GOVERNMENT OF KERALA

INFRASTRUCTURE STATISTICS OF KERALA 2011-12

Department of Economics and Statistics, Kerala

INFRASTRUCTURE STATISTICS OF KERALA 2011

PREFACE

In Kerala, the God's own country, the periodicity of generation of data on the suggested indicator is either annual or it depends on the frequency of related survey/records. Since the data corresponding to the year of review are not available, the latest figures of year under reference have been collected and consolidated to prepare this report. This report provides a single comprehensive source of infrastructure statistics for measure of transport, energy, communications and water infrastructure.Comprehensive and reliable statistics on the infrastructure sectors would play a prime role for the policy makers to determine infrastructure priorities, track progress on infrastructure development, benchmark performance against peers, and evaluate the impact of past investments. This report presents an overview of infrastructure statistics requirement of the State of Kerala.

This publication is the first and foremost of its kind in the Department of Economics and Statistics as well as in the State. This present document will help readers gain interesting insight in respect of the infrastructure statistics development for the State of Kerala.

I express my deep gratitude to all the data source agencies for their active co-operation, contribution and willing support extended without which it would have not been possible to this department to bring out the publication in time and in its present form.

This document has taken shape and come out due to the efforts of I&ES Division under the guidance and supervision of Sri. T.Gorkey Jose, Additional Director (P). I would like to place my due record of appreciation to the officers in the I& ES Division for the strenuous effort for the collection of data, analysis and computerization of the report made by them.

Suggestions, if any, to improve the quality, contents and presentation of this publication are most welcome.

THIRUVANANTHAPURAM
08- 01- 2013

V .RAMACHANDRAN
DIRECTOR

Introduction

INFRASTRUCTURE DEVELOPMENT

Infrastructure is a key driver of economic growth and its development has the potential to fuel the economy. Creation and maintenance of physical infrastructure facilities is also a pre-requisite to attract foreign funds and boost the growth pace. Infrastructure is understood as an important input for industrial and overall economic development. However, without dependable statistics on the infrastructure sectors it is difficult for policy makers to determine infrastructure priorities, track progress on infrastructure development, benchmark performance against peers, and evaluate the impact of past investments. The need for comprehensive, comparable and reliable information on infrastructure is widely recognized. The key components of physical infrastructure viz.power, roads, railways, ports, airports and telecommunications were traditionally in the exclusive domain of the Government. An over view of some of the key infrastructure facilities in the State are indicated in the subsequent sections.

Extensive and efficient infrastructure is critical for ensuring the real functioning of the economy, as it is an important factor determining the location of economic activity and the kinds of activities or sectors that can develop in a particular economy. Poor infrastructure impedes a nation's economic growth and international competitiveness. It is a critical enabler for economic growth and contributes significantly to human development, and the attainment of the Millennium Development Goals (MDG).

INFRASTRUCTURE STATISTICS-THE CORE STATISTICS

Infrastructure forms the foundation on which social, economic and Industrial Development is built. Kerala is among the well performing states in India and holds an important position in the industrial front. The state holds significant industrial potential owing to good infrastructure facilities like power, transport system, airports, port and harbours and availability of rare materials. Central agencies like Railways, National Highways, Ports, Post and Telegraph, Telecommunication and Civil Aviation Authorities play a significant role in providing infrastructure facilities. Measuring infrastructure performance is required for decision making purposes to improve the

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availability and capacity of existing infrastructure and extend it in other directions as well. Therefore to create and manage good quality infrastructure, we need to have some measures of infrastructure. The infrastructure statistics are although available in dispersed manner, there is a need to compile these statistics in a consolidated and comprehensive way that can be useful for the policy makers and researchers. The productivity growth has been higher in countries with an adequate and efficient supply of infrastructure services. Provision of infrastructure services to meet the demands of business, households and other users is one of the major challenges of economic development. In an increasingly recognized world, availability of good quality infrastructure is a crucial factor in attracting foreign investments. Availability and accessibility of adequate infrastructure in a country on par with international community is an indicator of the presence of high quality of life. Some of the Infrastructure definitions used are detailed below.

- Road transport includes the administration of affairs concerning the operation, use, construction, and maintenance of road transport systems and facilities (roads, bridges, tunnels, parking facilities, bus terminals, and so on). It includes highways, urban and rural roads, streets, bicycle paths, and footpaths.

- Railway transport includes the administration of affairs and services concerning the operation, use, construction, or maintenance of railway transport systems and facilities
(Railway roadbeds, terminals, tunnels, bridges, embankments, cuttings, and so on). It includes long-line and interurban railway transport systems; urban rapid transit railway systems, and other street railway transport systems; and the acquisition and maintenance of rolling stock.

- Maritime transport includes the administration of affairs and services concerning the operation, use, construction, and maintenance of inland, coastal, and ocean transport systems and facilities (harbors, docks, navigation aids and equipment, canals, bridges, tunnels, channels, breakwaters, piers, wharves, terminals, and so on).

- Air transport includes the administration of affairs and services concerning the operation, use, construction, and maintenance of air transport systems and facilities (airports, runways, terminals, hangars, navigation aids and equipment, air control amenities, and so on). It also includes radio and satellite navigation aids; emergency rescue services; scheduled and nonscheduled freight and passenger services; and the regulation and control of flying by private individuals.

- Availability of industrial infrastructure: Includes all the common facilities that are required to facilitate growth of industrialization in a region like industrial parks/ estates/ growth centers
- Water supply includes the administration of water supply affairs, the assessment of future needs and the determination of available resources to meet those needs, and the supervision and regulation of all facets of portable water supply including water purity, price, and quality controls.

- Sanitation (wastewater management) includes the administration, supervision, inspection, operation, and support of sewerage systems and wastewater treatment; Electricity (power) covers both traditional sources of electricity such as thermal or hydropower supplies and newer sources such as wind or solar; the administration of electricity affairs and services; the construction, development, and rationalized exploitation of electricity supplies; and the supervision and regulation of the generation, transmission, and distribution of electricity;

INFRASTRUCTURE STATISTICS OF KERALA -An Overview

Statistics related to infrastructure are important in determining the availability of inputs that are crucial to a wide variety of productive activities. There may be divergence of opinion whether infrastructure should be created in response to demand or in anticipation of demand. There is no denying, however, that its non-availability will act as a severe constraint on the productive capacities of the economy. Statistics relating to various types of infrastructure as well as its geographic distribution will be important for policy and planning purposes, as well as in guiding investment decisions. Data relating to infrastructure should be complete, accurate and up to date.

Composition of Infrastructure Sector

(a) Construction

(b) Electricity generation, transmission and distribution

(c) Gas generation and distribution through pipes

(d) Water works and supply

(e) Non-conventional energy generation and distribution

(f) Railway tracks, signalling system and stations

(g) Roads and bridges, runaways and other airport facilities

(h) Telephone lines and telecommunications network

(i) Pipelines for water, crude oil, slurry, etc.

(j) Waterways

(k) Port facilities

(l) Canal networks for irrigation

(m) Sanitation and sewerage

Based on these parameters, six sectors have been identified as infrastructure. These are:

i. Transport
ii. Communication
iii. Energy
iv. Drinking water supply and sanitation
v. Irrigation
vi. Storage

SECTION A: TRANSPORT INFRASTRUCTURE

Transport infrastructure facilitates the transportation of people and goods and provides them access to markets, employment and investment opportunities. Transport infrastructure is thus an essential component of the economy. An efficient transportation system can have a multiplier effect on the economy whereas a deficient transportation system can result in economic loss. For efficient transport system, an adequate infrastructure is very important. With growing population there is a need to provide matching transport infrastructure to avoid overcrowding, overloading and poor maintenance of the available infrastructure.

Transportation can be provided by various modes depending on the surface over which one has to travel – land (road, rail, and pipelines), water (shipping) and air. Road transportation: Road transportation is a large consumer of space and has high maintenance costs, both for vehicles and infrastructures. Rail transportation: Although expensive to build rail transportation provides movement of people and heavy loads to long distances. Heavy industries are linked by Rail transportation. Maritime transportation: Maritime transportation is the most effective mode to move large quantities of cargo over long distances.

Air transportation: Air transportation has unlimited routes but are constrained by site for landing and takeoff of planes, climate, fog and aerial currents. Air transportation is especially useful in long distance mobility of people and has been one of the most important factors in the globalisation.

For compilation of infrastructure statistics, transport sector has been divided into four sub sectors viz. Roads, Railways, Inland Waterways, Sea & Coastal Transport and Airways.

SECTION B COMMUNICATION INFRASTRUCTURE

Communication is an important part of economic development. It facilitates exchange of commercial activities and integrates the nation economically and socially. Communication system connects a place to rest of the world and provides facilities to trade both nationally and internationally. Telecommunication and posts are the two main constituents of communication system.

Postal communication: Postal communication system had been the main method of communication in India for nearly a century and half. It is viewed as the most dependable means of written communication. Postal services have provided other services as well in addition to delivery of letters. These are:

- Delivery of letter and other mail
- Savings Bank operations
- Money transfer
- Provision of Life Insurance

It is used as the most reliable means of sending money through money orders and for delivering articles of value. The banking services provided by Post Offices attract a large number of people both from rural and urban areas due to easy accessibility and wide network of post offices.

Telecommunication: Telecommunication is one of the prime support services needed for rapid growth and modernization of various sectors of the economy. Telecommunication has helped to build global business empires. Information tools such as telephones, personal computers and the internet are increasingly critical to economic success and personal advancement. All these help to encourage economic growth. Furthermore, a reliable telecommunications network can improve the productivity and efficiency of other sectors of the economy and enhance the quality of life.

SECTION C: ENERGY INFRASTRUCTURE

Energy is an important factor of economic development of a nation as it is required to meet the demands of industry, commerce and domestic users. Growing economies like India need to have stable and sustainable sources of energy supply as it is an important input in the production process. Indirectly, it also affects the health and education system of the country. Affordable energy directly contributes to reducing poverty, increasing productivity and improving quality of life. An efficient energy system provides better opportunities for industries and production processes. The most visible form of energy, which is often identified with progress in modern civilization, is power, commonly called electricity. It is a critical component of infrastructure that determines the economic development of a country. To increase the availability of electricity, kerala has adopted thermal and hydel resources. In addition to that, Kerala state is endowed with a number of mineral deposits and hence mining has its own significance.

SECTION D: IRRIGATION INFRASTRUCTURE

Irrigation is an essential component of agriculture in India as the rains occur only for three to four months. During rest of the year irrigation is the only source of water for agriculture. Access to good irrigation allows people to increase their productivity. They can also diversify to other crops. Irrigation reduces the vulnerability of farmers to unpredicted rains and other external shocks, thus enhancing their chances of higher productivity and better incomes. Availability of irrigation facilities encourage farmers to switch from low value subsistence production to high valued market oriented production. They can substitute low yielding crops with high yielding and more profitable crops. Irrigation through canals, wells and other sources is considered as a catalyst of economic development of a country.

SECTION E: STORAGE INFRASTRUCTURE

Storage of goods is of vital importance not only in the agriculture sector but also in the industrial sector. In the primary sector that is agriculture, storage is necessary at the farm and fields level; in the secondary sector that is industry, storage is essential at the processing and manufacturing level and in the tertiary level it is

inevitable for the domestic, import and export trade. The necessity for storage arises primarily because of lack of adjustment between the time and place of production of goods and time and place of their consumption. Warehouses play a vital role in the flow of goods from producers to consumers. It helps in combating annual and seasonal fluctuation in production and prices. Provision of facilities for food grains comes under the purview of Department of Food and Public Distribution.

It has been felt that infrastructure being the backbone of all productive processes; the statistics on this sector would become a necessity sooner or later.The detailed classification of infrastructure statistics, relevant definitions for each sub sector and available data are described in the following sections.

SECTION F: WATER SUPPLY AND SANITATION INFRASTRUCTURE

Water is a precious natural resource. Our connection to this invaluable resource is clear, without water a person could die of dehydration in a matter of days, even hours. But it is its scarcity which is the cause of concern in today's time. It is the most basic need to sustain all forms of life on earth. Yet its denied access is the problem with which the world is grappling with. Directly or indirectly, it affects the economic position of the country and hence an important barometer of a country's condition. Lack of improved sanitation facilities and unsafe drinking water sources kills and sickens thousands of children every day and leads to impoverished and diminished opportunities for thousand's more. Poor sanitation, water and hygiene have many other serious repercussions. Women are forced to spend large part of day fetching water, poor farmers and wage earners are less productive due to illness. And hence national economies are ultimate sufferers. Without WASH (water, sanitation and hygiene) sustainable development is impossible.

Unit No	Unit
1	Transport Infrastructure
2	Communication Infrastructure
3	Energy Infrastructure
4	Irrigation Infrastructure
5	Storage Infrastructure
6	Drinking Water Supply & Sanitation

C O N T E N T

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TRANSPORT

TRANSPORT

Connectivity like energy has a strong bearing on the development of different sectors of the economy. Connectivity and overall development has strong correlations through variety of linkages. First, the development of this infrastructure, especially rural one, has far reaching implications for poverty reduction by improving income-generating opportunities. Second, it raises agricultural production through diffusion of technology and corresponding reduction in prices, and thirdly the connectivity is essential ramification for tourism sector. As such, efficient transport and communication system are the lifelines of National economy. A dense and efficient network of connectivity and communication is the pre-requisite for local, National and Global trade of today.

Transport sector plays a pivotal role in the overall development of the country which enables social and culture and trade development between countries. Transport infrastructure is the backbone of a nation's economy Transport infrastructure facilitates the transportation of people and goods and provides them access to markets, employment and investment opportunities. An efficient transportation system can have a multiplier effect on the economy whereas a deficient transportation system can result in economic loss. For efficient transport system, an adequate infrastructure is very important. With growing population there is a need to provide matching transport infrastructure to avoid overcrowding, overloading and poor maintenance of the available infrastructure.

Transport infrastructure consists of fixed installation such as roads, railways, airways, canals, pipelines and terminals. Kerala had over the years developed a good infrastructure. For compilation of infrastructure statistics, transport sector has been divided into four sub sectors viz. Roads, Railways, Inland Waterways, Sea & Coastal Transport and Airways. The major development indicators of Transport and Communication sector in the State since 2005 are given in Table 1.5

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ROAD TRANSPORT

The socio-economic development of an area is directly linked to a better communication network particularly the road connectivity in that area. Of the various modes of transport, Road Transport is vital to economic development, trade and social upgradation. Road transportation is the large consumer of space and has high maintenance costs, both for vehicles and infrastructures. They are mainly linked to light industries where small batches of freight are required to be transported. They are useful for everyday movement of people to their workplaces or to meet everyday needs. For efficient road transportation we need good quality roads with proper signage and traffic regulation.Almost all the urban centres in the State are nodal points in road network., The different categories of roads are Rural roads, Urban roads, project roads Highways, National Highway, StateHighway,Muncipal roads,Railway roads, Major port roads, Others. There are 8 national Highways in the state-NH 66, NH 85, NH 966B, NH 744, NH 766, NH 966 and NH183.The National Highway network is of length 1542 Kms.

KSRTC is the largest single Public sector undertaking, which carries out transport operations in the State. Road transport acts as the feeder service to the rail, air and Inland water transport. The vehicle density of the state is very high compared to many other states in India. The tremendous increase in the volume of road traffic in recent years has caused increase of road accidents. Government of Kerala and police have taken several initiatives to enforce road discipline and rules and programmes to address the alarming issues of increasing road accidents by coordinating all stakeholders.

The State road includes 4342 Kms. of State Highways and 18900.058 Kms of Major District Roads. District wise and category wise details of Road length as on 31.03.2010, 31.03.2011, 31.03.2012 is respectively shown in Tables1.2, 1.3, 1.4. Of the 14 districts in the State, Kottayam has the major share of PWD roads with the length of 3449.301 Km and Wayanad has the lowest share with 1029.305 Km

NH

1.1 Length of roads in Kerala (in kms)

SL No	Type of roads	31.03.2007	31.03.2008	31.03.2009	31.03.2010	31.03.2011
1.	State Highways	4137	4137	4460.279	4341.651	4341.651
2.	Major District Roads	24066	24066	17117.928	18900.058	18900.058 2746
3.	Other District Roads	0	0	0	0	0
4.	Village Roads	0	0	0	0	0
TOTAL		**28203**	**28203**	**21578.207**	**23241.709**	**23241.709**

Source: Economic Review

Comparative study of details of roads maintained by P.W.D is as shown in Appendix. The district wise, surface wise and category wise length of road maintained by PWD(R & B) as on 31.03.2010, 31.03.2011, 31.03.2012 are respectively shown in Tables 1.7,1.8,1.9 .As on 31.03.2012, of the 14 districts in the State, Kottayam has the major share of PWD roads with the length of3449.301Km and Wayanad has the lowest share with1029.305 Km

The surface wise and category wise length of PWD Roads during 2010-2011 is given in Table1.10

1.2 District-wise and Category-wise Length of Roads Maintained by PWD(R &B) as on 31.03.2010

(In Kms)

Sl. No	District	State High ways	Major District Roads	Other District Roads	Village Roads	Total
1	Thiruvananthapuram	180.360	1471.942	0	0	1652.302
2	Kollam	123.790	1748.734	0	0	1872.524
3	Pathanamthitta	249.194	1044.856	0	0	1294.05
4	Alapuzha	170.841	1032.485	0	0	1203.326
5	Kottayam	406.531	2610.234	0	0	3016.765
6	Idukki	998.372	1402.688	0	0	2401.06
7	Eranakulam	325.206	1744.788	0	0	2069.994
8	Thrissur	374.033	1291.58	0	0	1665.613
9	Palakkad	245.987	1338.263	0	0	1584.25
10	Malappuram	374.764	1421.446	0	0	1796.21
11	Kozhikode	377.173	928.677	0	0	1305.85
12	Wayanad	128.955	637.397	0	0	766.352
13	Kannur	244.665	1453.196	0	0	1697.861
14	Kasargod	141.780	773.772	0	0	915.552
TOTAL		**4341.651**	**18900.058**	**0**	**0**	**23241.709**

Source: Roads & Bridges, PWD

State Highways:-Variation in the length of S.H is actual length after deleting the Overlap in the MDR portion

Major District Roads:-ODR with PWD converted as MDR during 2001-2006 are deleted and newly retained MDR as per GO (MS) No: 52/09/PWD dt 14.08.2009 are added, hence correct length of MDR comes to 18900.058 Kms

1.3 District-wise and Category-wise Length of Roads Maintained by PWD(R &B) as on 31.03.2011

(In Kms)

Sl. No	District	State High ways	Major District Roads	Other District Roads	Village Roads	Total
1	Thiruvananthapuram	180.360	1471.942	0	0	1652.302
2	Kollam	123.790	1748.734	0	0	1872.524
3	Pathanamthitta	249.194	1044.856	0	0	1294.05
4	Alapuzha	170.841	1032.485	0	0	1203.326
5	Kottayam	406.531	2610.234	0	0	3016.765
6	Idukki	998.372	1402.688	0	0	2401.06
7	Eranakulam	325.206	1744.788	0	0	2069.994
8	Thrissur	374.033	1291.58	0	0	1665.613
9	Palakkad	245.987	1338.263	0	0	1584.25
10	Malappuram	374.764	1421.446	0	0	1796.21
11	Kozhikode	377.173	928.677	0	0	1305.85
12	Wayanad	128.955	637.397	0	0	766.352
13	Kannur	244.665	1453.196	0	0	1697.861
14	Kasargod	141.780	773.772	0	0	915.552
TOTAL		**4341.651**	**18900.058**	**0**	**0**	23241.709

Source: Roads & Bridges, PWD

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1.4 District-wise and Category-wise Length of Roads Maintained by PWD(R &B) as on 31.03.2012

(In Kms)

Sl.No	District	State High ways	Major District Roads	Other District Roads	Village Roads	Total
1	Thiruvananthapuram	180.360	2420.430	0	0	2600.79
2	Kollam	123.790	2055.570	0	0	2179.36
3	Pathanamthitta	249.194	1790.570	0	0	2039.764
4	Alapuzha	170.841	1303.120	0	0	1473.961
5	Kottayam	406.531	3042.770	0	0	3449.301
6	Idukki	998.372	1853.390	0	0	2851.762
7	Eranakulam	325.206	2815.550	0	0	3140.756
8	Thrissur	374.033	1681.73	0	0	2055.763
9	Palakkad	245.987	1926.800	0	0	2172.787
10	Malappuram	374.764	2301.130	0	0	2675.894
11	Kozhikode	377.173	2063.930	0	0	2441.103
12	Wayanad	128.955	900.350	0	0	1029.305
13	Kannur	244.665	2013.230	0	0	2257.895
14	Kasaragod	141.780	1301.380	0	0	1443.16
	TOTAL	**4341.651**	**27469.950**	**0**	**0**	**31811.601**

Source: Roads & Bridges, PWD

1.5 Growth of Transport & Communication system in Kerala from 2005 to 2011

Sl. No	Item	Unit	2005	2006	2007	2008	2009	2010	2011
1	Road Length(PWD)	Km	26269	28203	28203	28203	21578	23241.71	23241.709
2	Motor Vehicles	No	3675930	4080392	4504220	4442387	4880059	5397652	6072019
3	Buses ownwd by KSRTC	No	4642	4687	4559	4893	5115	5402	5741
4	Railway Route Length	Km	1148	1148	1148	1148	1148	1198.9	1257
5	Flights operated(both domestic and International)	No	34326	43394	44033	78464	82313	73208	73208
6	Boats/Jhankars operated by SWTD	No	87	81	81	81	81	81	92
7	Route Distance by SWTD	Km	6775	6775	6775	6018	6730	6730	6890
8	Post Offices	No	5082	5071	5070	5070	5068	5070	5067
9	Telephone Exchanges	No	1218	1223	1239	1240	1240	1246	1245
10	Public Call Offices	No	104142	120570	127149	127369	118841	95193	95193

Source: Economic Review

*SWTD-State Water Transport Department

Analysing the PWD roads it reveals that only6.655 Km is cement concrete, 30744.395Km is black topped and 447.238 Km water bound macadam. The black topped surface contributes 96.6 percentages. The District wise details are given in Table1.9.There are 2179 bridges (627 on SH and 1552 on MDR) and 51422 culverts (11512 on SH and 39910 on MDR) in PWD.Of them 148 bridges and 1519 culverts are unsafe and need reconstruction/renovation and details is shown in Table1.12

1.6 Details of roads (in km) maintained by P.W.D

(In Kms)

Type of Road	31.03.2007	31.03.2008	31.03.2009	31.03.2010	31.03.2011	31.03.2012
Cement Concrete	6.655	6.655	6.655	6.655	6.655	6.655
Black Topped	27135.794	27135.794	20511.001	22174.503	22174.503	30744.395
Water Bound Mecadam	447.238	447.238	447.238	447.238	447.238	447.238
Others	613.313	613.313	613.313	613.313	613.313	613.313
Total	**28203**	**28203**	**21578.207**	**23241.709**	**23241.709**	**31811.599**

Source: EconomicReview

1.7 District-wise, Surface-wise & category-wise length of roads maintained by Kerala PWD as on 31.03.2010

(In Kms)

Sl No	District	State High ways				Major District Roads				Total Roads
		CC	BT	WBM	Others	CC	BT	WBM	Others	
1	Thiruvananthapuram	0	180.360	0	0	0	1428.724	12.978	30.240	1652.302
2	Kollam	0	123.790	0	0	0	1741.837	6.897	0	1872.524
3	Alapuzha	0	170.841	0	0	0	957.407	39.785	35.293	1203.326
4	Pathanamthitta	0	249.194	0	0	0	995.693	29.650	19.513	1294.05
5	Kottayam	0	406.531	0	0	0	2507.127	25.640	77.467	3016.765
6	Idukki	0	978.372	0	20	0	1182.431	22.407	197.850	2401.06
7	Eranakulam	0	325.206	0	0	0.464	1574.964	60.715	108.645	2069.994
8	Thrissur	3.391	370.642	0	0	0	1276.580	15.000	0	1665.613
9	Palakkad	0	230.237	1.250	14.5	0	1278.573	40.690	19	1584.25
10	Malappuram	0	374.764	0	0	0	1268.306	122.650	30.490	1796.21
11	Kozhikode	0	377.173	0	0	0	914.237	14.440	0	1305.85
12	Wayanad	0	126.955	2	0	0	593.615	23.600	20.182	766.352
13	Kannur	2.8	241.865	0	0	0	1408.677	4.386	40.133	1697.861
14	Kasaragode	0	141.780	0	0	0	748.622	25.150	0	915.552
TOTAL		**6.191**	**4297.71**	**3.25**	**34.5**	**0.464**	**17876.79**	**443.988**	**578.813**	**23241.71**

Source: Roads & Bridges, PWD

1.8 District-wise, Surface-wise & category-wise length of roads maintained by Kerala PWD as on 31.03.2011

(In Kms)

Sl .No	District	State High ways				Major District Roads				Total Road
		CC	BT	WBM	Others	CC	BT	WBM	Others	
1	Thiruvananthapuram	0	180.360	0	0	0	1428.724	12.978	30.240	**1652.302**
2	Kollam	0	123.790	0	0	0	1741.837	6.897	0	**1872.524**
3	Alapuzha	0	170.841	0	0	0	957.407	39.785	35.293	**1203.326**
4	Pathanamthitta	0	249.194	0	0	0	995.693	29.650	19.513	**1294.05**
5	Kottayam	0	406.531	0	0	0	2507.127	25.640	77.467	**3016.765**
6	Idukki	0	978.372	0	20	0	1182.431	22.407	197.850	**2401.06**
7	Eranakulam	0	325.206	0	0	0.464	1574.964	60.715	108.645	**2069.994**
8	Thrissur	3.39	370.642	0	0	0	1276.580	15.000	0	**1665.613**
9	Palakkad	0	230.237	1.250	14.5	0	1278.573	40.690	19	**1584.25**
10	Malappuram	0	374.764	0	0	0	1268.306	122.650	30.490	**1796.21**
11	Kozhikode	0	377.173	0	0	0	914.237	14.440	0	**1305.85**
12	Wayanad	0	126.955	2	0	0	593.615	23.600	20.182	**766.352**
13	Kannur	2.8	241.865	0	0	0	1408.677	4.386	40.133	**1697.861**
14	Kasaragode	0	141.780	0	0	0	748.622	25.150	0	**915.552**
TOTAL		**6.191**	**4297.71**	**3.25**	**34.5**	**0.464**	**17876.79**	**443.988**	**578.813**	**23241.71**

Source: Roads & Bridges, PWD CC-Cement Concrete BT-Black Topped WBM-Water bound Macadam Others-Mud &Earthen Roads

1.9 District-wise, Surface-wise & category-wise length of roads maintained by Kerala PWD as on 31.03.2012

Sl .No	District	State High ways				Major District Roads				Total Roads
		CC	BT	WBM	Others	CC	BT	WBM	Others	
1	Thiruvananthapuram	0	180.360	0	0	0	2377.212	12.978	30.240	2600.790
2	Kollam	0	123.790	0	0	0	2048.673	6.897	0	2179.360
3	Alapuzha	0	170.841	0	0	0	1228.042	39.785	35.293	1473.961
4	Pathanamthitta	0	249.194	0	0	0	1741.407	29.650	19.513	2039.764
5	Kottayam	0	406.531	0	0	0	2939.663	25.640	77.467	3449.301
6	Idukki	0	978.372	0	20	0	1633.133	22.407	197.850	2851.762
7	Eranakulam	0	325.206	0	0	0.464	2645.726	60.715	108.645	3140.756
8	Thrissur	3.39	370.642	0	0	0	1666.730	15.000	0	2055.763
9	Palakkad	0	230.237	1.250	14.5	0	1867.110	40.690	19	2172.787
10	Malappuram	0	374.764	0	0	0	2147.990	122.650	30.490	2675.894
11	Kozhikode	0	377.173	0	0	0	2049.490	14.440	0	2441.103
12	Wayanad	0	126.955	2	0	0	856.568	23.600	20.182	1029.305
13	Kannur	2.8	241.865	0	0	0	1968.711	4.386	40.133	2257.895
14	Kasaragode	0	141.780	0	0	0	1276.230	25.150	0	1443.160
TOTAL		**6.191**	**4297.71**	**3.25**	**34.5**	**0.464**	**26446.685**	**443.988**	**578.813**	**31811.601**

Source: Roads & Bridges, PWD CC-Cement Concrete BT-Black Topped WBM-Water bound Macadam Others-Mud &Earthen Roads

1.10 Surface-wise and Category –wise Length of P.W.D Roads added during 2010-11

(In Kms)

Item	State Highways	Major District Roads	Other District Roads	Village Roads	Total
Cement Concrete					
Length as on 31.03.2010	6.191	.464	0	0	6.655
Length added in 10-11	0	0	0	0	0
Length as on 31.03.2011	6.191	.464	0	0	6.655
Black Topped					
Length as on 31.03.2010	4297.710	17876.793	0	0	22174.503
Length added in 10-11			0	0	0
Length as on 31.03.2011	4297.710	17876.793	0	0	22174.503
Water Bound Macadam					
Length as on 31.03.2010	3.250	443.988	0	0	447.238
Length added in 10-11	0	0	0	0	0
Length as on 31.03.2011	3.250	443.988	0	0	447.238
Others					
Length as on 31.03.2010	34.500	578.813	0	0	613.313
Length added in 10-11	0	0	0	0	0
Length as on 31.03.2011	34.500	578.813	0	0	613.313
Total					
Length as on 31.03.2010	4341.651	18900.058	0	0	23241.709
Length added in 10-11	0	0	0	0	0
Length as on 31.03.2011	4341.651	18900.058	0	0	23241.709

Source: Roads & Bridges, PWD

1.11 District –wise and surface wise Length of Roads maintained by P.W.D as on 31.03.2012

Sl.No	Districts	Cement Concrete	Black Topped	Water Bound macadam	Others	Total
1	Thiruvananthapuram	0	2557.572	12.978	30.24	2600.79
2	Kollam	0	2172.463	6.897	0	2179.36
3	Alapuzha	0	1398.883	39.785	35.293	1473.961
4	Pathanamthitta	0	1990.601	29.65	19.513	2039.764
5	Kottayam	0	3346.194	25.64	77.467	3443.301
6	Idukki	0	2611.505	22.407	217.85	2851.762
7	Eranakulam	0.464	2970.932	60.715	108.645	3140.756
8	Thrissur	3.391	2037.372	15	0	2055.763
9	Palakkad	0	2097.347	41.94	33.5	2172.787
10	Malappuram	0	2522.754	122.65	30.49	2675.894
11	Kozhikode	0	2426.663	14.44	0	2441.103
12	Wayanad	0	983.523	25.6	20.182	1029.305
13	Kannur	2.8	2210.576	4.386	40.133	2257.895
14	Kasaragode	0	1418.01	25.15	0	1443.16
	Total	**6.655**	**30744.395**	**447.238**	**613.313**	**31811.601**

Source: Roads & Bridges, PWD

1.12 No of Bridges and culverts in P.W.D Roads as on 31.03.2011

Sl. No	Item	State Highways	Major District Roads	Total
1	Total Number of bridges	627	1552	2179
2	Number of unsafe bridges	60	88	148
3	Total number of culverts	11512	39910	51422
4	Number of unsafe culverts	641	878	1519

Source: Economic Review

GCPT. 37/585/2013/DTP.

PWD - NH

1.13 Details of National Highways with State Public Works Departments

District	NH No		Chainage		Length in Km	Total length	Remarks
	Existing	New	From	To			
Kasaragod	NH17	NH66	18.050	104.000	85.950	85.950	
Kannur	NH17	NH66	104.000	184.600	80.600	80.600	
Mahi	NH17	NH66	184.600	186.105	1.505	1.505	
Wayanad	NH 212	NH766	57.000	117.600	60.600	60.600	
Kozhikode	NH17	NH66	186.105	263.444	77.339	134.339	
	NH212	NH766	0.000	57.000	57.000		
Malappuram	NH17	NH66	263.444	349.600	86.156	157.500	NH17& NH47 are being developed to 4/6 la highway with servi roads under Nation Highway Developm Programme Phase through BOT schem NHAI
	NH213	NH966	15.656	87.000	71.344		
Thrissur	NH17	NH66	349.600	413.000	63.400		
	NH47	NH544	250.000	342.000	92.000	155.400	
Ernakulam	NH17	NH66	413.000	438.827	25.827	131.487	
	NH47	NH66	342.000	358.760	16.760		
	NH47C	NH966A	0.000	17.000	17.000		
	NH47A	NH966B	0.000	5.900	5.900		
	NH49	NH85	220.610	286.610	66.000		
Palakkad	NH47	NH544	182.000	250.000	68.000	121.960	NH208,NH212,NH2 NH220are planned develop into 2 lane highway with paved shoulder on both sid under National Development Programme Phase I through PPP mode
	NH213	NH966	87.000	140.960	53.960		
Idukki	NH49	NH85	119.017	220.610	101.593	157.343	
	NH220	NH183	159.850	215.600	55.750		
Kottayam	NH220	NH183	26.000	159.850	133.850	133.850	
Alappuzha	NH47	NH66	358.760	462.000	103.240	103.240	
Kollam	NH47	NH66	462.000	520.00	58.400	139.650	
	NH208	NH744	0.000	81.250	81.250		
Thiruvananthapuram	NH47	NH66	520.400	599.000	78.600	78.600	
Total						**1542.024**	

Source: PWD, National Highways

1.14 Abstract of Bridge Register

Sl. No	Division	Minor Bridges			Major Bridges			No of Minor Bridges (more than 6m less than 60m length)	No of Major Bridges (more than 60m length)	Grand Total
		Good	Bad	Reconsn required	Good	Bad	Reconsn required			
1	Thiruvananthapuram	56	23	1	10			80	10	90
2	Kollam	91	10	0	19			101	19	120
3	Alappuzha	106	26	2	19	2		134	21	155
4	Pathanamthitta	52	0	0	11			52	11	63
5	Kottayam	167	16	4	19	3		187	22	209
6	Idukki	67	23	1	11			91	11	102
7	Muvattupuzha	103	7		13	1	1	110	15	125
8	Ernakulam	28	8	2	19	4	1	38	24	62
9	Thrissur	108	7	4	15	1	1	119	17	136
10	Palakkad	78	8	25	25	1	5	111	31	142
11	Manjeri	19	5		30	1	1	24	32	56
12	Kozhikode	45	12	6	18			63	18	81
13	Vadakara Churam	6	1					7	0	7
14	Wayanad	28	19	6	4			53	4	57
15	Kannur	85	12	7	29	6		104	37	141
16	Kasaragode	36	3		24	4	2	39	28	67
	TOTAL	**1075**	**180**	**58**	**266**	**23**	**11**	**1313**	**300**	**1613**

Source: Roads & Bridges, PWD

Motor Vehicles Department

Motor Vehicles Department is one of the major revenue earning departments of the Kerala State. Towards the administration and enforcement of Motor Vehicle Laws, Collection of tax on Motor Vehicles under various categories, registration of vehicles, licensing of drivers and regulation of use of motor vehicles in the State in accordance with the powers conferred on the Department and has achieved remarkable achievements.

The number of motor vehicles having valid registration as on 31.3.2011 is 6072019.The District wise and category wise details of motor vehicles having valid registration for the year 2010 &2011 is given in Table.1.16 The number of newly registered vehicles for the year 2010-11 is 674367 In Kerala, Wayanad has the lowest registered vehicles followed by Idukki.The highest vehicle population is registered in Ernakulam district followed by Thiruvananthapuram The category wise growth of Motor vehicles in Kerala from 2001 to 2011 is given in the Table1.15

Trends of Road Accidents in Kerala

Tremendous increase in the volume of road traffic in recent years has caused increase of road accidents.As vehicle population increases road accidents also increases.It is also observed that 97.7 percent of the accidents occurred due to the rash driving of motor vehicles. Category wise details of Motor vehicle involved in road accidents are given in Table1.18

1.15 Category-wise Growth of Motor vehicles in Kerala from 2001 to 2011

Sl No	Type of vehicles	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
1	**Goods Vehicles**											
	Four wheelers and above	142168	146719	152802	161043	173110	194232	211175	227454	246687	262824	294395
	Three wheelers including tempos	31688	37457	42561	50455	61081	70030	83316	94532	100919	108104	117266
2.	**Buses**											
	Stage carriages	25161	26899	29149	31889	33776	35206	37076	39763	41998	43727	46594
	Contract carriages/ Omni	40520	45067	50464	55358	61750	92368	101840	108230	110833	114351	119150
3.	**Cars and station wagons**											
	Cars	282996	305837	336240	378955	428309	498472	567294	654582	767753	901663	1060861
	Stationwagons	0	0	0	0	0	0	0	0	0	0	0
	Taxis	75628	82236	88236	93458	99656	119753	127873	134650	142054	151533	163407
	Jeep	69621	70212	70885	71656	72245	73158	73680	75360	73698	73700	73700
4.	**Three wheelers**											
	Auto rickshaws	**248350**	**265767**	**285149**	**303092**	**320788**	**342466**	**368706**	**391100**	**422905**	**466135**	**518741**
	Rickshaws	**58**	**63**	**63**	**63**	**63**	**61**	**61**	**61**	**61**	**61**	**61**
5.	**Two wheelers**											
	Motorised cycles	**1124**	**1124**	**0**	**1124**	**1124**	**1017**	**1017**	**1017**	**1017**	**1017**	**1017**
	Scooters/ Motor cycles	1151735	1289035	1448452	1595901	1818939	2098635	2418092	2677444	2928226	3216123	3610838
6.	Tractors	8177	8459	8702	9002	9459	9978	10657	11236	11656	11680	12224
7.	Tillers	4763	4979	4979	4980	5037	5184	5184	5184	5184	5217	5335
8.	Trailers	1576	1771	1818	1913	2001	2264	2307	2321	2321	2321	2324
9	Others	28680	29697	30334	32679	34750	15880	17072	21115	24745	39196	46106
	TOTAL	**2112245**	**2315322**	**2549807**	**2791568**	**3122088**	**3558704**	**4025305**	**4444049**	**4880057**	**5397652**	**6072019**

Source: Transport Commissionrate

1.16 Vehicles Registered in Kerala

Sl .No	Type of Vehicle	31.03.2010	31.03.2011
1.	**Goods Vehicles**		
	i. Four wheelers and above	262824	294395
	ii. Three wheelers including tempos	108104	117266
2.	**Buses**		
	i. Stage carriages	43753	46594
	ii. Contract carriages/ omni	114351	119138
3.	**Four wheelers**		
	i. Cars	901663	1060861
	ii. Motor cab/Taxi	151553	163427
	iii. Jeep	70700	73700
4.	**Three wheelers**		
	i. Auto Rickshaws	466135	518741
5.	**Two wheelers**		
	Motor cycle /Scooter	3217204	3610838
6.	**Tractor/ Tiller**		
	i. Tractors	12803	13347
	ii. Tillers	5217	5335
	iii. Trailors	2321	2324
	iv. Others	38041	44963
	TOTAL	**5394669**	**6072019**

Source: Economic Review

1.17 Number of Motor vehicle having valid registration as on 2011

District	Goods Vehicle		Buses		Four Wheelers			Three Wheelers		Two Wheelers		Tractors/Trailors				Total
	Four Wheelers &above	Three wheelers including tempos	Stage Carriages	Contract Carriages/ Omni buses	Cars	Taxis	Jeeps	Auto rickshaws	Motorised cycle rickshaws	Motorised cycles	scooter /Motor cycles	Tractors/Trailors	Tillers	Trailers	Others	
Thiruvananthapuram	23843	11978	10747	16644	144434	16616	7172	48289	12	0	513099	375	113	143	5755	799220
Kollam	19610	7500	1310	7507	89810	8745	4879	38304	12	1004	275715	511	234	335	2484	457960
Pathanamthitta	11548	4605	1168	4477	59993	11093	3460	19913	9	4	140069	252	52	172	1249	258064
Alappuzha	18892	10590	1463	6339	62429	10676	544	21201	0	3	286373	1003	130	265	1338	421246
Kottayam	22365	6844	3034	11642	100537	15938	11130	41748	3	0	229505	680	124	60	2330	445940
Idukki	6100	2086	1196	2215	19494	5429	5367	16316	37	0	45383	238	139	16	1452	105468
Ernakulam	58849	15155	5566	20065	184205	22233	2124	56511	0	0	608960	1414	1301	155	8729	985267
Thrissur	27858	12938	4789	16828	93756	15852	4432	46412	0	0	409140	1032	467	612	2638	636754
Palakkad	21164	6836	2635	9336	44871	9487	3739	37931	0	0	252364	4646	969	121	3035	397134
Malappuram	28641	16044	4698	10494	79536	19832	9758	80083	0	6	247618	1238	724	97	3086	501855
Kozhikode	24011	10350	4043	5232	79936	10246	8003	41302	0	0	319618	339	154	79	3983	507296
Wayanad	4147	2118	584	1297	11134	3340	3874	9024	0	0	35109	151	258	102	2224	73362
Kannur	20661	8157	4291	6156	58820	10966	5936	38907	0	0	172323	1363	262	99	5049	332990
Kasargode	6706	2065	1070	906	31906	2974	3282	22800	0	0	75562	105	408	68	1611	149463
TOTAL	294395	117266	46594	119138	1060861	163427	73700	518741	73	1017	3610838	13347	5335	2324	44963	6072019

Source: Economic Review

1.18 Category wise details of Motor Vehicles involved in Road Accidents

Sl No	Type of Vehicles	2008	2009	2010	2011
1.	KSRTC Buses	911	873	950	1368
2.	Other Buses	3456	3255	3106	4003
3.	Goods Vehicles	3869	2676	1746	4191
4.	Motor cars	6718	5844	7401	9871
5.	Jeeps	1116	1342	955	1096
6.	Auto rickshaw	5718	4237	5352	6920
7.	Two wheelers	17157	12309	17309	23637
8.	Miscellaneous Vehicle	1687	1153	1378	1908
9.	Class not known	249	140	272	313
	TOTAL	**40881**	**31829**	**38469**	**53307**

Source: Economic Review

1.19 Infrastructure Details 1991-92 to 2011-12

Items	years				
Vehicles	**1991-92**	**1996-97**	**2001-02**	**2006-07**	**2011-12**
Registered During the year	67012	170364	203077	466646	596054
Upto the year	708172	1357825	2315322	4025350	6668073
Revenue Collection					
Fee(Rs)	103477202	252404811	552031655	1055900554	1957355298
Tax(Rs)	835576341	2210924654	3868494768	5947131940	13051815149
Other(Rs)	7988	12570999	43790	6917	8600
Total(Rs)	**93,90,61,531**	**247,59,00464**	**442,05,70,213**	**700,30,39,411**	**1500,91,79,047**
Expenditure					
Direction & Admn.(2041-00-001-99)	29168593	57562768	9,0490561	145433103	34366875
Inspection of vehicles(2041-00-102-99)	8983422	17738037	36254416	70604207	185737097
Road Safty Measures(2041-800-99)	0	10000	209592	111805	0
Total	**3,81,52,015**	**7,53,10,805**	**12,69,54,569**	**21,61,49,115**	**52,94,06,072**
Offices & Staff					
Regional Transport Office	14	15	18	18	18
Sub Regional Transport Office	35	42	42	42	47
Check post	12	12	12	17	17
Staff Strength	**1355**	**1484**	**1652**	**1753**	**1887**
Road Crash					
Cases Reported	24677	53875	38361	41647	34921
Injury	32421	51168	49675	49881	39977
Death	1952	2707	2674	3589	4145

Source: Transport Commissionrate

PT. 37/585/2013/DTP.

Water Transport

Kerala Port sector

The Kerala State lies in the southwest corner of the Indian peninsula. It has a coastal length of 585 km and the state has an average width of about 60 km with one major port at Cochin and 11 non major ports. The non-major ports are under the administration of Government of Kerala. The Non majorports are Kasaragod, Azhikkal, Kannur, Thalassery, Kozhikode, Ponnani, Kodungalloor, Alappuzha, Kollam, Trivandrum, Vizhinjam.

Cochin Port

Cochin port is the only major port in Kerala and is the major gateway to the State. Cochin Port is a major port on the Arabian Sea - Indian Ocean sea-route and is one of the largest ports in India. The port lies on two islands in the Lake of Kochi namely the Willingdon Island and Vallarpadam, towards the Fort Kochi river-mouth opening onto the Arabian Sea. The Vallarpadam International Container Trans-shipment Terminal (ICTT), a part of the Cochin Port, is the largest container trans-shipment facility in India.

The port is governed by the Cochin Port Trust, an establishment of the Government of India. The modern port was established in 1926.The Cochin Port is one among a line of maritime-related facilities based in the port-city of Kochi, the others being, the Cochin Shipyard, the largest ship-building as well as maintenance facility in India, the SPM (Single Point Mooring facility) of the Kochi Refineries - an offshore crude carrier mooring facility, and the Kochi Marina.

OPERATIONAL EFFICIENCY

24 Hour Pilotage

24 hour Cargo Operations

Real-Time co-ordination of vessel movement through VTMS

Single Window Transaction

Moving towards Zero Pre-Berthing Detention Time.

1.20 CATEGORY WISE DISTRIBUTION OF VESSELS ENTERED THE PORT DURING THE PAST 10 YEARS

Year	No. of vessels carrying							Sailing vessels	Total	NRT
	Containers	Coal	Fertilizers & raw materials	Food grains	General Cargo	Tankers	Others			
2002-03	433	5	38	-	129	330	239	-	1174	7,815,244
2003-04	381	4	29	-	141	338	240	-	1133	7,943,909
2004-05	314	8	26	-	117	342	319	-	1126	8,176,207
2005-06	421	4	38	-	109	383	270	-	1225	8,829,599
2006-07	382	7	27	5	92	382	278	-	1173	9,571,341
2007-08	350	6	15	2	73	352	323	-	1121	11,009,143
2008-09	334	6	22	0	63	305	352	-	1082	11,110,174
2009-10	390	5	17	0	45	381	440	-	1278	10,546,078
2010-11	360	2	18	0	39	372	465	-	1256	10,758,101
2011-12	**390**	**2**	**15**	**0**	**37**	**361**	**581**	**-**	**1386**	**12,219,423**

Source: www.cochinport.com

1.21 Distribution of Cargo Traffic for the last 5 years

(In'000 tonnes)

Sl.No	Category	2007-08	2008-09	2009-10	2010-11	2011-12
	Break Bulk					
1	Soda Ash	41	44	12	6	0
2	Oil cake	6	12	7	0	0
3	Timber logs	34	51	77	61	64
4	Others	58	31	29	7	46
	Total	**139**	**138**	**125**	**74**	**110**
Dry Bulk						
5	Rock Phosphate	182	126	55	158	145
6	Sulphur	89	139	156	194	171
7	Zinc Concentrate	58	60	76	77	49
8	Coal	246	259	148	40	34
9	Murate of Potash	56	123	52	76	59
10	Shredded Scrap	104	91	82	27	27
11	Others	120	281	401	326	542
	Total	**855**	**1079**	**970**	**898**	**1027**
Liquid Bulk						
12	POL	11300	10492	11957	12101	14010
13	Others	278	264	449	380	229
	Total	**11578**	**10756**	**12406**	**12481**	**14239**
Containers						
14	Containers (000' Tonnes)	3183	3521	3928	4419	4715
	(TEUs)	253715	260784	289817	312189	337053
	Total	**3183**	**3521**	**3928**	**4419**	**4715**
	GRAND TOTAL	**15755**	**15494**	**17429**	**17873**	**20091**

Source: www.cochinport.com

Performance Details

PARAMETER	PERFORMANCE (2011-2012)
Average pre-berthing detention of vessels on Port account (in hours)	
Liquid bulk	2.06
Dry bulk	3.99
Break bulk	0.00
Container	5.47
Overall	**3.68**
Average turn-around time of vessels (including detention on Port account) in days	
Liquid bulk	1.98
Dry bulk	5.98
Break bulk	3.74
Containers	0.96
Overall	**1.82**
Average ship berth day output (in tones)	
Liquid bulk	22762
Dry bulk	3636
Break bulk	870
Containers	19988
Overall	**15784**
Total Volume of Cargo (Major commodity-wise, in 000 Tonnes)	
POL	14010
Fertilizers	115
Fertilizer Raw Materials	315
Coal	34
Containers (TEUs)	4715 (337053)
Others	902
TOTAL	**20091**

Source: www.cochinport.com

1.22 Number of Ships called at Cochin Port During 2009-10 and 2010-11

Sl.No	Type of vessel	No of ships		Net Registered Tonnage	
		2009-10	2010-11	2009-10	2010-11
1	POL; Tankers	381	372	63,03,084.00	66,85,909
2	Colliers	5	2	86,724.00	35,763
3	Food grains	0	0	0	0
4	Fertilizer	6	4	55,126	43,813
5	General cargo				
6	Containers	390	360	23,68,715.00	23,52,366
7	Cruise Vessels	45	41	7,61,762.00	708.015
8	Passenger &Others	451	477	9,70,667.48	932.245
	Total	**1278**	**1256**	**1,05,46,078.48**	**91,19,491**

Source: Economic Review

1.23 Non-Major ports
Cargo handled at Non-Major ports from 2006 to 2011

Year	Non Major Ports (in Tonnes)
2006	172515.00
2007	146988.00
2008	9871.00
2009	129550.50
2010	124090.00
2011	106478.00

Source: Department of ports

1.24 Outlay and Expenditure at Non Major Ports

Year	Non Major Ports (in Lakhs)	
	Non Plan	Plan
2006	323.35	1057.61
2007	416.40	884.78
2008	485.53	2984.70
2009	483.50	3777.10
2010	490.72	17918.00
2011	1062.95	21435.40

Source: Department of ports

1.25 Imports & Export up to 2006-2011

Year	Non Major Ports (in Tonnes)
2006	172515.00
2007	146988.00
2008	9871.00
2009	129550.50
2010	124090.00
2011	106478.00

Source: Department of ports

1.26 Commodity wise analysis of Exports

Year	Ores & Minerals (In Tonnes)	Manufactured Goods (in Tonnes)	Total (in Tonnes)
2006	150.00	0.00	150.00
2007	249.00	0.00	249.00
2008	0.00	0.00	0.00
2009	3027.00	100.00	3127.00
2010	1392.00	263.00	1655.00
2011	1500.81	0.00	1500.81

Source: Department of ports

Inland water Transport

Inland Water Transport in Kerala

Inland water transport is a fuel efficient and environment friendly mode of transportation. Kerala is a land with abundant water bodies. Backwater is a wonderful gift of nature to the God's Own country, where waterways are successfully used for commercial inland Water Transport. Ashtamudy and Vembanadu lake which completes the network of waterways not only provides natural beauty but inland navigation facilities also. This Inland Water Transport system consists of 1895 kms of waterways. This includes navigable river, backwaters and man made cross canals. Most of these are in Travancore-Cochin region. Of the 44 rivers in Kerala, the 41 west flowing rivers together with backwaters and man made canals form the integral part of inland navigation system.

The Government agencies engaged in the development of Inland Water Transport in the State are coastal Shipping and Inland Navigation Department (CSIND), State Water Transport Department (SWTD) and Kerala Shipping and Inland Navigation Corporation Ltd (KSINC)

Kerala State Water Transport Department (SWTD)

State Water Transport Department is a governmental agency who provides inland water transport facilities to the people residing in the water logged areas of the Districts of Alappuzha, Kottayam, Kollam, Ernakulam, Kannur and Kasargode and to enjoy the everlasting memory of backwaters.

The Kerala State Water Transport Department formed during 1968 with its Head Quarters (Directorate) in the District of Alappuzha.The objective of the department was to provide transport facilities and cargo transportation to the people residing in the water logged areas at cheaper rates. Construction of roads, bridges and roadways shortened the operation of the department to passenger transport only, providing backwater transport through ferries. The system is free of pollution, accidents, and is affordable. But in the world of speed and hurry the advantage of this pollution free, accident free and cheaper transport system beckons least preferences. The government has now mooted setting up Kerala State Boat Jetty Corporation with a vision to convert the boat jetties in Kerala to

world class standards. This corporation will enhance and develop the boat jetties into commercial assets for the state. Some jetties were identified for development like Mairan jetty, Kaavalam jetty and Kumaran jetty. Jetty based shopping centers and cafeterias are sources of huge returns. The system provides on average 79,000 km of service to 80,000 people through its 13 stations and 81 boats daily. Even though, it is a commercial department; its functioning is like a service Department, ever since 'Transportation' came under "Essential Service" in Kerala. The Department transports about 150 lakhs of passengers per annum using Wooden/Steel and fibreglass passenger boats

Major areas of operation: -

Backwaters

(1) Vembanattu lake - 52 sq kms.
(2) Ashtamudy lake - 200 sq kms.
(3) Ernakulam - Vypeen ferry (Cochin port & Harbour)
(4) Muhamma - Kumarakom
(5) Vaikom - Thavanakkadavu
(6) Payyannur - Parassinikkadavu

Total distance operated ...79,00 km per day

No. of passengers carried..... 80,000 per day

No. of operating centers ..... 14 stations

Ernakulam District .... Ernakulam Station Office
Alappuzha District ....Alappuzha, Nedumudy, Kavalam, Pulincunnu, Edathua, Muhamma and Panavally Stations
Kottayam District .... Kottayam, Changanachery and Vaikom stations
Kollam District .... Kollam Station
Kannur District ....Payyannur and Parassinikkadavu stations

Longest route operated..... 60.km

Capacity of boats..... 50 passenger to 150 passengers (wooden boats) Boats are constructed in the traditional way with well seasoned teak wood.

Speed of boat.....10 to 15 km per hour Size of boats Length.....20 mtr to 35 mtrs Width - 3 to 4.5 meters Depth - 2 mtrs Weight - 5 to 15 tonns

No. of crew for a boat .....5 persons at a time

Boat Capacity - 50 to 150 passengers (wooden boats)
Services: Operates 81 boats

Now roads and bridges have come into existence in many of these waterlogged areas, and passengers have the alternative to reach their destinations through road. In spite of all these developments of the vehicles transport, the water transport facility extended by this department still maintains its significance. Water transport is safe, economical & pollution free, compared to any other mode of transport. The vision of the department is to decongest the Road Transport by introducing large-scale cargo movements through the waterways of the state interconnecting several districts.

1.27 Details of State Water Transport Department

		2010-11	2011-12
1	Total No of Boats	94	95
2	Passenger Boats	91	92
3	Pilot Boat	1	1
4	Workshop-cum-Ambulance Boat	1	1
5	Speech Launch	1	1
6	No. of schedules	49	49
7	No. of Trips per day	733	733
8	Cross Route Distance per day in kms	6070 kms	6900 kms
9	Distance operated per day	5657 kms	6555 kms
10	No. of passengers carried	195.38 lakhs	162.48 lakhs
11	Total Revenue Receipts	4.985 crores	5.21 crores
12	Total Revenue Expenditure	23.708 crores	31.528 crores
13	Collection per km	24/-	26/-(Including all Revenue Receipts
14	Cumulative loss	189.02 crores	251.34 crores
15	Expenditure per km	114	140

GCPT. 37/585/2013/DTP.

16	Percentage of Cancellation	6.80%	5.30%
17	Diesel Consumption per day	4734 litres	5201 litres
18	Collection per day	Rs.136575/-	Rs.142738/-
19	Expenditure per day	Rs.649534/-	Rs.863786/-

Source: State Water Transport Department

Kerala Shipping and Inland Navigation Corporation Ltd (KSINC)

Kerala Shipping and Inland Navigation Corporation Ltd is a company owned by the Government of Kerala. Kerala is the southern most state of India and is well endowed with rivers and backwaters. KSINC pioneers in shipping and Inland navigation in Kerala, aims to be an ideal organisation in pursuit of highest standards of excellence. KSINC maintains highest ethical and professional standards with due regard for environment safeguards while meeting client needs. KSINC is engaged in the fields of transportation of passenger and cargo through the inland waterways of Kerala, Backwater tourism and construction and maintenance of small vessels and crafts. The company carries bulk materials, petroleum products, potable water, acids etc. through its fleet of barge. For tourists it operates a number of tourist boats and speedboats, including the luxurious "Sagara rani", which is the only vessel of its kind at Kochi. The company also offers a sailing resort "Lake princess" with night accommodation for 16 persons. At its modern slipway, it can construct and repair vessels of any kind, weighing up to 200 Metric tons. KSINC runs a training school, which trains the personnel needed for the inland water transport sector. This is the only training school of its kind in Kerala.KSINC is the pioneers in mechanised inland navigation in Kerala. Starting from 1975, KSINC has hauled millions of tons of cargo and carried hundreds of thousands of passengers. Now KSINC is also providing an experience of luxurious and quality back water tourism at Kochi. KSINC is now a force to be reckoned with inland water transport, backwater tourism and construction and repair of small crafts and vessels, in Kerala.

SUMMARY OF PERFORMANCE DURING 2011-12

The performance of the company during the year 2011-12 was better compared to the previous year. During the year we are continuing the works under the 12th Finance Commission award. The company has completed construction of 2 Cutter Suction Dredgers for the Irrigation Department and one dumb oil barge for Visakhapatanam Port. The construction of 2 FRP boats for tourism department and one 6 Tonne Bollard Pull Tug are in progress Revenue from Cargo Transportation is also increased during the year. The industrial relation during the year was cordial. KSINC are successfully operating Tourist cruise services using vessels "Sagararani 1" and "Sagararani 2".

Railways in Kerala

Railways are the principal mode of transportation in the country. Railways bind the economic life of the country as well as accelerate the industrial and agricultural development of the nation. Well laid rail network is definitely the sign of industrial growth. A well advanced rail network makes the supply of raw material, labour and other requirements like marketing of the products possible and smooth. Moreover, Railways remained the largest employment provider for the huge population of the country. Rail transport began in Kerala at Malabar. On March 12, 1861, Kerala's first train, built by the Madras Railway Company, chugged along the Beppur - Tirur line (30.6km). Construction of a railway line started in Kochi province in 1889. In 1902, the Madras Railway Company completed work on a narrow gauge railway-line that connected Shoranur and Ernakulum (106.06 km). The line was converted into broad gauge between 1930 and 1935 as part of development of Cochin Port Train service began in Travancore on November 26, 1904, with the completion of the Chengotta -Punalur meter gauge line. On November 4, 1931, the Thiruvananthapuram Central Railway Station was launched. In 1956 during the formation of Kerala, the total length of railway line in the State was 745 km.Ernakulam and Kollam were not connected by rail then. The Ernakulam - Kottayam and Kottayam -Kollam railway lines were completed in 1956 and 1958

respectively. In December 1971, a Rs. 13.59 –crore projects to convert the Thiruvananthapuram -Ernakulam line (220 km) from metre gauge to broad gauge was sanctioned. The work was completed in 1976 The Railways opened the Thiruvananthapuram - Kanyakumari broad gague line (31 km in Kerala) in 1979. The Ernakulam -Alappuzha broad gague line and the Alappuzha -Kanyakumari line (943 km) were completed in 1989 and 1992 respectively. The Madras -Ernakulam (via Shoranur; 180 km in Kerala) stretch got a double track in 1986. The Thrissur - Guruvayur broad gague line (21 km) was laid in 1994. The Kayamkulam -Kollam (41 km) and Kollam –Thiruvananthapuram (65 km) stretch got double tracks in 1996 and 2000 respectively. Doubling of Shoranur -Mangalapuram line (313 km) is in progress. The Thrissur -Ernakulam line was electrified in 2002. The Southern Railway, headquartered in Chennai, Controls rail transport in Kerala. Southern Railway, in its present form, came into existence on 14th April 1951 through the merger of the three state railways namely Madras and Southern Mahratta Railway, the South Indian Railway, and the Mysore state railway. Southern Railway's present network extends over a large area of India's Southern Peninsula, covering the states of Tamilnadu, Kerala, Pondicherry,and a small portion of Andhra Pradesh. Serving these naturally plentiful and culturally rich southern states, the SR extends from Mangalore on the west coast and Kanyakumari in the south to Renigunta in the North West and Gudur in the North East.

The Southern Railway comprises of the following six divisions.

1. Chennai
2. Tiruchchirappalli
3. Madurai
4. Palghat
5. Trivandrum
6. Salem

Kerala is bestowed with a railway route length of 1257 kmsThe total length of railway line under the Thriruvananthapuram division is 488.60 km and that under Palakkad division 549 kms.

1.28 Route Km of Kerala

Route Km			Total Track Km
Broad Gauge	Meter Gauge	Total	
978	72	1050	1638

Source: www.irtsa.net/forums/thread-1173-lastpost.html

Passenger Reservation System: 45

Unreserved Ticketing System: 86

Railway lines of Kerala are mostly situated near to coastline, running in North-South direction. Thiruvananthapuram division has 407level crossings; of which 296 are manned and 111 are unmanned. Unmanned level crossings are main cause of concern with regard to safety of users. The number of deaths in railway level crossings in Kerala that had been declining has of late started increasing, clearly stating the negligence of the people. It is seen that 91 percent of level crossing accidents take place during daytime. It is mainly due to the fact that during night, track volume on roads is quite low. The propensity of accidents at level crossing is measured by multiplying daily traffic volume and train volume passing through a level crossing.

1.29 Analysis of Unmanned Level Crossing Accidents during the last 5 years in Kerala

Years	2006-07	2007-08	2008-09	2009-10	2010-11	Total
Unmanned Level Crossing Accidents	3	2	1	0	1	7

Source: www.kerala.gov.in/docs/publication/2012/kc/july

GCPT. 37/585/2013/DTP.

Thus it can be seen that during the past five years from 2006 to 2011, only seven accidents took place on unmanned level crossings in Kerala.

The scenic Kerala backwaters can now boast of an engineering marvel — the longest rail bridge in the country at 4.62km. The bridge is part of a 8.6-km railway link connecting Idapalli to Vallarpadam in Kochi, where the shipping ministry has constructed the International Container Transhipment Terminal (ICTT).

Air Transport

Air Transport is the fastest and comfortable mode of transporatation. Kerala has three Airports at Thiruvananthapuram, Kochi and Kozhikode handling both International and Domestic flights. Thiruvananthapuram and Kozhikode Air ports are owned by Government of India and Kochi Airport is owned by Cochin International Air port Ltd (CIAL), a company set up by Government of Kerala with public private participation. The details of the flights operated during 2010-11 by various agencies at these three airports are given in Tables1.31, 1.35 &1.36

Trivandrum International Airport

Trivandrum International Airport (IATA: TRV, ICAO: VOTV) is located inThiruvananthapuram and is the first airport in the state of Kerala, India. It is the first international airport in a non-metro city in India TIA is considered as an "all weather" airport in the country and is ISO 9001-2000 certified. Owing to this many flights from Cochin and Calicut are diverted here whenever weather hinders visibility in the respective airports. It is the 8th busiest airport in the country in terms of international passenger traffic and 10th busiest in terms of overall passenger traffic.

The Trivandrum International terminal is located approximately 3.7 km (2.3 mi) due west from the city centre, 16 km (9.9 mi) from Kovalam beach, 9.4 km (5.8 mi) fromTechnopark Trivandrum and 21 km (13 mi) from the proposed Vizhinjam International Seaport.Trivandrum International Airport is the second largest and the second busiest airport in Kerala after Cochin International Airport.

In addition to civil operations, Trivandrum Airport also caters to the Indian Air Force (IAF) and the Coast Guard for their strategic operations. IAF have an exclusive apron to handle all their operations. Trivandrum airport also caters for the Rajiv Gandhi Academy for Aviation Technology, which carries out pilot training activities

Statistics (Apr '11 - Mar '12)

Passenger movements	2,814,799
Aircraft movements	27,239
Cargo tonnage	48,202

Source: en.wikipedia.org/wiki/**Trivandrum**_International_**Airport**

1.30 Details as per financial year 2011-12

(Figures in 000s & Cargo in tonnes)

Passenger traffic handled-International	1835.952
Passenger traffic handled-Domestic	978.847
No. of flights handled-International	15,531
No. of flights handled-Domestic	11,708
Average no.of pax handled per day-International	5030
Average no.of pax handled per day-Domestic	2680
Average no.of cargo handled per day-International	127.62
Average no.of cargo handled per day-Domestic	3.968

Source: Airport Authority of India

1.31 Details of flights operated by various agencies from Thiruvananthapuram International Airport

Sl. No	Airlines	2009-10				2010-11			
		No.of Flights movements		Passengers		No.of Flights movements		Passengers	
		DOM	INT	DOM	INT	DOM	INT	DOM	INT
1	Air Indian Corporation		410		2158		516		73439
2	Srilankan Airliness		728		100694		730		93788
3	GulfAirlineCorporation		730		95098		246		28545
4	Tiger Airways						130		17221
5	Indian	2852	1396	186996	131224	2735	1456	281877	138717
6	Kuwait Airways		416		78577		416		76099
7	Oman Airways		728		89198		730		91651
8	Qatar Airways		930		114311		7300		109692
9	Silkair		328		32515		324		32487
10	Emirates		1002		241444		1252		291143
11	Air India Express		3853		338942		4208		335327
12	Air Arabia		1156		165966		1460		211325
13	Ethinad		729		80697		732		95751
14	Jet Airways	2126	716	125760	115760	2182	1458	150892	158338
15	Maidivian		1468		157155		1416		55927
16	Mihin lanka								
17	Air Deccan								
18	Indigo Air					492		59953	
19	Air sahara								
20	Paramount	1152		49437		24		836	
21	Air Asia		174		176885			362	36878
22	Kingfisher	4004		309999		2756		192547	
23	Non-Schedule	146	106	602	1385	80	486	367	76
	Total	**10280**	**14870**	**672794**	**1972006**	**8269**	**22860**	**686834**	**1846404**

COCHIN INTERNATIONAL AIRPORT LTD

Cochin International Airport (IATA: **COK**, ICAO: **VOCI**) is an international airport serving the city of Kochi. The airport is located in Nedumbassery, about 30 km (19 mi) northeast of Kochi, in the state of Kerala, India. It is the busiest and largest airport in the state of Kerala. For the financial year 2011-12, it was the fourth busiest airport in India in terms of international passenger traffic ferrying 2,586,658 passengers and seventh busiest in terms of overall passenger traffic carrying 4,717,650 passengers. The airport is the primary base for Air India Express operations and is a focus city for Air, Go Air, IndiGo, Jet Airways, JetLite and Spice Jet.

Cochin International Airport is the first airport in India developed under a public-private partnership (PPP) model. The airport pioneered the concept of private investment in the airport sector after being incorporated as a public limited company, receiving investments from nearly 10,000 non-resident Indians (NRIs) from 30 countries. The airport handled 4.7 million passengers and had air traffic movements (ATM) of about 800 per week for the year 2011–12. The airport handles approximately 13,000 passengers every day. 9 domestic airlines and 17 international airlines connect Cochin with nearly 30 destinations nationally and internationally.

Statistics (Apr '11 - Mar '12)

Passenger movements	4,717,650
Aircraft movements	40,181
Cargo tonnage	42,706

Source: en.wikipedia.org/wiki/Cochin_International_Airport

The Domestic Terminal of Cochin International Airport is having 1, 00,000 sq.ft with a Peak Hour Handling Capacity of 400 arrival and 400 departing passengers. This terminal is equipped with most modern passengers with a yearly passenger handling capacity of 3 million passengers.

The International Terminal is having 4,78,000 sq.ft(Arrival Terminal-1,78,000 and Departure Terminal 3,00,000 sq.ft) with a peak Hour Handling Capacity of 1200 arrival and 1200 departing passengers. This terminal is equipped with world-class most modern facilities with a yearly passenger handling capacity of 6 million passengers. The airport is having one of the largest and well-developed car parking area, which can accommodate approximately 1100 cars at a time.

At present, Cochin International Airport is having 15 aircraft parking stands and exclusive parking stand for parking of general aviation and helicopters. Cochin International is having separate terminals for international cargo, Domestic Cargo and Perishable Cargo. The perishable Cargo Centre, with state of the art facilities is equipped to handle 25,000 MT perishable Cargo per annum. Cochin International Airport has also constructed a Golf Course, Trade/Exhibition Centre, Airport Museum, 110 KV Sub Station, Aircraft Hanger etc.

The construction of the Radar Building and Duty Free Godown is nearing completion. Thework of the 2nd phase expansion of the Golf Course is going on.CIALis also planning to widen the Athani-Airport connecting road and also construction of a new International Terminal Building, Sports Complex etc.

1.32 International cargo handled at Cochin International Airport Limited

(Figures in Metric Tons)

Period	Export	Import	Total	%increase
2000 Dec to 2001 Mar	961.50	570.00	1531.50	-
2001 Apr to 2002 Mar	3942.60	2008.40	5951.00	-
2002 Apr to 2003 Mar	6288.80	2375.20	8664.00	45.59
2003 Apr to 2004 Mar	9484.00	3341.82	12825.82	48.04
2004 Apr to 2005 Mar	13092.70	5181.60	18274.30	42.48
2005 Apr to 2006 Mar	12057.50	5629.29	17686.79	-3.21
2006 Apr to 2007 Mar	12647.00	4363.80	17010.80	-3.82
2007 Apr to 2008 Mar	15024.00	5827.70	20851.70	22.58
2008 Apr to 2009 Mar	20645.34	6898.18	27543.52	32.09
2009 Apr to 2010 Mar	25627.80	9871.8	35499.6	28.89
2010 Apr to 2011 Mar	24867.23	9286.00	34153.23	-3.79
2011 Apr to 2012 Mar	26183.00	9358.00	35541.00	4.06336

Source: Airport Authority

1.33 Domestic Cargo Handled at Cochin International Airport Limited

Period	Departure	Arrival	Total	% increase
2005 Feb to 2005 Mar	219.30	318.30	537.60	-
2005 Apr to 2006 Mar	1554.00	2405.60	3959.60	-
2006 Apr to 2007 Mar	2239.70	2681.80	4921.50	24.20
2007 Apr to 2008 Mar	2451.70	3766.40	6218.10	26.35
2008 Apr to 2009 Mar	2392.80	4222.40	6615.20	6.39
2009 Apr to 2010 Mar	1610.60	4283.70	5894.30	-10.90
2010 Apr to 2011 Mar	1920.90	5017.70	6938.60	17.72
2011 Apr to 2012 Mar	2204.50	5098.70	7303.20	5.25

Source: Airport Authority

1.34 Cochin International Airport Limited

Year	International Terminal						Domestic Terminal						Total Movements (IT+DT)		% INCREASE OVER LAST YEAR	
	A/C movements			PAX movements			A/C movements			PAX movements						
	ARR	DEP	TOTAL	ARR	DEP	TOTAL	ARR	DEP	TOTAL	ARR	DEP	TOTAL	A/C	PASSENGER	A/C	PAX
JUN 99-MARCH 2000	547	724	1271	92648	111724	204372	2696	2506	5202	143822	147708	291530	6473	495902	-	-
2000-01	1150	1190	2340	155384	159725	315109	4225	4182	8407	223325	234277	457602	10747	772711	38.33	29.84
2001-02	2152	2166	4320	210335	208939	419294	3736	3748	7484	206003	207562	413565	11804	832859	9.83	7.78
2002-03	3147	3162	6309	287914	302804	590718	3575	3562	7137	209299	210269	419568	13446	1010286	13.91	21.30
2003-04	4303	4299	8602	422395	438609	861004	3988	4000	7988	233256	238341	471597	16590	1332601	23.38	31.90
2004-05	5160	5163	10323	495276	510880	1006156	4144	4144	8288	296785	293269	590054	18611	1596210	12.18	19.78
2005-06	5720	5724	11444	563719	590998	1154717	4768	4763	9531	373145	358515	731661	20975	1886378	12.70	18.18
2006-07	7082	7090	14172	686720	742452	1429172	8255	8246	16501	561306	570592	1131898	30673	2561070	43.23	35.76
2007-08	8165	8170	16335	865123	905489	1770612	11416	11417	22833	779461	788069	1567530	39168	3338142	27.69	30.34
2008-09	9522	9525	19047	986990	1023124	2010114	11066	11059	22125	669223	683464	1352687	41172	3362801	5.11	.73
2009-10	9024	9044	18068	1106412	1125934	2232346	11737	11739	23476	874248	839509	1713757	41544	3946103	0.9	17.34
2010-11	9236	9245	18481	1158563	1201374	2359937	11306	11294	22600	987951	997291	1985242	410 81	4345179	-1.11	10.11
2011-12	9157	9167	18324	1289116	1298916	2588032	11409	11408	22817	1072154	1063207	2135361	41141	4723393	0.15	8.7

Source: Airport Authority

1.35 Details of flights operated by various agencies from Cochin International Airport

Sl.No	Airlines	2009-10				2010-11			
		No of Flights		Passengers		No of Flights		Passengers	
		DOM	INT	DOM	INT	DOM	INT	DOM	INT
1	Air India		1962		138105		1496		126680
2	Air India Express		4506		4288856		4398		421480
3	Indian Airlines	4296	1021	195586	87750	4257	931	274431	79948
4	Oman Air		730		93430		730		96573
5	Silk Air		830		77543		730		82770
6	Kuwait Airways		434		71970		316		58118
7	Emirates Airlines		1462		406985		1462		431353
8	Qatar Airways		712		109937		936		143681
9	Saudi Arabian Airlines		400		81498		416		103861
10	Srilankan Airways						6		1097
11	Gulf Air		730		86583		730		83397
12	Mahan Air								
13	Air Arabia		1464		217527		1460		223744
14	Jazeera Airways		54		6189				
15	Ethihad Airways		730		91169		730		92137
16	Tiger Airways								
17	Jet Airways	4304	2391	337881	250683	5305	2187	438753	252274
18	Air Deccan								
19	King Fisher Airlines	7647		459234		5226		314316	

20	Go Air	1444		180894		1444		188860	
21	Paramount Airways	737		31683					
22	Air Sahara							291709	
23	Inter Globe Aviation	942		131011		2204		278793	
24	Spice Jer Limited	1186		186245		1639		189708	
25	Jet Lite	1154		184102		1448			
26	Behrin air		416		50446		452		50308
27	Non Scheduled flights	694	26	2870	1666	270	101	1060	3333
28	Air Asia		280		35233		730		92758
29	Trailing Flight					6			
30	PH to ONGC	327		1780		495			
31	Heligo to ONGC	284		2092				2374	
32	Decan Cargo	141							
33	United Heli charters	20		79					
34	Alliance Air					306		5238	
35	Intel Frighter						6		
36	Naz Air						10		26025

Source: Economic Review

Calicut International Airport

Calicut International Airport (IATA: **CCJ**, ICAO: **VOCL**), also known as **Karipur Airport**, is an International Airport serving the cities of Kozhikode (Calicut) and Malappuram in Kerala, India. The airport is located in Karipur, Malappuram district about 28 km (17 mi) from the Kozhikode Railway Station and 25 km (16 mi) from the city of Malappuram, with the closest railway station being at Feroke. Air India Express has a base at the airport. It is the *seventh busiest* airport in the country in terms of international passenger traffic and the *ninth busiest* airport in India in terms of overall passenger traffic .The airport was given the international airport status on 2 February 2006, thereby paving the way for the improvement of infrastructure for handling international flights. It is the third busiest airport in Kerala.

Statistics (Apr '10 - Mar '11)

Passenger movements	2,059,979
Aircraft movements	16,690
Cargo tonnage	22,246

Source: en.wikipedia.org/wiki/**Calicut**_International_**Airport**

1.36 Details of flights operated by various agencies from Kozhikode Airport

Sl. No	Airlines	2009-10				2010-11			
		No.of Flights movements		Passengers		No.of Flights movements		Passengers	
		DOM	INT	DOM	INT	DOM	INT	DOM	INT
1	Air India-DOM:&INT		2325		64095		2439		272173
2	Air India Express-Dom &Int		5378		165099		5145		549677
3	Air Arabia		738		37496		740		113607
4	Air Deccan								
5	Behrain Airlines		360		15326		424		51659
6	Eithad Airways		336		11830		310		40623
7	Emirates		872		102748		1180		334335
8	Indian Airlines-Dom &Int		3398		71083		2345		211721
9	Jetlite	62		7142		726		94934	
10	Jet Airways		664		23438	2		0	
11	Kingfisher Airlines	1432		9845		686		34598	
12	NACIL(IAC)								
13	Oman Air		730		31448		738		96430
14	Qatar Airways		738		30092		742		107615
15	Rak Airways						240		28985
16	Saudia Airways		420		28203		532		101371
17	Srilankan Airlines								

Source: Economic Review

Kannur International Airport

Kannur International Airport is an upcoming international airport located at Mattanur in Kannur District, Kerala, India. The airport is the fourth international airport in Kerala.Kannur International Airport is expected to be operational by 2015. Kannur Airport is located at a distance of 25 km from Kannur. The airport location is 19 kilometres away from National Highway 17(NH-17) and 4 kilometres away from Tellicherry-Mysore Highway (SH-30). Kannur-Mattannur Road, a new green field road, has been planned as the main access to the airport to ensure fast and free movement of traffic. It will not have any traffic junctions, and will have provision for entry and exit ramps for joining and exiting traffic from connecting roads. More than 8 roads are to be developed for connecting to the Airport, which includes Kannur (Melechovva) Mattannur road, Thalassery Mattannur road, Thalassery Anjarakandy Airport road, Thalassery Nadapuram Road, Karnataka Border (Koottupuzha / Makutta) Mattannur Road, Wayanad (Mananthavadi) Nedumpoil Mattannur road, Payyannur / Ezhimala Mattannurroad, Thalassery Mahe Bypass,etc. Thalassery – Mattannur road will be upgraded to 4/6 lanes, considering the availability of required land for widening. Other related roads will be widened and upgraded with high quality surfacing and constructing new bridges and culverts. Approximately, Rs. 300 crore are expected as the cost for the development of access roads to the Airport.

According to a detailed project report prepared by CIAL, in 2015, the number of domestic passengers expected to use the airport is 0.61 million, and international passengers 1.32 million. The number of passenger estimated to use the airport in 2021 is 2.94 million. Number of international passengers are expected to be 2.03 million and domestic passengers will be 0.91 million

Kerala State Industrial Enterprises Ltd

Kerala State Industrial Enterprises Ltd is a Government of Kerala undertaking and as part of their diversification program; they are into the sea cargo operations and thus decided to start a Container Freight Station. They started the construction of the same at Eloor along side ICTT Road near Kalamassery. It is so designed to extend impeccable freight management. It is characterized with exceptional features like.

- Hardly 15 kilometres away from the Vallarpadam International Container Transshipment Terminal and along side the new ICTT Highway with easy and trouble-free access to our CFS.
- App.4 acres of finished yard for the free movement of vehicles and equipments with distinct areas to stack containers.
- Elegantly designed Administrative Block with space to spare for User Agencies, CHAs, Liners, Banks etc.
- 40 Ton Reach Stacker for mounting and grounding the Containers
- 2 Nos., 3 Ton Fork lifts to move cargo from containers to warehouse and within warehouse.
- Sufficient Electric points for Freezer containers
- Separate Import and Export warehouses of total area 53000sq.ft
- 100 Ton In house Weighment facility.
- In house Container tracking facility.
- 24X7 power maintained by dedicated 250 KVA genset
- Fully mechanized containers and cargo movement in the yard.

- In house banking facility (proposed)
- Experienced supporting staff
- Sufficient lighting to yard by two High Mast lights
- In house Canteen
- 24 hrs Watch and ward.

COMMUNICATION

COMMUNICATION

Communication means exchange of information, ideas or feelings from one person to another. The word "communicate" comes from the Latin word Communicare, which means "to Share" or to "make common". Communication makes it possible for people to share their knowledge, add to it, and pass it on to the future generation. An effective communication network is essential not only for the requirement of travel and transport but also for socio-economic development of a state and country.

Postal Communication

In terms of area covered and population served, the Indian Postal network is amongst the largest networks in the world. These post offices provide a number of services, broadly classified into four categories: Communication services (letters, post cards), Transportation services (parcel, Logistics post), Financial services (savings Bank, Money order, International Money Transfer Service, Public Private Partnerships for extending financial service outreach through the post office network, Postal Life Insurance and Premium Value Added Services (like Speed Post, Business Post, Retail Post).

Kerala Postal circle includes the entire State of Kerala, the Union Territory of Lakshadweep islands and Mahe under the Union Territory of Pondicherry. Kerala is the only postal circle where every village has at least one post office. During 2010-11, there are 5067 post offices in Kerala. These post offices are categorized as Head Post Offices, Sub-Post Offices and Branch Post Offices. There are 51 Head Post Offices, 1455 Sub-Post Offices, 2 ED Sub Offices and 3559 Branch Post Offices.

2.1 ANALYSIS OF EXPENDITURE FOR LAST EIGHT YEARS KERALA POSTAL CIRCLE

Head of Account	2004-05		2005-06		2006-07		2007-08	
	Allt.	Exp.	Allt.	Exp.	Allt.	Exp.	Allt.	Exp.
3201-Working Expenses (Non-Plan)		223.23		231.01	245.31	245.40	259.41	259.66
Audit & Pensionery Charges		66.99		76.38	92.20	88.32	100.62	95.90
3201-Working Expenses including audit & Pensionary charges		290.22		307.39	337.51	333.72	360.03	355.56
PLI/RPLI								
5201-Capital Outlay (Non - Plan)					1.46	1.46	0.00	0.00
PLAN								
3201-Revenue (Plan)		0.74		1.32	338.97	338.13	1.20	1.13
5201-Capital Outlay (Plan)		2.42		6.14	0.07	0.03	1.27	5.13
Total - PLAN							**2.47**	**6.26**

Head of Account	2008-09		2009-10		2010-11		2011-12	
	Allt.	Exp.	Allt.	Exp.	Allt.	Exp.	Allt.	Exp.
3201-Working Expenses (Non-Plan)	351.73	347.49	449.84	449.34	449.11	468.55	478.18	486.74
Audit & Pensionery Charges	232.08	162.30	213.45	182.58	190.10	187.02	190.71	203.80
3201-Working Expenses including audit & Pensionary charges	583.81	509.79	663.29	631.92	639.21	655.57	668.89	690.54
PLI/RPLI							3.77	4.32
5201-Capital Outlay (Non - Plan)	0.15	0.15	0.32	0.20	0.05	0.04	0.00	0.09
PLAN								
3201-Revenue (Plan)	1.60	1.61	2.94	2.98	1.73	1.75	1.66	1.69
5201-Capital Outlay (Plan)	1.98	2.01	12.42	13.33	8.37	6.51	4.67	4.37
Total - PLAN	**3.58**	**3.62**	**15.36**	**16.31**	**10.10**	**8.26**	**6.33**	**6.06**

Source: Department of post

2.2 Revenue Achievement of Kerala Postal Circle for the last eleven years

(Rs.In crores)

Head of Account	REV 2001-02	REV 2002-03	REV 2003-04	REV 2004-05	REV 2005-06	REV 2006-07	REV 2007-08	REV 2008-09	REV 2009-10	REV 2010-11	REV 2011-12
Postage realized in Cash	33.29	28.52	28.69	28.06	30.62	30.78	30.46	30.78	27.04	29.57	29.97
Sale of Postage Stamps	88	92.90	89.64	84.74	76.55	67.5	65.32	63.35	61.86	56.48	54.96
Sale of Service Stamps	9.22	9.82	2.14	0.44	1.94	3.2	3.55	4.38	5.66	4.41	4.77
Commission on IMOs/IPOs	27.08	25.34	25.07	26.84	31.19	33.22	37.5	36.88	42.77	61.38	71.9
Others	2.64	5.48	5.55	6.89	7.17	7.57	7.65	2.36	2.18	1.97	1.98
Postal Operations-Total	**160.23**	**162.06**	**151.09**	**146.97**	**147.47**	**142.27**	**144.48**	**137.75**	**139.51**	**153.81**	**163.58**
Business Development	0	17.46	24.25	28.35	31.75	38.46	43.84	51.38	61.24	67.88	69.11
Total	**160.23**	**179.52**	**175.34**	**175.32**	**179.22**	**180.73**	**188.32**	**189.13**	**200.75**	**221.69**	**232.69**
SB/CC Work	67.78	74.59	64.2	84.4	107.81	106.16	108.4	121.19	128.23	141.43	170.02
Grand Total	**228.01**	**254.1**	**239.54**	**259.72**	**287**	**286.9**	**296.7**	**310.32**	**328.98**	**363.12**	**402.71**

Source: Department of post

Telecommunication

Bharat Sanchar Nigam Limited (BSNL)

Telecom is a very fast growing sector of the economy. The telecommunication has shown tremendous growth in the past few years particularly with the launching of cellular services in the State. Connecting all the panchayats through telephones is an important national goal. Kerala Telecom circle serves the whole of Kerala State, the Union Territory of Lakshadweep and part of Union Territory of Pondicherry (Mahe)

Kerala has an impressive record of performance in Telecom Sector. It was in this state that all the telephone exchanges were made automatic for the first time in the whole country, way back in 1990.In 1992, we become the first state to provide Public Telephone facilities in all panchayat Head Quarters. Kerala is also the first state to provide public telephone in every village; by 1995.Connecting all the villages through telephones is an important national goal. Again it has the unique status of providing STD facility to all telephone exchanges. In the mobile segment there has been a boom in the state. The Internet is another growing mode of communication and there are worldwide systems of computer networks. Broadband is often called high speed internet, because it usually has a high rate of data transmission.

2.3 District-wise estimated No. of fixed phones as on 31st March 2012

District	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
THIRUVANANTHAPURAM	325370	356417	366429	376452	383387	383614	380548	358196	345924	316511	303575
KOLLAM	204368	237456	251637	273217	294712	300315	297002	288974	272617	262702	256846
PATHANMATHITTA	168011	182398	194466	197264	198014	202430	198260	183647	176155	164824	161592
ALAPPUZHA	166585	196730	214350	229500	235478	238020	236053	227554	225052	208678	204509
KOTTAYAM	215154	241397	256984	270286	274831	277691	270001	264857	257915	244877	235746
IDUKKI	83131	86928	91540	99528	102609	103647	107593	94233	90114	88741	81267
ERNAKULAM	377847	394798	401181	410389	410438	414590	407334	389015	374281	356687	355526
THRISSUR	300835	325892	346704	368252	379612	386090	383725	377630	369440	363007	348242
PALAKKAD	139283	159292	169177	189196	193570	189181	184230	178001	166772	164743	162310
MALAPPURAM	196728	228060	255075	292047	323272	333245	323906	315985	299874	280306	267845
KOZHIKODE	193807	222139	242740	264885	282665	288133	280357	273327	270510	256132	236894
WAYANAD	36615	45809	50637	56891	59959	61119	60520	57978	56846	53967	47959
KANNUR	182846	208605	234479	264288	284985	300151	301577	301965	291100	277671	271352
KASARAGOD	85408	94699	105337	118771	131052	138025	141407	138860	136255	130944	120135
PONDICHERRY (MAHE)	5958	4638	4793	5004	5196	5413	5310	5283	5257	5149	5033
LAKSHADWEEP	8638	8679	8651	8927	8917	8903	8296	8123	7349	7273	6553
TOTAL	2690584	2993937	3194180	3424897	3568697	3630567	3586119	3463628	3345461	3182212	3065384

Source: BSNL

2.4 District-wise estimated No. of Landline + WLL+ Mobile as on 31st March 2012

District	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
THIRUVANANTHAPURAM	325399	358893	420164	496484	610785	663977	677825	721125	824705	1036710	1110569
KOLLAM	204368	240139	286982	343414	425869	475616	502824	526783	583878	685525	744681
PATHANMATHITTA	168011	183712	210731	230289	270561	296931	324400	308656	355857	417698	495736
ALAPPUZHA	166585	198351	234793	278337	335433	367525	386524	403863	454169	528312	586739
KOTTAYAM	215154	242914	292203	345666	436123	477278	492628	521038	607889	737197	847449
IDUKKI	83131	88678	105237	132256	165227	187844	199603	201487	247139	378485	353298
ERNAKULAM	381390	399028	466391	548096	680602	751732	766218	831236	874733	991605	1275268
THRISSUR	300835	327420	380870	447326	527272	573288	620118	635095	697721	841843	895389
PALAKKAD	139283	161660	197659	234248	348755	375773	394935	418942	495750	589512	653393
MALAPPURAM	196728	230836	287804	359604	458677	505415	531241	534037	627444	740267	787780
KOZHIKODE	193807	222891	288781	359263	450843	503132	502137	551264	641574	719668	844036
WAYANAD	36615	46523	61367	79163	97634	100997	107266	110571	140659	212762	177806
KANNUR	182846	210011	264293	321171	420024	452952	485494	509738	608087	705689	879294
KASARAGOD	85408	96538	118501	148854	191620	218392	234012	249226	305193	426386	473466
PONDICHERRY (MAHE)	5958	4638	5483	6959	10017	11077	11800	13249	18362	11441	11778
LAKSHADWEEP	8638	8679	8651	11471	15074	16306	18737	17706	24478	28241	41151
TOTAL	**2694156**	**3020911**	**3629910**	**4342601**	**5444516**	**5978235**	**6255762**	**6554016**	**7507638**	**9051341**	**10177833**

Source: BSNL

2.5 District-wise Teledensity per 1000 population (Fixedline+WLL+Mobile) as on 31st March 2012

District	2001-12	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
THIRUVANANTHAPURAM	100.59	110.94	129.88	153.47	188.81	205.25	209.53	222.91	254.93	320.47	343.30
KOLLAM	79.09	92.93	111.06	132.90	164.81	184.06	194.59	203.86	225.96	265.30	288.19
PATHANMATHITTA	136.37	149.12	171.05	186.92	219.61	241.02	263.31	250.53	288.84	339.04	402.38
ALAPPUZHA	79.14	94.23	111.54	132.23	159.35	174.60	183.62	191.86	215.76	250.98	278.74
KOTTAYAM	110.22	124.44	149.69	177.08	223.42	244.51	252.37	266.93	311.42	377.66	434.14
IDUKKI	73.63	78.55	93.21	117.14	146.35	166.38	176.80	178.47	218.90	335.24	312.93
ERNAKULAM	123.11	128.80	150.55	176.92	219.69	242.65	247.33	268.31	282.35	320.08	411.64
THRISSUR	101.12	110.06	128.02	150.36	177.23	192.70	208.44	213.48	234.53	282.97	300.97
PALAKKAD	53.22	61.77	75.53	89.51	133.27	143.59	150.91	160.08	189.43	225.26	249.67
MALAPPURAM	54.20	63.59	79.28	99.06	126.36	139.23	146.35	147.12	172.85	203.93	217.02
KOZHIKODE	67.34	77.45	100.34	124.83	156.65	174.82	174.47	191.54	222.92	250.06	293.27
WAYANAD	46.52	59.11	77.98	100.59	124.06	128.33	136.30	140.50	178.73	270.35	225.93
KANNUR	75.81	87.07	109.57	133.16	174.14	187.79	201.28	211.33	252.11	292.57	364.55
KASARAGOD	71.00	80.25	98.50	123.74	159.29	181.54	194.52	207.17	253.69	354.44	393.57
PONDICHERRY (MAHE)	198.60	154.60	182.77	231.97	333.90	369.23	393.33	441.63	612.07	381.37	392.60
LAKSHADWEEP	141.61	142.28	141.82	188.05	247.11	267.31	307.16	290.26	401.28	462.97	674.61
TOTAL	**84.38**	**94.62**	**113.69**	**136.01**	**170.52**	**187.24**	**195.93**	**205.27**	**235.14**	**283.49**	**318.77**

Source: BSNL

2.6 District-wise estimated No. Exchanges as on 31st March 2012

District		2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
THIRUVANANTHAPURAM	Rural	60	65	67	70	70	70	69	69	69	69	68
	Urban	28	28	28	27	27	27	27	27	27	27	27
KOLLAM	Rural	65	70	70	73	76	76	76	77	77	77	77
	Urban	14	14	13	13	9	9	9	9	9	9	9
PATHANMATHITTA	Rural	65	69	69	70	74	75	76	78	77	77	77
	Urban	8	8	8	8	7	7	7	7	7	7	7
ALAPPUZHA	Rural	40	51	50	51	53	51	52	52	52	52	52
	Urban	18	18	18	18	19	19	20	20	20	20	20
KOTTAYAM	Rural	75	78	79	83	80	84	84	84	84	83	83
	Urban	15	15	15	14	18	18	17	17	17	17	17
IDUKKI	Rural	77	78	78	78	78	78	78	78	78	78	78
	Urban	3	3	2	2	2	2	2	2	2	2	2
ERNAKULAM	Rural	72	72	72	70	70	72	72	72	72	72	72
	Urban	42	48	52	53	52	52	52	49	49	50	50
THRISSUR	Rural	52	54	58	58	63	63	65	65	65	63	63
	Urban	26	26	25	25	20	20	21	21	22	24	24
PALAKKAD	Rural	78	90	91	92	94	100	98	98	100	100	100
	Urban	12	12	13	13	17	17	17	17	17	17	17
MALAPPURAM	Rural	69	79	75	77	82	88	88	88	88	88	88
	Urban	6	6	6	6	6	6	6	6	6	6	6
KOZHIKODE	Rural	42	50	58	60	61	60	59	59	60	61	61
	Urban	32	32	32	32	32	32	32	32	32	32	32
WAYANAD	Rural	28	29	29	29	29	29	29	29	29	29	29
	Urban	1	1	2	2	2	2	2	2	2	2	2
KANNUR	Rural	72	87	87	88	85	85	85	85	86	86	86
	Urban	25	25	26	27	27	27	27	27	27	27	26
KASARAGOD	Rural	46	52	52	53	52	52	52	52	52	52	52
	Urban	6	6	6	6	6	6	6	6	6	6	6
PONDICHERRY(MAHE)	Urban	1	1	1	1	1	1	1	1	1	1	1
LAKSHADWEEP	Rural	7	7	7	8	8	8	8	8	8	8	8
	Urban	3	3	3	3	3	3	3	3	3	3	3
TOTAL		**1088**	**1177**	**1192**	**1210**	**1223**	**1239**	**1240**	**1240**	**1244**	**1245**	**1243**

Source: BSNL

POWER

GCPT. 37/585/2013/DTP.

POWER

Power or electricity is the essential source of commercial energy which is a vital component for sustained Economic Growth of the economy. Energy is a basic requirement for all facts of our life, it is also a basic human need and is a critical infrastructure on which the socio-economic development of the country. In addition to it, its widely recognized role as a catalyst to economic activity in different sectors of economy, the power sector makes a direct and significant contribution to economy in terms of revenue generation, employment opportunities and enhancing the quality of life. The increase of demand of power means the economy is growing and is leading to modernization, industrialization and improvement in basic amenities culminating into better quality of life of the people. It provides light and fuel to millions of households, electricity to industry, agriculture, commerce, all service sectors and so on. The hall mark of development of an economy depends more on energy than any other thing.

Hydro power is recognized as an environment friendly source of energy which is non polluting and economical. The State of Kerala is bestowed with hydel potential which if exploited fully will provide a strong thrust to economy of the State. The optimal exploitation of the available hydel resources in the State would not only meet the State's demand but will ensure supply of power to National grid to boost the overall development of the country. The Hydro Generated power is environmentally clean energy source, besides being the cheapest source of energy. Hydropower also offers unique possibilities to manage the power network by its ability to quickly respond to peak demands. Pumping-storage plants, using power produced during the night, while the demand is low, is used to pump water up to the higher reservoir. That water is then used during the peak demand period to produce electricity. This system today constitutes the only economic mass storage available for electricity. Hydroelectric power plants generally range in size from several hundred kilowatts to several hundred megawatts.

Power Sector in Kerala

Power Sector in Kerala plays a vital role in all developmental activities in Kerala. Obviously power crisis is the prime obstacle to start new initiatives in the industrial field. The need for power is increasing and the production of power should be increased accordingly. Monsoon is essential to sustain the hydropower base in the State. As we depend monsoon for the hydropower generation of power generation, the shortage in rainfall usually creates power crisis. The State of Kerala is rich in renewable sources of energy in the form of water resources. Kerala State Electricity Board is a public sector agency Established in 1957 under the authority of the Department of Power of kerala government. Kerala State Electricity Board (KSEB) has taken several initiatives to improve the physical and financial performances. During the past several years KSEB has been responsible for the generation, transmission and supply of electricity in the State, with particular emphasis to provide electricity at affordable cost to the domestic as well as for agricultural purposes. The Board has set up adequate generation capacity and transmission network and Kerala is one of the few states in the country having availability of power to meet the demand.

Power Generation

Main source of Energy generation in Kerala is Hydroelectric Power. Hydro power development in Kerala begins with the commissioning of Pallivasal Hydro Electric Project in 1940.Sabarigiri in 1966 and Idukki in 1976 are the milestones of Kerala State Electricity Board. Biggest Hydroelectric Project in Kerala is Idukki .Idukki power project includes Idukki,Cheruthonni and Kilivallithode dams.Important hydel projects in river periyar include Pallivasal, Chenkulam, Idukki, Panniyar, Neryamangalam, Idamalayar and lower periyar.

Power System in Kerala consisted of Hydel, thermal and wind sources.Hydel energy is the most reliable and dependable source in Kerala. Of the total installed capacity, 2862.64 MW during 2011, the lion's share of 2037.35 MW installed capacity comes from 24 hydel stations, 791.616 of MW is from the thermal projects including NTPC at Kayamkulam which is Kerala's dedicated thermal station. Two Diesel power plants are at Brahmaputra and Nallalam.Wind

farm power projects of Kerala are at Kanjikkode and Ramakkalmedu.Kanjikode wind farm, Palakkad has an installed capacity of 2.03 MW.

3.1 Generation installed capacity (MW) as on 31.03.2011

Sl.No	Source of Energy	Capacity (MW)	Firm Annual Generation Capability (MU)
1.	Hydel-KSEB	1994.35	7041.02
2.	Thermal:KSEB	234.60	1502.00
3.	Wind-KSEB	2.02	4.00
4.	Hydel-Pvt	43.00	159.14
5.	Thermal-Pvt	197.43	1358.63
6.	Wind-Pvt	31.65	67.52
7.	NTPC	359.58	
Total		**2862.64**	**12290.31**
8.	Hydro-renewable	1881.50	-
9.	RES*-MNRE	145.83	-

*Renewable Energy Sources
Source: KSEB

3.2 Generating Capacity, Maximum Demand and Load Factor

Sl.No	Year	Installed Capacity (MW)*	Total Energy (MU) (Generation Purchase-Export)	Maximum Demand	Load Factor (%)
1	2000-01	2420.68	12510	2316	61.66
2	2001-02	2601.62	12577.79	2333	61.54
3	2002-03	2601.62	12685.34	2347	61.7
4	2003-04	2614.22	12503.47	2426	58.83
5	2004-05	2617.22	12568.42	2420	59.29
6	2005-06	2644.22	13665.38	2578	60.51
7	2006-07	2657.22	14848.73	2742	61.82
8	2007-08	2670.90	15431.41	2745	64.17
9	2008-09	2739.00	15660.51	2765	64.66
10	2009-10	2746.00	17386.44	2998	66.2
11	2010-11	2862.60	17794.64	3119	65.13

Source: KSEB

3.3 Generation of Power at Different Stations (in MU)

Station	2006-'07	2007-'08	2008-'09	2009-10	2010-11
Brahmapuram, EKLM	85.06	95.76	216.98	233.04	96.0486
BSES (Gas- IPP)	182.76	355.18	587.56	577.5	223.5867
Chembukadavu	12.21	9.28	8.16	8.47	13.54
Idamalayar	388.18	474.63	293.16	334.51	388.116
Idukki	2429.04	3316.02	2096.8	2035.05	2264.51
Kakkad	248.57	246.75	162.8	224.25	224.42
Kallada	76.07	73.03	45.62	60.3147	72.2545
Kanjikode (wind farm)	2.14	1.96	1.81	1.94	1.5143
Kayamkulam	1137.27	1721.54	860.99	1137.18	1009.1392
KPCL(IPP)-Kasargode	24.29	35.53	97.24	75.34	27.076
Kozhikkode (KDPP)	161.96	278.38	438.28	359.202	219.3006
Kuttiyadi	361.22	644.72	594.7	634.72	558.68
Kuthunkal(Hydro captive)-Idukki	47.52	62.85	38.42	34.25	48.108
Lower periyar	645.04	677.97	482.99	525.24	616.0587
Lower Meenmutty	5.66	4.92	3.82	3.423	7.1956
Maniyar (PVT)	43.02	38.21	25.3	33.79	40.59
Mattupetty-Idukki	5.57	6.91	5.64	1.9323	2.28
Malankara	32.33	43.7	33.49	32.4216	36.9
Neriamangalam	277.84	313.06	318.88	336	370.5159
Pallivasal	241.7	229.04	197.96	240.19	235.64
Panniyar	168.35	82.15	0	132.74	180.8591
Peppara	8.19	8.18	5.41	5.89	9.7538
Poringal Kuthu	184.57	162.59	127.44	264.79	187.5685
Poringal LBE	107.81	59.94	109.62		120.6933
Sabarigiri	1560.53	1541.35	962.95	1404.01	1372.635
Sengulam	176.22	164.77	153.55	157.81	170.5848
Sholayar	265.9	254.68	213.93	229.96	243.24
Urumi 1&2-Kozhikode	14.55	13.78	8.87	11.64	15.64

Source: KSEB

Power consumption

Power consumption has increased substantially over the year. Domestic as well as commercial consumption, Railway traction, Agricultural pumping and Licensees increased. The sale of energy has increased corresponding to the increase of total consumers. In the year 2010-11, the domestic consumed about 46.85percent of the total consumption.Similarly, the commercial consumption is 19.17and for the industrial purposes there is about26.24 percent. The detail of consumption and revenue collected during 2010-11 is as shown below.

3.4 Power Consumption (in MU) and Revenue Collected (Rs. in Lakhs) in Kerala 2010-'11

Category	No. of Consumers	Energy Sold	Sales %	Connected load (KW)	Revenue	Revenue %
Domestic	8092072	6877.83	46.86	10497710	136344.16	26.23
Commercial LT+HT	1457682	2809.75	19.14	2778910	141083.45	27.14
Public Lightning	3038	265.68	1.81	91090	5627.7	1.08
Agricultural	446510	239.56	1.63	924490	2665.46	0.51
Industrial LT	127354	1053.45	7.177	1516560	46053.87	8.859
HT & EHT	1269	2697.13	18.38	724110	151282.97	29.1
Railway Traction	8	156.39	1.065	65270	6445.75	1.24
Licensees	13	448.11	3.053	83710	16345.76	3.144
Export	-	130.24	0.887	-	14003.12	2.694

Source: KSEB

3.5 Category wise Sales of Energy in Kerala (in MU)

Category	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Domestic	4668.36	5213.15	5602.85	5931.27	6559.00	6877.83
Commercial	1600.64	1811.71	1378.33	1501.60	1793	2809.75
Industrial LT	873.90	933.33	984.18	1015.40	1064	1053.45
Industrial HT & EHT	2365.99	2506.45	3139.50	2986.97	3417.09	2697.13
Public lighting	207.78	228.74	248.56	294.32	303	265.68
Agriculture	199.11	229.6	230.55	225.22	257	239.56
Railways	57.94	72.16	109.26	142.07	165	156.39
Licence	296.06	335.35	356.62	317.47	413	448.11
Export	635.90	1046.89	1346.76	463.33	53.90	130.24
Total	**10905.70**	**12377.89**	**13396.61**	**12877.65**	**14024.99**	**14678.14**

Source: KSEB

3.6 Consumers and Connected Load

Sl.No	Year	No. of consumers at the end of the year	Connected load in KW at the end of the year
1	2000-01	64,46,298	85,51,000
2	2001-02	66,61,724	89,17,060
3	2002-03	69,47,803	93,94,400
4	2003-04	73,00,078	99,10,150
5	2004-05	77,99,276	1,03,33,510
6	2005-06	82,95,081	1,09,07,200
7	2006-07	87,13,870	1,14,65,690
8	2007-08	90,33,756	1,23,78,000
9	2008-09	93,63,461	1,52,67,420
10	2009-10	97,43,476	1,58,66,550
11	2010-11	1,01,27,946	1,66,81,850

Source: KSEB

GROWTH OF KERALA POWER SYSTEM

The installed capacity has been increased to 2862.6MW as on March2011 as against the 2746.19MW in the previous year. Likewise, per-capita consumption has also been increased by 481KWh from 474 KWh.The details of growth of power system in Kerala is seen in Table 3.7

3.7 Growth of power system in Kerala

(from 2006 to 2011)

Sl. No	Particulars	March 2006	March 2007	March 2008	March 2009	March 2010	March 2011
1.	Installed capacity -MW	2644.22	2657.22	2670.90	2739	2746.19	2862.6
2.	Maximum demand(system) -MW	2578	2742	2745	2765	2998	3119
3.	Generation per Annum-MU	7600.78	7745.78	8703.55	6494.50	7240.38	7412.58
4.	Purchase per Annum	6700.50	8149.84	8074.62	9628.98	10199.96	10512.29
5.	Export per Annum-MU	635.90	1046.89	1346.74	463.33	53.90	130.24
6.	Energy sales per Annum-MU	10269.80	11331	12049.85	12414.32	13971.09	14547.9
7.	Percentage of energy loses to energy available for sales	24.59	23.43	21.63	20.45	19.41	
8.	Per capita consumption-KWh	427	465	470	472	474	481
9.	220KV line-CT Kms	2709.198	2709.198	2710.21	2710.21	2728.47	2728.47
10	110KV line-CT Kms	3814.5	3842.24	3898.618	3916.118	3964.42	3998.64
11.	66 KV line-CT Kms	2269.04	2299.31	2310.44	2310.44	2310.44	2310.44
12.	33KV line-CT Kms	686.42	801.47	906.91	1076.48	1275.70	1339.3
13.	22KV line-CT Kms	157	157	157	156.59	156.59	160.59
14.	11KV line-CT Kms	34596	36419	38235	41284.40	44682.67	48341.67
15.	LT line- CT Kms	217899	226128	234286	241849.11	249687.06	256448.6

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Sl. No	Particulars	March 2006	March 2007	March 2008	March 2009	March 2010	March 2011
16.	Step Up Transformer capacity -MVA	2388.63	2388.63	2408.13	2447.93	2447.93	2684.1
17	No of EHT substations	218	221	226	226	231	234
a.	400 KV	2	2	2	2*	2	1
b.	220 KV	14	14	15	15	17	18
c	110KV	109	111	112	116	123	133
d	66 KV	83	86	89	85	82	82
e	33 KV	49	59	72	88	106	113
18	Step down Transformer capacity --MVA	13231	13339	13808	14193	15288	16222
19a	Distribution Transformers Nos	37724	39848	42401	46510	52300	58104
b	capacity	5033.4	5157.60	5422.8	5937.46	6708.44	7319.66
20	No of Villages electrified	1384	1384	1384	1384	1384	1467
21	No of consumers-in Lakhs	82.95	87.14	91.03	93.63	97.43	101.2
22	Connected load-MW	10907.2	11465.7	12378	15267.4	15866.55	16681.85
23	No of Street light	960839	999599	1049048	1086688	1148220	1202988
24	No of Irrigation pumps	460470	474602	490155	501386	512101	524568
25	Total revenue per Annum(Rs lakhs)	336730.34	400970.76	469695.48	489302.15	474716.77	519852.28

*Pallipuram 400 KV substation owned by PGCIL
Source: KSEB, Economic Review

Power Transmission

Transmission is an important factor to evacuate the power in different parts of Kerala. Transmission of Electricity means bulk transfer of power over a long distance at high voltage, generally of 132 KV and above. A good transmission system is necessary to the effective distribution and to bring power from outside the State. In order to transfer the power from point of generation to point of consumption effectively, the Transmission and Distribution infrastructure needs development. Transmission network in Kerala is connected to the southern Region Transmission system Through two 400KV double circuit line at Madakkathara (Thrissur) and Pallippuram(Thiruvananthapuram).Another 400KV substation at Arecode(Malappuram) is being constructed by Power Grid Corporation of India Limited (PGCIL) Kerala's Transmission system consisting of substations and its connected lines are given below:

3.8 Transmission Infrastructure

Sl.No	Item	Target	Unit	Achievement	Unit	Percentage of Achievement
1	400KVSubstation	Nil	Nos	Nil	Nos	
2	220KVSubstation	Nil	Nos	Nil	Nos	
3	110KVSubstation	13	Nos	5	Nos	38.46
4	66KVSubstation	4	Nos	1	Nos	25.00
5	33KVSubstation	24	Nos	7	Nos	29.17

Source: Economic Review

3.9 Transmission facilities in Kerala (as on 30.09.2011)

Capacity	Substation(nos)	Lines(Ct Km)
400 KV	2*	260**
220KV	17	2701
110 KV	131	4035
66 KV	80	2387
33 KV	118	1418
Total	**348**	**10842**

*One number owned by PGCIL **owned by PGCIL
Source: Economic Review

Power Distribution

Distribution sector is a profound area, which provides electricity to all consumers in Kerala. Kerala has achieved full electrification in all villages, which is above average of national level.KSEB has given great attention to strengthen the distribution backbone by new ventures. The power consumption comes to all time high. As on 2010-11, the total number of consumers has increased to 10127946 nos aganist the 9743476 during 2009-10.The distribution infrastructure is an essential part of electrifying to all domestic and non-domestic purpose. The target and achievement of the distribution infrastructure during 2010-11 is given in the Table:

3.10 Targets and Achievements of distribution Infrastructure During 2010-11

Sl.No	Item	Target	Unit	Achievement	Unit	Percentage of Achievement
1	11KV Lines	4063	Kms	3644.67	Kms	89.70
2	Distribution Transformer	5812	Nos	5800	Nos	99.79
3	L.T Lines	3141	Kms	6928.69	Kms	220.59
4	ServiceConnections	425221	Lakhs	442611	Lakhs	104.09

Source: Economic Review

3.11 Transmission & Distribution Lines

Sl. No	Year	Transmission & Distribution Lines(in Km)						LT
		220KV	110KV	66KV	33KV	22KV	11KV	
1	2001-02	2646.24	3459.24	2160.90	213.12	102.94	30971.19	191930.80
2	2002-03	2646 .24	3495.63	2205.30	315.87	102.94	32054.42	196974.02
3	2003-04	2650.50	3671.33	2215.55	421.94	156.59	33280.22	201637.62
4	2004-05	2662.70	3743.19	2220.59	593.71	156.59	34235.70	207711
5	2005-06	2709.20	3814.49	2269.04	686.42	156.59	34596	217899
6	2006-07	2709.20	3842.23	2299.31	801.47	156.59	36419	226128
7	2007-08	2710.21	3898.61	2310.44	906.91	156.59	38235	234286
8	2008-09	2710.21	3916.11	2310.44	1076.48	156.59	41281.41	241849.11
9	2009-10	2728.47	3964.42	2310.44	1275.70	156.594	44682.67	249687.06
10	2010-11	2728.47	3998.64	2310.44	1339.3	160.59	48341.67	256448.6

Source: KSEB

Transmission and Distribution Loss (T& D loss)

Power which is supplied to various categories of consumers passes through various stages before it finally reaches the premises of the consumers. It involves transformation to higher voltage level, wheeling on high voltage line, transformation at various stages. The entire process itself involves energy losses known as Transmission and Distribution Loss (T& D loss).The main reasons for such high losses are technical as well as commercial. The high technical losses are due to existing outdated system. To minimize such losses, the system needs up-gradation and improvements. KSEB made significant achievement in the field of reducing the T&D loss. During 2003-04 onwards, T&D loss was considerably reduced by way of faulty meter replacement, intensification of theft detection, installation of new substations and lines, upgradation and modernization of sub transmission and distribution network through Accelerated Power Development and Reforms Programme.During 2010-11, T&D loss has come down to 16.09 percent from 17.71 percent in 2009-10.The energy loss in the KSEB system is accounted as internal loss. It can be seen in the Table below:

3.12 Generation sales and T&D loss

Sl. No	Year	Generation MU	Auxillary Consumption (MU)	Total SalesMU	Losses MU	% Loss	
						System	Internal
1	2001-02	7142.18	56.46*	8667.32	3865.32	32.15	30.76
2	2002-03	5475.74	55.39*	8752.07	3877.87	30.41	29.08
3	2003-04	4488.06	48.1	8910.84	3544.53	28.46	27.44
4	2004-05	6377.06	48.08	9384.4	3335.37**	26.22	24.95
5	2005-06	7600.78	46.42	10905.7	3349.16	24.59	22.96
6	2006-07	7745.78	50.67	12377.89	3467.06	23.43	21.47
7	2007-08	8703.55	55.86	13396.61	3325.7	21.63	20.02
8	2008-09	6494.5	54.06	12877.65	3191.77	20.45	18.83
9	2009-10	7240.38	50.87	14024.99	3364.48	19.41	17.71
10	2010-11	7412.59	55.13	14678.14	3191.61	17.99	16.09

*Include Auxillary Consumption in Substations also **Includes losses in interstate transmission line
Source: KSEB

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Rural Electrification

With the availability of power, the number of pump sets energized, streetlights and distribution transformer installed have increased over the years. By the end of 2000-01, the number of pump sets energized were 405900 which has risen to 524568 in 2010-11.Similarly, the installation of Street lights and distribution transformer increased over the last decades which is shown as below:-

3.13 Pump sets Energized and Street lights Installed

Sl.No	Year	No of Pump sets Energized	No of Street lights Installed	No of distribution Transformers
1	2001-02	405900	797053	32585
2	2002-03	417640	820201	33455
3	2003-04	430449	854584	34758
4	2004-05	446366	908016	36640
5	2005-06	460470	960839	37724
6	2006-07	474602	999599	39848
7	2007-08	490155	1049047	42401
8	2008-09	501386	1086688	46510
9	2009-10	512101	1148220	52300
10	2010-11	524568	1202988	58104

Source: KSEB

3.14 All India Generating Installed Electricity Generation Capacity as on 31.03.2011

Name of State/U.T s	Hydro	Coal	Diesel	Gas	Nuclear	RES*	Total
Northern Region	13822.75	24232.5	12.99	4134.76	1620	3165.55	46988.55
Western Region	7447.5	30995.5	17.48	7903.81	1840	5357.96	53562.25
Southern Region	11299.03	19882.5	939.32	4690.78	1320	9341.67	47473.3
Eastern Region	3 882.12	18747.88	17.2	190	0	359.64	23196.84
North Eastern Region	1116	60	142.74	787	0	223.6	2329.34
Islands	0	0	70.02	0	0	6.1	76.12
Total (All India)	**37567.4**	**93918.38**	**1199.75**	**17706.35**	**4780**	**18454.52**	**173626.4**

Source: KSEB

Energy consumption of Various Home appliances

The domestic sector accounts for 30% of total energy consumption in the country. It would be useful to know which gadget consumes how much electricity. Economic use of home appliances can help in reducing bills. The following table shows the energy consumption of various appliances normally used at home:

Appliances	Rating (Watts)	Operating Hrs/Day	Units/Month
Incandescent Bulbs	40	6	7
	60	6	11
Fluorescent Tube light	40	10	12
Night Lamp	15	10	4.5
Mosquito Repellent	5	10	1.5
Fans	60	15	27
Air coolers	175	8	42
Air conditioners	1500	6	270
Refrigerator	225	15	101
Mixer/Blender	450	1	13.5
Toaster	800	0.5	12
Hot plate	1500	0.5	22.5
Oven	1000	1	30
Electric Kettle	1500	1	45
Electric Iron	1500	1	45
Water heater-Instant Type(1-2Ltr capacity)	3000	1	90
Water heater-storage Type(10-20Ltr capacity)	200	1	60
Immersion rod	1000	1	30
Vacuum cleaner	700	0.5	11
Washing machine	300	1	9
Water pump	750	1	22.5
TV	100	10	30
Audio system	50	2	3

*Source:www.mercindia.org.in/pdf/**TIPS_ON_ENERGY_SAVING.***

MINING

The land of Kerala is endowed with a number of occurances/ deposits of good quality minerals such as Heavy Mineral Sands (Ilmenite, Rutile, Zircon, Monazite, Sillimanite) ,Gold, Iron ore, Bauxite, Graphite, China Clay, Fire Clay, Tile and Brick Clay, Silica Sand, Lignite, Limestone, Lime shell, Dimension Stone (Granite), Gemstones, Magnesite, Steatite etc. However, mining activities on large scale are confined mainly to a few minerals - Heavy Mineral Sands, China Clay and to a lesser extent Limestone/Lime shell, Silica Sand and Granite. The state owns mineral deposits like limestone, limeshell, silica sand, bauxite, graphite, iron ore, granite etc.These minerals are found in various districts providing base for forming various mineral based industries in the State. Kerala posses one of the world class deposits of minerals and sands and in the coastal tracts between Neendakara and Kayamkulam.Pazhayangadi, Kannur are some of the mineral based industries working in the State since several years. The resources of beautiful ornamental granites in the state are being exported to different countries. In fact, Heavy mineral sand and china clay contribute more than 90% of the total value of major production in the State.However, 75% of the mineral revenue comes from the minor minerals. For all the development activities, mineral is an essential commodity. The minerals deposited are found in various districts providing base for forming various mineral based industries in the State. Estimated available mineral reserves with occurrence and use are shown in Table 3.15 given below:

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3.15 Available Resources for Mineral Industries

Minerals	Reserves (Million tones)	Occurance	Uses
Gold	0.55	Wayanad, Marudp, Nilambur, Malappuram	Manufacture of ornaments
Iron	83.4	Kozhikode (Eleyettimala, Naduvallur Nanminda, Cheruppa, Alampara) Malappuram (Korattimala)	Iron is useful in bu ilding (Bridge, highway, rail road, etc.) , transportation (car, train, boats, plane, etc.) , tools (knife , machines , etc.)
China clay	172	Thiruvananthapuram,Kollam, Kannur,Kasaragod	Ceramics, pottery, paper, textiles, Rubber and paints
Ball clay	1.67	Thiruvananthapuram(Nadayara) Kollam(Kumbalam,Kanjirottusser, Mulavana) Kannur(Pattuvam,Karivalloor, Earipuram,Pazhayangadi)	Manufacture ofRefractory products, Ceramic Granite Tiles, Glazed Tiles, Table Ware & High Tension Electric Insulators etc.
Fire clay	11.55	Kollam(Kundamon,Pallikkal), Alappuzha(Thamarakulam), Eranakulam(Amballoor, Kanjiramattom, Keezhumadu), Thrissur(Poomangalam) Kannur(Pattuvam)	Manufacture of firebrick and of various accessory utensils, such as crucibles, saggers, retorts, and glass pots, used in the metalworking industries
Silica	28.40	Coastal area of Alappuzha	Used in ceramics and to make glass with. It can also be used to strengthen iron and steel.
Bauxite	12.5	Thiruvananthapuram(mangalapuram, Chilambil,Sasthavattom), Kollam.(Poruvazhy,Aadichanallo or) Kannur,Kasaragod	Manufacture of Aluminum .It is used in cement, chemicals, face makeup, soda cans, dishwashers, siding for houses.
Lime shell	4.05	Alappuzha, Eranakulam (Vembanad lake), Kottayam, Thrissur (Vadanapally) Kannur (Payyannur, Thrikkkaripur)	Manufacture of a variety of products including white cements
Lime stone	24	Palakkad (Walayar)	Manufacture of cement, calcium carbide, Iron & steel Industry etc

Graphite	2.81	Thiruvananthapuram (Veli, Kuttichal), Eranakulam (vadakode) , Kottayam (Chirakadavu)	Crucible Foundry, Refractory, Paints& Lubricant Industries
Lignite	9.65	Kannur(madai),Kaśaragod Nileswaram, Palayi)	Used as fuel for steam electric power generation in some countries
Magnesite	0.037	Palakkad (Attapadi)	Refractory bricks for furnaces.

Source: Dept of mining & Geology

The major mineral based industries like Indian Rare Earths Ltd, chavara, Kerala Minerals and Metals Ltd, chavara, Malabar cements, Walayar, Travancore cements Ltd, Kottayam, Kundara ceramics, Kollam, EnglishIndianclaysLtd, Thiruvananthapuram, Excel Glass Industry, Alappuzha, Kerala Clays and Ceramic Products Ltd, Pazhayangadi, Kannur are some of the mineral based industries working in the State since several years. The resources of beautiful ornamental granites in the State are being exported to different countries

The **Kerala Minerals and Metals Ltd (KMML)** is the world's first fully integrated Titanium Dioxide Plant. KMML is also India's first and only manufacturer of Rutile Grade Titanium dioxide by chloride process

Indian Rare earths

- Incorporated on August 18, 1950.
- An ISO 9001, ISO 14001 & OHSAS 18001 Certified Company.
- IREL has four Production Plants viz. Minerals Division at Chavara, Manavalakurichi, OSCOM and Rare Earths Division at Aluva.
- Major Activity: Mining and separation of Heavy Minerals like, Ilmenite, Rutile, Zircon, Sillimanite, Garnet and Monazite from beach sand.
- Also engaged in chemical processing of Monazite to yield Thorium compounds, Rare Earth Chlorides and Tri-Sodium Phosphate.

- Products find use in manufacture of white pigments, welding electrodes, foundries, ceramics, refractory's, abrasives for polishing glass/ TV tubes and in sand blasting etc.
- Sales turnover exceeding 3600 million with export component over Rs 1000 million
- Provides Value for money to its Customers.
- Professional, Creative and Committed Workforce.

Details of Major Mineral Mines in Kerala

As on 31st March 2011, there are 81 major mineral mines that are operation in the State. The table given below includes the statistics of the mines. Total area covered by mining leases is 2727.9231 ha

3.16 Details of Major Mineral Mines in Kerala

Sl.No	Name of major mineral	No. of mining leases
1	Graphite	1
2	China clay	34
3	Laterite	8
4	Iron ore	1
5	Quartz	2
6	Lime shell	5
7	Mineral sand	4
8	Lime Stone	1
9	Silica sand	25
Total		**81**

Source: Economic Review

3.17 Total area Covered by mining Leases

Sl.NO	Minerals	Area in Hectares
1	Clay	94.082
2	Silica sand	32.2844
3	Bauxite	1.3737
4	Lime shell	1949.90
5	Limestone	245.69
6	Mineral Sand	354.57
7	Quartz	50.023
Total		**2727.9231**

Source: Economic Review

3.18 Details of Mining lease in force as on 31.03.2010

Sl.No	Name of Mineral	Total
1	Graphite	1
2	China clay	34
3.	Laterite	7
4	Iron ore	1
5	Quartz	1
6	Lime shell	6
7	Mineral sand	3
8	Lime stone	1
9	Silica sand	22
10	Quartzite	1
Total		**77**

Source: Dept of mining & Geology

3.19 Statement showing number of Mining Leases in the State of Kerala as on 31.03.2010 (District wise and Mineral –wise).

Sl. No	District	Name of Mineral									
		Graphite	China clay	Laterite	Iron ore	Quartz	Lime shell	Mineral sand	Lime stone	Silica sand	Quartzite
1	Thiruvananthapuram		30.								
2	Kollam		1					3			
3	Pathanamthitta										
4	Alappuzha			1			4			22	
5	Kottayam						2				1
6	Idukki					1					
7	Ernakulam	1									
8	Thrissur										
9	Palakkad								1		
10	Malappuram										
11	Kozhikode				1						

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12	Wayanad										
13	Kannur		2	5							
14	Kasaragode		1	1							
Total		**1**	**34**	**7**	**1**	**1**	**6**	**3**	**1**	**22**	**1**

Source: Dept of mining & Geology

Royalty

Mining and Geology Department is authorized to receive Royalty on extraction of major as well as minor minerals in the state at the rates fixed by the Government. The production of various major minerals and minor minerals in the State during the year 2010-11 and the royalty summarized are given below:

3.20 Production of Major Minerals in Kerala during 2010-11

Sl.No	Major Mineral	Production in Tonnes	Royalty(Rs)
1	China clay	10,25,112	20502247
2	Lime stone	5,27,557	33236091
3	Illminite	1,11,988	11637768
4	Silica sand	72,425	3983369
5	Lime shell	56,906	3585080
6	Laterite	47,303	3784214
7	Zircon	13,648	10971980
8	Sillimanite	7,367	2055374
9	Rutile	6,514	4470021
10	Graphite	250	12480
11	Quartz	59	1180

Source: Economic Review

3.21 Production of Minor Minerals in Kerala during 2010-11

Sl.No	Minor Mineral	Production in Tonnes	Royalty(Rs)
1	Granite(building Stone)	1,09,60,209	175363340
2	River Sand*	30,84,704	30847044
3	Ordinary sand	27,91,576	27915759
4	Laterite	13,32,571	21321133
5	Brick clay	8,37,152	8371523
6	Lime shell	10,451	470302
7	Granite(dimension stone)m(in cubic meters)	1068	4272636

Source: Economic Review

Revenue from minerals

Government gets revenue from minerals mainly by way of royalty. About 75% of the revenue comes from minor minerals and rest from major minerals. Revenue collected during the year 2010-11 was Rs.36.3 crores.The year wise details of revenue collected and district wise details of revenue collected during 2010-11 are given below:

3.22 Revenue collection details for the 2006-2011

Year	Amount collected for Major Mineral (Rs)	Amount collected for Minor Mineral (Rs)	Total
2006-07	6,54,24,712	19,92,58,251	26,46,82,963
2007-08	7,05,32,053	24,03,12,854	31,08,44,907
2008-09	7,59,26,174	27,90,05,659	35,49,31,833

2009-10	8,81,27,172	27,40,44,838	36,21,72,010
2010-11	9,42,39,804	26,91,73,740	36,34,13,544

Source: Economic Review

The revenue realization by the department has been impressive and encouraging as is evident from the table given above. As compared to 2006-07 the revenue has increased by around 15 % during 2007-08. As compared to 2007-08 the revenue has increased by around 13 % during 2008-09.However there has been slight decline in the revenues generation during 2010-11 compared to 2009-10.

3.23 District-wise Revenue Collection for 2005-06

Sl.No	Districts	Major minerals	Minor minerals	Total
1	Thiruvananthapuram	9837025	17123165	26960190
2	Kollam	19945593	15922835	35868428
3	Pathanamthitta		7008403	7008403
4	Alappuzha	2267879	2336923	4604802
5	Kottayam	1210775	9522571	10733346
6	Idukki		5451987	5451987
7	Ernakulam		14045286	14045286
8	Thrissur		10899639	10899639
9	Palakkad	32869285	15821267	48690552
10	Malappuram		14985141	14985141
11	Kozhikode		15309199	15309199
12	Wayanad	42000	3853164	3895164
13	Kannur	1574700	14100230	15674930
14	Kasaragod	612625	7871616	8484241
15	Cherthala	2457673	210000	2667673
16	KMS(NR)		1916882	1916882
17	KMS(SR)	25000	1905000	1930000
18	DRT	2505882	4391040	6896922
Total		**73348437**	**162674348**	**236022785**

KMS (NR): Kerala Mineral Squad (Northern Region) KMS (SR): Kerala Mineral Squad (Southern Region)
DRT: Directorate
Source: Dept of Mining & geology

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3.24 District-wise Revenue Collection for 2006-07

Sl.No	Districts	Major minerals	Minor minerals	Total
1	Thiruvananthapuram	10627607	18406557	29034164
2	Kollam	20227768	23959807	44187575
3	Pathanamthitta	0	12019449	12019449
4	Alappuzha	2455354	2548265	5003619
5	Kottayam	2066400	10457410	12523810
6	Idukki	0	7271337	7271337
7	Ernakulam	12500	14781042	14793542
8	Thrissur	0	23214955	23214955
9	Palakkad	23268870	18315790	41584660
10	Malappuram	0	23241358	23241358
11	Kozhikode	0	16484643	16484643
12	Wayanad	24000	4067559	4091559
13	Kannur	1313861	10456529	11770390
14	Kasaragod	1248869	8652100	9900969
15	Cherthala	2721406	420000	3141406
16	KMS(NR)	0	1406000	1406000
17	KMS(SR)	25000	2185000	2210000
18	DRT	1433077	1370450	2803527
Total		**65424712**	**199258251**	**264682963**

Source: Dept of Mining & geology

3.25 District-wise Revenue Collection for 2007-08

Sl.No	Districts	Major minerals	Minor minerals	Total
1	Thiruvananthapuram	13628154	17428177	31056331
2	Kollam	26909692	16950260	43859952
3	Pathanamthitta	0	16974416	16974416
4	Alappuzha	1503467	2338498	3841965
5	Kottayam	1695600	12826848	14522448
6	Idukki	0	9062439	9062439
7	Ernakulam	2500	21720952	21723452
8	Thrissur	0	33360281	33360281
9	Palakkad	20089350	30817980	50907330
10	Malappuram	0	28643654	28643654
11	Kozhikode	20000	20129545	20149545
12	Wayanad	16000	3869909	3885909
13	Kannur	1108730	12871135	13979865
14	Kasaragod	1949642	7857040	9806682
15	CHILA	2725499	95000	2820499
16	KMS(NR)	0	1935000	1935000
17	KMS(SR)	0	2465000	2465000
18	KMS(CR)			0
19	DRT	883419	966720	1850139
Total		**70532053**	**240312854**	**310844907**

Source: Dept of Mining & geology

3.26 District-wise Revenue Collection for 2008-09

Sl.No	Districts	Major minerals	Minor minerals	Total
1	Thiruvananthapuram	14247338	17209364	31456702
2	Kollam	27688675	14381046	42069721
3	Pathanamthitta	0	18193924	18193924
4	Alappuzha	1735100	2559962	4295062
5	Kottayam	1986750	21917220	23903970
6	Idukki	0	9198310	9198310
7	Ernakulam	10000	48102262	48112262
8	Thrissur	0	34355185	34355185
9	Palakkad	22370747	17551156	39921903
10	Malappuram	0	31728260	31728260
11	Kozhikode	10620	21553010	21563630
12	Wayanad	16000	7581766	7597766
13	Kannur	1070733	15878077	16948810
14	Kasaragod	2043227	12773412	14816639
15	CHILA	2598404	55000	2653404
16	KMS(NR)	0	2071200	2071200
17	KMS(SR)	25000	2675000	2700000
18	KMS(CR)			0
19	DRT	2123580	1221505	3345085
Total		**75926174**	**279005659**	**354931833**

Source: Dept of Mining & geology

3.27 District-wise Revenue Collection for 2009-10

Sl.No	Districts	Major minerals	Minor minerals	Total
1	Thiruvananthapuram	16736249	18114177	34850426
2	Kollam	27971107	12153181	40124288
3	Pathanamthitta	0	18413292	18413292
4	Alappuzha	2560491	2604225	5164716
5	Kottayam	1629243	14516006	16145249
6	Idukki	0	11449541	11449541
7	Ernakulam	41000	45615965	45656965
8	Thrissur	0	29550169	29550169
9	Palakkad	30870190	21410375	52280565
10	Malappuram	0	32298297	32298297
11	Kozhikode	0	25643432	25643432
12	Wayanad	4000	7345629	7349629
13	Kannur	1273095	15616037	16889132
14	Kasaragod	2125577	13350593	15476170
15	CHILA	3488020	10000	3498020
16	KMS(NR)	0	2461912	2461912
17	KMS(SR)	0	1779000	1779000
18	KMS(CR)			0
19	DRT	1428200	1713007	3141207
Total		**88127172**	**274044838**	**362172010**

Source: Dept of Mining & geology

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3.28 District-wise Revenue Collection for 2010-11

Sl.No	Districts	Major minerals	Minor minerals	Total
1	Thiruvananthapuram	19114343	24028275	43142618
2	Kollam	29309675	14520347	43830022
3	Pathanamthitta	0	20823560	20823560
4	Alappuzha	6773803	2327500	9101303
5	Kottayam	1560636	15868926	17429562
6	Idukki	0	11834464	11834464
7	Ernakulam	12480	48028243	48040723
8	Thrissur	0	15507956	15507956
9	Palakkad	33236091	15057553	48293644
10	Malappuram	0	29541015	29541015
11	Kozhikode	1180	24286985	24288165
12	Wayanad	0	7939085	7939085
13	Kannur	1228000	20882898	22110898
14	Kasaragod	2162524	11509086	13671610
15	KMS(NR)	0	2171000	2171000
16	KMS(SR)	0	735000	735000
17	KMS(CR)	0	3188000	3188000
18	DRT	841072	923847	1764919
Total		**94239804**	**269173740**	**363413544**

Source: Dept of Mining & geology

3.29 District-wise Revenue Collection for 2011-12

Sl.No	Districts	Major minerals	Minor minerals	Total
1	Thiruvananthapuram	11661103	24633618	36294721
2	Kollam	47548382	14615433	62163815
3	Pathanamthitta	0	20203550	20203550
4	Alappuzha	8138592	2364614	10503206
5	Kottayam	1875258	20363947	22239205
6	Idukki	0	13817639	13817639
7	Ernakulam	18720	48886751	48905471
8	Thrissur	0	39086404	39086404
9	Palakkad	34417152	34307255	68724407
10	Malappuram	158850	33863331	34022181
11	Kozhikode	0	17572244	17572244
12	Wayanad	0	11442866	11442866
13	Kannur	1582350	27790851	29373201
14	Kasaragod	4040597	12668970	16709567
15	KMS(NR)	52700	1926000	1978700
16	KMS(SR)	0	915000	915000
17	KMS(CR)	0	4882000	4882000
18	DRT	2183979	1970672	4154651
Total		**111677683**	**331311145**	**442988828**

Source: Dept of Mining & geology

3.30 Gem Testing Fee Collection from 2005 to 2012

Year	Amount Collected (Rs)
2005-2006	476321
2006-2007	505125
2007-2008	449540
2008-2009	953135
2009-2010	632250
2010-2011	494175
2011-2012	498225
Total	**4008771**

Source: Dept of mining & Geology

There are more than 3500 licensed minor mineral quarries in the State. The mineral concession in force as on 31 st March 2011 with respect to minor minerals is given in Table 3.31.

3.31 Details of Mineral concessions pertaining to Minor Mineral

Sl.No	Type of mineral concession	Number of concessions
1	Quarrying permits	3043
2	Quarrying leases including including Dimension stone	537
3	Dealer's License	1510
4	License for registered metal crusher unit	112

Source: Economic Review

3.32 Statement showing number of Quarrying permits issued during 2009-10

(District wise and Mineral –wise)

Sl. No	District	Name of Mineral						
		Granite building stone	Laterite	Brick Clay	Ordinary sand	Sea shell	Lime shell	Total
1	Thiruvananthapuram	158	4	5	4			171
2	Kollam	112	11	7	25			155
3	Pathanamthitta	162	9	8				179
4	Alappuzha		51	4				55
5	Kottayam	274		14	239			527
6	Idukki	172			118			290
7	Ernakulam	294	11	14	2		1	322
8	Thrissur	299	60	82				441
9	Palakkad	142	7		283			432
10	Malappuram	326	489	17				832
11	Kozhikode	336	85	30	20			471
12	Wayanad	151	3	12	4			170
13	Kannur	218	226		37	1		482
14	Kasaragode	172	336		148			656
Total		**2816**	**1292**	**193**	**880**	**1**	**1**	**5183**

Source: Dept of mining & Geology

3.33 Production details of Major Minerals

(In Tonnes)

Minerals	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
China clay	528363.65	611031.17	667479.30	737271.04	947619.80	1025112.35	812977.6667
Ilmanite	0.00	0.00	148766.02	192218.44	100589.88	111987.76	146401.7895
Rutile	0.00	0.00	6810.70	8686.11	6593.16	6513.50197	10490.44
Zircon	0.00	0.00	13383.84	10158.38	11844.11	13648.0993	16164.68125
Silimanite	0.00	0.00	10903.92	15570.07	9043.54	7366.9319	5988.319444
Silica sand	130343.75	137874.05	141764.60	133116.85	65366.76	72424.8909	45638.00806
Lime shell/ sea shell	59546.78	87047.87	74358.07	77549.04	60996.68	56906.0317	63781.14286
Lime stone	732572.29	423070.36	366154.33	406733.02	490392.17	527557	546304
Bauxite/Laterite	21387.92	72016.81	96604.00	80910.28	46941.86	47302.675	76859.35955
Quartz	2150	1200.00	1800	2565.60	1145.00	59	0
Graphite	0	250.00	50	200	820.00	249.6	327.04
Brown Ilmanite	0	0.00	0	0	0.00	0	2579.039

Source: Dept of mining & Geology

3.34 Production details of Minor Minerals

(In Tonnes)

Minerals	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
GBS	3216115.81	4641131.00	6414453.81	9840832.31	9765296.19	10960208.8	13101468.63
GDS	2589.39	2915.96	1656.54	740.34	1109.65	1068.159	373.961
Laterite	603601.56	801618.31	1071537.69	1254878.94	1322706.00	1332570.81	1757764.313
Lime shell/Sea shell	14102.88	37403.56	7808.16	4421.13	4285.78	10451.1556	9486.54
Brick Clay	374154.6	304069.90	538711.40	1026139.50	1201741.10	837152.3	1588373.4
Ordinary Sand	6037840	4560252.30	5165247.20	3541904.30	2679072.50	2791575.9	3814097.1
River sand	2586047.5	4940442.20	5592126.50	5160936.30	5248901.60	3084704.4	3697269.8

Source: Dept of mining & Geology

3.35 Value details of Major Minerals

(in Rs)

Minerals	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
China clay	184927277.5	229136690.22	266991721.74	294908417.39	426428910	461300557.5	183732953.42
Ilmanite	0	0	505804453.13	653542687.50	352064568.90	391957159.4	5124062615.00
Rutile	0	0	207726339.77	264926223.99	204388054.26	201918561.2	839235200
Zircon	0	0	528661659.21	401256020.39	473764503.93	545923972.5	1212351000
Silimanite	0	0	62697527.40	89527893.84	54261247.31	44201591.4	44912400
Silica sand	71689062.5	82724430	92146990.	86525952.50	45756734.55	50697423.64	54217955.88
Lime shell/sea shell	5656944.1	87047866.67	74358066.67	77549044.44	76245853.17	71132539.68	79726425
Lime stone	109885843.5	67691258.18	58584692.36	65077282.91	88270591.43	94960260	109260800
Bauxite/Laterite	3208188	10802520.83	14490600	12136541.67	82148259.38	82779681.25	153718720
Quartz	1182500	660000	1080000	1539360	801500	41300	0
Graphite	0	0	0	0	0	0	261632
Brown Ilmanite	0	0	0	0	0	0	64475975

Source: Dept of mining & Geology

3.36 Value details of Minor Minerals`

(in Rs)

Minerals	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
GBS	51457853	1392339300	1924336143.75	2952249693.75	3906118475	4384083500	7860881178
GDS	10357574	58319265	33130840	14806820	33289357.50	32044770	11218800
Laterite	9657625	112226563.75	150015276.25	175683051.25	634898880	639633990	896459798.10
Lime shell/Sea shell	705144	37403555.56	7808155.56	4421133.33	11743031.11	28636166.22	26562312
Brick Clay	3741546	25845941.50	45790469	87221857	300435275	209288075	476512020
Ordinary Sand	60378400	2736151380.00	3099148320	2125142580	6697681250	6978939750	10679421480
River sand	25860475	2964265320	3355275900	3096561780	13122254000	7711761000	11091809400

Source: Dept of mining & Geology

IRRIGATION

IRRIGATION

Water is very important for survival of all forms of life- plant as well as animal Irrigation is an essential input for agriculture and used in all parts of the world where rainfall does not provide enough ground moisture. Irrigation is an artificial application of water to the soil through various systems of tubes, pumps, and sprays. Irrigation is normally used in areas where rainfall is inconsistent or dry conditions or drought is expected. In areas of irregular rainfall, irrigation is used during dry spells to ensure harvests and to increase crop yields. Access to good irrigation allows people to increase their productivity. Irrigation is also an essential input for cultivation for crops like paddy, which require high amount of water to grow. Irrigation is also used to prevent soil consolidation, suppress the growth of weeds in grain fields, and to protect plants against frost .Irrigation is very beneficial to farmers Irrigation reduces the vulnerability of farmers to unpredicted rains and other external shocks, thus enhancing their chances of higher productivity and better incomes. Especially those farmers who own land that are in places that don't get a sufficient amount of water. They use the strategy of irrigation to make up for that deficit and can water their crops to grow them to the full potential. Irrigation means the action of applying water to land in order to supply crops and other plants with necessary water

The rivers in the state provide east potential for irrigation and power generation. Frequent floods and occasional drought condition often affect the crops adversely. The details of area irrigated under various sources like canals, well/tube wells, tanks etc Irrigation development in Kerala is mainly centered on the development of surface water resources mainly on the development of major and medium irrigation projects. With the large population growth expected for the next decades, irrigation must be expanded to increase the food capacity production. It is estimated that 80% of additional food production by the year 2025 will need to come from irrigated land. Even with the widespread measures to conserve water by improvements in irrigation technology, the construction of more reservoir projects will be required.

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Purpose of irrigation

Irrigation is the process of supplying water, in addition to natural precipitation, to field crops, orchards, vineyards, or other cultivated plants. Irrigation water is applied to ensure that the water available in the soil is sufficient to meet crop water needs. The role of irrigation is to improve production and the effectiveness of other inputs. It also play a crucial role in enabling the adoption of green revolution technologies, including modern varieties of rice and wheat and their effects on income, employment, prices, food security and overall growth, are well documented in the development. Irrigation through canals, wells and other sources is considered as a catalyst of economic development of a country. Numerous studies have confirmed on the role of irrigation in increasing crop productivity, intensity of cropping in India since the evolution of planning. However, it alsohelps in reducing instability in crop production, changes the cropping pattern in favour of high valued crops, and reduces inequality in income among various section farmers in the society.

Major, Medium and Minor Irrigation Projects:

The irrigation projects can be broadly classified into three categories viz major, medium and minor irrigation schemes. Irrigation projects having Cultivable Command Area (CCA) upto 50 ha is treated as MI Class II works. Schemes having an ayacut area between 50 to 2000ha is treated as MI Class I works.

Medium irrigation works are those with irrigable command area of more than 2000 ha, but less than 10,000 ha. Those schemes above 10,000 ha are classified as Major irrigation schemes. For the purpose of analysis the major and the medium irrigation projects are generally grouped together. These projects comprise a network of dams, bunds, canals and other such schemes. Such projects require substantial financial outlay and are, therefore, constructed by the government or any other agency which may draw financial assistance form the government and financial institutions. The minor irrigation projects, on the other hand, comprise all ground water development schemes such as dug wells, private shallow tube wells, deep public tube wells, and boring and deepening of dug wells,

and small surface water development works such as storage tanks, lift irrigation projects, etc. Minor irrigation projects or the groundwater development schemes are essentially people's programmes implemented primarily through individual and cooperative efforts with finances obtained mainly through institutional sources.

Irrigation projects in Kerala.

There are about twenty completed and seven ongoing major Irrigation projects in Kerala. Some of the completed Irrigation projects in kerala are Neyyar in Thiruvananthapuram district,, Kallada in Kollam district, Pampa in Pathanamthitta district,Periyar valley and Kanakkankadavu in Ernakulam district, Chalakkudy, Chimmoni Mupli, Vazhani, Cheerakuzhy and Peechiin Thrissurdistrict, Malampuzha, Mangalam, Walayar, Gayathri, Pothundy, Kanjirapuzha, Thrithala and chitturpuzha in Palakkad district and finally Kuttiady in Kozhikode district ,Pazhassi in Kannur district.Ongoing project include Edamalayar and Moovattupuzha . At present all irrigation projects in Kerala are owned by government.

4.1 Storage levels in reservoirs of completed projects in Kerala

Storage (Mm3)

Sl.No	Name of Reservoir	01.10.2010	01.01.2011	01.01.2012
1	Malampuzha	200.139	177.238	149.176
2	Neyyar	102.220	99.570	103.106
3	Kallada	416.300	441.500	435.750
4	Kanhirapuzha	61.889	66.917	59.370
5	Kuttiyadi	102.221	69.416	73.360
6	Pothundy	34.526	34.992	25.712
7	Mangalam	24.341	18.327	10.221
8	Vazhazni	11.920	14.880	8.830
9	Peechi	53.770	70.150	53.590
10	Walayar	7.598	6.665	11.306
11	Meenkara	10.880	8.591	8.404
12	Chulliyar	11.846	10.360	9.323
13	Chimoni	141.090	131.560	117.680
14	Malankara	33.840	32.260	31.400
Total		**1212.580**	**1182.426**	**1097.228**

Source: Economic Review

4.2 Irrigation Projects in Kerala

Sl. No	Name of Project	Districts	Year if Start	Year of completion	Expenditure	Ayacut Net	In ha Gross
1	Neyyar	Thiruvananthapuram	1951	1976	461	15380	23470
2	Pampa	Pathanamthitta	1961	1994	5898.04	21135	48480
3	Periyar Valley	Ernakulam	1956	1994	8350.87	32800	78325
4	Chalakkudy	Thrissur	1949	1966	188.25	19696	27258
5	Vazhani	Thrissur	1951	1962	107.57	2113	4226
6	Cheerakuzhy	Thrissur	1957	1973	90.76	1619	1846
7	Malampuzha	Palakkad	1949	1966	580	21732	40208
8	Peechi	Thrissur	1947	1959	235	18623	23718
9	Mangalam	Palakkad	1953	1966	106	3639	6608
10	Wayalar	Palakkad	1956	1964	131.66	3844	6505
11	Gayathri	Palakkad	1956	1970	220	5466	10114
12	Pothundy	Palakkad	1958	1971	234.25	5466	10046
13	Chitturpuzha	Palakkad	1963	1994	2570.21	15700	29950
14	Kuttiady	Kozhikode	1962	1994	5072.69	14570	34710
15	Chimoni Mupli	Thrissur	1975	1996	5958	13000	26000

Source: IDRB, Thiruvananthapuram

4.3 Ongoing Irrigation Projects

Sl.No	Name of Project	Districts	Year of completion	Expen diture	Expecte d Net	Ayacut in ha Gross
1	Vamanapuram	Thiruvananthapuram	1981	3640	8057	16436
2	Kallada	Kollam	1961	45780	61630	92800
3	Thanneermukk am	Alappuzha	1975	1650	--	--
4	Meenachi	Kottayam	1980	4956	9950	14510
5	Moovattupuzha	Ernakulam	1974	8925	17737	34737
6	Edamalayar	Ernakulam	1981	6940	14060	43190
7	Kanjirapuzha	Palakkad	1961	7500	9713	21835
8	Kuriyarkutty-Karappara	Palakkad	1978	6018	11736	23470
9	Attappady valley	Palakkad	1975	5000	4347	8378
10	Thrithala (BCR)	Palakkad	1998	--	1303	3997
11	Chaliyar	Malappuram	1981	37800	73240	108035
12	Chamravattom(BCR)	Malappuram	1985	1765	3106	9659
13	Banasurasagar	Wayand	1979	1798	2800	4800
14	Karapuzha	Wayand	1975	4066	4650	9300
15	Pazhassi	Kannur	1962	7736	11525	23050
16	Kakkadavu	Kasaragode	1979	9885	13980	41760

Source: IDRB, Thiruvananthapuram

Irrigation status

The source-wise net area irrigated and gross area irrigated from 2001-2002 to 2010-2011 are given in Tables 4.4 & 4.6 respectively.Also the district wise details of net irrigated area and gross area irrigated are shown in Table 4.5 .There has been a good progress in irrigated area under coconut cultivation during the year. There was a decline in the area under irrigation for paddy cultivation this year compared to previous year

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4.4 Net Area (in hectares) Irrigated in Kerala– Source Wise

Area in hectare

Source	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-'09	2009-10	2010-11
Government Canal	95270	95596	99533	101397	104106	103070	88318	95956	94813	85825
Private Canal	4413	4465	4796	4729	4949	4300	4324	6318	2656	5584
Government Tanks	1962	1401	2245	2159	2193	1880	2065	1476	1720	1777
Private Tanks	47983	47237	41339	41824	42813	40184	39515	38276	39131	49287
Government wells	223	235	1264	1175	1166	1005	630	387	410	603
Private wells	86074	100680	104722	107270	109216	113472	130372	132925	125482	137113
Minor irrigation	7581	8853	8191	8591	8926	9434	9147	9163	6794	7015
Other sources	103207	105696	105978	110678	113854	106302	95386	96393	96794	108093
Tube wells	30449	14727	15976	15533	14227	12164	17788	18359	18462	19716
Total	**377162**	**378890**	**384044**	**393356**	**401450**	**391811**	**387545**	**399253**	**386262**	**415013**

Source: Agri.Statistics, DES

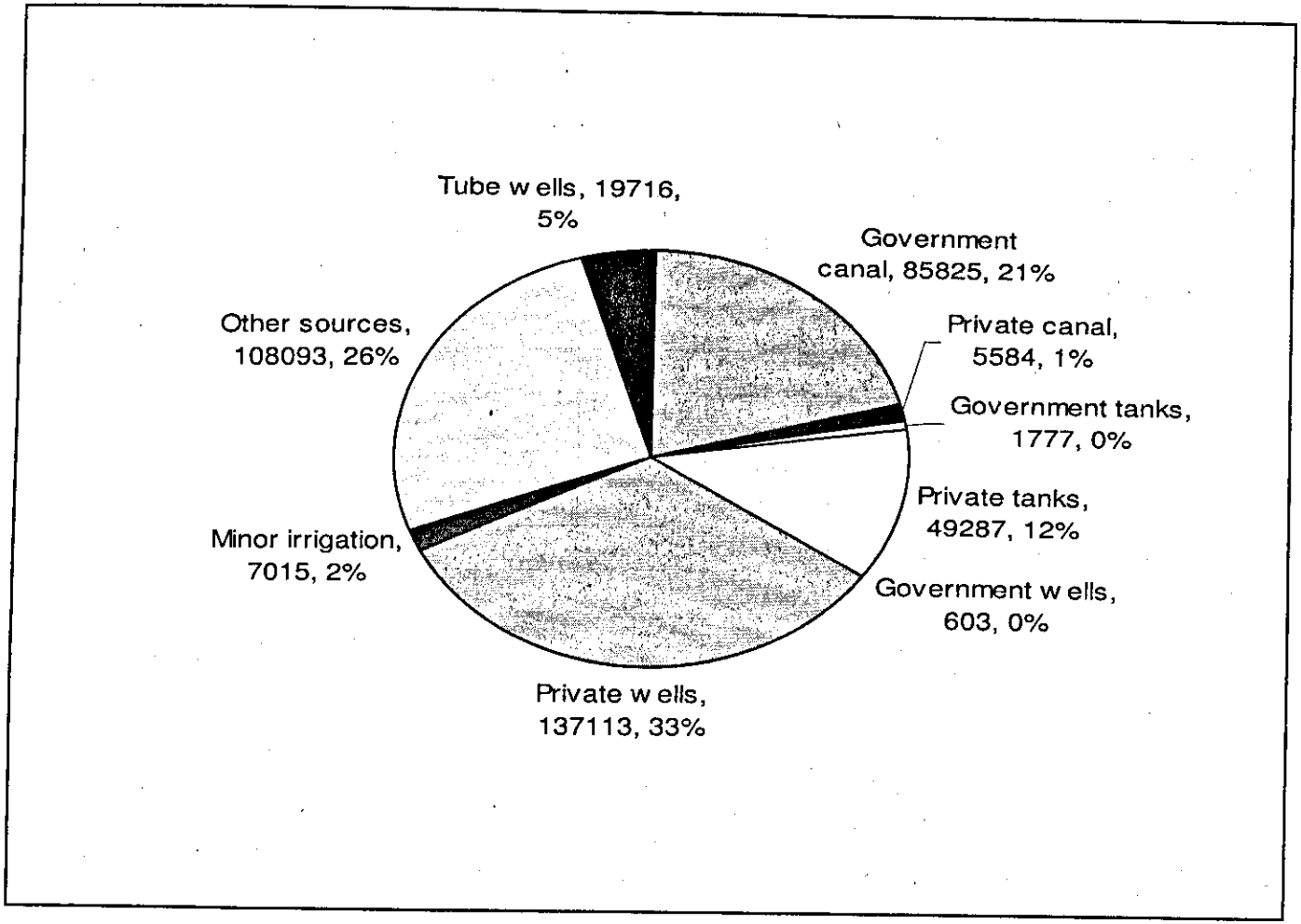
4.5 Net Area (in hectares) Irrigated in Kerala– District wise & Source Wise 2010-11

Area in Hectare

Sl. No	District	Govt canal	Private canal	Govt tanks	Private tanks	Govt wells	Private wells	Minor irrigation	Other sources	Tube wells	Total
1	Thiruvananthapuram	4779	3	202	18		2361		335	5	7703
2	Kollam	1220	5	18	73	12	1861		677	24	3890
3	Pathanamthitta	1460	10	1	32		2215	65	2036	6	5825
4	Alappuzha	577	1	0	2730	2	1275		31793	5874	42252
5	Kottayam	1058	120	5	216		1591	37	11105	2	14134
6	Idukki	3452	422	3	10400	1	3911		9523	1036	28748
7	Eranakulam	11380	2778	187	2914	16	7533	4280	3649	410	33147
8	Thrissur	14690	193	260	3547	203	40457	1023	7575	700	68648
9	Palakkad	41724	784	539	5530	193	15212	301	13060	5348	82691
10	Malappuram	3153	176	337	5418	130	13106	580	4018	956	27874
11	Kozhikode	812	167		510	8	3198	11	851	7	5564
12	Wayanad	144	365	171	120		247	416	13762	0	15225
13	Kannur	352	272	32	2631	17	15058	31	6182	87	24662
14	Kasaragode	1024	288	22	15148	21	29088	271	3527	5261	54650
Total		**85825**	**5584**	**1777**	**49287**	**603**	**137113**	**7015**	**108093**	**19716**	**415013**

Source: Agri.Statistics, DES

Net Area (in hectares) Irrigated in Kerala– District wise & Source Wise 2010-11



4.6 Gross Area (in hectares) Irrigated– Crop Wise

Area in hectare

Crop	2001-'02	2002-'03	2003-'04	2004-'05	2005-'06	2006-'07	2007-'08	2008-'09	2009-10	2010-11
Paddy	183992	181561	169829	183601	159638	173068	154405	169024	168587	150491
Vegetables	8972	9023	9657	14274	15197	24434	16924	10293	13065	15581
Tubers	972	952	1108	2253	2705	5158	7281	19238	17044	21328
Coconut	158050	153562	155520	157768	159912	177734	171336	157199	151913	161503
Arecanut	31467	33192	35238	36858	32727	34625	34090	33626	34240	36434
Cloves	333	342	420	540	543	557	127	135	294	283
Nutmeg	2170	2381	2068	5745	6269	9970	10028	7821	12769	14049
Other condiments and spices	3109	3131	3245	3403	3791	4312	6431	7369	5976	8530
Banana	24372	25902	25674	30265	57660	40852	42116	34888	35532	41796
Betel leaves	944	963	856	891	716	613	435	399	286	450
Sugarcane	3267	3758	4442	1630	1032	1156	2361	2976	2899	571
Others	14569	14578	17560	18163	19876	17552	9781	15270	12178	15022

Source: Agri.Statistics, DES

4.7 Gross area under irrigation (crop wise) 2010-11

Area in hectare

Sl No	Districts	Paddy	Tubers	Vegetables	Coconut	Arecanut	Cloves	Nutmeg	Other spices& condiments	Banana	Betal leaves	Sugarcane	Other crops
1	Thiruvanathapuram	2795	10886	761	2344	12			121	2887	19		3444
2	Kollam	1173	4099	966	708	25	7	7	8	1378	30		
3	Pathanamthitta	2985	377	838	868	26	5	326	93	1293	35		48
4	Alappuzha	35358	1153	1416	8200	57		72	365	568	25		816
5	Kottayam	14734	1	1342	318	20	152	1447	9	830	7		46
6	Idukki	1742	10	670	673	154	69	346	7	926			34
7	Eranakulam	7913	344	777	12264	1555	2	5816	1103	4601	15	1	710
8	Thrissur	17135	133	866	41524	4777	16	5558	2972	2198	10		2123
9	Palakkad	45915	794	4370	25417	4185		105	1044	10536	2	568	5951
10	Malappuram	3970	2557	1154	16655	5572	3	227	726	5307	288		432
11	Kozhikode	783	629	729	3363	388		9	15	1449			46
12	Wayanad	10855	12	437	93	298	2	1	63	7078			8
13	Kannur	3264	291	829	15214	2884	4	86	216	2364	6	1	161
14	Kasaragod	1869	42	426	33862	16481	23	49	1788	381	13	1	1203
State Total		**150491**	**21328**	**15581**	**161503**	**36434**	**283**	**14049**	**8530**	**41796**	**450**	**571**	**15022**

Source: Agri.Statistics, DES

MINOR IRRIGATION

Minor irrigation is considered to have an important role to play in states like Kerala, where the average farm size is small, land labour ratio is low and capital and foreign exchange resources scarce.

The major works under Minor Irrigation Sector are as follows

1. Construction of storage schemes like check dams, cross bars, regulators
2. Construction and Renovation of Irrigation tanks
3. Construction of diversion works from natural streams
4. Salt water extrusion and drainage works
5. Reclamation of Kayals (Backwaters)
6. Improvements to and protection works in streams and channels serving irrigation and drainage
7. Lift Irrigation Works

Rationalization of Minor Irrigation Statistics

The Centrally Sponsored Plan Scheme' Rationalization of Minor Irrigation Statistics(RMIS) Scheme was launched in 1987 with 100% Central assistance to the States/UT;s.The objective of the RMIS Scheme is to build up a comprehensive and reliable database in the Minor Irrigation sector for future planning.

4.8 Report of Minor Irrigation Schemes-2007-08

Sl.No	Name of Department/organisation	No of schemes completed		Expenditure incurred in 000's		Potential created (in Ha)		Potential utilized (in Ha)	
		GW	SW	GW	SW	GW	SW	GW	SW
1	Irrigation	36	195	27116	202716.9	1244.94	5730.87	1244.94	5618.4
2	Agriculture	2892	5	79211.61	160	2191.26	1.92	1976.55	1.92
3	Panchayath Raj/Rural Development	17	5	1799	3480	69.84	539	69.84	534
4	Other Departments(specify Ground water resources)	1688	0	3686	0	1616	0	3686	0
5	Institutional Finance	19110	2353	778227	98149	14773.14	23576.52	14865.86	22042
6	District Cooperative Bank	10	0	187	0	3.2	0	3.04	0
Total		**23753**	**2558**	**890226.6**	**304505.9**	**19898.38**	**29848.31**	**21846.23**	**28197**

Source: Irrigation& Administration GW-Ground Water SW-Surface Water
Based on information collected from departments dealing with minor irrigation schemes

4.9 Report of Minor Irrigation Schemes-2008-09

Sl.No	Name of Department/organisation	No of schemes completed		Expenditure incurred in 000's		Potential created (in Ha)		Potential utilized (in Ha)	
		GW	SW	GW	SW	GW	SW	GW	SW
1	Irrigation	36	195	27116	202717	1244.94	5730.39	1244.94	5618.39
2	Agriculture-Kerala State Cooperative agriculture and Rural Development Bank	2892	5	79212	160	2192.04	1.92	1976.55	1.92
3	District Panchayath LSGD	17	5	1799	3480	69.84	539	69.84	534
4	Other Departments(specify Ground water resources)	1688	0	0	0	1616	0	3686	0
5	Institutional Finance-Lead District Bank	19110	2353	778227	98149	14772.9	23576.5	14865.9	22042.5
6	District Cooperative Bank	10	0	187	0	3.2	0	3.04	0
Total		**23753**	**2558**	**886541**	**304506**	**19898.92**	**29847.8**	**21846.2**	**28196.8**

Source: Irrigation& Administration GW-Ground Water SW-Surface Water
Based on information collected from departments dealing with minor irrigation schemes

4.10 Report of Minor Irrigation Schemes-2009-10

Sl.No	Name of Department/ Organisation	No of schemes completed		Expenditure incurred in 000's		Potential created (in Ha)				Potential utilized (in Ha)	
		GW	SW	GW	SW	GW	GW	SW	SW	GW	SW
1	Irrigation	19	123	12373	160218	472.14	472.14	3683	3893.8	472.14	3683.34
2	District Panchayath LSGD	35	34	4950	25304	28	28	633	738	28	633
3	Ground Water Department	1381	Nil			1435.4	1435.4	NIL	NIL	1435.4	NIL
4	Agriculture Department	1230	416	16878	22414	1571.57	1293.8	1516	1615.1	1293.83	1516.33
5	Institutional Finance	16202	1884	707706	123020	12968.51	12136	20688	22361	12136.2	20688.03
Total		**18867**	**2457**	**741907**	**330956**	**16475.62**	**15366**	**26521**	**28608**	**15365.5**	**26520.7**

Source: Irrigation& Administration GW-Ground Water SW-Surface Water
Based on information collected from departments dealing with minor irrigation schemes

4.11 Report of Minor Irrigation Schemes-2010-11

Sl.No	Name of Department/organisation	No of schemes completed		Expenditure incurred in 000's		Potential created (in Ha)		Potential utilized (in Ha)	
		GW	SW	GW	SW	GW	SW	GW	SW
1	Irrigation	7	183	7512	372398	203	4519	203	4115.89
2	District Panchayath LSGD	1	1	500	844	15	21	15	21
3	Ground water Department	567	0			613	0	613	0
4	Agriculture Department	820	969	7282	4028	404	372	349	372
5	Institutional Finance	34907	3208	1250493	172039	22882.64	34373.81	21591.5	32494.31
Total		**36302**	**4361**	**1265787**	**549309**	**24117.64**	**39286**	**22771.5**	**37003.2**

Source: Irrigation& Administration GW-Ground Water SW-Surface Water
Based on information collected from departments dealing with minor irrigation schemes

4.12 4th Minor Irrigation Census-2006-07-District Wise Data
Minor Irrigation Schemes at a Glance

Sl. No	District	Ground Water			Surface Water		Total Schemes	Cultivable Area (In Ha)	Net Area Sown (In Ha)	Net Area Irrigated (In Ha)
		Dug well	Shallow well	Deep Tube Well	Surface Flow	Surface Lift				
1	Alappuzha	4660	1556	0	77	1277	7570	110423	74091	49812
2	Ernakulam	18846	100	5	546	1158	20655	163427	110538	61252
3	Idukki	5357	86	337	410	944	7134	271544	183564	39182
4	Kannur	19014	173	45	887	2142	22261	253299	218235	49159
5	Kasaragod	8013	406	58	665	185	9327	117446	87285	28149
6	Kollam	7609	27	0	565	18	8219	144161	105471	38301
7	Kottayam	6093	23	0	155	579	6850	193203	135944	21542
8	Kozhikode	8994	6	3	200	401	9604	188501	148564	12229
9	Malappuram	13510	347	39	728	1326	15950	202344	143082	52801
10	Palakkad	9692	1297	391	2019	3267	16666	210056	135601	95632
11	Pathanamthitta	7513	57	13	194	192	7969	221750	96328	39984
12	Thiruvananthapuram	6561	26	2	845	18	7452	130376	101388	43890
13	Thrissur	46121	1796	140	830	2843	51730	163943	110296	90404
14	Wayanad	843	13	17	459	677	2009	115039	80367	22146
Total		**162826**	**5913**	**1050**	**8580**	**15027**	**193396**	2485512	1730754	644483

Source: Irrigation dept

4.13 Season wise area irrigated by Minor Irrigation Schemes

Sl. No	District	Area Irrigated by Ground Water Schemes					Area Irrigated by Surface Water Schemes					Area Irrigated by Total minor irrigation Schemes				
		Kharif	Rabi	Perennial	Others	Total	Kharif	Rabi	Perennial	Others	Total	Kharif	Rabi	Perennial	Others	Total
1	Alappuzha	513	623	1032	346	2514	1066	2601	503	254	4415	1579	3224	1535	591	6929
2	Eranakulam	1617	2370	4183	1165	9335	3533	7622	5619	1961	18735	5150	9991	9802	3126	28070
3	Idukki	782	1122	4227	893	7023	1801	1669	7970	3037	14478	2583	2791	12197	3930	21501
4	Kannur	2488	2713	9571	3517	18290	4258	4772	7568	2378	18975	6746	7485	17139	5895	37265
5	Kasaragode	1977	2026	5593	1642	11237	4766	4320	6700	2576	18363	6743	6346	12293	4218	29599
6	Kollam	584	657	1209	692	3142	2531	2531	651	657	6370	3115	3188	1860	1349	9512
7	Kottayam	961	999	999	436	3395	1688	1373	652	403	4117	2649	2372	1652	839	7512
8	Kozhikode	196	486	2365	866	3913	192	437	1840	777	3246	389	923	4205	1643	7160
9	Malappurarm	1212	1451	4290	837	7789	10251	11784	6030	2434	30499	11463	13235	10319	3271	38288
10	Palakkad	5622	5530	6003	650	17804	17844	17792	1587	635	37858	23466	23321	7590	1285	55662
11	Pathanamthitta	807	621	506	261	2195	3158	2462	571	447	6639	3965	3084	1077	708	8834
12	Thiruvananthapuram	819	922	802	276	2818	8312	6578	2067	435	17393	9131	7500	2869	711	20211
13	Thrissur	2074	2713	10380	2659	17825	14238	12787	8102	2837	37964	16311	15500	18482	5496	55789
14	Wayanad	476	355	296	67	1195	5146	3967	1645	635	11392	5622	4321	1941	702	12587
TOTAL		**20128**	**22586**	**51455**	**14307**	**108476**	**78784**	**80695**	**51507**	**19459**	**230444**	**98912**	**103281**	**102962**	**33766**	**338920**

Source: Irrigation dept

4.14 Season wise area irrigated as supplementary source by Minor Irrigation Schemes

Minor Irrigation Census (2006-07)

In Ha

Sl. No	District	Area Irrigated by Ground Water Schemes					Area Irrigated by Surface Water Schemes					Area Irrigated by Total minor irrigation Schemes				
		Kharif	Rabi	Perennial	Others	Total	Kharif	Rabi	Perennial	Others	Total	Kharif	Rabi	Perennial	Others	Total
1	Alappuzha	2	4	3	2	**11**	5	0	0	0	**5**	7	4	3	2	16
2	Eranakulam	410	591	672	148	**1821**	284	284	372	39	**980**	695	875	1044	187	2801
3	Idukki	0	0	0	0	**0**	0	3	0	0	**3**	0	3	0	0	3
4	Kannur	0	0	0	0	**0**	37	34	34	26	**132**	37	34	35	26	132
5	Kasaragode	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	0
6	Kollam	40	36	71	28	**175**	117	54	55	28	**254**	157	90	126	56	429
7	Kottayam	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	0
8	Kozhikode	5	26	95	34	**160**	66	99	287	29	**481**	72	124	382	63	641
9	Malappurarm	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	0
10	Palakkad	1068	1019	536	57	**2680**	848	782	77	31	**1739**	1916	1801	613	88	4419
11	Pathanamthitta	2	0	8	2	**13**	46	530	0	0	**575**	47	531	8	2	588
12	Thiruvananthapuram	8	15	28	18	**69**	774	653	209	49	**1684**	782	668	237	67	1753
13	Thrissur	179	158	419	211	**967**	2715	2302	316	86	**5419**	2895	2460	735	297	6387
14	Wayanad	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	0
TOTAL		**1716**	**1849**	**1832**	**500**	**5896**	**4892**	**4742**	**1350**	**288**	**11273**	**6608**	**6591**	**3182**	**788**	**17169**

Source: Irrigation dept

4.15 Distribution of district wise holdings receiving irrigation by different sources 2005-06

Sl.No	District	Canal		Tank		Well		Tube wells		Other sources		Total	
		No	%	No	%	No	%	No	%	No	%	No	%
1	Thiruvananthapuram	3279	1.99	4538	3.83	205749	10.81	10288	4.67	120613	16.85	344467	11.03
2	Kollam	1203	0.73	2151	1.82	175693	9.23	814	0.37	43558	6.08	223419	7.16
3	Pathanamthitta	7914	4.8	1434	1.21	124052	6.52	1216	0.55	18329	2.56	152945	4.90
4	Alappuzha	6432	3.9	30039	25.38	135413	7.12	120330	54.67	47712	6.66	339926	10.89
5	Kottayam	781	0.47	4101	3.47	84271	4.43	921	0.42	31290	4.37	121364	3.89
6	Idukki	5356	3.25	10285	8.69	21032	1.11	1454	0.66	53396	7.46	91523	2.93
7	Eranakulam	51955	31.53	8443	7.13	163095	8.57	25000	11.36	55104	7.70	303597	9.72
8	Thrissur	21754	13.21	16419	13.88	314081	16.50	10055	4.57	65866	9.20	428175	13.71
9	Palakkad	52305	31.74	7927	6.70	101973	5.36	15079	6.85	134485	18.78	311769	9.99
10	Malappuram	4665	2.83	10061	8.50	116610	6.13	6243	2.84	28645	4.00	166224	5.32
11	Kozhikode	3331	2.02	1851	1.56	117842	6.19	4714	2.14	17325	2.42	145063	4.65
12	Wayanad	1844	1.12	1425	1.20	11620	0.61	496	0.23	35972	5.02	51357	1.64
13	Kannur	1718	1.04	6247	5.28	214038	11.25	3571	1.620	38609	5.39	264183	8.46
14	Kasaragode	2257	1.37	13414	11.34	117565	6.18	19902	9.04	25050	3.50	178188	5.71
Total		**164794**	**100**	**118335**	**100**	**1903034**	**100**	**220092**	**100**	**715954**	**100**	**3122209**	**100**

Source: Agri: census 2005-06

4.16 Distribution of district wise Area irrigated by different sources in 2005-06

(Area in Hec)

Sl.No	District	Canal		Tank		Well		Tube wells		Other sources		Total	
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
1	Thiruvananthapuram	375	0.68	436	1.23	4595	3.96	487	2.22	2633	2.17	8537	2.43
2	Kollam	95	0.17	175	0.49	3110	2.68	17	0.08	1827	1.50	5229	1.49
3	Pathanamthitta	827	1.49	93	0.26	2111	1.82	44	.20	2245	1.85	5326	1.52
4	Alappuzha	2312	4.17	2294	6.47	2887	2.49	5056	23.04	16287	13.40	28885	8.23
5	Kottayam	96	0.17	667	1.88	2435	2.10	98	0.45	9554	7.86	12863	3.67
6	Idukki	1832	3.31	9868	27.82	2722	2.35	306	1.39	20103	16.54	34882	9.94
7	Eranakulam	8022	14.48	1663	4.69	9788	8.44	798	3.64	5137	4.23	25443	7.25
8	Thrissur	7235	13.06	4093	11.54	28432	24.51	1906	8.69	10506	8.64	52238	14.89
9	Palakkad	30574	55.20	3055	8.61	14287	12.31	6268	28.57	11413	9.39	65711	18.73
10	Malappuram	1636	2.95	3108	8.76	12718	10.96	1247	5.68	10387	8.55	29133	8.30
11	Kozhikode	599	1.08	710	2.00	5540	4.77	218	1.00	3245	2.67	10323	2.94
12	Wayanad	628	1.13	1635	4.61	907	0.78	95	0.43	14436	11.88	17720	5.05
13	Kannur	289	0.52	1996	5.63	10765	9.28	383	1.75	8231	6.77	21688	6.18
14	Kasaragode	863	1.56	5685	16.02	15723	13.55	5017	22.87	5545	4.56	32890	9.37
Total		**55384**	**100**	**35478**	**100**	**116020**	**100**	**21940**	**100**	**121548**	**100**	**350870**	**100**

Source: Agri: census 2005-06

Distribution of district wise holdings receiving irrigation by different sources 2005-06

Table 4.17 shows the district wise distribution of holdings receiving irrigation by different sources. The different sources listed are canal, tank, well, tube wells and other sources .Out of the 3122200 irrigated holdings canal irrigated holdings are 164794, tank irrigated holding 118335, well irrigated holdings 1903034, Tube well irrigated holdings are 220083 and other sources irrigated holdings are 715954.

4.17 Distribution of district wise holdings receiving irrigation by different sources 2005-06

Sl.No	District	Canal		Tank		Well		Tube wells		Other sources		Total	
		No	%	No	%	No	%	No	%	No	%	No	%
1	Thiruvananthapuram	3279	1.99	4538	3.83	205749	10.81	10288	4.67	120613	16.85	344467	11.03
2	Kollam	1203	0.73	2151	1.82	175693	9.23	814	0.37	43558	6.08	223419	7.16
3	Pathanamthitta	7914	4.8	1434	1.21	124052	6.52	1216	0.55	18329	2.56	152945	4.9
4	Alappuzha	6432	3.9	30039	25.38	135413	7.12	120330	54.67	47712	6.66	339926	10.89
5	Kottayam	781	0.47	4101	3.47	84271	4.43	921	0.42	31290	4.37	121364	3.89
6	Idukki	5356	3.25	10285	8.69	21032	1.11	1454	0.66	53396	7.46	91523	2.93
7	Eranakulam	51955	31.53	8443	7.13	163095	8.57	25000	11.36	55104	7.7	303597	9.72
8	Thrissur	21754	13.21	16419	13.88	314081	16.5	10055	4.57	65866	9.2	428175	13.71
9	Palakkad	52305	31.74	7927	6.7	101973	5.36	15079	6.85	134485	18.78	311769	9.99
10	Malappuram	4665	2.83	10061	8.5	116610	6.13	6243	2.84	28645	4	166224	5.32
11	Kozhikode	3331	2.02	1851	1.56	117842	6.19	4714	2.14	17325	2.42	145063	4.65
12	Wayanad	1844	1.12	1425	1.2	11620	0.61	496	0.23	35972	5.03	51357	1.64
13	Kannur	1718	1.04	6247	5.28	214038	11.25	3571	1.62	38609	5.39	264183	8.46
14	Kasaragode	2257	1.37	13414	11.35	117565	6.17	19902	9.05	25050	3.5	178188	5.71
Total		**164794**	**100**	**118335**	**100**	**1903034**	**100**	**220083**	**100**	**715954**	**100**	**3122200**	**100**

Source: Agri: census2005-0

Distribution of district wise number of wells and tube wells

Table 4.18 shows the distribution of district wise number of wells and tube wells.The largest number of wells with pumpset are in Thrissur(299581) district and lowest in Wayanad (3816) district.Wells without pumpset are higher in Thiruvananthapuram141542.Majority of wells with pumpset is electric connected.Wells with diesel pump set are 18875 in the State.Tube wells are largest in Alappuzha(118843) district.Electric connected tube wells are also largest in Alappuzha district 118381.Diesel connected tube wells are highest in Ernakulam District(597)

4.18 Distribution of district wise number of wells and tube wells

Sl.No	District	Number of wells in use				Number of tube wells		
		With pump set			Without pump sets	Electric	Diesel	Total
		Electric	Diesel	Total				
1	Thiruvananthapuram	108263	393	108656	141542	12848	132	12980
2	Kollam	104603	427	105030	83935	1140	199	1339
3	Pathanamthitta	70678	425	71103	56654	1307	86	1393
4	Alappuzha	81034	382	81416	64882	118381	462	118843
5	Kottayam	66292	382	66674	34986	1240	114	1354
6	Idukki	25273	3091	28364	3857	1554	109	1663
7	Eranakulam	134504	785	135289	27805	23169	597	23766
8	Thrissur	297684	1897	299581	26723	12309	377	12686
9	Palakkad	52240	865	53105	18348	14644	306	14950
10	Malappuram	102095	2764	104859	37056	6463	227	6690
11	Kozhikode	51024	862	51886	26020	3777	532	4309
12	Wayanad	3577	239	3816	2743	372	120	492
13	Kannur	145921	1430	147351	71615	3639	95	3734
14	Kasaragode	90167	4933	95100	34266	18299	313	18612
Total		**1333355**	**18875**	**1352230**	**630432**	**219142**	**3669**	**222811**

Source: Agri: census2005-06

Number of wells and tube wells used for irrigation in different size classes

Table 4 .19 gives the number of wells and tube wells used for irrigation. There are 1352230 wells and 222811 Tube wells with pump sets and 630432 wells without pump set used for irrigation in the state as revealed in the census during 2005-06.Out of the total number of wells used for irrigation are 1333355 are electric connected and 188875 are diesel connected. Tube wells connected with electricity are 219142 and diesel tube wells are 3669.

4.19 Number of wells and tube wells used for irrigation in different size classes

Sl.No	Size class	Number of wells in use				Number of tube wells		
		With pump set			Without pump sets	Electric	Diesel	Total
		Electric	Diesel	Total				
1	Marginal Below1.00	1208223	11213	1219436	616198	202122	3233	205355
2	Small (1.00-1.99)	85507	4262	89769	10320	9944	178	10122
3	Semi-medium (2-3.99)	30775	2458	33233	3131	4799	172	4971
4	Medium (4.00-9.99)	7483	730	8213	643	1926	68	1994
5	Large (10.00-&above)	1367	212	1579	140	351	18	369
Total		1333355	18875	1352230	630432	219142	3669	222811

Source: Agri: census2005-06

Intensity of Irrigation (Gross Area concept)

Table 4.20 reveals intensity of irrigation .The intensity of irrigation is measured as a ratio of gross irrigated area and is expressed as percentage. The 8th Agricultural census reveals that the percentage of intensity of irrigation is 110.21.The intensity of irrigation during 1995-96 and 2000-01 is 113.97 and 109.25 respectively. The intensity of irrigation shows an increasing trend when compared with the 7th Agricultural census.

4.20 Intensity of Irrigation

Sl.No	Size class(Hectares)	Intensity of Irrigation (Gross Area concept)		
		1995-96	200-01	2005-06
1	Below 1.00	114.91	111.05	111.10
2	Small (1.00-1.99)	113.34	108.53	110.09
3	Semi-medium (2-3.99)	112.50	107.60	109.38
4	Medium (4.00-9.99)	113.76	107.17	107.69
5	Large (10.00- &above)	113.38	102.90	109.34
All sizes		**113.97**	**109.25**	**110.21**

Source: Agri: census2005-06

Irrigation Status

4.21 Percentage of area irrigated from different sources of irrigation by major size groups

2010 - 11

Sl.No	Category of holdings Size group	canal			Tank			Well		
		95-96	00-01	05-06	95-96	00-01	05-06	95-96	00-01	05-06
1	Marginal (0.02-0.99)	38.97	45.92	47.34	36.59	31.64	33.71	55.10	63.42	69.36
2	Small (1.00-1.99)	26.35	24.42	24.06	22.41	19.86	24.44	21.54	18.20	16.64
3	Semi medium (2.00-3.99)	22.87	19.48	17.67	20.01	15.77	19.95	13.62	10.59	9.50
4	Medium (4.00-9.99)	9.22	8.74	8.58	9.94	12.55	11.10	6.35	4.33	3.31
5	Large (10.00 & above)	2.59	1.45	2.35	11.05	20.18	10.8	3.39	3.46	1.19
All sizes		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Sl. No	Category of holdings Size group	Tube well			Other sources			All Sources		
		95-96	00-01	05-06	95-96	00-01	05-06	95-96	00-01	05-06
1	Marginal (0.02-0.99)	54.54	54.79	49.20	41.02	45.91	32.63	46.93	51.97	48.27
2	Small (1.00-1.99)	19.68	15.43	17.30	25.2	22.60	19.97	33.32	20.37	19.80
3	Semi medium (2.00-3.99)	15.56	12.61	17.96	18.41	15.79	17.55	17.19	14.11	15.17
4	Medium (4.00-9.99)	7.98	8.19	12.05	8.43	7.96	9.99	7.91	7.15	7.80
5	Large (10.00 & above)	2.25	8.98	3.49	6.54	7.73	19.86	4.65	6.39	8.96
All sizes		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

The above table shows the various percentages of source wise and size class wise irrigation during 6th, 7th and 8th census. Analysing the sources of irrigation to different classes compared with the result of previous census the percentage of irrigated area is higher in marginal followed by small, semi-medium, medium from all sources, viz Canal, Tank, Well, Tube well and other sources.This characteristic is same during the earlier census results also .Among the various sources, well and tube well is highest in marginal size class.

GROUND WATER

Richly endowed with natural resources, the tiny State of Kerala receives average annual rainfall of about 3000 mm.It also boasts of abundant fresh water resources including 44 rivers besides a large number of ponds and water bodies. The State also has a large number of large diameter open wells for extraction of ground water for various uses. Groundwater is water located beneath the earth's surface in soil pore spaces and in the fractures of rock formations. Ground water is recharged from, and eventually flows to, the surface naturally; natural discharge often occurs at springs and seeps and can form oasis or wetlands. However, in spite of the apparent riches, water scarcity is becoming common places in parts of the State, especially during summer months. Increasing population, rapid urbanization and industrialization has results in increasing use of ground water resources over the last few decades in the State. Judicious and planned development of ground water and its scientific management have become necessary to ensure long term sustainability of this precious natural resource in Kerala. This requires realistic estimate of the availability of ground water resources and the current status of its utilization. Ground water has traditionally been and still continues to be one of the preferred sources of fresh water for various uses in Kerala. With nearly 90 percent of the total geographical area underlain by massive hard rocks, the ground water development prospects of the State are very limited. Increasing demand of fresh water resources to satisfy the requirements of an increasing population has been putting these limited resources under increasing stress in recent decades. Changing life styles, increasing urbanization and consequent reduction in the recharge into the ground water reservoirs have also made significant contributions to the depletion of ground water resources of the State. Contamination of ground water resources from natural and anthropogenic sources is also emerging as a major threat to the sustainability of ground water sources in many areas. Groundwater contains information on rainfall performance, water flowing streams and ground water resources, water quality criteria and distribution of water monitoring stations. The occurrence and availability of ground water vary considerably from place to place within the state depending on the prevailing climatic, geomorphological and hydro geological conditions.

4.22 Ground Water Monitoring Wells in Kerala

Sl.No	District	No.of GWMW		
		Dug Wells	Piezometers	Total
1	Thiruvananthapuram	31	37	68
2	Kollam	25	30	55
3	Pathanamthitta	17	30	47
4	Alappuzha	22	40	62
5	Kottayam	23	29	52
6	Idukki	22	25	47
7	Eranankulam	39	25	64
8	Thrissur	37	37	74
9	Palakkad	31	36	67
10	Malappuram	28	30	58
11	Kozhikode	34	34	68
12	Wayanad	26	19	45
13	Kannur	39	28	67
14	Kasaragode	49	21	70
Total		**423**	**421**	**844**

Source: GW Dept

Total Annual Ground Water Recharge

The Total Annual Ground Water Availability in Kerala State has been computed as 6.620 Billion Cubic Metre (BCM).Rainfall recharge accounts for about 82 percent of the annual recharge, with the remainder contributed by other sources. The contribution of districts to the total annual recharge of the State is as shown below in Table 4.23. Also the Net Ground Water Availability for the

entire State is 6.029 billion cubic metre (BCM). The district wise availability in the State ranges from196.55 MCM in Idukki district to 795.25 MCM in Palakkad district.

Net Ground Water Availability for future Irrigation Development

The availability of ground water resources for future development has been computed as the difference between the net annual ground water resource available and the annual ground water draft for all purposes. The Net Ground Water Availability for future Irrigation Development in the State as in 2009 is of the order of 3.021 BCM. The district wise net ground water availability ranges from 82.21 MCM in Kasaragode district to 331.21 MCM in Kottayam district. District wise status of Net Ground Water Availability and Annual Ground Water Draft for all uses is shown belowin Table 4.24.

4.23 Annual Ground water Recharge

Assessment Year 2008-09

Sl. No	Districts	Recharge from rainfall during monsoon season (MCM)	Recharge from other sources during monsoon season (MCM)	Recharge from rainfall during non-monsoon season (MCM)	Recharge from other sources during non-monsoon season (MCM)	Total Annual Ground Water Recharge (MCM)	Provision for Natural Discharges (MCM)	Net Annual Ground water Availability (MCM)
1	***Alappuzha***	301.37	0.70	73.00	108.69	483.75	30.10	453.65
2	Eranakulam	393.21	4.87	72.25	145.39	615.72	58.37	557.35
3	Idukki	162.33	1.10	31.19	23.76	218.38	21.84	196.55
4	Kannur	452.08	6.84	0.00	72.25	531.17	52.06	479.11
5	Kasaragode	309.94	8.15	0.00	45.52	363.60	36.36	327.24
6	Kollam	301.98	1.60	103.94	41.71	449.23	39.97	409.27
7	Kottayam	370.74	1.33	81.39	69.39	522.85	49.69	473.16
8	Kozhikode	367.01	2.29	0.00	14.47	383.78	36.39	347.38
9	Malappuram	392.47	3.69	54.42	80.80	531.39	47.08	484.31
10	Palakkad	465.38	17.42	80.13	308.02	870.95	75.70	795.25
11	Pathanamthitta	207.37	1.54	67.09	34.61	310.61	26.50	284.11
12	Thiruvananthapuram	225.40	2.75	74.21	29.81	332.17	27.43	304.74
13	Thrissur	517.80	10.70	0.00	170.97	699.47	58.88	640.60
14	Wayanad	304.30	0.21	0.00	2.46	306.98	30.70	276.28
Total		4771.38	63.19	637.62	1147.85	6620.05	591.07	6029
Total in BCM		4.771	0.063	0.638	1.148	6.620	0.591	6.029

Source: GW Dept

4.24 Dynamic Ground Water Resources of Kerala

Sl. No	Districts	Net Annual Ground Water Availability 10	Existing Gross Ground Water Draft for irrigation 11	Existing Gross Ground Water Draft for domestic and industrial water supply 12	Existing Gross Ground Water Draft for all uses 13	Provision for domestic, and industrial requirement supply up to 2025 14	Net Ground Water Availability for future irrigation development 15	Stage of Ground Water Development (%) 16
1	***Alappuzha***	453.65	29.92	99.43	129.35	103.72	320.02	28.51
2	Eranakulam	557.35	103.08	136.67	239.76	152.54	301.72	43.02
3	Idukki	196.55	28.74	54.24	82.98	59.85	107.96	42.22
4	Kannur	479.11	109.43	107.95	217.39	119.32	250.35	45.37
5	Kasaragode	327.24	167.05	66.29	233.33	77.98	82.21	71.30
6	Kollam	409.27	40.15	116.96	157.11	131.02	238.10	38.39
7	Kottayam	473.16	34.91	91.07	125.97	107.04	331.21	26.62
8	Kozhikode	347.38	52.00	137.71	189.72	157.93	137.45	54.61
9	Malappuram	484.31	81.66	197.85	279.51	243.92	158.72	57.71
10	Palakkad	795.25	354.94	129.23	484.17	141.79	300.42	60.88
11	Pathanamthitta	284.11	34.63	59.62	94.24	63.04	186.44	33.17
12	Thiruvananthapuram	304.74	39.85	131.16	171.01	146.99	117.90	56.12
13	Thrissur	640.60	221.68	135.06	356.73	152.16	266.76	55.69
14	Wayanad	276.28	6.52	41.16	47.68	48.16	221.60	17.26
Total in MCM		6029	1304.56	1504.4	2808.95	1705.46	3020.86	47
Total in BCM		6.029	1.305	1.504	2.809	1.705	3.021	47

Source: GW Dept

4.25 Variation in Major components of Dynamic Ground Water Resources of Kerala between 2004 and 2009

Sl. No	Districts	Net Annual Ground Water Availability (MCM)		Existing Gross Ground Water Draft for all use (MCM)		Net Ground Water Availability for future irrigation development (MCM)		Stage of Ground Water Development (%)	
		2004	2009	2004	2009	2004	2009	2004	2009
1	***Alappuzha***	419.46	453.65	128.65	129.35	279.10	320.02	30.67	28.51
2	Eranakulam	567.83	557.35	293.82	239.76	249.02	301.72	51.74	43.02
3	Idukki	246.32	196.55	92.32	82.98	145.60	107.96	37.48	42.22
4	Kannur	540.62	479.11	261.19	217.39	272.21	250.35	48.31	45.97
5	Kasaragode	343.55	327.24	271.95	233.33	74.55	82.21	79.07	71.30
6	Kollam	448.25	409.27	205.07	157.11	224.78	238.10	45.82	38.39
7	Kottayam	470.83	473.16	133.60	125.97	322.34	331.21	28.37	26.62
8	Kozhikode	344.81	347.38	213.38	189.72	120.53	137.45	61.88	54.61
9	Malappuram	507.64	484.31	307.55	279.51	148.28	158.72	60.65	57.71
10	Palakkad	750.33	795.25	327.75	484.17	396.81	300.42	43.67	60.88
11	Pathanamthitta	316.55	284.11	100.51	94.24	209.70	186.44	31.75	33.17
12	Thiruvananthapuram	278.03	304.74	185.79	171.01	80.68	117.90	66.82	56.12
13	Thrissur	702.75	640.60	326.48	356.73	353.80	266.76	46.45	55.69
14	Wayanad	292.59	276.28	71.93	47.68	196.82	221.60	24.58	17.26
	Total in MCM	**6229.55**	**6028.99**	**2919.99**	**2808.95**	**3074.22**	**3020.87**	**46.87**	**46.62**
Difference in comparison with 2004(%)		**-3.22**		**-3.80**		**-1.74**		**-0.005**	

Source: GW Dept

A comparison of the major components of the dynamic ground water resources of Kerala as in 2009 with those in 2004 is as shown above. The data provided in the table indicate that the net annual ground water availability for the State of Kerala during 2009 has reduced by 3.22 % when compared with the corresponding figures during 2004.The annual ground water draft for all uses has reduced by 3.80% during the period. The net ground water availability for future irrigation development in the State as a whole shows a decrease of 1.74% in 2009 when compared to the corresponding figures in 2004.The stage of ground water development in the State shows a decrease from 46.87 % during 2004 to 46.64 % during 2009,registering a marginal decrease. It is observed that the variations in the major components of dynamic ground water resources of Kerala as computed in 2004 and 2009 vary from district to district.

Additional Annual Potential Recharge

The availability of ground water resources to be used as potential recharge has been computed for shallow water table areas of the State. The potential Recharge thus calculated for Kerala as a whole is of the order of 491.86 MCM.Details of district wise computations of potential recharge is as shown below:

4.26 Additional Annual Potential Recharge under specific conditions in Kerala (2008-09) (2011)

Districts	Potential Recharge in water logged and shallow water table area	Potential Recharge in flood prone area	Total Annual Additional Potential Ground Water Recharge
Alappuzha	39802.69	0.00	39802.69
Eranakulam	7584.77	0.00	7584.77
Kasaragode	108.88	0.00	108.88
Kollam	1624.19	0.00	1624.19
Kottayam	13.38	0.00	13.38
Kozhikode	7.50	0.00	7.50
Palakkad	33.83	0.00	33.83
Thrissur	11.20	0.00	11.20
Total	49186.43	0.00	49186.43
Total in MCM	491.86	0.00	491.86

Source: GW Dept

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STORAGE

Storage

The idea of Food Management has been introduced with the basic objectives of distribution of food to the needy sections of the society at affordable prices. This concept also focuses on the integrated national food which aim at maintaining a buffer stock which is created by purchasing supplies in surplus areas to counter the factors of local or seasonal variations in demand and supply, to provide a price support to the farmers on harvesting and also to put a check on unethical activities of hoarders and profiteers as these activities may cause violent fluctuations in the prices of food grains

Storage of goods is of vital importance not only in the agriculture sector but also in the industrial sector. In the primary sector that is agriculture, storage is necessary at the farm and fields level; in the secondary sector that is industry, storage is essential at the processing and manufacturing level and in the tertiary level it is inevitable for the domestic, import and export trade. The necessity for storage arises primarily because of lack of adjustment between the time and place of production of goods and time and place of their consumption.

Warehouses play a vital role in the flow of goods from producers to consumers. It helps in combating annual and seasonal fluctuation in production and prices. Provision of facilities for food grains comes under the purview of Department of Food and Public Distribution. There are three agencies in the public sector which are engaged in building large scale storage/ warehousing capacity- Food Corporation of India (FCI), Central Warehousing Corporation (CWC) and 17 State Warehousing Corporations (SWCs).In addition to food grains, storage also includes industrial warehousing, custom-bounded Warehouses, container freight stations, inland clearance depots and air cargo complexes.

The Central Government, through FCI, has the responsibility for procurement, storage, transportation and bulk allocation of food grains to the States. The State Government has the responsibility of making area wise allocations within the State, identification of BPL/APL families, issue of categorized ration cards and finally distribution of food grains to the rationed families in a simple and rational manner through the Public Distribution System network across the country.

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Kerala, being a deficit State, FCI undertakes the major role of providing scientific storage of food grains in the State thereby ensuring adequate stocks for timely distribution under GOI schemes and also in facilitating adequate buffer stocks for the State's requirement. In order to provide easy physical access in deficit, remote and inaccessible areas, the FCI has a network of storage depots strategically located all over India. These depots include silos, go downs and an indigenous method developed by FCI, called Cover and Plinth (CAP).

In the State the FCI is having 23 owned go downs with a total covered storage capacity of 5.13 Lakh Metric Tonne.This storage capacity ensures 3 months of buffer storage for state's TPDS requirement. In addition, FCI also has a CAP storage capacity of 19670 MT which is not put to use due to torrential rainfall in the state.

The Food Corporation of India was setup under the Food Corporation Act 1964, in order to fulfill following objectives of the Food Policy:

- Effective price support operations for safeguarding the interests of the farmers.
- Distribution of food grains throughout the country for public distribution system.
- Maintaining satisfactory level of operational and buffer stocks of food grains to ensure National Food Security

Since its inception, FCI has played a significant role in India's success in transforming the crisis management oriented food security into a stable security system.

5.1 Storage capacities with FCI in the state

Sl.No	Revenue District	FCI District	Depot	Capacity in MT	
				covered	open
1	Thiruvananthapuram	Thiruvananthapuram	Valliathura	33440	2250
			Kazhakutham	36136	0
2	Kollam	Kollam	Kollam	11900	0
			Karunagapally	30000	0
			Avaneeswaram	9200	0
			Kilikollur	5000	0
3	Pathanmathitta		No FCI Godown	Requirement is met from FSDs mavelikkara and Avaneeswaram	
4	Alappuzha	Alappuzha	Alleppey	10000	0
			Mavelikkara	20000	5000
5	Kottayam	Kottayam	Chingavanm	15320	0
6	Idukki		Arakkulam	5000	0
7	Ernakulam	Kochi	Kochi	18700	0
			Angamally	40000	0
8	Thrissur	Trichur	M.G.Kavu	48960	5750
			Chalakudy	10000	1670
9	Palakkad	Palghat	Palakkad	70740	5000
10	Malappuram		Angadipuram	10000	0
11	Calicut	Calicut	Kuttipuam	5000	0
			West Hill	35160	0
			Thikkodi	45000	0
12	Wayanad		Meenangadi	5000	0
13	Kannur	Kannur	Muzhapilangad	10640	0
			Payyannur	29000	0
14	Kasaragode		Neeleswaram	9500	0
TOTAL				**513696**	**19670**

Source: FCI

5.2 Storage Capacity with FCI

Capacity	Ist April 2005	Ist April 2006	Ist April 2007	Ist April 2008	Ist April 2009	Ist April 2010	Ist April 2011	Ist April 2012
Covered								
Owned	12.91	12.93	12.94	12.95	12.97	12.97	12.99	13.01
Hired	10.46	9.90	9.34	8.71	10.12	12.89	15.46	17.21
Total	23.37	22.83	22.28	21.66	23.09	25.86	28.45	30.22
CAP(cover and Plinth)								
Owned	2.25	2.21	2.29	2.20	2.17	2.51	2.62	2.63
Hired	0.41	0.51	0.63	0.03	0.02	0.47	0.54	0.75
Total	2.66	2.72	2.92	2.23	2.19	2.98	3.16	3.38
Grand Total	**27.03**	**25.55**	**25.20**	**23.89**	**25.28**	**28.84**	**31.61**	**33.60**

(Figure in million tones)
Source: FCI

5.3 Storage capacity available with the State Government is as follows

Capacity in MT

Sl.No	State Agency	Owned	Hired	Total
1	SWC	180243	16605	196848
2	Kerala State Civil Supplies Corporation Ltd.	15000	100000	115000
3	Marketfed	3250	-	3250
	TOTAL	**198493**	**116605**	**315098**

Source: FCI

5.4 District wise Food grain storage capacity, cold storages, warehouses and container Depots as on 31.03.2012

Sl.No	District	Food Grain storage (in tones)	(cold storage in number)	(warehouses in numbers)	Container Depots in number
1	Thiruvananthapuram	1440		5	
2	Kollam	21700		5	
3	Pathanamthitta	280		3	
4	Alappuzha	5090		6	
5	Kottayam	1455		6	
6	Idukki	540		3	
7	Ernakulam	620		5	1
8	Thrissur	4740		4	
9	Palakkad	3525		4	
10	Malappuram	875		4	
11	Kozhikode	0		2	
12	Wyanad	2110		3	
13	Kannur	2900		5	
14	Kasaragod	1625		4	
Total		**46900**	**Nil**	**59**	**1**

Source: Kerala State Warehousing Corporation

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Public distribution system

Food, drinking water, education and shelter are required to be provided to poor and weaker sections of the society for their upliftment.The changes in prices affect purchasing power and thereby the living conditions of the people. Food being the most important of all, availablity of selected food grains at the reasonable price to poor is the prime responsibility of the Government. The State Government has ensured the availability of food grains by opening sufficient number of Fair Price Shops (FPS) across the State, with the main objective of providing food grains at cheaper and subsidized rates to the poor. The responsibility of Public Distribution System (PDS) is shared by the Central as well as the State Government. Required allocation of food grains to the States is fulfilled by the Central Government, whereas the identification of needy families and allocation of food grains to them is the responsibility of the State Government. The main commodities covered under PDS are Wheat, Rice, Sugar and Kerosene. Public distribution system is very relevant for the State, where there is more than 75% deficit in food grain production. Only 15% of the food grains required are produced here and the rest is met from other states like Tamilnadu, Andhra Pradesh, Madhya Pradesh etc.The Public Distribution system is an instrument for ensuring the availability of certain essential commodities for consumption at subsidized rates to the people, particularly the poor.

5.5 Public distribution system of essential commodities

Item		2006-07	2007-08	2008-09	2009-10	2010-11
Number of ration cards for families		6986017	7025638	7034886	6835945	7340488
No. of Ration permits		14101	13330	10952	8709	7603
No. of FCI Depot		20	20	22	22	22
No. of wholesale shops	Co-operatives	34	36	35	25	35
	Supply Co	-	-	-	10	10
	Others	302	302	301	300	288
	Total	336	338	336	335	334
Number of Retail shops	Co-operatives	509	472	425	423	419
	Others	13702	13776	13819	13816	13833
	Total	14211	14248	14244	14239	14252

Source: Economic Review

5.6 Allotment of sugar and kerosene from 2004-05 to 2010-11

Year	Sugar allotment MT	Kerosene allotment KL
2004-05	55690	284998
2005-06	62586	277960
2006-07	56050	277966
2007-08	57236	277988
2008-09	49236	277968
2009-10	49338	277944
2010-11	49362	225096

Source: Economic Review

Drinking Water Supply And Sanitation

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Drinking Water Supply and Sanitation

Water is the edifice of all activities. Safe drinking water and its supply and proper sanitation are the basic necessities of life. Demand for water is increasing due to multitude of human activities in the country. Govt. of India as well as State Govt are committed to provide safe drinking water facilities and total sanitation to all The primary responsibility of providing drinking water facilities in the country rests with the respective state Governments, though the Centre formulates policies and guidelines for the sector, and supplements the efforts of State Governments by providing technical and financial assistance under various centrally sponsored schemes. The state of Kerala is no exception to it. Provision of safe drinking water not only reduces the risk of death due to water born diseases, but safe drinking water along with proper sanitation also helps in maintaining and determining the quality of life.

The problem, however is that with the growth of human population, there is a growing concern for adequacy of fresh water. Now access to safe drinking water remains an urgent need. Drinking water scarcity has been experienced in many parts of the state on an unprecedented scale. There is an imminent need to create greater social awareness about the rights and responsibilities in the use of water and to put in place better management practices in the utilization of this invaluable resource.

Coverage of water supply in Kerala

Our State has also initiated a number of programmes for giving safer drinking water and hygienic environment to its people on area specific basis in both Rural and Urban areas. As on 31.03.2011, the coverage of drinking water supply in Kerala was 75.28 percent of total population. In urban and rural areas of the state, 85.18 percent and 71.82 percent of the population were covered. The total number of urban and rural people covered by water supply schemes in Kerala was 70.41 lakh and 169.30 lakh respectively.

During 2010-11, Ernakulum District had the highest rural water supply coverage (98.26%) and Kozhikode district had the lowest coverage (41.69%).In urban area, Malappuram District had the highest coverage (99.35%) and Wayanad District had the lowest coverage with 50.10 percent. In the case of total population covered,

Ernakulum district had the highest coverage (97.41%) and Kozhikode District had the lowest coverage (54.60%) during 2010-11. As on 31.03.2012, the coverage of drinking water supply in Kerala was 77.10 percent of total population. In urban and rural areas of the state, 85.18 percent and 74.27 percent of the population were covered. The total number of urban and rural people covered by water supply schemes in Kerala was 70.41 lakh and 175.08 lakh respectively.

During 2011-12, Ernakulum District had the highest rural water supply coverage (98.28%) and Kozhikode district had the lowest coverage (41.69%).In urban area, Malappuram District had the highest coverage (99.35%) and Wayanad District had the lowest coverage with 50.10 percent. In the case of total population covered, Ernakulum district had the highest coverage (97.41%) and Kozhikode District had the lowest coverage (54.60%) during 2011-12. The district wise details of population covered by Water Supply Schemes as on 31/03/2012 and 31/03/2012 are given below:

6.1 District-wise population covered by Water Supply Schemes as on 31/03/2011

Sl. No	District	Rural population covered	% to Total Rural population	Urban population covered	% to Total Urban population	Total population covered	% to Total population
1	Thiruvananthapuram	1635733	76.34	958617	87.81	2594350	80.21
2	Kollam	1395194	65.83	453781	97.38	1848975	71.52
3	Pathanamthitta	835328	75.24	107700	87	943028	76.42
4	Alappuzha	1182805	79.51	528255	85	1711060	81.13
5	Kottayam	964558	58.32	292663	97.62	1257221	64.35
6	Idukki	652803	60.92	55262	95.95	708065	62.70
7	Ernakulam	1600350	98.26	1425000	96.47	3025350	97.41
8	Thrissur	1832646	85.85	828354	98.68	2661000	89.47
9	Palakkad	1583342	70.03	340964	95.62	1924306	73.52
10	Malappuram	1856979	56.80	353860	99.35	2210839	60.98
11	Kozhikode	741202	41.69	830762	75.44	1571964	54.60
12	Wayanad	669798	89.19	14835	50.10	684633	87.70
13	Kannur	1167377	97.60	708332	58.40	1875709	77.86
14	Kasaragod	811925	83.67	143298	61.32	955223	79.33
	Total	**16930040**	**71.82**	**7041683**	**85.18**	**23971723**	**75.28**

6.2 District-wise population covered by Water Supply Schemes as on 31/03/2012

Sl. No	District	Rural population covered	% to Total Rural population	Urban population covered	% to Total Urban population	Total population covered	% to Total population
1	Thiruvananthapuram	1819647	85%	958617	87.81	2778264	85.9
2	Kollam	1461312	68.95	453781	97.38	1915093	74.08
3	Pathanamthitta	835328	75.24	107700	87	943028	76.42
4	Alappuzha	1202805	80.85	528255	85	1731060	82.07
5	Kottayam	964558	58.32	292663	97.62	1257221	64.35
6	Idukki	655301	61.15	55262	95.95	710563	62.93
7	Ernakulam	1600350	98.26	1425000	96.47	3025350	97.41
8	Thrissur	1928376	90.33	828354	98.68	2756730	92.69
9	Palakkad	1583342	70.03	340964	95.62	1924306	73.52
10	Malappuram	2009185	61.46	353860	99.35	2363045	65.18
11	Kozhikode	741202	41.69	830762	75.44	1571964	54.6
12	Wayanad	669798	89.19	14835	50.1	684633	87.7
13	Kannur	1167377	97.6	708332	58.4	1875709	77.86
14	Kasaragod	869925	89.65	143298	61.32	1013223	84.15
	Total	**17508506**	**74.27**	**7041683**	**85.18**	**24550189**	**77.1**

Source: Kerala Water Authority

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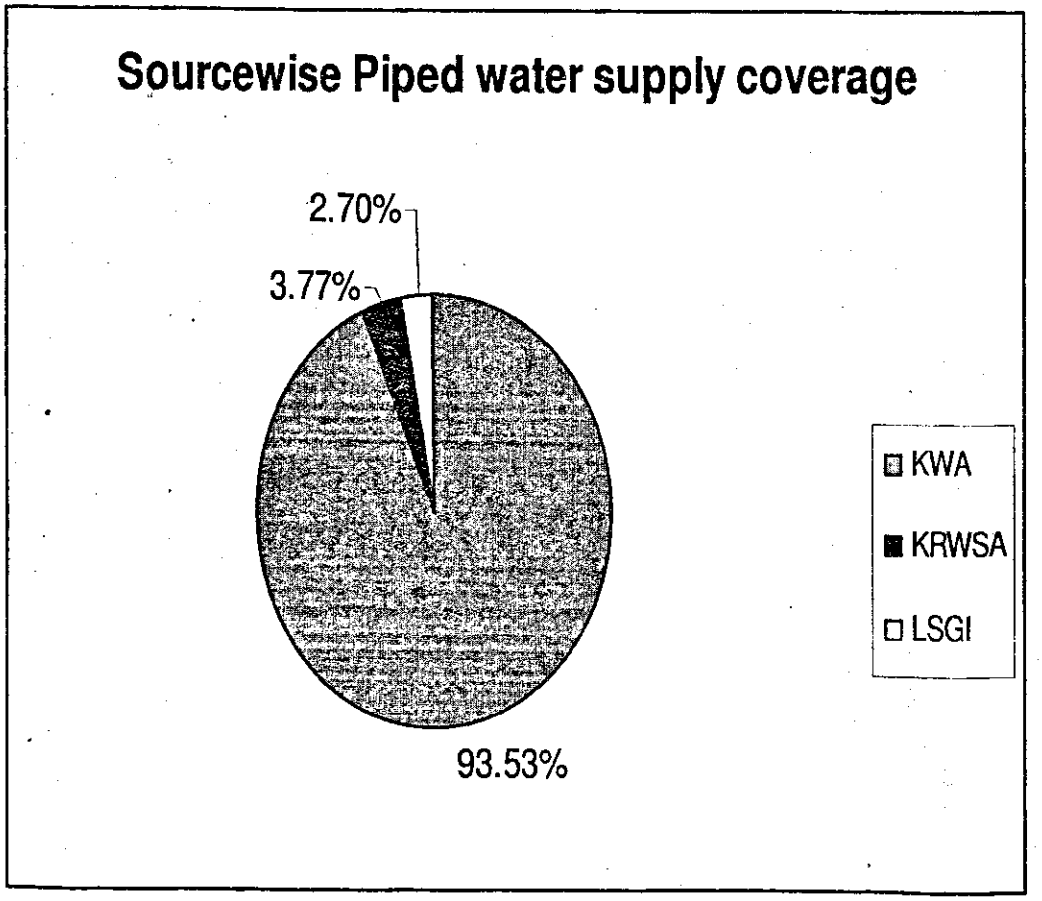
Source wise coverage of piped drinking water supply

Kerala Water Authority (KWA) is the single largest provider of drinking water supply in the state. It covers 93.53% of total piped water supply, of which 61.32% are in rural area and 32.21% in urban area. Other agencies which provide water supply in rural area are Kerala Rural Water Supply and Sanitation Agency (KRWSA) and LSGIs which covers 2.8%and 2% respectively. KRWSA and LSGIs are ensuring community participation in the implement of water supply schemes by sharing the financial costs and taking responsibility in management, operation and maintenance to some extent.



Kerala Water Authority

Various schemes are being implemented by Kerala Water Authority considering the need for extending the coverage of protected water supply in the state adopting scientific distribution and conservation such as Centrally Sponsored National Rural Drinking Water Programme (NRDWP) and Urban Water Supply schemes, Technology Mission Schemes, Swajaldhara schemes, schemes with loan assistance from NABARD/Banks, externally aided JBIC projects (now JICA) and ADB and World Bank assisted schemes. State funded water supply schemes are also being undertaken by Kerala Water Authority.

As on 31/03/2011, there are 2162 water supply schemes operating under Kerala Water Authority. Out of which 71 are urban schemes, 978 Multi panchayat and 1113 Single panchayat Schemes. Under urban water supply schemes Ernakulum (14 schemes) and Thrissur (12 schemes) have more schemes. As in the case of Multi panchayat schemes, Thrissur is in first position having 146 followed by palakkad (133 schemes) and Kozhikode (118 schemes).For Single panchayat scheme Wayanad has only 32 schemes.

As on 31/03/2012 there are 2188 water supply schemes operating under Kerala Water Authority. Out of which 71 are urban schemes, 985 Multi panchayat and 1132 Single panchayat Schemes. Under urban water supply schemes Ernakulum (14 schemes) and Thrissur (12 schemes) have more schemes. As in the case of Multi panchayat schemes, Thrissur is in first position having 147 followed by palakkad (133 schemes) and Kozhikode (118 schemes).For Single panchayat scheme, Wayanad has only 62 schemes. Details are given in the Table below:

6.3 District and Category-wise Water Supply Schemes-KWA as on 31/03/2011

Sl.No	District	No. of Urban Water Supply Schemes	Rural Water Supply Schemes-		Total
			Multi panchayat	Single panchayat	
1	Thiruvananthapuram	6	43	93	142
2	Kollam	3	38	64	105
3	Pathanamthitta	3	19	50	72
4	Alappuzha	7	1	77	85
5	Kottayam	5	55	97	157
6	Idukki	1	106	89	196
7	Ernakulam	14	62	87	163
8	Thrissur	12	146	103	261
9	Palakkad	4	133	50	187
10	Malappuram	5	112	38	155
11	Kozhikkode	2	118	128	248
12	Wayanad	0	30	32	62
13	Kannur	6	52	118	176
14	Kasaragode	3	63	87	153
	Total	**71**	**978**	**1113**	**2162**

Source: Economic Review

6.4 District and Category-wise Water Supply Schemes in operation as on 31/03/2012

Sl.No	District	No. of Urban Water Supply Schemes	Rural Water Supply Schemes-		Total
			Multi panchayat	Single panchayat	
1	Thiruvananthapuram	6	45	95	146
2	Kollam	3	38	65	106
3	Pathanamthitta	3	19	50	72
4	Alappuzha	7	2	77	86
5	Kottayam	5	55	97	157
6	Idukki	1	106	92	199
7	Ernakulam	14	63	91	168
8	Thrissur	12	147	104	263
9	Palakkad	4	133	51	188
10	Malappuram	5	113	43	151
11	Kozhikkode	2	118	128	248
12	Wayanad	0	30	32	62
13	Kannur	6	52	120	178
14	Kasaragode	3	64	87	154
	Total	**71**	**985**	**1132**	**2188**

Source: Kerala Water Authority

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6.5 District-wise details of water supply connections and street taps as on 31/03/2011

Sl. No	District	Water supply connection				Street taps		
		Domestic	Non-Domestic	Industrial	Total	Panchayat	Corp/Mun	TOTAL
1	Thiruvananthapuram	251889	23923	91	275903	11444	5393	16837
2	Kollam	100005	5393	191	105589	15836	4757	20593
3	Pathanamthitta	28006	2412	18	30436	10377	1482	11859
4	Alappuzha	76293	5553	55	81901	3738	536	4274
5	Kottayam	86433	3424	100	89957	23020	4377	27397
6	Idukki	19361	1695	3	21059	8963	2171	11134
7	Ernakulam	331213	20117	242	351572	29608	9793	39401
8	Thrissur	113284	4301	39	117624	22134	5735	27869
9	Palakkad	85194	5461	139	90794	14069	3367	17436
10	Malappuram	48982	3265	6	52253	7120	2480	9600
11	Kozhikode	52796	4081	30	56907	4912	3531	8443
12	Wayanad	9792	1051	3	10846	3990	265	4255
13	Kannur	29215	3580	68	32863	4800	1582	6382
14	Kasaragod	14911	882	9	15802	3164	497	3661
	TOTAL	**1247374**	**85138**	**994**	**1333506**	**163175**	**45966**	**209141**

Source: Economic Review

6.6 District-wise details of water supply connections and street taps as on 31/03/2012

Sl. No	District	Water supply connection				Street taps		
		Domestic	Non-Domestic	Industrial	Total	Panchayat	Corp/Mun	TOTAL
1	Thiruvananthapuram	264638	38085	110	302833	11756	5190	16946
2	Kollam	102655	9115	195	111965	16016	4757	20773
3	Pathanamthitta	29934	2622	24	32580	6286	1037	7323
4	Alappuzha	82016	3176	97	85289	20509	4441	24950
5	Kottayam	89598	6191	54	95843	13143	2079	15222
6	Idukki	19992	1794	4	21790	3510	536	4046
7	Ernakulam	351882	20888	241	373011	31535	10140	41675
8	Thrissur	118967	4497	40	123504	23205	5482	28687
9	Palakkad	91802	5809	142	97753	13065	3377	16442
10	Malappuram	52290	3409	7	55706	7190	2403	9593
11	Kozhikode	54515	4043	29	58587	4460	3458	7918
12	Wayanad	10719	1068	3	11790	3988	265	4253
13	Kannur	30095	3611	69	33775	5102	1605	6707
14	Kasaragod	15421	905	10	16336	3115	539	3654
	TOTAL	1314524	105213	1025	1420762	162880	45309	208189

Source: Kerala Water Authority

Receipts of Kerala Water Authority

Major financial source of Kerala Water Authority includes revenue from water charge and sewerage, plan and Non-plan allocation from state government, Deposits from Local Bodies, fund from Govt.of India and loan from LIC/HUDCO.Details of revenue receipts of KWA are given below:

6.7 Receipts of Kerala Water Authority from various sources from 2002-03 to 2010-11

Year	Revenue from Water/ Sewerage rates	State Govt		Deposits from local bodies	Govt of India	Loan from LIC/HUDCO	others	Total
		Plan	Non-Plan					
2002-03	10580.00	10400	6186	302	6204	0		33672
2003-04	11512.00	9738	6124	375	4341	1000		33090
2004-05	11523	9626	7621	385	5885	300		35340
2005-06	14937	17499	8000	395	6170	4431		51432
2006-07	13839.09	23782	8860	829	6527	3046.13		56883.22
2007-08	15022.78	70783	9946	951	8972	2836		108510.78
2008-09	23089.00	45800	10720	1225.81	12474	26301.4		119610.81
2009-10(p)	31371.00	66661	16792.66	598.37	15447	660.48	7041.86	138572.45
2010-11(P)	33215	37553	19971.80	928.90	14876.64	689.75	579.00	107814.09

Source: Kerala Water Authority

6.8 District Wise & Category wise number of ongoing water supply schemes during 2011-12 (as on 31.3.2012)

Name of District	Number of ongoing Water Supply Schemes																	
	Rural water Supply Schemes											Urban Water Supply Schemes						
	ARWSS	NC/PC	Technology Mission	TRPschemes funded by GOI	State plan	SAARK(2010-2011)	New Water Schemes (2010-2011)	NABARD	Externally Assisted(JICA)	Deposit works of KWA (For Schemes of local bodies /other agencies)	SAARK(2009-10)	Completion of ongoing UWSS - Special Package	Externally Assisted (JICA)	JNNURM	SPARK (2009-10) Replacement of old pipes	UIDSSMT	Bank	Total
Thiruvananthapuram	7				3			5		131	1	2	1	1				151
Kollam	6	1			1			3	1	62								74
Pathanamthitta	5	11			1			2		126						1		146
Alappuzha	5	11	2		2			0		77						1		98
Kottayam	11	1			3			0		168	1	1				1		186
Idukki	6	0						1		132								139
Eranakulam	1	3			1			4		397		2		1				409
Thrissur	4	1	2		1	1		3		309		6				2		329
Palakkad	3	4	1					3		411		2				2		426
Malappuram	10	3			1	3		3		266					1	2		289
Kozhikode	5	29	1		1			2		27			1		2	1		69
Wayanad	2							0		38						1		41
Kannur	4	4		1	1	1		0	1	88		3			2	2		107
Kasargod	2							0		38		1			1			42
Total	**71**	**68**	**6**	**1**	**15**	**5**	**0**	**26**	**2**	**2270**	**2**	**17**	**2**	**2**	**6**	**13**	**0**	**2506**

Expenditure pattern of Kerala Water Authority

During 2005-06 plan expenditure of Kerala Water Authority to its total plan expenditure was31.79 percent it has increased to 34.66 percent in 2010-2011.For Non-plan expenditure it was 68.21 percent in 2005-06 reportedly decreased to 65.34 percent in 2010-11.Details of plan and Non-plan expenditure of Kerala Water Authority shown in Table.6.9

6.9 Plan & Non Plan Expenditure of Kerala Water Authority from 2005-06 to 2010-11

Rs. In Lakhs

Items	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Plan Expenditure (Rs. In lakhs)						
State Plan Schemes	5459.59	8524.03	5887.16	5890.25	22710.89	3431.83
LIC/HUDCO	2634.98	2223.1	1593.423	Nil		0.00
Externally Assisted	1370.00	19321.16	49645.46	52541.55	31557.13	17290.69
Centrally Assisted	6667.55	6312.81	8346.25	9713.90	8138.22	2916.92
Others(if any)	1335.92	2509.11		2617.57		12059.32
Total Plan Expenditure	**17468.04**	**38890.21**	**65472.293**	**70763.27**	**62406.24**	**35698.76**
Non-Plan Expenditure (Rs . in Lakhs)						
Salary & Establishment	12738.72	13985.54	20610.66	25918.00	26356.00	30900
Power charge	14370.23	13800	13880.67	9544	14400	14715
Operation & Maintenance	4639.63	4667.91	4969.92	5091.71	5200	5338
Interest on Loans	3107.34	4209.58	2785.67	2720.89	5330.42	4698.06
(excludingGOK)						
Repayment of Loans	1907	2328	3533	3535.42	4973.25	10841.72
(excludingGOK)						
Others	725.87	703.45	747.01	769.21	779	804.78
Total Non- Plan Expenditure	**37488.79**	**39694.48**	**46526.93**	**47579.23**	**57038.67**	**67297.56**
Grand Total	**54956.83**	**78584.69**	**111999.223**	**118342.5**	**119444.91**	**102996.32**

Source: Kerala Water Authority

6.10 District wise distribution of KWA Water Supply Schemes Transferred to Local Bodies

Sl.No	District	No.of Schemes(Rural)		Total	Population coverage
		From the list of 1050 schemes	From other than the list of 1050 schemes		
1	Thiruvananthapuram	2	0	2	33687
2	Kollam	2	0	2	3950
3	Pathanamthitta	0	0	0	0
4	Alappuzha	0	0	0	0
5	Idukki	3	1	4	2710
6	Kottayam	9	0	9	32400
7	Thrissur	19	22	41	57640
8	Ernakulam	1	0	1	1500
9	Palakkad	69	51	120	434300
10	Malappuram	45	56	101	264643
11	Kozhikkode	49	65	114	142315
12	Wayanad	10	1	11	42445
13	Kannur	6	2	8	4800
14	Kasaragode	14	25	39	28700
	Total	**229**	**223**	**452**	**1049070**

Source: KWA

6.11 Income from water charges

(Rs in Lakhs)

year	urban schemes			Rural comprehensive schemes			Rural single panchayat scheme			Total		
	Domestic/non domestic Industrial	Street taps	Total	Domestic/non domestic (Industrial)	Street taps	Total	Domestic/non domestic (Industrial)	Street taps	Total	Domestic/non domestic (Industrial)	Street taps	Total
2000-01	4389	1393	5782	1097	1030	2127	549	894	1443	6035	3317	9352
2001-02	5184	1011	6195	1296	748	2044	648	649	1297	7128	2408	9536
2002-03	5633	1190	6823	1408	880	2288	704	763	1467	7745	2833	10578
2003-04	6030	1370	7400	1520	1012	2532	759	877	1636	8309	3259	11568
2004-05	8132	133	8265	2051	98	2149	1023	86	1109	11206	317	11523
2005-06	7695	986	8681	1930	4052	5982	979	1015	1994	10604	6053	16657
2006-07	8733	311	9044	2183	1123	3306	1213	293	1506	12129	1727	13856
2007-08	8598	1074	9672	2150	794	2944	1075	689	1764	11823	2557	14380
2008-09	12031	1363	13394	3008	1007	4015	1504	874	2378	16543	3244	19787
2009-10	15426	2618	18044	3857	1935	5792	1928	1679	3607	21211	6232	27443
2010-11	15969	5551	21520	3992	4103	8095	1996	3560	5556	21957	13214	35171

Source: Economic Review

JALANIDHI PROJECT

Kerala Rural Water Supply and Sanitation Agency (KRWSA) was set up, under the aegis of the World Bank, in November 1999 as an autonomous body functions under the Dept of Water Resources, Govt of Kerala. The primary aim of this agency is to facilitate and support year-round supply of adequate quantities of potable water to the rural Kerala, through the active participation of the user group themselves. The advances made by the Peoples' planning programme in Kerala and successful decentralization has made participatory planning a feasible and meaningful tool in adopting a demand driven approach rather than the hitherto followed supply driven approach. The rural water supply & sanitation project implemented by KRWSA is known as JALANIDHI

KRWSA has taken up 3712 water supply schemes in 112 GPs under the first phase of JALANIDHI project, of which 3693 small water supply schemes and 16 large water supply schemes have already been commissioned benefitting 11.28 lakh population. In addition to water supply schemes other components like ground water recharge activities, latrines, environmental sanitation measures, Rain Water Harvesting etc were also undertaken and successfully completed under the project.

6.12 Jalanidhi Project achievements highlights

Sl.No	Items	Achievement
1	No of small water supply scheme commissioned/proposed	3693/3696
2	No of large water supply scheme commissioned/proposed	16/16
3	No of households covered through commissioned schemes	1.69 lakhs
4	Total population covered through commissioned schemes	11.28 lakhs
5	Total No .of new latrines constructed	68023
6	Total No .of new latrines converted from single pit to two pit	24194
7	Total Environment Management Units(compost, soak pit etc)	89319

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8	Drainage constructed in Meters	68362
9	No.of BGs where GWR done	1013
10	No .of Rain water harvest units constructed	13304
11	No of school sanitations work completed	126
12	No of public comfort station completed	73

Source: Jalanidhi

6.13 Project Funding Pattern

Item	GOK share	GP share	BG share
Water supply	75%	10%	15%(7.5% labour+7.5% cash
WS for SC/ST/FM	80%	10%	10%(8% labour+2% cash)
Latrines	Subsidy Rs2000 for new latrine Rs 1000 for conversion		
GWR	90%	10%	Nil
GP strengthening	100%	Nil	Nil
Training	100%	Nil	Nil
Drainage	70%	30%	Nil
O&M cost	Nil	Nil	100%

Source: Jalanidhi

Financials

Total expenditure-398.06 Cr

Gok contribution-316.00 Cr

Grama panchayath contribution-28.00 Cr

BG contribution-54.06 Cr

External assistance received-276.18 Cr

The second phase of the project is aiming to cover the water supply and sanitation intervention is another 96 Grama panchayaths in the state with possible expansion up to 200 is underway. Since the project is in its planning phase, no infrastructure has been completed so far.

Production and Distribution of Water

Kerala Water Authority produced water @1890.64 million litres per day and distributed @1417.90 million litres per day under piped water supply system during 2009-10.

6.14 Production and distribution of water

Year	Production(mld)	Supply(mld)	leakage
2005-06	1635	1259	23
2006-07	1750	1400	20
2007-08	1791	1254	30
2008-09	1811	1268	30
2009-10	1890.64	1417.90	25

Source: Economic Review

Sanitation

The concept of sanitation was earlier limited to disposal of human excreta by cess pools, open ditches, pit latrines, bucket system etc. Today it has a comprehensive concept, which includes liquid and solid waste disposal, food hygiene, personal, domestic as well as environmental hygiene. Proper sanitation is important not only from the general health point of view but it has a vital role to play in our individual and social life too. Sanitation is one of the basic determinants of quality of life and human development index. Good sanitary practices prevent contamination of water and soil and thereby prevent diseases. The concept of sanitation was, therefore, expanded to include personal hygiene, home sanitation, safe water, garbage disposal, excreta disposal and waste water disposal. Individual Health and hygiene is largely dependent on adequate availability of drinking water and proper sanitation. There is therefore, a direct relationship between water, sanitation, and health. Consumption of unsafe drinking water, improper disposal of human excreta, improper environmental sanitation and lack of personal hygiene have been major causes of diseases in developing countries. The concept of sanitation includes personal hygiene, garbage, excreta disposal, waste water disposal etc.The Central Rural Sanitation programme(CRSP),a centrally sponsored scheme launched in 1986,was restructured by the Govt. of India in 1999 to introduce the Total Sanitation Campaign. This is one of the data poor sectors

TOTAL SANITATION CAMPAIGN

Total Sanitation Campaign is a comprehensive programme to ensure sanitation facilities in rural areas with broader goal to eradicate the practice of open defecation.TSC envisages synergized interaction between Government, people and active NGOs. It follows a principle of "low to no subsidy" where a nominal subsidy in the form of incentive is given to rural poor households for construction of toilets. TSC had given strong emphasis on Information, Education and Communication (IEC), Capacity Building and Hygiene Education for effective behaviour change with involvement of PRIs, CBOs and NGOs etc. The key intervention areas are Individual household latrines (IHHL), School Sanitation and Hygiene Education (SSHE), Community Sanitary Complex, Anganwadi toilets supported by Rural Sanitary Marts (RSMs) and Production Centers

(PCs). The main goal of the GOI is to eradicate the practice of open defecation by 2010. To give fillip to this endeavour, GOI has launched Nirmal Gram Puraskar to recognize the efforts in terms of cash awards for fully covered PRIs and those individuals and institutions who have contributed significantly in ensuring full sanitation coverage in their area of operation.NGP is also a way of awareness as well as a competition between Panchayats for firstly create open defecation free area and seek the Nirmal Gram Puraskar.

Objectives

The main objectives of the TSC are as under

- Bring about an improvement in the general quality of life in the rural areas
- Accelerate sanitation coverage in rural areas
- Generate felt demand for sanitation facilities through awareness creation and health education
- Cover schools/ Anganwadis in rural areas with sanitation facilities and promote hygiene education and sanitary habits among students
- Encourage cost effective and appropriate technologies in sanitation
- Eliminate open defecation to minimize risk of contamination of drinking water sources and food
- Convert dry latrines to pour flush latrine, and eliminate manual scavenging practice, wherever in existence in rural areas

Waste Management in Kerala

Keralites are traditionally well known for maintaining personal hygiene by almost all sections of people. Environmental awareness is very high in the state due to high literacy. They are therefore demanding better environmental quality. Solid and liquid waste management are the essential components of societal hygiene. But the peculiar characteristics of the state such as high water table in coastal areas, where most of the urban local bodies are situated and long period of monsoon season spread over six months in an year, makes the solid and liquid waste management a challenging job. Another peculiarity of the state is its very high density of dug wells, it comes about 400 dug wells per square Kilometer, makes the job of waste management at household level a difficult

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task. Small land holdings having well for drawing drinking water and household latrines with on-site excreta disposal system is a common scene in rural settings. In these circumstances finding a suitable site for household processing of solid waste using popular technologies like pit composting, ring composting, or biogas plant is very difficult.

Segregation of wastes at source of generation itself is the key element promoted for managing wastes at household level, institutions and other major waste generators. Encouragement has been given to segregate solid waste to at least two fractions namely, biodegradable and non degradable. Biodegradable wastes include all organic fraction of solid waste, which is intended to be processed at source. If biodegradable, especially the easily biodegradable waste is separated, then the non-degradable and hazardous waste could be handle safely. Non-degradable wastes include plastics, metal, glass etc. Homely hazardous wastes consist of CFL lamps, tube lights, discarded battery, discarded medicines, mosquito coils, remnant of pesticides, etc. The main advantage noticed from cultivating the habit of segregation and storage of waste at source is that the problematic easily degradable waste can be removed daily for processing at household level or at community level, and the non-degradable and hazardous wastes can be stored for comparatively a longer period, without mixing with biodegradable wastes. The first experiment in this regard in Kerala state was tried during 2003 at Kozhikode Municipal Corporation with the financial assistance of the Ministry of Environment and Forests, Government of India. Two bin systems, green bin for biodegradable and white bin for non-degradable were issued to the residents. House to house collection was introduced by involving Kudumbasree (Women Self Help Groups) volunteers, which showed encouraging results.

Technologies such as pit composting, ring composting, vermin composting and biogas plants are being promoted for processing of biodegradable wastes at household level and institutional level. Aerobic windrow composting, vermin composting and biogas plants are being promoted for processing of biodegradable waste at community level. In order to help the local bodies, the State Government in the Local Self Government Department has issued a comprehensive guideline on standards, specifications, operation and maintenance of protocol for the above mentioned processing technologies.

Solid Wasted management is an important component of sanitation. The solid waste management is a mandatory responsibility of Local Self Government institutions, as per provisions of the Kerala Municipality Act 1994, Kerala Panchayat Raj act 1994 and the Municipal Solid Waste (Management & Handling) Rules, 2000 notified under the Environment (Protection) Act. In order to make the waste management system more effective, implementation of the Municipal Solid Waste Rules has been done, which necessitates integrated Solid Waste management System (ISWMS) comprising of segregated storage of waste at source, primary and secondary collection system, street sweeping, regulated transportation, processing and disposal of rejects through engineered landfills. Thus, in brief, as per the provisions of the above legislations the LSGLs have been assigned with the mandatory responsibility to provide basic infrastructure for collection, conveyance, treatment and disposal of Municipal Solid waste. They are also responsible for operation and maintenance of such facilities. The District Collectors are responsible for overall co- ordination of solid waste management activities undertaken by the LSGIs as per the MSW Rules. Therefore the State Government is responsible for coordinating assisting the LSGIs for implementing the MSW Rules.

The sectoral status study on Municipal Solid Waste Management done in Kerala has indicated that the total solid waste generation in the State is about 8300 tonnes per day. Studies have also indicated that 70-80% of the total waste generated is biodegradable in nature and these putrescible waste needs to be managed within 24 hours. Of the total, 13% of the waste is generated by the five City Corporations, 23% by the 53 Municipalities and the rest by the 999 Grama Panchayats (2006 data)

6.15 Municipal Solid Waste Generation in Kerala

Local Governments	Population (Census 2001)	Per capita waste generation in gm	Waste generation per day in tone (2006)
5 City Corporations	2456618	400	1091
53 Municipalities	5810307	300	1935
999 Grama Panchayats	23574449	200	5312
Total			8338

In the state, 27 Municipalities and all the five Municipal Corporations have already completed the construction of Solid Waste Processing Plants and made the plant operational. They have been following the treatment technology based on biological processing of Municipal Solid waste, using mainly the Windrow Composting and biogas plants, as specified in the MSW Rules. The Suchitwa Mission has been focusing and filling the gap in the field of Solid Waste Management in urban areas and focusing in activities mainly at Grama Panchayats and small Municipality level. The Kerala sustainable Urban Development Project (KSUDP) has been involved in providing technical and financial support to Municipal Corporations, and some of the major Municipalities under the JNNURM/UIDSSMT schemes. Even though, the technical and financial support have been extended to Municipal Corporations and major Municipalities, through the KSUDP project, there are gaps and issues in those LSGIs in the field of solid waste management. Present status of implementation of Solid Waste Management System in ULbs has been assessed and a summary of the same is given below.

6.16 Status of Implementation of Integrated Solid Waste Management

Projects in Urban Local Bodies

Components	No. of UIBs			
	Nil	Minimal	Moderate	Adequate
Primary Collection	25	25	13	2
Source Segregation	53	9	3	
Transportation	25	4	31	5
Processing	16	34	13	2

The five City Corporations and 53 Municipalities were supported with partial financial assistance from the Suchitwa Mission for establishing full-fledged integrated Municipal Solid Waste Management Facility, with financial support from the state Plan. Funds have also been made available for solid waste management from LSG fund, and financial resource of Jawaharlal Nehru National Urban Renewal Mission Urban Renewal Mission, Urban Infrastructure Development scheme for small and medium Towns and Kerala Sustainable Urban Development Project. However, there are certain technical

issues like odour nuisance, open dumps, menace from flies, birds and dog, need to collect and treat leach ate, need for proper mechanization of processing plants, need to protect the site with boundary wall and barbed fencing, need to have a proper sanitary landfill system, need to have a resource recovery centre, need to have a proper waste management system for slaughterhouses, etc, that required to be addressed for mitigating the environmental impacts linked to ISWM facilities, in general, and waste processing plants, in particular.

The suchitwa Mission has also been providing technical support and part financial assistants to the Grama Panchayats for establishing solid waste management activities. A three level approach is being taken in this regard. At household level, Institution level and community level, biological treatment technologies are being followed for the purpose of source treatment of bio degradable waste. The suchitwa Mission has been giving technical approval and part financial support to Rural LSGIs for establishing solid waste management facilities under the centrally sponsored programme of Total Sanitation Campaign (TSC) and from Plan Schemes of the suchitwa Mission.

At present, the Municipal Corporations and Major Municipalities have been following the treatment technology based on biological processing of Municipal Solid Waste, using mainly the Windrow Composting and biogas plants, as specified in the MSW Rules. Those LSGIs have been facing the difficulties such as lack of adequate land for disposal of rejects from the compost plants, inadequacies of processing facilities and odour nuisance, excessive leach ate generation, water pollution and other environmental issues from operation of the compost plants. The major issues faced by these plants are being highlighted by media and there are public protests in some urban local bodies. There is a wide spread public concern over the management of Municipal Solid Waste especially in Corporation and major Municipalities. Hence, the Government is in the process of searching for alternate or better technologies for solving the above mentioned issues in those urban LSGIs. The selected technological options are to tried under the Kerala condition, in consideration of its special waste characteristics, climatic conditions, land constraints, environmental sensitiveness, etc.

There are a lot of environmental and operational issues due to mixing of waste plastic carry bags with municipal solid wastes. Therefore, the LSGIs are facing lot of problems in their waste treatment activities due to higher percentage of plastic waste. More over unscientific disposal of waste plastic carry bags led to various environmental issues in the State. The Plastic Waste (Management and handling) Rules, 2011 notified under Environment (Protection) Act, 1986 insist that the local bodies have to take action for collection of waste plastic carry bags and to take action for using the collected carry bags for mixing it with bitumen for road tarring and or co-incineration in the kilns of cement plants. The LSGIs are as part of their waste management projects, are planning to establish Plastic shredding Units at Grama Panchayat and Municipality level, for shredding the collected waste plastic carry bags. There is therefore an urgent need for utilization of these shredded plastic carry bags for road tarring or co- incineration in the Cement Kilns, as stipulated in the said Rules. In the case of sanitary latrines, Kerala has a good record. We have extensive coverage of sanitary latrines in the state. The coverage increased exponentially in the 90's backed up by a well organized programme and commitment of funds. Table 3 gives the progressive achievement in provision of household sanitary latrines in the state.

6.17 Household sanitary latrines: Access to sanitation facilities

Time line	1991	1995	2001	2005
Rural household with toilets (%)	44	73.4	81.3	94.9
Urban Household with toilets (%)	73	90.0	92.0	98.3

Emerging challenges of waste management in Kerala are many. Following are a few important challenges:

- Per capita generation of wastes in Local Self Governments in Kerala is higher than those in other states due to the peculiar consumption pattern in the State.
- Primary collection is limited to urban local self Governments. Storage of waste at source is limited to a few cities and towns.
- Plastic wastes and e-wastes are on the increase.
- After attaining high coverage of sanitary latrines, the remaining target mostly consists of landless people or those having very low extent of land, where construction of toilets poses a major challenge.
- High water table areas particularly in the coastal and in low lying areas like Kuttanad pose a technological challenge.
- Septage treatment has not been addressed so for.

6.18 DISTRICTWISE AND SCHEME WISE EXPENDITURE
DETAILS SCHEME: SOLID WASTE MANAGEMENT

SL.NO	NAME OF DISTRICT	YEAR			
		2008-09	2009-10	2010-11	2011-12
1	THIRUVANANTHAPURAM	2,490,000	0	2,577,500	82,610,050
2	KOLLAM	1,117,000	0	225,000	38,920,433
3	PATHANMATHITTA	0	115,000	488,000	1,035,000
4	ALAPPUZHA	0	0	225,000	24,891,892
5	KOTTAYAM	1,000,000	3,526,000	1,596,000	22,103,666
6	IDUKKI	0	600,000	0	11,457,500
7	ERNAKULAM	3,226,000	0	1,966,000	26,293,828
8	THRISSUR	570,000	500,000	1,489,000	27,815,000

9	PALAKKAD	4,628,000	2,734,000	0	18,311,483
10	MALAPPURAM	860,000	0	1,600,000	55,172,750
11	KOZHIKODE	1,127,000	0	738,000	6,590,306
12	WAYANAD	0	0	0	1,586,033
13	KANNUR	600,000	1,445,000	1,950,000	77,503,595
14	KASARAGOD	4,126,000	220,000	263,000	22,517,817
TOTAL		**19,744,000**	**9,140,000**	**13,117,500**	**416,809,353**

Source: suchitwa Mission

6.19 DISTRICTWISE AND SCHEME WISE EXPENDITURE DETAILS SCHEME: INTEGRATED LOW COST SANITATION (ILCS)

SL.NO	NAME OF DISTRICT	YEAR			
		2008-09	2009-10	2010-11	2011-12
1	ERNAKULAM			3,702,000	
2	PALAKKAD			6,565,000	
3	MALAPPURAM			5,428,000	
4	KOZHIKODE			2,593,000	
5	KASARAGOD			1,867,000	
TOTAL				**20,155,000**	

Source: suchitwa Mission

6.20 DISTRICTWISE AND SCHEME WISE EXPENDITURE DETAILS SCHEME: GIRL FRIENDLY TOILET AND BABY FRIENDLY TOILET

SL.NO	NAME OF DISTRICT	YEAR			
		2008-09	2009-10	2010-11	2011-12
1	THIRUVANANTHAPURAM	0	33,500	27,500	
2	KOLLAM	110,000	0	0	
3	PATHANMATHITTA	0	0	33,500	
4	ALAPPUZHA	110,000	0	0	
5	ERNAKULAM	110,000	140,000	27,500	
6	THRISSUR	0	0	67,000	
7	PALAKKAD	0	67,000	0	
8	MALAPPURAM	110,000	0	0	
9	KOZHIKODE	110,000	67,000	0	
10	WAYANAD	0	0	0	
11	KANNUR	0	100,500	0	
TOTAL		**550,000**	**408,000**	**155,500**	

Source: suchitwa Mission

6.21 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2000-03/2001(release VS Expenditure)

Sl.No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	KASARAGOD	128.780	0.000	0.000	128.780	0.000	0.000	0.000	0.000
2	KOLLAM	179.310	0.000	0.000	179.310	0.000	0.000	0.000	0.000
	TOTAL	**308.090**	**0.000**	**0.000**	**308.090**	**0.000**	**0.000**	**0.000**	**0.000**

Source: suchitwa Mission

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6.22 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2001-03/2002(release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	330.020	34.000	0.000	364.020	0.000	0.000	0.000	0.000
2	KASARAGOD	0.000	78.590	0.000	78.590	0.000	0.000	0.000	0.000
3	KOLLAM	0.000	52.360	0.000	52.36	0.000	0.000	0.000	0.000
4	MALAPPURAM	153.290	0.000	0.000	153.290	0.000	0.000	0.000	0.000
5	THIRUVANANTHAPURAM	152.070	24.060	0.000	176.130	0.000	0.000	0.000	0.000
6	WAYANAD	106.600	0.000	0.000	106.600	0.000	0.000	0.000	0.000
	TOTAL	**741.980**	**189.010**	**0.000**	**930.990**	**0.000**	**0.000**	**0.000**	**0.000**

Source: suchitwa Mission

6.23 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2002-03/2003 (release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	0.00	62.66	0.00	62.66	164.76	54.83	0.00	219.59
2	ERNAKULAM	51.42	0.00	0.00	51.42	0.00	0.00	0.00	0.00
3	IDUKKI	26.68	0.00	0.00	26.68	0.00	0.00	0.00	0.00

4	KANNUR	34.91	0.00	0.00	34.91	0.00	0.00	0.00	0.00
5	KASARAGOD	0.00	0.00	0.00	0.00	50.60	46.11	0.00	96.71
6	KOLLAM	179.31	0.00	1.40	180.71	50.35	15.09	38.38	103.82
7	KOZHIKODE	37.48	0.00	0.00	37.48	.0.00	0.00	0.00	0.00
8	MALAPPURAM	0.00	45.71	0.00	45.71	84.00	26.93	0.00	110.93
9	PALAKKAD	49.99	0.00	0.00	49.99	0.00	0.00	0.00	0.00
10	PATHANAMTHITTA	33.63	0.00	0.00	33.63	0.00	0.00	0.00	0.00
11	THIRUVANANTHAPURAM	0.00	20.87	0.00	20.87	82.80	26.80	0.00	109.60
12	THRISSUR	25.85	0.00	0.00	25.85	0.00	0.00	0.00	0.00
13	WAYANAD	0.00	30.98	0.00	30.98	0.00	0.00	0.00	0.00
	TOTAL	**439.27**	**160.22**	**1.40**	**600.89**	**432.51**	**169.76**	**38.38**	**640.65**

Source: suchitwa Mission

6.24 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2003-03/2004 (release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	330.02	96.66	468.03	894.71	219.26	71.99	468.03	759.28
2	ERNAKULAM	0.00	27.41	0.00	27.41	37.58	17.68	18.39	73.65
3	IDUKKI	0.00	16.74	94.94	111.68	20.47	13.31	15.96	49.74
4	KANNUR	0.00	21.93	20.78	42.71	27.98	15.59	20.79	64.36

5	KASARAGOD	128.78	78.59	101.47	308.84	216.71	41.73	299.59	558.03
6	KOLLAM	0.00	52.37	137.81	190.18	247.71	81.57	102.32	431.60
7	KOZHIKODE	0.00	35.06	0.00	35.06	48.98	22.58	8.56	80.12
8	MALAPPURAM	153.29	45.71	44.90	243.90	117.52	34.01	43.65	195.18
9	PALAKKAD	99.97	32.05	57.49	189.51	56.96	24.70	73.24	154.90
10	PATHANAMTHITTA	0.00	20.85	0.00	20.85	36.06	16.64	53.94	106.64
11	THIRUVANANTHAPURAM	152.07	51.73	199.22	403.02	115.00	42.02	206.10	363.12
12	THRISSUR	0.00	14.48	0.00	14.48	30.80	0.90	0.00	31.70
13	WAYANAD	0.00	0.00	25.67	25.67	105.84	32.13	24.82	162.79
	TOTAL	**864.13**	**493.58**	**1150.31**	**2508.02**	**1280.87**	**414.85**	**1335.39**	**3031.11**

Source: suchitwa Mission

6.25 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2004-03/2005 (release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	0.00	0.00	161.29	161.29	93.95	21.66	160.04	275.65
2	ERNAKULAM	102.83	54.82	0.00	157.65	0.00	0.00	0.00	0.00
3	IDUKKI	53.35	0.00	0.00	53.35	0.00	0.00	0.00	0.00
4	KANNUR	69.82	43.86	111.95	225.63	72.70	47.52	45.79	166.01

5	KASARAGOD	128.78	78.60	0.00	207.38	0.00	0.00	0.00	0.00
6	KOLLAM	179.31	52.36	5.18	236.86	74.78	25.10	3.69	103.57
7	KOZHIKODE	74.96	0.00	0.00	74.96	0.00	0.00	0.00	0.00
8	MALAPPURAM	0.00	0.00	4.60	4.60	22.68	8.36	0.50	31.54
9	PALAKKAD	0.00	64.08	128.26	192.34	69.75	50.82	119.46	240.03
10	PATHANAMTHITTA	67.26	41.71	173.08	282.05	36.47	29.38	119.14	184.99
11	THIRUVANANTHAPURAM	0.00	0.00	83.63	83.63	80.36	25.58	82.64	188.58
12	THRISSUR	129.22	28.97	128.75	286.94	46.14	35.53	128.75	210.42
13	WAYANAD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	**805.53**	**364.40**	**796.74**	**1966.67**	**496.83**	**243.96**	**660.01**	**1400.79**

Source: suchitwa Mission

6.26 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2005-03/2006 (release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	0.00	0.00	682.00	682.00	73.87	15.79	68.55	158.21
2	ERNAKULAM	154.25	0.00	114.19	268.44	120.00	77.19	95.82	293.01
3	IDUKKI	0.00	33.48	235.25	268.73	59.33	36.28	57.93	153.54

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4	KANNUR	0.00	0.00	1.14	1.14	4.05	1.54	0.93	6.52
5	KASARAGOD	0.00	0.00	465.91	465.91	95.55	75.79	178.06	349.40
6	KOLLAM	0.00	0.00	0.00	0.00	30.69	12.36	0.00	43.05
7	KOTTAYAM	61.58	0.00	0.00	61.58	0.00	0.00	0.00	0.00
8	KOZHIKODE	112.45	32.64	144.59	289.68	174.65	45.60	136.03	356.28
9	MALAPPURAM	0.00	0.00	5.31	5.31	49.74	13.30	4.50	67.54
10	PALAKKAD	149.96	96.13	180.38	426.47	78.30	62.82	183.20	324.32
11	PATHANAMTHITTA	0	62.56	222.20	284.76	16.77	9.65	26.15	52.57
12	THIRUVANANTHAPURAM	152.07	38.13	25.17	215.37	112.65	34.31	25.24	172.20
13	THRISSUR	0.00	43.45	115.60	159.05	71.58	48.34	119.20	239.12
14	WAYANAD	106.59	30.98	4.28	141.85	24.00	6.88	5.13	36.01
	TOTAL	**736.90**	**337.37**	**2196.02**	**3270.29**	**911.18**	**439.85**	**900.74**	**2251.77**

Source: suchitwa Mission

6.27 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2006-03/2007 (release VS Expenditure)

Sl.No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	0.00	0.00	1.93	1.93	47.32	11.12	0.40	58.84
2	ERNAKULAM	0.00	82.23	189.86	272.09	97.00	66.98	66.13	230.11
3	IDUKKI	80.03	50.22	44.73	174.98	82.94	34.55	56.90	174.39
4	KANNUR	104.73	65.79	103.15	273.67	50.85	41.51	51.22	143.58
5	KASARAGOD	0.00	0.00	0.00	0.00	13.17	11.82	0.00	24.99

6	KOLLAM	0.00	0.00	0.00	0.00	44.85	12.89	0.00	57.74
7	KOTTAYAM	0.00	35.74	59.20	94.94	52.56	35.74	31.03	119.33
8	KOZHIKODE	0.00	67.70	63.07	130.77	1.26	29.61	63.01	93.88
9	MALAPPURAM	0.00	0.00	3.54	3.54	18.56	4.52	3.54	26.62
10	PALAKKAD	0.00	0.00	71.17	71.17	50.60	29.03	72.66	152.29
11	PATHANAMTHITTA	100.89	0.00	2.15	103.04	70.82	59.49	2.10	132.41
12	THIRUVANANTHAPURAM	0.00	0.00	0.27	0.27	55.61	14.43	1.76	71.80
13	THRISSUR	77.53	43.45	115.26	236.24	58.39	45.50	0.22	104.11
14	WAYANAD	0.00	0.00	7.79	7.79	29.90	9.80	7.79	47.49
	TOTAL	**363.18**	**345.13**	**662.12**	**1370.43**	**673.83**	**406.99**	**356.76**	**1437.58**

Source: suchitwa Mission

6.28 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2007-03/2008 (release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	276.17	99.46	308.14	683.77	54.02	12.66	0.00	66.68
2	ERNAKULAM	133.14	69.48	130.75	333.37	132.89	72.08	132.36	337.33
3	IDUKKI	93.48	70.10	118.02	281.60	93.57	84.24	107.70	285.51
4	KANNUR	0.00	0.00	24.92	24.92	53.94	25.28	24.92	104.14
5	KASARAGOD	326.92	0.00	0.00	326.92	33.29	47.01	0.00	80.30

6	KOLLAM	390.98	134.12	32.64	557.74	226.97	71.38	32.64	330.99
7	KOTTAYAM	67.39	38.67	42.27	148.33	73.11	0.00	33.38	106.49
8	KOZHIKODE	34.59	12.32	0.00	46.91	33.35	44.47	0.06	77.88
9	MALAPPURAM	165.63	56.89	4.32	226.84	104.93	33.61	3.84	142.38
10	PALAKKAD	82.16	30.26	0.00	112.42	125.99	55.03	1.60	182.62
11	PATHANAMTHITTA	128.36	90.69	0.00	219.05	154.82	100.00	2.72	257.54
12	THIRUVANANTHAPURAM	325.12	112.09	0.00	437.21	227.04	74.79	9.10	310.93
13	THRISSUR	205.12	30.00	194.33	429.45	48.72	30.05	0.74	79.51
14	WAYANAD	0.00	0.00	12.55	12.55	45.94	12.24	12.54	70.72
	TOTAL	**2229.06**	**744.08**	**867.94**	**3841.08**	**1408.58**	**662.84**	**361.60**	**2433.02**

Source: suchitwa Mission

6.29 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2008-03/2009 (release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	0.00	0.00	0.00	0.00	89.40	25.97	0.16	115.53
2	ERNAKULAM	0.00	29.75	0.00	29.75	61.13	0.18	0.00	61.31
3	IDUKKI	0.00	0.00	0.00	0.00	0.20	2.12	2.19	4.51
4	KANNUR	81.90	19.66	51.43	152.99	69.02	19.8	50.49	139.31
5	KASARAGOD	0.00	145.52	0.00	145.52	49.37	19.94	0.00	69.31
6	KOLLAM	0.00	0.00	0.00	0.00	19.24	5.69	0.00	24.93
7	KOTTAYAM	0.00	29.75	21.71	51.46	3.59	38.6	42.54	84.73

8	KOZHIKODE	127.70	75.46	11.00	214.16	18.38	6.22	2.80	27.40
9	MALAPPURAM	0.00	0.00	15.10	15.10	86.23	27.34	15.10	128.67
10	PALAKKAD	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00
11	PATHANAMTHITTA	0.00	0.00	0.00	0.00	7.72	0	0.00	7.72
12	THIRUVANANTHAPURAM	0.00	0.00	13.08	13.08	104.15	28.22	29.23	161.60
13	THRISSUR	0.00	63.28	0.00	63.28	139.62	22.14	305.03	466.79
14	WAYANAD	179.39	58.36	15.33	253.08	71.54	31.72	15.34	118.60
	TOTAL	**388.99**	**421.78**	**127.65**	**938.42**	**719.59**	**227.94**	**462.88**	**1410.41**

Source: suchitwa Mission

6.30 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2009-03/2010 (release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Benefi ciary	Total	Centre	State	Benefici ary	Total
State Name :- KERALA									
1	ALAPPUZHA	0.00	5.16	0.00	5.16	90.17	31.01	710.00	831.18
2	ERNAKULAM	85.97	19.38	0.00	105.35	80.02	29.55	5.20	114.77
3	IDUKKI	98.05	71.38	315.60	485.03	97.77	71.33	310.25	479.35
4	KANNUR	58.38	34.85	121.80	215.03	56.11	26.8	153.47	236.38
5	KASARAGOD	0.00	0.00	0.00	0.00	17.20	34.86	0.00	52.06
6	KOLLAM	0.00	6.31	0.00	6.31	253.18	64.05	0.00	317.23

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7	KOTTAYAM	94.02	0.00	13.28	107.30	95.34	29.7	29.51	154.57
8	KOZHIKODE	0.00	0	0.00	0.00	86.14	29.6	7.46	123.20
9	MALAPPURAM	95.26	52.24	6.64	154.14	54.78	16.18	7.55	78.51
10	PALAKKAD	150.55	89.76	0.00	240.31	105.39	36.34	0.00	141.73
11	PATHANAMTHITTA	64.26	44.16	0.00	108.42	55.51	8.04	0.00	63.55
12	THIRUVANANTHAPURAM	142.70	67.80	0.00	210.50	152.02	68.53	17.55	238.10
13	THRISSUR	85.21	50.54	85.21	220.96	71.80	24.38	1.20	97.38
14	WAYANAD	101.05	62.12	27.26	190.43	130.76	57.98	27.26	216.00
	TOTAL	**975.45**	**503.70**	**569.79**	**2048.94**	**1346.19**	**528.37**	**1269.45**	**3144.01**

Source: suchitwa Mission

6.31 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2010-03/2011 (release VS Expenditure)

Sl. No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	1.99	0.48	1.99	4.46	54.17	14.86	155.54	224.57
2	ERNAKULAM	134.85	70.21	0.00	205.06	26.53	23.93	116.90	167.36
3	IDUKKI	406.51	243.59	0.00	650.10	145.44	57.36	0.00	202.80
4	KANNUR	91.59	54.67	0.00	146.26	27.57	25.44	1.30	54.31
5	KASARAGOD	28.10	14.84	0.00	42.94	23.65	3.17	0.51	27.33
6	KOLLAM	88.97	7.30	0.00	96.27	9.60	3.03	0.00	12.63

7	KOTTAYAM	147.52	102.67	8.72	258.91	91.86	73.6	8.72	174.13
8	KOZHIKODE	0.00	0	0.00	0.00	19.90	5.56	0.60	26.06
9	MALAPPURAM	149.44	39.87	0.00	189.31	53.20	13.32	2.44	68.96
10	PALAKKAD	620.57	348.66	28.55	997.78	93.88	41.6	4.61	140.09
11	PATHANAMTHITTA	100.80	34.03	0.00	134.83	35.35	3.6	0.00	38.95
12	**THIRUVANANTHAPURAM**	223.82	61.69	1001.81	1287.3	54.96	21.67	5.97	82.60
13	THRISSUR	133.64	69.21	0.00	202.85	43.24	13.4	0.00	56.64
14	WAYANAD	158.54	30.02	24.85	213.41	129.17	59.18	24.85	213.20
	TOTAL	**2286.34**	**1077.24**	**1065.92**	**4429.5**	**808.52**	**359.67**	**321.44**	**1489.63**

Source: suchitwa Mission

6.32 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2011-03/2012 (release VS Expenditure)

Sl.No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	23.19	5.62	23.09	51.90	38.35	44.14	15.29	97.78
2	ERNAKULAM	1.50	0.80	0.00	2.30	32.15	9.11	0.00	41.26
3	IDUKKI	35.54	22.76	0.00	58.30	186.76	52.61	12.54	251.91
4	KANNUR	10.47	5.71	0.00	16.18	12.31	3.51	0.00	15.82
5	KASARAGOD	10.67	5.70	0.00	16.37	45.21	17.41	0.31	62.93
6	KOLLAM	1.93	18.82	0.00	20.75	0.81	0.20	0.00	1.01
7	KOTTAYAM	29.06	16.23	21.99	67.28	50.64	33.95	12.93	97.52
8	KOZHIKODE	0.46	0.38	0.00	0.84	11.31	2.98	0.10	14.39

9	MALAPPURAM	11.49	3.85	41.33	56.67	118.30	42.90	37.98	199.18
10	PALAKKAD	0.00	0.00	32.05	32.05	200.02	117.42	43.14	360.58
11	PATHANAMTHITTA	1.39	31.94	0.00	33.33	124.33	51.94	0.00	176.27
12	THIRUVANANTHAPURAM	26.92	8.83	0.00	35.75	112.27	38.72	0.00	150.99
13	THRISSUR	2.05	1.07	0.00	3.12	23.24	6.59	0.00	29.83
14	WAYANAD	4.22	7.31	3.91	15.44	32.19	7.93	3.91	44.03
	TOTAL	**158.89**	**129.02**	**122.37**	**410.28**	**987.89**	**429.41**	**126.20**	**1543.50**

Source: suchitwa Mission

6.33 DISTRICT- WISE FINANCIAL PROGRESS DURING 4/2012-11/2012 (release VS Expenditure)

Sl.No	State/District	Release Amount (in Lakhs)				Expenditure Amount (in Lakhs)			
		Centre	State	Beneficiary	Total	Centre	State	Beneficiary	Total
State Name :- KERALA									
1	ALAPPUZHA	0.00	0.00	0.10	0.10	18.06	0.01	0.00	18.07
2	ERNAKULAM	0.00	0.00	0.00	0.00	66.15	21.23	0.00	87.38
3	IDUKKI	0.00	0.00	0.00	0.00	116.46	46.87	2.27	165.60
4	KANNUR	0.00	0.00	0.00	0.00	18.28	4.57	0.00	22.85
5	KASARAGOD	0.00	0.00	0.00	0.00	9.49	2.34	0.00	11.83
6	KOLLAM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	KOTTAYAM	0.00	0.00	0.00	0.00	24.79	4.56	0.00	29.35
8	KOZHIKODE	0.00	0.00	0.00	0.00	13.93	3.78	0.00	17.71

9	MALAPPURAM	0.00	0.00	0.40	0.40	16.28	4.17	0.40	20.85
10	PALAKKAD	0.00	0.00	10.24	10.24	180.83	132.92	10.24	323.99
11	PATHANAMTHITTA	0.00	0.00	0.00	0.00	19.27	3.34	174.34	196.95
12	THIRUVANANTHAPURAM	0.00	0.00	0.00	0.00	86.62	10.07	3.10	99.79
13	THRISSUR	0.00	0.00	0.00	0.00	100.42	31.83	0.00	132.25
14	WAYANAD	0.00	0.00	0.00	0.00	17.10	1.73	0.00	18.83
	TOTAL	**0.00**	**0.00**	**10.74**	**10.74**	**687.68**	**267.42**	**190.35**	**1145.45**

Source: suchitwa Mission

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6.34 Total Sanitation Campaign (TSC) Financial Achievement from April 2002 to March 2012

District-wise Financial Progress during 04/2002-03/2012(Release VS Expenditure)

Sl.No	District	Release Amount (In Lakhs)				Expenditure Amount (In Lakhs)			
		Center	State	Beneficiary	Total	Center	State	Beneficiary	Total
1	Thiruvanathapuram	1022.70	361.14	1323.18	2707.02	1096.86	375.07	377.59	1849.52
2	Kollam	840.50	271.28	177.03	1288.81	958.19	291.36	177.03	1426.58
3	Pathanamthitta	496.59	325.94	397.43	1219.96	537.85	278.74	204.05	1020.64
4	Alappuzha	631.37	270.04	1646.47	2547	925.27	304.03	1578.01	2807.31
5	Kottayam	399.57	223.06	167.17	789.80	367.10	211.56	158.11	736.77
6	Idukki	793.64	508.27	808.54	2110.45	686.48	351.80	563.47	1601.75
7	Ernakulam	663.96	354.08	434.80	1452.84	587.30	296.70	434.8	1318.80
8	Thrissur	658.62	344.45	639.15	1642.22	533.53	226.83	555.14	1315.50
9	Palakkad	1153.20	660.94	497.90	2313.04	780.88	417.76	497.90	1696.55
10	Malappuram	575.11	244.27	125.74	945.12	709.94	220.47	119.10	1049.51
11	Kozhikode	387.64	223.56	218.66	829.86	393.96	186.62	218.63	799.20
12	Wayanad	549.79	219.77	121.64	891.20	569.34	217.86	121.64	908.84
13	Kannur	451.80	246.47	435.17	1133.44	37454	206.99	348.90	930.43
14	Kasaragode	623.25	323.25	567.38	1513.88	544.75	297.84	478.47	1321.05
	TOTAL	**9247.74**	**4576.52**	**7560.26**	**21384.52**	**9065.99**	**3883.63**	**5832.83**	**18782.44**

Source: Commissionarate of Rural Development

6.35 State level Figures of Financial Components (Release Vs Expenditure)
All amount in Lakhs

Financial Year	No.of Project Approved	Approved Amount				Release Amount				Expenditure Amount			
		Centre	State	Beneficiary	Total	Centre	State	Beneficlary	Total	Centre	State	Beneficlary	Total
1999-2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000-2001	2.00	1902.24	793.74	639.39	3335..37	308.09	0.00	0.00	308.09	0.00	0.00	0.00	0.00
2001-2002	4.00	4045.27	1325.83	830.08	6201.18	741.98	189.01	0.00	930.99	0.00	0.00	0.00	0.00
2002-2003	7.00	5372.68	3115.40	3050.92	11539.00	439.27	160.22	1.40	600.89	432.51	169.76	38.38	640.65
2003-2004	0.00	0.00	0.00	0.00	0.00	864.13	493.58	1150.31	2508.02	1280.87	414.85	1335.39	3031.11
2004-2005	0.00	0.00	0.00	0.00	0.00	805.53	364.40	796.74	1966.68	496.83	243.96	660.00	1400.79
2005-2006	1.00	553.72	309.11	251.54	1114.37	736.90	337.37	2196.02	3270.29	911.17	439.83	900.73	2251.73
2006-2007	0.00	0.00	0.00	0.00	0.00	363.18	345.13	662.12	1370.43	673.83	406.99	356.76	1437.58
2007-2008	0.00	0.00	0.00	0.00	0.00	2229.06	744.08	867.94	3841.08	1408.58	662.85	361.59	2433.02
2008-2009	0.00	0.00	0.00	0.00	0.00	388.99	421.78	127.65	938.42	719.59	227.94	462.89	1410.42
2009-2010	0.00	0.00	0.00	0.00	0.00	975.45	503.70	569.79	2048.94	1346.20	528.36	1269.45	3144.01

Source: Suchitwa Mission

6.36 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2000-03/2001

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
State:- KERALA											
1	Kasaragod	0	0	0	0	0	0	0	0	0	0
2	Kollam	0	0	0	0	0	0	0	0	0	0
	TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source: suchitwa Mission

6.37 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2001-03/2002

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
State:- KERALA											
1	Alappuzha	0	0	0	0	0	0	0	0	0	0
2	Kasaragod	0	0	0	0	0	0	0	0	0	0
3	Kollam	0	0	0	0	0	0	0	0	0	0
4	Malappuram	0	0	0	0	0	0	0	0	0	0
5	Thiruvananthapuram	0	0	0	0	0	0	0	0	0	0
6	Wayanad	0	0	0	0	0	0	0	0	0	0
	TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source: suchitwa Mission

6.38 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2002 TO 03/2003

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	36500	0	36500	24	84	0	0	0	0	0
2	Ernakulam	0	0	0	0	0	0	0	0	0	0
3	Idukki	0	0	0	0	0	0	0	0	0	0
4	Kannur	0	0	0	0	0	0	0	0	0	0
5	Kasaragod	17972	0	17972	0	4	0	0	0	0	0
6	Kollam	7395	0	7395	34	19	0	1	0	0	0
7	Kozhikode	0	0	0	0	0	0	0	0	0	0
8	Malappuram	19000	0	19000	3	0	0	0	0	0	0
9	Palakkad	0	0	0	0	0	0	0	0	0	0
10	Pathanamthitta	0	0	0	0	0	0	0	0	0	0
11	Thiruvananthapuram	20000	0	20000	10	5	0	1	0	0	0
12	Thrissur	0	0	0	0	0	0	0	0	0	0
13	Wayanad	0	0	0	0	0	0	0	0	0	0
	TOTAL	**100867**	**0**	**100867**	**71**	**112**	**0**	**2**	**0**	**0**	**0**

Source: suchitwa Mission

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6.39 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2003-03/2004

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	10	0	10	30	72	0	6	0	0	0
2	Ernakulam	4323	0	4323	0	0	0	0	0	0	0
3	Idukki	3908	0	3908	0	0	0	0	0	0	0
4	Kannur	5197	0	5197	0	0	0	0	0	0	0
5	Kasaragod	1716	0	1716	7	158	0	0	0	0	0
6	Kollam	41161	0	41161	263	195	0	3	0	0	0
7	Kozhikode	4196	0	4196	2	28	0	0	0	0	0
8	Malappuram	7212	6800	14012	0	205	0	14	0	0	0
9	Palakkad	5749	0	5749	4	22	0	1	0	0	0
10	Pathanamthitta	4047	0	4047	0	3	15	0	0	0	0
11	Thiruvananthapuram	19844	0	19844	0	47	0	9	0	0	0
12	Thrissur	1362	0	1362	0	2	0	0	0	0	0
13	Wayanad	9500	0	9500	25	25	0	3	0	0	0
	TOTAL	**108225**	**6800**	**115025**	**331**	**757**	**15**	**36**	**0**	**0**	**0**

Source: suchitwa Mission

6.40 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2004-03/2005

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	26823	1642	28465	3	0	0	0	2	0	0
2	Ernakulam	11343	382	11725	1	17	84	1	0	0	0
3	Idukki	6422	1216	7638	1	2	0	0	0	0	0
4	Kannur	11342	968	12310	2	21	0	2	0	0	0
5	Kasaragod	915	8852	9767	0	64	135	1	0	0	0
6	Kollam	13227	4847	18074	93	45	0	2	6	0	0
7	Kozhikode	13474	1553	15027	2	92	0	1	0	0	0
8	Malappuram	4222	285	4507	1	25	0	0	0	0	0
9	Palakkad	12826	4936	17762	5	94	205	0	0	0	0
10	Pathanamthitta	8225	174	8399	0	29	52	0	0	0	0
11	Thiruvananthapuram	16352	1721	18073	0	22	0	0	0	0	0
12	Thrissur	7797	498	8295	2	24	0	2	0	0	0
13	Wayanad	6014	376	6390	0	0	0	0	0	0	0
	TOTAL	**138982**	**27450**	**166432**	**110**	**435**	**476**	**9**	**8**	**0**	**0**

Source: suchitwa mission

6.41 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2005-03/2006

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	27600	547	28147	0	10	0	2	6	0	0
2	Ernakulam	10822	5772	16594	11	35	0	1	0	0	0
3	Idukki	11226	5233	16459	0	22	0	0	0	0	0
4	Kannur	423	0	423	4	10	0	0	2	0	0
5	Kasaragod	1375	2628	4003	0	31	207	0	0	0	0
6	Kollam	4209	0	4209	0	0	0	0	0	0	0
7	Kottayam	0	0	0	0	0	0	0	0	0	0
8	Kozhikode	9615	133	9748	1	33	0	1	0	0	0
9	Malappuram	2885	145	3030	1	78	0	0	0	0	0
10	Palakkad	18038	1748	19786	4	44	67	0	0	0	0
11	Pathanamthitta	2174	497	2671	2	8	17	0	0	0	0
12	Thiruvananthapuram	23965	1600	25565	0	26	0	0	0	0	0
13	Thrissur	13261	5380	18641	7	22	0	3	2	0	0
14	Wayanad	4705	5	4710	1	1	0	0	0	0	0
	TOTAL	**130298**	**23688**	**153986**	**31**	**320**	**291**	**7**	**10**	**0**	**0**

Source: suchitwa mission

6.42 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2006-03/2007

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	9413	2311	11724	1	0	0	2	2	0	0
2	Ernakulam	10291	5952	16243	12	62	1	0	2	0	0
3	Idukki	10627	542	11169	1	1	37	0	0	0	0
4	Kannur	6221	0	6221	0	6	0	1	1	0	0
5	Kasaragod	1568	3570	5138	4	14	18	0	0	0	0
6	Kollam	9535	0	9535	0	0	0	0	0	0	0
7	Kottayam	3879	0	3879	0	0	0	0	0	0	0
8	Kozhikode	11829	454	12283	3	40	0	0	0	0	0
9	Malappuram	2835	61	2896	0	0	0	0	0	0	0
10	Palakkad	7103	6535	13638	1	45	39	0	0	0	0
11	Pathanamthitta	9727	305	10032	2	9	9	0	0	0	0
12	Thiruvananthapuram	2618	427	3045	0	18	56	0	0	0	0
13	Thrissur	9012	1144	10156	0	11	3	0	0	0	0
14	Wayanad	5429	270	5699	0	15	0	0	0	0	0
	TOTAL	**100087**	**21571**	**121658**	**24**	**221**	**163**	**3**	**5**	**0**	**0**

Source: suchitwa mission

GCPT. 37/585/2013/DTP.

6.43 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2007-03/2008

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	14013	0	14013	22	0	160	0	0	0	166
2	Ernakulam	14538	2477	17015	13	157	111	0	0	0	232
3	Idukki	26419	6713	33132	3	7	14	0	0	0	20
4	Kannur	14445	17301	31746	8	29	45	0	0	8	0
5	Kasaragod	20850	4450	25300	2	0	0	0	0	0	0
6	Kollam	16351	2443	18794	0	95	254	0	0	0	275
7	Kottayam	4648	0	4648	0	10	10	0	0	0	6
8	Kozhikode	3171	0	3171	1	60	250	0	0	0	205
9	Malappuram	5532	174	5706	0	24	33	0	1	0	0
10	Palakkad	46851	4394	51245	5	40	89	2	0	0	165
11	Pathanamthitta	28358	224	28582	6	123	28	0	0	0	0
12	Thiruvananthapuram	32221	3998	36219	1	62	380	0	0	78	180
13	Thrissur	14743	29	14772	1	25	42	0	0	0	0
14	Wayanad	4012	1830	5842	1	40	0	0	0	0	0
	TOTAL	**246152**	**44033**	**290185**	**63**	**672**	**1416**	2	1	**86**	**1249**

Source: suchitwa mission

6.44 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2009-03/2010

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	0	0	0	8	0	46	0	0	11	0
2	Ernakulam	1331	0	1331	2	0	169	4	0	0	0
3	Idukki	6127	19	6146	33	75	163	0	0	0	33
4	Kannur	0	0	0	0	22	182	0	0	0	22
5	Kasaragod	300	0	300	5	1	1	0	0	0	0
6	Kollam	2752	0	2752	8	68	97	0	0	0	87
7	Kottayam	10235	390	10625	11	94	106	0	0	0	43
8	Kozhikode	0	0	0	0	0	0	0	0	0	0
9	Malappuram	3145	385	3530	9	66	0	0	0	0	66
10	Palakkad	11720	6811	18531	7	27	11	1	0	0	0
11	Pathanamthitta	965	0	965	15	0	0	0	0	4	0
12	Thiruvananthapuram	11973	3974	15947	32	74	25	0	0	0	65
13	Thrissur	558	0	558	12	21	590	0	0	0	10
14	Wayanad	7617	0	7617	11	0	0	0	0	0	0
	TOTAL	**56723**	**11579**	**68302**	**153**	**448**	**1390**	**5**	**0**	**15**	**326**

Source: suchitwa mission

6.45 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2010-03/2011

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	0	0	0	3	0	0	0	0	10	0
2	Ernakulam	0	0	0	0	0	0	1	0	37	0
3	Idukki	3215	0	3215	9	5	15	0	0	9	3
4	Kannur	0	0	0	3	0	0	0	0	13	0
5	Kasaragod	0	0	0	6	0	0	0	0	1	0
6	Kollam	0	0	0	0	0	0	0	0	2	0
7	Kottayam	3966	194	4160	5	0	0	0	0	5	0
8	Kozhikode	0	0	0	4	0	0	0	0	15	0
9	Malappuram	0	0	0	6	0	25	0	0	5	0
10	Palakkad	4468	0	4468	4	0	61	0	0	2	0
11	Pathanamthitta	0	0	0	0	0	0	0	0	0	0
12	Thiruvananthapuram	0	0	0	6	24	47	0	0	0	28
13	Thrissur	0	0	0	10	0	0	0	0	9	0
14	Wayanad	8398	0	8398	2	0	47	0	0	0	0
	Total	**20047**	**194**	**20241**	**58**	**29**	**195**	1	0	**108**	**31**

Source: suchitwa mission

6.46 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2011-03/2012

Sl.No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	0	0	0	0	0	0	0	0	0	0
2	Ernakulam	0	0	0	0	0	0	0	0	0	0
3	Idukki	0	0	0	10	20	0	0	0	0	7
4	Kannur	0	0	0	4	0	0	0	0	12	0
5	Kasaragod	2188	0	2188	4	0	0	0	0	0	0
6	Kollam	0	0	0	0	0	0	0	0	0	0
7	Kottayam	0	0	0	13	56	0	0	0	14	28
8	Kozhikode	0	0	0	2	0	0	0	0	0	0
9	Malappuram	0	0	0	8	0	10	0	0	0	0
10	Palakkad	0	0	0	19	0	0	0	0	0	0
11	Pathanamthitta	0	0	0	0	0	0	0	0	0	0
12	Thiruvananthapuram	0	0	0	0	0	50	0	0	0	0
13	Thrissur	0	0	0	8	0	0	0	0	1	0
14	Wayanad	0	0	0	0	0	0	0	0	2	0
	TOTAL	**2188**	**0**	**2188**	**68**	**76**	**60**	0	0	**29**	**35**

Source: suchitwa mission

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6.47 DISTRICT- WISE PHYSICAL PROGRESS DURING 4/2012-12/2012

Sl. No	District Name	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Alappuzha	0	0	0	0	0	0	0	0	0	0
2	Ernakulam	0	0	0	0	0	0	0	0	0	0
3	Idukki	1560	0	1560	12	17	0	0	0	0	0
4	Kannur	0	0	0	0	0	0	0	0	0	0
5	Kasaragod	0	0	0	4	0	0	0	0	0	0
6	Kollam	0	0	0	0	0	0	0	0	0	0
7	Kottayam	0	0	0	4	13	0	0	0	0	7
8	Kozhikode	0	0	0	1	0	0	0	0	0	0
9	Malappuram	0	0	0	1	0	0	0	0	0	0
10	Palakkad	0	0	0	0	0	0	0	0	3	0
11	Pathanamthitta	0	0	0	0	0	0	0	0	0	0
12	Thiruvananthapuram	0	0	0	0	0	174	0	0	0	5
13	Thrissur	0	0	0	2	0	0	0	0	20	0
14	Wayanad	0	0	0	0	0	0	0	0	0	0
	Total	**1560**	**0**	**1560**	**24**	**30**	**174**	0	0	**23**	**12**

Source: suchitwa mission

6.48 Total Sanitation Campaign (TSC)-Physical Achievement from April 2002 to March 2012
District-wise Physical Progress During 04/2002-03/2012

Sl. No	District	IHHL (BPL)	IHHL (APL)	IHHL TOTAL	Sanitary Complex	School Toilets	Anganwadi Toilets	RSM	PC	SLWM	Total School covered
1	Thiruvanathapuram	134348	12496	146844	57	383	587	10	0	78	378
2	Kollam	95130	7290	102420	400	422	351	6	6	2	362
3	Pathanamthitta	53799	1200	54999	25	172	121	0	0	4	86
4	Alappuzha	114359	4500	118859	107	166	246	10	10	21	166
5	Kottayam	28118	1840	29958	30	165	133	0	0	19	83
6	Idukki	86535	13823	100358	61	139	248	0	0	9	82
7	Ernakulam	55916	16219	72135	62	365	394	7	2	37	365
8	Thrissur	51017	7051	58068	46	316	839	5	2	10	158
9	Palakkad	107018	24424	131442	49	289	520	6	0	2	165
10	Malappuram	61905	7850	69755	30	466	180	14	1	7	466
11	Kozhikode	42285	2140	44425	18	253	250	2	0	15	205
12	Wayanad	50655	2481	53136	41	84	94	3	0	2	43
13	Kannur	37628	18269	55897	40	174	374	3	3	33	174
14	Kasaragode	59153	23300	82453	32	281	382	1	0	1	186
	Total	**977866**	**142883**	**1120749**	**998**	**3675**	**4719**	**67**	**24**	**240**	**2919**

Source: Commissionarate of Rural Development

GCPT. 37/585/2013/DTP.

A duly completed household sanitary latrine shall comprise of a Basic Low Cost Unit with a super structure. Under Individual Household Latrines (IHHL) 1120749 units were completed from April 2002 to March 2012.According to Sanitary Complex (SC), number of toilet seats, bathing cubicles, washing platforms, wash basin etc can be set up in a place in the panchayat acceptable to women/men/landless families. From April 2002to march 2012,998 sanitary complex were completed. All the Government schools ie Pre-primary, primary, High school and Higher secondary schools, toilets are provided. From 04/2002 to03/2012, 3675 toilets are provided. In order to change the behaviour of the children from early stage in life as well of the mothers attending the Anganwadies, it is essential that Anganwadi are used as a platform for it. For this purpose each Anganwadi is provided with baby friendly toilets. From 04/2002 to 03/2012, 4719 Child toilet friendly units were constructed.

6.49 Year wise achievements of Physical Components

Sl. No	Component	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
1	IHHL BPL	0	100867	108225	138982	130298	100087	246152	74297	56723	20047	2188	1560
2	IHHL APL	0	0	6800	27450	23688	21571	44033	7568	11579	194	0	0
3	TOTAL IHHL(BPL+ APL)	0	100867	115025	166432	153986	121658	290185	81865	68302	20241	2188	1560
4	Sanitary Complex	0	71	331	110	31	24	63	89	153	58	68	24
5	school Toilets	0	112	757	435	320	221	672	605	448	29	76	30
6	Anganwadi Toilets	0	0	15	476	291	163	1416	713	1390	195	60	174

Source: suchitwa mission

Printed by the Superintendent of Government Presses at the Government Central Press, Thiruvananthapuram, 2013.