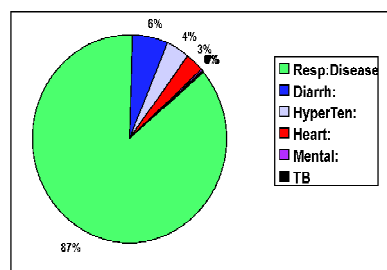


Fig.17.4: Major Diseases in the order of prevalence

Table.17.4: Number of cancer cases reported in the district

Year	Chavara	Panmana	Neendakara	Alappad	Total
2003	51	17	44	17	129
2004	45	17	34	11	107

Six major life threatening diseases reported from the district in 2004 are given in Table 17.3. From the table it is found that among the deadly diseases Hepatitis A is reported maximum (442 cases).

The spatial distribution of the number of dengue cases reported from the district is shown in (Figure 17.5).

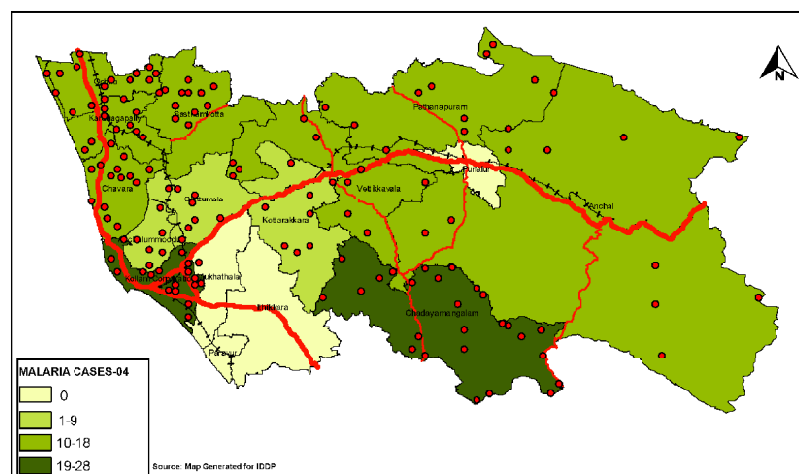


Fig.17.6: Distribution of malaria cases – 2004

Table 17.3: Major life threatening diseases

SI No:	Table	Number of cases reported in 2004
1	Typhoid	84
2	HepatitisA	442
3	Lepto	59
4	Malaria	170
5	Aids	4
6	Dengue	25

number of cases reported has increased.

The spatial distribution of malaria cases is shown in figure. The occurrence of malaria cases is seen more in Chadayamangalam block and Kollam corporation area.

The number of cancer cases reported from the district is given in Table 17.4.

The spatial distribution of the reported cases of cancer is depicted in Figure 17.7.

Figure 17.6 shows that occurrence of dengue cases is concentrated in the coastal (Kollam Corporation, Chavara and Karunagapally blocks) and eastern (Anchal block) areas of the district. However during the year 2005 and 2006

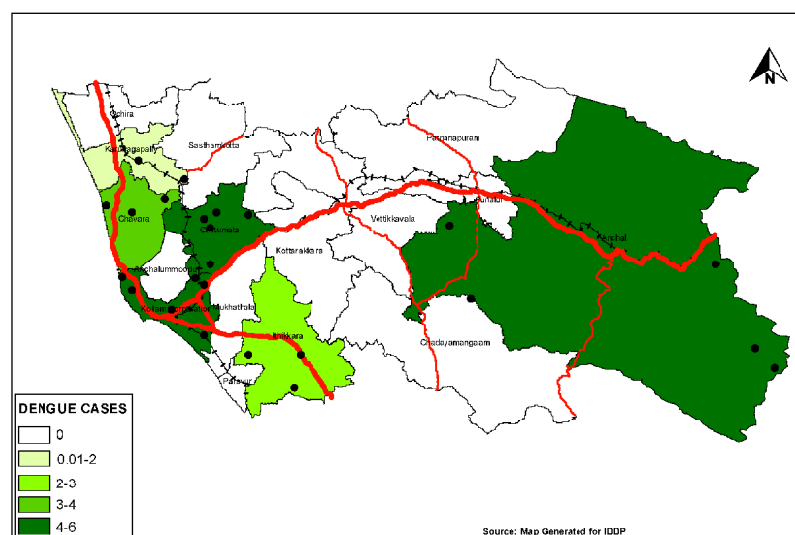


Fig.17.5: Distribution of the Number of Dengue cases – 2004

the number of dengue cases reported from the eastern part of the district is comparatively less. But in Kollam Corporation and surrounding areas the

The LSGIs with highest number of cancer cases reported are the coastal local bodies of Chavara, Panmana, Neendakara and Alappad Grama Panchayats of the district.

The radiation from the black sand, which is available in plenty in these regions, may be reason for the high incidence of cancer here.

1.2.2 Seasonal diseases in the district

Seasonal diseases differ with seasons. During summer and rainy seasons different types of diseases are occurring in the district. The prevalence rate of dengue fever, malaria, leptospirosis, diarrhea, hepatitis etc. increases during rainy season whereas chicken pox is a disease seen common during summer season. Occurrences of some of the seasonal diseases are having a concentration

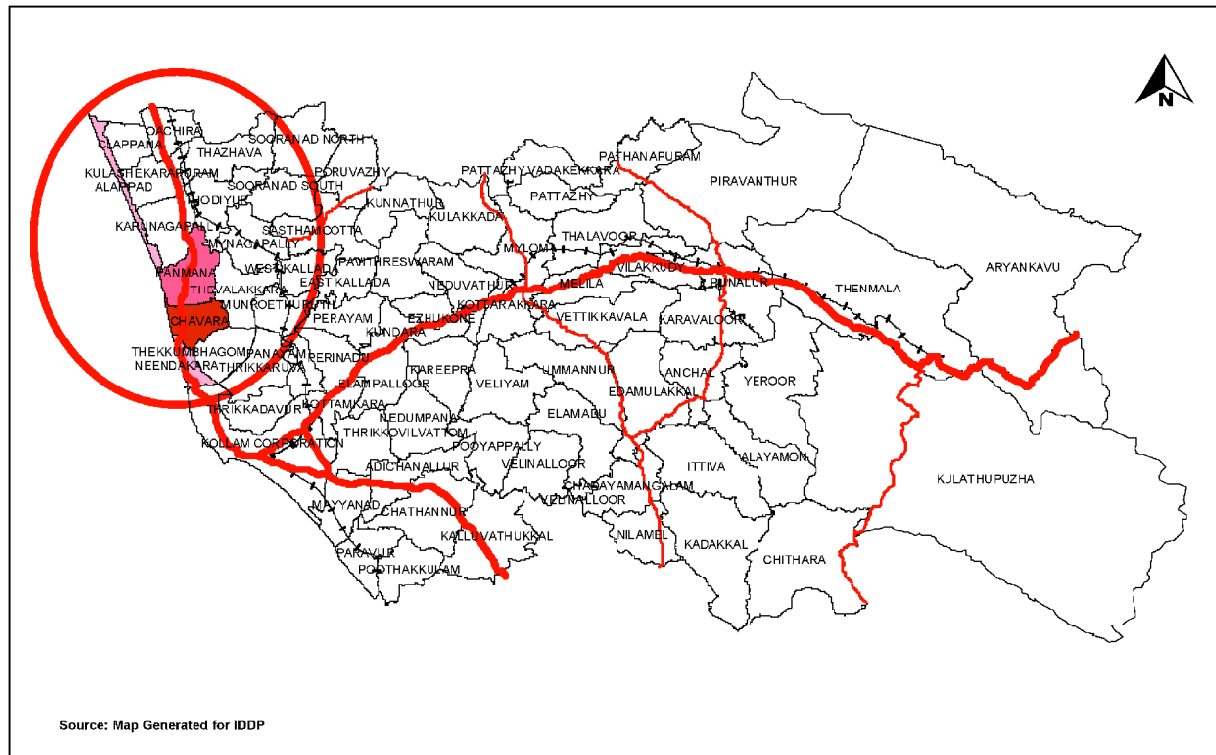


Fig.17.7: Distribution of cancer cases reported

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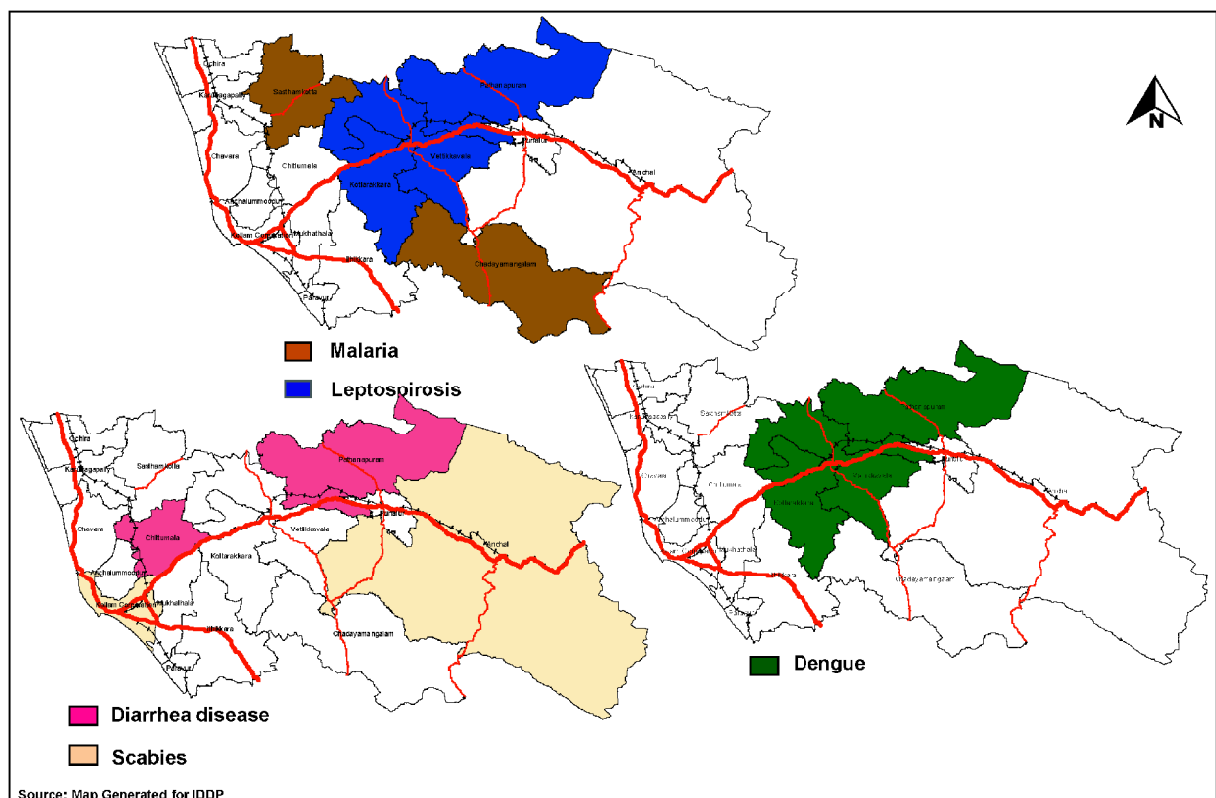


Fig.17.8: Concentration of seasonal diseases

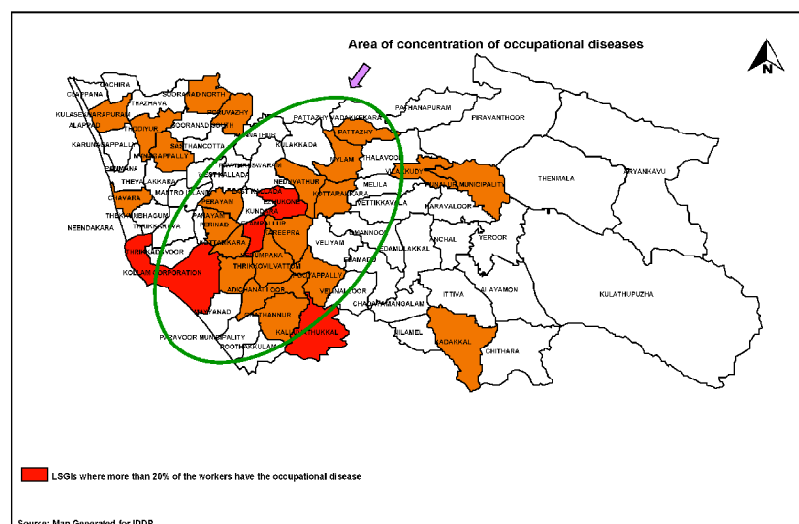


Fig.17.9: LSGI wise distribution of occupational diseases

pattern in the district. It is depicted in the Figure 17.8.

It is clear that occurrence of malaria is more in Sasthamkotta and Chadayamangalam blocks whereas the occurrence of leptospirosis is concentrated in Kottarakkara, Vettikkavala and Pathanapuram blocks. The occurrence of dengue fever is more at Kottarakkara, Vettikkavala and Pathanapuram blocks. Diarrhoeal disease is seen concentrated more in Pathanapuram and Anchallummod blocks.

1.2.3 Occupational diseases

Kollam district is famous for cashew and its processing. There are more than 1.5 lakhs of workers engaged in cashew factories. A lion share of the cashew workers are female.

The major occupational diseases seen among the cashew workers are bronchial asthma, dermatitis and prolapsed uterus. The areas of concentrations of cashew workers and also occupational diseases among them are shown in Figure 17.9.

Kollam corporation and the Grama Panchayats of Ezhukone, Kalluvathukkal, Elampallur, Kadakkal, Vilakkudi, Adichanallur, Thrikkovilvattom, Pooyapally, Kareepra, Perayam, Karunagapilly, Chavara, Kulasekharapuram, Thodiyoor, Mynagapilly, Pooruvazhy and Sooranad North are the local bodies where the cashew workers are concentrated and hence the occupational diseases are seen here. It is observed that about 20% of the cashew workers are suffering from any of the occupational diseases mentioned above.

Bronchial asthma is seen high among

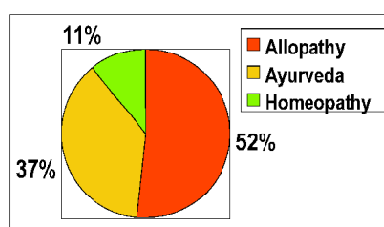


Fig.17.10: Systems of medicine wise percentage of health care institutions (including dispensaries)

cashew workers due to the inhalation of dust particles during the shelling of cashew nuts. Prolapse of uterus is due to the posture (sitting with the support of legs) of the workers during shelling process of cashew nuts. Both these ailments can be reduced considerably by improving working environment within the cashew factories. The cashew workers should be provided with masks for preventing the entry of dust particles in to the lungs. In stead of the present method of shelling the cashew nuts by sitting on the legs, proper raised plat forms should be provided so that the workers can shell the cashew nuts either by standing or sitting in a chair.

1.3 Health care infrastructure

The number of health institutions in the three systems of medicines, namely Ayurveda, Allopathy and Homoeo, under Government sector are 61, 89 and 40 respectively with a total bed strength of 2454. The number of beds per lakh of population is 95 where as in the case of state it is 153, which shows that the provision of health care infrastructure facilities in the district by Government is much lower than the state average. The total number of health care institutions

including private hospitals are 1070, 775 and 226 under Allopathy, Ayurveda, and Homoeopathy systems respectively. This indicates that about 52% of the health care institutions of the district are under allopathy, 37% are in ayurveda and 11% are in Homoeopathy (Figure 17.10).

Ownership details of the hospitals of the district show that (Figure 17.11) 70% of the hospitals are under the private ownership indicating the supremacy of private sector in the health sector.

1.3.1 Government Sector: Allopathy

Structure of the health care infrastructure under Government sector in allopathic system of medicines is shown in Figure 17.12.

Sub centre is the first level of contact of the community with the formal health care delivery system and is the grass root level

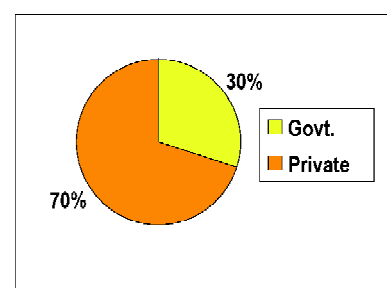


Fig.17.11: Health care institutions (under the three systems) government and private sector

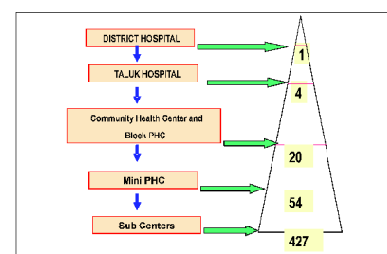


Fig.17.12: Health care infrastructure in allopathic system

institution to provide comprehensive primary health care to the community. A sub centre consists of two health workers. The main function of the sub centers is to create awareness about the diseases control measures taking by the Government. Usually a sub centre is expected to cater to a population of 5000 though it may vary from 3,000 to 8,000 depending on the density of population, geographic terrain and other special characteristics of the region.

Public health centre (PHC) is the

next higher order health facility which functions at Grama Panchayat level.

Service deliveries of a primary health center are:-

- | Preventive Care
- | Implementation of National programs
- | Prevention and control of communicable diseases
- | Prevention and control of Non-communicable diseases such as Cardiovascular disease, Diabetes Mellitus, Cancer care (Palliative cancer care), etc.,
- | School Health
- | Geriatric Care
- | Disability Clinic - once in a month with Psychiatrist from Taluk Hospital
- | First aid management of Surgical and Orthopedic and other speciality cases.
- | Curative service limited to clinical care-out patient care only
- | Limited laboratory investigation service

In Kollam district there are 54 Mini PHCs.

Block level PHCs are the next higher order (higher to PHCs) facility. A Block level PHC serves a block.

Service deliveries of Block PHCs are:-

- | Clinical care-with minimum in-patient service provision for General ailments- Medical and Surgical.
- | 24 hour delivery service
- | Normal Delivery services, Assisted delivery services, Essential and Emergency Obstetric (including blood storage facilities) and Essential New-born care
- | Blood transfusion service
- | Essential diagnostic service with ECG and Ultra sound scan service
- | Pediatric case management
- | Trauma care – basic services
- | First aid management of Orthopedic and other speciality cases.
- | Ambulance Services
- | Post-mortem
- | Preventive Care
- | Prevention and control of communicable disease
- | Prevention and control of Non-communicable diseases such as Cardiovascular
- | disease, Diabetes Mellitus, Cancer care (Palliative Cancer care), etc.,
- | School Health Programme

- | Geriatric Care
- | Preventive / Rehabilitative services
- | Implementation of national programs
- | Maternal and child health services
- | Community psychiatry
- | Community dentistry
- | RTI/STI and adolescent clinics

There are 20 Block level PHCs (including Community Health Centres [CHCs]) in Kollam district.

Taluk level hospitals are the next higher order facility in a district. The entire basic speciality services are expected at the Taluk level hospitals. Taluk Head Quarters Hospitals (THQHs) are to be equipped to provide all types of secondary level services.

Service deliveries of a Taluk Hospitals are:-

- | Curative services with essential speciality care of all types of specialities such as Surgical and Medical Management, Essential and Emergency obstetric care, 24 hour delivery services, Pediatric care management, Dermatology, Ophthalmology, ENT, Orthopedics, Psychiatry, Respiratory medicine, Radiology and Dental Services. Dental Specialities of Maxillo Facial Surgery and Conservative may also be provided from this level.
- | Reproductive Child Health (RCH) services through the PP units.

There are four Taluk hospitals in the district.

District Hospitals are to provide all types of tertiary level services. These institutions are to provide greater quantum of all the services provided at the THQH level and are also expected to provide the super speciality services like Cardiology, Neurology, Plastic Surgery, Urology and Pediatric Surgery. Speciality dental services-Maxillo facial surgery, conservative and Orthodontic- are to be provided at this level.

Service Deliveries of a District Hospital are:-

- | Curative services with essential speciality care of all types of specialities such as
- | Surgical and Medical Management,
- | Essential and Emergency obstetric care,
- | Pediatric case management,

- | Dermatology,
- | Ophthalmology,
- | ENT,
- | Orthopedics and
- | Radiology
- | Essential diagnostic facilities including all the facilities available at the lower levels and Pathology and Bacteriology services.
- | Trauma care casualty services.
- | Blood Bank
- | I.C.U for Cardiology
- | Physical Medicine and Rehabilitation Centres and Occupational Therapy Unit.
- | Limb Fitting Centers.
- | Ambulance Service
- | Post-mortem

In addition to the above there are 3 ESI hospitals and 30 ESI dispensaries in the district.

1.3.2 Private Sector: Allopathy

As noted earlier 70% of the health care institutions functioning in the district belong to the private sector. There are about 57 institutions in the district having at least IP facilities in the Allopathic system of medicine under the private sector. Total number of private hospitals in the district is 80 with total bed strength of 618.

1.3.3 Government Sector: Ayurveda

Growing popularity of Ayurveda is evidenced by its global acceptance. Various Ayurvedic formulations and herbs are subjected to intense research by reputed institutions abroad. In the coming years, there will be a sea change in the popularity and acceptance of Ayurveda because of its improved treatment methodologies and multilevel research programmes. Curative potentials of herbal medicines are being evaluated and recognized.

Even though all these advantages exist the internal scenario is quite different. Government and private institutions are contributing much to the Public Health Care system but most of them are devoid of primary facilities. Because of growing popularity and awareness on its safety means middle and upper middle class are turning to ayurvedic treatment apart from poor patients. So, it is inevitable to strengthen the Government Ayurveda institutions and to provide health care

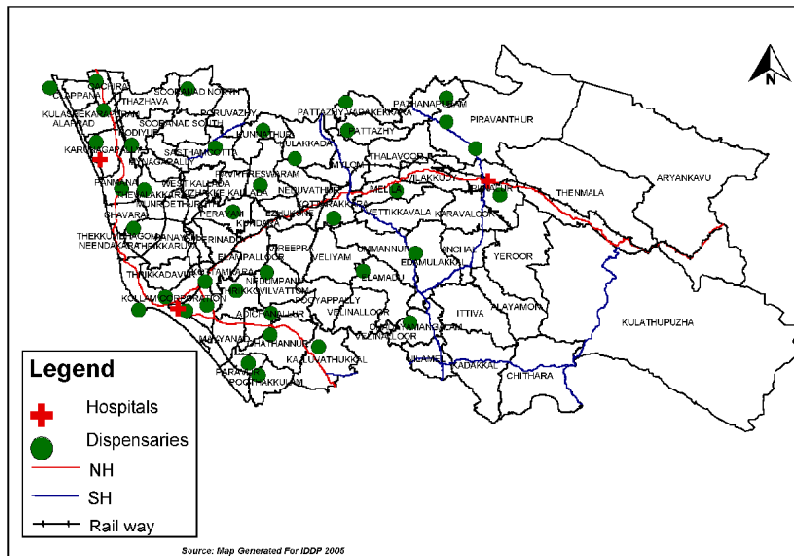


Fig.17.13: Locations of Homoeo hospitals and dispensaries

support based on ayurvedic principles. In the fast growing sector of health tourism, our Ayurvedic institutions can play a major role. Thus Ayurveda can be effectively marketed.

The total number of Ayurvedic hospitals in the district is 9 with total bed strength of 190. Among the hospitals, 5 are 10 Bedded, 3 are 30 Bedded and one is 50 Bedded.

In the Govt. Sector there are 62 institutions including these Hospitals and 53 Dispensaries.

1.3.4 Private Sector: Ayurveda

There are 2 Ayurveda Colleges viz. Sree Narayana Ayurveda College and Hospital, Puthoor and Amritha Ayurveda College and Hospitals, Karunagappally with total bed strength not more than 30. there are around 300 private practicing doctors.

1.3.5 Government Sector: Homoeo

Homoeopathy is classified as an alternative system of medicine by the WHO. National and State Governments have accorded equal status to Homoeopathy at par with Modern Medicine (Allopathy) and Indian Systems of Medicine (Ayurveda) both in curative and preventive sectors. It is a means to cater all the needs of various sections of the ailing public from neonatal to geriatric ailments including both acute and chronic diseases. The distinct phenomena of Health status of Kerala at present is "increased morbidity with low mortality." Homoeopathy offers a specific role in reducing morbidity.

Highlights of homoeopathic system of treatment include

- Safe
- Simple
- Scientific
- Economic
- Easily applicable
- Advisable to all age groups
- Absence of adverse side effects
- Power to cure acute and chronic

Table 17.5: Categorisation of Hospitals

Category	Type	Govt.	Private	Total
Category - 1A	Super-Speciality	0	5	5
Category - 1B	Speciality alone	1	10	11
Category - 2	Adv Facilities	13	15	28
Category - 3	24 Hr Facilities	5	27	32

Super speciality Hospitals.....	Category -1A
Speciality alone hospitals.....	Category -1B
Hospitals with Advanced Diagnostic facilities(Like CT scan , EEG).....	Category -2
Hospitals with 24 hr service.....	Category -3
Hospitals with OP only	Category -4

Fig.17.14. Pictorial depiction of Categorisation of hospitals

diseases

- Widely accepted by the general public especially by the rural mass.

There are three Homoeo hospitals and 37 Homoeo dispensaries in the district (Figure 17.13). Homoeo hospitals are located at Kollam, Punalur and Karunagappally with total bed strength of 75.

Present infrastructure under government sector in Kollam District is as follows.

1. Government Homoeo Dispensaries

Rural	- 31
Urban	- 6
Total	- 37

2. Government Homoeo Hospitals

Rural	- 1 (25 beds)	1
Urban	- 2 (25 beds each)	2
Total	- 3 (75 beds)	3

3. District Medical Office - 1 (District Administrative Office)

Staff Pattern

1) Dispensaries :- The approved staff pattern is as follows

a. Medical Officer	-1	6
b. Pharmacist	-1	7
c. Attender	-1	8
d. P.T. Sweeper	-1	8

2) Hospitals 25 beds

a. Chief Medical Officer	-1	9
b. Medical Officer	-1	10
c. Nurse	-1	11
d. Pharmacist	-1	12
e. Nursing Assistant	-2	13
f. Cleaner	-1	13
g. Cook	-1	14
h. Part-time-Sweeper	-1	15
i. Clerk	-1	16

A post of RMO is sanctioned additionally in district hospitals.

3) District Medical Office

a. District Medical Officer	-1	16
b. Senior Superintendent	-1	17
c. Clerks	-2	18
d. Typist	-1	19
e. Peon	-1	20
f. Part-time-Sweeper	-1	21

1.3.6 Private Sector: Homoeo

There are no private hospitals in the Homoeo sector in Kollam. There are about 230 homoeo dispensaries in the private sector.

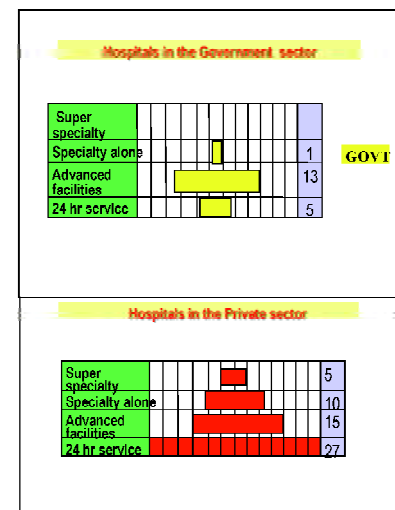


Fig.17.15: Hospitals in the Govt. and private sectors

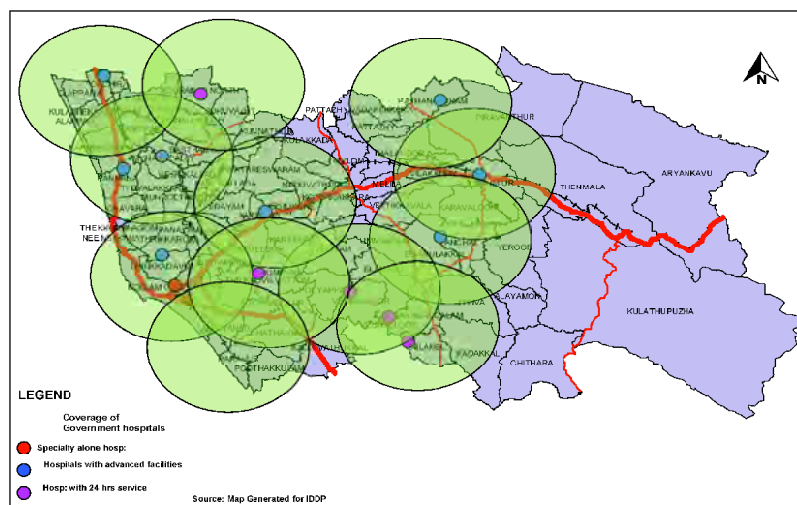


Fig.17.16: Distribution of Government hospitals with their service areas (15 km radius)

1.4 Classification of hospitals

In order to compare hospitals under Government and Private sectors a common criteria applicable to both sectors are needed. The availability of facilities can be taken as the criteria for classification of hospitals. Based on the availability of facilities hospitals (both government and private) can be classified as follows.

Categorization of hospitals under the allopathic system of medicine both in government and private sectors is shown in Table 17.5 and Figure 17.14. Figure 17.15 depicts the data graphically.

From the table and the diagrams above, one can infer that there are no super specialty hospitals under government sector and the number of hospitals under the government sector shows a skewed pattern which in turn will affect the efficient delivery of services specified in each level. Deliberately or not, the number of private hospitals in different categories forms a stable pattern which ensures efficiency in delivery of services at each level to the community.

Spatial distribution of the government hospitals (PHCs with bed facilities, block PHCs, Taluk hospitals and District hospital) with approximate service areas in the district, is shown in Figure 17.16.

From the figure it is clear that the following Grama Panchayats have unserved areas by a hospital with inpatient facilities under government sector considering distance criteria as 15km radius.

- ┆ Aryankavu
- ┆ Thenmala

- ┆ Kulathupuzha
- ┆ Mellila
- ┆ Vettikkavala
- ┆ Vilakkudy

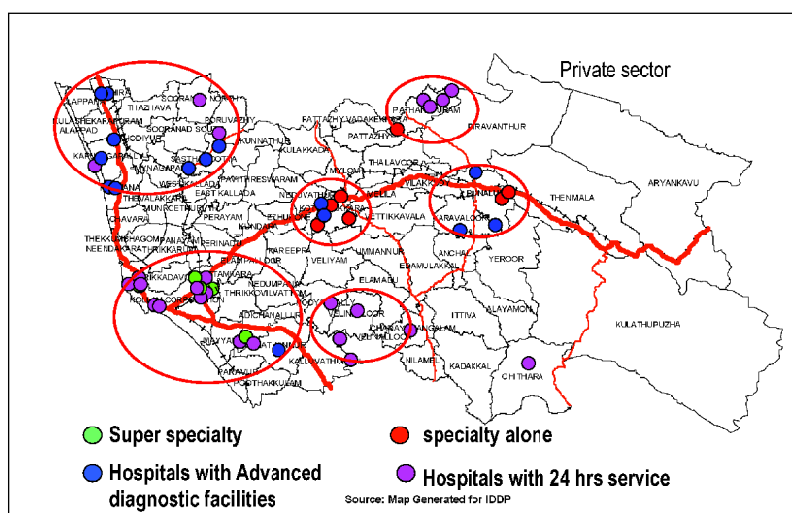


Fig.17.17: Distribution patterns of the four categories of hospitals

- ┆ Pattazhy
- ┆ Pattazhyvadakkekara
- ┆ Kulakkada
- ┆ Thalavoor
- ┆ Mylom
- ┆ Alayamon

Distribution of private hospitals in the district having at least IP facilities is shown in Figure 17.17.

From the figure it is clear that most of the private hospitals of the district are concentrated in the following five areas.

- ┆ Kollam Corporation and surrounding areas.
- ┆ Karunagapally and surrounding areas.
- ┆ Kottarakkara and surrounding areas.

- ┆ Pathanapuram and surrounding areas.
- ┆ Punalur and surrounding areas.

It is clear that these areas are widely spread within the district so that most of the people from the rural areas of the district have proximity of a private hospital within a distance of 15 km. However most of the rural Grama Panchayats situated in the eastern part of the district are devoid of private hospitals with sufficient health facilities within 15 km.

2. Overall Development Trend

2.1 Trend of Health indicators

The temporal variation in the health indicators are shown in Table 17.6. This indicates that the health status of the district shows progress in all the indices for the period from 2002 to 2004.

Temporal variation in the number of cases reported of the six major diseases from 1998 to 2004 are shown in the Figure

17.18.

The figure shows that except in the case of hepatitis A and dengue fever, a decline in the number of cases is seen from 1998 to 2004. This indicates that Dengue fever and hepatitis A are the major life threatening disease as far as Kollam District

Table 17.6: Trend in health status (2002 – 2004)

Variation in Health status from 2002 to 2004		
	Kollam (2002)	Kollam (2004)
Birth rate	15.39	14.23
Death rate	4.66	4.66
IMR	14	5.59
Maternal mortality rate	0.8	0.41
Life expectancy male	67	69
Life expectancy - female	72	74

is concerned.

Over a period of time the pattern of diseases in a place changes with the occurrence of new diseases and disappearance of existing diseases due to preventive measures adopted. The major diseases occurring in the district in the descending order of the prevalence rate with their causes are tabulated in Table 17.7.

It is a known fact that in the earlier years major life threatening diseases were communicable diseases like small pox, TB, malaria etc. But from the table it is clear that the prevalence rate of life style diseases and pollution causative diseases are the highest in the district. This is an indication of the changing pattern of diseases in the district. Now the pattern of diseases has

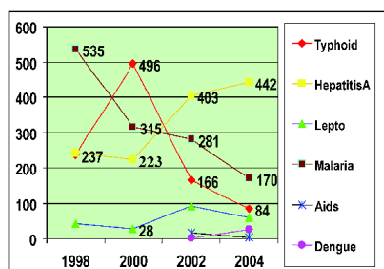


Fig.17.18: Trend in no. of cases of Major diseases

local bodies of Kottarakkara, Punalur and Anchal, to take measures for the safe disposal of both solid and liquid wastes so as to contain the increase in the respiratory diseases and other diseases causing due to pollution.

2.2 Trend of Inflow of Patients

In the Allopathy sector, trend of inflow

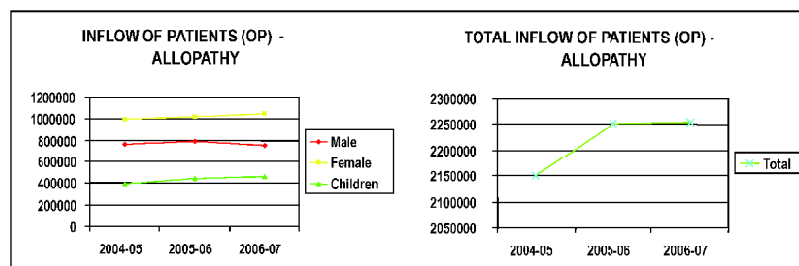


Fig. 17.19: Allopathy – Trend of inflow of out patients (individual and total)

changed to life style diseases and pollution causative diseases. Also there is emergence of new diseases like dengue fever, leptospirosis, Chikungunia and AIDS. It can be concluded that diseases occurring due to environmental degradation/pollution/lack of waste disposal facilities are emerging as a major threat. This factor should take in to account while forging new development proposals in the health sector.

The environmental pollution is mainly related with urban areas and those areas with high population density. The future urban areas of the district are delineated in figure 10.6. It is seen that most of the likely future urban areas are concentrated in the coastal region. Kottarakkara, Punalur and Anchal are the other designated urban areas of the district.

In the case of the distribution of population density within the district, it is seen that, the coastal areas of the district show the highest population density. This means that there is a need for deliberate attempts from the side of local bodies in the coastal belt and the other designated urban

of patients (OP) shows an increasing trend in the case of female and children while a decrease is shown in the number of males. The total OP increased considerably from 2004-2005 but became stagnant in 2006-2007 (Figure 17.19).

In case of IP, the number of children shows a decreasing trend (Figure 17.20). This could be due to effective preventive health care systems made available to children. The total number of IP shows an increasing trend over the years.

In case of Ayurveda, as it is globally accepted as a system of medicine, the number of patients is seen to be increasing. The Figure 17.21 shows that while there is increase in the no. of male and female

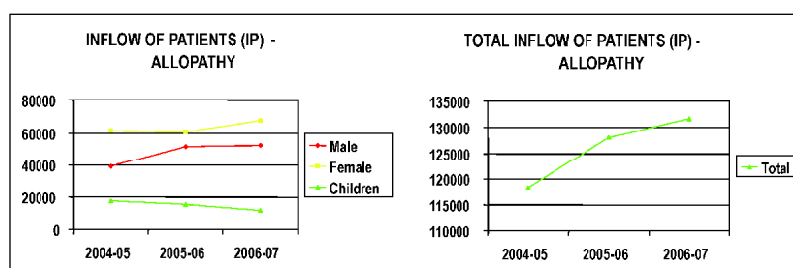


Fig. 17.20: Allopathy – Trend of inflow of inpatients (individual and total)

patients there is decrease in the case of children. The total no. of patients is increasing drastically in the sector. Number of foreigners seeking Ayurvedic treatment also increases year by year. Due to the growing popularity of Ayurveda and increased awareness of public about this system, middle and upper class people are increasingly opting Ayurvedic treatment.

Table17.7: Major diseases in the order of prevalence and reasons

Sl No:	Diseases	Prevalence rate/1000 (Kollam)	Major cause
1	Respiratory infection	225	Major cause - Pollution
2	Diarthea diseases	15	Major cause - Pollution
3	Hyper tension	10 - 11	Life style disease
4	Heart disease	8	Life style disease
5	Mental diseases	1	Life style disease
6	TB	0.398	Communicable disease

The inflow of patients to Government Ayurvedic Institutions proves this. The actual figure of patients inflow in the private sector is not available. Considering the fast developments in the Private Ayurveda sector than the Govt. sector we can assume the increase the outflow patients in this sector.

Most of patients visiting the OPD of Ayurveda Institutions are suffering from occupational diseases, low back ache, Spondylosis, Osteoarthritis, etc. In Kollam district large numbers of people are engaged in the cashew, coir, fishing and agricultural sectors and they are prone to these diseases. Allergic diseases and cancer etc are more prevalent in the Grama Panchayats of Neendakara, Chavara and Karunagapally. Ayurveda provides very good treatments to these ailments.

The Homoeo sector is also showing an increase in the no. of patient's inflow over the years (Figure 17.22.) The inflow of patients is more in geriatrics, gynecology, pediatric ailments, skin diseases, allergic complaints, arthritis and preventive medicines.

In the district, there is an obvious

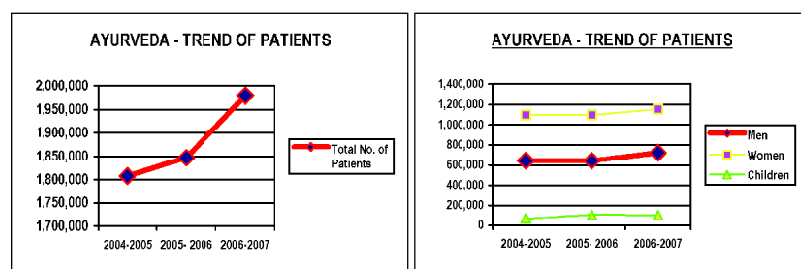


Fig. 17.21: Ayurveda – Trend of inflow of out Inpatients (individual and total)

increase in the in flow of patients over the years in all the three sectors of Health, showing a need for attention to the development issues in the sector.

3. Development Issues

3.1 General Issues

There are certain areas of concern in the health sector in Kollam. As mentioned in the health indicators (Article 1.1) the eastern part shows the lowest health status in the District. The northern coastal stretch and the eastern parts of the District show high IMR.

In the case of diseases, respiratory disease is having high prevalence rate and Hepatitis A is the most life threatening disease. As per the analysis, there are certain location specific diseases such as cancer cases in Chavara, Panmana, Neendakara and Alappad Grama Panchayats. There is concentration of dengue fever in Chavara, Karunagapally, Anchal Blocks and Kollam Corporation. Malaria concentration is in Chadayamangalam Block and Kollam Corporation. Another occupational disease in bronchial asthma found to be high among cashew workers.

Newly emerging diseases like Dengue Fever, Leptospirosis, etc and other communicable disease like diarrhea are associated with improper waste management. Prevalence rate of diseases caused by pollution and life style diseases are higher.

Regarding health care infrastructure, Kollam District shows a poor picture in Govt. sector. The rank of Kollam district based on beds /lakh of population in Govt: sector is only 11th and spatial distribution of hospitals is not uniform. There is absence of IP facilities in Govt Hospitals in Aryankavu, Thenmala, Melila, Vettikkavala, Vilakkudy, Kulathupuzha, Pattazhy, Pattazhyvadakkekkara, Kulakkada, Thalavoor, Mylom and Alayamon Grama Panchayats. There is absence of super specialty hospital in Punalur area.

Absence of periodic regional detection camps for life style diseases and inadequate coverage of the tribal areas including Piravanthur, Aryankavu, Kulathupuzha and Thenmala are other issues.

3.2 Problems

3.2.1 Problems associated with Allopathy

- Low bed strength in District Level

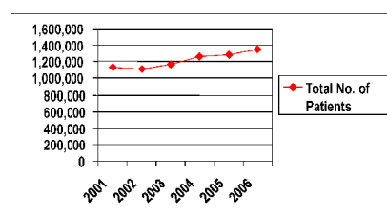


Fig. 17.22: Homoeo – Trend of patients (Total)

- Hospital, Taluk level hospitals and Block level hospitals.
- Inadequate number of doctors and other staff.
- Absence of advanced lab facilities like cyto pathology, microbiology and pathology in District hospital
- Unplanned and unnecessary civil works.
- Transfer and postings – Concerned specialist to be posted according to requirement in speciality hospitals avoiding gross anomalies.
- Absence of periodic maintenance of hospitals and equipments.
- Absence of modern investigative and diagnostic facilities.
- Shortage of funds.

3.2.2 Problems associated with Homoeopathy

- Identified gaps in infrastructure include
- Lack of dispensaries and hospitals in all Grama Panchayats/Taluks/ Blocks/HQs/ Municipalities.
- Lack of own land and building for hospitals and dispensaries.
- Lack of sufficient staff- Medical / Paramedical / ministerial

- Lack of clinical laboratories and technicians in hospitals.
- Lack of enough medicines.
- Lack of periodic capacity building programme for medical, paramedical and ministerial personals.
- Lack of transportation facilities to conduct timely epidemic preventive activities
- to inspect and monitor the institutions under the jurisdiction
- Lack of programme exploring IT
- Lack of collection of data/ information on epidemic diseases from local areas

3.2.3 Problems associated with Indian Systems of Medicine

- Even if there are so many post graduate degree holders in Government Sector, the Specialities of Ayurveda is not effectively implemented.
- Out of 63 Government institutions 22 institutions doesn't have own building and are functioning in rented buildings with limited infrastructure.
- Shortage of skilled and trained staff. Four institutions do not have even Pharmacist post.
- Institutions working in own building does not have proper drainage, toilet and waste disposal facilities.
- Lack of emergency and first aid facilities
- Shortage of Medicine - During past 5 years total allotment for medicines in the District remains constant at Rs.4,43,000 per year. Numbers of patients are increasing regularly. In 2006 -2007 total number of patients were 19,79,288 and the per capita allocation of funds for Medicine is a meager of Rs 0.22 only.
- Out of nine hospitals, Panchakarma Unit is effectively functioning in District Ayurveda Hospital only. All other hospitals are functioning in minimum level due to shortage of staff and facilities.

Health care system is most important in service sector. Government Ayurveda Institutions have to be upgraded for better health service. Most of the institutions lack even primary facilities. They may be developed to cater the needs of the common man. A scheme for generating income from atleast some of the institutions is to be planned, so that these institutions

can meet some of its financial requirements from the income thus generated. Kollam district has higher mortality rate, particularly among the poor, most of them are workers in Cashew factories, Brick kilns, Coir sector, Fishing sector and Agricultural sector. Malnutrition, occupational hazards and diseases, recurrent infections, periodic out break of epidemics, mental illness and other chronic diseases are identified as the main health problems.

3.3 Potentials

Since all the three systems of medicine are operational in the health sector of the district, there is good potential for improving health status in the district. The specific fields of development in each system are listed below.

3.3.1 Potentials in Homoeopathy

In the Homoeopathy sector there is good potential for the following fields.

1. Geriatrics
2. Gynecology
3. Curing Pediatric ailments
4. Skin diseases
5. Allergic complaints
6. Arthritis
7. Preventive medicines

3.3.2 Potentials in Allopathy

The potential aspects are in the following fields.

1. Geriatrics
2. Control of Blindness
3. Leprosy eradication
4. Control of Cancer
5. Immunization
6. Psychiatric patients care
7. Neuro-Surgery
8. Nephrology

3.3.3 Potentials in Indian Systems of Medicine

The potential aspects are in the following fields.

1. Geriatrics
2. Ayurvedic Hospital for Women and Children
3. Epidemic control cell.
4. Emergency Management Facilities.
5. Panchakarma Therapy
6. Medicinal Plant Cultivation
7. Health Tourism
8. Speciality Ayurveda Hospital
9. Drug manufacturing unit

For effective implementation the developments may be based on

- Infrastructure
- Patient amenity

- Speciality Clinic
- Medicines
- Staff training

Due to the global acceptance of Ayurveda, natives and foreigners are attracted towards the Ayurvedic form of treatments. In order to exploit this and to avoid hawkers of this field, the Govt. sector should take much more interest. Kollam District has very good opportunity in health tourism along with eco tourism and back water tourism in Thenmala and Ashtamudi.

4. Ongoing and Committed programmes

4.1 Allopathy sector

The ongoing and committed programmes in Allopathy sector are briefed below. All these programmes are under the National Rural Health Mission (NRHM).

4.1.1 Universal Immunization Programme

In 1974 the WHO launched its "Expanded Programme on immunization (EPI) against six, most common, preventable childhood diseases, viz. diphtheria, pertussis (whooping cough), tetanus, polio, tuberculosis and measles.

The Govt. of India launched EPI in 1978. Later it was renamed as Universal Immunization Programme, which was started in India in 1985. It has two vital components: immunization of pregnant women against tetanus, and immunization of children in their first year of life against the six diseases.

4.1.2 Integrated Disease Surveillance Project (IDSP)

It is a new strategy to control communicable diseases. It started under National Surveillance Programme. Integrated Disease Surveillance Project is a new project which aims to strengthen the effective system of disease surveillance both in the Government and private sector. It also aims to establish networking system from the peripheral level to District level and also to the central level. It also focuses on improving the lab facilities in the government sector.

4.1.3 National Cancer Control Programme : 1975-76

The emphasis is on prevention and early detection of cancer and augmentation of treatment facilities in the country. The project envisages projects at district level for preventive health education, early

detection and pain relief measures.

4.1.4 National Family Welfare Programme

This programme started in 1977 with the following objectives.

- To ensure small family norm.
- To prevent unwanted pregnancies
- To ensure adequate spacing between births

4.1.5 Communicable Disease Control Programme and National Vector Borne Disease Control Programme

Earlier it was National Malaria Control Programme which was started in 1953. Subsequently the following programmes came up- National Malaria Eradication Programme (1958) and National Anti Malaria Programme (1977). The control of vector borne diseases like malaria, dengue fever, Japanese encephalitis, filariasis, kala-azar etc are brought under National Vector Borne Disease Control Programme.

4.1.6 National Leprosy Eradication Programme (1983)

It is a centrally sponsored programme to achieve control of leprosy through early detection of cases and DDS (dapsone) monotherapy on an ambulatory basis. The National Leprosy Eradication Programme started with the goal of eradicating leprosy by the turn of the century. The aim is to reduce case load to 1 per 10,000 population. As the prevalence rate of leprosy cases has been considerably diminished the eradication programme has been merged with General Health institutions.

4.1.7 National Filaria Control Programme

Revised Filaria Control Strategy: Mass drug Administration programme for Elimination of lymphatic Filariasis started in March 2005.

4.1.8 Pulse Polio Immunization Programme

For eradication of Polio myelitis extra dose of pulse polio given to children below 5 yrs every year from 1991 onwards in the Government sector

4.1.9 National AIDS Control Programme (NACP - 1987)

It is a centrally sponsored scheme to reduce the spread of HIV infection in India and to strengthen India's capacity to respond to HIV/AIDS on the long term basis through;

- Operative part of the control programme.

- ┃ Blood safety programme
- ┃ Policy on HIV testing
- ┃ STD Control Programme
- ┃ Condom Promotion.
- ┃ HIV surveillance
- ┃ IEC
- ┃ Family Health Awareness Campaign

4.1.10 TB control Programme (RNTCP)

This programme is being implemented at the national level with WHO aid by short course therapy of multi drug regime according to the type of TB ensuring 98 to 100% cure rate.

4.2 Ayurveda sector

On going projects are very less in Ayurvedic sector. Presently there is only one centrally sponsored scheme to give minimal Medicine supply to the rural Ayurvedic dispensaries. Through this project the rural dispensaries get medicine cost of Rs.25000/- per year.

4.3 Homoeopathy sector

4.3.1 Thyroid Control Programme

A Thyroid centre is running at Kottarakkara Taluk under the control of Dept. of Homoeopathy which is engaged in this programme. About 60 patients/day are treated in this Centre.

4.3.2 Cancer Control Programme

The Cancer Research Centre at the Kollam District Homoeo Hospital is engaged in this programme.

5. Evaluation of Ongoing and Committed Programmes

In the Allopathy sector the on-going programmes are evaluated as follows.

In the Universal Immunization Programme, though there is very good achievement the coverage should be increased so that there should not be any drop outs and the achievement has to be 100%. This is particularly important in the tribal areas and remote rural areas. Integrated Disease Surveillance Project is only a recently launched centrally sponsored state based project. So, though the activities are going on, the activities are not yet reached in the full fledged stage primarily due to lack of permanent District Surveillance Officer and Office. In the case of National Cancer Control Programme, though the detection and referral works are going on very well, treatment facilities at the district level are yet to be developed. Considering the achievement of the National Family Welfare Programme, the male sterilization (particularly Non Scalpel

Vasectomy) is very poor probably due to lack of awareness among the male population. Female sterilization achievements (PPS, Mini lap, Laparoscopy) are also on the decrease. But the total sterilization percentage is static.

In case of Communicable Disease Control Programme and National Vector Borne Disease Control Programme, with regard to disease prevalence from 2004 to 2006 there is an increase in Hep-A, Leptospirosis, Chicken pox cases, Dengue, Viral fever, measles and Pneumonia. In the case of Leptospirosis, total no: of cases as well as death rate is on the increase. In the case of Dengue death rate is static being one. There is also a dreadful increase in the no: of viral fever cases. Even though Malaria cases are comparatively slightly less and decreasing over the years, the number is still high. Measles show a very rapid increase in number. Chikungunia has emerged as a new entity in 2006.

As a whole Vaccine preventable disease like Hep - A and measles show a gradual increase in incidence and hence an augmentation of immunization campaign should be brought up without any lapse. In all other cases, particularly in the case of Leptospirosis, proper waste disposal as well as rodent control activities along with continuous and exhaustive health awareness programmes should be implemented. The community should be made aware of the importance of vector control measures, proper waste disposal and timely and proper treatment of fever cases from qualified physicians. The treatment pattern as well as the sequelae of Chikungunea and their management is not yet developed in the state. An effective and intra sectoral co-ordination is indispensable for effective control of communicable diseases.

The National- Filaria Control- Programme has been implemented as a 5 year programme since 2004-2005 as a mass drug administration for elimination of lymphatic filariasis (MDA). So far only two courses have been completed. It is seen that the actual rate of consumption of the drug is not up to the target, which may due to lack of proper awareness on the safety and importance of the drug. An exact assessment can be made only after the completion of the programme. Pulse Polio Immunisation Programme is successful in

the district. AIDS Control Programme is actively going on and has created very good awareness among the high risk group and consequently there is a drastic reduction in the incidence of new cases of HIV/AIDS. In case of TB control Programme (RNTCP) our district has won a colorful achievement.

In the Homoeopathy sector, there are only two specific programmes in the district which obviously is not sufficient to provide better service to patients in the district. The support facilities like infrastructure, medicine supply etc. are the areas of concern.

In Ayurveda sector, the medicine cost, rural dispensaries get through the Centrally sponsored scheme will not eliminate the basic problem of institutions. To give better service to common people new projects for infrastructural developments, training to technical staff to update knowledge etc and projects to tackle newly emerging epidemics should be implemented.

6. Conclusion

In the Allopathy sector, special attention has to be given to tribal areas and coastal areas for bettering health parameters in view of outbreaks of vector borne diseases. Through implementation of NRHM scheme 10 CHC's in the District will be raised to public health standards with adequate manpower. Essentially the staff pattern in Government hospitals should be rearranged according to patient strength. Advanced and sophisticated investigating facilities should be made available under Government sector on an emergency basis. The spatial distribution of Government hospitals with IP facilities should be redistributed so that the services are made available to remote areas particularly among tribal areas.

People are more attracted to Ayurveda system of medicine for prevention as well as for curing of diseases. This potential is exploited by the private sector. For effective performance of Govt. sector, various measures such as infrastructural development, proper supply of medicines, proper staff strength, up gradation of Taluk Hospitals, starting new specialties in hospitals etc are required.

As evident from the analysis, the Homoeo sector has to concentrate on public health and preventive aspects of communicable diseases. Research and development in the field and infrastructural strengthening are required.



Chapter 18

Drinking Water and Sanitation

This chapter analyses the existing status and development issues of Drinking Water and Sanitation sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on temporal aspects. The third part probes into the development issues pertaining to the sector and finally the fourth part contains the evaluation of ongoing and committed projects.

1. Analysis of Existing Status

Water, the elixir of life, is also the most abundant material in nature, second to air. But only less than 1% of the whole water on earth is accessible to man and other living beings in the form of fresh water found in lakes, rivers and underground aquifers. About 97% is salt water that fills the oceans and nearly 2% lies frozen in Polar Regions. The average annual

rainfall of the State is estimated at 3000 mm. However, it's spatial and temporal distribution pattern is mainly responsible for the frequent floods and droughts in Kerala. About 60% of the annual rainfall in the state is received during the South-West Monsoon (June – August), 25% during North – East Monsoon (September – November) and the remaining during the summer months.

Kollam district has a tropical humid climate, with an oppressive summer and plentiful seasonal rainfall. The hot season, lasting from March to May, is followed by the south-west monsoon from June to September. The northeast- monsoon occurs from October to November and the rest of the year is generally dry. Average annual rainfall in Kollam District is 2089 mm (1993-2003). As per a study conducted by the Centre for Water Resources Development and Management (CWRDM) in 2003, the

average monthly rainfall for the period 1993-2003 is as given in Figure 18.1. Seasonally, monsoon season experiences maximum precipitation (1262mm) followed by post-monsoon (620.3 mm) and pre-monsoon seasons (389.3mm). Monthly maximum rainfall is noticed in October (396.5 mm) and minimum in January (12 mm).

For any society craving for better hygienic and health conditions, proper sanitation facilities are indispensable. Compared to other States in India, Kerala enjoys overall good sanitation facilities. The Total Sanitation Campaign has revolutionized the rural sanitation and in Kollam too it is a success story.

1.1 Existing Water Sources

Surface sources, Ground water sources and Rainwater collected from roof of buildings meet the water requirement for different purposes i.e., Domestic needs, Industrial & Commercial needs, Institutional

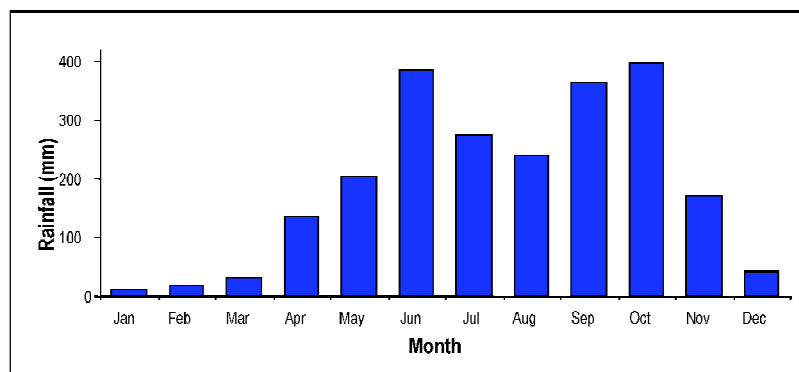


Fig.18.1. Monthly mean rainfall in Kollam district (1993-2003)

needs, Fire fighting, livestock, Public purpose, Agricultural needs etc. Identification of sources of water supply, their conservation and optimal utilization are of utmost importance.

1.1.1 Surface Sources

Surface sources include rivers, fresh water lakes, streams, ponds etc. Out of the 44 rivers of the State, 41 originates from the Western Ghats and flows towards the West and join the Lakshadweep Sea and the remaining 3 Rivers originate from the Western Ghats and join the Bay of Bengal, flowing through the neighboring States. The rivers of Kerala are mainly monsoon fed and fast flowing.

According to PWD estimates (1974) the total runoff of all the rivers of the State amounts to 77,900Mm³ out of which 70,200Mm³ is contribution from the catchments in Kerala and the remaining from that of Karnataka and Tamilnadu. The quantity that is considered utilizable is computed as 42,700 Mm³.

The rivers flowing through Kollam district are Pallikkal, kallada, Ithikkara and

Table.18.1. Details of rivers in Kollam District

Sl.No.	Name of river	Length of river in Km.	Origin	Finishing point
1	Kallada	121	Karimala	Ashtamudi Kayal
2	Achancovil	128	Pasukida medu (Western Ghat)	Pampa
3	Pallickal	42	Kalarithara	Vattakayal
4	Ithikkara	56	Madathara Kunnu	Paravur Kayal

Achancovil (part). Kulathupuzha River is the tributary of Kallada River. Details of rivers in Kollam District is shown in Table 18.1.

The largest fresh water lake in Kerala, the Sasthamcottta Lake is located at Kunnathur Taluk in Kollam. Kollam district is also gifted with an abundant storage of backwaters, the possibilities of which are still to be explored.

The major surface sources, which are being utilized for water supply in Kollam District are Sasthamcottta Lake, Kallada River, Ithikkara River, Achancovil River, Pallickal River and Kulathupuzha River. Minor surface sources like lakes and ponds are also being utilized in the district.

1.1.2 Ground Water Sources

Rainwater percolating in to the ground and reaching permeable layers in the zone of saturation constitutes ground water source. Ground water is normally beyond the reach of vegetation and is usually free from evaporation losses. Ground water sources are less severely affected by vagaries of rainfall than surface water resources. Generally Ground water is clear but harder than the surface water of the region in which they occur. Percolation in to the subsoil also results in the filtering out of bacteria and other living organisms.

Saline intrusion may occur in ground water. Ground water in coastal aquifers overlies the denser saline water. Every meter rise of the water table above the sea

from 90m to 250 m and aquifers, sand and sandy clay beds). Bore wells are usually constructed in hard crystalline rock areas. The aquifers are confined and semi confined aquifers.

The tube wells in coastal areas are affected by quality problems like salinity, iron content, hardness etc. As per the studies conducted by the Ground Water Department, Kerala the net ground water availability for future extraction is nil in Anchalumoodu and Mukhathala Blocks. So, drilling of new tube wells in these areas are to be avoided. In Kollam 58% of people use own wells as shown in Figure 18.2.

The principal sources of water for domestic use in rural areas are open wells. Field surveys conducted by CWRDM indicates that open well density in Kerala varies from 100 to 250 well per Sq. Km. On an average 85% to 90% of wells are used for drinking purposes. In Kollam the well density is 265 wells per Sq. Km which is highest compared to other coastal districts. However, the average withdrawal from wells is 800 liters per day which is low in comparison.

In regions where there is fair amount of rainfall, rain water is collected from

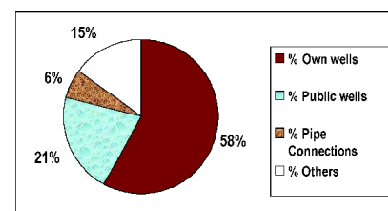


Fig.18.2. Existing drinking water facilities - Kollam

building roofs or from outdoor water sheds and stored in cisterns or ponds.

From the spatial distribution map (Figure 18.3), it can be seen that almost the entire district uses ground water as source of drinking water.

1.2 Water Supply System

The main aspect of a water supply project of a locality is the proper selection of source. The quality of water will determine the line of treatment before supplying it to the consumers. The treated water is then stored in service distribution reservoirs and water is supplied to consumers by proper distribution system. The present scale of water supply to Urban

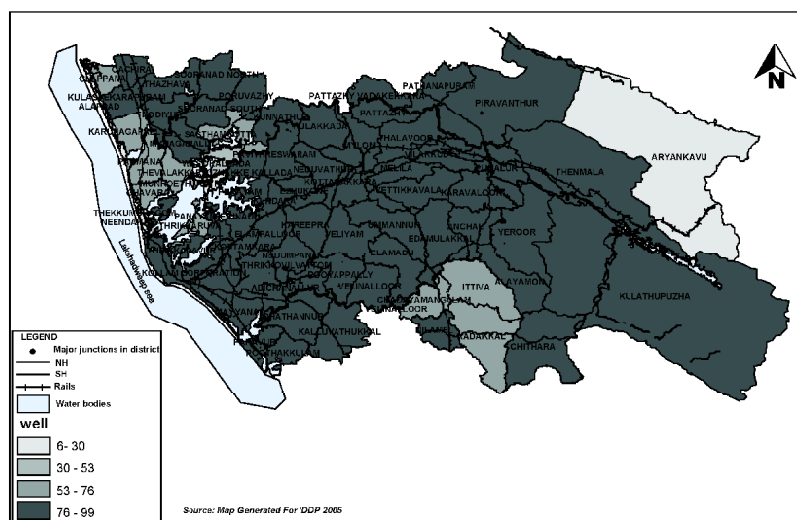


Fig. 18.3. LSGI wise distribution of wells as source of drinking water

and Rural population is grossly inadequate and not all communities are provided with safe water supply. In India, hardly any metropolitan city has a continuous water supply and very few cities are provided with adequate water supply at adequate pressure to meet their growing demands.

In the Kerala context it is found that majority of population depend on open wells for potable water i.e.86% in rural Kerala and 55 % in urban Kerala (Figure 18.4). Piped water supply covers 64.02% of population in Kerala and 59.19% in Kollam district.

Kerala Water Authority has 116 schemes in operation in Kollam District. Drinking water is supplied through 16845 taps and 71636 connections (Domestic, Non-domestic & Industrial). Community based water supply schemes are also in operation under Swajaldhara Project of Govt. of India.

Sasthamcotta Lake serves as the source of water supply for Kollam Corporation and a number of Grama Panchayats. It is a Perennial source with superior quality of drinking water. Water from the intake well located at Sasthamcotta is treated in the 37.5mld treatment plant at Sasthamcottta and supplied to Kollam Corporation and the Grama Panchayats of Neendakara, Sasthamcotta, Sooranad South and Chavara (portion). Water tapped from Adikkadu and Pottakkannanmukku is supplied after disinfection to West Kallada and Mynagappally respectively.

Kallada River serves as the source of water supply schemes to Punalur Municipality and Kundara and adjoining Grama Panchayats (Ezhukone, Melila, Vettikavala, Kottarakkara, Pavithreswaram, East Kallada and Kulakkada) with tapping points near Punalur Town and treatment plants at Punalur and Elampal respectively. Water is tapped from the intake well near Thenmala Dam site for water supply scheme to Thenmala. The ongoing JBIC Project which covers 13 Grama Panchayats and 1 Municipality has tapping point at Tholikodu and treatment plant at

adjoining Grama Panchayats (Eroor, Alayamon and Ittiva) has tapping point at Rakkodukadavu and treatment plant at 12 cent junction, Kulathupuzha.

Ithikkara River serves as the source for water supply scheme to Kalluvathukkal and Parippally (tapping point at Aduthala), WSS to Adichanalloor and Chathanoor (tapping point at Kattachal), RWSS to Ayoor (tapping point at Peringalloor), WSS to Elavoor Anakkulam (tapping point at Puthar, Channapetta), WSS to Anchal & Puthiyam Kuzhiyathadam (tapping point at Kuzhiyathadam), WSS to Kallumala Harijan colony (tapping point at Kuzhiyam) and WSS to Chadayamangalam (tapping point at Poomkode).

Pallimon River a tributary of Ithikkara River serves as the source of water supply scheme for Nedumpana and also the RWSS to Pallimon Harijan colony with tapping point at Kundumon.

Cheloor Kayal serves as the source of water supply for Kunnathoor Grama Panchayat.

Pallikkal River serves as the source of water supply for Poruvazhy Grama Panchayat.

Achancovil River serves as the source of water supply for Achancovil Grama Panchayats.

Grama Panchayats with no reliable

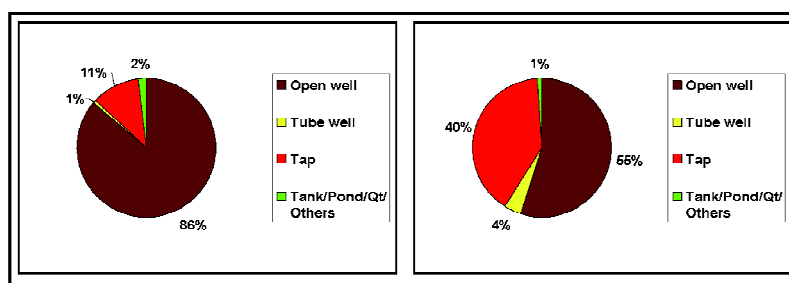


Fig.18.4. Drinking water sources in Rural and Urban areas in Kerala

Panamkuttimala. The Kallada river also is the proposed source for water supply improvements to Kollam Corporation (tapping point at Thenmala Dam) and Water Supply Scheme to Pattazhy North and South (tapping point at Panthaplavu).

Kulathupuzha River serves as the source of water supply scheme for Chithara and adjoining Grama Panchayats (Kadakkal, Nilamel, Chadayamangalam) with intake well located at Mylammoodu and treatment plant at Madathara. The ongoing water supply scheme to Kulathupuzha and

surface water sources depend on Open wells and Tube wells as drinking water sources. In 2005 water is supplied from 40 open wells and 163 tube wells in Kollam District by Kerala Water Authority. Area wise number of tube wells is listed in Table 18.2.

The Swajaldhara Schemes have been implemented well in 26 Grama Panchayats of Kollam district. At present 207 mini water supply schemes with open well as source are in operation.

1.2.1 Quantity of Water Supply

The demand of water for various

Table.18.2: Locations and number of Tube wells

Sl.No	Name of LSGI	No. of tube wells	Sl.No2	Name of LSGI3	No. of tube wells4
1	Kollam Corporation	34	15	Chavara	3
2	Panmana	7	16	Thevalakkara	7
3	Thekkumbhagam	3	17	Karunagappally	7
4	Alappad	8	18	Thodiyoor	2
5	K.S.Puram	3	19	Clappana	3
6	Oachira	3	20	Thazhava	3
7	Sooranadu South	2	21	Sasthamcotta	1
8	Sooranadu North	2	22	Kunnathoor	1
9	Thirikkaruva	5	23	Thrikkadavur	7
10	Panayam	7	24	Perinadu	7
11	Mandrolsland	2	25	Kottankara	7
12	Thrikkovilvattom	10	26	Mayyanad	11
13	Paravur Municipality	8	27	Poothakkulam	4
14	Elampalloor	2	28	Mynagapally	4

purposes is divided under the following five categories.

- TM Domestic purposes
- TM Civic or public purposes
- I Industrial purposes
- I Business or trade purposes
- I Others

The domestic water demand includes the quantity of water required in the houses for drinking, bathing, cooking, washing etc. The quantity of water required for domestic use depends on the habits, social status, climatic conditions and customs of the people. In India on an average the domestic consumption of water under normal conditions is about 135 ltrs./ day / capita

Existing water supply status of the State shows that 77% of habitations are only partially covered i.e. having a supply between 10 to 40 lpcd and 2% of habitations are totally uncovered. Almost 1788 habitations have less than 10 lpcd supply.

Existing water supply status of Kollam District shows that 66% of habitations are only partially covered i.e. having a supply

Piravanthoor, Vilakkudy, Kulakkada and Mylom gets less than 15 LPCD supply. Kollam Corporation, Punalur Municipality and Chithara Grama Panchayat are getting more than 40 LPCD supply. Paravur

in urban and 54.73 in rural areas.

Rural and urban population benefited from piped water supply in Kollam District is given in Table 18.3.

Percentage of population benefited from piped water supply in Kollam District is 59.05%. Percentage of benefited population is 97.41 in urban and 50.79 in rural areas (Table 18.4).

The water supply status analysis through the LSGIs reveals the following:

Less than 10% of the population of Karavalloor, Thalavoor, Kulakkada, Mylom and Vettikkavala Grama Panchayats only are having piped water supply (Table 18.5).

Kollam Corporation, Municipalities of Punalur and Paravur and the Grama Panchayats of Chadayamangalam,

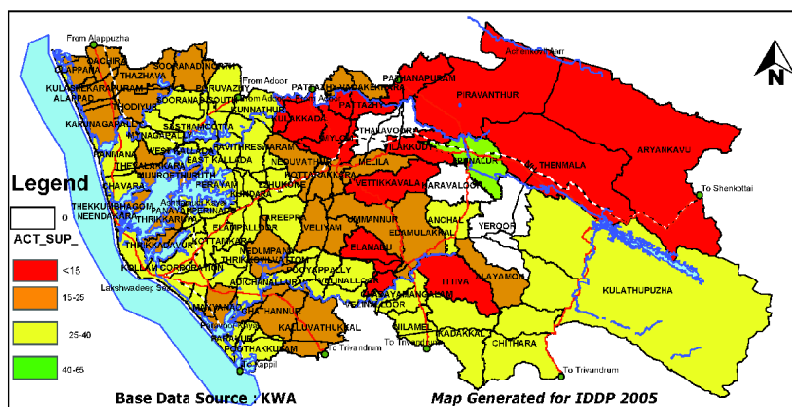


Fig. 18.6: LSGI wise distribution of actual supply of water

Municipality and all the other Grama Panchayats are having a supply level in between 15 and 40 LPCD.

In Kerala 58.11% of the population is benefited from piped water supply. Percentage of benefited population is 67.53

Needakara, East Kallada, Kundara, Perayam, Alappad, Elampalloor and Pavithreswaram have more than 70% percentage coverage (Figure 18.7). The status of piped water supply is given in Appendix I.

1.2.2. Quality of Water Supply

The Water found in nature contains a number of impurities in varying amounts. Wholesome water is that water which does not contain anything harmful to human health. The water required for domestic consumption should be free from bacteria and suspended/ dissolved/ organic impurities should be within the

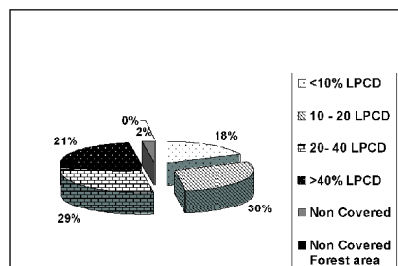
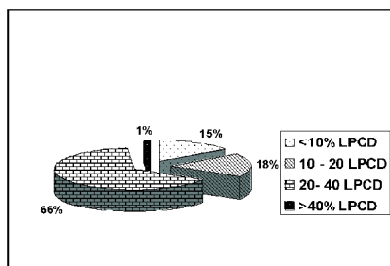


Fig.18.5: Actual water supply to habitations in LPCD-State and Kollam



between 10 to 40 lpcd and 1% of habitations are totally uncovered. Almost 146 habitations have less than 10 lpcd supply (Figure 18.5).

The spatial distribution of actual supply of water among LSGIs shows (Figure 18.6) that Aryancavu, Karavalloor, Thenmala, Yeroor, Pathanapuram, Pattazhy,

Table.18.3: Rural and urban population benefited from piped water supply in Kerala

Sl. No.	Category	Total population (1991 census)	Population benefited*	Percentage Population benefited
1	Urban	76,80,000	2493102	67.53
2	Rural	2,14,18,999	9695892	54.73
	Total	2,90,99,000	12189000	58.11

* Field data collected by RITES

Table.18.4. Rural and urban population benefited from piped water supply in Kollam district

Sl. No.	Type of Population	Number of population (2001 census)	Population benefitted*	Percentage Population benefitted
1	Urban	462097	450129	97.41
2	Rural	2122967	1090496	50.79
	Total	2585064	1540625	59.05

Table.18.5. Number of LSGIs in different ranges of coverage of population

% Coverage	LSGIs
Coverage of population between 71-100 %	Kollam Corporation and Punalur Municipality (2 LSGIs)
Coverage of population between 61-70 %	Paravur Municipality and 4 Grama Panchayats (5 LSGIs)
Coverage of population between 51-60 %	19 Grama Panchayats
Coverage of population between 41-50 %	8 Grama Panchayats
Coverage of population between 1-40 %	38 Grama Panchayats

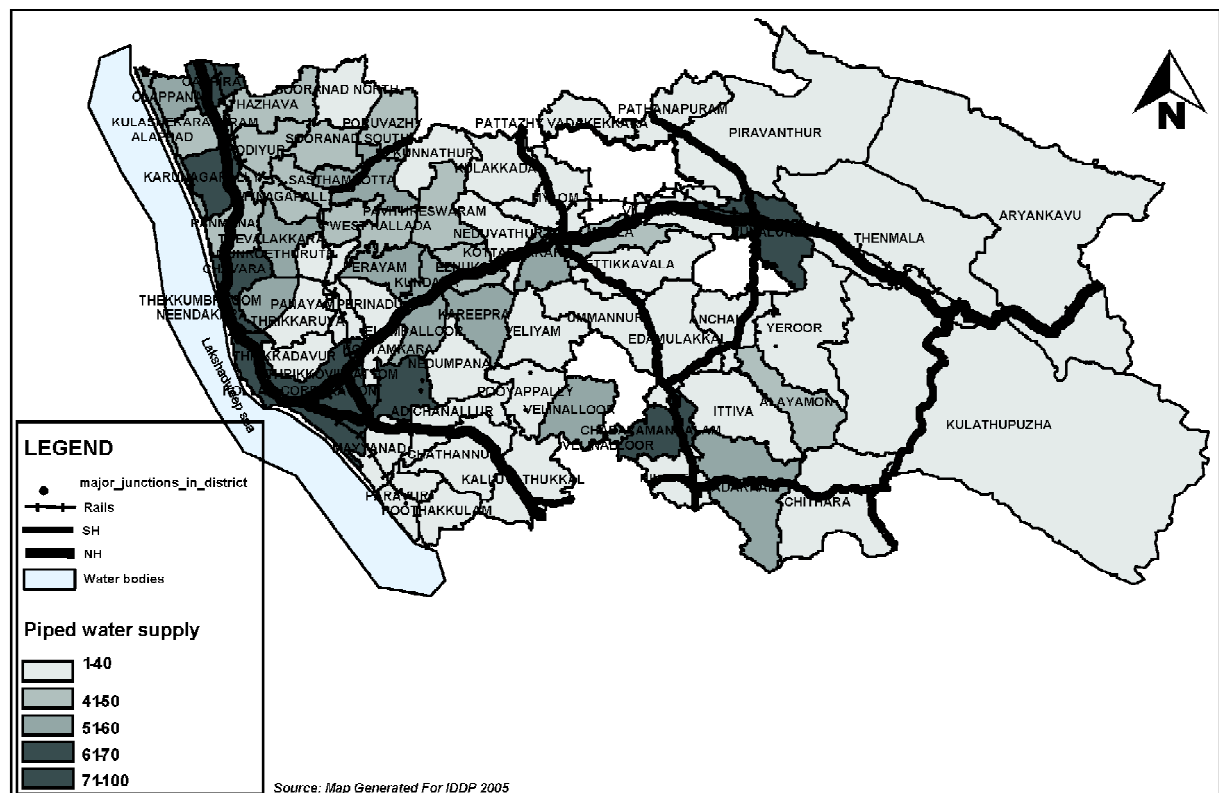


Fig 18.7. LSGI wise distribution of coverage of population of piped water supply

permissible limits.

Quality of water is scaled as given in Appendix 18 – I B.

In the costal areas water contain

1.3. Water Treatment and Treatment Plants

The aim of water treatment is to produce and maintain water that is

The method of treatment employed depends on the nature of raw water constituents and the desired standards of water quality. The unit operation in water treatment includes aeration, flocculation and clarification, filtration, disinfection etc.

In the case of ground water and surface water sources where the storage is well protected and the water has turbidity below 10 NTU and is free from odour and color, plain disinfection followed by chlorination is adopted before supply.

Fully treated water is supplied in Kollam Corporation and in Punalur, Kundara and Chithara Schemes. Only disinfection is provided in all other schemes. Production is maximum in Kollam Corporation (206.28 lakh litres) as shown in Figure 18.11.

Schemes with Treatment Plant

■ Quilon Water Supply Scheme
(Treatment Plant located at

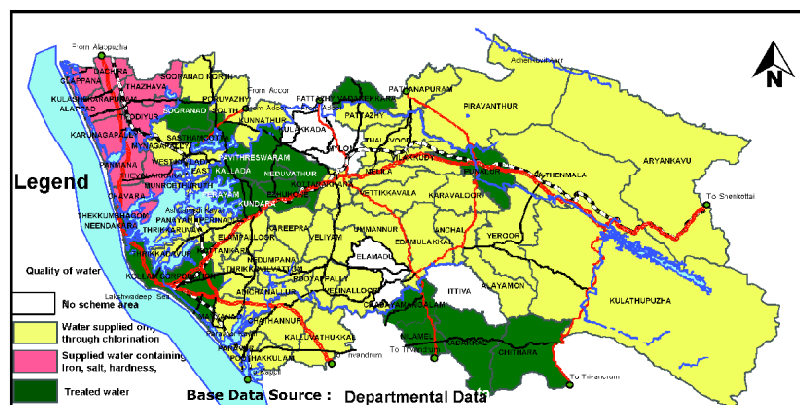


Fig. 18.8: LSGI wise status of quality of water in piped water supply

dissolved salts, iron, etc. Remaining areas are getting treated potable water.

The spatial distribution (Figure 18.8) reveals that LSGIs including Kollam Corporation, Punalur Municipality etc are getting treated water through modern treatment facilities.

1.2.3. Water Distribution

KWA is supplying drinking water through 16845 street taps in Kollam District. Grama Panchayats namely Mylom, Kulakkada, Elamad, Karavaloor and Yeroor are not provided with street taps. Maximum numbers of street taps are provided in the Grama Panchayats of Thrikkaruva, Karunagappally, Chavara, Sasthamcotta, Sooranad South and Clappana (Figure 18.9).

Distribution pipes are not laid in the Grama Panchayats of Kulakkada, Mylam, Thalavur and Elamad. Length of distribution pipes per 1000 population is greater than 2 kms in Punalur Municipality and the Grama Panchayats of Clappana, Chadayamangalam, West Kallada, Poothakulam, Kundara, Ezhukone, Velinalloor and Pavithreswaram.

Number of House connections is maximum in the Grama Panchayats of Clappana, Karunagappally, Chavara, Sasthamcotta, Thrikkaruva, Thrikkadavoor, Punalur Municipality and Kollam Corporation, Alappad and West Kallada. House connections are not provided in the Grama Panchayats of Elamad, Kulathupuzha, Eroor, Ittiva, Thalavoor, Pattazhy, Mylom, Kulakkada and Karavaloor (Figure 18.10).

hygienically safe, aesthetically attractive and palatable, in an economical manner.

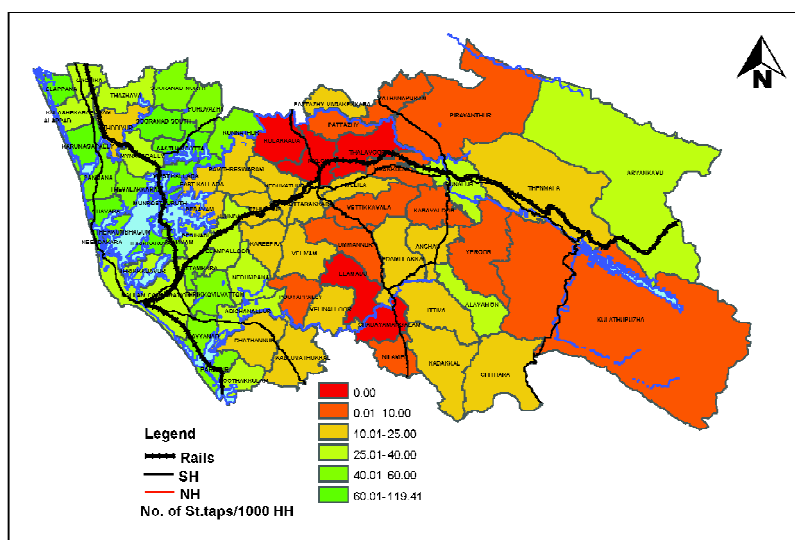


Fig. 18.9: LSGI wise availability of number of street taps/1000 house holds

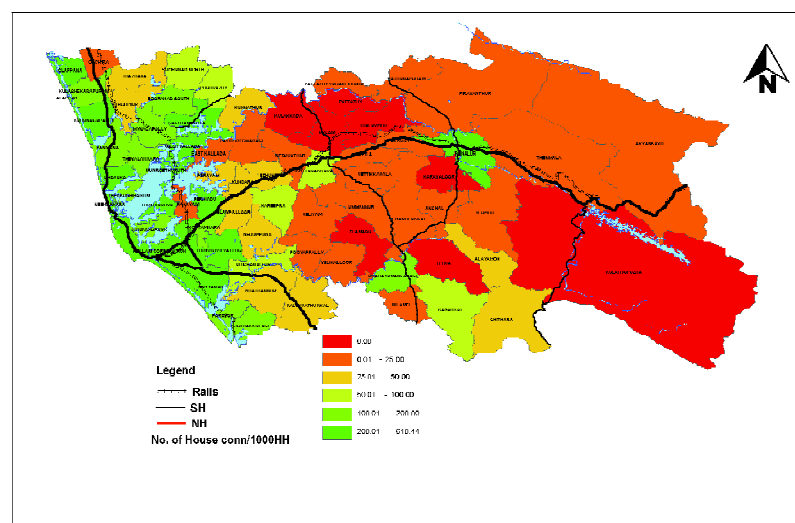


Fig. 18.10: LSGI wise number of house connections/1000 house holds

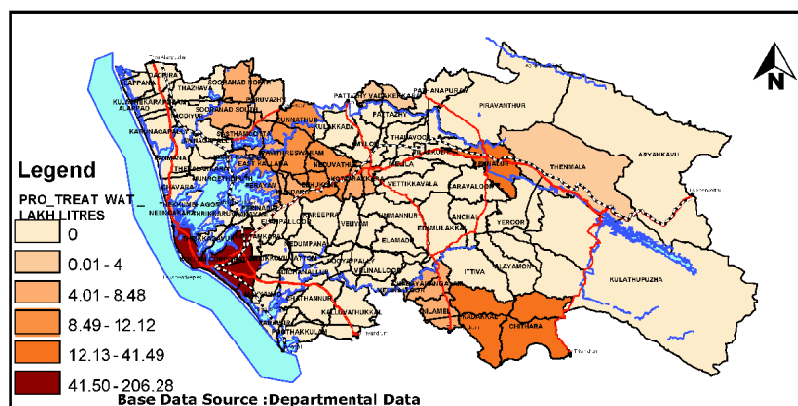


Fig.18.11. LSGI wise status of production of treated water in lakh liters

Sasthamcotta.)

- Urban Water Supply Scheme to Punalur (Treatment Plant located at Punalur)
- CWSS to Kundara and adjoining Grama Panchayats (Treatment Plant located at Elampal)
- CWSS to Chithara and adjoining Grama Panchayats (Treatment Plant located at Madathara)

1.4. Water Requirements

The Environmental Hygiene Committee suggested certain optimum service levels for communities based on population groups. In the Code of Basic Requirements of Water Supply, Drainage and Sanitation (IS: 1172-1983) as well as in the National Building Code, minimum of 135 lpcd has been recommended for all residences provided with full flushing system. The per capita water supply level as per Water Supply Manual is given in Table 18.6.

A minimum water requirement for domestic and essential non domestic uses is met through Public Water Supply. Based on the objectives of full coverage of urban communities easy access to potable drinking water in quantities recommended to meet the domestic and other essential non domestic needs the following recommendations viz 40 lpcd water supply requirements for rural areas and 70 lpcd for urban areas are made. Minimum water requirement for various household activities is given in Table 18.7.

1.4.1. Backlog

Backlog of water supply has been analyzed as backlogs in source, distribution, treatment, and storage.

As given in Appendix 18 – I B, backlog in source is scaled as 1 in places where additional source is required; value 2

Table.18.6. Per capita water supply level

For communities with population upto 20,000	Supply through street tap	40 litres (min) per capita
	Supply through house service connections	70 to 100 litres per capita
For communities with population 20,000 - 1,00,000		100 to 150 litres per capita
For communities with population above 1,00,000		150 to 200 litres per capita

Source: Water Supply Manual

Table.18.7. Minimum water requirement

Minimum water requirement	Stand posts/hand pump Supply (lpcd)	House service Connections (lpcd)
Drinking	3	3
Cooking	5	5
Bathing	15	20
Washing utensils/house	7	12
Ablution	10	15
Washing clothes		
Flushing WC		15
Total	40	70

indicates that those LSGIs can meet the requirements with new tube wells. A value 3 is an indication of adequate sources. Present source is adequate in Chithara, Kadakkal, Punalur, Sasthamcotta, Sooranad South and Neendakara (Figure 18.12). In all other areas source augmentation is required. However for future requirements, Sasthamkotta Lake is an inadequate source as identified by CWRDM.

As given in Appendix 18A – I B, backlog in treatment is scaled using a value 1 where chemical treatment other than chlorination

is required. A value 2 shows that chlorination alone is required. Value 3 indicates that present treatment is sufficient. Water available in the coastal area, Kulathupuzha, Alayamon, Elamad, Ittiva, Edamulackal and Karavalor Grama Panchayats requires chemical treatment before usage to remove iron content (Figure 18.13).

Backlog in distribution is scaled with value 1 where old and damaged pipes are to be repaired urgently. A value 2 shows the areas where pipeline extensions are required. A value 3 indicates that the present distribution network is sufficient.

Figure 18.14 shows that except for few areas in North and mid land, pipeline extensions are required.

As given in Appendix 18A – I B, backlog in storage is scaled as 1 where new tanks are to be constructed. A value 2 shows that tank repair is sufficient. Value 3 is an indicator of no further requirements. Figure 18.15 shows that except mid land area and North-East area, tank repair and new tank constructions will be required.

As given in Appendix 18 – I B, severity index has been arrived by taking the product of the values of backlog in source,

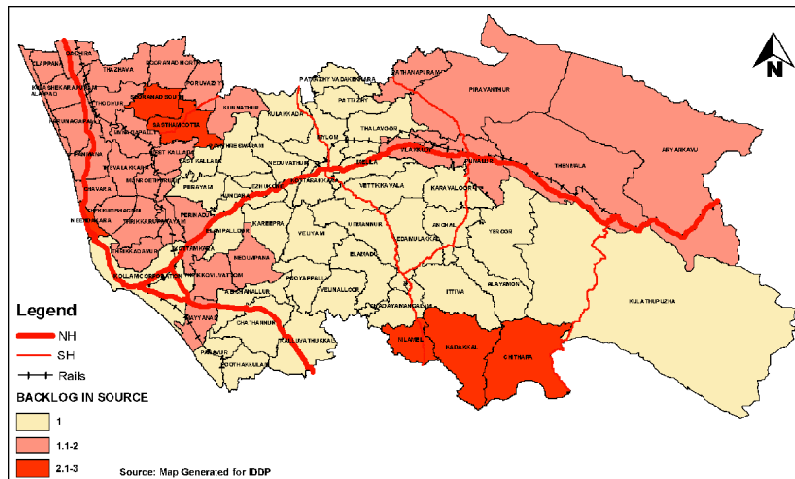


Fig. 18.12: LSGI wise status of back log of water supply in source

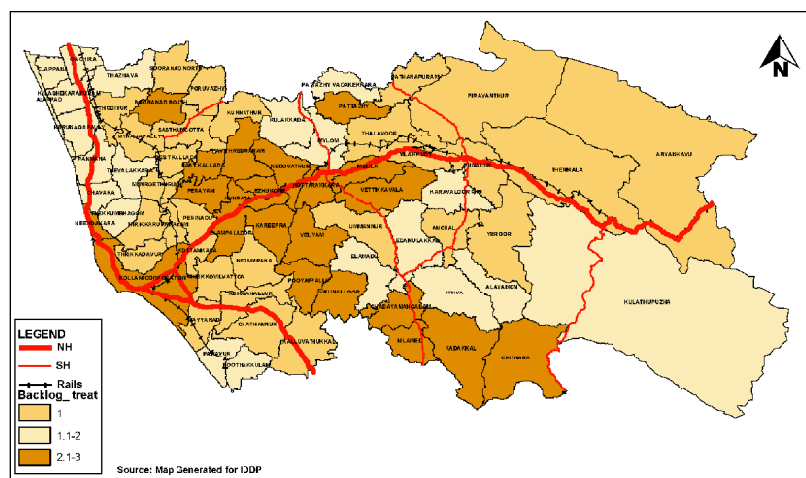


Fig. 18.13: LSGI wise status of back log of water supply in treatment

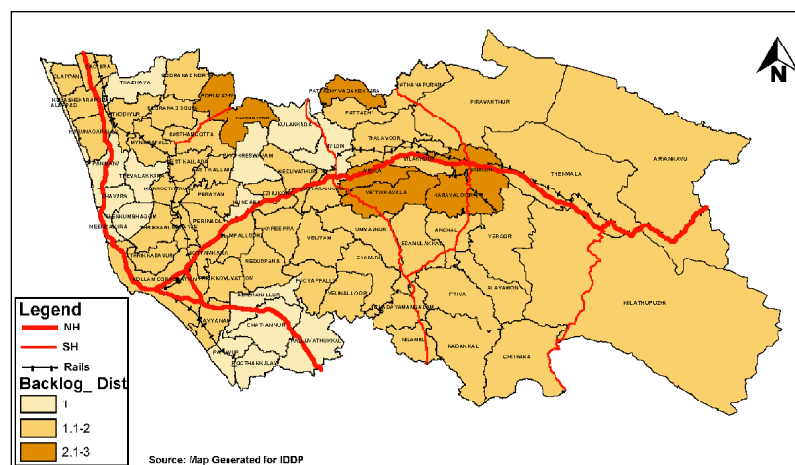


Fig. 18.14: LSGI wise status of back log of water supply in distribution

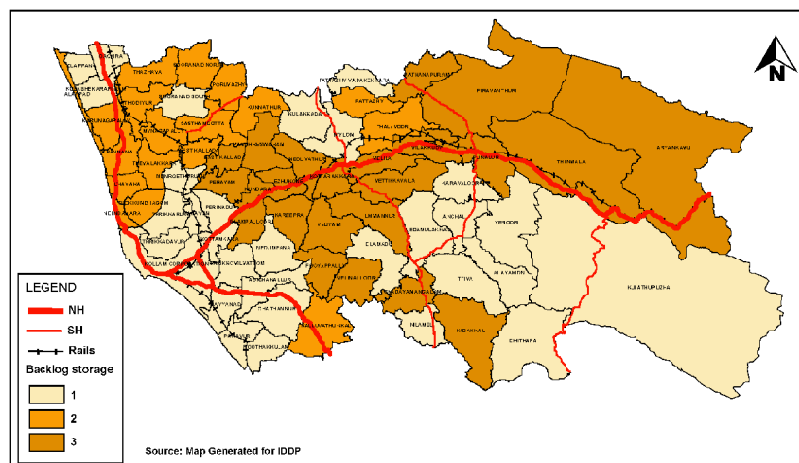


Fig. 18.15: LSGI wise status of back log of water supply in storage

treatment, storage, distribution and quality of water.

The present situation is most severe in the LSGIs of Alayamon, Edamulakkal, Yeroor, Anchal, Mylom, Kulakkada, Panayam, Perinadu, Thrikkaruva, Thrikkadavoor, Paravoor Municipality, Poothakkulam, Kottamkara, Thrikkovilvattom, Mayyanad, Oachira, Kulasekharapuram, Clappana, Manroelsland, Chathanoor, Adichanalloor, Nedumpna, Thekkumbhagam, Thevalakkara, Panmana, Chavara, Karunagappally, Alappad, Thazhava, Kalluvathukkal, Kulathupuzha, Thalavoor and Thodiyoor (Figure 18.16).

1.5 Water Scarcity

A study regarding the proximity of water sources to households conducted at the National as well as the state level reveals that in Kerala more than 50 % of population has nearer water sources whereas the

situation is different in other parts of the country (Figure 18.17 and 18.18).

Accessibility to water sources has been studied in the Socio Economic Survey (2005) conducted for IDDP-LDP Project which revealed that in Aryankavu Grama Panchayat 34 % of people reported to

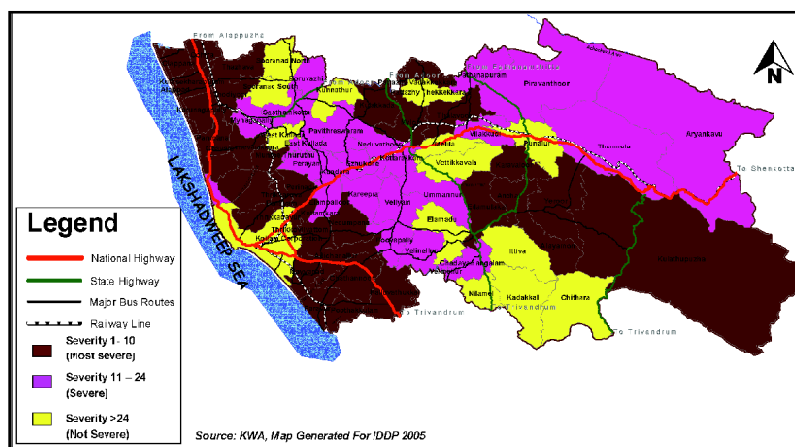


Fig. 18.16: LSGI wise distribution of Severity index of backlogs

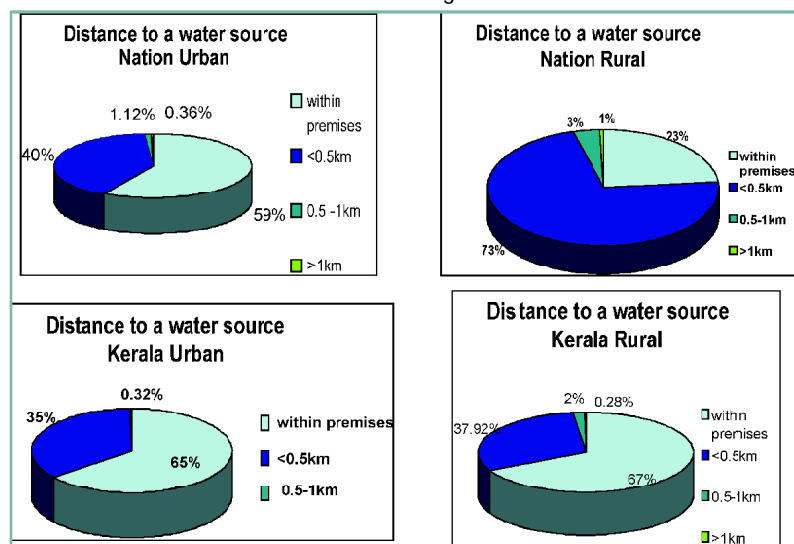


Fig.18.17 and 18.18: Classification of distance to a water source in India and Kerala – Urban and Rural

have drinking water sources at a distance greater than 0.5km. 4 more LSGIs have reported about distant sources namely Thalavoor, East Kallada, Panayam and Clappana Grama Panchayats (Figure 18.19).

Scarcity of water has also been studied in the LSGIs of Kollam district. As per the Socio Economic Survey (2005) the LSGIs having acute shortage of water are Aryankavu, Alayamon, Karavallur, Pattazhy, Elamadu, Velinalloor, West Kallada, Poothakkulam and Thrikkadavur (Figure 18.20).

1.6 Household and Environmental Sanitation

In every town or village wastes of different types such as used water from bath room, kitchens, lavatory basins, house and street washings, semi liquid wastes of human and animal excreta, dry refuse of house and street sweepings, broken furniture, crockery, wastes from industries

etc, are produced daily.

If proper arrangements for the collection, treatment and disposal of all the wastes produced from every human settlement are not made, accumulation of wastes will create various adverse condition. For example the safety of structures such as buildings, roads etc. will be in danger due to accumulation of used water in their foundations, disease causing bacteria will spread up in the stagnant water and the health of the public will be in danger, drinkable water will be polluted etc. Total unsanitary conditions will be developed making it impossible for the public to live in the towns or cities. Therefore it is most essential to collect, treat and dispose of all the wastes so as

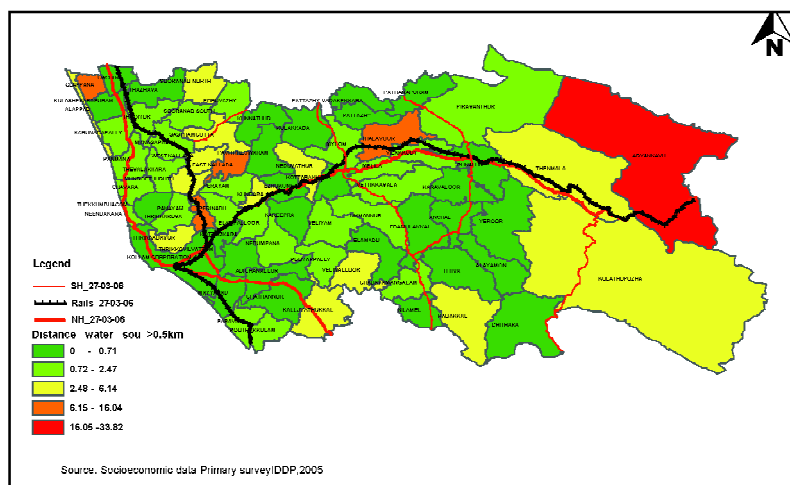


Fig. 18.19: LSGI wise status- Percentage population who has distance to a water source > 0.5 km

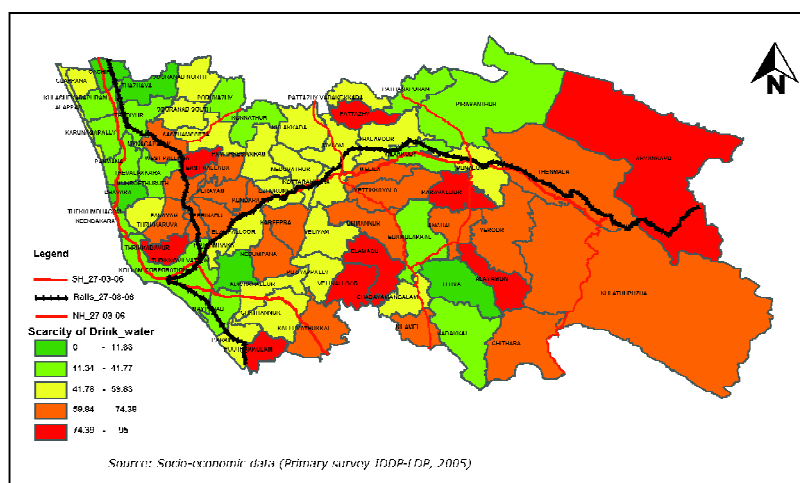


Fig. 18.20: LSGI wise status- Scarcity of drinking water

to avoid any havoc to the people residing in the area. The spatial distribution map showing shortage of household latrines in LSGIs of Kollam (as from Total Sanitation Campaign) shows that the critical LSGIs are Kollam Corporation, Punalur Municipality and the Grama Panchayats of Sooranadu North, Perayam, Kunnathur and Kareepra (Figure 18.21).

Community latrines are provided wherever the area of individual land holding is not sufficient for constructing Individual Household Latrines and where there is high density of population. Presently the Grama Panchayats of Kottarkkara, Edamulakkal, Sasthamcotta, Oachira, Thenmala, Poothakkulam, K.S. Puram, Ummanoor and Clappana are having community latrines at Public places.

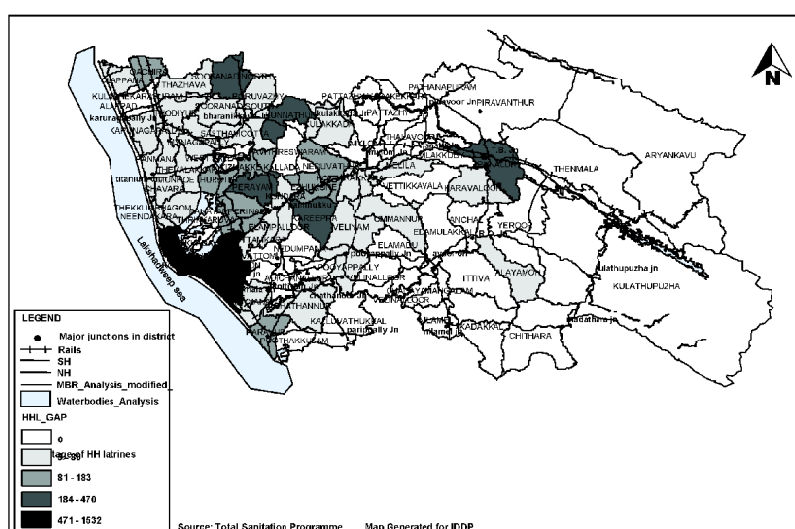


Fig. 18.21: LSGI wise distribution of shortage of household latrines

Ummanoor Grama Panchayat is having a community complex in the house cluster of Ambalathumkala SC colony.

2 Overall Development Trend

2.1 Overall Development Trend in Drinking Water Supply

The overall development trend of the drinking water sector in the district is analysed based on the following criteria.

- ┆ Population benefited over the years.
- ┆ No. of street taps installed over the years.
- ┆ No. of house connections provided over the years.
- ┆ No. of tube wells constructed over the years.
- ┆ No. of bore wells constructed over the years.

On analysing the population benefited from 2001 to 2005 it is seen that there is a steady increasing trend (Figure 18.22). This shows that more population is getting accessibility to drinking water.

On analysing the No. of street taps installed during 2001 to 2005, it is seen that there was steady increase upto 2004 which drastically increased during 2004 to 2005 (Figure 18.23). This means that public gets more accessibility to drinking water.

The house connections provided during 2001-2005 shows steady increase showing that more and more individual houses are getting accessibility to drinking water (Figure 18.24).

The No. of tube wells and bore wells constructed during 2001 to 2005 also show increasing trend (Figure 18.25).

Overall it is seen that the services

rendered to the population in terms of all the above criteria in the Drinking Water Sector shows increasing trend.

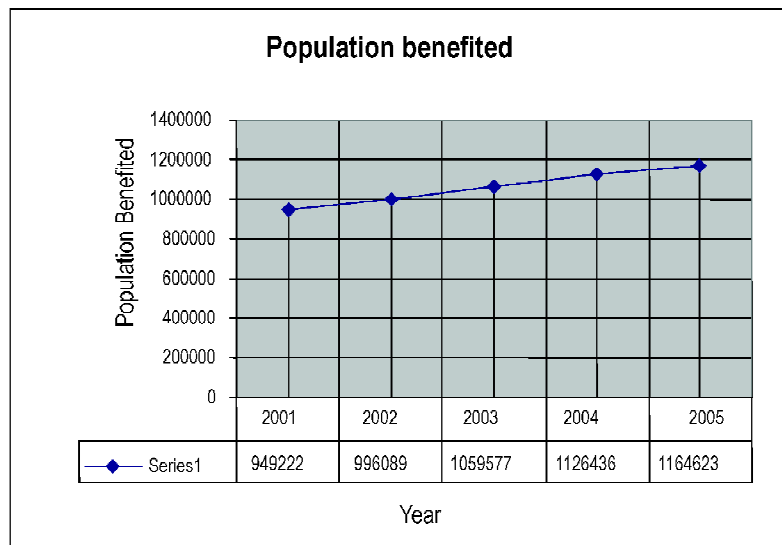


Fig. 18.22: Trend in drinking water supply – Population benefited

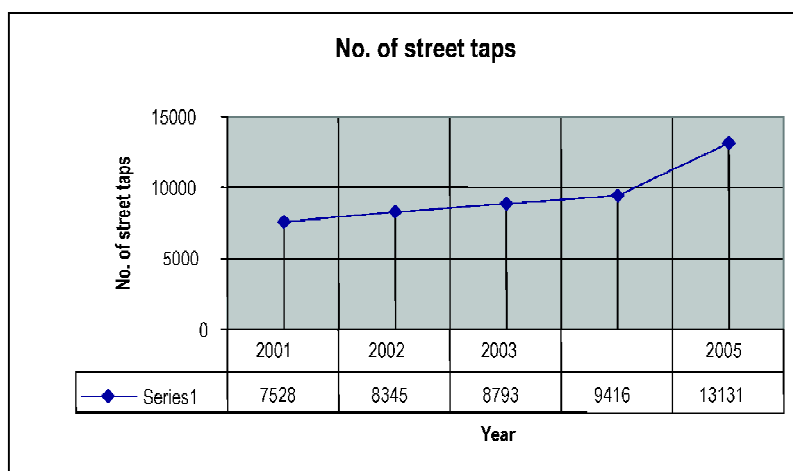


Fig. 18.23: Trend in drinking water supply – Number of street taps

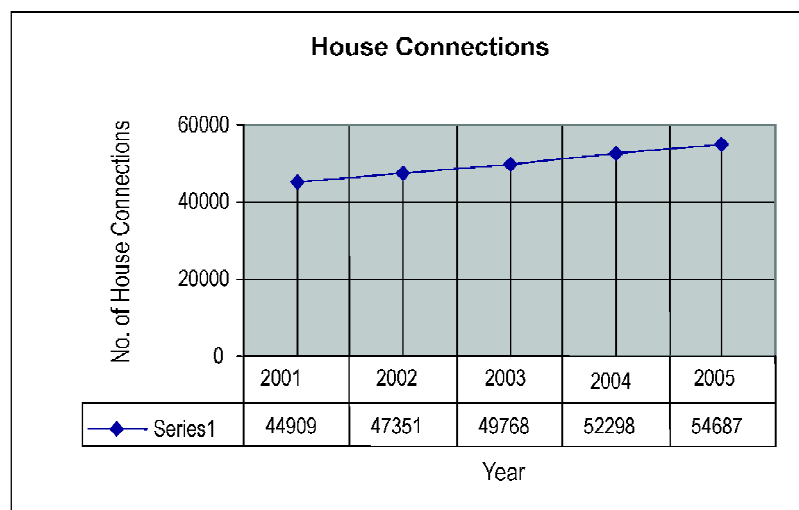


Fig. 18.24: Trend in drinking water supply – Number of household connections

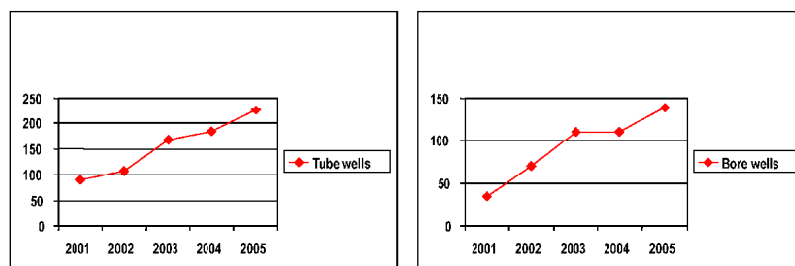


Fig. 18.25: Trend of tube wells and bore wells constructed over the years

2.2 Overall Development Trend in Sanitation

In the survey conducted during 2001, it was revealed that there are 95130 households without Household Latrine in Rural areas. Over the period 91878 HHLs were constructed. The trend from 2004-

which may go further and affect the present fresh water source also. Hence the rivers require urgent attention so as to maintain quality and quantity of river water.

Another major problem with the surface sources is the lack of proper conservation measures, which results in

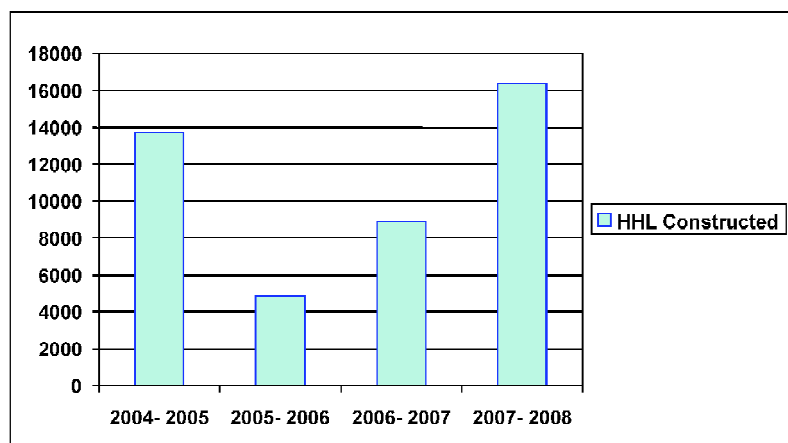


Fig. 18.26: Number of rural household latrines constructed

05 to 2007-08 shows that the coverage is increasing. The remaining could be covered by 2009 (Figure 18.26).

3 Development Issues

3.1 Problems of Drinking Water Supply

Regarding the perennial surface sources, the increased future drinking water demand may impose the prevention of other use of river water. On analyzing the river flow data it is seen that almost all the rivers in Kerala are recording an almost nil flow during the summer season. This demands construction of storage structures across the rivers for providing sufficient storage for the lean flow season. Otherwise almost all the water requirements which include drinking, irrigation, industrial and entertainment etc. will be affected. The over exploitation of river water also cause salinity intrusion in rivers during high tide. At present the saline water intrusion is reported up to Katapuzha in Kallada River

the runoff water directly going to sea. So is the case with minor sources such as lakes and ponds.

The adequacy of Sasthamcotta Lake, the major source of drinking water to the Kollam town is to be ascertained. The extensive use of water from this lake added with insufficient conservation methodologies adopted raises at most concern in the sustainability of this lake as pointed out by several agencies and environmental activists.

In the case of ground water, potential sources in the coastal areas are over exploited. This causes saline water intrusion, quantity reduction and frequent damages to tube wells. However the major health hazards like fluoride etc. are not encountered in Kollam as in the nearby coastal areas like Alappuzha etc.

The increased extraction of ground water is not advisable due to various reasons. Therefore protected good quality

water supply based on perennial surface water sources should be our priority. Schemes shall be sustainable and form a permanent solution to the drinking water shortage in the district.

As mentioned in the Article 1.2.1, the average domestic consumption under normal condition comes to 135 lpcd. But the Govt. of India norms for Water Supply are 40 lpcd in rural areas and 70 lpcd to 100 lpcd in urban areas. This is quite inadequate considering the way of life of Keralites, and also due to the development pattern of urban-rural continuum that exists here. The average density of population of the district is 1038 persons per sq.km as per 2001 Census. So the rural areas also have to be provided with 70 to 100 lpcd water as in urban areas for ensuring the envisaged hygienic conditions in rural areas as well.

In the case of water quality, all the areas without proper treatment facilities suffers water quality problems, in particular the coastal areas.

As for water distribution facilities, many of the existing pipes laid are damaged and not replaced due to lack of funds. The problem aggravates due to intermittent supply. When the supply is intermittent, the chances of pipes getting damaged will be more, resulting in supply of poor quality water. The analysis of data collected from field offices of Kerala Water Authority and other related offices reflected the shortage/ deficit of piped water supply schemes in various Grama Panchayats and the Kollam Corporation area.

It is identified under article 1.4.1, that LSGIs of Thazhava, Panmana, Chavara, Thekkumbhagam, Thevalakkara, Adichanallur, Poothakkulam, Paravur, Kalluvathukkal, Kulakkaada, Pavithreswaram and Chathanur have areas severely affected due to the old age of distribution system. These are all basically coastal LSGIs.

Generally the average rainfall received in Kollam District is far above the State average. But due to the topography and Soil Characteristics, most of the rain water drains to the sea as surface run off.

This causes water scarcity in almost all areas which in turn causes problems in sanitation sector. The reasons for drinking water shortage can be either qualitative or quantitative. They are

1. Depletion in ground water table.
2. Undue extraction and use of water.
3. Sand mining in Rivers, Lakes etc.
4. Damaging existing water sources.
5. Geological and Geographical characteristics of land.
6. Pollution of Water Bodies.

Water quality problems in certain areas are caused due to contamination of physical, chemical or bacteriological in nature.

As identified in Article 1.4.1 in the analysis of severity index, there are certain areas which are severely affected due to backlogs in source, treatment, storage distribution and quality of water. These include LSGIs such as Paravur Municipality, Alayamon, Anchal, Edamulakkal, Yeroor, Panayam, Poothakkulam, Kottamkara and Mayyanad Grama Panchayats.

Similarly according to people's perception, areas such as Aryankavu, Alayamon, Karavallur, Pattazhy, Elamadu, Velinaloor, West Kallada, Poothakkulam and Thrikkadavur suffer from water scarcity. Areas such as Aryancavu, Clappana, Perinadu, Pavithreswaram and Thalavoor suffer from the problem of greater distance to drinking water source (>0.5 km).

Based on severity index as calculated from the status of water supply facilities, distance to drinking water facilities (>0.5 Km) and scarcity of water from people's perception (Socio-economic data, 2005) it can be seen that Aryankavu Grama Panchayat is in the most severe category in the drinking water sector. Alayamon, Thrikkadavoor and Poothakkulam are in the second severe category. Edamulakkal, Yeroor, Anchal, Mylom, Kulakkada, Panayam, Perinadu, Thrikkaruva, Paravoor Municipality, Kottamkara, Thrikkovilvattom, Mayyanad, Oachira, Kulasekharapuram, Clappana, Manroelsland, Chathanoor, Adichanalloor, Nedumpana, Thekkumbhagam, Thevalakkara, Panmana, Chavara, Karunagappally, Alappad, Thazhava, Kalluvathukkal, Kulathupuzha, Thalavoor, Thodiyoor, Karavallur, Pattazhy South, Ezukone, Elampallur, Velimnalloor, and Pavithreswaram come in the severe category.

There is also an issue of change in attitude of the people. The drinking water

now supplied is used for all other regular use of the human which include even bathing of animals. Hence the water demand will always be very high than the expected drinking water demand in abstract sense. The use of drinking water has to be minimized to the specified purpose only by which we can reduce the demand for drinking water.

Ownership of the water resources is also now in question. Now some issues have developed in Kollam district regarding the ownership of the water sources and the use of water from the sources. Hence this also has to be defined to avoid disputes between local bodies/other agencies regarding the ownership of water sources. In Kollam District there are some local bodies where no safe source for drinking water is available. For example Alappad, a Coastal Grama Panchayat, severely affected by Tsunami, has no reliable source other than ground water which is now reported as having saline water intrusion at some places. Hence this issue has to be addressed very seriously while preparing development plans.

3.2 Potentials of Drinking Water Supply System

As mentioned in Article 1.1.1, the major perennial sources of water in Kollam district are Achencovil, Kallada, Ithikkara and

required include control of runoff, controlled use of drinking water etc. Kollam district is also gifted with sufficient storage of water as backwater which is slightly saline in nature due to its connection with ocean. Through proper treatment measures they may also be resorted as possible sources of drinking water. However the economic viability has to be considered.

3.3 Problems of Sanitation

Availability of drinking water, good sanitation and pollution free environment are the three essential factors of a healthy society. Generally health and sanitation are linked to safe drinking water.

Providing good sanitation is an obligatory function of the LSGIs. This includes providing good sanitary facilities in households, markets, public places and proper solid as well as liquid waste disposal and treatment systems. The solid waste management and liquid waste disposals are the obligatory functions of Urban Local Bodies. But even in the Corporation area, these services are poorly performed due to financial constraints creating problems of health, sanitation and environmental degradation.

An unhealthy sanitary condition itself invites difficulty in disposal of liquid waste generated from households. In Kollam, almost all the coastal Villages are facing

Table 18.8: Potentials of major perennial rivers – Annual yield

Sl.No.	Name of river	Annual Yield (Mm3)	Annual Utilizable Yield (Mm3)
1	Kallada and Pallickal	2283	1249
2	Achancoil	2270	1368
3	Ithikkara	761	429
	Total	5314	3046

Pallickal Rivers.

The water yield in these rivers is given in Table 18.8 (Water Scenario of Kerala, GoK, 1998). It is seen that the total percentage utilizable yield is 57.32%. Thus roughly 50% of total yield can be utilized as source for various water requirements in the district.

If proper conservation and protection measures are taken, other surfaces sources across the district can also be utilized as drinking water sources such as Vattakayal (Sakthikulangara), Akathu kayal (Paravur Municipality) etc. The measures

acute problems in liquid waste disposal due to the high population density, better water supply schemes in implementation, better living standards and above all the high water table level and the sandy nature of soil. Since the water table is high up to nine months period in a year, the possibility of contamination of ground water and top soil is very high.

In Kollam district high density areas like Karunagappally, Kottarakkara, Anchal, Punalur and Chathanur faces problems in the disposal of solid waste and sewage.

Sewerage sector remains as an

unattended issue in Kollam District. The serious issue that the next generation has to face is the disposal of waste, both solid and liquid. The severity of the issue increases as the living standards increases.

3.4 Potentials of Sanitation

In many LSGIs where water table is very high and soil is highly permeable, the possibility of contamination of ground water and top soil is very high. Here community sanitation system may be adopted. In the present and future urban centres there is potential for providing sewerage system. Usage of alternative technology is also possible in the district.

4 Agencies Involved

The agencies involved in the drinking water sector are Kerala Water Authority, Ground Water Dept., Kerala Rural Water supply and Sanitation Agency and Jilla Panchayat. The research agencies in the field include Centre for Water Resource Development and Management (CWRDM), Kozhikodu, Water and Sanitation Consultant (WASCON) etc. The agencies involved in rain water harvesting are Socio- economic Unit Foundation and Nirmithy Kendra.

In the case of sanitation sector, the Total Sanitation Campaign is the major agency for rural areas. The urban LSGIs are directly involved in the sanitation sector in their respective areas with financial assistance from GOI.

5 Existing, Ongoing and Committed Projects

5.1 Existing, On going and Committed Projects of Drinking Water Supply

5.1.1 Existing Schemes in Operation

Existing Schemes under KWA:

In 64 Grama Panchayats out of 71 Grama Panchayats, 2 Municipalities and Kollam Corporation, Mini and Major water supply schemes are in operation under KWA. There are four major schemes with surface source and full treatment facilities. Quilon Water Supply Scheme with Sasthamcotta Lake as source has 37.5 MLD treatment plant located at Sasthamcotta. Water treated in this plant is being supplied to all wards of Kollam Corporation, 15 wards of Sasthamcotta Grama Panchayat, 12 wards Sooranad South Grama Panchayat, Part of Chavara Grama Panchayat and 10 wards

Neendakara Grama Panchayat.

In addition to this, water pumped from 34 tube wells is also used for meeting the demands of Kollam Corporation. Urban water supply scheme to Punalur Municipality with Kallada River as source has intake arrangements and treatment plant of capacity 5 MLD located at Punalur town. This scheme covers all wards of Punalur Municipality.

Comprehensive water supply scheme to Chithara and adjoining Grama Panchayats with Kulathupuzha River as source has intake arrangement at Mylamoodu and treatment plant of capacity

Schemes under Other agencies

Sectoral Reforms Project: Rajeev Gandhi National Drinking Water Mission has launched the Sector Reforms Project (SRP) during 1999 for providing drinking water to the needy people of rural India. In Kerala state Kollam and Kasaragode Districts were selected for the implementation of SRP with the concerned Jilla Panchayats as implementing agency. 123 Mini water supply schemes are in operation under Sectoral Reforms Project with tube wells and open wells as sources (Figure 18.27).

Swajaldhara – II Project: The

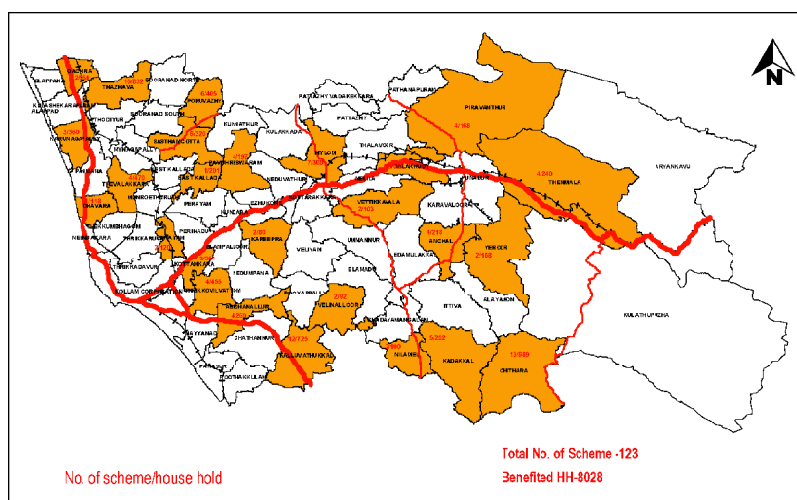


Fig. 18.27: LSGI wise distribution of schemes under Sectoral Reforms Project, Kollam

3 MLD located at Madathara. This scheme covers 14 wards of Chithara Grama Panchayat, 19 wards of Kadakkal Grama Panchayat, 10 wards of Nilamel Grama Panchayat and 11 wards of Chadayamangalam.

Comprehensive scheme to Kundara and adjoining Grama Panchayats with Kallada river as source has intake arrangements at Punalur town and treatment plant of capacity 16 MLD at Elampal. This scheme covers all wards of Grama Panchayats of Kundara, Perayam, East Kallada, Pavithreswaram, Elampalloor and Ezhucone, 7 wards of Neduvathoor and 5 wards of Kottarakkara. There are 15 Mini Water Supply Schemes with surface source in which water is being distributed after disinfection. Ground water sources meet the demands of the remaining Grama Panchayats. Details are given in Appendix 18 -II.

Sector Reforms Project was transited to Swajaldhara – II with effect from April 2004. 107 Mini Water Supply Schemes were taken up under this project. 26 Grama Panchayats were selected for this project (Figure 18.28).

Swajaldhara Project: From April 2006 the Scheme is called as Swajaladhara. 27 water supply schemes with 24 open well source and 3 tube wells were considered in this scheme. Out of this 20 schemes were completed and others are in the finishing stage. Nearly 1 lakh people will be benefited with drinking water due to the schemes taken up under Sector Reforms, Swajaldhara II and Swajaldhara.

5.1.2 On going Projects

JBIC Project (Japan Bank for International Co-operation):

The ongoing JBIC Project which covers 13 Grama Panchayats and 1 Municipality has tapping point at Tholikodu and treatment plant of capacity 73 MLD at

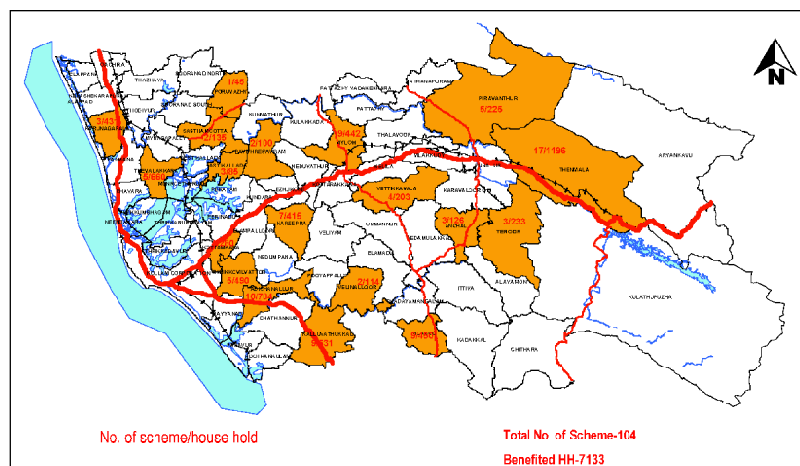


Fig. 18.28. Details of water supply scheme - Swajaldhara-II Project

Panamkuttimala. There are 14 storage reservoirs under this project for supplying water to areas coming under the project. Name of Grama Panchayats with percentage population covered under JBIC projects are shown in the Table 18.9.

Table 18.9: Percentage Population coverage in JBIC project areas

Name of Village/Municipality	% coverage (popin)
Paravur Municipality	63.74
Karavallur	55.78
Anchal	74.51
Edamulackal	61.19
Arackal	50.66
Ummannur and Valakom	56.34
Elamad	57.37
Veliyam and Odanavattom	60.29
Poooyappally	85.21
Meenad and Chirakkara	67.72
Paravur (Part)	67.72
Poothakkulam	60.99
Adichanalloor (Part)	60
Nedumpana and Pallimon	59.57
Mayyanad	69.49

Tsunami Rehabilitation Programme (TRP)

Administrative sanction has been obtained for the improvement of Water Supply facilities in coastal areas of Kollam Corporation, and coastal Grama Panchayats mainly Thevalakkara, Tekkumbhagam, Thodiyur, Kulashekharapuram (Water supply division) and Paravur Municipality, Thrikkadavur, Munreo Thuruth, East kallada and Perinadu (P.H Division) under TRP. Total estimate of this project is 1467.3 lakhs.

On completion of this project the inhabitants of the area, about 281376 persons, get 40 to 70 LPCD potable water. Tsunami Emergency Assistance Programme (TEAP)

Works by KWA: As a measure for the

reconstruction of damaged infrastructure in Tsunami affected areas, Asian Development Bank has granted an amount of 10.3 million US Dollar for Kerala Water Authority. With the financial assistance received from ADB, Kerala Water Authority has taken up the water supply scheme to Alappad, Clappana, Oachira and Karunagappally Grama Panchayats where the Tsunami disaster was at its maximum. The scheme benefits a population of 1, 25,000 and the cost of the scheme is Rs.52 crores. It is proposed to collect water from Achencoil River at Mavelikkara and the water treated at Oachira treatment plant (15MLD) will be supplied in the project area. The project is under implementation and expected to be complete by the first quarter of 2009.

Jalanidhi work: This is another work for the Tsunami affected area, financed by the World Bank and Govt. of Kerala and implemented with people's participation. The scheme is implemented jointly by Kerala Water Authority and Jalanidhi. In this scheme it is proposed supply treated water to Chavara and Panmana Grama Panchayats. The source of raw water is Sasthamcottah Lake and the treatment plant (11 MLD) is located at Sasthamcottah. The part of works undertaken by KWA is almost over and the distribution network that is to be laid by the Jalanidhi is still to be arranged. It is expected that the scheme can be completed by the end of 2009.

The cost of project is Rs. 35 crores and the population benefited is 88000. The speciality of this scheme is that there is financial contribution from the beneficiaries at the rate of 10% of the total cost of the

distribution network and the Grama Panchayat has to run the scheme at their own risk.

Deposit Works of LSGIs and Works funded by MP/MLA Funds

Works founded by MP/MLA funds, LSGIs etc. are basically carried out for minor works like extension of pipe line, drilling of tube wells etc. which would result in increasing the coverage and which also help to meet the immediate requirements of local people. Works in a number of major and minor water supply schemes taken up by KWA are in progress in various Grama Panchayats, Municipalities and also in the Corporation. The details are as listed in Appendix 18-A II.

Rain water harvesting projects

As mentioned in Article 4, rain water harvesting is by and large implemented by 2 agencies viz. Socio-economic unit Foundation and Nirmithy Kendra. From 2006 onwards 90 units have been constructed by Socio-economic unit Foundation and 77 units have been constructed by Nirmithy Kendra. The spatial distribution of the units among LSGIs in the district is given in Figure 18.29.

It is seen that Neendakara has the maximum number of units (58 no.s) constructed so far.

The capacity generated (Figure 18.30) is maximum in Punalur Municipality (235 m³) followed by Neendakara and Thodiyur Grama Panchayats.

5.1.3 Committed Projects

The major committed schemes are those funded by NABARD and those sanctioned by the Govt. of India [Accelerated Rural Water Supply Schemes (ARWSS)] implemented through the State Level Sanctioning Committee (SLSC).

NABARD Schemes

Following are the various schemes coming under NABARD funding.

1. RWSS to Elampalloor, Punukkannoor Chira

This project is proposed to provide full coverage to Elampalloor Grama Panchayat as well as to meet the ultimate demand in 2028 AD. The project propose to pump treated water from Punukkannoor Chira to the existing Reservoir at Thrikkoyikkal from where water gets distributed to various parts of the Grama Panchayat through existing transmission main and distribution lines. For the purpose

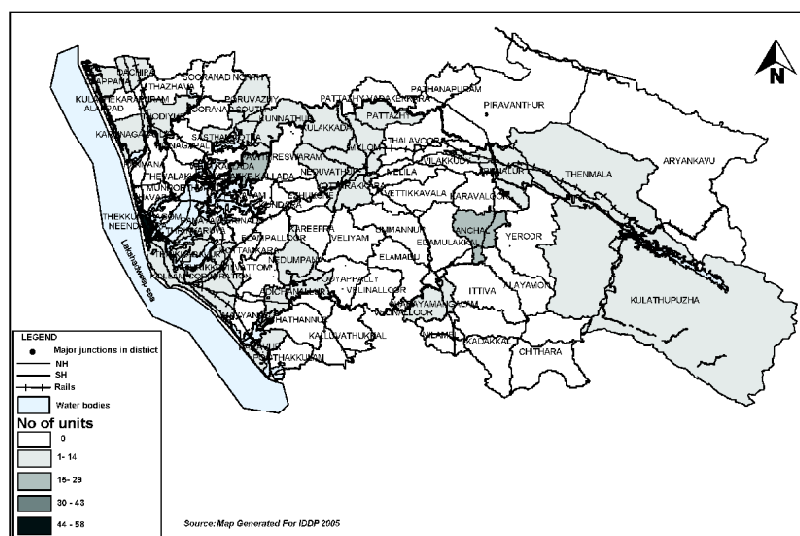


Fig. 18.29. LSGI wise distribution of number of rain water harvesting units

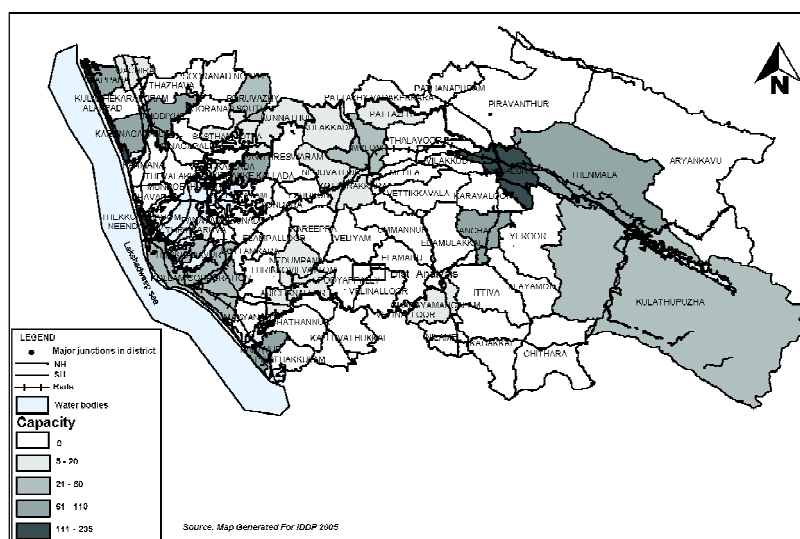


Fig. 18.30. LSGI wise capacity of rain water harvesting units

of treatment infiltration gallery is also proposed. Additional provision is made for construction of compound wall for Thrikkoyikkal OH Tank and for distribution lines for a length of 4 km.

2 WSS to Kundara and adjoining Grama Panchayats

The proposal is for improvement and rehabilitation of existing water supply scheme to Kundara and adjoining Grama Panchayats including Kottarakkara, Melila, Vettiikkavala, Ezhukone, Perayam and East Kallada. This proposal include relaying of 500mm AC pipe with DI K9 pipe and also improvements to water treatment plant at Elampal.

3. RWSS to Kareepra

The proposal is for improvement of existing water supply scheme to Kareepra Grama Panchayat. Improvement of treatment plant and rehabilitation of existing

scheme are proposed.

4. RWSS to Melila

This proposal also is for improvement of the existing scheme of Melila Grama Panchayat.

Accelerated Rural Water Supply Schemes (ARWSS)

I. WSS to Kulthupuzha and adjoining Grama Panchayats including Yeroor, Ittiva, Anchal and Alayamon

Administrative sanction for the water Supply scheme to Kulathupuzha and adjoining Grama Panchayats was received during 1993 under ARWSS. The works for well cum pump house has already been completed. The site for the construction of over head tank, Water treatment plant etc is yet to be handed over by the Grama Panchayat authorities. The delay for the work was occurred due to the delay in

handing over the required land. The schedule for the work has been revised four times during the interim period. Administrative sanction was obtained for Rs. 418.00 lakhs. Revised administrative sanction has been received for Rs.1400 lakhs and the estimate for the work prepared and submitted to higher authorities for tendering. The scheme is prepared for 125000 beneficiaries.

II. ARWSS to Kulakkada and Pavithreswaram

Administrative sanction for the Anthamon Water Supply scheme for Ward No. 1, 2 and 3 in Mylom Grama Panchayat has been received for Rs.58 lakhs. The works of construction of well cum pump house and 60% of laying of pumping main and distribution system has been completed. The scheme can be commissioned during December 2009. This scheme is proposed for 6000 beneficiaries.

III. Anthamon WSS for Mylom

Administrative sanction for the water supply scheme to Kulakkada and Pavithreswaram Grama Panchayats has been received for an amount of Rs.700 lakhs. Due to the revision of Schedule of rates, the estimate of the scheme also was revised and submitted for administrative sanction. This scheme is proposed for 66980 beneficiaries.

IV. Comprehensive water supply scheme

- To West Kallada, Sasthamcotta and Sooranadu South Grama Panchayats; and
- To Thevalakkara and Thekkumbhagam Grama Panchayats

With the aid of GOI, improvement works of water supply scheme to West Kallada, Sasthamcotta and Sooranadu South Grama Panchayats for an amount of Rs.427 lakhs and improvement works of Water Supply Scheme to Thevalakkara and Thekkumbhagam Grama Panchayats for an amount of Rs.1100 lakhs is taken up.

On completion of the above schemes, 131449 persons will be benefited from the water supply scheme to West Kallada, Sasthamcotta and Sooranadu South Grama Panchayats and 57288 persons will be benefited from Water supply Scheme to Thevalakkara and Thekkumbhagam Grama Panchayats.

Kerala Sustainable Urban Development Project (KSUDP)

The project is taken up to augment the water supply system of Kollam Corporation. As per Article 3.1 of this Chapter, the sustainable existence of Sasthamcottah Lake, the major source of drinking water to the Kollam town is in question. Considering the hydraulic data for Kallada River, it is not a perennial river. Considering the sustainability of a comprehensive Water Supply Scheme, Thenmala Dam Reservoir has been selected, as source. Raw water will be pumped and brought through 800 mm dia gravity main to Treatment plant site at Ayathil, Vadakkevila. The 18mld now available to city from Sasthamcotta WTP will serve Anandavalleeswaram area when the proposed scheme gets commissioned.

The treated water from the proposed WTP of capacity 45-50 mld (proposed) will be distributed through the existing distribution network. The project is to be completed by 2011 with design supply level of 135 lpcd.

5.2 On going and Committed Projects of Sanitation

Existing Sewerage Scheme of Kollam Corporation

In 1968 a scheme was proposed in the old Kollam town of area 18.48 sq.km for benefiting an ultimate population of 2,40,000 by 2001. The per capita water supply during that time was 90 L/day.

The town was divided into 11 zones under the proposed Sewerage project, each zone consisting of a collecting well into which the sewage from the zone flows by gravity. The collected sewage is proposed to be pumped to the proposed treatment plant at Kureepuzha, north of Kollam town.

The estimated cost for the scheme was Rs. 49.9 million.

The scheme could be taken up for execution only in 1980 and, work in four zones taken up. Only 38 kms. of sewer lines were laid and the scheme came to stand still position since 1987. In the mean while, the project cost has increased and the Kollam town rose from municipality (town) to the status of corporation (city). The area of the city has increased to 57.25 sq.km. from 18.48 sq.km.

Total Sanitation Campaign (TSC)

The Total Sanitation Campaign is a

Centrally sponsored programme launched in Kollam in 2002. The major objective of the programme is to provide sanitary facilities in rural areas so as to improve the quality of life. The project envisages making the district free from open defecation and thereby improving the environmental sanitation. The project has different components as given below.

- Construction of Household latrines to all BPL families in rural areas
- Construction of Community sanitation facilities in public places
- Construction of toilets in all Govt. Schools
- Construction of baby friendly toilets in all Anganwadis
- To provide financial assistance to Grama Panchayats for Solid Waste Management
- To build up a clean and tidy environment in rural areas
- To provide extensive Information, Education and Communication (IEC) among various stake holders to attain the above objectives

The component, construction of HHL will be completed by 2009. The campaign will continue till 2012 as a need based programme.

Integrated Low Cost Sanitation (ILCS) for urban areas

Govt. of India, has issued guidelines for low cost sanitation in urban areas. The objective of the scheme is to convert/construct low cost sanitation units through sanitary two pit, pour flush latrine with superstructure with appropriate variation to suit local conditions and construct new latrines where economically weaker section household have no latrine and even now follow the inhuman practice of defecating in the open.

6 Evaluation of Existing, On going and Committed Projects

Overall, it can be seen that through the existing on-going and committed projects, there will be coverage of almost entire district with 40 to 70 lpcd level of supply by 2021. Some LSGIs like Thodiyoor, Thazhava, Kulasekharapuram, Kalluvathukkal etc, will have some quality issues still.

As far as Kollam district is considered, though a fairly good water supply system exists, full coverage by area with sufficient quantity and quality of water is not

achieved. It is suggested that by 2021 full coverage by area with a supply level of 70 to 100 lpcd of treated water shall be achieved. Therefore the existing, on-going and committed projects have to be evaluated accordingly.

As mentioned in Article 4.1.1.1, the existing schemes in operation under KWA are basically the major and mini water supply schemes which covers almost the entire district except few LSGIs in the mid land area including Thalavur, Kulakkada, Mylom and Elamadu. However the supply by quantity and quality is not provided in the suggested standard in the scheme areas except Neendakara

The Sectoral Reforms Project and Swajaladhara project covers some of the LSGIs. Here also the supply by quantity and quality is not provided in the suggested level.

The JBIC scheme covers 13 LSGIs in the mid land area and the southern coastal belt. Here the average coverage is only 63.37% by population. Thus distribution network is not full by area.

Under TRP, the area covered is coastal areas of Kollam Corporation and coastal Grama Panchayats mainly Thevalakkara, Tekkumbhagom, Thodiyur, Kulasekhara-puram. Here the quantity of 70 to 100 LPCD will be achieved by completion.

Under TEAP, the area covered is coastal Grama Panchayats mainly Alappad, Clappana, Oachira, Karunagapally, Chavara and Panmana. These areas will satisfy the suggested standard when the scheme gets completed.

As already mentioned, works funded by MP/MLA funds, LSGIs etc. are carried out for minor works like extension of pipe lines etc.

The NABARD funded scheme is a committed project which is concentrated in Elampalloor, Kottarakkara, Melila, Vettikkavala, Ezhukone, Kundara, Perayam, East Kallada, Kareepra, Melila, Kulathupuzha, Eroor, Ittiva, Anchal, Alayamon, Kulakkada and Pavithreswaram and Mylom Grama Panchayats in the mid land area. By design, all these areas except Vettikavala, Ezhukone and Kulakkada will achieve the suggested standard by 2021.

Accelerated Rural Water Supply Schemes (ARWSS) covers Kulthupuzha,

Eroor, Ittiva, Anchal, Alayamon, Kulakkada, Pavithreswaram and Mylom. Here the supply is only 40 LPCD.

The Kerala Sustainable Urban Development Project (KSUDP) for Kollam Corporation envisages satisfying the standard by 2011.

Thus only 22 LSGIs will satisfy the

works, improvement works, rainwater harvesting and conversion of backwater source in to freshwater source, desalination and ground water recharging works etc are required. The additional requirement of fresh water for Kollam Corporation and the adjoining Grama Panchayats of Sasthamcottah lake

Areas for the recharging of ground water shall be identified based on the present water table, soil characteristics and topography. By recharging the ground water we can avoid the threat of salt water intrusion in to the ground water which is already reported in some tube wells in Alappad Grama Panchayat.

One major source of water, still not utilized effectively, is the rain water. Major portion of rain water reaches the rivers and sea within a few hours after rain as surface run off. Activities shall be initiated to minimize the quantity of run off there by increasing the ground water table, minimizing salt water intrusion and maintaining a high flow in streams and rivers even after rain. The present attention on rain water is limited to rainwater harvesting for drinking water purpose. This may be expanded to a broader sense where river based actions are required rather than person specific actions as at present.

As mentioned in Article 3.1, use of drinking water has to be minimized to the specified purpose only by which we can reduce the demand for drinking water. This requires effective development of civic sense and a sense of ownership among the society. Awareness creation in effective use of drinking water is essential.

As mentioned in Article 3.2, Kollam district is gifted with sufficient storage of water as backwaters which are slightly saline in nature due to its connection with ocean. But this backwater storage provides sufficient opportunity to extract water for domestic or any other specified use as required. The geographical location of the back waters shows that portions of the back waters can be converted in to fresh water lake by providing separation bunds. The quality of the back water is changing according the monsoon and tidal variations. So with minimum investment we can develop new sources of fresh water from the back water bodies. The possibility for this also has to be studied in detail to conserve water for the future.

Majority of the villagers in Kollam District are still depending on open wells for their drinking water requirements. The quality of drinking water from the open wells is always under threat due to poor maintenance of the wells. To maintain the hygiene of open wells, especially among

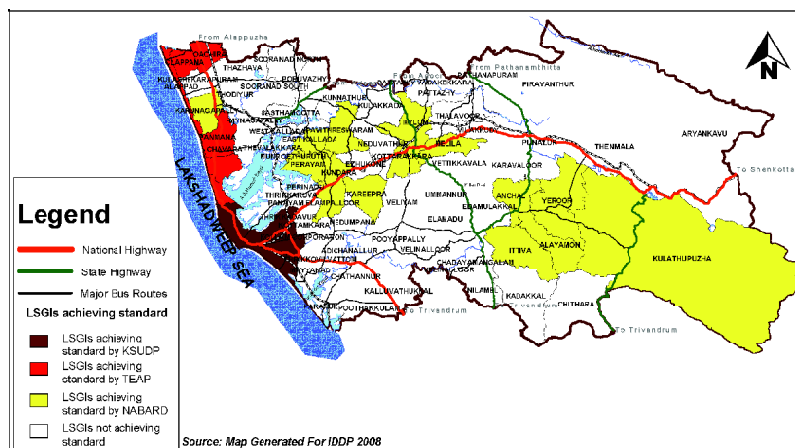


Fig. 18.31: LSGIs achieving suggested standard under different schemes

criteria of 100% water supply coverage by area with 70 – 100 lpcd supply level of potable water by 2021 (Figure 18.31).

In the case of sanitation facilities, the scheme for sewerage in Kollam Corporation has to be extended to future urban centres as well. Though the Total Sanitation Campaign provides conventional latrine facilities there are certain grave areas in some LSGIs where such latrines cannot be constructed due to geographical and soil conditions. Water logging and unavailability of water are the main reasons for the same. The water logged areas in Thekkumbhagom, Chavara, Neendakara, Thevalakkara, Panamana, Trikkadavoor, Thrikkaruva, Mynaga-pally, Karunagapaly, West Kallada, East Kallada, Perayam, Munroe Thuruth and Hilly areas of Thenmala, Piravanthur and Aryankavu are such destinations where alternate technology for construction of latrines has to be adopted.

7 Conclusion

From analyzing the exiting scenario it can be concluded that in case of drinking water, the district has to depend both on surface as well as ground water sources.

So, long term planning for protection and usage of existing water sources is very urgent in order to tide over the present/anticipated drinking water shortage in the district. Source protection

necessitate the exploration of alternate sources of fresh water, conservation of the lake etc. The existing conservation technologies are not sufficient to preserve the quality of the lake. Lake side management, exploring possibility to increase the catchment areas of lake, prevention of sand mining around the lake, prevention of pollutant discharge to the lake, etc. are urgently required to maintain the lake for the future generation.

One major source of drinking water in Kollam District is the Ground water. The number of existing tube wells itself is an indicator for this. However the over exploitation of ground water has created an imbalance between the withdrawal and recharging of ground water resulting in exhausting of ground water potential. It is the time to think about measures for replenishing of ground water. Coastal areas of Kollam district mainly depends on ground water sources. Once the water supply schemes based on river water is implemented in these Grama Panchayats, we will be in a position to isolate some areas where we can reduce the number of tube wells to a minimum and the existing tube wells can be used for recharging of ground water. Similarly policy decisions are required in providing ground water recharging activities along with buildings as envisaged for the rain water harvesting.

weaker sections, some sort of intervention from the Government is required.

From the analysis, it is seen that there are certain priority LSGIs where immediate attention is required in the water supply sector. As per Article 3.1, a number of coastal LSGIs are severely affected by old pipe lines in the distribution system. Also as mentioned in Article 1.4.1, there are certain areas which are severely affected due to backlogs in source, treatment, storage distribution and quality of water. These include LSGIs such as Paravur Municipality and Grama Panchayats of Alayamon, Anchal, Edamulakkal, Yeroor, Panayam, Bhoothakkulam, Kottamkara and Mayyanad. Also as discussed in Article 4.1, areas such as Aryankavu, Alayamon, Karavalloor, Pattazhy, Elamadu, Velinalloor, West Kallada, Pootahkkulam and Thrikkadavur suffer from water scarcity.

From the analysis it is identified that there are certain areas where an entire LSGI can be covered fully by surface water source only, Surface water sources and Bore wells, Surface water sources and tube wells and tube wells only (Table 18.20).

Possible types of water source in various LSGIs are shown in Figure 18.32.

As mentioned in Article 3.1 of this Chapter there is lack of proper conservation measures of major sources. Therefore check dam construction measures can be done in the following

Table 18.10 : LSGIs having coverage by source

Sl.No.	Source of water	Name of LSGIs
1	Surface water sources only	Sastamcotta & West kallada (Source: Sastamcotta lake) , and Kunnathur (Source: Chelur Kayal), Velinalloor & Veliyam (Source: Ithikkara River), Pooyapally and Kulakkaka (Source: Kallada River) of Sasthamcotta Water Supply Division
		Kalluvathukkal, Adichanallur & Nedumpna (Source: Ithikkara River) of PH Sub Division
		Ummannur (Source: Ithikkara River) of Kottarakkara Sub Division
		Chithara, Kadakkal, Nilamel, Edamulakkal, Elamad (Source: Kallada River) and Chadayamangalam (Source: Ithikkara River) of Kadakkal Sub Division
		Pathanapuram, Piravanthur, Thenmala, Aryankavu, Pattazhi South, Pattazhi North, Karavalloor, Punalur, Thalavur and Vilakkudy (Source: Kallada River) of Punalur Sub Division
2	Surface water sources and Bore wells	Ezhukone of Kundara PH Sub Division (Source: Kallada River & Bore wells)
3	Surface water sources and Tube wells	Thevalakkara, Thekkumbhagam, Mynagapally and Sooranadu South (Source: Sastamcotta lake) Poruvazhy (Source: Pallickal river, Nirichira), K.S. Puram (Source: Achankovil River) and Thazhava (Source: Pallickal river) of Sasthamcotta Water Supply Division
		Kollam Corporation of Kollam Water Supply Division (Source: Sastamcotta lake)
		Pootahkkulam, Paravoor Municipality, Chathannor. (Source: Kallada River), Munroe Thuru (Source: Sastamcotta lake) of PH Sub Division, Kollam
		Mayanadu (Source: Kallada River) of PH Sub Division, Kollam
4	Tube Wells only	Sooranadu North & Thodiyur of Sasthamcotta Water Supply Sub Division
		Kottamkara, Thrikkovilattom, Thrikkaruvu, Panayam, Thrikkadavur and Perinadu of PH Sub Division, Kollam

LSGIs.

Velinalloor (Atturkonam in Ithikkara River), Kulakkada (Madathanampuzhakadavu in Kallada river), Nedumpna (Kundumon in Ithikkara River), Chathannur (Kattachal in Ithikkara River), Kalluvathukkal (Aduthala in Ithikkara River), Mylom (Andaman Kadavu in Kallada River), Kulathupuzha (Mylammodu in Kallada River), Edamulakkal (Peringallor in Ithikkara

River), Chadayamangalam (Poongodu in Ithikkara River), Poruvazhy (Edakkadu in Pallickal River), Punalur Municipality (Muttathukadavu in Kallada River) and Sooranadu North (Parakkadavu in Pallickal River).

Other surface water sources to be improved through soil conservation can be prioritized based on the analysis of severity index in Article 1.4 and water scarcity in Article 1.5 of this Chapter.

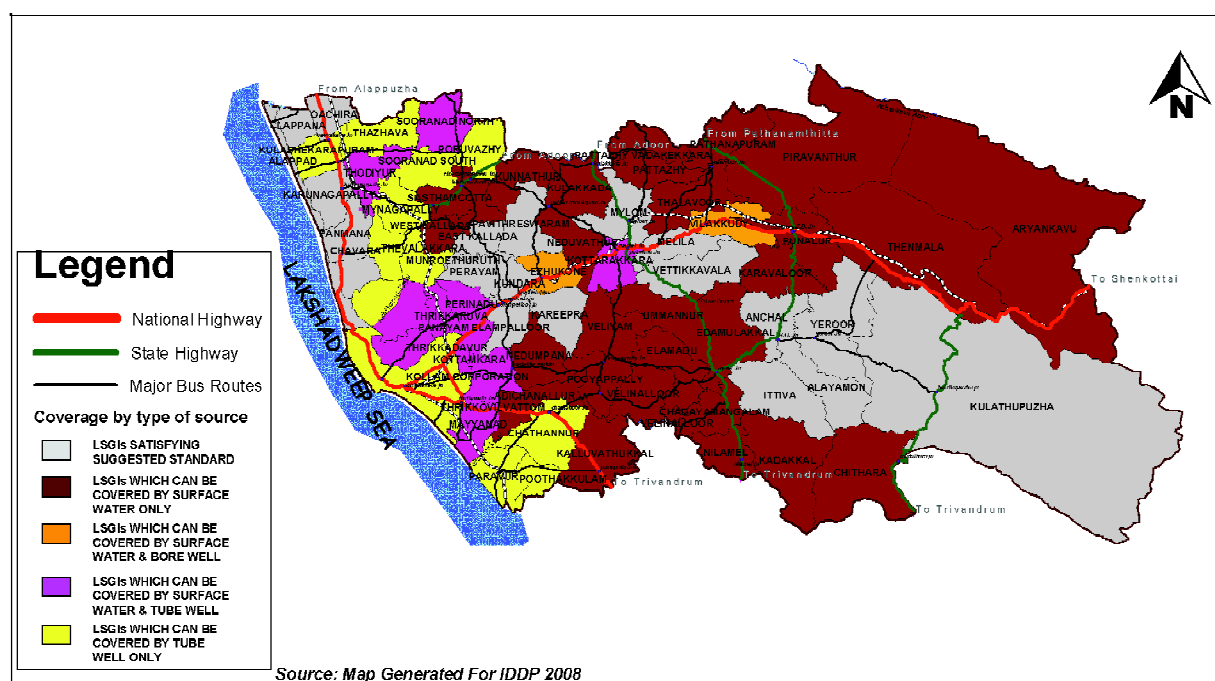


Fig. 18.32. Possible water sources in LSGIs

Also recharge tube wells can be constructed in the LSGIs of Sooranadu North, Thodiyur Kottamkara, Thrikkovilvattom, Thrikkadavur, Thrikkaruva, Panayam and Perinadu where tube wells are the only source and in Thevalakkara, Thekkumbhagom, Mynagapally, Sooranadu South, Poruvazhy, K.S. Puram and Thazhava, Kollam Corporation, Poothakkulam, Paravoor Municipality, Chathannor, Munroe Thuruth where there is scope for both surface water and tube wells.

As mentioned in Article 3.3 of this chapter, since the water table is high up to nine months period in a year in costal areas of the district, the possibility of contamination of ground water and top soil is very high. This calls for better waste disposal system or a planned sewage treatment system. For the coastal Villages and the emerging urban centers, the

disposal of solid and liquid waste require urgent attention.

Community sanitation system may be adopted for the weaker sections of the society, where a small decentralized sanitation facility or sewage treatment system can be developed for a cluster of houses.

Options like minimizing waste generation through good house keeping, recycling and reuse etc shall be resorted to waste that can be used as manure shall be used so. Reusable waste can be separated and categorized accordingly. Effective awareness creation is highly essential for waste minimization and disposal.

Comprehensive sewerage network has to be designed and implemented for at least in Kollam, Karunagappally, Anchal, Paravur, Kottarakkara and Punalur. The coastal Grama Panchayats also require

sewerage system in the near future owing to physical constraints in disposal of liquid waste and bettering of living standards in these areas.

As mentioned in Article 6 of this Chapter, the water logged areas in Thekkumbhagom, Chavara, Neendakara, Thevalakkara, Panamana, Trikkadavoor, Thrikkaruva, Mynagapally, Karunagapaly, West Kallada, East Kallada, Perayam, Munroe Thuruth and Hilly areas of Thenmala, Piravanthur and Aryankavu are such destinations where alternate technology such as Ecosans may be provided.

Further, specifications are required to be emerged from the community itself to reduce the quantity of solid waste generation. Creation of awareness among public is essential to meet the challenges in future by reducing the quantity of waste generated.



Chapter 19
Infrastructure

This chapter analyses the infrastructure facilities in Kollam District such as Roads, Bridges, Inland Navigation facilities, Harbours, Railways and housing.

1. Introduction

The infrastructure facilities of a country are the most decisive factor in its growth along with economics. Industrial development cannot be envisaged without a corresponding expansion in the infrastructure facilities in the country such as Road Transportation Network, Inland Navigation Network, Rail Network and Harbours. What is needed is a comprehensive Network that will include components of the above to achieve the desired results.

2. Existing Infrastructure

2.1 Road Network

2.1.1 National Scenario

India has the second largest road network in the world comprising of about 35 Lakh Kilometres of roads. Out of this,

about 0.65 Lakh Kilometres are National Highways (NH), 1.30 Lakh Kilometres are State Highways (SH) and the remaining 33 Lakh Kilometres are Major District Roads (MDR), Urban Roads and Rural Roads. The NHs, SHs and MDRs carry the bulk of the passenger and freight traffic. The high volume of MDRs, Urban Roads and Rural Roads shows the extensive reach of the road network to the remotest corners of the country. As per present estimates, 65% of the total freight movement and 85% of the passenger movement is catered to by the road network. This, combined with the fact that traffic on roads grow at a rate of 7 to 10% per annum highlights the importance of roads in the development and sustenance of the growth of the nation. Even though the National Highways comprises only about 2% of the total length of roads in India, it carries about 40% of the total traffic. This shows that the volume of long distance travel along roads

is quite high, which in turn is due to the inter-state movement of freight along roads. In spite of having an excellent rail network, which is also very cost effective, freight movement seems to prefer roads as the reach is quite deep. Even though India can boast of a road network which is high on quantity, the same cannot be said about its quality. Though National Highways tend to be maintained very well, the conditions of the other classes of roads cannot be claimed to be the same as the NHs. In order to give a boost to the economic development of the country, the Government had embarked upon a massive National Highways Development Project (NHDP) in the country.

2.1.2 State Scenario

National Highways constitute the primary arterial road system in the state. There are 1524 kms of National Highways in the state consisting of NH47, NH17, NH49, NH208, NH212 and NH213. NH

By-passes for major towns and cities have been initiated and are in various stages of completion. National Highways in the state carry about 60% of the total inter-state/inter-district traffic. There are deficiencies in the network such as inadequate carriageway width corresponding to traffic density, absence of road shoulders, substandard road geometrics, ribbon development etc. There is an urgent need for four lanes widening and strengthening of entire National Highway network in the state since the present traffic, far exceeds the design capacity. The NHAI has initiated the four laning of NH47 in the state to meet this demand.

The Kerala State Public Works Department maintains 3928 kms of State Highways and 22252 kms of Major District Roads. Roads that were earlier classified as Other District Roads and Village Roads are now under the ownership of local bodies like Grama Panchayats, Block Panchayats and Jilla Panchayats. Kerala has already achieved nearly cent percent connectivity to its villages by any one or other type of road. This has contributed very substantially to the state's progress in community development including literacy, health, agriculture and animal husbandry. The state has now fairly extensive secondary road network consisting of Major District Roads and other roads. However the quality of these roads is far from satisfactory and majority of these roads have only single lane carriageway and are poorly designed. They are mostly serviceable during fair weather season only. Much needs to be done in improving and strengthening of these stretches including their geometric profile.

2.1.3 District Scenario

The road network plays the most vital role in the all round development of any area. The existing road network (Figure 19.1) in the district consists of National Highways, State Highways, Major District Roads under the Kerala Public Works Department and other roads under the Local Self Government Department.

The National Highways in the district are 57.40 Kilometres of NH -47 (Kannyakumari – Salem), 4.79 Kilometres on NH -47 Bye-pass and 81.25 kilometres of NH -208 (Kollam – Thirumangalam).

There are 6 State Highways in the district as given as follows:

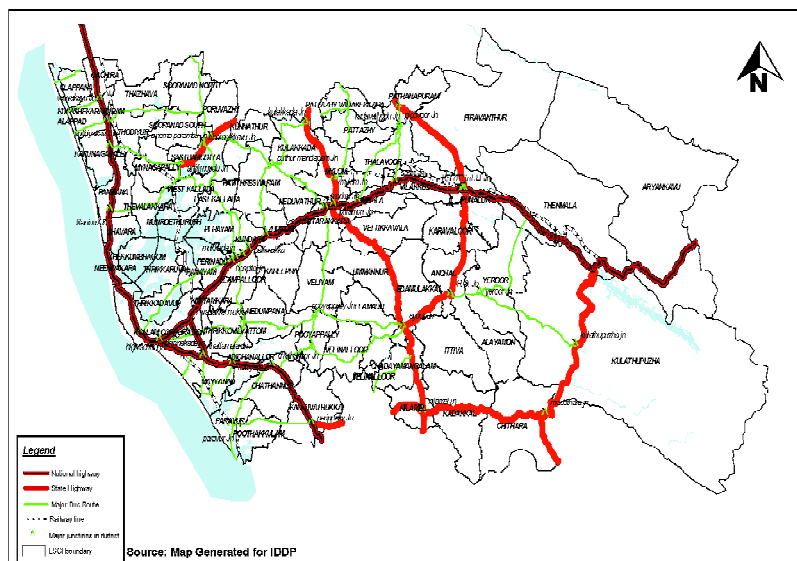


Fig. 19.1 Existing Road Network

1. SH 1 : Main Central Road – 36.70 km.
2. SH 2 : Thiruvananthapuram–
Shenkotta – 30.296 km.
3. SH 7 : Punalur – Muvattupuzha
– 13.80 km.
4. SH 37 : Adoor – Sasthamkotta
– 7.05 km.
5. SH 48 : Ayoor – Punalur
– 7.30 km.
6. SH 64 : Parippally – Madathara
– 23.507 km.

In addition to the State Highways and National Highways, there are about 1520 kilometres of Major District Roads in Kollam district under the PWD.

The length of Major District Roads in the district in each of the PWD road sub divisions are as shown in the Table 19.1.

Out of the 8472.59 kms of road under local bodies, about 1890 kms are black topped. Kottarakkara Grama Panchayat

Table.19.1.Length (in Km) of major district roads in PWD road subdivisions

Sl.No.	Sub Division	Length of Roads in Km.
1	Karunagapally	317.933
2	Kollam	398.816
3	Kottarakkara	454.947
4	Punalur	348.384

Table.19.2. List of boat jetties along the navigation routes

List of boat jetties along the navigation routes			
1. Kollam kadavu	2. Asramam	3. Kottayathukadavu	4. Panamukkam
5. Pathinettampadi	6. Kavanad	7. Kureepuzha	8. Sambranikodi
9. Guhanandapuram	10. Manali	11. Pallikodi	12. Prakkulam
13. Ashtamudi temple	14. Tholukadavu	15. Pavumba	16. Koyivila
17. Perungolam	18. Pattamthuruthu	19. Ashtamudi Bus Stand	20. Pezhamthuruthu

has the highest length of black topped roads.

2.2 Inland Navigation

Water Transport in the district is catered to by the State Water Transport Department by providing ferry service along the following routes.

- Kollam – Muthirapparambu : 24 km.
- Kollam – Guhanandapuram : 12 km.
- Kollam – Ashtamudi – Koyivila - : 25 km.
- Pattamthuruthu – Perumon

There are 30 Terminals (Figure 19.2) along the above 3 routes with 17 boat services catering to about 2060 commuters per day. In addition to these long distance services, there are about 102 short ferry services also. The District Tourism Promotion Council operates its own services for tourists.

The State Water Transport Department owns 3 boats; The District Tourism Promotion Council owns 4 House Boats, 1 Luxury Boat, 1 Safari Boat, 2 Pedal Boats and 1 Canoe. There are also 3 House Boats owned by Private parties for tourists to hire.

There are 20 numbers of Jetties along the navigation routes as mentioned in Table 19.2.

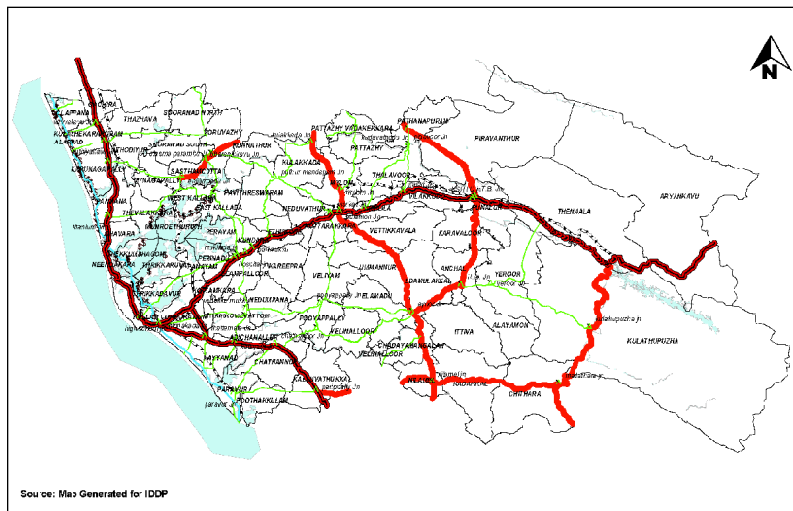


Fig. 19.2 Existing Navigation Terminals

The DTPC has the following 5 stops along their routes.

1. Kollam
2. Chavara
3. Alumkadavu
4. Vallikavu
5. Ayiramthengu

Vehicle Status and their environmental impact: Public transport in the district is dominated by road transport with 73% of the total passenger trip per day being covered by bus passenger trips. Majority of these bus passenger trips are by KSRTC buses and the rest by private buses. Most of the KSRTC buses are very old as shown by the inventory of buses at the KSRTC depots in Kollam (Table 19.3).

The buses which conform to the *Euro III* emission norms have been acquired within the past 5 years. Almost all of these buses are plying

Table.19.3. Depot wise details of buses

Name of Depot	No. of buses conforming to Euro III specifications	No. of older buses	Total number of buses
Chadayamangalam	13	29	39
Chethanur	5	34	39
Karunagapally	12	60	72
Kollam	16	47	93
Kottarakkara	10	106	116
Kulathupuzha	12	12	24
Pathanapuram	13	32	45
Punalur	23	35	58

along NH 47, NH 208 and MC road (SH 1) as Super Fast, Fast Passenger, Ananthapuri Fast and 'Venad' Limited Stop Ordinary services. The older buses are operating as local schedules along shorter routes.

Out of about 1000 private buses, about 700 buses are 5 years or less of age and the remaining 300 are older than 5 years. This points to the fact that private buses tend to be in a better condition than KSRTC buses. Another factor worth mentioning is that private buses older than 15 years are

not allowed to operate, thereby ensuring that the bus owner is forced to buy a new bus to continue operating in the same route.

The case of trucks and lorries is more critical. Of the total inter-district goods transportation, 90% is by Multi-axle trucks, Trucks and Lorries. These vehicles are poorly maintained and operate in an overloaded condition more often than not. There is presently no State agency which governs the operations of these vehicles and they operate based on the Permits issued by the Motor Vehicles Department.

Concentration of the polluting buses is higher along NH 47 and goods vehicles are higher along NH 208. Suitable pollution control measures need to be implemented in these routes as also measures to control pollution at their source itself.

2.3 Harbours

The existing Harbours in Kollam district

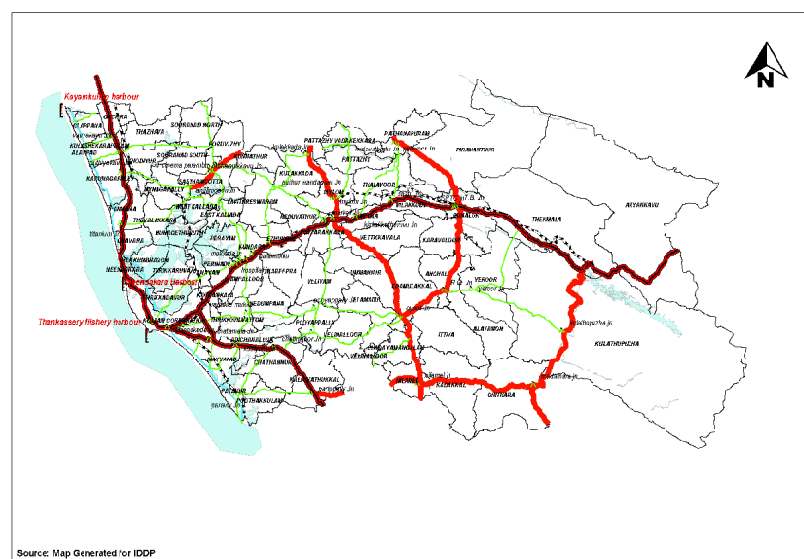


Fig. 19.3 Existing Harbours

(Figure 19.3) are the Fishing Harbour at Neendakara, the Fishing-cum-Cargo Harbour at Tangassery and the Fishing Harbour at Kayamkulam, whose construction is on-going.

The Neendakara Fishing Harbour was selected by the Indo-Norwegian Foundation in 1952 for establishing a Fishing-cum-community development programme in India. 10 to 20% of Kerala's total export of fish and crustaceans are from Neendakara Fishery Harbour. Envisaged for both traditional fishermen and mechanised fishing, it is situated at the estuary of Ashtamudi Lake and is one of the important fishing harbours in India and the biggest in Kerala. On either side of the estuary of Ashtamudi Lake, the Twin Fishing Villages Neendakara and Sakthikulangara are developed forming part of the Neendakara Fishery Harbour. Wide area of the basin of the Ashtamudi Lake offers safe mooring of fishing vessels.

The Tangassery Harbour was established for traditional fishing. The existing natural bay at Tangassery provides an ideal location for the harbour. Construction is going on to develop it into a fishing-cum-cargo harbour. An added advantage of the location is that the natural beach inside the harbour provides potential for tourism. The Kayamkulam Fishing Harbour is situated at the estuary of the Kayamkulam Lake at the northern boundary of Kollam district. The northern breakwater of the harbour is in Alappuzha district and the southern breakwater in Kollam district. The Harbour has been

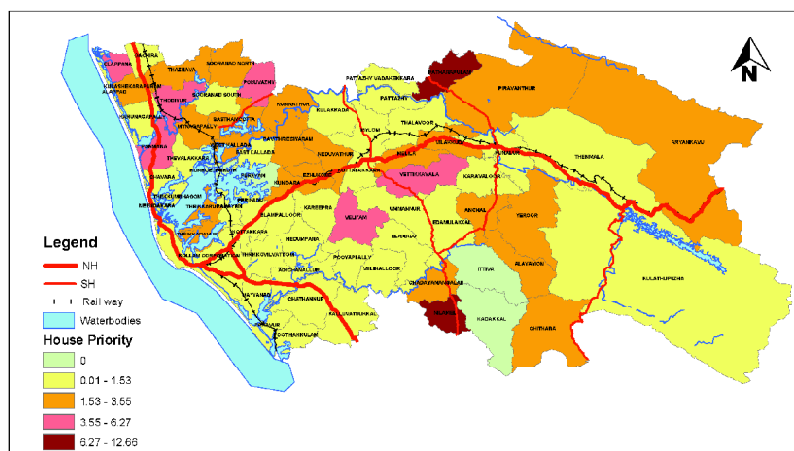


Fig. 19.4: LSGI wise distribution of gross household density

established for traditional as well as mechanised fishing. The basin of Kayamkulam Lake provides a safe mooring place for the boats. The harbour can be developed into a cargo harbour in future.

2.4 Railway

The railway passing through Kollam district consists of 55 kilometres of double line Broad Gauge Permanent Way of the Ernakulam– Thiruvananthapuram line. Till recently there also existed 88 Kilometres of Metre Gauge Permanent Way of the Kollam– Shenkotta line. Service through this Metre Gauge line is stopped temporarily now as work on gauge conversion to Broad Gauge is on-going. The 55 Kilometre Broad Gauge double-lines have been completely electrified.

In connection with the gauge conversion of the Kollam – Shenkotta line, Rail Over Bridges at Nedumpaikulam, Ambalathumkala, Kottarakkara and Mylom are being reconstructed to Broad Gauge standards. All level crossings in this route also are being upgraded to Broad Gauge standards. A Bridge is being constructed near the Office of the Superintendent of Police to ease traffic congestion in Kollam city.

2.5 Housing

Kerala context

Housing is a leading sector in Kerala, generating employment and income to a large number of skilled, semi-skilled and unskilled workers. Due to shortage of workers from Kerala, workers from outside the state also have ample employment opportunities in this sector. It is estimated that the overall employment generation in the economy due to investment in housing/ construction is eight times the direct

employment. Housing in Kerala has registered enormous growth both in terms of quality and quantity.

As per 2001 Population Census the state's population was 3.18% of the country's population, but the housing stock in Kerala is 66 lakhs, which is 3.75% of the total stock of housing in the country. The statistics show only a numerical shortage of 0.63 lakh housing units in the state. However, housing inequality has widened in the state. More than 8% of the households live in extremely poor quality or dilapidated houses.

2.5.1 Housing status (Physical)

2.5.1.1 Households

There are about 5,92,851 households in Kollam district of which about 78,182 households are in Kollam Corporation. The average household size in Kollam Corporation is about 4.62. Munroethuruthu has the least number of households. There are only about 2513 (0.42%) households in Munroethuruthu. The average household size in Kerala is 4.9 according to the 2001 census. The average household size in the district is 4.3. The maximum average household size among LSGIs is 4.8, which is in Paravoor Municipality. The household size along the coastal area is also high. It is about 4.65.

The gross household density is more along the coastal areas. Kollam Corporation has the maximum household density. There are 13.53 households per hectare in Kollam Corporation. The household density is lowest in Aryankavu Grama Panchayat which is about 0.15 households per hectare.

2.5.1.2 Residential Land use

The total residential area in Kollam

district is 712.76 Sq.km as mentioned in Article 1, Chapter 5. Residential area is highest in Kollam Corporation. About 41.5 sq.km of area is used for residential purpose in Kollam Corporation which is about 71.84% of the total area of Kollam Corporation. Pattazhy Vadakkekara Grama Panchayat has the lowest area under residential use (2.24 sq.km. which is only 13.41% of the total area).

Residential land availability is the residential area available per household. In Aryankavu the area available for residential purpose per household is 0.25 hectares which is the highest in the district and Yeroor has the lowest (only about 0.03 hectares).

The concentration index of residential land availability ie. the ratio of residential land availability in a LSGI to the total residential land availability in the district. The index is highest in Aryankavu Grama Panchayat which is 2.08. It is lowest in Yeroor Panchayat having about 0.25.

Analysis of net residential density

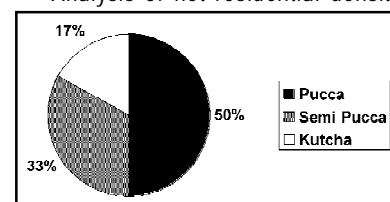


Fig. 19.5: Condition of houses

based on the existing residential land and vacant land shows that Yeroor has the highest residential density. It comes to about 19.19 houses per hectare. Aryankavu has the lowest residential density.

The residential land and vacant land available per household is the land availability based on existing residential land and the vacant land. The residential land availability is highest in Aryankavu. About 0.25 hectares of land is available per household. The residential land availability is lowest in Yeroor. Only about 0.05 hectares of land is available per household for residential purpose.

2.5.1.3 Housing Condition

In Kollam district about 50% of the houses are of pucca type. About 33% are of semi-pucca type and the rest 17% are in katcha condition.

From the spatial distribution it is seen that Kadakkal has the highest percentage of pucca houses where about 79.85% are pucca houses. Kulakkada has the

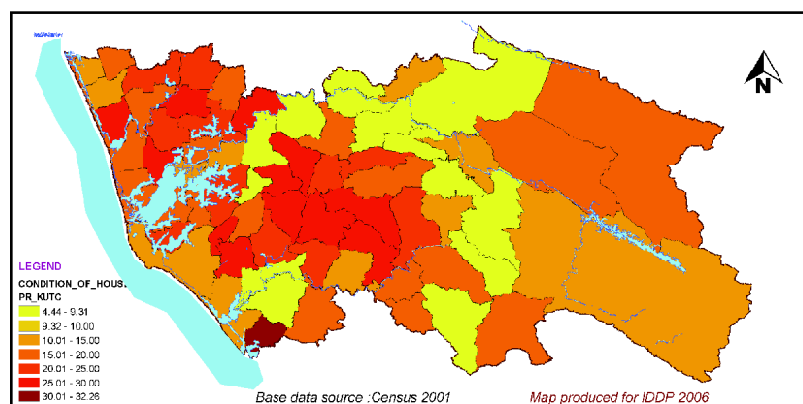


Fig.19.6: LSGI wise distribution of percentage of kutchha houses

highest percentage of semi-pucca houses, where about 60.12% of the houses are semi-pucca. Poothakulam has the highest percentage of kutchha houses. About 32.26% of the houses are in Kutchha condition in Poothakulam. The percentage of pucca houses is lowest in West Kallada. About 28.01% of the houses in West Kallada are in pucca condition. Poothakulam has the lowest percentage of semi-pucca houses. About 3.98% of the houses in Poothakulam are semi-pucca houses. The lowest percentage of kutchha houses is in Pattazhy. About 4.44% of the houses are in kutchha houses.

2.5.2 Social Status

2.5.2.1 Housing Status of BPL Population

As per Article of 1.2 of Chapter 24; Poverty Reduction, the Houseless Content of BPL population in the district shows more concentration of houseless families in Alappad (Pre Tsunami), Oachira, Thazhava, Thevalakkara, Alayamon and Aryankavu Grama Panchayats. Generally the concentration is in the Northern coastal area, mid land and high land areas. There are nearly 15000 numbers of houseless rural poor in the District. It is estimated that nearly 1 lakh houses need up gradation.

2.5.2.2 Housing Status of SC/ST Population

As mentioned in the Sectoral analysis of SC/ST Development (Article 1.7 of Chapter 25) Kollam Corporation has the maximum number of SC colonies (about 47 SC colonies). There are no SC colonies in Panayam, Elampalloor and Sasthamkotta Grama Panchayats.

The spatial distribution shows that SC colonies are maximum at Kollam Corporation and the Grama Panchayats of Chithara and Elampallur. Houseless

content of SC population is maximum in Alappad and minimum in Sasthamcotta, Kunnathur and Poruvazhy. On comparing with the district houseless content of SC, Eastern areas and some LSGIs in midland are showing greater values. Also problem of houselessness among ST needs special attention as fairly a large number of families are houseless though they own land. They are mainly settled in Kulathupuzha, Chirithara, Piravanthoor and Aryancavu Grama Panchayats. Houses are yet to be provided to those families who are rehabilitated in Kuriottumala as part of Government programme for providing cultivable land to landless ST families.

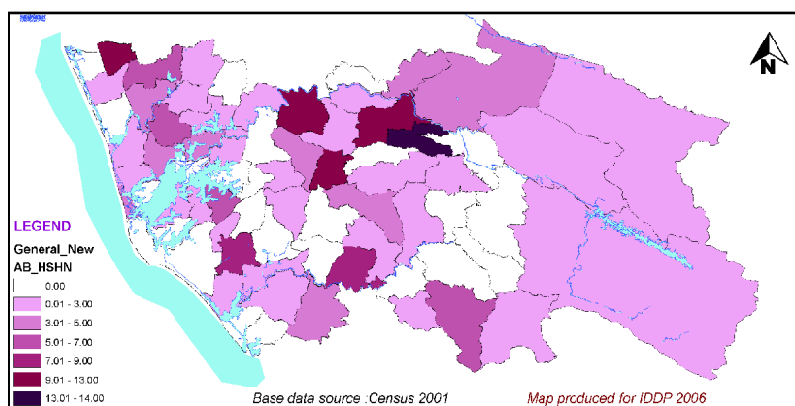


Fig.19.7: LSGI wise distribution of absolute housing shortage

Absolute housing shortage index is the ratio of the percentage of the absolute housing shortage of the panchayat to the percentage of the absolute housing shortage of the district. Ochira has the maximum housing shortage index. Ochira has a housing index of 5.9. Vilakkudy has a housing shortage index of 5.69.

2.5.3 Housing Shortage

There are about 851 people that are houseless in Kollam district. The houseless population is more in Vilakkudy Grama Panchayat. About 61 people are

houseless.

Absolute housing shortage is the difference between the total number of house holds and the total number of occupied residential houses. The absolute housing shortage is very low in Kollam district. Vilakkudy has the maximum absolute housing shortage. Percentage of absolute housing shortage is the percentage of the ratio of the absolute housing shortage to the total number of households. The absolute housing shortage is more in Ochira Grama Panchayat (0.193%) followed by the Vilakkudy Grama Panchayat (0.186%).

From the Socio-economic survey conducted it is seen that about 12.66% of the people in Nilamel has house facility as the priority.

3. Development Issues

3.1 Problems

The basic problems faced by road infrastructure in Kollam are that the condition of existing State Highways, Major District Roads and other roads are not as per standards prescribed by Indian Roads Congress. Roads are upgraded to higher classes without adhering to standards governing width and geometrics. There is lack of proper planning with regard to long

term development of the district. Encroachment of the land width of roads leads to legal and political issues. Blocking of drains meant to clear storm water from the pavement surface leads to damage and destruction of roads. Limited resources are allocated for maintenance works leading to delay in carrying out timely repairs. Missing links in the road network hampers development of certain areas of the district. Generally, the problems can be classified into three: socio-economic, administrative and technical. Also specific issues related

to roads in the district as well as the housing issues are discussed.

3.1.1 Socio-economic Problems

Lack of awareness about the Highway Protection Act, encroachment, violation of traffic rules and regulations and traffic signs due to ignorance are some of the socio-economic problems in the road infrastructure sector.

In order to overcome these problems it is suggested that public awareness programmes should be initiated to create awareness among public about the Highway Protection Act, laws pertaining to encroachment and eviction of encroachments, traffic rules, regulations and signs etc. from school level to end user level. Allocation of sufficient funds and establishment of an exclusive 'Highway Protection Force' to carry out evictions under the control of the concerned department is necessary. All projects should be scientifically planned and the details regarding its social implications should be published for the knowledge of the public. Acquisition of land should be completed before initiating new development projects.

3.1.2 Administrative Problems

In certain cases there is lack of coordination between Departments in respect of development projects leading to undue delays. Utilisation of funds generated at district level is not possible under the current setup. This causes delay for even small works for which financial sanction has to be obtained from a higher level. If the funds generated at district level can be utilised by the district level officer, such delays can be avoided.

To solve these issues, it is suggested that the District Level Coordination Committee actively participates in the implementation of major projects. Income generated by various departments at district level may be made available to the district level officer by means of PD accounts. Cumbersome administrative procedures can be streamlined by making use of technology like computer networks.

3.1.3 Technical Problems

Non-maintenance of inventory of assets of departments at various levels creates problems like identifying exact road boundary, ownership of buildings, trees, etc. Investigation works are not given due importance thereby causing cost overruns. Time consuming tender procedures

even for small works, lack of proper planning leading to traffic congestion causing waste of time and fuel, Inadequate parking space in commercial areas etc. are the other technical problems.

These problems can be overcome by conducting proper surveys to identify assets and maintaining digitized inventory and maps. Sufficient funds shall be allocated and due importance given to Project Investigation works. Highest priority for completion of by-passes and ring-roads to ease traffic congestion in cities and towns, Multi-tiered parking facilities to be made mandatory for all new commercial buildings within Corporation limits etc. are to be provided.

3.1.4 Specific Road Issues in Kollam

Master Plans are being prepared at regular intervals of time but development projects do not seem to be Master Plan oriented. Iron Bridge is causing a severe bottleneck in the main arterial road of the city and the situation is becoming worse day by day. National Highways and State Highways have very high Volume – Capacity ratios leading to accidents, loss of lives and property. Non-completion of the partially constructed NH by-pass is severely affecting the traffic flow within the city. Link roads are needed to join important towns in adjacent State Highways.

3.1.5 Housing Issues in Kollam

From the analyses it is seen that there is very less absolute housing shortage in the district. The major affected LSGIs include Vilakkudy, Oachira, Kulakkada, Thalavur and Kottarakkara. However the improper maintenance and kutcha houses creates problems in the district. Poothakkulam, Kunnathur, Kottamkara, Elamadu, Ummannur, Sooranadu South, Veliyam, Ezhukone and Thevalakkara are the LSGIs with more Kutcha houses. Another issue is the plight of the downtrodden masses in the district. Houseless SC concentration is more in Kollam Corporation, Chithara and Elampallur Grama Panchayats. Houseless ST concentration is more in Kulathupuzha, Chithara, Piravanthur and Aryancavu. The houseless BPL are more in Oachira, Thazhava, Thevalakkara, Alayamon and Aryancavu.

3.2 Potentials

Apart from the suggestions, various avenues are available to solve most of

the problems brought out above. Regarding improvement of the Road Network in Kollam, completion of an Outer ring Road for the Kollam Urban Area consisting of a coastal road on the western side and the NH 47 By-pass on the eastern side can go a long way in solving most of the traffic ills affecting Kollam city. Missing links in this Ring Road need to be connected to complete it and make it effective. This Outer Ring Road should be capable of handling long distance traffic which does not need to enter Kollam City as also traffic within the district which needs to by-pass the city. In addition to this, there can be an Inner ring Road for the Kollam Urban Area consisting mainly of the Railway Flyover near the SP Office on the southern side and the Asramom lake side Link Road on the Northern side. The missing links in this Inner Ring Road are the Flyover and the lake side Link Road. Once these missing links are connected, the Inner Ring Road can effectively keep by passable urban traffic out of the city centre. Considering the importance of the Tangassery fishing harbour and its possibility of being developed into a fishing-cum-cargo harbour, a coastal road from Kollam to Kappil assumes importance as a link to Thiruvananthapuram away from the National Highway. This particular coastal road will also have immense tourism potential. The coastal road project has already been proposed to be constructed in four reaches (0/000 to 3/000, 3/000 to 7/000, 7/000 to 13/850 and 13/850 to 18/800). The designs for coastal protection works is obtained from I.I.T. Chennai and is estimated to cost Rs. 11 crores.

Upgradations of the road network in the following sectors are also proposed as potentials for solving the road network problems of the district.

- Paravoor – Kollam (via Mayyanad)
- Alappad – Sooranad North
- Chittumala – Pattakadavu
- Kundara – Pooyappally
- Anchal – Melila
- Kadakkal – Pangode
- Ayoor – Alayamon
- Ayoor – Elamadu – Pooyappally – Kulappadom

With a number of potential agencies such as The Kerala State Housing Board, Kerala Police Housing and Construction

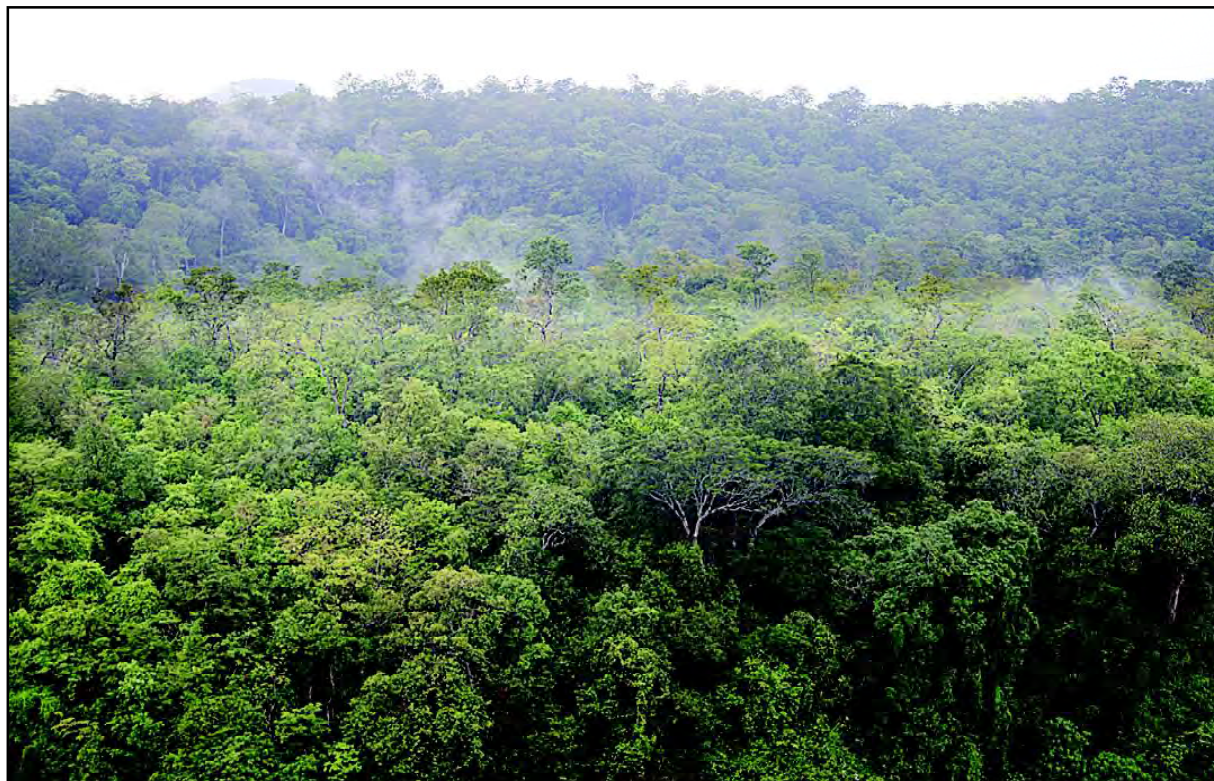
Corporation Ltd., Rural Development Department, Fisheries Dept., SC/ST Dept., Sainik Welfare Dept, Kudumbasree, Kerala State Co-operative Housing Federation, Kerala State Development Corporation for SC and ST, HUDCO, Nirmithi Kendra, Local Self Government Institutions, Kerala State Co-

operative Agriculture and Rural Development Bank, Agricultural Bank, and Nationalised Banks etc. the issued identified can be solved to a great extend in the housing sector.

4. Conclusion

The details of the existing infrastructure

facilities of Road Network, Navigation Network, Rail Network, Harbours and housing have been analysed and problems and potentials identified. This will help in moulding a suitable infrastructure strategies and in identifying new project proposals



Chapter 20

Forest

This chapter analyses the present scenario of Forestry sector in the District. The chapter is structured into four parts. The first part contains the analysis of existing status of forest sector, the second part deals with the overall development trend, the third part includes the development issues and finally the fourth part briefs the analysis of on going and committed projects and programmes.

1 Physical Status

Forests and people are connected, since ancient times, a special relationship based on survival. It was a delicate chain of existence that we once treated with respect and appreciation. But people began to upset this balance. They saw the forest, not as a part of them but as something to be conquered. They used the seemingly limitless forest, cutting down millions of trees. But now it is reckoned that the forests do have limits and it is time to bring them back into balance.

Forests protect our waters and manage our climate. When it rains in the forests, the bed of old and withered leaves allow the water to slowly percolate to the ground. When a forest is cleared, the rain pours

down hard on the exposed soil. The dirt then washes into streams, muddying the back waters. This is unhealthy for the fish, and can cause flooding. Also, without trees, the moisture in the air evaporates quickly, changing the climate of nearby forests. This process prevents trees from receiving the water they need.

Without the forests, we would have much less oxygen. One acre of forest provides over 6 tons of oxygen per year! This is because trees (and all green plants) use a process called photosynthesis, during which they absorb carbon dioxide and, as a by-product, liberate oxygen. Plants "breathe" carbon dioxide, like we breathe oxygen. There has been a balance between species that breathe out carbon dioxide and take in oxygen, and species that take in carbon dioxide and exhale oxygen. Since the 19th century this balance has been upset. Fossil fuels, when burned, create carbon dioxide, so carbon dioxide levels have risen drastically. Unfortunately, this gas, in large amounts along with other gases such as CFCs, Nitrous oxide, acts like an insulator and keeps heat near the surface of the Earth.

This is called the "greenhouse effect."

1.1 Forest Area

As per the Forest Department data, 29% of the total area in Kollam District is forest (Figure 20.1). As per Article 1 of Chapter 6, the forest area is 24% which is comparable with the actual Natural forest area. National average is 29% and State average is 25%. As per National Forest Policy 1/3rd of the Geographical area should be Forest area. From 1971 to 2001 overall forest area status increased within the State. Non forest area is 66% and leased area is 5%. Leased areas are those leased over to various Government agencies for rehabilitation purposes (Eg: Oil Palm India Ltd, Kerala Forest Development Corporation (KFDC), State Farming Corporation of Kerala (SFCK) etc).

Effective Forest area in Kollam district is 998.58 Sq.Km. As per records the leased area is a part of effective forest area, however functionally it is not. Punalur, Konni, Thenmala Achancoil, Shenduruny and Thiruvananthapuram are the forest divisions in Kollam District.

While the Punalur and Thenmala

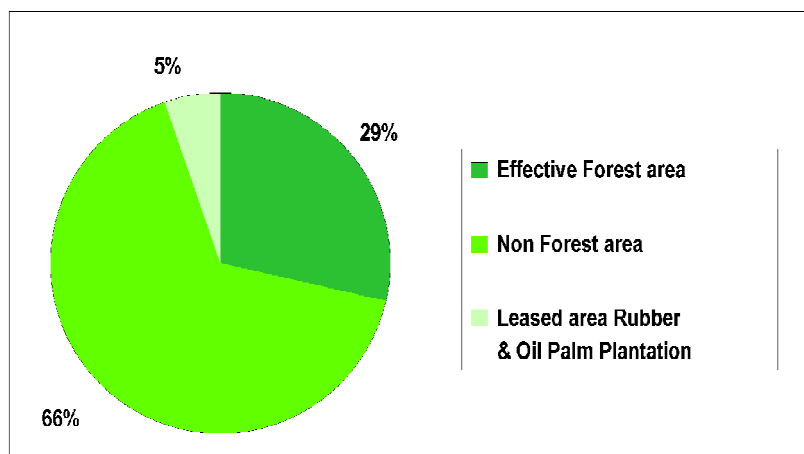


Fig.20.1: Percentage coverage of forest area in Kollam district

Divisions are fully in Kollam District, the other Divisions are partly in Kollam District. Punalur has the highest forest area compared to other Divisions with 346.87 sq.km, i.e. 35% of the

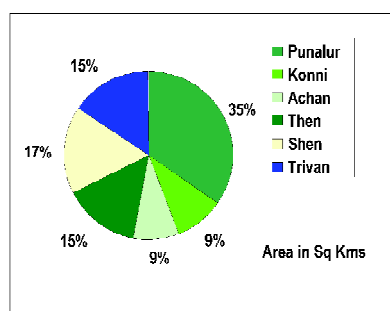


Fig.20.2.: Division wise area of forest

total extent (Figure 20.2).

Pathanapuram, Anchal, Mannarappara, Achancoil, Aryankavu, Thenmala, and Kulathupuzha are the main ranges in Kollam. Shenduruni Wild Life sanctuary is also in the district.

1.2 Types of Forests

Figure 20.3 shows forest divisions and LSGs in Kollam district.

The major types of forests based on the legal status are Natural Forest, Vested Forest and Plantations. Natural Forests are the forest areas which were not subjected to any treatment or activity in the past like clearfelling, planting etc. These are ecologically important. Vested Forests are the private forest areas which were vested with government by the Vesting and Assignment Act. Plantations are the forest areas which were converted by clear felling and planting of species like Teak, Eucalyptus, Elavu etc. In Kollam district, 77% of forest area is Natural Forest area (Figure 20.4).

Spatial distribution of Natural Forests

show that among the forest divisions of Shenduruni, Konni and Punalur, highest area is in Punalur Div with 280.05 Sq.Km (36% of Total). Shenduruni is in second second position with 166.42 Sq.Km (Figure 20.5).

Comprising only 1% of total forest area in the District, vested forest is more or less

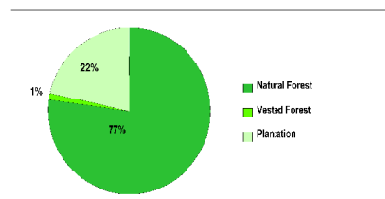


Fig.20.4.: Percentage coverage of forest by type

concentrated on the East. Thenmala Division has 6.895 Sq.Km and Shenduruni Division has 4.58 Sq. Km of vested forest area. Plantations comprise 22% of the total forest area in the District. Thiruvananthapuram Division has 72.07 Sq.Kms and Punalur Division has 66.65 Sq.Kms of area under plantations. Natural Forests being environmentally and ecologically sensitive and important, they are no more being converted into Plantations.

The major types of forests within natural forests are ever green forests, semi-evergreen forests and moist deciduous forests. Ever green forests are those forest

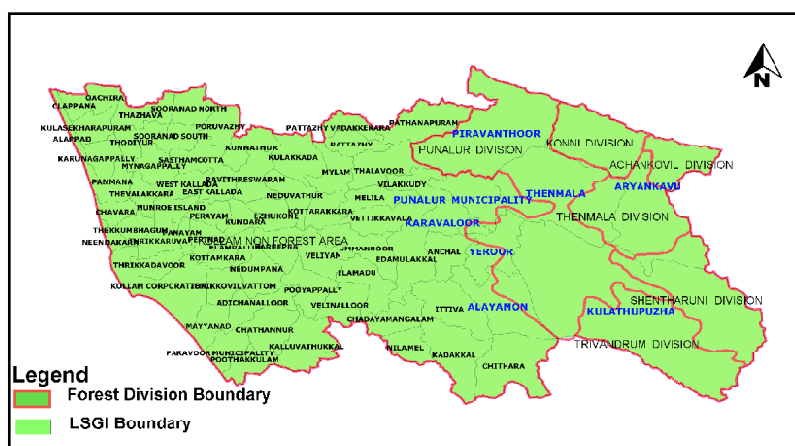


Fig. 20.3 : Forest divisions and LSGIs in Kollam district

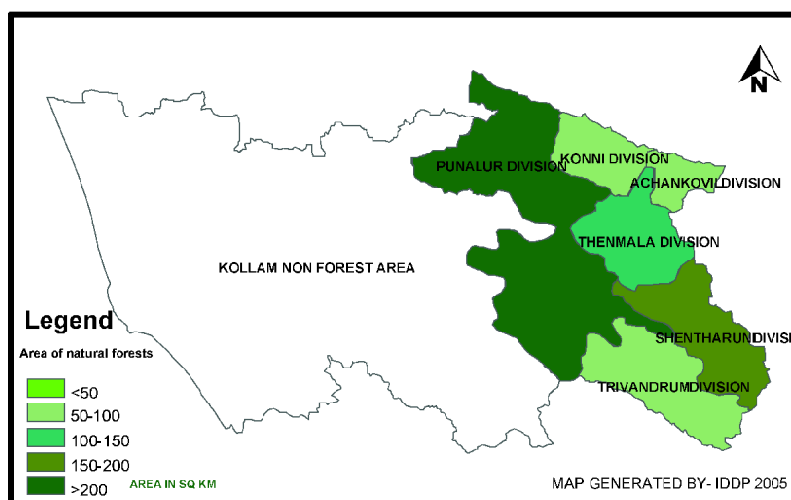


Fig. 20.5 : Distribution of division wise area of natural forests

that remains green throughout the year. Evergreen type of forests is seen at places having higher rainfall. The evergreen trees do not shed leaves during summer. Semi-evergreen forests have a mixture of the wet evergreen trees and the moist deciduous trees. The forest is dense and is filled with a large variety of trees of both types. Moist deciduous forests have broad trunks, are tall and have branching trunks and roots to hold them firmly to the ground. Some of the taller trees shed their leaves in the dry season. There is a layer of shorter trees and evergreen shrubs in the undergrowth.

Evergreen and Semi-Evergreen forests are ecologically important. Moist deciduous forests are important economically. Hence Evergreen and Semi-Evergreen forests should not be allowed to come down from their present status. In Kollam District we have 17% Ever green and 34% Semi-ever green forests (Figure 20.6:).

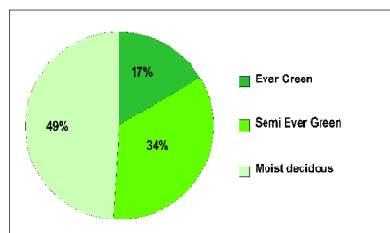


Fig.20.6. : Percentage of natural forest by type

Evergreen forests are ecologically important and are maximum in Shenduruni Division with an area of 54.32 Sq.Kms which is a wild life sanctuary (Figure 20.7).

Semi- Evergreen forest is also maximum in Shenthuruni division with an

area of 92.30 Sq. Kms. Moist Deciduous Forest is maximum in Punalur division with an area of 172.43 Sq.Kms. Thenmala Division has the highest area under vested forest of 6.9 Sq.Kms. while Shenduruni Division has 4.58 Sq.Kms. Konni division has no vested forest and other divisions have very small areas of vested forest.

Degraded grass lands were converted to plantations. Area of plantations in various forest divisions are: Konni has maximum teak plantation of 24.4 Sq.Kms, Achankovil has 23.13 Sq.Kms, Trivandrum has 22.60 and Thenmala has 22.1 Sq.Kms. (Figure 20.8). Shenduruni has no teak. Whereas

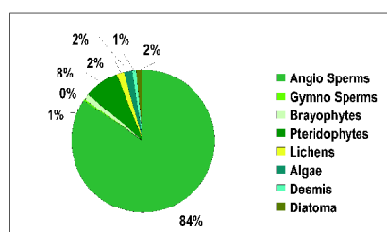


Fig.20.8. : Percentage plantations by type

eucalyptus is there in Punalur division only and has an area of 2.73 Sq. Kms. Comparing to other divisions, area of Acacia plantation is highest in Punalur (13.16 Sq.Kms). Except area leased to KFDC, all other leased area plantations are owned by Government. All the organizations are functioning in the territorial jurisdiction of Punalur Forest Division.

1.3 Flora

Kollam has a very vast biodiversity. Shenduruni Wildlife Sanctuary got its name from Chenkuninji which is Gluta travencorica, locally known as Chenkurinji and endemic to this place in the earth.

Figure 20.9 shows percentage share

of flora by type. It is seen that teak is maximum (62%).

As given in Appendix 20A-I A, we have

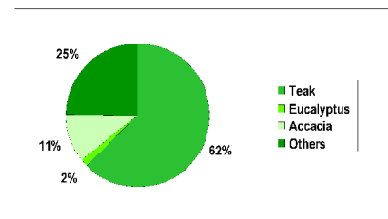


Fig.20.9. : Percentage flora by type
84% Angiosperms in the district. Endangered and Vulnerable Angiosperms are listed in Appendix 20A-IB. However these are in Shenduruni Division and are in the protected area.

Numerous medicinal plants are also present in various divisions of Kollam District as listed in Appendix 20A-I C.

There are 155 nos. of sacred groves in the District. All of them are managed by family trusts, temple trusts or Departments. List is attached in Appendix 20A-I D.

62.05 acres of mangroves have been identified in the district under Central Govt., State Govt. and private holdings. List is attached in Appendix I E. Urgent action needs to be initiated to procure more area under mangroves and to protect the existing ones.

1.4 Fauna

Among fauna we have 66% birds (Figure 20.10). The lists of Mammals, Reptiles and Fishes are given in Appendices 20A-IIIA, 20A-III B and 20A-III C respectively.

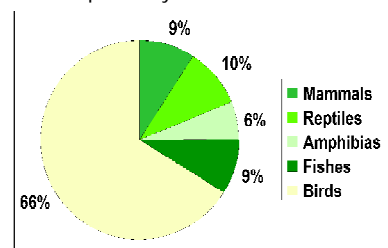


Fig.20.10. : Percentage fauna by type

1.5 Eco Tourism Spots

There are three Eco-Tourism spots in the district as listed in Appendix 20A-IV. More than 2 lakh tourists visited these spots during 2005. Of these Thenmala Eco-tourism spot attracted maximum number of tourists during 2005.

2 Economic Status

2.1 Forest Resources

2.1.1 Commercial Production

In Kollam District the maximum

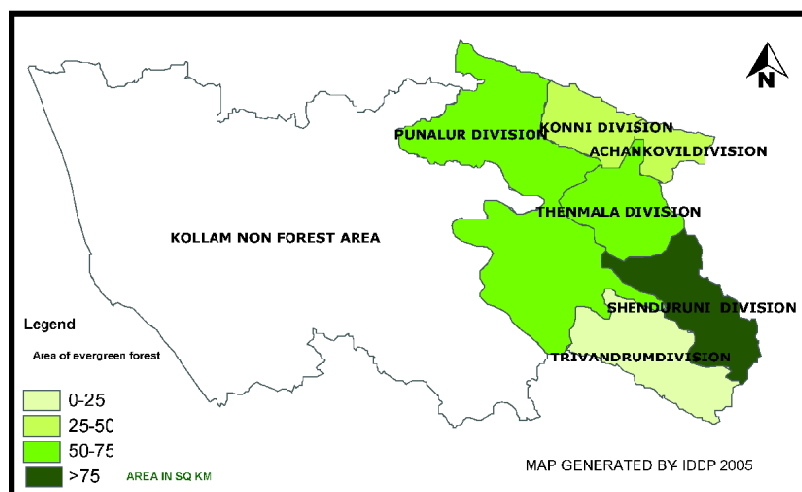


Fig. 20.7 : Distribution of division wise area of evergreen forest

commercial production of timer, firewood and poles is in Punalur division having 6309.36 Cum, 3202.98 MT and 13799 Nos. respectively.

Reeds are present in Punalur and Thenmala divisions. Other softwood like Elavu, Matti, cheeni etc. is produced in Konni, Achankovil and Shenduruni. The production is coming down now.

2.1.2 Industrial Production

In the Industrial production of Softwood, the District ranks highest in the State. The production of Eucalyptus in this district was highest in 2004-05 with 3755.5 MT. Acacia production was highest in 2002-03 and was 2660.16 MT. Bamboo production was highest in 2004-05 and the quantity was 500 MT. Production of Reeds was highest in 2000-01 and quantity was 340 MT. Production of other softwood i.e. Elave, Matti, Cheeni etc. was highest in 2002-03 and quantity was 1020.9 MT.

Eucalyptus plantations are basically only in Punalur division. Acacia plantations are only in Punalur and Achankovil divisions. In the production of Bamboo, Punalur Division is in top.

2.2 Revenue and Expenditure

Revenue which was highest in 2003-04, has drastically came down from Rs1053.85 lakh to Rs 577.71 lakhs in 2004-05. The reason could be the high commercial production of timber in 2003-04 especially in Punalur. Though the Plan fund expenditure is increasing to the tune of Rs 432.71 lakhs, the revenue showed decreasing trend. Non plan expenditure is decreasing over the years.

Achankovil and Konni are comparatively average revenue generating divisions with revenue around Rs 300 lakhs. Achankovil marked low revenue during 2002-03. Punalur and Shenduruni are comparatively low revenue generating divisions, with new revenue generation for certain years.

In Thenmala which was considered to be highest revenue generating division, the revenue generation has now came down from Rs 631.31 lakhs, the all the time maximum in 2003-04, to as low as Rs 77.44 lakhs in 2004-05. Thiruvananthapuram Division has shown fluctuating trend of revenue generation. However presently, the income generation is very low, not more than Rs 3.5 lakhs.

Timber sales Division, Punalur has

maximum revenue of Rs.25314 lakhs during 2000-01, is also showing decreasing trend with revenue generation in the range of Rs 15000-20000 lakhs.

Kollam social forestry wing is also showing lowering trend in revenue generation (Rs 60-80 lakhs range).

3 Social Status

Social status of forest divisions is analysed based on tribal settlements. Punalur Forest Division has maximum number of tribal settlements (11 nos). Part of the areas of Shenduruni and Thiruvananthapuram Forest Divisions within Kollam District has no tribal settlements (Figure 20.11).

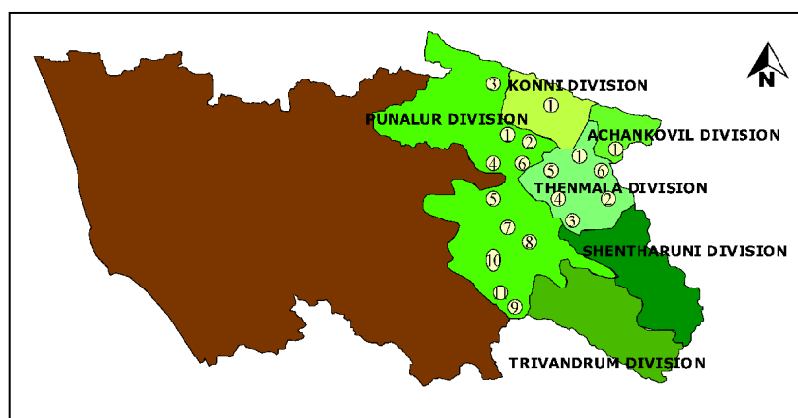


Fig. 20.11 : Location of tribal settlements

49% of the tribal family settlements in forest area are located in Thenmala Forest Division. Sex ratio is almost equal in all divisions except in Thenmala having higher value of 1106.

4. Overall Development Trend

The general trend of development is analysed based on;

- ┃ Commercial production of Timber
- ┃ Industrial production of Softwood
- ┃ Trend in revenue and expenditure – in various divisions
- ┃ Trend in revenue and expenditure – Social Forestry Wing
- ┃ Trend in revenue and expenditure – Overall

┃ Trend in fire incidences

┃ Trend in forest offences

The commercial production of timber in our state has been reducing during the last three years because of the lack of prescribed working plans. In the case of industrial production of Softwood, production of Eucalyptus and Bamboo are increasing over the years. Production of Acacia is almost nil.

From Figure 20.12 it is seen that the revenue from Achankovil division, has increased after a fall in 2002-03 while the non-plan expenditure has drastically come down and Plan fund expenditure is declining. In Konni division, revenue and

non-plan expenditure are increasing while Plan fund expenditure is declining.

From Figure 20.13 it is seen that the revenue from Punalur division is slightly increasing while the non-plan expenditure has drastically come down and Plan fund expenditure is slightly increasing after a sharp decline. In Shenduruni division, revenue, non-plan expenditure and Plan fund expenditure are increasing.

From Figure 20.14 it is seen that the revenue from Thenmala division has drastically came down after an increase in 2003-04 while the Plan fund expenditure has increased after a decline and non-plan expenditure is gradually declining. In

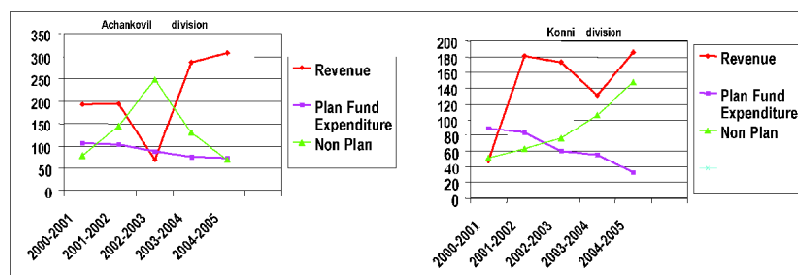


Fig.20.12: Trend in revenue and expenditure in Achencovil and Konni divisions

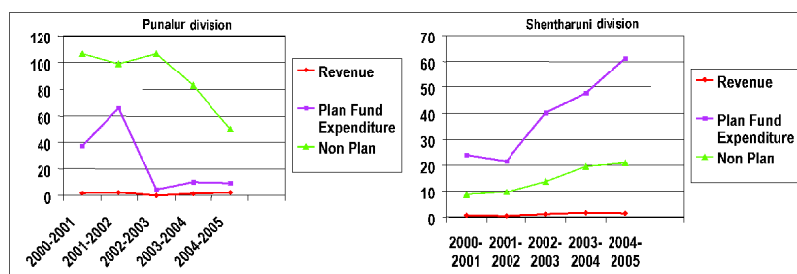


Fig.20.13 : Trend in revenue and expenditure in Punalur and Shenduruni Divisions

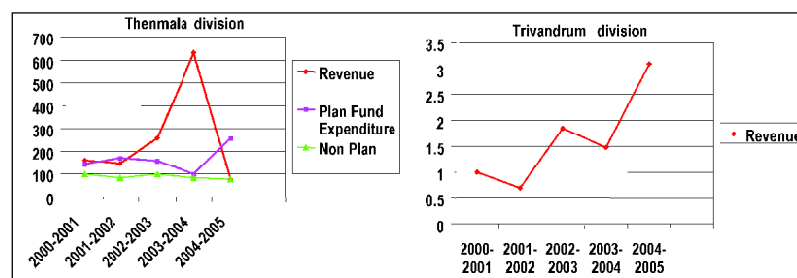


Fig.20.14 : Trend in revenue and expenditure in Thenmala and Trivandrum divisions

Trivandrum division, revenue is increasing after a decline in alternate years.

From Figure 20.15 it is seen that the revenue from Punalur timber division is decreasing after an increase while the non-plan expenditure and Plan fund expenditure are increasing after declining.

From Figure 20.16 it is seen that in Kollam Social Forestry Wing, Non Plan expenditure drastically came down after an increase in 2003-04 while the revenue and Plan fund expenditure has increased after a decline.

From Figure 20.17 it is seen that overall revenue has drastically came down after an increase in 2003-04 while the Plan fund expenditure has increased after a decline and non-plan expenditure is gradually declining. It shows that Thenmala division has greater influence in the overall trend in revenue and expenditure.

Fire incidences show declining trend after increasing in alternate years (Figure 20.18). Trend in number of forest offences is also declining as shown in Figure 20.19.

The overall development trend is also analysed based on Ecological Status and Economical Status.

4.1 Trend in Ecological Conservation

The ecological status is analysed based on grading the following criteria;

- Achievement of overall effective forest area compared to the required 1/3rd Coverage

- Availability of Natural Forest Area out of Total Forest Area
- Availability of Environmentally

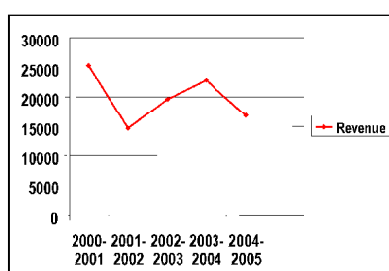


Fig.20.15: Trend in revenue and expenditure in Punalur Timber division

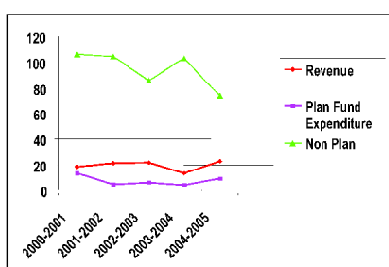


Fig.20.16: Trend in revenue and expenditure in Kollam Social Forestry wing

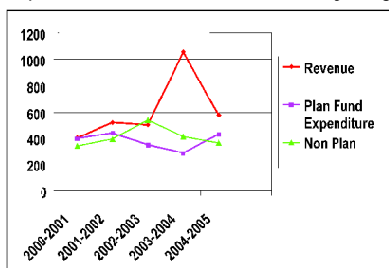


Fig.20.17: Trend in revenue and expenditure - Total in all divisions

- Sensitive Evergreen Forest within Natural Forest
- Encroached area
- Area affected by Forest Fire compared to maximum during last 5 yrs.
- Overall forest offences compared to maximum during last 5 yrs.

With 4 out of 6 getting I Grade, the Ecological status is showing a positive trend (Table 20.1).

4.2 Trend in Economic Development

The economical status is analysed based on grading the following criteria.

- Commercial Production of timber compared to previous year
- Industrial production of Eucalyptus compared to previous year
- Revenue generated compared to previous year
- Plan Fund Expenditure

With 2 out of 4 (Table 20.2), getting III Grade, the Economic status has rather negative trend.

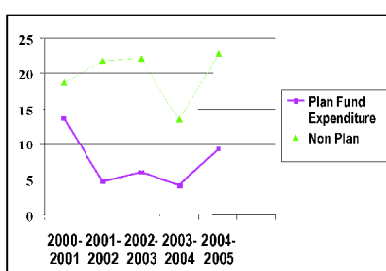


Fig.20.18: Trend in fire incidents

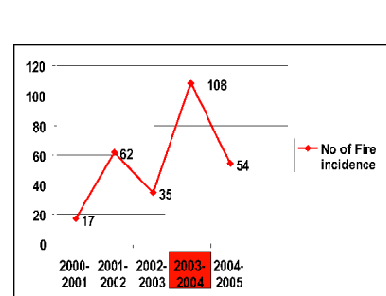


Fig.20.19: Trend in forest offences

Table.20.1: Overall trend in ecological conservation

Sl No:	Criteria	Percentage	Grading
1	Achievement of overall effective forest area compared to the required 1/3 Coverage	87%	I
2	Availability of Natural Forest Area out of Total Forest Area	77%	I
3	Availability of Environmentally Sensitive Evergreen Forest within Natural Forest	17%	II
4	Encroached area	0.02%	I
5	Area affected by Forest Fire compared to maximum during last 5 yrs.	-85.77%	I
6	Over all Forest Offences compared to maximum during last 5 yrs.	-39.91%	II

Table.20.2 : Overall trend in economic development

Sl no:	Criteria	Percentage	Grading
1	Commercial Production of timber compared to previous year	-49%	III
2	Industrial production of Eucalyptus compared to previous year	8%	II
3	Revenue generated compared to previous year	-45%	III
4	Plan Fund Expenditure	33%	II

hect. During the same year Konni division suffered only 13 incidences but accounted for the highest area destruction during the past few years, i.e. 613 hect (Figure 20.21).

5.1.3 Forest Offences

In the District the present trend in forest offences is showing a decrease. Division wise forest offences are maximum in Punalur Division with all time high of 96 nos. during 2001-02. This has however came down to 41 nos. presently. Illicit felling is reducing in the district, maximum in Punalur Division with all time high of 94 nos during 2001-02. This has however came down to 39 nos. presently. Generally, wildlife offences are low in the District, maximum is again in Punalur with all time high of 7 nos. during 2003-04. This has however came down to 2 nos. presently.

5.1.4 River bank management

It is said that rivers and streams are arteries of a region through which the life blood of water flows. If the river dies it will affect vegetation and the agriculture of the area which will adversely affect the people residing in the area. At present most of the

5. Development Issues

5.1 Key Issues

5.1.1 Encroachments

Out of the total forest area, only 0.023% is encroached. Out of the six divisions three have marginal encroachments with the Achenkovil, Konni and Thenmala division having 0.106 Sq.Kms, 0.0038 Sq.Kms and 0.07321 Sq.Kms respectively (Figure 20.20). Presently, there is no encroachment in Punalur division which is most susceptible due to proximity to human intervention. Hence the encroachment is very much controlled.

5.1.2 Forest Fires

2003-04 recorded the maximum occurrence of fire incidences (9108) which affected an area of 1143 Ha. This is mainly due to the lack of pre-monsoon showers in the forest area. Biotic interference is another reason. All divisions suffered from fire incidences.

During 2000-01 Punalur division had maximum fire occurrence (7 nos) and during 2004-05 Punalur and Thenmala equaled with 24 nos. of fire incidences.

During 2003-04 the Achankovil division suffered from 23 nos. of fire outbreaks and the area affected was 76

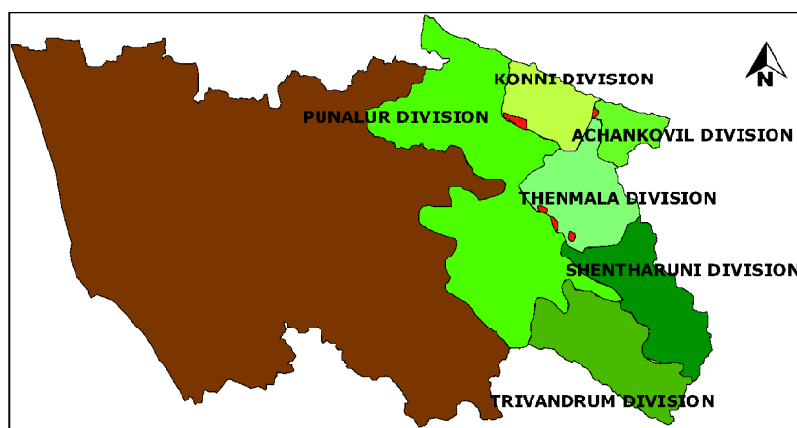


Fig. 20.20: Forest division wise encroachments in forest area

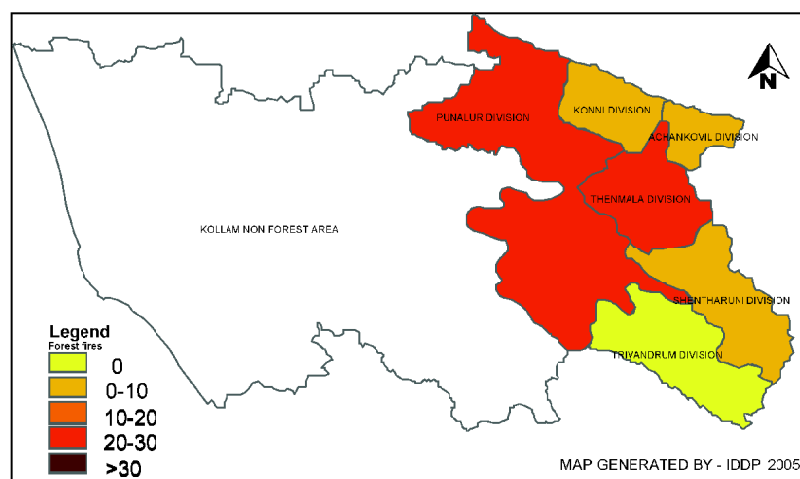


Fig. 20.21 : Distribution of the number of fire incidences in forest divisions of Kollam

rivers and streams are dying and struggling for existence. The main reasons are soil erosion in the water shed areas, encroachment of banks of rivers and streams, irrational removal of vegetation, irrational sand mining etc.

5.2 Problems

The major problems identified are discussed below.

Commercial production of timber, fire wood and poles increased up to 2003-04 but decreased in 2004-05. So is the case of Industrial production. This indicates unsustainable and low yield in Plantation/ Industrial Forestry Sector. The Reason could be lack of prescribed Working Plan especially in Thenmala and Achankovil division.

As per analysis, Revenue from forests is decreasing in Kollam District over the years even in Timber sales division, Punalur. The Reason could be the direct impact of low commercial and industrial production. In the case of Social Forestry Wing revenue (from Strip and Canal bank plantations) came to nil by 2002-03 besides non availability of timely fund for silvicultural operations. Also there is lack of new technology adoption in this field.

Punalur with 39nos. of incidences and Konni with 613Ha affected are most susceptible forest division to fire.

Forest Offences are more in Punalur compared to other Divisions. The reason could be easy accessibility to human interference. Also there is only one forest station in this District (Konni). Lack of forest stations and inadequate cadre strength affect the forestry activities including forest protection.

Even though the existing forest area equals the national average it is yet to be seen whether the required 33% is achieved.

Presently Shenduruni sanctuary is not able to support the pressure of tourists.

There is only a very small extent of mangroves directly in the ownership of Govt. The district supports a variety of mangroves over a large extent of area. This needs protection from clear felling by the owners.

Even though the encroachment and other forest offences are comparatively less in the district, the boundary needs consolidation and new forest stations are to be formed for the control of forest offences.

Further there is absence of a Forest Research Institute in the district.

5.3 Potentials

The major potentials identified are discussed below.

Existing forest area in Kollam district equals National Average of 29%. This controls and maintains locality factors, in particular pollution control and water conservation. Existing forest area is highest in Punalur division. Maximum natural forests area is also in this region. These are chief Carbohydrate and Oxygen producer.

Shenduruni, the ecologically sensitive forest Division, has maximum Evergreen and Semi-evergreen forests. Shenduruni has major portion of endangered, rare and vulnerable species of flora. There is a potential to develop Achenkovil as a new Wild life sanctuary. Also there are potential areas for new Bird Sanctuaries at Karali, Kandachira and Polachira etc.

There is potential for revenue from Plantation / Industrial sectors of forestry. Konni has maximum teak production. Punalur is a hub of eucalyptus and acacia. Also Punalur has good potential for commercial production of forest produce of all kinds. Punalur has well controlled encroachments over the years.

Overall, Kollam is a gene pool of the state having a large number of endangered, rare and endemic species of flora and fauna.

6. Agencies Involved

The chief implementing agency is the Forest Department. Several VSS units, EDC units and TSVS (Theera Samrakshna Vanavalkarana Samiti) Units work under the supervision of the Department.

Vana Samrakshana Samithis (VSSs) and Eco Development Committees (EDCs) are constituted under Forest Development Agencies. VSS President is elected from among the members and its Secretary is one of the field staff of the Department.

Forest Development Agency Chairman is the Conservator of Forests and Chief Executive Officer is the Divisional Forest Officer.

Activities of VSS and EDC: VSS undertakes both Protection and Management while EDC undertakes Protection only. EDCs are formed in Wild Life Wing of the Department only

(Shenduruni Division only in Kollam district). VSS functions under the territorial divisions and undertakes regular silvicultural activities like planting, Soil and Moisture Conservation, Fencing as also Eco Tourism. (Eg. Palaruvi and Manalar)

7. Ongoing And Committed Projects and Programmes

7.1 National Afforestation Project

Long Term Objectives:

1. Protection and Conservation of natural resources through active involvement of people.
2. Checking land degradation, deforestation and loss of biodiversity.
3. Ecological restoration and environmental conservation and eco-development
4. Evolving village level people's organizations, which can manage the natural resources in and around villages in a sustainable manner
5. Fulfilment of the broader objectives of productivity, equity and sustainability for the general good of the people
6. Improve quality of life and self-sustenance- aspect of people living in and around forest areas.
7. Capability endowment and skill enhancement for improving employability of rural people.

Short Term Objectives:

1. Regeneration and ecodevelopment of degraded forests and adjoining area on a watershed basis.
2. Ensuring of the availability of fuel wood, fodder and grass from the regenerated areas.
3. Promotion of agro forestry and development of Common Property Resources.
4. Promotion of fuel saving devices to reduce dependency on fuel wood and to reduce the drudgery of rural woman involved in collection of wood, as also to improve the environment
5. Conservation and improvement of non-timber products such as bamboo, cane and medicinal plants.
6. Encourage production of non-timber products such as wax, honey, fruits and nuts from the regenerated areas.
7. Raising coastal shelterbelts to mitigate the adverse impacts of cyclonic winds, Tsunami, etc.
8. Development and extension of improved technologies such as clonal

propagation and use of root trainers for raising seedlings, mycorrhizal inoculation etc.

9. Rehabilitation of special problem lands like saline/alkaline soils, ravines, desert areas, coastal areas, mined areas, Himalayas, Aravallis and Western Ghats, etc.
10. Employment generation for the disadvantaged section of society, particularly women, scheduled castes/scheduled tribes and landless rural labourers, inhabiting the forests and adjoining areas.

Physical and financial achievements are as follows.

100 Vana Samrakshana Samithis are formed so far against the targeted 106. Utilization of funds is 123.32 lakhs which is 78.52% of the received amount and 39.39% of the approved amount.

7.2 Compensatory Afforestation

Very high population, very low per capita land availability, ideal conditions for raising cash crops etc have exposed the forest of the state to very heavy pressure leading to encroachment. Developmental and welfare activities taken up immediately after the independence like colonization schemes, Grow More Food Scheme, Arable Land Scheme, Hydro Electric Projects, plantation etc. have taken away considerable extent of forest in the state. In 1960s and 1970s the perspectives was that of providing land based employment to land less people. Many of the above schemes had its origin in this line of thinking. However, already released forest land acted as centers for further encroachment into forests. So Govt. was compelled to regularize the forest encroachment on various occasions in the past. Even then, there were a large number of unauthorized occupations in the forest area when the Forest Conservation Act 1980 came into force. The State Govt. took a policy decision to regularize the all forest encroachment which came into being prior to 01.01.1977. Govt of India also accepted this in principle. A detailed field inspection was conducted and about 28588 ha of pre 1.1.1977 encroachment were identified. Proposals were submitted to Govt. of India for clearance as per Forest Conservation Act 1980 for regularizing the above encroachment.

The scheme was undertaken to

regularize all forest encroachments which came into being prior to 1-1-1977 and was started during 1994-95. The total target for the State was 57180 Ha. The target for the District which was 7090 Ha and will be achieved during the current year.

The objectives include

1. To compensate the loss of 28588 Ha. of forest land lost by way of encroachment through afforesting double the extent and thereby
2. To enrich the forests to maximize their direct and indirect utility
3. To restore the ecological balance of the degraded forests
4. To conserve soil and moisture
5. To provide ideal habitat for wildlife
6. To ensure steady flow of water in the rivers.

Physical and financial achievements are as follows.

An extent of 5653.28 Ha. has already been treated in the District and the balance 1437.14 Ha. will be completed during the current financial year. The anticipated expenditure for the current year is Rs.92 lakhs and Rs 370 lakhs have been spent during the previous years.

7.3. Coastal afforestation (Harithatheeram Padhathi)

Kerala coast is subjected to natural hazards like erratic monsoon precipitation, floods and beach erosion and other natural calamities like Tsunami, Cyclones etc. The coastal populations which are mainly poor fishermen have to bear these hazards. These hazards not only influence the physical dynamics of the coastal regions but also the surface hydrology, sub surface water domain, life and property of coastal people and even change the geomorphology altogether. In these types of natural calamities bio shields like mangroves forests helps a lot in reducing the force and impact of these hazards.

Kollam District has 37 Km length of coastal area. In the above 22.5 km of coastal length and 7 m wide (15.75 ha) were expected to be available for bio shield planting in the 1st phase and balance 13 km length and 7 m wide (9.1 ha) in 2nd phase after rehabilitation of the fishermen residing close to the sea.

The objectives include

- Protection of natural coastal ecosystem by establishing bio shield along the sea coast

- To minimize the impact of coastal erosions, Tsunami, wind etc.

- To improve the tree cover in the households in the coastal areas for meeting demands of local people for fuel, fodder and small timber.

- To provide better, safer living places and working conditions for the fishermen and other coastal population.

- To generate employment opportunities for local population.

- To provide opportunities for the overall development of the coastal area through various entry point activities resulting in improvement of the basic amenities.

- To enhance capacity building for improving income generation through training and awareness campaign among the coastal population.

The work will be executed through people's participation through TSVS (Theera Samrakshana Vanavalkarana Samithi). Kattady, Poovarasu, Punna etc and locally suitable species will be used for the coastal afforestation.

At present, most of the private agricultural fields and individual households are having very few numbers of trees that is mostly coconut trees. Therefore, these households and agricultural fields are having sufficient places for planting casuarina and other species. The local people in the coastal region will be motivated through awareness campaign to plant suitable species like casuarina, thespesia, teak, vallapine, albezia, bamboo etc. which will be raised by Forest Department and distributed free of cost to the local people.

7.4 Sanjeevini Vanam

This was established in Kulathupuzha during 1985 with an extent of 18.8 Ha. with an intention to create awareness among the public of the medicinal resources of our state. At present there are about 250 nos. of medicinal plants and trees planted in 5 ha of area. The seedlings are named and a short note on the medicinal uses is attached. Every year thousands of students and public visit this plot. Action is in progress to rejuvenate this project so as to attract more people and to create awareness among them for the conservation and distribution of the plants here.

7.5 Ente Maram Padhathi

This programme commenced in the

district during 2007. 484 schools were selected for the distribution of seedlings and 175637 seedlings were distributed. For the implementation of the program students from Vth standard to IXth standard were selected. The program continued in the subsequent year 2008 and 68470 seedlings were distributed to students from 455 educational institutions.

7.6 Nammude Maram Padhathy

This programme started during 2008. The objective was to plant the compounds of the educational institutions with the seedlings distributed by the Forest Department. Apart from the previous program, students of Professional Colleges, Higher Secondary Schools, Vocational Higher Secondary Schools, ITIs etc were included under this program. A committee was formed in each institution to ensure the protection and maintenance of the planted seedlings.

7.7 Vazhiyora Thanal Padhathy

Vazhiyora Thanal Padhathy began during 2007. The program was conceived to be implemented with the active participation of the head load workers unions in the protection and maintenance of the seedlings planted along the sides of the highways and interior roads. Since the co operation and participation from the workers were not satisfactory, the program could not achieve the target resulting in a

very poor survival percentage. In the subsequent year 2008, the program was implemented departmentally.

7.8 Forest Extension

Forest conservation programme cannot succeed with out the willing support and active cooperation of the people. It is essential, therefore, to inculcate the people, a direct interest in the forests, their development, conservation and sustainable management, and to make them conscious of the value of trees, wildlife, bio-diversity and nature in general. This can be achieved through the involvement of educational institutions, Kudumbasrees, residential associations, public leaders, NGOs and individuals etc. In Kollam, a District Forestry Extension and Information Centre (DFEIC) is functioning at Kottarakkara. Farmers and interested people are given opportunities through DFEIC to learn agro-silvicultural and silvicultural techniques to ensure optimum use of their land and water resources. Short term extension courses and awareness classes are organized in order to educate Students, Farmers, Kudumbasrees, etc Specialized and orientation courses to the staff will be given for developing better management, taking into account the latest development in forestry and related disciplines.

8. Evaluation of Ongoing and Committed Projects and Programmes

Basically all the above on going and committed projects and programmes are according to the conservation policy of the forest department and therefore aim to attain the required 33% target. However as evident from the analyses discussed above there are certain specific issues which need to be taken care of in this sector.

9. Conclusion

From the analysis it is seen that the district is endowed with a rich resource of biodiversity. Still the forest cover is short of national standards. The existing infrastructure has managed to protect the forest area of the district to a great extent particularly in the ecology side. In the economy side however there are certain areas which can be improved without affecting the principles of forest conservation. Further, there are certain problems to be resolved and potentials in the district still remain untapped. Thus conscious efforts have to be taken up to develop the forest economy within the strict parameters of ecological conservation. Therefore the efforts in development of forestry sector need to be directed towards sustaining and enriching the rich bio-diversity of Kollam and to make Kollam a greener district n



Chapter 21 A

Environment

This chapter analyses the existing status and development issues of Bio Physical environment in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on the temporal aspects. The third part probes into the development issues pertaining to the sector and finally the fourth part contains the analysis of ongoing and committed projects and programmes.

1. Analysis of Existing Status

Pollution is the introduction of pollutants into the environment to such a level that its effects become harmful to human health, other living organisms or the environment. Development activities carry with it the seeds of environmental damage, assisted and abetted by both needs and greed of man. Activities such as manufacturing, processing, transportation and consumption not only deplete the stock of

natural resources but also add stress to the environmental system by accumulating the stock of wastes. The productivity of the economic system, however, depends on the supply and quality of natural and environmental resources. While water, soil, air, forest and fisheries resources are productive assets, the pollution of water, air, atmosphere and the generation of noise to undesirable levels are the byproducts of economic development, particularly industrialisation and urbanization to undesirable levels. Environmental degradation often tending to become irreversible, impose damage costs on the economy resulting in low output, human losses, loss of labour productivity from ill health and loss of crop output. The level of environmental problems of a State varies with the stages of development, current production technologies and the environmental policies implemented.

Conventionally, the environmental

pollution problems are solved by introducing environmental management techniques such as control of pollution at source, providing of sewage treatment facilities etc. In greater context the environmental aspects are to be inducted into each of the developmental activities at the planning stage itself and are to be well co-ordinated and balanced. For all developmental activities, a crucial input is land and depending on the activity a specific land use is decided. The environmentally related land uses are trade and commerce, housing construction, transport facilities (road, rail and water), utilities (water - surface and ground etc.), refuse/hazardous waste disposal facilities, wastewater installations, quarrying and mining, power generation, forestry, inland and coastal fisheries, recreation and tourism etc. These land uses are likely to have some impact on the environment. The best use of the land needs to be

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assessed in terms of not only the economic aspects but also the environmental aspects and the land uses are accordingly to be allocated so that the natural environment and ecological balance is not disturbed. Key priorities in the coming years for the conservation of environment should include enhancing urban environmental conditions including air quality, access to safe drinking water, sanitation, waste management and improving governance of natural resources with a focus on biodiversity conservation.

1.1. Industrial Pollution

In the rush towards industrialization, it becomes expedient for people to produce more products and consume more. They forget that this is an orderly universe and an orderly world which work according to scientific i.e. natural laws which are inviolable. Now, the extent of environmental destruction has forced us to recognize that everything in the environment has an effect on everything else. Pollution prevention in the industrial sector is hardly a new concept. Industrial operations traditionally have adopted a verity of waste reduction techniques to lower cost of production to increase profits.

The spatial distribution of industries in the district analysed by the industries sector (Figure 21A.1) shows that, majority of the industrial units of Kollam district are located in Kollam Corporation (3933 units) followed by Punalur (973 units), i.e. most of the units are concentrated in low and middle land. It is seen that only 20% of the industrial units registered under the industries department are identified to have pollution potential, i.e. 1248 out of 26913 industries.

In 2006 out of 798 pollution potential industries the majority are located in Kollam Corporation (112 units) and in the adjacent LSGI Thrikkovilvattom (42). Industries are categorized as Red, Orange and Green according to the pollution potential, Red being units having the highest pollution potential.

The type of industries under each category is given in the Table 21A.1. It is seen that in 2006 among the pollution potential industries (Total 798 nos.) 67% of the industrial units identified to have medium pollution potential (Figure 21A.2). All together industrial units identified to have medium to high pollution potential is

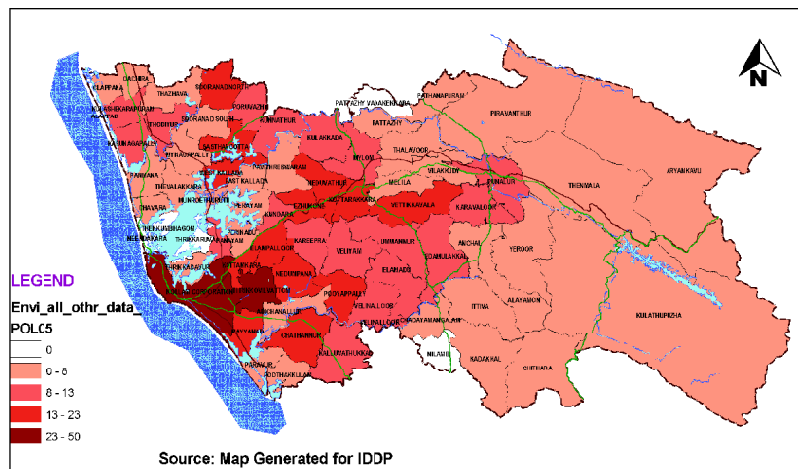


Fig. 21A.1: LSGI wise distribution of industries having pollution potential

Table.21A.1: Category wise type of industries

Red Category	Orange category	Green category
1. Crusher units	1. Cashew processing units	1. Bakery unit
2. Chemical Industries	2. Brick manufacturing unit	2. Cement products
3. Milk processing unit	3. Coir defibring unit	3. Electronic goods
4. Power generating units	4. Garbage processing	4. Engineering workshops
5. Slaughter houses	5. Hotels	5. Ice cream manufacturing
6. Steel re-rolling mills	6. Broiler farm	6. Power laundry
7. Latex centrifuging units	7. Pharmaceuticals	7. Manufacture of detergents
8. Waste oil processing units	8. Tyre retreading	8. PVC products

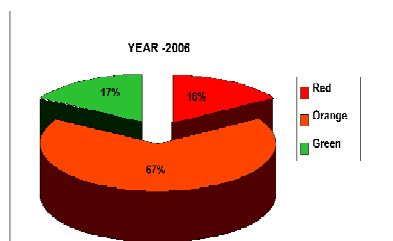


Fig.21A.2: Percentage of pollution potential industries– Category wise

83%.

In 2006, out of the 130 red category industrial units the highest number (12 each) are located in Kollam Corporation and Chathanoor GP. In 31 LSGs no industrial unit having high pollution potential exists (Figure 21A.3).

In 2006, out of the 536 industrial units having medium pollution potential, the highest number are located in Kollam

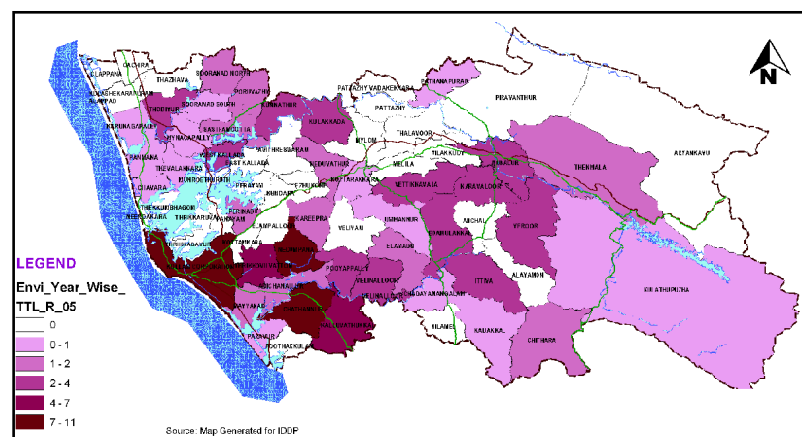


Fig. 21A.3: Distribution of Red category industries

Corporation (49 units) followed by Thrikovilvattom Grama Panchayat with 30 units. In 8 LSGIs no industrial units having medium pollution potential exists. In 2006, out of 132 industrial units having low pollution potential, the highest number are located in Kollam Corporation (51 units) followed by Paravur Municipality (11 units).

Air pollution is the modification of the natural characteristics of the atmosphere by a chemical, particulate matter, or biological agent. The atmosphere is a complex, dynamic natural gaseous system that is essential to support life on planet Earth. Stratospheric ozone depletion due to air pollution has long been recognized as a threat to human health as well as to the Earth's ecosystems.

Worldwide, air pollution is responsible for large numbers of deaths and cases of respiratory diseases. While major stationary sources are often identified with air pollution, the greatest source of emissions is actually mobile sources, mainly automobiles. Gases such as carbon dioxide, which contribute to global warming, have recently gained recognition as pollutants by some scientists.

There are many substances in the air which may impair the health of plants and animals (including humans), or reduce visibility. These arise both from natural processes and human activity. Substances not naturally found in the air or at greater concentrations or in different locations from usual are referred to as 'pollutants'.

Pollutants can be classified as either primary or secondary. Primary pollutants are substances directly emitted from a process, such as ash from a volcanic eruption or the carbon monoxide gas from a motor vehicle exhaust.

Secondary pollutants are not emitted directly. Rather, they form in the air when primary pollutants react or interact. An important example of a secondary pollutant is ground level ozone - one of the many secondary pollutants that make up photochemical smog.

Some pollutants may be both primary and secondary: that is, they are both emitted directly and formed from other primary pollutants.

Major primary pollutants produced by human activity include:

- Sulphur oxides (SOx) especially sulphur dioxide are emitted from

burning of coal and oil.

- Nitrogen oxides (NOx) especially nitrogen dioxide are emitted from high temperature combustion. Can be seen as the brown haze dome above or plume downwind of cities.
- Carbon monoxide is colourless, odourless, non-irritating but very poisonous gas. It is a product by incomplete combustion of fuel such as natural gas, coal or wood. Vehicular exhaust is a major source of carbon monoxide.
- Carbon dioxide (CO₂), a greenhouse gas emitted from combustion and respiration.
- Volatile organic compounds (VOC), such as hydrocarbon fuel vapors and solvents.
- Particulate matter (PM), measured as smoke and dust. PM₁₀ is the fraction of suspended particles 10 micrometers in diameter and smaller that will enter the nasal cavity. PM_{2.5} has a maximum particle size of 2.5 µm and will enter the bronchies and lungs.
- Toxic metals, such as lead, cadmium and copper.
- Chlorofluorocarbons (CFCs), harmful to the ozone layer emitted from products currently banned from use.
- Ammonia (NH₃) emitted from agricultural processes.
- Odors, such as from garbage, sewage, and industrial processes
- Radioactive pollutants produced by

compounds in photochemical smog, such as nitrogen dioxide.

- Ground level ozone (O₃) formed from NOx and VOCs.

- Peroxyacetyl nitrate (PAN) similarly formed from NOx and VOCs.

Minor air pollutants include:

- A large number of minor hazardous air pollutants. Some of these are regulated in USA under the Clean Air Act and in Europe under the Air Framework Directive.

- A variety of persistent organic pollutants, which can attach to particulate matter.

1.1.1. Industrial Air Pollution

Out of 829 industrial units of Kollam district creating air pollution, majority are located in Kollam Corporation (144 nos) followed by Thrikovilvattom (37 nos) Grama Panchayat (Figure 21A.4).

Out of 72.50 tonnes/day of Particulate Matter emission, higher concentration is observed in Kottamkara (3.75 T/day) followed by Elampalloor and Kottarakkara (3.5 T/day). Main source of emission is cashew processing units. Heavy emission with high concentration of particulate matter and phenolic compound is made from such units. Out of 4 Tonnes/day of NOx emission, a major portion (0.9 T/day) is concentrated in Neendakara Grama Panchayat followed by Kollam Corporation with 0.35 T/day. Out of 18 Tonnes/day of Sulphur Dioxide (SO₂) emission, major share is concentrated in Panmana Grama Panchayat (12.98 T/day)

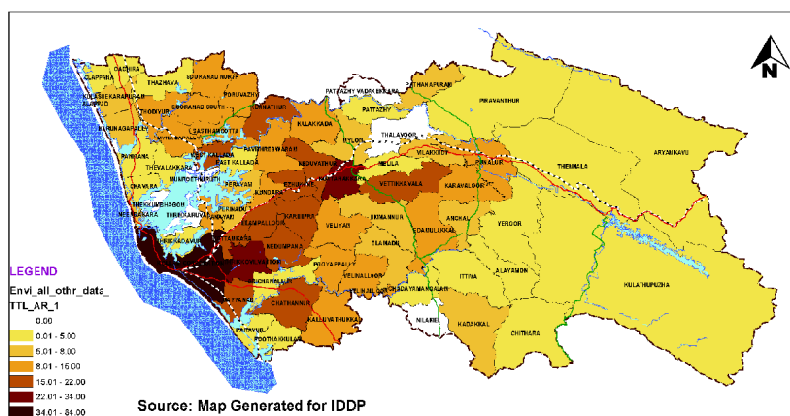


Fig. 21A.4: LSGI wise distribution of industrial units creating air pollution

nuclear explosions and war explosives, and natural processes such as radon.

Secondary pollutants include:

- Particulate matter formed from gaseous primary pollutants and

followed by Adichanalloor Grama Panchayat (2.41 T/day).

Out of 3.6 Tonnes/day of Carbon Monoxide (CO) emission, highest emission is in Panmana Grama Panchayat (0.836 T/day) followed by Adichanalloor Grama

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Panchayat (0.154 T/day). Out of 1.01 Tonnes/day of CI emission, major share is from Panmana LSGI (0.836 T/day) followed by Kollam Corporation (.008 T/day).

Out of 99.11 Tonnes/day of total emission of major pollutants namely Particulate matter, oxides of nitrogen, Sulfur dioxide, Carbon monoxide and chlorine and its compounds, the total share is highest in Panmana Grama Panchayat (17.21 T/day) followed by Grama Panchayats of Kottamkara, Elampallur, Kottarakkara and Neduvathur (4 T/day) as shown in Figure 21A.5.

There are more than 150 number of

quality of the water and affects the organisms living in it. This process ranges from simple addition of dissolved or suspended solids to discharge of the most insidious and persistent toxic pollutants (such as pesticides, heavy metals, and non degradable, bio-accumulative, chemical compounds). Water pollution is a large set of adverse effects upon water bodies such as lakes, rivers, oceans, and groundwater caused by human activities.

Although natural phenomena such as volcanoes, algae blooms, storms, and earthquakes also cause major changes in water quality and the ecological status of

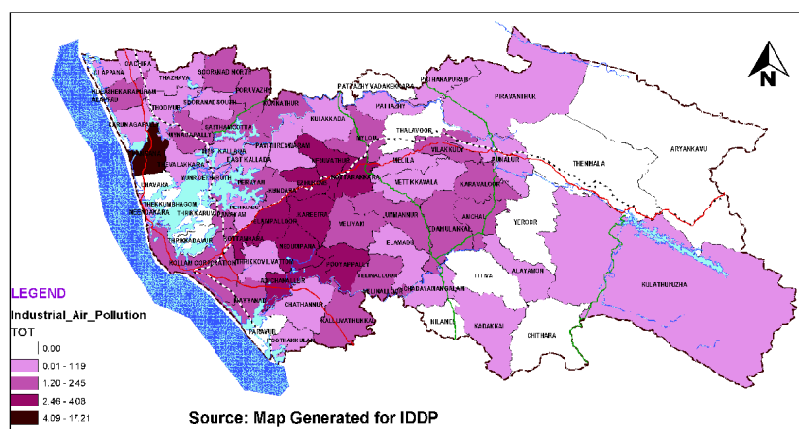


Fig. 21A.5: LSGI wise distribution of total emission of major air pollutants

wire cut brick manufacturing units in Kollam district. In the West Kallada Grama Panchayat itself, the number is about 50. Unlike in other states the units here are started with less investment, say, at the most five lakh rupees. The machineries needed are a pug mill and a moulding machine. The moulded wet bricks are air-dried and stacked under roof, normally in a kiln of area 18x18 ft for burning with the use of fire wood. The total height of the stacked bricks will be about 3.5-5.0m. The burning operation lasts for about 24-60 hours. After cooling the bricks are sold out. Meanwhile the adjacent kiln will be prepared as before and burnt. Altogether burning is possible for only two times a month.

During the burning time, thick and white smoke emanates from the top portion of kilns. The emission may contain toxic gases like carbon monoxide, fluorides etc. It will spread to the nearby area providing the inhabitants with bronchial problems.

1.1.2. Industrial Land/ Water Pollution

Water pollution is the introduction into fresh or ocean waters of chemical, physical, or biological material that degrades the

water, these are not deemed to be pollution. Water is only called polluted when it is not able to be used for what one wants it to be used for. Water pollution has many causes and characteristics. Increases in nutrient loading may lead to eutrophication. Organic wastes such as sewage impose high oxygen demands on the receiving water leading to oxygen depletion with potentially severe impacts on the whole eco-system. Industries discharge a variety of pollutants in their wastewater including heavy metals, resin pellets, organic toxins, oils, nutrients, and solids. Discharges can also have thermal effects, especially those from power stations, and these too reduce the available oxygen. Silt-bearing runoff from many activities including construction sites, deforestation and agriculture can inhibit the penetration of sunlight through the water column, restricting photosynthesis and causing blanketing of the lake or river bed, in turn damaging ecological systems.

Sources of water pollution:

Some of the principal sources of water pollution are:

- | Geology of aquifers from which groundwater is abstracted
- | Industrial discharge of chemical wastes and byproducts
- | Discharge of poorly-treated or untreated sewage
- | Surface runoff containing pesticides or fertilizers
- | Slash and burn farming practice, which is often an element within shifting cultivation agricultural systems
- | Surface runoff containing spilled petroleum products
- | Surface runoff from construction sites, farms, or paved and other impervious surfaces e.g. silt
- | Discharge of contaminated and/or heated water used for industrial processes
- | Acid rain caused by industrial discharge of sulphur dioxide (by burning high-sulphur fossil fuels)
- | Excess nutrients are added (eutrophication) by runoff containing detergents or fertilizers
- | Underground storage tank leakage, leading to soil contamination, and hence aquifer contamination
- | Inappropriate disposal of various solid wastes and, on a localized scale, littering
- | Oil spills

Out of 264 industrial units creating Water Pollution in Kollam District, majority are located in Kollam Corporation (51 nos) followed by Paravur Municipality (27 nos).

Land pollution is the degradation of the Earth's land surface through misuse of the soil by industrial waste dumping, and indiscriminate disposal of urban wastes. It includes visible waste and litter as well as pollution of the soil itself.

The accumulation of waste threatens the health of people in residential areas. Waste decays, encourages household pests and turns urban areas into unsightly, dirty and unhealthy places to live in.

Out of 425 industrial units creating Land Pollution in Kollam District, maximum number of units are located in Kollam Corporation (56 nos) followed by Thrikkovilvattom Grama Panchayat (30 nos) as shown in Figure 21A.6.

1.1.3 Industrial Noise Pollution

Industrial noise pollution is an ever growing problem and its management is centered on many pieces of legislation,

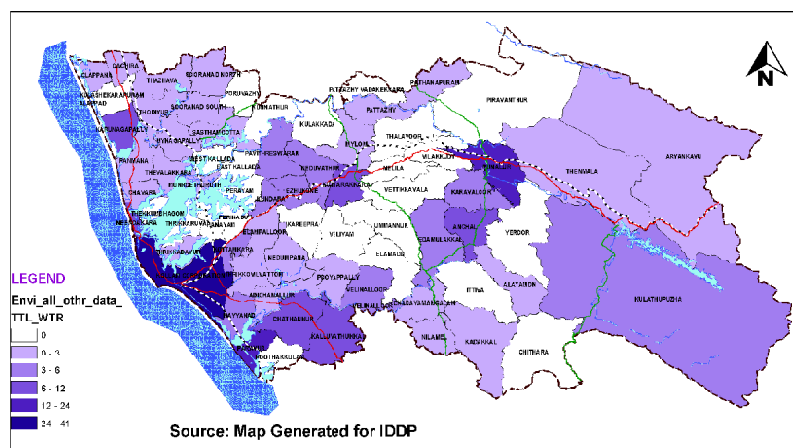


Fig. 21A.6: LSGI wise distribution of industrial units creating land/water pollution

standards, guidance documents, etc. many of which frequently contradict each other. There are two main viewpoints, the more obvious of which is the quantification and control of a noise nuisance, usually in response to a complaint. Secondly, we have planning considerations where a potential nuisance or loss of amenity is anticipated and planning refusal or control conditions are imposed.

Noise pollution (or environmental noise in technical venues) is displeasing human or machine created sound that disrupts the environment. The dominant form of noise pollution is from transportation sources, principally motor vehicles.

Out of 211 industrial units creating Noise pollution, maximum number of units are located in Kollam Corporation (59 nos) followed by Paravur Municipality (11 nos) as shown in Figure 21A.7.

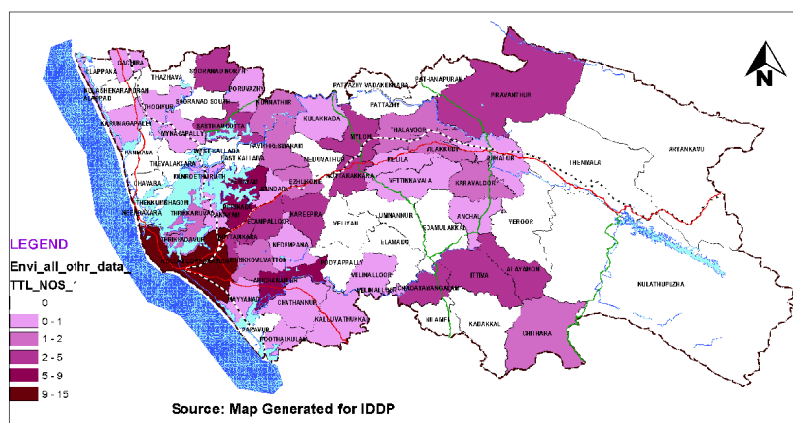


Fig. 21A.7: LSGI wise distribution of industrial units creating noise pollution

1.1.4. Treatment Facilities for Industrial Pollution

There are many air pollution control technologies available to reduce air pollution; however, costs of addressing the

issue are high world wide. Of course, these costs are a small fraction of the economic damage that air pollution will inflict on every nation of earth. Many countries have programs to or are debating how to reduce dependence on fossil fuels for energy production and shift toward renewable energy technologies or nuclear power plants.

Efforts to reduce pollution from mobile sources include primary regulation (many developing countries have permissive regulations), expanding regulation to new sources (such as cruise and transport ships, farm equipment, and small gas-powered equipment such as lawn trimmers, chainsaws, and snowmobiles), increased fuel efficiency (such as through the use of hybrid vehicles), conversion to cleaner fuels (such as bioethanol, biodiesel), or conversion to electric vehicles with

by industry or transportation devices. They can either destroy contaminants or remove them from an exhaust stream before it is emitted into the atmosphere.

- Particulate control**
 - i Mechanical collectors (dust cyclones, multicyclones)
 - i Electrostatic precipitators
 - i Baghouses
 - i Particulate scrubbers
 - Scrubbers**
 - i Baffle spray scrubber
 - i Cyclonic spray scrubber
 - i Mechanically aided scrubber
 - i Spray tower
 - i Wet scrubber
 - NOx control**
 - i Low NOx burners
 - i Selective catalytic reduction (SCR)
 - i Selective non-catalytic reduction (SNCR)
 - i NOx scrubbers
 - i Exhaust gas recirculation
 - i Catalytic converter (also for VOC control)
 - VOC abatement**
 - i Adsorption systems, such as activated carbon
 - i Flares
 - i Thermal oxidizers
 - i Catalytic oxidizers
 - i Biofilters
 - i Absorption (scrubbing)
 - i Cryogenic condensers
 - i Vapor recovery systems
 - Acid Gas/SO₂ control**
 - i Wet scrubbers
 - i Dry scrubbers
 - i Flue gas desulphurization
 - Mercury control**
 - i Sorbent Injection Technology
 - i Electro-Catalytic Oxidation (ECO)
 - i K-Fuel
 - Dioxin and furan control**
 - Miscellaneous associated equipment**
 - i Source capturing systems
 - i Continuous emissions monitoring systems (CEMS)
- The measures can be used to control land pollution are the following:
- i Anti-litter campaigns can educate people against littering;
 - i Organic waste can be dumped in places far from residential areas;
 - i Inorganic materials such as metals,

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glass and plastic, but also paper, can be reclaimed and recycled.

1.2. Pollution from Health care Institutions

The disposal of hospital waste, which contains infectious and other hazardous materials, has not received much attention until recently in our country. This problem attains very high significance in the Indian context, where it is normal practice to dispose off infectious medical waste containing blood and pus soaked cotton etc. into the community bins, together with domestic wastes and think no more about it. This puts the people who come in to direct contact with hospital waste as well as the society and environment indirectly at risk. The disposable items which are thrown away like this are retrieved by rag pickers and put back to use, some times even without a preliminary round of treatment or disinfection, thereby placing the entire population at risk. Many of the facilities even when available in the medical field are not utilised properly thereby aggravating the problem further. This increases the treatment cost and environmental pollution.

Hospital waste, due to its unique characteristics, requires special attention during its treatment and disposal. Hospital waste consists of different streams of materials, originating from various sources, which require different methods of treatment. In general, only a small fraction of the total hospital wastes is infectious or hazardous. This small percentage of the total waste, if, under any circumstances is caused to mix with the general waste, will render the whole lot infectious /hazardous that require special treatment and disposal, thereby making the task several times more difficult. Therefore it is vital to segregate the waste produced in a hospital at their points of generation itself so that they can be disposed off separately.

Incineration and land filling are the two most widely employed techniques for the disposal of hospital waste. As per provisions of the Bio Medical Waste (BMW) (M and H) Rules 1998, it is the responsibility of the waste generator to treat and dispose of the BMW. The Kerala State Pollution Control Board is the prescribed authority to implement the Rules in the state.

As per the Rules the BMW is to be collected in 4 different coloured bags

Yellow, Red, Blue and Black.

- i Yellow : Human body parts and Others- to be incinerated
- i Red : IV Sets of Blood and Urine bags- to be autoclaved
- i Blue : Needles, springs and sharps - after autoclaving /chemical treatment to be cut to small pieces and disposed.
- i Black: Discarded medicine, Incinerator ash, Chemical waste disposed in secured land fill.

After the introduction of Bio Medical Waste Rules in 1998, a common bio medical waste treatment system 'IMAGE' was installed under the banner of the organization of the Doctors of Kerala, IMA. The segregated bio medical wastes from the hospitals registered under the system of 'IMAGE' are collected, transported to the unit at Palakkad, treated and disposed. Some of the hospitals have installed their own waste disposal facilities more or less observing the methods stipulated under the BMW Rules 1998.

In Kollam district, as revealed in the analysis of health sector, out of 300 hospitals existing, maximum nos. are located in Kollam Corporation (37 nos) followed by Paravur Municipality (25nos.)

It is seen that 58% of the hospitals in Kollam District i.e. 174 hospitals are having high pollution potential. Majority of them are located in Kollam Corporation (30 nos). Numbers of such hospitals are maximum in Kollam Corporation and Anchal Grama Panchayat (7 each) (Figure 21A.8). 126

by hospitals is analysed it is seen that, majority of the hospitals contribute to Bio-medical waste pollution (49%) and water pollution (44%). Contribution to air pollution is only 7% (Fig.21A.10).

1.2.1. Hospital Air Pollution

Air Pollution generated from hospitals is mainly due to functioning of generator sets and incinerators. Out of 18 hospitals creating air pollution, majority are located in Kollam Corporation (5 nos).

1.2.2 Hospital Land/ Water Pollution

Large quantities of water are consumed in health care institutions particularly having inpatient facilities. Sewage, laundry, laboratory, canteen, toilets etc. contribute to water pollution.

Out of 174 hospitals creating Land/ Water pollution majority are located in Kollam Corporation (30 nos) and Paravoor municipality (23 nos).

1.2.3. Treatment Facilities

All hospitals have to provide Effluent treatment facilities (ETP) and Bio Medical treatment facilities.

In case of Effluent treatment facilities, out of 15 hospitals having High Pollution Potential three major hospitals in Kollam Corporation are not having ETP facility.

Only 17% of the hospitals of Kollam District are having proper Bio- Medical Waste Treatment facilities. Either they are having their own disposal facilities or they are registered with IMAGE who is having a common bio medical treatment facility. It is seen that none of the 17 hospitals in Punalur Municipality has Bio-Medical Waste Treatment facilities. Among 15

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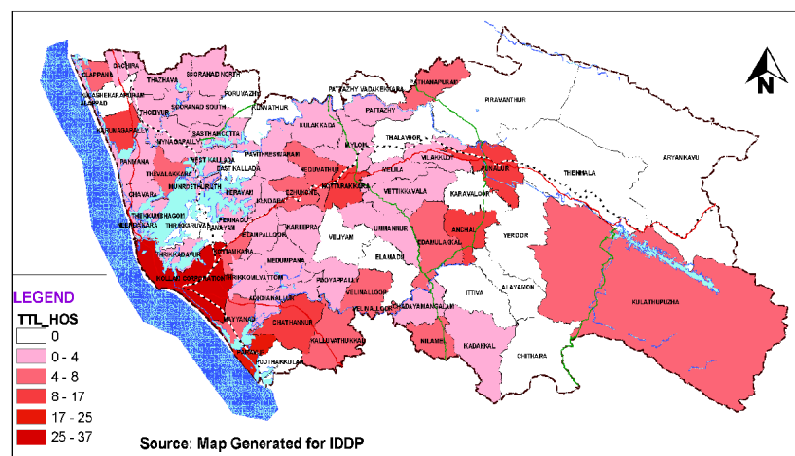


Fig. 21A.8: LSGI wise distribution of hospitals having high pollution potential

hospitals (42%) are having low pollution potential; (Figure. 21.A.9).

When the types of pollution contributed

hospitals in Anchal Grama Panchayat and 14 hospitals in Chathanoor Grama Panchayat only one each have treatment

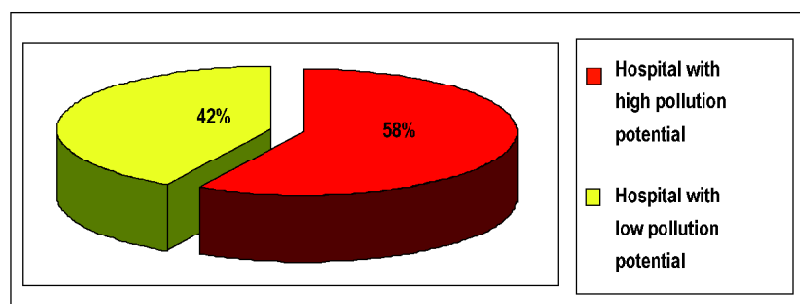


Fig.21A.9: Percentage share of units having high/low pollution potential

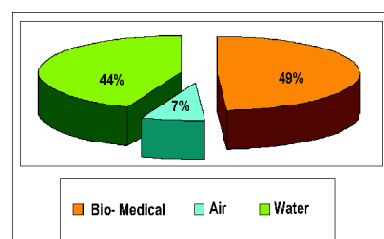


Fig.21A.10: Percentage share of hospitals creating Air/water/land pollution

facility. In Kollam Corporation out of 37 hospitals, only 21 have treatment facilities whereas Paravur Municipality has only 4 hospitals having bio medical treatment facilities. In Paravur Municipality, there are 21 hospitals without proper bio medical waste treatment facility. 17 hospitals in Punalur Municipality are not having the

1. A.A Rahim Memorial Hospital, Kollam
2. Govt Victoria Hospital, Kollam
3. Assissi Atonement Hospital
4. Taluq head quarters Hospital, Karunagapally
5. Taluk Hospital Kottarakkara
6. K.N.S Hospital, Kottarakkara
7. Vijaya Hospital, Kottarakkara
8. Govt Hospital, Punalur

1.3. Municipal Solid Waste Pollution

Solid waste can be defined as material that no longer has any value to the person who is responsible for it, and is not intended to be discharged through a pipe. It does not normally include human excreta. It is generated by domestic, commercial, industrial, healthcare, agricultural and

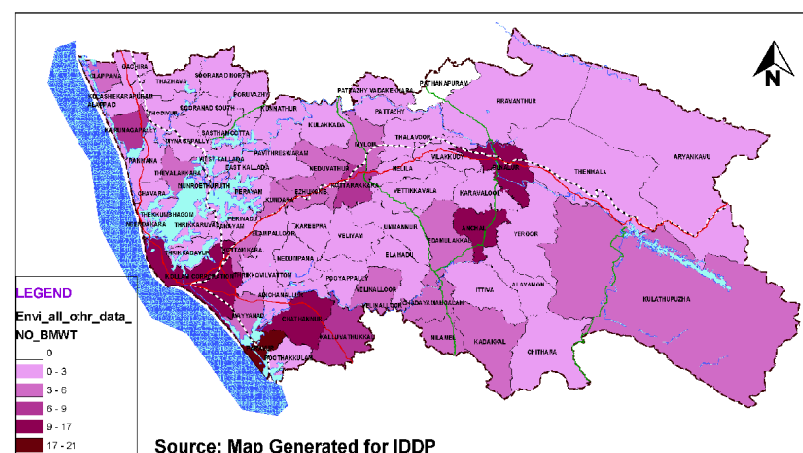


Fig. 21A.11: LSGI wise distribution of hospitals having bio medical treatment facilities (Figure 21A.11).

Pollution Problems created by specific hospitals are identified based on the following criteria.

- i Quantum of waste generated
 - i Facility for treatment of effluent
 - i Facility for systematic disposal of biomedical waste.
 - i Area of land/people/water course affected due to pollution from the unit.
- The identified hospitals are as follows.

mineral extraction activities and accumulates in streets and public places. The words "garbage", "trash", "refuses" and "rubbish" are used to refer to some forms of solid waste.

Salient features of the MSW (M and H) Rules 2000 are as follows.

1. Every LSGI is responsible for any infrastructure development for collection Segregation, Storage, Transportation processing and

disposal of MSW.

2. MSW generated shall be managed by LSGIs in accordance with schedule II of the Rules. The schedule II specifies compliance criteria for the collection, segregation, storage, transportation processing and disposal of MSW.
3. The processing and disposal facilities to be set up by the LSGs on their own or through an operator of a facility shall meet the specifications and standards as specified in Schedule III and IV.
4. Schedule III is the specifications for land fill sites and Schedule IV is the standards for composting, treated leachates and incineration.

In Kollam Corporation 90 tons of solid wastes are generated per day whereas in Mandrothurathu LSGI only 2.5 tons/day is generated as shown in Figure 21A.12. Density wise, maximum generation is in Kollam Corporation. Close behind are Alappad, Kottarakkara and Chavara Grama Panchayats. Higher concentration along coastal belt is observed as shown in Figure 21A.13.

1.3.1 Solid Waste Collection

It is the process of picking up wastes from residences, business premises, or a collection point, loading them into a vehicle, and transporting them to a processing, transfer, or disposal site.

It is seen that out of 100 Collection Centers in the entire district, more number are in Kollam Corporation followed by Karunagapally (20 nos.) and Thenmala (16 nos) Grama Panchayats.

1.3.2 Solid Waste Disposal

The various types of Municipal Solid Waste Disposal are:

- i Solid Waste Landfills - includes municipal solid waste, industrial waste, construction and demolition debris, and bioreactors.
- i Solid Waste Combustion/Incineration - waste volume is reduced in a controlled burning process called combustion or incineration.
- i Solid waste Composting
- i Bio gas generation

In Kollam district, about 64% LSGIs are using crude land fill method for disposing Solid waste. Land and water pollution are usually observed near such land fill sites.

About 21 LSGIs are using open

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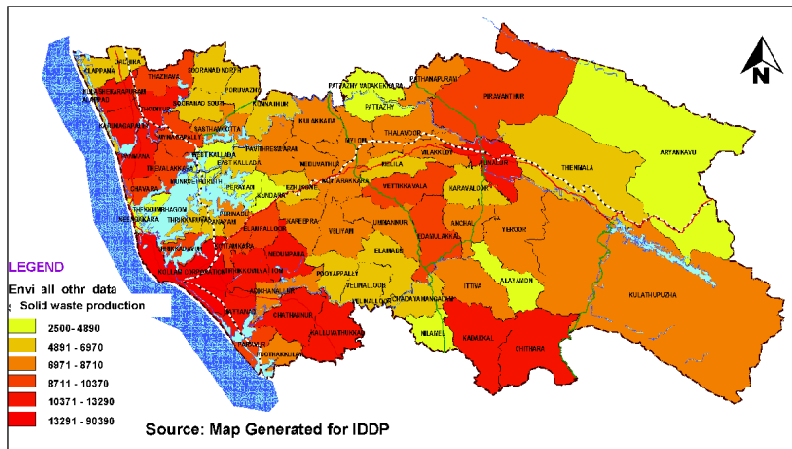


Fig. 21A.12: Production in ton/day of solid wastes in LSGIs

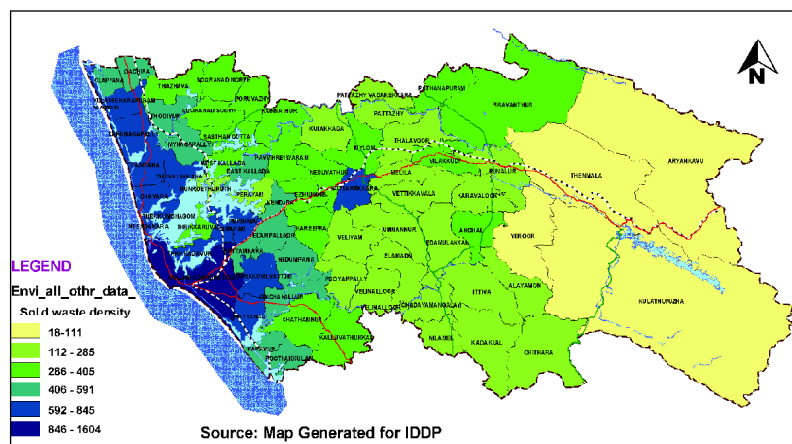


Fig. 21A.13: LSGI wise solid waste density (solid waste generation per sq.km)

burning method for Solid Waste Disposal. Open burning also is not advisable as per the Rules. 46 LSGIs are using land fill method for Solid Waste Disposal. Only 4 LSGIs are using Incinerators for Solid Waste Disposal. However, the incinerators

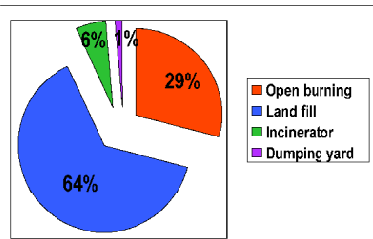


Fig.21A.14: Percentage of disposal method

do not meet standards. Figure 21A.14 shows percentage share of different disposal methods. Only Kollam Corporation is using dumping yard for Solid Waste Disposal.

1.3.3. Slaughter Houses

Slaughter houses are run by some local bodies for providing hygienic meat to the consumers. Though 5 LSGIs are having slaughter houses, none of them

conforms to the standards. Water and land pollution are created at the areas where these slaughter houses are functioning.

1.4. Noise Pollution

Noise pollution (or environmental noise in technical venues) is displeasing human or machine created sound that disrupts the environment. The dominant form of noise pollution is from transportation sources, principally motor vehicles. Kollam Corporation is experiencing exorbitant noise during day and night. A study conducted in 2006, specifically for IDDP project for studying noise pollution in and around Kollam urban area revealed the following.

The noise level measurements were taken at Major Residential Area, Major Commercial Area, Major Industrial Area and Sensitive Area (Educational and Health Institutions). Areas covered were

- Central Area - Kollam Corporation
- Kollam North – Up to Panmana
- Kollam South – Up to Chathanoor

The Standards in respect of Noise levels were taken as per the details in Gazette of India Extraordinary [Part II-

Sec 3 (ii)] given in Appendix 20B - 11.

The sites selected were Thankasseri, Uliyakovil, Shankar nagar and Mundakkal areas.

- i On Sunday day time, noise level of Thankasseri area is much above the limit.
- i On Sunday night time, noise level of Mundakkal and Shankar nagar areas are above the limit
- i On week days during day time, noise level of all residential areas namely Thankasseri, Uliyakovi, Sankar Nagar and Mundakkal are much above the limit
- i On Week days during night time, noise level in all the four residential areas excluding Sankar Nagar are above the limit (Figure 21A.15)

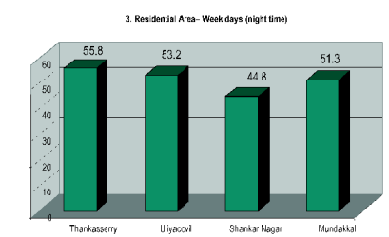


Fig.21A.15: Noise level over residential area

- i On Sunday night time, the noise levels at all the four Commercial areas namely Chinnakkada, Bishop Jerom Nagar, Kadappakkada and Polayathode Jn. are within the limit
- i On Week days day time, noise levels of all the four Commercial areas are much above the limit with Kadappakada topping the list followed by Polayathod (Figure 21A.16).

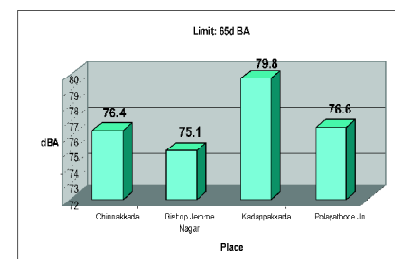


Fig.21A.16: Noise level over commercial area

- i On Week days night time, noise levels of all the four Commercial areas are much above the limit with Polayathod topping the list followed by Kadappakada
- i On Sunday day time, the noise levels of all the three Industrial areas namely

Mundakkal Industrial Development area, KMML and Meenad are within the limit

- i On Sunday night time, noise levels of all the three Industrial areas are within the limit
- i On Week days day time, noise levels of all the three Industrial areas are within the limit
- i On Week days night time, noise levels of also all the three Industrial areas are within the limit
- i On Sunday day time, noise levels of all the four Sensitive areas namely Sankers Hospital, District Hospital, Govt. Boys High School and Fathima Matha National College are much above the limit with highest in Fathima College area.
- i On Week day's day time, noise levels of all the four Sensitive areas is much above the limit with highest in Fathima College area (Figure 21A.17).

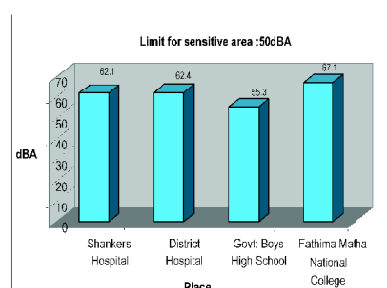


Fig.21A.17: Noise level over sensitive area –limit 50 d BA

- i On Sunday night time, noise levels of all the four Sensitive areas are much above the limit with highest in District Hospital area (Figure 21A.18).

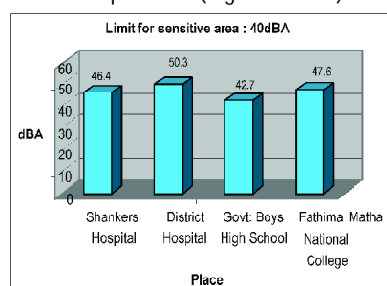


Fig.21A.18: Noise level over sensitive area –limit 40 d BA

- i On Week day's night time, noise levels of all the four Sensitive areas are much above the limit with highest in Fathima College area.

1.5. Water Pollution

There are many causes for water

pollution but two general categories exist: direct and indirect contaminant sources.

Direct sources include effluent outfalls from factories, refineries, waste treatment plants etc. that emit fluids of varying quality directly into urban water supplies. In the United States and other countries, these practices are regulated, although this doesn't mean that pollutants can't be found in these waters.

Indirect sources include contaminants that enter the water supply from soils/groundwater systems and from the atmosphere via rain water. Soils and groundwater contain the residue of human agricultural practices (fertilizers, pesticides, etc.) and improperly disposed of industrial wastes. Atmospheric contaminants are also derived from human practices (such as gaseous emissions from automobiles, factories and even bakeries).

Contaminants can be broadly classified into organic, inorganic, radioactive and acid/base. Examples from each class and their potential sources are too numerous to discuss here.

The effects of water pollution are varied. They include poisonous drinking water, poisonous food animals (due to these organisms having bio accumulated toxins from the environment over their life spans), unbalanced river and lake ecosystems that can no longer support full biological diversity, deforestation from acid rain, and many other effects. These effects are, of course, specific to the various contaminants.

The main rivers flowing through Kollam district are Kallada river, Ithikkara river and Pallickal river. The parameters namely Total Coli-form, Biochemical Oxygen Demand (BOD), Dissolved Oxygen, pH and Chloride are analysed to check the water quality.

Designated Best Use and Water Quality Criteria for various uses is given in Appendix 20B -1.

A study was conducted in 2006 specifically for IDDP project regarding the water quality aspects in rivers of Kollam district. Rivers selected were Kallada, Ithikkara and Pallickal Rivers. The parameters were Dissolved Oxygen, Total coli-form, pH and Chloride. In all the Rivers all the selected parameters were found to be within the limits.

1.6. Traffic Pollution

Traffic-related air pollution remains a

key target for public health action in most of the countries. As mentioned in Article 1.1.1, air pollution is a major aspect to be considered in the district also.

In Kollam Public transport in the district is dominated by road transport with 73% of the total passenger trip per day being covered by bus passenger trips. Majority of these bus passenger trips are by KSRTC buses and the rest by private buses. Most of the KSRTC buses are very old as shown by the inventory of buses at the KSRTC depots in Kollam.

The buses which conform to the *Euro III* emission norms have been acquired within the past 5 years. Almost all of these buses are plying along NH 47, NH 208 and MC road (SH 1) as Super Fast, Fast Passenger, Ananthapuri Fast and 'Venad' Limited Stop Ordinary services. The older buses are operating as local schedules along shorter routes.

Out of about 1000 private buses, about 700 buses are 5 years or less of age and the remaining 300 are older than 5 years. This points to the fact that private buses tend to be in a better condition than KSRTC buses. Another factor worth mentioning is that private buses older than 15 years are not allowed to operate, thereby ensuring that the bus owner is forced to buy a new bus to continue operating in the same route.

The case of trucks and Lorries is more critical. Of the total inter-district goods transportation, 90% is by Multi-axle trucks, Trucks and Lorries. These vehicles are poorly maintained and operate in an overloaded condition more often than not. There is presently no State agency which governs the operations of these vehicles and they operate based on the Permits issued by the Motor Vehicles Department.

Concentration of the polluting buses is higher along NH 47 and goods vehicles along NH 208. Suitable pollution control measures need to be implemented in these routes as also measures to control pollution at their source itself.

1.7. Overall Pollution Status

In the total pollution generated, air pollution is the maximum with 67% in Kollam Corporation. This is also corroborating with the sectoral analysis findings of Health sector (Article 2.2.7) which states that respiratory diseases are having maximum prevalence of 87% in the district (Figure 21A.19).

21A

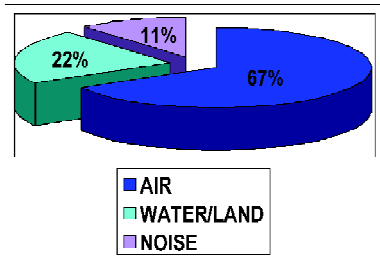


Fig.21A.19: Percentage share of pollution by type

1.8. Status of Wet land

The total wetland area of the country is about 4.1 million hectares. In Kerala state there are 32 natural and 2121 man made wet lands. Conservation of wetlands was initiated in 1987 in India with the objective of assessment of wet land resources, identification of wetlands of national importance, promotion of 'RandD' activities and formulation and implementation of Management Action Plans (MAP) of the identified wetlands. Under National Wetland Conservation Programme the wetlands identified from Kerala are Ashtamudi, Sasthamkotta, Kottuli, Kadalundi and Vembanad Kayal.

State has to prepare action plans for wetland project implementation. Immediate steps should be taken to protect them by changing their legal status to that of a protected category. Participatory methods are to be adopted with the involvement of PRIs, NGOs and local communities in the co management of wetlands.

In Kollam there are two Ramsar sites viz. Ashtamudi kayal and Sasthamcotta Lake. Ashtamudi Lake (Ramsar Site Number1204) was designated as a Ramsar site in November 2002. This is one of the largest wetland in the state and deepest among all the estuaries of Kerala with maximum depth of 6.4 m. at confluence zone.

Ashtamudi Lake has around 43 species of marshy and mangrove associates and include true mangroves. Some are endangered species such as *Syzygium Travencuricum* and *Calamus rotang*, according to the Red Data Book of Indian Plants. The back waters support 57 species of avifauna of which 6 are migratory and have 51 resident species. More than 20000 waterfowls visit the lake annually which supports 97 species of fishes of which 3 are estuarine, 9 estuarine reverie 15 marine-estuarine unique copepod

species.

Sasthamcotta Lake (Ramsar Site Number1212) was designated as Ramsar site in November, 2002. This is the largest freshwater lake in Kerala (373 ha). The lake has a capacity to hold 22390 million litres of water. The water in the lake is special in threat it does not contain common salt or other minerals and metals. Vegetation is very scant, floating and rooted plants are negligible. Insectivorous plant *Drosera Sp* is found in the eastern shore of the lake. It supports 27 species of fresh water fish including Pearl spt and Catfish and 2 genera of prawns. The lake abounds in 21 species of herring and sardines of the family *Cupeidae*. The most common fish in the lake is *Callichrous bimaculture* and

disasters like Tsunami are also great threat to the coastal eco system.

2 Overall Development Trend

The Overall Development Trend is analysed based on the following criteria.

- i Number of red category industries
- i Units without ETP in orange category industries
- i Total units creating air pollution
- i Total units creating land/water pollution
- i Total units creating noise pollution

There is steady increase in Red category Industries and in Orange Category Industries without ETP (Figure 21A.20).

There is steady increase in total units (Industries and Hospitals) creating Air

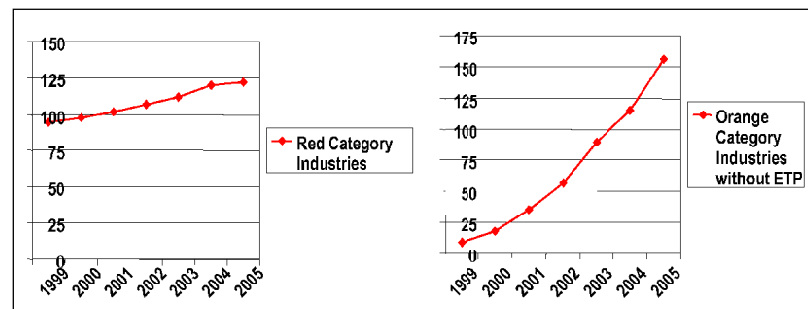


Fig.21A.20: Trend of pollution – Number of Red category industries and number of Orange category industries without efficient treatment plant

Wallagoattu. Bonnet monkeys frequent the banks. Teals are the notable migratory birds.

The Coastal eco-system is also very vulnerable with respect to sea erosion and due to discharge of wastes from industries and hospitals in the coastal area (Article 1.1.2). Further the pollution status analysis in fisheries sector (Article 1.4 of Chapter 15) reveals that the coastal areas in

Pollution and in the number of total units (Industries and Hospitals) creating Noise Pollution. But there is drastic increase in the number of total units (Industries and Hospitals) creating Land/Water Pollution from 2004 to 2005 (Figure 21A.21).

Overall it can be seen that there is steady increase in all the parameters analyzed showing a degradation of the Environmental status with respect to

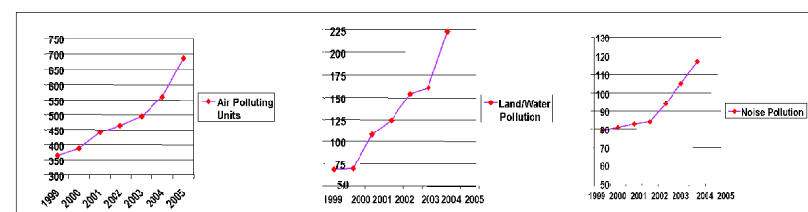


Fig.21A.21: Trend of pollution – Number of industrial units creating air pollution, number of total creating land/water pollution and number of total units creating noise pollution

particular, Kollam Corporation and Neendakara coasts are being constantly polluted by both organic and inorganic wastes from fishing harbour, landing centres, drying units, chitosan plant, processing centres etc. Unpredictable

pollution aspects in the District.

3. Development Issues

3.1. Problems

As far as pollution from Industries is considered, there is increase in the number of Red category industries. Also

there is steady increase in the number of Industries without ETP. This shows the tendency to skip rules and regulation from the part of the industrialists and inadequate implementation due to lack of staff strength and coordination among agencies.

For hospitals also the number of polluting units is increasing steadily. Again shows a tendency to skip rules and regulation from the part of the Hospital establishments.

It is estimated that 645760 Kg/day of Municipal Solid Wastes is generated in the district. Of this very little is properly disposed. Kollam Corporation is also not having proper disposal system

In most of the Residential, Commercial and Sensitive areas, the noise pollution is well above the tolerance limits. This could be due to increase in the number of vehicles on road and improper road geometry.

In the River points where the water quality aspects were checked, the values for the different parameters were within the DBU limits. The picture is a different one in the backwater area close to the urban centres.

The other major sensitive problems in the district are

1. Pollution of Sasthamcotta Lake
2. Pollution of Ashtamudi Lake
3. Air pollution from motor vehicles
4. Air pollution from cashew industries
5. Air pollution from brick manufacturing industries

The biggest fresh water lake of Kerala is getting polluted due to anthropological activities in and around the lake. Discharges from areas like Bharanicavu and Sasthamcotta, open defecation on the banks of the lake, discharges from poor quality latrines, retting of palm leaves in the lake, laundry activities at certain kadavu, use of fertilizers for plantation crops etc. are detrimental to the quality of lake only in the above discharges reach the lake only in the form of surface run off during rain. A study conducted by the Board reveals that the water quality of the lake has not deteriorated at any alarming level. Remedial measures are to be adopted for preventing it from further deterioration. Another issue is the water level depletion of the lake. Sand mining in the nearby areas, Kallada River and the over exhaustive withdrawal of water from the

lake to cater to the needs of Kollam town is the reasons for it.

The Ashtamudi lake is getting polluted due to the discharge of untreated sewage and effluents from hospitals and hotels, discharge of domestic effluents, discharge from slaughter house, municipal solid waste dumping yard, discharge from sea food export units and peeling sheds, coconut husk retting and coir retting, discharge from shrimp farms, discharge from acid mine water from clay mines into Kanjirott Kayal and spreading of oil from fishing boats.

Most of the roads in Kollam town are congested. Similar situation is faced in other major centres like Punalur, Kottarakkara, Kottiyam, Karunagapally etc. i.e. in the Multi Functional Zone. Traffic produces a lot of noise and air pollution. A diesel jeep or truck produces more noise than a petrol car. A very old or badly maintained automobile produces more noise than a new and good conditioned vehicle. An engine running at a less speed is less noisy than one running at higher speeds. As far as the carcinogenic effect of particulate matter emission from vehicles is concerned, a diesel car is equivalent to 24 petrol cars and 84 CNG cars.

Majority of cashew processing factories of Kerala are located in Kollam district, numbering about 700. Most of the units are located in populated areas basically in the Multi Functional Zone. It is a labour oriented industry. The Pollution control Board prescribes no control measures other than to provide specific heights for the stacks. But the thick emission coming out from the roasting plants and borma units has now become intolerable to the public. Presence of phenolic compounds in the emission was identified by the board earlier. A lot of complaints are received on air pollution.

There are more than 150 wire cut brick manufacturing units in Kollam district. In Agro Allied Development Zone, in particular in West Kallada Grama Panchayat itself, the number of units is about 50. During the burning time thick and white smoke emanates from the top portion of kilns. The emission may contain toxic gases like carbon monoxide, fluoride etc. It will spread to the nearby area providing the inhabitants with bronchial problems. Considering the rising a number of air pollution complaints, it is necessary to insist more stringent measures. It is observed

that there is fugitive emission even when chimneys are provided.

3.2. Potentials

Even though there are areas of concern in the district, the public are very much aware of the issues. So there is potential in pollution control by enactment of legislations and enforcement through Pollution Control Board and District administration with people's participation. There is always scope for a better environment in the district which has Forest, Ramser sites, mangroves, hillocks, free flowing rivers and rich tree cover through out the district.

4 Agencies Involved

The major agency involved in control of pollution in the district is the Pollution Control Board. The agencies funded through Dept. of Science and Technology from the Central Ministry of Environment and Forests include, District Administration, Centre for Earth Science Studies, CWRDM and a number of NGOs.

5 Evaluation of Projects and Programmes

Ongoing projects and programmes of all the agencies are conducting studies and research only. Thus, the major issue is that apart from concentrating on conducting studies and research none of the agencies could effectively implement action plans in abating pollution. The implementation which has to be entrusted to LSGIs is not materialized.

6 Conclusion

The sectoral analysis reveal that there are critical areas of concern in the district, including air pollution. The pollution is more or less concentrated in urban areas, in particular the Kollam Corporation area. The Ramser sites are also subjected to environmental degradation. Though number of research works are being conducted by various agencies they need be brought to the field. So the suggestions for providing a better environment in the district shall be location and design specific and shall be implemented through the LSGIs.

The solutions for solving the pollution in the Sasthamcotta lake include providing fencing along the boundaries, providing a hundred meter buffer zone around the lake to avoid influence of any type of anthropological activities like open defecation, crop cultivation, tree plantation, laundry, palm leaf retting, bathing etc.,

providing sewage treatment plants for the nearby towns , prohibiting unauthorized sand mining, at least for the stretch of river from Kannamthottu Kadavu to Cheekkal kadavu and limiting withdrawal of water from the lake scientifically.

In the case of Ashtamudi kayal, measures like providing effluent treatment facilities for hospitals, hotels etc, installation of sewage treatment plant by the Kollam Corporation, providing effluent treatment plant and solid waste disposal system for the slaughter house operated by Kollam Corporation, installation of systematic (as contemplated in the MSW Rules) land fill facility at the MSW dumping yard at Kureepuzha ,issuing clay mining licenses only if the operators maintain facility for the treatment and disposal of acid mine water etc. are needed. Coconut husk retting and coir retting units to be modernized and

brought under licensing by the LSGIs. Coordination among the statutory agencies and licensing authorities to see that only lawful activities are carried out by the concerned is also essential.

Air pollution and noise pollution due to traffic can be abated by various townplanning techniques like construction of barrier walls, allowing single lane traffic, isolated traffic for heavy vehicles, constructing smooth roads etc. For this, the proposals will have to be linked with infrastructure sector.

It is high time that scientific control measures for reducing air pollution from cashew processing units are planned and insisted for implementation. For this all cashew factories operating in Kollam Corporation and three LSGIs namely Thrikkovilvattom, Elampalloor and Kottamkara are included in the programme.

Emission from roasting plant is to be scrubbed with suitable medium in a scrubber and then vented through chimneys of specified height. The same system can be followed in the case of emission from bormas. Since both are carried out as batch processes, utilizing the same scrubber is possible. For existing factories the conventional borma units shall be converted to electric bormas to reduce emission.

To reduce air pollution and alleviate pollution complaints in brick kilns some drastic changes are required to be brought about in the design of kilns. An immediate solution is to provide hood system with chimney of 20 m height and sufficient draught.

Overall the development proposals are to be identified in a long term perspective and implemented based on the above findings analysed spatially.



Chapter 21 B

Mining and Geology

This chapter presents the outcomes of analysis of Mining and Geology sector in the District. The chapter is structured into four parts. The first part contains the existing status, the second part includes overall development trend, the third part includes development issues and finally the fourth part contains the various agencies involved and analysis of ongoing and committed projects.

1. Analysis of Existing Status

1.1 Physical Status

1.1.1 Geological Rock formations

The district geologic provinces shows that the western portion is having Quaternary alluvial deposits followed by the Tertiary sediments and the eastern most part contains Precambrian metamorphic of Charnockite - a Primary Hard Rock, garnet biotite gneiss, garnet biotite sillimanite gneiss, pyroxene granulite, quartzofeldspathic gneiss which are Secondary altered hard rock, Tertiary sediments,

Sandstone etc.

1.1.2 Mineral Resources

The important mineral resources of the district can be classified into major and minor mineral deposits. The major mineral deposits used for industrial purpose include china clay, bauxite, graphite, heavy mineral sand, chrysoberyl, mica, limeshell, limestone and the minor minerals used as building materials include granite building stone, brick clay, ordinary sand and laterite. Except mineral sand and river sand all others are non-renewable resources as shown in Figure 21B.1.

1.1.2.1 China Clay

Kerala is bestowed with good deposits of clay and its reserves of high-grade china clay are the highest among all clay producing states of India. They broadly fall under three categories namely: - residual or primary china clay, sedimentary or secondary china clay, ball clay and tile and brick clay. While residual and

sedimentary china clays are confined to the coastal sedimentary belts of the south and north Kerala, the tile clay occur extensively all over the state. They are used for Manufacturing of paper, Textile items, Pesticide, Ceramic tiles, Medicines (As filler).

The china clay deposits of the Southern Clay Belt (SCB) of the state are confined in Kollam and Thiruvananthapuram districts and the Northern Clay Belt (NCB) confined in Kannur and Kasargod. The SCB is rich in sedimentary china clay and the NCB is rich in residual china clay. While the source of clay in the SCB is Khondalite rocks, it is the Charnockite in the NCB. Both the sedimentary and residual clays of usable varieties are included in the resource calculation. In Thiruvananthapuram and Kollam districts (SCB) preliminary investigation for clay in 825 sq km area showed 21 sq km as promising with over

21B

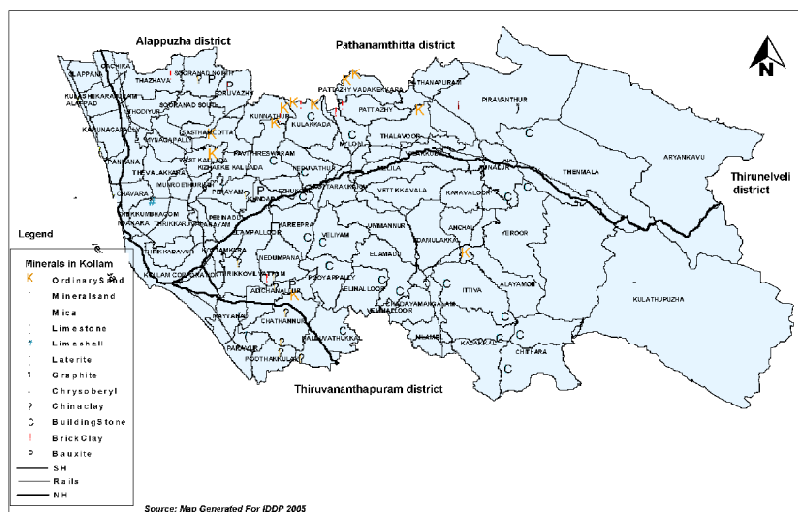


Fig. 21B.1: LSGI wise distribution of minerals in Kollam

1952 million tonnes of clay, distributed in 67 prospective blocks. While in Kannur and Kasaragod districts (NCB) 95 Sq.km was found to be clay bearing with over 935 million tonnes of clay, distributed in 52 prospective blocks. Ernakulam District has a reserve of 7.70 million tones. The cumulative resource potential is over 2964 million tonnes. Out of which the share of Kollam District is 18%. The District stands 3rd in resource potential among the districts (Figure 21B.2) of the State (State average

Thiruvananthapuram districts. They are generally used for the extraction of Aluminium metal.

Bauxites are derived from both crystalline and sedimentary rocks. The ore is found to occur at the surface or within a depth of 4 to 8m. In 2005, the total estimated reserves in the State are 12.81 Million Tonnes. Kollam district has 16% share of Bauxite resources of the State. It stands 2nd in resource potential. The important localities (Figure 21B.4) where fairly good

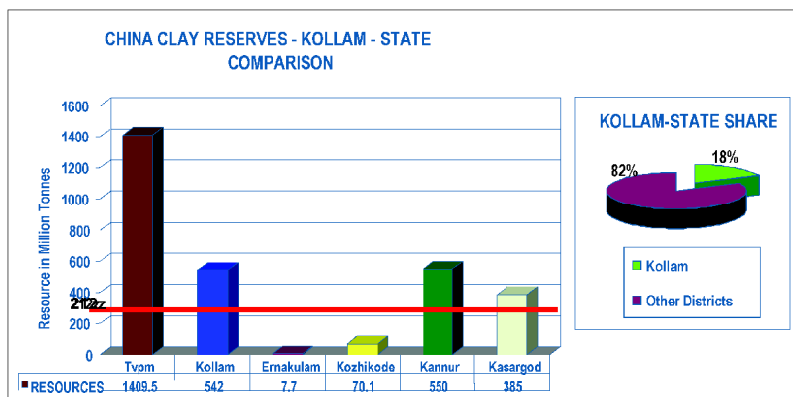


Fig.21B.2: China clay reserves – comparison with surrounding districts

212 million tones). The concentration (Figure 21B.3) of china clay is in Perayam (Mulavana), Chathanoor (Bus stand area) and Nedumpna (Velichikala) Grama Panchayats.

1.1.2.2 Bauxite

In Kerala, traces of bauxite are found in almost all laterite capping between 50m and 200m above the MSL. Fairly large deposits of possible economic significance are present at irregular intervals along the midland of Kerala, especially in parts of Kasaragod, Kannur, Kollam and

bauxite deposits exists are Sooranad - Vadakkemuri, Chittavattom and Adichanelloor with a cumulative area of 0.434km² where the potential bauxite bearing area is only 0.275km² with maximum potential at Sooranad Vadakkemuri (0.204). The grade of bauxite found in the district is low (<40% aluminum content) and is used for manufacturing of Cement.

1.1.2.3 Graphite deposits

Graphite is generally used for making graphite pencil (pencil lead), crucibles etc.

The total estimated reserve of graphite in the State is 2.81 Million Tonnes. Geographically the occurrence can be classified into two belts- Thiruvananthapuram and Kollam (TK) Belt and Thodupuzha-Muvattupuzha-Karimukul (TMK) belt. The graphite mineralization in the southern districts of TK belt is found as flakes in quartzites and gneisses in quartz-vein and migmatitic association. The concentration of Graphite is in Piravanthur at Karuppanthodu area (Figure 21B.5).

1.1.2.4 Mineral Sand

The state of Kerala forms a narrow strip of land at the southwestern portion of the Indian Peninsula. It has got a 560 km long shore line with lateral land expanse of 15-120 km forming a narrow strip between Western Ghats and the Arabian Sea. The southern Kerala has all the favourable geological and geomorphological conditions which have resulted in the formation of economic placer mineral deposits. These are used as Strategic mineral in nuclear reactors and also used for the manufacturing of paints and pigments.

The total heavy mineral reserves of Kerala are of the order of 163 million tones

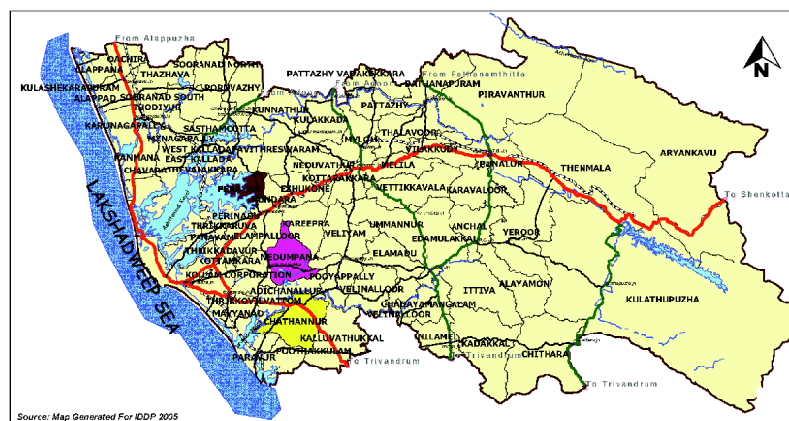


Fig. 21B.3: LSGI wise distribution of china clay in Kollam district

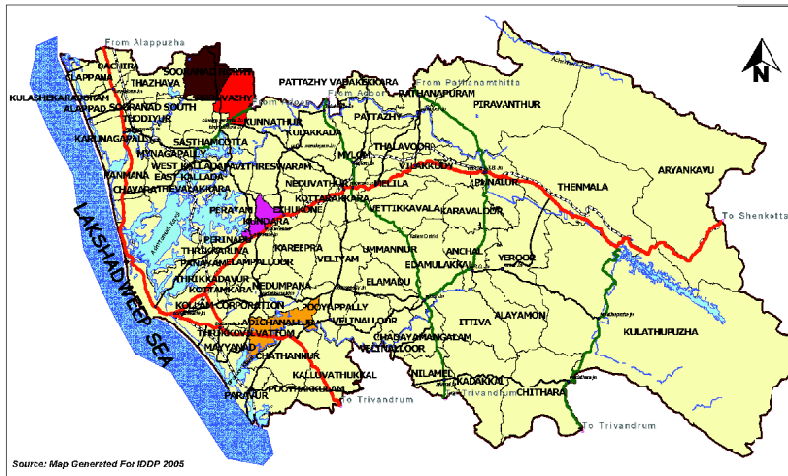


Fig. 21B.4: LSGI wise distribution of Bauxite in Kollam district



Fig. 21B.5: LSGI wise distribution of Graphite deposits in Kollam district

with ilmenite as a major constituent at 103 metres. The total estimated reserves of mineral sand in the State are 144 Million Tonnes.

The present strand line deposits are characterized by high concentration of heavy minerals up to 90% as in the case of Chavara barrier beach. On the basis of constituent mineralogy, the Kerala deposits can be classified into (a) ilmenite sillimanite province and (b) Pyribole-ilmenite province.

Chavara a major deposit of the ilmenite-sillimanite province and has three components – Chavara barrier beach, Eastern Extension I and Eastern Extension II. The Chavara barrier beach is one of the richest ilmenite deposits of the world accounting for total heavy mineral reserves of 18.49mt of 49.08% grade; predominantly of ilmenite – 13.15mt at 34.97% grade followed by sillimanite – 2.44mt at 6.48% grade. The total heavy mineral reserves of Chavara deposit including extensions, stand at 127.09mt of which ilmenite is

79.45mt. Such extensive reserves put 'Chavara' as one of the largest and richest deposits of the world. The northern contiguities of Chavara up to Ambalapuzha are also rich in ilmenite. The region to the north of Periyar river mouth (Azhikode) to Kasargod is essentially a pyroxene-amphibole dominant province with ilmenite. Other than Chavara, concentration of



Fig. 21B.6: LSGI wise distribution of Mineral sands in Kollam district

mineral is at Allappadu, Chavara, Neendakara and Panmana Grama Panchayats (Figure 21B.6).

1.1.2.5 Chrysoberyl

Chrysoberyl is a gem stone. Though the exploration and exploitation of the gemstones are not in approved agenda of any organized sector or initiative, fiscal hegemony of the precious stones in state cannot be ignored. There are three different geological settings in which gemstones occur a) the pegmatites traversing the crystalline rocks b) the older gravels which are often consolidated and lateritised c) with gravels in the river channels of the present day. These geological settings have fairly extensive geographical distribution in Thiruvananthapuram and southern parts of Kollam districts. The primary source of gem stones is pegmatite. The extend of chrysoberyl pegmatite stretches intermittently in the SSE direction from near Kottarakkara for more than 55 km to Parassala and further, into Tamil Nadu, with a width of about 35 km, extending from near the coast to the upper slopes of the Western Ghats.

Presently river gravels are intensively worked for gemstones in the Kulathuputha, Kalli-Vamanapurn-Attingal, Killi, and Neyyar rivers (Figure 21B.7). The available information on the occurrence of gemstones in southern Kerala points to the preponderance of chrysoberyl over other species of gemstones.

Most of the greenish shades of chrysoberyl show light colour changes to brownish shades and locally would be termed 5 per cent to 10 per cent alexandrite. These stones occur in pegmatites at Bonaccord, ooruttambalam,



Fig. 21B.7: LSGI wise distribution of Chryso beryl in Kollam district

Changa and other places. Stones with a more intense colour change are obtained from the ancient gravels and also from the recent river gravels at Kulathupuzha in Kollam district. They are used as Gem stone. Concentration of Chrysoberyl in Kollam district is in Kulathupuzha (River channels).

1.1.2.6 Mica

Mica is used as insulating material for electric and domestic purposes. Good quality mica of medium size has been extracted from Punalur mica mine located in Shalikara R.F. hill in Piravanthur at about 10-12 km north-east of Punalur town (Figure 21B.8). The mica occurs at the contact of pegmatites with calc-gneisses and dunite.

1.1.2.7 Lime Shell

The state is deficient in high grade limestone. Consequently the requirement of the lime for chemical industry is dependent on the lime shell resources occurring in the backwaters/estuaries, river mouths and lagoons along the coastal tract. By far the largest reserves are known to occur in Vembanad Lake. In Kollam district small scale lime shell deposits occurs in Ashtamudi Kayal and other backwaters, used for the manufacture of white cement, quick lime, hydrated lime, calcium carbide, soda ash and bleaching powder. In 2005, the total estimated reserve in the State is 4.05 Million Tonnes. The concentration of Lime Shell is in and around Ashtamudi kayal including Munroethuruth, Perayam and Thrikkaruva (Figure 21B.9).

1.1.2.8 Lime Stone

Kerala state is having lime stones of crystalline, kankar and fossiliferous varieties. The state is deficient in high grade limestone. Fossiliferous limestone is

known to occur in various parts of Kollam district such as Mayyanad, Nedungolam and Pozhikkara.

Limestone is used in cement manufacturing. In 2005, the total estimated reserve in the State is 24 Million Tonnes.



Fig. 21B.8: LSGI wise distribution of Mica in Kollam district

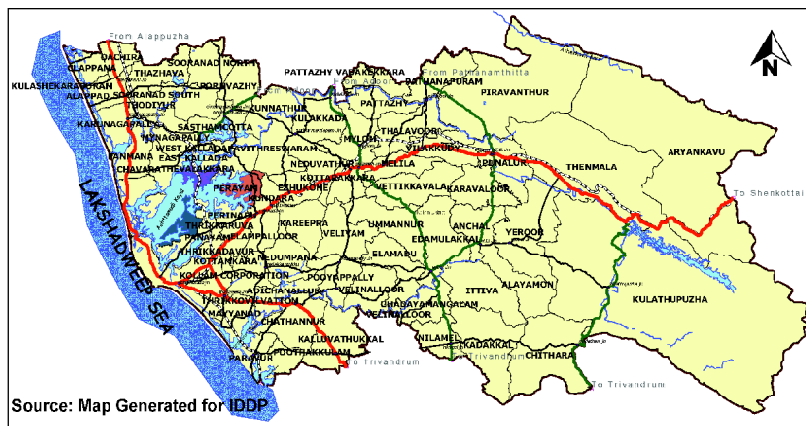


Fig. 21B.9: LSGI wise distribution of Lime shell in Kollam district

The concentration of Lime Stone is in Perayam (Padappakara), Paravur (Nedumgolam) and Mayyanadu in and around the Lakes (Figure 21B.10).

1.1.2.9 Granite Building Stone

Precambrian metamorphic of

Charnockite, garnet biotite gneiss, garnet biotite sillimanite gneiss, pyroxene granulite, quartzo feldspathic gneiss, etc contribute to the granite building stones. They are used as building material. The concentration of Granite building stones is in the mid, mid up and high land (Figure 21B.11) areas.

1.1.2.10 Brick Clay

Tile and brick clays are classified as minor minerals. Tile manufacturing units in the district are concentrated at Chathannur. The main reason for this localization is the availability of suitable quality clays for tile industry at these places. The topsoil comprising of clay from paddy fields is removed to the maximum depth possible for extraction. Because of the continued and excessive removal of clay for making tiles, mostly from paddy fields, makes the paddy fields fallow lands,

unsuitable for any agricultural purposes due to the loss of soil cover or water logging consequent to unrestrained digging operations.

Generally concentration of Brick clay is found in valley and river flood areas



Fig. 21B.10: LSGI wise distribution of Lime stone in Kollam district

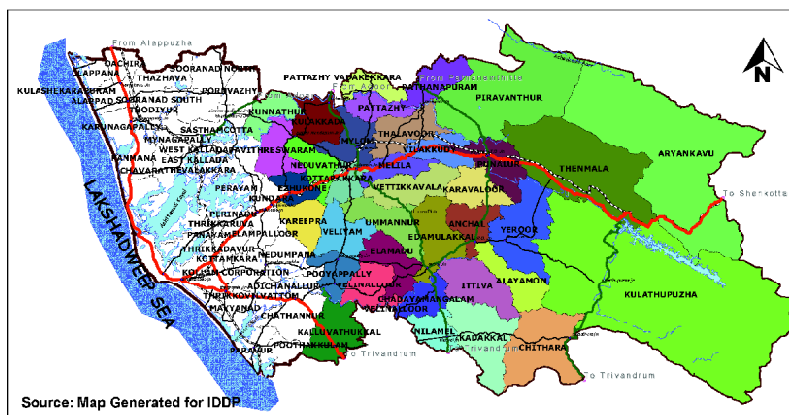


Fig. 21B.11: LSGI wise distribution of Granite building stone in Kollam district

(Figure 21B.12).

1.1.2.11 Ordinary Sand

Quaternary alluvial deposits of rivers and flood plains are the sources of ordinary sand. This deposit is used as building material.

The concentration of ordinary sand follows the river courses with more concentration in the up stream of river beds. Palaeo channel deposits are concentrated at Adichanallur, Chathannur, Kunnathur and Kulakkada areas (Figure 21B.13).

1.1.2.12 Laterite

Laterite is the weathering product in tertiary sediment category and is used as building material. The concentration of laterite is in the mid land area (Figure 21B.14).

1.2 Economic Status

The share of mining sector in the total revenue generated by the primary sector during 2004-05 is about 1% for both the district and state. Heavy minerals including ilmenite, rutile, zircon, sillimanite etc. constitute 74% of the revenue generated in the District (Figure 21B.15). The revenue is generated as royalty collected

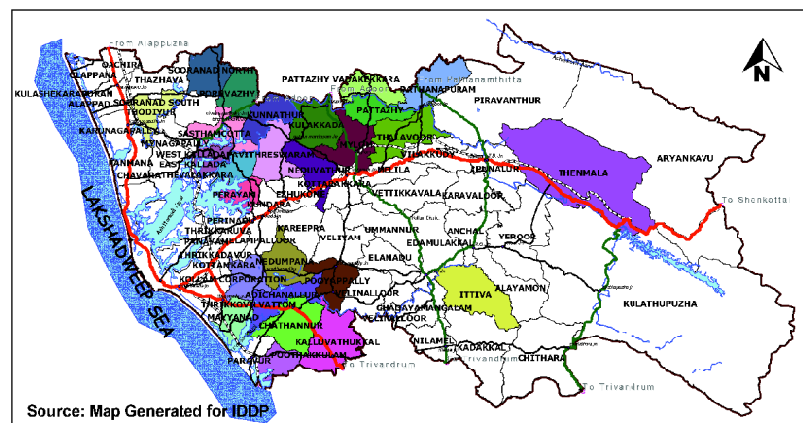


Fig. 21B.12: LSGI wise distribution of Brick clay in Kollam district

for issue of permits for quarrying various mineral deposits.

1.2.1 Royalty

Royalty collected for the mining of mineral deposit plays an important role in the revenue generation from mining sector of the district. The total royalty collected for heavy metals during 2004-05 is Rs.1, 65,58,560/- of which maximum royalty is collected from Chavara and is about Rs.10040980/- followed by Panmana (Rs.6517580/-). The total

royalty collected for china clay during 2004-05 is Rs.12, 36,190/- with maximum royalty collection from Perayam Grama Panchayat (Rs.9, 07,090/-).

The total royalty collected for granite mining during 2004-05 is Rs. 17,54,400/- with maximum from Veliyam Grama Panchayat which comes to about Rs.2,61,000/-. For bauxite total royalty collected during 2004-05 is Rs. 6,20,300/- of which maximum is from Poruvazhy Grama panchayat (about Rs.3,52,800/-) followed by Sooranad North (about Rs.267500/-). Royalty collected during 2004-05 for brick clay is Rs. 5,92,500/- of which maximum is from Kulakkada (about Rs.1,70,000/-).

Maximum royalty collected for laterite is from Chathanoor Grama Panchayat (Rs.64,000/-) whereas maximum royalty collected for ordinary sand is about Rs.3, 40,000/- from Kunnathur Grama Panchayat. The total amount of royalty collected for laterite and ordinary sand during 2004-05 is Rs. 1, 53,600/- and Rs. 11,30,000/- respectively.

2. Overall Development Trend

With respect to revenue generated, there is a decreasing trend from the

previous year for heavy minerals and for Bauxite. This could be due to the agitations against mining activities. However there is an increasing trend from the previous year for Brick clay, laterite and granite.

Mining and Geology Dept. could increase revenue from ordinary sand whereas revenue from LSGIs shows drastically declining trend.

The total revenue generated is showing an increasing trend (Figure 21B.16). However, this is due to increasing

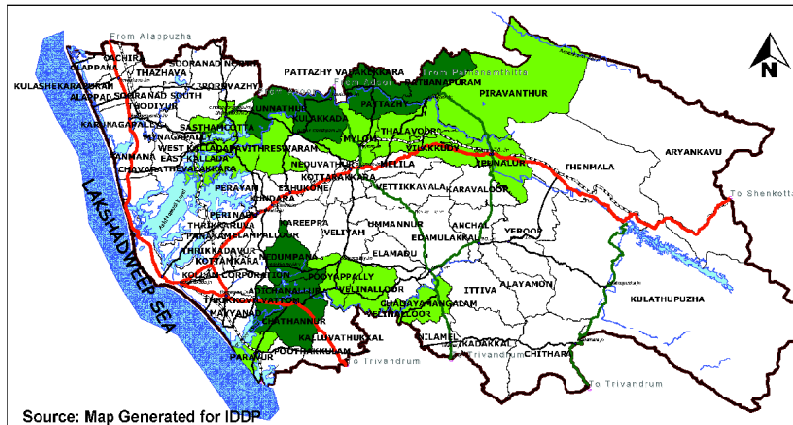


Fig. 21B.13: LSGI wise distribution of ordinary sand in Kollam district

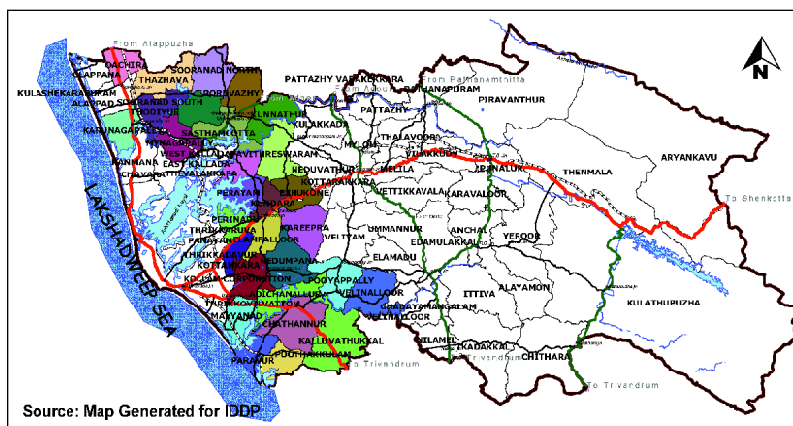


Fig. 21B.14: LSGI wise distribution of laterite in Kollam district

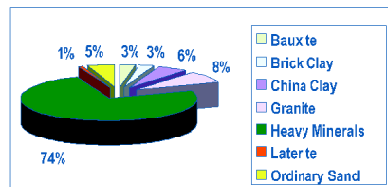


Fig.21B.15: Mineral wise revenue – 2004-05

revenue generated from compounding of offences while the revenue generated from mineral extraction is showing a declining trend (Figure 21B.17). This was substantiated by the increase in number of permits for mineral extraction, year after year, which in turn increases the royalty for minerals collected. Legalizing with quarrying permits has reduced the illicit

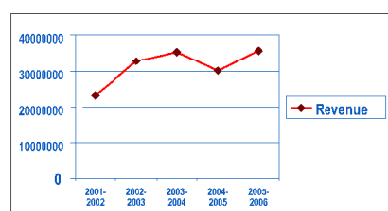


Fig.21B.16: Trend of total revenue generated

extraction. Moreover frequent checking increases the revenue through compounding the offenses of unauthorized transportation.

3. Development issues

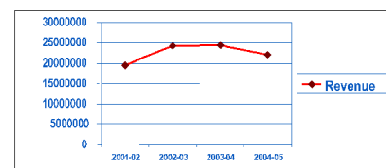


Fig.21B.17: Trend of revenue generated from mineral extraction

3.1 Problems

The China clay in Kollam District is inferior to that in the neighboring district of Thiruvananthapuram. The deposit of Kollam is having more iron content and thus it requires bleaching. Among the deposits the chances of further extraction from Chathannur is remote as approximately 70% of the mineral has already been extracted and the remaining falls in the settlement areas. Presently there are only two major industries extracting China clay (Kerala Ceramics Ltd., Kundara

extracting from the deposits in Perayam Grama Panchayat and Wolkem Clays Pvt. Ltd., Velichikkala extracting from the deposits in Nedumpana). Both these companies are facing extraction problems due to human settlements.

Bauxite deposits of Kollam at Poruvazhy and Sooranada area are of very low grade compared to the deposits of Kannur and Kasargode. This bauxite deposit is of aluminous laterite type. Major part of the deposits is in the settlement areas.

The heavy mineral deposits of Kollam, one of the richest deposits of its kind in the world, is found occurring in a highly populated coastal area creating constraints in extraction. Here the land holdings are private and the building construction activities are continuing unabated. Thus the world class deposits are getting submerged under the dwelling places. Presently only two public sector enterprises, IRE and KMML are functioning here, of which KMML is making value addition by producing TiO₂ pigment where as IRE is carrying out mineral separation and exporting.

Chrysoberyl usually associated with pegmatite veins in rocks and is present in Kollam District in Tertiary gravels along the river course in Kulathupuzha area. As the concentration of the deposit is feeble, the extraction of this is economically less viable.

Mica deposits of Kollam at Punalur mica mine was exploited intermittently from 1910 onwards. The mining operations were suspended due to slump in mica market and increased cost of pumping to keep the mine dewatered. Presently extraction is not feasible.

Graphite in Kollam occurs as dissemination and coarse flakes in the weathered rocks in Piravanthur area. Graphite content is very less (<15%) and not economically viable.

Shell limestone of Tertiary age is exposed at Padappakkara and Paravur area in the vicinity of lakes as detached and isolated deposits. Recovery of shell is very low and hence economically not viable (1-1.5 m thick).

Lime shell in Kollam occurs in Ashtamudi kayal. The extraction of this deposit will badly affect the natural fauna and flora.

Ordinary sand deposits seen usually associated with flood plains of rivers,

channels and palaeo (old) river courses are seen only in some pockets of the district. Demand for the mineral is high due to peak construction rate, which leads to greater gravity of extraction inviting environmental problems. Similarly, the deposition rate of sand in the rivers is less compared to the extraction rate, leading to deepening of river basin.

3.2. Potentials

Heavy Mineral sand deposit from Neendakara to Kayamkulam bar (22 km length, width nearly 225 m) is one of the best reserves of heavy minerals in the world, because of its high TiO₂ content (60%) in the mineral ilmenite.

China clay has ample scope for reserves i.e. the existing quantum of China clay in the district is sufficient for the smooth functioning of the existing Clay industries at least for another decade with the present status of extraction. The China clay has potential for value addition to products like ceramic plates, tiles, filler in medicines, paper industries, Rubber industry etc.

Bauxite deposit of Kollam can be used for cement manufacturing. As the mineral is enriched in the top layers, the extraction limits to a depth of 5 m. with less environmental concerns.

Granite building stone presently used as building stone in constructions can be given value addition by producing flooring tiles.

Laterite extraction needs no blasting and hence less environmental impacts are recorded and hence can be promoted as building material.

The shortage of sand from the rivers, to a certain extent, is met with the palaeo channel ordinary sand deposits in the district. The potential areas in the district are at Puthur, Kulakkada, Kunnathur and Chathannur.

4. Agencies Involved

The various agencies involved in the mining sector are shown in Figure 21B.18.

At the national level the Geological Survey of India conducts detailed survey for the exploration of Minerals in the country. The Indian Bureau of Mines (IBM) conducts Evaluation of Mines and their safety aspects.

In the State, the Department of Mining and Geology does the exploring and gives sanction to private agencies for mineral extraction. The Department has two divisions viz. Exploration Division for the prospecting of minerals and District offices in implementation of Acts and Rules for the regulation and development for the extraction of minerals. Dept. of Industries also sanctions long term quarrying leases for various minerals which are implemented through the Dept. of Mining and Geology.

The major autonomous body in this sector is Centre for Earth Science Studies (CESS), a research Organization related to earth science studies under Kerala State Council for Science and Technology with funds from Central/ State Governments and other agencies.

The Public Sector Agencies for mineral extraction in Kollam are:

(i) Indian Rare Earths Ltd., Chavara which does mineral separation of various Heavy Minerals from the raw beach sand and exporting of the same

(ii) Kerala Minerals and Metals, Chavara which does mineral separation of various Heavy Minerals from the raw beach sand and production of Titanium Dioxide pigment

(iii) Kerala Ceramics, Kundara which is involved in the Extraction and Beneficiation of China Clay and

(iv) Wolkem Clays Pvt. Ltd., Velichikala, Nedumpana which is involved in the

Extraction and Beneficiation of China Clay.

5 Evaluation of Ongoing And Committed Projects and Programs

5.1 Ongoing projects

Detailed investigation for China Clay in Mulavana and Kundara areas to identify the economically potential areas and their reserve estimation is a major on going project. Almost 60% of the work of investigation has been completed. Mapping of rock quarries in the District with emphasis on present status of the quarries with respect to density and potential for further extraction is another project. Quarry mapping has reached almost half way limit.

5.2 Evaluation of projects

The Evaluation of the projects reveals that the major problem for mineral extraction is the concentration of human settlements. Presently there are no projects to solve this issue. Reserve estimation and identification of potential area for further extraction of all minerals are not taken up.

6 Conclusion

In the Mining sector, there is immense potential for extraction of strategic minerals which can be the major thrust for the economic development of the district. Value addition for various heavy minerals and up gradation of existing technologies is also possible. So, top priority has to be given for this. There is also scope for China Clay. The identified potential areas at Perayam (Mulavana), Chathanoor (Bus stand area) and Nedumpana (Velichikala) can be specifically earmarked for extraction of China clay and settlement restrictions are to be imparted. Also the value addition measures in Kerala Ceramics Ltd. has to be revived using modern technology. Further, new SSI units can be developed for value addition. In the case of Bauxite after the extraction of minerals fully, the area can be used for plantations like rubber, cashew etc. The abandoned laterite quarries shall be used as ponds for ground water recharge from surface run off. In case of Granite the present royalty for building stone is Rs.32/m³ and that of dimension stone is Rs.4000/m³. Rocks discarded for the dimension stone units can be used for tile industry, for which lowering of royalty is required. For Ordinary sand, the alternatives like M-sand may be promoted and the budgeting of existing sediments in the dams of Kollam may be implemented

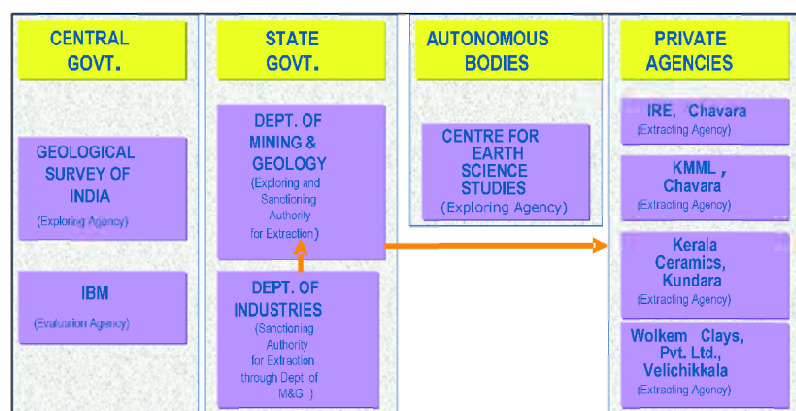


Fig.21B.18: Agencies involved in the mining sector



Chapter 22

Education

This chapter analyses the existing status and development issues of Education sector in the District. The chapter is structured into two parts. The first part contains the analysis of the existing status of the sector and second part probes into the development issues pertaining to the sector.

1. Analysis of Existing Status

Analysis of existing status of education sector includes the general education status of the district and the present status of different streams of education.

1.1. General Education Status of the District

1.1.1 Level of Education

The level of education can be assessed by analyzing the literacy rate, enrolment rate and drop out rate. Kerala stands first (90.9%) among all the states of the Country with respect to literacy rate. Literacy rate in Kollam District is 90.49% and the district stands in the 8th position

when compared to other districts. Also average gross enrolment rate of the district is 91.49% which is much higher than that of India (82.35% only). Even the gross enrolment ratio of the district is higher than that of the state (90.16%). In the case of drop out rate, the district is having only 0.40 % dropout rate against a drop out rate of 1.36% (2002) in Kerala which being the lowest among other states. The occurrence of dropout is related to many factors. Basically it is a social factor. The pupils from the poor families are the main dropout cases. This is because such pupils have other responsibilities at home. They would be forced to get any kind of employment at the earliest, even before completing the studies. Figure 22.1 shows number of educational institutions per 1 lakh population.

Again, there are students who are poor in studies. These pupils would also try to end studies if proper care is not given

to them by the teachers.

There is a special case of dropout in Government and aided schools with poor academic standards. After enrolling to such schools these pupils are taken away by unaided schools in the same locality offering much concession like free conveyance, fee concessions, bags, umbrellas etc.

Based on these indicators of education, it can be assessed that the level of education is high in Kollam District.

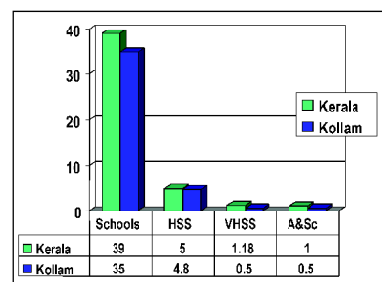


Fig.22.1: Number of Educational institutions per 1 lakh population

However when the number of educational institutions per one lakh population in the district is compared to that of State, it is seen that higher education facilities are less in Kollam District.

1.1.2 Educational Status

Out of the total 90.49 % of literate people in the district, majority of them (60%) have acquired pre-degree and the percentage of those who acquired only primary level education is 9% (Figure 22.2).

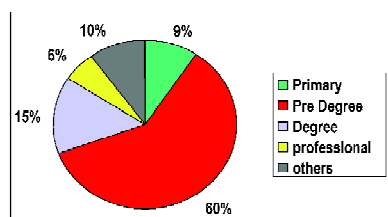


Fig.22.2: Level of education – percent age qualification of literates by type

Degree holders constitute 15% and professional degree holders constitute 6% share among the literate.

While analyzing the LSGI wise educational status, it is found that concentration of people possessing graduate degree seen in the mid land region (Figure 22.3).

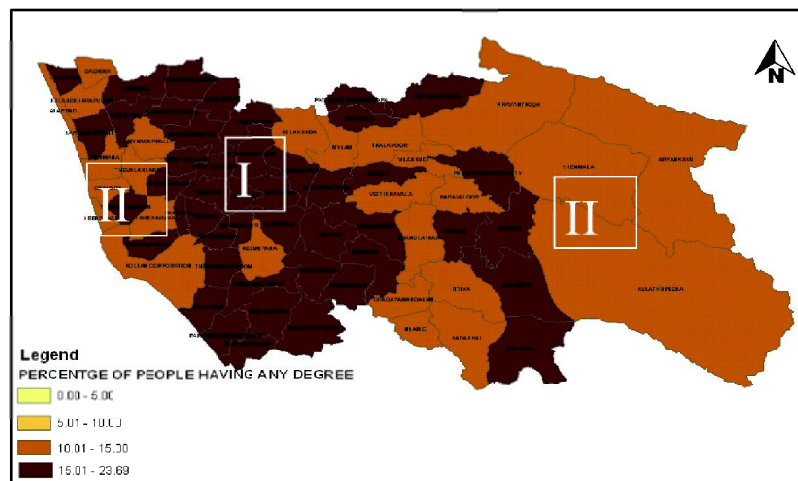


Fig 22.3: LSGI wise distribution of percentage of people with degree

1.2. Status of Streams of Education

Kollam district has a well established educational stream from Pre-Primary level to College level. The various streams of education in the district include the following

1. School Education
2. Vocational Higher Secondary Education
3. Arts and Science Colleges
4. Professional Education

- 1. B Ed Centres
- 2. TTIs
- 3. Ayurveda college
- 4. Dental college
- 5. Nursing college
- 6. Technical Education
 - 1. Technical High school
 - 2. ITI, ITC
 - 3. Poly technique
 - 4. Engineering Colleges

The present status of the above streams of education with respect to the number of schools, number of students, ownership details etc are explained below.

1.2.1. School Education

Present strength of schools and students

The total number of aided schools in the district consisting of primary (L.P) schools, upper primary (U.P) schools High (H.S) schools and higher secondary (H.S.S) schools is 1043 (Table 22.1).

In addition to the aided schools there are 19 CBSE, 10 ICSE and 1 Jawahar

is crucial problem. Lack of transportation and accommodation in many areas of Punalur adversely affect the progress of the students. The facilities of the schools at Kulathupuzha are to be improved urgently. Similarly, more attention is to be given for the schools at Piravanthur, Thenmala, Aryancavu etc. The Eastern part of Punalur-Aryancavu, Kulathupuzha, Yeroor, Alayamon, Ittiva, Karavalur- does not have any Higher Secondary Schools. Therefore, an urgent study on the conditions of the students of these areas is demanded.

The total number of students in all aided schools in the district during 2006-07 academic year is 338552. The total number of students in primary level is 1,26,672 which reduces to 95,641 in higher secondary school level. In the year 2005-06 there were 3,47,122 students (Figure 22.6). This reveals that 8,750 students are less this year new admission.

During the year 2005-06, 28,766

Table.22.1: Number of schools by type

	High Schools	UP School	LP school	HS+UP+LP	HSS
No of schools	218	216	485	919	124

students were admitted in Standard I (Figure 22.7). But in 2006-2007 it is only 27,288. There is the reduction of 1,478 students at Primary level. This reveals that 30 divisions are reduced in Primary Section. Therefore 30 teachers at Primary level lost their jobs in the academic year. This loss will be continued during the next ten years. While analyzing the number of girls and boys enrolled in LP schools to High school level it is found that about 49.32% of students enrolled are girls indicating that there is no gender disparity in enrolment. Even though the number of students enrolled in unaided schools in the year 2005 remained the same in 2006, there is a slight reduction in the number of students in Aided schools and considerable reduction of students in government schools. If this condition is continued in the coming years, the unaided sector will supercede the Government and Aided sectors.

Ownership of Schools

While analyzing the ownership of schools in the district it is found that Aided Sector has domination up to High school

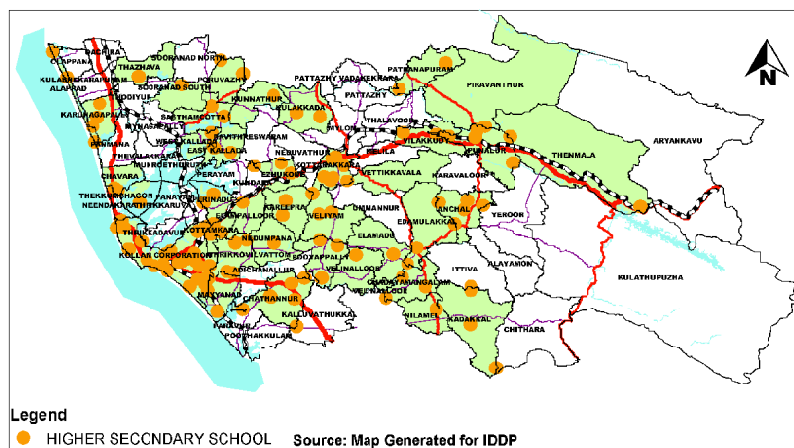


Fig.22.4: LSGI wise distribution of Higher Secondary Schools

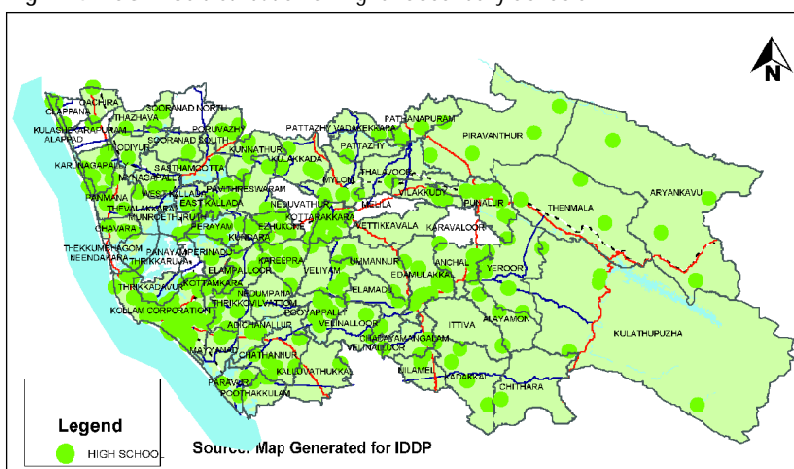


Fig.22.5: LSGI wise distribution of High Schools

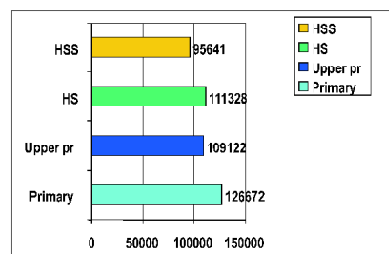


Fig.22.6: Number of students admitted to schools by type

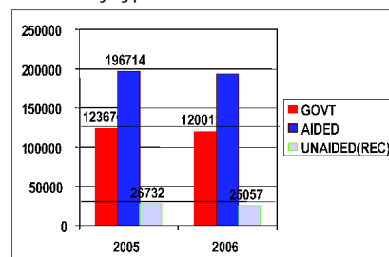


Fig.22.7: Number of students in 2005-06 in schools by type level education.

The unaided sector plays about 6% to 7% role at LP, UP and High School levels. But at H.S.S. Level its role is doubled (15%). This reveals that the unaided sector tries to establish more Educational

Institutions with the motive of monitory profits.

At High School level there are only 35% Government schools but at H.S.S. Level this has increased to 46% (Figure 22.8). This

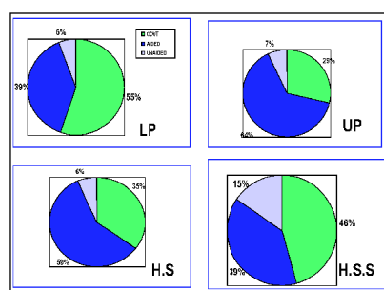


Fig.22.8: Ownership of schools in the District

is a positive sign at H.S.S level. However the dominance of unaided institutions at this level too may affect the education system prevailing at this level. Therefore deliberate attempts to consider this aspect also may be looked upon while framing Govt. policies.

1.2.2. Vocational Higher Secondary Education

Total number of Vocational Higher Secondary Schools in the District is 52

consisting of 34 Aided schools (70%) and 18 Government schools (30%) accommodating 7898 students. It is seen that the pupils, who prefer Vocational Higher Secondary Education are generally from economically backward families. Many of the students of economically backward families in the district are not able to get admission even in the Aided Schools. Therefore, more V.H.S.E schools are to be started by the Government.

1.2.3. Arts and Science Colleges

The total number of Arts and Science Colleges in the district is 13 of which 3 colleges are in Kollam Corporation. The details such as location, courses offered, number of students etc of the Arts and Science colleges in the district is given in Table 22.2. From the Table it is clear that colleges offering Post-graduate courses are very less in Kollam district. Only 3 colleges, all located in Kollam Corporation, offer PG courses.

The scarcity is to be considered and solved soon. There is only one Government college in Kollam district which is at Chavara.

From the spatial distribution map (Figure 22.9) it is seen that the Arts and Science colleges are concentrated in the low land and mid land areas of the district. Therefore, more Government Colleges are to be started at the eastern parts of the district.

1.2.4. Professional Education

(i) B.Ed colleges/ Centres

There are six B.Ed colleges in the district including two aided colleges and four unaided colleges. Aided colleges are Karmala rani training college at Kollam and Mount tabo training college at Pathanapuram. The four Unaided B.Ed colleges are:-

- 1 BEd college, Valakom
- 1 BEd college, Vendar
- 1 BEd college, Pallimukku
- 1 BEd college, Mylapoor

In addition to the above B.Ed colleges there are two B.Ed centers in the district; one is at Anchal and the other at Kulakkada Grama Panchayat (Figure 22.10).

(ii) Teachers Training Institutes

The total number of Technical Training Institutes in the district including Aided (6 numbers), Unaided (19 nos) and Government (2 nos) is 27 as shown in

Table.22.2: List of arts and science colleges in Kollam

SI No	Name of the College	Panchayat	Courses	No of Students
1	Fathima Matha National College, Kollam	Kollam corporation	Graduation	2449
			Post graduation	348
2	T.K.M College of Arts & Science, Kollam-8	Kottamkara	Post graduation	1756
3	NSS College, Nilamel	Nilamel		1314
4	St Johns College, Anchal	Anchal		1223
5	Sree Narayana College, Kollam	Kollam Corporation	Graduation and Post Graduation	3168
6	S N College, punalur	Punalur Municipality		901
7	D.B College, Sasthamkottah	Sasthamkottah		2629
8	St.Gregorious College, Kottarakkara	Kottarakkara		1161
9	St.Stephens College, Pathanapuram	Pathanapuram		1098
10	N.S.S College ,Kottiyam	Adichanalloor		671
11	S.N College for Women, Kollam	Kollam Corporation		3170
12	Govt College, Chavara	Chavara		444
13	S.N College, Chathannoor	Chathannoor		451

too in the unaided sector. The total number of students in this college is 72.

(V) Nursing Colleges

There are five nursing colleges in Kollam. All of them are in the unaided sector. Four of them are in Kollam Corporation and the remaining one is in Anchal Grama Panchayat in the eastern part of the district. The total number of students in all these Nursing colleges is less considering the future demand of employment in nursing field, it would be better to increase the number of Nursing Colleges in the district.

The spatial distribution of all the professional institutions is shown in Figure 22.11. From the figure it is clear that there is no Medical College in Kollam District. It is to be considered urgently.

1.2.5. Technical Education

In the technical stream of education, there are 9 engineering colleges, 4 Polytechnics and 37 I.T.I / I.T.C in the District.

The Engineering colleges are:-

1. Amrutha Institute of Technology & Science, Vallikavu, Karunagapally
2. Baselious Mathew II College of Engineering, Sasthamcotta
3. College of Engineering, Karunagappally
4. College of Engineering, Perumon
5. Shahul Hameed Memorial Engineering College
6. Travancore Engineering College
7. TKM Institute of Technology, Ezhukone
8. TKM Institute of Engineering, Kollam Corporation
9. Younis College of Engineering &

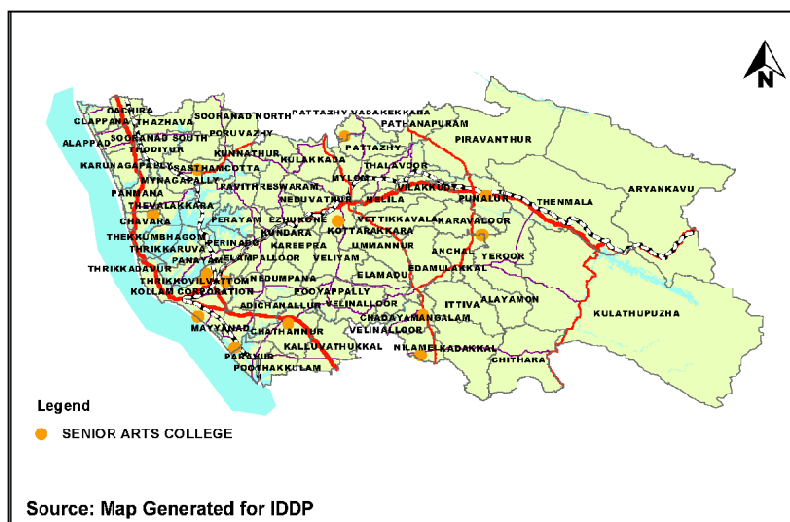


Fig.22.9: LSGI wise distribution of senior arts college in Kollam

Table 22.3.

There are 40 students in each Government and Aided T.T.I and 50 students in each Unaided T.T.I.

While analyzing the spatial distribution of Teachers Training Institutes, it is found that these institutions are evenly distributed in the district proportionate to the surrounding population and the existing number of TTIs is found sufficient.

(iii) Ayurveda Colleges

There are two Unaided Ayurveda colleges in the district namely S.N. Ayurveda College, Puthur and Amrutha College, Kulasekharapuram. The total number of students is 110.

(iv) Dental College

Azeez College (Pooyappally) is the only Dental College in the district and that

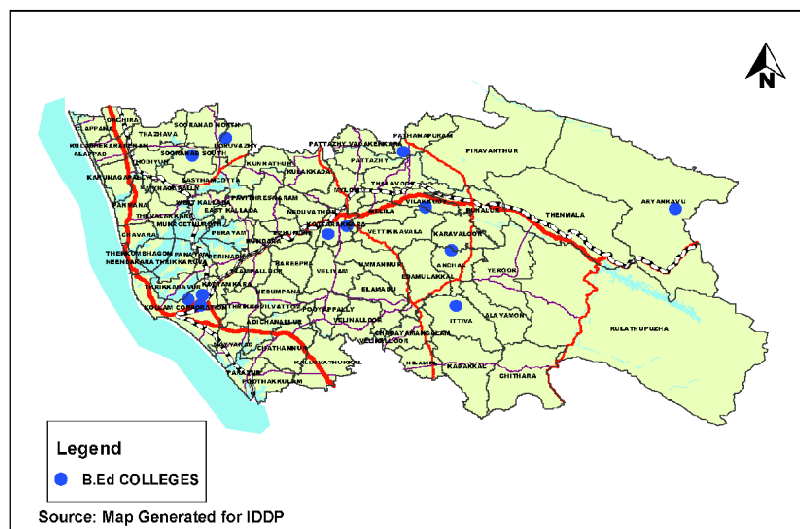


Fig.22.10: LSGI wise distribution of senior B. Ed colleges in Kollam

Table.22.3: List of Teacher's training institutes of Kollam

Unaided			Govt		
1	SVTTI, Thamarakudy, Kottarakkara	11	Erathu TTI, Chenkoor, Nettiayam	1	Govt TTI Kollam
2	Fathima Memorial TTI, Manacaud	12	RBM TTI, Punalur	2	Govt TTI Kottarakkara
3	ASTTI, Chandanathope	13	SVM TTI, Vendar, Kottarakkara	Aided	
4	Milade Sherief Memmorial TTI, Chandanathope	14	APRM TTI, Chithara, Kadakkal	1	Kottiyam CF TTI
5	Sreethi Sahib Memmorial TTI, Ayur	15	NGPM TTI, Vemchempu, Punalur	2	Kollam IHM TTI
6	Kasthurba Gandhi TTI, Kadavur	16	PKJM TTI, Mulavana, Kollam	3	Chempakasser Tti
7	Kulamudiylil Neelakantan Nair Memorial TTI,	17	Devi Vilasam TTI, Thalavoor	4	Karunagapally S N TTI
8	Mayappara TTI, Ayur	18	Ramavilasam TTI, Valakam, Kottarakkara	5	Sasthamkottah JM TTI
9	Badhriya TTI, Nedumpana	19	National TTI, Kunnikode, Punalur	6	Chovallur St George TTI
10	CH Memorial TTI, Karunagapally				

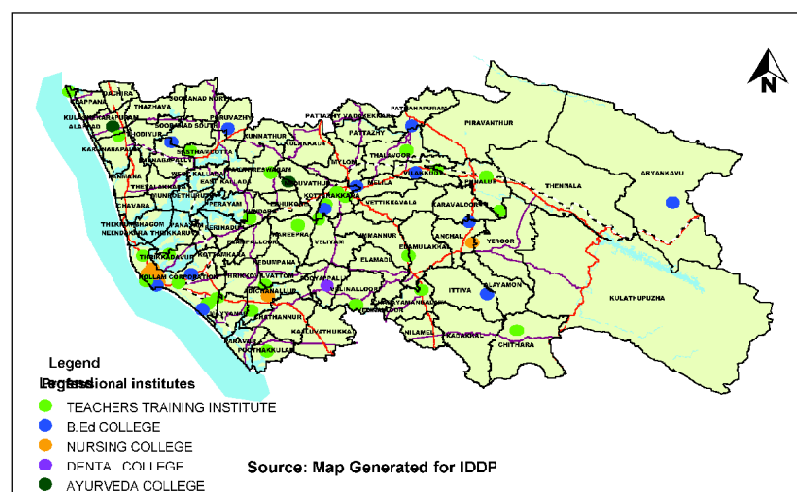


Fig.22.11: LSGI wise distribution of professional institutes in Kollam district

Technology, Kollam Corporation Courses offered and the total number of seats considering all the above Engineering colleges in the district is given in Table 22.4. The 4 Polytechnics in the district are located in Karunagapally, Kottarakkara, Adichanallur and Karavalloor.

From the spatial distribution (Figure 22.12) of technical institutes in the district, it is very clear that there are no technical educational institutions in the eastern parts of the district.

2 Development Issues in Education sector

The major development issues in education sector of the district are listed below.

2.1. Problems

2.1.1. School Ownership Based Problems

Due to issues in quality of education in Government and Aided schools there are a number of uneconomic schools in the

Table.22.4: Courses and seats offered in Engineering colleges

Courses and Seats in Engineering Colleges	
Computer Science	790
Electronics	805
Information Technology	510
Instrumentation	60
Electrical	500
Architecture	80
Civil	300
Chemical Engineering	30
Medical Engineering	200
Production Engineering	60

district. The Government schools and aided schools are not utilizing even 10% of their capacity. Utilization of funds also have to be more effectively. There are sufficient infrastructure facilities in Government and aided schools given

under various schemes like S.S.A. etc. But these are not utilized, which is basically a management issue. Also often it seen that there is improper management in aided schools under single management. Due to the above reasons, the unaided schools are becoming the major attraction for parents even in rural areas.

H.S.S. Section is still largely in the control of Government. The shifting of HSS education from the Colleges to existing schools have created heavy burden in the Govt. sector. Still many of these institutions are lacking facilities like infrastructure, library, lab etc.

2.1.2. Problems based on type of schools

The dropout rate is still high particularly in the Primary section. The number of educational institutions in the higher education sector like Arts and Science colleges and Technical institutions like Poly Technics, ITI and ITC are less. Also there is absence of Law colleges and medical colleges.

2.1.3. Problems of Spatial disparity

The literacy rate of Kollam is 0.51% less than that of Kerala. About 10% of the people in the eastern parts of the district are illiterates. Not even 5% of the total educational facilities of the district are available in its eastern parts. Comparatively eastern parts of the district have less number of schools.

The number of Vocational Higher Secondary Schools in areas coming under Punalur and Kottarakkara Educational Districts is less, indicating spatial disparity.

2.1.4. Other Problems

The Primary teachers need adequate training as most training programmes of teachers are in-effective. A permanent institution to train teachers with accommodation facilities is required. There should be proper post evaluation of the training programmes.

The grading system is not vigorously implemented. An assessment is required in this scheme to further modify it. Further modern policies of curriculum developments in the Education sector are not being entirely appreciated by a few teachers. There is a need for general awareness in this regard.

Pre-Primary Education in this district is not strong due to certain technical reasons for implementing the Pre-primary

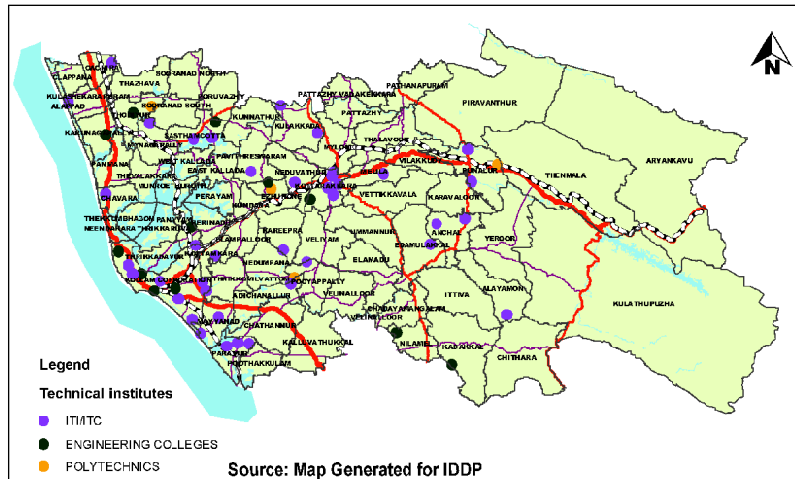


Fig.22.12: LSGI wise distribution of technical institutes in Kollam district

Education envisioned by the NPE. 90% of the Pre-primary schools in the district are now attached with LP and UP schools. We rarely see the institutions that work independently.

The percentage of students enrolled in Standard I who completes higher education in Kollam district is less than 10. Majority of them drop out either at 10th HSS or Degree level.

There are parallel educational institutions functioning in the State for a long period. The importance of these institutions in villages and in the towns is not negligible. These are institutions that provide coaching to pupils to enhance results. They also give tuition at various levels. There are no rules at present to restrict or regulate parallel educational institutions.

The only 2 Law Colleges in the Southern part of the State are at Thiruvananthapuram. In a situation where global culture is discussed, the importance to judicial information is very important. So there is a need for starting a Law College in the district.

2.2. Potentials

The higher education facilities in Engineering are a potential for Kollam district. Further there is great scope for improving skill development through developing Polytechnics, VHSC, ITI, ITC etc. Better transportation facilities, economic development and better management are good potentials for development of the sector. Though less in number there are schools in the district even in the Govt. and aided sector which are managed properly. There is no decrease in the number of pupils in the schools of Karunagapally area for the last two years. In short the educational culture available at these areas can be extended to the other parts of the district too.

3 Conclusion

Level of education is high in the District. But availability of higher education facilities are only limited. Aided sector has domination in academic and other aspects of school education. The position of Government sector schools are far behind. This has to be rectified urgently. In Vocational Higher

Secondary sector there is an urgent need to start more VHSS in the District, particularly in the eastern part (i.e., Kottarakkara, Punalur Taluks). Post Graduate Education facilities are very poor. There is only one Government College in Kollam. Though the status of Professional Education facilities in the Engineering side are better and sufficient to be needs of the district, the status is poor in the absence of Medical Colleges, Law colleges etc. As far as the development issues are concerned huge allocation is required to overtake the existing problems, particularly problems of spatial disparity. At present investing huge amounts for technical institutions, Medical institutions, Arts and Science Colleges etc. may not be financially viable for the State. So, private participation may be welcomed. The Co-operative sector can also be allowed to open more professional institutions in the district. Funds from Central Government can be utilised also for this purpose.

Upgrading the quality of education is a common demand of the Society. There are several institutions that stood in the forefront of quality education. T.K.M Engineering College, a pioneer in the field of Science and Technology, is a leading institution among the Engineering Institutes in India. At the same time there are institutions at the heart of the town that do not function well. The major attributes to the demand for quality education is the mental desire of the community to accept education as a means to social change.

To conclude, for the development of educational sector in Kollam District, the planners should have a clear vision of the future and they should allow private participation in a bigger way to improve facilities for higher learning.



Chapter 23

Social Welfare, Women and Child Development

This chapter contains the analysis of present status and issues of weaker sections of the society namely women, children, adolescent girls, old age people and disabled persons. Subsequently, the ongoing social welfare programmes under implementation are explained. It also covers other general issues of the society. Even though scheduled caste/ scheduled tribe families and BPL families belong to the weaker sections of the society, analysis pertaining to these sections are separately dealt elsewhere in the reports.

1. Analysis of Existing Status

1.1 Women

As per census 2001, the total number of women in the district is 13,35,516 constituting 52% of total population (Figure 23.1). Lowest Female Population content is in the Panchayats of Neendakara and Alappad (<50%) and highest is in Poothakkulam Panchayat (53.42%). Literacy rate of females in the district is

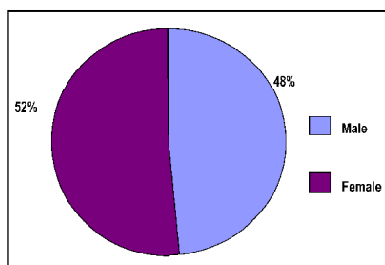


Fig.23.1: Status of female content in total population

88.06 % only where as for males it is 94.63%.

Alappad is a stretch of land, where fishermen population is maximum. This could be the reason for low female population here. In Nilamel the representation of women in the Grama Panchayat and Jilla Panchayat are 34% and 33% respectively against 33.33% reservation seats for women (Figure 23.2).

1.2. Adolescent Girls

According to WHO (World Health

Organisation), Children in the age group of 10 to 19 years are considered as adolescents. Adolescence is a period of dramatic changes and development. It is characterized by physical, emotional and sexual changes. Adolescent population constitute around 20 percentage of Kerala's population. In Kollam about 16% of total population is adolescents with almost equal share of female & male.

1.3. Children

Every human being below the age of 18 yrs is nationally defined as a child.

Children are the greatest assets of any nation. Investing in them is investing for a better future of the nation. Kerala has got a unique position in health, which is comparable with that of developed countries. However Water born diseases are rampant among children. 40% of kids suffer from malnutrition and eye diseases. The drop out rate of female children in schools is high compared to male children.

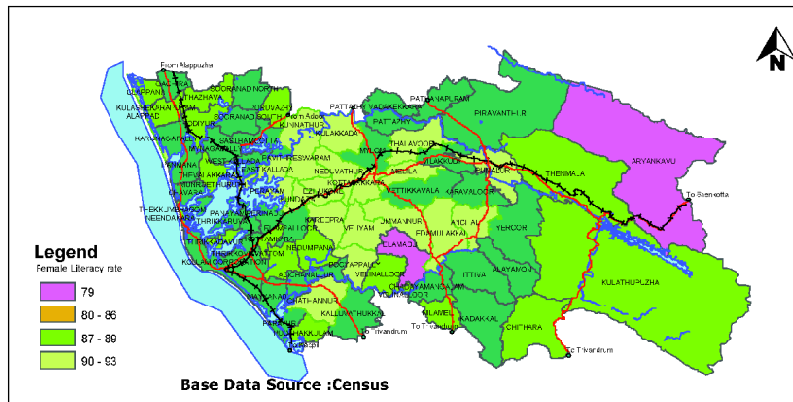


Fig.23.2: LSGI wise distribution of female literacy rate (2001)

Children constitute 11.3% of the total population of the district in which only 49% are female (Figure 23.3).

1.4. Birds with broken wing (Mentally and physically challenged)

Disabled persons include hearing and vision impaired, movement impaired, mentally retarded, persons having mental problems etc. In Kollam district about 15586 persons are found as disabled of which the maximum disabled persons are movement impaired (7255 persons). Hearing disability is found more in Kundara and East Kallada and vision impaired persons are found more in Adichanallor. Maximum concentration of movement impaired persons are in the Grama Panchayats of Sooranad North, Karunagappally, Panmana, Chavara and in Kollam Corporation. Mental Retardation is a state of arrested development of the mind existing from birth or from an early age. Mental retardation varies in severity and can result from a variety of causes. It has been estimated that about 5 percent of

all the babies born are retarded to some degree. Mentally retarded persons are more in Kollam Corporation and Chithara Grama Panchayat.

1.5. Old Aged

Care of the elderly people as a complete science is to yet to emerge in our country. From the demographic details it is found that the number of senior citizens is rapidly rising in our country. The United

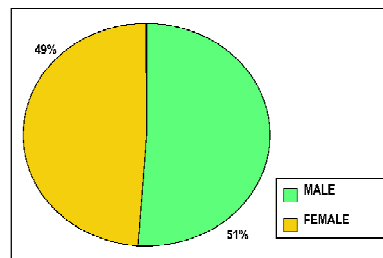


Fig.23.3: Percentage of male and female in child population

Nations declared 1999 as the international year of older persons to highlight their special needs and plight. In Kollam about 9.46% of total population of the district is in the above 60 years group. The Age-sex

pyramid is shown in Figure 23.4.

The goal of National Policy on Older Persons announced by GOI in 1999 is the well being of older persons, which will be achieved by securing them their place in society so that they live this phase of life with purpose, dignity and peace.

1.6. Status of Anganwadis

Anganwadis are the grass root level service delivery point of social welfare activities. There are 2399 sanctioned Anganwadis in the district of which 2394 are functioning.

Existing Criteria for sanctioning of Anganwadis is as follows.

- General - 1 Anganwadi / 1000 Population
- Corporation - 1 Anganwadi / 1500 Population
- Tribal area - 1 Anganwadi / 800 Population and even 1 Anganwadi / 1 Ooru

The distribution of functioning Anganwadis shows (Figure 23.5) that the

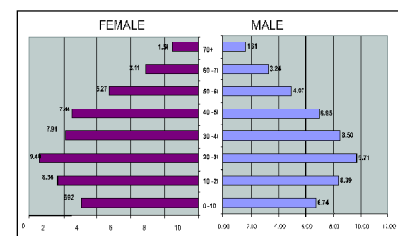


Fig.23.4: Age sex pyramid

Anganwadis are maximum in Kollam Corporation (308 Nos) and minimum in Munroe Thuruth (11 Nos).

The statuses of anganwadis of Kollam district are evaluated based on the following parameters.

1. Having no own land
2. Having no own building
3. Without child friendly toilet (CFT)
4. Without water supply/power facility
5. Without compound wall
6. Without outdoor playing material

It is seen that out of 2394 Anganwadis in Kollam district, 43% do not have own land, 48% are not having own building

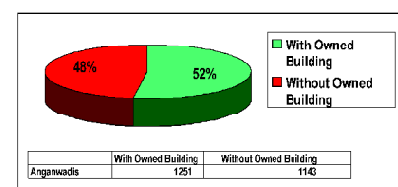


Fig.23.6: Status of Anganwadis based on ownership of buildings

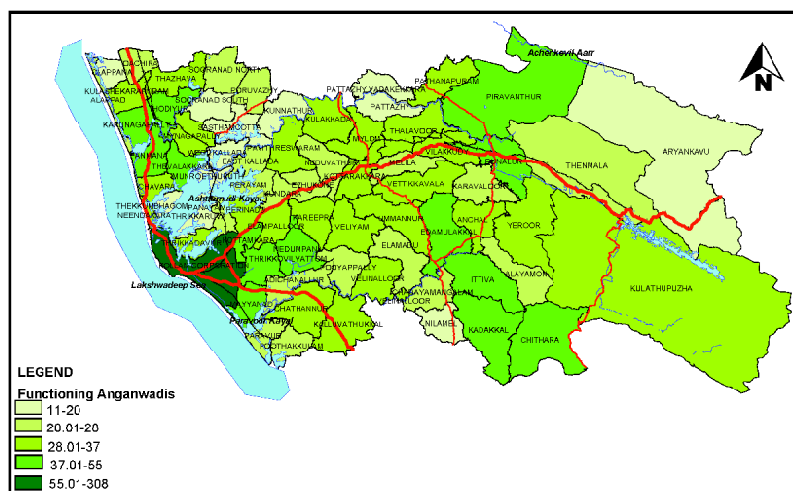


Fig.23.5: LSGI wise distribution of functioning Anganwadis

(Figure 23.6), 41% do not have own land & building, 37% do not have child friendly toilets, 81% do not have water supply/power, 91% do not have compound wall and 85% are without outdoor playing materials.

The spatial distribution maps show that with respect to all the above parameters, the status of Kollam Corporation is poor. In Kollam corporation of the total 308 Anganwadis 76% do not have own building, 95% do not have own land, 23% do not have child friendly toilets, 98% do not have compound wall, 99% of Anganwadis do not have child play equipments and 85% do not have safe drinking water facility. Hence Kollam Corporation is rated as one among the LSGI s having worse situations in the case of facilities of Anganwadis. Figure 23.7

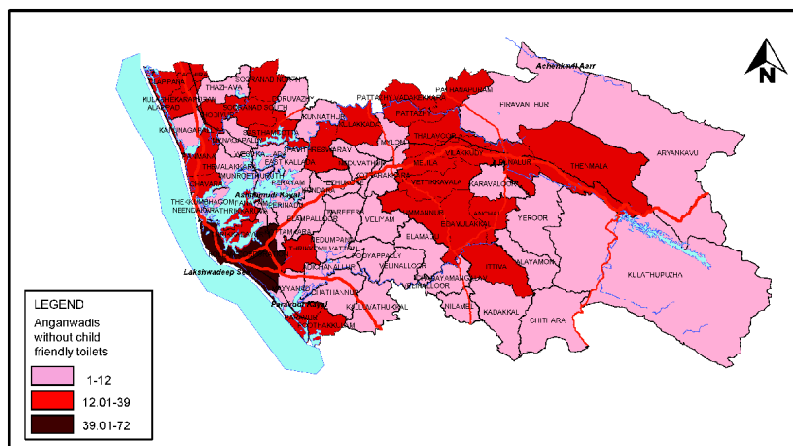


Fig.23.7: LSGI wise distribution of Anganwadis without child friendly toilet

LSGIs having least no. of Anganwadis viz. Munroe Thuruth (11 nos.). Hence Kollam Corporation cannot be compared with other LSGIs and so excluded in this analysis.

Spatial distribution of the status of LSGIs

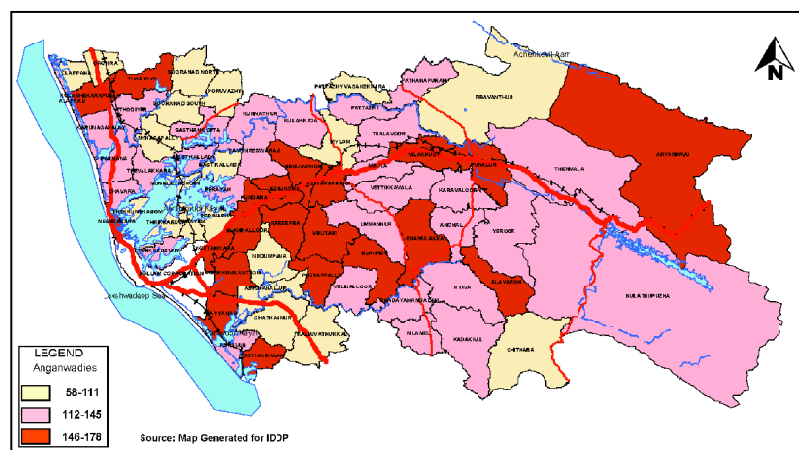


Fig.23.8: LSGI wise distribution of status of Anganwadis based on cumulative index shows distribution of Anganwadis without CFT.

In order to identify the critical LSGIs a Cumulative Index methodology is adopted. Methodology for assessment is as follows.

The percentage of Anganwadis lacking each of the above facilities is calculated in each LSGI. Each LSGI is given indices based on the percentage value of the parameters. A cumulative index is worked out by adding up all the indices. A higher value of this cumulative index for a particular LSGI indicates the lack of facilities in that LSGI. The spatial distribution of LSGIs based on this cumulative index will give the situation of Anganwadis in the LSGIs of Kollam district.

In case of no. of Anganwadis, Kollam Corporation has maximum no. of functioning Anganwadis (308 nos.) much higher than that in the next lower LSGI i.e. Punalur Municipality (55 nos.) and the

of Kollam district based on their cumulative index (excluding Kollam Corporation) is shown in Figure 23.8.

The LSGIs in a critical situation are Punalur Municipality (CI=178) and the Grama Panchayats of Ezhukone (CI=170), Elamadu (CI=168) and Neendakara

(CI=168).

1.7. Fire and safety

The Fire and Rescue Services is under the Home Ministry. The main objective of Fire force is to protect the people and their properties from fire and other calamities which include both natural and incidental. Therefore a demarcation of its service area is a bit difficult. Today the department provides different services like ambulance facility at times of emergencies, pumping out water during flood, supplying potable water in draught affected areas, provides stand by duty during carnivals, exhibitions etc, removing road blocks caused by felling of trees or motor vehicle accidents with the help of Recovery Van, saves the victims from the accidents of well, lift and so on.

At present there are seven Fire Stations in Kollam District, located at Kadappakada, Chamakkada, Kundara, Karunagappally, Punalur, Kadakkal and Paravur.

It can be seen from Figure 23.9 that the fire and rescue call are more from Kollam Corporation (219 nos.) followed by

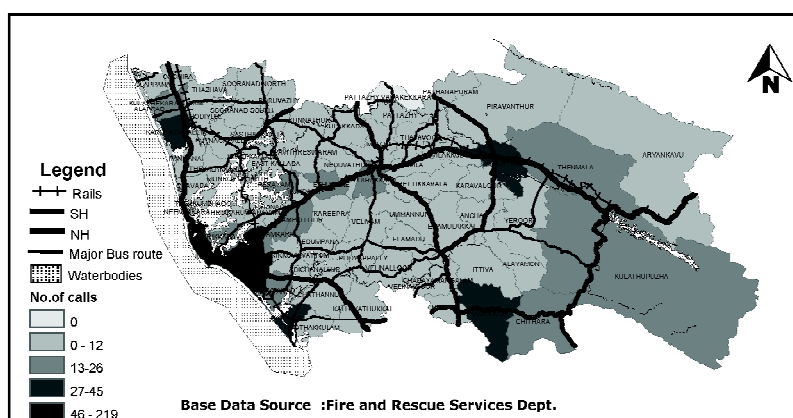


Fig.23.9: Number of calls to fire station

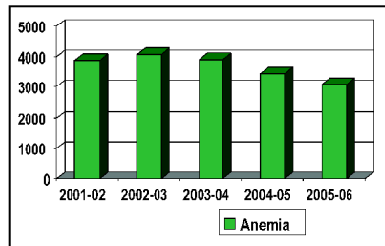


Fig.23.10: Trend of anemia among women

Karunagapilly, Kadakkal and Punalur (2008 data). The existing locations of Fire stations are more or less according to the distribution of number of calls.

2. Overall Development Trend

The Overall development trend of the sector is analysed based on the following criteria.

- Anemia among Women
- Atrocities against Women
- Suicide among Women
- Atrocities against Children
- Suicide among Children
- Low Birth Weight
- Suicide among Old aged
- Fire and Rescue calls

It is seen that cases of anemia among women though increased in 2004 – 2005 reduced by 2005-06 (Figure 23.10).

The cases of atrocities against women show an increasing trend (Figure 23.11) while the cases of suicides among women show a decreasing trend (Figure 23.12).

In the case of children both these aspects are showing an increasing trend (Figure 23.13 and Figure 23.14).

In case of low birth weight there is a decreasing trend (Figure 23.15). In the case of suicide among old age, there is an increasing trend in 2005 in Kollam (Figure 23.16).

In general, analyses show that the social status of the weaker sections of the society shows a lowering trend in the district.

In case of fire calls there is declining trend and in case of rescue calls there is an increasing trend particularly in Kadappakkada area in Kollam Corporation

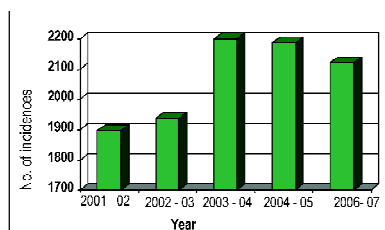


Fig.23.15: Trend of low birth weight

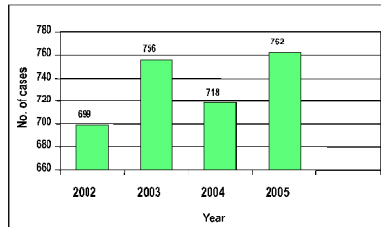


Fig.23.11: Trend of Atrocities against women

(Figure 23.17).

3. Development Issues

3.1 Women

Women are facing lots of problems in the society. For the purpose of analysis these are grouped as physical and physiological harassment and health related problems.

3.1.1. Physical and Psychological Harassment

i) Problems within the family

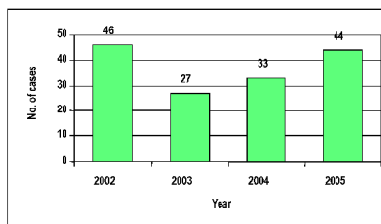


Fig.23.13: Trend of Atrocities against children

- Most of the women belonging to lower middle class families are victims of continuous physical and mental torturing by uneducated and alcoholic husbands resulting in the destruction of domestic peace and marital harmony which in turn increases the suicide rates. It is, however surprising to note that this malaise pervades even in the upper class of our society.
- Dowry system is another formidable evil which often results in heated discussions in the family with the mother-in-law threatening the bride of dire consequences in the event of non compliance with their insatiable desire for money.

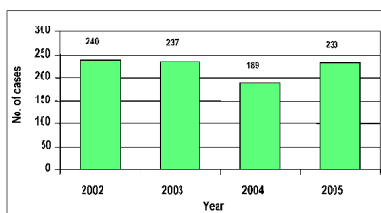


Fig.23.16: Trend of Suicides among old age

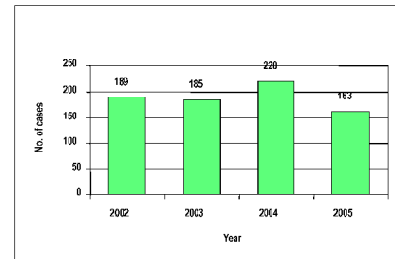


Fig.23.12: Trend of Suicides among women

- Violence in marriage life has a degenerating psychological impact on the entire family. An ill treated woman is a prisoner of circumstances. Desertion is out of the question. There is social stigma attached to it.

ii) Problems at work place

Majority of female workers are engaged as maid servants, factory workers (cashew, sea food, brick choolas etc), sales girls etc. The main problem they are facing

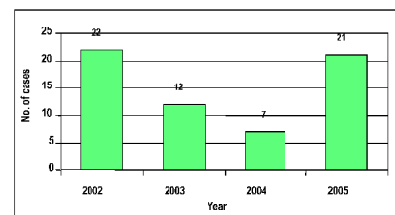


Fig.23.14: Trend of Suicides among children

is low wages. Insecurity and sexual exploitation are other serious problems that women faces at work places. Though labour rules are in favour of working women, violation of labour rules makes their life miserable.

iii) Social harassment

Rape and molestations are alarmingly increasing in the society. The recent survey on crime against women conducted by the Bureau of Police Research on Development stated that while the number of criminal cases in general rose by 35% from 2000 to 2006, the number of rape cases in the same period rose by 70%. In the year 2005, about 762 cases of atrocities against women have been registered within the district. Sexual abuse while traveling is yet another serious problem women are facing in the society. By obscene portrayal in films, theatre advertisements, magazines etc. the once venerated women is treated in practice as an inanimate object, a sexual machine and a mechanical incubator. In Kollam, as per

the records of Police Dept., highest number of cases of suicide among women is reported in Kundara Circle area (Elampallur, Kottamkara(part), Perinad, Kundara, Panayam (part), Thrikkadavur, Thrikkaruva, Munderthuruthu and East Kallada Grama Panchayats) as shown in Figure 23.18.

3.1.2 Health problems

The health status of women in the district is low. About 18% of women are undernourished and 22% have anemia. Also 38% of women have some reproductive health problems like maternal death, abortion etc. During 2005-06 about 3086 anemia cases and 3145 abortions were reported in the district. In addition to this, female workers employed in areas like cashew processing, peeling sheds etc are under the threat of occupational diseases.

Figure 23.19 depicts the no. of cases of anemia in LSGIs of Kollam. Maximum cases of anemia are reported from the

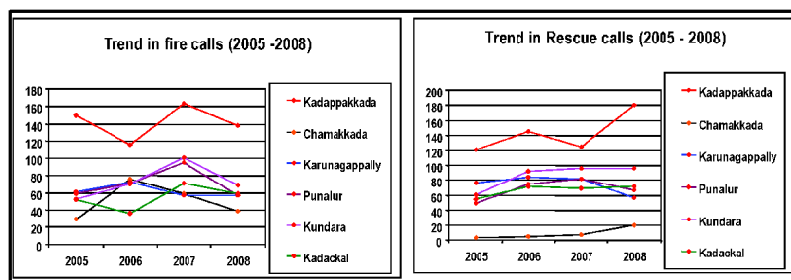


Fig.23.17: Trend in the fire and rescue calls

abuse, about 69% children are physically abused and every second child faces emotional abuse. Physically abused children consist of about 54 – 68 % boys. Of the children physically abused, those abused in family situation is about 68.6 % and parental abused is about 83%. Also two out of three children experience corporal punishment. Of the 53.22 % of children who faced one or more forms of sexual abuse, 5.6 % are sexually assaulted. The worst affected were children on streets, at work and in institutional care.

32.1 % of children had experimented with one of the substances like alcohol, ganja, charas or heroin. In Kollam District 44 cases of atrocities and 21 suicide cases had been registered against children in the year 2005.

ii) Child Labour

As per law no children below the age of 15 yrs should be engaged in any job. But usually they are employed in hotels, as house servants and in poultry & cattle farms etc.

iii) Issues of street children

Children wandering in street are facing additional problems like lack of education, health problems, rehabilitation issues and security issues.

iv) Low Birth Weight

Low birth weight is another problem among children. In Kollam district 2123 children were born with low birth weight during 2005-06. However, the number of births with low weight is decreasing from 2003-04 to 2005-06 (from 2199 to 2123). The number of children with low birth weight is highest in Kollam Corporation.

3.4. Birds with broken wing (Mentally and Physically Challenged)

Problems of mentally handicapped persons are much more severe than that

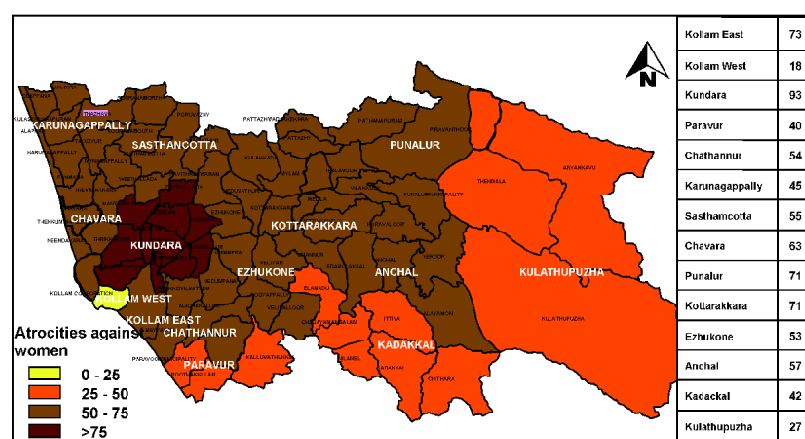


Fig.23.18: Police Circles wise distribution of atrocities against women

Corporation area, which could be due to fast food culture.

3.2. Adolescent Girls

Following are some of the general problems that adolescent girls are facing;

1. Identity crises
2. Emotional instability
3. Sexual or physical abuse
4. Anxiety about future (job, marriage etc)
5. Growing number of suicides
6. Exploitation at work place
7. White slavery

3.3. Children

Child abuse, child labour, issues of street children and low birth weight are the major problems with children.

i) Child abuse

As per the national survey on child

50 % of the abusers are known to the child and in the position of trust and responsibility.

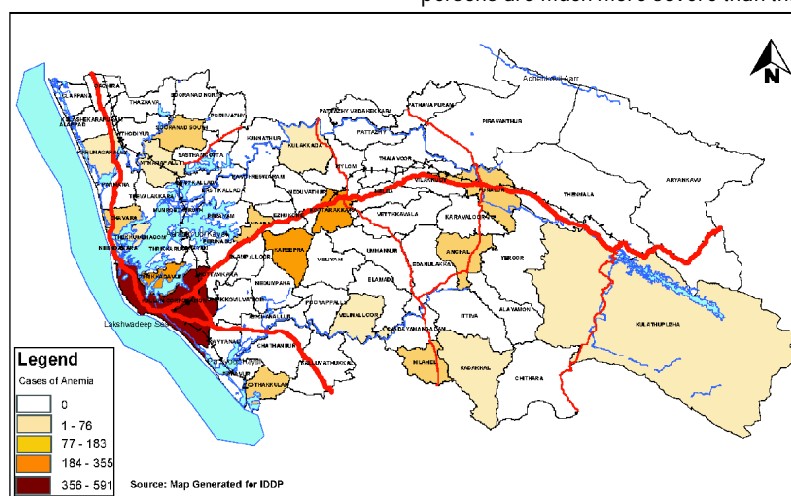


Fig.23.19: LSGI wise distribution of cases of anemia

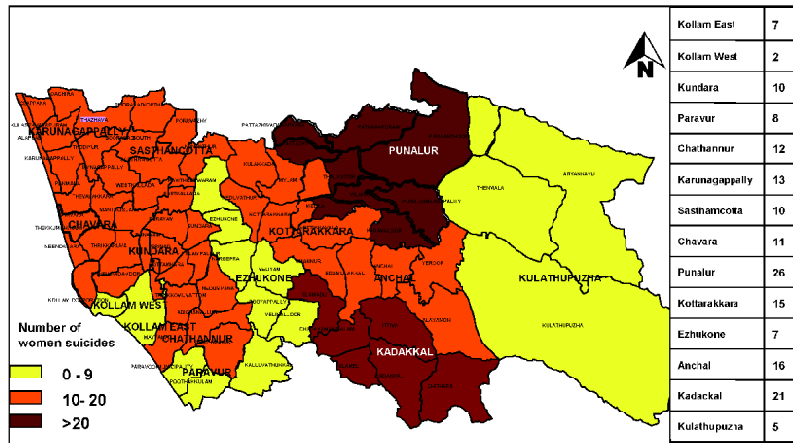


Fig.23.20: Police Circles wise number of women suicides

of other physically disabled persons. A mentally handicapped child is a problem to a family. The mental agony of the parents is beyond our imagination. Some sort of social isolation is experienced by the hapless mother who gives birth to such child. Mentally retarded persons are ill treated and kept inside the house. They are malnourished and are prone to diseases. They have little or no opportunity to mingle with normal children, to express their emotions, feelings, desires etc.

3.5. Old Aged

The main problems associated with old aged people are:-

1. Loneliness
2. Negligence
3. Age related health problems.

3.6. Other Social Challenges

Other social challenges include antisocial activities, suicides, dowry, accidents, drug addiction, female feticide, HIV positive children and white slavery.

3.6.1. Antisocial activities

Other than atrocities against women and children, antisocial activities like theft, violence, murder and other crimes destroy the social peace and security of the society. Proper law and order system to be maintained in the district for ensuring social harmony and security in the district.

3.6.2 Suicides

Suicide is as ancient as man himself and throughout the whole of recorded history; there are references to the act of self destruction. Society has viewed suicide from the extreme of out right condemnation to the other extreme of veneration.

As per police records, during the period from 2002 to 2004 the number of suicide cases reported in the district had

reduced from 1136 to 1085. However in the year 2005, the number of suicide cases increased to 1128 of 711 are men. From this data it is presumed that financial crisis may be the main reason behind. Once we achieve a sustainable development in all sectors, suicides could be reduced to some extent.

In Kollam, more cases of suicide by Women is reported in Punalur Circle area comprising of Punalur Municipality and Pathanapuram, Piravanthur (part), Pattazhy, Pattazhy Vadakkekara, Karavalur, Thalavur, Vilakkudy Grama Panchayats (Figure 23.20). Influence of illicit liquor, broken families, debt, backwardness etc. in these areas leads to emotional instability and personality disorder ultimately leading to suicide tendency.

3.6.3. Dowry

Dowry for the new nuptial knot is another formidable evil. Incompatible couples, the result of commercial arranged marriages, later become parties to mutual recrimination, endless bickering and physical violence. Inadequate dowry often results in heated discussions in the family, with the mother-in-law threatening the brides of dire consequences in the event of non compliance with their insatiable desire for money.

The consultative committee constituted by Parliament in 1980 has suggested the creation of dowry prohibition officer's post in each district to be assisted by a team of five social workers and supported with police forces. But it took more than 25 years to implement the suggestion.

3.6.4. Accidents

The number of accidents in the district

during the period 2002 to 2005 is alarmingly increasing from 6592 to 8061. This is mainly due to the lack of well designed / maintained roads in the district. Hence the road net work in the district has to be properly planned to avoid future accidents.

The increasing number of road accidents and their subsequent disasters causes irreparable loss to our society. Accidents leave innumerable innocent men and women hapless and create number of living martyrs. Every segment of our society has fallen prey to this menace. In spite of all the efforts taken by the government and NGOs the safety of our roads remains still a dream. So effective schemes are required to take measures to check road accidents and to help victims of accidents.

3.6.5. Drug Addiction

Drug addiction has become one of the biggest unsolved problems after poverty and unemployment. This is a major social problem which needs to be tackled on a war footing. Today our college and school campuses are becoming fertile lands of drug peddlers.

3.6.6. Female feticide

Deep rooted social disease - Amniocentesis, the examination of foetus inside the womb, is another instance of science being used for an ignoble end. Amniocentesis is a means to find out whether the foetuses have any genetic abnormalities which can be set right before delivery. But the method is now used almost exclusively to find out the sex of the foetus so that it can be aborted if it is a female.

The urge to avoid female issues is so widespread in the state that centres conducting amniocenteses have sprung up like mushrooms all over and are doing a roaring business, so that the tests are now more honestly called sex determination tests.

The practice of female feticide should be curbed in our society by strict laws and educating women to know their right through persuasive propaganda over radio and television.

Cases of abortion are found to be highest in corporation area Figure 23.21. (The cases reported here could be from other parts of the district).

3.6.7. HIV Positive Children

National AIDS Control Organization report of 2004 estimates that, the total

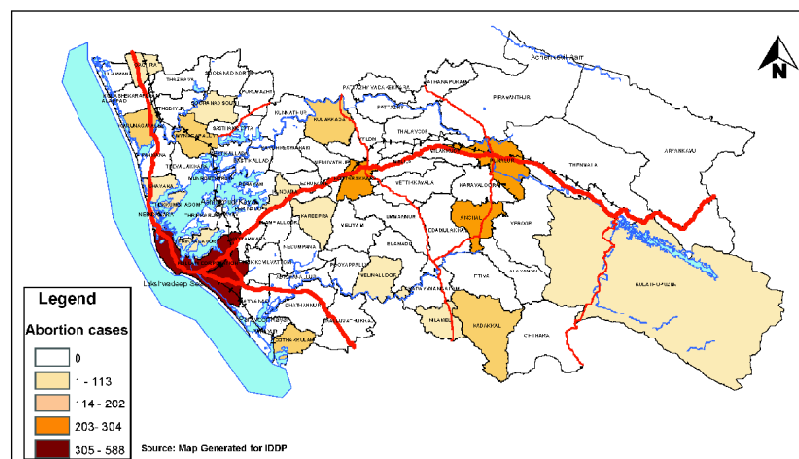


Fig.23.21: Police Circles wise abortion cases

number of HIV positive population of India is 5.134 million. The number of children with HIV is not known. In Kerala people rarely speak for children with HIV positive. Recently innocent children of parents, who died of AIDS, have been mercilessly ousted from schools and Anganwadies in our district. In our society HIV infected children are marginalized and they don't have a childhood.

Institutional care should be given for HIV +ve children where they get love, security and value based education so that they can blossom and live long enough to give back to society.

3.6.8: White Slavery

A new (old?) scourge, white slavery is reported to be in existence in many parts of the State is reported to be in existence in many part of the State.

One wonders why there are more stories about abduction of minor girls for forcible prostitution involving people from all walks of life in Kerala where the people are highly educated and the State has a rich cultural heritage. Nobody is least bothered about the plight and humiliation experienced by the hapless victims of such cases. The number of suicides by the girls who have been trapped in the procurer's nexus is alarmingly increasing in our state.

Many are the reasons for this evil. Unemployment, poverty, desire to be part of the colorful world of film industry, the prevailing dowry system in our society etc., are some of them.

These can be prevented through sex education and counseling to adolescent girls and their parents, in addition to strict enforcement of law and community support.

3.6.9. Cyber Crimes

Three great discoveries mark the last

40 years of our century viz. the unleashing of atomic energy, the conquest of space, and the birth of Cybernetics. With the evolution of Cybernetics, a new system of crime originated in the cyber world. The impact of cyber crime is to play havoc to the society. The origin of cyber crimes are very difficult to detect. The following are some of the cyber crimes.

1. Cyber crime against individual
 - ! Email spoofing, spamming
 - ! Cyber deformation
 - ! Cyber stalking etc.
2. Cyber crime against property
 - ! Credit card fraud
 - ! Intellectual property crime
 - ! Internet time theft etc.
3. Cyber crime against organisation
 - ! Unauthorized access of cyber space
 - ! Changing or deleting data
 - ! Virus attack
 - ! Email bombing
 - ! Salami attack etc.
4. Cyber crime against Society
 - ! Forgery
 - ! Cyber terrorism
 - ! Web jacking etc.
 - ! Pornography

For checking cyber crimes, there is a High Tech Crime Enquiry Cell in the State Police HQ. All District HQ are also having District Crime Enquiry Cells under the supervision of a Crime Detachment DySP (started during 2008) for assisting local police on enquiring cyber related petitions. The existing law in this regard is I.T Act 2000.

3.6.10. Fire and Rescue

In the case of Fire and rescue services, in order to improve the efficiency of the force, the department needs full support and co-operation of several other

government departments and other government bodies. Since the availability of water is not adequate at all stations, the service needs the co-operation of water authority in providing sufficient water. Unfortunately very often the fire hydrants installed at strategic points to meet emergency water demands are inactive. Similarly our rural and urban areas also lack planned water sources to meet any emergency needs. Another problem is the under development of the road facility. Many times, the water tender cannot reach the spot because of the narrow roads, unplanned electrification etc. Other important problems the service experiences are the shortage of equipments, absence of modernization of equipments and so on.

Since the district is in the phase of gradual urbanization and development fire accidents and other accidents are increasing every year. But the department faces several problems such as lack of modern equipments, modernization etc. due to lack of fund and over all failure due to disintegrated functioning of the whole government system.

Even though there are 7 Fire stations well distributed in the district, they still lack much required infrastructure facilities such as owned building, emergency tender, recovery vehicle etc. Taking into consideration of the growing accidents, these are highly essential for effective rescue activities. Another aspect lacking in the district are hydrants which are essential for fire fighting.

4. Agencies Involved

Various agencies involved in the development of Women, Children and Adolescent girls are:

1. Ministry of Human Resources Women and Child Development
2. United Nations International Children's Educational Fund (UNICEF)
3. Integrated Child Development Scheme(ICDS)
4. Self Help Groups under Integrated Women Empowerment Programme (IWEP)
5. World Health Organization (WHO)
6. Ministry of Human Resources Development
7. Social Welfare Department
8. Non Governmental Organizations

Various agencies involved for the welfare of old aged are:

1. Arya nursing Home, Ashok Nagar, Hyderabad, Andra Pradesh
2. Heritage Medical center, rehabilitation unit Ameer pet, Hyderabad, Andra Pradesh
3. Age care, India. N 17 B, Saket, New Delhi.
4. Cheru Resmi center, Valiyathura, Thiruvananthapuram.
5. Old Age Home, Anchalumoodu (Run by SW Dpt.)

Various agencies involved for the Mentally and Physically Challenged are:

1. State Social Welfare Department
2. Voluntary Organizations / NGOs
3. Child Development Center, Medical College, Thiruvananthapuram

Fire and Rescue and Police are the Departments having major role in the social security aspects.

5. Evaluation of On going and Committed Projects and Programmes

5.1. Welfare programmes for Women, Children and Adolescent girls

5.1.1. ICDS Projects

ICDS projects provide supplementary nutrition, NHED, immunization and awareness on different subjects etc to women. These projects also provide a package of service for the development of children such as

1. Non formal preschool education
2. Supplementary nutrition
3. Immunization
4. Health check-up
5. Referral services

A number of services are being rendered to adolescent girls through ICDS projects.

Adolescent girls clubs were formed and functioning in anganwadi centers. Through the club nutrition, awareness counseling, personality development service etc are given.

This programme is very successful. In the adolescent clubs, girls can participate

in various activities connected with social work. School experience is not the only thing the adolescents are to come across. It is a subset of childhood. Art, music, dance, theater all those areas engage the child in wholesome and enjoyable activities.

5.1.2. Integrated Women Empowerment Programme (IWEP)

Integrated women empowerment programme envisages the holistic empowerment of women. The programme is being implemented through Anganwadi centers by constituting self help groups (SHG) of women.

Following are the impacts of ICDS projects and IWEP programmes

1. Awareness explosion among women
2. Economic Empowerment
3. Improvement of nutritional status
4. Social Empowerment
5. Psychological empowerment-reduces the tendency of suicide among women.
6. Women participation in Local Self Governments
7. Law enforcement against child labour
8. Protection against child abuse
9. Social and psychological development of children

5.2. Birds with broken wings (Mentally and Physically Challenged)

Following welfare programmes are under implementation for disabled persons.

1. Early detection of childhood disabilities and community-based rehabilitation programmes
2. Individual therapy
3. Respite service
4. Education (Sight Vocabulary System)
5. Training on simple jobs
6. Training for personal needs, and care

The status of disabled persons remains the same as earlier despite the assistance provided by government and NGOs.

5.3. Old Aged

Following welfare programmes are under implementation for old aged persons.

1. Respite service
2. Geriatric care

3. Psychological services

The above programmes are not sufficient comparing to the number of old aged persons. Hence additional programmes are to be introduced for the well being of old aged persons.

6. Conclusion

It is a crying shame that after six decades of independence we have been unable to harness our rich human resources for economic and social welfare programmes. A large majority of our deprived poor segment of population are cut off from the main stream of national life. Eruption of eradicated diseases and AIDS are serious threats to humanity. Leprosy, curable at cheapest cost, rages among tribals. Apart from leprosy, tuberculosis is spreading silently. Cancer is another scourge that is on the increase mainly in urban areas. Water born diseases are rampant among children. 40% of kids suffer from malnutrition and eye diseases. The health status of women in the district is low. The drop out rate in schools particularly of female children is high. The graph of infant mortality rate shows upward trend. All these point out the fact that the weakest of the weaker sections of the society in the district are still unable to come out of their deprived situation and there exists severe lack of service facilities rendered to them. So the proposals in this regard have to focus on these issues.

In the case of fire and rescue services, few more stations are needed for effective resource operations in the district. Suggestions for new stations at various parts of the district are in consideration. Their service is in the phase of gradual development. But still a lot is to be done which would be possible only with the help of absolutely integrated, well co-operated, futurity envisioned good governance. In the case of fire and safety, there are still some short falls in the existing scenario such as lack of hydrants etc. which are to be rectified. Modernization of existing fire stations and commissioning of new fire stations would be essential.



Chapter 24

Poverty Reduction

This chapter analyses the existing status and development issues of Poverty Reduction and Rural Development sector in the district. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on the temporal aspects. The third part probes into the development issues pertaining to the sector and finally the fourth part contains the analysis of ongoing programs and projects.

1. Analysis of Existing Status

Poverty is a social phenomenon in which a section of the society is unable to fulfill even its basic necessities of life. When a substantial segment of a society is deprived of the minimum level of living and subsistence level, that society is said to be plagued with mass poverty. Generally poverty is defined in terms of a caloric norm of minimum 2400 per person per day in

rural areas. But the caloric value assessed in Kerala at the poverty lines come to around 1500.

Poverty continues to prevail among the downtrodden and depressed sections of the people. Socio economic inequalities between place and people have sharpened over the years. India is passing through the 2nd stage of demographic transition, where the rate of fall in birth rates exceeds the fall in death rate. The absolute number of poor population living below poverty line has far exceeded. After 5 decades of planned development, roughly 260 million people of the country are reported to be living below poverty line. Poverty is a combination of deficiency of food, shelter, drinking water, sanitation, employment, income, basic amenities, health aspects, safety of assets and opportunities. Removal of poverty is a time bound and realized policy which should be filled with vigor and imagination.

1.1. Physical Status

The physical status is analysed based on demographic details. Total population of the State is 31841374. Out of this, as per the studies conducted in 1998 37% is BPL. In Kollam district out of the total population 2459528, 39% is BPL (Figure 24.1). This shows that the district needs, special attention in the poverty alleviation.

The result of the BPL survey conducted in 2002 has not yet been published. The survey was based on the following nine indicators:

- 1) The family not having a house fit for occupying.
- 2) Scarcity of drinking water.
- 3) Family not having sanitary latrine.
- 4) Family in which members are illiterate.
- 5) Family in which more than one member is not having income.
- 6) Family not having sufficient food for survival.
- 7) Family in which there are children

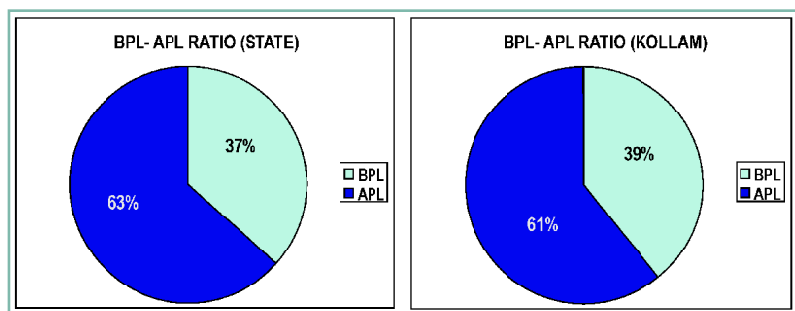


Fig.24.1: BPL-APL ratio – Kerala and Kollam

- below 5 years.
- 8) Members of family addicted to liquor and other intoxication
 - 9) SC/ ST family.

The spatial distribution of the BPL population shows that in the year 1998, the distribution is rather sporadic without much of a clear cut spatial pattern. Lowest BPL population was in Pattazhy Vadakekkara Grama Panchayat (1430) and highest was in Kollam Corporation (15407).

Obviously numbers of BPL families are also more in Corporation area. It is assumed that people migrating to urban areas in search of job are still in the BPL group. Hence Kollam Corporation demands special attention in poverty reduction.

While, the BPL population in absolute numbers is more in Kollam Corporation- a 1st order settlement with more population than its next lower LSGI, the BPL Content (BPL Population *100 /Total Population) gives a clear picture on the LSGIs with more concentration of BPL population within its total population. It is seen that BPL content of population in year 1998 was highest in Nilamel, Velinallur and Elamadu Grama Panchayats (Figure 24.2). So

these LSGIs also need to be given special attention.

1.2. Social Status

The Social status is analyzed for identifying the critical sections within the BPL Population. The aspects analyzed are SC/ ST content, Houseless content, Landless content, Women Headed family content, content of differently-abled people of the BPL population, Health Status, Educational Status, Status of Household latrine facilities

census. The corresponding figures for SC and ST population are 29.75% and 30.17% respectively, indicating that a moderately higher proportion of SC/ST population are workers.

Analysis indicate excessive dependence of STs on agriculture (54.79%) for their livelihood as against just 19.52 % for the total population and for SC's the corresponding figure is 31.09%.

SC and ST content of BPL population is quiet relevant as even today these sections are weaker and their issues are doubled when they fall in the BPL category. It is seen that SC families in BPL population and the SC Content in the BPL population are highest in Kollam Corporation. Obviously the ST population and ST family's content in BPL population are more in the eastern parts in particular, Ariyankavu, Kulathoopuzha and Chithara Grama Panchayats (Figure 24.3 and

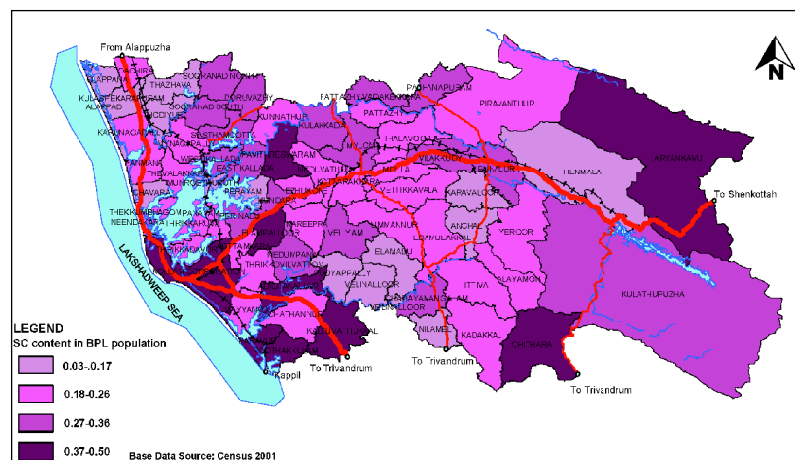


Fig.24.3: LSGI wise distribution of SC content in BPL population

and status of Neighborhood Groups.

In Kollam District 25.87% of total population were main workers as per 2001

Figure 24.4).

The Landless Content of BPL population shows that concentration of landless families is more in Chavara, Thekkumbhagam, Thazhava, Pathanapuram, Thrikovilvattom, Neendakara, Panmana, Oachira and K.S Puram Grama Panchayats (Figure 24.5).

Government of India put emphasis on social sector planning with appropriate policy and programme initiatives, so that the poor and vulnerable segments of the population could get access to essential commodities, facilities and services based on their need. The social sector planning envisages expansion and improvement of social infra structure including housing. The poor lives in slums and squatters and their housing conditions and living environment

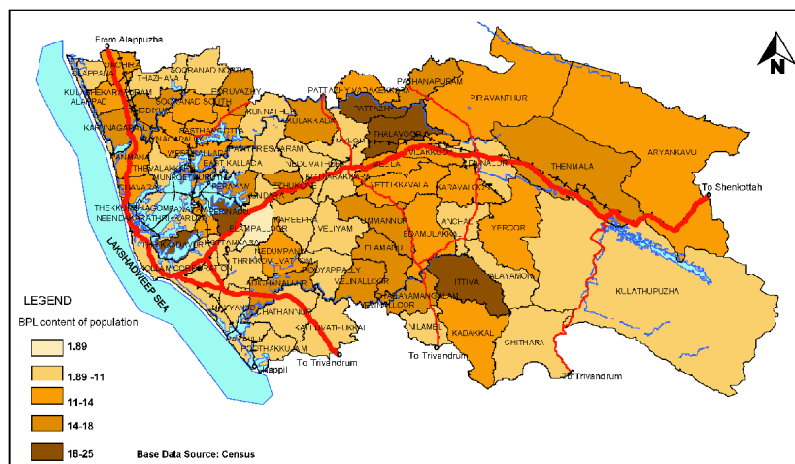


Fig.24.2: LSGI wise distribution of BPL content of total population

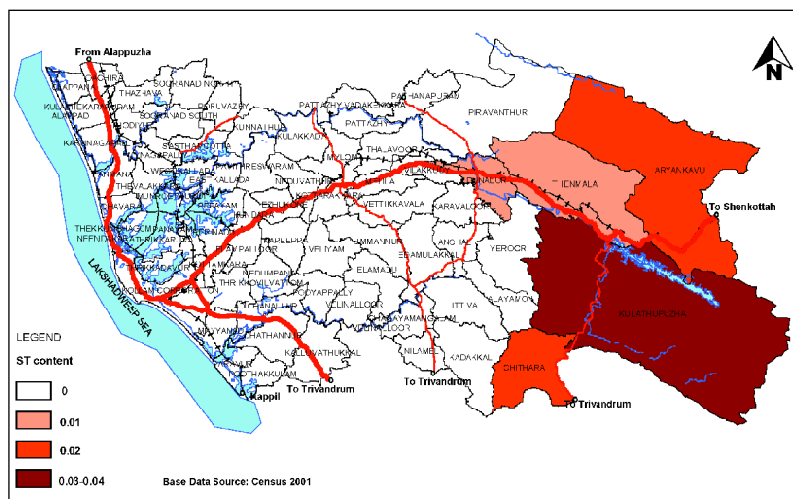


Fig.24.4: LSGI wise distribution of ST content in BPL population

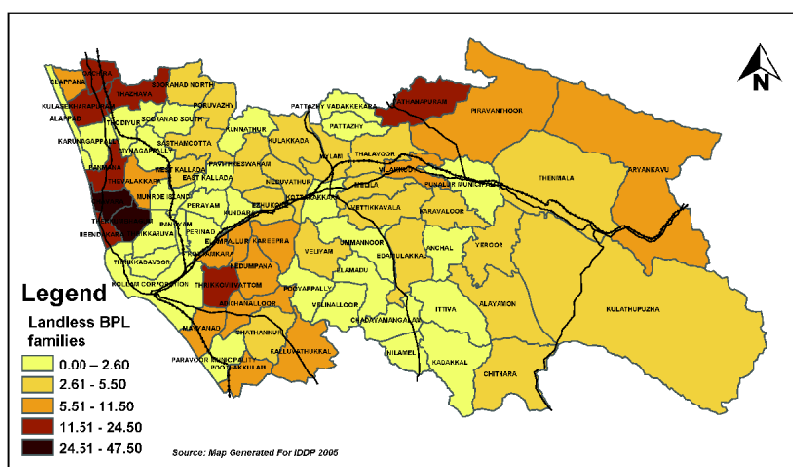


Fig.24.5: LSGI wise distribution of landless BPL families

are equally deplorable. Poor people in rural areas live in Kutcha sheds, human beings and cattle live side by side without any light, air and sanitation facilities. They are continuous victims of recurring floods and cyclones and this creates the problem worse. The number of required houses for the period 1991-2002 was estimated as 24.47 millions (Government of India 1998-99).

The Houseless Content of BPL population in the district shows concentration of houseless families more in Alappad (Pre Tsunami), Oachira, Thazhava, Thevalakkara, Alayamon and Aryankavu Grama Panchayats. Generally the concentration is in the Northern coastal area, mid land and high land areas (Figure 24.6). There are nearly 15000 houseless rural poor in the District. It is estimated that nearly 1 lakh houses need upgradation.

As per Article 1.6 of Chapter 18, the spatial distribution of shortage of Household latrines in the district shows that the

coverage of sanitary latrines is less in Kollam Corporation, Punalur Municipality and the Grama Panchayats of Sooranadu North, Perayam, Kunnathur and Kareepra when compared to other LSGIs.

The Women headed families are yet another deprived section. Figure 24.7 reveals that number of women headed

families is more in Piravanthoor, Karunagappally, Mynagappally, Thodiyoor, Thalavoor, Vialkuady, Pathanapuram and Alappadu Grama Panchayats.

Obviously the most vulnerable people among the lot are the birds with broken wings. From the Figure 24.8 it is noted that the number of differently abled people out of 1000 population is more in Aryankavu, Ittva, Chithara, Alayamon, Nilamel, Kulakada, Mylom and Pavithreswaram Grama Panchayats.

Regarding health status, even though the outreach of health institutions is comparatively better in the district, due to lack of infrastructure and human resources in all the three systems of medicine as mentioned in the Article 3 of Chapter 17, the poor are deprived of better health services.

Literacy level is very high due to progressive reforms of the state government from time to time. In Kerala 100% of the children at the age of 5 are enrolled in school and the dropout rate is as low as 1.36%. Compulsory schooling is a major policy of the state. The drop out rate in Kollam district is 0.4%. On analyzing the educational status of the district (as given in the Article 1.1.2 of Chapter 21), it is seen that 60% among the literates are Pre-degree holders and 21% are of holders of Degree and above. This has indirectly resulted in unemployment among educated. Recent studies also reveal that the employability among the educated youth especially the poor and marginalized is below the required standard. Due to many reasons as mentioned in Article 2.1.1

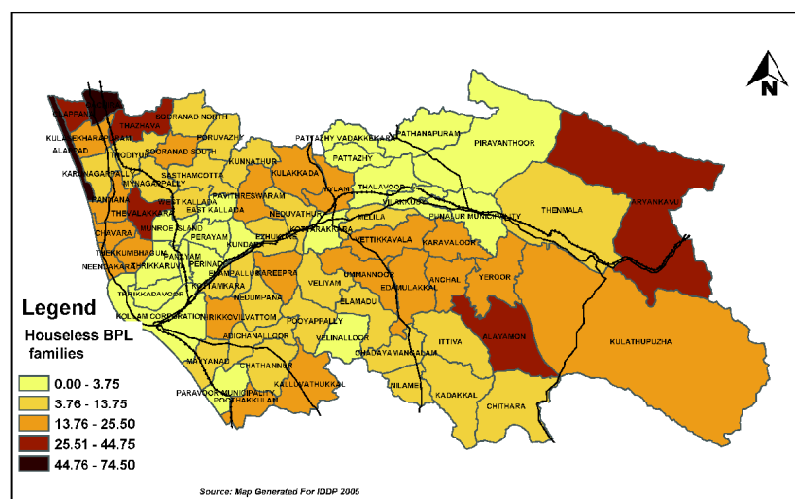


Fig.24.6: LSGI wise distribution of houseless BPL families

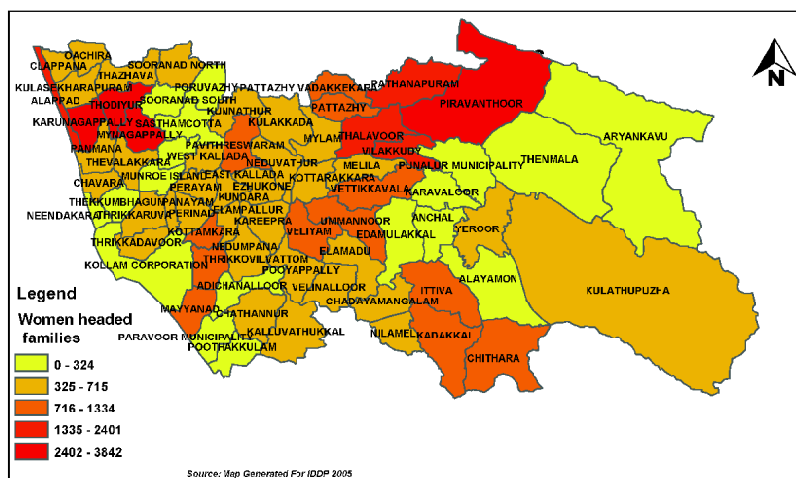


Fig.24.7: LSGI wise distribution of women headed families

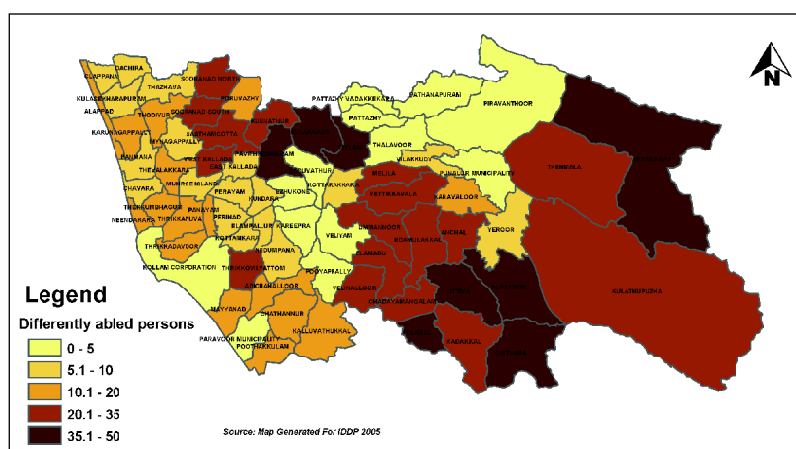


Fig.24.8: LSGI wise distribution of differently abled persons per 1000 population

of Chapter 21, the unaided schools are becoming the major attraction for parents even in rural areas.

In the State of Kerala the Government has introduced a new strategy for addressing the problem of poverty in mission mode. The State Poverty Eradication Mission-KUDUMBASREE was formulated in the year 1998. The women representatives of poor families are organized under Kudumbasree. It is a community based organization aiming to reduce poverty through convergence of various resources and is facilitated by LSGIs. The lowest tier of Community Based Organisation of Kudumbasree is the Neighborhood Group. As on 01/01/2008 there are 12,153 NHGs in Rural areas and 1339 NHGs in Urban areas of the district.

It can be seen that NHGs are scattered all over the district. However it is concentrated in large numbers in Kollam Corporation and the Grama Panchayats of Kulathupuzha, Chithara, Kadakkal, Ittira, Elamudakkal, Piravanthur, Panmana, Thazhava and K.S Puram (Figure 24.9).

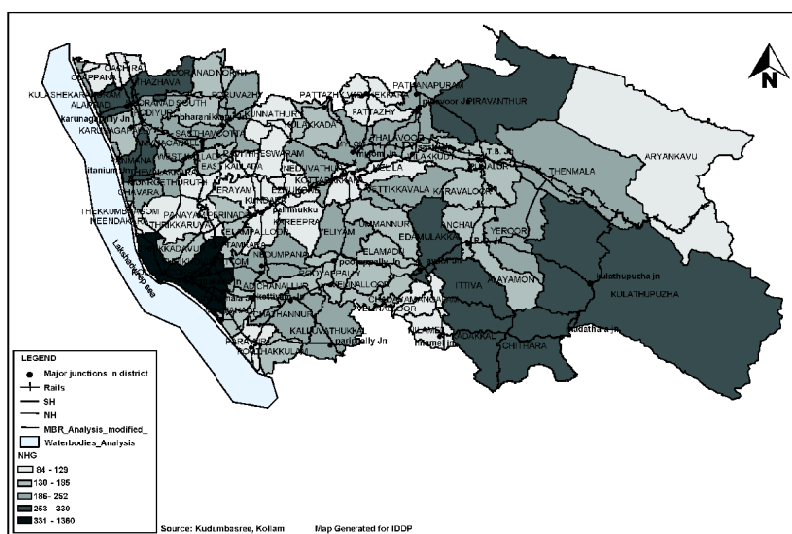


Fig.24.9: LSGI wise distribution of neighbourhood groups

Table.24.1: Urban slum population in Kollam district (1995-96)

Sl.No.	Name of Urban Centre	Total Population	Slum Population
1	Kollam Corporation	361560	13711
2	Paravur Municipality	38652	693
3	Punalur Municipality	47235	9371
Total		447447	23775

Another aspect is the concentration of BPL population in the urban slums. As per the reports of Urban Slums in Kerala (1995-1996), prepared by the Town and Country Planning Department, there are 71 notified slums in Kollam district. Of this 25 are in Kollam Corporation, Punalur has 41 nos. and Paravur has 5 nos. The population details are given in the Table 24.1.

1.3. Economic Status

The economic status of the BPL people is evaluated based on the occupational structure and average annual income of BPL population. The BPL survey conducted during 1998 reveals that the BPL population are mainly occupied as coolie, agriculture labourers, fishermen etc. In Kollam district 58% of workers of the BPL population are coolies and 25% are agricultural labourers (Figure 24.10).

Fig 5.12 in Article 5 of Chapter 5, depicts that there is a drastic change in the occupational structure in the district from 1991 to 2001. There is a shift of agriculture labourers to other workers over the period of time. Also over the years there is a tendency to shift from food based to commercial based crops (Figure 11.43 of Chapter 11). The trend line of area of Food and Commercial crops from 1986- 2004,

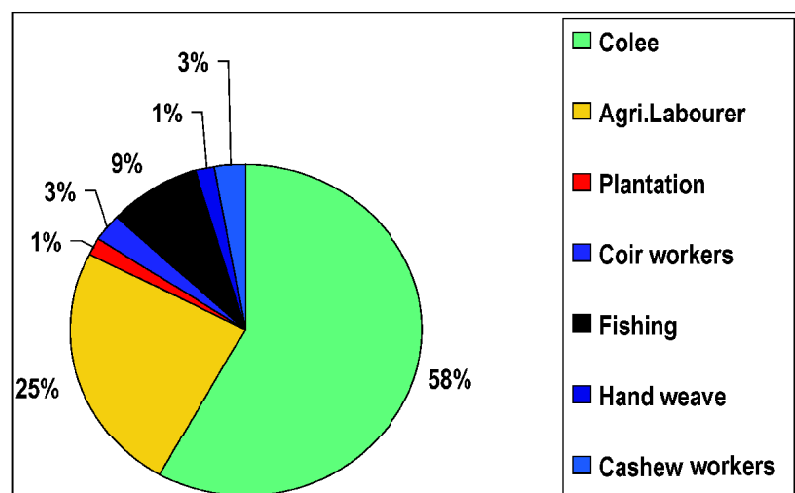


Fig.24.10: Economic status of BPL in Kollam district

clearly indicates the shift in cropping pattern from food to commercial crops. This has resulted in the migration of poor labourers from agriculture to other sectors. This could be the reason of high percentage of coolies among BPL population. In the case of traditional industries, as mentioned in the sectoral analysis of industries (Article 3.1 of Chapter 16) there is steady decline in the handloom and coir sectors which are facing crisis for several years. Since workers in the traditional industries are from among the BPL population, they are directly and severely affected by the decline in the sector. In the case of fisheries, as mentioned in the sectoral analysis (Article 3.1.1 and 3.1.2 of Chapter 15), marine fishing is in the Growth over stage and there is depletion of fishery resources in the inland fisheries sector. This also affects the BPL population as 9% of workers are engaged in the fisheries sector. The animal husbandry sector has become under-remunerative due to declining trend of animal population, increasing cost of inputs of production etc as mentioned in article 3.1 of Chapter 14.

1.4. Implementation of Poverty Alleviation Schemes

In order to have an understanding of the sectors in which the BPL are occupied, a detailed list of Poverty alleviation schemes implemented by Rural Development Department in Kollam for the period 2006-07 is furnished in Table 24.2.

An amount of Rs. 558.856 lakhs has been expended, out of which RS. 257.535 lakhs i.e. 46.08% has been expended for schemes related to Animal Husbandry sector.

The second position comes to Agricultural sector with a constituent share of 18.43%. Industries sectors constitute 18.05%. This analysis shows the importance of Animal Husbandry and Agricultural sectors in the development of BPL population. These Sectors can provide a total assistance of Rs. 2794.28 lakh to 11830 families up to the end of 2011.

From the Figure 24.11 it is revealed

Table.24.2: Poverty alleviation schemes in Kollam district (2006-07)

Sl. No.	Year 2006-07	No. of beneficiary	Amount (in lakhs)	Percentage
1	Agricultural & Allied Activities	465	103.02	18.43%
2	Animal Husbandry	1081	257.535	46.08%
3	Industries	406	100.902	18.05%
4	Handicrafts	29	8.01	1.44%
5	Handloom	33	6.15	1.10%
6	Fishing & Others	165	40.12	7.18%
7	Tertiary Sector Small Handloom	187	43.119	7.72%
Total		2366	558.856	100%

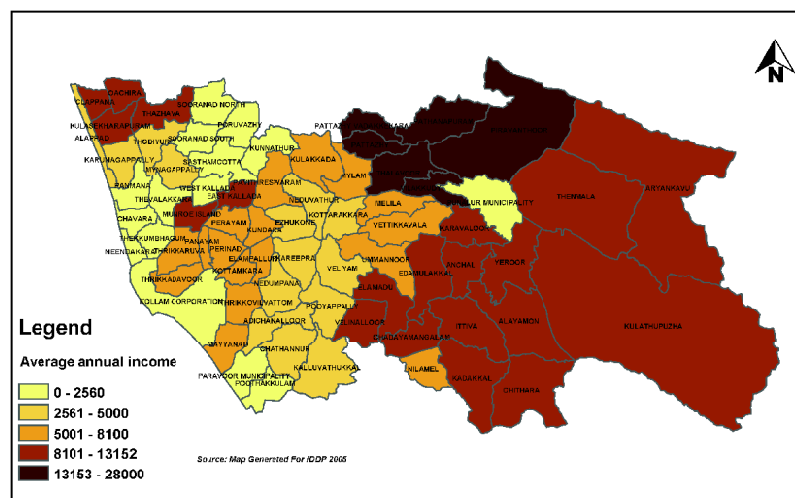


Fig.24.11: LSGI wise distribution of average annual income among LSGIs in Kollam district

that average annual income of BPL families is high in Pathanapuram Block area when compared to other parts of the district. It is less in the urban areas, coastal area and in the North-West part of the district.

From the above analysis it is clear that the job opportunities in the traditional sectors are continuously declining. There is clear disparity in the level of income of the poor in coastal area, mid land and high land. This indicates that BPL population working in the agriculture sector, which in turn has shifted to cash crops, is earning better income than those engaged in the traditional industrial and fisheries sectors.

The economic status of the BPL people is further evaluated based on the savings mentality, entrepreneurship mentality and Velocity of Internal Lending among the NHGs.

One of the important activities of the NHGs is Micro Financing. Micro financing stage is the beginning stage of community action which brings the members of the groups stand together. The members of each NHG will contribute periodically their savings to the thrift account. The NHG will

disburse loan to the members from the thrift account to meet their credit needs. As per the details in rural area, the cumulative amount of thrift collected till 31/12/2007 is Rs.63.67 crores. The total amount of the loan distributed from the thrift comes to Rs. 141.11 crores. In urban areas total amount of thrift as on 31/12/2007 is Rs.5.77 crores and loan distribution from the thrift is Rs.5.97 crores.

In order to satiate the larger credit needs of the members of the NHGs, the NHGs will be linked to Banks through a process of grading. As on 31.12.07 a cumulative amount of Rs.66.77 crores and Rs.1.14 crores have been tapped in Rural NHGs and Urban NHGs respectively. A total number of 9037 NHGs have already been linked with banks. The average investment amount per NHG is Rs.80,000/-.

It is seen that the Savings mentality of people calculated from the deposits in thrift account is found to be more in the Grama Panchayats of Elampallur, Punalur, Elamadu, Clappana, East Kallada, Sooranadu South, Kulathupuzha and Karunagapally and less among urban areas.

Figure 24.12 shows high rate of entrepreneurship mentality among SHGs in the mid land and high land area. It is

group dynamism of NHGs. If an NHG is vibrant in their thrift contribution and availing loans from thrift the VIL will be high. The VIL in Rural area is 2.2. But the VIL in Urban area is 1.03 only.

Velocity of Internal Lending (VIL) among BPL population arrived at from thrift deposits and loans availed shows that the NHGs are active in the Grama Panchayats of Kadakkal, Anchal, Panmana and Mynagapally.

The above analyses reveal that the BPL population is facing issues in both the areas of social and economic development. Still through the incorporation of micro finances there is hope for development in the BPL population.

2. Overall Development Trend

The incidence of poverty in rural areas in India has reduced from 37.30% to 27.10% during the period 1993-94 to 1999-2000. The corresponding figures for urban areas were 32.36 % and 23.6 % respectively. This figure also shows a clear cut trend of diminishing rate of incidence of poverty in India.

In Kerala, the rate of poverty is continuously diminishing. Respective Governments have undertaken several welfare measures and have given importance to minimum needs programme.

is extended to all districts. Measures like increase in stress on education, reservation of seats in Government jobs, increase in women empowerment and empowering weaker sections of the society are also expected to contribute in the alleviation of poverty. The rate of reduction of poverty during 2004-05 is reported as 22 %. A significant fraction of rural population will continue to migrate towards cities making the issue of urban poverty more significant in the long run.

The rate of incidence of poverty during 1993-97 was 25.76% in rural areas and 20.46 % in urban areas. The rate of incidence of rural poverty has reduced to 9.38%, while the rate incidence of urban poverty was stand still. This shows a clear cut diminishing trend of rural poverty and vehement and stand still trend of urban poverty. But this vehemence of poverty in Kerala is controversial. The results of the field level sample survey are against the figure of NSS.

Poverty ratio has declined from 54.90% in 1973-74 to 26.10% in 1999-2000. For rural areas the ratio fell from 56.4% to 27.1% while for urban areas from 49% to 23.6%.

In general according to the present status the poverty is decreasing in the district.

Overall development trend in the poverty sector is analysed based on the following criteria during the previous years

- Savings mentality and Credit absorption
- Entrepreneurship mentality

Trend of Savings mentality and corresponding Credit absorption are analyzed based on Thrift and Internal Loan among NHGs from 2006 March to 2008 March. Both these aspects are found to be increasing over the years (Figure 24.13). Credit absorption from the thrift is also at an increasing rate and the velocity of internal lending has gradually grown to more than 2 (Figure 24.14). This is a positive indication of development of social capital among the organization of poor.

Entrepreneurship mentality is observed by analyzing the trend of NHGs linking with banks. It is seen that not only the number of NHGs linked with banks increases every year but also the amount of credit absorbed. While the internal loans are being used for meeting the

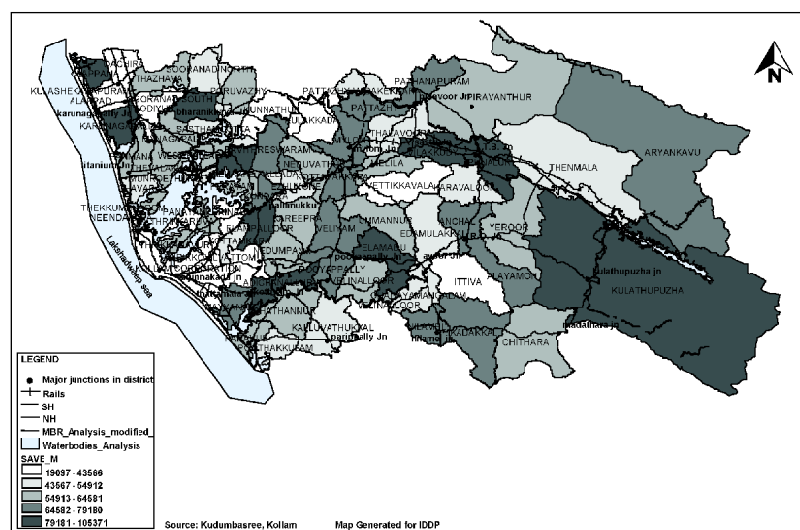


Fig.24.12: LSGI wise distribution of Kudumbasree linkage banking among LSGIs in Kollam district

calculated by analysing the willingness to enter into new ventures by utilising more Bank loan.

Velocity of Internal Lending (VIL) among BPL population is a criterion to assess how much the NHGs are vibrant in their activities. This directly reflects the

As a result the rate of incidence of poverty has been reduced to a considerable extent. The National Rural Employment Guarantee Act promises 100 days of minimum wage employment to every rural household in two hundred districts out of 600 districts in India. In Kerala this scheme

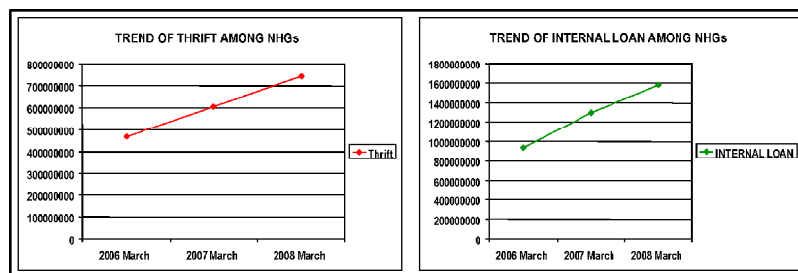


Fig. 24.13: Trend of thrift and internal loan among NHGs

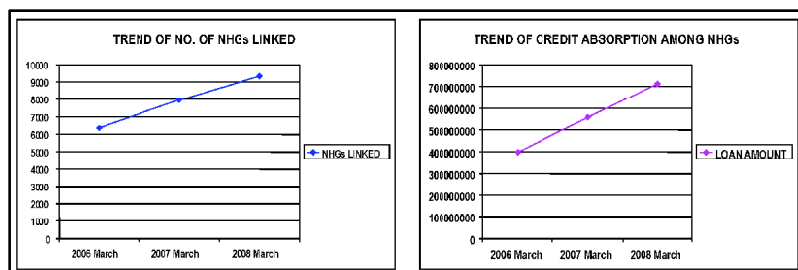


Fig.24.14: Trend of number of NHGs linked and trend of credit absorption among NHGs.

consumption purposes of poor families, the credit absorbed from banks is being used mainly for livelihood purposes.

3. Development Issues

Though the statistics of National Sample Survey points that poverty has been reduced, the issues related to poverty reduction still remains crucial and critical. There arise new problems in the field of food security, shelter, access to safe drinking water, better sanitation, employment, health, education etc. The absolute poor are marginalized even though there are intervention from the part of government departments and LSGIs. This happens to be the after effect of national level policies of liberalization.

The important developmental issues identified in these areas are:-

- Transformation of cultivation from food crops to cash crops leading to migration of labour. Thus the workers among BPL population are forced to migrate from agriculture to other sectors such as coolies, construction works etc.
- Still there are houseless rural poor in the District and also a large no. of shelters need immediate up gradation.
- Coverage of sanitation in BPL families is only 80% and critical in costal areas and habitats of SCs and STs.
- Safe drinking water could not be provided to 20% of rural poor. The situation becomes further critical due to the depletion of ground water level.
- Decline of the traditional industrial

sector and consequent unemployment directly affect the BPL population

- Depletion of sea wealth and consequent unemployment.
- The animal husbandry sector has become under-remunerative for the BPL Population.
- Services from Public Health Institutions are not sufficient to cater the poor. Cost of treatment alienates the poor from availing treatment.
- In the perception of the poor, the quality of public education is not at par with private education the BPL families admit their children in unaided schools and hence education becomes costly which in turn may increase the gravity of poverty.
- Social development and security issues are not well taken care of and addressed timely.
- Poverty reduction strategy through enterprise development does not follow a holistic approach

3.1. Problems

- Problem of landlessness is more in Kareepra, Chavara and Pathanapuram Grama Panchayats.
- Houseless BPL families are more in Aryankavu, Alayamon, Oachira, Clappana, Alappadu, Thevalakara. The problem is also critical in case of slum dwellers in Urban areas.
- Drinking Water: Critical in many parts of the District.
- Sanitation : Mainly Solid waste disposal.

- Health : Inadequate service from Government Hospitals. Private hospitals are not accessible to BPL.
- Lack of nutrition
- Occupational diseases
- Natural hazards like Tsunami, Flood etc. lead the affected to poverty
- Anti Poverty Programmes are implemented without an integrated approach
- Lack of methodology to identify poverty
- Illogical utilization of funds
- Disparity between intensity of poverty and investment of resources
- Poverty reduction approach through women empowerment activities are not at similar wave length all over the district
- Economic development through Community Based Organisations (CBOs) of women has not gained momentum
- A cluster approach has not been developed
- Inherent limitations for development of micro enterprises in Kudumbasree, State/Centrally sponsored schemes etc. as part of poverty reduction activities especially in the areas of product development, marketing strategies, technology accessing etc.

3.2. Potentials

The potential areas of development to alleviate poverty in the district are as follows.

- Intervention through promoting cultivation of vegetables, fruits and ornamental plants etc
- Dairy Development
- Backyard Poultry
- Revamping traditional industries through product development, diversification and technology upgradation
- Judicious exploitation of sea wealth, inland water fish culture, fish processing and value addition measures.
- Micro enterprise development through cluster approach
- Intervention of LSGIs in Health and Education Sector
- Effective network of CBOs of poor women under Kudumbasree
- Flexibility of executing poverty reduction activities in Kudumbasree

in mission mode

4. Agencies Involved

Central Government, State Government, Autonomous Bodies and Private Agencies are involved in the poverty alleviation programmes in the district.

5. Ongoing and Committed programmes

5.1 Swarnajayanthi Grama Swarozgar Yojana (SGSY)

SGSY is a Self Employment programme for the rural poor. Both individual beneficiaries and SHGs are eligible for assistance under this programme. The scheme envisages reduction of rural poverty through Micro Enterprise (ME) development. It is a holistic approach covering all aspects of ME development such as formation of SHGs, capacity building, cluster development, providing credit and subsidy, infrastructure development, marketing etc. The subsidy limit of the programme is as follows:-

Individual (G1) : 30% of project cost
(Maximum limit Rs.7,500/-)

SC/ST/PH – 50% of project cost
(Maximum Rs.10,000/-)

Group : 50% of project cost
(Maximum Rs.1,25,000/-)

5.2. National Rural Employment Guarantee Programme (NREGP)

The NREG Act provides a legal guarantee for 100 days of employment in every financial year to adult members of any rural household willing to do unskilled manual work at the statutory minimum wages (Presently Rs.124/- per day in Kerala). The effective implementation of the scheme will generate additional income to families, thereby reduce poverty.

Adult members of rural households submit their name, age and address with photo to the Gram Panchayat. The Gram Panchayat registers households after making enquiry and issues a job card. The job card contains the details of adult member enrolled and his /her photo. Registered person can submit an application for work in writing (for at least fourteen days of continuous work) either to Grama Panchayat or to Programme Officer.

The panchayat/programme officer will accept the valid application and issue dated receipt of application, letter providing work will be sent to the applicant and also

displayed at Grama Panchayat office. The employment will be provided within a radius of 5 Km: if it is above 5 km extra wage will be paid.

If employment under the scheme is not provided within fifteen days of receipt of the application daily unemployment allowance will be paid to the applicant.

5.3. Indira Awaas Yojana (IAY)

The objective of Indira Awaas Yojana is primarily to help construction of dwelling units by members of Scheduled Castes/ Schedule Tribes, freed bonded labourers and also non- SC/ST rural poor below the poverty line by providing them with grant-in-aid.

The target group for houses under Indira Awaas Yojana is people below poverty line living in rural areas belonging to Scheduled Castes/ Scheduled Tribes, freed bonded labourers and non- SC/ST Categories. A maximum of 40% of the total IAY allocation during a financial year can be utilised for construction of dwelling units for non-SC/ST BPL categories.

Funds to the tune of 3% are earmarked for the benefit of disabled persons below poverty line. This reservation would be horizontal reservation i.e., disabled persons belonging to sections like SCs, STs and Others would fall in their respective categories.

The amount of assistance under this scheme is as given below

Central fund LSGI contribution Total
General - 38,500 + 11,500 = 50,000/-
SC/ST - 38,500 + 36,500 = 75,000/-

5.4. Swarnajayanthi Shahari Rozgar Yojana (SJSRY)

SJSRY is a centrally sponsored scheme for providing gainful employment to the urban unemployed and under employed poor by setting up of self employment ventures. Taking up of wage employment in public works of local bodies implemented through community based organization of the poor is also a component of SJSRY. Under self employment part of this scheme there are two sub components viz (1) Urban Self Employment Programme (USEP) (2) Development of Women and Children in Urban Areas (DWCUA).

5.4.1. Urban Self Employment Programme (USEP)

USEP is the self employment scheme formulated for assisting individual adult members of urban BPL families through

setting up of micro enterprises. This is a bank linked programme supported with subsidy. The project cost of the project is Rs.50,000/- subsidy is 15% of the project cost subject to a maximum of Rs.7,500/- Beneficiary contribution is 5% of project cost. Men and women of BPL families can be assisted under the scheme. Under this not less than 30% of the assisted poor should be women. SC/ST families will get priority over others.

5.4.2. Development of Women and Children in Urban Area (DWCUA)

DWCUA is meant for urban women from BPL families. The women are supported to undertake micro enterprises activities by group in order to generate appreciable income. The minimum size of the activity group is stipulated as ten. It is a credit linked programme. There will be subsidy of 50% of the project cost subject to a maximum of Rs.1.25 lakhs. The per family maximum subsidy is fixed at Rs.10,000/-. The beneficiary contribution will be 5% of project cost. The scheme is implemented in Kerala through the community based network of Kudumbashree.

5.4.3. Rural Micro Enterprises (RME) under Kudumbashree

The members of the Kudumbashree NHGs can access support from this scheme for starting micro enterprises individually, or in group. The minimum size of the group shall be five. Project based financial support is extended by way of bank loan and subsidy. An individual entrepreneur is eligible to get 30 % of the project cost subject to the ceiling of Rs. 7500/-. A group enterprise is eligible to get 50 % of the project cost subject to a maximum of Rs. 1, 00, 000/- (Family ceiling Rs. 10, 000/-) There is provisions to provide and upgrade the skills of the entrepreneur as per requirements.

5.4.4. Yuvasree

The youths (18-35 years age) who have undergone matriculate studies with appropriate capabilities and skills can access subsidy support from this scheme for starting up individual or group enterprise. Both man and women will be assisted. It can also be mixed groups. The pro rate subsidy is same as for Rural Micro Enterprises (RME). There is provision for imparting appropriate skill trainings.

5.4.5. Revolving fund for Micro Enterprises

New group enterprises started under

Kudumbashree supports which function promisingly for 6 months are eligible to receive revolving fund. This financial support can be used for procuring of raw materials, fixed assets etc.

5.4.6. Innovation and Technology supports

The entrepreneurs who take up very innovative activities are eligible to get support from innovation fund. It can also be used for innovating existing enterprises. Funds are available for technology up gradation also.

5.4.7. Lease land farming – production incentives

Kudumbashree members who take up farming activities in a commercial manner (individual – minimum 25 cents, groups- minimum 1 acre) are eligible for receiving production incentives under this scheme. The support is extended for increasing the area of cultivation with the ultimate aim to ensure food security. 20 % of the cost of production of paddy and 10 % of the cost of production of other crops is released as incentives.

5.5 ASRAYA programme

Destitute Rehabilitation and Monitoring Programme known as “ASRAYA” sponsored by the State Government is a community based programme for rehabilitation of destitute families and implemented through

Kudumbashree. In every LSGI there is a sect of poorest among poor who are voiceless due to marginalisation. It is estimated that roughly 2% of families strive to live on their destiny in every LSGI area. They are identified through the NHGs, participatory need assessment is done and project is prepared for their rehabilitation. The integrated detailed project report is submitted to government for special assistance. Presently around 700 LSGIs are implementing the scheme all over Kerala. In Kollam, as of now, 32 Grama Panchayats and one Municipality are implementing the scheme. The State of Kerala will release 40% of the project cost subject to a maximum of Rs.15.00 lakhs as special assistance to LSGIs.

6. Evaluation of Ongoing and Committed programmes

Basic features of the Poverty alleviation programmes are following:-

- To provide land, job training, pension schemes, to make available the services of Public distribution system and to provide houses, latrine etc.
- To provide employment
- To provide primary education, health, drinking water, nutrition etc.
- To ensure community and women empowerment activities

However there are certain critical

issues in this report such as:

- Mismatch of guidelines of centrally sponsored schemes with the Socio-Economic situation of Kerala.
- Unit cost of centrally sponsored housing schemes is very less compared to the approved unit cost of state sponsored schemes

7. Conclusion

From the analysis it is seen that poverty is considerably reducing in the district. However there are certain areas of concern in the development of BPL population. Eradication of slums should be given top priority in urban areas. There are certain areas where the down trodden are generally occupied including Animal Husbandry, Agriculture and fisheries which has good potential in the district. Therefore the development programmes in these sectors should give priority to include the BPL population especially the SC/ST and other socially weaker sections of the society. Also, infrastructure facilities including safe drinking water, electricity, solid waste disposal system etc. should be provided in the BPL concentration areas. Thus in order to have best results in the area of poverty alleviation and rural development, there has to be an integrated approach for poverty alleviation through concerted efforts of Government Departments and LSGIs



Chapter 25

Power

This chapter analyses the existing status and development issues of Power sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on the temporal aspects. the third part probes into the development issues pertaining to the sector and finally the fourth part contains the evaluation of ongoing and committed projects.

1. Analysis of Existing Status

The analysis of existing status of power sector in the district include the different sources of power both conventional and non conventional existing distribution system and consumption details.

1.1. Sources of Electricity

The general sources of electricity are Hydel, Thermal, Wind, Solar, Tidal, Nuclear and Bio mass. Of these sources Hydel and Thermal sources are

conventional energy sources and others are considered as non conventional energy sources.

1.1.1. Conventional sources

During the year 2005-06, the major share of power (about 70%) in India was supplied from Thermal sources, followed by Hydel projects with 26% (Figure 25.1). The contribution of Wind and Nuclear energy sources were the least with 2%

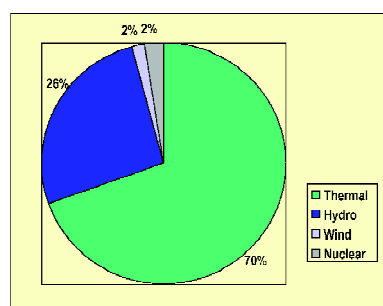


Fig. 25.1: Share in percentage coverage of conventional sources of power (2005-06)

each. Though the cost of power generation through hydel projects is the least, the potential of hydel projects is not being fully utilized in India. In the case of Kerala, Hydel-Thermal-mix during the same period was 31.44: 68.54, major share contributed by thermal energy which includes energy generated from thermal plants inside the state and purchased from outside. In the case of state also, the hydel potential is not fully tapped or used.

The only hydel project in the district is Kallada Hydro electric project which generates about 60 MU of power annually. The power consumption of Kollam district during 2005-06 was 719 MU. Thus the power generation within the district is only 6% of the total power consumed in the district.

1.1.2. Non-conventional sources

(a) Solar energy

Solar energy is utilized for lighting houses in remote areas in the eastern part



Kallada dam

of the district where the conventional method of distribution of electricity is not feasible. ANERT has already installed solar home lighting system in Piravanthur, Aryankavu, Thenmala, Kulathupuzha and Alayamon for 272, 700, 511, 767 and 446 Systems respectively (Figure 25.2.). Minimum 6 hrs sun light per day is required for the functioning of a solar unit. Generally eastern areas are suitable for tapping solar energy.

The solar home lighting system of ANERT consists of 35 watts solar panel and 40 Amp.hr Battery. Using this system, 2 nos. of 9 watts CFL and one number black and white Television can be run.

(b) Wind energy

Area where a wind velocity of 20 to 50 km / hr at a height of 20 m is found suitable for the installation of wind mills. Feasibility study on wind energy is going on in Aryankavu Panchayat.

(c) Bio-waste energy

Generation of energy from bio waste has got an additional advantage of safe disposal of waste. Kollam Corporation has initiated such a project which is intended to generate 1200 units of energy from 10 tonnes of bio waste with an investment of rupees 140 lakhs other than 1.5 acres of land. The bio-gas generation is expected to be 550- 600m³ / day.

1.2. Transmission

The power from generating stations are transmitted through EHV lines to substations, which step down the voltages to 11000 Volts (11 KV) and then sub transmitted through transformers. Transmission net works in the district is given in the Table 25.1.

Transmission net work in the district is shown in Figure 25.3. From this it is clear that the substations are concentrated in the western part of the district. The proposed

Table.25.1: Transmission networks

Sl.No.	Type	Number
1	220 KV sub station	2
2	110 KV Sub station	6
3	66 KV sub station	6
4	33 KV sub station	3
5	Transformers	2672

Madurai-Thiruvananthapuram 400 KV line passes through the district at Chithara, Kulathupuzha and Aryankavu Panchayats. When the spatial distribution of the transformer is analyzed it is again found that transformers are also concentrated in the western part of the district where the density of population is comparatively high.

From the analysis of existing status of transmission network it is assessed that satisfactory power transmission system exists in Kollam District.

1.3. Consumption

The total power consumption of state during 2005-06 is 9950.49 M.U. In the case of district total, power consumption during the same period is 719 M.U and the total number of consumers is 6,72,106. On further analysis of consumption pattern it is found that the maximum power consumption is in the domestic category (73%) followed by commercial 13%. Power consumption in the industrial, agricultural and other categories are 8.8%, 0.29%, and 4.84% respectively (Figure 25.4).

In the case of consumers also, majority of consumers are in the Domestic category (84%), followed by Commercial consumers (13.75%). Industrial (1.35%) and Agricultural category (0.9%) shows poor representation. The analysis of LSGI wise spatial distribution of power consumption revealed that the coastal belt, i.e. west side of the district consumes more power than the eastern belt (Figure 25.5).

The analysis of existing status of power sector in the district shows that hydel and thermal power are the major sources of electricity in the State, conventional energy sources are not fully utilized and majority of the power is supplied from outside the District.

2. Overall Development Trend

Generally the share of power generation through Hydel projects is decreasing in Kerala from 1998 to 2005.

During 98-99, the hydel thermal mix

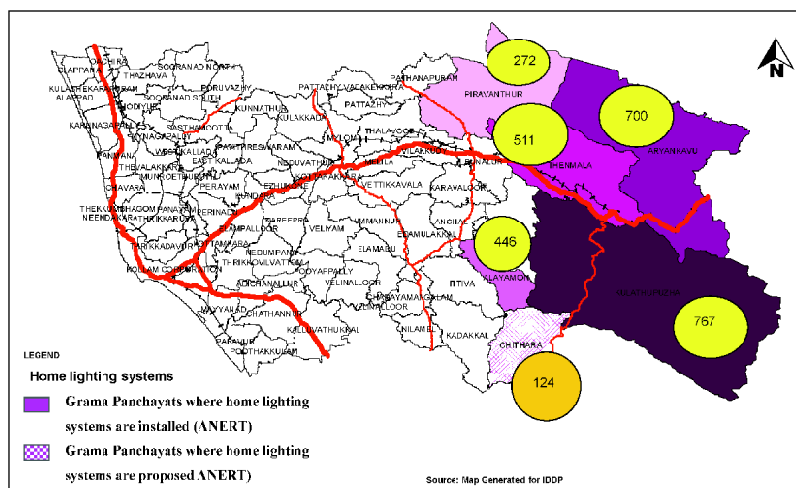


Fig.25.2: LSGI wise distribution of home lighting systems

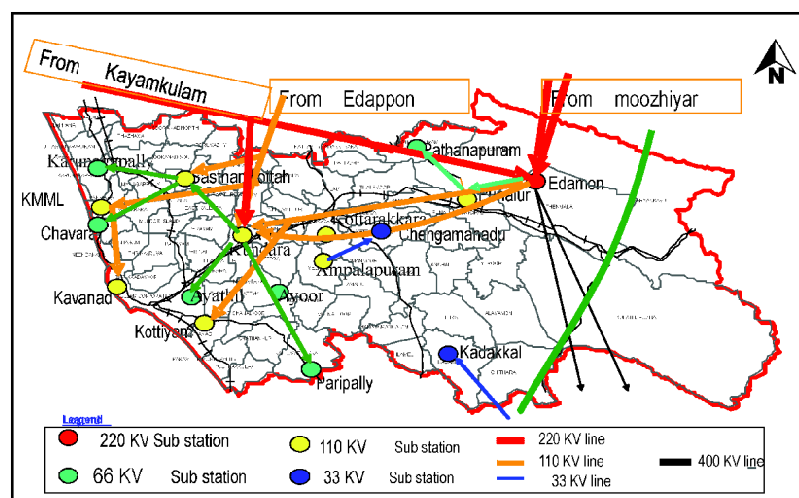


Fig.25.3: LSGI wise distribution of transmission lines in Kollam district

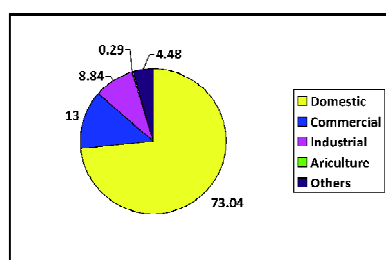


Fig.25.4: Category wise power consumption details – Kollam

the thermal share will increase in the coming years which will affect the economy of power sector of the district as majority of the required power in the district is obtained from outside the district. The solution would be to tap all hydel potentials on a war-foot manner.

Power Consumption in the district is steadily increasing from 582.59 M.U in

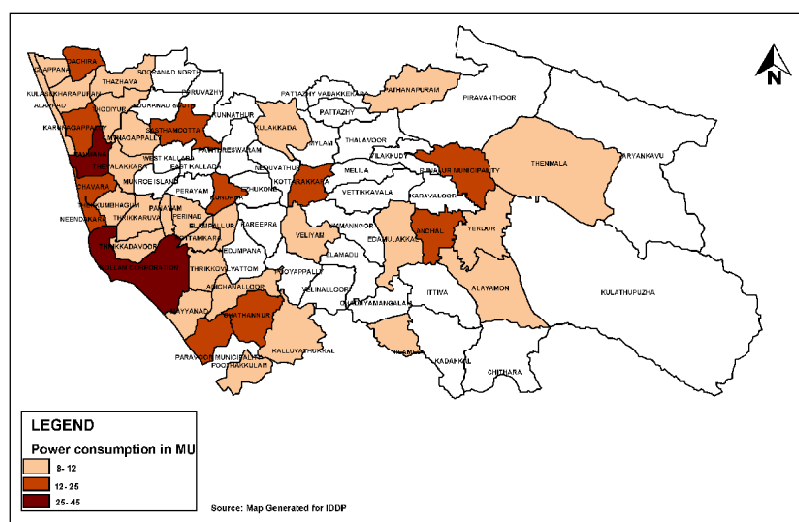


Fig.25.5: LSGI wise LSGI wise distribution of power consumption

was 67:33 which is drastically changed to 38.3:61.7 during 2003-04 and 2004-05 (Figure 25.7). If this pattern is continued,

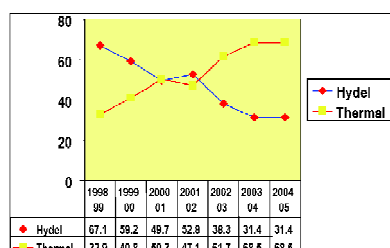


Fig. 25.6: Trend in hydel/thermal (in %) mix in Kerala (1998-2005)

2001 to 719 M.U in 2006 (Figure 25.7). The average growth rate of power consumption is 4.31%. From the category

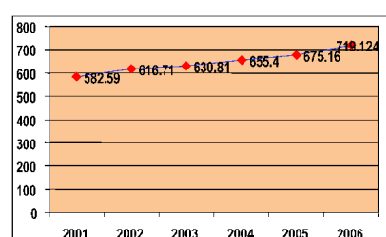


Fig.25.7: Trend in Total power consumption

wise analysis of past data on consumption, it is found that the power consumption for Domestic, Commercial, Industrial, Agricultural and HT sectors has varied in 2001 from 23.9%, 22.2%, 2.1%, 12.88% and 1.8% respectively to 73%, 13%, 8.8%, 0.29%, and 4.84% respectively in 2005. This shows poor commercial and

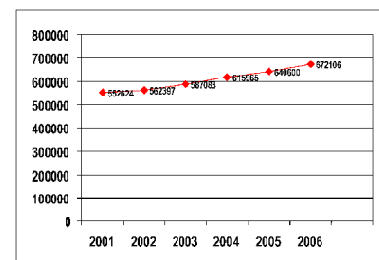


Fig.25.8: Trend in Total number of consumers

industrial growth in the district.

The number of consumers is also steadily increasing from 2001 to 2006 (Figure 25.8). The average growth rate is about 4% which is almost in line with the average growth rate of power consumption. The growth rate is maximum for the domestic consumers (4.6%) followed by commercial consumers (3.6%). The average annual growth rate for Industrial (2.21%) and Agricultural consumers (0.6%) are comparatively less.

Analyzing the overall development trend it is seen that there is an annual growth of 4% in power consumption, major share of power is consumed for domestic purposes, commercial sector shows significant growth with respect to the power consumed, Industrial sector shows the lowest growth rate and coastal stretches of Kollam consumes more power than other area.

3. Development Issues

3.1 Problems

From the analysis of the distribution of Un-electrified Houses among LSGIs, classification of LSGIs based on the number of un-electrified areas and low voltage area in the district it is seen that the Grama Panchayats in the North and North- Eastern part of the District viz. Poruvazhy, Kulathupuzha, Edamulakkal, Ittira, Chithara, Aryankavu, Yeroor, Pattazhy Vadakkekara, Kunnathur, Pattazhy, Mylom, Melila, Neduvathur, Pavithreswaram, Piravanthur, Thenmala, Alayamon, Anchal, Kadakkal, and Karavaloor are identified as the problem

areas as far as power sector is concerned. In these areas unelectrified houses and unelectrified areas are comparatively more. Also in these areas low voltage problem exists (Figure 25.9).

affected by voltage problem, power has not reached isolated places and there is no separate building for KSEB. As per Local level analysis report of Edamulakkal, there is voltage problem, there are places not

problem, non availability of continuous power, no. of connections beyond the capacity of transformers, old and inefficient power lines etc are the major issues. As per the Local Level Analysis Report of Chithara, there is no power connection in Wards 3 & 5. As per the Local Level Analysis Report of Aryankavu, there is voltage problem, less no. of transformers, lack of power lines etc. are the major issues. As per the Local Level Analysis Report of Yeroor, there are places not reached by power, lack of street lights etc. As per the Local Level Analysis Report of Pattazhy Vadakkekara there is voltage problem, there are places not reached by power and no office for KSEB etc.

The major problem in power sector is found that non-conventional Energy sources are not utilized. Majority of the power is supplied from outside the District and major share of power is consumed for domestic purposes not by the production sectors.

3.2. Potentials

The main potential of power sector in Kollam district is that satisfactory power transmission network is available in the district. Also the scope for generating power from non conventional energy sources is another potential.

4. Evaluation of On going and committed projects

The details of ongoing and committed projects in power sector are given in Table 25.2.

It can be seen that only to certain extent the on-going and committed projects and programmes will be able to solve the identified issues in the power sector.

5 Conclusion

As far as the power sector in Kollam is considered there is acute shortage of power in the district when generation and consumption are compared. The consumption is by and large for domestic purposes and to some extent for commercial purposes showing lack of growth in the production sectors. So when the existing policies are focusing on economic development, the insurgence in the production sectors in future will effect in a huge power shortage in the district. There is also spatial disparity in the availability of power in the eastern parts of the district. So there has to be effective utilization of energy resources in the district including non conventional energy resources while minimizing losses during transmission.

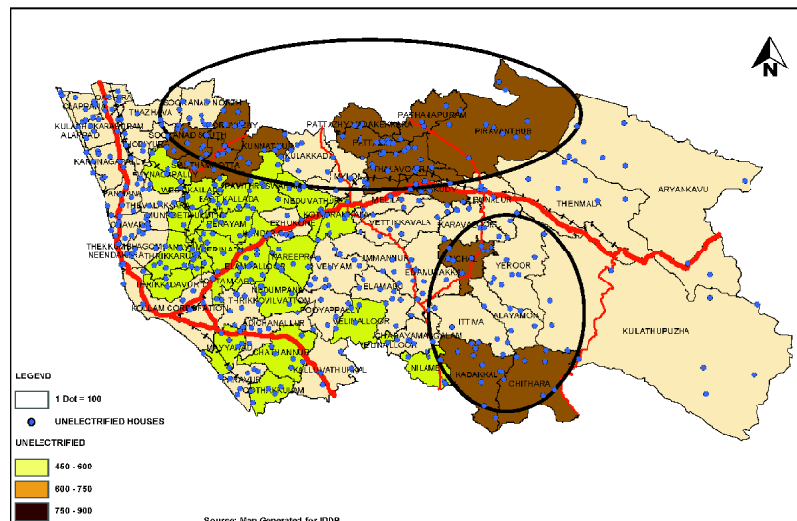


Fig.25.9: LSGI wise distribution of un electrified houses

These are also corroborated in the Local level analysis reports and Grama Sabha Reports of these LSGIs. As per Local level analysis report of Poruvazhy, many places are affected by voltage problem. As per Local level analysis report of Kulathupuzha, most of the places are

reached by power, usage of low quality equipments, excess usage of power by the rich, no separate building for Ayoor Major Section are the major issues. As per the Local Level Analysis Report of Ittina, none of the wards in the Grama Panchayat have complete power coverage; there is voltage

Table.25.2: List of ongoing projects

Sl. No	Name of Station	Voltage in KV	Capacity in MVA	LSGI	On going and committed works on Transmission side
1	Chengamanad	33	10	Melilla	Work completed
2	Ezhukone	33	10	Ezhukone	Work completed
3	Adichanalloor	33	10	Adichanalloor	Work started
4	Parippally	110			Work started (upgradation of existing 66KV sub station)
5	Chavara	110		Chavara	Work started (upgradation of existing 66KV sub station)
6	Anchal	66		Anchal	Work started
7	Kannanalloor	33	10	Thrikovilvottam	Sub Station Sanctioned, but site acquisition pending
8	Paravoor	33	10	Paravoor Municipality	Sub Station Sanctioned, but site acquisition pending
9	Pooypally	33	10	Veliyam	Sub Station Sanctioned, but site acquisition pending
10	Puthoor	33	10	Kulakkada	Sub Station Sanctioned, but site acquisition pending
11	East Kallada	66		East Kallada	Sub Station Sanctioned, but site acquisition pending
12	Thevalakkara	66		Thevalakkara	Sub Station Sanctioned, but site acquisition pending

Table.25.3: List of committed projects for sub stations

Sl. No	Name of Station	Voltage in KV	LSGI
1	Perinadu	110	Thrikadavoor
2	Paravoor	110	Paravoor Municipality



Chapter 26

Scheduled Castes and Scheduled Tribes

This chapter analyses the existing status and development issues of Scheduled Castes and Scheduled Tribes sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on the temporal aspects. The third part probes into the development issues pertaining to the sector and the fourth part contains the analysis of ongoing and committed projects and programmes.

1. Analysis of Existing Status

A glimpse on the present social and development aspect of SC and ST in Kollam District is inevitable for the formulation of projects for further development of these communities. There are more than 60 SC communities in the SC list and about 35 ST communities in the ST list for the state. However, only the following SC

communities are generally seen in the district viz Pulayan, Cheramar, Kuravan or Sidhanar, Chakkiliyan, Cheruman, Kakkalan, Mannan, Nayadi, Pulluvan, Panan, Parayan, Sambavan, Thandan, Vannan and Vetan. Vetan and Nayadi are the most vulnerable among the SC.

In Kollam District, to a great extent, Scheduled Castes have co-equal social status with rest of the members of the society. They have social recognition. Untouchability is not prevalent in the District in its evil form.

Their economic lot has also been substantially improved when compared to their conditions two decades back. Roads, drinking water, electricity etc. were made available to 2/3rd of their habitats or dwelling places. Thousands of houses have been built by themselves with government grants. 60% of the landless families have been rehabilitated.

1.1 Demographic Characteristics

1.1.1 SC Population

People belonging to SC reside in almost all parts of the district (Figure 26.1). According to the census figures of 1971 to 2001, SC population has been steadily increasing in Kollam District. In 2001 census SC Population was 322805. The corresponding figure in 1991 census was 305717.

SC content of the state population is 9.8% whereas SC content of Kollam District is 12.5%. SC content is relatively high in the eastern high land region and also along Kallada and Ithikkara river basins (Figure 26.2). These areas are the principal agricultural belt in the district cultivating variety of crops including plantation crops. SC content is low in coastal LSGIs and Perayam, which are devoid of paddy fields and major coconut plantation areas.

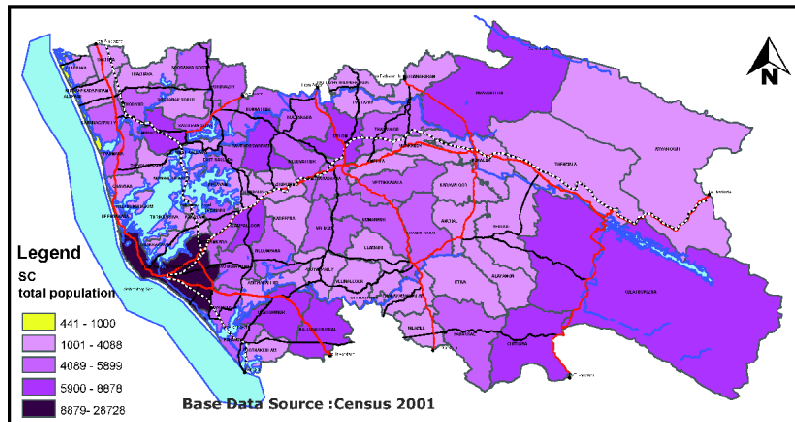


Fig.26.1 LSGI wise distribution of SC total population (2001)

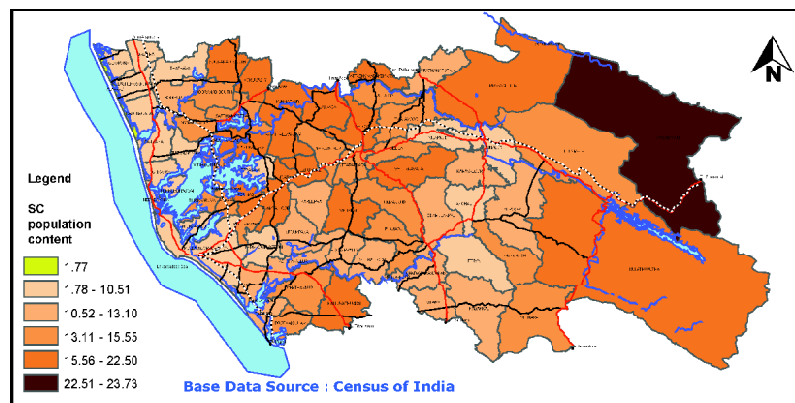


Fig.26.2 LSGI wise distribution of SC population content (2001)

The shift in SC population content within the LSGIs of the district during 1981-2001 periods is depicted in Figure 26.3. Over the period the concentration of SC population in the high land sustained. Increase in SC content is mainly around the Kallada river basin and its environs.

1.1.2 ST Population

As per 2001 census ST population in the district is 5193 which is 0.2% of the total population of the district. Kollam district has the 3rd least ST population in the state, just behind Alleppy (0.15%) and Ernakulam (0.16%) districts. From 1981

onwards ST population shows an increasing trend. ST population is mainly concentrated in the eastern hilly and forest regions especially in Kulathupuzha, Aryankavu and Thenmala Panchayats. However some communities among STs, have been seen residing in midland coastal area too (Figure 26.4).

Though ST population is gradually getting distributed to some areas other than hilly and forest areas, it cannot be attributed to a population shift. 14 LSGIs do not have any ST population. The concentration of ST population in the eastern high land areas is attributed to the existence of forest; as their major source of livelihood is from forest. ST population is maximum in Kulathupuzha GP in the year 2001. By 2001 ST population extended to most of the LSGIs in the District. However the concentration is marginal (Figure 26.5) with the highest concentration in the eastern high land. ST penetration outside the highland is still relatively marginal. Presence of ST population in Kalluvathukkal Grama Panchayat is due to a hostel for ST students.

Growth rate of SC and ST population has been studied based on 1991 and 2001 population census figures. High growth rate has been recorded in the North Western and South Western parts of the district. In Elampalloor Grama Panchayat growth rate was found to be exorbitant, though the Grama Panchayat was formed only 10 years back. So there may be errors in the calculation of growth rate in this LSGI.

1.2 Literacy and Sex Ratio

About 94% of SC has educational access up to higher secondary level, out of which 30% have higher education. Figure 26.6 shows that 83.8% has passed metric. This requires consideration while formulating education and employment policy for the district.

Sex ratio among SC and ST communities has been analyzed. The sex ratio is lowest (1994) in Karunagappally. The consolidated SC population in the midland region contributes to high Sex ratio. Midland is basically an agricultural area. Historically, SC population is an agrarian community. Eastern region, though has high SC content, has relatively low Sex ratio. SC population consolidation has not yet taken place in this region having relatively poor facilities.

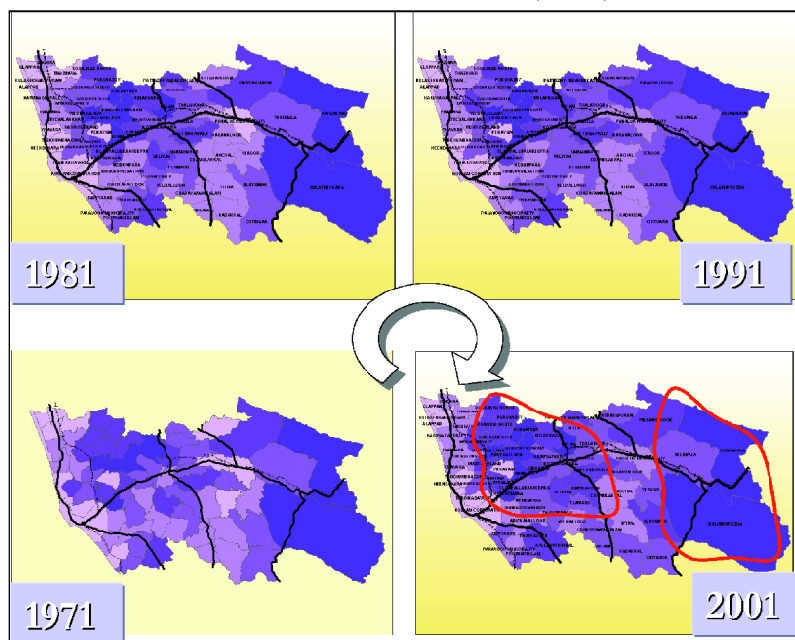
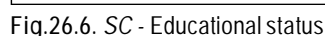
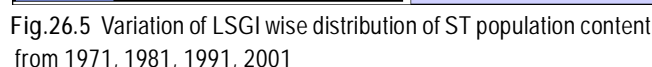
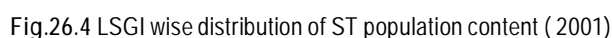


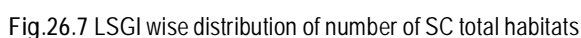
Fig.26.3 Variation of LSGI wise distribution of SC population content from 1971, 1981, 1991, 2001



of employment.

In 2001 most of the LSGIs show sex ratio >1000. However the high land region is showing gradual reduction when compared to the district average.

Sex ratio among ST is maximum in Elampallur and Thrikkovilvatom GPs. The



1.3.1 Scheduled Caste

Around 65% of the SC population is settled in colonies. These colonies are located in all parts of the district except in Alappad Grama Panchayat with concentration in the coastal and mid lands (Figure 26.7). From time to time Government formulated schemes for the integrated development of SC colonies, for which some of such colonies were identified and christened as 'Ambedkar Gramams' and 'IHDP Colonies'. But their number is much less when compared to other colonies. It is seen that still there are infrastructure shortages in various colonies. The spatial distribution of number of habitats with water shortage shows that habitats with water shortage are found more in Punalur, Kareepra and Veliyam. Pattazhy Vadakekkara and Pathanapuram have 6 habitats with water shortage. Power shortage is maximum in Kulathupuzha, Piravanthur, Nilamel and Sasthamcottta. Majority of the LSGIs are benefited with power supply.

Colony concept is beneficial to inhabitants since investment in infrastructure development can be made for a cluster of families comprising not less than 10 SC houses. But socially, the colony concept is unacceptable.

1.3.2 Scheduled Tribe

ST people are also settled in colonies known as 'Oorukootams'. Such Oorukootams are located in the eastern part of the district especially in Kulathupuzha, Aryankavu and Thenmala Grama Panchayats (Figure 26.8).

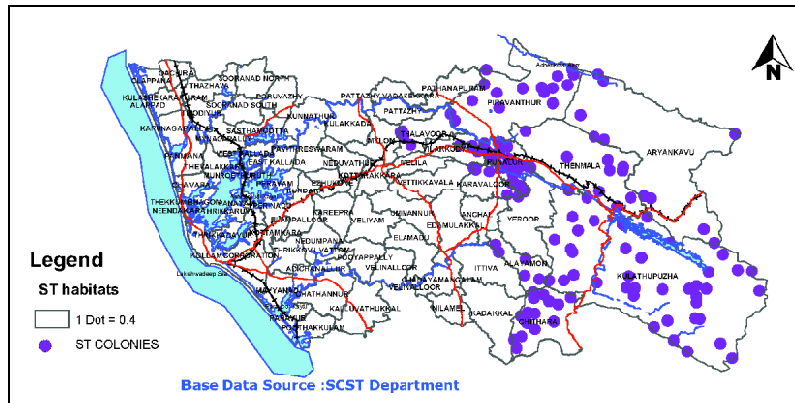


Fig.26.8: LSGI wise distribution of number of ST habitats

1.4 Occupational Pattern

1.4.1 Scheduled Caste

Occupational pattern among SC's is a mirror of their living conditions. A study reveals that large chunk of workers among SC population are ordinary workers, around 49% agricultural labourers and cultivators (Figure 26.9) and around 22%

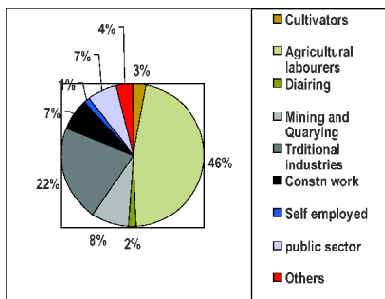


Fig.26.9: Occupational pattern among SC population

are workers in traditional industries like cashew and coir etc.

A distressing point is that only 3% of the SC population are cultivators because they do not own and possess land to the required extent. (Details of landless SC is given in Article 1.6). But, SC population is predominantly an agrarian community. Around half of them are agricultural labourers. A quarter of them are engaged in traditional industries, predominantly rooted in agriculture related industries. Around 3/4th of the SC population is dependant on Agriculture and allied industries for their livelihood. Their participation in Govt. service is much below in proportion to their population.

The number of people involved in unclean occupation such as scavenging etc. (data based on stipend given to children of those who are engaged in unclean occupation) is maximum in Kollam Corporation (Figure 26.10). About 209

people are involved in this occupation in Kollam Corporation.

1.4.2 Scheduled Tribe

As far as the occupational pattern of ST population is concerned, 53% are

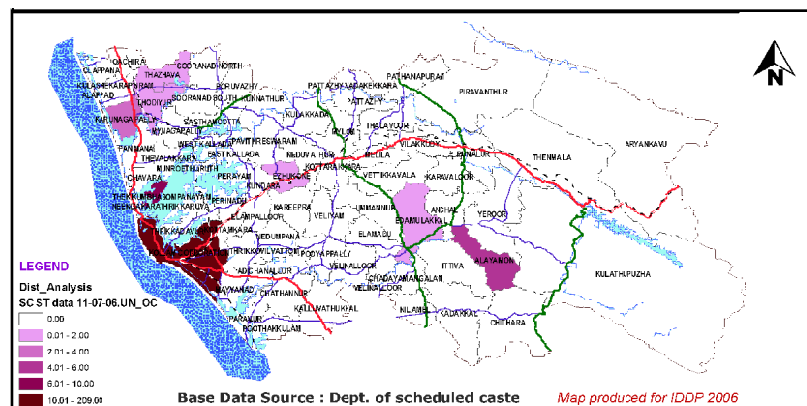


Fig.26.10: LSGI wise distribution of unclean occupation among SCs

agricultural labourers (Figure 26.11). But one of the striking features is that 15.23% are cultivators because more land is available with them. 18% are engaged in

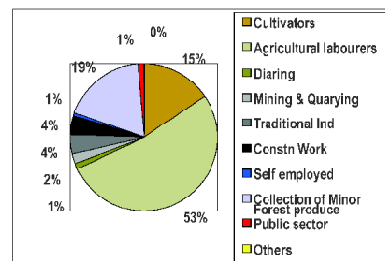


Fig.26.11: Occupational pattern among ST population

collection of forest products. Their representation in Govt. service is very nominal.

1.5 Social Backwardness

Centuries old social taboos deprived them of education, employment and possession of economic assets. They were denied basic human rights and were put under the lower strata of the society. These

things together led to the social and economic backwardness of SC and ST, quite a lot of them live in abject poverty and lack facilities for a decent human life. Their hapless living situations are revealed through the study of BPL content, proportion of landless and houseless, level of unemployment, absence of electricity, lack of drinking water etc.

1.5.1 SC Population Below Poverty Line

BPL content of SC population is studied at LSGI level and it sheds light on the fact that the BPL families are concentrated in the eastern region of the District with highest concentration in Aryancavu, Alayamon, Vettikkavala, Mylom and Kulakada. This needs further study since where SC population is high; ratio of poverty is also high. High rate of BPL is

due to lack of gainful employment and absence of income generating assets.

In mid land region BPL level is moderate and in urban areas too it is not severe. The lowest number is in Alappad Grama Panchayat (96) and highest in Kollam Corporation (4032) as shown in Figure 26.12. Poverty among SC is high in the entire highland and parts of midland. Poverty among SC in the midland area assumes significance, as the area has larger SC population. Urban poverty among SC is less severe. BPL content of scheduled caste population is maximum in Nilamel and Thrikkadavur Grama Panchayats.

1.5.2 ST Population Below Poverty Line

The study of BPL families among STs reveals that they are concentrated in Kulathupuzha Panchayat (Figure 26.13). The number of BPL ST families in other ST dominated Panchayats are also high. Poverty among ST is high in the entire

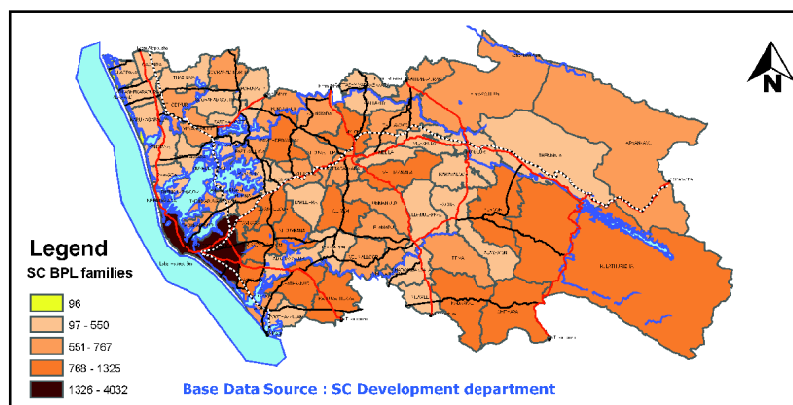


Fig.26.12: LSGI wise distribution of number of SC BPL families

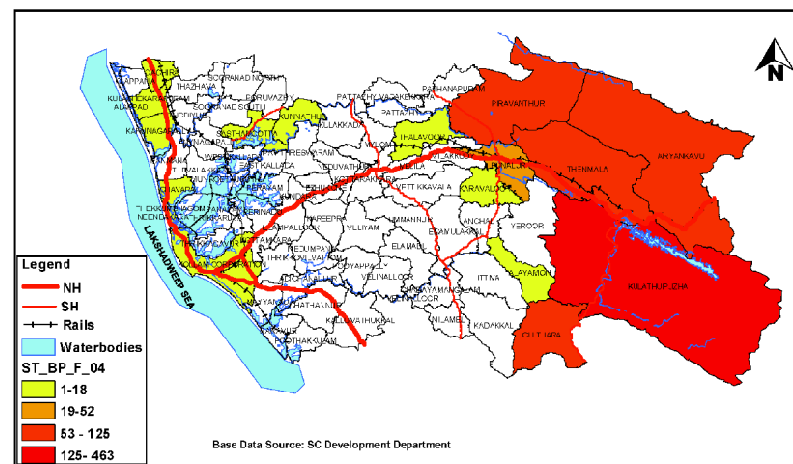


Fig.26.13: LSGI wise distribution of number of ST BPL families

highland and parts of midland.

1.6 Landless

1.6.1 Scheduled Caste

Ownership of a piece of land is a symbol of social recognition. Distribution of land is highly skewed towards general community. We have seen that only 3% of SC population is cultivators. This discloses the fact that land holding by SC's is very nominal. Latest figures show that 5,320 SC families are landless. A person is identified

as landless if he does not own even 2 cents of land. An analysis of LSGI wise distribution of landless shows that, the problem is not much severe in the Eastern region. But in Kollam Corporation area it is severe since rehabilitation of landless is very difficult due to high cost of land, non-availability of land etc.

Landless SC population is maximum in Alappad (Figure 26.14). Landlessness among SC is considerable (w.r.t District

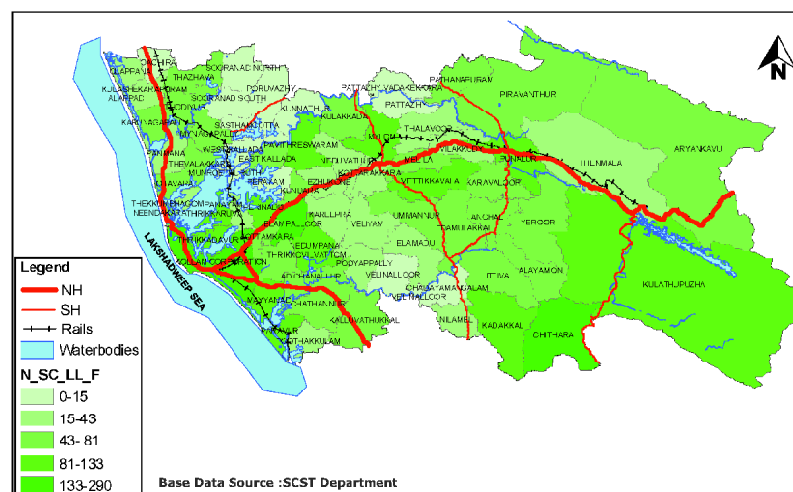


Fig.26.14: LSGI wise distribution of number of SC landless families

average) in the areas to the north of Kollam Corporation (low land and midland), Southern mid land and Northern high land.

1.6.2 Scheduled Tribe

Landless ST families are less in number compared to landless SC families. However landless ST families have a concentration in Aryancavu and Thenmala Grama Panchayat. Some landless ST families are also seen in Chithara Grama Panchayat also. The landless ST families are maximum in Aryancavu and Thenmala (Figure 26.15).

1.7 Houseless

1.7.1 Scheduled Caste

Shelter is one of the basic needs of human being. Houseless are those who have land for constructing houses but do not have proper house. In Kollam district 5870 SC families still remain as houseless. They are distributed throughout the district. The problem is severe in Chadayamangalam, Mukhathala and Anchal Blocks.

The spatial distribution shows that houseless ST families are maximum in Kollam Corporation and the Grama Panchayats of Chithara and Elampallur. Content of houseless SC population is maximum in Alappad and minimum in Sasthamcotta, Kunnathur and Poruvazhy Grama Panchayats (Figure 26.16).

In the district the Eastern areas and some LSGIs in midland are showing greater values of houseless SC content.

1.7.2 Scheduled Tribe

Problem of houseless among ST needs special attention as fairly a large number of families are houseless though they own land. They are mainly settled in Kulathupuzha, Chirithara, Piravnthoor and Aryancavu Grama Panchayats (Figure 26.17). Houses are yet to be provided to those families rehabilitated in Kuriottumala as part of the programme for providing cultivable land to landless ST families.

1.8 Unemployment

An analysis of the status of unemployment among SC and ST reveals that the problem is acute. Unemployment among educated SC, especially those having Degree, P.G. B.Ed., TTC and other technical and professional qualification is very high despite reservation. In the district, a total of 22027 SC/ST people are registered in employment exchanges.

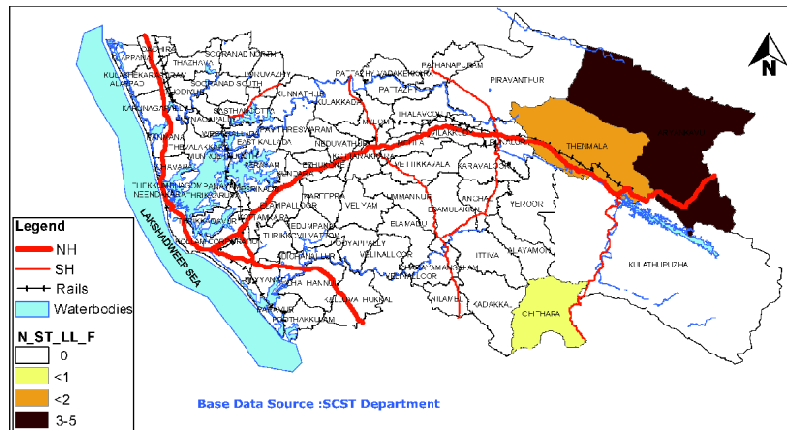


Fig.26.15: LSGI wise distribution of number of ST landless families

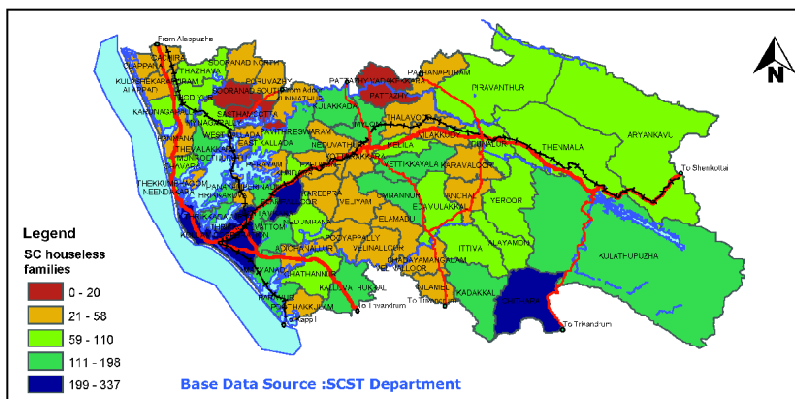


Fig.27.16: LSGI wise distribution of number of SC houseless families

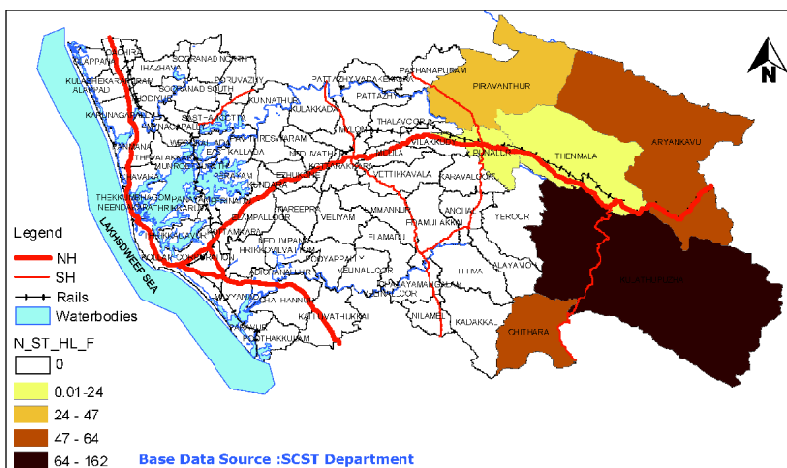


Fig.26.17: LSGI wise distribution of number of ST houseless families

1.9 Un-electrified Houses

1.9.1 Scheduled Caste

Consumption pattern of electricity is considered as a yardstick of development. As far as SC and ST population are concerned quite a large number of their houses are un-electrified and hence consumption of electricity is very low. Concentration of unelectrified houses is more in Kollam Corporation and

Kulathupuzha Grama Panchayat. In Kollam Corporation it could be due to the presence of slum dwellers. In Kulathupuzha it is due to those settled in and around forest who are experiencing difficulty in extending electric line because of the restrictions imposed by forest authorities. Un-electrified houses content is highest in Chadayamangalam (42%) and lowest in Neendakara (7%) Grama Panchayats

(Figure 26.18).

1.9.2 Scheduled Tribe

About 20% of ST houses are yet to be electrified. Such houses are concentrated in Kulathupuzha, Thenmala, Chithara and Aryancavu Grama Panchayats (Figure 26.19).

2. Overall Development Trend

The SC and ST population in the district have separate identity in economic and social development because of their traditional backwardness. There is marked improvement in the overall living conditions. Consistent efforts are being made to provide the basic facilities to these communities through different schemes of Govt. and LSGIs. Provision for land, housing, education, employment, drinking water etc., are increasing year after year to mitigate their problems and the community is positively responding to the efforts. We have to sustain the present development trend in the area with accelerated pace of development.

The Overall development trend is analysed based on the following indicators.

- TM % literates male and female
- TM No. of applicants for land
- TM No. of applicants for house
- TM No. of persons engaged in unclean occupation

Both the percentage literates of SC male and female population are showing an increasing trend after a decrease (Figure 26.20). The number of applicants for land is decreasing. This shows the lowering of landless population which is a positive trend. The number of applicants for house is also decreasing (Figure 26.21). This shows the lowering of houseless population which also is a positive trend. The involvement of LSGIs and other agencies have contributed to this.

The number of persons engaged in unclean occupation is decreasing after a sudden increase in 2004-2005 (Figure 26.22). However in absolute numbers they remain the same. The overall development trend shows that there is considerable improvement in the general status of SC population in the district.

3. Development Issues

3.1 Problems

- (1) SC population is mainly concentrated in colonies, especially those located in rural areas and ST population is concentrated in the hilly forest areas in the eastern part of the district.

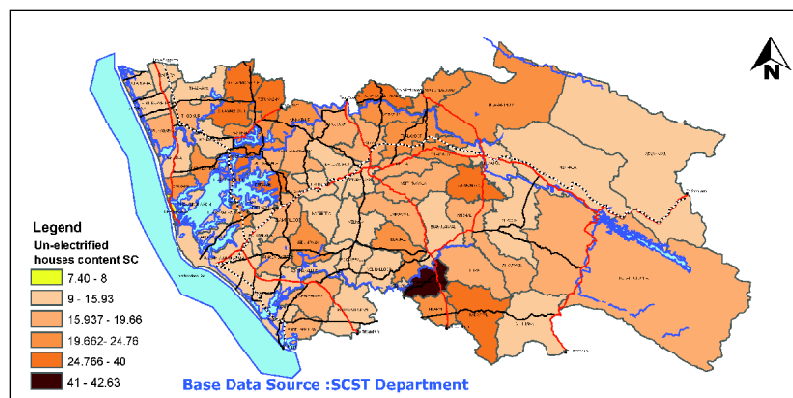


Fig.26.18: LSGI wise distribution of number of un-electrified houses content of SC population (2004)

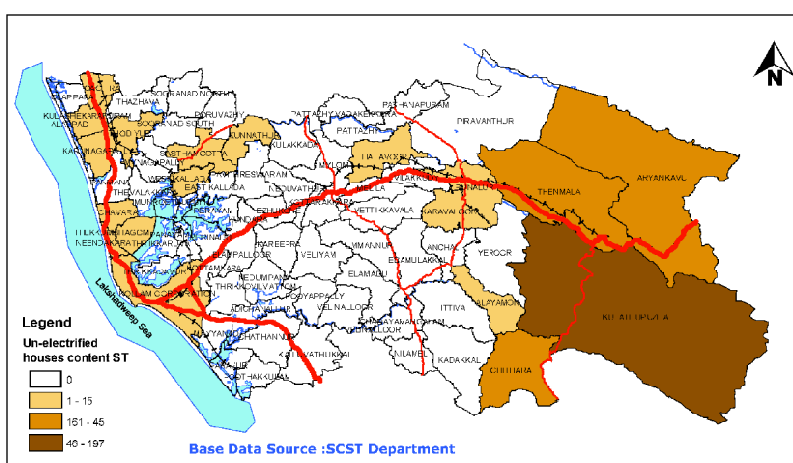


Fig.26.19 LSGI wise distribution of number of un-electrified houses content of ST population (2004)

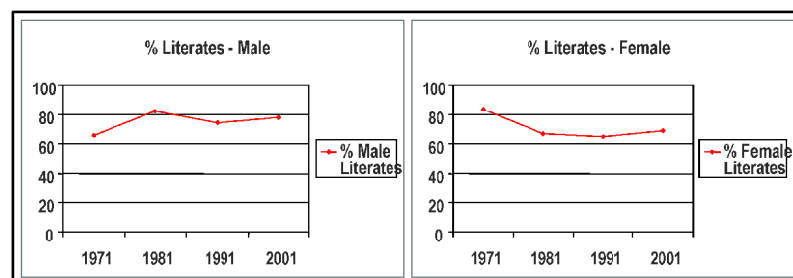


Fig.26.20: Trend in Percentage of literates - Male and Female

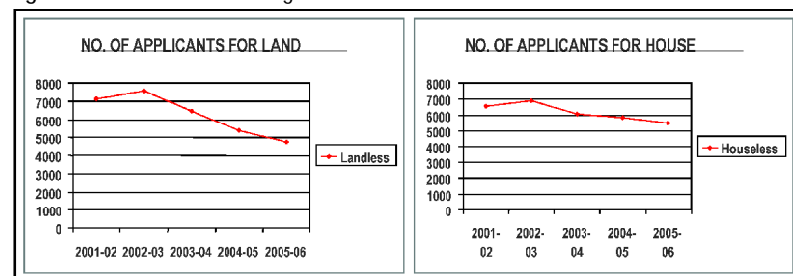


Fig.26.21: Trend in number of applicants for land and houses

- (2) Educational backwardness.
- (3) High dropout from schools and colleges
- (4) Acute unemployment.
- (5) Lack of entrepreneurial ability

- (6) Increasing number of landless people
- (7) Lack of safe drinking water
- (8) Lack of basic amenities in the habitats such as electricity, road etc.
- (9) Caste based problems still persists.

- (10) Lion share of the working population among SC and ST are engaged in low paid, unskilled work.
- (11) Human right violations against SCs and STs.
- (12) Exploitation by intermediaries.
- (13) Impact of liberalization and privatization.

3.2 Potentials

Govt.'s financial assistance for education at all levels, reservation in educational institutions as well as for employment in Govt. sector are major potentials. A minimum of 10% of budget allocation at State level and 22% at national level is mandatory for the development of SC/ST. Compared to State average the existing educational status and employment level in the district are higher.

4. On going and Committed Projects and Programmes

Existing projects and programmes can be broadly grouped into two.

- (a) Implemented by SC and ST development department
- (b) Implemented by Local bodies

4.1 Departmental Programmes

Departmental Programmes are again classified into

- (1) Educational development programmes
- (2) Social Development Programmes
- (3) Economic Development programmes

4.1.1 Educational Development Programmes

By considering the educational backwardness of SC and ST numerous programmes have been formulated by the Govt. for the overall educational development of these communities. Major schemes are enlisted below.

1. Pre-Primary Education

In departmental nurseries lumpsum grant, uniforms and feeding charges are given. In other Govt. nursery schools only lumpsum grant is given.

In Kollam District there are 6 Pre - Primary schools under SC Development Department as given in Table 22.1.

In these schools, besides free child education, Rs.5/- per child per day is given for mid-day meals and two sets of uniforms are provided at a cost of Rs. 200/- for a child per year and Rs. 100/- given to each SC student as lump-sum-grant. 25% of seats of these schools are reserved for non SC students and they are also given

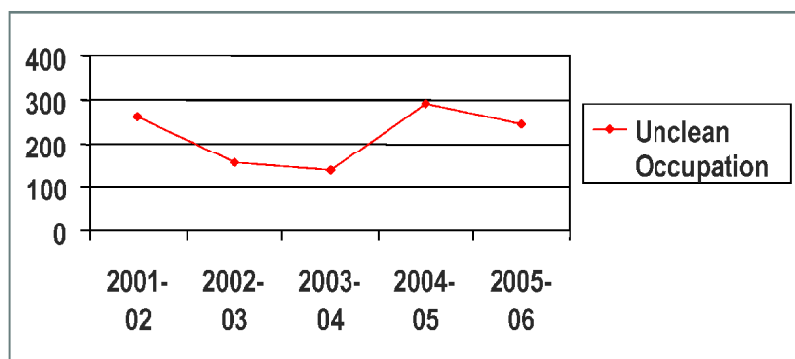


Fig. 26.22. Trend in number of persons engaged in unclean occupation

Table 26.1 Pre-primary schools under SC Development Department

Sl No.	Location of Nursery School	Panchayat / Municipality	Taluk	Govt / Rent	Capacity	Strength during 2007-08 SC	Strength during 2007-08 Other
1	Chaloorikonom	Kottarakkara	Kottarakkara	R	50	27	4
2	Veliyam	Kottarakkara	Kottarakkara	R	50	28	8
3	Kulakkada	Vettikkavala	Kottarakkara	G	50	25	5
4	Kadaykamon	Pathanapuram	Pathanapuram	G	50	28	6
5	Vilakkudy	Pathanapuram	Pathanapuram	G	50	23	7
6	Gracing Block	Punalur Municipality	Pathanapuram	G	50	25	7

all benefits except lump sum grant.

2. Pre-matric Section

In Govt. and aided pre-metric schools lump sum grant alone is being given. In recognized unaided schools in addition to lump sum grant, tuition fee at the prescribed rate is reimbursed. In model residential schools, entire expenditure on education upto 12th Standard is met by Govt. Meritorious students are selected and send to residential schools under better education schemes – entire expenditure up to 10th standard is met by Govt.

3. Post-matric section

In post matric section besides lumpsum grant, monthly stipend is also given. Rate of lumpsum grant ranges from Rs.715/- to Rs.2065/- and monthly stipend Rs.405/- for students residing within 8 K.M. beyond which rate of stipend is Rs.475/-. For those who are residing in college hostels, actual boarding/ lodging charges and pocket money at the rate of Rs 70/-, Rs 100/- and Rs 120/- per month are given for different courses.

4. Reservation of Seats

In all post metric courses there is reservation of seats for SC and ST in the following manner. For Higher Secondary and Degree courses 20% seats are reserved. For V.H. Secondary 12% seats are reserved. For other technical, Professional and P.G. Courses reservation is 10%.

5. Pre-matric Hostel

In Kollam district there are 8 Pre-matric Hostels, 5 for boys and 3 for girls. Admission to these hostels are open to students from 5th standard onwards. The inmates are given pocket money is given at the rate of Rs. 70/- per month and two sets of uniforms in addition to food and accommodation. Feeding charge per student per month is Rs.700/-.

6. Post-matric Hostel

There are two Post-matric hostels in the district located at Amrithakulam in Polyathode. Feeding charge per student is Rs.900/- per month. Besides, pocket money is given at the rate of Rs. 65/- and Rs.80 /-per month for the respective courses they are studying.

7. Special Incentive

Special incentive is given to SC/ST students who score 60% or above marks from S.S.L.C. onwards.

8. Book Bank Scheme

For the use of SC/ST students studying in professional courses one set of costly reference books are provided for two students each. Financial assistance under this scheme is given to the head of institutions to purchase the recommended books and to keep them in the colleges for issuing to the students for reference.

9. Financial assistance is given to SC/ST students who failed in S.S.L.C/ Higher Secondary/Degree examinations for 2nd appearance.

10. Parallel Stream students are also given educational benefits just like that of regular students.

11. Ayankali Talent Search Scholarship is given to meritorious students in pre matric section.

12. Financial assistance i.e., ad hoc grant and monthly stipend is being given to the children of those engaged in unclean occupation. This benefit is available irrespective of caste or religion.

13. Educational benefits to those studying in self-financing institutions (technical and professional courses) are also given lump sum grant, monthly stipend and tuition fee and other fees at higher rate.

4.1.2 Social Development Programmes

1. Housing Grant

Housing grant to houseless SCs and STs at the rate of Rs.75,000/- and Rs1,00,000/- respectively is given to each selected beneficiary for constructing dwelling houses with concrete roof.

2. Rehabilitation of landless

An amount of Rs.45,000/- is given to each selected beneficiary for purchasing 3 cents of land in Panchayat areas. Rs 50000/- is given to a selected beneficiary in Municipality area for purchasing 2 cents of land and Rs.60,000/- is given in Corporation areas for purchasing 1 ½ cents of land.

3. Interest free Housing loan

A loan up to Rs.1,00,000/- shall be given to those having annual income up to Rs.50,000/-.

4. A special scheme has been evolved for the rehabilitation of vulnerable communities among SC's like Vetan, Nayadi etc, under which assistance is being given for a composite scheme for purchasing land and constructing house at the rate of Rs.75000/- for land and Rs.75,000/- for house.

5. Assistance to inter-caste marriage couples: An amount of Rs.20,000/- is given to inter-caste married couples who are experiencing financial difficulty and social isolation.

4.1.3 Economical Development Programmes

1. Self – employment schemes for educated unemployed

A separate scheme has been formulated with a component of bank loan

for setting up self-employment ventures. Projects costing up to Rs.3,00,000/- will be considered for subsidy assistance. Subsidy will be 1/3 of the project cost, subject to a maximum of Rs.1,00,000/-.

2. Apprenticeship scheme

For certificate holders of ITI/ITC, Engineering Diploma and Engineering Degree a separate apprenticeship programme has been launched to impart more skill in the trade in which they qualified. Stipend at the rate of Rs.2000/-, Rs. 2500/-, Rs.3000/-respectively will be given.

4.2 Projects and Programmes implemented by Local Bodies

LSGI's are implementing various schemes for the development of SC's and ST's. There are State sponsored and Centrally sponsored schemes and projects formulated and implemented with plan funds of LSGIs.

Some of such major schemes are:

- (1) Housing scheme under IAY and with plan fund.
- (2) Rehabilitation of landless with plan fund.
- (3) Training schemes for up gradation of skills.
- (4) Projects for development of infrastructure such as water supply, electricity, road etc.

5. Evaluation of On-Going and Committed Projects and Programmes

5.1. Educational Development Programmes:

(a) Pre-primary Education.

Number of departmental nursery schools for imparting preprimary education to SC and ST students are quite inadequate in the district. Hence a proposal for setting up of one departmental nursery school in each block where there are no departmental nursery schools, shall be submitted along with final proposal.

(b) Pre-matric Education:

There are adequate numbers of primary schools in the district, either in Government or in aided sector to admit all the SC students who seek admission. So there is no additional requirement, moreover Government have very recently increased lump-sum-grant payable to them by 50%.

(c) U.P. and High School:

There are sufficient number of U.P and High Schools in Kollam district, and there

is no problem in getting admission in these schools as far as SC and ST students are concerned. Amount of lump-sum-grant per student per month has been increased to Rs. 240/- and Rs.330/- respectively.

(d) Post matric Studies:

Post matric studies include Higher Secondary, Degree, P.G, Professional Courses and other Technical Courses. As far as Higher Secondary education is concerned almost all the SC and ST students who seek admission can get admission, because of the 20% reservation provided in plus one course and 12% reservation provided in Vocational Higher Secondary Course. Hence, there is no additional requirement of seats. Same is the case as far as Degree and Post Graduate Courses are considered. But in Professional and Technical Courses, inadequacy of seats is a problem. So some suggestions shall be included in the final proposal for setting up of certain technical institutions exclusively for SC and ST. A proposal shall also be formulated so as to provide special coaching to SC and ST students in entrance examinations for professional courses because of poor performance of SC/ST students in such competitive examinations.

(e) Reservation of Seats:

Present rate of reservation may be maintained as per State policy.

(f) Prematric Hostel:

There are eight prematric hostels for SC and three prematric hostels for ST students. Quite often seats are not fully filled in these hostels and there is no additional requirement.

(g) Post matric hostels:

There are only two post matric hostels which are located at Polayathode, Kollam. Two more post-matric hostels, in central and eastern parts of the districts, are essential.

(h) Special Incentives:

The scheme is a novel one and no change is required.

(i) Book Bank Scheme:

Some changes are required in this scheme because the benefit of this scheme is not fully available to the SC and ST students. The required changes are to be brought in at the departmental level.

(j) Tutorial System:

The scheme indented for failed students in different courses from S.S.L.C. onwards, but it lost its importance due to grading

system. The rate of assistance is to be enhanced after departmental level assessments.

(k) Assistance to Parallel Students:

No further change is required in this scheme.

(l) Ayyankali Talent Search Scholarship:

In Kollam district this scheme is not vigorously implemented due to lack of proper guidance. Selection of students may be done on the basis of a scholarship examination.

(m) Grant to children of those who are engaged in unclean occupation:

No further change is required in this scheme except for increasing the rate of grant.

(n) Educational benefits to students studying in Self Financing Institutions:

This scheme is vigorously implemented in the district without any lapse. No further modifications are required.

5.2. Social Development Programmes

(a) Housing Grant:

This is one of the important and prestigious schemes of the department. Major portions of the Corpus Fund is spent for this purpose. Recently, rate of assistance has been increased from Rs. 70,000/- to Rs. 75,000/-. But when compared to the steep increase of cost of building materials and labour charges the amount of grant is insufficient. The rate of assistance need to be enhanced.

(b) Rehabilitation of landless:

Very recently, the rate of assistance has been substantially increased. In Grama panchayats for purchasing three cent of land Rs. 45000/- will be given, whereas in Municipality and Corporation areas the rate of assistance will be Rs.50000/- and Rs.60000/- for purchasing two cents and one and a half cents of land respectively. No further modifications are required at present.

(c) Interest free Housing Loan:

This scheme is intended for those who are above poverty line. The scheme is to be modified to the following extent to suit the changing situations. Income limit need to be suitably raised (say to Rs.1,00,000/- from Rs.50,000/-) and loan amount also need to be increased to say Rs.2,00,000/-.

(d) Special Scheme for vulnerable communities:

Modifications has been introduced

recently hence no further suggestions.

(e) Assistance to Intercaste marriage couples:

This assistance is given to those who are under hard circumstances due to intercaste marriage. So the assistance should suffice for making a decent livelihood. So the amount of assistance has to be increased from Rs 20000/- to Rs 50000/-.

5.3. Economic Development Programmes:

(a) Self Employment Scheme:

This scheme gives the maximum subsidy to self employment ventures, to the tune of Rs. 1,00,000/- to individual projects and Rs.3.5 lakhs to group projects. So no modifications are required.

(b) Apprenticeship Scheme:

The scheme is to be revitalized. Rate

of stipend need to be increased, since stipend under Apprenticeship Act is higher than what is given by the department. Moreover, action need to be taken to bring the scheme under the Apprenticeship Act so as to enable the students to attend all India Trade Test.

The overall ongoing schemes, departmental as well as those implemented by local bodies, are formulated with maximum care so as to suffice the requirement of SC/ST people. Hence total revamping of the aforesaid schemes is not required. Some changes are required due to the compulsions of change in time.

6. Conclusion

From the analysis it is seen that the major issues regarding the SC/ST sector

are providing shelter to the houseless Scheduled Caste and Scheduled Tribe families and rehabilitation of landless Scheduled Caste and Scheduled Tribe families. The existing educational assistance also need additional support for including Pre-Primary Schools, Pre-Metric Studies and Post - Matric Studies. Post-Matric Hostels and other facilities are also required in this sector. It is seen that still there are SC/ST concentrated areas in the district having insufficient drinking water, power, sanitation facilities etc. Another area of concern is the unemployment prevailing among the SC/ST. These are all the aspects to be considered for carving the future development programmes in this sector **n**



Chapter 27

Tourism

This chapter analyses the existing status and development issues of Tourism sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on the temporal aspects. The third part probes into the development issues pertaining to the sector and finally the fourth part contains the evaluation of ongoing and committed projects.

1 Analysis of Existing Status

In recent times 'Tourism' has emerged as one of the few economic alternatives to develop the State economy. It has been recognized as an important sector for the development on account of its potential for generating income and employment. In the context of deprived prospects of the manufacturing sector and the severe threats facing agricultural and traditional sectors and the uncertainties facing

expatriate employment, tourism is considered as one of the sectors, which can drive Kerala economy to take the State to the pinnacle of socio-economic development. Kerala stands unique in the matter of its rich tourism experience keeping the customs and traditions of the State intact, at the same time receptive to new ideas and alien culture. Sandwiched between the Western Ghats and the Arabian Sea, Kerala is blessed with unmatched natural diversity that provides immense scope for tourism. One of the reasons for the sustaining success of Kerala Tourism is its' continuous efforts on improving the existing tourism products and innovating new tourism products. Houseboats, Ayurveda, eco-tourism, Medical Tourism etc. are examples of tourism products which are inter-sectoral in nature and showing tremendous success.

Kollam, the erstwhile 'Desinganadu' is

the pride of Kerala. The old sea-port town on the Arabian coast, Kollam stands on the Ashtamudi Lake. Historically Desinganadu attains significance as a reputed commercial center from the era of Phoenicians and the Romans. Fed by the Chinese trade, it was regarded by Iban Batuta, as one of the five chief ports, which he had seen in the course of his travels during a period of twenty-four years, in the 14th Century.

The rulers of Kollam and China, exchanged embassies and there was a flourishing Chinese settlement at Kollam. Merchant Suleiman of Siraf in Persia (9th Century) found Kollam to be the only port in India, touched by the huge Chinese junks, on his way from Canton to Persian Gulf. Marco Polo, the great Venician traveler, who was in Chinese Service under Kublakhhan in 1275, visited Kollam and other towns on the west coast, in his capacity as a Chinese mandarin. The

Portuguese were the first Europeans to establish a trading center at Kollam in 1502. Then came the Dutch followed by the British in 1795. A British garrison was stationed at Kollam in pursuance of a treaty between Travancore and the British. Velu Thampi Dalawa of Travancore did much for the improvement of Kollam town. He built new bazaars and invited the merchants from Madras and Tirunelveli to settle here. Kollam later became the capital of the enlightened and liberal rulers of Desinganadu. It was the nerve center of the rebellion organized by Velu Thampi against the British. Once a city of palaces, Kollam has been known to the outside world, by the time honored proverb- "Kollam Kandavanu Illam Venda" (once you have seen Kollam you would no more need your home).

The city of Kollam located 71 Kms to the north of Trivandrum, the State capital, is the center of cashew trading and processing industry. Thirty percentage of the historic city is covered by the renowned Ashtamudi lake, making it a gateway to the magnificent backwaters of Kerala. A large number of tourists from all parts of the world are visiting Kollam every year to enjoy the enchanting beauty of the place. The specialty of Kollam is that it offers all that Kerala can offer i.e. beaches, backwaters, wildlife etc. in a short stretch of 90 kms across.

The district is blessed with evergreen vegetation with a large variety of flora and fauna, spreading over Thenmala, Punalur, and a portion of Achancoil forest division. The analysis of existing status of tourism in Kollam has been covered by studying the various aspects viz. tourism attractions, tourist traffic, infrastructure, and tourism circuits.

1.1 Tourism attractions

The tourism attraction of Kollam is based on its vibrant landscapes. Kollam provides a miniature of Kerala with representations of all its products. So, all forms of tourism like Nature based tourism, Heritage tourism, Cultural tourism, Pilgrim Tourism, Adventure Tourism are having strong base for development in the district. The location specific details of major tourism attractions are given in Appendix 26-1.

1.1.1 Nature based Tourism

The tourism industry strongly relies on

the natural beauty of the region. It occupies a predominant role in the scope of development of tourism. Kollam is blessed with abundant beauty of its Backwaters, Beaches, Wildlife, Hill stations, Rivers etc. The district has tropical humid climate, with an oppressive summer and plentiful seasonal rainfall. The hot season lasting from March to May is followed by the southwest monsoon from June to September. The northeast monsoon occurs from October to November. The rest of the year is generally dry. The LSGI wise spatial distribution (Figure 27.1) shows that the Nature based tourism spots are maximum in Kollam Corporation, Paravur and Thenmala (3 each).

backwaters. The estuary where sea meets the backwater in Pozhikkara and Thekkumbhagam area are scenically beautiful areas in Paravur. The location of Paravur is between Varkala and Kollam. Varkala Municipal Corporation enhances its tourism potential as Varkala is a tourist destination which has found place in the world tourism map.

Chittumala chira, Muttara Maruthimala and Ayiramthengu are a few of the natural formations with potential for tourism activities with due consideration for ecological conservation.

The Sasthamkotta lake is the largest fresh water lake in the state of Kerala, which is surrounded by the hills on three

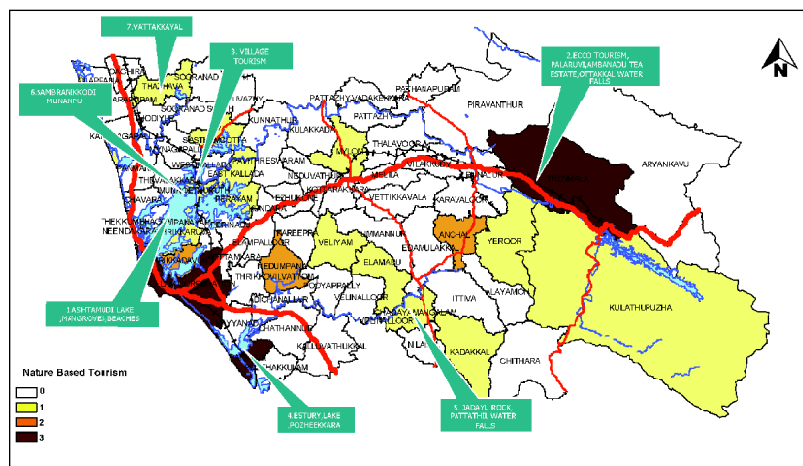


Fig.27.1: LSGI wise distribution of nature based tourism

Thus as far as nature based tourism is concerned Ashtamudi and Thenmala are the two major attractions. The Ashtamudi lake named after of its eight 'arms' or channels is one of the biggest backwaters of Kerala. This lake offers magnificent views of the countryside. Fringed with coconut palms on the shores, the area is pristine and serene. The Chinese fishing nets and the sailed local boats carrying the local coir, copra and cashew is also a rare thing to watch. The variety of fish resources is a 'must-taste' attraction. The mangroves here are very attractive. The shores of Ashtamudi at Clappana, Munroe Island, and Adventure park area are prominent eco-tourism attractions due to the presence of mangroves. The Paravur lake, Edava Nadayara kayals and its shores are unique attractions because of their close vicinity to the Arabian sea. Paravoor has immense potential for development of tourism due to its location on sea coast, presence of backwaters and canals connecting the

sides and is situated 29 Km from Kollam town. This spot with great scenic beauty is turning to be a favorite place for the tourists in the recent days. The tourism potential of Sasthamkotta lake is yet to be tapped with due reference to preserve its natural beauty.

As per Article 1.1 of Chapter 20; Forests, effective forest area in Kollam is 998.58 Sq.Km. The evergreen vegetation in Kollam district houses a large variety of flora and fauna. The forest areas in the District is comprised of Thenmala, Punalur and a portion of Achancoil forest divisions. Thenmala range with the first planned eco-tourism project, Aryankavu range and the Shendurney Sanctuary constitute the Thenmala division. Achancoil range Kallar range and Kanayar range make up the Achancoil Division while Punalur Division includes Anchal and Pathanapuram Ranges. Teak and soft wood form the major forest plantations in the district. The Rosemala, Parappara Dam site etc. are

potential areas for eco-tourism. Muttara Maruthimala, Chadayamangalam, MattidamPara, Chittumala chira are potential areas for eco-tourism.

There are waterfalls also in the district viz. Palaruvi, Courtalam, Kumbhavurutti, Vattathilthangal, Meenmutti etc. Except Palaruvi, the other waterfalls are not promoted much due to the lack of basic amenities for tourists. The two rivers Kallada and Ithikkara are highly linked with the life of Kollam. These rivers are part of Ashtamudi and Paravur lake which are highly potential to explore better connectivity from National Highway and State Highway. An extremely potential natural body which links with the Ashtamudi backwaters is the Kollam Thodu (Trivandrum – Shornur canal). The canal, once a prominently used water way, presently is in highly polluted and silt covered state. Though there are attempts to improve it for transportation, it has to be beautified in the tourism point of view also.

The beaches are mainly Paravur, Kollam, Mundakkal, Thangassery and Thirumullavaram. Out of this, the Thirumullavaram Beach is more beautiful and satisfies the characteristics required for beach tourism. As far as Kollam beach is concerned it attracts large number of domestic tourists almost round the year. A beautiful park is also housed parallel to the sea as well as the Kollam – Kovalam canal.

1.1.2 Heritage

The land of Kollam is blessed with many heritage sites. The Palaces, Forts, Cave temple, locations of historical importance, temples with traditional architecture, traditional houses, settlements, century old light house, Punalur hanging bridge etc are examples of Heritage precincts of Kollam.

From the spatial distribution map (Figure 27.2) it is seen that Heritage Tourism precincts are maximum in Kollam Corporation (14 nos.). The Thevally Palace, Govt. Guest House building at Ashramam, Chinese Palace at Railway station, SMP Palace, Tangassery Fort are among the famous attractions frequented by tourists. Tangassery has much potential as far as Heritage tourism is concerned. The historic remnants of Tangassery have to be preserved so as to introduce Heritage walk/tours etc. The churches and residential units here are pretty old, having

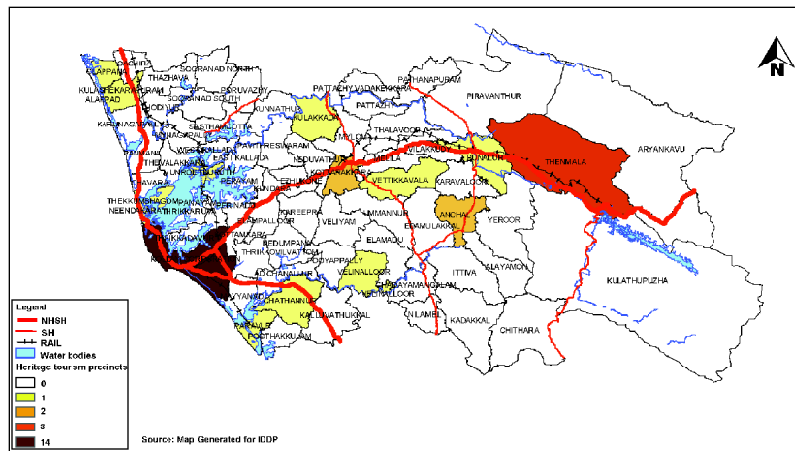


Fig.27.2: LSGI wise distribution of heritage tourism precincts

been established in the 18th century. The chief attraction here is the light house which was built in 1902. The 144 ft. light house stands as a sentinel, warning Seamen of the treacherous reefs of Tangassery. Thangassery was an enclave of the Portuguese, Dutch and British in succession. The remnants of the Portuguese and Dutch Forts still exist, which is now under the control of Archeological Survey of India.

The Punalur Hanging Bridge is an engineering marvel. Restoration of the bridge is under progress. Department of Tourism has given approval for the landscaping of two sides of the Bridge so as to ensure basic amenities for the visitors. Heritage tourism locations are also found to be more in corporation area. Thevally Palace, Tangassery Fort, Kottukal cave Temple etc are famous among them.

The Government has allotted Rs. 96 lakhs for the restoration of the Guest house building at Ashramam. The Thevally Palace is now occupied by NCC wing. The palace is ideal for the setting up of a Museum of Kollam. The Chinese palace and Kollam- Shenkotta metergauge rail connectivity are historically important. The very old thirteen-pillar bridge en-route is an example of architectural marvel which has to be conserved.

The Kottukkal Rock cut temple situated in Ittiva Grama Panchayat represents an outstanding and typical style of its kind. It is dated back to 8th –9th century and now under the control of State Archeology Department.

1.1.3 Cultural

The cultural contributions of Kollam are very important. It was a great center of

learning and culture. It attracted distinguished scholars from all parts of South India. Leelathilakam and Unnineeli sandesam two outstanding literary works of historical importance are contributions of 14th century, Kollam. The dance form of Kathakali in its new version of Ramanattam was the creation of Kottarakkara Thampuran, who also improved Krishnanattam by substituting Malayalam for Sanskrit. Paravoor K.C.Kesavapilla a gifted poet, prose writer, dramatist and scholar originated the musical play in Malayalam through his work Sadarama. Many prominent literary persons lived in Kollam.

The temple festivals of Kollam are highly diverse. They reflect the art and cultural creations of the people of Kollam. Kathakali, Koothu, Ottamthullal, Paatakam, Harikatha, Kaikottikali, Kolattam are also practiced here. The traditional folk music and dances are very attractive and unique in Kollam. The Kottamkulangara festivals, Kettukazhcha, Oachirakkali, and Ashramam pooram are very famous and attract lot of tourists. There are innumerable variety festivals across the breadth and length of Kollam which underlines the scope of cultural tourism promotion. The major cultural events important from tourism point of view include Kollam pooram, Kallada boat race, Oachira festival, Chamaya vilakku, Kettukazha etc (Figure 27.3). It is seen that Oachira and Poruvazhy (3 events each) Grama Panchayats have great potential in this respect.

1.1.4 Pilgrim Tourism

Kollam district has a number of pilgrim centers. From the spatial distribution

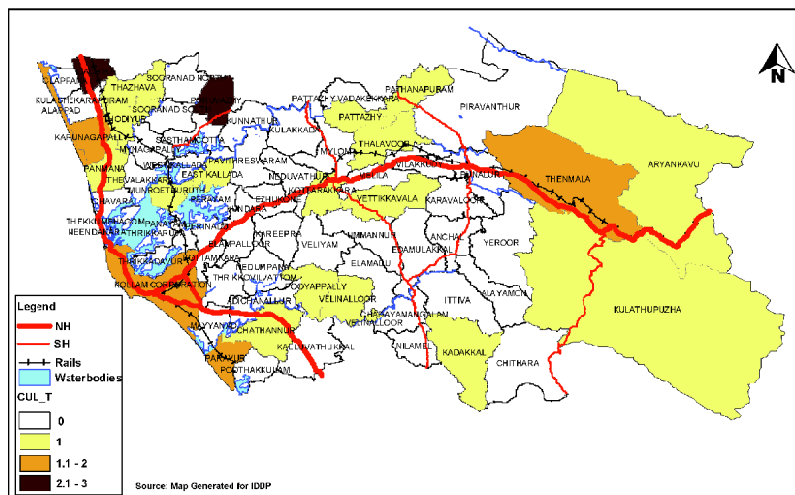


Fig.27.3: LSGI wise distribution of major cultural tourism destinations

(Figure 27.4) it is seen that Pilgrim Tourism is also maximum in Kollam Corporation.

The temples dedicated to Sastha at Achancoil, Aryankavu and kulathupuzha are visited by large number of pilgrims.

within the Kollam Corporation area and adjacent Grama Panchayats. The Matha Amruthanandamayi Ashramam at Vallikavu, Karunagappally is an internationally acclaimed Pilgrim tourism

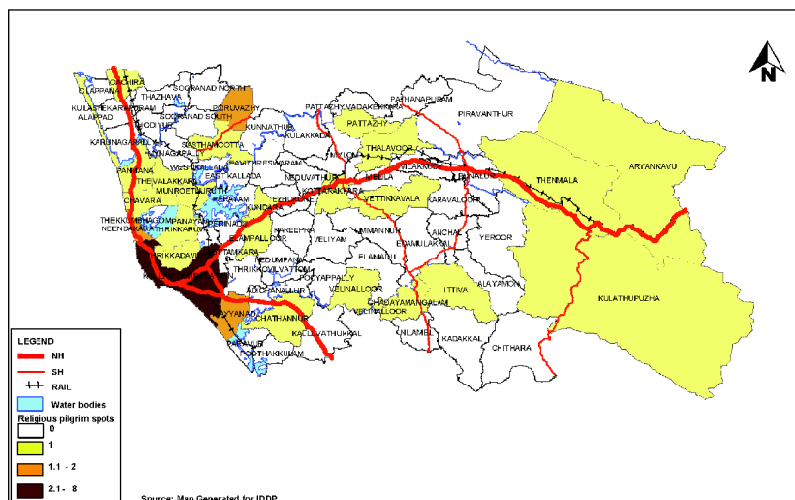


Fig.27.4: LSGI wise distribution of pilgrim tourism spots

The festivals 'theroottam' and pushpabishekam of Achencoil temple are famous. The Oachira temple, dedicated to Parabrahma attracts large number of pilgrims particularly during the festival called Oachirakali and Panthrandu vilakku Mahotsavam. The Ashramam pooram and Parippally elephant march are very famous. The Chavara Kottamkulangara festival is very famous because of its peculiar custom that men dress up as women and carry lighted lamps. The Kettukazhcha- exhibitions of effigies are unique in Kollam. There are many traditional music and fascinating rituals associated with temple festivals. Most of such variety temple festival locations lie

spot. Some of the important churches are St. Casimir's Church, Kadavur, Velankanni Matha shrine; St. Francis Church, Koduvila, Amololbhava Church Pullichira, St. John Britto Church, Sakthikulangara, St. Sebastian CSI church. Valiyapalli Jonakappuram; Juma-ath-palli, Kolluvila Juma-ath-masjid, Thattamala muslim-juma-ath palli, Muthiraparambu and Siyavathummodu Palli, Kilikollur are the most important mosques. Ancient temples, well known for festivals in Paravoor increase the potential for tourism development in Paravoor. The sacred groove attached to the Ayiravalley Temple is an important scenically beautiful area in Paravoor.

1.1.5 Adventure Tourism

The District has tremendous potential for adventure tourism. As shown in Figure 27.5 the areas include Kollam Corporation and Thenmala, Aryancavu, & Kulathupuzha Grama Panchayats. Ashramam ground is ideal for aero adventure sports such as micro light flying, hand gliding, para sailing etc.

The National Adventure Foundation is actively involved in promotion of adventure tourism at locations of Ashramam and Thenmala. Paravur and Jadayupara are also potential for adventure sports. Adventure water sports activities are yet to be promoted in Ashtamudi and Kallada Rivers. The hill places of eastern region have also many potential spots for the development of Adventure Tourism. The important adventure tourism opportunities are located in the corporation area as well as in Thenmala area. There are other promising locations for adventure tourism

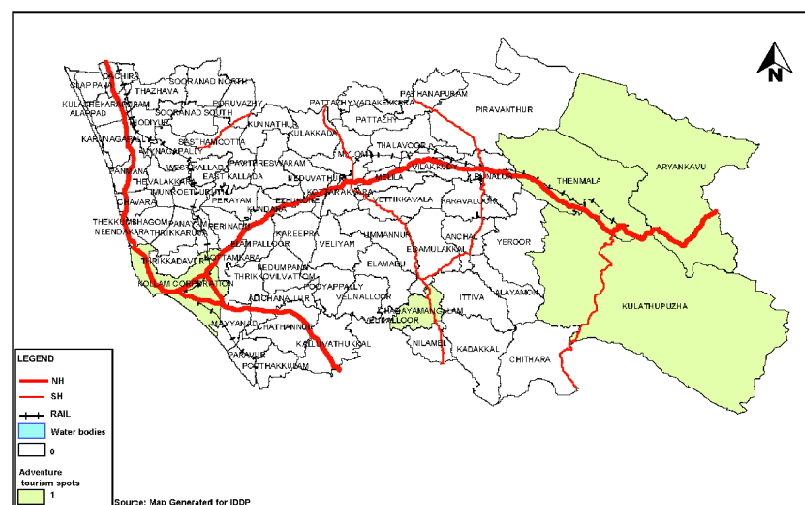


Fig.27.5: LSGI wise distribution of adventure tourism spots

in the eastern sector viz. Chadayamangalam, Kulathupuzha, Muttara, Aryankavu, Achancoil, Kumbhavurutti, Rosemala, Ambanad etc.

1.1.6 Backwater Tourism

Kerala is one of the major destinations of Backwater tourism in the International map and Ashtamudi is one of the major destinations in the State. So, though a nature based tourism, special emphasis has to be given to Backwater tourism in the district.

At present the potential of Ashtamudi backwaters is not fully utilized. There are only two tour trips being conducted in the backwaters; the City to City tour from Kollam to Alappuzha and the Village tour as shown in the Figure 27.6. The City to

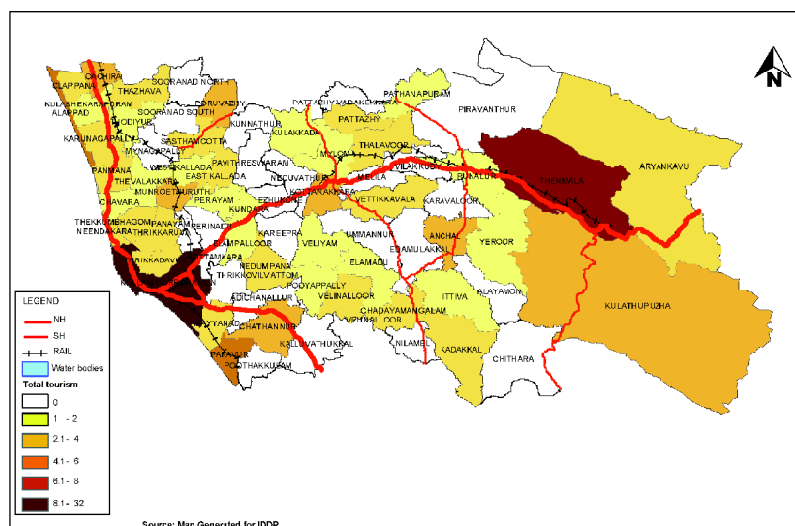


Fig.27.7: LSGI wise distribution of backwater tourism activities

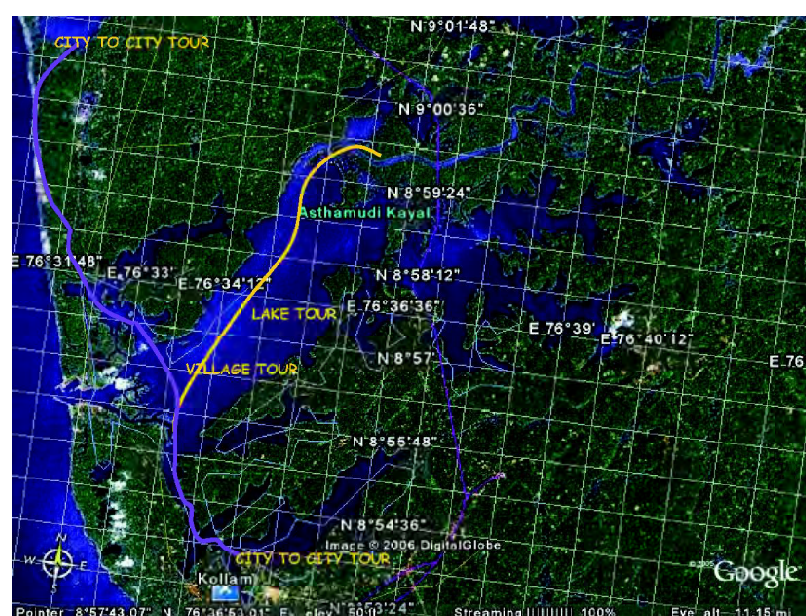


Fig.27.6: Backwater tourism network in Kollam

City Tour is more like a transit to Alappuzha. Majority of the foreign tourists visit Kollam straight away move to Alappuzha without staying. The Village Tour is more like a walk through the village activities. The tourists can have a feel of the activities like Coconut peeling, Lime making, Fishing using Chinese Fish nets etc. There is potential for many more compatible activities which can be included to this for making it more attractive.

In general, tourism activities in Kollam district are mainly focused on Ashtamudi backwaters (within the Corporation area) and the tourism attractions at Paravur and Thenmala. From the Figure 27.7 it is seen that the tourism activities are concentrated in Kollam Corporation (32 no.) and

Thenmala (12 no.)

1.2 Tourist Traffic

The tourist traffic is analysed based on the type of tourists visiting. Tourists are generally classified as foreign and domestic tourists. As per 2004 data, the district wise comparison of tourists visiting

Kerala shows that, 18% are from United Kingdom (Figure 27.8).

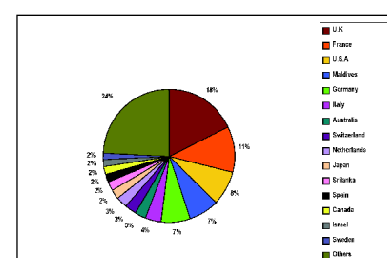


Fig.27.8: Country wise percentage of tourists arrival to Kerala

As per the 2006 data the district wise comparison of foreign and domestic tourists shows that Kollam District (7918) is below the State average of 30609. In case of domestic tourists (122998) also Kollam is below the State average of 447980 (Figure 27.9).

In Kerala over the years, foreign tourist arrival time during 2004 is maximum during the first quarter of the year i.e. January, February and March. The peak periods are the New Year eve and the time of boat race festivals. As shown in Figure 27.10 in 2003 and 2004, the month of January marked the highest and June marked the

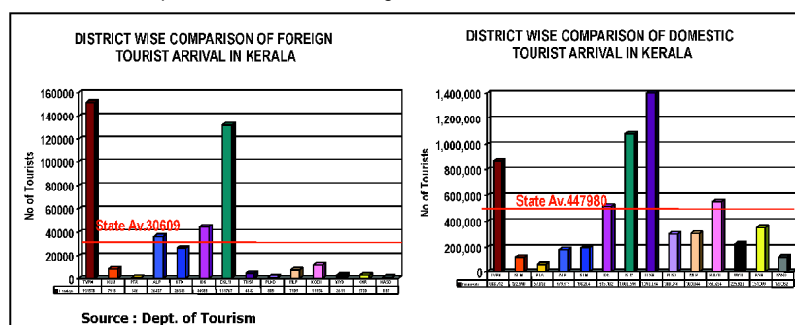


Fig.27.9 District wise comparison of foreign and domestic tourist's arrival in Kerala

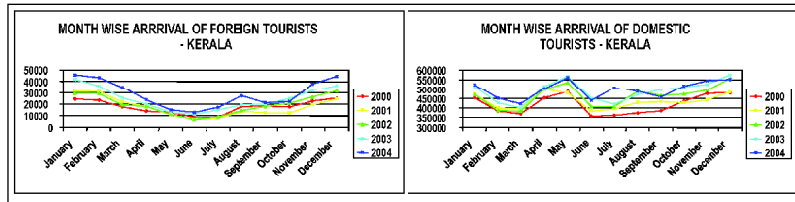


Fig.27.10: Month wise arrival of foreign and domestic tourists – Kerala

lowest foreign tourist inflow.

Domestic tourist arrival during 2004 is maximum during the IV quarter (October, November and December) of the year. In 2003 & 2004, the highest figure was for December and the lowest was for March. The peak period is the school summer vacation time.

In 2004 the month of January marked the highest and June marked the lowest tourist inflow in Kollam District following the same trend as in State (Figure 27.11).

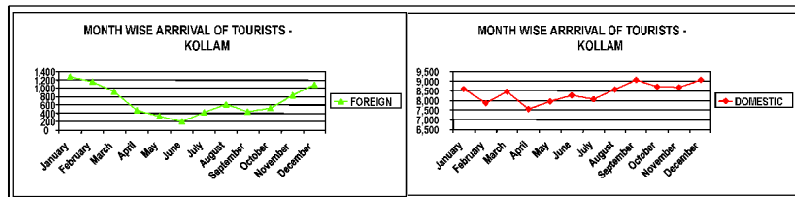


Fig.27.11: Month wise arrival of tourists -Kollam

1.3 Tourism Infrastructure

The basic infrastructure facilities for tourists are much lacking in Kollam district as a whole.

As the backwaters are the center point of attraction, tourists are mainly accumulating at the Boat jetty and KSRTC bus stand area so as to start their backwater cruise. But the existing boat jetty and other basic facilities available at the above points are not adequate even for the existing visitors.

The accommodation facilities in the town and adjoining areas are just satisfactory in terms of quantity as per existing requirement. But, quality accommodation facilities suited for the up-market tourists are the need of the hour. The locations like Karunagappally, Punalur, Thenmala, and Paravur need to be improved. The existing accommodation includes Hotels, Resorts, Home stays, Ayurveda centers, Yatri Nivas, Govt. Guest House, PWD rest houses etc.

The spatial distribution of Hotels, Motels and Resorts shown in the (Figure 27.12) shows that such facilities have a concentration in Kollam Corporation area followed by Thenmala. There is also a

concentration in the Thenmala area.

The spatial distribution shows that Home Stay units are maximum in Kollam Corporation area than the other points of attractions. Ayurveda centers and Resorts are also more in Corporation limits and adjacent Grama Panchayats on the banks of Ashtamudi backwaters.

The Houseboats are another form of accommodation as well as cruise option for backwater lovers. There are four private agencies running Houseboat service and the

same is flourishing day by day with various promotional campaigns offered by Kerala Tourism. House Boats are available only in Kollam Corporation and Alummkadavu, Karunagappally. The basic amenities for proper parking of Houseboats as well as waste disposal plants are however lacking at these locations.

Transportation facilities are quiet satisfactory at all the major tourist destinations. But proper modernization and renovation are required to ensure more

safety for the movements of vehicle and passengers. Moreover, parking and other basic amenities at bus terminals have to be improved with special emphasis on hygienic surroundings.

Information Centers are maximum in Kollam Corporation. Major Tourist Information centers are located at KSRTC Bus stand compound and Railway station, Kollam. More such centers are required at least at Kottarakkara, Punalur, Paravur, Alummkadavu/Karunagappally etc. From the analysis it is seen that, availability of infrastructure is maximum in Kollam Corporation followed by Karunagappally.

1.4 Tourism Circuits

A distribution of major tourist destinations is shown in the Figure 27.13. Many potential destinations are also in Kollam.

Analysing the present pattern of flow of tourists, a major circuit, a transit circuit and a minor circuit have been identified here (Figure 27.14). The major circuit is Trivandrum-Pariappally-Kollam. Majority of tourists coming to Kollam are those from different parts of the Country and World who arrive at Trivandrum by air or train and then reach Kollam by train or road. This is the Major Circuit. After attending the Village tour tourists generally move to Alappuzha by City to City backwater tour or by KSWT Dept. facility. Some of them take road route via NH47. Some tourists visit Thenmala eco-tourism spot and return. Unfortunately they seldom stay in Kollam.

Another circuits include the Trivandrum-Kottarakkara-Thenmala-Palaruvi (from south) Alappuzha-Kayamkulam-Kollam and Kottayam-

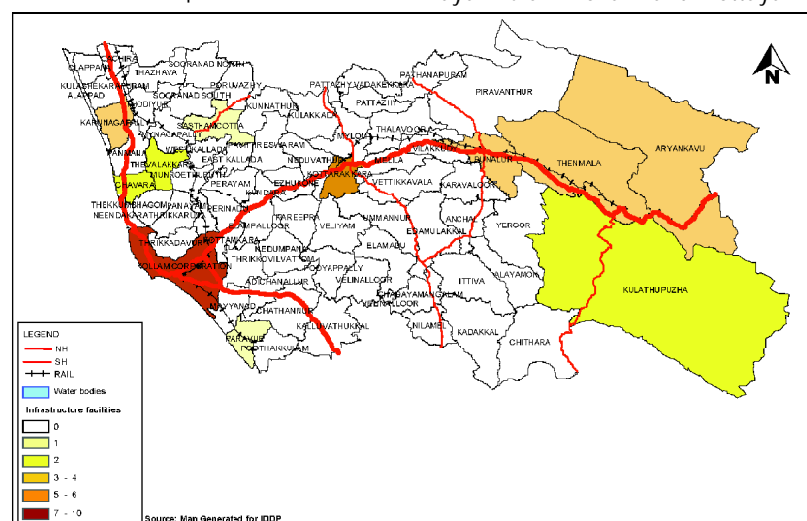


Fig.27.12: LSGI wise distribution of tourism infrastructure facilities in Kollam



Fig.27.13: Major tourist destinations in Kollam

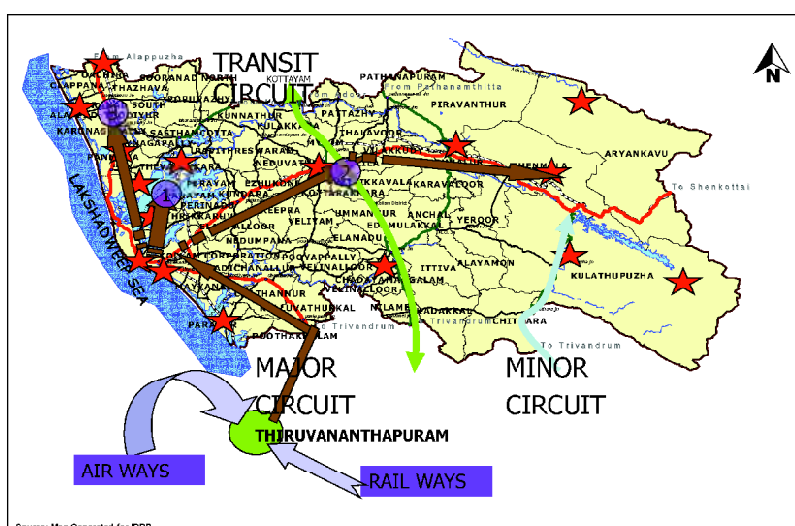


Fig.27.14: Existing tourist circuits in Kollam

Kottarakkara-Palaruvi-Thenmala (from north). These circuits are transit in nature. A Minor Circuit is also there through which tourists from Trivandrum reach Thenmala via Kulathupuzha. The transit nature is because most of the tourists are not interested in staying at Kollam due to various reasons. The major complaint is that there is no activity here other than backwater cruises. Therefore activity based tourism has to be encouraged along with some value addition of existing tourism products.

2 Overall Development Trend

The development trend has been studied based on two criteria.

- The inflow of tourists over the years
- The revenue generated by the DTPC, Kollam

Tourist traffic to Kerala shows an increasing trend over the past few years. It is estimated that the total tourist inflow to Kerala is 6700258 during 2006, showing an increase of 6.47% over the previous year (Figure 27.15). The drastic fall in the

tourist inflow in 2005 is due to Tsunami.

Tourist traffic to Kollam shows an increasing trend over the past few years. It is estimated that the total tourist inflow to Kollam is 130916 during 2006, showing an increase of 14.63% over the previous year (Figure 27.16).

Foreign tourist traffic to Kollam decreased in 2005 due to Tsunami and then increased in the last year. It is estimated

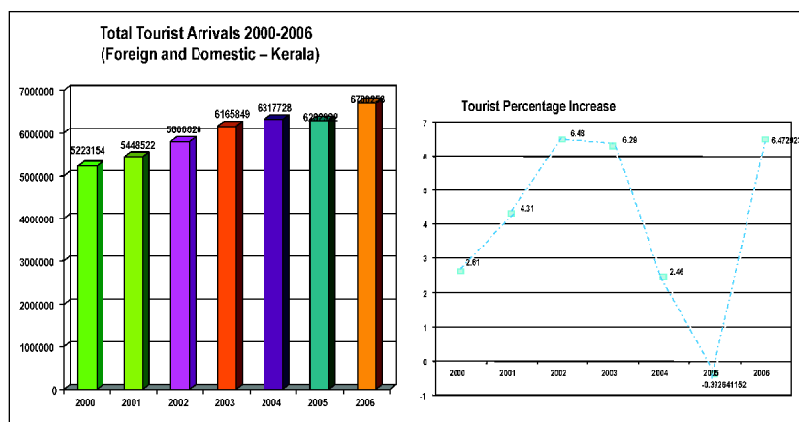


Fig.27.15: Trend in total tourist's arrival (foreign & domestic) 2000-06 in Kerala

that the foreign tourist inflow to Kollam is 7918 during 2006, showing an increase of 16.21% over the previous year (Figure 27.17).

Domestic tourist traffic to Kollam shows an increasing trend over the past few years. It is estimated that the domestic tourist inflow to Kollam is 122998 during 2006, showing an increase of only 25.21% over the previous year (Figure 27.18).

At the State level the total revenue generated is showing an increasing trend (Figure 27.19). In the district for this analysis there is lack of data, so the revenue generated by the DTPC is taken as the criteria.

The revenue generated by DTPC shows that presently there is an increasing trend after a decrease in 2003-04 (Figure 27.20). The number of private players in the tourism sector, especially houseboat service sector has to be taken into account while calculating the overall development trend. Due to non-availability of exact data on private sector turnover, it is very difficult to substantiate the development trend based on revenue generation. However, it is true that the tourism sector in Kollam is showing an increasing trend over the years and those new firms are coming up in investing backwater tourism, facilities are increasing and a competitive trend exists among investors. Home stays are also doing well and more people are being encouraged to apply for registration under home stay concept. So, overall there is an increasing trend of tourism in the district showing its tremendous potential here.

3 Development Issues

3.1 Problems

The major problems are as follows:

- I Lack of proper infrastructure facilities
- I Roads to destinations need to be

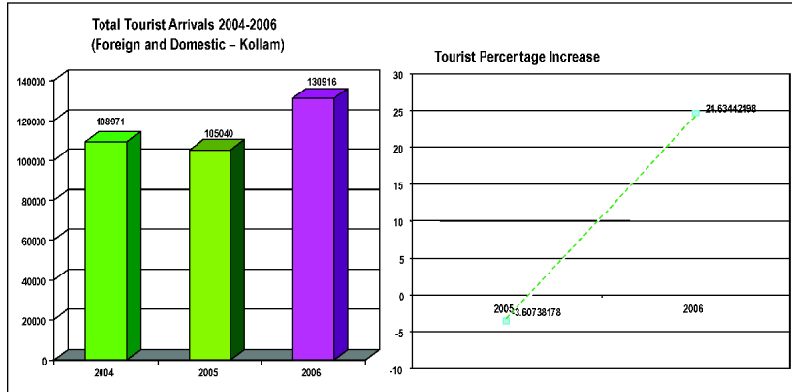


Fig.27.16: Trend in total tourists arrival (foreign & domestic) in Kollam 2004-06

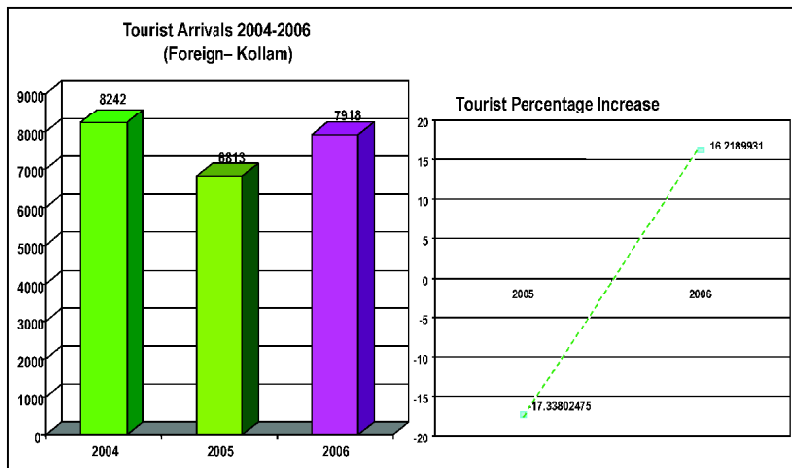


Fig.27.17: Trend in foreign tourist arrivals in Kollam 2004-06

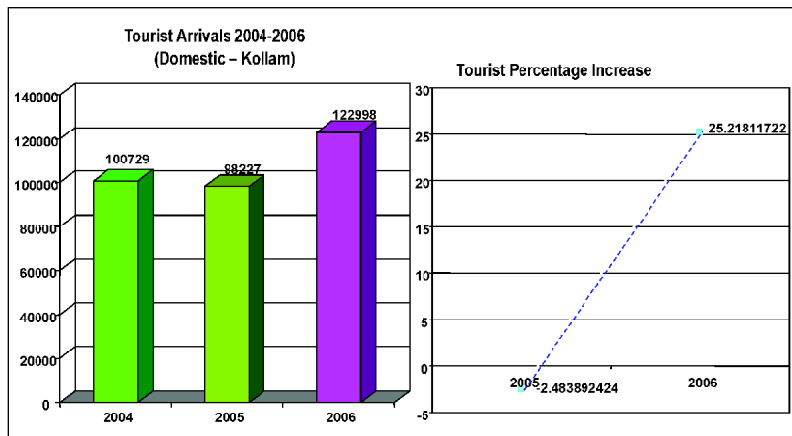


Fig. 27.18: Trend in domestic tourist arrivals in Kollam 2004-06

- improved and maintained properly
- ❑ Lack of boat jetties and other basic amenities at the existing destinations.
- ❑ Proper parking spaces are required at all destinations.
- ❑ Lack of tourism signage
- ❑ Lack of proper waste management plants /systems in tourist centres
- ❑ Pollution of backwaters and declared National Waterway
- ❑ Lack of guided tours / trekking options at wild life sanctuary.

- ❑ Lack of coordination between line departments and agencies for time bound implementation of tourism projects.
- ❑ Lack of tourism study centre

3.2 Potentials

Basically, Kollam has a great advantage of all that Kerala can offer as God's own country. Natural resources occupy a predominant role as far as tourism potential is concerned. Ashtamudi backwaters, Sasthamkotta freshwater lake,

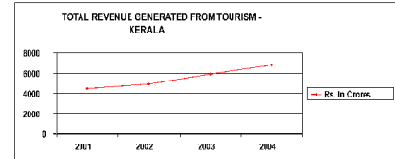


Fig.27.19: Trend in total revenue generated from tourism in Kerala

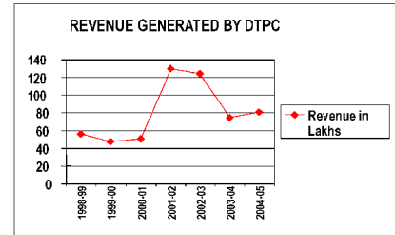


Fig.27.20: Trend in revenue generated by DTPC

Thenmala, Achankoil, Palaruvi, Paravur, under utilized beaches such as Thirumullavaram, Mundakkal etc. are unique. The location Ambanad offers the characteristics of a hill station. The Vellimon area has untapped tourism potential. Culture occupies the second position because of diverse art and cultural attractions available in Kollam. The temple festivals attract a substantial number of tourists and a calendar of all such events can act as a strong motivation among the tourists to chart out their journeys in advance. Villages of Kollam, especially backwater island villages offer a novel experience of life of Kerala they give. The handicrafts – traditional art and craft works of Kollam- screw pine, papal leaf art work, lace, coir making, bamboo crafts etc are yet to be tapped for tourism. Home stays are another potential avenue because of the special experience-stay opportunity with the people of Kerala- they give. Heritage attractions are also most important.

The colonial architectural assets viz. Govt Guest House, Thevally Palace, Chinese Palace, Tangassery fort, Light house, Kottukal cave temple etc and historically important places viz. Mayyanad, Kundara, Elampalluur, Panmana etc are worth visiting. Kollam canal can be developed as a tourism corridor than mere waterway. Potential tourists areas are shown in Figure 27.21.

4 Agencies involved

Various agencies are involved in the field of tourism promotion. The Department of Tourism is the state level body in formulating policies and guidelines for the

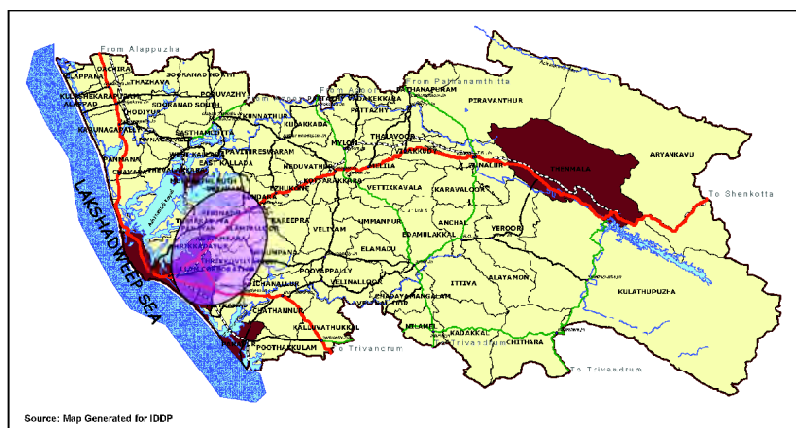


Fig.27.21: Potential tourist areas in Kollam

promotion of tourism. The district office of the Department is functioning in each district other than DTPC. DTPC acts as the district level nodal agency in promoting tourism in the district with the assistance of Department of Tourism and other sources of funds from local bodies, peoples representatives etc. KTDC and TEPS are two other government established agencies concentrating on the hospitality sector and Eco-tourism initiatives respectively. Other departments viz. Revenue, Forest, Fisheries, Port, Irrigation, Power, Agriculture, Industry and respective LSGIs etc are indirectly involved in tourism activities in the district.

5 On going and committed projects

5.1 Landscaping at Punalur Suspension Bridge

The project sanctioned in the year 2004 has an estimate of Rs.25,25,275/-. Rs.9,00,000/- was released by the Dept. of Tourism. The project envisages landscaping and lighting both the sides of the suspension bridge at Punalur. The idea is to preserve the heritage value of Punalur suspension bridge so as to promote tourism. Fencing, gardening, granite path ways, signages, lighting etc are the components in the project.

5.2 Construction of Pilgrim Amenity Centre at Oachira

The project for the construction of a pilgrim amenity cum tourist information centre is facing delay due to the delay in getting permissive sanction from the Revenue department in handing over the land on lease/transfer basis to DTPC. The project envisages multi-purpose amenity centre complex for tourists and pilgrims

visiting the temple. The project sanctioned in the year 2004 has an estimate of Rs.20,00,000/-.

5.3 Value addition of Houseboats - Renovation

The project sanctioned in the year 2005 has an estimate of Rs.5,00,000/-. The full amount was released by the Dept. of Tourism and 90% of the fund is utilized. As part of value addition for Houseboats it has been decided to install inboard engines for two houseboats of DTPC, Kollam. The initiative is for conservation of lake from pollution arising out of the operation of present out board engines. The project is in good progress.

5.4 Proposal for the construction of Hanger at Ashramam

The project sanctioned in the year 2006 has an estimate of Rs.10,40,625/-. The project envisages construction of a Hanger for parking and facilitation of adventure aero sports equipments to conduct various adventure aero sports activities at Ashramam Ground. Flying in micro-light air crafts, gliding, para-sailing etc are a few. The construction work is being implemented by SIDCO. The operation of the facility will be jointly done by National Adventure Foundation and DTPC, Kollam. The project will be the first permanent Aero-adventure tourism venture in Kerala.

5.5 Semi-deluxe Luxury Boat for DTPC, Kollam.

In order to tap the potential of Ashtamudi backwaters and also to explore the unseen routes and channels connecting T.S canal and towards Paravur lake, a luxury boat having fifty seating capacity with state-of-the-art facilities is proposed and the project is sanctioned.

5.6 Water sports Centre near T.S Canal, Kollam Beach

The project for water sports centre adjacent to the Kollam beach and T.S. Canal will provide basic amenities for launching variety water sports/cruises. Landscaping, parks, boat jetty, lighting, toilets, gardening, seating, mandapams etc will be included in the project. The Dept of Tourism has accorded an amount of Rs.25 lakhs to Inland Navigation Division, Kollam for the implementation of the project. As part of the second phase procuring of water sports equipments and various types of boats are planned.

5.7 Houseboat Terminal at Boat Jetty, Kollam

Recently, the Department of Tourism has sanctioned Rs 80 lakhs for the construction of Houseboat Terminal at Boat jetty, Kollam. The present dilapidated Boat jetty will be converted as a two storied Houseboat Terminal so as to ensure proper facilitation for the tourists as well as Houseboat operators. This will provide a landmark development for backwater tourism promotion in Kollam district. As a second phase, it is planned to extend the Boat jetty up to the Slaughter House area and a walkway will be set up linking the Boat jetty and T.S canal up to Kollam Beach.

5.8 Restoration of Govt. Guest House - Heritage building at Ashramam

The Department of Tourism has sanctioned an amount of Rs 1 crore for the restoration and preservation of the heritage building, the present Govt. Guest House, Ashramam, Kollam. The project is not yet started. Tourist Resorts Kerala Limited (TRKL) is the implementing agency of the project.

6 Evaluation of On going and Committed projects

The tourism development of Kollam largely depends on our natural resources viz. Backwaters, Hill stations, Waterfalls, Beaches etc. Backwaters occupy a lead role in the development of tourism in Kollam. The Ashtamudi backwater is acting as the gateway to the backwaters of Kollam. The lack of basic amenities and proper facilitation are the two major limitations facing the destination Kollam. Lack of accommodation facilities is another major limitation in making Kollam as a transit destination. The economic and commercial

growth, on account of tourism, is not encouraging mainly due to the above reasons. The trend of visitors flow is also not encouraging. The reason may be that tourist spots beyond Kollam are getting more attraction not only because of the natural attraction but also existence of supplementary attractions and basic amenities attached to them. The potential of developing a circuit based destination promotion is much lacking in Kollam district. Besides natural attractions there are a lot of tourism products in different forms and shapes which are also yet to be tapped. Even though some attempts are being

done to improve the situation through implementation of various projects, the efforts are quite insufficient considering the untapped and underutilized potential for the sector in the district.

7 Conclusion

Spatial analysis is truly an eye opener for conceiving new ideas and plans to integrate the future tourism needs and developments of Kollam. The approach "make Kollam as a complete destination for all seasons" is the need of the hour. New tourism circuits have to be developed in such a way that the unseen attractions of Kollam has to be linked with

our immense variety of forms of tourism which form part of a tourism product. Basic amenities at all prominent and potential tourism spots have to be ensured in a phased manner based on priority and time-bound frame work. More accommodation facilities have to be encouraged to its maximum. Activity based tourism has tremendous scope in Kollam since it has a rich cultural and traditional heritage of its kind. Promotion and marketing campaigns connecting all our features under a proper branding will substantiate our efforts in achieving the desired results on all aspects n



Chapter 28

Finance

This chapter analyses the existing status and development issues of Finance sector in the District. The chapter is structured into four parts. The first part contains the analysis of the existing status and second part covers the overall development trend of the sector based on the temporal aspects. The third part probes into the development issues pertaining to the sector and finally the fourth part contains the evaluation of ongoing and committed projects.

1 Analysis of Existing Status

Credit deployment to priority sectors by the financial institutions viz: commercial banks, cooperative banks and KFC is planned every year under Lead Bank Scheme. The system has worked well and can be judged from the fact that Kollam district has consistently surpassed the target set for the priority sector advances. The agency wise and sector wise achievements are monitored every quarter

and necessary guidance are given to the branches to pursue the set goals. NABARD prepares the groundwork by assessing the potentials, where credit could be deployed by bringing out the Potential Linked Credit Plan (PLP) for the district. A detailed analysis of the infrastructure facilities available for development of various sectors, the credit requirement for the same and the developmental programmes through which banks dispense the credits can be found in the PLP document.

The Service Area - Approach to bank lending in rural/semi urban areas was introduced through out the country in 1989. It aims at forging an improved link between Bank credit in the rural sector and its objectives viz. increasing production, productivity and income levels of rural population. It is a fact that, banks have made big strides in lending for development of rural sector in the subsequent two

decades of post-nationalisation of banks i.e., from 1969 to 1989; yet, Government of India and RBI felt that much remained to be achieved in terms of increased production productivity and income. Hence, the introduction of service area approach, which was intended to bring about an orderly and planned development of the specific villages (wards) earmarked as 'service area' for each bank branch.

Yet another significant feature in this approach is the stress given for "Credit Planning" by the Bank Branches at the grass root level and their direct involvement in the development of the assigned service area. This calls for a degree of skill and a better understanding of the rural area on the part of staff of branches and a coordinated approach to development by all concerned, including the developmental agencies of the Government. However RBI has decided to dispense with the

restrictive provisions of the scheme, while retaining the positive features of Service Area Approach such as credit planning and monitoring of credit purvaynce. Accordingly the allocation of villages among the rural and semi urban branches of banks shall not be applicable for lending except under government sponsored schemes. While the Commercial Banks and Regional Riural Banks (RRB) will be free to lend in any rural and semi urban area, the borrowers will also have the choice of approaching any branch for their credit requirements.

The Credit Plans are being formulated every year by all the branches of Commercial Banks, Co-operative Banks/ Societies, Kerala Finance Corporation etc., and are successfully implemented with the co-operation of the developmental Depts/ Agencies of central and State Governments under the guidance of the District Consultative Committee headed by the District Collector. The Service Area Monitoring and information System (SAMIS) is being implemented by the Lead Bank and NABARD through computerization of lead Bank Returns LBR-1, 2, and 3.

The credit plans prepared by the Lead bank every year based on the Potential linked Plan prepared by NABARD can be made more realistic by synchronizing bankable credit plans of LSGIs and other developmental departments with bank branch credit plans. An attempt is made here to achieve the above objective.

1.1 Banking Statistics

In India there are 19 Nationalised Banks, 8 SBI and Associate Banks, 21 Private Sector Banks, 9 New generation Banks and 33 Foreign Banks. The State wise distribution of Scheduled Commercial Bank Branches as on March 2004 is given in Table 28.1. It can be seen that in Kerala we have more banks in Semi Urban areas (16.2% - highest) and share of rural branches (1.1% - lowest) on all India level).

Details of working chit funds registered in Kerala (1997-98 to 2002-03) are given in Table 28.2. Leaving Trivandrum and Ernakulam having highest number of registered chit funds, Kollam ranks 3rd which shows private chit funds/ institutions still plays a vital role in the District's economy.

Table.28.1: Banking statistics in India

Sl No.	State	Rural		Semi urban		Urban		Metropolitan		Total	
		No.	%	No	%	No	%	No	%	No	%
-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12
1	Andra Pradesh	2401	7.5	1258	8.4	1082	9.8	543	6.1	5284	7.9
2	Assam	792	2.5	261	1.7	168	1.5	-	-	1221	1.8
3	Bihar	2495	7.7	673	4.5	411	3.7	-	-	3569	5.3
4	Gujarath	1503	4.7	845	5.6	484	4.4	836	9.4	3668	5.5
5	Haryana	701	2.2	422	2.8	492	4.5	-	-	1615	2.4
6	Karnataka	2185	6.7	1053	7	820	7.5	796	9	4834	7.2
7	Kerala	346	1.1	2430	16.2	628	5.7	-	-	3404	5.1
8	Madhyapradash	1866	5.8	789	5.3	438	4	360	4.1	3453	5.2
9	Maharashtra	2242	7	1102	7.3	932	8.5	2058	23.2	6334	9.5
10	Orissa	1587	4.9	331	2.2	322	2.9	-	-	2240	3.3
11	Panjab	1125	3.5	722	4.8	575	5.2	219	2.5	2641	3.9
12	Rajasthan	1843	5.7	750	5	493	4.5	264	3	3350	5
13	Tamilnadu	1724	5.4	1225	8.2	1016	9.2	792	8.9	4757	7.1
14	Uttarpradesh	4862	15.2	1353	9	1440	13.2	549	6.2	8213	12.1
15	West Bengal	2270	7.1	565	3.7	625	5.7	1006	11.3	4466	6.7
	Total	27912	87	13779	91.7	9935	90.4	7423	83.6	59049	88.2
	All India Total	32080	100	15018	100	10990	100	8882	100	66970	100

Table.28.2: Details of working chit funds registered in Kerala

Sl No	District	Working Chits		Capital Turnover	
		No.	%	Amount (Rs. crores)	%
1	2	3	4	5	6
1	Thiruvananthapuram	19664	43.31	133.94	37.17
2	Kollam	3745	8.25	32.15	8.92
3	Pathanamthitta	890	1.96	7.18	1.99
4	Alappuzha	665	1.46	2.07	0.57
5	Kottayam	1667	3.67	29.53	8.2
6	Idukki	469	1.03	4.41	1.22
7	Ernakulam	10324	22.75	78.18	21.7
8	Tirissur	1153	2.54	9.15	2.54
9	Palakkad	3139	6.91	32.32	8.98
10	Malappuram	481	1.06	5.13	1.42
11	Kozhikode	1645	3.63	13.33	3.7
12	Wayanad	71	0.16	1.94	0.54
13	Kannur	1333	2.94	9.59	2.66
14	Kasaragode	152	0.33	1.4	0.36
	Kerala	45398	100	360.32	100

The district has 191 commercial bank branches, 40 DCCB branches, 121 PACS (Primary Agricultural Co-operative Society) and 4 Primary Co-operative and

Agriculture and Rural Development Banks (PCARDB) spread through out the district. The banking statistics in the district is shown in the Table 28.3. There are 165 nos. of

Table.28.3: Details of banking statistics in Kollam

Sl No.	Name of the Block	No. of the Panchayat	Area in Sqkm	No. of CBS	No. of Co. ops	Total
1	Anchal	8	51	18	14	32
2	Anchalummood	2	54	4	13	17
3	Chadayamangalam	7	249	11	11	22
4	Chavara	5	75	8	9	17
5	Chittumala	6	-	7	10	17
6	Ithikkara	5	135	13	16	29
7	Karunagappally	4	90	11	6	17
8	Kottarakkara	6	133	15	11	26
9	Mukhathala	4	80	16	16	32
10	Oachira	4	47	7	9	16
11	Pathanapuram	5	248	11	12	23
12	Sasthamcotta	7	-	9	14	23
13	Vettikkavala	6	169	11	11	22
14	Urban Kollam	-	-	50	3	53
	Total	70	1526	191	155	346

cooperative institutions including PACS (Primary Agri.Co.op.Society). Leaving Urban Kollam, Anchal Block and Mukhathala Block are having sufficient bank branches, compared to the density of banks in other blocks.

1.2 Business Position

Business position is the aggregate of advances and deposits on the district which mainly depend on credit off take by the cashew industry, which in turn depends on international demands. The global demand for cashew depends on stable economy which has a direct bearing on this industry. Though the district has other traditional and progressive industries, the highest quantum is contributed by cashew sector. The district also attracts NRI deposits from gulf countries. The remittances from other countries like USA, UK etc, are less compared to neighbouring districts like Pathanamthitta. Business Position (Rs. in Crores) as on March 2005 is given in Table 28.4.

Kollam's share in Kerala is 5.80%

Table.28.4: Details of business position in India, Kerala and Kollam

BUSINESS POSITION	INDIA	KERALA	KOLLAM
Aggregate Deposit of SCB	1778358	69396	4031
Aggregate Advances of SCB	1144051	40948	2610

under deposits; Kollam's share in India is 0.22% under deposits. Kollam share in Kerala is 6.3% under advances; Kollam's share in India is 0.22% under advances.

The spatial distribution of deposits shows (Figure 28.1) that it is sporadically distributed within the district. More deposits are seen in Chathanur, Pathanapuram, Karavalur, Kareepra Grama Panchayats.

LSGI Wise Variation of Advance shows that it is more in Karavallor, Kareepra and Kottarakkara.

1.3 Credit Flow

Credit flow is the amount of loans given to various sectors. Credit flow to Production and investment credit (All India Level) i.e. the per capita credit, deposit and cumulative CD ratio of different State / Union territories is given below (Credit deposit Rs.In Crores) per capita actual is shown in Table 28.5.

Under per capita deposit and per capita advance, Kerala holds 5th position.

LSGI wise distribution of advances is given in Figure 28.2.

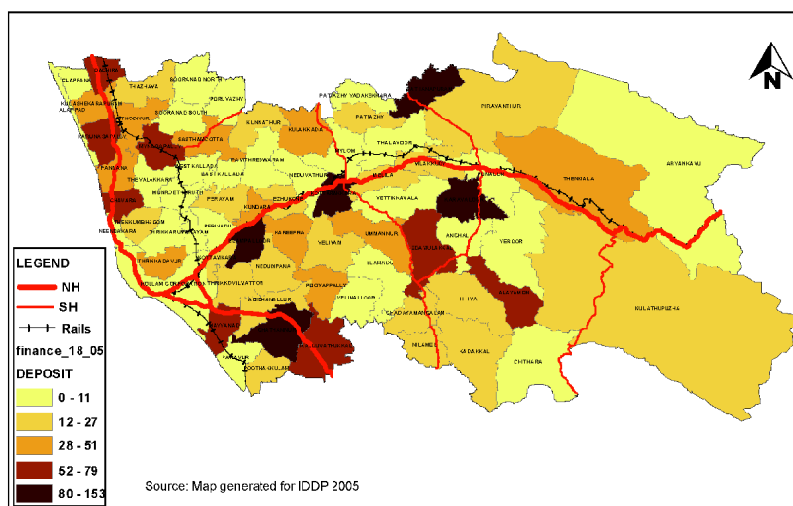


Fig.28.1: LSGI wise distribution of financial deposits

Region wise share of Agri and Allied sector credit Short and Long term (Percentage) is shown in Table 28.6. It can be noted that Southern States absorbs more Agriculture Credit.

Comparative Study of Credit Flow under Priority Sector lending in Kollam with

neighbouring Districts during 2004- 2005 (Rs. In Crores) is given in Table 28.8.

It is seen that only area where Kollam excels neighbouring districts is in SSI sector and it shows lowest in Minor irrigation. The flow of credit in Kollam district is larger compared to neighbouring districts. It constitutes 12.23% share of the State.

Flow of Credit under Agriculture Sector is discussed here. Over the years the LSGI with maximum flow is found to be changing. During 2002 Mayanadu had the highest flow of credit, during 2003 it was Neduvathur and during 2004 it was Kollam

Table.28.5: All India level credit flow

Sl No	State/ Union Territory	Population (2001)	Credit	Deposit	Per capita Credit	Per capita Deposit	CD Ratio
1	2	3	4	5	6	7	8
1	Chandigarh	900635	11632	11359	129153	126122	102
2	Tamilnadu	62405679	88180	98170	14130	15731	90
3	Maharashtra	96878627	262158	327909	27060	33847	80
4	Kanataka	52850562	61568	92905	11649	17579	66
5	Andhara Pradesh	76210007	56202	85482	7375	11217	66
6	Delhi	13850507	110548	186067	79815	134339	59
7	Rajasthan	56507188	22500	38695	3982	6848	58
8	Orissa	36804660	12416	22483	3373	6109	55
9	Kerala	31841374	32498	65609	10208	20605	50
10	West Bengal	80176197	46955	100349	5856	12516	47
11	Gujarat	50671017	35683	86691	7042	17109	41
12	Uttar Pradesh	166197921	33683	86691	2027	5216	29
13	Bihar	82998509	8738	34501	1053	4157	25
14	Utaranchal	8489349	3628	18262	4274	21512	20

neighboring Districts during 2002-03, 2003-04, 2004-05 (Rs. In Crores) is discussed here. During 2002 – 2003 and 2003 – 2004, overall performance of Kollam is better than other districts under Agri and Teritory sector Trivandrum district is slightly better than us. The value during 2004-05 is given Table 28.7.

Comparative Study of Credit Flow under various sectors in Kollam with

Corporation and Edamulakkal. The Spatial distribution of Flow of Credit under Agriculture Sector during 2005 is shown in Figure 28.3. It is seen that Kollam Corporation has the highest flow during 2005.

LSGI wise variation of flow of credit under Non Farm Sector (NFS) shows that over the years Kollam Corporation and Neduvathur constantly have higher NFS

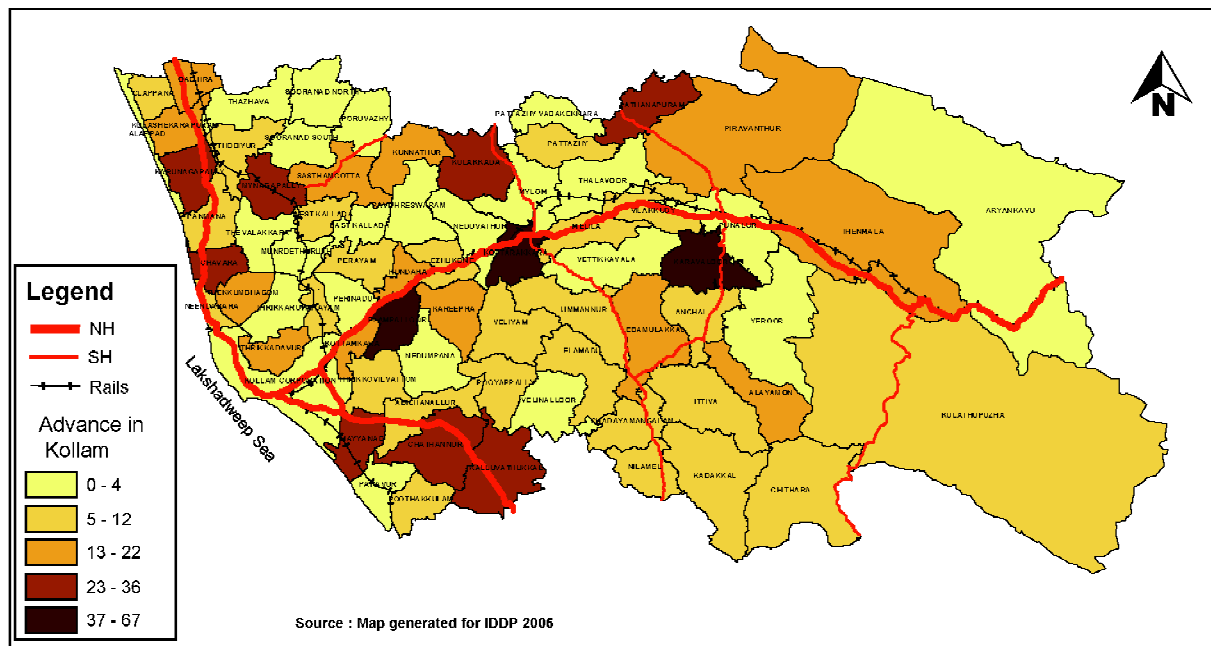


Fig.28.2: LSGI wise distribution of Advance in Kollam

Table.28.6: Region wise share of agriculture and allied sector credit flow

Region	1990-91	1995-96	2001-02
Northern	12.9	11.6	19.9
North Eastern	0.4	0.4	0.5
Eastern	8.3	6.4	4.4
Central	16.9	16.4	14.1
Western	13.6	17.1	14.4
Southern	47.5	48	43.8

Source: RBI

Table.28.7: Comparative study of credit flow under priority sector lending with neighbouring districts 2004-05

Sector	Kerala	Kollam	Trivandrum	Pathanamthitta	Alleppy
Agri	6854	296	547	291	432
Secondary	2519	1516	107	35	146
Tertiary	9013	428	1154	416	574
Total P.S.	18387	2249	1828	753	1151

Source: Lead bank statement

Table.28.8: Comparative study of credit flow under priority sector lending with various sectors in Kollam with surrounding districts

Sector	Trivandrum	Kollam	Alleppey	Pathanamthitta
Minor Irrigation	4.34	2.82	4.28	7.24
Land Devpt.	26.98	13.97	9.2	12.63
Farm Mech.	0.17	1.68	0.63	1.81
Plant & Horti.	47.17	29.3	15.42	28.77
Crop Loan	459.61	216.21	356.68	208.14
Allied	19.35	8.23	17.16	11.39
SSI	65.39	1505.42	131.71	26.83
TPT	27.47	5.16	7.6	7.66
Small Business	146.33	66.79	101.38	66.5
Proff. & Self emp	13.78	26.15	14.65	13.38
Education	53.23	20.87	45.91	39.89
Housing	620.76	120.51	174.49	163.4

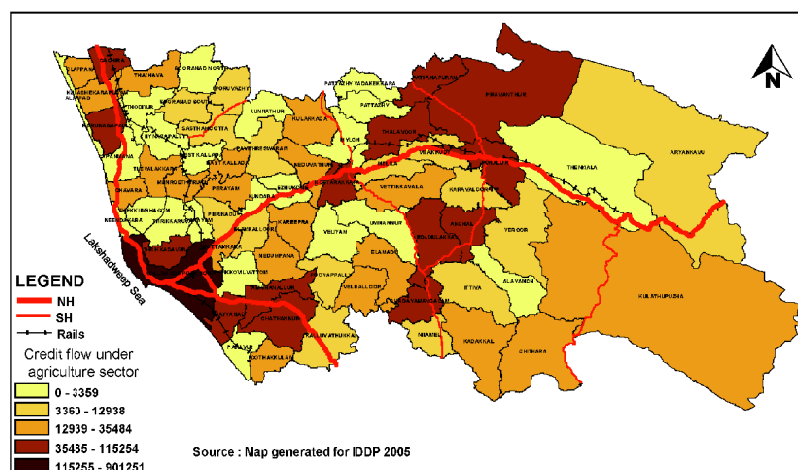


Fig.28.3: LSGI wise distribution of credit flow under agriculture sector during 2005

compared to other LSGIs Figure 28.4.

LSGI wise variation of Other Priority Sector (OPS) shows that though during 2002 Neduvathur and Kadakkal had highest values, during 2003 to 2005 Kollam

loan.

Pattern of credit plan for 2005-06 (Rs. in lakhs) is given in Figure 28.10 It can be seen that maximum is for NSF (42%).

Sector wise achievement under District

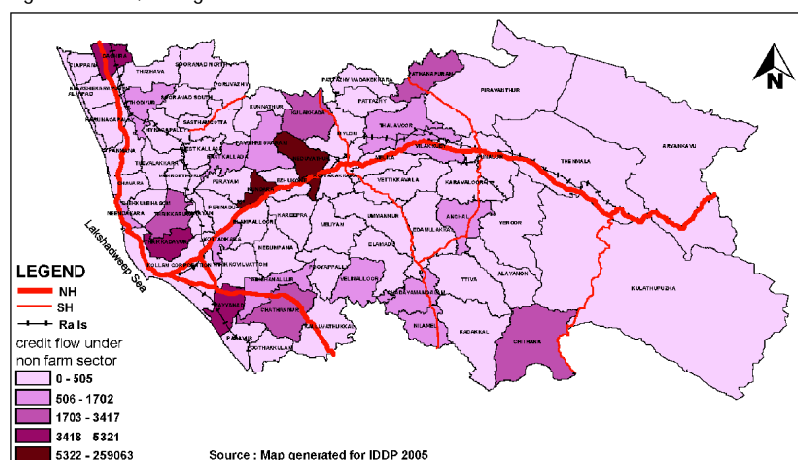


Fig.28.4: LSGI wise distribution of credit flow under non farm sector (NSF) during 2005

Corporation has maximum values Figure 28.5.

LSGI wise variation of Total Priority Sector (TPS) shows that, from 2002 to 2005 Kollam Corporation and Neduvathur have maximum values Figure 28.6.

LSGI Wise Variation of Non Priority Sector (NPS) shows that, during 2002 Kadakkal, Neduvathur, Edamulakkal and Chathanur had highest values. By 2005 it was Kollam Corporation Figure 28.7.

LSGI wise variation of Total Priority Sector Lending shows that during 2002 kadakkal, Neduvathur, Edamulakkal and Chathanur had highest values. By 2005 it was Kollam Corporation and Neduvathur (Figure 28.8).

Flow of credit to important areas in Primary Sector is given in Figure 28.9. It is clear that 70% of the flow is for crop

Credit Plan shows that maximum achievement (67%) is in secondary sector(Figure 28.11).

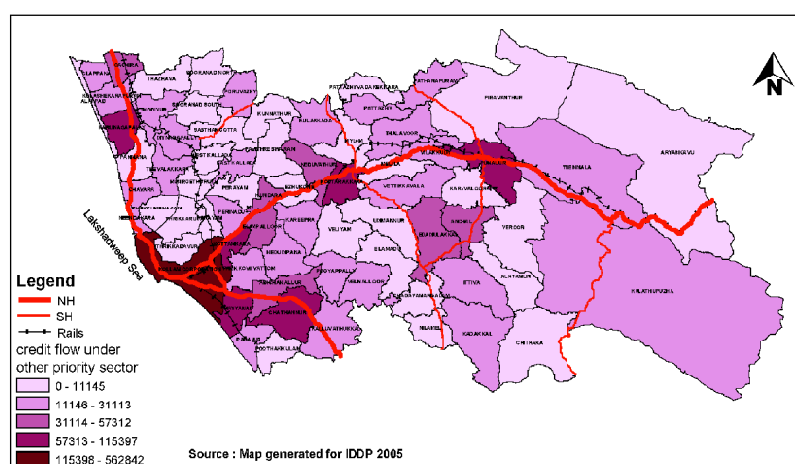


Fig.28.5: LSGI wise distribution of credit flow under other priority sector (OPS) during 2005

The NFS shows the maximum credit delivery due to high credit off take by cashew exporters.

1.4 Non Performing Assets (NPA)

These are assets where over dues of principle and interests exits for more than 90 days. Sector wise NPA in Public Sector Banks as at March 2004 (Rs.in crores) at National level is shown in Table 28.9.

It can be seen that, NPAs are more under SSI than Agri. NPAs of private sector banks under non priority sector is three times priority sector NPAs. Unlike public sector banks where NPAs are almost equal under priority or non priority. The NPAs under SSI is comparatively higher than Agri/OPS. The NPA of private sector banks under Non Priority Sector is huge compared to Priority Sector lending showing their outlay under this sector requires further improvement.

1.5 Credit – Deposit Ratio

The CR Ratio is a very good indicator of the economic activity of the place.

This indicates how much credit is deployed in relation to the deposit. CD ratio of the district is well above the State average indicating the credit absorbing capacity of the district.

Cumulative CD Ratios of Commercial banks in the Country (as of June 04) (Rs. in crore) is given in Table 28.10.

It can be seen that CD ratio of neighboring states of Tamilnadu and Karnadaka stood at 90% and 66% respectively. Our credit absorption capacity is evidently low compared to other States.

In Kollam the spatial distribution shows that Anchal has the maximum value of CD

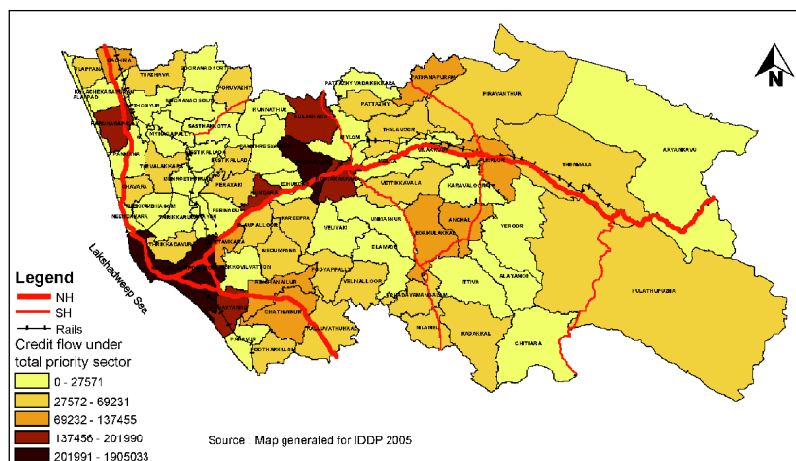


Fig.28.6: LSGI wise distribution of credit flow under total priority sector (TPS) during 2005

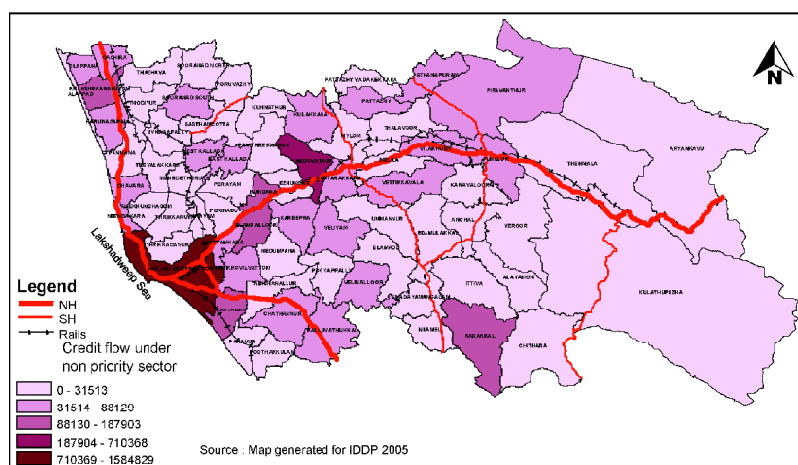


Fig.28.7: LSGI wise distribution of credit flow under non priority sector (NPS) during 2005

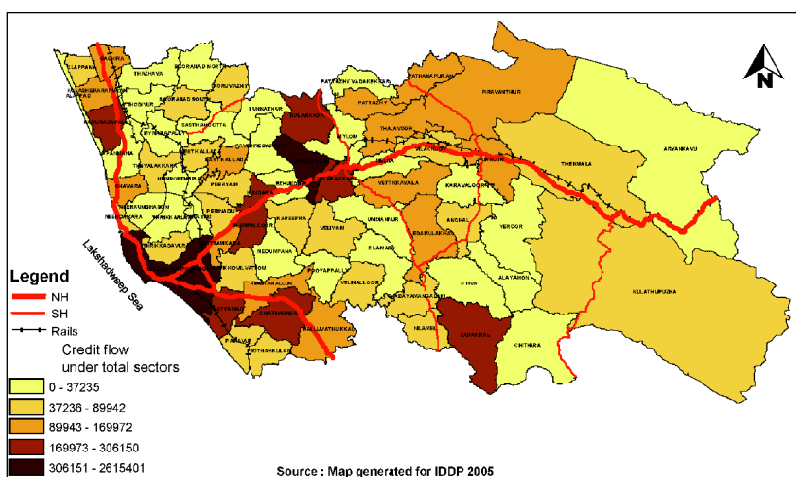


Fig.28.8: LSGI wise distribution of credit flow under total sectors lending during 2005

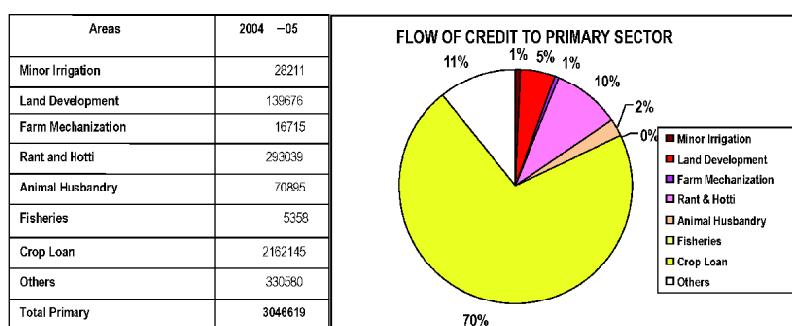


Fig28.9: Flow of credit to primary sector

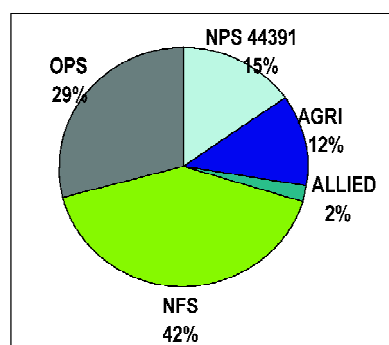


Fig. 28.10: Pattern of credit plan 2005-06

Table.28.9: Distribution of sector wise Non Performing Assets

	Agri	SSI	Others	PrioritySector
Gross NPA	7240	8838	7762	23840
% NPA to Loans outstanding	8.4	15	8.1	9.7

	Agri	SSI	Others	Priority Sector	N.P.S
Public Sector	14.44	17.62	15.48	47.54	51.24
Private Sector	4.43	12.19	7.35	23.97	75.3

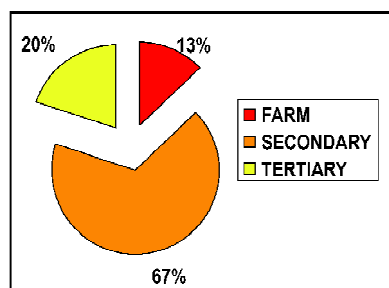


Fig28.11: Sector wise achievement under district credit plan

Table.28.10 : Cumulative credit deposit ratio in commercial banks

State	Credit	Deposit	CD Ratio
Chandigarh	11632	11359	102
Tamil Nadu	88180	98170	90
Maharashtra	262158	327909	80
Karnataka	61568	92905	66
Andhra Pradesh	56202	85482	66
Delhi	110548	186067	59
Rajasthan	22500	38695	58
Orissa	12416	22483	55
Kerala	32498	65609	50
West Bengal	46955	100349	47
Gujarat	35683	86691	41
Uttar Pradesh	33890	117891	29
Bihar	8738	34501	25
Utaranchal	3628	18262	20

Ratio in 2005 Figure 28.12.

1.6 Priority Sector Disbursement

It is the disbursement of funds to primary, secondary and tertiary sector including agriculture, Industry, Housing and other service sectors.

The Priority sector disbursement (Comparative Study) Rs. in crores is shown in Table 28.11. It is seen that the

(Crores) from March 1995 to March 2005

Growth of Population per Bank Branch in Kerala (1991 to 2001) is given in Table 28.12. The average population per branch is almost same for Kollam. Leaving Wayanadu and Idukki, no. of branches of scheduled commercial banks opened is encouraging. Wayanadu and Idukki are

achievement is generally above the target.

Sector wise Achievement under Dist. Credit Plan during 2000-01 to 2004-2005 is given in Figure 28.14. During 2003 to 2005 the DCP targets are achieved.

District credit plan achievement for Kollam (Rs. In Crores) from 2004-05 to 2005-06 is given in Table.28.14. Under agri credit growth is commendable of Commercial Banks.

Though overall projection under Priority Sector for 05-06 is +19.21% the projection under NFS is pruned at 5.57% level considering the existing high exposure of the district under NFS.

Agency-wise Annual Credit flow to Agriculture and total priority sector in Kerala (Rs. in crores) – 2001-01 to 2003-04 is given in Table 28.15. In both priority sector and Agriculture during 2003-04, the percentage increase to previous year is above 25%.

Credit Flow under various sectors in Kollam from 2002-03 to 2004-05 is given in Figure 28.15. The credit flow except in

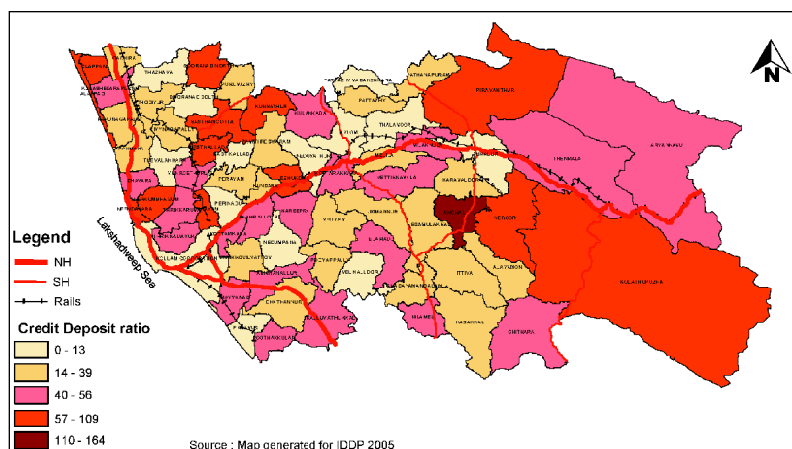


Fig.28.12: LSGI wise distribution of credit deposit ratio

percentage of achievement has come down in 2004-2005 in Kollam compared to State.

2 Overall Development Trend

The major criteria used for analyzing overall development of the sector are as follows.

- I Growth of Population per Bank Branch from 1991 to 2001
- I Priority sector advances disbursed by commercial Banks in Kerala from 1992 to 2004
- I Priority Sector Advances in Kollam District - Target and Achievements from 2002- 03 to 2005-06
- I Sector wise Achievement under Dist. Credit Plan in terms for % of Advances from 2000-01 to 2004-2005
- I District credit plan achievement for Kollam (Rs. In Crores) from 2004-05 to 2005-06
- I Agency-wise Annual Credit flow to Agriculture and total priority sector in Kerala (Rs. in crores) from 2001-02 to 2003-04
- I Credit Flow under various sectors in Kollam from 2002- 03 to 2004-05
- I Percentage Growth in CD (Credit Deposit) Ratio in Kerala from 1992 to 2003
- I Performance in Kollam District (Rs. in

Table.28.11: Priority sector disbursement – Comparison with State

	2002-03		2003-04		2004-05	
	Kerala	Kollam	Kerala	Kollam	Kerala	Kollam
Primary	3514.19	261.25	4491.24	220.13	6854.38	304.66
Secondary	1840.11	967.42	1928.9	985.57	2519.73	1516.59
Tertiary	5208.87	367.73	7072.05	548.06	9013.08	426.25
Total Priority	10563.17	1596.4	13492.19	1753.76	18387.19	2247.5
% of achievement	119	173	128	163	115	108

having less scope.

Priority sector advance disbursed by commercial Banks in Kerala from 1992 to 2004 is given in Table 28.13. The percentage of Priority Sector lending is above the benchmark of 40% and under agriculture lending the benchmark of 18% could not be achieved.

Target and achievements in the Priority Sector Advances in Kollam District are shown in Figure 28.13. It is seen that the

case of tertiary sector is increasing over the years.

Percentage Growth in CD (Credit Deposit) Ratio in Kerala (1992 to 2003) is given in Table 28.16.

Performance of Kollam District (Rs. In Crores) during March 1995 to March 2005 is given in Table 28.17.

Remarkable feature is that for more than a decade, the priority sector lending is above 50% well above the bench mark of

Table.28.12: Growth of population per bank branch (1991 – 2001)

District (Rank wise)	1991		2001		Growth of Population Per Branch	Index
	No. of Branches of Sched./ Com. Banks	Average population Per branch	No. of Branches of Sched./ Com. Banks	Average population Per branch		
Pathanamthitta	164	7246	232	5319	-26.5928	100
Thrissur	303	9034	379	7848	-13.1331	54
Kottayam	227	8054	273	7156	-11.1477	47
Kasaragod	101	10609	125	9633	-9.2032	40
Ernakulam	410	6871	497	6249	-9.05529	40
Thiruvananthapuram	288	10231	347	9321	-8.89918	39
Kozhikode	222	11802	259	11116	-5.80602	29
Malappuram	178	17395	218	16631	-4.39498	24
Palakkad	223	10683	255	10285	-3.91319	22
Alappuzha	197	10158	215	9810	-3.4298	21
Kannur	197	11430	216	11153	-2.42791	17
Kollam	179	13450	189	13678	1.697088	3
Wayanad	64	10502	73	10893	1.822614	3
Idukki	96	11230	98	11523	2.607417	0
Total	2840	10214	3376	X	X	X

Table.28.13: Priority sector advance disbursed by commercial banks in Kerala

Year (March)	Total Advance	Total Priority Sector Advance		Agriculture Sector		Sal Sector	
		Amount	% to Total Advance	Amount	% to Total Advance	Amount	% to Total Advance
1	2	3	4	5	6	7	8
1992	5093	2151	42.2	821	16.1		
1993	5861	2380	40.6	914	15.6		
1994	6485	2590	39.9	953	14.7	811	12.5
1995	7843	3407	43.4	1199	15.3	1090	13.9
1996	9007	3994	44.3	1364	15.1	1223	13.6
1997	10505	4539	43	1597	15.1	1445	13.7
1998	12361	5211	42.2	1811	14.7	1558	12.6
1999	13577	5997	44.2	1951	14.4	1783	13.1
2000	15941	6840	42.9	2231	14	1991	12.5
2001	19180	8894	46.4	2747	14.3	2262	11.8
2002	22062	10132	45.9	3036	13.8	2540	11.5
2003	27007	11867	43.9	3507	13	2562	9.5
2004	31867	15725	49.35	4502	14.1	2618	8.2

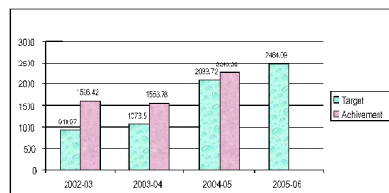


Fig.28.13: Trend in priority sector advances in Kollam district – Targets and achievements

Table.28.14: District credit plan achievement for Kollam from 2004-05 to 2005-06

Sector	2004-05 Target	2004-05 Achievement	% of achievement	2005-06 Target	% of increase
Agri	278.86	296.42	106	361.57	29.66
Allied	29.96	8.23	27	67.39	124.93
NFS	1135.42	1516.58	133	1198.71	5.57
OPS	639.48	428.05	67	856.41	33.92
TPS	2083.73	2249.3	108	2484.08	19.21
NP	354.62			443.91	25.17
Grand Total	2436.34			2927.99	20.08

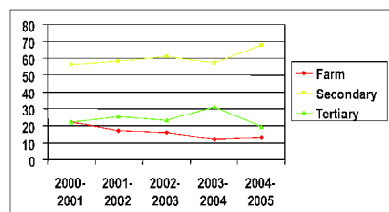


Fig.28.14: Trend in percentage advance in development sectors

Table.28.15: Credit flow under various sectors in Kollam (2000-01 to 2003-04)

Agency	Priority Sector			Agriculture		
	2001-02	2002-03	2003-04	2001-02	2002-03	2003-04
Commercial Banks	4863	5703	5947	1466	1914	7519
RRBs	687	628	1108	414	408	755
Co-operatives including Land Development Banks	2550	3138	3539	981	1192	1215
Kerala Financial Corporation	141	94	102	0	0	0
Grand total	8241	10566	135963	2861	3514	4549
Percentage increase to previous year	14%	28%	23%	-1.57%	22.92%	23.44%

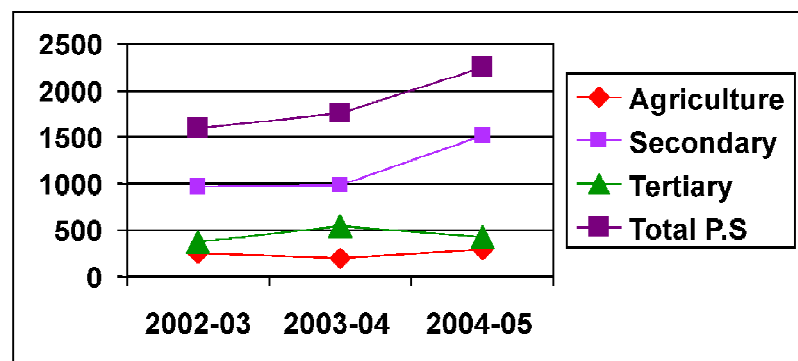


Fig.28.15: Credit flow under priority sector lending

40% stipulated by Govt. of India.

3 Development Issues

3.1 Problems

Crop loan plays a vital role in increasing agricultural production. As

Table.28.16: Percentage growth in credit deposit ratio

District (Rank wise)	Credit - Deposit Ratio		Growth (%)	Index
	1992	2003		
Pathanamthitta	14.43	16.6	15.04	100
Thiruvananthapuram	51.03	50.8	-0.46	77
Wayanad	198.68	179.4	-9.7	63
Palekklad	51.83	48.3	-10.84	61
Idukki	102.52	90.3	-11.92	60
Kottayam	50.72	39.2	-22.71	43
Thrissur	37.33	27.7	-25.8	39
Kannur	49.33	35.4	-28.24	35
Alappuzha	47.44	33.7	-28.96	34
Ernakulam	92.89	04	-31.1	31
Kozhikode	81.66	54.1	-33.75	27
Malappuram	51.36	32.1	-37.5	21
Kasaragod	77.36	46.1	-40.41	17
Kollam	95.46	46.6	-51.03	0
State	59.14	X	X	X

given in Article 1.3, there is low credit flow in the mid land and high land in general. The credit flow to agri sector is affected since Agricultural holdings are small and fragmented with average holding 0.39 ha. The low credit flow in the area immediately after the coastal belt could be due to the shrinking Paddy cultivation in this area.

Credit off take under Animal Husbandry sector is not improving and the credit flow is meager in fishing sector.

As given in Article 1.3, almost the entire district is having low NFS during 2005. This means that there is lack of overall industrial development in the district. The higher value in Kollam Corporation is because

primary sector shows that majority of the credit is channelised for crop loan. There is meager flow to fisheries sector due to various reasons.

3.2 Potentials

As given in Article 1.3, The NFS shows the maximum credit delivery due to high credit off take by cashew exporters. This shows the potential for this sector in the district.

4 Agencies Involved

Commercial Banks, Cooperative banks/Societies, Urban Banks, Primary Cooperative Agricultural and Rural Development Banks, (PCARDBs), Kerala Financial Corporation, NABARD etc. are the major agencies involved in credit deployment. The other Govt. Depts./ Agencies are given in Table 28.18.

5 On going and Committed Projects linked to Banking Sector

The major On-going and Committed Projects linked to Banking Sector are listed here.

- Swarnajayanthi Gram Swarozgar Yojana (SGSY)
- Swarna JAYanthi Shahari Rozgar Yojana (SJSRY)
- Kudumbasree
- Credit cum Subsidy Scheme of Government of India for Rural Housing
- Self-Employment Scheme for Ex-

Holdings For Productivity Improvements

- Production and Distribution of Txd Coconut Seedlings
- World Bank assisted Rubber Development Project
- State Government proposal to distribute rooted pepper cuttings free of cost to cultivators
- Farm mechanization programmes of Agricultural Department
- Floriculture
- Medicinal Plant Cultivation
- Integrated Programme for Rice Development
- Scheme to Encourage Group Farming For Augmenting Rice Production
- Intensive vegetable development programme
- Commercial vegetable garden
- Integrated programme for development of spices
- Scheme for massive livestock development programme
- Margin money scheme and margin money loan scheme of KSDC for SC/ ST
- Rural artisans programme
- kvic margin money scheme
- Fish cultivation programme
- Fisher women assistance programme
- Scheme for provision of fishing equipment of fishermen groups
- Special live stock production programme
- Non-farm sector programmes
- Transport sector programmes
- Retail Trade and Small Business programmes
- Professional and self employment programmes
- Education programmes
- Housing Schemes
- Kerala State Self Employment Scheme for the Registered Unemployed 1999 (KESRU 99)
- Vegetable and Fruit Promotion Council Kerala (VFPC)
- Rain water harvesting for SC/ST
- Increasing flow of credit at village Grama Panchayat level
- The follow up action after the tragic disaster "Tsunami"
- Kisan Credit Card Scheme
- Homestead Farming
- Doubling of agriculture credit

Table.28.17: Priority sector lending - Performance of Kollam (March 1995 – March 2005-06)

Particulars	Mar-95	Mar-96	Mar-97	Mar-98	Mar-99	Mar-00	Mar-01	Mar-02	Mar-03	Mar-04	Mar-05
Deposit	1212.49	1274.73	1540.96	1738.03	2126.27	2481.82	2805.09	3209.08	3704.82	3961.88	4031.14
Advance	765.5	853.68	917.64	918.91	1192.26	1259.65	1482.23	1461.52	1778.15	2057.88	2610.57
OD Ratio	63	67	60	52	56	51	52	46	48	52	65
PS Adv.	396.75	487.79	538.84	590.68	696.08	700.11	803.41	735.35	988.22	1303.35	1602.99
%PS adv. to Tot adv	52	57	59	62	58	56	55	50	56	63	61

the credit delivery is more there. However the credit absorbed here could be utilized elsewhere.

The growth under service sector and its distribution in the district is reasonable as evident from the discussion on OPS given in Article 1.3. Still there is scope for improvement in this sector as it is directly linked to flow of credit in Agri, sector and NFS.

The distortions under CD ratio in different areas are due to high credit and equally high deposit in the urban centres with low credit off take commensurate with the deposit mobilized.

As per Article 1.3, the flow of credit to

Service Men (SEMEX)

- National Sericulture Project
- Women Entrepreneurs Development Scheme
- SC/ST Entrepreneurs Development Scheme
- State Investment Subsidy for SSI Units
- Margin Money Loan Scheme for Industrial Loan
- Minor Irrigation
- Land Development programmes
- Dairy Development programmes
- Poultry Development programmes
- Fisheries Development programmes
- Biogas-Development programmes
- Integrated Farming In Coconut Small

Table.28.18: Other agencies involved in credit deployment

Sl. No.	Name of the Dept/Agency	Headed by
1	Dept. of Agriculture	The Principal Agricultural Officer, Kollam
2	Animal Husbandry	Dist. A.H. Officer, Kollam
3	FFDA	Chief Ex. Officer, Govt. Boat Yard, Sakthikulangara.
4	Dairy Development	Asst. Director, DD, Kollam
5	Fisheries	Regional Manager, MATSYAFED, Near Collectorate
6	Industries	GM, DIC, Ashramam, Kollam
7	KVIB	Project Officer, KVIB, Kollam
8	MILMA	Officer-in-charge, MILMA, Kollam
9	Minor Irrigation	Ex. Engr., Minor Irrigation Divn. Kollam
10	Planning	District Planning Officer, Collectorate
11	KSEB	Ex. Engr., KSEB, Kollam
12	Rural Development	Project Officer, DRDA, Kollam
13	District Mission State Poverty Eradication Mission	District Mission Co-ordinator, Kudumbasree
14	Sericulture Dept.	Dist. Sericulture Officer, SERIFED, Ayur
15	Rubber Board	Regional Manager, Rubber Board, Kottarakkara
16	Brackish water FFDA	Chief Exe. Officer, BFFDA,
17	Ground Water Dept.	Hydro-Geologist, Ground Water Dept.
18	Poverty Alleviation Unit	Project Director

6 Performance Evaluation of Banking Sector

The CD ratio, the major performance evaluating factor, is consistently above the bench mark stipulated by the Govt. registering performance above the State average. Further the credit flow under district credit plan in the state is in the top bracket.

7 Conclusion

From the analysis is clear that the maximum credit flow is towards Non farm sector. However through the management of funds from various sources all the three sectors can bring about substantial development in the district.

To bring a substantial boost for Agriculture and allied sector, Community structures can be developed with assistance of Government, Grama Panchayat and banks.

The unit cost/ scale of finance is to be revised taking into account the escalation in prices of various inputs required

The essence of the issue under agriculture sector is there is a need for creating a price stabilization fund with an objective to ensure that remunerative prices are obtained by farmers.

Similarly the service sector in the district also witnessed tremendous growth recently

considering the general uptrend in the economy during last five years.

As the general saying goes any first rate proposal going into the hands of a 2nd rate entrepreneur will go waste or any 2nd rate proposal going to a first rate entrepreneur will be a success. There are abundant avenues for resources around us. Only we have to pick the most suited one for our requirement. The finance sub committee felt that the resource crunch need not be a bar for taking up good, viable, feasible proposals by the supplementing agencies or entrepreneurs.

Wrong signals are given by moratorium / waiver which can be curtailed to a certain extent. Inter subvention is today's watch word. Also Commodity Trade has to come in a long way MCX, NCDEX, etc.

As far as rural area is concerned, Rural India still banks on lenders. Outstanding debt per household to non institutional agency is Rs.3234/- for rural and Rs. 2931/- for urban. The need of the hour is to go for RRBs and for financial inclusion.

Resource needs of rural sector not to be neglected and rural areas have to be empowered. ATMs with wireless connectivity through CDMA Technology can be provided in rural areas as no electricity is required.

In case of urban areas, Municipalities now look to capital market for funds as a Special Purpose Vehicle. House holds have largest share in municipal bonds. Our growth is more domestic driven while others have export led growth. Labour market has to be more flexible. High interest charged by microfinance agencies has to be reduced. Credit guarantee scheme for farmers can be mooted by RBI. Earlier the concept was to do business then think risk, now it is weigh risk then do business. So overall there is great scope for development of certain sectors in the district which can be enhanced through financial support from various funding agencies



Chapter 29

Spatial Pattern

In this chapter the spatial pattern of activities, settlement hierarchies and road network evolving out of the settlement analysis and the spatial pattern of resources, environmental aspects and social aspects are probed into.

1. Spatial pattern based on settlement studies

In the settlement analysis the following aspects pertaining to settlements of the district were studied

1. Land use distribution
2. Population distribution
3. Occupational structure
4. Functional character
5. Hierarchy of settlements
6. Hierarchy of nodes
7. Urban profile

A. Activity pattern

The activity pattern existing within the district is derived based on the study of the spatial distribution of the aspects covered in the settlement studies. Here three

aspects namely, the land use concentration pattern, functional character and urban profile, which cover all the aspects taken for the study of the settlements are combined in order to evolve the activity pattern (functional character is determined based on population distribution and land use, Urban profile is derived taking in to account occupational structure and hierarchy of settlements, the land use concentration pattern is studied based on the land use analysis).

The classification of settlements as per the three aspects - the land use concentration pattern, functional classification and urban profile-are given in Table 29.1.

Table 29.1: Classification of settlements

Urban Profile	Land Use Concentration	Functional Classification
Urban	Non Agricultural	Urban
Non urban	Agricultural	Semi Urban
	Forest	Rural
		Semi Rural

The activity pattern within the district is derived by combining the characters under the three aspects (Table 29.2).

If the character of a settlement is urban as per urban profile, non agricultural as per land use concentration and is urban as per functional classification, that settlement can be termed as an urban activity area – mainly service sector activities.

Table 29.2: Urban activity

Urban Profile	Land Use Concentration pattern	Functional Classification	Activity
Urban	Non Agricultural	Urban	Urban activity
Non urban	Agricultural	Semi Urban	
	Forest	Semi Rural	
		Rural	

In such areas, the work force is predominantly non agricultural (more than 75% -as per urban profile such areas are designated as urban) and there is concentration of non agricultural land uses (as per land use concentration pattern). Besides the plot sizes and major land uses indicate (as per functional classification) the nature of activity as urban.

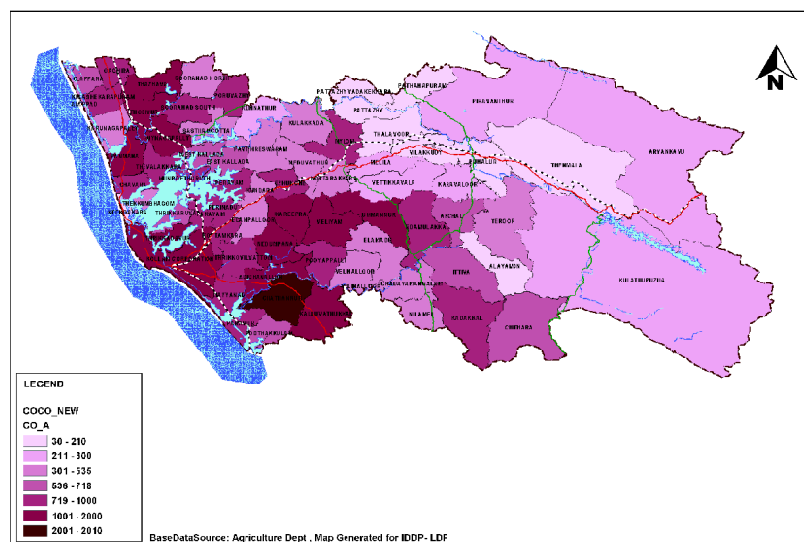


Fig 29.13: LSGI wise distribution of area under coconut cultivation

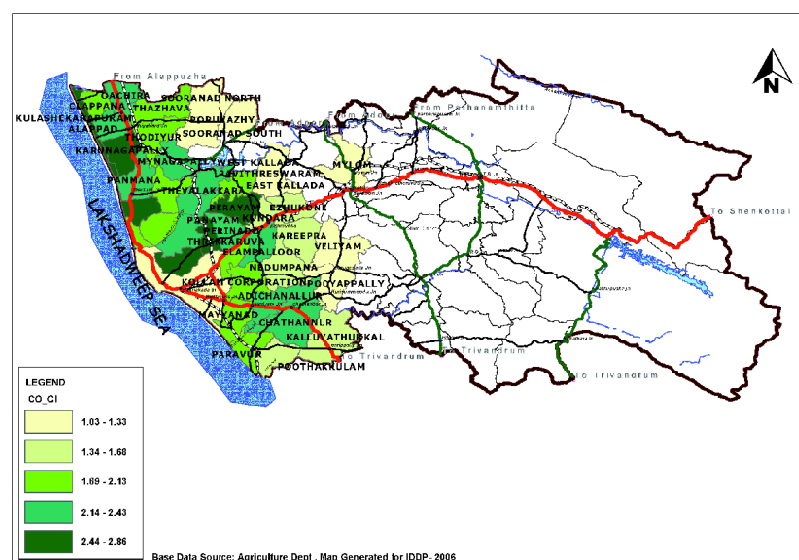


Fig 29.14: Variation of cropping intensity of coconut

the district. Figure 29.14 shows the areas of higher cropping intensity of coconut.

Rubber

The land use studies reveal that the concentration of Rubber cultivation is in the mid land and mid up land region. As per the crop suitability study by the Dept. of Soil Survey, mid up land and up land region are suitable for rubber cultivation.

Figure 29.15 shows the distribution pattern of rubber cultivation in the district.

When the spatial distribution of area of cultivation, production and productivity of rubber (as per the data collected by the Agriculture sub committee of special TAC) are analyzed, it is again noted that there is a concentration of rubber in the mid land, mid up land and up land region.

Figure 29.16 shows the spatial distribution of area under cultivation of

rubber.

The higher value of cropping intensity of rubber is seen in the eastern belt of the district, which shows a clear concentration

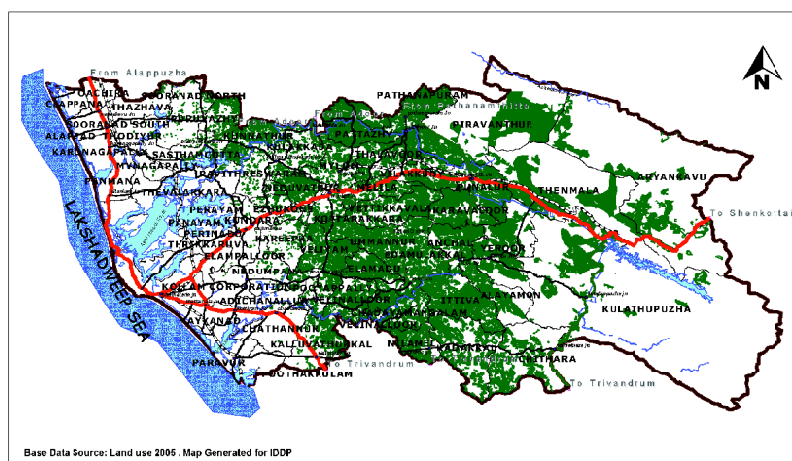


Fig 29.15: Distribution pattern of rubber cultivation

of rubber cultivation areas in the eastern part of the district. The variation of cropping intensity is shown in Figure 29.17. The maximum cropping intensity is found in Thenmala and Thalavur grama Panchayats. Hence from the analysis of land use pattern, area of cultivation and cropping intensity of rubber, high concentration of Rubber cultivation is seen in the mid land, mid up land and up land regions.

Pepper

Since the details of land under pepper alone is not available from land use studies the cropping pattern of pepper is arrived at mainly using the cropping intensity variation of pepper calculated based on the data furnished by agriculture sub committee of Special TAC.

In the case of pepper also higher variation of cropping intensity is seen in the mid upland, upland and high land areas of the district. As per the crop suitability study by the Dept. of Soil Survey also mid up land area is suitable for pepper cultivation.

Figure 29.18 shows the variation of cropping intensity of pepper. Pepper cropping is intense in Kulathupuzha & Aryankavu Grama Panchayats. Hence studies reveal that pepper cultivation is concentrated in the mid land, mid upland and highland regions of the district.

Banana

From the spatial distribution of area under cultivation of banana, (Figure 29.19) based on the data furnished by agriculture sub committee of special TAC, it is seen that there is no specific spatial concentration for banana cultivation. Instead the banana cultivation is distributed all over the district.

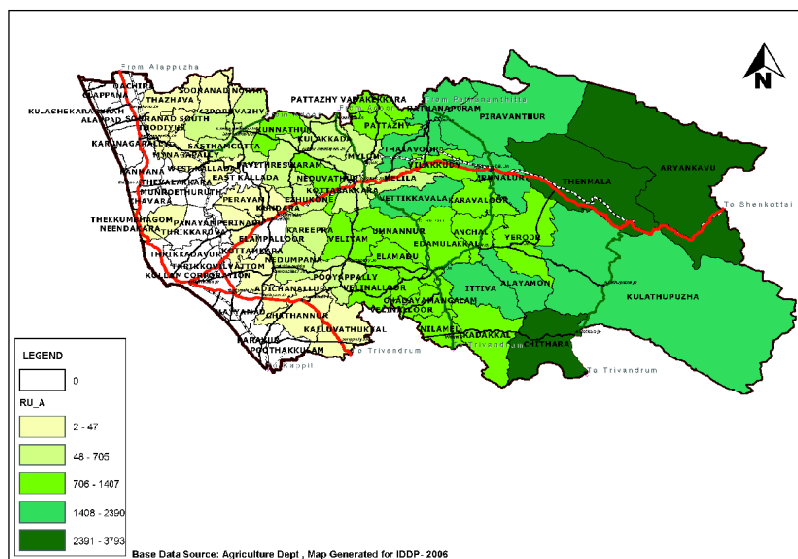


Fig 29.16: LSGI wise distribution of area of rubber cultivation (Ha)

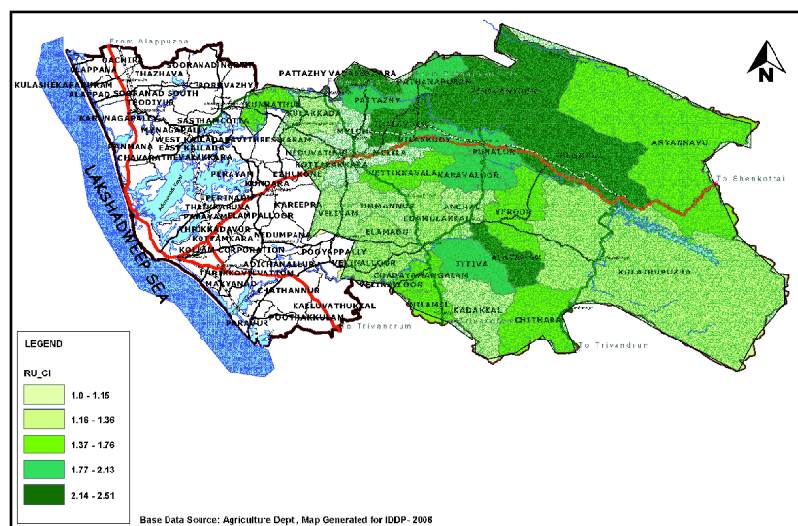


Fig 29.17: Variation of cropping intensity of rubber

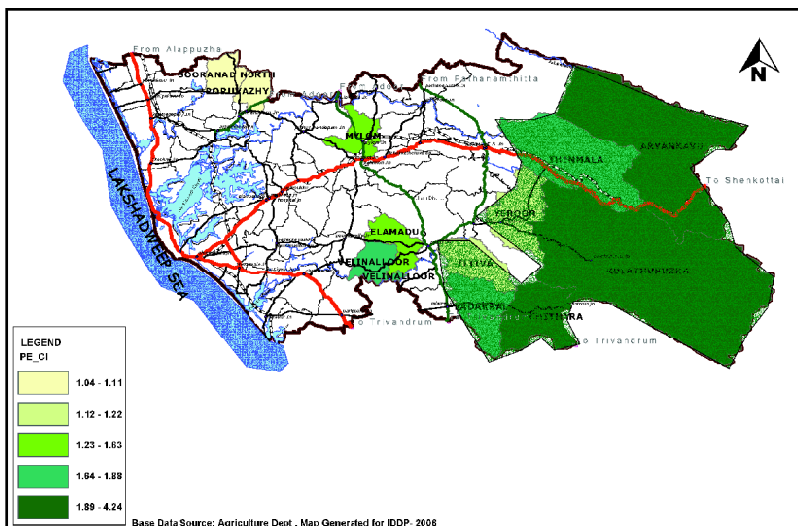


Fig 29.18: Areas of higher cropping intensity of pepper

Paddy

From the land use analysis it is found that the concentration of paddy cultivation is in the area immediately after low land. As per the crop suitability study by the Dept. of Soil Survey, low land and mid land region where soil series of Kallada and Mylom are found are suitable for paddy cultivation.

Figure 29.20 shows the paddy areas/lands in Kollam.

The cropping intensity, calculated based on the data furnished by agriculture sub committee of special TAC (Figure 29.21) shows a clear pattern of spatial concentration in the areas adjacent to low land towards mid land. Paddy cultivation is highest in Sooranadu North and Kalluvathukkal. Both area wise and cropping intensity wise paddy concentration is the highest in Sooranadu North Grama Panchayat.

Though paddy is classified as one of the sub major crops, it has got importance from the point of view of environmental aspects. The decrease in area of cultivation of paddy due to filling, directly causes flooding in the surrounding areas in rainy season. Since paddy fields are the main storage basins of surface run off, it helps in recharging ground water storage and in turn the scarcity of drinking water can be eliminated to some extent. Hence from the angle of environmental concern, paddy fields are of prime importance and are to be conserved.

Tapioca

The higher variation of cropping intensity of Tapioca shows that the cultivation of tapioca is not concentrated in specific areas but is distributed all over the district. Figure 29.22 shows areas of higher cropping intensity of tapioca.

Arecanut

The areas of higher cropping intensity of Arecanut show a spatial concentration in the low and high up land. Figure 29.23 shows the areas of higher cropping intensity of Arecanut in the district.

Cashew

Though cashew is classified as one of the minor crops, cashew processing is one of the most important industrial activities in the district. From the analysis of spatial distribution of area of cultivation of cashew (Figure 29.24), it is seen that cashew cultivation is concentrated in the mid land area.

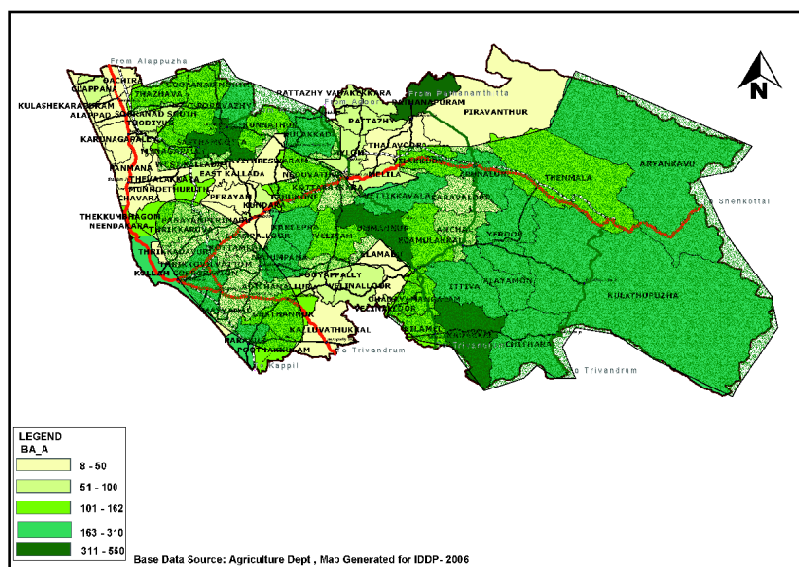


Fig 29.19: LSGI wise distribution of area of banana cultivation (Ha)

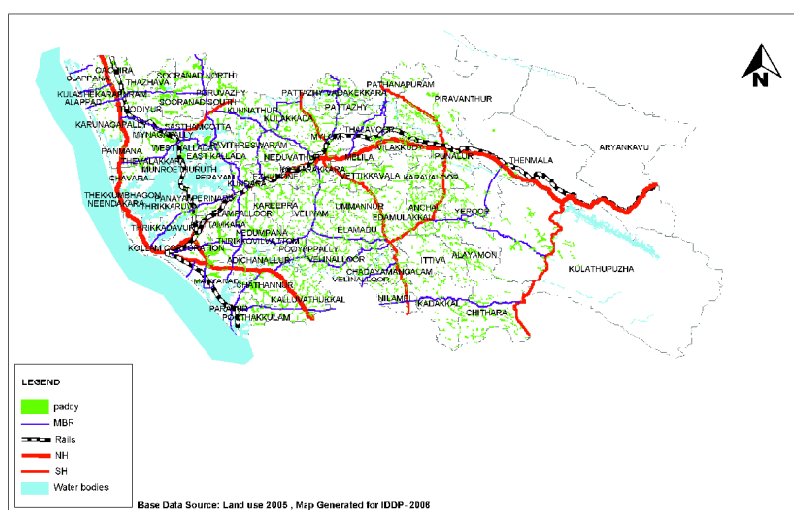


Fig 29.20: Paddy areas in Kollam

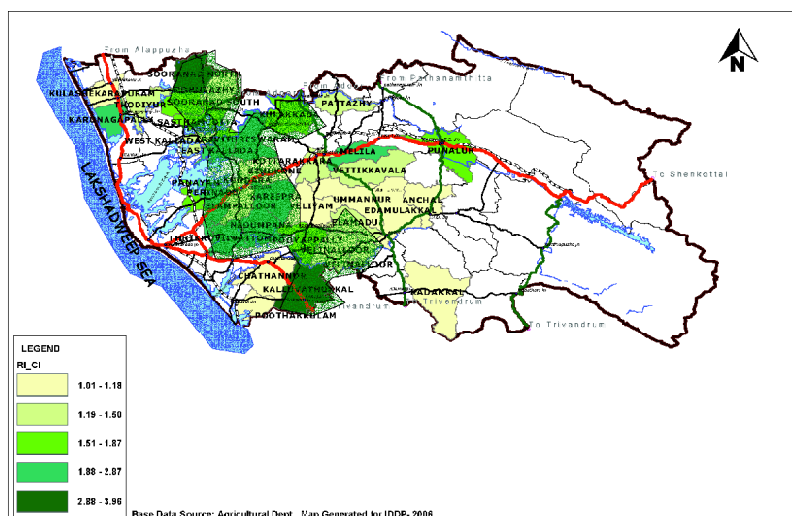


Fig 29.21: Areas of higher cropping intensity of rice

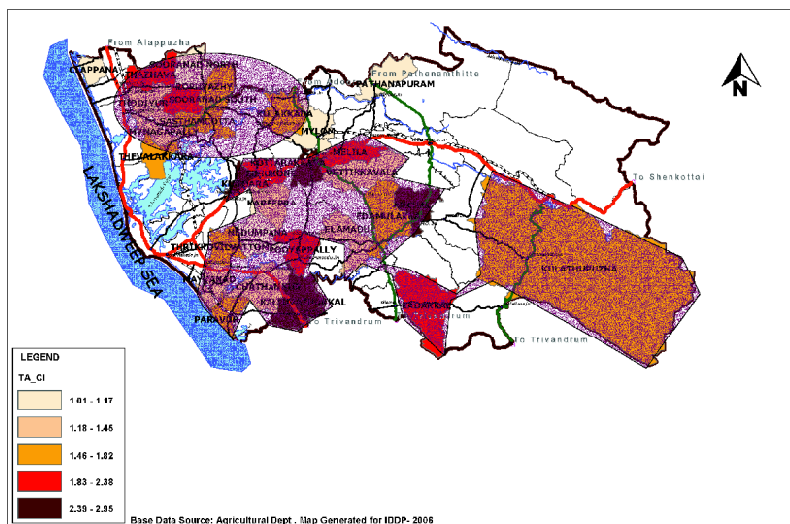


Fig 29.22: Areas of higher cropping intensity of tapioca

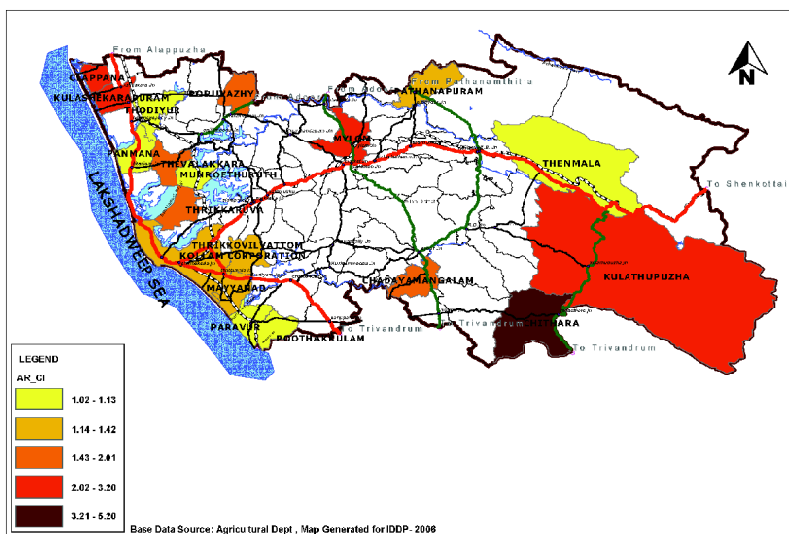


Fig 29.23: Areas of higher cropping intensity of arecanut

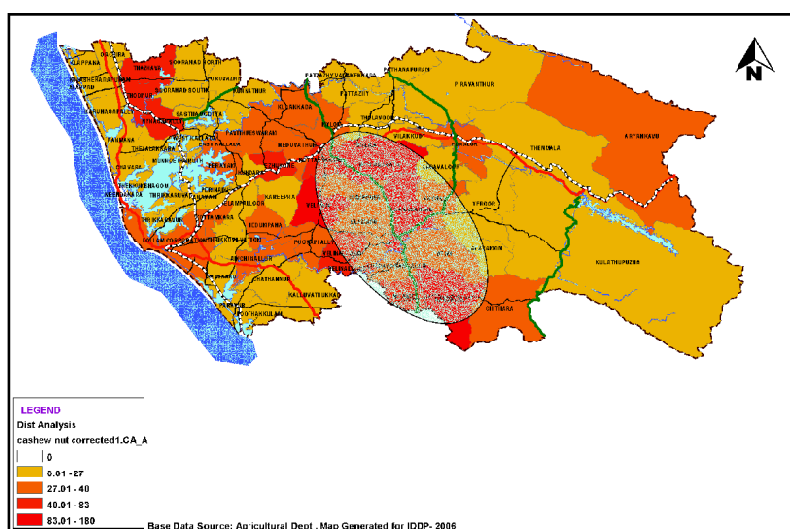


Fig 29.24: LSGI wise distribution of area of cashew nut cultivation

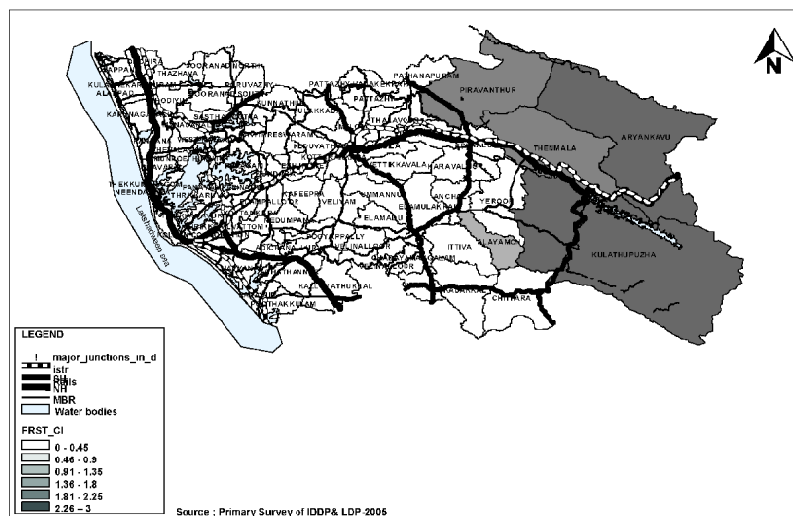


Fig 29.25: Concentration pattern of forests

Forest

The concentration pattern shows (Figure 29.25) that forest area of the District is mainly concentrated in the eastern part of the District. Pepper and rubber are concentrated in this area. Since the major land use is forest and the area is environmentally sensitive main thrust to be given for preserving the forest area. At the same time cultivation of the crops like rubber and pepper are to be intensified.

Spatial Pattern evolved from the study of agriculture

After analyzing the land use pattern, cropping intensity, crop suitability etc. of all the important crops which are the major agriculture resources along with forest areas, an attempt is made to evolve a cropping pattern of the district.

From the analysis of major crops, three distinct patterns of cultivation of major crops viz. coconut, rubber and pepper are seen with coconut concentrated in the coastal belt, rubber concentrated in the mid land and mid up land areas and pepper concentrated in the up land and high land regions of the district. Among the Sub major crops, only paddy has a distinct cropping pattern with concentration in the mid land area. Hence from the study of the intense cropping area of major and sub major crops, a distinctive pattern of cropping can be observed.

The cropping pattern evolved from the study of major and sub major crops is given in Figure 29.26.

From the figure it is seen that there is a clear pattern of intense coconut cultivation in the low land area. This corroborates to

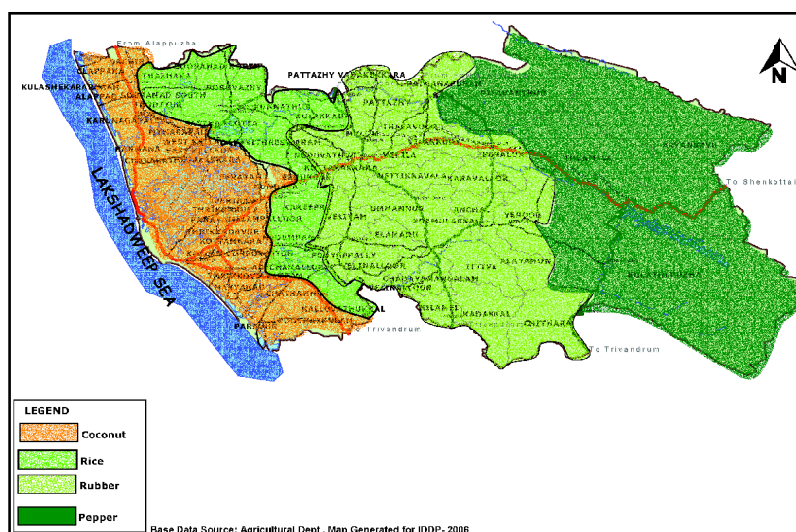


Fig 29.26: Cropping pattern of the district

the fact that coconut is primarily cultivated as homestead cultivation in the district. The paddy cultivation, as noted from the Sectoral Analysis, is drastically declining in the district over the years. However there is a pattern evolved in the low-mid land area where paddy cultivation is still practiced.

Despite the pressure due to urban land demand, this area needs to be developed keeping in mind the environmental impact of water logged paddy land which can act as water recharging pools as well. In the agriculture development perspective, rubber undoubtedly is the major cultivation for the district. There is a clear-cut pattern of intense agricultural area in the mid land area comprising primarily of rubber cultivation. The eastern tract of the district is obviously forest area, which is below the 33% standard as stipulated by the

Ministry of Environment and Forests. So this area needs to be treated with utmost care for its development even though there are areas where rubber and pepper are intensely cultivated.

In a nutshell, there are four distinctive agriculture development patterns in the district.

1. Sparsely distributed crop cultivation area in the low land where homestead cultivation such as coconut, jackfruit etc, can be promoted.
2. Mixed cultivation area in the low –mid land area where paddy cultivation can be sustained and cashew, vegetable and fodder cultivation etc can be promoted.

3. Intense crop cultivation area in the mid land where Rubber can be sustained and pineapple and cashew cultivation etc. can be promoted.
4. Resource based area where forest resources are to be conserved. Intense afforestation is to be promoted while rubber and pepper cultivation areas in between are to be sustained.

Figure 29.27 shows the suggested spatial pattern for the development of agriculture in the district.

B. Animal Husbandry

Spatial Pattern

Animal husbandry is closely associated with Agriculture sector as the existence of livestock directly depends on agricultural activities. This sector is highly labour oriented mainly targeted for the household enterprises. Hence the development of this sub sector is highly beneficial to the socially

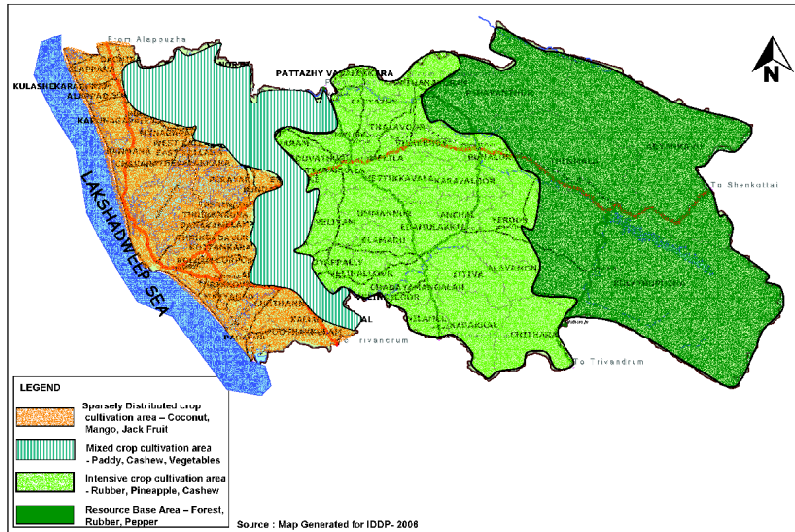


Fig 29.27: Agricultural Development Pattern

weak families within the district. Animal Husbandry is one of the potential development sectors in Kollam. So, it is essential to understand the activity pattern of this sector in the district.

For evolving the activity pattern of animal husbandry sector, distribution of major livestock viz. cattle, buffaloes and goats which form more than 99% of total livestock in the district and poultry are considered. To get the concentration of animals and poultry with respect to the geographical area of each LSGI, spatial distribution of density (total number per unit area) of each of the above species are prepared based on the data collected by the Animal husbandry and dairy development sub committee of special TAC.

Also from the local aspirations elaborated in the Local Level Analysis Reports prepared by the SICs in connection with the preparation of LDPs, it is seen that animal husbandry activities are considered as one of the important economic bases in the LSGIs towards northern and southern parts of the district.

Cattle

In the district cattle constitute about 57% of total livestock population. From the analysis of spatial distribution of density (cattle per Sq.Km) of population of cattle (Figure 29.28), it is seen that there is a concentration in the western part of the district (low land and portions of mid land adjacent to low land) except Kollam Corporation and surrounding areas.

Buffaloes

Though the total number of buffaloes

spatial distribution of density of buffaloes (Figure 29.29), it is seen that the concentration is again to the western part of the district mainly in the low land area.

Goats
Goats constitute about 41 % of total live stock population. As there is quick return in goat rearing which need comparatively less area of land, goat rearing activity has got importance. The spatial distribution of density of goats (Figure 29.30) shows a concentration in the west and central areas of the district.

Poultry

Poultry consists of fowls, duck and other birds of which the major part is that of fowls. As in the case of state, back yard

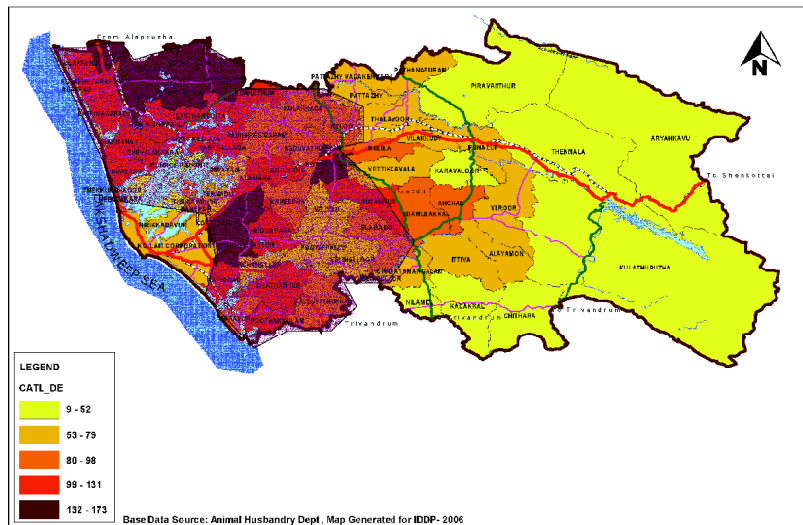


Fig 29.28: LSGI wise distribution of cattle per sq.km

in the district is considerably small (only 1 % of total live stock population), from the point of view of production of milk and meat, buffaloes play an important role. From the

poultry rearing is practiced in the district also.

Analysis of spatial distribution of density of poultry shows a concentration in low and

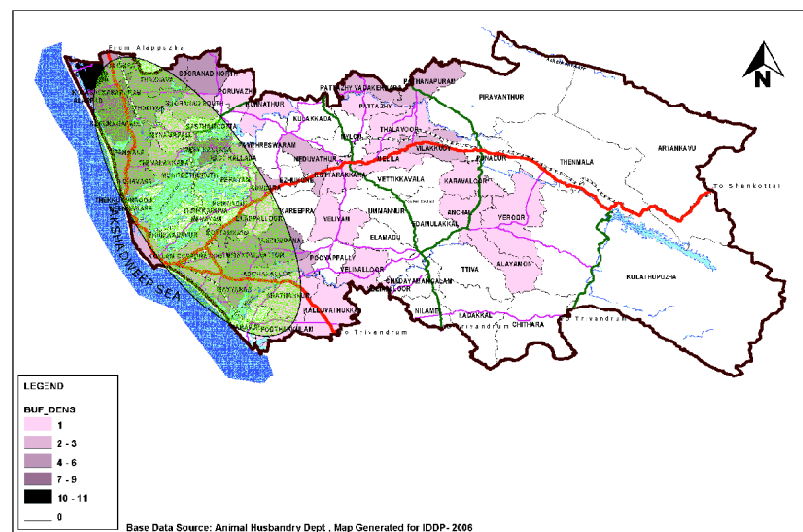


Fig 29.29: LSGI wise distribution of Buffaloes per sq.km

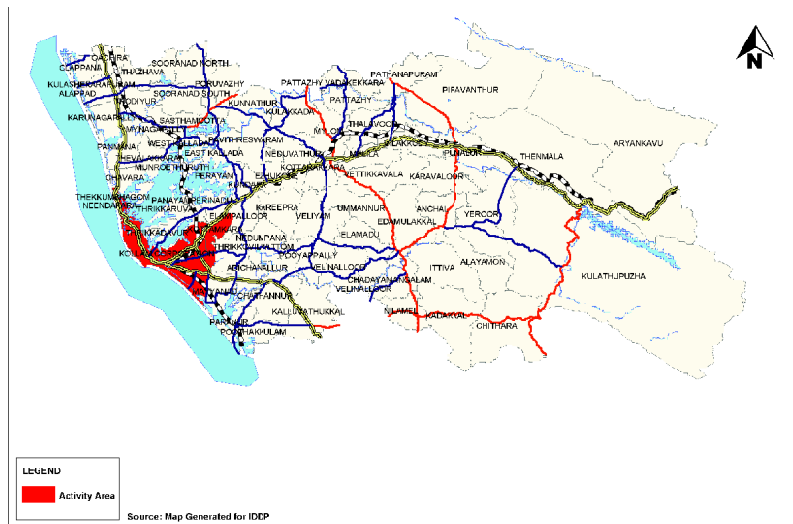


Fig 29.1: Urban activity area

The area delineated accordingly is shown in Figure 29.1.

If the character of a settlement is non urban as per urban profile, agricultural as per land use concentration pattern and rural as per functional classification, the most suitable activity in that settlement can be rural related activities, mainly agricultural activities.

Agricultural workers plus cultivators are the predominant workers in these areas (as per urban profile this area is designated as non urban), there is concentration of agricultural land use in such areas (as per land use concentration pattern), and the plot sizes and major land uses indicate (as per functional classification) the nature of activity as rural Table 29.3.

The area delineated accordingly is shown in figure 29.2.

Table 29.3: Rural activity

Urban Profile	Land Use Concentration pattern	Functional Classification	Activity
Urban	Non Agricultural	Urban	
Non urban	Agricultural	Semi Urban	
	Forest	Semi Rural	
		Rural	Rural Activity

If the character of a settlement is non urban as per urban profile, forest area as per land use concentration pattern and rural as per functional classification, the most suitable activity in that settlement can be rural related activities, mainly agricultural activities which are non-detrimental to forests. When the character of a settlement is rural as per functional classification, it indicates the existence of significant extent of agricultural land in the area. Hence agriculture will remain as a significant activity in such settlements

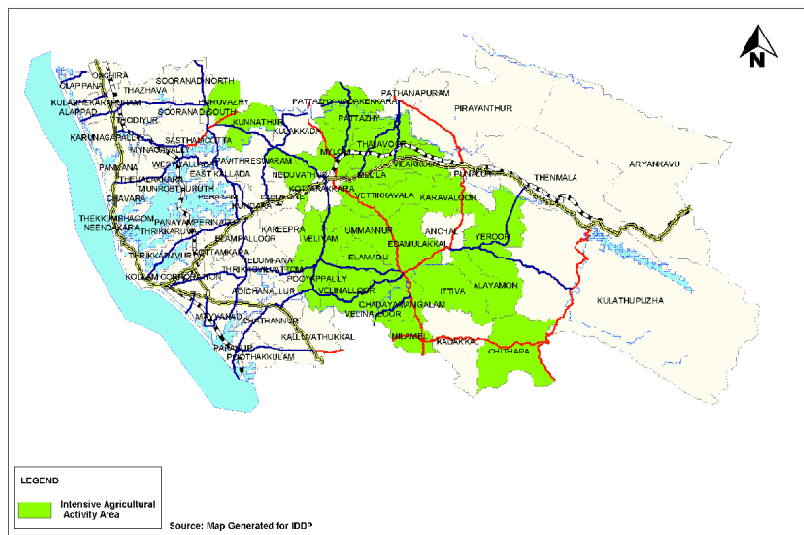


Fig 29.2: Rural activity area – Intense Agricultural area

(Table 29.4).

The area delineated is depicted in Figure 29.3

If the character of a settlement is urban as per urban profile, non agricultural as per land use concentration pattern and semi urban as per functional classification, the most suitable activity in that settlement can be secondary activities (Table 29.5).

The work force here is predominantly (more than 75%) non agricultural (because as per urban profile this area is designated

Table 29.4: Primary activity non detrimental to forest

Urban Profile	Land Use Concentration pattern	Functional Classification	Activity
Urban	Non Agricultural	Urban	
Non urban	Agricultural	Semi Urban	
	Forest	Semi Rural	
		Rural	Primary activity non detrimental to forest

as urban), there is concentration of non agricultural land use (as per land use concentration pattern), and the major land use is residential with average plot size 25- 50 cents (as per functional classification). Hence these areas are suitable for secondary activities mainly small scale and cottage industries.

The secondary activity areas delineated above is shown in Figure 29.4. Anchal Grama Panchayat should have been included in this category, but being rural character as per functional classification it is excluded.

However being a second order settlement of the district, Anchal Grama Panchayat has been included in the semi

urban category.

The final combination is taken as the settlements with non urban character as per urban profile, semi urban or semi rural as per functional classification. This is an area where major land use is residential (because the functional classification is semi urban or semi rural) and the plot size varies from 25 to 70 cents.

Majority of the workers are either cultivators or agricultural laborers (it is a non urban area as per urban profile). This area suitable for agricultural purpose but the limitation is the average plot size between 25 to 70 cents only imposing restrictions on agricultural operations. This plot size limitation makes the area suitable for small scale or cottage industries and also for animal husbandry activity (Table 29.6).

The area delineated is shown here (Figure 29.5).

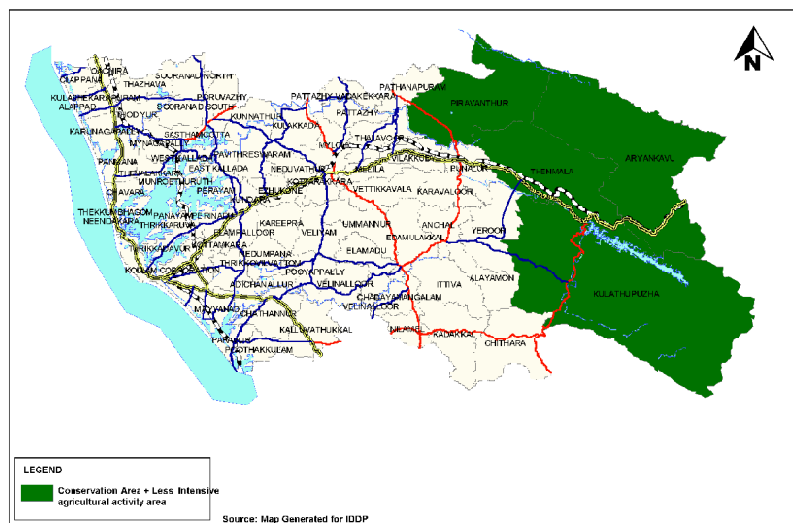


Fig 29.3: Primary activity non detrimental to forest

Table 29.5: Secondary activity

Urban Profile	Land Use Concentration pattern	Functional Classification	Activity
Urban	Non Agricultural	Urban	
Non urban	Agricultural	Semi Urban	Secondary activity
	Forest	Semi Rural	
		Rural	

The activity pattern of the district so arrived at is shown in Figure 29.6.

B. Hierarchy of settlements and nodes

As per the settlement analysis, it is found that the settlements in the District can be grouped into four hierarchies. The 1st order settlement is Kollam Corporation. Karunagappally, Kottarakkara, Punalur, Chathannur and Anchal are the proposed 2nd order settlements. The 3rd order settlements proposed are Thevalakkara, Kadackal, Velinallur, Vettikkavala, Pathanapuram, Kundara and Sasthamcotta Grama Panchayats. The remaining Grama Panchayats are classified as 4th order settlements. The study of nodes revealed that three higher order nodes are there in the district. The 1st order node is Chinnakkada in Kollam Corporation. Karunagappally, Kottarakkara, Punalur, Anchal and Chathannur are the 2nd order nodes. The higher order settlements and nodes are shown in Figure 29.7.

C. Road net work

The proposed road net work of the district is derived based on the hierarchy of settlements and nodes.

The road network should connect the higher order settlements and nodes each other. This means that a net work of major roads should be there connecting Karunagappally, Kottarakkara, Anchal,

Chathannur and Kollam Corporation. At the same time, there should be sub major roads connecting the lower order

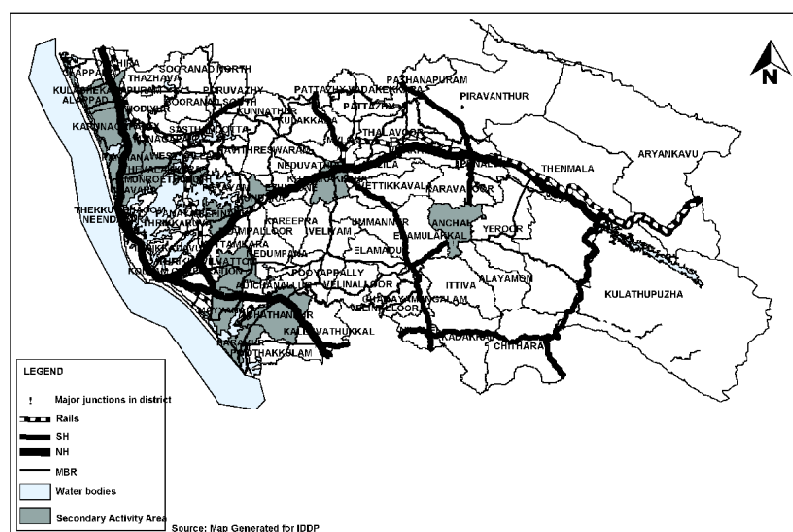


Fig 29.4: Secondary activity area

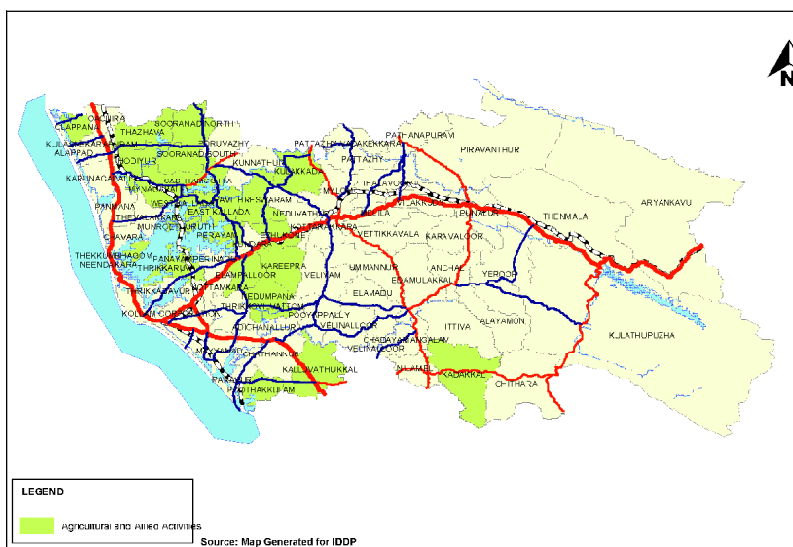


Fig 29.5: Agricultural and allied activity area

Table 29.6: Agricultural and allied activity

Urban Profile	Land Use Concentration	Functional Classification	Activity
Urban	Non Agricultural	Urban	
Non urban	Agricultural	Semi Urban	Agriculture, animal husbandry, cottage industries
	Forest	Semi Rural	
		Rural	

settlements with the higher order settlements and minor roads connecting lower order settlements each other.

Schematic representation of such a road net work is shown in Figure 29.8.

A final proposal of the road network is derived taking in to account those existing roads and suggesting new road links in those areas where the existing road is insufficient. The resultant road net work is shown in Figure 29.9.

National Highway Department has a

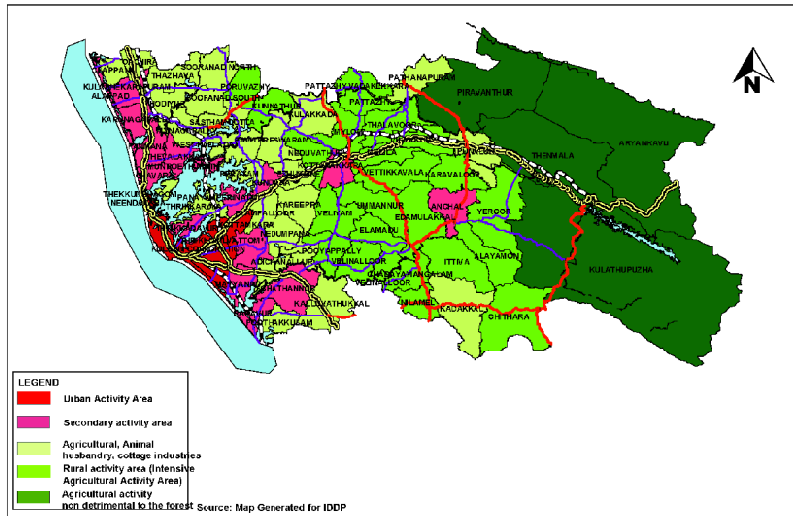


Fig 29.6: Activity pattern of the District

proposal of a new NH (NH 220) from Kollam to Theni via Chengannur, Changanassery & Kottayam. As per tentative alignment, this NH connects following centres within Kollam District viz Kollam HS Jn –Thevally – Anchallummodu – Elampalloor - East Kallada – Bharanikavu - Chakkuvally-Sooranad and then enters Pathanamthitta District.

The initial phase of this proposed alignment (of NH 220) from Kollam HS to Elampalloor and the last phase Bharanikavu-Sooranad are not included in the suggested alignment of road derived based on the settlement studies. The first phase the proposed NH-220 is close and parallel to the existing NH-208 and both ends ie Kollam (Chinnakkada) and Elampalloor are already connected by NH -208.

The only additional junction served by the first phase of the NH 220 is

Anchallummodu, which is already well connected to Chinnakkada and hence the alignment of the first phase of the proposed NH- 220 is not having much significance.

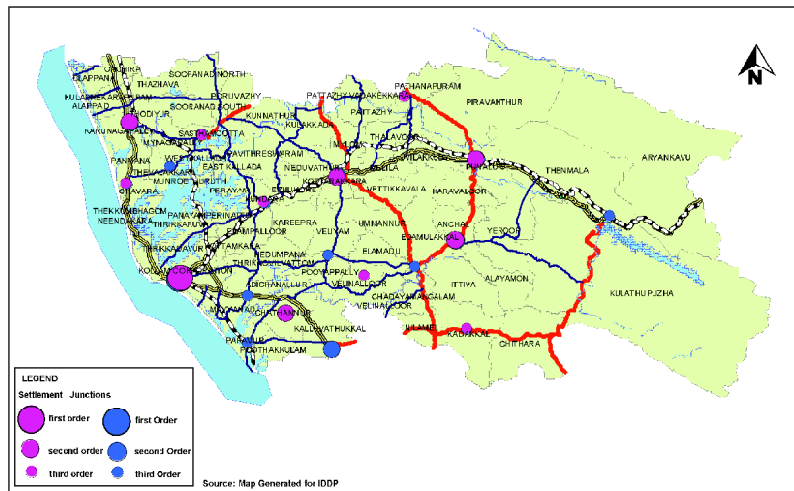


Fig 29.7: Hierarchy of settlement and nodes

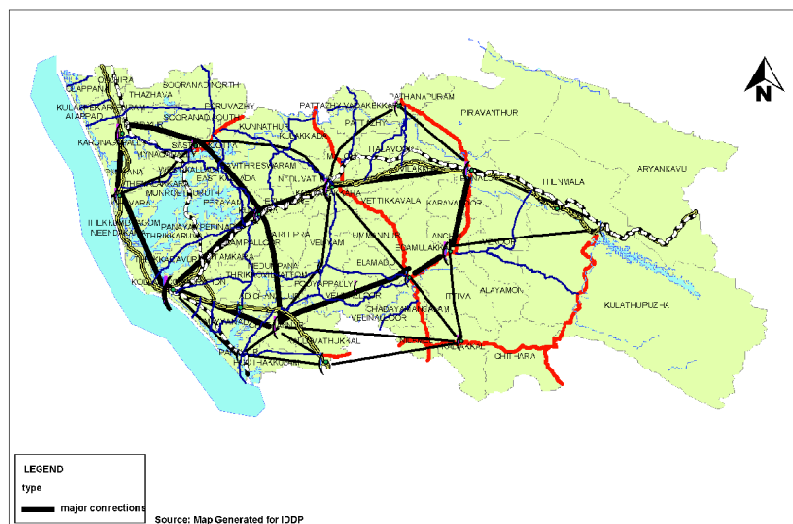


Fig 29.8: Schematic representation of the road net work

A new alignment from Kollam (Chinnakkada) to Kannanallur is proposed as the first phase of the NH -220. This stretch of the road is identified in the concept and also as per the approved Maser Plan for Kollam Town it is proposed as a 20 m wide road. The last phase of the proposed NH- 220 is maintained as such. So the revised suggested alignment for the NH-220 is Kollam (Chinnakkada) – Kannanallur-Kundara-Bharanikavu-Chakkuvally-Sooranad.

The transportation net work planned for connecting important junctions and settlements includes three types of roads net work viz: Major roads, Sub major roads, and Minor roads.

1. Major Roads

Major roads as per the planning concept, consists of four lane roads. The following roads are included in major roads.

1. The three National Highways (NH -47, NH -208, NH -220) passing through the district.
2. A new road Kottiyam- Kannanallur-Kundara –Bharanikkav-Karunagapally.
(This is an existing road but not of the status of a major road)
3. Existing State Highways. Following stretches of State highways passing through the district:
 - a. Nilamel-Ayur –Kottarakkara-Kulakkada (MC Road)
 - b. Ayur-Anchal-Punalur-Pathanapuram
 - c. Paripally-Nilamel-Chithara
 - d. Kulathupuzha-Chithara
 - e. Sasthamcotta-Bharanikavu-Adoor
4. Coastal road from Thangassey port to

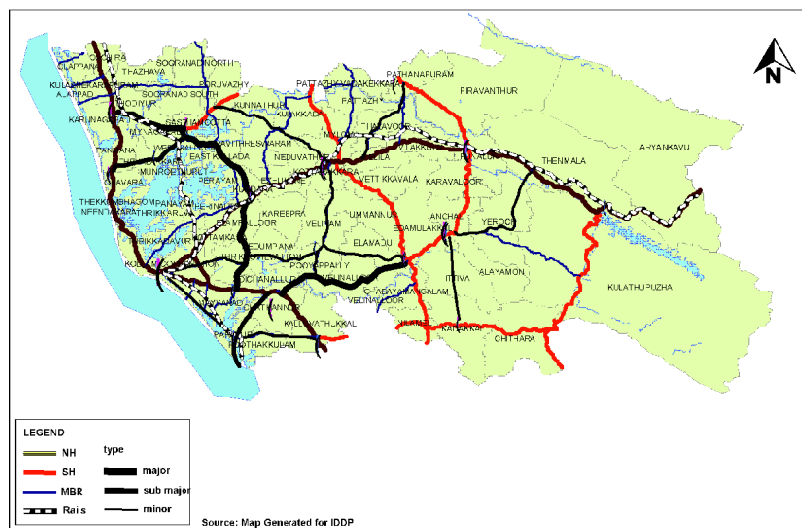


Fig 29.9: Suggested road network

Paravur and its extension to Chathannur.

5. Road starting from NH 47 near Chathannur to Ayur through Velinallur.

2. Sub Major Roads

The following roads are included in the sub major roads category:

1. Chavara- Sasthankotta road
2. Road from Paravur to Varkala
3. Paravur- Parippally Road
3. Minor roads

The following roads are included in minor roads category:

1. Kannanalloor- Pooyappally- Ayur Road
2. Bharanikavu- Chandamukku (near Kottarakkara)- Pooyappally- Kuriumoode Jn. Road
3. Kottarkkara – Pathanapuram Road
4. Anchal – Kadackal Road
5. Anchal – Thenmala Road

D. Spatial structure

The spatial structure of the district is obtained by overlaying the activity pattern, road network and hierarchy of settlements derived. The spatial structure so obtained is shown in Figure 29.10

2. Spatial pattern evolved from the study of resources

Since the resources are the backbone of any economy, the spatial pattern of major resources in the district also need to be incorporated to detail out the spatial structure evolved from the settlement studies. The key sectors which can contribute to the spatial structure are Agriculture, Animal Husbandry, Industries, Mining and geology and Tourism which have manifestations on land. The spatial pattern of the district evolved out of the

Figure 29.11) clearly reveals a concentration of agricultural land in the mid land area of the district. While wet agricultural land, though not much in area, is predominantly concentrated in the low land area, dry agriculture contributes to the major chunk of agricultural land in the mid land area.

As per the Local Level Analysis Reports, prepared so far by the SICs in connection with the preparation of LDPs, the major economic base of the LSGIs in mid, mid up land and some of the LSGIs in high land regions is agriculture.

Thus there is a concentration of agriculture activities in the mid and mid up

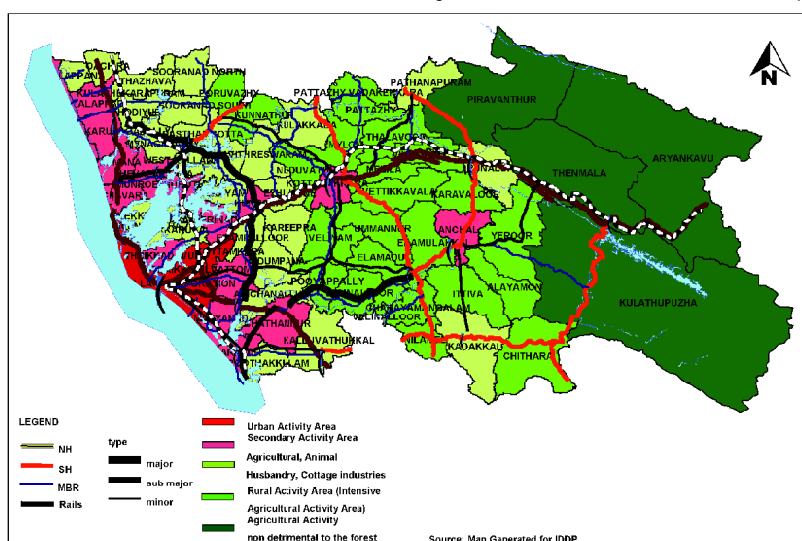


Fig 29.10: Spatial Structure of the district obtained by overlaying the activity pattern, road network and hierarchy of settlements

above sectors is detailed as follows.

A. Agriculture

Spatial Pattern in general

The land use pattern (as shown in

land regions.

Crop wise spatial pattern

As per the Sectoral analysis, 25 principal crops are cultivated in the district of which 16

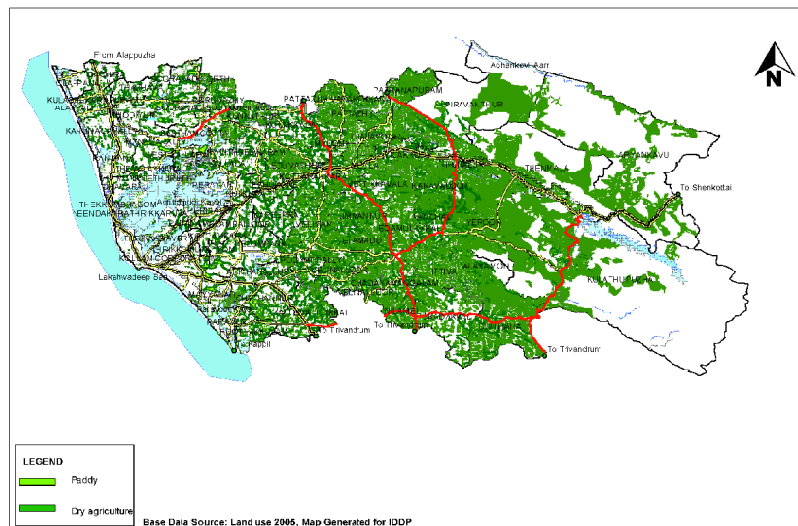


Fig 29.11: Agriculture land use concentration

crops are food crops and the remaining are commercial crops (Table 29.5).

For the purpose of analysis, these crops are classified as major crops, sub major crops and minor crops based on area of cultivation and revenue generated. The crops included in major crops are Coconut, Rubber and Pepper. Banana, Rice, Tapioca and Areca nut are the sub-major crops. All the remaining crops are classified as the minor crops. It is noticeable that all the three major crops identified are

commercial crops.

For evolving the crop wise spatial pattern of the district, detailed analysis of major crops and sub major are made. Since Cashew tops the maximum average farm price at the State level among the minor crops, it is also included in the analysis. The analysis includes land use pattern, crop suitability, and spatial distribution of cropping intensity of the selected crops. (Cropping intensity of a particular crop in an LSGI is the ratio between the area under cultivation of that crop in the LSGI to the total cropped area in the LSGI and the area under cultivation of that crop in the district to the total cropped area in the district). Higher value of cropping intensity (i.e., more than 1) indicates that the intensity of cultivation of that particular crop is more than the average intensity of cultivation of the same crop in the district.

From the land use analysis of the district, it is seen that the main land use in the eastern region of the district is forest with different types of crops cultivated in between. Hence while evolving the spatial pattern based on crops as mentioned above, the concentration pattern of forest area is also to be studied.

Coconut

From the analysis of land use pattern, it is seen that concentration of Coconut cultivation is in the low land region with some sporadic areas of concentration in the mid land.

Figure 29.12 shows the distribution pattern of coconut cultivation in the district.

As per the crop suitability study of the Dept. of Soil Survey, by and large soil is suitable for coconut cultivation in all the areas except in the mid up land and up land regions. Hence the potential area for coconut cultivation is low land and mid land regions.

When the spatial distribution of area of cultivation, production and productivity of coconut are analyzed, it is again found that there is a clear concentration of coconut in the low land area. Figure 29.13 shows the spatial distribution of area under coconut cultivation.

For getting a clear concentration pattern of coconut, the cropping intensity of coconut in each LSGI, is calculated and the spatial variation of cropping intensity is analyzed. From this analysis also it is seen that a clear concentration of coconut cultivation is in existing the western belt of

Table 29.7: Classification of main crops

Sl No:	Food crops	Sl No:	Commercial crops
1	Rice	1	Coconut
2	Pineapple	2	Banana
3	Jack Fruit	3	Rubber
4	Mango	4	Pepper
5	Pulses	5	Sesamum
6	Tapioca	6	Cashew
7	BetalVine	7	Aracanut
8	Tamarind	8	Turmeric
9	Bitter Gourd	9	Cinger
10	Snake Gourd		
11	LadiesFinger		
12	Brinjal		
13	Amaranthu		
14	Green Chilly		
15	OtherPlantain		
16	Other Vegetable		

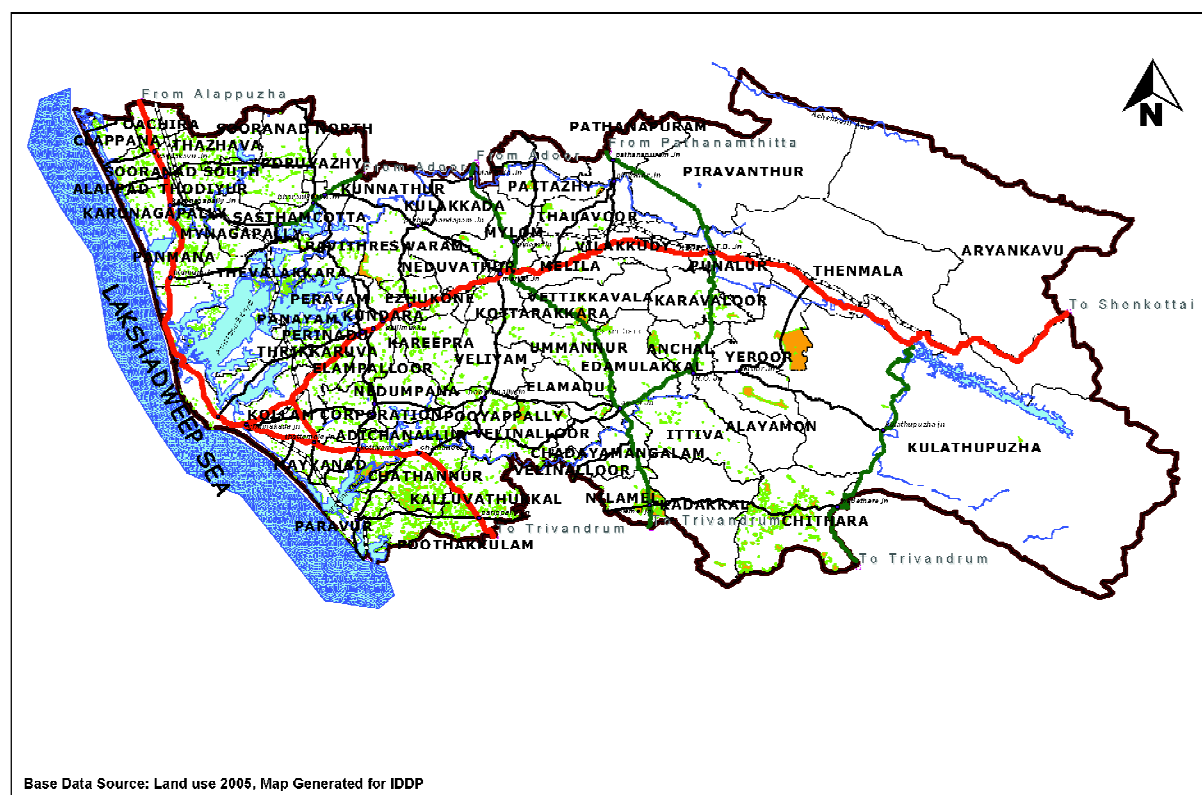


Fig 29.12: Distribution pattern of coconut cultivation

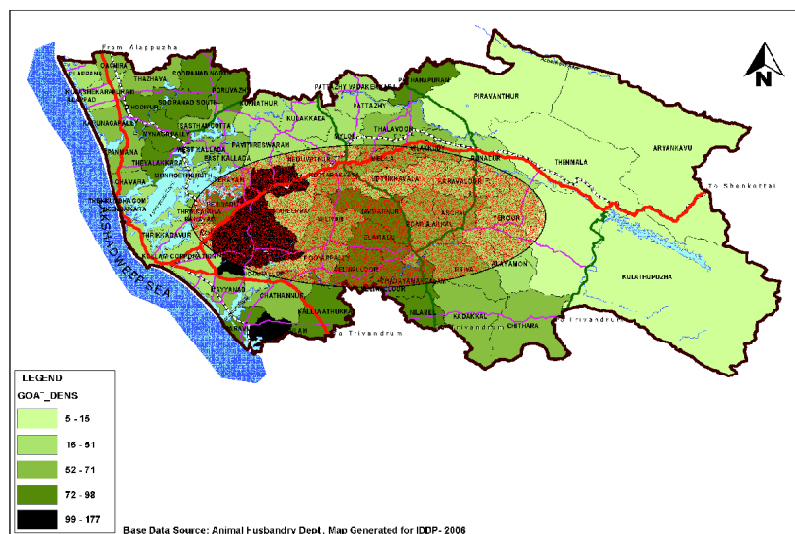


Fig 29.30: LSGI wise distribution of Goats per sq.km

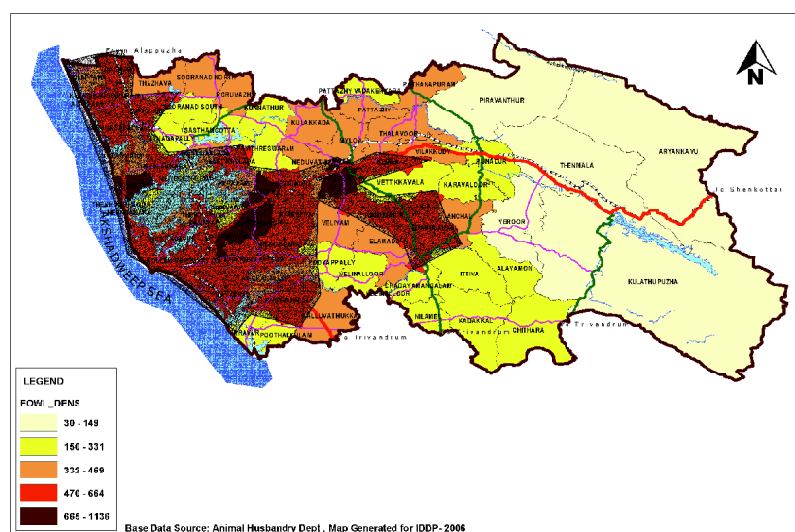


Fig 29.31: LSGI wise distribution of Poultry per sq.km

mid land area of the district (Figure 29.31).

In general notwithstanding the existing potential for animal husbandry activities in the low and mid land area, the un exploited potential in the mid upland is also to be explored for promoting animal husbandry activities.

C. Industries

Spatial Pattern in general

Kollam district, once renowned for its industrial base, is now very much in the declining stage as is evident from the analysis of industrial sector. Still Kollam has its own share of industrial distribution so much as to contribute to the State's economy.

Therefore it is essential to analyze the existing spatial pattern of industries in the district.

Industrial land use concentration as shown in Figure 29.32 clearly reveals a

concentration of industrial land in the low land area of the district, in particular in and around Kollam Corporation area.

Also from the local aspirations elaborated in the Local Level Analysis Reports prepared by the SICs in connection with the preparation of LDPs, it

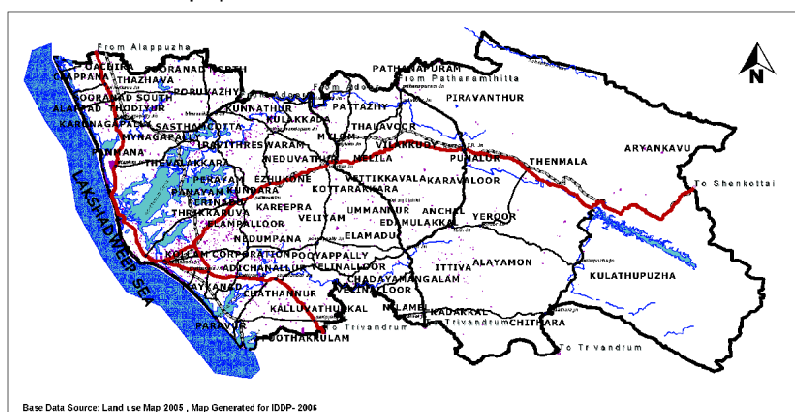


Fig 29.32: Industrial land use concentration

is seen that LSGIs in and around Kollam Corporation have identified industrial development as their major economic activity.

Spatial Pattern of industries by type

As per the sectoral analysis made by sub committee of special TAC on 'industries and trade', there are mainly four types of industries in the district. They are large & medium industries, traditional industries such as Handloom, Coir, Cashew, Khadi, small-scale industries and Coir cooperatives.

As per the spatial distribution of large and medium industries (Figure 29.33) they are concentrated in and around the urban centers of the District and also along the major traffic corridors.

From the analysis of spatial distribution of cashew industries (Figure 29.34), it is clear that Cashew industries are more or less concentrated in the mid land region along NH 208.

Also from the sectoral analysis of Industries sector, it is seen that the handloom industries are concentrated in Kollam corporation area and Khadi industries are concentrated in low land area.

It is seen from the spatial distribution of SSI units in the district (Figure 29.35), that concentration of SSI units is generally in the urban centres.

Also from the spatial distribution (Figure 29.36), it is found that the coir cooperative societies are mainly concentrated along the Coastal belt and Ashtamudi Kayal area.

When the spatial concentration of all industries together (Figure 29.37) is analyzed it is clearly seen that concentration of industries are in the low and mid land regions. However in order

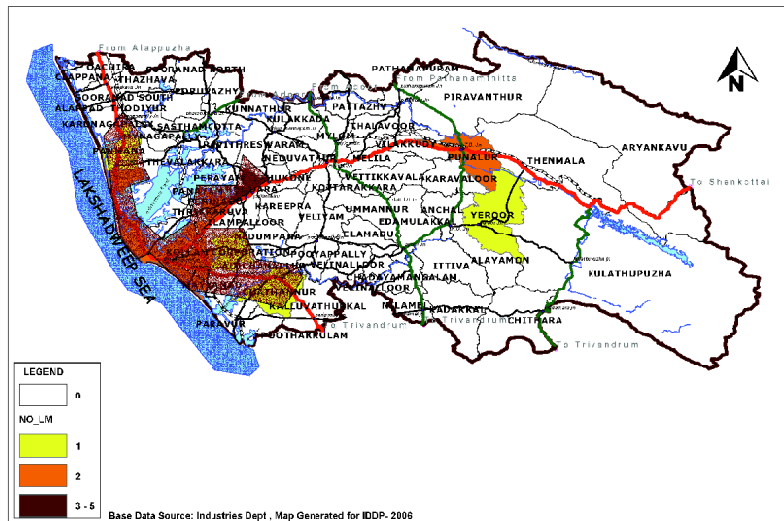


Fig 29.33: LSGI wise distribution of large and medium industries

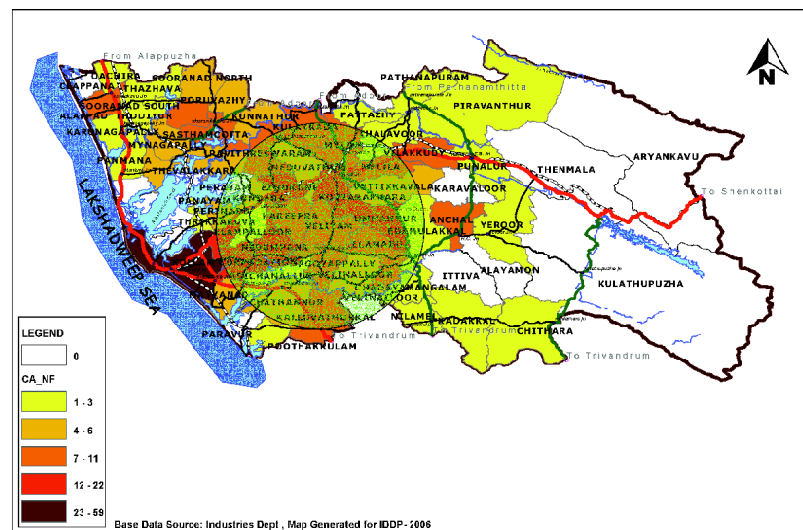


Fig 29.34: LSGI wise distribution of cashew industries

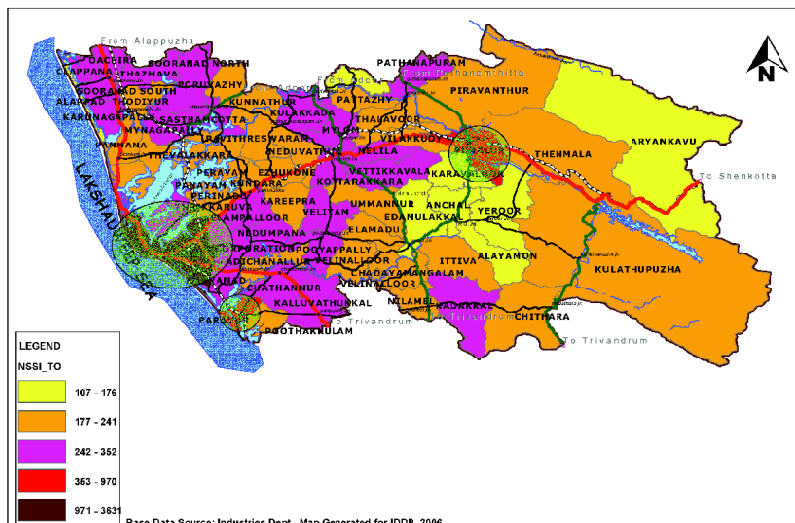


Fig 29.35: LSGI wise distribution of SSI Units

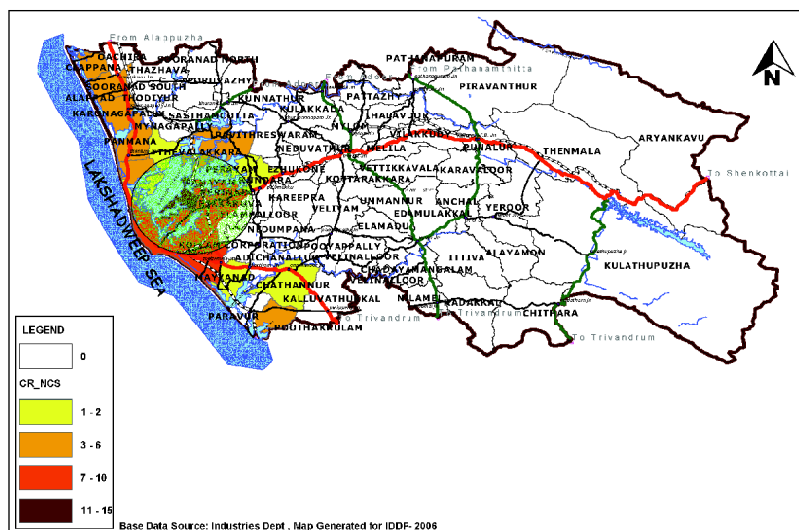


Fig 29.36: LSGI wise distribution of coir cooperative societies

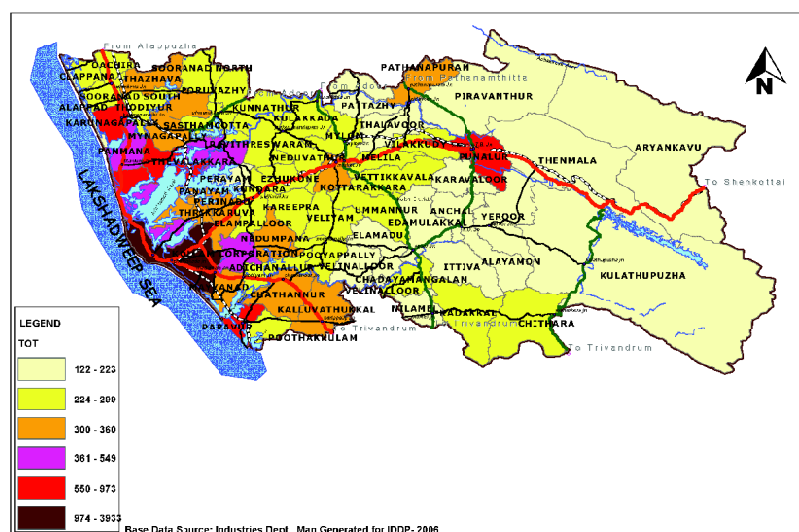


Fig 29.37: LSGI wise distribution of total industries

to sieve out the major industrial concentration areas the spatial pattern is evolved based on the criteria of above-district average values of various types of industries.

The spatial pattern thus evolved (Figure 29.38) clearly shows that apart from Kollam Corporation, there is a definite concentration of industrial area in the northern and southern coastal belt.

D. Fisheries

Having a coastal stretch of 37Km and enriched with numerous inland water bodies including the back waters, the district has immense potential for the development of fishing activities. From the study of fisheries sector it is evident that there is good scope for the development of under utilized potentials of marine activities in the coastal area and also the inland fishing activities in and around Ashtamudi kayal

(Figure 29.39).

E. Mining and Geology

Mining activities are predominant in the district as other neighboring districts are

concerned. Panmana Grama Panchayat is well known due to the presence of the large-scale industry Kerala Minerals and Metals Ltd (KMML). Two of the most potential mining activities in the district are those of Mineral sand and China clay.

The spatial pattern of mining activities is evolved from the spatial distribution of mining activities of mineral sand and china clay. It is seen from the sectoral studies of Mineral sand and their extraction activities are concentrated in the northern area of Ashtamudi Kayal. Kundara and Perayam Grama Panchayats are found suitable for processing industries utilizing China clay. Figure 29.40 shows the concentration pattern of mining activities in the district

F. Tourism

Due to the peculiar physical features of the district consisting of rivers, back waters, sea shore, dense forest etc. the district is having tremendous potential for developing tourism related activities.

Spatial Pattern

From the analysis of tourism sector, it is found that Kollam Corporation, Thenmala Grama Panchayat, Paravur municipality, Munroethuruth Grama Panchayat and Perayam Grama Panchayat are the main potential areas for tourism activities. From the sectoral studies it is also found that, in order to make the tourists stay in Kollam it is essential to develop the existing tourism potential of Kollam Corporation area. Further the potentials of Thenmala, Paravur and Munroe Thuruth are to be enhanced. The immense potential, of portions of Ashtamudi kayal and near by

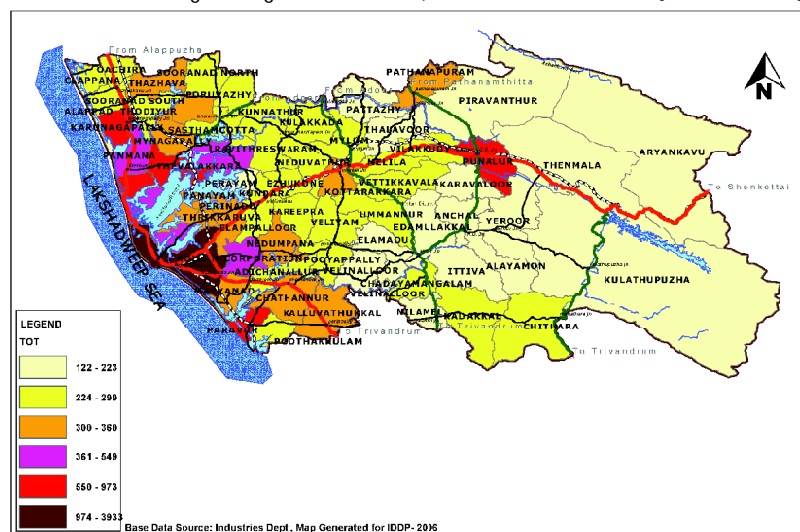


Fig 29.38: Spatial pattern of Industries

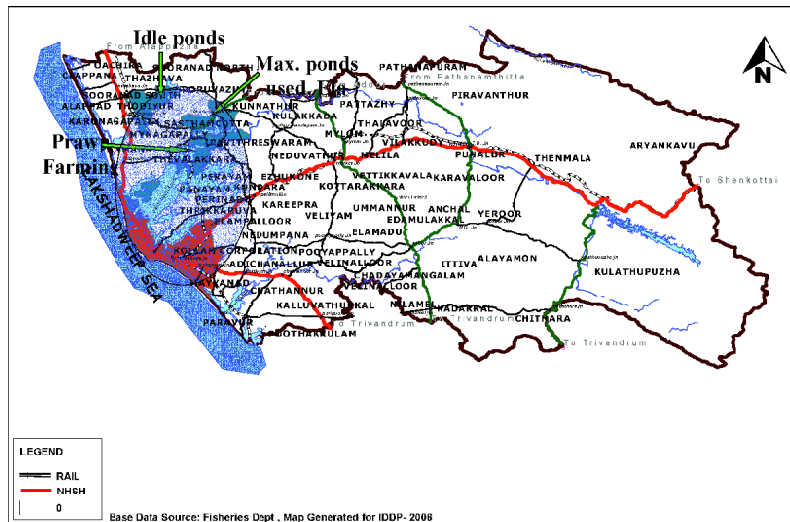


Fig 29.39: Potential areas of development sector-Fisheries sector

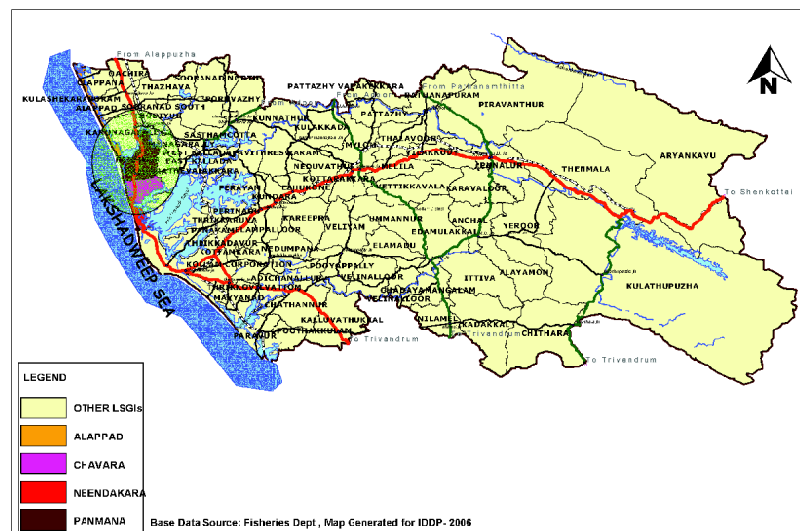


Fig 29.40: Concentration pattern of mining activities

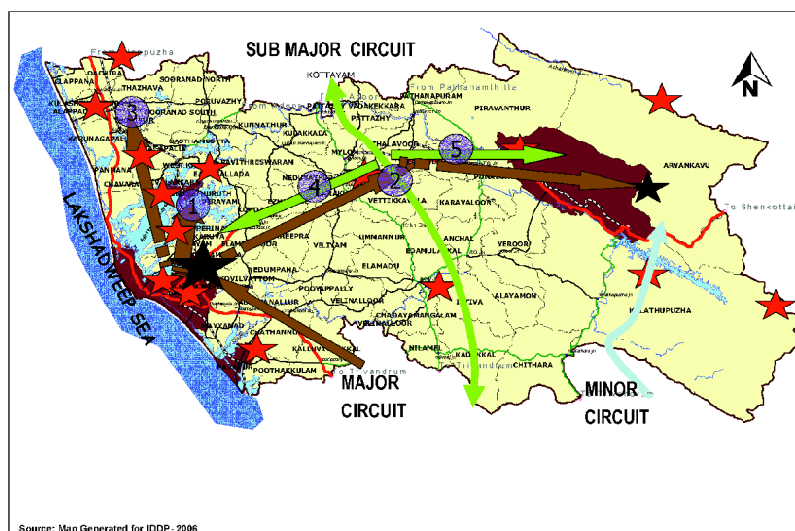


Fig 29.41: Potential tourist circuits

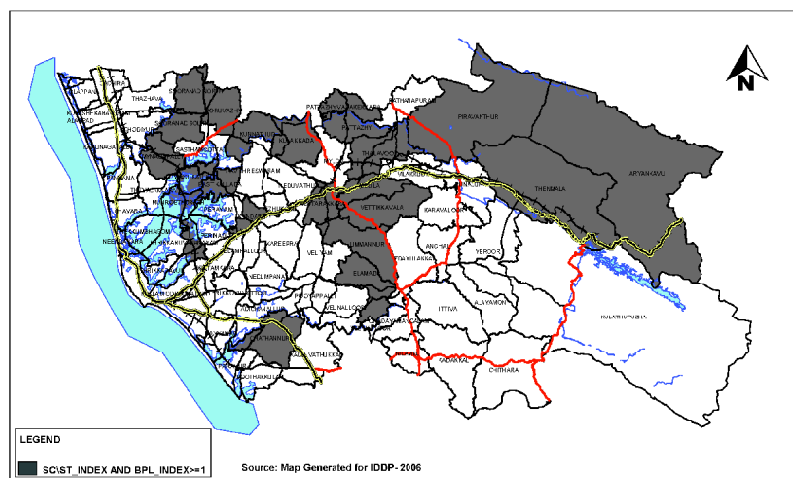


Fig 29.42: Socially backward areas

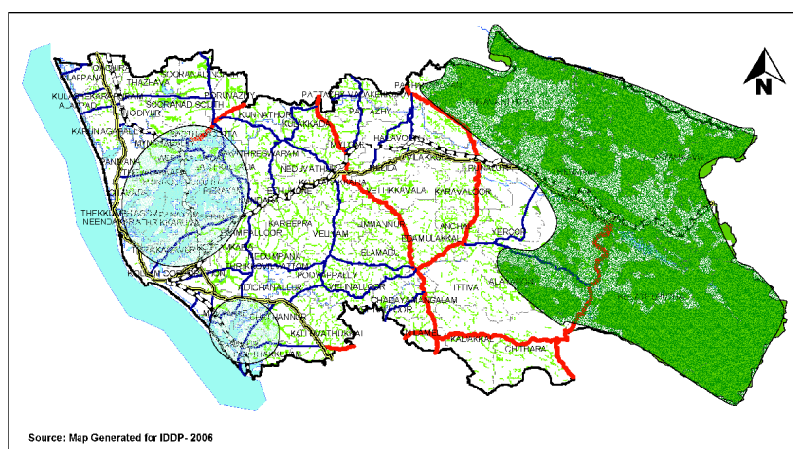


Fig 29.43: Spatial pattern evolved from environmental studies

local bodies, in particular of Perayam area needs to be enhanced. The potential tourist circuits of Kollam district are shown in Figure 29.41.

3. Spatial patterns evolved from the study of Social aspects

Improvement in quality of life cannot be achieved solely through economic development. Various social aspects will also influence the comprehensive development of an area. Here the spatial pattern of social backwardness is looked into for enhancing the quality of life of people in the backward areas. Social backwardness is closely linked to economic aspects and also it is quite often seen

among the Scheduled Castes and Scheduled Tribes. Hence the social backwardness is measured in terms of these two criteria – number of families Below Poverty Line (BPL) and number of SC/ST families. Those Local Self Government Institutions where both the number of BPL and SC/ST families are higher than the district average (BPL concentration index and SC/ST concentration index greater than or equal to one) are taken as most socially backward. Such areas are shown in Figure 29.42. The socially backward areas of the district are concentrated in the central and eastern parts of the District.

4. Spatial pattern evolved from Environmental studies

At this juncture when societies are yearning to attain a healthier environment, it is essential that the pattern of environmental pollution and the distribution of ecologically sensitive areas are looked into for detailing the spatial structure. Out comes of environment studies of the district are as follows:

As per the pollution studies by the Environment sector, in all aspects related to industrial pollution such as concentration of Red category industries, industries causing air pollution, Land/Water pollution and noise pollution, Kollam Corporation is most vulnerable.

Considering the case of Hospitals, concentration of hospitals having no Bio-medical treatment facilities and concentration of hospitals functioning without effluent treatment plants are more in Kollam Corporation. In the case of Solid waste, there is a concentration of critical areas along the coastal belt with maximum issue in Corporation. Among the two Ramsar sites in the district, Ashtamudi Lake is in the most polluted state while Sasthamcotta Lake is affected by reclamation and soil erosion. Thus in terms of pollution the most critical areas in the district are Kollam Corporation and surrounding local bodies and the Ashtamudi Kayal region. Thus the coastal belt at west, back water and lakes in the inland paddy cultivation areas in the mid land, and the Forest area at East belong to the environmentally sensitive areas of the District. Therefore due consideration has to be given for environmental conservation in these areas while framing the Development Concept. The spatial pattern evolved from the study of environmental aspects is depicted in Figure 29.43.

5. Conclusion

Through the study of settlements, study of major resources, study of social aspects and environmental studies it can be seen that the district has a definite spatial pattern in terms of activities and resources n



Chapter 30

Findings

A summary of the findings relevant to settlement studies and study of resources are given below based on which the direction of development of the district are derived.

1. The existing land use pattern of the District shows that agricultural land use in nearly 40% of the total area. The Spatial Distribution of the land use shows that most of the agricultural area is concentrated in the mid land and high land regions of the district. And also the general character of settlements shows that most of them are rural in nature, indicating that there is scope for developing the agriculture sector as one of the economic bases of the District.
2. The occupational structure of the district shows that (Refer Chapter 6), more than 70% of the total workers engage in non-agricultural pursuits, (even the rural area shows the same pattern) indicating a

declining trend of primary sector in Kollam District. This indicates that the agricultural land in the district is either unutilized or under utilized. From the point of view of economic as well as environmental stability of the District, the agricultural land should be put to optimal use.

3. Population growth rate of the district is comparatively low. An increase of only about 2 lakh population is expected by 2021.
4. The population growth rate pattern among LSGIs of the District shows that growth rate is the highest in those LSGIs adjacent to Kollam Corporation. It can be presumed that migrants to the district prefer to live in the periphery of urban areas rather than within. If this tendency is continued it will result in the conversion of agricultural land in rural areas for residential and other non-agricultural purposes resulting in the

destruction of the economic base of rural areas.

5. Low work force participation rate and significant out migration from the district indicates decline in local economic activities both rural and urban in the District.
6. A shift (towards service sector) in the occupational structure of the rural areas resulting in the possible destruction of the rural character of rural areas. There is dilution in the rural nature of the rural areas of the district as far as the occupational structure is considered. At the same time industrial activity in the urban areas is also on the decrease and the share of other workers category in the work force is increasing. This has resulted in narrowing down of the boundary distinguishing the character of rural and urban areas in terms occupational structure.
7. A surge in the urban population and

- extent of urban area is likely in the district leading to significant change in the urban profile.
8. High population density of the district in general and its coastal areas in particular and the presence of fragile ecosystems comprising water bodies, forest and paddy lands impose restriction on high level of industrialization of the district.
 9. Even though there exists Urban-Rural continuum, there is a clear demarcation of urban activity concentration areas, agricultural activity areas and forest land areas of the district making it possible to assign definite development character to each region.
 10. The local bodies of the district show four distinct characters – Urban, rural, semi urban (predominantly urban) and semi rural (predominantly rural), which is a pointer on the likely economic base of each local body.
 11. The district is blessed with potential resources such as tourism potential spots, minerals, lengthy coastal stretch with potential for fishing, availability of skilled cashew laborers.
 12. The present urban area of Kollam comprising Kollam Corporation, Punalur and Paravur Municipalities fails to attract economic activities and in turn fails to create developmental impulses.
 13. The spatial analysis of the settlement study shows the existence of a clear activity pattern in the district comprising Urban activity zone, Agricultural activity zone, non detrimental to forest zone, Intense agricultural activity zone, Secondary activity zone and Agricultural allied activity zone.
 14. On analyzing the sectors related to major resources such as Agriculture, Industries, Forest, Animal Husbandry, Fisheries, Mining, Tourism etc. it is seen that the district is having areas of concentration of the above activities. Same is the situation regarding environmentally sensitive areas
 15. From the analysis of Agricultural Sector, four distinctive agriculture development patterns have evolved viz. Sparsely distributed crop cultivation area in the low land where homestead cultivation such as coconut, jackfruit etc can be promoted, Mixed cultivation area in the low –mid land area where paddy cultivation has to be sustained and cashew, vegetable and fodder cultivation etc can be promoted, Intense crop cultivation area in the mid land where rubber to be sustained and pineapple and cashew cultivation etc. can be promoted and finally Resource base area where forest resources are conserved. Here, intense afforestation has to be promoted while rubber and pepper cultivation are sustained.
 16. Industrial developments are mainly concentrated along coastal belt of the district and to the north and north-east side of Ashtamudi Lake.
 17. Coastal belt is suitable for marine fishing and Ashtamudi Lake and surrounding areas are found suitable for inland fishing.
 18. Mining activities especially black sand mining has got immense potential within the district; the potential areas are coastal areas to the north of Kollam Corporation and Ashtamudi kayal and surrounding areas. Also China clay is found in Kundara and Perayam Grama Panchayats.
 19. Kollam district, especially the Kollam Corporation and the tourism spots at Thenmala, Paravur, Manrothuruthu and Vellimon area and portions of Ashtamudi and Paravur back waters, has got tremendous tourism potential.
 20. Ashtamudi lake is deteriorating due to pollution, silting and encroachment. The coastal area where coastal regulations are applicable, the lake sides etc. which are rich in aquatic bio content as well as the paddy fields and forests are the areas to be given thrust for environmental conservation.
 21. Forest area within the district has got economic potential. Also it is one of the main environmentally sensitive areas of the district.



Chapter 31

Goals and Objectives

1. Development Goals

From the findings derived from the sectoral studies and settlement studies it is evident that even though the district has enough resource potential to sustain socio-economic development, it is not utilized optimally. Both in primary and secondary sectors, the backwash effect to the major economic centres are not from within but from outside the district, in particular from the neighboring state. Therefore the resources have to be effectively utilized to make the district self-sufficient at least in few sectors and to attain the desired socio-economic development. It is seen that presently Kollam Corporation is the sole local body which is handling multiple functions. The corporation area, together with the potential centers around it, constitute an urban agglomeration which acts as a major generator of economic momentum. Further there are some centres of economic

development to cater second order functions in the other parts of the district as well, which can create a balanced development within the district. Manifestly, due consideration will have to be given to tackle the environmental issues identified.

Thus the major development goals for the IDDP are,

- I Optimum utilization of resources for economic development and social justice
- I Attain a certain level of self-sufficiency in primary and secondary sectors
- I Attain balanced development
- I Ecological conservation and environmental protection

2. Objectives

From the analyses, it is seen that there is reduction in the general growth rate of population and that the urban population content in the total population is also decreasing. While analyzing the primary

sector, it is seen that in the case of agriculture the Net State Domestic Product (NSDP) at current prices in 2004-05 is having an increasing trend. Also there is increase in production in the commercial crops showing that economy wise the sector is developing. However the food crop production is drastically declining which in turn affects the goal of self-sufficiency. In Animal Husbandry sector also the livestock and poultry population are declining and meat, egg and milk production are obviously showing a decreasing trend. In fisheries sector, there is an increasing trend in marine fishing while there is a declining trend in inland fishing. Despite the immense development potential in marine exports, the export quantity in marine fishing sector is showing a declining trend, revealing underutilization of potential. In the case of Forest resources also the scenario is not much different where the revenue generation is showing a

declining trend. In mining sector, the total revenue is increasing. Even then the revenue extracted from minerals is showing declining trend as the higher revenue attained is through the revenue from compounding. So, overall, in the development perspective, there is a declining trend in the primary sector. In the secondary sector, in case of industries, except IT industries all major types like Agro based, Forest based, Animal Husbandry based, Fisheries based etc. as well as the industries by category i.e. Large and Medium, SSI, Traditional industries and Industrial cooperative societies are showing a declining trend. Even though the NSDP from tertiary sector shows increasing trend, it can be held that overall growth trend of the district is declining. Therefore the primary objective should be to revitalize the declining growth trend of the district through the optimum utilization of resources. This can be achieved by identifying the key sectors of the area and coordinating complementary sectors spatially.

In the social sector, considering the case of women, children and old aged, the atrocities against both women and children and suicide by both children and old aged are increasing which is an alarming situation in a district where 52% of total population is female and 10.96% of total population is persons above 60 years of age and children constitute 11.30%. Though the development trend of SC indicates that there is considerable improvement with increasing literacy and decrease in persons in unclean occupation, there are SC/ST colonies in the district lacking bare minimum facilities indicating the need for improved services to be rendered to these sections of the society. Further in the district with 39% BPL population, it has to be ascertained that the downtrodden and helpless sections have to be brought up to achieve the goal of social equity, through providing them job opportunities, better services and social security.

Comparing industrial and commercial

land uses, it is seen that land under commercial use is higher, indicating domination of tertiary sector over secondary sector. Also, in 2004-2005, 57.36% of NSDP of the district is from tertiary sector compared to 23.33% from the secondary sector, supporting the same. This illustrates the cutting down of forward and backward linkages of primary, secondary and tertiary sectors. In reality, by and large the tertiary sector of the district is handling the products of primary and secondary sectors from outside the district while in some cases products from the primary sector are directly taken to the tertiary sector without value addition and in others the products are directly taken to the secondary sector out side the district for value addition. This affects the economic bases of urban areas of the district, which are supposed to be generators of economic momentum and also that of rural areas which are supposed to be the granaries of production. Also it is seen that in rural areas, there is considerable decrease in agriculture workers with increase in the percentage of other workers from last decade. Thus there is a changing trend in the basic economic base of rural areas too. This shows that the economic base of both urban and rural areas is in dilution. This necessitates, planned intervention such that selective concentration of urban and rural economic activities in their assigned spatial regions are made possible in the district.

Also cultivators and agricultural laborers constitute only 17 % of the total main workers indicating the declining rural nature of the District. The drastic change in the occupation pattern, whereby people are withdrawing from agricultural sector in the rural areas and narrowing of distinction between rural and urban areas makes it obvious that the economic base of both rural and urban areas are decaying. This necessitates the need to diversify the economic base of the district.

From the study of existing hierarchy of settlements and existing order of nodes,

it is seen that there is uneven distribution of higher order settlements and junctions. The existing pattern of higher order settlements and nodes do not follow the population distribution creating a distorted spatial structure. This necessitates reorganizing of the spatial structure of the district so as to arrive at a planned settlement hierarchy to attain balanced development.

Even though the ecological conservation of forests is showing positive trend, considering the pressures for revitalization of forest economy and tourism there has to be definite conservation perspectives for this area. Obviously, the already disturbed aquatic bio diversity also needs to be conserved and whatever pollution generated in the urban centres needs to be eradicated.

Although the district has fairly good road distribution, the existing connectivity pattern is not sufficient to distribute the movements of people, goods and services. Therefore it is essential to develop a road connectivity pattern based on the hierarchy of nodes and the reorganized spatial structure of the district.

Thus the major development objectives are :

1. To revitalize the declining growth trend of the district through optimum utilization of resources achieved by identifying the key sectors of development of different areas and coordinating their complementary sectors spatially.
2. To selectively concentrate urban and rural economic activities and diversify the economic base mainly through strengthening production sectors.
3. To conserve the ecologically sensitive areas and to eradicate environmental pollution.
4. To attain certain level of self-sufficiency especially in the production sector.
5. To up bring the weaker sections of the society by rendering them job opportunities, better services and social security.
6. To develop a rational road network pattern



Chapter 32

Development Concept

The development concept is derived by incorporating the findings of spatial analysis of production sectors in the spatial structure of the district evolved through settlement analysis. The spatial structure comprises of hierarchy of settlements and nodes, road net work and activity pattern. Settlements of the district are categorized in to four hierarchies. There is one higher order settlement – the Kollam Corporation – and five second order settlements viz. Karunagapally, Kottarakkara, Punalur, Anchal and Chathannoor. The first order settlement is supposed to provide higher order facilities in Education, Health and in other sectors to the entire district population. The second order settlements are supposed to provide second order facilities of various development sectors to the surrounding area. A district level road net work with roads of three hierarchies viz major roads, sub major roads and minor roads are suggested, such that it connects all the higher order nodes and settlement each other. The

activity pattern showing the likely major economic activity in each LSGI area is also suggested in the spatial structure of the district.

Through the sectoral studies, the activity pattern of those development sectors which has physical manifestation on land is studied. The sectors of Agriculture, Animal husbandry, Industries, Tourism, Fisheries as well as the Environmental and socio-economic aspects are studied in this regard.

1 Development Zones

The process of integrating sectoral studies and spatial structure, to evolve development concept is schematically shown in Figure 32.1. As per the development concept thus derived, the district is divided in to six development zones. The proposed Hierarchy of Settlements and Nodes along with a future transportation net work connecting the higher order settlements are planned.

A development zone is delineated by grouping the settlements possessing similar

major economic activity pattern as per the Spatial Analysis. When a Grama Panchayat or Municipality is bracketed in a particular zone, it only specifies the thrust development sector of that LSGI. In addition to the activities pertaining to the thrust sector; LSGIs can perform other supplementary activities also (as per sectoral detailing).

In Figure 32.2 Development Zones of Kollam District is shown.

The list of Local Self Government Institutions in each development zone is given in Table 32.1.

i. Zone A –Bio Reserve Zone

In order to preserve the environmentally sensitive areas of the district, the areas where natural forest land use is concentrated is delineated as a Bio Reserve Zone. This zone includes Piravanthur, Aryankavu, Kulathupuzha and Thenmala Grama Panchayats. In this zone, no activity that causes deforestation of any kind shall be permitted. Afforestation, cultivation of crops like Rubber, Pineapple

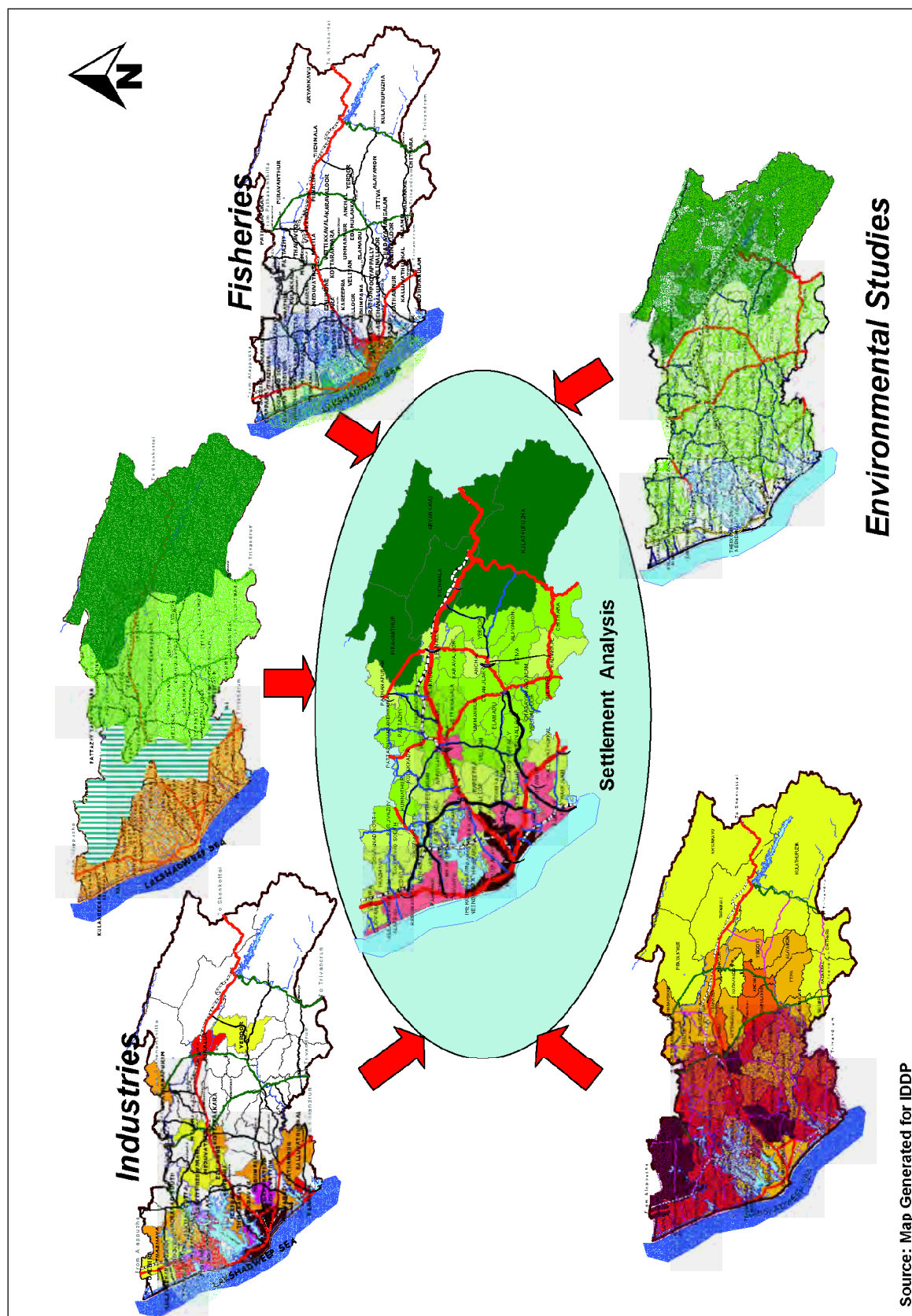


Fig 32.1: Integration of the findings of spatial analysis of sectors and settlement studies

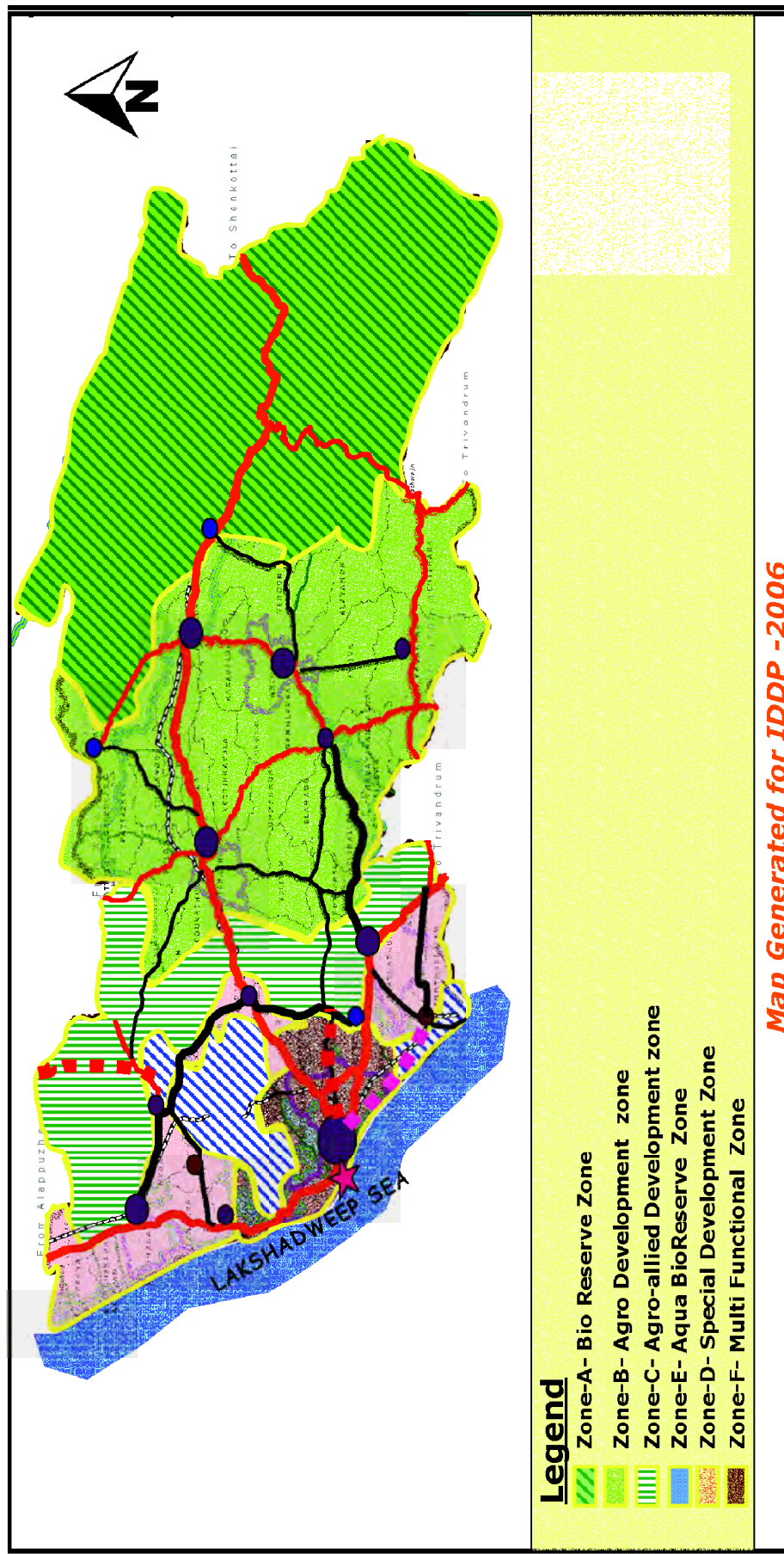


Fig. 32.2: Different Development Zones of the District

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Table 32.1: List of Local Government institutions in each activity zone

SI No	Panchayat/ Municipality/ Corporation	Activity Zone
1	Alayamon	Agro Development Zone
2	Anchal	Agro Development Zone, Multi Functional Zone
3	Aryankavu	Bio Reserve Zone
4	Edamulakkal	Agro Development Zone
5	Karavallur	Agro Development Zone
6	Kulathupuzha	Bio Reserve Zone
7	Thenmala	Bio Reserve Zone
8	Yeroor	Agro Development Zone
9	Thrkkadavoor	Aqua Bio Reserve Zone
10	Thrkkaruva	Aqua Bio Reserve Zone
11	Chadayamangalam	Agro Development Zone
12	Chithara	Agro Development Zone
13	Elammadu	Agro Development Zone
14	Ittira	Agro Development Zone
15	Kadakkal	Agro Development Zone
16	Nilamel	Agro Development Zone
17	Velinalloor	Agro Development Zone
18	Chavara	Aqua Bio Reserve Zone, Special Development Zone
19	Neendakara	Aqua Bio Reserve Zone, Special Development Zone, Multi Functional Zone
20	Panmana	Special Development Zone
21	Thekkubagham	Aqua Bio Reserve Zone
22	Thevalakkara	Aqua Bio Reserve Zone, Special Development Zone
23	Kizhakkallada	Special Development Zone, Agro Allied Development Zone, Aqua Bio Reserve Zone
24	Kundara	Special Development Zone
25	Mandrothuruthu	Aqua Bio Reserve Zone
26	Panayam	Multi Functional Zone, Aqua Bio Reserve Zone
27	Perayam	Aqua Bio Reserve Zone, Special Development Zone
28	Perinadu	Aqua Bio Reserve Zone, Special Development Zone
29	Adichanalloor	Agro Allied Development Zone
30	Chathanoor	Special Development Zone, Agro Allied Development Zone, Multi Functional Zone
31	Kalluvathukkal	Special Development Zone, Agro Allied Development Zone
32	Nedumpana	Agro Allied Development Zone
33	Bhoothakulam	Aqua Bio Reserve Zone, Special Development Zone
34	Alappad	Special Development Zone
35	Karunagappally	Special Development Zone, Multi Functional Zone
36	Mynagappally	Agro Allied Development Zone, Special Development Zone
37	Thodiyoar	Agro Allied Development Zone
38	Ezhukone	Agro Allied Development Zone
39	Kareepra	Agro Allied Development Zone
40	Kottarakkara	Agro Development Zone, Multi Functional Zone
41	Neduvathoor	Agro Development Zone
42	Pooyapally	Agro Development Zone
43	Veliyam	Agro Development Zone
44	Elampalloor	Special Development Zone, Agro Allied Development Zone
45	Kottamkara	Multi Functional Zone
46	Mayyanadu	Multi Functional Zone, Aqua Bio Reserve Zone
47	Thrkkovilvattom	Multi Functional Zone
48	Clappana	Special Development Zone
49	Kulasekharapuram	Special Development Zone
50	Oachira	Special Development Zone
51	Thazhava	Agro Allied Development Zone
52	Pathanapuram	Agro Development Zone

53	Pattazhy	Agro Development Zone	1
54	Pattazhy vadakkekara	Agro Development Zone	
55	Piravanthoor	Bio Reserve Zone	2
56	Thalavoor	Agro Development Zone	
57	Vilakudy	Agro Development Zone	3
58	Kunnathur	Agro Allied Development Zone	
59	Poruvazhy	Agro Allied Development Zone	4
60	Sasthamcottah	Aqua Bio Reserve Zone, Special Development Zone, Agro Allied Development Zone	5
61	Sooranad North	Agro Allied Development Zone	
62	Sooranad South	Agro Allied Development Zone	6
63	West Kallada	Aqua Bio Reserve Zone, Special Development Zone	
64	Kulakkada	Agro Allied Development Zone	7
65	Melila	Agro Development Zone	
66	Mylom	Agro Development Zone	8
67	Pavithreswaram	Agro Allied Development Zone	
68	Ummannoor	Agro Development Zone	9
69	Vettikkavala	Agro Development Zone	10
70	Kollam Corporation	Multi Functional Zone, Aqua Bio Reserve Zone	
71	Paravur Municipal council	Aqua Bio Reserve Zone, Special Development Zone	11
72	Punalur Municipal council	Agro Development Zone, Multi Functional Zone	12

and Pepper are found most suitable for this zone. This zone will be under the purview of Forest Conservation Act.

ii. Zone B – Agro Development Zone

The intensive agricultural area as per the spatial analysis of settlement studies and the area of concentration of agricultural activity as per the spatial analysis of the Agricultural sector are included in Agro Development zone of the district where intensive agricultural activity can be promoted. In this zone, though all types of agriculture activities are to be permitted, dry crops like Rubber, Pine apple, Pepper are found more suitable. Also this zone may be used for intensive Animal Husbandry activities. The list of Grama Panchayats which fall in Agro Development Zone is given in Table 32.1.

iii. Zone C – Agro Allied Development Zone

The area adjacent to Agro Development zone, where agriculture and allied activities are dominating over urban activities forms the Agro Allied Development Zone. This zone is suitable for the cultivation of crops like Paddy, Coconut, cashew etc. Also animal husbandry activities and agro based industries like cashew processing, food processing etc are very much suitable for this zone. In addition, this zone is suitable for providing wholesale markets and warehousing facilities for supporting the agriculture activities of the Agro Development Zone.

(The Grama Panchayats included in this zone is listed in Table 32.1)

iv. Zone D –Special Development Zone

The areas adjacent to Agro Allied Development Zone where urban activities are dominating over rural activities is delineated as Special Development Zone. In this Zone special types of developmental activities, in line with the existing activities, which are found very much suitable for those particular places are intended. Special Development Zone is further sub divided in to four Sub Zones according to the type of activities suitable. These Sub Zones are explained hereunder

Sub Zone 1

Major portions of Mayyanad Grama Panchayat, Paravur Municipality and portions of Chathannur and Kalluvattukkal Grama Panchayats to the western side of NH 47 are included in this Sub Zone. This zone to be developed as a part of Thiruvananthapuram - Kollam IT Corridor and high technology (IT, BT, NT) based industries are to be introduced in this Zone.

Sub Zone – 2

This zone consists of Kundara Grama Panchayat and portions of West Kallada, East Kallada, Perayam and Elampallur Grama Panchayats. Industries based on clay, cashew and starch are found suitable for this Sub Zone.

Sub Zone – 3

This zone consists of part of Perayam

Gram Panchayat, which is situated to the northern side of Ashtamudy Kayal. Due to the close proximity of Ashtamudy Kayal and its situation adjacent to NH 208, this zone has tremendous tourism potential. Hence this zone is to be developed as a tourism hub of the District. All developmental activities to promote tourism without affecting the environmental sensitiveness of Ashtamudy Kayal are to be permitted in this Sub Zone.

Sub Zone – 4

This zone comprises of Oachira, Clappana, Kulashekharapuram, Allappad and Panmana Grama Panchayats. Portions of Chavara, Thevalakkara, Mynagapally, Sastamkotta, Neendakara and Karunagapally Grama Panchayats also form part of the zone. In this zone, value addition units and industries based on marine resources, coir, plastic and chemicals are suggested. As the existing industries, especially chemical industries are causing pollution utmost care to be taken for installing efficient treatment facilities to prevent pollution from the existing as well as proposed industries.

v. Zone E- Aqua Bio Reserve Zone

This zone comprises the major water bodies within the district like, Sasthamcotta Lake, Ashtamudy Kayal, Paravur Kayal, Nadayara Kayal and major rivers and surrounding land. The zone is an environmentally sensitive zone. No activities that affect the water resources are

to be permitted in this zone.

To protect the aqua bio resources, rules applicable to CRZ to be enforced in this zone also. Tourism, inland fishing, protection activities for aqua resources, traditional industries like coir which are eco friendly are found suitable in this zone.

The Grama Panchayats included in the Aqua Bio Reserve Zone mainly the Munrothuruth Grama Panchayat can be developed as a bird sanctuary to attract tourists. The Sasthamcotta kayal and surrounding areas together to be delineated as a watershed area and integrated protection activities are to be planned and implemented in this water shed for the preservation of the lake. Those agricultural activities, fishing activities and other allied activities which do not affect the water resources of the lake are permissible in this zone.

vi. Zone –F. Multi functional zone

This zone is delineated including the existing municipal areas and those Local Self Institutions which are found to attain municipal status as per future urban profile of the District. Multi Functional zone is again classified into multi functional zone 1st Order, and multi functional zone – 2nd order.

1st Order Multi functional zone

1st order multi functional zone includes Kollam Corporation, Kottamkara & Thrikkovilvattom Grama Panchayats and portions of Neendakara, Elampalloor, Panayam and Mayyanad Grama Panchayats. In this zone all urban activities including higher order educational and health care facilities and a transportation net work coping up with the requirements etc are to be made available. This zone will act as a service centre for the entire district. Suitable projects and programmes are to be implemented to exploit the urban potential of this zone. The environmentally sensitive areas of this zone are to be preserved by preventing pollution. For this strict rules and regulation to be enforced in this zone.

2nd Order Multi functional zone

This zone consists of Punalur Municipality and portions of Kottarakkara, Karunagappally, Anchal and Chathannur Grama Panchayats. In this zone all type of 2nd order urban activities, 2nd order educational and health care facilities and enabling transportation facilities etc. are to

be provided. This zone will act as a service centre for the hinter lands and this zone is very much suitable for industries utilizing agricultural produces of hinter land.

2. Hierarchy of Settlements

The proposed hierarchy of settlements required for a balanced distribution of facilities to all the Local Self Government Institutions in the district consists of Ist order settlements, IInd order settlements, IIIrd order settlements and IVth order settlements.

a. Ist order settlement

Kollam Corporation, the existing Ist order settlement will continue as the Ist order settlement in the district and will be serving the entire area of the district. Being the Ist order settlement, all types of higher order facilities viz. higher education facilities, health facilities like super speciality hospitals, higher order roads etc, to promote all types of urban activities are to be provided in this area.

b. IInd order settlements

Kottarakkara, Punalur, Karunagappally, Anchal and Chathannur are the proposed IInd order settlements. Each of these second order settlements has to serve about 10 LSGIs surrounding them. They shall have second order facilities like Taluk Hospitals, marketing facilities etc.

c. IIIrd Order settlements

The proposed IIIrd order settlements are;

1. Chavara
2. Kadackal
3. Velinallur
4. Pathanapuram
5. Kundara
6. Sasthamcotta

Each has to serve about six or seven surrounding LSGIs. Here third order (block level facilities) educational institutions, hospitals, roads etc to be provided.

All the remaining LSGIs in the district fall under IVth order settlements. The proposed hierarchy of settlement is shown in Figure 32.3.

3. Hierarchy of Nodes

The proposed hierarchy of nodes arrived at based on population concentration, centrality with respect to surrounding service area, existing hierarchy of nodes viz Ist order, IInd order and IIIrd order.

a. Ist order Node

The existing Ist order node,

Chinnakkada and surroundings of Kollam Corporation, where all types of commercial activities are concentrated, will continue as the first order node of the district. This will be a service centre for all the LSGIs in the district. Besides all types of whole sale and retail markets, facilities which require large scale investments like luxurious hotels, shopping malls etc will be available here.

b. IInd order Nodes

The proposed second order nodes, each of which has to serve about one or two blocks in the district are;

1. Karunagappally Jn
2. Kottarakkara Jn
3. Anchal Jn.
4. Punalur Jn
5. Parippally Jn.

In each of the above IInd order nodes, commercial facilities like supermarkets, hardware shops, shopping malls etc will be available.

c. IIIrd order Nodes

Following are the proposed IIIrd order nodes, each of which has to serve about 3 or 4 LSGIs directly.

1. Sasthamcotta
2. Chavara
3. Kadackal
4. Velinallur
5. Pathanapuram
6. Kundara
7. Thevalakkara
8. Kottiyam
9. Paravur
10. Thenmala
11. Pooyappally
12. Ayoor

In the above IIIrd order nodes, daily markets for selling perishable items like fish, vegetables will be available. The hierarchy of nodes (proposed) is shown in Figure 32.4.

4 Transportation network

The required road network, rail net work and water transport system in accordance with the development concept is described below:

Road network

The transportation net work planned for connecting the development zones, important nodes and settlements includes four types of roads viz: National Highways & State highways, Primary roads, Secondary roads and Tertiary roads.

1. National Highways and State Highways

National Highways and State

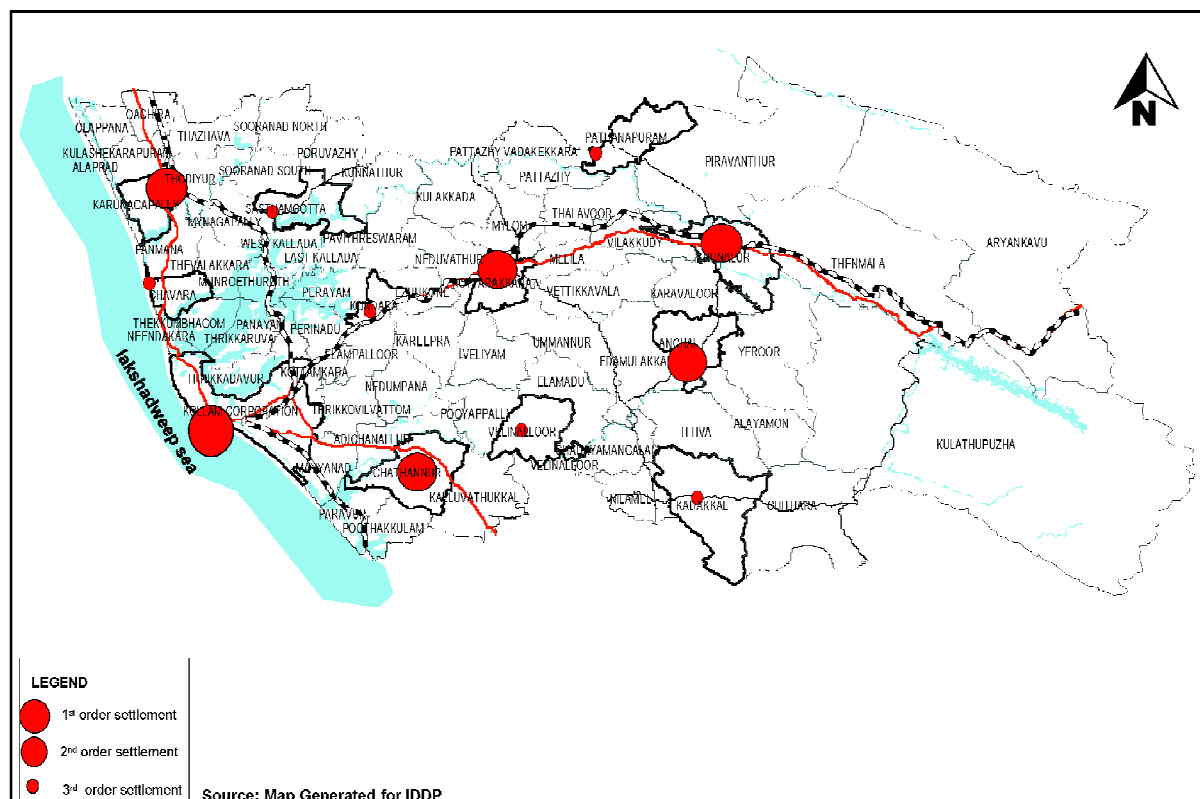


Fig. 32.3: Hierarchy of settlements

Highways are the most important roads for any district which provide connectivity to other Districts / States. In Kollam District there are two existing National Highways (NH -47 & NH-208), one proposed National Highway and four State Highways.

a. National Highways

Three National Highways (NH -47, NH -208 and NH -220 (proposed)) are passing through the district

b. State Highways

The following stretches of State highways are passing through the district:

- a. Nilamel-Ayur –Kottarakkara-Kulakkada stretch of MC Road
- b. Ayur-Anchal-Punalur-Pathanapuram
- c. Paripally-Nilamel-Chithara
- d. Kulathupuzha-Chithara
- e. Bharanikavu- Adoor

2. Primary Roads

Primary roads include major roads other than National Highways and State Highways which connect the designated 1st order settlements and nodes within the district, as per the planning concept. These roads are proposed as four lane roads having a total right of way of 21m. The following roads are included in the category of primary roads.

1. Kottiyam – Kannanalloor – Kundara – Bharanikavu - Karunagappally
2. Coastal road from Thangassey port to Paravur and its extension to Chathannur
3. Road branching off from NH 47 near Chathannur and goes to Ayur through Velinallur.

3. Secondary Roads

The secondary roads consist of sub major roads connecting 2nd order settlements and nodes each other and also to 1st order nodes. The following roads are included in the category of secondary roads: (The proposed right of way is 16m).

1. Chavara- Sasthankotta road
2. Road from Paravur to Varkala
3. Paravur –Parippally Road

4. Tertiary Roads.

Tertiary roads includes all other minor roads connecting lower order settlements each other and also the lower order settlements with the second and first order nodes. The following roads are included in tertiary roads category. (The proposed right of way is 12m).

1. Kannanalloor- Pooyappally- Ayur Road
2. Bharanikavu – Chandamukku (near Kottarakkara)- Pooyappally –

Kuriumoode Jn. Road

3. Kottarkkara – Pathanapuram Road

4. Anchal – Kadackal Road

5. Anchal – Thenmala Road

The transport net work with all the four categories of roads is shown in Figure 32.4

Rail Network

The district has two rail net works. Kollam is interlinked to Ernakulam at North and Thiruvananthapuram at South by broad gauge line. The major railway stations along the route viz Paravur, Kollam (Chinnakkada) and Karunagappally are situated in the proposed higher order settlements. The second rail net work links Kollam with Madurai through Chenkottai. The portion of this railway line within the district, currently a metre gauge line is being converted to broad gauge. All the major railway stations along this route viz Kundara, Kottarakkara, Punalur and Thenmala are also in the designated higher order settlements and higher order nodes of the district. Since almost all the major railway stations along both routes are situated in identified higher order settlements, it can be concluded that the development impulse created due to the presence of railway stations in the respective areas are well taken care of.

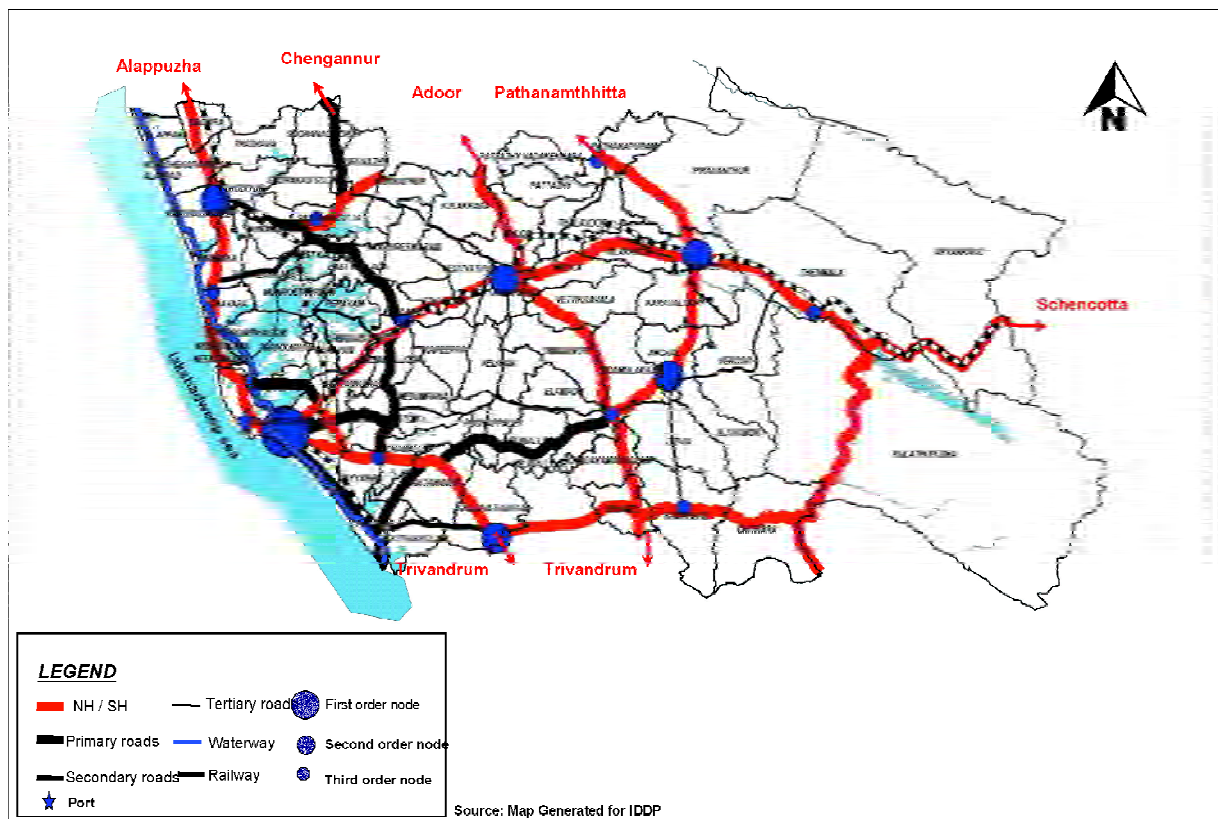


Fig.32-4: Future transportation network with hierarchy of nodes

Water Transport

As part of developing Inland Water Transport System and also ensuring cargo movement by water, the Government of India have declared the section of west coast canal between Kollam and Kottapuram as National Waterway No:3. Steps are being taken by Inland Waterways Authority of India (IWAI) to widen the NW-3 portion to a minimum bed width of 32 meters and uniform depth of 2.2 metres between Kollam and Kottapuram to promote trade and tourist activities. Kollam Corporation, Paravur Municipality and Karunagappally are the three major settlements enroute which will have direct impact due to the water way.

Port

Development of Thangassery Port is a major project on the anvil in the district which when materialized will create direct impact on economic development. A port road from Thangassery via Paravur, proposed to meet the NH-47 at Paripally to facilitate cargo movement from Trivandrum side and Eastern part of the District also forms component of the Port development.

5. Projection of Population and Occupational Structure

5.1. Projection of population

Main development objective of the Integrated Development Plan of Kollam District, is to revitalize the declining growth trend of the District through optimum utilization of resources in the District and to diversify economic base through strengthening production sectors. The resources (natural and man made) in sectors like agriculture; animal husbandry, tourism, fishing and mining, give scope for having a diversified economic base within the District. At the same time environmental protection should also be given prime importance. Manifestly, optimum utilization of the resources in the District will have reflection in the future occupational structure and future population of the District.

As per the development concept, Kollam is divided into six development zones as below.

1. Bio reserve zone
2. Agro development zone
3. Agro allied development zone
4. Special development zone
5. Multifunctional zone
6. Aqua bio reserve zone

Each development zone has its own development potential and this has to be taken into account in ascertaining the future occupational structure, population and its distribution within the district. Another factor to be considered in the projection of occupational structure and population distribution is the projected urban scenario of the District. The future urban scenario shows that the urban content of Kollam District will increase to 36% by 2021 from the value of 18% in 2001. It is projected that 16 rural local bodies, will attain urban status by the end of the plan period. The population in the district is to be so redistributed (to the possible extent) that it has more concentration in special development and multifunctional zone, less concentration in agro development and agro allied development zones and lesser in Bio reserve and Aqua bio reserve zones.

The character of development in each zone and their likely impact on the occupational structure and population growth rate is discussed hereunder.

Bio reserve zone is an environmentally sensitive area of the District consisting of mainly forest lands. Any activity that result in

deforestation is not permitted here. Only medium level agricultural activity is expected here. Hence an enhanced growth in population and work force is not expected in this zone. Only natural growth in population and slight increase in agricultural work force is expected.

In the agro development zone intensive agricultural activity is proposed. This will bring more cultivators and agricultural laborers into this zone. Consequently there will be increase in growth rate of population in this zone along with increase in agricultural workers.

The agro and allied development zone is suitable for cultivation of crops like paddy, coconut, cashew etc. Animal husbandry activities and agro based industries like cashew processing and food processing are found suitable for this zone. Hence increase in the work force is expected in this zone and as a result an increase in population is expected. The increase in the workforce will mainly be in primary sector- i.e. agriculture sector.

In the special development zone urban activities are dominating over rural activities. IT/BT based industries, tourism activities, industries based on marine resources/ coir/ plastic and chemicals are suggested in this zone. There will be enhancement in the number of workers – mainly in secondary and tertiary sector- in this zone and consequent increase in population.

Aqua bio reserve zone is formed by major water bodies within the district. Polluting activities are prohibited in the local bodies falling within this zone. Only natural growth in population is expected in this zone. The likely impact of development on population growth and occupational structure, as per the development concept

is summarized in the Table 32.2.

5.1.1. Projection of decadal population growth rate.

The current (2001) decadal population growth rate of Kollam is 7.38%. Trend based projection of population growth rate shows that it will be 4.69% during 2001-2011 and 2.88% during 2011-2021 (as given in Chapter 4). The average figure of 3.5% can be assumed as the lower limit of the accelerated population growth rate during the plan period, assuming that the induced development will push up the population growth rate above the trend based projected value.

At the same time, the Kollam situation cannot be opposite to the decreasing trend of population growth rate over decades prevailing among the districts in Kerala. Hence the future accelerated population growth rate of the district should be less than the current population growth rate of 7.38% of Kollam. It can be assumed that the accelerated future population growth rate of Kollam will be between 3.5% and 7.38%. The actual value of population

growth rate depends on the extent of area and the population under different growth category specified in table 1. The zone wise population (2001) is shown in Table 32.3

The table reveals that about 90 % of the present population is in the zones where enhanced growth is anticipated as per the development concept. Thus the population growth rate for these zones will be near to the upper limit of the deduced population growth rate range of 3.5 -7.38.

The actual value of population growth rate, in between 3.5% and 7.38%, depends mainly on the migration pattern of population due to the development scenario visualized in the development concept assuming birth rate and death follows the same pattern of the yester years.

Hence ;Population 2021= Population 2001+ {Birth – Death + In migration – Out migration} during two decades.

i.e., Population 2021= Population 2001+ (Population 2001 x future birth rate)- (Population in 2001 x future Death Rate)+ (Future in migrants)- (Future out migrants)

In order to ascertain the migration trend

Table 32.3: Zone wise population

	Impact on population growth	Zone wise (2001) Total ppn	% of ppn, zone wise (2001)
Bio reserve zone	Only natural growth	109101	4.22
Agro Development zone	Enhanced growth	782850	30.3
Agro allied development zone	Enhanced growth	485925	18.81
Special Development zone	High Enhanced growth	558276	20.61
Multifunctional zone	High Enhanced growth	539228	20.87
Aqua bio reserve zone	Only natural growth	107935	4.18

Table 32.2: Likely influence of developments on population growth and occupational structure zone wise.

Zone	Impact on population growth	Impact on occupational structure
Bio reserve zone	Only natural growth	Moderate increase in cultivators and agricultural laborers
Agro Development zone	Enhanced growth	Increase in cultivators and agricultural laborers
Agro allied development zone	Enhanced growth	Increase in cultivators and agricultural laborers
Special Development zone	High enhanced growth	Increase in industrial sector workers and service sector workers
Multifunctional zone	High enhanced growth	Increase in industrial sector workers and service sector workers
Aqua bio reserve zone	Only natural growth	Moderate increase in cultivators, agricultural laborers, inland fishermen are expected

in future, the existing scenario of migration (from 1991-2001) is to be known. This calculated hereunder.

The average annual birth rate and death rate in 2001 in Kollam District are 16.58 and 5.13 respectively for 1000 population. [Source of Data: Vital Statistics Bulletin 2002, Directorate of Economics and Statistics, Thiruvananthapuram]. This implies that the natural growth rate for the period 1991-2001 will be 16.58 - 5.13 = 11.45 %.

Projected population of 2001, taking into account the natural growth component alone is (Population in 1991 as per census is 2407566)

Population of 2001 = $2407566 + 0.1145 \times 2407566 = 2683232$

But as per 2001 census, Population in 2001 is 2585208 which takes into account the total number of births, deaths, in migration and out migration taken place in the district during 1991-2001 period. The difference between the two population figures accounts for the net migration which has taken place during this period.

The difference is negative (i.e. $2585208 - 2683232 = -98024$), indicating that there is out migration during the period 1991-2001. Percentage wise, it is 4.07% of the total population of 1991.

As per the Development Concept, 90% of the population of the district lives in the zones of enhanced growth rate. Hence, a reversal in the above trend is expected. Instead of the net migration being out migration at present, in migration is expected. There is all the probability that the net migration will become zero by the end of the plan period. This means that, during the plan period, there will be in migration of 98,024 persons. Percentage wise, it is 3.79% of the total population of 2001.

It is deduced in chapter 4 that the trend based growth rate of population in 2011-2021 decade will be 3%. The assumption is that the existing trend in birth rate, death rate and migration will continue. But the Development Plan visualizes a change in pattern of migration as discussed above. By taking this into account the future population growth is calculated as follows.

Adding the net percentage of migrants to the trend based decadal growth rate of population in 2021, expected population growth rate (accelerated growth) in 2021 comes to be 6.8% ($3 + 3.79$). (ie within the range of 3.5-7.38 and towards the upper side of the range)

The population growth rate during 2001-2011 is interpolated as 7.0%. The projected population growth rates are

Table 32.4: Projected population growth rate and population

1991	2001	2011	2021
10.67	7.38	7	6.8

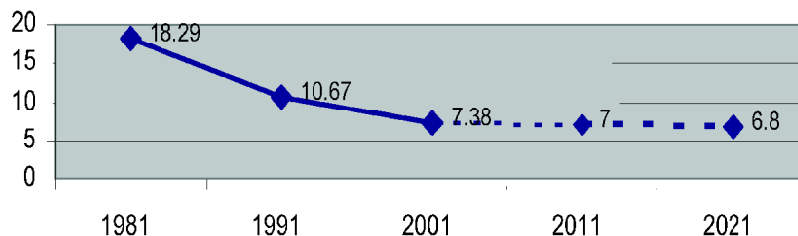


Fig 32.5: Population growth rate -Projected

shown in Table 32.4 and Figure 32.5.

5.1.2. Distribution of projected population among the development zones.

The projected population is distributed among different zones taking into account the existing population growth rate, the trend based projected population growth rate and the types of development envisaged in each zone as per the

zone are 5.1% and 0.38% respectively during 1991-2001. Assuming only trend based population growth during the plan period, average decadal population growth in aqua bio reserve zone and bio reserve zone is calculated to be 2.49% and 0.10% respectively (see Table 32.5)

In the case of special development zone and multifunctional zone highly enhanced growth rate is expected and

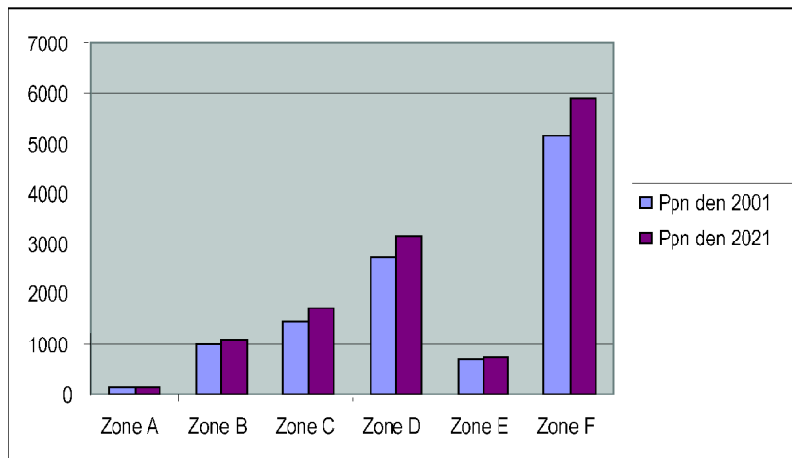


Fig 32.6: Zone wise population density

development concept (Figure 32.6).

As per the development concept, the bio reserve zone and aqua bio reserve zone are environmentally sensitive zones of the District and hence the development activities are limited there. Only natural growth is expected in the population in the bio reserve and aqua bio reserve zones. Average decadal population growth rate of aqua bio reserve zone and bio reserve

hence it is assumed that the high growth during 1991-2001 will prevail in future also.

In the case of agro development zone and agro allied development zone enhanced growth rate is expected. It is assumed that the population growth rate in these zones will be less than the present (during 1991-2001) population growth rates of 7.06 % and 9.16 % respectively. At the same time, the total population growth

Table 32.5: Trend based Projected population growth rate- Zone wise.

	Decadal growth Rate in 1991-2001	Trend based decadal growth rate (projected)
Bio Reserve Zone (Zone A)	0.65	0.1
Agro Development Zone (Zone B)	7.1	3.8
Agro Allied Development Zone (Zone C)	9.23	5.77
Special Development Zone (Zone D)	7.78	4.53
Aqua Bio Reserve Zone (Zone E)	5.38	2.49
Multi Functional Zone (Zone F)	7.59	4.16

rate of the district should be 6.8%. The future population growth in agro development and agro allied development zone are so calculated that the total population growth rate of the District is

existing workforce participation and occupational structure is shown in Figure 32.7 and Figure 32.8 respectively.

The Work Participation Rate (WPR) of Kollam District from 1981 to 2001 is shown in Table 32.6: Induced projected population growth rate zone wise

Zone	Decadal growth Rate existing	Trend wise growth rate-Projected	Induced growth rate -Projected
Bio Reserve Zone (Zone A)	0.65	0.1	0.1
Agro Development Zone (Zone B)	7.1	3.8	6.25
Agro Allied Development Zone (Zone C)	9.23	5.77	8.1
Special Development Zone (Zone D)	7.78	4.53	7.78
Aqua Bio Reserve Zone (Zone E)	5.38	2.49	2.49
Multi Functional Zone (Zone F)	7.59	4.16	7.59

Table 32.7: Zone wise projected population

Zone	Population in 2021
Bio Reserve Zone (Zone A)	109636
Agro Development Zone (Zone B)	881062
Agro Allied Development Zone (Zone C)	565012
Special Development Zone (Zone D)	645509
Aqua Bio Reserve Zone (Zone E)	113642
Multi Functional Zone (Zone F)	621447

6.8%.

The trend based population growth rate and accelerated population growth rate is calculated zone wise is shown in Table 32.6.

Zone wise population based on the projected accelerated growth rate is shown in Table 32.7.

The change in scenario of the population distribution within district due to projected population is depicted by the change in zone wise percentage of population and population density. It is shown in Table 32.8 and Table 32.9.

The share of population in bio reserve zone and agro development zone and aqua bio reserve zone is decreasing whereas in other zone it is increasing. This shows a population distribution in conformity with the development concept.

As shown in figure 2, significant change in population density is noted in zones C, D and F whereas the change in population density is negligible in zones A and E.

5.2. Projection of Work Force.

Existing trend of work force participation rate and existing occupational structure of the District are analysed in Chapter 5. The

existing workforce participation and occupational structure is shown in Figure 32.7 and Figure 32.8 respectively.

The Work Participation Rate (WPR) of Kollam District from 1981 to 2001 is shown in Table 32.6: Induced projected population growth rate zone wise

But the proposed developments (as per development concept) will open up new avenues of employment and consequently there will be enhanced work force participation rate. Just like in the case of population projection, the trend based projected WPR can be taken as the lower limit of the work participation rate at the end of the plan period, on the assumption that the accelerated WPR will be higher than this.

As per the likely impact in the occupational structure due to future developments (Table 32.2), increase in work force is expected in 5 out of the 6 development zones. This will surely increase the WPR significantly well above the trend based projected WPR of

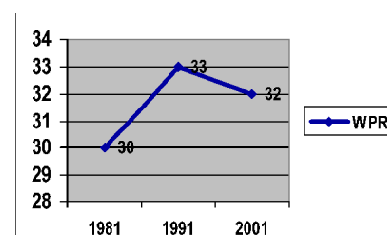


Fig 32.7: Work force participation rate (Existing)

Table 32.8: Percentage of projected population - Zone wise

Zone	% of total population in each zone in 2001	% of total population in each zone in 2021
Bio Reserve Zone (Zone A)	4.23	3.73
Agro Development Zone (Zone B)	30.29	30.01
Agro Allied Development Zone (Zone C)	18.81	19.24
Special Development Zone (Zone D)	21.61	21.98
Aqua Bio Reserve Zone (Zone E)	4.19	3.87
Multi Functional Zone (Zone F)	20.87	21.16

Table 32.9: Zone wise population density

Zone	Population Density-Existing(ppn/sqkm)	Population Density-Projected(ppn/Sq km)
Zone A	117.4	117.64
Zone B	982.17	1104.94
Zone C	1469.09	1707.09
Zone D	2744.25	3171.26
Zone E	699.5	734.33
Zone F	5141.99	5922.55

in figure 3. WPR is increased by 6.7% from 1981 to 2001. If the same trend is continued, work force participation rate at the end of the plan period (2021) will be about 34.26 (Figure 32.9).

34.26%. It is accepted that a WPR of 40% indicates a well off society as far as the job opportunities are concerned. The present WPR of Kollam District is only 32% and attaining a WPR of 40% by two decades is

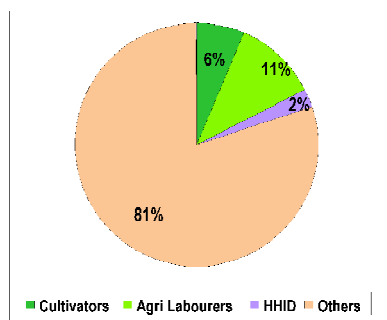


Fig 32.8: Occupational Structure (Existing)

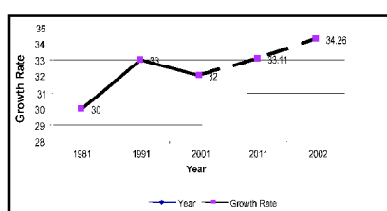


Fig 32.9: Projected WPR – Trend based.

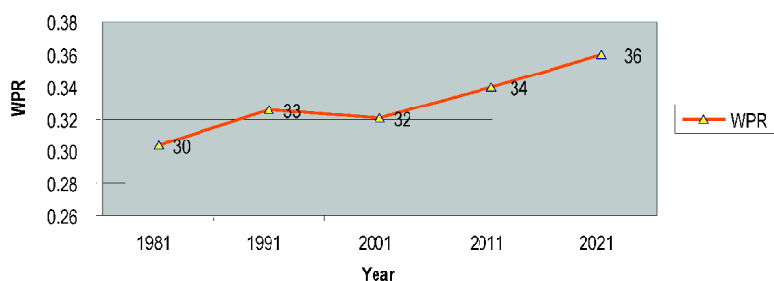


Fig. 32.11: Projection of WPR

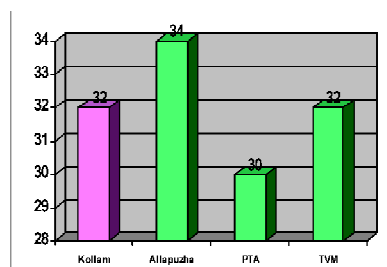


Fig 32.10 : WPR of Districts surrounding to Kollam

Table: 32.11: WPR zone wise – Existing scenario

	Population in 2001	Total workers	WPR
Bio Reserve Zone (Zone A)	109417	36220	33.10
Agro Development Zone (Zone B)	783166	247077	31.55
Agro Allied Development Zone (Zone C)	486241	161394	33.19
Special Development Zone (Zone D)	558592	170813	30.58
Aqua Bio Reserve Zone (Zone E)	108251	38543	35.61
Multi Functional Zone (Zone F)	539544	173905	32.23

Table: 32.10: Projected Value of WPR

	1981	1991	2001	2011
WPR	30	33	32	34

very difficult. The WPR of the surrounding Districts shows (Figure 32.10) a maximum value of 34% (in Alappuzha District). The WPR of the State as per 2001 census is only 32.3 %. Considering all these a WPR of 36% is targeted (2% above the lower limit of 34%) as the WPR for future population of Kollam District.

Assuming a uniform increase in the WPR, the projected WPR of the District is

Table: 32.12: Combined Average WPR (Existing)- Zone wise

	Existing
Average work force participation rate in special Development zone and multifunctional zone	31
Average work force participation rate in Agro development and agro allied development zones	32
Average work force participation rate in bio reserve and aqua bio reserve zones	34

shown in Table 32.10 and Figure 32.11

5.2.1 Zone wise distribution of WPR

Zone wise distribution of WPR based on 2001 census data is shown in Table 32.11.

The existing scenario shows that work force participation rate in the designated bio reserve zone and aqua bio reserve zone is comparatively higher, whereas it is lowest in the special development zone.

The special development zone and multifunctional zone are mainly the urban activity (secondary and tertiary) areas whereas agro development and agro allied development zones are rural activity (primary) areas of the district as per the development concept. Though the bio reserve and aqua bio reserve zones are rural (primary activity) in nature as per development concept, they are more or less "inert" in nature because of environmental sensitiveness.

As understood from Table 32.12, in the present scenario work force participation rate in the designated environmentally sensitive area is the highest, whereas the urban areas show the least value of WPR. The fact that WPR of the urban area is less compared to that of the rural area contradicts the popular belief that urban area creates more job opportunities. But this ought to be reversed as per the development concept derived and in view of environmental and economical sustainability of a region.

'Selective concentration of urban and rural economic activities and diversification of the economic base through interventions in production sectors to prevent the dilution of economic base of rural and urban areas' is one of the development objectives of the Development Plan. Another objective is to protect the environmentally sensitive areas of the District. These two objectives will have a direct bearing in the determination

of future economic base and in turn future WPR and spatial distribution of work force.

In order to arrest the trend of migration of people from urban to rural areas, it is assumed

Table: 32.13: Combined average WPR (Existing and projected)- Zone wise

	Existing	Projected
Average work force participation rate in special Development zone and multifunctional zone	31	37
Average work force participation rate in Agro development and agro allied development zones	32	37
Average work force participation rate in bio reserve and aqua bio reserve zones	34	35

Table: 32.14: WPR zone wise – projected for year 2021

Zone	WPR
Bio Reserve Zone (Zone A)	33.2
Agro Development Zone (Zone B)	36.21
Agro Allied Development Zone (Zone C)	37.29
Special Development Zone (Zone D)	35.64
Aqua Bio Reserve Zone (Zone E)	35.71
Multi Functional Zone (Zone F)	37.86

Table: 32.15: Workers projected

Zone	WPR	Population in 2021	Total workers projected
Bio Reserve Zone (Zone A)	33.2	109636	36399
Agro Development Zone (Zone B)	36.21	881062	319033
Agro Allied Development Zone (Zone C)	37.29	565012	210693
Special Development Zone (Zone D)	35.64	645509	230059
Aqua Bio Reserve Zone (Zone E)	35.71	113642	40582
Multi Functional Zone (Zone F)	37.86	621447	235280

that the WPR in both urban and rural areas have the same value. But in the agro development and agro allied development zones the existing WPR is assumed to continue. At the same time the combined average WPR of the district shall be 36. The projected values are shown in Table 32.13.

The zone wise work force participation rate is projected taking in to account the combined average of WPR in table 12 (36.75 and 34.5) and the district average of 36 %.

The zone WPR so projected is tabulated in the Table 32.14.

Total number of workers projected based on the projected WPR is shown in Table 32.15.

5.2.2. Main workers

Main workers (projected) are calculated from the total workers (projected) based on the main to marginal workers ratio deduced from the previous decades data (Table 32.16)

The zone wise main workers are calculated from the total workers, taking in

to account the main to marginal workers ratio. It is shown in Table 32.17.

5.3. Projected occupational structure

The occupational structure of an area is determined by the constituent category of workers in the area. Existing zone wise (2001) occupational structure (based on main workers) existing is shown in Table 32.18.

Table 32.16: Main to marginal workers ratio

Year	1981	1991	2001
Main workers	523636	683293	655093
Marginal workers	137452	100207	173852
Total workers	661088	783500	828945
Main - Marginal Ratio	3.8095917	6.81881505	3.768107
Average Ratio			4.8

Table 32.17: Zone wise Main workers (Projected)

Zone	Total workers	Main wokers (Projected)
Bio Reserve Zone (Zone A)	36399	30123
Agro Development Zone (Zone B)	319033	264027
Agro Allied Development Zone (Zone C)	210693	174367
Special Development Zone (Zone D)	230059	190394
Aqua Bio Reserve Zone (Zone E)	40582	33585
Multi Functional Zone (Zone F)	235280	194714

Table 32.18. Existing occupational structure

Zone	Total Workers in 2021	Main workers in 2001	Cultivators	Agr Labr	HH ind wrks	Other
Bio Reserve Zone (Zone A)	38558	25989	3090	5934	442	16523
Agro Development Zone (Zone B)	307910	192275	24132	39068	3310	125765
Agro Allied Development Zone (Zone C)	201824	123045	10257	15060	3270	94458
Special Development Zone (Zone D)	225360	137770	3322	8261	3952	122235
Aqua Bio Reserve Zone (Zone E)	39745	30112	609	1326	1521	20050
Multi Functional Zone (Zone F)	231220	145902	696	3434	3360	138412

Table 32.19: Development zone wise area and population

Zone	Area(sq km)	% of Total Area	Population in 2021	% of total population
Bio Reserve Zone (Zone A)	932	36.93	109636	3.73
Agro Development Zone (Zone B)	797.381	31.6	881062	30.01
Agro Allied Development Zone (Zone C)	330.98	13.12	565012	19.24
Special Development Zone (Zone D)	203.55	8.07	645509	21.98
Aqua Bio Reserve Zone (Zone E)	154.755	6.13	113642	3.87
Multi Functional Zone (Zone F)	104.929	4.16	621447	21.16

Table 32.20: Projected occupational structure

	Zone	Cultivators - 2001	Agr Labr- 2001	HH ind wrks -2001	Other-2001	Impact on occupational structure	Cultivators - 2021	Agr Labr- 2021	HH ind wrks - 2021	Other- 2021
		%	%	%	%		%	%	%	%
1	Bio Reserve Zone (Zone A) and Aqua Bio Reserve Zone (Zone E)	6.59	12.94	3.49	76.96	Existing scenario remain as such	7.59	13.94	3.49	75
2	Agro Development Zone (Zone B) and Agro Allied Development Zone (Zone C)	10.9	17.16	2.08	69.84	Increase in Cultivators and Agricultural laborers	14	20.7	2.1	62.84
3	Special Development Zone (Zone D) and Multi Functional Zone (Zone F)	1.41	4.12	2.57	91.88	Increase in Industrial sector workers and service sector workers	1.3	3	3	92.7

Table 32.21: Projected number of workers- Category wise

Sl. No	Zone	Cultivators - 2001	Agr Labr- 2001	HH ind wrks - 2001	Other-2001	Total main workers 2001	Cultivators - 2021	Agr Labr- 2021	HH ind wrks - 2021	Other- 2021	Total main workers in 2021
		%	%	%	%		No	No	No	No	
1	Zone A and Zone E	3699	7260	1963	43179	56101	4835	8881	2223	4768	53707
2	Zone B and Zone C	34389	54128	6580	220223	315320	61375	91887	9206	275925	438393
3	Zone D and Zone F	4018	11695	7312	260647	283672	5006	11553	11553	356995	385107
	Total (Dist)	42106	73083	15855	524049	655093	71216	112321	22982	680688	887207

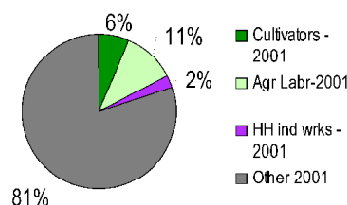


Fig 32.12: Occupational Structure-2001

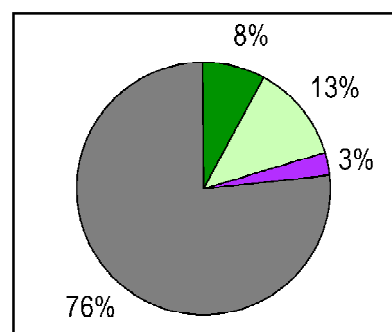


Fig 32.13: Occupational Structure-2021

While calculating the future occupational structure of an area, the category of workers and their number in future is to be known. This in turn requires the knowledge of the type of future development activities likely to happen in that area. The development concept (Table1) is an indication of it.

Table 32.19 shows that the agro development and agro allied development

zones constitute about 44.72 % of the total area of the District and that this area accommodates 49.25 % of the total population of District. This is a reflection of the thrust given to agriculture and allied activities in the development concept of the district.

In the agro development and agro allied development zone, increase in agricultural laborers and cultivators are expected. Only a marginal increase in house hold, industrial worker and other workers are expected in these zones.

As per the Table 1, significant increase in industrial workers and other workers category are expected in the special development and multi functional zones. In the bio reserve zone and aqua bio reserve zone, only moderate change in occupational structure is expected.

The projected occupational structure of the district is as shown in Table 32.20

Projected number of workers category wise is shown in Table 32.21.

A comparison of the projected occupational structure (2021) and existing occupational structure is given in Figures 32.12 and 32.13.

6. Conclusion

The present declining trend in population growth rate is expected to

reverse during the plan period mainly because of the change in trend of migration pattern, ie from the exiting out migration trend into in migration into the District due to the enhanced developments activities expected in the District. A population growth rate of 6.8% is expected in the District in the plan period instead of a population growth rate of 3.5% that would have been possible if the present trend of development continues. The future pattern of population distribution within the district would be such that that it has more concentration in special development and multifunctional zones, less concentration in agro development and agro allied development zones and even lesser concentration in Bio reserve and Aqua bio reserve zones. This is in conformity with the development concept.

The work force participation rate in Kollam District is expected to increase from 32% in 2001 to 36 % in 2021. The development proposals in agriculture sector are a major component in increasing the workforce participation rate. The boost in agricultural activities is expected to arrest the dilution in the economic base of the District in its rural areas.



Chapter 33

Development Policies and Strategies

This chapter includes the General Policies and Strategies, Projections and Requirements, sectoral Development Policies and Strategies derived from the sectoral and settlement studies, spatial analysis and the District Development Concept.

1. General Policies and Strategies

The general development policy for the district carved out based on the studies conducted and District Development Concept is as follows:

District Development Policy Statement – 2021- General

To economically develop the district by 2021, mean while maintaining an eco-friendly environment where there is optimum production, provision and utilization of goods and services and where people can live a better quality life through social development.

Development Strategies – 2021

- I** Economic development through production enhancement and value addition of goods
- TM** Agricultural development by obtaining self sufficiency in food crops and enhancing production in commercial crops
- TM** Co-ordination of various agencies in irrigation
- TM** Soil conservation treatments based on the spatial zones defined in the district development concept
- TM** Fisheries development by development of fish seed production centres, enhancement of fish production for self sufficiency, enhancement of fish production for economy generation
- TM** Development of live stock and poultry products for self sufficiency

- TM** Optimum utilization of the mineral resources of the District especially mineral sand, China clay and ordinary sand
- TM** Economic development in forest sector through optimum utilization of forest products
- TM** Industrial development through development of Agro Processing industries, strengthening and modernization of traditional industries and revival and diversification of closed and defunct Public Enterprises
- TM** Tourism development through various measures such as developing back water and beach tourism, promoting eco tourism, destination developments, cultural & traditional tourism and pilgrim tourism, generating a tourism network, developing marketing facilities for

- enhancing tourism promotion as well as attracting private investors
- I Creating an eco-friendly environment
 - TM Conservation of Water Bodies
 - TM Conservation and Regeneration of Mangroves as well as flora and fauna
 - TM Conservation of sacred groves
 - TM Abatement of Air Pollution
 - TM Abatement of Noise pollution
 - TM Conservation of Hillocks
 - TM Controlling Land Pollution
 - TM Solid Waste Management
 - TM Ecological conservation of forests
 - TM Prevention of critical issues such as forest fire, encroachments etc.
 - TM Greening of non forest land
- I Social development through providing service facilities to the laborers, working class and the socially backward class in the society.
 - TM Establishing a farmer friendly agricultural marketing network and also a labor friendly environment
 - TM Fish resource conservation and fisher folk welfare
 - TM Developing Health Services industries and Developing knowledge based industries and services and creating a pool of skilled human resource
 - TM Implementing social welfare activities for Welfare of Women, Welfare of Children, Welfare of Adolescent Girls, Welfare of Birds with broken wing etc. with vigor and adopting suitable measures to tackle other social challenges such as antisocial activities, suicides, dowry, accidents, drug addiction, female feticide, HIV Positive Children and white slavery and also taking steps for betterment of services through Anganwadis
 - TM Providing infrastructure facilities including land to all the landless,

Table.33.1: Production of Milk , Meat and Egg over the years

Sl. No.	Year	Milk(Gms)	Meat(Gms)	Egg
1	1984-85	126	7	50
2	1988-89	149	9	53
3	1992-93	176	9	60
4	1996-07	199	9.54	65
5	1998-99	207	10.08	64
6	1999-00	214	10.31	63
7	2000-01	217	10.35	63
8	2001-02	234	10.78	63

dwelling houses to all the houseless, safe drinking water and electricity to all houses to provide healthy and hygienic environment to Scheduled Caste and Scheduled Tribe families in the district, providing quality education to Scheduled Caste and Scheduled Tribe students, bringing down BPL Scheduled Caste and Scheduled Tribe families to zero level, bringing down, substantially the present level of unemployment among the educated Scheduled Caste and Scheduled Tribe youths and organizing awareness camps to ensure participation of Scheduled Caste and Scheduled Tribe people in development programmes

- TM Poverty eradication by bringing down BPL population by diversifying their areas of occupation through skill development
- TM Protection of endangered species of flora and fauna
- TM Providing Animal welfare

- I Providing better service facilities to the people
 - TM Provision of better health service facilities and conducting research and awareness programmes through the three systems of medicine
 - TM Providing quality power for the existing and proposed economic activities of the district giving emphasis on non conventional energy sources in the domestic and commercial sector
 - TM Providing quality education by increasing coverage of educational facilities, increasing quality of education, precluding spatial disparity in the distribution of higher educational institutions and skill development
 - TM Source improvement of water

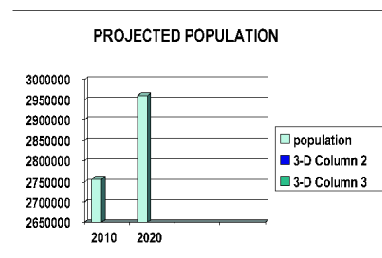


Fig.33.1: Projected Population 2010, 2020

Table.33.2: Projected requirements of Milk, Meat and Egg

ITEM	2010	2020
Milk (Kg)	251524055	270100456
Meat(Kg)	29769422	31968054
Egg(nos.)	496157040	532800900

resources, providing sufficient quantity and quality water

- TM Providing infrastructure facilities for various development sectors
- TM Providing a Communication Network for the district and to identify and phase the infrastructure developments for various development agencies accordingly

2. Projections and Requirements

2.1 Animal Husbandry

Requirement Analysis of Milk, Meat and Egg

(i) Norms

Per capita requirement of Milk – 270 ml/day

Per capita requirement of Meat – 10.8 gm/day

Per capita requirement of Egg – 180/ year

(ii) Future requirements

Table 33.1 shows the production of milk, meat and egg over the years in the district.

Table 33.2 shows the projected annual requirements of milk, meat and egg for the years 2010 and 2020 based on the projected population (Figure 33.1).

From this it is clear that there is going to be a huge shortage of animal husbandry products by 2021. Therefore it is essential that at least self sufficiency be targeted for the animal husbandry sector.

2.2 Tourism

From the sectoral analysis it is seen that in 2006, the state average of annual foreign tourist arrival is 30609 and that of domestic tourist arrival is 4,47,980. In comparison, Kollam district has a foreign tourist arrival of 7918 and domestic tourist arrival of 1,22,998. Therefore Kollam is

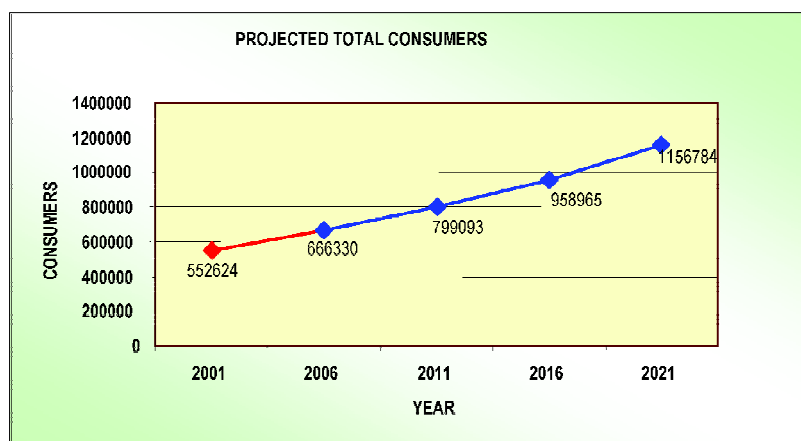


Fig.33.2: Projected Total Consumers

way behind the State average of 2006 by 22691 foreign tourists and 324982 domestic tourists. As per the State Tourism Vision Target 2025, Kerala has to achieve an annual rate of growth of 7% in foreign tourist arrivals and 9% in domestic tourist arrivals. Therefore in order to reach at least the State average by the year 2021, Kollam would require a growth rate of 12.4% in foreign tourist arrivals and a growth Rate of 11.4% in domestic tourist arrivals.

Revenue Earnings & Employment Generation in Kerala shows that total earnings in 2005 was Rs.7738/- crores and total earnings in 2006 was Rs.9126/- crores. As per World Travel and Tourism Council (WTTTC) estimates, Kollam topped in domestic tourists arrivals in 2006. In Kerala, the employment generation in 2006 was 10 lakhs and it is expected that it would reach 20 lakhs by 2012 with an average increase of 20% per annum. Thus if earnest efforts are taken for the development of tourism sector in the district, targeted revenue earnings of Rs, 10,000 crores and the targeted employment generation of 1.5 lakhs can be easily achieved by 2021.

This means an extra effort will have to be taken by the district in developing tourism sector through planned intervention.

2.3 Power

2.3.1 Total Number of Consumers

The total number of consumers is

projected (Figure 33.2) assuming that the existing trend of growth of consumers continues. The average annual growth rate in the number of consumers is 4%.

Number of Consumers : As on
2001 (Actual) – 552624

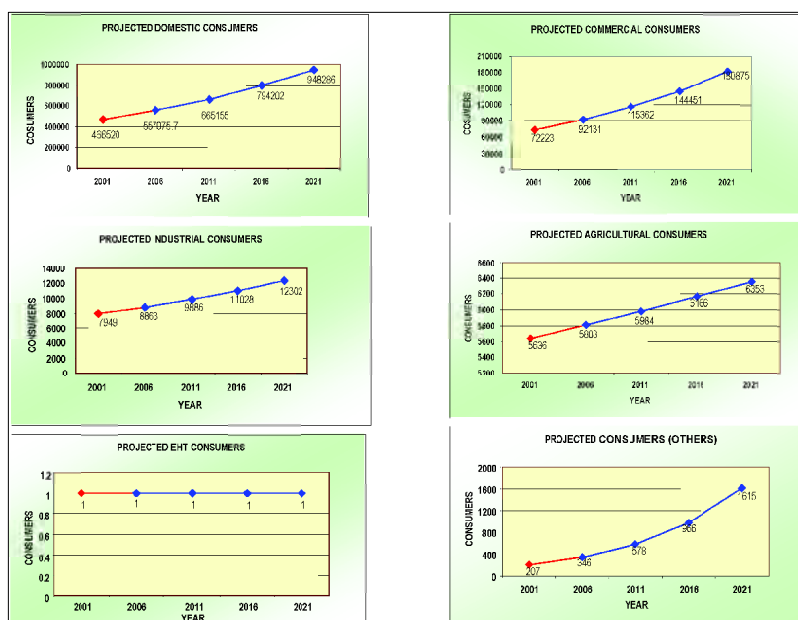


Fig.33.3: Category wise-Projected Consumers

Number of Consumers : As on
2006 (Actual) – 666330
Projected number of Consumers in
2011 assuming the existing trend
continues – 799093
Projected of number of Consumers in
2021 assuming the existing
trend continues – 1156784

2.3.2 Number of Consumers –Type wise

The Consumers under different categories are also projected based on trend and the details are given in Table 33.3 and Figure 33.3.

2.3.3 Total Power Consumption

The power consumption is projected assuming that the existing trend continues. The average annual growth rate of power consumption is estimated to be 4.3%.

Actual power
consumption
during 2001 – 582.6 mu

Actual power
consumption
during 2006 – 719 mu

Projected figures of power consumption
– assuming the existing trend continues
Power consumption
in 2011 – 844.4 mu

Power consumption
in 2021 – 1226.1 mu

2.3.4 Consumption by Type

Power consumption by type is also projected based on trend and the results are given in Figure 33.4 and Table 33.4.

2.3.5 Estimation of power requirements based on Development Concept

As per the existing power consumption and development concept (in which the coastal local bodies and local bodies adjacent to them fall within the Multi Functional or Special Development Zone), coastal stretch of the District consumes

Table.33.3: Category wise-Projected Consumers in numbers

Year	Total	Domestic	Coml	Ind	Agri	HT	EHT	Others
2001	552624	436520	72223	7949	5636	88	1	207
2011	799093	665155	115362	9886	5984	117	1	578
2021	1156784	948286	180875	12302	6353	157	1	1615

2/3rd of the total domestic power consumption of the District.

2/3rd of the domestic connections are concentrated in areas like Kollam Corporation, Paravur Municipality, Oachira, Chavara, Karunagappally and local bodies within Ithikkara and Mukhathala Block Panchayats.

As per the development concept (Fig. 32.2), the agricultural area is concentrated in the mid land area. It is assumed that 2/3rd of Agricultural connections will be concentrated in these areas.

2.3.6 Projected load on existing substations

Taking into account the area covered by each substation and the present consumption, load on each substation is projected for 2011 and 2021 as given in Table 33.5.

From the table it can be seen that the projected load on substations at Chavara, Parippally, Kottarakkara & Pathanapuram will be greater than the existing capacity of substations by 2011. In addition projected

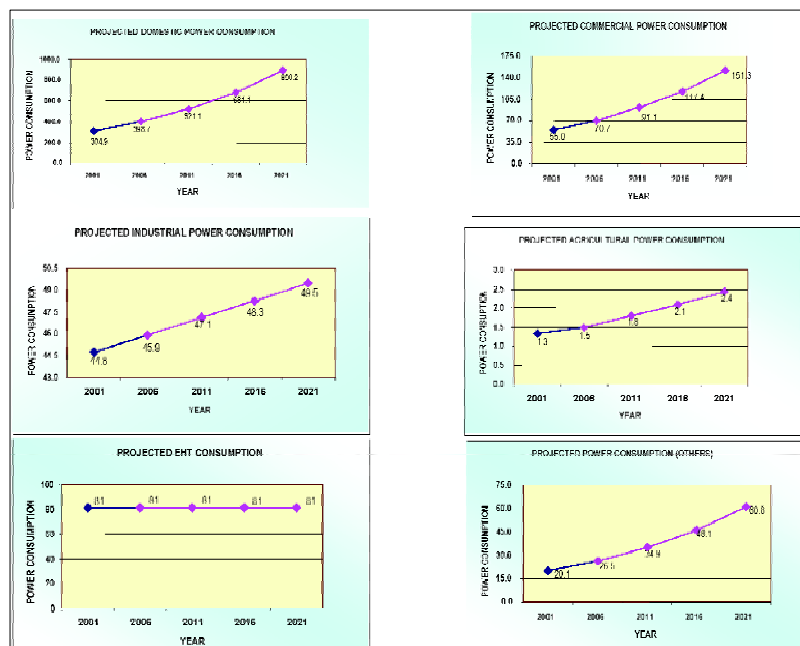


Fig.33.4: Projected power consumption by type

Table.33.4: Projected power consumption by type in mu

Year	Domestic	Coml	Ind	Agri	HT	EHT	Others	Total
2001	304.9	55	44.8	1.3	75.5	81	20.1	582.6
2011	521.1	91.1	47.1	1.8	79.2	81	34.9	844.4
2021	890.2	151.3	49.5	2.4	83.3	81	60.8	1226.1

of the agricultural areas are concentrated in the mid land and high land regions of the district. Also the general character of settlements shows that most of them are

agricultural development in the district.

- ™ Self sufficiency in food crops
- ™ Enhancing production of commercial crops
- ™ Establishing a farmer friendly marketing network and
- ™ Establishing a labor friendly environment

The district agriculture policy is derived based on this. Thus the development policy of the sector is;

“to make Kollam, a land of sustainable agriculture development by attaining a certain level of self sufficiency in food crops, improving production in commercial crops, enabling value addition and export and establishing a farmer friendly marketing

load on substations at Kavanad, Ayathil and Punalur will be greater than the existing capacity of substations, by 2021.

2.4 Infrastructure

The National Transportation Planning and Research Centre (NATPAC) has conducted a study on the transportation system in Kollam district in 2001. The traffic volumes of some of the selected roads for 2021 are projected by them based on the 2001 traffic volume. The average daily traffic capacity of these roads are also included in the report (Table 33.6).

It is clear that most of the major roads in the district will go beyond their carrying capacity which stresses the need for widening of roads and provision of better road design and application of appropriate road geometrics.

3. Sectoral Development Policies and Strategies

3.1 Agriculture

The existing land use pattern of the District shows that nearly 40% of the total land use of the District is agricultural. Most

rural in nature, indicating scope for developing the agricultural sector as one of the economic bases of the District.

As derived from the analyses, there are basically four aspects to be considered for carving out policies and strategies for

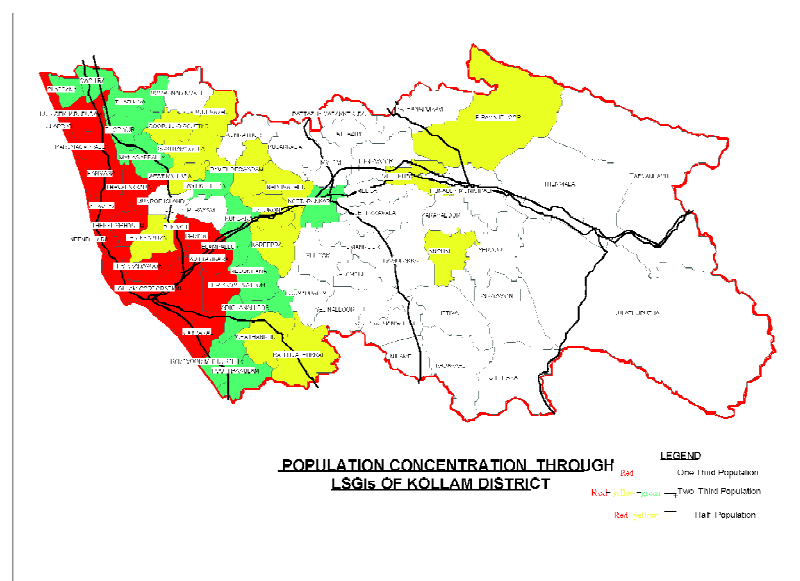


Fig.33.5: Distribution of population concentration

Table.33.5: Power feeding substations in the district

SI No	Name of sub station	11 Kv side capacity in MVA	No of 11 KV feeders	Present load in MVA	Power surplus/deficit in MVA	Projected load in MVA 2011	Projected load in MVA 2021
1	Kundara	37.5	15	12.38	5.62	14.86	20.80
2	Kottarakara	12.5	6	12.38	0.12	14.86	20.80
3	Ambalappuram	25	3	9.14	15.86	10.97	15.36
4	Punalur	25	7	18.67	6.33	22.40	31.37
5	Edamon	4	1	2.38	1.62	2.86	4.00
6	Kadakkal	10	2	5.9	4.1	7.08	9.91
7	Ayoor	20	7	9.14	10.86	10.97	15.36
8	Parippally	20	6	17.43	2.57	20.92	29.28
9	Kottiyam	25	6	11.43	13.57	13.72	19.20
10	Ayathil	25	9	19.05	5.95	22.86	32.00
11	Kavanad	25	7	17.14	7.86	20.57	28.80
12	Chavara	12.6	6	12.6	0	15.12	21.17
13	Karunagappally	20	7	19.05	0.95	22.86	32.00
14	Sasthamcotta	20	8	17.52	2.48	21.02	29.43
15	Chengmanad	10	2	4.8	3.9	5.76	8.06
16	Pathanapuram	4	1	3.62	0.38	4.34	6.08

network and a labour attractive environment”.

3.2 Irrigation

Optimum utilization of available water for sustainable agricultural development to facilitate maximum production of food crops is the development policy of Irrigation sector.

Equity, sustainability and participation are the basic principles. Accountability to the farmer and co-ordination of various agencies is the strategy.

3.3 Watershed Development and Soil Conservation

To develop the natural resources including land, water and bio mass through integrated watershed management and thereby assimilating the agriculture and allied activities in Kollam district is the development policy of the sector.

The strategy is that the soil conservation treatments should be based on the spatial zones of the district development concept.

3.4 Animal Husbandry and Dairy Development

The development policy of the sector framed at state level is; “Develop Veterinary and Animal Husbandry as a major field for employment generation and economic upliftment of the weaker sections in the state”.

Accordingly, the following has been framed as the district policy “To equip Kollam district self sufficient in milk, egg and

meat by creating farmer attractive environment while considering the improvement of the economic status of the rural poor and also to improve the animal welfare”.

The strategies for the same include

- Development of live stock and poultry products for Self Sufficiency
- Providing other infrastructure facilities and
- Providing animal welfare

3.5 Fisheries

The fisheries sector of the State anchors on the following policies

- To develop fish landing centers and fishing harbours according to international standards.
- Give priority to export of fisheries products and to the production of Value Added Products.
- To impose trawl ban during the

Table.33.6. Projected Average daily traffic volume and Average daily traffic capacity

Sl.No.	Stretch of Road	Average Daily Traffic Volume (PCU)		Average Daily Traffic Capacity (PCU)	
		2001	(proposed 2021)	2001	2021
1. Nilamel – Ayoor – Kottarakkara – Kulakkada road					
(a)	Nilamel –	6221	14700	10000	30000
(b)	Chadayamangalam – Ayoor	9845	23280	10000	30000
(c)	Ayoor – Kottarakkara	7006	16566	10000	30000
(d)	Kottarakkara – Kulakkada	93-47	22100	10000	30000
2. Ayoor – Anchal – Punalur – Pathanapuram road					
(a)	Ayoor – Anchal	5177	12237	10000	30000
(b)	Anchal – Punalur	5222	12342	10000	30000
(c)	Punalur – Pathanapuram	13187	31187	10000	30000
3. Kulathupuzha – Madathara – Chithara road					
(a)	Kulathupuzha – Madathara	3604	8524	7000	30000
4. Paravur – Varkala road					
(a)	Paravur – Varkala	2245	4865	5000	20000
5. Paravur – Parippally road					
(a)	Paravur – Parippally	6-478	14000	5000	20000
6. Anchal – Kulathupuzha – Thenmala road					
(a)	Kulathupuzha – Thenmala	6675	15775	7000	20000

monsoon to ensure protection of the fisheries wealth.

- I Compulsory registration for all boats fishing in the seas near the coast of Kerala State.
- I Steps will be taken to regulate the excess number of boats.
- I All fishermen will be supplied with identification cards with photographs at Government cost.
- I Steps will be initiated to strengthen the Enforcement Wing to enforce efficiently the proposed Policies of the Kerala Marine Fisheries Regulation Act.
- I Steps will be taken to strengthen the Matsyabhavans for satisfying the various needs of the fishing communities as a single window system.
- I Government will persuade commercial banks to provide loans to farmers for aquaculture.
- I The marine fish wealth of the Kerala seas will periodically be assessed with the help of C.M.F.R.I.
- I Fish and Prawn farmers will be persuaded to go for group farming and technical assistance and effective super Policy provided to them.
- I A time-bound-program to provide houses to landless & houseless fishermen.
- I Efforts will be made to provide sanitation facilities in all fishing villages.
- I Steps will be taken to install solar lamps in fishing villages where electricity is yet to reach.
- I Special programs will be formulated for the conservation and development of fish and prawns under the threat of extinction.
- I Government will go for legislation to protect common water sources from the threat of pollution.
- I Group insurance facilities will be introduced in the field of aquaculture.
- I Projects will be formulated for integrated fish farming in inland waters, game fisheries and cultivating cold water fish like the trout.
- I For preventing of the fish wealth from extinction steps for constructing artificial reefs in the sea and lakes, ranching fish seed in public water bodies etc. will be taken.
- I Government will take steps to check disease to prawns and fish which

causes heavy loss to fish farmers.

- I Government will go for a unified Inland Fisheries Act.
- I For maintaining the ecological balance of the estuaries all the existing unlicensed nets will be removed in phases within the next five years.
- I Steps will be initiated to bring in efficiency to the fish seed production centers under Matsyafed and Fisheries Department.
- I Steps will be taken to see that the fishing rights in the reservoirs under the control of Kerala State Electricity Board or the Forest Department is given to the Fisheries Department.
- I Steps will be taken for the development of Fisheries Tourism. The reservoirs are set for angling of Mahaseer fish.
- I To conserve the genetic diversity of fish which is facing the threat of extinction, mangroves will be developed on the beaches of lakes.
- I Steps will be taken to promote aquaculture that includes cultivation of prawns, crabs etc. in all the available brackish & back water areas.
- I Seminars and exhibitions will be conducted to make people aware of the potential of development of ornamental fisheries.

The District Policy Statement framed in tune with is: "To make Kollam a major Marine Export Zone considering its potentials in inland & deep sea fishing, aquaculture and proximity to port while giving emphasis to Aqua Resource Conservation and Fisher Folk Welfare".

The strategies for this would be

- I Development of Seed Production Centres
- I Enhancement of Production for Self Sufficiency
- I Enhancement of Production for Economy Generation
- I Resource Conservation
- I Infrastructure Development and
- I Fisher Folk Welfare

3.6 Industries and Co-operation

The industrial policy of the State is

"To convert Kerala into an investment friendly destination and to achieve consistently high economic growth with specific thrust to social objectives, without adversely affecting ecology and environment and to create employment opportunities for the people in Kerala and

ensuring them fair wages" (As per Industrial and Commercial Policy 2007 (Final Draft), December 30, 2006).

The Objectives framed under the policy are:

- I Convert Kerala into a favored destination for Manufacturing, Agro Processing, Health Services, Knowledge Based Industries and Services
- I Enabling growth, revival and diversification of State Level Public Enterprises
- I Strengthening and modernization of Traditional Industries
- I Accelerating the fast growing Services and Commerce sector to develop Kerala as a global centre of excellence with state of the art education and skill sets and preparing a pool of multi skilled, technically competent individuals and organizations
- I Creation of additional employment of 5 lakh persons in the manufacturing and service sectors
- I To sustain industrial and economic growth by facilitating accelerated flow of investment

Within this overall frame and based on district level findings and conclusions, the District Policy Statement of the sector framed is;

"To convert Kollam into a destination of environment friendly agro processing and traditional industries while giving thrust to IT and health service sectors through the creation of skilled personnel".

The strategies for the same include

- I Develop Agro Processing Industries
- I Strengthen and modernize Traditional Industries
- I Develop Health Services Industries
- I Develop Knowledge based Industries and Services
- I Revive and diversify closed and defunct Public Enterprises
- I Create a pool of skilled human resource

3.7 Health

To enhance the health status of the people of the District by 2021 through providing preventive measures and quality treatment through the three systems of medicine is the development policy of health sector.

The strategy includes provision of better health service facilities and

conducting research and awareness programmes through the three systems of medicine.

3.8 Drinking Water and Sanitation

The District Drinking water and sanitation policy is;

“To provide sufficient drinking water and sanitation facilities in the district while assuring sustainability of water resources in the district”.

The strategies for the same include source improvement of water resources, providing sufficient quantity of quality water through adequate Water Supply Schemes, providing better sanitation facilities and implementing other specific proposals.

3.9 Infrastructure – Traffic and Transportation

District Policy Statement pertaining to the sector is;

“To provide a Transportation Network for the district which will ensure smooth flow of traffic connecting major settlements and nodes as well as the major future activity areas”.

The strategy would be to identify and phase the development requirements including widening of roads, provision of better road design and application of appropriate road geometrics etc. by various development agencies as per the Transportation Network.

3.10 Forest

The State Policy of the sector Forest is;

“To protect natural forests, increase tree cover, enrich biodiversity, increase productivity using modern technology, protect and enhance gene pool, improve livelihood of tribals, protect mangroves, sacred groves, wetlands, coastal areas and places of environmental importance” (as per Draft Forest Policy of Kerala).

The corresponding District Policy Statement is;

“To make Kollam rich in bio-diversity by economically developing while ecologically conserving the forest land and settlements, flora and fauna and making a more green non forest land”.

The strategies would be

- I Ecological Conservation
- I Protection of endangered species of flora and fauna
- I Economic Development through optimum utilization of forest products
- I Prevention of critical issues such as forest fire, encroachment etc.

I Greening Non Forest land

3.11 Environment

The District Environment Policy is;

“To make Kollam an eco friendly district through the abatement of pollution, efficient use of environmental resources by protecting and conserving critical ecological systems and resources including wet lands and green open spaces without being detrimental to traditional economic activities”.

As far as the Bio physical environment of Kollam district is considered conservation of water bodies, abatement of air pollution, controlling land pollution and waste management are the critical aspects.

Therefore the strategies include:

- I Conservation of Water Bodies
- I Conservation and Regeneration of Mangroves
- I Conservation of Sacred groves
- I Abatement of Air Pollution
- I Abatement of Noise pollution
- I Conservation of Hillocks
- I Controlling Land Pollution
- I Solid Waste Management

3.12 Mining and Geology

The District Policy framed for the sector is;

“To optimally utilise the mineral resources of Kollam District with due regard to environmental, economical and social impacts”.

The strategies include

- I Extraction of Mineral sand
- I Extraction of China Clay
- I Optimum utilization of Ordinary Sand

3.13 Education

The Policy of education sector in the District is;

“To increase coverage and preclude spatial disparity in the distribution of higher educational institutes in Kollam and establish technical institutes to support the economic activities of the District”.

The strategies for the same include

- I Increasing Coverage of Education
- I Increasing Quality of Education
- I Precluding Spatial Disparity in the Distribution of Higher Educational Institutions
- I Skill Development

3.14 Social Welfare, Women and Child Development

The District Policy Statement derived for the sector is;

“To provide better health, social status and security to women & children,

adolescent girls, mentally and physically challenged and aged in Kollam district’.

The strategies for the same include

- I Welfare of Women
- I Welfare of Children
- I Welfare of Adolescent Girls
- I Welfare of Birds with broken wing
- I Adopting suitable measures to tackle other social challenges such as antisocial activities, suicides, dowry, accidents, drug addiction, female feticide, HIV positive children and white slavery
- I Taking steps for Betterment of Services through Anganwadis

3.15 Poverty Alleviation and Rural Development

District Development Policy for the sector Poverty Alleviation and Rural Development shall be that the present BPL population has to be brought above the poverty line by giving access to better employment opportunities and infrastructure facilities both in rural and urban areas.

The strategies for the same include reducing absolute poverty to less than 5% in the district through eliminating the deprivations and incapability of the poor.

3.16 Power

The policy in the power sector is to provide quality power for the existing and proposed economic activities of the district and to give more emphasis on non conventional energy sources in the domestic and commercial sector in Kollam.

With a projected Power demand of 844.4 mu by 2011 and 1226.1 mu by 2021, the strategy is to meet at least 1% of the domestic plus commercial power demand by non conventional sources by 2011 & 2021.

3.17 Scheduled Castes and Scheduled Tribes

The District Policy Statement derived is ;

“Socio-economic development of Scheduled Castes & Scheduled Tribes to bring about equity, who are well below other sections of the society in terms of education, employment and social status”.

The strategies include

- I To provide land to all the landless Scheduled Caste and Scheduled Tribe families in the district;
- I To provide dwelling houses to all the houseless in the district.
- I To provide safe drinking water to

problem areas

- I To electrify all the Scheduled Caste and Scheduled Tribe houses.
- I To provide quality education to Scheduled Caste and Scheduled Tribe students
- I To bring down BPL Scheduled Caste and Scheduled Tribe families to zero level.
- I To bring down, substantially the present level of unemployment among educated Scheduled Caste and Scheduled Tribe youths.
- I To create healthy and hygienic environment
- I To organize awareness camps to ensure participation of Scheduled Caste and Scheduled Tribe people in development programmes

3.18 Tourism

Kerala State Policy of tourism sector is to make Kerala, the God's Own Country, an up- market, high quality tourist

destination through rational utilisation of resources with focus on integrated development of infrastructure, conserving the heritage and environment, enhancing productivity and income, creating employment opportunities and alleviating poverty thereby making tourism the most important sector for the socio-economic development and environment protection of the State.

Following are targeted in the sector.

1. To increase earnings from tourism at the rate of 10% annually
2. To achieve an annual rate of growth of 7% in foreign tourist arrivals and 9% in domestic tourist arrivals.
3. To create 10000 employment opportunities every year.
4. To add required hotel rooms in star categories every year
5. To innovate and promote at least one new tourism product/destination every year.

Within the State vision and based on the District Development Concept and projected requirements, the district policy is carved and stated as follows.

"To make Kollam, the God's Own Capital a model responsible tourism destination for all seasons by utilizing its natural resources, art, culture and heritage and showcasing it as a slice of Kerala".

The strategies for this would be

- I Developing back water tourism
- I Developing beach tourism
- I Promoting eco tourism
- I Promoting destination developments
- I Promoting cultural and traditional tourism
- I Promoting pilgrim tourism
- I Generating a tourism network
- I Developing marketing facilities for enhancing tourism promotion
- I Attracting private investors

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Annexure 1					
Taluk and Villages in Kollam District					
Name of Taluk	Sl.No	Village	Name of Taluk	Sl.No	Village
Kollam Taluk	1	Thrikkaruva		23	Kottarakkara
	2	Perinad		24	Neduvathoor
	3	Thrikkadavoor		25	Kulakkada
	4	Sakthikulangara		26	Valakom
	5	Parippally		27	Kareepra
	6	Kollappuram	Kurunagappally Taluk	1	Alappad
	7	Paravur		2	Thevalakkara
	8	Kalluvathukkal		3	Pavumpa
	9	Chirakkara		4	Oachira
	10	Vedakkevila		5	Thazhava
	11	Mayyanad		6	Chavara
	12	Mundakkal		7	Karunagappally
	13	Eravipuram		8	Thodiyoor
	14	Thrikkovilvattom		9	Kalilbhagam
	15	Poothakkulam		10	Neendakara
	16	Kollam East		11	Adinad
	17	Adichanallor		12	Thekkumbhagam
	18	Meenad		13	Kulasekharapuram
	19	Mangad		14	Clappana
	20	Pallimon		15	Ayanivelikkulangara
	21	Kottamkara		16	Panmana
	22	Nedumpana	Kunnathur Taluk	17	Vadakkumthala
	23	Kollam West		1	Sooranad South
	24	East Kallada		2	Sooranad North
	25	Manreothuruth		3	Poruvazhy
	26	Mulavana		4	Mynagappally
	27	Kilikolloor		5	Sasthamcotta
	28	Thazhuthala		6	Kunnathoor
	29	Elampalloor		7	West Kallada
	30	Penayam	Pathanapuram Taluk	1	Pattazhy Vadakkekara
Kottarakkara Taluk	1	Nilamel		2	Pattazhy
	2	Veliyam		3	Thalavoor
	3	Elamadu		4	Vilakkudy
	4	Mankode		5	Pidavoor
	5	Velinalloor		6	Pathanapuram
	6	Chadayamangalam		7	Punnala
	7	Kummil		8	Piravanthoor
	8	Kottukkal		9	Karavallor
	9	Ittira		10	Edamulakkal
	10	Ummannoor		11	Arakkal
	11	Kadakkal		12	Anchal
	12	Chithara		13	Alayamon
	13	Vettikkavala		14	Channappetta
	14	Puthoor		15	Yeroor
	15	Kalayapuram		16	Ayiranallor
	16	Ezhukone		17	Edamon
	17	Chakkuvarakkal		18	Thenmala
	18	Odanavattom		19	Aryanakavu
	19	Pooyappally		20	Thinkalkarikkakom
	20	Melila		21	Kulathupuzha
	21	Mylom		22	Punalur
	22	Pavithreswaram		23	Valakkode

3

Annexure 2			
Local Self Government Institutions in Kollam District			
Sl.No	Name of LSGI	Sl.No	Name of LSGI
1	Anchal Block Panchayat	47	Kottarakkara Block Panchayat
2	Alayamon Grama Panchayat	48	Ezhukone Grama Panchayat
3	Anchal Grama Panchayat	49	Kareepra Grama Panchayat
4	Aryankavu Grama Panchayat	50	Kottarakkara Grama Panchayat
5	Edamulakkal Grama Panchayat	51	Neduvathoor Grama Panchayat
6	Karavalloor Grama Panchayat	52	Pooyapally Grama Panchayat
7	Kulathupuzha Grama Panchayat	53	Veliyam Grama Panchayat
8	Thenmala Grama Panchayat	54	Mukhathala Block Panchayat
9	Yeroor Grama Panchayat	55	Elampalloor Grama Panchayat
10	Anchalaumoodu Block Panchayat	56	Kottamkara Grama Panchayat
11	Thrikkadavoor Grama Panchayat	57	Mayyanadu Grama Panchayat
12	Thrikkaruva Grama Panchayat	58	Thrikkoilvattom Grama Panchayat
13	Chadayamangalam Block Pyt	59	Oachira Block Panchayat
14	Chadayamangalam Grama Pyt	60	Clappana Grama Panchayat
15	Chithara Grama Panchayat	61	Kulasekharapuram Grama Pyt
16	Elammadu Grama Panchayat	62	Oachira Grama Panchayat
17	Ittiva Grama Panchayat	63	Thazhava Grama Panchayat
18	Kadakkal Grama Panchayat	64	Pathanapuram Block Panchayat
19	Kummil Grama Panchayat	65	Pathanapuram Grama Panchayat
20	Nilamel Grama Panchayat	66	Pattazhy Grama Panchayat
21	Velinalloor Grama Panchayat	67	Pattazhy vadakkekara Grama Pyt
22	Chavara Block Panchayat	68	Piravanthoor Grama Panchayat
23	Chavara Grama Panchayat	69	Thalavoor Grama Panchayat
24	Neendakara Grama Panchayat	70	Vilakudy Grama Panchayat
25	Panmana Grama Panchayat	71	Sasthamcottah Block Panchayat
26	Thekkumbhagham Grama Panchayat	72	Kunnathur Grama Panchayat
27	Thevalakkara Grama Panchayat	73	Poruvazhy Grama Panchayat
28	Chittumala Block Panchayat	74	Sasthamcottah Grama Panchayat
29	Kizhakkekallada Grama Panchayat	75	Sooranad North Grama Panchayat
30	Kundara Grama Panchayat	76	Sooranad South Grama Panchayat
31	Mandrothuruthu Grama Panchayat	77	West Kallada Grama Panchayat
32	Panayam Grama Panchayat	78	Vettikkavala Block Panchayat
33	Perayam Grama Panchayat	79	Kulakkada Grama Panchayat
34	Perinadu Grama Panchayat	80	Melila Grama Panchayat
35	Ithikkara Block Panchayat	81	Mylom Grama Panchayat
36	Adichanalloor Grama Panchayat	82	Pavithreswaram Grama Panchayat
37	Chathanoor Grama Panchayat	83	Ummannoor Grama Panchayat
38	Chirakkara Grama Panchayat	84	Vettikkavala Grama Panchayat
39	Kalluvathukkal Grama Panchayat	85	Kollam Municipal Corporation
40	Nedumpna Grama Panchayat	86	Paravur Municipal Council
41	Poothakulam Grama Panchayat	87	Punalur Municipal Council
42	Karunagappally Block Panchayat	88	Kollam Jilla Panchayat
43	Alappad Grama Panchayat		
44	Karunagappally Grama Panchayat		
45	Mynagappally Grama Panchayat		
46	Thodiyoor Grama Panchayat		

Annexure 3

Population Projection –KERALA

The population of the State is calculated based on the decreasing rate method since the growth rate of population of the State has been decreasing for the last four decades. The tables below (Table-1) show the population details of Kerala over a century.

Table1 - Population of KERALA

Year	Total population	Growth rate	% Decrease in Population Growth rate
1901	6396262		
1911	7147673	11.75	
1921	7802127	9.16	-22.06
1931	9507050	21.85	138.66
1941	11031541	16.04	-26.62
1951	13549118	22.82	42.32
1961	16903715	24.76	8.49
1971	21347375	26.29	6.18
1981	25453680	19.24	-26.83
1991	29098518	14.32	-25.56
2001	31841374	9.43	-34.17

The variation in the growth rate of population over a century is shown in the figure-1.

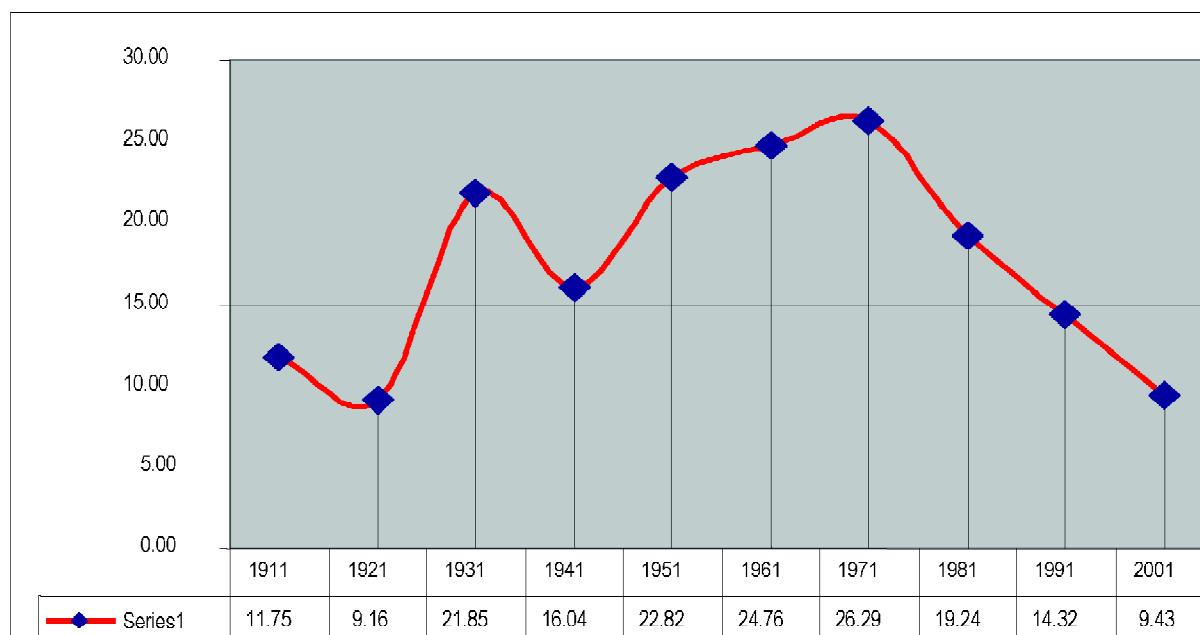


Fig.1 : Growth rate of population - Kerala

The projected population growth rate is shown in the figure 2

4

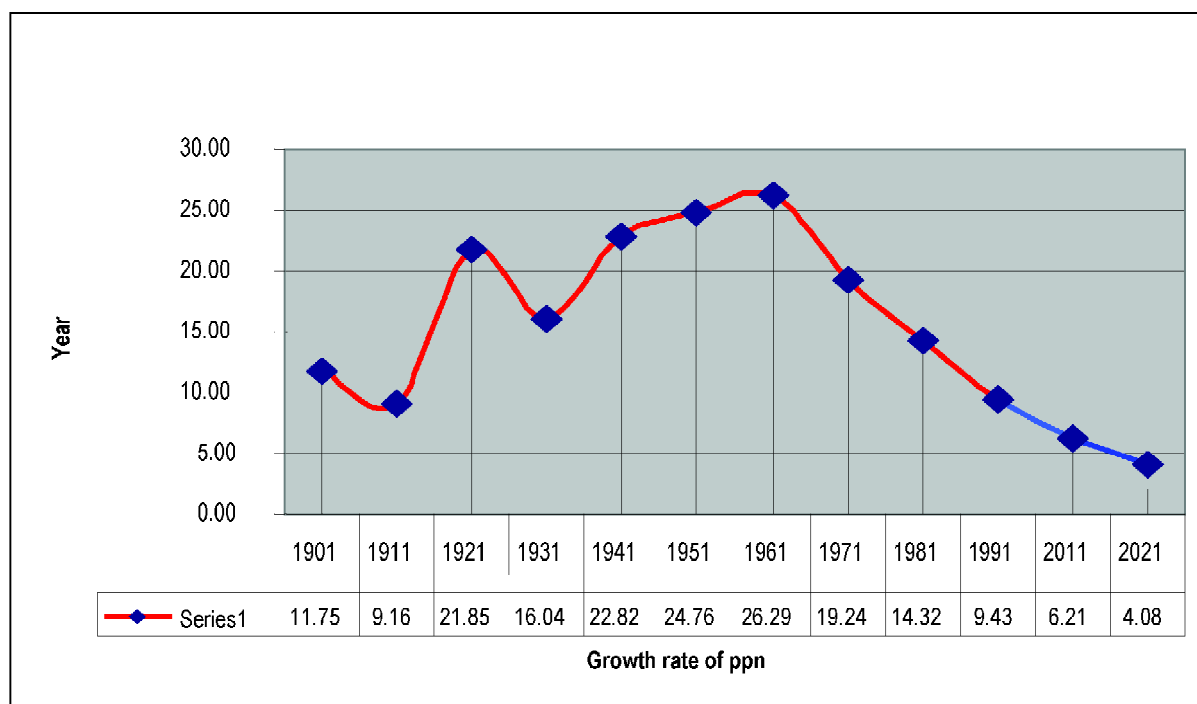


Fig. 2: Projected Growth rate of population - Kerala

The projected population details are shown in the table -2

Population of Kerala			
Year	Total population	Growth rate	% Decrease in Population Growth rate
1901	6396262		
1911	7147673	11.75	
1921	7802127	9.16	-22.06
1931	9507050	21.85	138.66
1941	11031541	16.04	-26.62
1951	13549118	22.82	42.32
1961	16903715	24.76	8.49
1971	21347375	26.29	6.18
1981	25453680	19.24	-26.83
1991	29098518	14.32	-25.56
2001	31841374	9.43	-34.17
2011	33817196	6.21	-34.17
2021	35198589	4.08	-34.17

Annexure 4				
Concentration Index of workers				
Sl No	NAME	CULTIVATORS	AGRI LABOURS	HH INDS WORKERS
		CI	CI	CI
1	Kollam Corporation	0.03	0.08	0.87
2	Paravoor Municipality	0.14	0.54	0.95
3	Punalur Municipality	0.62	1.11	0.77
4	Alayamon	1.92	2.65	0.59
5	Anchal	1.36	1.55	0.71
6	Arienkavu	1.42	0.70	0.31
7	Ladamulackal	2.22	1.71	0.53
8	Karavalloor	1.98	2.06	0.76
9	Kulathupuzha	1.13	2.72	0.95
10	Thenmala	1.16	1.48	0.33
11	Yeroor	1.94	2.32	0.65
12	Thrikkadavur	0.13	0.28	1.24
13	Thrikkaruva	0.15	0.25	2.16
14	Chedayamangalam	1.68	1.66	0.77
15	Chithara	1.30	2.11	0.75
16	Elamadu	2.24	1.99	0.58
17	Ittiva	2.35	2.14	1.22
18	Kadakkal	1.80	1.78	0.55
19	Nilamoi	1.90	1.92	0.55
20	Velinalloor	2.25	1.87	0.70
21	Chevara	0.23	0.13	1.41
22	Neendakara	0.02	0.15	1.23
23	Panmana	0.26	0.40	1.18
24	Thekkumbhagom	0.25	0.20	2.14
25	Thelvalakkara	0.18	0.50	0.78
26	Kizhakkalada	0.76	0.81	0.62
27	Kundara	0.59	0.96	0.40
28	Mundrothuruthu	0.30	0.52	5.70
29	Panayam	0.30	0.39	1.45
30	Perayam	0.53	0.30	0.77
31	Perinad	0.21	0.59	1.31
32	Adichenalloor	0.47	0.60	0.90
33	Chethannur	0.59	1.14	1.33
34	Kalluvathukkal	0.93	1.65	0.72
35	Nedumpana	1.03	1.32	0.55
36	Poothakkulam	0.61	1.01	1.73
37	Alappad	0.14	0.01	0.22
38	Karunagappally	0.28	0.27	2.19
39	Myrnanagappally	0.76	0.77	0.43
40	Thodiyoor	0.53	0.74	1.63
41	Ezhukone	1.00	1.14	0.57
42	Kareepra	1.29	1.02	0.73
43	Kottarakkara	0.91	1.20	0.84
44	Neduvathoor	1.62	1.49	1.28
45	Pocayappally	2.34	1.38	0.83
46	Veliyam	2.07	1.19	0.48
47	Elampalloor	0.53	0.92	0.67
48	Kottamkara	0.14	0.81	0.93
49	Mayyanadu	0.15	0.30	1.98
50	Thrikkovilvattom	0.44	0.92	0.55
51	Clappana	0.16	0.21	1.17
52	Kulasekharapuram	0.24	0.36	1.24
53	Oachira	0.64	0.76	1.62
54	Thazhava	1.13	0.89	3.19
55	Pathanapuram	1.14	1.94	1.22
56	Pattazhy	3.25	1.11	0.51
57	Pattazhy Vadakkakara	2.65	1.53	0.76
58	Piravanthoor	2.44	2.12	0.92
59	Thalavur	2.58	1.75	0.37
60	Vilakkudy	0.97	1.69	0.72
61	Kunnathur	2.20	1.11	0.87
62	Poruvazhy	1.71	1.44	1.80
63	Sasthamkotta	1.28	1.03	1.40
64	Sooranad North	2.18	1.46	0.67
65	Sooranad South	1.89	1.32	0.63
66	West Kallada	0.88	1.16	1.69
67	Kulakkada	2.19	1.12	0.93
68	Mella	1.79	1.12	0.49
69	Mylom	1.94	1.47	0.71
70	Pavithreswaram	2.04	1.11	1.31
71	Ummannoor	2.65	1.65	0.39
72	Vettikkavala	2.06	1.58	0.62

Annexure 5					
Concentration index of land use					
Sl.No	Name of the Panchayat	Concentration Index			
		Commercial	Industrial	Agriculture	Forest
1	Adichanallor	1.74	2.85	1.12	0.00
2	Alayamon	0.56	0.21	1.70	0.92
3	Anchal	5.38	0.52	1.93	0.00
4	Ariekavu	0.15	0.12	0.68	2.86
5	Chadayamangalam	0.62	0.24	1.51	0.00
6	Chathannur	1.41	2.97	0.87	0.00
7	Chavara	1.50	7.24	0.11	0.00
8	Chithara	0.85	0.06	1.98	0.00
9	Clappana	0.77	0.24	0.17	0.00
10	Edamulackal	1.88	0.67	1.65	0.00
11	Elamad	0.21	0.61	2.06	0.00
12	Elampalloor	1.74	3.97	0.55	0.00
13	Ezhukone	2.68	1.55	0.94	0.00
14	Kadakkal	0.94	0.12	1.09	0.00
15	Kalluvathukkal	1.59	1.76	1.08	0.00
16	Karavallor	0.62	0.15	2.00	0.00
17	Kareepra	0.79	1.27	0.78	0.00
18	Karunagappally	4.59	0.55	0.24	0.00
19	Kizhakkallada	0.79	1.88	0.47	0.00
20	Kollam (M C	6.53	6.27	0.10	0.00
21	Kottamkara	0.71	3.70	0.37	0.00
22	Kottarakkara	4.77	0.67	1.16	0.00
23	kulakkada	0.44	1.70	0.88	0.00
24	Kulasekharapuram	4.79	2.15	0.41	0.00
25	Kulathupuzha	0.06	0.03	0.63	2.91
26	Kundara	4.82	7.85	0.43	0.00
27	Kunnathur	0.85	1.55	1.57	0.00
28	Melila	1.41	1.15	1.79	0.00
29	Mundrothuruthu	0.09	0.21	0.48	0.00
30	Mylom	0.50	0.46	1.30	0.00
31	Mynagappally	0.59	1.24	0.51	0.00
32	Mayyanadu	1.35	2.24	0.38	0.00
33	Nedumpana	0.53	1.30	0.59	0.00
34	Neduvathor	2.18	2.03	1.63	0.00
35	Neendakara	0.21	4.64	0.05	0.00
36	Nilamel	2.15	0.12	1.83	0.00
37	Oachira	3.27	0.61	0.25	0.00
38	Panayam	0.71	1.24	0.30	0.00
39	Panmana	0.53	12.97	0.21	0.00
40	Paravoor Municipality	2.41	0.88	0.34	0.00
41	Pathanapuram	3.12	0.79	1.91	0.07
42	Pattazhy	1.59	0.15	2.05	0.00
43	Pattazhy Vadakkekara	0.71	0.33	2.13	0.00
44	Pavithreswaram	0.82	4.15	0.78	0.00
45	Perayam	0.91	5.00	0.13	0.00
46	Perinad	0.56	4.27	0.30	0.00
47	Poothakkulam	1.50	0.42	0.74	0.00
48	Pooyappally	0.38	0.97	1.39	0.00
49	Poruvazhy	0.71	0.85	1.29	0.00
50	Punalur (Municipality	2.77	0.64	1.70	0.00
51	Sasthamkotta	1.27	0.52	0.43	0.00
52	Sooranad North	0.68	1.88	0.79	0.00
53	Sooranad South	0.71	3.67	0.72	0.00
54	Thalavur	0.62	0.27	1.91	0.00
55	Thazhava	0.77	0.46	0.46	0.00
56	Thekkumbhagam	0.53	0.24	0.13	0.00
57	Thenmala	0.21	0.03	1.05	2.19
58	Thevalakkara	1.21	1.30	0.24	0.00
59	Thodiyoor	1.65	3.39	0.43	0.00
60	Thrikkadavur	1.47	0.82	0.23	0.00
61	Thrikkaruva	0.27	0.15	0.10	0.00
62	Thrikkovilvattom	1.44	4.55	0.56	0.00
63	Ummannoor	0.97	0.76	1.93	0.00
64	Velinalloor	1.88	0.61	1.65	0.00
65	Veliyam	0.91	0.61	1.72	0.00
66	Vettikkavala	1.00	0.30	1.62	0.00
67	Vilakkudy	0.53	0.61	1.33	0.00
68	West Kallada	0.44	2.39	0.61	0.00
69	Yeroor	0.44	0.06	2.09	0.39
70	Piravanthur	0.47	0.03	0.95	1.96
71	Alappad	0.47	0.09	0.00	0.00
72	Ittiya	0.44	0.21	1.95	0.00

Annexure-6 Character of Settlements- Methodology

A close examination of the land use pattern existing in Kerala will reveal that there are only a few areas in the State which are pucca urban or pucca rural. In between the pucca urban or pucca rural area, large chunks of land ('in between land') with mixed land use, character where in a combination of residential and agricultural land use exists. This peculiar character of the land use makes it difficult to classify a local body or a ward of a local body as either pucca urban or pucca rural. The pucca urban or pucca rural area is only a minor share of the total area; the remaining area being mixed land use areas. Hence the character of the mixed land use area determines the total character of the area. This mixed land use area is to be again classified in order to ascertain the character of the land use of an area. An attempt to do the above classification is made in the forthcoming paragraphs.

Average plot size (see the note) of the mixed land use is taken as the criterion for classifying the mixed land use area, because in most of the cases this determines type of activity to be introduced there and consequently the character of the mixed land use area.

If the average plot size (total area/ number of houses) in the mixed land use area is such that one can earn reasonable income from agricultural activity alone (without considering the present status of land use), it can be classified as a rural area.

If the average plot size is such that a family can earn their livelihood only partially from the agricultural activity, it can be termed as semi urban or semi rural area. The share between the agricultural and non agricultural activity determines whether it is a semi urban or semi rural area. If the plot size is such that a family has to earn major share of their livelihood from rural activity but has to resort to some urban activity also to fill the gap (in the earnings) it can be termed as semi rural area. A reversed situation indicates a semi urban area.

Those plots size with an extent, which is not at all sufficient for any agriculture activity of namesake, can be treated as urban area. From the above explanation it can be concluded that the mixed land use area can be classified as rural area, urban area, semi urban area and semi -rural area based on the average plot size.

Note: Average plot size as the major Criterion for the classification of mixed land use area- Derivation

The income from agricultural products from unit area of land is taken as the criteria to determine the average plot size. Yield of coconut trees in an area is taken for the calculation. Since the major agricultural cultivation in the mixed land use in this context is coconut cultivation, the minimum plot area which produces coconuts sufficient enough to fetch one third of the total income for the sustenance of an average family has to be determined here. It is presumed that the other agriculture and allied activities will bring in the remaining part of the income. An average family of 5 members needs an income of at least Rs.3500/ month- for their food, shelter and other daily necessities.

In the Kerala context, the average yield of coconut is 5771 nuts / ha/year (the least value is taken). This is equivalent to Rs.50000/ Ha /year (Rs.16.4 /cent/ month). This means that an average extent of 70 cents will fetch minimum a monthly average income of Rs.1148 /- from the coconut trees. So if the average plot size is greater than or equal to 70 cents, this can be termed as rural area. Also it can be presumed that an extent of 25 cents of land or less will not fetch significant agricultural production to be taken in to account. An average plot of size less than 25 cents is assumed not to bring any agriculture products worth mentioning. Hence an average plot size of 25 cents or below can be termed as urban area. If the averages plot size is in between one HH/25- 70, a family has to depend on both agricultural activity and non agricultural activity for their livelihood. Depending on the share between agricultural and non agricultural activity which can be introduced in the plot, it can be termed as semi urban or semi rural. If the average plots size is between one HH/ 50-70 cents it is termed as semi rural area and if it is in between one HH/ 25-50 cents it is termed as semi urban area.

Classification of an area (ward or local body or district) into urban, semi urban, semi rural and rural

So in the Kerala context, a ward or a local body will be having either pucca urban area, pucca rural area or mixed (Residential cum agricultural) use area in separate or in its combination. And also the mixed land use area can be further classified into-Urban, semi urban, semi rural and rural as noted above. When the total area of a ward or local body is concerned, the predominance of any of the four (urban land use, rural land use, semi urban or semi rural) determines the character of the area. While this condition is always acceptable, certain other conditions, from the practical point of view, are also incorporated for classification of an area.

The conditions are elaborated below.

The character of an area can be termed as urban

1. If the pucca urban land use (not taking in to account the classification of mixed land use) is more than or equal to 25 % of the total area, then the area can be termed as an urban area. (The analysis of the land use of various urban local bodies & the share of various land uses of an urban area as specified in the UDPFI guide lines shows that an urban area is having a residential land use of the same percentage as that of pucca urban land use (commercial, industrial, public & semi public etc. This is actually the residential land use attached to the urban land use. So if the pucca urban land use is 25% then by adding the residential share of 25% the total urban land use share becomes 50%)
2. The urban land use (Taking in to account the classification of mixed land use) percentage of 50% of the total area of a region can be taken as the lower limit to term it as an urban area.

The character of an area can be termed as rural,

1. If the pucca rural land use share is more than 50% it is a rural area.
2. If the rural land use (taking into account, both pucca rural land use and the classification of mixed land use) share is greater than or equal to 50 % of the total area, then it can be termed as a rural area.

The character of an area can be termed as Semi urban,

1. If the mixed land use area is classified as semi urban and the sum of urban land use share and semi urban residential land use is greater than or equal to 50% of the total area.

The character of an area can be termed as Semi rural,

1. If the mixed land use area is classified as semi rural area and the sum of rural land use share and semi rural- mixed land use land use is greater than or equal to 50% of the total area.
2. If the pucca rural land use share is at least 1/3rd of the total area and the mixed land use is not urban or semi urban, then also the area can be termed as semi rural area (this condition is included after practical verification).

Annexure 7		
Weightage of facilities		
Sl No.	Name of the Facilities	Weightage
1	Market-District Centre	72.00
2	Super Speciality Hospital	36.00
3	Ayurveda college	36.00
4	Post Office HO	24.00
5	Market-Division Level	24.00
6	Seed Farm	14.40
7	Fire Station	14.40
8	Speciality Alone Hospitals	10.30
9	Teachers Training Institute	8.00
10	KSRTC Bus Stand	8.00
11	B. Ed College	8.00
12	Engineering College/College of Science & Technology, & Poly technic	7.20
13	Sector Level Market Centre	6.50
14	Private bus stand	6.00
15	Arts & Science College	5.50
16	Veterniry hospital	4.50
17	Railway Station	4.50
18	Parks, Tourist Centres	4.20
19	ITC/ITI	3.30
20	HSS	2.00
21	Cinema Theatre	1.80
22	Telephone Exchange	1.76
23	HS	1.60
24	Play Ground/ Stadium	1.50
25	Veterinary dispensary	1.40
26	PHC	1.40
27	Hospital with IP facility	1.10
28	LP and UP	1.00
29	Local Market Centre	1.00
30	Library	1.00
31	Krishi Bhavan	1.00

Note : Weightage of a facility = $\frac{\text{Total No. of settlements}}{\text{No of settlements having that facility}}$

8

Annexure 8					
Composite functional index (CFI) of settlement					
Sl.No	LSGI Name	CFI	Sl.No	LSGI Name	CFI
1	Clappana	10.08319328	37	Nilamel	37.93846154
2	Needakara	12.07142857	38	Edamulakkal	38.69877769
3	Karavalloor	12.44033613	39	Mynagappally	41.97272727
4	Melila	16.24163484	40	Veliyam	42.18449198
5	Pattazhy	17.17563025	41	Chadayamangalam	43.16451196
6	West Kallada	18.02605042	42	Kulathupuzha	43.96386555
7	Panayam	18.71176471	43	Thenmala	45.22605042
8	Mandrothuruthu	19.18319328	44	Pooyapally	45.32605042
9	Piravanthoor	20.14033613	45	Aryankavu	45.38319328
10	Thazhava	21.26890756	46	Kulakkada	46.14545455
11	Perayam	21.38319328	47	Chavara	46.45152495
12	Thrkkaruva	21.81848739	48	Thrkkoilvattom	48.06890756
13	Poothakulam	22.62857143	49	Kottamkara	48.62967621
14	Kizhakkekallada	23.06890756	50	Kundara	49.87142857
15	Thekkubagham	23.27142857	51	Kareepra	50.02987013
16	Sooranad North	23.79243697	52	Sasthamcottah	50.76710936
17	Elampalloor	26.04285714	53	Kalluvathukkal	51.65462185
18	Velinalloor	28.500000	54	Oachira	52.93659282
19	Pattazhy vadakkekara	28.7073691	55	Ezhukone	53.28319328
20	Poruvazhy	28.82605042	56	Mylom	53.37563025
21	Sooranad South	28.86890756	57	Ittiva	56.65462185
22	Thevalakkara	28.92605042	58	Vettikkavala	58.78449198
23	Alappad	28.98319328	59	Kulasekharapuram	60.08449198
24	Yeroor	29.38319328	60	Thodiyoor	60.26890756
25	Nedumpana	29.65714286	61	Anchal	68.63349592
26	Panmana	30.35714286	62	Pavithreswaram	69.19121467
27	Thalavoor	31.18319328	63	Pathanapuram	80.61848739
28	Neduvathoor	31.28449198	64	Chathanoor	81.49896574
29	Alayamon	31.64163484	65	Mayyanadu	83.23937827
30	Chithara	34.61176471	66	Kadakkal	86.24285714
31	Thrkkadavoor	34.62605042	67	Paravur Municipality	89.89885409
32	Elammadu	35.11176471	68	Adichanalloor	111.9416348
33	Perinadu	36.96134454	69	Karunagappally	137.5781513
34	Ummannoor	37.06890756	70	Punalur Municipality	172.91921
35	Vlakudy	37.11176471	71	Kottarakkara	214.1306693
36	Kunnathur	37.86890756	72	Kollam Corporation	704.9333373

Note : CFI of a settlement = $\sum_{i=1}^n$

No of a particular facility in the settlement x weightage of that facility

Annexure 9					
Hierarchy of Settlements (Existing)					
Order of the settlement	Sl.No	Name of the settlement	Order of the settlement	Sl.No	Name of the settlement
I	1	Kollam Corporation	IV	15	Kunnathur
II	1	Kottarakkara		16	Vlakudy
	2	Punalur Municipality		17	Ummannoor
	3	Karunagappally		18	Perinadu
III	1	Adichanalloor		19	Elammadu
	2	Paravur Municipality		20	Thrkkadavoor
	3	Kadakkal		21	Chithara
	4	Mayyanadu		22	Alayamon
	5	Chathanoor		23	Neduvathoor
	6	Pathanapuram		24	Thalavoor
	7	Pavithreswaram		25	Panmana
	8	Anchal		26	Nedumpana
	9	Thodiyoor		27	Yeroor
	10	Kulasekharapuram		28	Alappad
	11	Vettikkavala		29	Thevalakkara
	12	Ittiva		30	Sooranad South
	13	Mylom		31	Poruvazhy
	14	Ezhukone		32	Pattazhy vadakkekara
	15	Oachira		33	Velinalloor
	16	Kalluvathukkal		34	Elampalloor
	17	Sasthamcottah		35	Sooranad North
	18	Kareepra		36	Thekkubagham
IV	1	Kundara		37	Kizhakkekallada
	2	Kottamkara		38	Poothakulam
	3	Thrkkovilvattom		39	Thrkkaruva
	4	Chavara		40	Perayam
	5	Kulakkada		41	Thazhava
	6	Aryankavu		42	Piravanthoor
	7	Pooyapally		43	Mandrothuruthu
	8	Thenmala		44	Panayam
	9	Kulathupuzha		45	West Kallada
	10	Chadayamangalam		46	Pattazhy
	11	Veliyam		47	Melila
	12	Mynagappally		48	Karavaloor
	13	Edamulakkal		49	Needakara
	14	Nilamel		50	Clappana

Annexure 10 Methodology for Calculating the value for centrality

A - Centrality

Centrality: - Centrality is the locational importance acquired by an area because of its position in the geographical center or proximity to the geographical center of a region. An area placed in the centre of a region or near to the center possesses the advantage that it is accessible (if there is no physical barrier in between) equally from all parts of the region under consideration. In practical terms, a local body located in the centre of a District has a potential, deriving out of its central location with respect to the District. For deriving the proposed hierarchy of the settlements, this criteria, the centrality of the settlements are also to be taken into account. An attempt is made here to quantify the centrality of an area to make this value in analysis.

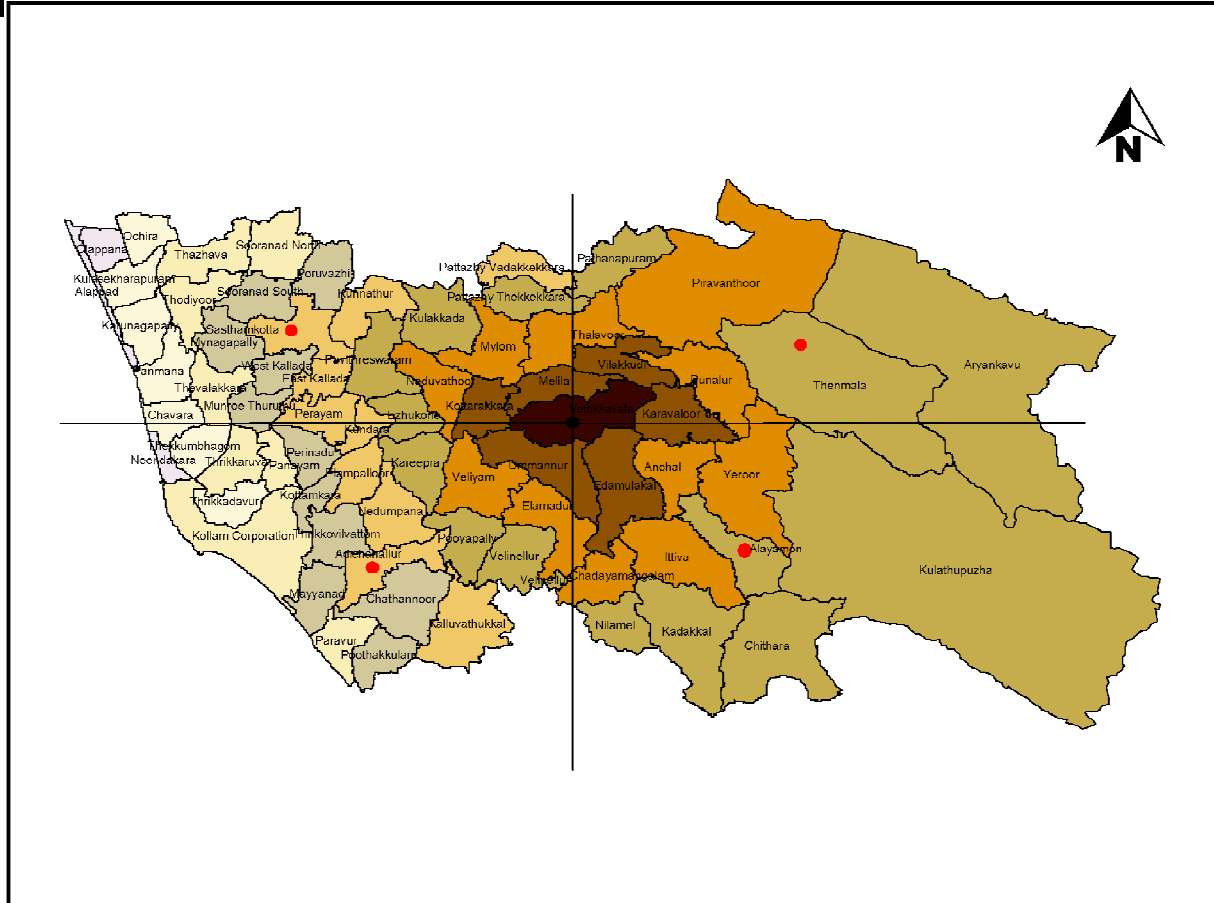
This centrality value is very much useful in identifying the proposed hierarchy of various local bodies. The most important part in the identification of the hierarchy of settlements is assigning various order (1st Order, 2nd Order, 3rd Order etc.) to the settlement and for of this centrality at different levels are to be calculated. Practically it can be assumed that centrality at three levels are existing. They are Regional centrality, Sub regional centrality and Local Centrality.

Regional Centrality

Regional Centrality is the locational importance, a settlement is deriving out of its proximity to the geographical central position of the region. A settlement falling at the centre of the region possesses the maximum regional centrality value of 1 and it can be termed as the central settlement. Those settlements adjacent to the central settlement can be said to possess the regional centrality value of 2. The next layer of settlements adjacent to the settlements having the regional centrality value of 2, possess the regional centrality value of 3. In this way, the regional centrality value of any settlement in a region can be calculated. The figure below shows the variation of the centrality value of various Local bodies of the District.

The Regional centrality value of various local bodies of Kollam District are shown in the table below.

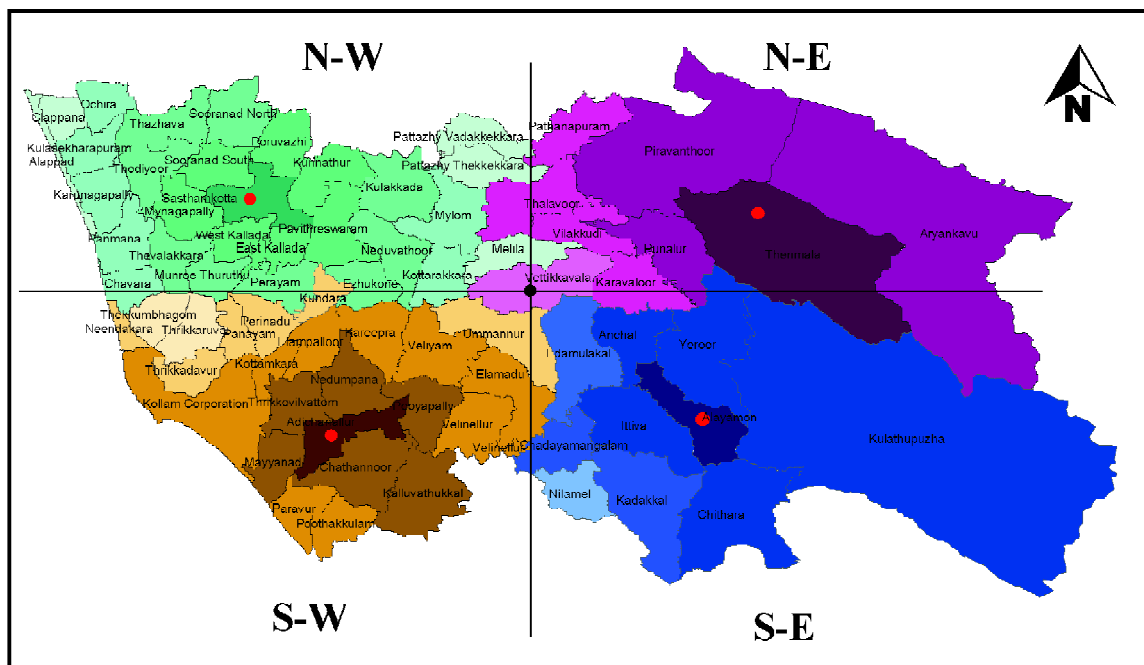
Regional Centrality			
LSGI	Value of Centrality	LSGI	Value of Centrality
Vettikavala	1	East Kallada	5
Melilla	2	Perayam	5
Ummanoor	2	Kundara	5
Vilakkudi	2	Elampallor	5
Karavalloor	2	Nedumpana	5
Edamulakal	2	Adichanalloor	5
Kottarakkara	2	Kalluvathukkal	5
Mylom	3	Poruvazhi	6
Thalavoor	3	Sooranad South	6
Piravanthoor	3	Mynagapally	6
Punaloor	3	West Kallada	6
Yeroor	3	Munrothurath	6
Anchal	3	Perinadu	6
Ittiva	3	Poothakulam	6
Chadayamanglam	3	Chathanoor	6
Elamadu	3	Mayyanad	6
Veliyam	3	Thrikkovilvattom	6
Neduvathoor	3	Kottamkara	6
Pattazhy Thekku	4	Paravoor	7
Pathanapuram	4	Kollam Corpn	7
Aryankavu	4	Panayam	7
Thenmala	4	Thrikkaruva	7
Kulathupuzha	4	Thevalakkara	7
Alayamon	4	Thodiyoor	7
Chithara	4	Thazhava	7
Kadakkal	4	Sooranad North	7
Nilamel	4	Thrikadavoor	8
Vellinallor	4	Thekumbhagm	8
Pooyapally	4	Chavara	8
Kareepra	4	Karunagapally	8
Ezhukone	4	Panmana	8
Pavithreswaram	4	Oachira	8
Kulakkada	4	Kulasekharapuram	8
Pattazhy Vadaku	5	Clappana	9
Kunnathoor	5	Alappad	9
Sasthamkotta	5	Neendakara	9



Sub Regional Centrality

Sub Regional centrality is the locational importance; a settlement is deriving out of its proximity to the geographical centre of a sub-region. A region can be divided into four sub-regions, Viz North-East region, North-West region, South-East region and South West region. A settlement falling in the center of a sub-region will possess the maximum sub regional value of 1 and this settlement can be termed as the sub regional central settlement.

Those settlements adjacent to the central settlement can be said to possess the Sub regional centrality value of 2. Similarly, settlements adjacent to the settlements with centrality value of 2 can be said to possess sub-regional centrality value of 3. The sub-regional centrality value of any settlement in sub regional can be assessed like this. The figure below shows the variation of the sub regional centrality value of various Local bodies of the District.

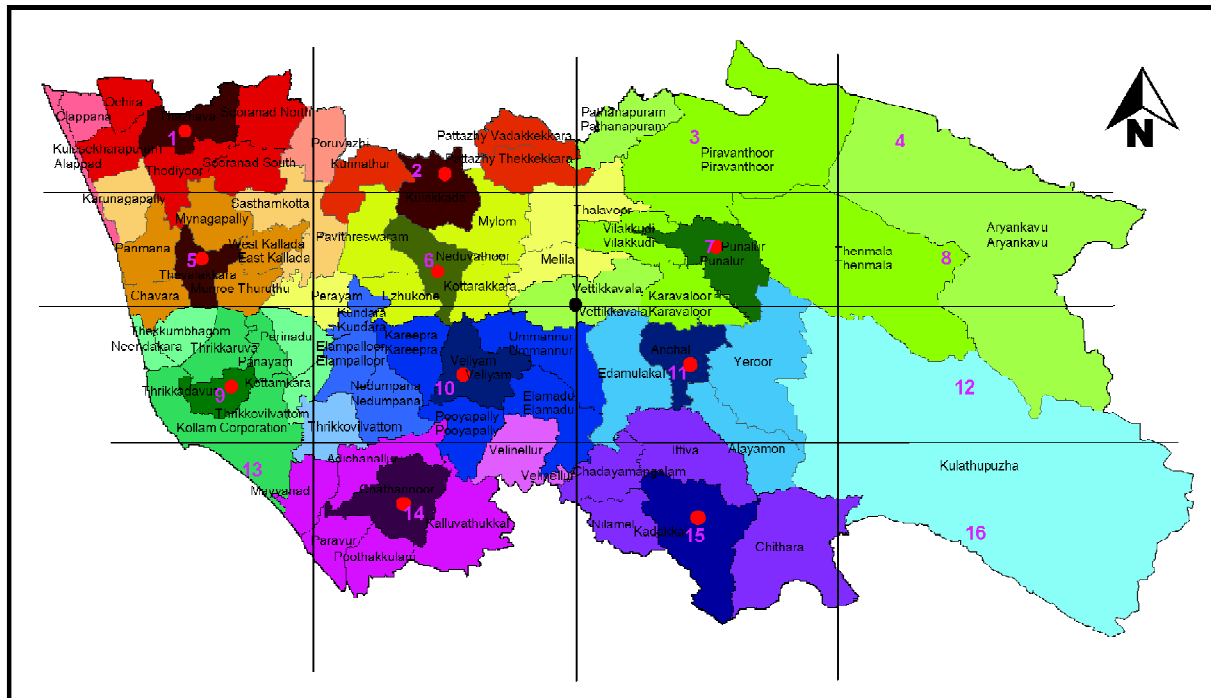


Division	Panchayath	Centrality Value
S E 1	Alayamon	1
1	Anchal	2
1	Yeroor	2
1	Chithara	2
1	Ittiva	2
1	Kulathupuzha	2
1	Edamulakal	3
1	Chadayamangalam	3
1	Kadakkal	3
1	Nilamel	4
S W 2	Adichanallor	1
2	Nedumpana	2
2	Pooyapally	2
2	Thrikkovilvattom	2
2	Mayyanad	2
2	Chathanoor	2
2	Kalluvathukkal	2
2	Paravoor	3
2	Poothakulam	3
2	Vellinallor	3
2	Elamadu	3
2	Veliyam	3
2	Kareepra	3
2	Elampalloor	3
2	Kottamkara	3
2	Kollam Corpn.	3
2	Perinadu	4
2	Panayam	4
2	Thrikadavoor	4
2	Neendakara	4
2	Ummanoor	4
2	Kundara	4
2	Thekumbhagam	5
2	Thrikaruva	5
N W 3	Sasthamkotta	1
3	Mynagapally	2
3	Pavithreswaram	2
3	West Kallada	2
3	East Kallada	2
3	Kunnathoor	2
3	Poruvazhi	2
3	Sooranad South	2
3	Sooranad North	3
3	Thazhava	3
3	Thevelakkara	3
3	Munroethurath	3
3	Perayam	3
3	Ezhukone	3
3	Noduvathoor	3
3	Kulakkada	3
3	Thodiyoor	3
3	Kottarakara	4
3	Mylom	4
3	Chavara	4
3	Panmama	4
3	Karunagapally	4
3	Kulasekharapuram	4
3	Oachira	4
3	Pattazhy Theku	5
3	Pattazhy Vadak	5
3	Mellila	5
3	Clappana	5
3	Alappad	5
N-E-4	Thenmala	1
4	Piravanthoor	2
4	Aryankavu	2
4	Punaloor	2
4	Pathanapuram	3
4	Thalavoor	3
4	Vilakudi	3
4	Karavalloor	3
4	Vettikavala	4

Local Centrality

The Sub regions identified earlier can be further divided into four parts (NE, NW, SE, SW) and each area can be termed as a local area & the centrality of a settlement deriving out of the proximity of the settlement with the centre of the local area can be termed as the local centrality. Like regional centrality, different settlements can have the local centrality value of 1, 2, 3 etc.

The figure below shows the variation of the local centrality value of various Local bodies of the District



B - Connectivity

Connectivity is a term to denote how well an area is connected to other parts of the region (inter regional) or other regions (intra regional). Two indicators are taken to assess the connectivity of an area under consideration with other areas.

First criterion is the existence of a road of the category of NH, SH or MDR and second is the grade of the rail way station existing (if any) in the area under consideration. The details of the rail way station and the type of roads in each of the local body of Kollam District are shown in the table below.

LSGI name	Grade of Railway station(Indian Railways)	Type of road
Alayamon		
Anchal		MDR
Aryankavu	F	NH
Edamulakkal		MDR
Karavaloar		MDR
Kulathupuzha		SH
Thenmala	F	NH
Yeroor		MDR
Thirkkadavoor		MDR
Thirkkaruva		MDR
Chadayamangalam		SH
Chithara		MDR
Elammadu		MDR
Ittira		
Kadakkal		MDR
Nilamel		SH
Velinallur		MDR
Kummil		
Chavara		NH
Needakara		NH
Panmana		NH
Thekkubhagam		
Thevalakkara		MDR
Kizhakkallada		MDR
Kundara	E	NH
Mandrothuruthu	F	
Panayam		MDR

LSGI name	Grade of Railway station(Indian Railways)	Type of road
Perayam		
Perinadu	E	NH
Adichanalloor		NH
Chathanoor		NH
Kailuvathukkal		NH
Nedumpana		
Poothakulam		
Chirakkara		
Alappad		
Karunagappally		NH
Mynagappally	F	
Thodiyoor	E	
Ezhukone	F	NH
Kareppra		
Kottarakkara		NH
Neduvathoor		NH
Pooyapally		MDR
Veliam		MDR
Elampalluor		NH
Kottamkara		NH
Mayyanadu	E	NH
Thrkkovilvattom		MDR
Clappana		
Kulasekharapuram		NH
Oachira	E	NH
Thazhava		
Pathanapuram		SH
Pattazhy		
Pattazhy vadakkekara		
Piravanthoor		SH
Thalavoor	F	
Vlakurdy	F	NH
Kunnathur		MDR
Poruvazhy		MDR
Sasthamcottah		MDR
Sooranad North		
Sooranad South		
West Kallada		MDR
Kulakkada		SH
Melila		NH
Mylom		SH
Pavithreswaram		MDR
Ummannoor		SH
Vettikkavala		SH
Kollam Corporation	A, F	NH
Paravur Municipality	E	MDR
Punalur Municipality	E	NH

While calculating the proposed hierarchy of the settlements the presence of NH or SH is given a value of 1 and the presence of MDR is given a value of 2. The railway station of A grade is given a value of 1 and the lower grades B, C, D etc is given values of 2, 3, 4 etc respectively.

Annexure 11

Table for Determination of the second order settlements from NE and SW sub regions

Division	LSGI Name	Existing Hierarchy	Administrative status			Centrality (Sub regional)	Connectivity	Count of 1	Count of 2	Count of 3	Count of 4
			Dist HQ	Taluk HQ	Block HQ		Rail way station Road				
N_E	Alayamon	5	0.0	0.0	0	1	0 0	1.0	0.0	0	0.0
N_E	Anchal	4	0.0	0.0	1	2	0 1	2.0	1.0	0	1.0
N_E	Edamulakkal	5	0.0	0.0	0	3	0 2	0.0	1.0	1	0.0
N_E	Kulathupuzha	5	0.0	0.0	0	2	0 1	1.0	1.0	0	0.0
N_E	Yeroor	5	0.0	0.0	0	2	0 2	0.0	2.0	0	0.0
N_E	Chacayamangalam	5	0.0	0.0	1	3	0 1	2.0	0.0	1	0.0
N_E	Chithara	5	0.0	0.0	0	2	0 2	0.0	2.0	0	0.0
N_E	Ittiva	4	0.0	0.0	0	2	0 0	0.0	1.0	0	1.0
N_E	Kadakkal	4	0.0	0.0	0	3	0 2	0.0	1.0	1	1.0
N_E	Nilamel	5	0.0	0.0	0	4	0 1	1.0	0.0	0	1.0
S-W	Thrkkadavoor	5	0.0	0.0	1	4	0 2	1.0	1.0	0	1.0
S-W	Thrkkaruva	5	0.0	0.0	0	5	0 2	0.0	1.0	0	0.0
S-W	Elammadu	5	0.0	0.0	0	3	0 2	0.0	1.0	1	0.0
S-W	Velinalloor	5	0.0	0.0	0	3	0 2	0.0	1.0	1	0.0
S-W	Neeckara	5	0.0	0.0	0	4	0 1	1.0	0.0	0	1.0
S-W	Thekkubagham	5	0.0	0.0	0	5	0 0	0.0	0.0	0	0.0
S-W	Kundara	5	0.0	0.0	0	4	5 1	1.0	0.0	0	1.0
S-W	Parayam	5	0.0	0.0	0	4	0 2	0.0	1.0	0	1.0
S-W	Perinadu	5	0.0	0.0	0	4	5 1	1.0	0.0	0	1.0
S-W	Adichanalloor	4	0.0	0.0	0	1	0 1	2.0	0.0	0	1.0
S-W	Chathanoor	4	0.0	0.0	1	2	0 1	2.0	1.0	0	1.0
S-W	Kalluvathukkal	5	0.0	0.0	0	2	0 1	1.0	1.0	0	0.0
S-W	Nedumpana	5	0.0	0.0	0	2	0 0	0.0	1.0	0	0.0
S-W	Poothakulam	5	0.0	0.0	0	3	0 0	0.0	0.0	1	0.0
S-W	Kareepra	5	0.0	0.0	0	3	0 0	0.0	0.0	1	0.0
S-W	Pooypally	5	0.0	0.0	0	2	0 2	0.0	2.0	0	0.0
S-W	Veliyam	5	0.0	0.0	0	3	0 2	0.0	1.0	1	0.0
S-W	Elampalloor	5	0.0	0.0	0	3	0 1	1.0	0.0	1	0.0
S-W	Kottamkara	4	0.0	0.0	0	3	0 1	1.0	0.0	1	1.0
S-W	Mayyennadu	4	0.0	0.0	0	2	5 1	1.0	1.0	0	1.0
S-W	Thrkkovilvattom	5	0.0	0.0	1	2	0 2	1.0	2.0	0	0.0
S-W	Ummannoor	5	0.0	0.0	0	4	0 1	1.0	0.0	0	1.0
S-W	Kollam Corporation	1	1.0	1.0	0	3	1, 6 1	4.0	0.0	1	0.0
S-W	Paravur Municipality	4	0.0	0.0	1	3	5 2	1.0	1.0	1	1.0

Annexure 11 A				
Character of the Service settlements of 2nd order settlements				
Second Order settlements	Number	Service settlements and character		General Character of service area
KARUNAGAPALLY	1	KARUNAGAPALLY	Semi Urban	Semi Urban
	2	CIAPPANA	Semi Urban	
	3	KULASEKHARAPURAM	Semi Urban	
	4	THAZHAVA	Semi Urban	
	5	ALAPPAD	Semi Urban	
	6	WEST KALLADA	Semi Urban	
	7	EAST KALLADA	Semi Urban	
	8	SOORANAD SOUTH	Semi Urban	
	9	OACHIRA	Semi Urban	
	10	PORUVAZHI	Semi Urban	
	11	PANMANA	Semi Urban	
	12	THODIYOOR	Semi Urban	
	13	CHAVARA	Semi Urban	
	14	THEVALAEKKARA	Semi Urban	
	15	SASTHAMKOTTA	Semi Urban	
	16	SOORANAD NORTH	Semi Urban	
	17	MYNAGAPALLY	Semi Urban	
KOTTARAKKARA	1	KOTTARAKKARA	urban	Semi rural
	2	KUNNATHOOR	rural	
	3	KULAKKADA	Semi rural	
	4	PATTAZHI VADEKU	rural	
	5	PATTAZHI THEKKU	rural	
	6	THALAVOOR	rural	
	7	MYLAM	Semi rural	
	8	NELLILA	rural	
	9	NEDUVATHOOR	rural	
	10	PAVITHRESWARAM	Semi rural	
	11	VETTIKAVALA	rural	
	12	KUNDARA	Semi urban	
	13	KAREEPRA	Semi rural	
	14	VELIYAM	rural	
	15	UMMANOOR	rural	
	16	EZHUKONE	Semi urban	
ANCHAL	1	ANCHAL	rural	Rural
	2	YEROOR	rural	
	3	EDAMULAKAL	rural	
	4	ITTIVA	rural	
	5	ALAYAMON	rural	
	6	KADAKKAL	rural	
	7	NILAMEL	rural	
	8	CHADAYAMANGALAM	rural	
	9	CHITHARA	rural	
	10	KULATHUPUZZHA	rural	
	11	ELAMADU	rural	
CHATHANOOR	1	CHATHANOOR	Semi urban	Semi urban
	2	PARAVOOR	Semi urban	
	3	POOTHAKULAM	Semi urban	
	4	MAYYANAD	Semi urban	
	5	KALLUVATHUKKAL	Semi urban	
	6	VELLINALLOOR	Semi rural	
	7	ADICHANALLOOR	Semi urban	
	8	NEDUMPANA	Semi urban	
	9	POOYAPALLY	rural	
PUNALOOR	1	PUNALOOR	rural	Rural
	2	ARYANKAVU	rural	
	3	PIRAVANTHOOR	rural	
	4	THENMALA	rural	
	5	KARAVALOOR	rural	
	6	VILAKUDI	Semi rural	
KOLLAM	7	PATHANAPURAM	rural	Urban
	1	MUNDROETHURATH	Semi urban	
	2	PERAYAM	Semi urban	
	3	THEKKUMBHAGUM	Semi urban	
	4	NEENDAKARA	urban	
	5	THRIKKARUVA	urban	
	6	PANAYAM	semi urban	
	7	PERINAD	semi urban	
	8	ELAMPALOOR	semi urban	
	9	KOTTAMKARA	urban	
	10	THRIKKADAVOOR	urban	
	11	KOLLAM CORPORATION	urban	
	12	THRIKKOVILVATTOM	semi urban	

Annexure 11 B				
Service settlements of 3 rd order settlements				
Third Order settlements	Number	Character of Service settlements	Character	
KARUNAGAPALLY	1	KARUNAGAPALLY	Semi Urban	Semi Urban
	2	OACHIRA	Semi Urban	
	3	CLAPPANA	Semi Urban	
	4	KULASEKHARAPURAM	Semi Urban	
	5	ALAPPAD	Semi Urban	
	6	THODIYOOR	Semi Urban	
	7	THAZHA	Semi Urban	
	8	PANMANA	Semi Urban	
THEVALAKKARA	1	THEVALAEKKARA	Semi Urban	Semi Urban
	2	MYNAGAPPALLY	Semi Urban	
	3	WEST KALLADA	Semi Urban	
	4	CHAVARA	Semi Urban	
	5	MUNDROETHURATH	Semi Urban	
	6	THEKKUMBHAGUM	Semi Urban	
	7	NEENDAKARA	Urban	
KOLLAM CORPORATION	1	THRIKKADAVOOR	Urban	Urban
	2	KOLLAM CORPORATION	Urban	
	3	THRIKKARUVA	Urban	
	4	THRIKKOVLVATTOM	Semi Urban	
	5	MAYYANAD	Semi Urban	
	6	PANAYAM	Semi Urban	
CHATHANNOOR	1	CHATHANNOOR	Semi Urban	Semi Urban
	2	POOTHAKULAM	Semi Urban	
	3	KALLUVATHIUKKAL	Semi Urban	
	4	ADICHANALLOOR	Semi Urban	
	5	PARAVOOR MUNIC	Semi Urban	
KADAKKAL	1	KADAKKAL	Semi Rural	Rural
	2	NILAMEL	Rural	
	3	CHITHARA	Rural	
ANCHAL	1	ANCHAL	Rural	Rural
	2	YEROOR	Rural	
	3	EDAMULAKAL	Rural	
	4	ITTIVA	Rural	
	5	KULATHUPUZZHA	Rural	
	6	ALAYAMON	Rural	
VELINALLOOR	1	VELIYAM	Rural	Rural
	2	UMMANOOR	Rural	
	3	CHADAYAMANGALAM	Rural	
	4	ELAMADU	Rural	
	5	POOYAPALLY	Semi Rural	
	6	VELLINALLOOR	Rural	
PUNALLOOR MUNI	1	PUNALLOOR	Rural	Rural
	2	ARYANKAVU	Rural	
	3	PIRAVANTHOOR	Rural	
	4	THENMALA	Rural	
VETTIKAVALA	1	VETTIKAVALA	Rural	Rural
	2	KARAVALLOOR	Rural	
	3	VILAKUDI	Semi Rural	
PATHANAPURAM	1	PATTAZHI VADEKU	Rural	Rural
	2	PATHANAPURAM	Rural	
	3	PATTAZHI THEKKU	Rural	
KOTTARAKKARA	1	KOTTARAKKARA	Urban	Semi Rural
	2	THALAVOOR	Rural	
	3	MYLAM	Semi Rural	
	4	MELLILA	Rural	
	5	NEDUVATHOOR	Rural	
	6	KULAKKADA	Semi Rural	
SASTHAMKOTTAH	1	KUNNATHOOR	Rural	Semi Urban
	2	SOORANAD NORTH	Semi Urban	
	3	SOORANAD SOUTH	Semi Urban	
	4	PORUVAZHI	Semi Rural	
	5	SASTHAMCOTTA	Semi Urban	
	6	EAST KALLADA	Semi Urban	
	7	PAVITHRESWARAM	Semi Rural	
KUNDARA	1	KUNDARA	Semi Urban	Semi Urban
	2	KAREEPRA	Semi Rural	
	3	PERAYAM	Semi Rural	
	4	PERINAD	Semi Urban	
	5	ELAMPALLOOR	Semi Urban	
	6	NEDUMPANA	Semi Urban	
	7	KOTTAMKARA	Urban	
	8	EZHUKONE	Semi Urban	

Annexure 12						
Second order settlements, its service area & service population						
Second Order settlements	Number	Service settlements	Population		Total service Population	
			2001	2021	2001	2021
Karunagappally	1	Karunagappally	46716	49585	567206	608187
	2	Clappana	21169	22723		
	3	Kulasekharapuram	44000	47195		
	4	Thazhava	38488	41313		
	5	Alappad	24931	26761		
	6	West Kallada	18033	19357		
	7	East Kallada	21632	23220		
	8	Sooranad South	23737	25480		
	9	Oachira	26932	27847		
	10	Poruvazhi	27612	29639		
	11	Panmana	48552	50677		
	12	Thodiyoor	43937	47162		
	13	Chavara	41497	45795		
	14	Thevalaekkara	40363	44513		
	15	Sasthamkotta	32391	34769		
	16	Sooranad North	27880	29927		
	17	Mynagapally	39336	42224		
Kottarakkara	1	Kottarakkara	29765	29107	434608	459587
	2	Kunnathoor	25026	26863		
	3	Kulakkada	32180	34542		
	4	Pattazhi Vadakkekkara	14775	15860		
	5	Pattazhi Thekkekkara	17342	18615		
	6	Thalavoor	31910	34253		
	7	Mylam	33352	35800		
	8	Mellila	22243	23876		
	9	Neduvathoor	28721	30829		
	10	Pavithreswaram	27065	29052		
	11	Vettikavala	36510	39190		
	12	Kundara	17654	14867		
	13	Kareepra	28888	31009		
	14	Veliyam	31789	34123		
	15	Ummanoor	33647	36117		
	16	Ezhukone	23741	25484		
Anchal	1	Anchal	31543	33859	351793	377617
	2	Yeroor	32413	34792		
	3	Edamulakal	38881	41735		
	4	Ittiva	35736	38359		
	5	Alayamon	19589	21027		
	6	Kadakkal	50214	53900		
	7	Nilamel	14808	15895		
	8	Chadayamangalam	22213	23844		
	9	Chithara	45640	48990		
	10	Kulathupuzha	34374	36897		
	11	Elamadu	26382	28319		

Chathanoor	1	Chathanoor	51679	57866	350233	380432
	2	Paravoor	38652	41631		
	3	Poothakulam	28417	30503		
	4	Mayyanad	47148	52286		
	5	Kalluvathukkal	47940	51459		
	6	Vellinalloor	32079	34434		
	7	Adichanalloor	32906	35599		
	8	Nedumpana	47488	50974		
	9	Pooyapally	23924	25680		
Punalur	1	Punaloor	47235	50875	209115	224638
	2	Aryankavu	14238	15283		
	3	Piravanthoor	35683	38302		
	4	Thenmala	24806	26627		
	5	Karavaloar	23709	25449		
	6	Vilakudi	32677	35076		
	7	Pathanapuram	30767	33026		
Kollam	1	Mundroethurath	10013	10748	670358	733965
	2	Perayam	19118	20521		
	3	Thekkumbhagum	16925	18167		
	4	Neendakara	17060	18465		
	5	Thrikkaruva	24823	26645		
	6	Panayam	24752	26569		
	7	Perinad	32509	34895		
	8	Elampaloor	36749	39447		
	9	Kottamkara	35513	42239		
	10	Thrikkadavoor	38141	42847		
	11	Kollam Corporation	361560	389422		
	12	Thrikkovilvattom	53195	64000		

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Annexure 13						
Service settlements of 3 rd order settlements						
Third Order settlements	Number	Service Settlements	Population		Total Service Population	
			2001	2021	2001	2021
Karunagapally	1	Karunagapally	46716	49585	294725	313264
	2	Oachira	26932	27847		
	3	Clappana	21169	22723		
	4	Kulasekharapuram	44000	47195		
	5	Alappad	24931	26761		
	6	Thodiyoor	43937	47162		
	7	Thazhava	38488	41313		
	8	Panmana	48552	50677		
Thevalakkara	1	Thevalaekkara	40363	44513	183227	199269
	2	Mynagappally	39336	42224		
	3	West Kallada	18033	19357		
	4	Chavara	41497	45795		
	5	Mundroethurath	10013	10748		
	6	Thekkumbhagum	16925	18167		
	7	Neendakara	17060	18465		
Kollam Corporation	1	Thrikkadavoor	38141	42847	549619	601769
	2	Kollam Corporation	361560	389422		
	3	Thrikkaruva	24823	26645		
	4	Thrikkovilvattom	53195	64000		
	5	Mayyanad	47148	52286		
	6	Panayam	24752	26569		
Chathanoor	1	Chathanoor	51679	57866	199594	217058
	2	Poothakulam	28417	30503		
	3	Kalluvathukkal	47940	51459		
	4	Adichanalloor	32906	35599		
	5	Paravoor Munic	38652	41631		
Kadakkal	1	Kadakkal	50214	53900	110662	118785
	2	Nilamel	14808	15895		
	3	Chithara	45640	48990		
Anchal	1	Anchal	31543	33859	192536	206670
	2	Yeroor	32413	34792		
	3	Edamulakal	38881	41735		
	4	Ittiva	35736	38359		
	5	Kulathupuzha	34374	36897		
	6	Alayamon	19589	21027		
Velinalloor	1	Veliyam	31789	34123	170034	182516
	2	Ummanoor	33647	36117		
	3	Chadayamangalam	22213	23844		
	4	Elamadu	26382	28319		
	5	Pooyapally	23924	25680		
	6	Vellinalloor	32079	34434		
Punaloor Muni	1	Punaloor	47235	50875	121962	131087
	2	Aryankavu	14238	15283		
	3	Piravanthoor	35683	38302		
	4	Thenmala	24806	26627		
Vettikavala	1	Vettikavala	36510	39190	92896	99715
	2	Karavaloor	23709	25449		
	3	Vilakudi	32677	35076		
Pathanapuram	1	Pattazhi Vadeku	14775	15860	62884	67500
	2	Pathanapuram	30767	33026		
	3	Pattazhi Thekku	17342	18615		
Kottarakkara	1	Kottarakkara	29765	29107	178171	188407

	2	Thalavoor	31910	34253		
	3	Mylam	33352	35800		
	4	Mellila	22243	23876		
	5	Neduvathoor	28721	30829		
	6	Kulakkada	32180	34542		
Sasthamkottah	1	Kunnathoor	25026	26863	185343	198950
	2	Sooranad North	27880	29927		
	3	Sooranad South	23737	25480		
	4	Poruvazhi	27612	29639		
	5	Sasthamcotta	32391	34769		
	6	Pavithreswaram	27065	29052		
	7	East Kallada	21632	23220		
Kundara	1	Kundara	17654	14867	241660	259435
	2	Kareepra	28888	31009		
	3	Perayam	19118	20521		
	4	Perinad	32509	34895		
	5	Elampaloor	36749	39447		
	6	Nedumpana	47488	50974		
	7	Kottamkara	35513	42239		
	8	Ezhukone	23741	25484		

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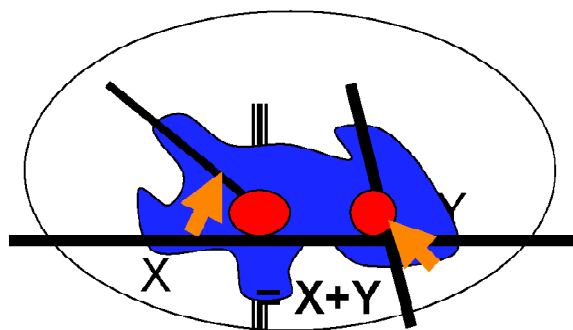
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Annexure-14 Hierarchy of Nodes - Methodology

In the Kerala context where urban rural continuum persists, each local body is having at least one node. The agglomeration of activity area around one or more (adjacent) road junctions which act as commercial centre of a local body is termed here as a node. The node need not be confined fully within a local body area and in most of the cases its service area goes beyond the boundary of the local body within which it locates. In certain cases the nodes may be located at the meeting point of the boundary of one or two local bodies. This means that the nodes have an entity independent of the local body area which necessitates a separate study other than the settlement study. The hierarchies of the nodes are determined by the extent of activity taking place there. The number and type of shops, the number of people using the node, the business turn over and the extent of traffic, all determine the extent of activity and hence the hierarchy of nodes. But extensive survey and study are required to assess all these factors of the node. In this chapter the hierarchy of nodes and urban rural growth centers of the District are identified. However the extent of activity in a node can be determined by a proxy indicator denoted by the hierarchy of roads meeting at that place. The concept behind it and the methodology is explained here under.

The concept

1. The hierarchy of the activity nodes is the sum of the hierarchy value of all the junctions containing the node.
2. The hierarchy of a junction is directly proportional to the hierarchy and the number of the roads meeting at the junction



Methodology

Step-1 :

Categorize the roads meeting at a junctions

- A-NH & SH
- B-Major District roads
- C-Major Bus routes, Jilla Panchayat roads, Local primary/Block Panchayat roads
- D-Sub major Bus route, Local secondary roads/ Grama Panchayat roads
- L-Lower category roads, Minor bus route

Step-2:

Assign values to the meeting of various roads according to the following matrix

This can be termed as junction values

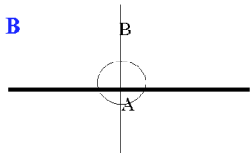
	A	B	C	D	L
A	9	8	7	6	2
B	8	7	6	5	2
C	7	6	5	4	2
D	6	5	4	3	2
L	2	2	2	2	1

Step-3:

Find the sum of all the junction values (within the node taken) to get the total weightage of the node.

EXAMPLE-1

A meets B



Here Junction value is of A meets B
ie. (11) \therefore TWJ = 8.

	A	B	C	D	L
A	9	8	7	6	2
B	8	7	6	5	2
C	7	6	5	4	2
D	6	5	4	3	2
L	2	2	2	2	1

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EXAMPLE-2

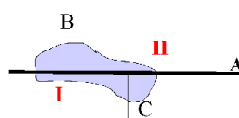
A meets B



Weightage = $\frac{3}{4}$ of the weightage of the A meets B
 $= \frac{3}{4} * 8 = 6$

EXAMPLE-3

The physical development is so contiguous
that it contain two junctions



Calculate the weightage
of jns in the in the order
of its hierarchy ie
Calculate the weightage
of highest order first

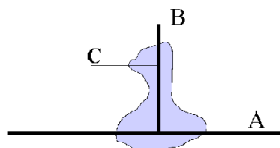
Weightage of I = $\frac{3}{4}$ of the weightage of the A meets B

$\frac{3}{4}$ of 8 = 6

Weightage of II = $\frac{1}{4}$ of the weightage of the A meets c.

$\frac{1}{4}$ of 7 = 1.25

Total weightage = $6 + 1.25 = 7.25$

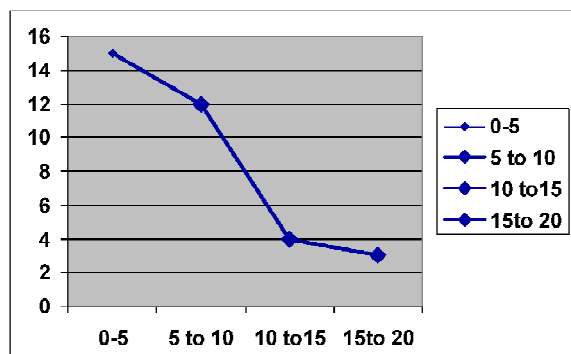
EXAMPLE-4

The road B makes two
jns one with A and the
other with C, but the
development due to B is
taken only once

$\frac{3}{4}$ of A meets B + $\frac{1}{4}$ of B meets C

Step4

A graph is plotted with the weightage of nodes in the range 0-5, 5-10, 10-15, 15-20 etc along X axis and the number of nodes in each range along Y axis. The break points in the graph determines the order of the nodes.



Annexure 15																								
Number of workers in nine fold category - Estimated from 1991 - 2001																								
Name of Panchayat	Total main workers calculated		Main Cultivators		Main Agricultural Labourers		Livestock, Forestry, Fishing, Hunting, Plantation, Orchards, and allied activities		Mining and Quarrying		Manufacturing, Processing Servicing and repairs in Household industries		Manufacturing, Processing, servicing and repairs in other than household industries		Trade and commerce		Transport, storage and Communications		others		Total Non Agr male workers		% of Non agr male workers	
	Male		Male		Male		Male		Male		Male		Male		Male		Male		Male		Male			
-																								
Adicheralloor Panchayat	4733	200	486	140 52	75 76	61 10	961 65	828 46	527 87	1451 64	3630 72	0.806	0.539											
Alappad Panchayat	5029	35	3	4792 80	6 86	16 67	203 95	154 14	69 62	706 96	1131 34	0.198	0.197											
Alayamon Panchayat	3671	594	1251	331 27	12 12	9 09	255 52	353 48	180 78	683 74	1452 52	0.404	0.333											
Archal Panchayat	5226	708	1389	369 05	19 80	74 94	764 79	1138 30	530 27	1211 83	3740 14	0.601	0.4 1											
Ariencavu Panchayat	2956	379	347	1280 59	5 56	29 67	107 57	226 26	180 82	401 52	945 34	0.320	0.262											
Chidayanargalam Panchayat	3915	459	805	266 33	32 83	55 46	331 66	698 41	203 75	1042 52	2331 79	0.596	0.450											
Chethamur Panchayat	10463	513	1796	237 07	142 24	212 49	2019 49	1624 38	1250 33	2671 00	7777 59	0.743	0.473											
Chavara Panchayat	7765	123	1 17	1927 99	14 28	25 83	1742 33	1453 06	590 73	1496 25	5552 73	0.719	0.579											
Chithara Panchayat	7821	829	18 19	865 43	20 72	226 66	628 17	1345 71	581 54	1503 72	2255 79	0.548	0.3 9											
Clappana Panchayat	4225	47	95	814 31	22 94	77 14	579 63	739 12	295 65	1553 43	3245 76	0.768	0.566											
Edamulakkal Panchayat	7435	1332	1856	397 94	92 13	60 14	673 04	981 42	369 79	1636 54	3720 93	0.500	0.336											
Elanadu Panchayat	5129	1059	12 17	434 92	39 81	119 42	409 86	561 72	227 05	1020 23	2338 27	0.456	0.302											
Eroor Panchayat	5579	528	2101	1265 65	13 15	57 00	301 07	638 68	287 92	986 52	2271 18	0.345	0.196											
Ezhukore Panchayat	3804	331	606	129 20	102 07	25 84	565 91	555 57	399 24	1089 18	2635 73	0.693	0.452											
Ittira Panchayat	7044	1415	1889	668 01	18 24	96 24	689 06	872 90	249 80	1143 75	3053 75	0.434	0.287											
Kacakkal Panchayat	3936	1255	1771	499 27	88 73	66 17	914 32	1457 80	794 02	2049 70	5322 01	0.596	0.331											
Kalluvethukkal Panchayat	3933	802	2253	197 23	286 06	110 15	1129 45	1397 57	808 97	1964 62	5430 55	0.604	0.351											
Karavallor Panchayat	4576	583	1122	395 33	22 40	83 02	350 52	654 93	269 91	1023 90	2432 27	0.531	0.347											
Kareepra Panchayat	4578	505	588	193 75	76 70	37 68	613 58	765 97	395 59	1400 73	3214 54	0.702	0.456											
Karunagapally Panchayat	10533	150	402	1607 04	22 57	273 31	1734 02	2606 32	965 48	2536 25	5317 39	0.786	0.647											
Kizhakkakal Panchayat	3694	214	454	807 25	114 99	51 63	471 68	427 09	268 69	884 69	2133 77	0.570	0.4 7											
KOLLAM CORPORATION	73627	119	787	13372 56	144 63	1286 41	33 49	277 6 39	13650 58	21316 95	64203 82	0.817	0.722											
Kottamkara Panchayat	12764	255	13 13	328 51	155 98	148 40	3289 10	2463 80	1469 81	3310 30	10671 42	0.836	0.582											
Kottarakara Panchayat	4025	159	288	180 23	20 13	21 96	388 81	1249 69	504 09	1213 10	3377 55	0.836	0.624											
Kulakkada Panchayat	3917	1370	856	245 53	183 85	118 39	639 31	672 74	346 81	1483 36	3250 52	0.551	0.321											
Kulasekharapuram Panchayat	7783	157	330	1007 55	21 87	118 94	1190 75	2224 29	704 06	2031 53	6259 57	0.805	0.580											
Kulathupuzha Panchayat	5790	605	1772	1138 63	2 69	122 34	240 54	691 00	269 04	927 61	2270 53	0.392	0.208											
Kundara Panchayat	2988	175	409	107 14	18 37	15 31	644 88	309 17	227 54	1081 60	2278 49	0.763	0.605											
Kumalthur Panchayat	5489	1189	1111	202 95	326 49	171 19	510 03	655 51	241 78	1080 06	2659 56	0.488	0.283											
Mayanad Panchayat	3882	81	386	1065 29	39 46	168 87	1456 69	2073 76	1137 89	2473 05	7310 26	0.823	0.6 8											
Meella Panchayat	4345	642	779	222 43	20 22	62 01	506 88	671 35	292 53	1148 57	2631 34	0.617	0.4 4											
Mundoruuthu Panchayat	2202	59	184	265 67	201 28	134 62	378 21	512 82	132 05	533 34	1451 05	0.677	0.477											
Myllam Panchayat	5574	1212	1668	185 25	87 92	69 08	681 34	912 12	502 37	1255 93	3420 84	0.522	0.321											
Mynagappally Panchayat	7451	451	935	365 41	228 57	254 74	1189 57	1455 18	662 23	1687 90	5470 02	0.734	0.472											
Nedumpana Panchayat	3129	533	1603	183 04	67 79	130 50	1620 28	1236 55	591 50	2164 33	5742 16	0.706	0.396											
Neduvathur Panchayat	4323	623	663	110 53	184 72	43 98	581 80	725 30	400 85	956 77	2711 70	0.627	0.373											
Neendakara Panchayat	3977	6	60	1912 85	22 55	42 15	431 40	384 33	321 59	796 12	1975 50	0.497	0.497											

Annexure 15													
Number of workers in nine fold category -Estimated from 1991 - 2001													
Name of Panchayat	Total main workers calculated	Main Cultivators	Main Agricultural Labourers	Livestock, Forestry, Fishing, Hunting, Plantation, Orchards, and allied activities	Mining and Quarring	Manufacturing, Processing Servicing and repairs in Household industries	Manufacturing, Processing, servicing and repairs in other than household industries	Trade and commerce	Transport, storage and Communications	others	Total Non Agr male workers	% of Non agr male workers	
Year-2001	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male		2001	1991
Nilamel Panchayat	2'50	332	514	84.95	2.83	24.07	138.75	308.63	168.49	576.25	1216.22	0.566	0.263
Oachira Panchayat	5'31	243	491	367.73	3.16	88.38	702.32	1493.02	476.63	1265.76	4026.11	0.785	0.508
Pannana Panchayat	8959	167	372	1016.09	20.91	119.87	2225.9'	1980.60	793.08	2263.55	7333.01	0.324	0.583
Paravur Municipality	5931	70	332	1603.13	35.73	50.71	1029.18	1200.90	591.23	1018.12	3890.15	0.656	0.483
Pathanapuram Panchayat	6218	534	1497	662.77	2.88	93.65	505.73	1443.69	393.34	1084.93	352' .34	0.566	0.355
Pattazhi Panchayat	3452	851	676	220.13	19.74	53.13	286.93	423.55	139.67	781.84	1685.13	0.488	0.290
Pattazhi Vadakkekara Panchayat	3'58	753	792	303.70	23.14	43.39	174.99	396.25	114.25	597.28	1326.16	0.415	0.263
Pavithreswaram Panchayat	4768	763	594	198.15	170.04	43.56	727.95	657.63	319.00	1274.61	3022.81	0.534	0.353
Perayam Panchayat	3772	157	132	1369.91	145.12	38.81	503.44	415.54	171.24	837.93	1956.95	0.521	0.431
Perinad Panchayat	10606	205	744	1261.03	63.16	336.37	2692.46	1781.14	1059.50	2458.33	8327.81	0.785	0.566
Piravanthur Panchayat	6901	1305	1806	864.57	23.73	116.23	595.45	689.57	346.09	1'45.36	2896.70	0.420	0.258
Poothakkulam Panchayat	5085	268	652	247.85	60.19	122.15	754.17	778.95	454.98	1736.71	3846.95	0.757	0.366
Pooypally Panchayat	4615	825	901	156.90	102.20	95.00	545.56	598.82	303.73	1086.79	2629.90	0.570	0.366
Poruvazhy Panchayat	5092	704	1117	150.53	65.23	286.01	596.10	1112.41	174.61	885.11	3054.24	0.600	0.361
Punalur Municipality	8857	425	1047	766.29	19.69	107.05	1282.18	2452.33	1113.60	1563.82	6619.02	0.744	0.497
Sasthermoolah Panchayat	6'48	627	948	396.82	33.07	54.18	666.26	1347.15	348.50	1722.01	4138.10	0.573	0.465
Socranad North Panchayat	5207	890	979	194.59	83.01	148.33	477.63	1216.54	210.92	1006.98	3050.40	0.588	0.363
Socranad South Panchayat	3920	532	605	147.50	61.71	73.75	680.32	723.97	182.12	913.52	2573.79	0.657	0.392
Thalavoor Panchayat	6631	1491	1832	483.79	39.90	68.58	610.98	624.69	295.51	1'84.55	2734.31	0.420	0.297
Thazhava Panchayat	7862	739	1113	324.86	25.82	138.59	1530.44	1490.21	439.61	2059.46	5658.31	0.720	0.469
Thekkumbhagam Panchayat	3576	70	55	1263.63	9.71	146.88	634.85	443.05	155.03	787.79	2177.65	0.505	0.501
Thennala Panchayat	4854	461	841	1341.51	20.50	71.78	322.20	566.77	480.37	768.88	2209.98	0.452	0.244
Thevalakkara Panchayat	7374	93	471	1551.50	11.84	231.61	1204.09	1554.13	386.89	1869.95	5246.65	0.712	0.523
Thodiyoor Panchayat	8766	299	834	356.67	10.69	133.58	1761.98	2182.77	833.57	2353.75	7255.64	0.825	0.601
Thrikkadavur Panchayat	7737	71	232	1733.99	17.13	249.03	1549.52	1394.04	845.91	1544.39	5682.89	0.735	0.609
Thrikkarava Panchayat	4718	55	140	774.88	11.58	267.56	924.29	787.62	422.76	1334.31	3736.54	0.792	0.593
Thrikkovilvetom Panchayat	9047	219	1176	263.45	47.36	158.73	1870.32	1952.22	939.85	2409.57	734' .18	0.311	0.574
Ummannur Panchayat	6'74	1532	1598	211.69	42.87	42.87	550.65	699.37	271.98	1224.57	2789.44	0.452	0.301
Vellinallur Panchayat	5'51	1000	1437	244.73	43.65	29.49	487.99	731.25	258.00	953.87	2450.61	0.474	0.311
Velliyam Panchayat	6980	1522	1530	203.86	320.57	93.37	888.35	823.22	406.16	1'62.47	3353.57	0.480	0.318
Vettikkavala Panchayat	7247	1255	1935	350.93	32.30	82.23	626.98	1061.63	372.96	1530.00	3673.77	0.507	0.344
Vilakudy Panchayat	5909	465	1370	300.27	47.41	104.88	752.82	1169.45	645.07	1053.09	3725.32	0.590	0.413
West Kallada Panchayat	3555	297	622	267.08	95.16	107.48	404.45	526.07	258.79	955.97	2252.76	0.534	0.402

Appendix 13-1

Details of Watersheds in Kollam

Sl no:	Name of the Watershed	Extent in the district	Panchayats included	Drainage	Slope	Shape	Geology	Soils	Land use
1	Ithikkara	60960 ha	Portions of Paravur, Kalluvathukkal, Chathanoor, Adichannalloor, Nedumpana, Thrikkovilvattom, Kottankara, Elampalloor, Kundara, Ezhukone, Neduvathur, Kottarakkara, Veliyam, Ummannoor, Edamulakkal, Alayamon, Chithara, Kadakkal, Velinalloor, Elamadu, Nilamel, Ittiva, Veliyam, Pooyappally, Chadayamangalam, Kareepra, Yeroor, Anchal.	Ithikkara River (56km)	3-5% to 10-15%	Triangular	Archean formation	Gravelly clay	Agriculture land, Forest land and Waterbodies
2	Kallada	142695 ha	Portions of Neendakara, Thekkumbhagam, Chavara, Thrikkadavur, Thrikkaruva, Panayam, Perinadu, East Kallada, Perayam, Munrothuruth, West Kallada, Kunnathur, Poruvazhy, Sasthamcotta, Pavithreswaram, Ezhukone, Neduvathur, Kottarakkara, Kulakkada, Mylom, Pattazhy, Punaloor, Pathanapuram, Yeroor, Anchal, Karavalloor, Vettikkavala, Piravanthoor, Thenmala, Aryankavu, Kulathupuzha.	Kallada River (121km)	0-1% to 15-30%	Rectangular	Archean formation	Loamy clay to Gravelly clay	Agriculture land, Forest land and Waterbodies
3	Pallickal thodu	21618 ha	Portions of Oachira, Kulasekarapuram, Thazhava, Alappad, karunagappally, Thodiyur, Mynagappally, Thevaikkara, panmana, Sasthamcotta, Socranad, North, Sooranad, South, Poruvazhy.	Pallickal thodu (42km)	0-1% to 3-5%	Triangular	Archean formation	Sandy, clayey and Gravelly clay	Agriculture land and Waterbodies
4	Achenkoil	17752 ha	Portions of Aryankavu, Piravanthoor, Clappena, Oachira.	Achenkoil (128km)	0-1% to 15-30%	Rectangular	Archean formation	Sandy, Loamy, Clayey and Gravelly clay	Agriculture land, Forest land and Waterbodies
5	Ayirur	2868 ha	Portions of Paravoor, Poothakkulam, & Kalluvathukkal.	Nadayara, Kilimukku & Paravoor lake.	0-1% to 3-5%	Triangular	Archean formation	Gravelly clay	Agriculture land and Waterbodies
6	Vamanapuram	5942 ha	Portions of Chithara & Kadakkal.	Vamanapuram river	3-5% to 10-15%	Elliptical	Archean formation	Gravelly clay	Agriculture land, Forest land, Waste land and Waterbodies

Appendix 13-2
Details of On Going and Committed Projects and Programmes

SI No.	Name of project	Estimated cost	Target no of beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project
1	Kurakkodu -watershed- (Chithara)	7500000	1790	Final stage of completion	2007	State	NABARD Assistance	Area development project
2	Velamancor WS-(Kalluvathukkal)	8953000	1540	30 % completed	2007	State	NABARD Assistance	Area development project
3	Mavila WS-(Anchal)	4665000	515	35 % completed	2007	State	NABARD Assistance	Area development project
4	MAP for Ashtamudi Wetland-(Perayam)	2357100	750	25 % Completed	2007	national	Centrally sponsored	Area development project
5	Anayam chirayil (Neduvathoor)	500000	65	Just initiated	2007	District	State fund	SCP Project
6	Puthoor mukku (Kulakkada)	500000	200	50 % Completed	2007	District	State fund	SCPProject
7	Kannankode kuzhiyanthadam(Alayamon)	500000	200	Just initiated	2007	District	State funded	SCP Project
8	Thachoor Vazhappana(Chithara)	500000	47	Just initiated	2007	District	State funded	SCP Project
9	Nedukkunnu Colony(Kareepra)	500000	100	Final stage of Completion	2007	District	State funded	SCP Project
10	Kallikkace Colony(Chacayamangalam.am)	500000	84	25 % Completed	2007	District	State funded	SCP Project
11	Parayankuzhi Harijan Colony(Nedumpana)	500000	32	25 % Completed	2007	District	State funded	SCP Project
12	Chayikkalazhikam Colony(Nedumpana)	500000	50	25 % Completed	2007	District	State funded	SCP Project
13	Blavazhikam Colony (Nedumpana)	500000	55	Completed	-	District	State funded	SCP Project
14	Padinjattavila Malakaya(Chathanoor)	500000	59	Just initiated	2007	District	State funded	SCP Project
15	Cherikkonam Colony(Elampallor)	500000	120	Just initiated	2007	District	State funded	SCP Project
16	Thadikkadu Kanikkonam(Edamulackal)	500000	35	25 % Completed	2007	District	State funded	SCP Project
17	Odumukal(Ezhukone)	500000	93	25 % Completed	2007	District	State funded	SCP Project
18	Kokkade Pallimala(Vettikavala)	500000	26	Just initiated	2007	District	State funded	SCP Project
19	Punavoor (Nedumpana)	500000	150	Abandoned	-	District	State funded	SCP Project
20	Perumpuzha WS-Nedumpana & Elampallur	13890000	13500	25 % Completed	2007	National	Centrally sponsored	Area development project
21	Attuvasseri WS- Kulakkada, Mylom,Neduvathur,Pavithreswaram,Thalavur,Melila	5696000	1200	35 % Completed	2007	State	NABARD Assistance	Area development project
22	Mylom WS-Kulakkada,Mylom,Neduvathur, Thalavur,Kottarakkara,Vettikkavala	16440000	8800	30 % Completed	2007	National	Centrally sponsored	Area development project
23	PCRWSS,Sasthamcotta-Sasthamkotta,Mynagapally	19000000	2150	60 % Completed	Will be continuing	State	State funded	Area development project

The list of committed projects of Soil Conservation department is given below.

Sl No.	Name of project	Estimated cost	Target no of beneficiaries	Level of project	Type of project	Category of project
1	Anthamon(Mylom)	2500000	810	District	State funded	Area development
2	Karavoor verukuzhi (Pathanapuram)	2500000	300	District	State funded	Area development
3	Anakkalungu(Thenmala)	2000000	200	District	State funded	Area development
4	Erappil Kondodi(Chithara)	2000000	280	District	State funded	Area development
5	Paruthiyara WS(Veliyam)	14500000	343	District	State funded	Area development
6	Kuriyottumala (Piravanthoor)	1305440	114	District	State funded	Target group (ST) project
7	Kaduvungal Venkulam(Poruvazhi)	200000	750	District	State funded	Area development
8	Maroor WS (Veliyam)	2500000	750	District	State funded	Area development
9	Channattumukku Mullakkara WS(Kummil)	2100000	610	District	State funded	Area development
10	Mampallikkunnu WS (Chathannoor)	4091000	520	District	State funded	Area development
11	Peroor yela (Kottankara)	690000	600	District	State funded	Area development
12	Eelode Kadakkode WS (Kareepra)	2500000	570	District	State funded	Area development
13	Muttathu chakkupara (Vilakudy)	2500000	630	District	State funded	Area development
14	Thevannoor WS (Elamadu)	7170000	805	State	NABARD	Area development
15	Asuramangalam (Edamulakkal)	10000000	2600	State	NABARD	Area development
16	Punnala Chempramon (Piravanthoor)	5700000	1520	State	NABARD Assistance	Area development
17	Kokkade Thengara (Melila)	8900000	3700	State	NABARD	Area development
18	Vadakode WS(Ummannoor)	7275000	1565	State	NABARD	Area development
19	Mannayyam (Kalluvathukkal)	5758700	1300	State	NABARD	Area development
20	Kottampali (Oachira)	5887000	980	State	NABARD	Area development
21	Vilakudy (Vilakudy)	5800000	550	State	NABARD	Area development
22	Kodannoor WS (Alayamon)	7951000	1500	State	NABARD	Area development
23	Edavattom Karuvelil (Pavithreswaram)	6700000	1368	State	NABARD Assistance	Area development
24	Maruthamon Pally (Pooyappally)	7985000	1170	State	NABARD	Area development
25	Ashtamudi Wetland (Phase III)(Perayam)	200000	500	National	Centrally sponsored	Area development project
26	Thannichal (Pathanapuram)	6035000	1850	State	NABARD	Area development project

Appendix 14-1

Estimates of Milk Production – State wise										
(tonnes)										
State	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
All India	72128	75424	78206	80607	84406	86159	88082	92434	97066	100869
Andhra Pradesh	4473	4842	5122	5521	5814	6584	6959	7257	7624	7939
Arunachal Pradesh	43	45	46	42	42	45	46	48	48	49
Assam	719	725	667	683	682	705	727	739	747	751
Bihar	3420	3440	3454	2489	2664	2859	3180	4743	5060	5450
Chhattisgarh	-	-	-	777	795	804	812	831	839	849
Goa	38	41	44	45	45	45	48	57	56	57
Gujarat	4913	5059	5269	5312	5862	6089	6421	6745	6960	7533
Haryana	4373	4527	4679	4850	4978	5124	5221	5222	5299	5367
Himachal Pradesh	714	724	742	761	756	773	786	870	869	872
J & K	1167	1232	1286	1321	1360	1389	1414	1422	1400	1400
Jharkhand	-	-	-	910	940	952	954	1330	1335	1401
Karnataka	3970	4231	4471	4599	4797	4539	3857	3917	4022	4124
Kerala	2343	2420	2532	2605	2718	2419	2111	2025	2063	2119
Madhya Pradesh	5377	5442	5519	4761	5283	5343	5388	5506	6283	6375
Maharashtra	5193	5609	5707	5849	6094	6238	6379	6567	6769	6978
Manipur	62	65	68	66	68	69	71	75	77	77
Meghalaya	59	61	62	64	66	68	69	71	73	75
Mizoram	17	20	18	14	14	15	15	16	15	16
Nagaland	46	48	48	51	57	58	63	69	74	67
Orissa	672	733	850	876	929	941	997	1283	1342	1431
Punjab	7165	7394	7706	7777	7932	8173	8391	8554	8909	9168
Rajasthan	6487	6923	7280	7455	7758	7789	8054	8310	8713	9375
Sikkim	35	35	35	35	37	45	48	46	48	49
Tamil Nadu	4061	4273	4506	4910	4980	4622	4752	4784	5474	5560
Tripura	57	76	77	77	90	79	84	86	87	89
Uttar Pradesh	12934	13618	14152	13857	14648	15288	15943	16512	17356	18095
Uttarakhand	-	-	-	1025	1066	1079	1188	1195	1206	1213
West Bengal	3415	3441	3465	3471	3515	3600	3686	3790	3891	3982
A&N Islands	22	22	23	22	23	26	25	24	20	23
Chandigarh	43	43	42	43	43	43	44	43	46	46
D&N Haveli	4	8	8	8	8	8	8	4	5	5
Daman & Diu	1	1	1	1	1	1	1	1	1	1
Delhi	267	290	290	291	294	296	299	303	310	289
Lakshadweep	1	2	1	2	2	2	1	1	2	2
Puducherry	36	36	37	37	37	37	40	41	43	45

Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Govt.

Appendix 14-2

Per Capita Availability of Milk by States (gms/day)															
State	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	02-Jan	03-Feb	04-Mar	05-Apr	06-May
All India	178	182	188	191	197	202	207	213	217	220	225	230	231	233	241
Andhra Pradesh	120	124	148	163	162	169	167	185	192	194	209	231	238	250	260
Arunachal Pradesh	22	64	62	64	119	115	109	119	119	102	105	112	109	114	113
Assam	77	78	78	79	95	79	78	79	71	69	70	71	71	72	72
Bihar	100	98	96	95	101	100	98	121	119	80	88	92	100	147	154
Chhattisgarh								-	-	100	105	103	102	103	103
Goa	65	68	73	72	73	72	71	88	92	89	91	91	93	110	105
Gujarat	236	245	249	277	229	289	280	290	297	280	317	321	330	344	349
Haryana	586	597	605	625	618	617	630	623	631	614	645	647	643	631	628
Himachal Pradesh	313	314	330	324	329	316	314	347	349	335	341	339	337	378	373
Jammu & Kashmir	204	321	251	210	276	302	345	353	362	348	367	365	363	364	353
Jharkhand								-	-	90	96	94	92	127	126
Karnataka	149	154	180	173	185	191	216	233	241	233	249	229	190	194	197
Kerala	167	174	181	190	198	199	204	221	227	219	234	203	173	169	171
Madhya Pradesh	197	196	195	199	199	192	194	262	261	211	240	236	233	233	262
Maharashtra	136	138	140	156	163	161	161	168	168	162	172	172	172	176	178
Manipur	122	119	118	88	80	75	74	87	88	81	86	85	85	90	92
Meghalaya	76	77	77	77	83	74	73	76	76	74	78	78	78	81	82
Mizoram	31	34	32	32	31	29	53	65	57	42	43	45	44	46	43
Nagaland	96	95	93	91	88	86	82	69	69	69	78	78	83	90	96
Orissa	43	46	47	47	49	54	53	58	66	64	69	68	71	92	95
Punjab	722	739	776	797	847	823	861	883	902	854	892	895	898	917	943
Rajasthan	275	276	292	280	294	322	348	356	367	353	376	368	371	376	387
Sikkim	194	191	186	192	204	190	188	186	185	173	187	222	231	221	232
Tamilnadu	164	167	168	175	180	183	185	199	210	211	219	198	198	204	231
Tripura	31	33	33	35	35	36	45	69	69	64	77	66	68	70	70
Uttar Pradesh	199	204	207	209	216	215	221	238	243	223	241	245	250	254	262
Uttaranchal								-	-	323	344	339	365	364	361
West Bengal	120	118	119	123	130	123	123	125	123	116	120	120	120	124	126
A&N Islands	227	219	223	215	173	170	169	179	184	165	177	195	183	165	135
Chandigarh	141	147	145	142	143	148	147	139	134	129	131	127	127	115	116
Dadra & Nagar Haveli	59	196	129	144	87	89	86	106	13	97	100	97	95	45	53
Daman & Diu	0	25	26	25	25	16	17	26	144	17	17	17	16	10	11
Delhi	65	65	67	66	69	61	59	61	60	55	58	57	56	54	54
Lakshadweep	55	55	50	53	54	107	97	72	47	88	90	87	43	45	64
Pondicherry	90	89	103	98	90	44	43	109	106	102	104	101	107	108	108
Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, GoI															

Appendix 15.1								
Projects and Programmes of Major Agencies								
Name of Agency : Dept. of Fisheries								
Sl No	Name of project with location	Estimated cost	Targeted No. Of beneficiaries	Present stage	Expected year of completion	Level of Project	Type of Project	Category of project
1	KMFR Act	8 lakhs	All active fisher man	Continuous programme. This year program will be completed by March 31 st	Continuing	State	State Funds	Beneficiary oriented
2	Sea ranching	0.5 Lakh	All fisher men	Completed	Continuing	State	State Funds	Area Development project
3	Open water ranching	1 Lakh	All fisher men	Completed	Continuing	State	State Funds	Area Development project
4	Education to the children of FM	7.4 Lakhs	All fisher men families	Completed	Continuing	GRFTHS	State Funds	Beneficiary oriented
5	NFWF Housing	68lakhs	All fisher men families	Completed	Continuing	GRFTHS	50% css	Beneficiary oriented
6	Special package housing scheme	150 Lakhs	All fisher men families	Completed	Continuing	GRFTHS	100% css	Beneficiary oriented
7	Special package house repair	67.4 Lakhs	All fisher men families	Just situated	Continuing	GRFTHS	100% css	Beneficiary oriented
8	Saving cum relief scheme	2.3 cores	All fisher men families	Just situated	Continuing	GRFTHS	50% css	Beneficiary oriented scheme
9	Lump sum grant to the children of FM	59 Lakhs	All fisher men families	This year Program completed	Continuing	GRFTHS	50% css	Beneficiary oriented scheme
10	Diesel subsidy	70 Lakhs	Boat Owners	Just situated	Continuing	GRFTHS	50% css	Beneficiary oriented scheme

Name of Agency : Mathsyaed

SI No	Name of project with location	Estimated cost	Targeted No. Of beneficiaries	present stage	Expected year of completion	Level of Project	Type of Project	Category of project
1	Beach level Auction / control over fish sale		All active fisher man		Continuing	State	M. Fed	Cluster development
2	IFDP	2458 Lakhs	Members of the societies affiliated to M.Fed		Continuing	State	NCDC Assistance	Cluster development
3	Motorisation of centry crafts	10 Lakh	Members of the societies affiliated to M.Fed		Continuing	State	50% Css	Cluster development
4	Subsidy for suitable compliments of fishing gear	10 Lakh	Members of the societies affiliated to M.Fed		Continuing	State	50% Css	Cluster development
5	Employment generation activities	21 Crore	Back classes and minority community	Completing	Continuing	State	NBCFDC, NMDFC & state fund	Beneficiary oriented
6	Women empowerment programmes	48 Lakhs	600 Nos	On going	Continuing	State	Central + State	Beneficiary oriented
7	Production and marketing of value added fishing products	100 Lakhs	500 Nos	Completed	Continuing	State	Central + State	Beneficiary oriented
8	Commercial activities				Continuing	State	Central + State	Beneficiary oriented
9	Fish manure plant				Continuing	State	Central + State	Beneficiary oriented
10	Diesel Bunk & 27 oil supply				Continuing	State	M. Fed	Beneficiary oriented
11	Welfare activities				Continuing	State	M. Fed	Beneficiary oriented
12	Aquaculture activities				Continuing	State	M. Fed	Beneficiary oriented

Name of Agency : ADAK & AED

SI No	Name of project with location	Estimated cost	Targeted No. Of beneficiaries	present stage	Expected year of completion	Level of Project	Type of Project	Category of project
1	Polckali cum shrimp culture	13.99 cr. Granted	1000 ha	On going	Continuing	District	Central + State	Beneficiary oriented
2	Oru vellum oru museum	13.21 cr. Granted	25000 ha	On going	Continuing	District	Central + State	Beneficiary oriented
3	Farming				Continuing	District	Central + State	Beneficiary oriented
HED								
1	Thankessery fishing harbour	4385.5 L		Partially commissioned	Continuing	District	Central + State	Cluster Oriented
2	Neendakara fishing harbour	622 L		Partially commissioned	Continuing	District	Central + State	Cluster Oriented
7	Production and marketing of value added fishing products	100 Lakhs	500 Nos	Completed	Continuing	State	Central + State	Beneficiary oriented
8	Commercial activities				Continuing	State	Central + State	Beneficiary oriented
9	Fish manure plant				Continuing	State	Central + State	Beneficiary oriented
10	Diesel Bunk & 27 oil supply				Continuing	State	M. Fed	Beneficiary oriented
11	Welfare activities				Continuing	State	M. Fed	Beneficiary oriented
12	Aquaculture activities				Continuing	State	M. Fed	Beneficiary oriented

Appendix 16-1 Projects and Programmes

Name of the Sector : Industries - SSI

Table. 1 Details of projects and programmes implemented by District Industries Centre

Name of Project	Estimated cost	Targetted No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
PMRY	10 Crore	2550	Final Stage of Completion	2006 June	Block, Corporation, Municipality	Centrally sponsored	B.O	Kollam Corpn. Anchalumood Block, Chittumala, Ithikkara, Paravoor Municipality, Mukhathala, Kottarakkara, Vettikkavala, Chadayamangalam, Pathanapuram, Punaloor Municipality, Anchal, Sasthamcotta, Karunagappally, chavara, Oachira
Cluster Development programme								
SIS	5005250	54	100%	Completed	District	Stage Govt.	„	District
MML	1225000	100	100%	„	„	„	„	„
SURP	1230000	10	100%	„	„	„	„	„
Prathyasa	40 Crores	2000 unit & 8000 Employment	25%	2007	„	„	„	„

Appendix 16-1 Projects and Programmes

Name of the Sector : Industries

Table 2. Details of projects and programmes implemented by District Panchayat

Name of Project	Estimated cost	Targetted No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
Mini Industrial Estate								
1. Pooyappally	2953205	10 shed	Completed		District	Plan Fund	B.O	Pooyappally
2. Karavaloore	3133894	10 shed	„	„	„	„	„	Karavaloore
3. Piravanthoor	2424847	2 shed	„	„	„	„	„	Piravanthoor
4. Nilamel	2017749	6 Shed	„	„	„	„	„	Nilamel
Industrial units through Kudumbasree	2820000	166 units	„	„	„	„	„	List attached.

Sl. No.	Grama Panchayats	No. of Units	Sl. No.	Grama Panchayats	No. of Units
1	Kulakkada	4	2	Ummannur	3
3	Melila	3	4	Mylom	7
5	Neduvathur	5	6	Kottarakkara	13
7	Veliyam	8	8	Perayam	3
9	Karavalur	3	10	Anchal	6
11	Alayamon	5	12	Aryankavu	1
13	Kulathupuzha	1	14	Yeroor	3
15	Thenmala	1	16	Edamulakkal	3
17	Nedumpna	8	18	Adichanalloor	5
19	Poothakkulam	8	20	Piravathur	4
21	Vilakkudy	4	22	Thazhava	1
23	Kulashekarapuram	6	24	Sooranadu North	3
25	Sooranadu South	4	26	Poruvazhy	3
27	Kunnathur	2	28	Sasthamkotta	3
29	Kottamkara	2	30	Thekkumbhagam	5
31	Chavara	3	32	Neendakara	3
33	Velinalloor	3	34	Chithara	4
35	Mynagappally	2	36	Karunagappally	2
37	Clappana	1	38	Nedumpna	2
39	Pathanapuram	2	40	Thodiyur	3
41	Panayam	2	42	Thrikkovilvattom	1
43	East Kallada	1	44	Thrikkaruva	1
45	Pavithreswaram	4	46	Kummil	1
47	Thalavur	1	48	Kundara	2
	Total	165			

Appendix 16-1 Projects and Programmes

Name of the Sector : Industries

Table. 3 Details of projects and programmes implemented by Kerala Khadi and Village Industries Board, Kollam

Name of Project	Estimated cost/ Allotment	No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
Financial Assistance to SSI units 2005 and 2006 (MM Grant)	6931806	47	Completed in 2005-06	-	District	Central	B.O	All over District

Appendix 16-1 Projects and Programmes								
Name of the Sector : Industries - Handloom								
Table. 1. Details of projects and programmes implemented by District Industries Centre.								
Name of Project	Estimated cost	Targetted No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
G.S.P.	269500	4 societies	Just initiated	2006 July	Panchayat	State	Beneficiary	Veliyam, Karunagappally, Chirakkara Panchayat
Modernization of factory type I IWICS	5,25,000	39 Societies	Utilized	Completed	Panchayat	State	"	Chathanoor, Pavithreswaram, Vadakkevila, Karunagappally, Velinalloor, Kulathupuzha, Pooyappally, Poruvazhy, Paravoor Municipality
Exhibition Grant	2,90,876	24 Societies	"	Completed	"	State	"	Karunagappally, Vadakkevila, Mayyanad, Adichanloor, Chathanoor, Chirakkara, Nedungolam, Paravoor Municipality
Robate	580368	32 Societies	"	Completed	"	State	"	Pooyappally, Veliyam, Velinalloor, Pavithreswaram, Neduvathoor.
Marketing Incentive	236149	27 Societies	"	"	"	Central/State	"	Poruvazhy, Pattazhy, Kulathupuzha
Yarn Subsidy	384232	29 Societies	"	"	"	State	"	Do
CTF	94282	8 Societies, 180 members	"	Completed	"	Central/State	"	Pooyappally, Veliyam, Mayyanadu, Vadakkevila, Chathanoor, Nedungolam, Chirakkara, Pavithreswaram, Kollam Corporation
Work shed	10500	50% grant to 3 member of 3 societies	50% work down	As and when balance amount received	"	Central scheme	"	Veliyam, Nedungolam, Kollam Corporation
Mahatma Bankar Bima Yojana	137940	363 members in 14 societies	Implemented	Completed	"	Central & State	"	Veliyam, Velinalloor, Pooyappally, Mayyanadu, Chathanoor, Neduvathoor, Karunagappally, Vadakkevila, Pattazhy, Kulathupuzha.
ICICI Lombard	411200	514 members in 22 societies	"	Completed	"	State	"	Veliyam, Velinalloor, Pooyappally, Mayyanadu, Chathanoor, Neduvathoor, Karunagappally, Vadakkevila, Pattazhy.

Appendix 16-1 Projects and Programmes								
Name of the Sector : Industries - Handloom								
Table. 2 Details of projects and programmes implemented by Hantex								
Name of Project	Estimated cost	Targetted No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
Production of Value added Handloom product	120000	10	Completed	-	Panchayat	Central	B.O.	Veliyam, Poothakkulam, Kulathoopuzha, Pooyappally, Vadakkevila, Velinalloor, Perinad.

Appendix 16-1 Projects and Programmes								
Name of the Sector : Industries - Handloom								
Table. 3 Details of projects and programmes implemented by Handloom Development Committee								
Name of Project	Estimated cost	Targetted No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
Conducting of Exhibition	380355	1000	Completed	NA	Taluk wise	Own fund	B.O	Kollam, Karunagappally, Kottarakkara.

Appendix 16-1 Projects and Programmes									
Name of the Sector : Industries - Coir									
Table. Details of projects and programmes implemented by Kerala Coir Workers Welfare Fund Board.									
Sl. No.	Name of Project	Estimated cost	Targetted No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
1	Training to Coir workers in ¼ HP motor	3450000	2300 Coir workers	Completed	Nil	Panchayat	State funded	Beneficiary oriented	Karunagappally
									Thrikkaruva, Clappana, Kulasekharapuram Chavara
2	¼ HP motor Grant	8070000	2300 Coir workers	Just initiated	2006	Panchayat	State funded	Do	Do
3	Financial Assistance to Self Help Groups	1300000	208 Beneficiaries of 26 SHG's	Completed	Nil	Panchayat	State funded	Do	Do
4	House Repair Grant to coir workers	940000	94 Coir workers	Completed	Nil	Panchayat	State funded	Do	Do
5	House Electrification of Coir workers	525000	150 Coir workers	Completed	Nil	Panchayat	State funded	Do	Do
6	Old age pension scheme to coir workers	4800000	4000 Coir workers	Completed	Nil	Panchayat	State funded	Do	Karunagappally, Thrikkaruva, Clappana, Kulasekharapuram, Chavara, Perinadu, Thrikkadavoor, Panalyam, Mayyanadu, Kundara Panchayat & Paravoor Municipality.

Appendix 16-1 Projects and Programmes									
Name of the Sector : Industries - Coir									
Table. 1 Details of projects and programmes implemented by Coir Project Office, Kollam									
Sl. No.	Name of Project	Estimated cost	Targetted No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
1	MARKET DEVELOPMENT ASSISTANCE	5055666	17 Coir Societies	Completed	-	District	Central & State Scheme 50:50	Beneficiary oriented	17 Coir societies in the District
2	SICK REVIVAL GRANT	1738500	25 Coir Co operative societies	Completed		..	State funded	Do	25 societies in the District
3	Production & Marketing Incentive	755973	45 societies	Completed	-	..	Do	Do	45 societies
4	Mahila Coir Yojana	285929	1037 Coir workers	Completed	-	..	75% Central and 25% State	Do	8 societies
5	Coir Grama Project	2900000							

Appendix 16-1 Projects and Programmes									
Name of the Sector : Industries - Coir									
Table. Details of projects and programmes implemented by Kerala Coir Board. Ernakulam.									
Sl. No.	Name of Project	Estimated cost	Targetted No. of Beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project	Location of project
1	Construction of Pandal and Latrine in Coir co-operative societies	10 lakhs	10 Coir societies	Just initiated	2007	Panchayat	Central	BO	Thrikkaruva and Thrikkadavoor Panchayat
2	Coir cluster at Mangad	65 lakhs	50 Coir co-operative societies	Just initiated	2007	Corporation	Central	BO	Kollam Corporation.

Appendix 20 A - IA		
Name of the Sector: Forest		
Status of Biodiversity, Kollam		
Sl. No.	Flora	% of species
1	Angio Sperms	84.7
2	Gymno Sperms	0.3
3	Brayophytes	1.3
4	Pteridophytes	7.8
5	Lichens	1.6
6	Algae	2.2
7	Desmids	0.6
8	Diatoma	1.5

Appendix 20 A - IB		
Name of the Sector: Forest		
Endangered and Vulnerable Angiosperms		
PLANT NAME	FAMILY	STATUS
Impatiens hirsutii	Halsaminaceae	Endangered
Poeciloneuron pauciflorum	Bonnetiaceae	Endangered
Hedyotis travancorica	Rubiaceae	Endangered
Biophytum insigne	Oxalidaceae	Endangered
PLANT NAME	FAMILY	STATUS
Cinnamomum travancoricum	Lauraceae	Vulnerable
Antistrophe serratifolia	Myrsinaceae	Vulnerable
Didymocarpus fischeri	Gesneriaceae	Vulnerable
Psychotria globicephala	Rubiaceae	Vulnerable
Dimorphocalyx beddomei	Euphorbiaceae	Vulnerable
Impatiens travancorica	Balsamiferae	Vulnerable

Appendix 20A-IC		
Name of sector: Forest		
Medicinal Plants		
PLANT NAME	FAMILY	STATUS
Goniothalamus wightii	Annonaceae	Rare
Appollonias amottii Nees	Lauraceae	Rare
Cinnamomum chemunjanum	Lauraceae	Rare
Piper galeatum	Piperaceae	Rare
Piper hapinum	Piperaceae	Rare
Thottea idukkiana	Aristolochiaceae	Rare
Thottea dinghoui	Aristolochiaceae	Rare
Thottea abrahamii	Aristolochiaceae	Rare
Poeciloneuron indicum	Bonnetiaceae	Rare
Elacocarpus munronii	Elacocarpaceae	Rare
Grewia heterotricha	Tiliaceae	Rare
Begonia crenata	Begoniaceae	Rare
Begonia trichocarpa	Begoniaceae	Rare
Eugenia floceosa	Myrtaceae	Rare
Syzygium ocideutal	Myrtaceae	Rare
Orthosiphon comosus	Laminaceae	Rare
Phlebophyllum lawsonii	Acanthaceae	Rare
Acranthera anamallica	Rubiaceae	Rare
Lasianthus jackianus	Rubiaceae	Rare
Mycetia acuminata	Rubiaceae	Rare
Ochreinaudea missionis	Rubiaceae	Rare
Ophiorrhiza shendurunii	Rubiaceae	Rare
Ophiorrhiza nairii	Rubiaceae	Rare
Pavetta calophylla	Rubiaceae	Rare
Glochidion phustonei	Euphorbiaceae	Rare
Ampelocissus amottiana	Vitaceae	Rare
Semecarpus travancorica	Anacardiaceae	Rare
Biophytum intermedium	Oxalidaceae	Rare
Amorphophallus nicolsonianus	Araceae	Rare

Appendix 20 A - ID				
Name of the Sector: Forest				
Mangroves Details in Kollam District				
Sl. No	Panchayath	Area (Acre)	Lake portion	Status of land
1	Panayam	1	Kandachira	Govt.
2	Perayam	2	Ashtamudi	Private
		10	Ashtamudi	Central Govt.
		2	Ashtamudi	Private
		2	Ashtamudi Lake	Govt.
		8	Ashtamudi	Govt.
		1	Ashtamudi	Private
3	Mandrothuruth	10	Ashtamudi	Private
		0.05	Ashtamudi	Private
4	Kollam Corporation	5	Ashtamudi	Govt.
5	Kollam Corporation	0.5	Paravoor	Private
6	Karunagappally	1.5	Kayamkulam	Private
7	Alappad Panchayath	2	Kayamkulam	Private
		2	Kayamkulam	Private
		5	Kayamkulam	Alappadu Panchayath
8	Ochira	10	Kayamkulam	Govt.

Appendix 20 A - IE						
Name of the Sector: Forest						
List of Sacred Groves in Kollam						
Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
I. Ithikkara Block						
1	Kamadathu pazhaya Kavu	Kalackodu	Poothakkulam	0.12	Devaswom Trust	vepu, Athi, Teak, Kanjiram, Accasia, Perumaram, Pala, Nelli, Manjamathi, Koovalam, Chadanam and climbers
2	Mylakkal Kavu	Kongal	Paravoor Municipality	0.026	Family Trust	Kanjiram, Elanji, Cherru, Pala, Njara, manjadi and climbers
3	Sarppakkavu	Kayipaducheri	Adichanalloor	0.16	Family Trust	Pine, Mavu, Cherru, Panachi, Koovalam and climbers
4	Vazhappally Kavu	Adichanalloor	Adichanalloor	0.1	Family Trust	Kanjiram, Aranthal, Poovam, pala, cherra and climbers
5	Kadujathi Kavu	Koonayil	Paravoor Municipality	0.04	Temple Trust	Pala, Cashew, Mavu, Puli, Manjaaruti
6	Mudiyoor Kavu	Pazhangalam	Nedumpana panchayath	0.024	Family Trust	Marotti, Cherru, Vatta, Elanji and climbers
7	Chavaru Kavu	Varinjam	Kalluvathukka	0.08	Temple Trust	Kanjiram, Thanni, Pala, Maruthy, Vatta, Manjunathy, Rubber, Cashew, Anjily and climbers
8	Mannancheril Kavu	Perayam	Thrikkovilvattom	0.1	Temple Trust	
9	Kalangara Durga temple kavu	Thazhathucheri	Ithikkara	0.26	Temple Trust	Aranthal, Kanjiram, Pazhakotta, Karinthakara, Koovalam, Chandanam, Elanji, Panachi, Ambazham, Manchadi, Pongu
10	Arekkonam kavu	Pazhangalam	Nedupana	0.04	Temple Trust	Kalampotty, Marotti, Kanjiram, Pala, Anjili, Peral, Chandanam and climbers

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
11	Thiru pazhangalam Sastha temple Kavu	Pazhangalam	Nedupana	1	Temple Trust	Panachi, Manjapunna, Pongu, Karimarom, Arayal, venkotta, Ponnampine, chooral, marotti, pana, cheru, mazhamaram, Anjily, Kanjiram etc.
12	Theechethuveetil Family Kavu	Adichanalloor	Adichanalloor	0.212	Family Trust	Pala, Kanjiram, Vatta, Subabul, Kannikonna, Vayana and climbers
13	Family Kavu	Pallimon	Nedupana	0.072	Family Trust	Vayana, Pala, Kanjiram, Anjili, Bamboo, Vatta etc.
II. Mukhathala Block						
1	Caharuvila Sarpa Kavu	Thazhuthala	Thricovilvattom	0.1	Family Trust	Charu, Kanjiram
2	Indilayappan Kavu	Ayathil	Kollam Corp.	1.2	Family Trust	Charu, Anjily, Koovalam, Oothlam, Manjadi, Palm, Kanjiram, climbers
3	Mannancherry Bhagavathi temple	Thazhuthala	Thricovilvattom	0.1	Family Trust	Teak, elavu, Cheru, Kanjiram
4	Padinjareveetil Surppakavu	Valathungal	Kollam Corp.	0.16	Family trust	Karinjettu, kambakom, Oothi, Cashew, veepu
5	Meloott Kavu	Perumpuzha	Elampalloor	0.2	Temple trust	Charu, Kanjiram, Njerinji, Panachi, Pala, Manjakadambu, Anjili climbers
6	Kadappal Kavu	Kadappakkada	Kollam Corp.	0.26	Family trust	Pene, Charu, Koovalam, Anjily, Manchadui, Veppu, Climbers
7	Idamannara kavu	Naduvilakkara	Thirikkovilvattom	0.16	Temple trust	Pala, Cashewnut, Plavu, Mavu
8	Mallanthodathu devi temple kavu	Pallimukku	Kollam Corp.	0.1	Temple trust	Vallakom, Charu, Njara, Maruthi, etc
9	Valiyathottathu kavu	Eravipuram	Kollam Corp.	0.48	Temple trust	baniyan tree, Vallakom, Anjily, Pala, Kanikonna, Mahagoni, Plavu, Mavu, Veppu, Koovalam, Sandal
10	Kulathur kavu	Mukhathala	Thirikkovilvattom	0.28	Temple trust	Pala, Cashewnut, Plavu, Mavu, Kanjiram, Konna
11	valathungal kavu	Valathungal	Kollam Corp.	1	family trust	Karinjettu, Veppu, Charu, Sandal, Elanji, Kambakom, Njara, Pathimugham, Raktha chandanam, Oothalam

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
12	Allumood family kavu	Thekkumkara	Myyanadu	0.088	Allumode devi temple kavu	Sandal, Elanji, Baniyan tree
13	Kavadi kavu	Mundakkal	Kollam Corp.	0.36	Family Trust	Kanjiram, Pala, Elanji, Sandal, Climbers
14	kalarikavu	Valathungal	Kollam Corp.	0.64	Kalarikavu smarka samithy	
15	Elamploor devaswom kavu	Elampalloor, Kundara	Elampalloor	0.26	Devaswom trust	Nelli, Vatta, Elanji, Sandal, Kanikonna, Pala, Kanjiram, Baniyan tree
16	Ellampallor kavu	Elampalloor, Kundara	Elampalloor	0.34	Family trust	Puli, Vatta, Perumaram, teak, Manjakadabu, Kanikonna
17	Lekshmi narayan Temple kavu	Valathungal	Kollam Corp.	0.524	Temple trust	Anjily, Mavu
III. Chavara Block						
1	Thazhathathil	Near Palazhiyil Junction	Panmana	0.2	Family trust, Vadakkadathu Kudumba vaka	Pana, Charu, Pongue, Kanjiram, Punna, Kulamavu, Vallithattu, Njara
2	Thudayamkottu	Koozhankulam Jn.	Thevalakkara	0.3	Family Trust	Anjili, Kulamavu, Cane etc
3	Anilzhikathu Kavu	Near Panmana Asramom	Panmana	0.15	Family Trust	Anjili, Vayana, Charu, Kulamavu
4	Palliyadiyil Kavu	Near Kunnel Jn.	Thevalakkara	0.2	Family Trust	Anjili, Vayana
5	Edavanathu Kavu	Near Koozhakulam Jn	Thevalakkara	0.2	Family Trust	Anjili, Chooral, Manjadi, Marutii, Vallikkettu, Tharu, Vayana etc.
6	Paithodil Kavu	Near Azhakathu veedu	Thekkumbhagom	0.4	Family Trust	Puli, Anjili, Kulamavu, Plavu, Kanjeeram, Pala etc
7	Manayil kavu	Near Panmana Asramom	Panmana	0.4	Family Trust	Anjili, Elanji, Vayana, Charu, Kulamavu, Chooral, Kanjiram etc
8	Karuvazhathu Kavu	Near Sivanandapuram Temple	Panmana	0.276	Family Trust	Anjily, Elanji, Cashew, Vayana, Kulamavu, Pine, Kanjiram
9	Kavunada Padinjattathil Kavu	Back side of SBT, Chavara branch	Chavara	0.2	NSS Karayogam, No.2352, Cherusseri Bhagom & Family Trust	Anjily, Kulamavu, cane etc.
10	Mukkonathu kavu	Vadakkumthala	Panmana	0.32	Family trust	Anjili, Vayana, Kulamavu, Mango trees, peral, Chooral
11	Mampuzha temple kavu	Muttackal	Thevalakkara	0.15	Temple trust	Anjily, Elanji, Elavu, Konna, Punna, Pine etc.
12	Chavarackal kavu	Vadakkumthala	Vadakkumthala	0.16	Family trust	Anjili, Pine, Kulamavu, Chooral, Vazhanna

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
13	Kallumpurathu kavu	Near Kottamkulangalara temple	Chavara	0.04	Family trust	Anjily, Arayal, Elanji
14	Sarppa kavu	Panmana	Panmana	0.92	Family trust	
15	Madathil Kavu	Near Subramanya Swamy temple	Panmana	0.09	Family Trust	Anjily, Charu, Pine, Kulamavu, Cane
16	Thekkumvila Family kavu	Thekkum Bhagom	Thkkumbagom	1.36	Family trust	Anjily, Arayal, Elanji, Mango
17	Cheppathil Kavu (Kolluvila Kavu)	Near creesentr Junction	Chavara	0.276	Family Trust	Anjili, Cheruppunne, Kulamavu, Charu, Chooral, Mavu, Arayal, etc.
IV. Ochira Block						
1	Thennala kavu	Thennala	Karunagappally	0.072	Family trust	Anjili, Mavu, Pine, Vayana, Karinjotta, Ponkaranti, Asokam, Maruthi, Myla, Kanjiram, Arayal
2	Thekkevittoor kavu	Maruthoor Kulangara	Karunagappally	0.022	Family trust	Njara, Elanji, Anjili, Caim, charu, Kulamavu, Vatta
3	Govinda kavu	Maruthoor Kulangara	Maruthoor Kulangara	0.016	Family	Arayal, Pana, Elanji, Maruthi, Cane, Charu
4	Kotheril kavu	Edakulangara	Thodiyoor	0.024	Family trust	Kanjiram, Maruthi, Mavu, Vayana, Kanjiram, Elippa
5	Thevar kavu	Karunagappally KSRTC	Karunagappally	0.4	NSS Karayogam Administrative Trust	Edana, Maruthi, Marotti, Kanjiram, Asokam, Pavizhamuth, Arayal, Plavu, Macvu, Chembakam, Koovalam, Anjily
6	Muthalappallil kavu	Kottampallil	Ochira		Family trust	
7	Ezhavettather kavu	Alumpedia		0.44	Family trust	
8	Family kavu	Thekkumkara	Thazhva	0.074	Family trust	
9	Valiyaveetil kavu	Vadakkum	Thazhav	1.2	Temple trust	
10	Alazhathu kavu	Panmana	panmana	0.15	Family trust	
11	Valiyaveetil Deargu devi temple kavu	Vadakkumneri	Thazhavu	0.6	Temple trust	
12	Karevazhath kavu	Vadakkumthala	Thazhave		Family trust	
13	Cherukara kavu	Manappally	Thazhava	0.176	Family trust	
V. Karunagappally Block						
1	Vitikkavu madan Nada	Vettikkottu Ela	Mynagappally	15cent	Temple trust	Kanjiram, Al, Pine
2	Valloorathu Kavu	Muzhangodi	Thodiyoor	0.18	Temple trust	Vayana, Caim, Kanjiram, Anjili, Pongu, Chempunna, Maruthi

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
3	Vishnu Kavu	Adinadu	Kulasekharam	0.2	Family trust	Marotti, Pine, Arayal, Pana, Charu, Kulamavu, Anjili, Elanji, Vetti, Vayana, Mavu
4	Kannamathu kavu	Varuvila	Klappara	0.04	Family trust	Charu, Pongu, Cairn, Panacha, Elanji
5	Mucharath kavu	Manappally	Thazhava	0.06	Family trust	Elanji, Anjily, Koovalam, Pine, Kulamavu, Vayana
6	Vazhayil kavu	Adinadu	Kulasekharapuram	0.04	Temple trust	Kanjiram, Pana, Anjili, Elanji, Koovalam,
7	Velasseril Kavu	Pavumba	Thazhava		Temple trust	
8	Ayyankoickal kavu	Adinadu	Kulasekharapuram	0.2	Family Trust	Anjili, Vallabhom, Pongu, Charu, Karinjotta, Njara
9	Plavannoor kavu	Kadathoor	Thazhava	0.4	Temple trust	Anjily, Kudampuli, Punna, Peral, Arayal, Charu, Vayana, Karinjotta, Elippa, Njara, Chooral, Pine etc.
10	Madannada kavu	Vettikkad	Mynagappally		Temple trust	
11	Cheppathil Kavu	Mattathara	Thazhava		Family trust	
12	Vainthamangalam kavu	Thazhava	Thazhava	0.112	Family trust	Anjili, Chempunna, Elanji, Bamboo, Cairn, Peral, Vayana, Kanjiram, Charu, Nagadanti, Poriyal
13	Manayil kavu	Manayilmuri	Panmana	0.2	Family trust	
14	Neduntharayil kavu	Kadathur	Kulasekharapuram	0.12	Temple trust	Cairn, Anjili, Cherupunna, Teak, Marotti, Elanji, Vattta, Vayana, Edana, Kudampuli, Pala, Charu
15	Mundappallil kavu	Thekkummuri	Thazhava	0.12	Family trust	
16	Mudilethu kavu	1 Km from Aramathumadom Jn	Thazhava	0.04	Family trust	Anjili, Elanji, Pana, Vayana, Cairn, Peral, Pala
17	Venkattakkal Kavu	Near Klappana AVHS	Thazhava	0.012	Family trust	Charu, Pongu, Elanji, Thetti, Cairn, Cherupunna, Pine
18	Venkottackal kavu	Near Klappana AVHS	Thazhava	0.012	Family trust	Charu, Pongu, Anjily, Elanji, Thetti, Cairn, Marotti
19	Ualloorethu kavu	Muzhangodi	Thodiyoor	0.18	Family trust	
20	Moorthiambalam kavu	Kadathur	Thazhava	0.4	Family trust	Charu, Pana, Anjili, Vatta, Cairn, Edana, Marotti

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
21	Moorthiambalam kavu	Kadathur	Thazhava	0.4	Family trust	Charu, Pana, Anjili, Vatta, Cirm, Edana, Marotti
22	Kalluvila kavu	Kumbala	Mynagappally	0.212	Temple trust	
23	Thazhoor kavu	Pavumba	pavumba	0.6	Temple trust	
24	Pulippurathu kavu	Ivarkalu	puthanambalam	0.22	Family trust	
25	Kaleekkal kavu	Vadakkum meari	Thazhava	0.172	Family	
26	Attloor kavu	Kadathoor	Thazhava	0.4	Family Trust	Cherupunna, Anjili, Marotti, Cairn, Njaval, Charu, Kudampull
27	Padinjattathil KavU	Cherussery	Karunagappally	0.152	Family	
28	Thekkemury kavu, Thekkedathu kavu	Thekkemury East	Thazhava	0.036	Family	
VI. Sasthamkotta Block						
1	Nadayil Thekkathil KavU	Kumarachira	Sooranadu South	0.032	Family Trust	Kulamavu, Vetta, Panacha, Elanji, Pongu, Vayana, Kanjiram, Kuzhatti
2	Kullasseril KavU	Pallimuri, Ambalathumbag m	Poruvazhi	0.56	Temple Trust	Vellapine, Undapine, Cheru, Anjili, Pala, Chooral
3	Patheerayyathu KavU	Ambalathumbago m	Poruvazhi	0.028	Family Trust	Panacha, kanjiram, Vellapine, Anjily, Chooral and climbers
4	Kadoothra KavU	Koikkal Bagam West kallada	West Kallada	0.12	Family Trust	Marotti, Kanjiram, Elanji, Vellapine, Chooral, Thondy, Teak, Perumaram, Pana, Vayana
5	Muttathu KavU	Naduvilakara	West Kallada	0.02	Family Trust	Anjily, manchadi, Panacha, Vayana, Perumaraom, Charu, Kanjiram, and Climbers
6	Vadakkedathu kavu	Kidangeyam Naduvil	Sooranad South	0.12	Family Trust	Elanji, Coconut tree
7	Thallakkattu kavu	Thrikunnapuzha	Sooranad	0.1	Family Trust	Plavu, Anjily, Pana, Vayana, Vetti, Mula, Badam
8	Thannikkal kavu	Ayikunnam	South Sooranad	0.4	temple Trust	Kanjiram, Elanji, Thondy, Panacha, kanikonna, Nervallay
9	Mannoor kavu	Muthupilakkadu	Sasthamcotta	0.75	Family Trust	Vellapine, Cheru, Manchadi, Chooral, Anjili, Thondy, Elanji and Medicinal Plants

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
10	Kollakkal kavu	Manakkara	Sasthamcotta	0.2	Family Trust	Pana, Uravu, anjily, Kanjiram, Manchadi, Chooralm Chamatha
11	Nedumpurathu kavu	Karalimukku	West Kallada	0.4	Family Trust	Anjily, Plavu, Thekku, Vatta, Kanjiram
12	Mamachan kavu	Near west Kallada Panchayath office (Valiyapadam)	West Kallada	0.2	Family Trust	Panacha, Uthy, Anjily, Peryumarom, Kanjiram, Kanikonna, Vallbhom, Vayana, Cane
13	Azhakiyakavu	Sooranadu	Sooranadu North	1	Family Trust	Vellapine, Cheru, Vayana, Uthy, Anjily, Climbers, Chooral, and medicinal plants
14	Puthusseri kavu	Panappetti	Sasthamcotta	0.12	Family Trust	Anjily, Cheru, Vayana, Vatta
15	Mathirampally kavu	Aithottuva	West Kallada	0.056	Family Trust	Panacha, Uthy, kanjiram, Cheru, Anjily, Chooral and medicinal plants
16	Velangattu kavu	Padinjattin muri	North Sooranadu	0.08	Family Trust	Vellapine, Charu, Cane, Anjily, Climbers
17	Cherekone Vayalil Bhadra kali temple kavu	Cherekone	Kunnathoor	0.2	Temple Trust	Pana, Kanjiram, Vellapine, Anjily, Vatta, Uthy, Therakom, Porivatti, Climbers, and Vallikanjiram
18	Eruvila kavu	Sooranadu North - Padinjattu Kizhakku	Sooranadu north	0.12	Family Trust	Vellapine, Uravu, Anjily, Plavu, Elanji, Manchadi, Pana
19	Pappanadu kavu	Padinjatinmury	Kunnathoor	0.02	Family Trust	vellapine, uravu, Vatta, Manchadi, Pana, Chooral and climbers
20	Karingatil Malanada Kavuvu	Anayadi	Soorandu North	0.2	Temple Trust	Vellapine, Panacha, Anjily, Manchadi, Vayana, Cheru, Pana and Climbers
21	Illathu kavu	Sooranadu Edappanayam	North Sooranadu	0.028	Temple trust	Vellapine, Panacha, Anjily, Manchadi, Pana, Kulamavu, Mula and Climbers
VII. Chittumala Block						

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
1	Pancheril Kavu	Thekkemuri	East kallada	0.04	Family Trust	Marotti, Anjili, Koovalam, Kilimaram, Manjadi, Kannikonna
2	Chegavalli Kavu	East Kallada LPS Jn.	East Kallada	0.124	Family Trust	Pala, Vayana, Asokam, Vetta, Plavu, Mavu, Vayana, Karun
3	Kannilazhikathu Kavu	Thekkemuri Pazhayar	East kallada	0.072	Kavu Trust	Kanjiram, Vellikonna
4	Paruvathuruthil Kavu	Kayikkalmuri	East kallada	0.12	Temple Trust	Kanjiram, Uthy, Vatta, Plavu, Elanji, Mavu, Cashew, pana, Vayana, Asokam
5	Ambithodu Kavu	East Kallada	East kallada	0.186	Family Trust	
6	Madan Kavu	Chittumala-Koduvila road	East Kallada	2	Purampokke	Anjili, Vatta, Kanjiram
7	Marangattu Kavu	Villimangalam	Manruethuruthu	0.57	Family Trust	Mavu, Kanjiram, Anjili, Thondy, Vetta, Kulamavu, Vayana, Cherumaraom, Enja, Pulathi, kanjiravalli
8	Paramparu Kavu	Chirakkonam vellimon	Perinadu	0.168	Temple Trust	Pala, Njerichil, kanjiram, Kannikonna, Pala, Mavu, Vatta
9	Kumbenkattu kavu	Pampalil	Panayam	0.04	Family Trust	Kanjiram, Mavu, Parangi, Koovalam, Perumaram, climbers and etc
10	Kurthakkal Kavu	Perumon	Panayam Ward I	0.064	Family Trust	Thanni, Charu, Anjily, Vallabhom, Manjadi, choondapana, Parangi, Vatta, Palamarom, manjakambu, Kanjiram, Perumaram, Pullathi
11	Ayiravilli Kavu	Kuzhiyam	Panayam Ward VI	0.1884	Temple Trust	Perumarom, Edatha, Karimaram, Vetta, Mylanchi, kalaravalli, Kanjiravalli, enja,
12	Edathundil Kavu	Chemmekkad	Panayam Ward IV	0.4	Family Trust	mahagoni, Vayana, Teak, Manjakavu, Kanjiram, Anjili, Mavu, Vetta, Parangi, Vayana,
13	Mulakkal Kavu	Panayam	Panayam Ward XI	0.04	Family Trust	Koovalam, Kanjiram, Manjakambu, Mylanchi, Uthy, Kanjiramvalli, Kurinvalli
14	Chettimana kavu	Chathinamkulam	Panayam Ward VI	0.08	Family Trust	Kanjiram, Mavu, Pine, Plavu, Zvayana, uthy

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
15	Madathil Kavu	Pampalil	Panayam Ward IX	0.064	Temple Trust	Peral, Anjily, Perumarom, Choondapana, Pulathi
16	Moorthivila Kavu	Perumon	Panayam Ward II	0.25	Sree Ramakrishna Seva Trust	Kanjiram, Pala, Kannikonna, Anjili, Chanji
17	Parappurathu kavu	Perayam	Perayam Ward IV	0.04	Family Trust	Puli, Elanji, Kanjiram, Pala, Manjakadambu, Manjadi, Choondapana, Sandal, Kanjiram, etc
18	Earathu kavu	Perayam	Perayam	0.008	Temple Trust	Pongu, Aranamaram
19	Mullasseril kavu	Mulavana	Perayam	0.064	Temple Trust	Anjili, Vayana, Pala, Pana, Vetta, Kanjiram
20	Nalloor Kavu	Kanjiracodu	Kundara Panchayath	0.1	Family Trust	Elanji, Kanjiram, Manchadi, Kulamavu, Chru, Pullathi
21	Thettikunnu mahadevan temple Kavu	Kanjiracodu	Kundara Panchayath	0.48	Temple Trust	Arayal, Teak, Maruthi, Peral
22	Pillaveettil Kavu	Kanjiracodu	Kundara Panchayath	0.1	Family Trust	Kanjiram, Elanji, Karimthakara, karimaram, Manchadi, Choondapana, Maruthi, Pala, etc
23	Puthuveettil kavu	Mulavana	Kundara Panchayath	0.3	Temple Trust	Anjili, Sandal, Kulamavu, Kanjiram, Choondapana, Vetti, Uthy, Puna,
24	Moorthi Kavu	Mulavana	Perayam	0.064	Trust	Choondapana, Plavu, Kanjiram,
25	Pulippra sarppa kavu	Pulippra	Kundara IV	0.18	NSS mKarayogam Trust	Anjily, Teak, Vetta, Kanjiram
26	Paingavelil Kavu	Pazhayattin-muri	East kallada		Family Trust	
27	Govt. Purampokku Land	East Kallada	East kallada	2		
VIII. Anchalummoodu						
1	Thonipurakkal Bhagavathi Kavu	Neeravil	Thrikkadavoor	0.02	Thonipurakkal temple Trust	Athy, uthy, Arayal, Peral, Poriyal, Pongu, Anjily, Nelly, Pana, Charu, Ambazham, Pala, Manjady, Chooral, Climbers
2	Poothakulam siva temple kavu	Pattathanam	Kollam Corp.	0.02	Family Trust	Arayal, Elanji, Vallabham, Pongu, sandal, Pine, Anjily, Mavu, Plavu, Wood Climbers

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
3	Pathoor Sri. Madannada temple Kavu	Pattathanam	Kollam Corp.	0.053	Temple Trust	Elanji, Veppu, V.Pine, Maruthy, Njara, Pongu, Arayal, Thondy, Anjily, Woody climbers
4	Chembakkulam Kavu	Kallumthazham	Kollam Corp.	0.02	Ayyappan	Pala, Sandal, Mavu, Teak, Matti, Vatta, Manjakanambu
5	Manamel Kavu	Puthenthura	Neendakara	0.2	Muralledharan	Arayal, Peral, Elanji, Anjily, Charu, Pana, Koovalam, Pala, Chooral, Woody Climbers
6	Nelluvila Kavu	Kureepuzha	Thrikkadavoor	0.3	Temple Trust	Koovalam, Kanjiram, Charu, Uthi, Vayana, teak, Plavu, Arayal, Vatta, Manjady, Pongu, Manjakambu, woody climbers
7	Mundakkal Bhadrakali temple kavu	Mundakkal	Kollam Corp.	0.36	Temple Trust	Elanji, Njara, Pala, Uthy, Vallbhom, Vetty, Kanikonna, Charu, Myla, V. Pine, Maruthy, Pana, Manjady, Kanjiram, Anjily, Woody climbers
8	Vanchipuzha Kavu	Kureepuzha	Thrikkadavoor	0.72	Keekkolil family trust	Pala, Charu, Peral, Vallabham, Kanala, Pongu, Anjily, Manjady, Uthy, Njara, Manjakadambu, Vatta, Kanikonna, Climbers
9	Valiyazhikathu Bhadrakali temple kavu	Ashtamudi	Thrikkadavoor	0.1	Temple Trust	Njara, Koovalam, Vallabham, Kanjiram, Pana, Uthy, Pazhu, Maruthy, Climbers
10	Mukkarathil Kavu	Kavanad	Kollam Corp.	0.052	Mukkarathil family Trust	Kanjiram, Kanikonna, Veppu, Maruthy, Kulamavu, Vatta, Koovalam, vayana vetty
11	Sankara Narayana Moorthi temple Kavu	Mangad	Kollam Corp.	0.32	Temple Trust	Peral, Arayal, Sandal, Charu, Elanji, Edana, Vayana, Thanni, Koovalam, Kanikonna, Anjily, Manjady, Plavu, Pana, Chooral, Climbers
12	Edavanadu Family Kavu	Mathilil	Thrikkadavoor	0.3	Family Trust	Elanji, Kanjiram, Pana, Climbers

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
13	Palackattu Yogeewara Swami temple Kavu	Kureepuzha	Thrikkadavoor	0.02	Temple Trust	Arayal, Manjady, Plavu, Manjakadambu, Anjily, Vetta climbers
14	Pandonnel kavu	Kureepuzha	Thrikkadavoor	0.075	Temple trust	Arayal Muthu vergai, uthy
15	Paingavelil Kavu	Anchalumoodu	Thrikkadavoor	0.2	Family Trust	Kanjiram, Koovala, Anjily, Mavu, Vetty, V. Pine, Pana, Plavu. Pulivaka, Climbers
16	Puthen Purakkal Kavu	Manayil Kulangara	Kollam Corp.	0.06	Family Trust	Pala, Kudampuli, Vallbham, Vetti, Climbers
17	Chozhattual Devaswom Kavu	Sakthikulangara	Sakthikulangara	0.032	Devaswom Trust	
18	Pandannil Durga Kavu	Kureepuzha	Thrikkadavoor	0.075	Temple Trust	
I. Kottarakara Block						
1	Palookonam NagaRaja kavu	Maruthamanppally	Pooyappally	0.36	Temple trust	Arayal, Pala, Incha, Kanjiram
2	Perumon Bhagavathy temple kavu	Maruthamanppally	Pooyappally	0.24	Temple trust	Arayal, Pala, Incha, Kanjiram, Pullangi
3	Thundazhikathu Moorthy Kavu	Veliyam	Veliyam	0.12	Temple trust	Pullangi, Vatta, Badam, Kanikonna
4	Pakkode Moorthy Kavu	Edaikkidom	Kareepra	0.14	Family Trust	Kanjiram, Koovalam, Elanji, Kasumavu, Kanjavu,
5	Dharma Sashta Temple kavu	Edaikkidom	Kareepra	0.2	Temple trust	Chooral, Pine, Arali, Elanji
6	Vadakkathil Kavu	Vakkanadu	Kareepra	0.024	Family Trust	Parakottakka, Manjakadampu, Arayal
7	Muttathuveli kavu	Erumpanganadu	Ezhukon	0.2	Family Trust	Mottal, Marotti, Pala, Pana, Vayana, Charu, uthi
8	Moorthy Kavu	Poovattora Kizhakku	Mylam	0.08	Temple trust	Anjili, Kanjiram, Aanathondy
9	Panamkunnil Moorthy Kavu	Poovattora Kizhakku	Mylam	0.024	Family Trust	Anjili, Marotti, Poovan
10	Mannarakizhakkathil Kavu	Pallikkal East	Mylam	0.048	Family Trust	Therakam, Kanjiram, vava, Anjili, Perumarom, Plavu, Ethy
II. Vettikavala Block						
1	sree Durgadevi temple kavu	Vayakkal	Ummannore	0.18	Temple Trust	Pana, Uthy, Vaha, Thondi, Vetty, vatta, Pala
2	Kudumba Kavu	Pavithreswaram	Pavithreswaram	0.16	Family Trust	Charu, Anjily, Pala, Punna, Maruthy, Kanjiram
3	Marangattu Sarppa Kavu	Pavithreswaram	Pavithreswaram	0.269	Family Trust	Maruthy, Charu, Uthy, Mavu, Myla
4	Sree Nagaraja Kavu	Pavithreswaram	Pavithreswaram	0.16	Family Trust	Maruthy, Charu, Anjily, Pana

Sl. No	Name of Kavu	Locality	Panchayath	Area (in ha)	Ownership details	Species available
5	Ozhyil Appooppan Kavu	Vayakkal	Unnannore	0.04	Temple Trust	Anjily, Uthy, Vaha, Thondy, Vetty, Valla, Plavu
6	Cherukara Thekkathil Kavu	Karikayattom	Vettikavala	0.008	Family Trust	Anjily, Valla, Elavu
7	Erakkulathu Kavu	Melila	Melila	0.04	Temple Trust	Charu, Kulamavu, Anjily, kanjiram, Vallu
8	Chakkottu kavu	Enchakkadu	Mylam	0.032	Family Trust	Anjily, Maruthy, Vayana, Pana, Vennil
9	Erakkulathu kavu	Melila Kizhakke Kavu	Melila	0.1	Family Trust	Charu, Kulamavu, Anjili, Kanjiram
III. Anchal Block						
1	Malathil kavu	Vadamon	Anchal	0.12	Family Trust	Kanjiram, Marotty, Pana, Anjily, Charu
2	SreeKrishna Swamy Temple kavu	Vadamon	Anchal	0.16	Temple Trust	Kambakam, Thanni, Maruthy
3	Puthu Nagoora Kavu	Thinkal karikkom	Kulathupuzha	0.14	Temple Trust	Maruthi, Pala
4	Pullangiyodu Moorthy kavu	Pullangiyodu	Alayamon	0.08	Family Trust	Poovam, Kanikonna, Pana, Mulluvenga, pully vaha, Maruthy
5	Kokkottu moorthy Kavu	Agasthyakkode	Anchal	0.12	Family Trust	Mottal, Poovam, Marotty, elavu, Kanjiram,
IV. Chadayamangalam Block						
1	Ayiravali Temple Kavu	Malapperur	Ittiva	0.16	Ayiravali Temple committee	Charu, Vatta, Kashumavu, Pala, maruthy, Karimaram, Anjily, Elippa
2	Vettikkavu Nagaraja Kavu	Malapperur	Ittiva	0.01	Family Trust	Vetty, Gulmohar, Chembakam, Alu
V. Pathanapuram Block						
1	Muthan kavu	Kudayam	Pathanapuram	0.028	Family Trust	Pala, Rubber, Pullanji

Appendix 20 A -IIIA	
Name of the Sector: Forest	
List Of Mammals	
COMMON NAME	SCIENTIFIC NAME
Slender Loris	<i>Loris tardigradus malabaricus</i>
Bonnet macaque	<i>Macaca radiata</i>
Nilgiri langur	<i>Trachypithecus johni</i>
Lion- tailed macaque	<i>Macaca silenus</i>
Jungle cat	<i>Felis chaus</i>
Tiger	<i>Panthera tigris</i>
Leopard	<i>Panthera pardus</i>
Small Indian civet	<i>Viverricula indica</i>
Toddy cat	<i>Paradoxurus hemaphroditus</i>
Brown palm civet	<i>Paradoxurus jerdoni</i>
Common mongoose	<i>Herpestes edwardsii</i>
Stripe necked mongoose	<i>Herpestes vitticollis</i>
Ruddy mongoose	<i>Herpestes smithii</i>
Brown mongoose	<i>Herpestes fuscus</i>
Wild dog	<i>Cuon alpinus</i>
Sloth bear	<i>Melursus ursinus</i>
Indian flying fox	<i>Pteropus giganteus</i>
Indian false vampire	<i>Megaderma lyra</i>
Three striped palm squirrel	<i>Funambulus palnaram</i>
Malabar giant squirrel	<i>Ratufa indica maxima</i>
Flying squirrel	<i>Peaurista Peaurista</i>
Small travancore flying squirrel	<i>Petinomys fuscocapillus</i>
Indian mole rat.	<i>Bandicota bengalensis</i>
Common house rat	<i>Rattus rattus</i>
Brown rat	<i>Rattus norvegicus</i>
Indian porcupine	<i>Hystrix indica</i>
Elephant	<i>Blephas maximus</i>
Gaur	<i>Bos gaurus</i>
Sam bar	<i>Cervus unicolor</i>
Barking deer	<i>Muntjac muntjac</i>
Mouse deer	<i>Tragulus memna</i>
Wild boar	<i>Sus scrofa</i>
Indian pangolin	<i>Manis crassicaudata</i>
Black naped hare	<i>Lepus nigricollis</i>

Appendix 20 A -IIIB	
Name of the Sector: Forest	
List Of Reptiles	
NAME	FAMILY
Chamaeleo, zeylanicus	Varanidae
Varanus bengalensis	Agamidae
Psammophilus blanfordianus	
Draco dussumieri	
Calotes elliotii	
Calotes calotes	
Calotes versicolor	
Calotes rouxi	Geckonidae
Hemidactylus brooki	
Hemidactylus frenatus	
Cnemaspis kandiana	
Hemidactylus leshennaulti	
Mabuya carinata	
Mabuya beddomii	
Mabuya macularius	Scincidae
Sphenomorphus dussumieri	
Ristella beddomii	Boidae
Eryx conicus	Pythoninae
Python molurus	Typhlopidae
Typhlops acutus	
Brachiolepidium rhodogaster	Colubridae
Elaphe helena	
Ahaetulla nasutus	
Boiga ceylonensis	
Boiga trigonata	
Dendrelaphis tristis	
Dendrelaphis caudolineata	
Pas mucosus	
Xenochrophis piscator	
Oligodon amensis	
Oligodon taeniolatus	
Lycodon aulicus	Viperidae
Hypnale hypnale	
Daboia russelli	
Trimeresurus macrolepis	

Appendix 20 A -IIC	
Name of the Sector: Forest	
List Of Fishes	
NAME	FAMILY
Parambassis thomassi	Ambassidae
Anguilla bengalensis bengalensis	Anguillidae
Aplochilus lineatus	Aplocheilidae
Batasio travancorica	Bagridae
Mystus montanus	Bagridae
Mesonoemacheilus guentheri	Balitoridae
Mesonoemacheilus triangularis	Balitoridae
Oreonectes koxalensis	Balitoridae
Schistura denisonii	Balitoridae
Travancorica jonesi	Balitoridae
Xenentodon cancila	Balitoridae
Channa marulius	Channidae
Channa orientalis	Channidae
Channa striatus	Channidae
Clarias dussumieri	Cichlidae
Barilius bakeri	Cyprinidae
Barilius gatensis	Cyprinidae
Bhavana australis	Cyprinidae
Danio aequipinnatus	Cyprinidae
Esomus danricus	Cyprinidae
Garra mullya	Cyprinidae
Gonoproktopterus curmuca	Cyprinidae
Gonoproktopterus kurali	Cyprinidae
Lepidocephalichthys thermalis	Cyprinidae
Neolissochilus wynadensis	Cyprinidae
Parluciosoma daniconius	Cyprinidae
Puntius amphibius	Cyprinidae
Puntius arulius	Cyprinidae
Puntius chola	Cyprinidae
Puntius denisonii	Cyprinidae
Puntius fasciatus	Cyprinidae
Puntius filamentosus	Cyprinidae
Puntius sarana subnasutus	Cyprinidae
Puntius ticto	Cyprinidae
Puntius vittatus	Cyprinidae
Salmostoma boopis	Cyprinidae
Tor khudree	Cyprinidae
Awaous gutum	Gobiidae
Heteropneustes fossilis	Heteropneustidae
Hastacembelus armatus	Mastacembelidae
Ompok bimaculatus	Siluridae
Glyptothorax madraspatanum	Sisoridae

Appendix 20 A - IV			
Name of the Sector: Forest			
List of Eco tourism spots, Kollam			
Sl. No.	Name of Division	Locality	No. of visitors
1	ACHANKOVIL DIVISION	Manalar	28,000
2	KOLLAM NON FOREST AREA	Nil	0
3	KONNI DIVISION	Nil	0
4	PUNALUR DIVISION	Nil	0
5	SHENTHARUNI DIVISION	Thenmala Eco-tourism	1,20,000
6	THENMALA DIVISION	Palaruvi	84,500
7	TRIVANDRUM DIVISION	Nil	0

Appendix 21A-1		
Name of Sector: Environment		
Designated Best Use & Water Quality Criteria for various uses		
Designated Best Use (D.B.U)	Class of water	Primary water quality criteria
Drinking water source without conventional treatment but after disinfection	A	1. Total Coliforms Organism MPN/100ml shall be 50 or less
		2. pH between 6.5&8.5
		3. D.O 6mg/l or more
		4. B.O.D 5days 20oC 2mg/l or less
Outdoor bathing (Organised)	B	1Total Coliforms Organism MPN/100m; shall be 500 or less
		2. pH between 6.5 & 8.5
		3. D.O 5mg/l or more
		4. B.O.D 5 days at 20oC 3mg/lit or less
Drinking water source with conventional treatment followed by disinfection	C	1.Total Coliforms Organism pN/100ml shall be 5000 or less
		2. 2.pH between 6 & 9
		3.D.O 4mg/l or more
		4.B.O.D 5days 20oc 3mg/l or less
Propagation of wild life, fisheries	D	1. pH between 6.5 & 8.5
		2. D.O 4mg/l or more
		3. Free Ammonia(as N) 1.2mg/l or less
Irrigation, Industrial Cooling, Controlled Waste Disposal	E	1. pH between 6 & 8.5
		2. Electrical Conductivity at 25oC mhos
		3. Sodium absorption ratio max 26
		4. Boron, Max 2mg/l

Appendix 21A-2

STANDARDS IN RESPECT OF NOISE POLLUTION
THE GAZETTE OF INDIA : EXTRAORDINARY [Part II-Sec 3 (ii)]
SCHEDULE
(See rule 3(1) and 4(1))
Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area/Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note :-

1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is defined as an area comprising not less than 100 metres around hospitals, educational institutions and courts. The silence zones are zones which are declared as such by the competent authority.
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

*dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A "decibel" is a unit in which noise is measured.

"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

[F.No. Q-14012/1/96-CPA]
VIJAI SHARMA, Jt. Secy.

Appendix 26-1		
Name of the Sector: Tourism		
Major Tourism attractions in Kollam		
Nature based Tourism		
Sl.No.	Name of LSGI	Details
1	Anchal	Kudukkathpara & Malavattam water falls
2	Kulathupuzha	Neduvanoor Kadavu
3	Thenmala	Ambanadu Tea Estate, Palaruvi, Ottakkal Waterfalls
4	Yeroor	Oliariku river
5	Thrikkaruva	Sambranikodi Munambu
6	Chadayamangalam	Pattathil Water falls
7	Elammadu	Pattayappara water falls
8	Kadakkal	MattidamPara
9	Kizhaekallada	Chittumala Chira
10	Munrothuruthu	Village Tourism
11	Perayam	Kuthiramunambu water falls
12	Nedumpana	Valiyamala & Kallakkal
13	Aleppad	Azcekkal Estury
14	Veliyam	Maruthwamala
15	Thazhava	Vattakkalyal
16	Sasthamcottah	Lake
17	Mylom	Ayiravallippara
18	Kollam Corporation	Ashtamudi lake, Mangroves, Beaches
19	Paravoor Municipality	Estuary, Lake, Pozheekara
Heritage Tourism		
Sl.No.	Name of LSGI	Details
1	Aryankavu	Kannara Bridge
2	Kulathupuzha	Kannadi Bungalow
3	Thenmala	Pre Indus valley Civilisation rock engravings, GuestHouse, Palaruvi Kalmadapam
4	Velinaloor	Pallikkapuzha bridge
5	Neendakara	Ruins of ancient light house
6	Thekkumbhagam	Ancient house of Azhakathu Padmanabha Padathalavan
7	Munrothuruthu	MunroBungalow
8	Chalhanoor	Chennamath Siva Temple(ASI)
9	Kottarakkara	Old palaces, Maniveedu
10	Clappana	Open gallery
11	Kualashekharapuram	Old buildings
12	Kulakkada	Kulakkada Nambimadam
13	Vettikavala	Heritage buildings
14	Kollam Corporation	Govt. Guest hosue, NCC building, Old Church-cemetery, ruins of forts, Thevally palace, Bishoppalace, Old rly sttionbldg, cheenakkottaram, Aanavaathilkaval, light house, clock tower, mummukkunnu bangalow, Dutch/English cemetery, TKM Engineering college bldg.
15	Paravoor Municipality	Pozhikara Palace
16	Punalur Municipality	Suspension bridge

Cultural Tourism		
Sl.No.	Name of LSGI	Details
1	Kadakkal	Kadakkal Thiruvathira
2	Velinaloor	Kalachanda(Cattle Market)
3	Panmana	Panmana festival and Elephant procession
4	Kizhaekalleda	Kettukazhcha
5	Munrothuruthu	Kallada Boat race
6	Chathanoor	Boat race
7	Alappad	Cheriyazeekal elephant feeding, Kathakali performance
8	Karunagapally	Kanneti boat race & Houseboat building units
9	Thodiyoor	Screwpine industry
10	Kottarakkara	Kathakali museum
11	Pooyapally	Maruthamanpalli CattleRace
12	Oachira	Ochira fight, 12 Lamp festival, 28th Onam
13	Thazhava	Screwpine industry
14	Pathanapuram	Chandanakkudam festival
15	Pattazhy	Pattazhipooram
16	Thalavoor	Fire works
17	Poruvazhy	Malanada festival, Malarkuda festival, Chandanakkudam festival
18	Vettikavala	Kathakali
19	Kollam Corporation	Paarampara museum, Police Museum
20	Paravoor Municipality	Elephant procession and elephant stable
Adventure Tourism		
Sl.No.	Name of LSGI	Details
1	Aryankavu	1.Trekking in Aryancavu Forest
2	Kulathupuzha	1.Trekking in Kulathupuzha Forest
3	Thenmala	1. Boating & Trekking at Tenmala Eco-Tourism
4	Chadayamangalam	1. Jadayu rock at Chadayamangalam
5	Kollam Corporation	Ashramam walk way, Adventure Park, Other parks
6	Paravoor Municipality	Parasailing
Religious/Pilgrimage Tourism		
Sl.No.	Name of LSGI	Details
1	Aryankavu	Aryancavu Temple
2	Kulathupuzha	Kulathupuzha Temple
3	Thrkkadavoor	Kadavoor temple & Church
4	Thrikkaruva	Ashtamudi Veerabhadra Temple
5	Chadayamangalam	Chandayamangalam temple
6	Ittira	Kottukal cave temple
7	Kadakkal	Kadakkal Temple
8	Velinaloor	Sreerama temple
9	Chavara	Kottankulangara temple
10	Neendakara	Maruthadi temple & Neendakara Church
11	Panmana	Panmana Ashram
12	Thevalakkara	Tekkan Guruvayoor temple
13	Kundara	Kundara Valiyapalli
14	Munrothuruthu	Edachal Church
15	Chathanoor	SriBhoothanatha Temple
16	Alappad	Amrithapuri Ashramam
17	Kottarakkara	Kottarakkara temple
18	Elampaloor	Elampallur Temple
19	Mayyanadu	Subhramanyaswami temple,PulichiraChurch
20	Oachira	Ochira temple
21	Pattazhy	Temple
22	Thalavoor	Devi temple
23	Poruvazhy	Duryodhana Temple,narasimha temple
24	Sasthamcottah	Temple
25	Vettikavala	Temple
26	Kollam Corporation	Ashramam & Anandawalleshwaram temple, Jonakappuram valiyapalli, chinakkadapalli, pattaithu palli, CSI church, Mt.carmel church, thankassery, tuet church

Appendix 27

A. Special Technical Advisory Committee

I. Agriculture

1. Sri.N.S.Prasannakumar, DPC Member (Chairman)
2. Sri. Sharad Chandra Kumar, Principal Agricultural Officer, Kollam (Convener)
3. Deputy Director of Agriculture, Principal Agricultural Office, Kollam.
4. Representative, Agriculture University Centre, Sadanandapuram, Kottarakkara
5. Representative, Tropical Botanical Garden & Research Institute, Palode, Thiruvananthapuram.
6. Sri.George Oommen, (Rtd. J.D, Agriculture), House No.22, Thevally Nagar, Kollam-9
7. Sri.Balachandran Pillai (Rtd. J.D. Agriculture)
8. Dr.U.Muhammed Kunju, Rtd. Director, P.G. Studies, Kerala Agricultural University
9. Sri.P.Y.Varghese, (Rtd.J.D. Agriculture) Padavila, Kundara, Kollam

II. Irrigation

1. Sri.S.Subash, DPC Member (Chairman)
2. Smt. G.Indira, Executive Engineer, Minor Irrigation, Asramam, Kollam (Convener)
3. Executive Engineer (Irrigation) District Soil Conservation Officer, Kollam.

III. Watershed Development and Land use

1. Sri.Kollayil Sudevan, DPC Member (Chairman)
2. Sri. K.C.Harilal, District Soil Conservation Officer, Kollam (Convener)
3. Assistant Director, Soil Survey, Kollam (Joint Convener)
4. Assistant Engineer, District soil conservation office, Kollam
5. Principal Agricultural Officer/ Representative, Kollam.
6. Representative, Centre for Earth Sciences Studies, Thiruvananthapuram.
7. Representative, Land Use Board.
8. Sri.Habibulla, Sulfi Manzil, Muslim Street, Kottarakkara, Kollam
9. Shri.N.Jyotheendra Nadh, Rtd. J.D.A, Nadha Mandiram, Thevally P.O
10. Sri.D.Subash Chandra Bose, Rtd. Soil Conservation Officer, Thayyil Veedu, Chirakkarathazham, Kollam
11. Shri.J.Muhammed Kunju, Rtd. Soil Conservation Officer, Pulliyil Veedu, Aakkolil Cheri, Koottikkada P.O, Thattamala, Kollam

IV. Animal Husbandry and Dairy Development

1. Smt.J.Chinchu Rani, DPC Member (Chairperson)
2. Dr. S.Chandran Kutty, District Animal Husbandry Officer, Kollam (Convener)
3. Deputy Director, Dairy Development, Kollam.
4. Principal, Dairy Training Centre, Oachira, Kollam.
5. Dairy Development Officer, Oachira, Kollam.
6. Dairy Development Officer, Deputy Director Office (Dairy Development), Kollam.
7. Dr.P. Bahuleyan, Rtd. Joint Director Cherusseril, Thevally P.O, Kollam

V. Fisheries

1. Sri.P.B.Sathyadevan, DPC Member (Chairman)
2. Sri. K.J. Prasanna Kumar, Deputy Director, Fisheries, Kollam (Convener)
3. Chief Executive Officer, B.F.F.D.A., Kollam.
4. Chief Executive Officer, F.F.D.A., Kollam
5. Project Officer, MALSIAFED Kollam
6. Dr.N.Ramanujan, Rtd. Professor, Indusree, Pattathanam East, Kollam
7. K.Sudhakaran, Rtd. Joint Director of Fisheries, Vishakam, House No.2, Keerthi Nagar, Near Nair's Hospital, Kadappakkada, Kollam
8. Sri.Balachandran Pillai, Rtd. Deputy Director, Fisheries
9. Dr.Appukkuttan, Rtd. Scientist, CMFRI

VI. Industries, Co-operation, Trade and Commerce

1. Sri.Sethumadhavan, DPC Member (Chairman)
2. Sri.Salim B' ker, General Manager, D.I.C., Kollam (Convener)
3. Joint Registrar of Co-Operative Societies, Kollam.
4. Project Officer, Khadi & Village Industries, Kollam.
5. District Officer, Artisans & Silks Workers Welfare Fund, Kollam.
6. Representative, Kerala Minerals & Metals Limited, Chavara, Kollam.
7. Representative, Kerala State Cashew Development Corporation, Kollam
8. Shri.D.Balachandran, Sumathi Bhavan, Mayyanad P.O, Kollam

9. Shahul Hameed (Retired General Manager, Industries) Manjapparavila veedu, Manjappara P.O, Ayoor, Kollam
10. M.Sheik Pareeth, Babukkan purayidam, Nedukunnu, Pathanapuram (P.O),Kollam
11. N.Rajendran, Kochuthundil Veedu, Kareepra, Nallimukku (P.O)
12. P.K. Karthikeyan Nair, (Retired J.R), Athira, Thekkumbhagam, Paravur, Kollam

VII. Health

1. Adv.C.P.Sudeesh Kumar, DPC Member (Chairman)
2. Dr. K.I George, District Medical Officer (Allopathy), Kollam (Convener)
3. Dr. K. Nalini, District Medical Officer (Homeo), Kollam
4. Dr. E.M Saith, DMO (ISM), Kollam
5. Deputy Director (Homeo), Kollam
6. Health Officer, Kollam Corporation
7. Dr.Uma Mohan Das, Rtd. D.M.O. (H) Vathilad, Near Velankanni Shrine, Kollam
8. Shri.N.Sugathan, Rtd.Biologist, N.F.C.P.U, Vinayaka, No.81, NTV Nagar, Kadappakkada, Kollam
9. Dr.N.Gopinathan (Rtd. Jilla Maleria Officer), Sreekrishna Vilasam, Mundackal, Kollam

VIII. Drinking water and Sanitation

1. Smt.J.Chinchu Rani, DPC Member (Chairperson)
2. Sri. M. Krishna Kumar, Executive Engineer, Kerala Water Authority, Water Supply Division, Kollam (Convener)
3. Executive Engineer, Ground Water Department, Kollam
4. Programme Officer, Socio-Economic Unit Foundation, Kollam
5. Assistant Executive Engineer, Rajiv Gandhi Kudivella Padhadi, District Panchayat, Kollam
6. Shri.N.Nalinakshan, Alumoottil Veedu, Mylode P.O, Pooyappally, Kottarakkara

IX. Infrastructure (Roads, Bridges and Housing)

1. Sri.George Mathew, DPC Member (Chairman)
2. Sri. Thomas Mathew, Executive Engineer, Roads, Kollam (Convener)
3. Executive Engineer, P.W.D., District Panchayat Division, Kollam
4. Executive Secretary, Nirmithi Kendra, Kollam
5. Executive Engineer, Kerala State Housing Board, Kollam
6. Executive Engineer, P.W.D. Building division, Kollam
7. Deputy Collector (Housing), Kollam
8. Representative, NATPAC, Thiruvananthapuram
9. Executive Engineer, National Highway, Kollam
10. Executive Engineer, Investigation & Planning, P.W.D., Kollam
11. Assistant Executive Engineer, D.R.D.A., Kollam
12. Superintending Engineer, Harbour Engineering Department, Kollam
13. Shri.Viswanathan, (Rtd Executive Engineer) Kailathara, Decentmukku. P.O, Vettilathazham, Kollam
14. Shri.G.Viswambharan, (Rtd. Manager), IRE, Sangeetha, Kaikkulangara North, Kollam

X. Forest, Environment, Mining and Geology

1. Sri.N.S.Prasannakumar, DPC Member (Chairman)
2. Sri. Atsase, Divisional Forest Officer, Thenmala, Kollam (Convener)
3. Sri. S. Sun, Assistant Conservator of Forest, Social Forestry, Kollam. (Joint Convener)
4. Divisional Forest Officer, Achancovil, Kollam
5. Divisional Forest Officer, Punalur, Kollam
6. Sri. G. Yasodharan, Environmental Engineer, Pollution Control Board, Kollam
7. Sri. P.S. Jayachandra Panicker, District Officer, Mining & Geology, Kollam
8. Representative, Kerala Forest Research Institute, Thrissur
9. Representative, C.W.R.D.M., Kozhikode
10. Representative, Centre for Earth Sciences Studies, Thiruvananthapuram
11. Prof. N.Ravi, Verbeena, Mundackal, Kollam

XI. Education

1. Kumari K.Devaki, DPC Member (Chairperson)
2. Sri. V. Rajendran, Deputy Director of Education, Kollam (Convener)
3. Principal, DIET, Kottarakkara
4. Deputy Director, Collegiate Education, Kollam
5. Shri.C.K.S. Banerji, Rajamally, Madannada

XII. Social Welfare, Women & Child Development

1. Smt. Sabitha Beegum, DPC Member (Chairperson)
2. Smt. Thresyamma Michael, District Social Welfare Officer, Kollam (Convener)

3. Assistant Development Commissioner (F.L.P), Kollam
4. Programme Officer, I.C.D.S., Kollam
5. U.S.N.P. Project Officer, Kollam
6. District Woman's Welfare Officer, Kollam

XIII. Poverty Alleviation and Rural Development

1. Sri.A.Manmadhan Nair, DPC Member (Chairman)
2. Sri. G. Anil, Assistant Development Commissioner - General (Convener)
3. Sri. Basheer Ahammed. A, District Mission Co-Ordinator, Kudumpasree Mission (Joint Convener)
4. Project Officer, Kudumbasree, Kollam Corporation
5. Project Officer (D.R.D.A) Representative

XIV. Power and Telecommunication

1. Sri.Kollayil Sudevan, DPC Member (Chairman)
2. Sri. K.Prabhakaran Nair, Deputy, Chief Engineer, K.S.E.B. Electrical Circle, Kollam (Convener)
3. Deputy Chief Engineer, K.S.E.B. Electrical Circle, Kottarakkara, Kollam
4. Deputy Electrical Inspector, Kollam
5. Project Officer, IREP, Chavara
6. Project Officer, IREP, Sadananthapuram, Kottarakkara
7. Shri.K.Janardharan Pillai, (Rtd. Senior Superintendent), Jyothish, Kadappakkada P.O, Kollam

XV. Scheduled Caste / Scheduled Tribe Development

1. Adv.S.Venugopal, DPC Member (Chairman)
2. Sri. D. Venu Gopala Pilla, District Development Officer(In-charge), Scheduled Caste Development, Kollam (Convener)
3. Tribal Development Officer, Punalur
4. Representative, Kerala State Backward Development Corporation
5. Shri.N.Krishnan Kutty, (Rtd. Under Secretary), Sree Lekshmi, Mayyanad P.O, Kollam

XVI. Tourism, Culture, Sports & Youth Affairs

1. Sri.P.B.Sathyadevan, DPC Member (Chairman)
2. Sri. S.Nazar, District Information Officer, Kollam (Convener)
3. Sri. B. Ali Sabrin, District Youth Coordinator, Nehru Yuva Kendra, College Jn., Kollam (Joint Convener)
4. Deputy Director, Public Relations Department, Kollam
5. Programme Coordinator, District Saksharatha Mission, Kollam
6. Sri. K. Shirish, Secretary, D.T.P.C, Kollam
7. Shri.P.Somanadhan, (Rtd. H.M), Sumeru, Mundekkal West
8. Sri.S.G.K.Pillai, Rtd. Commander, Tharangini, Thevally, Kollam
9. Smt. Rajalekshmi Ammal, Rtd. Assistant Excise Commissioner, QMC 24/32, Lekshmi Nivas, Olayil, Kollam

XVII. Human Resource Development

1. Adv.S.Venugopal, DPC Member (Chairman)
2. Sri. R. Balan, Deputy Director, Economics and Statistics, Kollam (Convener)
3. Sri. Thomas, Deputy Director of Panchayat, Kollam

XVIII. Finance

1. Adv.C.P.Sudeesh Kumar, DPC Member (Chairman)
2. Sri. M. Surendran Pillai, Lead Bank Manager, Kollam (Convener)
3. Regional General Manager, NABARD, Kollam
4. Deputy Director, National Savings Scheme, Kollam
5. General Manager, District Co-operative Bank, Kollam

XIX. Spatial Planning Sub Committee

1. Sri.George Mathew, DPC Member (Chairman)
2. Sri. P. Anil Kumar, District Town Planner, Kollam (Convener)
3. Town Planner, Kollam Development Authority
4. Town Planning Officer, Kollam Corporation
5. Sri. Nelson J. District Planning Officer, Kollam.
6. Sri.K.G.Nadarajan, (Rtd. Senior Town Planner), Pattathuvila, Kadappakkada, Kollam
7. Sri. C.Y. Unnunni, (Rtd. Town Planner), Kottukonathu Vikas Bhavan, Channpetta, Anakkulam, Anchal, Kollam
8. Sri.G.Krishnan, (Rtd. Town Planner), J.J. Bhavan, Puliylila, Nallila P.O, Kundara
9. Late K.Janardhanan (Rtd. Deputy Town Planner)
10. Sri.S. Jamal, Member, State Resource Group, Thiruvananthapuram
11. Sri.B. Sunil Kumar, Lecturer (Senior), TKM College of Engineering, Karickode, Kollam
12. Sri.Manoj Kumar Kini, Senior Lecturer, Department of Architecture, College of Engineering, Thiruvananthapuram

B. Spatial Analysis Team

1. Sri. Jacob Easow, Senior Town Planner, Office of the Chief Town Planner, Thiruvananthapuram
2. Sri. K. Devarajan , Senior Town Planner, Office of the Chief Town Planner, Thiruvananthapuram
3. Sri S. Ajaya Kumar, Senior Town Planner, Department of Town and Country Planning
4. Sri. T.V. Kaladharan, Senior Town Planner, Department of Town and Country Planning (Rtd)
5. Sri.P.Anil Kumar, Town Planner, District Town Planning Office, Kollam
6. Sri.C.J. Poulse , Town Planner, Regional Town Planning Office, Kozhikodu
7. Sri. J. Jaya Kumar, Town Planner, Kerala Sustainable Urban Development Project, Thiruvananthapuram
8. Smt.K.S.Girija, Town Planner, Office of the Town Planner, Pathanamthitta
9. Sri. Shaji Joseph, Town Planner, Gosree Island Development Authority, Ernakulam
10. Smt. P.R.Ushakumary, Town Planner, Office of the Chief Town Planner, Thiruvananthapuram
11. Sri. H. Prasanth, Town Planner, Office of the Chief Town Planner, Thiruvananthapuram
12. Sri. S. Ajay Kumar, Deputy Town Planner, IDDP-LDP Project Office, Kollam
13. Sri. K. Baiju, Deputy Town Planner, Office of the Chief Town Planner, Thiruvananthapuram
14. Smt. Shary.M.V, Assistant Town Planner, Office of the Town Planner, Kollam
15. Smt. Jinumole Varghese, Assistant Town Planner, Office of the Town Planner, Kollam

C. Other Officials involved in the preparation of IDDP

I. Agriculture

1. Sri. G. Surendran, Additional Director, Thiruvananthapuram
2. Sri. Pushpangathan, Joint Director, Kerala Seed Development Corporation, Thrissur
3. Sri. P.S. Soman, Joint Director (Rtd.)
4. Sri. S. Mohanachandran, Deputy Director, Horticulture
5. Sri.C. Stanly, Agriculture Department
6. Smt. V.Rajatha, Technical Assistant, Thiruvananthapuram
7. Sri. Hareendran.V.G, Agriculture Officer, Idukki
8. Sri. K. Pradeep Naick, Assistant Soil Chemist, Kollam

II. Irrigation

1. Sri.K.V. Sreenivasan Kartha, Executive Engineer, Quality Control Division, Kollam

III. Watershed Development and Land use

1. Sri. Anil Kumar Babu, Assistant Director of Soil Conservation, Kattapana, Idukki
2. Smt. C.A. Anitha, Soil Conservation Officer, Kottarakkara
3. Smt. Mathura Devadas, Soil Conservation Officer, Kollam
4. Smt.R. Anitha, Soil Survey Officer, Kollam

IV. Animal Husbandry and Dairy Development

1. Dr. J. Padma Kumar, Joint Director, SLBP, Thiruvananthapuram
2. Dr. B. Aravind, Senior Veterinary Surgeon, Veterinary Hospital, Kottiyam
3. Dr. S. Jyothi, Veterinary Surgeon, District Animal Husbandry Office, Kollam
4. Dr. S. Rajesh Kumar, Veterinary Surgeon, Veterinary Poly Clinic, Karunagapally
5. Dr. M. Kamarudeen, Joint Director (Rtd.)

V. Fisheries

1. Smt. Lethy Geroge, Joint Director of Fisheries
2. Sri. Rajendran, Deputy Director of Fisheries
3. Sri. S. Prince, Technical Assistant, Fisheries Station, Neendakara, Kollam
4. Sri. H. Suhair, Extension Officer, FFDA, Kollam
5. Sri. Thomas Varghese, Extension Officer, FFDA, Kollam

VI. Industries, Co-operation, Trade & Commerce

1. Sri. Vijayan Pillai, Manager (Rtd), District Industries Centre, Kollam
2. Sri.E. Salahudeen, Manager, District Industries Centre, Kasargod

VII. Health

1. Dr. N. Prasanna Kumar, District Leprosy Officer(Rtd)
2. Dr. Sasidharan Pillai, Deputy DMO (Rtd.)
3. Smt. P.S. Vijaya Lakshmi, Deputy Mass Media Officer, DMO Office, Kollam
4. Dr. S. Shine, Medical Officer, Govt. Ayurveda Dispensary, Kummil
5. Late Dr. Kishore, MO, District Ayurveda Hospital, Kollam

6. Dr. T. Peethambaran, Deputy DMO (Homeo), Kollam
7. Dr. P.R. Pradeep Kumar, CMO,GHD, Polayathodu, Kollam
8. Smt. Ambili Prasad, ADNMM, Thiruvananthapuram
9. Dr. Susan John, CMO, GHD,Karunagapally
10. Dr. Sreelatha L.B, MO, GHD, Elakamon
11. Sri. Baburaj, Technical Assistant, DMO, Office, Kollam

VIII. Drinking water and Sanitation

1. Sri.A. Mohammad Najeem, Executive Engineer, Kerala Water Authority
2. Sri. Joseph Mathew, Executive Engineer, Kerala Water Authority
3. Sri. Abdul Kalam Azhad, ADC, Total Sanitation
4. Sri. P. Mohanan, Assistant Executive Engineer, Kerala Water Authority
5. Smt. P. Sandhya, Assistant Executive Engineer, TRP(Deputy Project Coordinator)
6. Sri. Santhosh Kumar.S, Assistant Executive Engineer, Chavara, TRP
7. Sri. N.R. Joy, Assistant Executive Engineer, Kerala Water Authority
8. Sri. P. Sajeev, Assistant Executive Engineer, Kerala Water Authority
9. Sri. Arun, Assistant Engineer, Kerala Water Authority

IX. Infrastructure (Roads, Bridges & Housing)

1. Er. E.S. Wilson, Executive Engineer, PWD Roads Division, Kollam
2. Er. Koshy John, Executive Engineer, PWD Roads Division, Kollam
3. Er. Leela M., Assistant Executive Engineer (Tech.), PWD Roads Division, Kollam
4. Er. Samson Lawrence, Assistant Executive Engineer (Tech.), PWD Roads Division, Kollam
5. Er. Sirajudeen A., Assistant Executive Engineer, PWD Roads Subdivision, Kollam
6. Er. Ashraf S.M., Assistant Engineer, PWD I&P (Roads) Section No.I, Kollam
7. Er. John Kenneth D., Assistant Engineer, PWD Bridges Section No.I, Kollam
8. Er. Russell Ravindranath, Assistant Engineer, PWD I&P (Roads) Section No.III, Kollam

X. Forest, Environment, Mining & Geology

1. Sri. Pradeep Kumar, Divisional Forest Officer, Thiruvananthapuram
2. Sri. Pukazhendi IFS, Divisional Forest Officer, Konni
3. Sri. George Varghese IFS (Rtd.)
4. Sri. B. Prem Kumar, Assistant Conservator of Forests
5. Sri. Sai, Environmental Engineer, Pollution Control Board, Thiruvananthapuram
6. Sri. Gopa Kumar, Geologist, Department of Mining and Geology
7. Sri. H.M Sabeen, Assistant Geologist, Department of Mining and Geology

XI. Education

1. Sri. S. Balakrishnan, Former, Deputy Director, Education
2. Sri. M. Vijayan, Former, Deputy Director, Education
3. Sri. G. Chandrasekharan Unnithan, Assistant Provident Fund Officer, Office of the Deputy Director of Education, Kollam

XII. Social Welfare, Women & Child Development

1. Smt. Nadeera Kareem, District Social Welfare Officer (Rtd.)
2. Sri. P. Rajan, Child Development Project Officer (Rtd.),
3. Sri. M. Abbas, Programme Officer, ICDS Cell, Kollam
4. Sri. T. Vinod, District Social Welfare Office, Kollam
5. Sri. Naushad, District Officer, Fire Department
6. Sri. Raj. B, Fire Department
7. Sri. Fernandez Kitty, Fire Department

XIII. Poverty Alleviation and Rural Development

1. Sri. L.P. Chithir, Assistant Development Commissioner, Thiruvananthapuram
2. Sri. John A D' Cruz, Chittumala Block Panchayat

XIV. Power and Telecommunication

1. Sri. S. Rajendran, Deputy Chief Engineer, KSEB
2. Sri. B. Pradeep, Executive Engineer, KSEB
3. Smt. S. Prasanna Kumari, Executive Engineer, KSEB
4. Smt. Sheela R Pillai, Executive Engineer, Office of the Deputy Chief Engineer, Electrical Circle, KSEB, Kollam

XV. Scheduled Caste / Scheduled Tribe Development

1. Sri. R.Rajendran Nair, Additional Director, Thiruvananthapuram
2. Smt. A.X. Ancy, Additional Director (Rtd.)
3. Sri. K.A. Mohanan, Joint Director, Thiruvananthapuram

4. Smt. Vilasini, DDO (Rtd.)
5. Sri. V. Soman Nair, DDO
6. Sri. N. Raveendran, SC Development Officer, Pathanapuram
7. Smt. M.P. Pushpalatha, UD Compiler, Town Panning Office, Kollam
8. Sri. Shibulal, UD Compiler, SC Development Office, Kollam

XVI. Tourism, Culture, Sports & Youth Affairs

1. Sri. Dileep Kumar, Former Secretary, DTPC, Kollam
2. Sri. S. Vijaya Kumar, Former Secretary, DTPC, Kollam

XVII. Human Resource Development

1. Sri. V. Ramachandran, Former Deputy Director, Department of Economics and Statistics
2. Sri. R. Sree Kumar, Former Deputy Director, Department of Economics and Statistics
3. Sri. S. Abdul Salam, Assistant Director, Office of the Chief Town Planner, Thiruvananthapuram
4. Late M. Bhaskaran Nair, Department of Economics and Statistics

XVIII. Finance

1. Sri. H. Chandra Sekhara Iyer, Senior Manager, Indian Bank

D. Supporting Staff of Office of the Town Planner, Kollam

1. Sri. N. Satyababu, Assistant Town Planner
2. Sri. M. Remanan Pilla, I Grade Town Planning Surveyor (HG) (Rtd.)
3. Sri. Y. Sirajudeen Kutty, I Grade Town Planning Surveyor (HG)
4. Sri. D. Jayapalan, I Grade Town Planning Surveyor
5. Sri. G. Sunil Kumar, II Grade Town Planning Surveyor
6. Sri. A. Joseph, Upper Division Cleark (HG)
7. Smt. J. Sheela, Upper Division Cleark (HG)
8. Sri. J. Shaji Kumar, Chainman (HG)
9. Sri. I. Babu, Chainman
10. Sri. P. Anil Kumar, Peon
11. Sri. V. Anil Kumar, Peon
12. Sri. G. Rajesh, Driver
12. Kum: Priyanka P.J. Planning Assistant, IDDP-LDP Project Office, Kollam
13. Smt. A. Minimol, Computer Assistant, IDDP-LDP Project Office, Kollam
14. Smt. Ancy. R.S., Computer Assistant, IDDP-LDP Project Office, Kollam
15. Sri. Vinod Kumar. C., Secretarial Assistant, IDDP-LDP Project Office, Kollam

E. Supporting Staff from other Offices of Town and Country Planning Department

1. Sri. N.K. Raju, Deputy Town Planner, Ernakulam
2. Sri. P. Anil Kumar, Deputy Town Planner, Kottayam
3. Sri. M. A. Masoom, Deputy Town Planner, Town and Country Planning Department
4. Sri. K. Viswanathan, Assistant Town Planner, Office of the Town Planner, Idukki
5. Sri. K. Jalajakshi, Assistant Town Planner, Office of the Chief Town Planner, Thiruvananthapuram
6. Sri. Jose K Syriac, Assistant Town Planner, Kottayam
7. Sri. O. Samuel, Department of Economics and Statistics
8. Sri. G. Arun, II Grade Town Planning Surveyor, Office of the Town Planner, Pathanamthitta
9. Sri. Sirajudeen A, Artist cum Photographer, Office of the Chief Town Planner, Thiruvananthapuram
10. Sri. K.G. John, Office of the Chief Town Planner, Thiruvananthapuram
11. Sri. M.P. Jobert, I Grade D'man, Kottayam
12. Sri. M. Muhammed Sidhick, Office of the Town Planner, Pathanamthitta
13. Sri. V. Sasi, Office of the Town Planner, Pathanamthitta
14. Sri. J. Jayaprakash (Joined Irrigation Department)



**Manual for Integrated District Planning,
Planning Commission, Government of India**

*“The Kollam experience, particularly
the methodologies developed
by it can be easily upscaled to
other districts too.”*

**The Committee for Evaluation of
Decentralised Planning and Development,
Government of Kerala**

*“This was like a demonstration
mission.Creating it is only
honouring the Constitutional mandate
enshrined in Article 243ZD in letter and in spirit.”*

**The 57th National Town and Country
Planners’ Congress 2009**

*“ Based on the experience gained from the
Kollam Model of Development Plan, an
exercise for designing a fast track district
development plan along with its handbook, manuals,
toolkit etc. may be prepared.”*