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**REPORT OF THE  
CENTRE-STATE TEAM  
FOR INTEGRATED DEVELOPMENT  
OF COCHIN AND THE ADJOINING ISLANDS**

**GOVERNMENT OF INDIA  
PLANNING COMMISSION, MARCH, 1968**

## PREFACE

The Prime Minister of India Shri Rajiv Gandhi visited Cochin on January 17 1987 and had occasion to appreciate the multifarious problems faced by the people living in the Cochin urban region. The Centre State Team for Integrated development of Cochin and the adjoining islands was constituted to have a closer look at the situation.

The fast pace of urban growth has thrown up intricate problems socio-economic and environmental in several centres of urban growth in the country. The undeterred urbanward movement of economic forces continues to make these problems more and more intense with the passage of time. Even so the situation in Cochin region stands on a singular footing.

The vast expanse of backwaters within the vicinity of the region the existence of thirtytwo small and big islands close to the urban area a large number of chemical and processing industries defiling the environment and a substantial concentration of central and state organisations within a small territorial compass pointing to the need for Centre State coordination of a high order in the interest of even urban growth make the Cochin situation unique.

The Team has endeavoured to be objective in its assessment of the need for institutional and infrastructural development in different sectors of urban growth while adopting an approach of integration which its terms of reference specifically enjoined on it. Its projections generally extend upto the end of the Eighth Plan except where technical or planning compulsions suggested a projection beyond this period.

The Team had Shri Xavier Arakal as its Chairman who apart from being Chairman of the Inland Waterways Authority of India hails from the area and possesses valuable experience of an academic and of working in public field in Cochin. His presence imparted the much needed local perspective so necessary in an essay of the present type.

The Team is deeply indebted to Shri S. Narayanaswamy Chief Secretary Govt. of Kerala and Shri V. Ramachandran his predecessor in office for the unstinted cooperation and guidance they offered to the Team. It places on record its gratitude to all the departmental Secretaries and Heads of Dep'ts. of Govt. of Kerala the Central Ministries and the chief executives of the Govt. of India organisations private bodies and the public men of Kerala who volunteered in providing valuable views and information to the Team.

The Team considers it important to mention here the substantial contribution made by Shri Elias George Commissioner of Cochin Corporation Smt. Aruna Sundararajan Member Secretary Greater Cochin Development Authority and Shri Philipose Thomas Secretary Local Administration Govt. of Kerala in analysing the multitude of data and views received by the Team in a correct perspective and in rendering valuable assistance to the undersigned in formulating and preparing this Report.

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Adviser (State Plans) Planning Commission &  
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## CHAPTER ONE

### CONSTITUTION OF THE CENTRE STATE TEAM ON INTEGRATED DEVELOPMENT OF COCHIN AND THE ADJOINING ISLANDS

1.1 Cochin is emerging as a metropolitan area having immense potential for growth. Greater Cochin is among the urban areas in the country recording rapid expansion during the decade preceding 1981. With amenities failing to catch up with the increase in population and fast industrial expansion, several socio-economic and developmental problems have come to the fore, demanding the urgent attention of policy makers, planners and administrators for a solution.

1.2 The multifarious problems of Cochin have been further aggravated by the existence of as many as thirty two islands, small and big, which adjoin the main land and which constitute an integral part of the complex socioeconomic fabric that is Cochin. Truly speaking, these islands are as good as part of the main land, the farthest of them being only 2.3 km away from the main land. A large number of the islands are only islands in name, being separate from the main land by varying width of backwaters.

#### **Cochin & adjoining islands**

1.3 The problems of Cochin and its adjoining islands were brought to the notice of the Prime Minister during his visit to the State of Kerala in January 1987. In a meeting held on 17th January 1987 at Cochin, the State Govt. pleaded with the Prime Minister for an exclusive consideration of the problems of the city and the adjoining islands which occupied a strategic location on the west coast of the country in a setting of backwaters and serene sea with tremendous promise for development. In the discussion that ensued, a decision was taken to appoint a joint Centre State Team to work out projects for the integrated development of the Cochin area.

#### **PM's meeting of Jan. 1987**

1.4 Accordingly, in consultation with the State Govt. of Kerala, a Centre State Team for Integrated Development of Cochin and the adjoining Islands was set up by the Planning Commission in Planning Commission's Order No. PC (P) 9/25/87 KRL Vol. II dated 9th June 1987 (reproduced in Appendix I) with Shri Xavier Arakal, Chairman, Inland Waterways Authority of India as its Chairman and Shri Premananda Tripathy, Adviser (State Plan), Planning Commission, as its Member Convener. Representatives of Central Ministries of Surface Transport, Defence (Naval Base), Railways, Environment, Commerce (Cochin Export Processing Zone) were taken in as members. Later on, representatives of Ministries of Tourism and Urban Development of Govt. of India were also included. The State level representation included Secretaries of Kerala State Govt. in the Departments of Town Planning (Local Administration), Public Works, Transport and Environment and District Collector Ernakulam. The Chairman, Cochin Port Trust (CPT), Managing Director, Fertilizers and Chemicals Travancore Ltd (FACT), Chairman, Greater Cochin Development Authority (GCDA) represented the organisations working in this area as members on the Team. A list of the members of the Team is enclosed as Appendix II.

**1.5** The terms of reference of the Team were quite comprehensive and were as follows :

- Terms of reference of the Centre-State Team**
- (i) To identify programmes for integrated development of Cochin area keeping in view the industrial, commercial and strategic installations in the area in a setting of islands and backwaters.
  - (ii) To identify the need for reclamation of land deepening of waterways and construction of road links to the islands in the interest of integrated development of the area;
  - (iii) To advise on the implementation strategy keeping in view environmental and ecological parameters;
  - (iv) To advise on ways to integrate financial resources of both Central organisations operating in Cochin area and State, available for the development and suggest ways to meet shortfalls, if any;
  - (v) To advise the manner in which the activities of both Central and State agencies in this area can be coordinated within the framework of the suggested developmental activities and;
  - (vi) To make recommendations on any matter ancillary and related to the above purpose.

In brief, the terms of reference included, identification of programmes relevant for integrated development of the Cochin area in its unique setting of islands and backwaters and expected the Team to advise on the implementation strategy keeping in view environmental and ecological parameters. The financial input for development of the Cochin area has already been forthcoming not only from State/municipal sources but also from several organisations like Cochin Port Trust, FACT, Airport, Railways, Naval Establishments, CEPZ, to name the most important ones, which are GOI organisations. As such, the Team was asked to advise on ways to integrate financial resources flowing from all these different sources. Further, the Team was to suggest ways to meet shortfalls in financial resources, if any, and also advise on the manner in which the activities of both Central and State agencies in the area could be coordinated within the framework of the developmental strategy suggested by it.

**1.6** The first meeting of the Team was held on 29th June, 1987, at the State Guest House, Cochin. This meeting was also attended by the Chief Secretary, Govt. of Kerala, besides several State Govt. representatives. In this meeting the Team decided to set up a Core Committee with Chairman, G.C.D.A. Special Secretary, Local Administration, District Collector Ernakulam, Chairman & M.D. FACT and Executive Director, National Traffic Planning and Research Centre (NATPAC) as members to identify and suggest areas requiring special investigation.

**1.7** The Core Committee was expected to go into the problems existing in several developmental sectors relevant to Cochin and the adjoining islands, keeping in view the existing situation and various viewpoints in the matter. The Core committee had a series of meetings on 6th, 17th and 31st July, 1987 and also on 14th and 27th August, 1987. On the date last mentioned, a discussion was held with labour leaders, trade unions, MPs and MLAs. To the series of discussions and consultations were invited important interests having a stake in Cochin area like Chamber of Commerce, Spices Board, MPE&A, IRE, Cochin Shipyard, Cochin Refinery, West Coast Industrial Employees Association etc. Factual data as also views emerging in these meetings were finally discussed in a meeting of the Core Committee on 29th & 30th September, 1987.

**1.8** The work entrusted to the Team presupposed collection of relevant data from a large number of municipal/local bodies and corporate units besides the State Govt. and Govt. of India Organisations. The responsibility of collection of data was entrusted by the Planning Commission to the National Traffic Planning and Research Centre (NATPAC) Trivandrum, an autonomous organisation under the State Govt. of Kerala.

**1.9** The Members of the Team maintained continuous touch with the State Govt. of Kerala. The Chairman and Convenor had several formal and informal meetings with the Chief Secretary and other senior officers at Trivandrum and Cochin. Minutes of discussions held with the Chief Secretary and Senior State Govt. representatives in Yojana Bhava New Delhi on 7th December, 1987 is given in Appendix III.

**1.10** After its first meeting at Cochin on 29.6.1987, the second meeting of the Team was held at Trivandrum on 29th December, 1987. In the meantime a Drafting Committee under Shri Philipose Thomas, Secretary, Local Admn., Kerala, with Shri Elias George, Commissioner of Cochin Corporation and Smt. Aruna Sundararajan, Member Secretary, GCDA was constituted for collation, sifting and analysis of data and for preparing draft report. Simultaneous arrangements were made for checking of draft report by the Convenor of the Team. The draft Report of the Centre-State Team was finalised in its final meeting at Cochin on 21st March, 1988.

**1.11** The constitution of the Team is unique in as much as no formal Centre-State Team was set up earlier in the country for development of a region lying within a State. No doubt, there does exist ample local level cooperation amongst the Govt. of India and State agencies in the matter of development of urban areas, of importance both to the GOI and the State. Normally, however, the developmental problems of urban areas within the States are left to be looked after by the State administration and the local bodies under them. In its terms of reference which require it not only to identify programmes of relevance, but also require it to suggest ways to integrate financial resources of both Centre and State to achieve integrated development in the area and to advise on Centre State coordination in the matter, the Team is a pre-eminent instance of Centre State collaboration in a matter of common interest.

## CHAPTER TWO

### INTEGRATED DEVELOPMENT OF COCHIN AND ADJOINING ISLANDS—BROAD ASPECTS OF STRATEGY

2.1 More than one view was expressed on what should constitute the area comprised in Cochin and adjoining islands in the context of contemplated integrated development of the area. Location of the major port in Cochin, the volume of import, export and domestic trade handled in the area and the concentration of strategic and industrial establishments lent support, prima facie, to a view that the "hinterland area" and "influence area" of these vital institutions could be taken into account while planning for integrated development of the area. The Team deliberated upon this suggestion at depth. The "hinterland" particularly of major ports extends to vast areas as also the "influence area" of huge urban agglomerations and major industrial establishments. To extend the area concept to such expanses which would have included large tracts of Kerala and even the adjoining States was not considered appropriate in the light of the terms of reference of the Team. Accordingly, the Team, in consultation with the State Govt., decided that the area comprised in Cochin and adjoining Islands may be confined to GCDA area including a few islands which are presently outside such area but which are intimately connected in day-to-day life to the area.

2.2 Defining the scope and content of "development" of Cochin and adjoining islands also engaged the attention of the Team. The question was whether specific development requirements of institutions/organisations operating in the Cochin area should be highlighted in the report of the Team. While on the one hand some views were expressed that specific programme of development for organisations like the Cochin Port Trust and Fertilizers and Chemicals Travancore (FACT) would mean development of the Cochin area as a whole, the other view held was that only social and economic offshoots of the problems flowing from such existing units and affecting the area, besides the problems of the population in general, should only be looked into by the Team. As the Team was concerned with integrated development of Cochin and adjoining islands as a whole and not development of any specific project or institution, a wholistic view was called for and hence the latter view was finally adopted by the Team.

2.3 The period upto which development projections have to be made was another important item which engaged the attention of the Team. The virtues of a far-off projection into a distant future



versus realistic projection into a foreseeable future were deliberated upon to come to a consensus on the period upto which the Team's recommendations would be confined. An important factor which was taken into consideration while deciding on this matter was the reasonable period upto which financial projections by various GOI and State Govt. agencies could be realistically made. Of equal importance were the requirement of economic viability of proposals and projects and planning compulsions needing projections upto a certain length of time. In the light of these relevant aspects, the Team veered round to the view that the problems of the area as also the financial needs as can be foreseen upto the end of the Eighth Plan will be covered in the Report of the Team except where requirements of economic viability or planning compulsions need projection into a more distant future. In such cases, projections' requirements upto 2000 AD could be indicated.

2.4. (i) Addressing itself to the main task of identifying programmes for the integrated development of Cochin area, the basic approach that has been adopted in this Report has been

- Identifi-  
cation of  
programmes  
& pattern of  
development**
- (1) to make a detailed assessment of the critical requirements of various sectors based on which specific schemes and programmes have been suggested to meet these requirements; and
  - (2) to identify priority sectors for the growth and development of this region and to indicate broadly the pattern of development to be followed in each sector.

While identification of the requirements of the various sectors and the desired investment levels in these sectors has been one of the important areas of emphasis of the Team, the implicit assumption underlying the Team's recommendations has been that any strategy for growth would be a failure unless the necessary infrastructure is provided for it.

2.4. (ii) The priority sectors have been identified based on their relative importance and contribution to the regional economy as derived from an analysis of the economic profile and growth trends in the area. Further, an important aspect of the development strategy has been to select areas of future high growth potential or thrust areas and to ensure that sufficient fund flow is assured to these sectors.

2.4. (iii) While assessment of the infrastructural gaps and selection of priority sectors has been a relatively easier task based as they are on (a) frequently voiced and felt demands, (b) the gap between what is required and what is now existing, and (c) on a factual analysis regarding likely sectoral contributions, choosing the pattern of development to be followed has been more difficult. The pattern of development suggested for achieving the objectives has been guided by two primary considerations:

- (1) the resource availability for and within the region; and
- (2) the factor of compatibility with the total socio-economic and ecological environment.

To illustrate the point second mentioned above, the specific instance of augmentation of transport facilities in the region is cited. Whereas the natural land forms and settlement patterns in the region impose practical constraints on the expansion of the road network except with very huge investment, the area has a large expanse of backwaters and waterbodies whereby water transport could be ideally developed to serve as a complementary mode of transport with less damage to the environment. Hence water transport has been suggested as an alternative appropriate mode to be developed in the Cochin area. Similarly, in the industries sector, development of local resource based industries suiting the prevalent occupational pattern and living modes of the people, such as processing of

marine food products, extraction of edible oils like coconuts, rubber-based units etc. have been highlighted.

2.4.(iv) Within the framework of the terms of reference, the objective of balanced development in the region has been stressed, with special reference to the numerous adjoining small islands in the area. Provision of facilities to the islanders has, therefore, received special attention in this report.

2.5 The ordering of priorities which is of crucial question in determining the fund flows has been dictated by the following factors :

- Ordering of Priorities**
- (i) The provision of certain basic amenities, (without which it would be meaningless to talk of development of any kind) which are essential pre-requisites for the healthy development of any community, are necessarily accorded the first priority. These include schemes for water supply and sanitation, shelter and recreation.
  - (ii) The improvement of transport and communication facilities in the region has been considered as the key infrastructural requirement, and accordingly, highlighted in the Report. While it is obvious that development of communication facilities is a must for the growth of any region, it is particularly so for a 'Port-face' region which is dependent on the efficiency of its transport system for sustaining its economic activities.
  - (iii) Increasing Port activities, urbanisation and concentration of large public and private sector industries in the Region have led to an increased demand for power, calling for substantial investment in this priority sector.
  - (iv) Though it is well-recognised that Cochin is uniquely endowed with a wealth of marine resources, (which are a source of substantial foreign exchange to the country) and is, in addition, ideally located to take advantage of these resources, development in this sector has not been commensurate with the potential. In fact, justification for conservation of the coast-line environment and prevention of marine pollution in this region are buttressed by the strong economic rationale of conserving our marine wealth.
  - (v) One industry which has not been adequately encouraged in the region, in spite of its definite potential, has been tourism. A group of islands in the region could be earmarked for low density development, which could become centres of tourist attraction if water-transport, water sports and other recreation facilities are created.
  - (vi) As the limited availability of land in a high-density region constitutes one of the most important constraints within which all planning has to be done, it has been necessary to examine the land-utilisation patterns closely and evolve a rational future land use plan for the area.

2.6 It may be mentioned here that although most of the physical requirements have been taken into account and are dealt with in the chapters relating to the sectoral infrastructure, problems relating to improvement of institutional aspects had also to be studied under each chapter as far as possible. As regards the general aspects of institutional development in the region, this has been dealt with in a separate chapter on Management of integrated development by Greater Cochin Development Authority.

2.7 The broad strategy outlined above has been dealt with in sufficient detail in subsequent chapters

## CHAPTER THREE

### DEVELOPMENT OF COCHIN AREA— A RETROSPECT

#### 3.1 Physical setting and background :

Cochin is the largest city in Kerala and is also the headquarters of Emakulam district. Cochin Region lies between 9°49 and 10°14 north latitude and 76° 31 east longitude. It is located on the western coast. The force of interaction between the sea, river and land has imparted a peculiar topography to Cochin area with a predominance of water sheets and lagoons. About 30% of the surface area of Cochin consists of water sheets formed by canals and the lagoons of the Cochin Estuary of the Vembanad Lake. The river Periyar empties into the Cochin Channel and has given rise to a number of islands lying in the backwaters. This estuarine sector which is particularly rich in marine life lends to the whole of the Cochin region a distinctive character. The entire region consists of 32 islands and low and mid lands. The height above mean sea level in the western coastal areas is only 1 meter on an average.

The soil of the region can be classified into sandy, peaty and latent soils. While the sandy soil found in the western parts of the region is porous and deficient in organic matter, the peaty or Khan soil is extremely acidic with a high content of organic matter. Large reaches of the eastern portion of the region are endowed with latent soil which is fertile.

The annual variation of temperature is between 22°C and 32°C and the region is subject to a more or less uniform temperature throughout the year with high humidity. The region experiences two major seasons, namely the dry season and the wet season. The wet season is usually associated with the months in which the South west and North east monsoon occur. The maximum annual rainfall in the region is around 3000 mm.

The Cochin Corporation area is traversed by a network of canals linked to the backwaters. The main canals are navigable for small and medium crafts. The secondary canals serve as natural drainage channels for flood water. But many of them today are in an advanced state of deterioration. The wet lands in the region comprise 36.66% of the total area which is one of the highest in the whole country.

The Cochin region is one of the most densely populated areas in the whole country and has a density of about 2025 persons per sq Km, as compared to 655 persons for Kerala State and 216 persons per Sq Km for the country as a whole as per the 1981 census. The region is the most urbanised in the state and has a total population of 14.81 lakhs within an area of 731 sq kms. It is estimated that in 1995 the population of GCCDA area would have risen to 18.06 lakhs (projected). The region encompasses not only most of the urban centres in the district but also their urbanising vicinity zones. The literacy rate within the region is extremely high (75.71%). An analysis of the sectoral composition of workers reveals that 37.32% are employed in primary sector, 20.65% in secondary sector and 42.03% in the tertiary sector.

The Cochin Port was formed as a result of a catastrophic deluge which took place in the year 1341 and this gave rise to the adjoining islands besides separating a distinct water body from the sea which is now known as the Cochin backwaters. Cochin has a natural harbour and hence the early settlements were near the water front. From the sixteenth century, Cochin faced rapid changes through the trading and colonising attempts of European powers—the Portuguese and the Dutch—and in 1795, the British. These three powers have left lasting imprints on the city in the form of commercial, residential and religious artefacts in their respective distinctive architectural styles. The Cochin Port was completed in 1940 under the direction of the eminent harbour engineer Sir Robert Bristow and consequently the Willingdon Island was formed by utilising the dredged material from the backwaters. The City developed commercially and the availability of power in this decade from nearby hydro-electric sources aided industrial growth in the city area. The agricultural produce of Kerala like spices, coir and sea foods etc. are exported through the Cochin Harbour. Cochin Harbour has the natural advantage of having proximity to the International Shipping Route.

The importance of Cochin is largely locational. The geo-strategic importance of the Cochin Port, situated as it is on the International Shipping Route, has been the main contributory factor in the growth of the city as a centre of trade and commerce. The strong industrial base it has acquired with a number of heavy Petrochemical and Engineering Industries located here and the establishment of the key Defence establishment i.e. the Naval Base (Cochin is the headquarters of the Southern Naval Command), have led to concentration of economic activities in the region.

The region's resource base, which is mainly agricultural and marine based, extends over a vast area and includes stretches of the coast and backwaters of the area. The region's economy is dominated by the port and the establishment of the proposed International Container Transhipment Terminal will provide a further impetus for the growth of the region. The obvious locational advantages of this Port as a major port of call for ships with transit cargo and the increasing volume of export-import activity are factors pointing to its continued growth. Besides the large public sector units like FACT, Oil Refinery, HMT, and Cochin Shipyard etc., the recent setting up of the Export Processing Zone in the region is a development which is expected to have considerable long-term impact on its economic growth.

The transportation system of the region includes Air, Road, Rail and Waterways. Cochin is linked by air to the major airports in the country. Air services are also operating between Cochin and the islands of Lakshadweep (which have their Administrative headquarters here). The prospect of finding oil off the coast of Cochin where ONGC has started exploratory drilling is likely to have major implications for this region's economic development and growth. The whole question of economic development and growth has to be considered in the background of this environmental setting of the region.

### 3.2. Development Planning process so far

The earliest effort in Cochin to guide urban affairs was in 1866 when the Fort Cochin area became a municipality. This was followed by constitution of a municipality comprising the Mattancherry urban area in 1912 followed by constitution of the Emakulam municipality in 1913.

The first step in tackling the problems of urban growth as a whole in these three adjoining municipalities was taken in 1966 when a joint Planning Committee was constituted to coordinate the planning efforts of these municipalities. In order to streamline and integrate municipal administration and planning, the Cochin Corporation was formed in 1967 incorporating the three municipalities, the Willingdon Island and a few suburban areas.

Planning problems of Cochin and its environs received special attention after the Kerala State was reorganised (1956) and the Department of Town Planning was constituted in 1959. The Kerala government entrusted the preparation of a development plan for Cochin Region in 1961 to the

**Department of Town Planning.** The Department of Town Planning prepared an Interim Development Plan in 1968.

The Cochin Town Planning Trust was constituted in 1968 to implement the Interim Development Plan. In 1976 a Development Plan for Cochin region was formulated as a comprehensive policy document to guide balanced growth of the region on a long term basis. The Greater Cochin Development Authority was constituted in 1976 with jurisdiction over the entire region to implement the Development Plan for the region.

The Development Plan and Structure Plans for the region prepared by the Town Planning Department as far back as 1968 had remained as mere policy enunciations of the planners and development was largely uncontrolled and haphazard except for certain small local area schemes which were action plans as well and which were directly implemented by the Development Authority itself. After coming of the Greater Cochin Dev. Authority (GCDA) an impetus has been given to Urban development programmes in the region though an integrated approach in a comprehensive sense is yet to be perfected.

### **3.3. Absence of Co-ordination in Urban Development :**

The absence of coordination between the various public agencies involved in development has led to residential colonies springing up without proper access roads, adequate water supply, drainage or sanitation facilities etc. and industrial and commercial establishments being located in crowded areas leading to congestion and traffic hazards. The suggestions of the Committee with reference to the basic defects in the planning process are detailed in the later chapters and it will be sufficient to say here that all funds flowing to a particular urban area must be shown separately in the state budget so that effective co-ordination can be ensured and each agency is assured of the fund flows. A proper mechanism has to be instituted so that the Development Authority can play its primary role of coordination and have a decisive influence on the growth of the region.

The Team has gone into these problems at length and has dealt with them in the chapters relating to management of integrated development by GCDA and important aspects needing attention at the governmental level.

## CHAPTER FOUR

### WATER SUPPLY

#### 4.1 Introduction :

A package of schemes designed to augment the existing water supply systems for domestic as well as industrial consumption forms a central part of the proposals for the Integrated Development of the Cochin region. Such schemes have to consider fresh water as a costly and scarce resource and recognise the processing of drinking water as a service industry affecting the health and well being of the people in the Cochin region.

The proposals envisaged in this report have been framed with the intent of upgrading drinking water supply systems to meet the prescribed minimal per capita consumption requirements in Cochin City and adjoining municipalities and Panchayats by the end of the Eighth Five Year Plan. The drinking water requirements of the population in the islands adjoining Cochin have also been specifically covered by the schemes proposed here. However, it is presumed that the scheme outlined here for meeting the needs of industrial water supply can be completed only by the year 2000 A.D.

A systematised water supply scheme was initiated for the Cochin region in the year 1914 with a 2.3 million litre/day plant to serve a target population of about 20,000. However, a Master Plan was evolved only in 1969 by the erstwhile Public Health Engineering Department to meet the drinking water requirements of the population falling within the territorial area of the Greater Cochin Development Authority. This Master Plan was designed to service a total population of 33.41 lakhs and postulated a total daily requirement of 696 million litres/day. It was presumed that this system would be sufficient to cater to the Cochin region well beyond the turn of the century upto 2011 A.D. In view of fund shortages, this Master Plan was not implemented on the basis of the planned implementation schedule. But all the separate sub-schemes which are ongoing now and which are proposed for consideration by the Centre State Team in this Report derive from this original Master Plan.

#### 4.2 Water Supply Zones:

The Kerala Water Authority (KWA) which was formed by reorganising the Public Health Engineering Department is the principal agency which administers and executes water supply schemes in Kerala. The KWA, while framing the Master Plan for water supply, has divided the Greater Cochin region into seven zones for the purpose of design and implementation. This Master Plan covers Cochin Corporation, five municipalities and thirty-three Panchayats which constitute the area falling within the GCDA, and also another 21 adjoining Panchayats. Additionally, the Industrial Water Supply Scheme outlined here covers the requirements of the Eloor and the Aribalamughal Industrial Zones which straddle the Cochin region.

Even though the area falling within the territorial jurisdiction of the GCDA is only 731 sq kms the Master Plan scheme Area encompasses a larger region of approximately 1102 Sq Kms. The development potential of these areas on the periphery of the Greater Cochin region as well as geotechnical consideration of the water line route etc. favoured such inclusion as part of this scheme.

#### 4.3 Principal geographical and geological features of the scheme area and water sources

Stretching along the western margin of the Cochin region is a narrow palm fringed coastal plain with its lagoons and backwaters. The land rises gradually from sea level towards the east and the inland margin abuts sloping uplands with altitudes of 40 m and above. Two major rivers flow through the region—the Periyar river and the Muvattupuzha river. Sand clay beds cover the coastal areas and the islands while the upland regions are covered by a blanket of laterite. The region enjoys a tropical monsoon climate with an average rainfall of 2500 mm to 3500 mm.

Efforts have been made to tap the ground water resources of the region and exploratory tube well studies were conducted by the Geological Survey of India in 1966. Good quality ground water was available in the upland region where formations of chamoscrites and gneisses laterite were found but the yield was found to be poor. Most of the wells drilled in the coastal belt were covered with thick sediments ranging from 30m to 120m in depth. The yield from these wells were appreciable in quantity but the chloride content was above permissible limits varying from 1000 ppm to 12000 ppm. It had high iron and sulphur content also.

In the coastal area of the State the available fresh ground water is in a condition of hydrostatic equilibrium with the saline water of the sea. The indiscriminate withdrawal of fresh water can upset the hydrostatic equilibrium and can cause salt water intrusion into the aquifer. Once this happens it takes many years to restore the earlier condition. Uncontrolled and indiscriminate lowering of ground water level by extraction is likely to result in a condition of mixed water unsuitable for drinking. Hence the tapping of ground water sources for any comprehensive scheme has been conclusively ruled out.

Thus only major surface sources are the two rivers—the Periyar flowing through the northern half of the Cochin area and the Muvattupuzha river traversing the south east border area. The maximum flood discharge in Periyar is 1700m<sup>3</sup>/Sec. Though the summer flow normally gets reduced considerably a firm discharge from the various upstream hydro electric projects can maintain a summer flow of 133m<sup>3</sup>/Sec. which would be sufficient to meet the major share of the water requirement of the region. These flows are however contingent on a normal monsoon. The Periyar river is dependent on the discharge from the upstream Edamalayur dam (which has to be regulated to ensure a desired minimal level of water flow throughout the year after accounting for irrigation needs). Since the headworks are situated not very far from the mouth of the river the phenomenon of salt water intrusion has also to be considered. It is seen that the problem of salinity arises during periods of drought when the summer flow in the river is reduced and this can be controlled by the construction of protection bunds.

#### 4.4 Present Water Supply System

The Alwaye Water Works is a major water supply installation on the Periyar river. There are 5 intake points in the Periyar from which water is supplied to six out of the seven zones in the region and one intake point in the Muvattupuzha river serving the remaining zone in the South East.

Each intake point has a number of intake wells which deliver raw water through the raw water pumping system to the treatment plants. After treatment the water is pumped to the zonal reservoirs. In the hilly areas the water is pumped to the overhead tanks which serve as storage tanks and then distributed, whereas in the lowlands water is directly pumped into the distribution system. The overhead tanks serve as balancing tanks in these areas.

#### 4.5 Water Quality:

While the quality of water in the Periyar and Muvattupuzha rivers is generally satisfactory after the adoption of normal methods of drinking water treatment, certain major long term problems in ensuring water quality have been identified. They are the following:

- (a) Some of the major Chemical and metallurgical industries of the State located in the Eloor and Ambalamugal belts discharge their wastes into the rivers. The Periyar is subjected to toxic inorganic pollutants from a cluster of factories along a reach 1 km downstream from the Alwaye Headworks. The discharge of waste containing mercury from the Travancore Cochin Chemicals Ltd. (TCCL) and acid and insecticides wastes from the Hindustan Insecticides Ltd. (HIL) has to be viewed with concern. No systematic study has as yet been attempted to assess the impact of these discharges.
- (b) The drainage outfalls from the riverbank municipalities of Alwaye and Perumbavoor are also discharged directly into the Periyar upstream of the headworks at points fairly close to it.
- (c) The problem of salinity in the Periyar in the summer due to salt water ingress from the mouth has increased beyond permissible levels in the recent drought years.
- (d) The distribution lines in Cochin City are very old, and some of them have been untouched after they were laid in the years preceding the Second World War. Especially in the dense western parts of Cochin, the pipes are heavily corroded resulting in leakages and external contamination of the pipeline.

At some points the pipelines intersect with the city drainage system and the consequential accelerated corrosion and ensuing contamination has been one of the primary causes of the relative yearly outbreaks of gastro-enteritis and other water borne diseases in Cochin.

#### 4.6 Target Population and water demand.

Even though the Water Supply Master Plan has been formulated by KWA to cater to an ultimate target population of 33.41 lakhs by 2011 A.D., the schemes for drinking water supply proposed in this report are limited to a client population of about 18 lakhs in the Cochin region by the close of the Eighth Plan Period.

To meet these needs the Central Public Health and Engineering Organisation's Manual on Water Supply & Treatment stipulates the following standards of Per Capita Supply:

Community Population	Per Capita Availability of drinking water (Litres Per Capita per day) (lpcd)
Less than 10,000	70 to 100 lpcd
Between 10,000 and 50,000	100 to 120 lpcd
Above 50,000	120 to 200 lpcd



For the detailed schemes formulated to meet the foregoing requirements the order of investment required would be very large. It may be mentioned here that the prescribed levels of per capita supply are yet to be attained in most Indian cities. In view of this the schemes proposed in this report are designed to cater only to intermediate per capita requirements as shown in Annexure I. With implementation of these schemes the level of satisfaction by the end of Eighth Plan would vary from 40 lpcd in the rural areas to 125-150 in the urban areas.

It is to be noted that the industrial as well as the domestic requirements of the entire area including those of the Cochin Port and the Southern Naval Command based in Cochin have been covered in the water supply schemes suggested in this report up to the end of Eighth Plan except in case of industrial water which goes beyond the Eighth Plan.

#### **4.7 An overview of the existing situation regarding protected Water Supply**

The delineation of the development area, its topographic and climatic features, industrial and commercial importance and scope for development as a highly industrialised region have been discussed in detail in other chapters of this report for integrated area development. It must be mentioned that provision of basic amenities such as water supply and sewerage has unfortunately not kept pace with the rapid development that is taking place in this area. In the coastal parts and the islands where most of the available sources of water are polluted with brackish water, the most often voiced demand of the people is for protected water supply. A review of the existing status reveals the lamentable inadequacy of water supply.

The protected water supply schemes now functioning in the area partially covers the Cochin City Corporation, the suburban municipalities of Perumbavoor, Alwaye, Parur, Tripunithura and some of the rural areas. Industries like Cochin Refineries, FACT, Cochin Shipyard etc. get a part of their requirements from this scheme. The target population covered now is only about 30% of total and the area covered is only 15%. This coverage is far below the accepted norms and supply is as low as a mere 5 lpcd in some of the rural Panchayats and 35 lpcd in some urban areas including certain parts of Cochin Corporation.

#### **4.8 Master Plan of KWA for protected Water Supply**

As stated previously, the KWA's Master Plan was designed to cater to an ultimate population of 33.41 lakhs and a water demand of 696.15 mld which would be sufficient upto the year 2011. But in view of the magnitude of the funds required for its implementation, it was proposed by the KWA to take up the schemes in two stages.

In the First Stage, per capita water availability was to be stepped up from the various existing levels to a minimum of 40 lpcd in the rural areas and 125-140 lpcd in the urban centres. In the Second Stage of the Master Plan, these levels were to be augmented to meet the ultimate projected demand of 150 lpcd and 200 lpcd in the rural and urban areas, respectively. Although it was planned that stages I and II would be completed by 1991 and 2000 AD, respectively, so far it has been possible for the Kerala Water Authority to partially take up schemes under Stage I only. Even for the completion of schemes under Stage I, the KWA was constrained by the paucity of resources and had to resort to implementing area-specific sub-schemes, availing of loans and grants from agencies like the World Bank and the LIC.

At present there are 9 such ongoing schemes which were scheduled to be completed by 1991.

However owing to the revision in cost estimates of these schemes it would not be possible to adhere to the completion schedule unless additional funds are provided. These schemes are under various stages of completion.

#### **4.9 Suggestion of the Centre State Team**

While suggesting that first priority should be given to proposals for funding the on going schemes of KWA, the schemes to be taken up for implementation in Cochin area are shown below under the following headings (1) on going schemes (2) new schemes proposed (3) Water Supply to Njarakkal and adjoining Panchayats (4) Industrial Water Supply and (5) Salinity control in Penyar river.

##### **On Going Schemes**

###### **(1) Water Supply Scheme to Angamaly Municipal Area (LIC aided)**

The Angamaly municipality situated 20 kms away from the core of the Cochin city has at present only a skeletal water supply system. The present population is 29,300. The availability is only 25 lpcd in this rapidly urbanising area. The scheme when completed envisages a supply of 125 lpcd for a population of 50,000. The total estimated cost is Rs. 215 lakhs.

###### **(2) Water Supply Scheme for Tnpunithura Municipality**

The two specific problems that this area faces with regard to water supply are the reduction in the quantity of water now being made available from the share of the Refineries and the pollution of the water source on account of its proximity to the industrial belt. The scheme when implemented envisages a supply of 125 lpcd as against the present 30 lpcd. The total estimated cost is Rs. 256 lakhs.

###### **(3) Water Supply Augmentation—Cheranalloor Panchayat**

The Cheranalloor Panchayat which is contiguous to the Cochin Corporation area has been experiencing acute scarcity of drinking water due to inadequate ground water sources and insufficient distribution lines. The proposed project would increase the availability from 30 lpcd to 140 lpcd for the population of 26,000. The estimated cost is Rs. 35.57 lakhs.

###### **(4) Rural Water Supply Scheme for Chengamanadu and Nedumbassery (ARWS Scheme):**

The people in these two Panchayats mainly depend on wells for water. But most of the wells completely dry up during summer. The proposal is to augment supply to 40 lpcd for the population of 46,580 from the present supply of 5 lpcd through the street fountains. The estimated cost of the scheme is Rs. 66 lakhs. It has already been taken up under 100% Central assistance—ARWS Scheme.

###### **(5) Rural Water Supply Scheme to Sreemoolanagaram and Kanjoor Panchayats (LIC aided)**

The areas covered under the scheme are the Sreemoolanagaram and Kanjoor Panchayats with a population of 40,000. The scheme envisages augmentation of the existing supply of 15 lpcd to 40 lpcd for the projected population of 56,000.

###### **(6) World Bank aided scheme for South West and Central Greater Cochin Development Region**

The scheme covers the coastal and Island belts of Kumbalangi and Chellanam in the South West the important industrial area of Kalamassery and certain subzones where the supply is grossly inadequate and where only 10-11% of the present population is served through existing street hydrants. This scheme when completed would benefit an area of 250 sq kms and cover eleven Panchayats with a population of around 5 lakhs. The major items included in this proposal are

construction of reservoirs and pump houses, intake works, water treatment plant and clear water transmission mains. The total estimated cost of the scheme is Rs 3100 lakhs. The project has been started in 1985 with the assistance of World Bank. 50% cost is to be met by State Government.

**(7) Puthencruz Water Supply Project (World Bank Aided):**

The project covers an area which includes the Panchayats of Aikkaranadu, Poothrikka, Vadavucode, Puthencruz and Thiruvaniyoor with a population of 79,500. The population benefitted from the present street hydrant supply is only 10,000. The scheme when completed will ensure supply of 40 lpcd for a population of 1,12,000. The total cost of the project is Rs 382 lakhs. The scheme has been approved for bilateral assistance (ie 50% World Bank loan and 50% from State Funds).

**(8) Water Supply Scheme for Thiruvankulam Panchayat:**

The Panchayat has a population of about 15,500. Potable water is available only for a population of about 1700 with the rest of the population depending on wells which have very poor yield. The scheme proposed will ensure a supply of 40 lpcd (ARWS norms) for a population of 21700 by 2001 A.D. The estimated cost of the scheme is Rs 18.12 lakhs.

**(9) Rural Water Supply to Mulanthuruthy**

The population benefitting from the present six local water supply schemes and tube well tapings is only 7407 against total population of 34193. The scheme is designed to provide water supply of 40 lpcd for a population of 48900 by 2000 A.D.

**Newly Proposed Schemes:**

**(1) Augmentation of Water Supply to Cochin Corporation:**

Industrial growth in the outskirts of the city, commercial development and the resultant increase in employment opportunities have attracted a large number of people to the City Corporation area in general and the developing zones like Vaduthala, Palluruthy and Vyttila in particular. One of the major problems in the city is the lack of sufficient potable water in these areas. In fact the availability of water is a mere 35 lpcd in some of these parts. Since the supply of water from the Always Headworks is assured, the objective is to provide additional facilities for boosting, pumping and balancing overhead tanks to ensure a supply of at least 150 lpcd to a population of about 1.59 lakhs. The estimated cost of the scheme is about Rs 1650 lakhs.

**(2) Augmentation of Cochin City Pipeline Distribution System:**

In the Ernakulam municipal area, water supply scheme was first introduced in 1914 and in Mattancherry and Fort Cochin municipal area it was introduced in 1947. The entire distribution system is maintained by the Cochin Corporation. The pipelines now existing in this area were found to be partly damaged due to ageing and as a result of this, heavy loss of water, contamination owing to leakage and pressure shortage were discovered. In the circumstances the Corporation of Cochin and the Kerala Water Authority commissioned a study by the National Environmental Engineering Research Institute, Nagpur. NEERI conducted field studies on the distribution system in 1984 and their observation is summarised below:

The water waste assessment test was conducted and the rate of leakage in the mains and in the service connections (including public hydrants) was found to be fairly high.

This could be brought down substantially only if proper control measures were taken.

Rectification of leakage of the very old pipes is practically impossible. Hence these pipes are to be replaced urgently with new ones with higher diameter size considering the likely increase in population.

The study also found the presence of loose deposits and waste matter in the distribution mains.

**As this is highly hazardous to health, revamping of the existing distribution system seems imperative.**

Detailed investigation has identified that 190 Kms of pipes have to be replaced out of the existing 635 Kms of pipes. Further, 215 Kms of new lines are to be laid. The laying and replacement of the 150 Kms of 150 mm A.C. pipe, 170 Kms of 110 mm and 85 Kms of 63 mm PVC pipes is estimated to cost Rs. 303 lakhs.

### **(3) Water Supply Scheme to Njarakkal and adjoining Panchayats:**

Most of the 32 islands of the region are to be covered by this scheme. The following panchayats would be covered under this scheme:

1. Edavanakadu
2. Elamkunnappuzha
3. Kuzhupally
4. Nayarambalam
5. Njarakkal
6. Pallipuram
7. Mulavukadu
8. Chennamangalam
9. Chittatukara
10. Ezhikkara
11. Kottuvally

These Panchayats fall in the coastal region and are separated by stretches of backwater. The ground water in these areas is highly saline and people have to depend on the street hydrants under the existing water supply scheme. Even though adequate number of street hydrants (one street tap/250 person) are provided to cater to the needs of the present population, the supply is inadequate.

The proposal now under consideration is for increasing the supply in the existing network to 70 litres/head/day from the present level of less than 20 lpcd and the design period is taken as 2011 A.D. The population benefited will be 3,89,551, the source of water being the Periyar. There will be booster stations at Vypeen, Ezhikkara and Chennamangalam, and over head tanks at Pallipuram, Nayarambalam, Njarakkal and Elamkunnappuzha. The total estimated cost is Rs. 5.4 Crores.

It is proposed that the scheme would be completed by the end of the Eighth Plan Period. This is one of the most important augmentation schemes for the project area since the target population live on the coast and the islands and have to travel some distance for getting their supply of drinking water.

### **(4) Industrial Water Supply:**

The Greater Cochin Area has four distinctly delineated industrial complexes. They are the following:

- Ambalamughal Complex
- Eloor-Edayar Complex

- Angamaly Zone
- Thirkkakara—Kalamassery Zone

Out of these four the first two are the more important ones encompassing the majority of the large industries in Kerala such as Petroleum Chemical Fertilizer and Aluminium Units. The fresh water requirements of these units for industrial and domestic purposes are very large.

The Master Plan of the Kerala Water Authority which was approved by the Government in 1969 and which forms the basis of the expansion proposals for domestic water supply did take into account a portion of the demand for industry to the tune of 128.60 mld. But this figure was felt to be grossly underestimated and in 1980 a high level task force was set up by the Government of Kerala with the objective of reviewing the Industrial Water Supply situation (Ref. G.O. Rt. No. 394/80/Plg).

The proposals submitted by this task force were to be implemented in two stages: one for meeting the critical industrial demands of the Ambalamughal Zone and the second stage to take care of the long term demand. Consequently a scheme for supplying 32 mld water to the Ambalamughal Zone was taken up with the source at Ramamangalam in the Muvattupuzha river at a cost of Rs. 307 lakhs. The scheme was completed in 1985.

The Task Force addressed itself to identifying the ultimate demand for all the industrial units till 2000 AD and arrived at a total figure of 945 mld. These estimates were arrived at on the basis of the projected requirements of the separate industries in the belt. However, since these projections have limited validity in that industrial growth has fallen short of the earlier projections, the industrial water demand upto 2000 AD has been re-estimated in consultation with Kerala Water Authority on the basis of critical requirements of the major industries such as the expansion of FACT Cochin Oil Refinery and Central Export Processing Zone. The need for this purpose beyond the Eighth Plan period is estimated to be around 250 mld of water for which a rough cost estimate has been prepared. The amount required is likely to be Rs. 3800 lakhs approximately (detailed estimates are however to be worked out by the Kerala Water Authority). The implementation of the Industrial Water Supply Scheme presupposes fulfilment of the following three conditions as suggested by the task force:

- (a) The tail race waters of the recently commissioned Edamalayar Hydro Electric Scheme is to be made available to the Periyar.
- (b) Further drawal of water for irrigation or for any other new proposal from Periyar is to be stopped.
- (c) Two permanent regulators are to be constructed: one at Puthalam near Udyogamandal and the other at Manjummel.

The teams feels that fund required for industrial water supply augmentation beyond Eighth Plan will have to come substantially from the beneficiary industries.

##### **(5) Salinity Control in the Periyar River**

The requirements of water for Industrial and Domestic Supply presuppose certain measures as recommended by the task force mentioned earlier. These are necessary to prevent salinity intrusion into the river mouth. Presently a minimum flow of at least 500 cusecs of water is required to push back salinity at Manjummel. By constructing two bridge-cum-regulators not only will salinity be controlled but this quantity of water can be made available for industrial purposes. The FACT has also been pressing for the construction of these regulators as they are affected by the problem of salinity intrusion. Another advantage of this scheme would be that the water impounded would meet the irrigation requirements of 3000 hectares of paddy and 5000 hectares of other crops.

A very rough preliminary cost estimate for these two regulators comes to around Rs 5 50 Crores. As industries draw their water from this river for their manufacturing processes industrial development in this area will be seriously hampered unless the proposal is given priority.

#### **4.10 Implementing Agencies and Financial Implications:**

The Kerala Water Authority (KWA) is the principal agency to design and exercise the main items of work relating to construction and maintenance of headworks, treatment plants and pumping stations and overhead and ground level tanks for the schemes proposed. The Water Authority also carries out distribution work in some of the local urban bodies, whereas some urban bodies like Cochin Corporation and Alwaye Municipality maintain the distribution system themselves. In the Cochin Corporation area, the Cochin City Corporation designs, executes and maintains the distribution network.

The execution of the Water Supply schemes which have been recommended in this report is primarily the responsibility of the KWA. The Corporation of Cochin would be responsible for implementation of the scheme for replacing the distribution lines in Cochin city while the scheme for salinity control would be executed by the State Irrigation Department.

The financial implication of the schemes suggested by the team is Rs 87 65 Crore as given in annexure II.

#### **4.11 Recommendations**

- (i) In view of the necessity of completing the on-going schemes which have been taken up and which are still unfinished, the Team recommends that a sum of Rs 18 86 crores should be made available during the Seventh Plan period for completion of these schemes.
- (ii) It is further recommended that a sum of Rs 30 79 crores be made available during the Eighth Plan period for implementation of the schemes relating to augmentation of water supply to Cochin Corporation and the replacement of aged distribution lines, the scheme for providing water supply to Njarakkal and adjoining panchayats which caters to the majority of the Islanders, and the scheme for salinity control in the Penyar river.
- (iii) While the requirements for normal industrial use upto the end of Eighth Plan have by and large been covered in designing the drinking water supply schemes, the requirements of industry necessitate the implementation of a separate industrial water supply scheme for future. This scheme is estimated to cost about Rs 38 crores and it is recommended that it can be taken up beyond the Eighth Plan period in view of resource constraints. A large part of the finances necessary for implementing the scheme will have to be provided on a cost sharing basis by the beneficiary industries.
- (iv) Water supply schemes have not proved to be cost effective because the tariff structure has not been rationalised. For instance, the Cochin Corporation levies water charges on the basis of the type of building and its annual rental value, with a free allowance upto a certain level of consumption. Ambiguous norms and free allowance result in a good percentage of consumers paying no price at all for the water supplied. The Corporation had formulated a proposal for fixing the tariff charges on the basis of a slab-system, and if these revised proposals are approved by the State Government, the returns from investment in water supply will improve. The billing rates for supply of water by the Kerala Water Authority to Cochin Corporation have to be clearly formulated on the basis of the revised tariff policy.

- (v) **Effective Waste treatment measures** have to be ensured for the river bank industries and the State Pollution Control Board has to be armed with the necessary powers in this regard. The river bank municipalities of Alwaye and Perumbavoor should take steps to treat the drainage effluent before discharge into the river.
- (v) Since the flow in the Periyar river is dependent on the discharge from the upstream dams, a definite plan for the discharge of water has to be formulated to harmonize the often conflicting requirements of Periyar water for drinking purposes, for irrigation use, for electricity generation at Edamalayar dam and for prevention of salt water intrusion. This could be finalised by a committee with adequate representation from the concerned departments, the major users, GCDA and the local bodies in the area.

**ANNEXURE I**  
**PRESENT AND PROPOSED COVERAGE UNDER WATER SUPPLY SCHEMES**

(1)	(2)	(3)	(4)	(5)	(6)
Name of Scheme	Area	Present population	Projected population 2011-12	Present per Capita Supply of drinking water	Proposed per Capita Supply of drinking water
<b>ONGOING SCHEMES</b>					
1	Regularly water supply scheme				
	Agumaly Municipality	29320	50 000	25 lpcd	125 lpcd
2	Water supply scheme for Tirupattur	43646		30 lpcd	125 lpcd
3	—do— Chennailoor	22150	23734	30 lpcd	140 lpcd
4	A.E.W.S. for Nedumbassery/Chengamattai, Panthevali, Panobabais	46950		5 lpcd	40 lpcd
5	R.N.S. for Karpur and Sennodevilagam	39815	56000	15 lpcd	40 lpcd
6	World Bank aided scheme for South-West and Central C.C. DN	435000	500700	20 lpcd in rural area 40 lpcd in urban and industrial area	80 lpcd in rural area 150 lpcd in urban and industrial area
7	Puthencuz Water supply scheme	79900	111600	15 lpcd	80 lpcd for house connections 40 lpcd for street pipes
8	Water supply scheme for Thuvankulam	15000	21724	5 lpcd	40 lpcd
9	—do— for Madanthuuthi	34193	46900	5 lpcd	40 lpcd



ANNEXURE I Contd.

**NEW SCHEMES**

10	Augmentation of water supply to Cochin Corporation	Cochin City	122300	158028	35 lpcd	150 lpcd
11	Augmentation of water supply distribution in Cochin City	Cochin City	800000			Distribution to be improved
12	Water supply scheme to Njaraikal and adjoining Parishes.	Njaraikal Edavembada Katturupuzha Kulumbalam Noyemmbalam Pallippuram Mulanvada etc. Cheruvu Cheruvu Ettukozha Kottuvally Vodakkethala	310000	389551	20 lpcd	70 lpcd

**ANNEXURE II  
DETAILS OF FUND REQUIREMENTS IN WATER SUPPLY SECTOR**

Name of Scheme	Estimated cost	Year of commencement	Loan amount received till 1987/88	Expenditure upto 1987/88	Budget allots for 1989 (State Plan)	Balance required	(Rs. in lakhs)	
							Proposed year of completion	
1	2	3	4	5	6	7	8	9
<b>ONGOING SCHEMES</b>								
1. Agamaly Water Supply Scheme	215.00	1980	79.00	166.32	30.00	18.68		1989
2. Water Supply scheme for Tipunbure Municipality	256.00	1981	97.54	153.93	50.00	52.07		1989
3. Water supply scheme for Cherasakur Area	35.57	Not commenced	Not received	—	—	35.57		1995
4. A.R.W.S for Neelumassery Chengamandu	66.00	1986	—	14.50	—	51.50		1989
5. R.W.S for Seemoolangham and Kappur	96.85	1984	40.10	54.77	—	42.68		1990
6. World Bank aided scheme for South West and Central Area of CCDA	3100.00	1985	1019.00	130.96	* 605.00	1476.00		1991
7. Water supply scheme for Puthencuzh Vaduvodu	382.00	1985	—	141.00	75.00	166.00		1991
8. Water supply scheme for Thuvankulam	18.20	—	—	—	—	18.12		1991
9. ——— for Muthanthudy	61.07	—	—	—	—	61.07		1991
Total 19211 Cr. (A)								

\* 5 Lakhs for Export Processing Zone included

**Annexure II (Contd.)**

	3	4	5	6	7	8
<b>NEW SCHEMES:</b>						
I. The introduction of water supply and distribution in Cochran City Area	1650.00	--	--	--	300.00	Eighth Plan
II. Augmentation of water supply to Cochran City Corporation	--	--	--	--	1650.00	Eighth Plan
III. Water supply scheme to physical and eleven adjoining Panchayats	540.00	--	--	--	540.00	Eighth Plan
IV. Industrial Water Supply	--	--	--	--	3800.00	Beyond 8th Plan
V. Salinity Control	--	--	--	--	550.00	Eighth Plan
<b>Total</b>	1650.00	--	--	--	6040.00	
<b>Total financial requirement for Water Supply Schemes (A)-(B)</b>	1650.00	--	--	--	6040.00	Rs. 67.65 Crores

\* Most of the islands fall under this category.

## CHAPTER FIVE

### SANITATION

#### 5.1 Introduction :

Any programme for the integrated development of an area has to accord a significant priority to schemes designed to improve sewerage, drainage and sanitation. The importance of such schemes in a highly urbanised area like the Cochin region is self evident, especially when it is characterised by low lying flat terrain, a high water table and a high density of population.

Schemes pertaining to solid and liquid waste have not traditionally been accorded the same priority which is given for instance, to protected water supply, though they should form part of the basic minimal infrastructure. Out of the 30 infectious diseases communicated through environmental agents and vectors at least 12 have been identified to be propagated through urban waste.

The package of Sanitation schemes proposed for the Cochin region are primarily confined to the requirements of the Cochin Corporation area.

The Cochin Corporation limits fall within the low land regions adjacent to the sea with a mean elevation of less than 1 metre above sea level and easy natural drainage is not feasible here. The suburban towns in the Cochin region like Alwaye, Tnpunithura and Perumbavoor fall within the midland regions with a rolling terrain where the sanitation problems are of a lesser magnitude. Considerations of population size and population density also dictate that immediate intervention is needed with regard to the problems faced by Cochin city.

#### 5.2 The Present Situation :

The Kerala Water Authority has drawn up a Master Plan for the provision of a sewerage system for the Greater Cochin Development Authority area. But till date no appreciable work could be done even for the inner city for lack of funds. Part of this scheme pertaining to a small area within the city was started by the Kerala Water Authority with financial assistance from the LIC, but even this project has not been completed till date.

It is estimated that about 3.2 lakhs of people accounting for nearly half of Cochin city's population are affected during the monsoon months by waterlogging in their homesteads. The absence of a proper drainage network and the blocking of natural watercourses by unauthorised land filling for house construction are the main causes leading to this situation. In certain areas, there is even a backflow from the water bodies into the drainage system during high tide. Flooding of major roads during the monsoon resulting in total paralysis of city traffic is a common occurrence every year.

The Cochin Corporation is vested with the responsibility of disposal of approximately 580 M<sup>3</sup> of solid waste that is generated daily. But it is estimated that only 304 M<sup>3</sup> of this daily total is handled and disposed off by the Corporation. It is expected that the solid waste to be processed will grow to be around 1300 M<sup>3</sup> by 2000 AD.

### 5.3 Proposals for processing Liquid and Solid Waste:

The schemes which are proposed here are designed to upgrade the Sewerage and Drainage network to the minimum desired levels by the end of the Eighth Plan period and also include provision of basic infrastructure by 1995 to the City Corporation for processing solid waste. The proposals are grouped into three heads: sewerage, drainage and solid waste.

### 5.4 Sewerage Schemes:

Presently in the Cochin Corporation the Sewerage system is functioning only in 3 sq km out of an area of 87 sq km and serving only 600 households out of a total of 91300 households. The Master Plan proposal drawn up by the Kerala Water Authority contemplated 6 schemes for the corporation and suburbs. The Zonal System was adopted here with pumping to the Zonal Sewerage Treatment Plants where the Sewerage would undergo high rate filtration and sludge digestion to yield an effluent quality of 20 ppm B.O.D. (Biological Oxygen Degradation). The effluent would then be discharged to the canals and backwaters nearby.

The Cochin Corporation area has been divided into three zones for this purpose: the Elamakulam South Zone, the Elamakulam North Zone and the Mattancherry Fortcochin Zone. Of these only the South Zone has been partially commissioned and works related to the laying of pipes in blocks A, B and C of this Zone are partially completed.

It is estimated that the foregoing partially done works can be completed at a total estimated cost of Rs. 700 lakhs including the provision for pumping lines, pumping stations and augmentations of the existing zonal treatment plant at the Elamakulam site in the Elamakulam South Zone to the required capacity.

The Fortcochin and Mattancherry areas of the Cochin Corporation lie between the backwaters and the sea and are characterized by high density urban settlements. Many of the slums in the region are also situated here. The roads which will have to carry the sewerage lines are very narrow here and the level of the ground is also low, and hence the problems relating to disposal of sewerage are very acute here. But the execution of the underground sewerage scheme as originally proposed will involve a variety of technical problems in addition to the acquisition of land in areas which are now completely built up. It is difficult to envisage the local populace supporting the scheme in this zone, even if funds are made available. Hence a Piped Conveyance System supported by transfer tankers for sewerage is proposed for this zone. As a first step, it is proposed to set up a Pilot Scheme in one of the densest localities of the western zone (Division No. 6 of the Cochin City Corporation). This proposal involves the provision of pipeline network leading from the houses of a locality to a covered common neighbourhood tanks from where the waste is transported by tankers to the existing Sewerage Treatment Plant at Elamakulam. It is estimated that this pilot project will involve an expenditure of Rs. 35 lakhs. It is to be noted that this sewerage system is presently existing in Singapore and the proposal made in this report is based on a study made by an engineer of the Kerala Water Authority there.

The proposals relating to sewerage are grouped under two categories: Category I with an implementation schedule of 5 years from 1990 to 1995 and Category II with an implementation schedule of 5 years beyond 1995. It is estimated that these schemes will be sufficient to cater to a client population of 5.40 lakhs by 2000 AD. The descriptions of these schemes and cost estimates are given in Annexure I.

The aforementioned proposals are designed to comprehensively cover the eastern part of the Cochin City by the end of Ninth Plan period. After the pilot scheme for the western part is completed, it can be extended to cover other adjoining areas also. Schemes for the suburban towns of Alwaye, Tripunthura, Perumbavoor and Parur and the industrial townships can be taken up beyond the Eighth Plan period and the funding requirements for these schemes are not shown here. Requirement of funds for recommended sewerage schemes come to Rs. 25.35 crores as indicated in the annexure enclosed.

### 5.5 Drainage Schemes:

The absence of a proper interconnected network of drains leads to periodic submersion of parts of Cochin during the monsoon months. Though the low lying suburban areas around the city like Vypeen and the islands have problems of inadequate drainage, the impact is not so pronounced due to the lesser percentage of developed and built up areas. The other areas where the towns like Alwaye, Perumbavoor and Thripunithura are located, are in the midlands and because of surface relief, drainage does not constitute a major problem requiring external intervention of a substantial magnitude.

The reverse side towns of Alwaye and Perumbavoor discharge their storm water and sullage directly into the Periyar river which is the source of drinking water for the Cochin region. The proposals earlier drawn up by the Cochin Municipal Corporation and the Kerala Water Authority and implemented partially till date envisage area drainage facilities by constructing collecting basins and the pumping out of the collected waters into the canals and backwaters. But this pumping system has not proved to be completely effective and hence it is suggested that a system of multiple outlets into the waterbodies can replace the pumping system except in very low lying areas which are at the mean sea level or even below it.

The scheme suggested for augmenting and improving the city drainage system consists of the following components:

- Construction of additional feeder drains
- Improvement of the existing feeder drains by realignment where necessary
- Provisions of silt pits to eliminate silting at drain mouths
- Construction of collecting drains
- Improving the discharge characteristics of Canals

The discharge characteristics of the drains and the canals in Cochin are adversely affected by reduction in carrying capacity due to unprotected sidewalls, encroachments, heavy silting etc. and choking at points of intersection of road and railway culverts. The schemes proposed in this report incorporate provision to overcome these problems.

Any comprehensive drainage network for complete elimination of drainage water involve large financial outlays and hence only those schemes which cater to problem areas are shown in the annexure. These proposals are based on identification of flow patterns, land contours and the final discharge outlets. They are grouped into area-wise schemes coming under two categories with different implementation schedules. A brief description of these schemes likely to cost Rs 713 lakhs is given in Annexure II.

### 5.6 Solid Waste Disposal:

In the Cochin region, the problem of solid waste disposal is most acutely felt within the Cochin Corporation limits. In the smaller towns falling within the region, the problem is of a much lesser magnitude and the financial consequences do not warrant external intervention. The proposals outlined here would strengthen the basic infrastructure which will be sufficient to service the population of the Cochin Corporation till the turn of the century.

Presently solid waste is collected from roadside communal bins and also directly from shops, hotels and houses manually by the use of handcarts, wheelbarrows, trolleys and tractor trailers as primary collection vehicles. This waste is transferred to open sub-depots from which secondary collection vehicles like ordinary trucks and tractor trailers carry the waste to landfill sites. Till recently, the

practice was to dump waste openly but now the practice of what is called **sanitary landfilling** has been introduced. This involves covering of the dumped waste by a layer of earth daily. But no landfilling sites are owned by the City Corporation and now filling is done on small private sites many of which are unsuitable for the purpose.

As mentioned earlier generation of solid waste has been calculated to be around 231 tonnes/or 580M<sup>3</sup>/day which is expected to rise to 1300M<sup>3</sup>/day by 2000 A.D. Out of the present daily generation only 304M<sup>3</sup> is collected leaving the rest in open spaces. The existing system of collection and disposal suffers from the following drawbacks:

- Environmental and aesthetic Pollution from uncollected waste and primitive loading and transfer techniques
- Incomplete collection and disposal of noxious waste from hospitals slaughter houses etc
- Lack of properly prepared disposal sites and consequent pollution problems like leaching, bird strike hazard to aircraft etc
- Non conversion of waste into biofuels or compost and consequent loss of revenue

Proposals for improving the existing waste disposal system may include the following:

- (a) Introduction of scientific collection methods like house to house collection in residential areas, installation of communal bins which can be directly unloaded into the primary collection vehicles and trailer collection in markets and commercial centres
- (b) Construction of enclosed transfer sub depots of the **split level type**;
- (c) Fleet augmentation and introduction of tipping type vehicles and refuse compactors
- (d) Establishment of well planned land fill disposal sites
- (e) Health and Environmental awareness education and training

Three methods of ultimate waste disposal commonly used in Indian cities are landfilling, composting and incineration. Incineration can be firmly ruled out for Cochin on account of the waste composition here and the attendant air pollution hazards and it is found that **Sanitary landfilling** which is supported by a **Composting Plant** would be the ideal disposal solution with minimal pollution.

The schemes relating to solid waste management are divided into two categories. Category I proposals require immediate attention and include schemes for the augmentation and modernisation of the collecting fleet and the acquisition of proper landfilling sites. These schemes are estimated to cost a total of Rs. 95 lakhs and are proposed to be completed by the year 1991. It is envisaged that if this is implemented the uncollected waste can be reduced to around 10% and the disposal system will be environmentally acceptable.

The proposals outlined above can only be sufficient to handle the problems associated with the present level of waste generation. It is estimated that Cochin will need at least 28 refuse depots in the next 10 years to handle the increased generation of waste. Waste generation goes up with increase in the standard of living of the population and hence additional schemes are proposed under Category II to meet these needs by the end of the Eighth Plan Period. It is estimated that these schemes will cost around Rs. 340 lakhs. The details of these schemes under the two Categories and their cost estimates are given as **Annexure III**.

### 5.7 Summary of Costs:

The summary of the costs involved in the three sectors, categorywise are as follows

	Category I (Seventh Plan Period)	Category II (Eighth Plan Period)	Beyond 8th Plan
A—Sewerage		735 lakhs	1800 lakhs
B— Drainage	440 lakhs	273 lakhs	—
C— Solid Waste Disposal	95 lakhs	340 lakhs	—
Total	<u>535 lakhs</u>	<u>1348 lakhs</u>	<u>1800 lakhs</u>

### 5.8 Recommendations:

- (i) A sum of Rs 535 lakhs has to be made available in the Seventh Plan Period and a sum of Rs 1348 lakhs in the Eighth Plan Period for completion of the Schemes proposed in the areas of Drainage Sewerage and Solid Waste Management for the Cochin region
- (ii) The sanitation levels of the region are a function of the environmental awareness of the people and specific awareness schemes have to be formulated for integration into the educational system and the local public media
- (iii) Many of the problems faced in Cochin relating to Drainage and Sewerage are consequent on the blocking of the watercourses as a result of unauthorised landfilling of wet lands and encroachment into water ways and canals for private gain Legislation already exists to prevent this but it has to be more strictly enforced
- (iv) Laws relating to littering have to be enforced more strictly especially in the thick residential and commercial areas of Cochin
- (v) The financial consequences of the foregoing proposals are relatively less when compared to the requirements in other sectors related to the development of the Cochin region but their consequences will be felt immediately in the rising health standards of the urban population and the cleanliness and improvement of the environs of Cochin



**ANNEXURE I  
DETAILS OF SEWERAGE SCHEMES**

No schemes under category I – Nil

Category II Schemes (Implementation Schedule 1990/95)

Description of scheme	Area covered	Population benefited by 2001 A.D.	Estimated cost (Lakhs)	Remarks
1. Sewerage scheme for Ennakulam South Zone Blocks A, B & C. Additional network of lines pumping stations and expansion of Treatment Plant.	Southern part of Ennakulam –Boreem Road. Population benefited 2.05 lakhs by 2000 A.D.	2.05 lakhs	Rs 700	Pipe laying work partially completed
2. Pilot scheme for Fort Cochin and Mettancherry Piped conveyance by pumping to tanks from common manholes to Treatment Plant	Mettancherry & Fort Cochin		35	Pilot Scheme
		Total	Rs. 735	
<b>Schemes Beyond Eighth Plan (Implementation Schedule Beyond 1995)</b>				
1. Sewerage scheme for Ennakulam North zone. For laying U.C sewer lines, pumping stations and Treatment Plant. No part of the area is covered by U.C Sewerage System.	Ennakulam North, Kabor/Pachalam, Vedduthala and Palamvattom. Population benefited 2.10 lakhs by 2000 A.D.	2.10 lakhs	Rs. 1200	
2. Sewerage system for Ennakulam South Zone Blocks, C & D. Includes six pumping stations three lifting stations and a Treatment Plant.	Vennala, Vytala and Edappally. Population benefited 1.20 lakhs by 2000 A.D.	1.25 lakhs	Rs. 600	
			Rs. 1800 lakhs	
		Grand Total for all sewerage schemes	Rs. 2535 Lakhs	

**ANNEXURE II**  
**DETAILS OF DRAINAGE SCHEMES**

Category I Schemes (Implementation Schedule 1989/91)

Description of scheme	Area covered	Cost (Lakhs)
<b>A) Cochin City—Ennakulam Area</b>		
1 Construction of drains for discharge of water to Perambur Canal	Ennakulam Town Hall area, St. Benedict road area, Perambur Road and East upto Kabor	Rs. 79.00
2 Rainwater & South Railway Station Drainage Scheme	East of M.G. Road upto Perambur Canal.	Rs. 52.00
3 Kambale Area Scheme		
Construction of major collecting drain from Pulleppey to Kambale area and minor drain from KSCVT Bus Station Area, 1.47 Sq. Kms. of area.	From Chitbor Road on West to Perambur Canal on East and between Pulleppey & South Railway Station	Rs. 45.00
4 Panampilly Nagar South & Kadamantla Drainage Scheme		
Construction of connecting drain to Perambur Canal 2.1 Sq. kms. of area	Between Panampilly Nagar and Kadamantla Road	Rs. 30.00
5 Central Market Area Drainage	West of Chitbor Road to backwaters	Rs. 30.00
Whipping of drains from Rainey Road to backwaters and construction of culverts		
<b>TOTAL (A)</b>		<b>Rs. 232.00</b>

ANNEXURE II Contd.

Description of scheme	Area covered	Cost
<b>B) Cochin City—Cochin Area</b>		
<b>6 Mettancherry Town Hall Area</b>		
Construction of Escapes and Main Drains from Town Hall area to Backwaters.	Mettancherry Town Hall area, Pallathundy Road, Alattukatty Road	Rs 15.00
<b>7 Cochin College Area Drainage Scheme.</b>		
Construction of two main interconnecting drains in the area below NSL and pumping water to the back waters through the boundary canal.	East of College Ground	Rs 30.00
<b>8 M.G. Road Drainage Scheme.</b>		
Construction of additional discharge drains with all pits	Area on eastern side of M.G. Road	Rs 45.00
		TOTAL (B) Rs 95.00
<b>C) Canal Development Schemes</b>		
<b>a) Widening of the main Thomas Peruvudor Canal and the cross canals such as Kotta canal Mullaseen Canal</b> The area has critical flooding problems	Entire central area of the City	Rs 65.00
<b>b) Boundary canal development schemes Widening strengthening of bank walls and deepening of the canal through the Mettancherry Fort Cochin Area.</b>	Cochin Area	Rs 30.00
<b>c) Ramavaram Canal Scheme:</b>		
To design walls and construct the side protection walls the canal connecting the boundary canal to backwaters.	South Mettancherry Area	Rs 18.00
		TOTAL (C) Rs. 113.00
	Total for Category I—Schemes	Rs. 440.00

ANNEXURE II Contd

Description of scheme	Area covered	Cost (Lakhs)
<b>Category II – Schemes</b>		
1) Edappally/Palmanthalam Area Drainage Scheme Construction of major drain along the Kakkor Edappally Road and to provide connecting drains.	South of Kakkor Edappally Road	Rs. 35.00
2) Kalamattithal Chalaiemmoor Area Drainage Scheme Construction of major drains to drain the water from the area being developed and major residential complex to the Sasthamangalam channel	East of Kalamattithal and West of Chalaiemmoor	Rs. 30.00
3) Gandhi Nagar and Panampilly Nagar Area Scheme Construction of a service drain to drain the water to the Thovara Perimoor Canal.	Gandhi Nagar & Panampilly Nagar Area.	Rs. 35.00
3 Multiple outlet drainage scheme for Shammughom Road and Chittoor Road in Ernakulam area. (Dhobidhara in Fort Cochin, Kurupumbalam, Panampilly, Panampilly and Kurupumbalam in Fort Cochin)	Parts of Ernakulam, Mattancherry and Fort Cochin	Rs. 1,30.00
4 Drainage Scheme for Alwaye Municipality For controlling and diverting the discharge from the Periyarlake. Two of existing canals has to be improved	Alwaye Municipal Area	Rs. 35.00
Total for category II schemes		Rs. 273.00
Grand Total For All Drainage Schemes		Rs. 713 Lakhs

**ANNEXURE III**  
**SANITATION-SOLID WASTE MANAGEMENT**  
**DETAILS OF SCHEMES**

<p><b>Category I Schemes.</b></p> <p>Quantity of waste generation at present The estimated generation of waste by the turn of the century (Source: NEFTS Studies)</p>	<p>960m<sup>3</sup>/day 1300m<sup>3</sup>/day</p>
<p><b>Category I—Schemes (Implementation Schedule: 1989-90)</b></p> <p>Augmentation of collection fleet including man-bulkover, loading tractor and trailers, refuse collectors and front end loaders. The acquisition of land fill sites to the extent of 11.0 hectares at Mundamelai in Cochin area and Vaiduthala in Ernakulam Area</p>	<p><b>Estimate Cost</b></p> <p>Rs. 95 Lakhs</p>
<p><b>Category II—Schemes (Implementation Schedule: 1990-95)</b></p> <p>1. Establishing 28 refuse dumps of 12 to 15m<sup>3</sup> capacity acquisition of 25 sites, 13 trailer stations, fleet augmentation and additional workshop facilities.</p> <p>2. Compost Plant</p> <p>Due to the difficulty in the acquisition of sites, proposal for composting as a disposal method which may also yield revenue by sale of compost. The 250 tonne capacity semi-mechanical compost plant will have two pulverizers of 125 tonne capacity, screening plant, process mill, formation and storage yard. The 2.5 hectares will be acquired at Vaiduthala.</p>	<p>Rs. 150 Lakhs</p>
<b>TOTAL</b>	<p>Rs. 95 Lakhs</p> <hr/> <p>Rs. 150 Lakhs</p>
<b>TOTAL</b>	<p>Rs. 190 Lakhs</p> <hr/> <p>Rs. 340 Lakhs</p>
<b>Grand Total on Solid Waste</b>	
	Rs. 435 Lakhs

## CHAPTER SIX

### HOUSING

#### 6.1 Introduction:

Any plan for the integrated development of the Cochin region has to necessarily include adequate proposals for the housing sector especially with reference to requirements for housing the economically underprivileged sections. Since Governmental intervention alone cannot be a solution, public housing schemes have to incorporate provisions for creative interlinks with private sectoral efforts in this area since about 70-80% of house construction activities are in the private sector.

#### 6.2 Approach to housing problem :

(1) The Government of India has recently announced the National Housing Policy which has as its main objectives the following

- (i) To help every family own an affordable shelter by the year 2001
- (ii) To encourage people to build and improve their own houses
- (iii) To promote repair, renovation, expansion and upgradation of the housing stock.
- (iv) To preserve India's rich and ancient heritage in settlement planning and architecture and to conserve buildings of historic, cultural and aesthetic significance.

With the increasing realization that what is required is not normative but participative planning it is envisaged that in the coming years public institutions will be re-oriented to function more as facilitators i.e. providing the common man the basic infrastructure for shelter at an affordable cost than as agencies directly taking up constructing activity themselves.

(2) In line with the objectives of the National Housing Policy the State Government's housing strategy includes the following

- Acquisition and development of land and distribution of serviced plots to prospective beneficiaries
- Provision of direct and indirect subsidy for house construction to the weaker sections
- Pursuit of improved construction techniques and application of appropriate technology especially for low cost units
- Provision of training of facilities to masons and builders in these techniques
- Improving basic sanitation especially in slum pockets and general environmental upgradation of such areas

There are three main agencies which implement public housing programmes in the Cochin area. They are (a) the Kerala State Housing Board (b) the Greater Cochin Development Authority and (c) the Housing Co-operative Societies

### 6.3 Present housing situation in the region:

(a) As per the 1981 census the numerical shortage of housing in the Cochin region is approximately 14600 dwelling units. About 30% of the houses have a plinth area less than 23 sq m and about 50% have less than 3 rooms. Since the average member per household is 5.81, houses having 2 rooms or less would naturally be congested and overcrowded. About 60% of the households have no latrines connected to septic tanks and sewers. Even in the city of Cochin, about 13,500 households (out of 1.47 lakhs) depend on open land for latrine facilities. The condition of housing in the island zone deserves special mention where 75% of the existing housing stock is substandard and at least 50% of this stock has to be repaired or renovated to be habitable.

(b) The economic composition of the households in the region reveals that 25% of households constitute the economically weaker section and 35% belong to the low income group. The middle income group constitutes 35% and the high income households fall in the marginal 5%.

(c) A mere numerical assessment of the shortage in housing would not be truly indicative of the magnitude of the problem, since many of the existing houses are made of temporary and substandard materials while others are very old and dilapidated. A recent survey by the State Housing Department reveals that nearly 14% of the existing stock will have to be demolished and replaced.

(d) In brief the housing situation in the Cochin region with reference to the 1981 census is as below:

A Total housing stock	224 lakhs
B Numerical shortage	14 623 Nos
C Qualitative shortage	33 600 Nos (14% of existing stock)
	48 223
B+C	

About 30% of the total stock is of kutcha type construction (as per the GCDA's Development Plan) and about 50% of this may have to be renovated. In addition a large number of houses within the island zone are of kutcha type of which at least 50% (i.e. about 20,000 houses) will require improvement and repair for continued habitability.

### 6.4 Accretion to housing stock:

(1) Out of total requirement of houses, public housing meets only a small part, private initiative contributing the rest. The shortage of houses has been calculated basing on the difference between the total requirement of houses and addition/accretion to housing stock which would have been built in the normal course. It is reasonable to assume that the trend in decadal growth rate in housing which was 28.34% by 1981 will continue in the coming decade as well. Based on an analysis of this trend from 1961, the decadal growth rate is projected at 30% by 1991 and 32% by 2001 or an average of say around 30%.

(2) Counting out the decadal accretion mentioned above, it has been estimated that about 1 lakh additional housing units would be required by the year 2000. Of this, the contribution of the public housing agencies such as Kerala Housing Board, Greater Cochin Development Authority, Housing Co-operative Societies would be less than 15.20%. In line with the priorities identified, it would be

desirable to step up this contribution in the case of EWS & LIG and other specific target groups as it is estimated that out of 1 lakh additional housing units which would be required by the year 2000 the majority requirement would relate to these target groups

#### 6.5 Proposals for housing improvement:

(1) In pursuit of the foregoing situational imperative the Team suggests emphasis to be given on the following type of scheme/programmes

- Schemes for making available developed serviced land for housing in the residential zones delineated by the Greater Cochin Development Authority at a reasonable cost
- Schemes for providing loan assistance for construction of houses with reasonable pay back facilities
- Programmes of providing loans for repair and improvement of housing stock.
- Schemes for providing fully constructed houses by the three public agencies
- Schemes for rehabilitation of slum dwellers
- Schemes for Environmental Improvement of slum pockets
- Scheme of providing accommodation to specific population groups such as Urban Homeless Destitutes etc
- Providing assistance for construction of pucca housing in the islands adjoining Cochin where the soil is marshy and building costs prohibitive
- Development of appropriate technology base and ancillary production units in the region especially for low income housing

(2) It has been estimated that in the Cochin region the share of MIG/MIG/LIG and EWS in the incremental housing stock needed by 2000 A.D. would respectively be 5% 35% 35% and 25%. In other words LIG and EWS would constitute about 60% of the requirement and if MIG is also included along with them the percentage would come to be 95.

The Housing Policy under the Seventh Plan visualises maximum government loan assistance of Rs 5000 Rs 23500 and Rs 43000 for the EWS/LIG and MIG respectively. While for the EWS loan assistance is equivalent to the estimated cost of construction (Rs 5000) in the other two cases the beneficiaries are to make a substantial contribution varying between 20-45%. Obviously these categories would need long term loan assistance from institutional sources in order to be able to participate in the house construction programmes on such a scale. Further a massive effort has also to be mounted for developing sites and providing services to the area where houses are to be built.

The above situation points out to the need for adequate institutional and financial support to the public housing agencies in the area including Kerala State Housing Board (KSHB) and the GCDA by the HUDCO as well as the proposed National Housing Bank (NHB) and the National Urban Infrastructure Development Finance Corporation (NUIDFC).

(3) For repair and renovation of dilapidated houses the GCDA has a scheme of cash loan assistance subject to mortgage of the housing stock/other asset and with an easy repayment schedule. HUDCO finances GCDA under the scheme which has been quite popular and has been taken as a model for the rest of the country. This scheme would need boosting in the region.

(4) Along with attempts to enlarge ongoing schemes to cater to the increasing demand of this sector the Public Housing Agencies and especially the GCDA would have to ensure that growth of housing and of residential areas are in consonance with the land use plans and the Master Plan for



the region. Attempts must be made to regulate and control the growth of residential areas in accordance with the principles of urban planning.

(5) Public Housing Agencies in the region like KSHB and GCDA can serve as catalysts for the promotion of House Construction Cooperative Societies and Group Housing Societies which have proved to be successful in the larger metropolitan cities of India. This approach would also ensure that the quantum of public funds needed for the housing sector would be minimised while at the same time promoting self help in the sector. Suitable sites could be earmarked and developed before being sold/leased to such cooperative societies with instalment payment facilities. The provision of basic civic amenities could be ensured by the GCDA and the local bodies in the region. The Team is of the view that institutional support for cooperative housing ventures would encourage prospective beneficiaries to join together and form housing cooperatives.

(6) In addition to the general demand for housing, the requirements of specialised groups have to be met. Specific sites for industrial housing for employees of the Central Government and its organisations and for Naval personnel have to be provided. The GCDA could take the initiative in identification of suitable sites subject to firm commitment on behalf of the user organisations to deposit cost of development etc. on agreed instalment basis. The development of the layouts at such sites and their subsequent sale to the client organisations would also have to be considered on mutually agreed terms.

(7) The housing situation in the island zone is more acute than in other parts of the region. More than 75% of the houses on the islands are of kutcha construction. Since these areas are isolated the basic infrastructure for housing development is insufficient. The slushy nature of the soil also contributes to high building costs. It is recommended that special housing repair loan schemes should be taken up for the island zone on the pattern of such schemes already undertaken by GCDA with HUDCO finance. The total number of houses to be repaired/improved in the island zone is estimated to be about 20,000 units i.e. about 50% of the existing stock. A rough assessment of the magnitude of loan assistance needed @ Rs 5,000/ per house is of the order of Rs. 10 crores. The modalities of scheme implementation may be worked out by the GCDA in consultation with the State Govt. the financing institutions and the constituent panchayats.

(8) In addition to the foregoing schemes, Governmental intervention is necessary to improve the lot of the urban poor who live in the slums of the region. The majority of urban slums in the region are located within the limits of the Cochin Corporation. A list of thirty four such slums is given in annexure 1. Schemes for environmental improvement of these slums are being carried out by the local bodies in the region under the minimum Needs Programme in accordance with the prescribed norms.

There are however certain slum areas within Cochin Corporation namely Edappally, Kandankulam slums near railway lines at Ponekkara and slum near PGT compound which need larger investment than that permissible under the existing scheme for environmental improvement of slums. Most of the slum dwellings here are encroachments. It is estimated that about Rs. 15 lakhs would be needed for improving the environment in these areas. Subject to the State Govt's decision to settle the dwelling plots with the slum dwellers, this amount may have to be provided by the local bodies in the region with a substantial component of State assistance.

While the accent has been on improving the surroundings of the existing major slums, the rehabilitation of certain slum pockets mentioned at (a), (b) and (c) of Annexure II has become a necessity in the interests of development of Cochin. One such area is Vathuruthy village on Willingdon Island near the airport. The strategic importance of this area and the suggested development of the Cochin airport would necessitate resettlement of the 367 houses which may have to be shifted from this pocket (see chapter on Airport). A scheme has been envisaged for resettling these households on 3.5 hectares of alternate land at an approximate cost of Rs. 266 lakhs. The team recommends that subject to final decision on modality of expansion of the airport, this scheme

be accorded the highest priority Likewise the rehabilitation of the slum-dwellers on government land near the main bus station at Ernakulam as also of a slum pocket in Edappally which is repeatedly subjected to flooding during the monsoon is also suggested These two schemes are estimated to cost around Rs 20 lakhs

One of the largest slums in the region is along the Kalvathy Canal in the Fort Cochin area This canal is silted and is stagnating causing health problems to the inhabitants There are 590 houses here accommodating 850 households It is assessed that at least 720 houses have to be built on a suitable alternate location near the present habitation to resettle them This scheme would cost approximately Rs 136 lakhs

The slum improvement and rehabilitation schemes which have been recommended by the Team in this Chapter are by no means comprehensive Slum dwellers in Cochin city alone are estimated to be around 25 000 or 5% of the city's population This percentage is not significant when compared to the situation in the larger Indian cities but effective planning can prevent the situation from acquiring larger dimensions Out of a total number of 34 large slum settlements only a few as mentioned above have been identified by the Team for resettlement/upgradation based on a study by the GCDA on the basis of indices like environmental degradation overcrowding lack of basic amenities etc The implementation of these shelter schemes for the slum section of the urban poor will have to include a significant component of State assistance with a built in subsidy component to the local bodies in the region

#### **6 6 Requirement of building materials and transfer of technology**

Since cost of construction in the region is prohibitively high there is a definite need to provide building materials at a reduced cost and to evolve alternate low cost technologies which would be accessible to and affordable by the poor To achieve this an institution on the lines of the recently set up Nirmithi Kendra (functioning in Quilon district) could be established in Cochin This institution which is a registered society has succeeded in preparing a suitable low cost mixture of mud coconut husk other local materials and concrete to manufacture prefabricated house building material This may be examined It is estimated that a budgetary allocation of Rs 10 lakhs may be needed for the purpose

#### **6 7 Recommendations**

In brief the Team would recommend as follows

- (i) The public housing agencies operating in Cochin region like the GCDA and the KSHB have to further activate themselves to grapple with the housing problem in the area Suitable schemes will have to be formulated by these bodies for availing larger assistance from HUDCO as also assistance from the proposed National Housing Bank (NHB)/National Urban Infrastructure Development Financing Corporation (NUIDFC), HDFC etc A conscious effort has also to be made to organise larger number of housing cooperative societies/group housing societies to encourage self help housing
- (ii) Development of sites for EWS and LIG as also for the specialised groups covering employees in the public organisations will have to be planned and implemented in a methodical manner by GCDA
- (iii) The slum improvement/rehabilitation and low cost technology schemes dealt with in Paragraphs 6 5 & 6 6 will need budgetary support to the tune of Rs 0.50 crores during the Seventh Plan period and Rs 3.97 cr during the Eighth Plan period from State Plan sources The State Govt. may have to keep this in view

**ANNEXURE I**  
**LIST OF MAJOR SLIMS**

	Population					Remarks
	1	2	3	4	5	
	No. of houses	No. of Households	Persons per house			
1. Soda's colony	110	15	15	7.33	Included under the Corporation scheme for improvement submitted to Government.	
2. Cheliparambu	564	70	76	8.06		
3. Manthara Pulaya colony	220	16	49	13.75		
4. Puthiyaveetil parambu	144	10	17	14.40		
5. Pulimoodal parambu	617	121	1222	5.10		
6. Adhikamalappu	935	106	136	8.62		
7. Thundiparambu	200	29	52	6.90		
8. Thunthiy colony	1943	221	287	8.70		
9. Kochuparambu Vakkuparambu	2346	148	327	15.89	Yet to be improved/rehabilitated	
10. Eraveli	1983	262	285	7.57		
11. North of Varma & Co	399	63	65	6.33		
12. Cheriakadavu	1267	109	184	11.62		
13. Kalvathy canal	182	590	890	8.27	Some improvements done by Corporation. To be rehabilitated.	
14. Near Metal Bus Co at Edappally	140	30	32	4.67		
15. Near Perummanoor junction	183	45	45	4.07	Included under the Corporation Scheme	
16. Kochukkadaverthara	348	59	59	5.9	To be improved	
17. Near Railway line at Porekkara	77	12	18	6.42		
18. Edappally Kondamittalam						

## ANNEXURE I Contd ..

	1	2	3	4	5
19 North of Ernakulam Stadium Bus stand	182	38	48	4.88	To be rehabilitated
20 Chelavannur	202	45	45	4.06	Corporation has already done some environmental improvements
21 Old Railway Station	108	25	25	4.32	Included under the Corporation scheme submitted to Government.
22 Near E S I hospital	86	19	20	4.3	To be improved
23 Elankulam behind P. E. T compound	335	93	98	4.14	Included under Corporation scheme.
24 Elankulam West extension near Kothea area.	190	18	19	10.95	To be rehabilitated
25 Valthuruthy area	9175	367	487	25.0	Included under Corporation scheme
26 Ponnakkassery parambu	268	30	46	8.03	To be rehabilitated
27 Military parambu	223	40	40	5.98	Included under Corporation scheme
28 Navelampally padam	319	54	60	5.90	Included under Corporation Scheme
29 Poonthi	135	29	29	4.65	Included under Corporation scheme
30 Vellopparambu	130	26	26	5	Rehabilitation scheme
31 Thiruvannam colony	460	71	71	6.47	Improvements done by Corporation
32 Knevappally colony	21	5	5	4.2	Included under Corporation scheme.
33 East of St. Agnes church	45	7	8	6.42	Included under Corporation scheme.
34 Vadayar parambu					

**ANNEXURE II**  
**IMPROVEMENT/REHABILITATION OF SPECIFIED SLUM POCKETS**

a) 1	Environmental improvement/rehabilitation of slum on the banks of the Kakavetty Canal in Fort Cochin area 720 families		
	1) Deepening & desilting of Calvetty canal	Rs	2 lakhs
	2) Installing pumping station with 3 Nos pumps and necessary equipments to pump out the water to the sea		2
	3) Construction of foot bridges—4 nos @ 0.5 /bridge		2
	4) Acquisition of 1.5 hect of land in the Calvetty area @ 25 /hect.		37.5
	5) Formation of roads drains etc say 2.5 /hect.		3.75
	6) Water supply electricity etc say 1.25 /hect.		1.875
	7) Construction of flats @ 10,000/unit for 720 units		72.00
	8) Construction of a community hall		1.00
	Construction of shopping centre		1.00
	Land scaping		0.25
		Total Cost	Rs 136.375

**NOTE** As per HUDCO norms the ceiling cost per unit is Rs 15000. Considering the high land cost it is imperative to go in for at least 4 storeyed building in which case the building cost per unit is likely to come down to Rs 10,000.

b) 1	Rehabilitation of slum dwellers in Vathuruthy Area. (Needed for expansion of Air Port)		
	Acquisition for 3.5 hect. @ 20 lakhs/hect		70.00
	Formation of roads drawings etc 2 /hect		7.00
	Water supply electricity etc /hect.		3.50
	Construction of flats @ 10000/unit		182.40
	Construction of community hall		1.50
	Construction of shopping centre		1.50
	landscaping		0.50
		Total	Rs 266.40

ANNEXURE II Contd.....

- c) Estimate of cost for rehabilitation of slum dwellers near metal box company at Edappally and near north of Emakulam Slum bus stand (Prone to water logging)

Total No of families to be rehabilitated 80

Assuming that the rehabilitation can be in 4 storeyed blocks area required comes to 15 cents in Kalamassery area and 25 cents near Railway Station area

15 cents @ 8000/cents	Rs 1 20 Lakhs
25 cents @ Rs 15000/cents	3 75 "
Cost of development including roads drains etc	4 50 "
Cost of providing water supply electricity etc	2 35 "
Cost of construction of 80 units @ Rs 10000/unit	8 00
Cost of construction of convenient shop	0 20
	<hr/>
Total cost	Rs 20 00
	<hr/>

- d) Estimate of cost for environmental improvement and slum upgradation

The slums taken up for upgradation are

1) Slums at Edappally Kandankulam	— 13 households
2) Slum near Railway line at Ponekkara	— 13
3) Slum near P&T compound	— 96
	<hr/>
	124 households
	<hr/>

Total cost Rs 15 lakhs

## CHAPTER SEVEN

### (a) ROAD TRANSPORT

#### 7.1 Introduction:

The development of Road Transport is one of the critical indicators of a region's economic progress. In any regional development plan, due priority has to be attached to fund allocation to roadways expansion as well as maintenance and upkeep of the existing system. The growth of the transport network has to conform to the urban form and the pace of growth envisaged for the region. In particular, the strategy for road transport in Cochin region is to ensure that the incremental growth of the region is unhampered by any major transportation bottlenecks.

Roadways development has to be linked up with the overall land use planning and where more than one mode of transportation is feasible, due consideration should be given to develop the cheaper and more energy efficient modes, with provision of sufficient interchange facilities. Therefore, investment in road network development has to be tied up with that of railways and inland navigation. This is particularly important in view of the singular situation of Cochin where developments are not concentrated merely on the mainland, but are spread over the adjoining inhabited islands.

#### 7.2 Existing Situation:

The Port provides the focus and centre of activity to the transportation network in the region. Major growth directions emerge from the Port, or in other words, the commodity flow to and from the hinterland is channelised along the major transportation corridors focussing on the port. This pattern follows what is called the 'Open Finger Plan', typical of Port Cities. The Cochin road network has been conceptualised in the Structure Plan of the Greater Cochin Development Authority as a system of radial commuter corridors which are major inter city linkages with ring roads interconnecting these radial corridors.

Seven of the existing trunk routes together with one proposed highway constitute the eight radial corridors proposed in the Structure Plan as the primary distributors from the city centre to the environs. All of them are actually stretches of the State Highways or the National Highways except serial no. 8 of the list of radial roads given below.

- |                       |                                 |
|-----------------------|---------------------------------|
| 1 Cochin—Alway        | — (NH 47 Part)                  |
| 2 Cochin—Munambam     | — (through Vypeen Island)       |
| 3 Cochin—Alleppey     | — (through Edacochin old NH 47) |
| 4 Cochin—Perumbavoor  | — (through Thrikkakara)         |
| 5 Cochin—Muvattupuzha | — (through Thiruvankulam)       |
| 6 Cochin—Vaikom       | — (through Udayamperoor)        |

- |                     |                       |
|---------------------|-----------------------|
| 7. Cochin—Chellanam | — (West Coastal Road) |
| 8. Cochin—Parur     | — (Proposed NH 17)    |

These radial corridors are connected by tiers of ring roads.

**Ring roads** which are major link roads in the region are as follows:

- (1) **The Inner Ring Road** of which the existing **Elamkulam-Kaloor-Perandoor Road** forms a major part facilitates quick access to the Central Business District comprising the trading centres around Ernakulam Port extension and Mattanchery.
- (2) **The Middle Ring Road** is constituted by the existing **Cochin Bypass** on the NH 47 and the proposed NH 17.
- (3) **The Outer Ring Road** is the **Irimpanam Kalamassery** industrial road. This road would link the industrial magnets of Eloor and Ambalamugal as well as the Civil Station (office complex) the Cochin Export Processing Zone, the Naval Physical and Oceanographic Laboratory at Thrikkakara and other prospective work centres of the region.

The operational efficiency of transportation along these radial corridors and connecting major link roads is hampered by poor alignment, bad geometrics, uncontrolled ribbon development along the road sides, bottlenecks created by narrow bridges, railway level crossings and ill maintained road surfaces. The recently opened bypass reach of the NH 47 is the only road that is free from these hazards. Maximum congestion is observed in the Central Business District area of Ernakulam, Mattanchery, Fort Cochin and the suburban Municipal towns of Alwaye, Angamaly, Parur, Perumbavoor and Tripunithura. The existing roads within these urban centres have failed to keep pace with the trend of rapid urbanisation due to lack of planned investment.

Though the number of vehicles on the road increased more than 4 times, the road surface area within the region in the past 15 years has not even doubled. Another reason for overcongestion in the region is that the potential of water transport has not been adequately utilised. The road congestion in the Central Business District area of Ernakulam is the primary reason for the area being unable to bear further commercialisation. The north-south alignment of the railway line parallel to the sea coast and with limited land extent in between has impeded east-west road development connecting the hinterland.

A glance at the accompanying map will reveal that the entire east bound hinterland traffic is now dependent only on two corridors, namely the **Tripunithura Road** for Vaikom, Kottayam and Muvattupuzha routes and the **National Highway 47** for the Alwaye and Perumbavoor routes. These two corridors pass over railway overbridges which are permanent bottlenecks during peak hours. Such bottlenecks have also led to selectivity in Public Transport routes resulting in undue concentration of services in certain areas of the city.

### 7.3 Bus Transport:

More than 50% of the road traffic generated in the city is bus transport. The city and suburban routes are operated by the private sector while longer routes are operated by the Kerala State Road Transport Corporation (KSRTC). Certain sectors like the route connecting Ernakulam and Alwaye have at present one bus operating every minute and such selective route priority can be corrected only if there is planned development of the road network. Bus terminal facilities in Cochin city as well as in the suburban towns are inadequate and suffer from congested access roads.

### 7.4 Truck Traffic:

The existing road system, especially within the city, is totally inadequate for the ever increasing



volume of truck traffic servicing the Port as well as the industries in the area. This has resulted in diversion of heavy truck traffic through residential areas thereby adding to the civic problems. There is an urgent necessity to divert this traffic from the inner city by implementing the plan for the Cochin Truck Terminals drawn up by the GCDA and recommended by the Transport Policy Committee.

#### **7.5 Road Junctions & Parking Bays:**

The absence of proper city planning in the early days has resulted in the formation of narrow roads with little facilities for parking or for junctions with convenient geometrics. The construction of buildings with inadequate parking facilities have led to on street parking resulting in street side congestion. Narrow city roads without parking bays and footpaths cause considerable traffic problems during peak hours in the city. The suburban municipalities in the Cochin region also experience this problem but in a lesser magnitude.

7.6 Surveys reveal that the peak hour traffic and the number of registered road vehicles in Cochin increased beyond all reasonable projections in the recent past thus straining the road network to its limits. The number of registered vehicles in Ernakulam District increased from 12825 in 1971-72 to 43188 in 1986-87. Similarly the volume of peak hour traffic in terms of Passenger Car Units (PCU) along the 3 major corridors namely Cochin Alwaye, Cochin Vaikom and Cochin Alleppey increased from 1337, 1055 & 2130 in 1968 to 11149, 7412 and 8532 in 1987 respectively. In sum the lack of an overall road network plan which dovetails with a properly conceived land use plan has resulted in haphazard road development and ensuing congestion.

#### **7.7 Project Proposals For Road Transport:**

As stated earlier, the regional road network for Cochin comprises of eight radial corridors. The GCDA has drawn up a comprehensive development plan with the objective of ensuring that no point in the city is located more than 1 K.M. from the public transport routes. But the financial implications of this scheme would be very huge and hence only important roads which are proposed for immediate implementation are recommended in this report. These will include roads or missing links where maximum strain is felt in the total network.

The implementing agencies operating in this area are the State P.W.D., which forms and maintains the state highways, national highways and the district roads, the Corporation of Cochin and the local municipalities who are responsible for the city and town roads. The Cochin Port Trust constructs and maintains roads within its area and the Greater Cochin Development Authority constructs and maintains roads within specific scheme areas.

It must be noted that there have been long standing demands from the inhabitants of Vypeen and adjoining islands for road links from these islands to the mainland and also link bridges between the islands. Due priority has been assigned to this view in the interest of integrated development of this island group. However, since such proposals will necessitate spanning the waterways by long bridges and reclaiming land for approach roads, the environmental and ecological implications of such proposals have to be carefully examined in advance. Once Inland Water Transport facilities are improved, small link bridges between islands can facilitate easier interchanges to road transport terminals.

A High Level Committee constituted by the State Government under the Chairmanship of the Chief Secretary formulated a list of 11 prioritised schemes (Wide G.O. (Rt) 2141/86/PW&T dated 12.12.1986) with a total project cost of Rs. 1127.30 Lakhs. The schemes identified by the Government

have been included as part of the Team's recommendations, besides additional proposals relating to areas not covered by these schemes. Residual schemes pertaining to the road transport sector like provision of a Central Bus Station for Cochin city and Truck Terminals at Edappally and at Ambalamughal have also been proposed in this report. A priority list of projects proposed for implementation under road transport sector is given in the annexure. As details of area to be served/points to be connected etc. are given in the annexure, these are not repeated here.

#### **7.8 Recommendations:**

- (1) The total amount of schemes recommended by the Team for the road transport sector aggregates to an amount of Rs. 71.2 crores. It is recommended that Rs. 17 crores be earmarked in the Seventh Plan leaving a sum of Rs. 38.2 crores to be set apart in the Eighth Plan
- (2) The scheme to construct a bridge between Vypeen and the mainland, which would serve to increase the tempo of development in the adjoining islands could be taken up after its ecological consequences are thoroughly examined. A sum of Rs 16 crores has been proposed for this project beyond the Eighth Plan period.

## SUMMARY OF PROPOSALS UNDER ROAD TRANSPORT SECTOR

		(Rs in lakhs)			
Sl No	Scheme & Description	Area Served	Estimated cost	Implementation Agency	Remarks
1	2	3	4	5	6
1	<p><b>Vainambalam Vytilla Road</b></p> <p>This is the city end of the Kochin Vytilla corridor road, being the 3 Km portion between Vytilla and the city. This road will bypass the city and will be a stretch of 3 km. The road will be on the city. After the commissioning of the Vytilla bridge and opening of the MTR bypass, Port bound traffic from Alleppey and Trichur sides (both directions) will be diverted to this road. This road is to be widened to 22 mbs (B+V) Radial Corridor standards.</p> <p><b>Kaloor Kothawathira Road</b></p> <p>This forms the middle portion of the inner Kochi-Kothamangalam-Kumar Puzha road which will be the link between the city and the road to a width of 22 mbs and constructing a railway overbridge will facilitate parallel direct link between the commercial centres of Kaloor on the Kochi-Vytilla corridor and Kothamangalam. There will be a partial widening and formation of new stretches. The road alignment is preserved and land acquisition of the Stage I portion to be completed by the end of 2018. The Stage II portion has been completed by GDA under the Deemed Town Planning Schemes.</p>	<p>Linking major access to Cochlin Port and CPO from the entire hinterland. A viable road with a 22 mbs width is essential for smooth flow of traffic.</p> <p>300</p> <p>PWD</p>	<p>Included in the original proposal of the High Level Committee. Stage I for the road is completed. Stage II for Rs 170 lakhs Land acquisition for Stage I portion almost completed by GDA.</p> <p>PWD</p> <p>185.00</p> <p>Being the only parallel road in between MG Road and MTR. This road will be a viable road which alone can reduce the congestion in the CPO. Also this will provide public transport Access to a vast residential area on either side.</p>		

1	2	3	4	5	6
	<p><b>3 Surfacing treatment and Improvements to City Roads</b></p> <p>High Water Table and Changing climatic conditions warrant very frequent road maintenance. Due to increased goods and heavy traffic, the roads are subjected to heavy loads and are in need of repairs. Resurfacing of essential city roads only is included in this</p>	<p>Bad road surfaces will lead to traffic hold ups and accidents. Savings in fuel and travel time justifies investment in road repairs</p>	<p>40.00</p>	<p>PWD/ Corporation of Cochin</p>	
	<p><b>4 Panampilly Nagar – Thomas Road</b></p> <p>This is a missing link of about 1.4 kms between the 36 m wide Panampilly Nagar main road formed by CCDA and Thomas Inan road, Panampilly Nagar. The proposed road can function as an effective detour to through traffic from Cochin Port to NH Bypass without entering the congested CHD Road alignment. It has been preserved free of encroachments and is under Detailed Town Planning Scheme.</p>	<p>Major portion of this road already completed and railway road under bridge in the alignment is available. The proposed road stretch between Panampilly Nagar and MG Road used for heavy truck traffic is very narrow passing through a main level cross.</p>	<p>160.00</p>	<p>PWD</p>	<p>Included in the original proposal of High Level Corridor Stage I Corridor, Stage II 135 lakhs</p>
	<p><b>Extension of Shammings Road in Cochin Marie Dine upto Fine Arts Hall</b></p> <p>As part of the Cochin Marine Drive Scheme CCDA has converted part of the old Shammings Road to a 5 lane road with 1000 nos of parking spaces in front of the House. The remaining portion of 600 nos between Guest House and Fine Arts Hall in the foreground is proposed in this. No major structures are to be demolished or private land for encroachment. The road to be taken from the Parks, additional land has already been reclaimed by CCDA on the water front. A minor bridge over Padath Canal also is to be constructed.</p>	<p>Extension of this along with widening of Valsambalam Road and the existing road between Fine Arts Hall and Guest House. Fine Arts Hall and Guest House road will complete a vital link through the city. No fresh land acquisition is required</p>	<p>50.00</p>	<p>PWD</p>	

	2	3	4	5	6
1					
6	<p><b>New bridge over Market Canal</b> The existing bridge over the canal in the extended portion of the old road portion. Utilization of the full width of the 6 lane carriage way requires construction of the new bridge in the extended portion of the road.</p>	Very heavy traffic in this portion of the city creates bottleneck at the bridge portion since only one half of the carriage way has bridge across the canal	51.00	PMD	
7	<p><b>New 12 m. parallel road to NH between Kochupaly Road Junction and Numbalapuram Junction</b> The 477 meters between Thesapally and Education in the western zone of Cochin City is very congested. Many of the fish processing plants and other establishments connected to Marine resources also add to the truck transport in the zone.</p>	Traffic from Mattim-Cherry and Fort Cochin sides can be diverted through this to relieve congestion and traffic block in the old NH portion	11.00	PMD	
8	<p><b>Ernakulam North Overbridge widening:</b> Present North Overbridge in the Cochin Always corridor is only of 2 lane width and is not adequate for the increasing traffic along the overbridge always creates bottle neck. Present proposal is to add two additional lanes on either side to serve the slow moving and sign vehicles</p>	Necessary to serve the needs of the city and to provide a wide berth and to meet bottleneck on the overbridge. No fresh land acquisition required	37.00	PMD	
9	<p><b>Mullaseery Canal road widening and overbridge:</b> The city being located ideally by the railway line the developing areas on the eastern part of the city are congested. The existing Mullaseery canal road starting from MG Road is proposed to be widened upto the railway line near KSRTC bus Station, and to connect to Godehi Nagar road with a new overbridge. The new road is proposed to serve as a new secondary road from the centre to the Nalloor/Kadavanthra inner ring road</p>	A third over bridge is essential in view of the existing bridge over the Canal between Cochin Alapuzha and Cochin Alapuzha corridors to relieve the congestion in the City Centre	160.00	PMD/Railways	

	2	3	4	5	6
10	<p><b>Development of Intersections of roads.</b></p> <p>Road intersections without beltmouth or sufficient turning radii create traffic bottlenecks and cause delays. These bottlenecks are to be removed. The proposed beltmouths at the city centre. Proposed to widen the road intersections and provide channellers road markings and such other devices at 31 selected junctions for smooth flow of traffic.</p>	<p>For good visibility and road safety improvement of intersections is to be done with priority</p>	100.00	PWD Companion of Cochin	As measures for matters relating to channelling city roads, the Commissioner has given top priority for this work.
11	<p><b>Kaloor-Pennemur Road</b></p> <p>This forms widening of the 2 km portion between Kaloor and Pennemur of the Kadavanthra Pennemur Road designated as part of the traver road. The 20m wide road will link the Cochin Airport to the Pennemur road. The widening of the alignment of the road and the buildings on either side are controlled by GUDA under Detailed Town Planning Scheme. This when completed along with the widening of the road will reduce the traffic overcrowding along the Valangumbalam Vytala road to a great extent.</p>	<p>Necessitated as part of the future City Scheme in the north south axis of the city. Also needed for widening road towards the island zone and Chennambator</p>	251.00	PWD	
12	<p><b>New Bridge over Mettancherry Channel:</b></p> <p>The existing bridge connecting Thoppilpaddy and V/Sabo across the Mettancherry channel is very old and has suffered its life. Since there is no direct alternate road connection to the main land from western zone a new bridge of about 100 mts. proposed in the Structure Plan covering 10000 sq. ft. link road and Paluvally is to be constructed with priority.</p>	<p>Alternate link is required from western zone essential since existing bridge has out lived its life. Existence of Naval establishments in Venventually island and its strategic importance of this bridge</p>	600.00	PWD/Port	To add revenue link can be introduced for the usual period after completion Provision for Rs. 600 lakhs expected in the 6th Plan.

	2	3	4	5	6
13	<p><b>Vypren Ennathulam Road and Bridges</b></p> <p>This forms part of the Cochin Peninsular Corridor and extension of middle ring road from Vypren to Ennathulam. The road is at Vaddakkal. This road is to connect the isolated islands of Mulavukad and Vypren; a long cherished dream of the islanders. 3 major bridges will also be required. Alignment of the road is under consideration. The change terminal locations also cross reference to chapter on Water Transport.</p>	Required for the integrated development of the islands	1600.00	PWD	Necessary provision may be made during the 9th Plan period
14	<p><b>Link Roads and Connecting Bridges in Island Zone Madhavady</b></p> <p>Madhavady Island group is at present unconnected. Proposal is to construct 4 link bridges between the islands and form approach roads to the access from the proposed Cochin-Palau Corridor</p>	Required for the integrated development of the island zone	800.00	PWD	Provision for Rs. 800 lakhs expected during 9th Plan Period
15	<p><b>Port Link Road and Bridges</b></p> <p>The new road starting from the Port gate near the existing road, is to be extended to the west and south side of the extended area of Venduthy island to meet the NH bypass at Hettur in Mandu Panchayat. The same align ment is to continue further east as the Cochin Port Road. The road will provide direct access to Cochin Port from NH bypass. 3 bridges also are to be constructed</p>	Road of economic and strategic importance due to existence of Port and Cochin Airport. Alternate bridge also necessitated since existing Venduthy bridge has lived its life	100.00	NH Port.	Work of bridges in progress. Lane width of the bridge to be detailed for 9th Plan period. Provision is included in this report.

	1	2	3	4	5	6
16	<p><b>Construction of Tanker Truck Terminal at Ambalambaghal</b></p> <p>On an average 400 to 500 tanker trucks operate at present in the Ambalambaghal zone for transportation of oil products from Cochlin Refinery. There is no provision for organised parking so much so trucks are parked on the roadside. This causes a lot of obstruction to the commuter traffic. With the commissioning of the Hindustan Organic Chemicals the number is likely to increase soon. Since these are long destination loads, mainly from Gujarat, the waiting times are to be provided essentially.</p> <p>Proposal is to acquire about 7 acres of land in the vicinity of Cochlin Refineries to develop an organised Tanker Truck Terminal with provision for Truck parking, refueling rooms, refreshment room, waiting room, and a separate stage for display of waiting/movement outside etc.</p>	<p><b>Construction of Tanker Truck Terminal</b></p> <p>Priority item as per recommendation of National Transport Policy Committee.</p>	120.00	GCOA/Cochlin References	Contribution from the industrial establishments can be expected.	
17	<p><b>Construction of Truck Terminal at Edappally</b></p> <p>Proposal is to establish a Truck Terminal by the side of NH bypass so as to restrict heavy truck traffic within the CBD in the mode of the country. This will have provision for Truck parking, refueling rooms, repair workshop, fuel filling, restaurants, booking facilities, etc. A combined project costing Rs. 1275.00 billion has been approved by the Government of Kerala (Building Materials Market (Cross Ref: Tank &amp; Commerce)).</p>	<p>Priority item as recommended by Transport Policy Committee for decongesting CBD.</p>	180.00	GCOA	The original estimate for the whole project covering 20 hects of land is Rs. 1275.00 billion (only Phase I Stage) is considered in this.	



1	2	3	4	5	6
18	<p><b>Providing approach to interchange facilities at ferry/railway stations and pedestrian bridges in Island Zone.</b></p> <p>Efficiency in any transport system lies in the availability of appropriate and efficient transportation facilities. Cochlin being blessed with extensive water front proper utilisation of Water Transport mode is very ideal especially in the integrated development of the islands within the region.</p> <p>Proposed is to set up the three available modes namely water, rail and road by providing suitable intermode interchange facilities at appropriate points. In the first phase 10 interchanged terminals are proposed in the road sector at the following points, to</p> <ul style="list-style-type: none"> <li>i) Mani ferry station in Manne Drive</li> <li>ii) High Coast Ferry</li> <li>iii) Viperen Jetty</li> <li>iv) Fort Cochlin</li> <li>v) Champelara</li> <li>vi) Erjiludem North Railway Station (east side)</li> <li>vii) Pambay Railway Station</li> <li>viii) Kalamassery</li> <li>ix) Alappuzha</li> <li>x) Alappally</li> </ul>	<p>Optimization of intermode of energy efficient systems as recommended by the Transport Policy Committee</p> <p>30.00</p> <p>Improved transportation facilities for integrated development of islands</p>	30.00	Cochlin Corporations/ PMD	
19	<p><b>Kalaminthra Road</b></p> <p>This forms the southern portion of the Inner Ring Road. Proposal is to widen the existing road to 42 mts. This also has got a controlled road side parking facility. Detailed Town Planning Scheme of GCDA.</p>	<p>Necessitated as major access road to an extensive residential area which is not served by sufficient public transport facilities</p>	240.00	PMD	

1	2	3	4	5	6
20	<p><b>Ennakulam Ettumanoor Road Widening of portion between Vytilla and Champakera</b></p> <p>The 1.6 km stretch of the Cochin-Vayalambal Road forms the continuation of the 22 m wide Vayalambal Vytilla road. The hill produce from the eastern hinterland and the industrial area are transported through this road. Improvement of this road. The proposed interchange point in Champakera canal (cross reference to chapter on Water Transport) also requires this</p>	<p>Road of economic importance for intermodal interchange facilities at Champakera for integrating the development of islands in the vicinity</p>	30.00	PWD	
21	<p><b>Vayalambal-Champakera Road upto The Ais Hill</b></p> <p>Known as Church Landing Road this is the continuation of the Vayalambal Vytilla Road towards west to connect the Cochim/Manne Drive widening of this 600 Mts. stretch from the interchange point from P.M.G Road to Nagine Drive and the CED.</p>	<p>Essential for relieving the congestion of P.M.G Road and facilitating smooth access to CED</p>	60.00	PWD	
22	<p><b>Improvement and providing side drains for roads in Municipal areas</b></p> <p>Lack of well laid side drains is a main cause for congestion of storm water from the road margins. Proposal is to lay or link the side drains for urban roads and provide cover-slides in areas where the road width is marginal</p>	<p>Protection of road surface from congestion of storm water from the road margins. Cost in road maintenance can be minimised by protecting road surface</p>	50.00	Municipalities/ PWD	

1	2	3	4	5	6
23	<p><b>Irmpanam—Kalmassery Road:</b></p> <p>This forms the outer Ring Road to the city interlinking the industrial magnets of Elkor and Annalamungal. The Cochin Export Process ing Zone, The Cold Station, the new campus of the Government Engineering College, the Government Industrial Estate, the Government Industrial and commercial establishments will also be benefited by this road. Major stretches from Kalmassery to the Cochin Airport are also covered by this road. The Government Engineering College campus is also formed. A bridge at Irmpanam is to be constructed and the remaining portion from Thikkalam to Kalmassery is to be formed.</p>	<p>Major industrial road of economic importance. Substantial Savings in fuel cost and travel time will be gained for the truck traffic from the industrial establishments.</p>	180.00	PWD	
24	<p><b>FACT (Cochin Division)—Koravann Road and bridge at Kochikattambadev.</b></p> <p>This small stretch of link road to about 600 mtrs. and a bridge across Chinnathu will reduce the road distance from FACT (CD) to NH by-pass by more than 10 kms. Also the commuting distance from Annalamungal to Elkor will be reduced substantially.</p>	<p>Road of economic importance due to industrial linkages.</p>	40.00	PWD	

1	2	3	4	5	6
25	<p><b>Tripunithura-Karungghal Road widening and deviation at Ambalamangalath:</b></p> <p>This is the major access road to the industrial belt of Ambalamangalath where there is heavy concentration of petro-chemical industries like Oxyethylene, Oxyethylene Oxide, Carbon and Chemicals etc.</p> <p>In addition to the industrial traffic, this has to cater to the needs of a high degree of commuter traffic to the work centres. The existing road is narrow and congested during peak hours for heavy truck traffic. The location of the LPG plant within the Cochin Refinery also is at a close throw distance from this road.</p> <p>From planning considerations, public transport route should be away from such uses. The proposed road deviation proposal is to form a diversion road of 22' hrs. width from Tripunithura to Muthalaid and widening of the remaining portion upto Karungghal. An existing road is already crossing at Tripunithura is also proposed.</p>	<p>Road of economic importance due to existence of major industrial establishments</p>	140.00	PWD/Railway	Contribution from the industrial establishments within the area proposed for upgrading this.
26	<p><b>Pennarur Edappally Road:</b></p> <p>Improvement of this 1.6 km road from Pennarur to Edappally including formation of a short stretch will link the Naddoanina road forming a bypass route around the NH Junction Edappally and will constitute part of the Cochin Penumbayoor corridor.</p>	<p>Required for relieving the congestion caused by north bound traffic within the CBD</p>	120.00	PWD	

1	2	3	4	5	6
27	<p><b>Vijayan Muniambar Road Improvement:</b> Widening and improvement of this same road along Vijayan island is essential to reduce congestion on this important road in the island. The widening and improvement of these interchange terminals also.</p>	Road benefiting island zone and interchange terminals	50.00	PWD	
28	<p>Old NH widening and improvement—portion between Therapampady and Edacochin</p>	Necessary for reducing the congestion in the western zone	100.00	PWD	
29	<p><b>Pedestrian overbridge across busy roads:</b> Due to increased vehicular traffic, pedestrians are forced aside. Road crossing has become very difficult. Construction of subways will be expensive and time consuming. So the proposal to construct pedestrian overbridges at selected crossing points within the city and Municipal limits.</p>	Pedestrian needs priority. Pedestrian overbridges will be more economic than subways	2000	PWD	
30	<p><b>Panamally Nagar-Continuity Road and bridge upto Port Link road:</b> This will be the extension of the Panamally Nagar main road to connect the Port Link road and other roads. Construction of this road will not only be a boon for the area but also require two bridges also to be constructed</p>	Major secondary road which will help the Port-bound traffic towards north to bypass the CBD	117.00	PWD/Port	
31	<p><b>Construction of Central Bus Station and Interstate Bus Terminal:</b> Proposal is to construct a modern bus terminal for NSRTC with facilities for local and interstate Transport separately. The location suggested is by the side of the NH bypass</p>	Locations and access facilities of existing bus station are bad	300.00	NSRTC	

1	2	3	4	5	6
32	<p><b>Banewasaram West Detailed Town Planning Scheme Road:</b> This is a new road proposed under the DTP scheme of CHN. The road is proposed to be laid in this backward area will gain importance by completing this road.</p>	Required for intimate traffic	80.00	PMD	
33	<p><b>Bidge near Railway Canal In Cochin Marine Drive :</b> Extension of the Marine Drive across the railway canal requires this. The access to the Central Govt. CHRI complex, proposed Regional Park and other facilities in this area will be through Marine Drive with the Myspet/Ernakulam Road. This is essential.</p>	Required as access road to the Regional park to be established at Myspet/Ernakulam Road. This is essential for inter change facilities in the adjoining islands on the west and north zones.	60.00	PMD	
34	<p><b>Pettah/RTI Bypass Link Road:</b> This 1.2 km stretch westwards from Pettah junction upto the Mubarakpet junction will connect the RTI Bypass Road to the Mubarakpet road towards the NH Industrial Traffic from Anikalamthighal also will find this short route to bypass very economical.</p>	Important road link for industrial and commercial traffic.	104.00	PMD	
35	<p><b>Paravally Nagar-NH Bypass Road:</b> Proposed as for a 2.3 km road starting from Paravally Nagar eastwards upto Cochin Bypass as an extension of the Paravally Nagar Thorem road ultimately this will link up with the main road to be laid by the Government to be a shorter route for the Cochin Muvattupuzha corridor.</p>	Road of economic importance	106.00	PMD	
36	<p><b>Muvattupuzha Traffic Control and Management:</b> Proposed it for reducing traffic control and management by specialised training of police personnel.</p>	Traffic control is essential for minimizing road accidents.	10.00	Police	

1	2	3	4	5	6	
37	<p><b>Flyover at Vytilla Junction</b></p> <p>Vytilla junction is the most crowded entrance point to the CBD. Segregation of through traffic from local traffic is essential. A flyover is necessary to facilitate a grade separation at the intersection. The north-south traffic through NH can flow uninterrupted through the flyover. Side connections from the flyover can be given to the roads leading to the residential area. Vytilla road for reducing the cost on land acquisition.</p>	<p>Necessary for the uninterrupted flow of through traffic along the National Highway</p>	150.00	PMD/NH		
38	<p><b>Cochin Marine Drive Extension upto Vaidikals</b></p> <p>Formation of about 3 kms of this portion in the form of a road will be essential for the development of the island zone and the Regional park at Thanthyannilam</p>	<p>Needed for the integrated development of the island zone</p>	150.00	PMD		
39	<p><b>Cochin Madasa Road—New Road portion Between Maduli and Thiruvannikulam</b></p> <p>The existing road from Thiruvannikulam to Madasa has been in a poor condition and will require major repairs. The proposed extension of a link of about 4 kms from Madasa (Part link road junction) to NH standards will facilitate direct access to Cochin Port from the Madasa area. The proposed extension will also facilitate the return hinterland reducing the road distance considerably.</p>	<p>Road of economic importance for integration of significant areas in the eastern regions</p>	247.00	NH (Proposed)		
<b>TOTAL FUND REQUIREMENT</b>				NS 7,20.00		

## (b)—INLAND WATER TRANSPORT

### 7.9 Introduction:

As part of the comprehensive strategy for development of the transport sector outlined in the preceding pages, emphasis is proposed to be laid on planned development of the waterways of this region as an alternate and complementary mode of transport. Although Kerala had an elaborate system of water transport in the past through a network of canals connected by lagoons and backwaters, several factors contributed to its subsequent decline. The priority given to rapid expansion of the road network in the State is one of the main reasons. The consequent neglect of the waterways resulted in this mode of transport becoming increasingly uneconomical and now this sector has only a marginal role in meeting the transportation requirements of the State.

However, a glance at the map of the Cochin region and the confluence of waterways in the region would reveal the special significance of water transport for the area especially for the many adjoining small but inhabited islands which are solely dependent on the waterways for connectivity to the main land to which they are intimately linked. The analysis will be incomplete unless one also takes into account the pressure and strains on road transport. There is a growing realisation that the roadway system by itself cannot accommodate future transportation needs entirely and hence waterways would provide an alternative of high potential. Besides the fact that this region is naturally endowed with large navigable water bodies suitable for inland navigation ecological and environmental considerations favour the development of waterways as an important mode of transport. The need to maintain the several water courses which serve as main drainage channels and the urgent necessity to conserve the shrinking backwaters for the rich life that they sustain are also reasons dictating the choice of waterways as an appropriate form of transport for the region.

It is envisaged that conservation and development of the waterway system would provide a major impetus to the development of tourism. If this mode of transport were to be fully developed Cochin's lure as a tourist destination would be considerably higher than it is now. Maintaining the environmental quality of some of the less inhabited islands (which can be developed as centres of tourist attraction) would form part of this strategy while at the same time preserving the long established settlement and occupation patterns in these areas.

Investment in this sector generates more employment both direct and indirect and this has particular significance in a State like Kerala with high levels of unemployment. Water transport being the cheapest and most energy efficient system for movement of people and goods with minimal damage to the environment due to pollution the overall transport plan for the region has to consider integration and articulation of this mode with the prevailing land use and settlement pattern.

### 7.10 Waterways around Cochin :

The importance of water transport for the region flows from its location and topography. In fact



Cochin is at the centre of a large interconnected system of lakes, canals and lagoons linking it with most parts of its hinterland. The city is also connected by waterway to the other major commercial centres in the State like Kottayam, Alleppey and Quilon. About 30% of the area of the Cochin City Corporation is covered by water sheet, which is one of the highest percentages in India for any city.

The waterways around Cochin comprise of a long reach of the West Coast Canal, the Udyogamandal Canal and the Champakkara canal, which are feeder canals to the two industrial belts here: the large Vembanad lake and a series of interconnected smaller inland canals and water bodies. The West Coast Canal from Cochin to Quilon is likely to be declared as a National Waterway and there is the distinct possibility of developing this canal for cargo movement in parallel with the two main longitudinal roads to the south of Kerala. (The Cochin-Badagara Northern link portion of this coast canal is also likely to be developed with Dutch assistance.)

#### **7.11. Population dependent on Water Transport**

It has been estimated that there are about 7500 households in the islands who are dependent solely on water transport for their daily needs. Apart from commuting for work, this island population is dependent on water transport for movement of produce to and from the city markets. These islands are predominantly residential settlements with the primary economic activities of fishing and cultivation, with a few clusters engaged in manufacturing of coir and brick making. A large percentage of this workforce is also employed outside the islands in non-agricultural activities as well.

In addition, it has been estimated on the basis of surveys that about 18,000 households from the water front regions and peninsular zones depend on this mode for their conveyance needs. About 30% of the total work force and 32% of the student population in the Cochin region resort to water transport for their daily travel.

Even on routes which are serviced by road links, considerations of less cost and travel time and congestion-free journeys tend to favour the development of water transport. The zones dependent on water transport in the region extend as a north-south corridor on the western waterfront.

#### **7.12. Waterway traffic in the region**

It has been estimated that about 60,000 passengers and about 1,800 tonnes of cargo (Annexure I) are transported daily through the waterways in the region. It is significant that out of this, cargo other than industrial raw materials are carried mainly by country craft. Annexure shows the various commodities transported by water in the region. Among passenger routes, the major water route is the Ernakulam-Vypeen route which carries about 25,000 passengers to and from the mainland daily. Whereas passenger movement within the region is confined largely to traffic between the islands/peninsula and the mainland, cargo traffic is directed inland where the industrial units are located.

The following agencies are involved in the transportation of passengers and goods in the region in addition to operating their fleets: these agencies also maintain their own terminal facilities:

- 1 The State Water Transport Department (SWTD)
- 2 The Water Wing of the Kerala State Road Transport Corporation (KSRTC)
- 3 The Kerala Inland Navigation Corporation (KINCO)
- 4 The Corporation of Cochin
- 5 Private agencies

Goods movement around Cochin can be classified under long and short distance.

movement. It is seen that coal, hay and provisions are long-distance movement goods while construction materials, chemicals and manure are short distance movement goods. In the waterways around Cochin, chemicals and other industrial raw materials are moved by motor boats while all other goods are transported by unpowered country boats. One important aspect of cargo movement is the transhipment of raw material from the Cochin Port to the Cochin Division of FACT. This is undertaken by KINCO on barges. During the year 1985-86 KINCO handled 1.50 lakh tonnes of cargo.

#### **7.13 Deficiencies of the present system:**

The present system of water transport in the region is characterised by very low levels of investment insufficient to maintain/provide even basic infrastructural requirements, and a complete lack of planning to integrate this mode of transport with other forms of surface transport. The main problems of this sector are as below.

##### **(a) Lack of maintenance of the waterways:**

Major reaches of the existing waterway network, where boat routes are currently in operation are getting shallower due to siltation with every passing year. This is primarily due to lack of periodic dredging and inadequate maintenance of the canals. These responsibilities are vested with the State Irrigation Department and the Cochin Port within its area. The funds provided for this item of work in the State Plan are very meagre, being of the order of Rs. 58 lakhs only for the State as a whole for the year 1987-88. There is no systematic plan for dredging either. The lack of sufficient dredgers for this purpose is another major problem.

##### **(b) Inadequate fleet strength:**

A recent study conducted by the Greater Cochin Development Authority has revealed that during peak hours an average of 250 to 270 people travel on boats which have a passenger capacity of about 85 persons. At these times of the day most passenger boats are dangerously overcrowded. It is evident that the combined fleet strength of the agencies operating in Cochin is grossly insufficient even to bear the present day traffic. Many of the existing boats are old and obsolete, as a consequence of which they are slow and even unsafe. Considerations of fuel-efficiency and safety therefore necessitate urgent modernisation of this sector.

##### **(c) Absence of terminal/Interchange facilities:**

It is imperative that the different modes of transport in Cochin are properly integrated. Many of the landing places in the region are not properly connected by road. Wharves, Jetties and Landing places in the region are of three types depending upon whether they are owned by the State Irrigation and Water Transport depts., a State Corporation or private parties viz. Public, Private and Semi-Public. Private Jetties are constructed on the basis of designs approved by the State PWD with 50% cost as deposit from private parties. In order to cope with the traffic volume, it is necessary to repair and expand these landing places. For instance, the Main Jetty Terminal situated on the Cochin Marine Drive handles an average of 40,000 passengers per day and nearly 320 boat trips and yet, the facilities available here are minimal. The facilities at the other main terminals at the High Court, Vypin and Fort Cochin are also largely inadequate.

##### **(d) Organisational Problems:**

The four Government agencies operating ferry services in the Cochin region are running them at a loss, for the following among other reasons:

- High overheads and establishment costs and unfavourable manning ratios.

- Unscientific fare structure
- Subsidies for various categories of commuters
- Lack of timely repair of vessels and lack of a centralised repair facility at Cochin
- Lack of fund for improvements

#### **7.14 Proposals for water Transport**

The proposals delineated in this report are based on assumptions relating to the potential for traffic growth in this sector rather than on a mere extrapolation of the present growth rates. This is because it is felt that the present rate of growth is very low, mainly due to lack of infrastructural facilities in the region and if such facilities are provided, the rate of increase in traffic would be much higher. A very conservative estimate (on the basis of projections made by the GCDA) reveals that by the year 2000, the number of commuters in the region is likely to be at least around one lakh.

The increasing pressure on the road/rail network and the hike in freight charges for cargo movement by these modes is likely to result in a somewhat favourable tilt of the present pattern of cargo transport from road to water. The efficiency of water transport to carry long-distance bulk cargo at relatively less cost is one of the main advantages of this system. In any case, in the context of the need for an alternate transport system in the Cochin region and given the favourable geography of this area, the dependence on water transport is expected to substantially increase in future. This trend can be accelerated by modernising the system by forming a network of dredged waterways, introducing fuel efficient and faster crafts and establishing modern terminals with interchange facilities. Proposals for improvement in water transport sector are indicated below.

##### **(a) Water Improvement**

A Dredging Plan for periodical dredging has to be prepared by the State Irrigation Department in consultation with the Port and the user agencies for the maintenance of Cochin's waterways. As an immediate measure, two of the most frequently used routes connecting Manjanakad to Chathanad and portions of the Arookutty route should be taken up for dredging. They connect islands which have no alternate means of transport and in the summer months, only very small boats can operate because of siltation of the waterway.

The maximum quantum of waterborne goods movement in the State is through the Champakkara canal (NATPAC Study 1984). This canal bears the traffic from the Cochin Port to the FACT at Ambalamughal. The canal has a length of about 14 kms and a minimum draft of 2.5 Meters. Under the existing centrally sponsored scheme on inland water transport improvements were sanctioned by the Government of India in 1986 and these works are in progress. A sum of Rs 155.25 lakhs has been earmarked for the purpose which should be sufficient for the purpose. The ultimate intent is to increase the draft to 3 meters. The FACT (Cochin Division) is discharging effluent gypsum into the tail end of the canal which solidifies and obstructs barge movement. FACT has to be requested to make alternate arrangements for effluent discharge.

The Udyogamandal Canal is the second important waterway in the area, purveying cargo traffic to the Eloor Industrial Zone. Deepening of this canal to maintain a 3 M draft is essential. A project has been drawn up by the Irrigation Department at an estimated cost of rupees 189 lakhs and this has been sanctioned by the Government of India in 1985.

Linking the Champakkara Canal and Udyogamandal Canal by widening Edappally canal would provide a navigational link between these two major waterways, thereby facilitating the movement of

goods, particularly container traffic to the Cochin Export Processing Zone from the Cochin Port. These three canals, when linked will function as a major network for cargo movement by water in the region. The preliminary estimate for this work is around Rs. 10 lakhs and it is proposed to include this item for implementation in the Eighth Plan period under the Centrally sponsored scheme.

In addition to the foregoing proposals, the State Irrigation Department has drawn up schemes for improving navigability on the following canals:

- (i) Improvements to the Ayyampilly canal which provides a link to the areas in the northern part of Vypeen.
- (ii) Vijayan Canal in Chellanam Panchayat which connects the backwaters in the south-west of the region to the sea; and
- (iii) The Punchayil Canal

The total estimate for these improvement works is roughly rupees 75 lakhs.

The Irrigation Department has drawn up a proposal for conducting hydrographic survey of the West Coast Canal from Cochin to Quilon at a total cost of Rs. 18.50 lakhs. This work is in progress now and should be expedited.

**(b) Fleet augmentation and modernisation:**

The State Government's Irrigation Department has drawn up a scheme for the procurement of a dredger and water hyacinth harvester to clean Cochin's waterways. Even though the cost of this proposal is rather high at Rs. 620 lakhs, it is to be accorded priority in any proposal for regenerating the waterways around Cochin.

The KINCO has proposals to augment its fleet of barges for carrying industrial raw materials for FACT through the Champakkara and Eloor Canals. KINCO should explore the possibility of availing institutional finance for this purpose.

For the phased replacement of old and obsolete passenger vessels by modern, speedier crafts for carrying the additional passenger traffic and for introducing tourist and other services on new routes, it is estimated that at least 30 passenger boats would be required over the next five years. The approximate cost of acquisition would be around Rs. 500 lakhs.

**(c) Landing places and interchange facilities:**

A comprehensive scheme for modernisation and improvement of jetties in the State has been prepared by the Irrigation Department. The landing places on the State's waterways have been standardised based on the volume of passengers handled by them. Accordingly, jetties are categorised as A, B and C types. Additionally, the Cochin Marine Drive Ferry Station has been categorised as a 'Special Type Jetty', in view of the large number of passengers handled and the regional importance of this terminal once the West Coast Canal becomes fully operational. It is also a significant transit point for cargo movement to and from the important coir trading centres of Alleppey and Kottayam. Two major jetties on the main water-front route from Ernakulam to Vypeen are categorised as 'A' type and others of lesser importance as 'B' type. A number of small, but nevertheless important jetties in the islands are included under type 'C'. The highest priority has to be accorded for the reconstruction of the aforesaid jetties in a phased manner by the end of the Eighth Plan period as the existing landing facilities, especially in the 'C' type jetties on the islands are nominal.

There is a necessity to establish an Interchange Terminal at Champakkara on the banks of the canal. This will facilitate transhipment of goods to and from the Port. Only preliminary estimates of this terminal have been made. This work can be taken up during the Eighth Plan period. It is to be

noted that there is a proposal to connect this point to the Cochin bye pass on NH 47 by constructing a road along side the Champaikara Canal thereby serving the needs of canal bank conservation

There is also the necessity to comprehensively modernize the existing terminal at the Market Basin which services the largest market in the Cochin Corporation (Ernakulam market) and which is the main landing place for country crafts carrying consumer goods. Detailed cost estimates are yet to be worked out

#### **7.15 Other Important Issues:**

The following important issues should receive attention of the State Government

- (i) The fare structure and the manning ratios of the boats plying in the region have to be restructured suitably to make these services economically viable for the operating agencies
- (ii) KINCO has submitted a proposal to establish a centralised Workshop cum—Repair facility at Cochin at a cost of Rs. 150 200 lakhs. This could be designed and constructed so as to accommodate the repair needs of all the vessels plying in the region. Institutional finance could be availed for establishing this workshop
- (iii) The State Government has mooted a proposal to form an Inland Water Authority for directing and co-ordinating activities in this sector. The necessary changes in related legislation may have to be expedited
- (iv) The country craft operators could be brought under the umbrella of the co-operative movement and schemes could be drawn up incorporating elements of cash subsidy, hire purchase as well as preferential treatment in the movement of State owned commodities. The departments concerned will have to formulate the details of these schemes

#### **7.16. Recommendations:**

In view of the vast potentiality for development of water transport in the region, the Team recommend as follows

- (i) The emphasis should be to provide the basic infrastructure and the capital equipment necessary to support the system, anticipating that further development in the sector will follow naturally as a consequence, given the growth potential of the sector. This sector should be accorded preferential treatment from Plan allocations until its viability is well established
- (ii) Out of the total outlay of Rs. 21.57 crores which has been proposed for the schemes relating to IWT, the recommended outlay for the Seventh Plan is Rs. 9.93 crores inclusive of on-going schemes. For the Eighth Plan period, the proposed outlay is Rs. 11.64 crores.
- (iii) The Team suggests bringing about a gradual structural change in the existing transport system. However, this in itself would be inadequate unless backed by a suitable institutional framework capable of ensuring its efficient operation. Elimination of the multiplicity of agencies engaged in water transport and/or the setting up of one Centralised agency to co-ordinate their activities is essential. The proposal of the State Government to institute the Inland Water Authority must be given effect to as speedily as possible. The creation of infrastructure, operation, maintenance and repair of vessels and other components of the system could be integrated and streamlined under this agency in due course.

- (iv) The existing fare structure may be revised. The present fare structure has a number of anomalies and distortions which are to be corrected to ensure cost-efficiency.
- (v) Integration of the existing and proposed systems would be possible only if the unorganised private sector (consisting mainly of small craft carrying retail commodity goods from the Emakulam Market to the west zone) is not neglected nor left to languish, but is given sufficient incentives by way of loans/subsidies. A lump sum provision of Rs. 10 lakhs is suggested during the Seventh Plan for initiating a pilot scheme for purchase / modernisation of country crafts. The State Govt. should co-ordinate the matter and ensure that the private operators take adequate advantage of the interest subsidy scheme which is presently in operation under the auspices of the Ministry of Surface Transport.

There has been no organised attempt to promote inland waterways as an alternate/complementary means of transport in Kerala on a large scale. It is hoped that the investment proposed in this sector as given in Annexure II would provide the necessary fillip for the revival of this mode of transport.

## ANNEXURE I

### Distribution of average daily goods traffic by waterways in Cochin Region according to commodities

Sl No	Commodity	Tonne
1	Rice paddy and rice flour	109833
2	Copra and coconut	42853
3	Hay and green grass	65480
4	Coconut oil cake and other cattle feed	8667
5	Fruits and vegetables	62000
6	Potato onion chilly spices and other provisions	275590
7	Kerosene	2200
8	Limestone and lime shells	78162
9	Chemicals and fertilizers (FACT)	38570
10	Cowdung and organic manures	37450
11	Fibre Teakwood etc	10000
12	Firewood coconut shell charcoal etc	16100
13	Fish and ice	0400
14	Paper and Stationery	3000
15	River sand mud and clay	380710
16	Bricks and tiles	76926
17	Earth gravel etc	4500
18	Granite and rubbles	25980
19	Coconut husk and coir fibre	34200
20	Coir yam and coir products	37543
21	Parcel	55400
22	Industrial raw materials	434000
	Total	1799564

Source National Transportation Planning and Research Centre Trivandrum and G C D A

**ANNEXURE II**

**ABSTRACT OF COST ESTIMATES**

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Schemes	Estimate in Rs. lakhs	Total Rs. lakhs
<b>I. Waterway Improvement:</b>		
i) Chambakkara Canal	155.25	
ii) Udyogamandal Canal	189.00	
iii) Edappally Canal	10.00	
iv) Manjanakkad Chathanad and Arookutty.	20.00	
v) Ayyappan Canal, Vijayan Canal and Puncheri Canal.	75.00	449.25
<b>II. Fleet Augmentation/Repair Facilities:</b>		
i) Dredger	620.00	
ii) Barges for KINCO	225.00	
iii) Others including replacement/purchase of new boats.	500.00	
iv) Central Repair Yard	200.00	1545.00
<b>III. Terminal Interchange Facilities:</b>		
	134.00	134.00
<b>IV. Hydrographic Survey</b>		
	18.50	18.50
<b>V. Incentives to Private Sector</b>		
	10.00	10.00
<b>TOTAL</b>		<hr/> 2156.75 <hr/>

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## (c) RAILWAYS

### 7.17. Introduction

The character of the Cochin region is defined by the Port, the strategic naval installations comprising the Southern Naval Command and the industrial belts around the city. If these institutions are to develop unhindered, the provision of adequate facilities for rail travel and goods movement is essential.

Cochin is presently connected to the North and South by broadgauge railway lines. The northern line bifurcates at Shornur towards Mangalore and Madras. The southern line touches Trivandrum through the towns of Kottayam and Quilon and goes on to Kanyakumari. Work is in progress on the construction of a broadgauge line between Cochin coastal town of Aleppey which will form part of Kerala's coastal railway network.

### 7.18 Existing Situation.

As far as railway facilities are concerned, Kerala as a whole and Cochin in particular lags behind other regions of the country. The rate of growth of the railway network in Kerala in the recent past has been quite insignificant. The length of railway lines per lakh of the population at the country, State and regional levels are given in table below.

#### Comparison of railway network: -

Zones of comparison	Total length (Km)	Length per lakh of population (Km)
India	60050	12
Kerala	922	4.6
Cochin region	70	3.5

Among the municipal towns falling within the Cochin region, Parur and Perumbavoor have no railway facilities. On the currently running long distance trains, the allocation of seats and berths to cities like Bombay, New Delhi and Calcutta is inadequate compared to the demand generated on account of people from the region who live and work in these cities.

There is daily commuter movement within a zone of about 75 Km towards the north of Cochin (Trichur town) and 60 Km towards the south (Kottayam town). It is estimated that about 10,000 people commute daily between Cochin and the adjoining regions by utilising the railway system. This segment of the population has to depend mainly on long destination trains for their movement. With

provision of facilities for fast movement on short-haul trains, the pressure on housing and land in Cochin could be reduced.

Altogether there are 13 railway stations falling within the region at an average interval of 5 Kms each. The major railway stations falling within the region are the Alwaye railway station, Ernakulam junction and Ernakulam town station. Facilities at these stations are inadequate to cope with the present passenger flow.

There is one marshalling yard in an area of 35 hectares at Ponnurruni in the Central city and the loco yard is situated on Willingdon Island near the Port. There is also a diesel shed at Ernakulam south station for homing 20 diesel shunters.

### **7.19 Proposals for Improvement in Rail Transport in the region**

#### **Route Expansion and Augmentation:**

The major route expansion programme of the Railways in the region is the proposal to connect Cochin and the coastal town of Alleppey by a broadgauge line of 57 Kms length. This work is ongoing at the moment and funds have been allocated in the Seventh Plan for the purpose. The present cost estimate of the Project is Rs. 56.90 crores against expenditure of Rs. 30 crores already incurred. This revised estimate has to be sanctioned. It is expected that this railway line will considerably ease the load on the corresponding highway and further add to the traffic through the Ernakulam junction station. The Team recommends that the highest priority should be accorded for the early completion of this line.

One of the main demands of the islanders is to connect Cochin by a coastal line running through Vypeen Island to Kuttipuram and Trichur in the north. However, no specific proposal has been formulated in this regard. Likewise there is popular demand for a railway line from Cochin to Madurai crossing the western ghats. This line would increase the accessibility between the Cochin Port and the hinterland where spices, etc are grown provided its economic viability is established. (The construction of the road highway connecting these two towns has been taken up.)

One of the proposals awaiting approval by the Railways is the scheme to convert the southbound line from Cochin to Kottayam into a double line. No detailed estimates have been worked out till date, though it is estimated that the cost would be approximately Rs. 2700 lakhs. The Team recommends taking up this line as economic viability is reported to have been established.

#### **Improvement of Stations and Marshalling and Loco Yards:**

The Ernakulam South railway station is the biggest and most important station in the region. Works are on-going here for the provision of a Parcel Office Complex at a cost of Rs. 28.5 lakhs and also for a Rest House at a cost of Rs. 20.4 lakhs. Additional platforms and facilities for coach maintenance are contemplated here at a cost of Rs. 1 crore, but the proposal has not been accorded sanction. It is hoped that this scheme would be sanctioned for work to commence in the Eighth Plan period.

The second important railway station in the region is the Ernakulam North station. It is proposed to construct additional platforms here and to lengthen the existing ones. The entire upgradation proposal is expected to cost Rs. 1 crore and this scheme could be sanctioned in the Eighth Plan period.

Provisions of railway siding to the FACT at Udyogamandla at a cost of Rs. 1000 lakhs will become an imperative necessity with the commissioning of the Caprolactum Unit under construction here. But this would have to be financed by the concerned user agency.

It is estimated that the monthly freight traffic to the Ernakulam Goods Station is 18367 tonnes. Considering this volume and the anticipated increase, construction of a Goods Shed Station at Ponnuranni is proposed at a cost of Rs 600 lakhs in the Eighth Plan period. The land presently used for this purpose falls in the heart of the city and once released could be ideally utilised for commercial development schemes under the aegis of the GCDA.

The Cochin Refineries has made a request for the provision of additional facilities to their yard at Ambalamughal for transport of petro products at a cost of Rs 600 lakhs to be completed by 1995. The proposal would however have to be financed by the users.

The development of the Cochin Harbour Terminus station which serves as the chief transshipment point to the Port, is very important. The monthly freight traffic here is about 19 770 tonnes. Recently the Civil Aviation ministry and the State Government have been exploring ways to shift the railway line leading to this station in view of proposals for expanding the Cochin airport. The ultimate route alignment would depend upon the final decision on expansion/relocation of the air port.

#### Overbridges and electric traction

There are four points in the city (Gandhi Nagar, Pulepady, Kathrikkadavu and Kalamassery) where there are rail/road intersections. Both these modes are heavily used at these intersections. At Ambalamughal also there is such an intersection where there is heavy tanker traffic to Cochin Refineries Ltd. crosses the railway line. There is a strong case for construction of railway overbridges at these points. However detailed estimates for these flyover bridges remain to be worked out as also trying up of funds from state sources as per norms of the railways.

Conversion of the Cochin Kottayam Sector to electric traction is one of the proposals contemplated by the Railways for implementation in the Eighth plan period at a cost of approximately Rs 1200 lakhs as this is the highest density sector in Kerala. But in view of the power deficiency experienced by the State, assured supply of electricity has to be examined before the proposal is firmed up.

#### 7.20 Recommendations

(i) The Team recommends projects mentioned below to be taken up. Fund requirement till the end of the Eighth Plan period (1988-1995) for these proposals is as follows:

1	Additional allocation for Cochin Alleppey line	Rs 2690 lakhs
2	Doubling of Cochin-Kottayam Line	2700
3	Construction of Goods Shed near Ponnuranni and shifting of Ernakulam Goods Stations	600
4	Coach maintenance facilities at Ernakulam Junction	100
5	Construction of Rest House at Ernakulam Junction	21
6	Construction of Parcel Office Complex at Ernakulam Junction	29
7	Construction of additional platforms in Ernakulam North Station	100 lakhs

TOTAL

6240 lakhs

(ii) Of the above amount Rs 37.4 crores will have to be provided during the Seventh Plan period leaving the balance of Rs 25 crores to be provided in the Eighth Plan.

#### (d) AIR PORT

7.21 While considering the adequacy of the Air services available in the region it must be said that though Cochin is presently fairly well connected to most major centres of the country by air, further expansion of the air services raise certain problems. These problems arise from the fact that the Cochin Airport does not permit landing of larger and wider bodied aircraft than a Boeing 737 as the present length of the runway is inadequate. Expansion of the airport by extending the length of the runways is however subject to two constraints— (1) the lack of available land at the present site unless extensive reclamation of the backwaters within the Port limits is resorted to and (2) the possible adverse impact of such expansion on the operations of the Port.

#### 7.22 Present Situation

##### Air-Services:

The Airport, which is at present functioning on the Willingdon Island is owned and maintained as an air station by the Southern Command of the Indian Navy and therefore commands a great deal of strategic importance in addition to its being utilised as a civil airport. Cochin Airport is an important terminal handling a substantial volume of passenger and cargo traffic. The Cochin Bombay Sector is a particularly heavy sector on account of the Gulf traffic on this route.

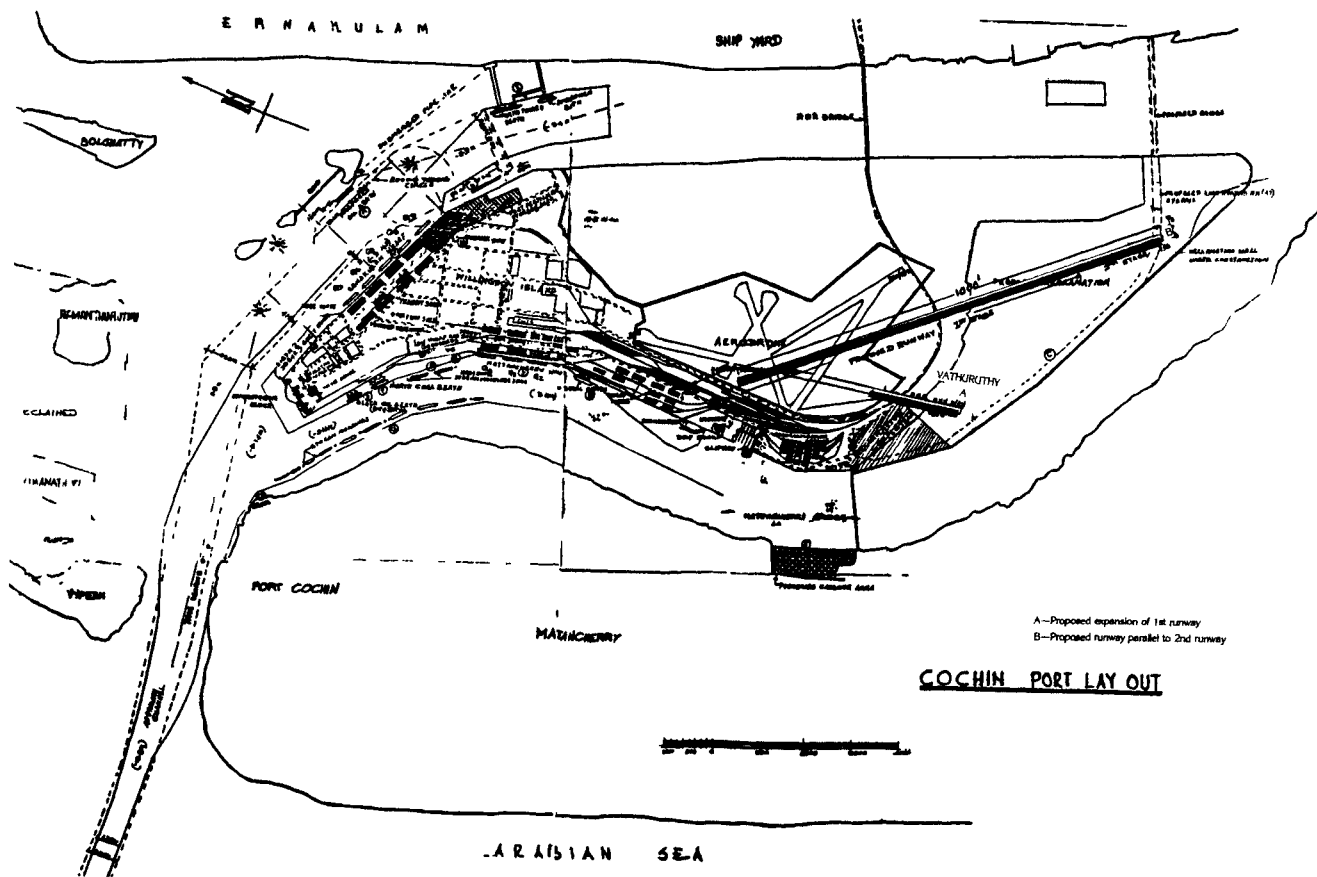
##### Passengers and Cargo Traffic:

At present there are 8 flight services by 737 Boeing operating from Cochin airport to Bombay, Madras, Delhi, Trivandrum, Goa and Bangalore. About 1.91 lakh air passengers travelled to various destinations during 1986-87 against 1.82 lakh passengers during 1985-86 which is indicative of the increased demand for air services from this airport. Similarly a total of 9.05 lakh Kgs of air cargo and mail was despatched from the airport in 1986-87. Regarding incoming traffic the figure was 2.23 lakh passengers and 20.05 lakh Kgs of cargo in 1986-87 and the respective figures for 1985-86 are 2.19 lakh passengers and 19.33 lakh Kgs of cargo. Vayudoot services are available for 3 days in a week to Madurai and Madras. Helicopter services are also available from Cochin airport to the Lakshadweep Islands. There is a proposal to start a regular service to Lakshadweep Islands twice in a week and this is likely to be implemented in the near future.

##### On-going Schemes:

With a view to providing more facilities to the air passengers the Civil Aviation Department have sanctioned some minor improvement works at a total cost of Rs. 17.21 lakhs.

- (i) Construction of a visitors gallery on the top of the VIP room.



- (ii) Expansion of airport restaurant; and
- (iii) Expansion of present VIP room.

### **7.23. Proposals for Expansion of the Cochin Airport:**

Considering the importance of Cochin, its future traffic potential and the transport requirements of the region, there appears to be a definite case for considering expansion of the airport, notwithstanding the proposal for making Calicut airport operational shortly. In response to the repeated demands of various sections to either establish a new civil airport or expand the present one, the State Government has, of late, been exploring both the possibilities and has recently constituted a Committee with representatives from the National Airports Authority, the Central Ministry of Civil Aviation and the State Government, the Cochin Port Trust, Railways and the Indian Navy to examine all aspects relating to the two alternatives.

The possibility of constructing a new air port is rather remote at this point of time on account of the costs involved in acquiring and developing a green-field site within a reasonable radius from the centre of the city. Six sites have been suggested for the construction of a new air port and these sites are under consideration of the Committee. It has been estimated that about 750 acres of land would have to be made available for such a site *is to be developed in addition to construction* charges of about Rs. 30 crores. The proposal for expansion of the present air port to receive larger aircrafts is also under examination by this committee. Such expansion would involve either the extension of the present primary runway by 2000 feet or the development of a 5000 feet long runway parallel to present secondary runway at a rough cost of Rs. 6 crores. (See Map). But such extension, in either case, would involve reclamation of land from the sea, the re-alignment of the existing railway line and the shifting of the Vathuruthy village to an alternate site, all of which excluding runway expansion is estimated to cost about 17 crores. Of this, the expenditure involved in rehabilitating the inhabitants of Vathuruthy village, likely cost of Rs. 2.7 crores, is to be borne by the State Govt. This amount has been shown in the chapter on Housing. It is to be noted that Cochin Port has raised strong objections to the proposal for reclamation of land for expansion of the air port on the grounds that reclamation for air port purposes would affect its proposed expansion plans as well as being technically difficult and time consuming. Under the circumstances the specific recommendation in this regard can be formulated only after the above-mentioned committee's views on the relative merits of expansion of the present air port *visa-vis* the development of a green-field site are known.

### **7.24 Recommendations:**

In view of the diversity of views prevailing in the matter, the Team is not in a position to make any specific recommendation about the manner in which air port facilities in Cochin can be improved. Assuming that a 5000 feet long runway parallel to the existing secondary runway emerges as the most feasible and acceptable proposition, the total cost would be around Rs. 20.40 crores inclusive of cost of reclamation of land and shifting of the railway line (about Rs. 15 crores) but exclusive of the cost of rehabilitating the inhabitants of Vathuruthy village (Rs. 2.7 cr.) to be taken up by the State.

## CHAPTER EIGHT

### COMMUNICATION

#### 8.1. Introduction

The comprehensiveness and the sophistication of the communications network is an important indicator of the level of a region's development. A reliable communications network is a basic prerequisite for the growth of commerce and industry especially in a port city like Cochin.

The network in the Cochin region to which this report addresses itself has to cater to a population of about 15 Lakhs and needless to say the spread of this network has not been commensurate with the urban growth.

#### 8.2. Present Situation

The communications sector comprises of the **Postal Service, Telephones, and Telegraphs**. There are 37 post offices in the region which is on par with the national standards so far as population coverage is concerned. Nine of the islands in the region have post offices located within the islands while the rest are served by those located in the adjoining areas. It is seen that the number of articles sent by post offices from Cochin is one of the highest in the country being 17.25 lakhs articles per day. Cochin is connected by the speed post service to 15 centres in India. One of the major problems impeding the expansion of postal services in the region is the lack of accommodation. It is suggested that separate space must be earmarked for this purpose while developing planned residential areas.

While the region is adequately covered by postal network the existing telephone network is not sufficient to cater to the demand. The Cochin region falls within the Ernakulam Telephone District and here about 10,225 applications are pending for new connections. It is estimated on the basis of present trends that there will be 25,000 additional applicants by the end of the Eighth Plan period. The department has plans to give 5,000 new connections per annum at a unit cost of Rs. 30,000. Since only five of the islands have public call offices the Department could consider extending this facility to other islands as well. However, the major problem in implementing the expansion plans of telephones relates to the necessity of laying large quantities of underground cables in the city in addition to augmentation of switching capacities. Although the Department has embarked upon an ambitious Cable Duct Scheme estimated to cost Rs. 10 crores during the current plan, not much progress has been made as laying of these cables involves keeping road sections open for a period of 3 to 4 months which would result in dislocation of traffic for that period.

**This problem is primarily due to a lack of planning and co-ordination on the part of the various civic authorities concerned. Delay in land acquisition has also hampered the expansion plans of the department. Priority must be given to completing such acquisition within a reasonable period.**

### **8.3. Recommendations**

The list of schemes which is proposed to be taken up for augmenting services in the telephones and Post and Telegraph sectors are given in the Annexure. The schemes in the telephones sector relate to capacity expansion in the telephone exchanges of the region, computerisation of trunk exchanges, establishment of new exchanges and the provision of a digital microwave system during the Seventh Plan period at a total cost of Rs 2688 lakhs. The District Manager, Telephones, has estimated that the requirements for the telephones sector in the Eighth Plan period would cost Rs. 5000 lakhs approximately and detailed proposals would be formulated in this regard.

In the Post and Telegraphs sector, an amount of Rs 411 lakhs is required till the end of the Eighth Plan period for construction of a Central Telegraph Office in Cochin, construction of zonal offices, land acquisition costs and expansion of the computerised telegraph switching system. Out of this requirement, Rs. 106 lakhs has been provided in the Seventh Plan and Rs. 305 lakhs has to be allocated in the Eighth Plan.

Thus the totality of recommended schemes in the communications sector would require an amount of Rs. 8099 lakhs, out of which Rs. 2794 lakhs has been already provided in the Seventh Plan period. It is recommended that the balance amount of Rs. 5305 lakhs be provided in the sectoral allocations for the region during the Eighth Plan.

The cable laying and the duct laying scheme of the Telecommunications Department require effective co-ordination with other regional agencies like the City Police, the Municipal Corporation and the State Govt. Lack of such co-ordination results in damaged roads and disruption in the cable laying schedule. This is one of the primary grievances of Cochinites also. The existing co-ordination Committee be activated and subsequent follow-up action speeded up.



**ANNEXURE**  
**AUGMENTATION OF COMMUNICATION FACILITIES**

**A. Telephones:**

	Fund required (Rs in lakhs)
1 Electronic Local Exchange at Palanvattom—3000 lines	450
2 Expansion of Ernakulam Exchange — 3000 lines	200
3 Digital Trunk Automatic Exchange — 2000 lines	200
4 Digital Trunk Automatic Exchange expansion —1000 lines	100
5 Computensation of Trunk exchange	75
6 New Cross Bar exchange at Trnpunithura — 1500 lines	350
7 do do-expansion	100
8 Ambalamughal Exchange—300 lines	62
9 Nettoor exchange —300 lines	60
10 Kandakadavu exchange—300 lines	61
11 Digital Microwave system Ernakulam	107
12 Expansion of Kalamassery exchange	233
13 North Parur Exchange—Expansion 400 lines	60
14 Njarakkal Exchange—2000 lines	30
15 Alwaye Expansion—2000 lines	200
16 Mattancherry—4000 lines	400
Total	2688

**Note :** The above listed schemes stands cleared already and are in various stages of implementation. For the Eighth Plan period about Rs 5000 lakhs are required for the expansion of telephone facilities for which the department has to work out detailed proposals

**Total Fund required for the expansion of Telephone facilities upto 1995 Rs. 7688 lakhs**

**B. Telegraphs:**

	Fund required (Rs. in lakhs)
1. Zonal Telegraph Office at Broadway	2
2. Telecommunication Bureau at Perumbavoor, Udyogamandal & North Parur.	6
3. Expansion, development and construction of Central Telegraph Office, Cochin.	65
4. Expansion of Computerised Store and forward message switching System.	100
Total fund required for the expansion of Telegraph facilities upto 1995.	<hr/> Rs.173 lakhs. <hr/>

**C. Postal Services :**

1. Building Projects	188
2. Land Acquisition cases	28
3. Important offices for which sites are to be located	22
Fund required for Postal services upto 1995.	<hr/> Rs. 238 lakhs <hr/>

B + C = Rs. 411 lakhs

## CHAPTER NINE

### POWER

#### 9.1. Introduction:

The per capita consumption of electricity is an important index by which the growth of a State or a region is assessed. The present per capita consumption of electricity in Kerala is only 140 Kwh as against the all India average of 190 Kwh. The State of Kerala is endowed with adequate potential for hydro electric power generation (3000 MW at 60% load factor) but only 35% has been developed so far. The lack of financial resources coupled with stipulations under the Forest (Conservation) Act 1980 have stood on the way of development of hydel resources in the State. With no fossil fuels and no thermal or nuclear plant, Kerala is solely dependent on hydropower which is subject to the vagaries of the monsoon.

The State had a comfortable power position till the year 1982-83. Thereafter, due to the rise in internal demand and failure of successive monsoons, power cuts and load shedding had to be imposed from year to year in varying degrees until the power situation reached crisis proportions in 1987 with very severe power cuts on industries and 57 hours load shedding for domestic consumers in the region.

The Cochin region, the focus of industrial and commercial activity in the State, accounts for over 40% of the total power consumed in the State. The problem of power shortage has been one of the main reasons for the slow down in industrial growth in the last few years. In spite of the fact that the area already has a number of core industries capable of generating sufficient impetus for setting up of related ancillary units, it has not been possible to attract investors without adequate power. The major industrial establishments of the State such as FACT, the Oil Refinery, HMT, Cochin Shipyard, Indian Aluminium Co., the defence establishments under the Southern Naval Command and the Port Trust are located in the region. It may be noted that out of the 14 EHT consumers in the State, 9 are located within the region. Several medium and large scale industries could not be commissioned for want of adequate power. The constraint of inadequate power has led to restrictions on power connections for both domestic and commercial use. At present, there are 21,750 connections pending in the region.

The transmission and distribution system is to be fully matched to carry power to the consuming centres, if losses are to be kept at a minimum level. This report highlights the necessity of augmenting power generation as well as improving the transmission and distribution system for feeding power into the area more economically.

#### 9.2. Anticipated Demand, Availability and need for Augmentation:

Based on the figures of energy availability and requirement for the State (as projected from the 13th Central Electricity Authority Survey Report, 1987), the deficit in energy for the State during 1988-89 and 1989-90 would be 564 million units (8.75%) and 728 million units (10.6%)

(Annexure I) The details of the power requirements in the region by 1991 (domestic and commercial) is given in Annexure II

Thermal power plant (420 MW) at Kayamkulam in Alleppey and Chalakudy HEP (200 MW) in Trichur district can be expected to be fully operational only in another 5--7 years. Based on the projections by the Kerala State Electricity Board the power availability of the State by 2000 A.D. even with the proposed plants commissioned would only be 11848 million units against requirement of 17543 million units resulting in a shortage of 32.5%

In the context of the bleak power situation in the region urgent steps are called for to improve availability of power. Measures for augmentation of power generation and improvements in the transmission and distribution systems are also to be implemented if the crisis is to be overcome

### 9.3 Proposals for improvement of Power Situation

#### (i) Gas Turbine station at Brahmapuram

There is no possibility of substantially augmenting power generation in Kerala either with a thermal or medium hydro power project in the immediate future. (Consequently the only short term solution would be a diesel based Gas turbine station of 90 MW (3 × 30 MW) capacity. If sanctioned immediately this could be completed within 24 months with benefits accruing in stages from 1989--90 onwards. Being packaged units they could be installed in ready assembled condition. The civil and other appurtenant works are minimal. It is proposed to set up this unit at Brahmapuram about 18 Km from Cochin city where a 220 KV substation is now under construction. The water requirement is negligible. Such gas turbine units are well proven all over the world. Although for the present these units might have to be imported (delivery time indicated is 9/12 months) for future requirements of spares and services BHEL's expertise could be available as they have commenced manufacture of such units. As per the manufacturing programme of M/s BHEL in 1988-89 they have already embarked upon manufacture of gas turbine units from 5 to 38.5 MW (They have already supplied 2 × 15.5 MW capacity plants to M/s Bharat Petroleum Ltd. Bombay and 2 × 20 MW plants to M/s ONGC Hazra). There is no other source from which sizeable energy could be availed for immediate requirement of the industrial belt of the Cochin area. The cost of the installation is likely to be approximately Rs. 100 Crores. The Team would suggest as follows:

- (i) The 90 MW gas turbine installation should be given immediate consideration. As natural gas is not available High Speed Diesel Oil would have to be sanctioned on a priority basis for running these units. The extent to which LSHS (Low Sulphur Heavy Stock) oil could be available from Cochin Refineries would also have to be examined.
- (ii) Kerala at present receives only 10% share from the central power projects in the southern region. (The present power allocated to Kerala from the Ramagundam Thermal Plant Stage I (installed capacity 3 × 200 MW) is 66 MW, the Neyveli Thermal Plant (installed capacity 3 × 210 MW) is 63 MW and Kalpakam Plant (installed capacity 2 × 235 MW) is 25 MW). In view of the crippling power shortage that looms ahead for the State of Kerala a higher allocation of power out of the central share in such projects may be considered for the future.

#### (B) Transmission & Distribution System

The existing Transmission and Distribution system is inadequate to cope with the requirements for economical transport of power from generating stations to the consuming centres. Losses in

transmission in Kerala have touched 26% in some years against the situation obtaining in other States ranging from about 16 to 20% (while the International Standard of losses are within 14%)

The reason for this situation is the disproportionately long length of HT and LT lines radiating from existing 66/110 KV substations. A route length of 245 Kms of 11 KV lines, 665 Km LT 3 Phase lines and 475 Km LT single phase lines alone cater to the Cochin central city.

As already stated the Cochin region accounts for over 40% of the total energy consumption in the State. The 220 KV substation at Kalamassery in the region is the biggest nerve centre of the transmission system in the State. But the Transmission and Distribution system in the region has become outdated and inefficient. The Cochin Central City with a perspective growth of 10% has at present only 4 feeding points in the substations at Vyttila, City North, Njarakkal & Mattancherry for the 245 KM of 11 KV line and 1140 KM of 400/230 VLT line and 285 Nos of distribution transformers. With only four feeding points, 11 KV feeders from the substations extend to long distances to feed load centres resulting in large line losses of nearly 20%. It is in this context that the Team feels that system improvement must receive urgent attention.

Kerala State Electricity Board has prepared a Master Plan for the Cochin city and adjoining areas to meet the power requirements during the next 10 years. (The present load in the Cochin Central city covered in the Master Plan is anticipated to be 136 MVA in 1991, 272 MVA in 1998 and 412 MVA in 2000 A.D.) The scheme envisages the setting up of four 110 KVA substations at Kaloor, Palluruthy, Thikkakara and Naval Base (MES) and one 66 KV substation at National physical and Oceanographic Laboratory, Thikkakara. The cost for these substations is estimated at Rs. 7.635 crores. (See Annexure). 10 Sub stations are proposed in the plan as Stage-II. The cost of Stage II as detailed in Annexure is estimated at Rs. 15.97 crores. For the improvement of the distribution system, 30 Nos of 11 KV switching stations, 100 kms of 11 KV OH lines and U.G. Cable, estimated to cost Rs. 8.10 crores are proposed.

In addition to the works included in the Master Plan for the provision of service connections to the expected number of consumers, works costing Rs. 6.08 crores have been proposed in this report. These include the provision of HT & LT service connections, installation of 500, 250 and 160 KVA transformers, construction of HT and LT lines, improvements to street lighting and communication system. The total cost of these proposals is estimated to be Rs. 6.08 crores.

Besides the above, the works for improvements to the distribution system in the suburban area of the Cochin central city, estimated to cost Rs. 5.29 crores are included as part of the suggested programme.

As per figures furnished by KSEB, Board, an anticipated 10% growth per annum is expected in Cochin central city for the period upto 2000 A.D. when the requirement of energy would be 1250 M.U. With the proposed investment of Rs. 43.8 Crores as indicated above, a substantial reduction in transmission losses is expected.

#### 9.4. Financial Implications:

A brief summary of the estimated project costs is given below

1 Capital cost of 90 MW Gas Turbine Plant in Brahmapuram	Rs 100 Crores	
2 Transmission & Distribution Schemes		
a) Transmission Stage I	Rs 7 635 Crores	} Rs 43.075 crores
b) Transmission Stage II	Rs 15 970 Crores	
c) Distribution system improvement and additions	Rs 8 100 ,	
d) Provision for service connections	Rs 6 080 ,	
e) Cochin city suburban area distribution network	Rs 5 290 ,	
Grand Total Rs 100 crores + Rs 43.075 Crores	Rs 143.075 Crores	

#### 9.5 Recommendations:

As already discussed in the body of the chapter the Team recommends as follows

- (i) Speedy clearance and execution of the Gas turbine project at Brahmapuram at a cost of Rs 100 Crores. The Power Finance Corporation set up at the national level may fund this project atleast to an extent of Rs 80 Crores
- (ii) The extent to which more power can be allocated to Kerala from the Central share in the Ramagundem, Neyveli and Kalpakkam projects may be explored
- (iii) Improvement of the Transmission and Distribution system may be undertaken on a priority basis

ANNEXURE I  
ENERGY AVAILABILITY & ENERGY REQUIREMENT KERALA  
BASED UPON 13TH CEA SURVEY REPORT:

	Actual			Provisional			Estimated				
	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Installed Capacity—MW	1012	1012	1012	1012	1309	1477	1477	1477	1492	1610	1735
Peak Availability—MW	798	796	812	906	1002	1097*	1254	1334	1419	1509	1638
Peak Load—MW	796	796	812*	906	1002	—	37	27	-31	-25	-49
Surplus (Deficit)—MW	384	386	3675	4624	5181	5111*	5394	5878	6122	7126	7644
Energy Availability—MVAH	3841	3869*	3675*	4624	5181	5111*	6058	6442	6890	7285	7911
Energy Requirement—MVAH	—	—	—	—	—	—	-664	-364	-728	-125	-287
Surplus (Deficit)—MVAH	—	—	—	—	—	—	-664	-364	-728	-125	-287

	Estimated		
	1992-93	1993-94	1994-95
Installed Capacity—MW	1735	2005	2595
Peak Availability—MW	1656	1729	2126
Peak Load—MW	1772	1931	2096
Surplus (Deficit)—MW	-116	-202	30
Energy Availability—MVAH	6948	8023	10121
Energy Requirement—MVAH	—	—	—
Surplus (Deficit)—MVAH	-565	-1004	-188

\*Revised

**ANNEXURE II**  
**ESTIMATE OF REQUIREMENT OF POWER IN COCHIN REGION BY 1991**  
**(DOMESTIC & COMMERCIAL EXCLUDING INDUSTRIAL)**

Sl No	Name of urban area Panchayat group	Domestic and all other uses except industrial		Light and small scale industries		Medium and large scale industries		Total power requirements ( lakh KWH/day)
		Population in lakh	Consumption in lakh KWH/day	No of workers in 000	Consumption in lakh KWH/day	No of workers in 000	Consumption in lakh KWH/day	
1	Central City	13.41	6.70	38.30	1.53	70.40	70.40	78.63
2	Perumbavoor	0.80	0.40	2.28	0.00	9.90	7.60	8.09
3	Pattur	0.45	0.23	1.29	0.05	7.00	3.50	3.78
4	Alwaye	0.36	0.19	1.14	0.05	7.00	3.50	3.74
5	Marayur Panchayat Group	0.30	0.15	4.26	0.17	4.56	2.87	3.15
6	Changanassery Panchayat Group	1.49	0.30	4.26	0.17	4.56	2.87	3.15
7	Changanassery Panchayat Group	1.53	0.31	4.38	0.18	8.10	4.86	5.35
8	Thiruvananthapuram Panchayat Group	1.59	0.32	4.55	0.18	2.82	1.69	2.19
9	Mulattur Panchayat Group	1.30	0.27	3.89	0.16	3.60	2.16	2.59
10	Porumbuzha Panchayat Group	0.40	0.06	1.15	0.05	—	—	0.13
Total (Cochin Region)		22.31	8.98	63.79	2.56	118.46	99.74	111.26

Assuming 2% yearly increase demand for 2000 A.D. would be 123 lakh units/day

Source: Projection of Town Planning Department



**ANNEXURE III**  
**COST OF DETAILS OF PROPOSALS**

I) Augmentation of Power Generation 90 MW Gas Turbine Plant at Brahmampuram	100 00 crores
<b>II) Transmission &amp; Distribution Schemes in Cochin Central region</b>	
<b>a) Transmission 1st stage (5 substations)</b>	
Cost of land	60 0 lakhs
Cost of substations	523 0 ..
Cost of lines (34 KMs)	180 5 ..
	<u>7 639 crores</u>
<b>b) Transmission 2nd stage (10 substations)</b>	
Cost of land	85 Lakhs
Cost of substations	1160
Cost of lines	142
Cost of cables (14 KMs)	210
	<u>15 97 crores</u>
<b>c) Distribution</b>	
i) 30 Nos. of 11 KV stations	3 60 crores
100 K.Ms. 11 KV O/D structures	1 00
100 K.Ms. of U.G. cables	3 50
	<u>8 10 crores</u>
<b>ii) Addl. Work for providing service connections</b>	
Providing service connections 100 HT services	50 0 Lakhs
30 000 LT services	180 0
Installing transformers	73 5
<b>Constructing</b>	
500 K.Ms. of 3 Phase line	150 0 Lakhs
500 K.Ms. of single Phase line	100 0
Improvements and additions	35 0
Communication system	20 0
	<u>6 08 crores</u>
<b>d) Transmission and Distribution schemes in Suburban areas of Cochin Corporation</b>	
11 KV transmission system	85 5 Lakhs
LT distribution Installation of transformers service connections street lighting	443 5
	<u>5 29 crores</u>
<b>Grand Total for transmission and distribution systems</b>	<u>43 075 crores</u>
<b>Grand Total I &amp; II</b>	<u>Rs. 143 075 crores.</u>

## CHAPTER TEN

### INDUSTRIES

**10.1** Economic policy in general and industrial policy in particular is largely shaped by and are reflective of considerations operating at the State and national level. The approach of the Centre State Team in respect of industrial development of the Cochin region can only be indicative. Government's efforts to further industrial growth in the region have to be matched by entrepreneurial initiative and participation. Hence specific prescriptive programmes of industrial development do not form part of this report. It is also neither possible nor desirable in the context of the terms of reference to specify exactly what is to be the magnitude of investment in the industrial sector nor indicate what industrial unit is to come up where and when. But since it is possible at least to identify certain growth areas in industrial development at the regional level it is also desirable to plan ahead for such growth rather than make belated and adhoc adjustments in response to growth impulses in future. At the same time the impact of the general industrial policy of the State on the urban region can be evaluated and spatial and other implications of sectoral investments worked out and planned for accordingly. This aspect is important as the preparation of investment plans without taking into account physical plans worked out for the area has been of the main lacuna in the urban planning process earlier.

**10.2** It is a well accepted fact that urbanisation is largely a corollary to industrialisation which in turn depends on general economic growth. The correlation between economic growth and industrial growth has to be kept in view while planning for an urban region. Though this aspect was given due importance even while drawing up the Development Plan for the Cochin region in 1976 by the Town Planning Department, this document has so far remained as a mere theoretical blueprint, with industrialisation trend in the main following its own dictates. This has been one area where lack of coordination between various agencies concerned has resulted in a number of problems including haphazard growth and costly delays.

**10.3** The three main factors to guide overall industrial policy for the Cochin region as spelt out in the Development Plan are

- (i) Conformity with the essence of the settlement structure proposed for the region
- (ii) Optimum utilisation of the existing infrastructure particularly transport and planning of investments so as to take advantage of proposed infrastructure improvements and
- (iii) Prevention of haphazard development of industries to achieve balanced development of the region.

**10.4.** The main tool by which balanced growth and the desired urban form for the region (which in the case of the Cochin region is to consist of a highly urbanised central city and a series of

hierarchical nodal growth centres to ensure decongestion of the core city and growth of compact, self-reliant and smaller settlements) can be achieved is through the industrial location policy in the light of the transport network. It is felt that evolving a sound industrial location policy is of utmost importance in guiding balanced growth of the region. With a declining agricultural base, the dependence of the regional economy on the secondary and tertiary sectors is correspondingly higher. The total secondary sector employment for the region is estimated by GCDA to be around 2.5 lakhs by 1991. The high incidence of unemployment in the region requires that development programmes in the sector have to provide for greater employment opportunities. It is in this context that the Team has considered the scope for further industrialisation in the area. Taking a broad interpretation of the terms of reference, the two points specifically addressed in the chapter are (1) the scope for expansion of industry in the area and (2) Industrial Location Policy for the region.

### **10.5 Industries within the region**

As stated earlier, Cochin is the focus of industrial activity in the State. With its locational advantages of a major Port, a well-connected network of air, rail and road transport and availability of power, water and skilled labour, Cochin has over the years acquired a fairly large industrial base. For various historic and other reasons, most of the industries in the State have come to be located in and around the Cochin region. With the major share of the Central investment in the State being concentrated in this region and establishment of several large public sector units like the Refineries, the Shipyard and FACT, the area has attracted a great deal of activity in several ancillary and subsidiary sectors.

There are 38 large and medium industrial units and 5032 small scale industries located in the region's three industrial belts, namely:

- 1) Eloor-Edayar
- 2) Ambalamughal
- 3) Thirikkakara-Kalamassery

For the region as a whole, Chemical industries occupy the pride of place in terms of number of units and total employment generated. Metallurgical and agro and forest based industries absorb a high percentage of labour as well. It is likely that with the proposed heavy investments in petro-chemical units, Cochin will be a major centre of chemical industry in the Southern region.

In terms of employment, it is seen that the share of large scale industry with nearly 40% of the total employment in the secondary sector is the highest, with the medium scale sector accounting for 34% and the small scale sector the remaining 26%.

The share of agro-based and household industry, which have high employment potential, has unfortunately been declining over the years and this requires special attention if these sectors, which include rubber, timber and coir manufacturing and marine processing units, are to be revived. The mineral resources of the region being insignificant, the share of mining/quarrying is negligible though there are quite a few mineral base units in the region.

### **10.6 Recommendations of the High Level Committee on Industry, Trade & Power**

In 1982 the State Government constituted a High Level Committee to study the developments so far made in the area of Industry, Trade & Power to suggest objectives and proposals for

development upto 2000 AD and to indicate the priorities to be followed and the major projects to be undertaken during the remaining period of this decade. The Committee submitted its report in 1984. Industrial development being one of the key areas of integrated development, some of the important recommendations of this Committee relevant to the Terms of Reference of the Centre-State Team are mentioned in this chapter.

The Committee identified prospective areas of investment with high potential for future growth. The Committee stressed that the approach to industrialisation should be local resource based and suggested that rubber processing, marine processing, exploitation of the rare mineral resources of the sands of Kerala etc. should be the key areas for development. The Committee specifically highlighted the scope for establishing electronics and software units with sufficient efforts directed at creating a favourable climate.

#### 10.7 Suggestions for industrial Growth in the region:

##### (i) Electronics industry:

The above mentioned High Level Committee recommended the development of electronics industry in the following terms:

"In view of the high employment potential of the electronics sector and its importance in the future, this industry is to be developed as the key sector and the already existing base laid in the State by Keltron etc. could be built upon."

The Centre State Team would support this recommendation. Suitable measures will have to be taken at the level of the State Government to implement it.

##### (ii) Agro-based and forest-based industries:

There are a large number of small scale and medium units in this sector located around Cochin particularly wood based industries employing a large number of people. Manufacture of coconut-based products, processing of fruits/vegetables, tapioca, timber-based products are of particular relevance for the region. The State Government has a proposal to start a large coconut processing factory, under the umbrella of KERAFED with the assistance of the E.E.C. This should be taken up as a high priority scheme.

##### (iii) Chemical based industries:

The setting up of a large number of public and private sector units in the region like the HOC, the Cochin Refineries Ltd. and the F.A.C.T., their diversification and expansion plans and the exploratory efforts of the O.N.G.C. off the Cochin coast point to the distinct likelihood of more petro-chemical complexes coming up in the region. This would necessitate:

- 1) making sufficient land available for installation of the units, and adequate storage facilities for them
- 2) accessibility to large quantities of water supply and
- 3) access to the Port and provision of transport corridors to provide raw materials.

The State Government may also consider the possibility and scope of diversification into allied industries such as nylons/plastics etc. as well as the setting up of small ancillary units to service these industries.

##### (iv) Rubber based industry:

While Kerala accounts for 40% of the total production of natural rubber in India, investment in

rubber based industries in the State is only 8% of the all India investment. In such industries, in fact almost 75% of the rubber goods consumed within the State are brought from outside. This reveals the irony that only about 15% of the rubber produced in the State is processed here. In the light of the above, it is suggested that modalities be evolved to set up Rubber Processing Units within the region.

**(v) Ancillary of Engineering Industries.**

Some of the largest Engineering Industries in Kerala like Hindustan Machine Tools, the Cochin Shipyard, etc. are located within the Cochin region. The potential for establishing ancillary units to these industries has not been sufficiently utilised. The Government can act as facilitator by providing earmarked land and concessional services in consultation with these industries to attract investors.

**(vi) Traditional Industry**

Of the traditional industries, which are of importance in the region, coir, handlooms and handicrafts are in the small scale sector and are concentrated in the northern part of the region. The relative significance of coir industry is that a substantial number of people in the islands and coastal areas of the region are engaged in this activity and any improvement in the quality of their life would be contingent on the success of the industry. Adequate training, provision of workshops and marketing facilities are some of the steps necessary to modernize this sector. The head quarters of the Coir Board is located here and this has been a traditional item of export from the Cochin Port. The transport of coir products by road and waterways from Alleppey to Cochin is to be contemplated with the setting up of an inland container depot in Alleppey.

**(vii) Marine Based Industry**

The marine product industry in Kerala has traditionally been concentrated in the Cochin region. There are about 80 canning/freezing units located in the region. Though this industry has been facing a number of problems which threaten to affect its profitability on account of less landing due to depletion of stocks, it is felt that there is sufficient scope for diversification and export of value added items. Optimal exploitation of these resources would also encourage ancillary industry like boat building, nylon net making, sea food packing units, etc. coming up. The potential of this sector has been stressed in the chapter on Marine Resources.

**(viii) Mineral Based Industry**

Although it has been mentioned earlier that the region is not particularly rich in mineral resources, it is estimated that graphite resources are available nearby for commercial exploitation in the region. About 7.5 lakh tonnes of graphite ore have been estimated as the reserves in Vadavucode and Nagapuzha area in Emakulam District as per the Geological Survey of India. The Kerala State Industrial Development Corporation (KSIDC) has formulated a proposal to mine 40,000 tonnes of ore annually from which 2,000 tonnes of graphite is to be obtained. Using the beneficiated graphite about 400 tonnes of silicon carbide crucibles could be manufactured. However, detailed studies may have to be carried out and the feasibility of the project examined.

**10.8 Industrial Location Policy**

It has already been said that a sound industrial location policy is one of the crucial determinants of the growth of a region. Although detailed exercises have been carried out by the planners for the Cochin region to ascertain the suitability of sites for industrial use in the Development Plan of 1976 and the Structure Plan, a rational industrial location policy has been lacking. One of the main constraints has been the fact that both these Plans are not legally enacted documents and hence the location of industries has been unregulated.

As per the Development Plan for the region the GCDA has identified certain areas where industries may be permitted to come up and other areas where it would be desirable for certain types of industries not to be located. Since the Team considers that the suggestions contained in the Development Plan and Structure Plan have been formulated after careful deliberation these are reiterated and it is suggested that the Panchayats of Vadavukode-Puthencruz which are adjacent to the Ambalamughal industrial belt may be developed as an industrial township.

#### 10.9, Recommendations:

The Team recommends as follows

(1) A Committee may be formed with representatives from the Industries Department, State Planning Board, KSIDC and Kerala State Industrial and Technical Consultancy Organisation (KITCO) to identify specific projects for funding based on the broad guidelines contained in the report of the State High Level Committee in 1982. A representative of the Development Authority may be included in this committee as it will necessarily have to take into account land use/area implications.

(2) A Committee be constituted with representatives from the Industries Department, Chambers of Commerce and Industry, KSEB, P.W.D., the major industries located here, GCDA, the Pollution Control Board and Environment Department to identify suitable green field sites for the location and expansion of large and medium industrial units in the Vadavukode—Puthencruz panchayat areas and elsewhere. Development of the proposed layout areas could be financed out of the sale of industrial plots as has been done in the case of plots in industrial estates. The Selection of sites will have to broadly conform to the guidelines formulated in the Development Plan/Structure Plan which will have the necessary statutory backing once they are approved by Government.

(3) In view of the comparative economic backwardness of the islands facilities and incentives should be provided for encouraging local resource based industries like coir making, brick making, sea food processing etc.

(4) There is a definite need to provide more training facilities for certain activities such as fisheries, coir making, handicraft, etc. by linking such training centres with the existing industrial estates. The details of such training facilities are to be worked out by the concerned departments.

(5) The establishment of a permanent Industrial Exhibition Centre would help to create a climate conducive for industrialisation in the region. In addition an information centre can also be set up within this Centre so that all information regarding import, export, industrial financing institutions etc. would be easily obtained.

In view of the rapid growth of industries in certain pockets like the Ambalamughal and the Udyogmandal areas the Team also feels the carrying capacity of a region should be carefully studied to set limits to concentration of industries as also to initiate a policy of dispersal wherever justified.

## CHAPTER ELEVEN

### TRADE AND COMMERCE

#### 11.1 Importance of Trade and Commerce in the region

The development of trade and commerce in Cochin region is of a much higher order than in other regions of the State. In 1971 while only 9.1% of the total working force in the State were employed in trade and commerce, Cochin region had 14.2% employed in the sector. Retail and wholesale trade activity and commercial establishments including export/import concerns are found to be concentrated in the urban areas, particularly Cochin city. Certain areas such as Fort Cochin/Mattancherry, which are the centres of the trade in spices and the in South India have a large number of establishments concentrating on these activities.

Wholesale trade in the region is confined mainly to the city with minor centres located in other municipal areas. Employment in trade and commerce in the various panchayats are in retail trades or in agricultural produce collection centres. The number of commercial establishments in the region has shown a phenomenal increase over the last two to three decades.

Although in any urban region the importance of commercial activity is likely to be high, it is of particular significance in the case of this region. Cochin Port earned substantial foreign exchange through the exports of traditional items like tea, spices (particularly pepper and cardamom), rubber, cashew kernels, coir and marine products. The prosperity of the region is inextricably linked to the growth and development of Cochin port.

Growth of Trade and Commerce in the region had two aspects: external trade and domestic trade and commerce. Of the various factors that influence external and internal trade, the relevance of certain infrastructural facilities and certain limited areas of policy directions are dealt with in this report.

#### (1) External Trade :

Expansion of trade and commerce is directly linked to the efficiency and adequacy of the transport and communication network, which has been dealt with in the appropriate chapters. The proposal to establish an International Container Transit Terminal at Vallarpadam and other expansion proposals of the port are likely to give a boost to external trade.

The Export Processing Zone set up in the region is expected to attract more commercial activity to the region. The zone was set up only recently and is yet to be fully operational.

As the region and the city's hinterland have potential for increased exports, Governmental efforts in promoting improved production techniques and creation of additional exportable surpluses, accelerating export oriented industrialisation and evolving the concept of single window clearances etc. must be given due emphasis. Since these problems have been studied by various specialised agencies, task forces etc., this Committee has not gone into them in depth.

The Kerala State Government has recently established The Kerala State Export Trade Development Council (Kerexil) with the objective of providing a State Organisation to look after the interests of the producers/exporters of Kerala and advise them on strategies for stepping up exports. Since information regarding various regulations and procedures to be followed clearances to be obtained and liaison between various agencies and Governments are some of the most important requirements a separate Trade Information Division within Kerexil may be set up as suggested by the TDA which was commissioned to carry out a detailed study in 1986. This office may have its headquarters in Cochin which is also the Headquarters of the MPEDA, the Coir Board and the Spices Board.

#### (ii) Domestic trade

Regarding internal trade, given the high employment potential of this sector and its contributions to the regional economy, it is essential to ensure its sustained growth by providing necessary infrastructure. This sector absorbs the largest number of self-employed petty traders besides a substantial number of women and lower income groups. Any improvement in this sector would have a very perceptible and qualitative impact on the day-to-day lives of the residents of the area.

Wholesale trade related to export and import is predominant in Mattancherry and Fort Cochin areas. Warehouses and godowns are mainly concentrated around Mattancherry, Fort Cochin, Willingdon Island and around Emakulam South Railway Station. Wholesale activities on a regional scale are concentrated mainly along Broadway, T.D. Road, Market Road and the vicinity. Other municipal areas in the region have marginal wholesale activities. Cochin has well-dispersed retail outlets throughout the region. In panchayats there are identifiable commercial or panchayat centres. Trading of fish and vegetables is another activity which is evenly distributed throughout the region. Apart from the formal trade and commerce establishments in the region, the informal sector comprising of street vendors and petty traders with push carts and wheeled carriages is on the increase in urban and rural areas alike. In the larger interest of the region, it would be necessary for the local authorities to bring in some order in this sector before it reaches unmanageable proportions. Since unemployment is acute, people try to earn a living by entering into this sector where modest investment can provide a subsistence unlike manufacturing industries where investment involved is high. In the regional context where unemployment is high, measures for development of retail trade activities merits consideration.

#### 11.2 Problems relating to domestic trade and commerce

The shift of many of the commercial establishments from the Mattancherry area to the mainland and decline of business in this area has led to the abandonment of large godowns and neglected spaces. Once busy market areas of Mattancherry and Fort Cochin are now experiencing large scale physical deterioration due to crowded narrow streets, structurally obsolescent buildings, abandoned spaces and environmental degradation. Notwithstanding this, it remains a fact that this area still retains a good share of the export activities in this region. A planned approach for physical redevelopment of this area is necessary if its decline is to be arrested.

The wholesale trade activities in Cochin city are concentrated around Emakulam Market along Broadway, T.D. Road, Market Road and other vicinity areas. The expansion of existing concerns in this area is constrained by non-availability of space. The major roads in this area are excessively crowded due to parking of trucks, mix of slow moving vehicles and loading and unloading activities. Decentralisation of activities from this area is one of the main objectives of the GCDA's Master Plan for the area.



The retail markets for fish and vegetables in the central city are not properly maintained. They lack many of the basic needs like covered stalls and hygienic environment. Many of these markets are privately owned and are located on the sides of the busy city arteries. At peak hours the activities are extended over to the carriage ways resulting in traffic bottlenecks and accidents. These private markets are also a source of a loss of revenue to the Cochin Corporation.

The existing wholesale markets in the adjoining municipal areas have to be developed to divert a part of the wholesale trade to decongest the central city. For further decentralisation of retail trade panchayat centres in all the panchayats in the region have to be developed.

### 11.3 The Proposals for development of trade & Commerce:

The major proposals envisaged upto 2000 AD for development of trade and commerce in the region are listed below. The proposals are categorised as those falling within the central city and other areas in the region.

#### A. Central City :

##### (1) Redevelopment of Market areas of Fort Cochin & Mattancherry.

With a view to reorganising wholesale activity and improving the physically deteriorated environment of the wholesale market areas of Fort Cochin and Mattancherry a large scale redevelopment programme is proposed. This will necessitate acquisition of land and buildings for widening of road, construction of new buildings for shops, offices etc., creation of warehousing centres and allied facilities and total restructuring of the pattern of land use. The estimated cost of this scheme is Rs. 5 Crores.

##### (2) New Sub Centres:

With a view to decentralise some of the wholesale activities from the already congested parts of the city, new sites have been identified at Kaloor and Palarvattom for location of centres. These centres will accommodate wholesale activities of a selected nature, retail activities, small scale service industries, commercial offices, hotels, community centres and facilities for storages and godowns. The estimated cost of this scheme is Rs. 2.4 crores.

##### (3) Relocation of Wholesale Vegetable Market.

The Ernakulam Market is at present heavily overcrowded due to proliferation of activities and concentration of wholesale functions in the vicinity. The roads leading to the market have already become incapable of carrying the present traffic and further widening of the roads is not possible. The alternative is to relocate the wholesale activity of vegetable trade in another convenient location within the city. A detailed study has been conducted in this regard and a location has been identified at Vyttila near the NH Cochin bye-pass. The estimated cost of this scheme is Rs. 6 crores.

##### (4) Truck Terminal at Edappally

With a view to decongest the central business area of the city and to relieve some of the existing roads from parking of trucks, a Truck Terminal is proposed to be located on the outskirts of the city. The site proposed is at the periphery of the city at the confluence point of the proposed NH 17 and NH 47 bye-pass. This will accommodate offices of parcel booking agencies, godowns, commercial and administrative offices, banks, lodges and dormitories, restaurants, warehousing centres etc. The GCDA has prepared an estimate of about Rs. 13 crores for this purpose. The Team however would advise a staged approach in the matter to ensure provision of the core facilities at a cost of around Rs. 3 crores. It is further suggested that private investment may be roped in with the provision of leasing

facilities. It is to be noted that a provision of Rs. 1.8 crores has been included in the chapter on road transport for development of road net work, parking lots etc. in the proposed site for the truck terminal.

**(5) Extension of Central Business Area**

The Central business area of Ernakulam has already become overcrowded and saturated in terms of buildings and activities. To prevent the sprawl along traffic corridors, it was decided to reclaim the water front contiguous to the centre of the city and to extend the activities in a phased manner. Shops, commercial offices, hotels, theatres etc. are proposed to be constructed in the area thus reclaimed. G.C.D.A. has already taken up the first phase of this extension under the name of the Cochin Marine Drive Scheme. The project is estimated to cost Rs. 7 Crores.

**(6) Reorganisation of Vegetable and Fish Markets in the City**

Apart from the central market at Ernakulam, the City has nearly 22 retail markets for fish and vegetables spread throughout the city. Almost all of these markets do not have the required facilities of covered stalls, walkways, drains and water disposal arrangements. The majority of these markets are owned by private individuals. These markets have to be reconstructed by acquiring them and constructing sheds, walkways, drains, waste disposal systems etc. in a planned manner. It is recommended that all the fish and vegetable retail markets should be taken over by Cochin Corporation so that a proper check could be exercised on the unauthorised running and extension of markets posing hazards to traffic and public health. This is estimated to cost Rs. 4.78 crores.

**B Other Areas**

**(1) Improvements to Municipal Markets**

The municipal markets in the region may have to be improved with a view to providing facilities for accommodating more wholesale and retail activities. Approximately an amount of Rs. 3.9 crores would be required for this purpose.

**(2) Creation of Rural Centres**

Within the constituent panchayats of the region the proposal is to create rural commercial centres in a planned manner. The rural centres will accommodate wholesale and retail activities, community centres, recreational facilities and spaces for assemblage etc. Rural Centres are proposed to be built by G.C.D.A. in all the panchayats in the region in a phased manner at an estimated cost of Rs. 4 crores.

**(3) Incentives to informal sector**

Both in the city and the surrounding areas of the region there is a proliferation of small traders. A scheme for the provision of basic infrastructural facilities to assist this informal sector has been prepared by G.C.D.A. and is estimated to cost Rs. 25 lakhs.

**11.4 Financial Projection**

Based on the above proposals, financial projections have been worked out covering the project period from 1988 to 2000 A.D. In view of the longer time frame required for completion of the schemes, an amount of Rs. 22.2 crores may be invested by the end of the Eighth Plan leaving the rest for the period beyond.

**11.5 Recommendations**

(1) The Team recommends that the proposal suggested in paragraph 11.3 of this chapter be taken up in a phased manner. It is expected that implementation of these proposals will require

resources to the tune of Rs. 3.6 crores during the Seventh Plan period, Rs. 18.6 crores during the Eighth Plan period, and Rs. 38.73 crores beyond this period.

(2) The schemes which have been recommended in this chapter should be initiated by the GCDA and its constituent municipal bodies drawing upon institutional finance from HUDCO, the proposed NUIDFC (National Urban Infrastructure Development Finance Corporation), KUDFC (Kerala Urban Development Finance Corporation) etc. Since these schemes are remunerative their component of Government assistance would be minimal.

(3) The schemes for renovation and establishment of markets, commercial sub-centres etc. can be implemented with partial financial contribution from the prospective stall holders who would eventually be resettled in these markets.

(4) As far as foreign trade is concerned, the proper growth and development of regional institutions like Cochin Port, the Cochin Export Processing Zone etc. are necessary. Facilities for exporters would be augmented by establishing the envisaged Trade Information Division of the Kerala Export Trade Development Council (KEREXIL) at Cochin. It is recommended that this proposal is expedited in order to create the necessary climate for export promotion.

Annexure I and II indicate the investment proposed and the agencies who are to implement the programmes in this sector.

**ANNEXURE I**

**PROPOSED INVESTMENT—TRADE AND COMMERCE**

Item No	Development envisaged	Phasing of Investments	
		Till the end of the VI Plan	Beyond VIIIth Plan
1)	Redevelopment of Market areas of Fort Cochin and Mattancherry	100.00 Lakhs	400.00 Lakhs
2)	Creating new sub-centres in the City	600.00	1 800.00
3)	Relocation of wholesale Vegetable Market	600.00	—
4)	Extension of Manne drive Area	200.00	500.00
5)	Truck Terminal at Edappally	300.00	300.00
6)	Reorganising fish Market in the city	50.0	428.00
7)	Improvements to Municipal Markets	160.00	230.00
8)	Creation of Rural Centres	200.00	200.00
9)	Improvement to informal sector	10.00	15.00
	<b>Total</b>	<b>Rs 2220.00</b>	<b>3873.00</b>

**ANNEXURE II**  
**AGENCIES RESPONSIBLE FOR IMPLEMENTATION**  
**OF THE DEVELOPMENT PROGRAMME SUGGESTED**

Sl No	Agency	Development Programmes suggested
1)	Greater Cochin Development Authority	1) Redevelopment of Mattancherry Fort Cochin Market Area 2) Creating new sub centres in the City 3) Relocation of wholesale vegetable Market 4) Extension of CBD area 5) Truck Terminal at Edappally 6) Improvement to informal sectors
2)	Cochin Corporation	1) Reorganising fish market in the City
3)	Municipalities	1) Improvement to Municipal Markets.
4)	Panchayats	1) Creation of Rural Centres

## CHAPTER TWELVE

### MARINE RESOURCES

#### 12.1 Introduction:

Cochin is one of the most important centres of the fisheries industry in India. The coastal belt of Cochin region is occupied by fishermen families. In addition to the usual methods of fishing like trawling and purse seining, methods like Chinese fishing dip nets are also used here.

The Vembanad lake with an area of 365 Sq. km, of which the Cochin backwaters form a part is the biggest brackish water reservoir in the west coast of the country. Fish farming is carried out in about 130 square km of its area. The sixties recorded tremendous growth in the fisheries industry here. The introduction of mechanised trawlers, ice factories, cold storages and modern methods of sea food preservation as well as organised export of sea food to markets like USA and Japan provided the necessary thrust to the growth of the sector. The sea food industry continues to be one of the prime foreign exchange earners and Cochin has a dominant share in this earning. However the rate of growth of the last decade has not been sustained and there is even a declining trend in several export items, though the total value of exports from Cochin show a gradual increase.

#### 12.2 The existing situation

As far as the export of shrimps which are a high value item is concerned, the share of the Cochin region has reduced from a peak of 70% of the all India total to 30% now. It has been estimated that fish catches in the region are declining at the rate of 6% per annum. No new fish processing units are coming up because of the fluctuations in supply of power. The most important reason for this downward trend is the depletion of fishing stock in the sea off Cochin due to over fishing. Important Central organisations relating to fisheries are situated in Cochin, namely the Central Marine Fisheries Research Institute, the Central Institute of Fisheries Technology, the Marine Products Export Development Authority, Central Institute of Fisheries and Nautical Engineering Training (CIFNET) and the Integrated Fisheries Project. The know how available in these institutions has to be harnessed to revitalise the fisheries industry in the region. It is necessary to ensure that the development of this industry brings about some measures of prosperity to the poor fishermen families engaged in fishing. The occupational pattern in the Cochin region reveals that about 5 percent of the work force (about 20,000) is dependent on activities relating to fishing. Large scale activities in the fisheries sector have been traditionally confined to a few entrepreneurs and companies. Measures have to be evolved to ensure a fair share of the benefits to the primary workers by bringing them within the cooperative fold. In view of the fact that the sea food exports industry is a high foreign exchange earner, the Seventh Plan has accorded a very high priority to this sector. An export target of Rs. 700 crores is envisaged by the terminal year of the Seventh Five Year Plan. This would require an annual growth rate of 13% per annum. This growth figure cannot be attained by continuing the present practices and levels of technology. Innovation and diversification are therefore necessary.

The State Govt. has started an apex federation MATSYAFED under the Fisheries Deptt to coordinate the primary fishermen cooperative societies in the State and to provide a market mechanism for the fish products. MATSYAFED has formulated improvement proposals for implementation in 5 fishing villages in the Cochin region. They are Kannammall, Kandanekadavu, Cheriyakadavu, Manassery and Soudhi. It is proposed to provide the basic infrastructure for traditional fishermen in these villages and ensure a larger share of the market value of the fish caught by them. This scheme is proposed to be implemented with the assistance of the National Cooperative Development Corporation.

In view of the depletion of fish in the inshore areas, large scale fishing in deep sea vessels in the off shore seas of Cochin would be a necessity. But the Cochin fishing harbour has a draft of only 4 M and hence these vessels cannot be berthed here even after acquisition of such vessels.

The fisheries industry in the Cochin region is beset by a variety of other problems also like reduction of export consignments, shifts in world trade, lack of shipping space, fluctuations in the international currency rate etc. No specific recommendations are made with respect to these problems in this report as the measures needed to overcome them would be beyond the purview of the Team.

### 12.3 Proposals for fisheries development

- (1) The following strategy appears to be necessary for fisheries development in the region
  - (a) Rationalisation of fishing effort in the inshore waters for diversified fishing without depletion of the stock.
  - (b) development of off shore and deep sea fishing
  - (c) organisation of large scale aquaculture utilising the vast expanse of brackish water and fresh water in the region
- (2) Keeping this strategy in view the following proposals are suggested
  - (a) Cochin Fisheries Harbour suffers from inadequacy of berth facilities. There is a proposal to take up the second phase development of this fisheries harbour. This has to be expedited.
  - (b) One more fishing harbour in the region at Munambam to the north on the outskirts of GCDA area is already an approved scheme under the Ministry of Agriculture. The cost of this scheme is Rs 5.27 crores. Preliminary work in this harbour is on-going. Steps should be taken to complete the harbour expeditiously.
- (3) There are unutilised wet lands and marshy lands in the Cochin region. It might be worthwhile for the State Govt. to take a decision regarding the leasing out of these low lying areas to individuals or cooperatives for development of aquaculture.
- (4) Fish farming in the Cochin estuary and the wet lands around Cochin can be promoted as an organised activity. This would overcome some of the difficulties faced on account of depletion of fish in the traditional fishing grounds. The currently unproductive low lying lands can be utilised profitably by such a venture. Suitable land will have to be identified by the State Fisheries Department in consultation with GCDA for such fish farms. Recently a Prawn Farmers Development Agency has been started by the State Govt. in the cooperative sector and this programme can be managed by fishermen cooperatives under the umbrella of the Matsyafed. In the first phase a limited number of model fish farms can be constructed in the Perumbalam and Njarakkal areas which are considered suitable for the purpose. In the second phase 750 hectares for brackish water farms and 50 hectares for fresh water farms can be taken up. At the moment, loan assistance of

Rs 20,000 per hectare is being made available as a soft loan by the State Govt for this purpose. This project is estimated to cost around Rs 16 crores along with ancillary infrastructure till the end of the Eighth Plan period.

(5) The fishermen community will have to be trained in brackish water fish farming and the management of the fish farms. Such expertise is available with the institutions like Marine Products Export Development Authority and the College of Fisheries at Panangad near Cochin city and training could be given at the Prawn Farming Training Centre which is proposed to be set up by the MPEDA at Vallarpadam.

(6) Some of the infrastructural problems faced by the industry in the region deserve attention. One of the common problems faced by the eighty or so fish processing units is the lack of steady supply of power and fresh water. In view of the very high health standards for export consignment of fish, regular supplies of power and water is an absolute necessity for the growth of this industry. It is felt that steps should be taken by the State Govt. and the Cochin Corporation to ensure uninterrupted water and power for the fish processing units.

#### 12.4 Recommendations:

The Team would recommend the following

- (i) the proposals given in para 12.3 should be taken up for implementation
- (ii) a Task Force comprising of the representatives of GCDA/Port/CIFT/CMFRI/MPEDA/CIFNET and the State Fisheries Department may be formed to devise ways and means to disseminate technical knowhow to the fishing community and to suggest measures for improving fisheries cooperatives/industry
- (iii) The State Fisheries Department should take advantage of its own plan funds as also funds available under several Centrally sponsored schemes (some of which are mentioned in Chapter twenty) and formulate specific projects for brackish water fish farming
- (iv) the requirement of funds for the suggested schemes upto the end of the Eighth Plan is Rs 21.27 crores including a flow of Rs 5 crores from NCDC and the balance from GOI/State sources. Financial provisions may have to be made accordingly.



## CHAPTER THIRTEEN

### TOURISM AND RECREATION

#### 13.1 Introduction

The topography and the physical setting of the Cochin region as well as its historical and cultural heritage are attracting domestic and foreign tourists in increasing numbers. It was only in the recent past that concerted efforts have been made under the aegis of the Government to provide the basic infrastructure and the services necessary to promote tourism in an organized manner. The State Government has now accorded the Tourism Sector the status of an Industry with attendant benefits for tourism service industries like hoteliering.

It is well known that even with relatively low levels of investment, tourism can have a multiplier effect on the regional economy. The generation of employment as a consequence of investment in the tourism sector is also very high. Tourism promotion is a relatively new function of Government which is carried out in Kerala by the State Tourism Department and the Kerala State Tourism Development Corporation (KTDC). Their functions had traditionally been confined to the maintenance of a few tourist hotels, guest houses, tourist information centres and tourist coaches as well as the maintenance of facilities at selected tourist centres. But now these agencies of the State Government are increasingly involved in co-ordinating activities of the private sector which are related to tourism as well as prescribing promotional packages which emphasise reliable and accurate information about tourist destinations in Kerala.

The State Department of Tourism envisages a target of one lakh foreign tourist arrivals and eight and a half lakh domestic tourist arrivals into Cochin by the year 1995 as against the present arrivals of thirty thousand foreign tourists and two and a half lakh domestic tourists annually. To achieve these targets the tourist inflow has to be increased at the rate of 20% per annum which is almost double the present rate of increase of the inflow.

Measures for the promotion of tourism in this region can be divided into three viz expansion of transportation network, augmentation of the infrastructure for accommodation of tourists and facilities at tourist destinations, and development of tourism services like promotional packages, information centres, reliable tourist guides etc. The role of the governmental agencies in promoting tourism is envisaged as being primarily regulatory and co-ordinative, in addition to providing the core investment in schemes like tourism promotional packages overseas, low budget accommodation etc.

The Cochin region offers a variety of sights for the discerning tourist, domestic as well as foreign. In addition there are several tourist destinations around Cochin which fall outside G.C.D.A. area. Cochin has the potential for being developed into a specialised destination by providing facilities for water sports on the backwaters and lagoons.

### 13.2. Transportation Requirements :

Cochin is serviced by all three modes of transport and the existing transportation system is by and large sufficient to cater to the existing tourist inflow. An analysis of present tourist arrivals into the Cochin Region indicate that roughly 30% of them arrive by air, 50% by rail and another 10% by ship. The proposals which have been outlined in this report to augment the transportation system to the region will be adequate to cater to the targeted tourist arrivals by the end of the Eighth Plan period.

The provision of charter flights normally go a long way towards increasing foreign tourist inflows and it is recommended that such facility be started either at Cochin during the Eighth Plan period on the lines of the existing services at Goa. Passenger traffic by ship into Cochin is very sporadic now and is confined to the occasional cruise ship. If more tourist cruise vessels are to touch Cochin, tourist promotion has to be intensified through marketing efforts abroad and the dissemination of good quality tourism literature highlighting the ambience and the attractions of the place.

### 13.3. Accommodation Requirements ·

It is estimated that there are around 3000 hotel rooms available in Cochin city which can be used by tourists. It has been presumed that all the foreign tourists arriving in Cochin will need hotel rooms but only 60% of the domestic tourists will be in need of such accommodation. (This presumption is based on a Master Plan for the development of tourism in Kerala prepared for the State Department of Tourism).

The additional demand for rooms which will be generated in the next five years could be met by the private sector subject to control and regulation by the Department of Tourism and the Cochin Corporation regarding basic amenities, hygiene, tariff rates etc. However, a tourist hotel for middle income tourists, the construction of which has been started by the KTDC on land purchased from the GCDA at the waterfront in the city is now abandoned in a semi finished condition. This building could be completed during the Seventh Five Year Plan period to augment the existing facilities. An additional amount of Rs. 225 lakhs is required for the completion of this hotel. Institutional finance in the form of a long term soft loan would have to be forthcoming if this is to be completed. The Bolghatty Island in the Cochin backwaters is an ideal location for accommodating tourists. The Kerala Tourism Development Corporation is already running a tourist hotel here and additional proposals to the tune of Rs. 45 lakhs have been formulated by the Kerala Tourism Development Corporation for the construction of tourist cottages here.

The following projects are also being processed by the State Tourism Department to provide accommodation facilities.

- (i) A guest house is proposed to be constructed on the side of National Highway bypass in Cochin. The project is in the initial stage and is expected to be completed during the 7th and 8th plan period. Financial assistance for the project is sought from the State Government but so far no provision has been made.

- (ii) A Yatri Nivas is proposed to be constructed in the Willingdon Island at a cost of Rs 35 lakhs. Financial assistance has been sought from the Central Government and it is expected to be completed during the 7th plan.
- (iii) A guest house and a dormitory accommodation are proposed to be provided in Malayattoor a place of religious significance. Land for the same is being acquired. The proposal is expected to cost Rs 4.71 lakhs.
- (iv) A Yathrika (Dharamsala) is proposed in Kalady the birth place of Sri Sankaracharya Bharatiya Yatri Avas Vikas Samiti a voluntary organisation sponsored by the Department of Tourism Government of India is funding the scheme. Land has been identified which is estimated to cost Rs 4.7 lakhs and work is expected to be completed before the end of the 7th plan.

Even though there is a requirement for construction of clean low cost rooms and dormitory type accommodation for back packing tourists no specific recommendations need be made regarding the construction of further accommodation in the Cochin region since it is felt that private sector investment can easily be attracted for this purpose. However lease of government lands could be made at concessional rates to private entrepreneurs as an added incentive for the construction of such low tariff hotels.

#### 13.4 Other Infrastructural Requirements Including Tourism Services

In addition to providing accommodation and transport it is necessary to provide facilities like tourist guidance offices, wayside amenities, camp sites and public comfort stations, boats and country crafts for cruising in the backwaters. A Luxury Cruiser which will accommodate about 100 people is under construction for the Department of Tourism by the Cochin Shipyard Limited at a cost of Rs 95 lakhs and this vessel is expected to be delivered in the year 1989. This could be utilised for conducting guided tours around the backwaters of Cochin and the adjoining islands.

Presently there are two tourist information centres functioning in the Cochin region. The Tourism Department has proposed a scheme for the construction of a Tourist Centre within Cochin city which will have facilities for Travel Reservations, Middle Class Accommodation, Information Centre, Banking and Money Changing facilities. This Tourist Centre is estimated to cost Rs 5 crores. Government investment for the present could be limited to providing basic facilities in some specific tourist destinations at a total cost of about Rs 50 lakhs during the Eighth Plan.

Even though the Department of Tourism has commissioned a Master Plan for the development of tourism in Kerala which envisages a travel circuit with Cochin as its base, no systematic attempt has been made to develop proposals keeping in view the lure of the backwaters to the arriving tourists. Schemes for conducting cruises in the backwaters in country canoes can be taken up with minimal investment. Private boat operators could also be licensed to conduct cruises through the backwaters touching the islands.

The development of the requisite software also deserves attention for the development of Regional Tourism. Promotional material (including brochures highlighting the tourist attractions of Cochin) has to be developed for dissemination through the media and our tourist offices and embassies abroad. The tourist information centres should be in a position to provide accurate and reliable information to the tourist and such centres have to be opened at all major tourist entry points in the region. Cochin lacks professionally trained tourist guides who are proficient in local lore and history. A proposal has been in the air for some time regarding the starting of a tourism course.

in the University of Cochin. The establishment of such a course would help to overcome some of these shortfalls.

### 13.5. Additional Tourist Centres :

In addition to the foregoing proposals for planned promotion of tourism and strengthening of the tourist infrastructure, two specific projects have been formulated to develop additional tourism destinations in the region. The Seventh Plan has laid emphasis on destination tourism to develop resorts to attract specialised tourists. The **Cherai Beach Development Project** in the north western part of the Cochin region is one such proposal of the State Tourism Department. The scheme is planned to be completed by the end of the Eighth Five Year Plan. The scheme involves land acquisition, construction of roads, bridges and boat jetties, purchase of boats, provision of water power etc. and import of water sports equipment of international standards. The Project is estimated to ultimately cost Rs 20 crores and the Team would suggest an initial investment of about Rs 2 crores in the first phase during the Eighth Plan period while roping in as much private investment as possible.

The Cochin Backwater is one of the most ideal sites in the country for development as a centre for **Water Sports** like water skiing, canoeing, yachting etc. The Indira Gandhi Memorial International Boat Race is being held here annually. The District Sports Council has prepared a detailed report on the establishment of a Water Sports Complex here at an estimated cost of Rs 800 lakhs. The Kadamakudy Group of Islands on the backwaters and Thanthonni Island can be developed as tourist villages for such specialised tourists by providing low density tourist huts and common facilities. An initial investment of Rs 3 crores on this item could be made during the Eighth Plan period.

The Cochin Municipal Corporation and the Marine Products Export Development Authority have jointly submitted proposals to the State and Central Governments for the establishment of a 'Marine Park' at Fort Cochin covering an area of about 1 acre on the beach front. The proposed park will contain aquaria, a dolphinarium and facilities for study and research on marine biology. This project could be taken up in the Eighth Plan period at a cost of Rs 1.34 lakhs.

### 13.6 The Team Would recommend the following measures to be accorded high priority :

- (a) Augmentation of the infrastructure for transport and accommodation and services to meet the targetted tourist arrivals by the end of the Eighth Plan period. Incentive for construction of low tariff hotels could be given by way of concessional leasing of government land.
- (b) Development of tourism software, highlighting accurate information about the Cochin region and promotional packages for domestic and foreign tourists.
- (c) The establishment of facilities for low cost accommodation, facilitation centres, cruise boats and the setting up of a Manne Park and a Water Sports Complex in Cochin and the development of the Cherai Beach into a Tourist Resort at a total estimated cost of Rs 4.6 crores in the Seventh Plan period and Rs 9.34 crores in the Eighth Plan period. A sum of Rs 10.00 crores is estimated as the requirement beyond the Eighth Plan period. Part of this requirement would be met by drawing upon the resources of the private sector.
- (d) According permission to operate charter flights to Cochin by foreign operators on the lines of Goa.
- (e) Expediting the proposal to start a course on Tourism at the University of Cochin.

Care has to be taken to ensure that on shore structures relating to tourism keep safe of the high tide mark.

## CHAPTER FOURTEEN

### LAND USE

#### 14.1. Introduction:

The basic objective of Land Use planning is to arrive at a rational synthesis of the demands on urban land arising out of the various sectors in the regional economy. The Land Use plan thus forms the matrix for balanced regional development which is to be achieved by planned distribution of the population of the area and its activities.

Land use planning assumes considerable significance in an area like the Cochin central city with a population density of more than 5000 persons/sq km and the consequent pressures on land.

Land use and settlement patterns vary from region to region. Hence land use planning should take into consideration the specific characteristics of the region for which the plan is prepared. Provision of housing, infrastructure and other facilities should be in accordance with the comprehensive land use proposals evolved related to the urban form envisaged for the particular region.

#### 14.2. Land Use Planning in Retrospect:

The Interim Development Plan prepared by the Town Planning Department for Cochin region in 1966 identified the requirement of land to contain the projected population and its activities. Later with the objective of evolving a suitable spatial pattern of development and location of a hierarchy of human settlements consistent with the optimal exploitation of natural resources, a Regional Development Plan was prepared in 1976 by GCDA. The Regional Development Plan aimed to secure a desired pattern of distribution of population between rural and urban settlements and to achieve economic utilisation of land ensuring suitable space reserves for the healthy growth of each population cluster. The plan sets apart land for the expansion of activities within the region in addition to land reserves for open spaces, parks and community facilities etc.

The Regional Development Plan visualised a rational urban form with a Central city characterised by concentrated urban development surrounded by a peripheral belt of planned Panchayats to arrest the urban expansion and secondary urban centres as counter magnets to absorb the over-spill of urban population. This regional form is a combination of what is called the **Radial-corridor pattern** and the **satellite concept**.

On the basis of this proposed urban form, the developments in the central city deserved prime consideration and hence a Structure Plan has been prepared by the GCDA for the Central city. A detailed land use analysis has been done for this area and a proposed land use pattern evolved.

### **14.3 Present pattern of land use in Central City area:**

#### **(1) Land Under Water**

The existing land utilisation pattern of the constituent areas of Cochin region reveals that dryland capable of being developed for urban use forms only 62.45% of the total area, the remaining being water sheets, paddy fields and unusable vacant lands. It is interesting to note that the central city which constitutes about one third of the area of the region and as more than half of its population has only 57.66% of dryland capable of being developed for urban use. Land under water constitutes nearly 20% of the land of the city, backwaters alone constituting 95% of this water area.

#### **(2) Agricultural Land Use:**

The percentage of land exhibited under agricultural use in the central city amounts to 23.43% of the gross area. Large portions of these lowlying wet lands are left uncultivated in the city. In the westerly parts, on the other hand, it is more often cultivated for single crop and are some times used for fish farming.

In the developing parts of the city, the low lands are fast getting filled up and converted to urban land both by public and private agencies. Conversion of low lands into urban land is an economic proposition and if done judiciously with due regard to the ecological consequences can enormously increase the supply of land in the city. It may even have the beneficial effect of eliminating marshy lots which are the breeding places of insects. Such conversions, however, have to take into account the natural drainage of the area and will require the planning of a system of drainage channels and deepening of the existing canals to take away the storm water. On a rough estimate about 10 percent of the low lands could then be converted, thereby increasing the supply of dry land by 646.2 hectares by 2000 A.D. The remaining low lands could form part of the open space in the city.

#### **(3) Dry Land for Urban Use**

Dry land capable of being developed for urban use in the central city accounts for 57.66% of the gross land. This land can be categorised under the following headings:

##### **a) Residential Land Use:**

The percentage of residential land to the net dry land is 84.64%. Considering the existing population, the gross residential density comes to 63 persons per hectare. It is seen that the residential areas are evenly distributed all over the central city and that it is interspersed with open agricultural land. This is a characteristic feature contributing to the spread pattern of settlement with a typical rural bias. Most of the residential land is built over with isolated buildings except in the central parts of Cochin Corporation where the residential land is mixed with commercial and public uses. Changes in the character of land use from residential to commercial uses are seen specially in the Central Business District and at the intersection of important roads. Correspondingly the residential density in such areas tend to be high. Here multistoreyed buildings and flats have started appearing. When compared to these areas, the density of planned residential areas are on the lower side.

##### **b) Commercial Land Use :**

Around 1.39% of the net dry land of Cochin city is under commercial use. The commercial uses consist of retail and wholesale trade, warehouses and storages, commercial institutions and professional establishments. The spatial distribution of commercial land indicates the concentration of this activity in the centre of the city as well as at nodal points formed by the intersection of important roads.

Another feature is the spread of these activities along the roads. Clearly in the future land use, it is necessary to distribute the commercial facility in different planning zones with the twin purpose of preventing ribbon development and reducing the distance from residential zones to the commercial zones. It is also necessary to have a hierarchy of commercial centres catering to different levels of service such as city level, zonal level, community level etc.

**c) Industrial Land Use:**

Industrial land takes up 2.53% of the net dry land of the central city. All types of industries, i.e. large scale, medium scale and small scale, are included in this category. The distribution trends of industrial land shows that the land under large scale industries are concentrated in Eloor and Ambalamughal Kalamassery areas with the exception of Cochin Shipyard and Tata Oil Mills. The medium scale industries are distributed along the foreshore areas and small scale units are spread all over the city. There is an industrial estate in Kalamassery where a number of small scale industrial units are functioning. Such industrial estates could be distributed in different parts of the central city for a balanced development of the area.

**d) Area under Transport and Communication:**

The land under transportation use in the central city constitutes 6.14% of the net dry land area. This includes areas under railway installations, road transport, dockyards, jetties etc. and airport. Although the proportion of land under this use is comparatively high, it does not necessarily imply a good transportation system/traffic network in the city. The roads are narrow and the streets are irregular lanes. The railway line divides the city into two in the north-south direction. The landing facilities for ferry services and for inland navigation are inadequate. Creation of a road network, widening of roads, improving the terminal facilities and expansion of railway installations as recommended in this report will require additional area to be brought under the transportation use.

**e) Land under public and semi-public Use:**

Public and semi-public use includes all administrative, educational, religious, cultural and medical institutions, utility and service installations and land under defence. In the central city of Cochin, 4.52% of the net dry land area comes under this category. The spatial pattern of this land shows a balanced distribution all over the city. With increased population, land under public and semi-public use will register corresponding increase.

**f) Parks, playgrounds and open spaces:**

The open space requirement for the passive and active recreation of the city population is to be met by adequate provision of spaces catering to this demand at different levels. There is a need for city level parks and playgrounds as well as zonal, community level and neighbourhood level open spaces. There appears to be a conspicuous shortage of land under this category of use in the central city. The percentage of land under parks, playgrounds and open spaces in the city comes to only 0.78% of the net dry land. Although the water sheets and agricultural land provide the lung space of the city and supplements the open space requirements, their use for passive and active recreation is limited. Development of water front areas for recreational needs and earmarking green lands by planned conversion of paddy fields for such uses is required in the interest of future city needs.

**14.4 Land use pattern in rural and other Urban Areas outside the Central City**

**(1) Rural areas:**

A notable feature of the rural areas of the region is the phenomenon of mixed land use. In the region, agricultural land use (other than paddy field) is interwoven with all other land uses normally noticed in the rural areas. The majority of agricultural lands incorporate the households of the

agriculturist and associated labourers. Cultivation on dry lands is a combination of cash crops like coconut, arecanut and pepper. All these crops are cultivated with regular inter spaces and the houses are conveniently located along such cultivation. In spite of the low per capita availability of land, land sub-division has been on the increase especially in dry lands. In the context of the existing land use pattern in the rural areas, the strategy of planning could be the grouping of certain panchayat areas as viable urban planning units and provision of additional facilities at selected growth centres within these units.

#### **(2) Urban areas outside Central City-**

The five secondary urban centres are Tripunithura Alwaye Parur Perumbavoor and Angamaly. Tripunithura municipality forms part of urban agglomeration as per 1981 Census and is very close to the central city. The percentage of developed land in the other four urban centres is more than that of the Cochin region. Alwaye, Angamaly and Perumbavoor lie in the midland zone of the region where the percentage of land under water is less than Parur which has nearly 24% as watersheets. The settlement pattern in these secondary urban centres with homesteads and agricultural land around renders possible mixed land use pattern as in the case of rural areas. The Town Planning Department of the State government is presently preparing Master Plans for these urban centres.

#### **14.5 Salient features of GCDA's Structure Plan for Land Use in the Central City**

While land use plan for the entire Cochin region has not yet been prepared, a Structure Plan for land use in central city area has been prepared by GCDA. The salient features of this plan are mentioned below.

(1) The per capita availability of developed land within the central city is only 4.6 cents. Hence it is imperative that the supply of developed land should be increased without detriment to the environmental system. The land use plan divides the city into specific planning zones which are self-contained multi-functional units. The GCDA plan seeks to decentralise work centres based on population distribution and to distribute the urban services. The heavily built-up Central Business District areas are to be decentralised by initiating adequate number of planned sub-centres. For community needs, the plan proposes the development of 24 community centres, each serving a population of about 30 to 40 thousand. Thus concentration of activities in specific nodes of the city is planned to prevent the proliferation of such activities all over the urban area. Simultaneously, green belt zones along the existing water courses and canal systems is also planned.

(2) The GCDA's Structure Plan also envisages further development of wholesale trade centres in the municipal towns of Perumbavoor, Parur and Alwaye to divert a part of the wholesale trade to these areas.

#### **14.6 Specific Schemes proposed**

In order to achieve the general objective mentioned in the Master Plan and the Structure Plan, the following schemes are proposed:

- Creation of a land bank to cater to such specific uses as commerce, industries, open spaces, housing etc. Excess Government land in the Cochin region is to be transferred to this land bank.
- Creation of subcentres and community centres to act as nodes for decentralisation.
- Creation of growth centres to serve specific Panchayat groups.
- Preparation of Master Plans for the Urban centres not yet covered in the Master Plan.
- Preparation of special plans for the proposed industrial townships at Vadavukode and Puthencruz.
- Modernisation of land use inventory.



#### **Preparation of a Master Plan for backwaters**

As mentioned elsewhere in the report, substantial portions of the backwaters has been reclaimed for purposes like paddy cultivation, coconut husk retting, civil construction, harbour development etc. Indiscriminate reclamation would adversely affect the eco system of the backwaters. The Structure Plan envisages the reclamation of nearly 522 hectares during the next 20 years for Port activities and Urban Development. Nearly 1/3 of this land is to be retained as park and open spaces. However, it is recommended that extreme caution should be exercised before taking up any reclamation of the backwaters. This should be done only after critically examining the possible environmental impact of such reclamation.

#### **14.7 Recommendations:**

(1) Even though detailed planning exercises have been conducted by the GCDA to ease urban congestion and to impose a model of orderly growth on Cochin city and its adjoining suburban areas, it is seen that in the absence of any kind of legal backing, this master plan remains only on paper. Hence, it is recommended that the master plan prepared by the GCDA be approved by Government at the very earliest. The major land use proposals of GCDA's Structure Plan should be followed in promoting urban growth.

- (2) (a) The creation of sufficient reserves of land for developmental activities and for forming green belts is necessary. The Govt may initiate steps to release surplus land or poramboke land to the GCDA for constituting such land reserves.  
(b) The Southern Naval Command headquarters is based at Cochin, and adequate provision has to be incorporated in the land use plans to accommodate the requirements for the expansion of the Navy's facilities. The Navy has intimated that their future land requirements for training facilities, for residential colonies and other classified facilities etc. would be to the tune of 1000 acres. Sufficient extent of land has to be earmarked for this purpose.  
(c) About 140 hectares of reclaimed land are available at Vallarpadam, on the northern side of the entrance to Cochin Port. While the land use proposals here have not been finalised, the Port is processing a proposal for the establishment of a transit container terminal at this site. The ONGC is now conducting exploratory oil drilling in the Cochin off shore seas and if oil reserves are located, this area can serve as a suitable site for supply base, repair yard etc. The detailed land use plans for Vallarpadam have to be finalised in consultation with these organisations.
- (3) The backwaters in the Cochin region are getting rapidly depleted due to siltation, haphazard land filling etc. It is recommended that environmental impact studies be carried out urgently as suggested in the chapter on Environment, and a Master Plan prepared for the backwaters alone.
- (4) The preparation of Master Plans for the secondary Urban centres in the municipalities adjoining Cochin Corporation and for the proposed industrial townships at Vadavukode and Puthencruz should be taken up.
- (5) A Working Group may be set up within the GCDA to finalise the land use pattern on the lines suggested, keeping in view guidelines of the Union Dept of Environment on location of industries and on safeguards for ecologically sensitive areas.

There is a public demand for converting the Cochin University into a Central University and the establishment of an institute of Medical Sciences. There is a similar demand for regional art centre, art gallery, amusement park on one of the islands and a stadium of international standards. No specific view on these demands could be taken by the Team since no clear proposals have yet been formulated. In case these proposals materialise, sufficient land has to be earmarked for the purpose.

## CHAPTER FIFTEEN

### ENVIRONMENT

#### 15.1 Introduction:

Environment is variously defined and encompasses the whole complex of physical, social, cultural, economic and aesthetic factors which affect individuals and communities and ultimately determines their form, character, relationship and survival. Ensuring the environmental quality of the habitat is the basic premise on which all developmental efforts for any region must be based. The Cochin region is endowed with a singular topography with a predominantly marine ambience and it must be ensured that changes which have any adverse impact on this setting must be carefully controlled.

#### 15.2. The Impact of Urban settlement on the Environment:

The physiographic profile of the region has been affected by the process of urbanisation resulting in a built-up environment and changes in the land contours. The density of settlements has been increasing steadily in the region. Such high coverage also results in high heat absorption resulting in the phenomenon of heat islands which concentrate and confine the pollutants within the city. In order to assess the environmental impact, the city can be considered as an organism with a metabolism of its own. It is estimated that about 500 tonnes of food/day are consumed here with a consequent sullage of around 250 tonnes/day, while domestic effluents aggregate to 80 million litres/day. These human wastes pollute the waterbodies and the soil in the absence of an effective sewerage system. Additionally another 180 tonnes/day of urban solid wastes is assumed to be generated here. In the absence of effective disposal methods, these wastes degrade the habitat.

The growth of large chemical industries in the industrial belts of Eloor and Ambalamughal and the presence of the Indian Rare Earths factory in the Eloor belt contribute to pollution of the Penyar and Chitrapuzha rivers besides affecting the air quality. Industrial effluents discharged into these rivers reach the Cochin harbour by the usual oceanic processes creating conditions destructive to the estuarine marine life. The quantity of effluents discharged into these rivers from these two areas have been estimated to be around 200 million litres per day. The city is also subjected constantly to smog and the occasional pall of ammonium chloride fumes.

The increasing tendency to fill up the lowlands and to reclaim the backwaters for land development has adversely affected the watersheds, caused drainage problems and substantially depleted marine life.

The various agencies in this field have been working in isolation and no concerted study has as yet been attempted. Different facets of the environmental situation have been subjected to scrutiny by bodies like the NEERI (National Environmental Engineering Research Institute), KSPCB (Kerala State Pollution Control Board), CEISS (Centre for Earth Science Studies), the CMFRI (Central Marine Fisheries Research Institute) and the Environmental Sciences Department of the University of

Cochin However no systematic attempt has been undertaken to assess the environmental impact separately and to ensure environmental security

**15.3** The approach adopted by the Team in assessing the environmental problems in the Cochin region has been on the following lines

- 1 To highlight the need for a study of the environmental problems of the region
- 2 Enumeration of the various environmental problems natural and manmade
- 3 To make recommendations on matters relating to preservation of the environmental quality

Environmental problems can be classified into two natural and manmade. While the impact of the natural environmental forces would be obvious only in the long run environmental problems resulting from human intervention are more often immediate and visible

#### **Consequences of Natural Forces on the Environment:**

The Cochin coast is made unique by the presence of a number of lagoons estuaries and backwaters. This estuarine eco system is affected by the geology and geography of the landmass tidal flows from the sea and discharge from the drainage of the perennial river system. Large quantities of silt are brought down by the rivers and get deposited in the inland water bodies which become shallower. In channels which are relatively free from tidal flows like the Champaikkarra Canal silting and land erosion is a recurring problem resulting in depletion of the navigable draft. The Kadamakudy group of islands has been especially noticed to be prone to erosion. Likewise the Cochin Shoreline, covering a distance of approximately 18 Kms is subjected to sea wave inundation and the consequent erosion is one of the major problems faced in this coastal belt.

#### **Man-Made Environmental Problems:**

The consequences of urbanisation are manifest in the increased land coverage by buildings and roads which creates congestion while the industrial and transportation system generates atmospheric and noise pollution. The filling up of the drainage basins and watersheds and conversion to urban land have created problems of water logging.

The Cochin Backwaters are part of the Vembanad lake which is the largest such estuary in the State and was formed consequent on the catastrophic deluge in the year 1341 A.D. which gave rise to the natural harbour of Cochin and the adjoining islands. This backwater has been subjected to horizontal and vertical shrinkage by natural and manmade processes like siltation and paddy and shrimp cultivation coconut husk retting harbour development and land reclamation for urban construction. It has been calculated (by V.C. Gopalan et al) that the extent of the backwaters is now only 34.8% of what it was in the mid nineteenth century and the present trend if continued will result in reducing it further. The agricultural runoff of the pesticides and the industrial and domestic wastes deplete the marine life in the backwaters thereby affecting the livelihood of nearly 20,000 people in the Cochin region who make a living from fishing and allied activities.

Those parts of the city such as Mattancherry and Fort Cochin which have a specifically historic character and a maritime ambience deserve preservation and conservation if the environmental heritage of Cochin is not to be lost in the process of urbanisation.

#### **15.4 Schemes and Studies Proposed for the enhancement of Environmental Security:**

- (1) A study has been suggested by the Centre for Earth Science Studies (CESS) Trivandrum to monitor environmental pollutants in the rivers of Penyar and Chitrapuzha in the Cochin

region and the Cochin backwaters and to investigate hot spot areas of major pollutants their pathways and carriers. The CESS has also proposed the construction of two major effluent treatment plants for Eloor and the Chitrapuzha industrial belts with the pumping of the treated effluents through underground pipelines to the sea. The cost implication of such a scheme will however be enormous and need detailed examination.

The Team feels that a study of the horizontal and vertical shrinkage of the Cochin backwaters and of siltation in the estuaries could be conducted by a multidisciplinary team constituted for this purpose. The dredging plan for desilting the waterways on the backwaters to be taken up by the Port Trust and the Irrigation Department should conform to the findings of the study.

(2) The Cochin region including the islands has a total shoreline of 523.5 Kms which can be broken as follows

Sandy beach	—17800 M
Shore of Large Canals	—8000 M
Perimeter of Islands	—439500 M

The stabilization of the shoreline is essential to prevent erosion of these banks as well as siltation of the adjoining water bodies. The State Irrigation Department has a continuing programme of seawall construction in appropriate patches, one of the cheapest, easiest and ecologically most satisfactory methods which can be adopted is by planting trees along these shorelines. In Cochin region it is found that the Avicennia trees (a type of Mangrove) are ideal for the purpose. If such seedlings are sown on the mudflats they would attain about 2 M height in 2 years producing pneumatic phores which bind the mud.

(3) Proposals for augmentation of the treatment of the sewerage, drainage and solid waste disposal systems for the Cochin region are given in a related chapter. The final plan for land use suggested in this report has also to be drawn up keeping in view the need to ensure that regional development does not adversely impinge on the land contours or the water bodies and the environment security aspects.

(4) Control measures for the specifically hazardous industries have to be devised for the Cochin region. The case of the Indian Rare Earths Plant with radioactive thorium sites on the Periyar river bank and the Travancore Cochin Chemicals which discharges mercury containing waste into the river have to be separately considered. The Kerala State Pollution Control Board's role needs to be strengthened if effective regulatory control on industry is to be imposed. Likewise the 10,000 tonne Ammonia tank of FACT at the Willingdon Island is a specific hazard and the proposals which have been taken up for shifting the tank away from the built up region have to be considered. (It is perhaps pertinent to point out here that in a recent decision of the Kerala High Court, a few pollutive industries in the Udyogamandal belt have been required to deposit Rs. 9 lakhs with NEERI for research on the pollution caused by them). Details and pollution measures already taken by the industries are given in annexure III & IV.

(5) Appropriate changes in the State Motor Vehicles Act to regulate automobile emissions have been proposed by the State Pollution Control Board and are being processed by the State Government. It is expected that the suggested provisions would be sufficient to check the pollution arising from automobile exhausts in the region.

(6) A typical mangrove swamp, Mangalavanam, located behind Kerala High Court which is a rich repository of manne life in the region could be protected by the City Corporation as a conservation area.

### 15.5 Recommendations:

The Team would recommend as follows

(i) The proposals for immediate funding which have been detailed in annexures I & II

relate to the creation of infrastructure for the monitoring of air and water pollution levels in the Cochin region by the State Pollution Control Board. The schemes propose the creation of five water quality monitoring stations and seven ambient-air monitoring stations at a total of Rupees 83 lakhs. An amount of Rs. 28 lakhs has to be set apart in the Seventh Plan period leaving the balance to be met during the Eighth Plan. It is hoped that these stations would become fully operational during the Eighth Plan.

(ii) The cost of the studies suggested in para 15.4 of this chapter should be at least partially borne by the pollutant industries. These industries should adopt adequate control measures, either singly or jointly, under the overall supervision of the State Pollution Control Board.

(iii) Legislative changes in the Pollution Control Act, the Motor Vehicles Act, the Kerala Building Rules, the Factories and Boilers Act, the Marine Fisheries Regulation Act, and the Kerala Land Conservancy Act might be examined by the State Govt. in the interest of environmental security.

(iv) It is further recommended that a multidisciplinary team to function as an Environmental Task Force for the Cochin region be created comprising of representatives from the State Pollution Control Board, the Centre for Earth Science Studies, the Central Marine Fisheries Research Institute and the University of Cochin to monitor and oversee the pollution levels and suggest specific measures to be taken in order to conserve the environment.

**ANNEXURE I**  
**SCHEME FOR WATER QUALITY MONITORING STATIONS**

The proposal by the Kerala State Pollution Control Board for Water and Air Pollution monitoring improvement in Cochin region would cost as follows

**(a) Cost of Water Monitoring Stations**

Sl.No.	Description	Cost in Rs.
1	Fibre glass motonised boat of size 5 M x 1.75 M with 8 to 10 person capacity and accommodating sampling kit	50,000.00
2	Chopstick type samples assembly (imported)	10,000.00
3	Automotive PH Monitor, D.O, conductivity, temperature, near to station No. 9 of Chitrapuzha water ways with automotive recording type of instrument	1,00,000.00
4	Water level recorder	20,000.00
5	Land and building	50,000.00
<b>Cost per station Total</b>		<u>2,30,000.00</u>
<b>Total Expenditure for 5 stations</b>		<u>11.5 lakhs</u>

**ANNEXURE II**  
**(b) COST OF AMBIENT AIR MONITORING STATIONS**

Sl.No.	Description	Cost in Rs.
1.	Purchase of land for permanently placing the instrument	40,000.00
2.	Construction of building for placing the instrument.	30,000.00
3.	Imported automatic recorder instruments for S.P.N., NO <sub>2</sub> and SO <sub>2</sub> , CO, Ammonia	8,00,000.00
4.	Meteorological instruments such as windspeed and direction indicator and recorder, rain guage etc.	1,00,000.00
5.	Consumables and spares, maintenance charge, other contempt expenditure/year.	50,000.00
Cost per station—Total		10,20,000.00
Total Expenditure for 7 stations		71.4 lakhs

**ANNEXURE III**  
**STEPS ALREADY TAKEN BY INDUSTRIES IN WATER**  
**POLLUTION CONTROL MEASURES.**

Constant vigil and repeated persuasion has influenced the industries to go for modifications of the existing set ups in industrial water pollution control measures. The details of industries within Cochin area which are capable of producing effluents are listed below along with details of water pollution control measures taken by them.

Sl. No	Name of Industry	Pollution control measures
1	M/s FACT Odogamandal	1) Reduced the no. of outlet from 14 to 5. Major portion is treated with lime and allowed to settle in a clarifier. Gypsum and calcium fluoride removed are done by dry cake removal. Carbon recovery system is introduced. The system is partial and can only bring down the quality.
2	M/s Hindustan Insecticides	Effluent collection tanks for D.D.T and B.H.C. plants. Lime treatment facilities, clarifier and sludge drying beds. Incinerator plant for Endosulfan Plant. The system is inadequate to maintain the standard.
3	M/s Indian Rare Earths	Mixing of Acid and Alkaline wastes and treating with HCl, Ca <sup>2+</sup> and FeCl <sup>3</sup> . Clarifier for settling purposes and vacuum filter for sludge collection.
4	M/s Comico Binani Zinc Ltd	Lime treatment and settling facilities.
5	M/s Penyer Chemicals	Neutralisation and settling tanks.
6	M/s United Catalyst India Ltd	Settling tanks.
7	M/s Travancore Chemicals and Mfg. Co	Lime treatment and settling facilities.
8	M/s Kerala Acids and Chemicals	Neutralisation and settling facilities.
9	M/s Mill Marketing Federation	Skimming tank, screens, Oxidation ditch, settling tank.
10	M/s ISRO Alwaye	Solar bed.
11	M/s Sri Chitra Textile Mills	Settling tanks cum oxidation ponds.
12	M/s H.M.T	Neutralisation and Hypochlorite treatment.
13	M/s Cochin Refineries	API Separator, Equalisation tank, Activated sludge clarifier and polishing tanks and chemical treatment facilities.
14	M/s FACT Cochin Division	Acid neutralisation, Ammonia stripping, sludge drying beds and vacuum filtration units.
15	M/s T.C.C. Ltd	Sodium sulphides filtration and lagooning.
16	M/s Tata Oil Mills	No treatment.
17	M/s Premier Typres Ltd	No treatment.
18	M/s Toshiba Anand Batteries	Settling tank.
19	M/s Indian Aluminium	No treatment. Almost within the standard.
20	M/s South India Wire Ropes	Covering and utilising for treating effluents from other industries.
21	M/s Travancore Rayons	Rins treatment and settling.

Source: Kerala State Pollution Control Board



**ANNEXURE IV**  
**STEPS TAKEN BY INDUSTRIES IN AIR POLLUTION CONTROL MEASURES**

Chemical industries contribute to air pollution in Cochin region. List of industries which have incorporated some pollution control measures are given hereunder.

**M/s. FACT Cochin Division :** has recently commissioned scrubbers for their NPK Plant with existing area hydrolyser stripper and mist eliminator for acid plant.

**M/s. Cochin Oil Refineries:** has commissioned a smoke free tall flare stack for flaring the tail gas from the processes.

**M/s. Hindustan Organic Chemicals** also has provided a flare stack for their new installations.

**M/s. Carbon and Chemicals:** has recently commissioned a tail gas flaring system.

**M/s. FACT Udyogamandal:** has done internal plant level modifications with scrubbers etc. to curtail air pollution problems. The construction of a Double Combustion Double Absorption Plant for Sulfuric Acid is going on for scrapping the potential air pollution source of the contact process acid plant. Certain other proposals are also under consideration.

**M/s. Cominco Binani Zinc Ltd:** has commissioned a new DCD A acid plant.

**M/s. Hindustan Insecticides:** has a bag filter unit for their DDT plant and also has provision for flaring/incinerating the water effluent in their endosulfan plant.

**M/s. Premier Tyres:** has a dust collector unit for the Carbon recovery from the mixing units.

The above measures need further augmentation. Steps will have to be initiated by the other industries which have no air pollution control measures. Industries have to be persuaded to adopt effective measures for minimising air pollution and keeping the air clean.

Source: Kerala State Pollution Control Board

## CHAPTER SIXTEEN

### DEVELOPMENT OF ISLANDS ADJOINING COCHIN

#### 16.1. Introduction:

The singular geographical feature of the Cochin region is the vast expanse of backwaters and the islands which lie on this waterbody. These islands despite being close to the city and having high density of population are characterised by small extent of developed land, insufficient infrastructural facilities and general economic backwardness.

#### 16.2. Physical Setting :

There are 32 islands of varying sizes dispersed over the entire region. More than 75% of these islands are unconnected by roads to the mainland and hence depend entirely on water transport. The annexure attached to the chapter shows the list of adjoining islands and some of the indicators of their development. The basic characteristic of these islands is the large extent of low lying marsh lands as mentioned earlier which poses a special problem in that only about 39% of the land area is suitable for habitation.

#### 16.3. Present Situation .

Most of the adjoining islands lie less than 10 Kms from the city centre. However the disparity of development between the city and these islands is conspicuous. Lack of direct road linkage with the mainland is cited as one of the reasons for the slow pace of development of these islands.

A comparative analysis of the islands with the Cochin Corporation and the other municipal areas of the region based on the general development indices reveals the backwardness of the islands. The total population of 2.14 lakhs of the Island Panchayats constitutes nearly 14.10% of the total regional population, whereas the secondary urban centres (municipalities) of the region contain only 6.95% of the total population of the region. The total number of industrial units (44) in the island Panchayats forms only 3.15% of the total number of industrial units (1399) in the region. Similarly the total number of people engaged in the industrial sector from the Island Panchayats is only 1.45% of the total industrial employment in the region. There is ample potential for the development of household and cottage industries on the islands. The gross density of population in the island Panchayats comes to 15 persons per hectare compared to 20 persons per hectare for the region as a whole. The islands have a comparatively higher net population density compared to the other rural areas of the region since the available developed land is only 30% in these areas. The length of road per 1000 persons comes to 1.54 km in the island zone. This is less than half of the state average, the state's average length of road being 3.7 km/1000. This is mainly due to the fact that there are practically no major black topped roads through these islands.

With regard to water supply the island dwellers have to depend solely upon public protected

water supply due to the salinity in the ground water. The present water supply in this zone is only 20 litre per capita per day which is much below the recommended standard. This necessitates special emphasis to be given for improving the quantity of water supplied. More than 75% of the houses in this area are substandard and at least 50% of the houses need repair or renovation to continue in habitable condition during the next decade. (Refer chapter on Housing) This requires mobilisation of special assistance for repair and renovation of Lower Group houses. The number of houses connected to electric power supply is only nominal. The lack of sufficient power is one of the main reasons for the low level of industrial development here.

The main retardants in the development of these islands can be summarised as follows

- (1) Lack of sufficient road connections
- (2) Lack of proper inland water transport facilities which is the only mode on which the majority of islanders depend
- (3) Poorly maintained housing
- (4) Insufficiency of other infrastructural facilities like water supply, sewerage etc.
- (5) Dearth of public facilities like hospitals, technical institutions, workshops etc.
- (6) The absence of a sound economic base and the consequent lack of employment opportunities
- (7) Lack of sufficient technological inputs in the development of agricultural and fisheries resources

The main occupation of the islanders are **fishing, agricultural activities, brick making, pottery making and petty trade**. These islands still retain their rural character and they are endowed with natural scenic beauty.

#### **16.4. Suggested line of development :**

(a) The main objective here is to improve the quality of life of the people of the island zone. This should be done without affecting the environmental character or ecological balance in the islands. Any development scheme has to primarily depend upon the improvement of the economic, social and physical conditions of living of the inhabitants. Hence the primary objective should be to improve the economic base of the area. This will in turn reduce the intra-regional disparities in development. However, the selection of options for improving the economic base should not prove detrimental to the natural environment. Thus, the following combination of options are recommended which are in consonance with the present occupational pattern and the environmental setting of the islands.

- (1) Improvement of the agricultural sector by introducing scientific methods of cultivation of paddy and coconut
- (2) Setting up of agricultural co-operative societies including for marketing of the products
- (3) Introducing agro-based small scale industries
- (4) Development of the Fisheries sector by providing proper training on fish culture, prawn farming etc. in a scientific manner
- (5) The potential of the fisheries sector in employment generation especially for women to be fully exploited by providing training facilities
- (6) Setting up of fish processing units and peeling sheds

- (7) Setting up of fishermen welfare fund and fish farmer s co-operatives
- (8) Utilizing the potentials of selected islands for promotion of tourism by declaring them as tourist villages and providing the necessary infrastructure
- (9) Protection of the backwater resources from industrial pollution
- (10) Providing essential road connection without detriment to the ecology of the islands
- (11) Development of the water transport system by the introduction of regular services introducing faster vessels and increasing the navigability of the channels
- (12) Providing additional facilities for collection and distribution of local produce by creating market centres as part of rural growth centres.
- (13) Providing additional social and community facilities like public health centres banks educational institutions and public call offices
- (14) Encouraging local employment in traditional occupation such as pot making brick making etc by providing incentives and other infrastructural facilities
- (15) Providing sufficient drinking water through the public water supply system
- (16) Providing loan assistance for repair and renovation of the existing substandard houses

(b) Keeping the above objectives in view several suggestions have been made relating to development of the islands under the appropriate sectoral chapters. Some of the suggestions already made are mentioned here in brief

- (i) Water Supply Scheme to Njarakkal and adjoining panchayats which will cater to the requirement of the majority of islanders will have to be taken up on priority basis
- (ii) Adequate loan assistance to the low income group for repair and renovation of their houses has to be provided
- (iii) Provision of adequate jetty facilities deepening and improvement of water ways and adequate provision for providing incentives to country craft operators have to be taken up in accordance with the recommendations made in regard to improvement of inland water transport. Development of link roads and connecting bridges should be taken up as recommended in the chapter relating to road transport
- (iv) Taking appropriate steps for checking depletion of in shore fishing stock and setting up of brackish water fish farms at Njarakkal construction of fish landing centres and the extension of training facilities in modern fishery practices to benefit the islanders
- (v) Extension of public call offices to cover all the islands
- (vi) Demarking the less inhabited islands including Thanthonni and Pig Islands as Tourist villages and developing a water sports complex
- (vii) Planting of abicennia type trees (a type of mangrove) on the shore lines of the islands to prevent bank erosion and siltation of water bodies
- (viii) Taking preventive measures against indiscriminate reclamation of the backwaters and uncontrolled spewing of effluents/Pollutants into the backwater adversely affecting the environment and also marine resources which is the basis of island economy

- (ix) Formulation of a separate master plan for the backwaters region
- (x) Measures to promote and encourage local resource-based industries in the island region like brick making, coir making & sea food processing
- (xi) Inclusion of the left out islands within the GCDA area in the interest of integrated development.

(c) Financial requirement for the above activities are not separately indicated here as they have been shown under the sectoral chapters. The foregoing proposals will however require the coordinated efforts of various departments for successful implementation. The State Fisheries Department could take up the responsibility of setting up fish farms and landing centres for the island zone. They could draw upon the expertise already available at Cochin from institutions like Central Institute of Fisheries Technology, Central Marine Fisheries Research Institute etc. The State Industries Department would have to acquire and develop areas in collaboration with the private sector as required for the promotion of agro based industries providing incentive for investing in these units. The formation of agricultural co-operatives providing of incentive and the adoption of modern farming practices would be the responsibility of the Agricultural Department.

The State Tourism Department would also have to step in in order to conserve and improve these islands for tourism and water sports. The recommendations of the Team with regard to the other sectors as mentioned in this chapter and the sectoral chapters would have to be acted upon by the concerned departments of the State Govt. handling the subject.

#### **16.5 GCDA to take up periodic review**

In view of the poor levels of development prevalent in the islands it is recommended that special care should be taken for developing the basic infrastructure in these islands in the several identified Sectors. The planning and project cell wing of GCDA should keep a special tab on progress in various sectors and ensure periodic review while coordinating the activities of different sectors in the Island Zone.

### ANNEXURE

Sl No	Name of Island	Panchayat/ Corporation comprising the island	Population	Main economic activity	Availability of Shopping facility	Bank	Co-op society
<b>Adjoining Island</b>							
1	Vypeen Island	Elankunnapuzha Njarackal Nayarambalam Kuzhippilly Pallipuram	1 53 978	Agr / Fishing	Yes	Yes	Yes
2	Valiyavattom	Nayarambalam	650	Agr / Labour	—do—	Nil	Nil
3	Menjakkad	Njarackal	175	Farming	—do—	—do—	—do—
4	Thanthonn	Cochin Corporation	275	Nil	Nil	—do—	—do—
5	Pig Island		Nil	Nil	NA	NA	NA
6	Gundu Island		Nil	Nil	NA	NA	Yes
7	Kunniakotta	Chenanelur	1 000	Fish farming	Nil	Nil	Nil
8	Mulavukad	} Mulavukad	21 397	Boatyard	Yes	Nil	Nil
9	Vallarpadam			Weaving	Yes	Yes	Yes
10	Chenyamulavukad			Fish Farming	Yes	Nil	Nil
11	Moolampilly			Potmaking	Yes	Nil	Yes
12	Kothad			Agr	—do—	—do—	Yes
13	Puzhale			Brickmaking	—do—	—do—	—do—
14	Chennur			Textile mill	—do—	—do—	Nil
15	Chenyanthuruth	} Kadamelakudy	13 696	Brick	—do—	—do—	—do—
16	Kadamelakudy			Agr	—do—	—do—	—do—
17	Chenyakadamelakudy			Labour	—do—	—do—	—do—
18	Pullickapuram			Nil	—do—	—do—	—do—
19	Murchal			Nil	—do—	—do—	
20	Edampadam	Eloor	381	Brick making	Yes	Yes	Yes
21	Valanthakud	Meradu	350		Yes	—do—	—do—
22	Cheppanam				Nil	Nil	Yes
23	Chathanama	} Kumbalam	21 678	Agr	Nil	—do—	—do—
24	Paragad			Nil	—do—	—do—	—do—
25	Kumbalam			Yes	—do—	—do—	—do—

Other Islands within the Region not surveyed

Island	Panchayat	Island	Panchayat
1 Mukkothakudy	Udayempoor	5 Mattammal	Parur
2 Ameshadythuruth		6 Pullakad	Ezhilakara
3 Kalathirachal	Chellanam	7 Kodelakud	Kottuvally
4 Thurathy	Chengamanad		

	Education			Health			Communication			Protected Water Supply
	LP	UP	HS	Allo pathy	Ayur ved	Homeo pathy	PO	TO	PCO	
1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes	Nil	Nil	Nil	NA
3	Nil	Nil	Nil	Nil	Nil	Nil	--do--	--do--	--do--	Yes
4	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--	Yes
5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Yes
8	Yes	Yes	Yes	Yes	Nil	Nil	Yes	Yes	Yes	NA
9	--do--	--do--	--do--	--do--	--do--	--do--	Yes	Nil	Nil	NA
10	Yes	Yes	Yes	Nil	Nil	Nil	Nil	Nil	Nil	NA
11	Yes	Yes	Yes	Nil	Nil	Nil	Yes	Nil	Nil	Yes
12	--do--	Yes	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--
13	--do--	--do--	Nil	Yes	--do--	--do--	--do--	--do--	--do--	--do--
14	--do--	Nil	--do--	Nil	--do--	--do--	Nil	--do--	--do--	--do--
15	Nil	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--	Yes
16	Yes	Yes	Yes	--do--	--do--	--do--	--do--	--do--	--do--	--do--
17	Nil	Nil	Nil	--do--	--do--	--do--	--do--	--do--	--do--	Yes
18	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--
19	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--	--do--	Yes
20	Yes	Yes	Yes	Yes	Nil	Nil	Yes	Yes	Yes	Yes
21	Nil	Nil	Nil	Yes	Nil	Nil	Nil	Nil	Nil	--do--
22	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
23	--do--	--do--	--do--	--do--	--do--	--do--	Nil	--do--	--do--	Nil
24	Yes	Yes	Yes	Yes	--do--	--do--	Yes	Yes	Yes	Yes
25	Yes	Yes	Yes	Yes	--do--	--do--	--do--	--do--	Yes	Yes

## CHAPTER SEVENTEEN

### MANAGEMENT OF INTEGRATED DEVELOPMENT BY GCDA

#### 17.1 Introduction

For achievement of results in a time bound horizon management of urban development has to receive purposive attention. This matter assumes considerable importance in the context of the GCDA area where development has to be coordinated in as many as 6 urban local bodies and 33 panchayats besides some adjoining islands. At present there is no well defined mechanism to regulate and guide the planning process in the area taking care of the spatial implications of sectoral investments notwithstanding the fact that the GCDA was intended to ensure coordination and regulation of the planning process and plan implementation in the area. With industrialisation going apace in the area at a high speed inter sectoral and inter regional body linkages must be ensured if development in the area is to be integrated.

#### Role of GCDA as Coordinator

17.2 A metropolitan planning authority like the GCDA is not intended to be an executing agency of the usual development schemes in urban areas. The usefulness of such organisations is to be judged from what they have ensured in getting done by the affiliated regional/local bodies while exercising the role of a coordinator and not by what specific items of development works they execute. Its functions should be to prepare Five Year Plans co terminus with national/state plans and further break them up into Annual Plans consistent with the priorities for development decided for the area for execution by the constituent municipal/local bodies. No doubt its entry into the arena of execution would be welcome where the constituent agencies lack the necessary administrative financial and organisational strength. But that would be again in the role of an overseeing coordinator and not as a ground level implementor. The structural relationship between the GCDA and the municipal/local bodies comprised within its jurisdiction will have to be given a relook in this light.

17.3 The recommendations made in this report being intended for implementation within certain time targets involving both organisational and financial discipline in a predetermined order of priorities the following aspects would need attention:

- (i) Structural change in inter relationship between the State Govt. GCDA and the municipal/panchayat bodies comprised within the Cochin area.
- (ii) Inter relationship amongst the above organisations in the matter of execution of development works and
- (iii) Source of finance and financial relationship amongst them.

17.4 Improvement of the institutional milieu of a whole range of State, sub state and other local level bodies which share the same space and influence the working of the core local bodies is an important item identified by the Task Force on Housing and Urban Development (1983) of the Planning Commission. While dealing with the relationship amongst the institutions in the GCDA area



in this chapter, the relationship and coordination with the State Govt. has been left to be dealt with in the next chapter.

**17.5** The organisational and financial problems and the problems of coordination between the development authorities, Govt. Depts. and other agencies was looked into by a Special Committee constituted by Kerala Govt. in the year 1982. This Committee was of the view that development authorities being bodies created above the level of traditional local bodies and covering a large number of the latter in an urban agglomeration, their primary task should be regional planning for the development of the urban area as a whole. Amongst other things, the Special Committee had suggested preparation of a Regional Development Budget, creation of a situation where the development authorities would be required to undertake only schemes of a regional nature, conferment of patta rights on the development authorities in respect of land acquired in the development region, transfer of poramboke lands free of cost within a detailed town planning (DTP) scheme area sanctioned by the Chief Town Planner/State Govt. and creation of a revolving fund to improve the financial standing of such authorities. An Empowered Committee was set up by the State Govt. in 1983 under the Chairmanship of Commissioner for Economic Development to suggest specific action to be taken in pursuance to the recommendations of the Special Committee. Many important suggestions are however yet to be implemented in the GCDA area.

**17.6** As has been stated, the rationale for a metropolitan development authority is not so much as to what it can do; rather its task should be to take up what others cannot do at the metropolitan level and may therefore go by default. In other words, in a metropolitan or a pre-metropolitan situation like that of Cochin area, the importance of specifically laying down the principle that the metropolitan level of planning activities should be effectively discharged and coordinated at the GCDA level needs no elaboration.

**17.7** So far the GCDA has taken up several local area action schemes known as detailed town planning schemes prepared by it in accordance with the guidelines issued under the Regional Development Plan prepared in 1976. These cover (1) Housing Schemes (2) Road improvement and development schemes as a part of major road plan in the area (3) Commercial development schemes like warehousing complex in the Gandhinagar area and the Ernakulam South Commercial Centre (4) City Centre development scheme like taking up an integrated scheme for commercial and residential houses over 17.69 ha. of land reclaimed out of the back waters in Cochin marine drive area; (5) Recreational facilities improvement by way of providing two stadia in the city; and (6) A dhobikhana at Fort Cochin (handed over to the Dhobies Cooperative Society) by way of creation of work centres for urban poor, besides some city beautification schemes through provision of bus bays along major traffic corridors, re-organisation of parks etc. While these activities broadly conform to metro politan level of activities, it has still to be stated that the GCDA is yet to play a coordinating role in giving a direction to the developmental activities of the area.

**17.8** For exercising a superior role expected of such a body, there is a case for providing a face-lift to its standing vis-a-vis the other municipal/local bodies within its area both through legal and administrative devices. The existing Town Planning Act 1108 under which the development authorities in the State are created by virtue of provisions of section 53(A) is an old one and its replacement was recommended by the Special Committee referred to above. Taking into consideration the present day requirements of planning in a metropolitan/pre-metropolitan situation, the State Govt. did examine a new Town Planning Bill in the year 1982. This Bill is yet to be enacted into a law.

**17.9** For strengthening the GCDA as the coordinating organism at the area level, the Team would make the following recommendations:

(i) Presently the membership of the authority includes Chief Engineers/Superintending Engineers of Govt in-charge of roads Water Supply and Sewerage Electricity Chief Town Planner/Regional Town Planner District Collector Mayor of Cochin and two representatives selected from constituent municipalities besides the Member Secretary and the Chairman appointed by the Govt. This membership does not include any State level representation and to that extent makes the processing of cases sponsored by the authority difficult of appreciation at the State level. It is suggested that the Local Administration (Urban Development) Deptt. of the State be closely associated with the goings on in the authority and a representative of that Deptt. be made a member of the authority. Apart from the above Kerala Urban Dev. Finance Corporation an important State level institution likely to be of considerable assistance in arranging funds from institutional sources for several development programmes within the area should also be represented on the authority.

(ii) At present the Authority doesn't include any representative from the panchayats within its area. As problems in these areas are likely to be somewhat different from the more urbanised localities at least two representatives from the rural panchayats may be taken as members.

(iii) A few islands adjoining the mainland have been left out of the jurisdiction of GCDA. These may be included within the area of the authority.

#### RESOURCES FOR PERFORMING BASIC TASK

**17 10** Resource constraint has been a major factor for the continuing disability of urban local bodies in the country and the Cochin area municipal bodies are no exception. The State Govt. had appointed a Municipal Finance Commission during 1976. However, a regular system of devolution of finances except for devolution following statutory stipulations such as under entertainment tax Act, property registration fees and the like and small assistance by the State Govt. to implement sanctioned town planning schemes is yet to be implemented. In this context serious efforts have to be made by urban local bodies to improve their resource base.

**17 11** So far as GCDA is concerned apart from Govt. grant its source of revenue mainly consists of 2% of gross annual revenue of the constituent local bodies within its jurisdiction and fees levied for issue of development permits and receipts from sale of developed plots and other remunerative schemes like construction of market complexes housing schemes etc. These receipts are however utilised substantially for repayment of loans received from Kerala Urban Dev. Financing Corporation and other financial agencies. The State Govt. also expects the Authority to repay back amount sanctioned to it for reclamation of development sites. In this background the Authority has not been left with any surplus worth the name for taking up new development schemes without resorting to further loans.

**17 12** The GCDA reclaimed sea front land of about 12 ha. at a total cost of nearly Rs. 8 crores and has taken a loan of about Rs. 12 crores from Kerala Urban Dev. Finance Corporation. Govt. of Kerala and other institutional sources for reclamation and other improvement activities. The State Govt. however expects the authority to pay for full market value of the land (about Rs. 30 to 40 lakhs per acre). This is notwithstanding the fact the total loan amount including loan from State Govt. is repayable. While as a measure of additional resource mobilisation at the State level asking for market value of land reclaimed may be sensible particularly if one banks on the expectation that the authority will be able to spin substantial revenue out of the asset created in practice these expectations have so far been belied. A more liberalised approach in such cases may have to be

adopted, to meet the growing needs of urbanisation and imperative need to provide civic facilities in Cochin area.

**17.13** The Water tax in Cochin Corporation area was fixed in the year 1973. The existing rules visualise varying degrees of exemption for buildings based on their monthly rental value. Buildings with a monthly rental value of Rs. 50/- have a minimum free allowance of 20,000 litres per mensem. It is well-known that the buildings within the Cochin Corporation area fetching such low monthly rent will be very few and yet taking advantage of the exemption provision, a large number of building owners do not in practice pay any water tax, depriving the Corporation of substantial revenue. It is estimated that revenue from this source alone may go up atleast three-fold if the exemption concessions are abolished.

**17.14** The Special Committee referred to earlier had suggested conferment of ownership rights on the development authorities in respect of land it had taken up for development in cases where the Town Planning Scheme was duly approved by the competent authority. This however is yet to be implemented by the State Govt. as a matter of policy. The Team would feel that apart from conferring patta rights in respect of land acquired for development, the State Govt. may consider conferment of ownership right on the GCDA in respect of about 100 acres of poramboke land in Trikkakara Panchayat and identify such other land for conferment of similar rights. This is likely to expand the asset base of the authority enabling it to take up a bigger role in development of the area.

**17.15** Levying charges for services provided by municipalities and panchayats has been a more acceptable alternative to taxation proposals within such areas. By and large, Cochin Corporation and the 5 municipalities of Alwaye, Perumbavoor, Panur, Angamaly and Tripunithura have levied the usual charges namely water tax, property tax, including lighting charges, conservancy fee, market fee etc. A good number of panchayats however, are yet to levy fee/charges on the same level as obtaining in the municipal bodies. There is a case for reviewing this matter including standardisation of rate of fee/charges for similar quality/quantum of services provided in different areas under the jurisdiction of GCDA.

**17.16** For non-remunerative scheme like bus shelter, recreational spaces and schemes for socially backward classes, the State Govt. in its GO of 29.7.69 had laid down sharing of cost @ 25 : 25 : 50 between GCDA, the urban local bodies and the State. However, in practice, the State Govt. has not been able to earmark adequate funds for this purpose and the same applies to the local bodies. In this background the GCDA as also the constituent bodies will have to formulate a good number of bankable schemes for remunerative works of relevance to the area:

- (i) Development of swampy area identified for reclamation and sale of land;
- (ii) Development of lands acquired, poramboke land to be alienated in favour of the GCDA with patta rights by the State Govt.; and
- (iii) development of commercial centres & markets.

#### **MUNICIPALISATION OF RURAL AREAS**

**17.17** Legislation for inclusion of new areas within municipal limits is usually resisted mainly because of anticipated fear of tax. However, provision of services in the non-municipal areas i.e.

panchayat areas within the GCDA limit, without beneficiaries obligation to pay for the services provided has resulted in erosion of the tax base. In panchayats like Trikkakara Eloor and Kalamassery where the industrial units of FACT HMT etc. are located municipal services and conveniences available are as good as several other areas within the adjoining municipalities and Corporation of Cochin. However on account of these areas being Panchayats, property tax levied within its limits is at a lesser rate. While equity in incidence of taxation between the existing developed urban areas and the new expansion areas should be carefully gone into it has to be appreciated that overall requirements of planning execution and finance base dictate municipalisation of the panchayat areas exhibiting strong trends towards urbanisation. The Team feels that the following panchayats would come under this category Eloor Kalamassery, Trikkakara Maradu Njarakkal Mulavukad Elamkunnappuzha Cheranelloor Tiruvankulam and Kadamakkudi. We would suggest to the State Govt. to take steps for constitution of new municipalities or merger of this area with the adjoining municipalities in order to secure larger volume of finance for development programmes in the area.

#### **URBAN COMMUNITY DEVELOPMENT APPROACH**

**17.18** The Urban Community Development project in the Municipal Corporation of Hyderabad was sanctioned as a Centrally Sponsored Scheme in the year 1967 covering a population of 50,000. The expenditure was to be shared between the Centre, State and MCH in the ratio of 2:1:1. The scheme was transferred to the State sector in 1969 and the State Govt. continued the programme with cost being met 50% by the State Govt. and the MCH. Through appointment of a small contingent staff of community organisers and social workers, the felt needs of the communities in the urban area, particularly amongst the backward sections, in education, health, sanitation, shelter improvement and loans for small business in the slum sector which serve the urban community have been successfully tackled by fostering a dialogue among all strata of the urban communities. Serving as a link between the people and the authorities, the UCD programme has helped in decentralising delivery of certain services and cost recovery of public services. The Team recommends adoption of the UCD approach to start with for the heavy congested slum areas and areas inhabited by the backward classes belonging to the fishermen community.

#### **Improvement of resource-base of urban local bodies**

**17.19** The Team would suggest that to look up matters relating to improving asset and resource base and financial capability of the municipal and local bodies in the GCDA area dealt with in the foregoing paragraphs, the State Govt. may appoint a small group to go into the matter and suggest specific action to be taken within specified time.

#### **ACTION PROGRAMME TO IMPLEMENT INTEGRATED DEVELOPMENT**

**17.20** In order that the major items of development programmes in the Cochin area proposed by the Team are taken up for implementation and finished within a reasonable preparation time horizon, GCDA will have to immediately engage itself on the work of preparing detailed action programme. The Team would suggest the following five year & annual plans.

- (i) The GCDA will be expected to prepare Five Year Development Plans (FYDP) with reference to the sectors of Development dealt within this report and break them up into Annual Action Plans (AAP) in terms of priorities in implementation to be decided by the Authority in consultation with the constituent local bodies. The FYDP and AAP should include a development budget indicating funds available and funds to be mustered/arranged for the five year/annual plan respectively.

(ii) The FYDP/AAP should feature out municipal/local body wise action plan in all respects relating to implementation, resource mobilisation target date for completion etc. Each one of the municipal/local bodies within the jurisdiction of GCDA area should adopt and implement similar FYDP/AAP

(iii) Depts/organisations of State Govt. as also GOI who would be concerned with the activities in this area should intimate GCDA the likely availability of funds for various programmes in the area during the ensuing year by 30th of November each year. The development budget/AAP for the following year should be supplied to the constituent bodies for discussion and incorporation of the relevant financial projections in their budgets. The GCDA will have to devise a time schedule in this regard keeping in view the time for presentation of budgets in these bodies.

(iv) Requirements of planned urban growth would dictate that investment in the metropolitan area should be subjected to clearance by the metropolitan planning organisation. While the State Govt. provides funds under different plan heads relevant to Cochin area as suggested in the relevant chapter, care has to be taken by them through issue of appropriate directives to ensure that the departmental schemes for the area are initially vetted by the GCDA before they form a part of the departmental programme. Since GCDA is visualised as the area level coordinating authority, prior consultation with them by the departmental authorities would appear to be a salutary pre condition.

(v) Area level coordination would require suitable institutional forum. The Team recommends that a Cochin Area Dev. Coordination Committee may be set up at the local level under the chairmanship of Secy. Local Admn. (Urban Dev.) of the State Govt. with Chairman GCDA, Member Secretary GCDA, two Chief Executives of the GOI organisations in the area (to be chosen by the Chairman of the Committee by rotation), two representatives of the municipal/local bodies (to be nominated by the Chairman in rotation) and Secretaries to Kerala Govt. in Roads and Power Depts. as members. The nominations referred to above have to be rotated strictly keeping in view the problem areas emerging from time to time. The decision taken at the Coordination Committee should be placed before the State Govt. and incorporated in appropriate Govt. orders to be implemented by concerned Department/organisations/bodies. The Committee should meet at least twice a year.

17.21 The GCDA has five important wings namely the Planning (including project Cell Wing) and the Engineering, Estate, Finance and Administrative Wings. The organisation would be in a position to discharge duties of coordination of the programmes of development dealt within this report without any major addition to staff strength.

## CHAPTER EIGHTEEN

### IMPORTANT ASPECTS NEEDING ATTENTION OF STATE GOVT. AND GOVT. OF INDIA

#### 18.1. Introduction:

A well defined policy of managing urban growth at the State level always lends support to urban bodies functioning within the State. Generally speaking the States in our country are yet to adopt a clear cut policy on urban development notwithstanding the fact that the urban population in the country has grown from 107m to 156m between 1971 and 1981. However Kerala Govt. can be credited with an eagerness to systematise urban development matters and this is evidenced by its appointment of a High Level Committee on grant in aid policy to municipalities in 1972, appointment of Municipal Finance Commission in 1976 and the constitution of a Special Committee in 1982 to go into the problems of development authorities. Even with this however the Team has come across problems relating to

- (i) Fiscal transfer to the municipal bodies and
- (ii) Plan assistance to such bodies

18.2 The Task Force on financing of Urban Development set up by Planning Commission in 1983 identified three major items under fiscal transfer mechanism to the municipal authorities

- (i) Assigned revenue and shared tax
- (ii) Revenue grants and
- (iii) Plan assistance

18.3 In Kerala assignment of revenues and shared tax include entertainment tax, property registration fee and motor vehicle tax. The devolution to the urban local bodies under these heads however has not increased at a sufficiently fast pace mainly because of low buoyancy rate (around 8%) and has not therefore been able to fulfil the expectations of the urban local bodies ever taking up newer and newer responsibilities with passage of time. It is in this context that the Rural Urban Relationship Committee 1966 emphasised the need for a well defined policy towards grants to municipal bodies

While separation of definite sources of income and sharing of others should be adopted to the extent possible to fulfil the normal requirements of local bodies, grants in aid are very important and should play an important role as supplementary to other methods of financial assistance.

18.4 As for the development authority at Cochin the Special Committee referred to above found that upto 31st March 1982, the GCDA received a total of about Rs. 20 lakhs from Govt. as grants towards administration and Rs. 165.75 lakhs as loan for specific development works. The Committee found the level of grants to be minimal and recommended loan and seed capital

**18.5** The Taxation Enquiry Commission had suggested some principles for devising a system of general performance and special performance grants to municipalities and corporations and had further suggested that the basic grant should be adequate to finance basic functions after taking into account the municipal domestic resources. Following these recommendations Kerala Govt. had appointed a High Level Committee in 1972. Its recommendations are however to be implemented in full.

**18.6** In respect of Metropolitan cities the Task Force of the Planning Commission on Management of Urban Development (1983) observed as follows:

**Plan assistance and metropolitan sub Plan** It is crucial that in the State Development Plan a Metropolitan Sub Plan is presented as a distinct head. Investment in the Metropolitan area should be subject to clearance by the Metropolitan Planning Organisation. The creation of such a separate Development Budget head will also enable better monitoring.

**18.7** Grant of development assistance to municipal authorities and effective integration of the municipal sector in the State Plan is a sine qua non for balanced urban growth. However in Kerala as in most other States in the country this is yet to take place in a satisfactory manner. A block plan assistance to the municipal sector at the beginning of a plan period has been advocated as a measure of fostering even tempo of planning activities in the urban local bodies. While adoption of such a measure in the totality of its implications has not been possible in any State in the country there is a case for examining the situation of Cochin area on a special footing. In this context, it would be worthwhile quoting from the Annual Plan document of the State of Kerala for the year 1988-89:

Assistance to GCDA (Outlay Rs. 100.00 lakhs). The Greater Cochin Development Authority is implementing housing schemes, land acquisition and development programmes and towns improvement/beautification schemes with funds raised from HUDCO and other financial institutions like LIC, HFDC and by way of market borrowings. The authority has drawn up a plan for Rs. 95 crores for 1985-90 with emphasis on housing programmes, land acquisition and other developmental programmes. As the Authority has to complete a large number of spill over schemes a provision of Rs. 100 lakhs (is proposed) which will be funded by market borrowings.

**18.8** In other words apart from permitting market borrowings of a certain order the State Govt. has no other proposals for plan assistance to the Authority. The Team no doubt appreciates the additional financial burden that may come on the State Govt. if substantial plan funds were earmarked to such authorities and other municipal bodies. But in the context of the special situation of Cochin as delineated in this report, hard decision to earmark adequate plan funds for the area by way of a metropolitan sub plan will have to be taken.

**18.9** Adoption of suitable budgetary mechanism by way of separate exhibition of funds for a sector needing attention is an important way of ensuring adequate flow of funds to the particular sector. As Kerala's urban population is increasing and Cochin area is the biggest urban agglomeration in the State, the Team feels that the requirement of funds for this region under important programmes like Water Supply, Power, Housing etc. will have to be shown separately in the State budget under the appropriate demands. Amongst major States in the country West Bengal Govt. has created a separate Metropolitan Development Department with separate budget grant under its control for the Calcutta Metropolitan Development Authority area. This area has 39 municipalities and two municipal corporations (of Calcutta and Howrah) within its limits, out of a total of about 129 urban local bodies in the State. However it is upto the State Govt. of Kerala to exhibit allocation plan and non plan for

GCDA/development authorities in the State in the departmental budget heads under a separate sub head/minor head if it so chooses

**18.10** The Municipal Finance Commission (1976) set up by the State made suggestions on levy of property tax at different rates related to stage of urban growth incorporation of provision in Kerala Municipal Corporation Act to empower Government to issue orders directing enhanced levy of property tax and permitting surcharge on sales tax in urban areas etc. The extent to which these and other similar recommendations have been implemented or could be implemented in future in Cochin area may have to be examined afresh by the State Govt. Similar examination would be needed with reference to the recommendation of the Commission regarding the rate of per capita (Rs 2 to 3) grant suggested for Urban Local Bodies as grant in aid from the State Govt. for bridging the gap between the resources and expenditure

**18.11** As was observed by the Municipal Finance Commission established by the State Municipal Councils are prone to limit the maintenance of services and amenities so as to keep the expenditure thereon within the bounds of resources actually raised by them. In the past, assets created through investment of plan funds within the region has been transferred to the municipal authorities but there has been no commensurate non plan devolution for maintenance of the assets so transferred. As a result, municipalities have found it difficult to maintain their assets

**18.12** The above situation would indicate that harmonising the requirements of integrated development of Cochin area with the State Plan and non plan budget has to be attempted in a methodical manner. The Team would therefore, suggest that State Govt. may go into this matter at a very early date. Several points relating to the manner in which resource base of GCDA, the municipalities/panchayats in the Cochin area can be improved has been mentioned in the relevant chapters. These also would need State Govt.'s consideration

**18.13** Adequacy of flow of funds from GOI sources to the relevant schemes is an important factor in ensuring timely implementation of the proposed development programmes in the area. The sources relevant are

**Points**  
**needing** (i) The national level corporations, boards and funds  
**attention** (ii) Central and Centrally Sponsored Schemes and  
**at GOI level** (iii) Matching budget provision under the GOI organisations working in the area

Details relating to these sources have been given in the chapter on Financial implications of Integrated development in Cochin area and are therefore not repeated here

**18.14** The nodal Ministry suggested for monitoring progress of integrated development will have to ensure budget provision, schematic allocation and flow of funds in the above areas. In the other equally important sphere of technical clearance of projects by national level organisations and authorities like Central Electricity Authority, Inland Waterways Authority of India etc. similar watch dog functions will also have to be exercised by the nodal Ministry at GOI level

**18.15** Another important aspect which has to be taken care of would relate to ensuring adequate Plan allocation to Cochin area under the Annual and Five Year Plan of Kerala State. The Urban Development Division of Planning Commission has to look into the adequacy of provision under urban development and other allied and relevant sectors during the annual plan discussions



## CHAPTER NINETEEN

### CENTRE STATE COORDINATION OF INTEGRATED DEVELOPMENT

#### 19.1 Introduction:

The terms of reference of the Centre State Team require it to advise on the manner in which the activities of both Central and State agencies in Cochin area can be coordinated within the framework of the suggested developmental activities. As it is the Cochin area is one where large number of State and Government of India organisations and agencies work in their own spheres side by side. The pace of development in the area is likely to intensify further as has been already featured out in the preceding chapters. In this context, a well designed mechanism for regular coordination and review of progress of integrated development is an essential requirement of the situation.

19.2 The Team went into this matter at some depth and identified important aspects of coordination which may need attention. The suggested programmes visualise flow of funds both

**Important aspects needing coordination**

from the Centre and the State as also from Central and State level organisations and from institutional sources. Formulation of a Perspective Plan for development incorporating suggestions made in this report and indicating annual priorities will be an important ingredient in a time bound programme of implementation. While initial programming has to be done at GCDA level, direction and guidance from higher coordinating level would also be needed. As has already been indicated in the chapter on Financial provisions for integrated development, deficits in resources are to be made up in several sectors. Measures for bridging deficits will have to be formulated in consultation with all concerned particularly with those in higher echelons connected with policy decisions in this matter. All these will require coordination at a higher level in which both State Govt. and GOI representatives have to be associated.

19.3 Monitoring and review of progress in implementation and devising remedial and corrective

**Monitoring and review**

steps to deal with backlog in progress if any is another important aspect of coordination. Slippages in implementation may have to be brought to the notice of appropriate departments/Ministries of the Central and State Govt. who, in turn, would be expected to pursue the matter with the organisations under them working in the Cochin area.

19.4 The Five Year Development Plan (FYDP) and Annual Action Plan (AAP) to be prepared by GCDA in keeping with the requirements of integrated development as indicated in a separate chapter will need review by the coordinating organism from time to time. In particular both physical and financial input needed for the programmes and their adequacy and issue of general guidelines in the interest of timely execution will be within its scope and authority. Problems of local relevance and bottlenecks if any noticed during implementation will also have to be brought to the notice of appropriate authorities along with suitable suggestions for remedial action.

**19.5 The Team** would suggest a Joint Coordination Committee with Chief Secretary of the State as its Chairman and with representation from Ministries/Departments of Govt. of India and the State Govt. along with some representatives from GCDA for this purpose. The composition of the Committee may be as follows:

Chief Secretary, Govt. of Kerala	Chairman
Representative of the Planning Commission in Housing & Urban Development Division.	Member
Representatives of Ministries/Depts. of Urban Development, Civil Aviation, Surface Transport, Railways, Environment	Member
Secretaries of Planning, Water Supply, Roads & Buildings and Power Depts., Kerala Govt	Member
MD, FACT/Representative of Southern Naval Command, Cochin	Member
Chairman GCDA and Member Secretary GCDA	Member
Secretary, Local Admn. (Urban Dev.) Kerala Govt.	Member:Secy.

**19.6** Representatives of other State and Central Ministries/departments as also organisations could be invited/coopted for specific meetings as may be necessary from time to time. The meetings of the Joint Coordination Committee may be held at least twice a year.

**19.7** The nodal department for the purpose of coordination may be the Local Administration (Urban Development) Department, Govt. of Kerala at the State level. In a similar manner, the nodal department for this purpose at Govt. of India level may be the Ministry of Urban Development. The Team recommends that representatives from the Govt. of India to sit on the Joint Coordination Committee may be at least of the rank of Director and may preferably be of the rank of Jt. Secretary, wherever possible.

## CHAPTER TWENTY

### FINANCIAL IMPLICATIONS OF INTEGRATED DEVELOPMENT IN COCHIN AREA.

#### 20.1 Introduction:

To arrive at the broad financial implications of the development projections delineated in this Report, the Team had to depend upon data furnished by Central and State organisations and local bodies comprised in the region. To start with, it was considered necessary to know the existing Plan and non Plan provisions under various sectors on which to base projections for the future. Ascertaining the existing resource base of the local bodies in the area and the likely additional resource mobilisation they could do was an important element in this exercise. Funding of schemes in Cochin area has been not only from State and Central sources, but also from several financing institutions like HUDCO and LIC. Obtaining information about existing financial outlays and future projections was attempted by the Team as far as possible for basing its findings in this chapter. The Team however feels that data collected/supplied during the period of its working were not entirely complete.

**20.2.** The Team identified the following sources for funding the development projections incorporated in this Report

Source of funding	(i) State Plan
	(ii) Central Plan/Plan of Central Govt. orgns in the area
	(iii) Centrally Sponsored Schemes relevant to the sectors
	(iv) Fund flow from Cochin Corporation/Municipalities/Panchayats
	(v) Funds from institutional sources like HUDCO, National Housing Bank, National Urban Infrastructure Development Corporation, LIC etc.
	(vi) Funds from externally aided schemes/private sector

From information collected and incorporated in the annexure attached at the end of this chapter, it would be seen that the requirement of funds upto the end of Seventh Plan would be around Rs. 205.95 crores and that upto the end of Eighth Plan Rs. 308.88 crores totalling up to Rs. 514.83 crores. The requirement beyond 8th Plan has been assessed at Rs. 120.73 crores. As has been indicated in the chapter dealing with broad aspects of strategy, the Team generally confined itself to physical and financial projections upto the end of the Eighth Plan, though in certain cases, technical and planning compulsions need projections into a more distant future. In working out the likely fund availability for the future, a 10 percent annual step up on the existing base has been generally taken into account in the absence of any better criterion. Broadly, a 50 percent increase in the Eighth Plan outlay over the Seventh Plan provisions has been assumed. However, where likely allocations for the future years are known, the relevant amount has been included.

**20.3** Important sectors of relevance like water supply, sanitation, road development, power, housing, tourism fishery, small industries would get bulk of its funding from the State Plan sources except where central participation is of relevance under the appropriate Centrally Sponsored Schemes. The availability of funds under the State Plan under several sectoral heads has been estimated at Rs 56.84 crores and Rs 85.64 crores respectively upto the end of the Seventh Plan & Eighth Plan. A large portion of the amount shown under "other sources" coming to a total of Rs 67.58 crores upto the end of Eighth Plan which is to be taken care of by GCDA and the local bodies can also be stated to be falling under the State sector plan. Further the State will have to bear a large portion of unsighted funds mentioned in para 20.9 by augmenting its plan provisions suitably. The Team would urge the State Govt. to keep these requirements in view while formulating their annual plans and five year plan.

Provision of plan funds for the GCDA area either under a separate budget head or under appropriate minor head/sub head of the respective Departmental demands on the pattern of Calcutta Metropolitan Development Authority has been suggested by the Team elsewhere. It is important to mention here that the State Govt. authorise the Local Administration (Urban Dev.) Deptt. to coordinate and monitor fund provision and utilisation by different sectoral departments in the Cochin area.

**20.4** As regards the ministries/departments of the Govt. of India the funding projections are related to their existing level of budgetary outlay with step up as indicated above. The total flow from the Central sector has been estimated at Rs 117.68 crores upto the end of the Seventh Plan and Rs 144.91 crores upto the end of Eighth Plan. These will need further checking by the appropriate Ministries and central organisation. The sectors needing adequate funding from GOI sources include railways, communication, airport, national highway and roads of economic importance, inland water transport, provision of basic urban services besides port, refinery and chemicals. Fund requirement from GOI sources is more than that from the State Plan sources mainly because of the larger outlays necessary for implementation/completion of projects normally funded from Central sources like communication, railways and civil aviation. It is also pertinent to mention here that bulk of the funding required for the Brahmapuram Power Plant is visualised to flow from the Power Finance Corporation. The nodal ministry at the central level namely the Ministry of Urban Development will have to exercise a coordinating role in ensuring adequate provision in the appropriate sectors.

Under environment, an amount of Rs 38 lakhs has been visualised as flow to Cochin area from Govt. of India. For this purpose, the State Govt. will have to formulate specific schemes on research and action programme and submit the same to the Min. of Environment to be eligible to draw upon the allocation.

A flow of Rs 5 crores from GOI for development of brackish water fisheries has been included in the anticipated allocation from the Centre during the Eighth Plan, assuming the success of the brackish water fish production project taken up by the Min. of Agriculture in four States including at Cochin. For this purpose, detailed scheme will have to be formulated by the State Govt. for submission to the Min. of Agriculture/NCDC.

For the Brahmapuram Gas Turbine Project estimated to cost Rs 100 cr, funding to the extent of Rs 80 cr from the Power Finance Corporation has been visualised. In the Inland Water Transport sector, the Eighth Plan flow for Cochin area has been estimated at Rs 5.44 cr from the State Govt. and Rs 3.75 crores from the GOI assuming a step up of 50 percent over the average plan allocations in the past two years.

**20.5** The Plan provision under several Centrally sponsored schemes can be drawn upon for the present purpose provided matching provision where needed is made by the State Plan. Some of the

relevant schemes are

<b>Centrally Sponsored schemes</b>	(i)	Development of aquaculture
	(ii)	Brackishwater aquaculture
	(iii)	Development of derelict water bodies and utilisation of organic waters for aquaculture
	(iv)	Roads of economic importance
	(v)	Inland water transport
	(vi)	Integrated development of small & medium towns
	(vii)	Centrally Sponsored Scheme on inter state transmission lines
	(viii)	Urban basic services scheme
	(ix)	Strengthening of facilities and services for monitoring work environment in hazardous chemical industries in States/UTs
	(x)	Common facility centre/raw material depot (textiles)
	(xi)	Weed control (ICAR Scheme)
	(xii)	Introduction of beach landing craft and mechanisation of traditional crafts (fisheries)
	(xiii)	Cooperativisation of coir industries
	(xiv)	Workshed cum Housing (handlooms)
	(xv)	Development of coconut (Central Coconut Board)
	(xvi)	Development of spices
	(xvii)	Development of floriculture including medicinal plants

The central share in the above schemes vary in their grant/loan element from 50 to 100 percent except under urban basic services scheme where it is 20:40:40 (Centre : State : UNICEF). There are some other schemes of an allied nature which can also be taken advantage of. Formulation of detailed viable schemes after suitable survey in the context of Cochin area should receive special attention of the State Govt. and GCD.

#### 20.6. The principle adopted for financial projections by State/Central Govt. would also apply to the

**Funding by local bodies in Cochin area** Cochin Corporation, municipalities and panchayats in the area. Most of the schemes suggested to be taken up by the local bodies will require institutional finance and these financing institutions have different funding patterns. Therefore, pending formulation of detailed schemes following the appropriate funding pattern applicable to each scheme, the Team is not in a position to indicate the exact extent of financial involvement of the local bodies in the suggested development programmes. The Team would suggest that the local bodies initiate a dialogue with the financing institutions, work out their funding liability and mobilise adequate resources for meeting their part of the financial obligation.

**20.7 Fund availability from institutional sources and National level organisations** The Team found it difficult to collect complete data on the existing level and likely level of fund flow from institutional sources. In the Annexure on Availability of funds for various recommended programmes attached at the end of this chapter, specific fund flow from institutional sources has been mentioned in a few cases. This however is not exhaustive and there is further scope for identifying schemes where finances from institutional sources can be availed of. The cases included in the annexure are only indicative and have been mentioned so that the concerned institutions do not lose sight of the requirements of Cochin area. While stating this, the Team would like to highlight the desirability of earmarking adequate allocation to the Cochin area programmes by the following national level organisations

**(i) Power Finance Corporation (PFC):**

The Power Finance Corporation with an authorised capital of Rs 1000 crores and paid up capital of Rs 50 cr has been set up at the national level recently to provide term finance to the power sector. It is intended to supplement the efforts of the state Govts/State Electricity Boards in this direction. As has been indicated in the relevant chapter, the power supply situation in Kerala is critical and the problem in Cochin area which is not only the single biggest consuming centre but also consumes over 40% of the total units consumed in the State, is becoming more and more intense. In this background, the Team would suggest that the gas turbine project at Brahmapuram which is a short gestation project (estimated cost Rs 100 crores) may be taken up for substantial funding (Rs 80 crores) by the Power Finance Corporation, subject to tying up availability of gas/fuel oil.

**(ii) National Housing Bank (NHB):**

The National Housing Bank Bill has been passed in 1987 and presently a Group under Deputy Governor Reserve Bank of India is working out details about the pattern of funding to be adopted by the National Housing Bank (NHB). A three tier organisation with intermediate bodies at Zonal/State level and District/local level is proposed. The RBI would be investing an amount of Rs 100 crores in the NHB which is to function as its subsidiary in the housing sector. The State level organisation which could take advantage of financing of housing schemes in the GCDA area could appropriately be the Kerala Urban Development Finance Corporation/the State Housing Board. Besides programmes of relevance could also be taken up by GCDA directly as the local level body in the three tier organisation. Once the pattern of organisational framework under NHB becomes clear, appropriate action will have to be taken by the State Govt. and GCDA to formulate suitable eligible schemes for the area.

**(iii) National Urban Infrastructure Development Finance Corporation (NUIDFC)**

The Seventh Plan strategy in the Urban Development sector visualises establishment of a National Urban Infrastructure Development Finance Corporation (NUIDFC) with an equity base of Rs 35 cr from Urban Development sector and Rs 20 cr from Housing sector, total Rs 55 cr. It is expected that the Corporation will be established and become operational during 1988-89. The Team recommends that requirement of infrastructure development in Cochin area may be given due importance by NUIDFC and GCDA should take advance action to prepare bankable schemes of infrastructure which yield adequate returns.

**(iv) Metropolitan Transport Consortium Fund (MTCF)**

Railway based mass transit systems being very expensive, a new scheme known as Metropolitan Transport Consortium Fund (MTCF) is proposed to be made operational from the year 1988-89 to provide financial support to transport improvement schemes in cities. A nucleus fund of sufficient magnitude for the purpose has been suggested. A token amount of Rs 2 cr under Urban Development Ministry has been agreed to by the Planning Commission for the year 1988-89. The Team would suggest that transport problems of GCDA area may be adequately taken note of under the MTCF for financing transport improvement schemes in the area. The State Govt. and the development authority would be expected to keep adequate matching provision for availing of finance under the scheme.

**(v) HUDCO**

The level of financing schemes in Cochin area by the Housing and Urban Dev. Corporation has been of the order of about Rs 10 cr on an average during the last three years. Their work has mainly been confined to the housing sector. Greater involvement of HUDCO in low cost sanitation

slum improvement, repair and renovation of houses truck terminal and other urban development schemes is called for

**20 8 1** The State Govt has formulated a scheme for Urban Dev to be posed for World Bank assistance which include programmes under sanitation roads water supply and environmental projections. The estimated amount of the scheme is Rs 140 cr. The scheme is under appraisal by the World Bank Team and is yet to be processed and cleared through D.E.A. and other concerned Ministries of the GOI. The Team would suggest that this scheme may be given due priority and cleared expeditiously by the concerned agencies of the Govt. of India.

**20 8 2** Requirement of industrial water upto the end of the 8th Plan will largely be met by the Water Supply Schemes proposed for implementation during this period. However such requirement beyond the Eighth Plan will need an additional amount of Rs 38 cr which will have to be substantially funded by the beneficiary industries. Several items under tourism and recreation sector could be funded fruitfully by the private sector.

**20 9** After going into funds likely to be allocated during the last two years of the Seventh Plan (1988-90) and funds likely to be available during the Eighth Plan the Team found that an amount of Rs 42.18 cr would still remain unspent. These amounts relate to roads (Rs 33 crores) and Inland Water Transport (Rs 9.18 cr) sectors. It is likely that some amount may be received as additionality under the proposed World Bank Aided Scheme for urban development mentioned above. The same applies to the proposed scheme of Dutch assistance of Rs 605 lakhs for purchase of a dredger and water hyacinth harvester presently under discussion between IWAJ and the Dutch Govt. The bulk of the funds will however have to be found out from Central/State Plans by way of augmenting the plan provisions.

**20 10** Requirement of funds beyond the Eighth Plan has been estimated at Rs 120.73 cr. Most of the important requirements having been taken care of by the end of the Eighth Plan this requirement would relate to schemes of lesser priority/schemes where proposals are yet to be firm up. The Team therefore did not consider it expedient to go into the source of funding these schemes nor proposes any specific allocations for them.

**20 11** The projected requirement of funds upto the end of the Eighth Plan at a level of Rs 514.83 crores gives an average of Rs 2860 per capita (projected 1995 population 18.06 lakhs). The Task Force on financing of Urban Development (1983) estimated that the per capita cost of providing urban infrastructure would vary from about Rs 750/ to Rs 1500/ (at 1980 prices) depending on the technology used and the level of services provided. The requirement of Rs 750 would cover basic minimum in the usual infrastructure sectors of water supply sanitation waste disposal drainage roads streetlights and land development. If transport, telecommunication health and education facilities are taken into account the per capita cost could go up much higher. In this connection the Team finds that if the amounts envisaged under the latter (transport and telecommunication) sectors namely road transport (Rs 27.6 cr being 50% of the total amount) inland water transport (Rs 21.57 cr) airport (Rs 20.4 cr) railways (Rs 62.4 cr) communication (Rs 80.99 cr) alongwith the amount required for the Brahmapuram gas turbine project (Rs 100 cr) are excluded the requirement of funds upto the end of the Eighth Plan would come down to Rs 201.87 cr with a per capita investment of about Rs 1120/.

Specific information about total investment in the several items of infrastructure in GCDA area is

not readily available. However, keeping in view the price increase and the moderately high standard of technology used/services provided in the Cochin area, the per capita requirement of funds at Rs 1120 does not appear to be unreasonable.

**20.12** There is a case for exploring avenues of economy in expenditure in view of large investments required for the projected development in the area. While it is not intended that sub standard services should be provided, the Team feel that it would be desirable to keep cost within control as far as possible by adopting the following strategies

**Scope for economy in formulation of schemes**

- (i) Considerable economies can be ensured in infrastructure cost by use of economic and innovative layouts in residential development.
- (ii) Substantial savings may accrue if sewerage systems are avoided to the extent possible in favour of low cost sanitation (pit latrines in preference to water borne) in all except heavily populated areas. The scope for community Sulabh Souchalaya type of water seal latrines may also be explored.
- (iii) Promotion and encouragement of self help housing has been recognised to be a less costly way of tackling the housing problem. While attempting to organise new housing cooperatives in the area and increasing membership in the existing ones, it would be advisable to actively encourage cooperative Housing Societies of Economically Weaker Sections also.
- (iv) For environmental improvement of the slum areas, the Urban Community Development approach on the pattern of Municipal Corporation of Hyderabad would not only evoke interest in the local populace, but also ensure slum improvement at a lesser cost by public participation.

**20.13** Finally, the Team would suggest that the financial requirement and availability of funds for implementation of the suggested programme in Cochin area should be reviewed by the Joint Coordination Committee at the State level every year. The Committee should apprise the Ministry of Urban Development and the Planning Commission (Urban Development Divn.) of important aspects needing attention at Government of India level from time to time.



**ANNEXURE**  
**AVAILABILITY OF FUNDS FOR VARIOUS PROGRAMMES**  
**(Rs. Crores)**

Sl. No. of the Sector	Total funds required				Funds likely to be allocated/during 7th Plan (1968-80)				Funds likely to be available during 8th Plan				Balance require 1965 (end of Eighth Plan)		Add require beyond Eighth Plan	
	7th Plan	8th Plan	Beyond 8th Plan	Total	Central Govt.	State Govt.	Other Sources	Total	Central Govt.	State Govt.	Other Sources	Total	13	14		15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	Water Supply	18.86	30.79	38.00	87.65	—	18.96	—	18.86	—	15.00	15.79 (MUDCO/ Institutional Finance)	30.79	—	38.00	
2	Sanitation	5.35	13.48	18.00	36.83	—	1.00	4.35 (K.W.A./ Cochin Corp Fin Inst)	5.35	3.8	9.68 (Cochin Corp/K.W.A. Inst. Fin.)	13.48	—	18.00		
3	Housing	0.50	3.97	—	4.47	—	0.25	0.25 (Inst. Fin.)	0.50	2.66	1.31 (MUDCO Inst. Fin.)	3.97	—	—		
4	Roads	17.00	38.20	16.00	71.20	0.50	2.00	0.20 (Cochin Corp)	2.70	2.00	7.50 (Cochin Corp)	10.00	19.50	33.00	16.00	
5	Rainy's	37.40	25.00	—	62.40	37.40	—	—	37.40	25.00	—	—	25.00	—	—	
6	Inland Water Transport	9.83	11.64	—	21.57	1.00	1.45	0.30 (Cochin Corp)	2.75	3.75	5.44 (Cochin Corp)	9.45 (Cochin Corp)	9.64	9.18	—	
7	Air Port	4.17	16.63	—	20.40	4.17	—	—	4.17	16.23	—	—	16.23	—	—	
8	Communication	27.94	53.06	—	80.99	27.94	—	—	27.94	53.05	—	—	53.05	—	—	
9	Power	74.32	68.76	—	143.08	46.90 (P.F.C.)	29.32 (State W.E.)	—	74.32 (Inst. Fin. P.F.C.)	36.00	33.76	—	68.76	—	—	
10	Trade and Commerce	3.60	18.60	38.73	60.93	—	2.00	1.69 (Inst. Fin.)	3.60	—	7.50 (G.C.D.A./ Inst. Fin.)	11.10 (G.C.D.A./ Inst. Fin.)	18.60	—	38.73	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
11 Home Resources			200	1927	--	2127	0.50	0.50	1.00	2.00	7.13	7.14	500	1927	--	--
									(INCL)				(INCL)			
12 Tourism and Recreation			460	9.34	10000	2194	167	1.78	2.25	460	2.50	2.74	4.10	9.34	--	10000
									(INCL)				(Private Sector)			
									(Incl F.I.I.)				(Incl F.I.I.)			
13 Environment			0.28	0.95		0.83	0.10	0.18		0.78	0.25	0.10	0.20	0.55	--	--
													(Incl F.I.I.)			
<b>Total</b>			200.95	308.88	120.71	618.96	117.68	56.04	9.95	1841.7	144.91	85.64	57.63	288.18	47.18	120.71
			<u>214.83</u>		<u>618.96</u>		<u>117.68</u>		<u>9.95</u>		<u>1841.7</u>		<u>288.18</u>		<u>120.71</u>	

## CHAPTER TWENTY ONE

### SUMMARY OF IMPORTANT RECOMMENDATIONS

Specific recommendations relating to various chapters have been given at the end of the concerned chapters. The more important recommendations are mentioned here. For a proper understanding these recommendations however should be read with the relevant chapters and recommendations given at their end.

1. The present per capita availability of drinking water in the GCDA area varies from **Water Supply** 5 lpcd in Mulanthuruthy panchayat to about 35 lpcd in the more developed urban areas. While recommending an outlay of Rs. 18.86 cr. during the Seventh Plan and Rs. 30.79 cr. during the Eighth Plan in the Water supply sector, the Team suggests that top most priority should be given to completion of the 9 on going schemes. The suggested scheme for augmenting water supply to Mjarakkal and the adjoining panchayats should receive early attention in the interest of the majority of the islanders in Cochin area who will also be served by this scheme. Salinity control in the Periyar river has assumed considerable importance and the State Govt. will have to prepare a definite plan for release of water from Edamalayar dam for the several conflicting requirements of drinking water, irrigation, use, electricity generation and prevention of salt water intrusion. While the schemes suggested in the Report would take care of normal industrial requirements of water till the end of the Eighth Plan, augmentation of industrial water supply for the subsequent period will have to be done on a substantial cost sharing basis by the beneficiary industries.

The responsibility for the execution of the water supply schemes should primarily be that of Kerala Water Authority which is the principal agency in the State for construction and maintenance of water supply installations. The Cochin Corporation has to initiate steps for replacement of dilapidated distribution lines so as to complete this item of work during the course of the Eighth Plan. The Irrigation Deptt. of the State should prepare detailed plan estimate for salinity control measures in river Periyar and execute the works during the course of the Eighth Plan. (Chapter Four)

2. Sanitation sector takes care of the sewerage, drainage and solid waste disposal problems in the **Sanitation** region. Construction of additional feeder drains, providing inter-connection amongst drains and improving discharge characteristics of canals will need urgent attention. Introduction of scientific collection methods for collecting solid wastes, provision of additional intermediate refuse depots, sanitary land fill disposal sites and composting plants will be needed to improve solid waste disposal system in the area. Enforcement of legal provisions to prevent unauthorised land filling of wet lands and encroachment of water courses will also need attention. (Chapter Five)

3. Even after taking into account the normal incremental accretion to housing stock by the public housing agencies in the State like the Kerala State Housing Board, GCDA and the **Housing** Housing Cooperative Societies and the private Sector, it has been estimated that about 1 lakh additional housing units would be required in the Cochin region by the year 2000.

The majority of this requirement (60%) would relate to the EWS and the LIG. In this background, the public housing agencies will have to further activate themselves to grapple with the situation. Suitable schemes will have to be formulated by them to avail larger assistance from HUDCO/NHB/UIDFC, HDFC etc. A conscious effort has also to be made to encourage self-help in housing by organising larger number of housing cooperatives/group housing societies.

Development of house sites and residential areas has to be done by GCDA in a planned manner in keeping with the Land use Plan/Master Plan for the region. Of the thirty-four identified major slums in the region, steps to improve the slum areas and to rehabilitate the slum dwellers will have to be taken speedily in case of the slums on Kalvathy Canal in Fort Cochin area, slums in Vathuruthy area and a few other slums mentioned in para 6.5(8) of the Report (Chapter Six).

**4. The existing road network in the Cochin region has failed to keep pace with the trend of rapid urbanisation. Poor alignment and inferior geometrics, uncontrolled ribbon development, narrow bridges and railway level crossings coupled with phenomenal increase in the number of passenger and goods traffic vehicles result in considerable traffic bottleneck during the peak hours. A High Level Committee constituted by the State Govt. had gone into the matter and had formulated a list of 11 prioritised schemes. The Team recommends execution of these schemes along with some additional proposals relating to areas not covered by these schemes. Provision of a Central Bus Station for Cochin City and two Truck Terminals at Edappally and Ambalamughal also form part of the Team's recommendations. In view of the large tracts of water bodies in the area, the Team also recommends renewal and construction of bridges as detailed in the Report as well as establishment of inter-change facilities at ferry points, railway stations and pedestrian linkages to the adjoining roads in the Island Zone (Chapter Seven) (a) Road Transport)**

**5. The strategy for development of the Transport Sector should lay adequate emphasis on planned development of water ways in the region. Endowed with large and navigable water bodies, ecological and environmental considerations favour the growth of inland waterways as the most important mode of transport in this region, next only to road transport. Already some 18,000 households living in the water front region, about 30% of the total work force and around 32% of the student population depend upon water transport. Besides some 1800 tonnes of cargo are transported daily through the waterways of the region. Improvement of Champakkara and Udyogmandal canals serving the Ambalamughal and Eloor industrial area by way of deepening the canals and improving navigability of a number of smaller canals need attention. Fleet augmentation and modernisation should receive attention both in the private sector as also from the public sector agencies including Kerala Inland Navigation Corporation (KINCO). Improvement of landing jetties and provision of an inter-change terminal on Champakkara canal are likely to facilitate transshipment of goods to and from Cochin port. A centralised workshop cum repair facility under KINCO, if established, would go a long way in meeting the repair and maintenance needs of vessels both in the private and the public sector. The State Govt. has also to take an early decision on the formation of an Inland Water Authority and explore the possibility of bringing country craft operators under cooperative fold. (Chapter Seven) (b) Inland Water Transport)**

**6. The Team recommends the early completion of the Cochin Allepey Kayamkulam broad gauge line improvement of stations, marshalling and loco yards, besides examining tract-doubling on Railways (Chapter Seven) (c) Railways)**

**7. While the Team saw the need for expansion of Port facilities in Cochin on account of diversity of views prevailing in the matter, the Team is not in a position to make any recommendation about the specific manner in which such facilities can be improved. Assuming that a 5000 ft. long runway parallel to the existing secondary runway emerges as the most feasible and acceptable proposition, the total cost would be around Rs. 20.4 crores. (Chapter Seven) (d) Air Port)**

**8. For augmenting services in the telephones posts and telegraphs sector an amount of Rs. 27.94 crores has already been provided in the Seventh Plan period. The balance requirement of Rs. 53.05 crores may have to be provided during the Eighth Plan (Chapter Eight)**

**9. Over 40% of the energy units consumed in the State of Kerala relates to the Power** Cochin region on account of the heavy concentration of industrial undertakings in the area. The State of Kerala is likely to face a bleak power supply situation unless remedial steps are taken well in advance. The Cochin region in particular is likely to head for stagnation in the industrial/commercial sectors unless power situation improves. The Team recommends speedy clearance and execution of the Gas Turbine Project (3 x 30 MW) at Brahmapuram at a cost of around Rs. 100 crores. The Power Finance Corporation at the National level should come up for substantial funding of this project. Improvement of the transmission and distribution system may be undertaken on a priority basis and the extent to which more power can be allocated to Kerala out of the Central share in the Central Sector power projects may have to be explored (Chapter Nine)

**10. Cochin area has 38 large and medium industrial units and 5032 small scale industries located in the region's three industrial belts namely (i) Eloor-Edayar (ii) Ambalamughal and (iii) Thnikkarak Industries** Kalamassery Chemical industries occupy the pride of place in the industry sector followed closely by Metallurgical and agro based industries. Though the Team did not go into the question of establishment of any specific industry in the area, the matter being outside the purview of its terms of reference, the Team went into the problems of industrial growth in the region in general. The Team agrees with the recommendations of the high level Committee on Industry, Trade and Power set up by the State Govt. in 1982 that the approach to industrialisation in the region should be local resource based and should relate to rubber processing, marine resources processing, coir making etc. besides taking up units ancillary to chemical and other industries already existing in the area.

The Team suggests a sound industrial location policy and implementation of the related suggestions made in the Development Plan of 1976 prepared by the Town Planning Deptt. Formation of a Committee to identify specific projects for funding based on the broad guidelines contained in the report of the State High Level Committee, 1982 and for selection of suitable green field sites for the location and expansion of large and medium units in the Vadavukode-Puthencruz panchayat areas adjoining the Ambalamughal industrial belt is also recommended by the Team (Chapter Ten)

**11. Commerce and wholesale trade related to export and import along with warehousing and godown facilities are concentrated in Mattancherry, Fort Cochin, Willingdon Island and near Trade & Commerce** Ernakulam South Railway Station in the Cochin region. Regional scale wholesale activities are however, mainly concentrated along Broadway, T.D. Road, Market Road and the vicinity areas of Cochin City, with retail outlets being dispersed throughout the region. The once busy market areas of Mattancherry and Fort Cochin are presently experiencing large scale physical deterioration due to narrow crowded streets, structurally obsolescent buildings, abandoned spaces and environmental deterioration. Expansion of trade and commercial activities in several areas is heavily constrained by non availability of space including for loading and unloading activities. The retail markets for fish and vegetables in the Central city of Cochin lack the basic needs like covered stalls and a hygienic environment.

In the above perspective, the Team suggests decentralisation of activities from the congested areas as per GCDA's Master Plan. Re-development of market areas of Fort Cochin and Mattancherry, opening new sub-centres for wholesale activities at Kaloor and Palanvattom, truck terminals at Edappally and Ambalamughal and extension of the central business area of Ernakulam are among the proposals.

suggested by the Team as being of relevance for decongestion of the Central city in the other areas, decentralisation of wholesale markets and retail activities improvement of municipal market creation of rural commercial sub centres in a planned manner in the Panchayat areas and incentives to the informal sector of small traders by way of provision of basic infrastructural facilities are suggested. It would be advisable for the State Govt. to establish a Trade Information Division of the Kerala Export Trade Council (KEREXL) at Cochin in the interest of creating necessary climate for export promotion (Chapter Eleven)

12 A substantial number of fishermen families depend for their livelihood on the Vembanad Lake and the backwaters in Cochin. Cochin has the largest concentration of national level fisheries organisations like CMFRI, CIFT, MPEDA and CIFNET. The share of Cochin sea food exports industries which is a high foreign exchange earner has gone down in the recent past mainly on account of depletion of fishing stock in the sea off Cochin. Recently the State Govt. has established a MATSYAFED at the apex level and prawn farmers development agency in this area.

Efforts to increase productivity in this sector and also attention to infrastructural problems faced by the processing centres will be needed. The Team recommends cooperativisation of fishermen community their training in brackish water fish farming and management of fish farms and establishment of fish farms in 750 hectares in Perumbalam and Njarakkal areas. Expertise available with institutions like MPEDA and the College of Fisheries at Panangad near Cochin city should be availed for this purpose. A Prawn Farming Training Centre at Valarpadam and expeditious completion of the fisheries harbours at Cochin (Expansion) Munambam are also suggested. The Team suggests setting up of a Task Force comprising of GCDA, Cochin Port, Central level Fisheries Organisations and the State Fisheries Department to devise ways and means to disseminate adequate knowhow and improve fisheries cooperatives/industry (Chapter Twelve)

13 The Cochin region offers great potential for development of tourism and measures for promotion of tourism need special attention. Augmentation of infrastructure for tourist accommodation and transport, tourism software and tourism services like information centres, promotional packages and tourist guides should receive special attention. Encouragement of destination tourism, Cherai Beach development, water sports complex at the backwaters, development of Kadamakudy group of islands and Thanthoni island as tourist villages and establishment of a marine park at Fort Cochin are considered important in the context (Chapter Thirteen)

14 The existing land utilisation Pattern of the constituent areas of Cochin region reveals that dry land Land Use capable of being used for urban use constitutes only 62.45% of the total area, the remaining being water sheets, paddy fields and unuseable vacant lands. The problems presently faced in the region will be compounded in future if some form of a model of orderly growth is not imposed. In this background it is recommended that the Master Plan for Cochin city which has been prepared by the GCDA should be approved by the State Govt. at the earliest to provide the needed legal backing. Preparation and approval of Master Plans for the other urban centers as also for the backwaters should be taken up besides modernisation of the land use inventory.

Creation of sufficient reserves of land for developmental activities, green belts and open spaces is necessary including for future expansion of the Navy, Cochin Port and other important institutions. It is recommended that a working group be set up within the GCDA to finalise the land use pattern on the basis of recommendations made by the Team (Chapter Fourteen)

15 The large chemical and metallurgical industries in the industrial belts of Eloor and Ambalamughal have been major pollutants of air and water in the Cochin region. The Environment environmental quality is also affected adversely by urban solid and liquid waste of a substantial quantum and through automotive emission. Horizontal and vertical shrinkage of the backwaters by natural and man made processes has also made this problem more intense. While

suggesting further studies to be made to assess the extent of environmental pollution and to suggest control measures, the Team specifically recommends installation of some water quality monitoring stations and ambient air monitoring stations. The State Govt will have to consider legislative changes in the Pollution Control Act, the Motor Vehicle Act, the Kerala Building Rules, the Factories and Boilers Act, the Marine Fisheries Regulation Act and the Land Conservancy Act in the interest of enforcing environmental security. The Team also recommends that an Environmental Task Force for the Cochin region be set up comprising of representatives from State Pollution Control Board, the Centre for Earth Science Studies Trivandrum, the CMFRI and the University of Cochin to monitor and oversee pollution levels in the area and to suggest specific measures to be taken. (Chapter Fifteen)

16. The singular feature of Cochin area is the vast expanse of backwater and the thirty two islands which lie on this water body. Low lying marsh lands with only 39 percent of the land area being suitable for habitation, an average of 20 lpcd of protected water supply and absence of any major road network through these islands are indicative of the low level of development of the island panchayats. The Team recommends improvement in the quality of life of the people of the island zone without adversely affecting the environment and ecological balance in these islands. The suggested line of development should generally confine itself to a combination of options in agriculture, fisheries, small scale industries conforming to the occupational pattern of the island inhabitants, protection of backwaters from industrial pollution, development of water transport system, promotion of tourism on selected islands, provision of essential road connection without detriment to environment, provision of drinking water and loan assistance for repair and renovation of existing substandard houses.

Special care should be taken of developing basic infrastructure in the islands and the GCDA should coordinate the activities of different sectoral development in the island zone. (Chapter Sixteen)

17. Membership of GCDA should be expanded to include state-level representatives from local Administration (Urban Development), Roads, Water-supply and Power departments. It may also include representatives of State level financing institutions in the Urban Development sector and two representatives from rural panchayats. (Para 17.9) by GCDA

18. Rate of water tax in Cochin Corporation area should be revised and concessions in the water consumption should be reduced. The rate of water tax in the other constituent municipalities/panchayats should be reviewed keeping in view the level of satisfaction of minimum needs. (para 17.13).

19. A review of levy of usual charges like lighting charges, conservancy fee, market fee etc. may be conducted in all constituent urban and rural bodies within the jurisdiction of GCDA for standardisation of rate of fee/charges for comparable quality/quantum of services provided. In the interest of augmentation of revenues and improving resources. (Para 17.15).

20. The GCDA as also its constituent bodies should formulate a good number of bankable schemes covering remunerative works of relevance to the area like development of identified swampy land, development of poramboke land alienated to the bodies, sale of land, market centres etc. to improve their resource base (Para 17.16).

21. Municipalisation of rural panchayat areas within the GCDA limits may be examined by the State Govt to avoid erosion of the tax base while ensuring parity and equity in the incidence of taxation between new expansion areas and the existing developed urban areas (para 17.17).

22. The GCDA may adopt the Urban Community Development approach, to start with, in the heavily congested areas, to involve the backward and weaker sections in the slum sector and to serve as link

between the people and the authorities and to foster a dialogue among all strata of the urban community. (Para 17.18)

23. The State Govt of Kerala will have to pay serious attention to improving the finances of GCDA and its constituent bodies by rationalisation of tax, rates and charges and earmark adequate landed assets for them with Patta rights. (Para 17.19 read with 17.14 and 17.15).

24. GCDA should prepare five year development plans (FYDP) and annual action plans (AAP) to implement the projected development of Cochin area in a phased manner in accordance with agreed priorities (Para 17.20).

25. To enable preparation of the development budget for the area, departments/organisations of State Govt/GOI should intimate GCDA about likely availability of funds for various programmes in Cochin area during the following year, by 30th of November each year (Para 17.20 (iii)).

26. Requirement of planned urban growth would dictate that departmental schemes and plan investments in the metropolitan area are initially vetted by GCDA as the area level coordinating authority before they form part of the departmental programme (Para 17.20 (iv))

27. For regular review and coordination of integrated development a Cochin Area Development Coordination Committee may be set up at the local level under the chairmanship of Secretary, Local Administration (Urban Development) department of the State Government with Chairman, GCDA, two Chief Executives of the GOI organisations in the area, two representatives of the municipal/local bodies (to be nominated in rotation) and Secretaries, Kerala Government in Roads and Power departments as members. This Committee should meet at least twice a year (Para 17.20(v))

28. The quantum of assigned revenues and shared taxes like entertainment tax, property registration fee and motor vehicles tax to the urban local bodies in Kerala has not increased sufficiently in the past to fulfil the expectations and needs of the urban local bodies. The level of grant-in-aid has also been minimal. This aspect may need a relook (Para 18.3-18.5).

Important points needing attention of State Govt./GOI.

29. There has been no earmarked plan allocations in the State for the metropolitan development authority areas except by way of allocating some market borrowings. The State Govt. will have to take up a review of the situation and earmark adequate plan funds for the GCDA area under different sectoral departments in the interest of expediting integrated development of the area (para 18.7/18.8)

30. Suitable budgetary mechanism to exhibit exclusive flow of funds to the GCDA area under important sectors like water supply, housing and power may be adopted in the State (Para 18.6, 18.9).

31. Harmonising requirements of integrated development of Cochin area with the State Plan and non-Plan outlay has to be attempted in a methodical manner. (Para 18.11/18.12).

32. Planning Commission (Urban Dev. Divn.) should ensure that fund requirement for integrated development of Cochin and the adjoining islands is properly reflected in the urban development and other allied and relevant sectors of the State Plan. (Para 18.15).

33. For overall coordination of integrated development of Cochin and the adjoining islands, a Joint Centre-State Coordination of integrated development. Coordination Committee with representation both from GOI and State Govt. may be set up with Chief Secretary, Govt. of Kerala, as its Chairman. Its membership should include representatives of Central Ministries of Urban Development, Civil Aviation, Surface Transport, Railways Environment and Planning Commission. The appropriate State Departments, Chief Executives of some Central Govt. organisations beside GCDA should be on this body. The Secretary, Local Admn. (Urban Development) department of the State



Govt. should function as its Member-Secretary. The Committee should meet at least twice a year (Para 19.5-19.6).

34. The nodal department for the purpose of coordination may be the Local Admn. (Urban Dev.) Department Govt. of Kerala at the State level and Ministry of Urban Development at Govt. of India level (Para 19.7).

35. The requirement of funds for various development programmes contemplated in the Report of the Team is estimated at Rs. 514.83 crores upto the end of the Eighth Plan to be met from State Plan, Central Plan/Plan of Central Govt. organisations in the area, Centrally sponsored schemes, fund flow from the constituent units of GCDA and funds from institutional sources. The State/Central Government ministries/departments will have to keep these requirements in view for provision of outlay (Para 20.2).

36. The Team has identified the State Govt.'s liability to provide funds at the level of Rs. 56.84 crores and Rs. 85.64 crores (total Rs. 142.48 crores) during the Seventh & Eighth Plan respectively. However, bulk of the amount shown under "other sources" and the unsighted balance requirement upto 1995 will have to be arranged by them (Para 20.3).

37. Including funds required for completion of on-going projects under sectors like railways and communication and the proposed assistance of Rs. 80 crores from the Power Finance Corporation to the Brahmapuram gas turbine power project, fund flow from GOI sources has been estimated at Rs. 117.68 cr. and Rs. 144.91 cr. respectively during the Seventh & Eighth Plans (Para 20.4).

38. The Kerala Govt. should avail of funds available under appropriate Centrally sponsored schemes and provide matching contribution where needed (Para 20.5).

39. Ministry of Energy/Power Finance Corporation may keep in view the requirement of Cochin area for setting up the Gas Turbine Project at Brahmapuram which is a short gestation project. Kerala Govt. may identify an appropriate State level organisation to work as an intermediate body between the National Housing Bank and GCDA for availing housing finance in consultation with Reserve Bank of India. Suitable eligible scheme will also have to be formulated by GCDA in consultation with NHB. The National Urban Infrastructure Development Finance Corporation (NUIDFC) may keep the requirement of infrastructure development of Cochin area in view while allocating funds for urban areas in the country. The GCDA should take urgent steps to prepare bankable schemes of infrastructure in consultation with NUIDFC. For availing adequate funds from the Metropolitan Transport Consortium Fund at the national level, Kerala Govt. and GCDA should make provision for appropriate matching contribution besides formulating eligible schemes of transport improvement in the area. It is also suggested that HUDCO, whose activity in the area has been mainly confined to the housing sector, should extend its activities to encompass sanitation, slum improvement, repair and renovation of houses etc. (Para 20.7).

40. The scope for avenues of economy in expenditure in view of large investment required for projected developments in the area may be examined as suggested by the Team (Para 20.12).

41. Financial requirement and fund availability for implementation of suggested schemes should be reviewed by the Joint Coordination Committee every year, besides reviewing progress and bottlenecks in implementation and suggesting corrective measures (Para 20.13).

#### **Acknowledgement**

The Team gratefully acknowledges the help rendered to it by the Central and State Governments and their agencies in preparing the Report. It is hoped that the foregoing recommendations, when implemented, will go a long way in solving the problems and in imparting a new direction to development and growth of the Cochin region.



## **DETAILS OF MAPS**

### **1. ADMINISTRATIVE UNITS OF COCHIN REGION & ADJOINING ISLANDS**

This map indicates the following details of the Cochin region and adjoining islands included in the report

- a The jurisdiction of the Corporation of Cochin municipalities and panchayat areas
- b The island groups/scattered islands in the region
- c Major rivers and waterways in the region
- d Location of major industrial units in the region
- e Water supply sources
- f Location of Airport Port CEPZ Refinery and other important institutions

### **2. TRANSPORT Roads/Railways/Air**

The map indicates

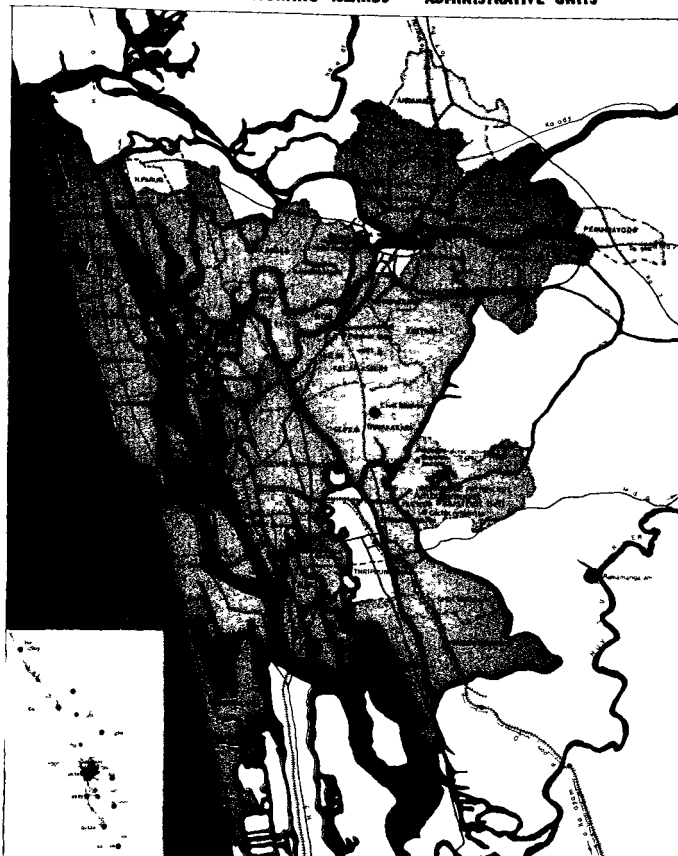
- (a) The details of existing road network and the linkages the widening/improvement and bridges proposed
- (b) The existing railway network in the region and the proposed linkages/doubling
- (c) The location of the Airport/Sea Port


### **3. TRANSPORT—WATER WAYS**

The map indicates in detail

- (a) The existing waterways in the region the improvements proposed
- (b) The different classes of jetties existing and proposed/fishing harbour
- (c) The proposed National Waterway ie the Costal Canal from Cochin to Quilon

# COCHIN REGION & ADJOINING ISLANDS — ADMINISTRATIVE UNITS



 COCHIN CORPORATION

 MUNICIPALITIES

 PANCHAYATS

## 1 ISLAND GROUPS

### I Vypeen Island Group

- 1 Vypeen
- 2 Valiyavattom
- 3 Manjanakkad

### II Kadamakudy Island Group

- 4 Kadamakudy
- 5 Pzhala
- 6 Kothad
- 7 Chennur
- 8 Edampadam
- 9 Cherya Kadamakudy
- 10 Murckal
- 11 Puzhickapuram
- 12 Moolampilly
- 13 Cheriyanthuruth

## III Mulavukad Island Group

- 14 Thanthonni
- 15 P g Island
- 16 Kurumkotta
- 17 Mulavukad
- 18 Vallarpadam
- 19 Cheryamulavukad
- 20 Gundu Island

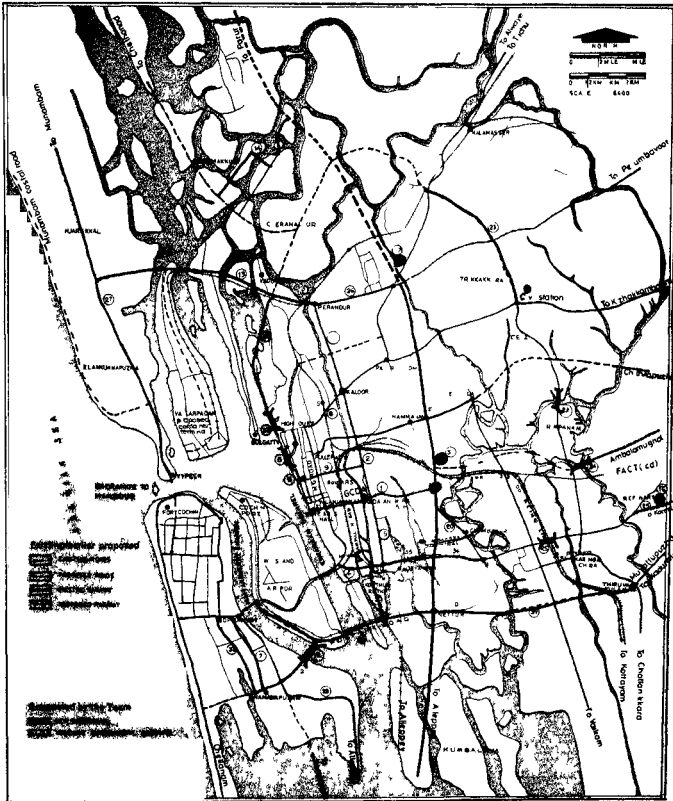
## IV Kumbalam Island Group

- 21 Cheppanam
- 22 Chathamma
- 23 Panangar
- 24 Kumbalam
- 25 Valanthacaud

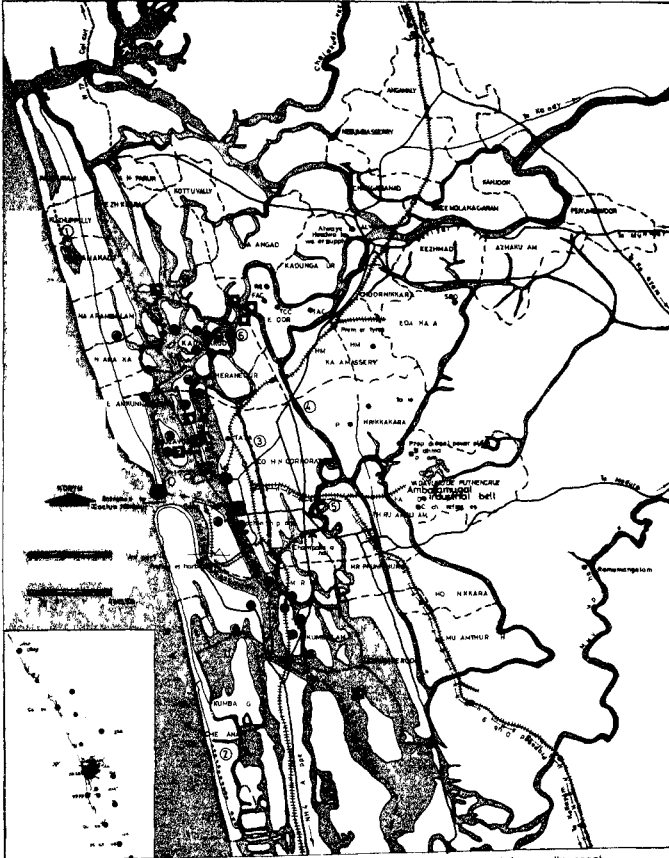
## 2 SCATTERED ISLANDS

- 26 Mukkathukury
- 27 Amachady Thuruth
- 28 Mattammel
- 29 Thuruthy
- 30 Kalathirachal
- 31 Kodavakkad
- 32 Pulekkad

**COCHIN AREA & ADJOINING ISLANDS — TRANSPORT — ROADS / RAILWAYS / AIR**



# COCHIN REGION & ADJOINING ISLANDS — TRANSPORT — WATERWAYS



**TYPE OF JETTIES**

- Special type jetty
- Type A
- Type B
- Type C

- Area to be improved
- National water route

- 1 Ayyampally canal
- 2 Vayam canal
- 3 Pungna canal
- 4 Edappally canal
- 5 Champaka canal
- 6 Udyogamanda canal

## APPENDIX I

### CONSTITUTION OF CENTRE—STATE TEAM

No. PC (P) 9/25/87 KRL  
Government of India  
Planning Commission

Yojana Bhavan  
Parliament Street  
New Delhi 110001  
Dated the 9th June 1987

### O R D E R

**Subject :** Setting up of Centre State Team for Integrated Development of Cochin and the adjoining islands

It has been decided by the Government of India in consultation with the State Government of Kerala to set up a Centre State Team to advise on measures to be taken for integrated development of Cochin and the adjoining islands. The constitution of the Team shall be as follows

- |   |                 |
|---|-----------------|
| (1) Shri Xavier Arakal<br>Chairman<br>Inland Waterways Authority of India                 | Chairman        |
| (2) Shri Premananda Tripathy<br>Adviser (State Plans)<br>Planning Commission<br>New Delhi | Member—Convener |
| (3) Representative of Ministry of Surface<br>Transport                                    | Member          |
| (4) Chairman<br>Port Trust<br>Cochin  | Member          |
| (5) Representative of Naval Base<br>Cochin  | Member          |
| (6) Representative of Ministry of<br>Railways   | Member          |
| (7) Representative of Deptt. of<br>Environment<br>Government of India                     | Member          |

(8)	Secretary Town Planning Government of Kerala	Member
(9)	Secretary Public Works Govt of Kerala	Member
(10)	Secretary Transport Govt of Kerala	Member
(11)	Secretary Environment Govt of Kerala	Member
(12)	Chairman Greater Cochin Development Authority Cochin	Member
(13)	Managing Director FACT	Member
(14)	District Collector Ernakulam Kerala	Member

**2. The terms of reference of the Team shall be as follows**

- (i) To identify programmes for integrated development of Cochin area keeping in view the industrial commercial and strategic installations in the area in a setting of islands and back waters in the area
- (ii) To identify the need for reclamation of land deepening of waterways and construction of road links to the islands in the interest of integrated development of the area
- (iii) To advise on the implementation strategy keeping in view environmental and ecological parameters
- (iv) to advise on ways to integrate financial resources of both Central organisations operating in Cochin area and State available for the development and suggest ways to meet shortfalls if any
- (v) To advise the manner in which the activities of both Central and State agencies in this area can be coordinated within the framework of the suggested developmental activities
- (vi) To make recommendations on any matter ancillary and related to the above purpose

**3. The Team may appoint task forces of technical and experienced persons for specific purposes. The Team may give its first set of proposals within three months of its constitution and its final recommendations within six months.**

4 The Team will be serviced by the Planning Commission. TA/DA of non official members will be made by the Planning Commission as per Government rules

Sd/  
(J.C. Dangwal)  
Director (Admin)

Copy to  
All Members of the Team

Copy also forwarded to

**Prime Minister's Office**

- 1 Secretary to Prime Minister
- 2 Spl Secretary to Prime Minister
- 3 Information Officer
- 4 Shri Wajahat Habibullah Jt Secy to P.M

**Cabinet Secretariat**

Cabinet Secretary

**Planning Commission**

- 1 Secretary
- 2 P.S. to Deputy Chairman
- 3 P.S. to Minister of State
- 4 JS (SP)
- 5 Dy Adviser (SP)
- 6 Dy Adviser (PSA)

**Secretaries to Government of India**

- 1 Secretary Surface Transport
- 2 Secretary Defence
- 3 Secretary Railways
- 4 Secretary Forest and Environment
- 5 Secretary Urban Development
- 6 All other Secretaries to the Govt. of India

**Kerala State**

- 1 Chief Secretary Kerala Trivandrum
- 2 Planning Secretary Kerala Trivandrum

Sd/  
(J.C. Dangwal)  
Director (Administration)



## APPENDIX II

### LIST OF MEMBERS OF THE CENTRE—STATE TEAM FOR INTEGRATED DEVELOPMENT OF COCHIN AND THE ADJOINING ISLANDS

1	Sh Xavier Arakal Chairman Inland Waterways Authority of India Transport Bhavan New Delhi	Chairman
2	Sh Premananda Tripathy Adviser (SP) Planning Commission New Delhi	Member Convener
3	Sh D.P. Gupta Chief Engineer (Planning) Min. of Surface Transport New Delhi	Member
4	Shn D. Babu Paul Chairman Port Trust Cochin	Member
5	Sh Rakesh Sahani Director Min. of Defence New Delhi	Member
6	Sh V.S. Ramaswamy Chief Engineer Constn (W) Southern Railway Madras	Member
7	Dr. S. Maudgal Director (IA) Deptt. of Environment New Delhi	Member
8	Shn Philipose Thomas Secretary Town Planning Govt. of Kerala Trivandrum	Member
9	Shn Thomas C. George Secretary Public Works Govt. of Kerala Trivandrum	Member
10	Shn K. Uppliappan Secretary Transport Govt. of Kerala Trivandrum	Member
11	Shn N. Kaleeswaran Secretary Environment Govt. of Kerala Trivandrum	Member
12	Shn Paul P. Mani and later Shn K.R. Rajan Chairman Greater Cochin Dev. Authority Cochin	Member
13	Sh N.B. Chandran Managing Director Fertiliser & Chemical Travancore Ltd Udyog Mandal Cochin	Member
14	Shn Rajagopala and later Shri K.R. Rajan District Collector Emakulam Kerala	Member

- |    |  |        |
|----|--|--------|
| 15 | Shri N Ramakrishnan<br>Development Commissioner<br>Cochin Export Processing Zone<br>Cochin | Member |
| 16 | Shri R.L. Sudhir<br>Addl. Director General (S)<br>Ministry of Tourism<br>New Delhi         | Member |
| 17 | Shri R.L. Pardeep<br>Joint Secretary (UD)<br>Min. of Urban Development<br>New Delhi        | Member |

## APPENDIX-III

### MINUTES OF THE CENTRE-STATE TEAM MEETING FOR INTEGRATED DEVELOPMENT OF COCHIN & ADJOINING ISLANDS HELD AT ERNAKULAM ON 29.6.1987

The meeting of the Centre State team for Integrated Development of Cochin and adjoining Islands took place on 29th June 1987 under the Chairmanship of Shri Xavier Arakal and the following members were present

- |    |  |                 |
|----|--|-----------------|
| 1  | Shri Xavier Arakal   | Chairman        |
| 2  | Shri. V Ramachandran<br>Chief Secretary<br>Govt. of Kerala         |                 |
| 3  | Shri Premananda Tripathy   | Member Convenor |
| 4  | Shri D. P. Gupta Representing<br>Min. of Surface Transport         |                 |
| 5  | Capt. Mathew Representing<br>Port Trust                            |                 |
| 6  | Shri Sivamani Representing<br>Naval Base                           |                 |
| 7  | Shri Uppilappan Secretary<br>Transport Govt. of Kerala             |                 |
| 8  | Shri Paul P. Mani Chairman<br>Greater Cochin Development Authority |                 |
| 9  | Shri Chandran FACT   |                 |
| 10 | Shri Rajagopal District Collector,<br>Ernakulam                    |                 |
| 11 | Shri Varadachary Secretary<br>Planning Govt. of Kerala             |                 |
| 12 | Dr. N.S. Srinivasan NATPAC   |                 |
| 13 | Smt. Aruna Sundararajan Secretary<br>Greater Cochin Dev. Authority |                 |
| 14 | Shri Elias George Commissioner<br>Cochin Municipal Corporation     |                 |
| 15 | Shri S. Muthuswamy NATPAC  |                 |

The Chairman in his introductory remarks has said that the constitution of the Centre State team is the off shoot of Prime Minister's visit to Cochin in January 1987 and explained the keenness the Prime Minister has shown in the integrated development of Cochin and adjoining islands keeping in view the balance of the ecology and environment of the region

The Chief Secretary Government of Kerala explained that this is the first Centre State team appointed in the country for the development of a region and also that there is a need for tackling the problem with an inter-disciplinary approach. He also highlighted the problems of resource, space and infrastructure including transportation, water and electricity. He has also emphasised the need for developing new markets in suitable location and proper development of port and railways and highlighted the need for working out a list of priorities. He also stressed the need for bringing out specific integrated plan for each of the priority items and to specify the institutional arrangements and participation. Such an integrated plan alone will provide the basis for any concrete action plan.

Shri Tnpathy, Adviser, Planning Commission, Government of India, explained that this is a new and unique exercise carried out in the country for the first time for development of a region jointly by the State and the Centre. There is a need for taking an inventory of the development programmes implemented so far by different central and state agencies for this region and to bring out the details of the programmes already implemented and the programmes yet to be taken up. The committee has also to identify the available resources, new ways for generating resources and the implementing machinery. In this regard, there is a need for representation from all the organisations and active participation of them in the action programme for development of this region. In this regard, the committee may have to set up task forces on different aspects of development with specific suggestions on the type of work to be done by each body.

Shri Paul P. Mani highlighted the salient features of the work carried out by GCDA. The book entitled 'Structure plan for central city Cochin' prepared by GCDA was made available to all the members. The Secretary of GCDA explained briefly various points given in the note prepared by GCDA for the consideration of the team.

Capt. Mathew of Cochin Port Trust has explained the proposals of Cochin Port Trust regarding the reclamation of land in Vallarpadam for developing new container terminal besides the traffic and financial problems faced by Cochin Port Trust. He has also explained the need for working out development programmes for this region keeping in view the interests and development of Cochin Port.

Shri Chandran of FACT has highlighted the problems of transport, water and power in the development of industries and has suggested the need for identifying the requirements of industries for proper development of this region.

Shri Swamani of Cochin Naval Base has explained the constraints of land in drawing up development programmes such as training programme and construction of defence colony. He has also highlighted the shortage of water and electricity and need for augmenting the same.

Shri Rajagopal, District Collector, Emakulam explained the financial problems of the district administration in developing the road systems within the existing Cochin city and shortage in the water supply to the citizens of the city which is getting aggravated by the presence of about two lakh floating population in the city every day besides the need for water for industrial use. He has also explained the special problems of garbage disposal faced by the city due to the absence of any waste land and highlighted the need for bringing in new technology and modernisation for the disposal of garbage which comes to about 300 tonnes a day. He also explained the scope available in Cochin for the development of tourism which would bring life to Fort Cochin and Mattancherry areas of the city.

Shri D. P. Gupta of the Ministry of Surface Transport has explained the need for preparing short term plans for port development which should be part of a long term plan and the scope for

developing container terminal. In this context he wanted that the impact of container movement over rail, road and water should clearly be spelt out so that action plan for the construction and strengthening of infrastructure including replacement of weak bridges and missing links can be worked out.

Shri Uppiliappan, Secretary Transport, Govt. of Kerala has suggested the need for working out suitable solution for tackling the present and future transport problems. The development of industry and transport in the entire region should be linked with the development of Cochin Port. Advantages of the natural waterways available both for industrial development and for developing cheaper mode of transport should be taken.

Dr. N.S. Srinivasan of NATPAC has explained the details of traffic and transportation studies carried out in Cochin and mentioned about the constitution of a High Level Committee for implementing the development programmes suggested for short, medium and long terms. He has also explained the need for identifying the area to be brought under the proposed programme of integrated development of Cochin and adjoining Islands since a substantial portion of the area in Alleppey and Trichur districts adjoining Cochin city had not been included in the GCDA development plan. He explained the need for replacement of Mattancherry bridge, construction of bridge to link Vypeen with the mainland and need for development of IWT besides tackling the problems of drainage, power, sanitation etc. without disturbing the environment and ecology of the region.

A core committee consisting of the following as members was constituted:

Chairman: GCDA  
Special Secretary: Local Administration  
District Collector: Ernakulam  
Shri Chandran: FACT and  
Dr. N.S. Srinivasan: NATPAC

The core committee was asked to identify, finalise and suggest the areas required for special investigation and to appoint working groups on each of the identified items for further investigation.

## APPENDIX IV

### MINUTES OF DISCUSSION WITH CHIEF SECRETARY, KERALA ON 7.12.87 AT YOJANA BHAVAN, NEW DELHI

The progress of the work of the Centre State Team for integrated development of Cochin and adjoining islands was discussed with Chief Secy Kerala at 205 Yojana Bhavan New Delhi. Shri Xavier Arakal, Chairman of the Centre State Team and Shri Premananda Tripathy, Adviser (State Plans) cum Convener of the Centre State Team were present. Besides the Chief Secretary Kerala, Shri M. Vijayanunni, Secretary Planning & Economic Affairs, Shri K. Uppilappan, Secretary Transport, Shri Choudhury, Secretary PWD Kerala and Shri Elias George, Commissioner of Corporation Cochin were present.

2. It was broadly agreed as follows:

(1) The area comprised in Cochin & adjoining islands may be confined to GCDA area except in case of the islands which may be outside such area but which are intimately connected in day to day life to such areas.

(2) The problems of the influence area and hinterland where relevant may be touched upon in the report of the Centre State Team but need not be gone into in detail. Where justified, further study in those areas may be separately conducted later on.

(3) The problems of the area as can be foreseen upto end of 8th Plan will be covered in the report of the Team except where requirements of economic viability or planning compulsions need projection into a more distant future. In such cases, projections/requirements upto 2000 AD may be indicated.

(4) Existing plan programmes and likely fund available under Govt. of India/State Govt./Corporations and other local bodies may be projected upto end of the 8th Plan period.

(5) The Chapters of the draft report of the Centre State Team as suggested by Secretary GCDA to Adviser (SP) in her letter of 2nd December 1987 (revised format) as also the general structure for each module was discussed. The suggestions were generally agreed to with some modifications. The Secretary GCDA and the Commissioner Cochin Corporation will however get the final chapterisation format vetted by Secretary, Planning & Economic Affairs, Kerala.

(6) As and when chapters are ready, the Secretary GCDA/Commissioner Cochin Corporation will forward copies of the chapters simultaneously to the Secretary Planning and Economic Affairs Kerala and Adviser (SP) & Convener of the Team.

(7) Discussions revealed that considerable difficulty is being experienced in collecting factual data from State Govt./Govt. of India organisations and local bodies. It was felt that collection of financial data from the Gram Panchayats comprised within the GCDA area may be dispensed with. It was also felt that data may be confined to core items and important aspects as far as possible.

3. The Chief Secretary Kerala felt that it may not be possible for the Team to finalise its report by end of Jan 1988 in view of delay in supply of data by several agencies including Railways and other GOI agencies. There has also been delay in drafting of the report on account of Sh. N. Ramakrishnan.

Dev. Commissioner, Cochin Export Processing Zone and Chairman of the Drafting Committee not being available to handle the job. The Chief Secretary indicated that while drafting of the report may be done by Secretary, G.C.D.A. as earlier decided, with data being fed to her by NATPAC. Sh. M. Vijayanunni, Secretary, Planning & Economic Affairs will coordinate drafting at the State Govt. level. The Chief Secretary felt that extension of about 3 months time upto end of March 1988 for finalisation of the report of the Centre State Team would be necessary in the above background.

4. The next meeting of the Centre State Team will be held at Trivandrum on 30th December 1987.

## APPENDIX-V

### MINUTES OF THE 2ND MEETING OF THE CENTRE STATE TEAM ON THE "INTEGRATED DEVELOPMENT OF COCHIN AND ADJOINING ISLANDS" HELD AT TRIVANDRUM ON 30th DECEMBER 1987

The meeting of the Centre State Team for the Integrated Development of Cochin and adjoining Islands took place on 30th December under the Chairmanship of Shri Xavier Arakal and the following members of the Team/representatives of Kerala Govt. were present

- |    |  |                 |
|----|--|-----------------|
| 1  | Shri Xavier Arakal<br>Chairman<br>I/W T. Authority of India              | Chairman        |
| 2  | Shri Premananda Tripathy<br>Adviser (State Plans)<br>Planning Commission | Member—Convenor |
| 3  | Shri M. Vijayanunni<br>Secretary (Planning & E.A.)<br>Govt. of Kerala    |                 |
| 4  | Shri K. Uppiliappan<br>Secretary Transport<br>govt. of Kerala            |                 |
| 5  | Shri Philipose Thomas<br>Secretary Local Admin<br>Govt. of Kerala        |                 |
| 6  | Shri N.B. Chandran<br>Chairman & Managing Director<br>FACT               |                 |
| 7  | Shri K.R. Rajan<br>District Collector<br>Emakulam                        |                 |
| 8  | Shri Ramaswami<br>Chief Engineer<br>Southern Railway                     |                 |
| 9  | Dr. N.S. Srinivasan<br>Executive Director<br>NATPAC                      |                 |
| 10 | Shri Elias George<br>Commissioner<br>Cochin Corporation                  |                 |



11 Shri K Srinivasan  
Dy Secretary (Planning & E.A.)  
Govt. of Kerala

Prior to the commencement of the meeting an audiovisual show was presented by NATPAC on the Development of the Cochin Region

The Chairman of the Centre State Team in his opening remarks summarised the work which had been done till date on the preparation of the report on the Integrated Development of Cochin. He recollected that this Team was constituted on 9th June 1987 and subsequently a Core Committee was constituted to identify the relevant issues and present them to the Team. The NATPAC was entrusted with the task of collection of data. In order to formulate the draft recommendations a drafting committee was constituted on 16th October 1987. But later the Chairman of this Committee communicated his inability to assume this role. Subsequently, a meeting was held in Delhi with the Chief Secretary Kerala and the Drafting Committee was reconstituted under the Chairmanship of the Secretary Local Administration Kerala. The Chairman stated that the draft report had to be ready by 10th February so that the recommendations could be assessed and finalised by the Centre State Team and a report submitted to the Prime Minister by mid March. The Chairman also suggested that the schemes and recommendations suggested in the draft report could be prioritised in order of importance.

The Convenor of the Team and the Adviser (SP) Shri P. Tripathy stressed the need to complete the report within the proposed time in order to submit it to the Prime Minister by mid March. He suggested that the Secy (Local Administration) could finalise each Chapter in consultation with the concerned Heads of Departments and forward it to him. He also stated that no views had been received from the members till date regarding the policies and priorities to be stressed in the report and suggested that members could communicate their suggestions to the Drafting Committee by mid January. It was also stated that the draft report had to be discussed and finalised with the State Govt. formally before its submission.

Shri Srinivasan representing NATPAC stated that he had collected data from 25 organisations for the purpose of providing information to the Drafting Committee.

The Secretary (Transport) Govt. of Kerala Sh. Uppiliappan stated that the stand of the Kerala Govt. regarding the Cochin airport had been finalised and submitted a copy of the position paper to the Chairman of the Centre State Team. The expansion of the airport is proposed at the present site itself with lengthening of the runway to cater to the needs of larger aircraft. These proposals involve the intersection of the existing runway with the present railway lines leading to the Cochin Harbour. The Secretary (Transport) felt that this would ensure a saving of Rs. 15 crores which would have to be spent on the construction of a new Railway Bridge. The Chief Engineer (Southern Railway) and the Adviser (State Plans) were of the view that the proposed crossing might result in disruption to the traffic to and from the Cochin Port which would affect the Port's expansion proposals. The District Collector (Ernakulam) pointed out that in any case, Airport expansion would involve the displacement of nearly 800 families in the Vathuruthy area.

The Chairman and Managing Director of FACT Shri N.B. Chandran suggested that when the Report was ready it could include a prioritised summary of proposals and projects indicating the costs involved for each scheme and the time frame for the completion of each scheme. This suggestion was accepted by the members.

The question of the final delimitation of the study area was also discussed. The members

concerned in the view that the areas within the territorial jurisdiction of the GCDA and the other islands related to the growth of Cochin should be the limits of the study region. The areas that would influence Cochin's development—the hinterland-catchment areas—could be mentioned in the report. Whenever infrastructural development of Cochin would be linked to these influence areas that fact should be specifically mentioned for separate study.

The structure of the proposed report was also discussed. The Executive Director NATPAC suggested that instead of having separate Chapters on infrastructure development and sectoral development the requirements for infrastructure could be shown as arising from the development of various sectors. The Secretary Planning suggested that the Report should maintain continuity while each sector would be taken up separately. These suggestions were accepted and it was also decided that the combined land use implication of the various proposals could be shown separately in the Report.

The question of dovetailing the team's recommendations with the Annual Plan for 1968-69 was also discussed. It was felt that the reorientation of allocations to give effect to the recommendations of the team could be done even after the allocations were finalised if it was found necessary to do so.

The Convenor of the Team reiterated the necessity to have the draft report ready by the 10th of February so that the formal meeting at the level of the State Govt. to deliberate upon the draft report could be held by the end of February at Trivandrum and the Centre State Team could have a sitting the next day at Cochin to finalise its recommendations. Subsequent redrafting could be finished by the first fortnight of March and the report readied for submission by mid March. In view of the severe time constraints he requested the members of the drafting committee and the Executive Director NATPAC to ensure that their work was completed in time.

The meeting came to an end with vote of thanks to the Chair.

2. Subsequent to the meeting, the Chairman of the Team, the Convenor and the Chairman of the Drafting Committee met the Chief Secretary of the State and apprised him of the progress in the Team's work.

## APPENDIX VI

### PROCEEDINGS OF THE THIRD AND FINAL MEETING OF THE CENTRE—STATE TEAM FOR INTEGRATED DEVELOPMENT OF COCHIN AND THE ADJOINING ISLANDS HELD ON 21ST MARCH 1988

#### PLACE-CONFERENCE HALL OF GCDA, COCHIN TIME 3 00 PM

The final meeting of the Centre State Team was held under the Chairmanship of Shri Xavier Arakal Chairman of the Team List of participants is enclosed

In his introductory remarks the Chairman thanked the members and the officials who contributed to bringing out the Draft Report in time and stated that the final report would be shortly submitted to the Prime Minister's Office

The Convenor of the Centre State Team Shri Premananda Tripathy gave a brief account of the overall proposals and the financial requirements arising from the recommendations made in the report He indicated that total funds required for the programmes proposed by the Team for Integrated Development of Cochin and the Adjoining Islands upto the end of Eighth Plan was Rs 514.83 crores of which Rs 205.95 crores have to be found out during the Seventh Plan and the balance during the Eighth Plan He indicated that fund requirements beyond the Eighth Plan related to schemes of lesser priority to schemes where proposals were yet to be firmed up or to schemes where large part of funding was to come from users and beneficiary industries and hence the Team did not consider it expedient to go into the source of funding of these schemes These schemes related to items like industrial water supply most of the amount for which is proposed to come from the beneficiary industries sanitation roads trade and commerce and tourism and recreation He indicated that adequate financial provision will have to be made by the State and Central Government besides the Financing Institutions in order to be able to implement the suggested programmes

The Convenor clarified that the following types of changes would be necessary in the draft report of the Team in the interest of consistency

- (1) In order to ensure that the sectoral figures accord with the total financial figures changes where necessary would be made
- (2) Subsequent information received from Departments and Ministries (relating to fishery harbour at Munambam funding of scheme of action/research programmes to prevent environmental pollution by Ministry of Environment and Forests availability of interest subsidy to country craft operators from Surface Transport Ministry etc) would be duly incorporated in the report
- (3) Abndging for brevity and editing for clarity and refinement would be done

- (4) The heading 'Land Use and Reclamation' has to be changed to 'Land Use' (as reclamation without environmental clearance is not favoured) besides specifically mentioning the need for environmental clearance at relevant points
- (5) Communication amount would come down to Rs 8099 crores after excluding amount already invested in the first three years of the Seventh Plan
- (6) No specific financial requirement was shown under Railways in the first draft report. The amount has been calculated at Rs 62.40 crores excluding amount already spent/provided for during the Seventh Plan
- (7) The Brahmapuram Gas Turbine Project cost would have to be revised to Rs 100 crores in place of Rs 125 crores originally suggested as this appeared to be necessary after consultation with the concerned Division of the Planning Commission

The Secretary, Local Administration, Govt of Kerala, indicated that on the draft of the report circulated to the members, comments had been received from members representing FACT, Railways, Navy, as well as from the District Collector, Ernakulam. He stated that corrections suggested and accepted by the Team would be incorporated in the final report. He also stated that the report laid emphasis on proposals which had implications on overall development rather than on the requirements of specific institutions falling within the area.

The District Collector, Ernakulam, suggested that the proposal to upgrade the Cochin University into a Central University, as well as the demand of the people to establish an Institute of Medical Science, could find a place in the report.

The Chief Engineer, Ministry of Surface Transport, remarked that the responsibility for central funding of roads is basically in respect of National Highways. For other roads, the responsibility lies with the State Governments concerned. However, the Ministry provides for schemes under the E.G.I. roads programmes. The position in the Seventh Plan is that it is not possible to consider any new works due to constraints of resources. As regards Eighth Plan, the requirements for Cochin area would need to be integrated by the State Government for the State as a whole and depending upon the allocations available and inter se priorities, projects can be considered. Therefore, he suggested that the State's priority in availing of central assistance, where eligible, has to be clearly indicated. He added that provisions have been made in the annual proposal of the Ministry at an estimated cost of Rs 16 crores for construction of the Port Link Road Phase II from Thevara to Cochin by pass, including the bridges which would form part of the NH 47—A. Phase I work from Cochin Port to Thevara is already in progress and all expenditure required after its declaration as NH 47 will be met out of Central funds. He suggested that the possibility of availing central assistance for urban roads may be explored with the Ministry of Urban Development. He requested for certain corrections/modifications in Annexure I of the Chapter 7 (a) relating to roads.

The Chief Engineer (Construction), Southern Railways, remarked that the comments of the Railways had already been given to the Convenor and stated that the proposal for doubling the Ernakulam-Koottayam line is given less priority in view of the fact that the Ernakulam-Alleppey-Kayamkulam line would serve as a secondary loopline. He also stated that the suggestion of shifting Ernakulam Goods Station to the Ponnunni side is not contemplated by the Railway at the moment.

Rear Admiral P P Sivamani indicated that the expansion programmes of the Southern Naval Command necessitated earmarking of sufficient land for future use. It was clarified to him that this requirement had been incorporated in the suggestions of the Team.

The Chief Engineer (Roads & Bridges) Govt of Kerala, who was in attendance, suggested that the recommendations of the Team to have a separate budget head in the State Government's Plan Budget for developmental programmes relating to Cochin has to be pursued on a priority basis to ensure effective and speedy implementation of the proposed schemes and programmes. The representative of the Cochin Port Trust indicated that the Port has given a suggestion to State Government regarding the location of a Thermal Power Plant north of the entrance of the Cochin Harbour. But this proposal was at a very preliminary stage. The Executive Director of NATPAC stated that while the recommendations regarding roadways are comprehensive, they were by no means exhaustive in view of the large requirements in this sector in the region. He also added that growth of passenger traffic in the inland waterways sector could be even more than the projection made in the report and inland water transport sector would justify full support.

The Executive Director, NATPAC suggested that adequate fund allocation for the islands may be made. The Convenor explained that the report has taken into account special requirements of the islanders in all relevant sectors and wherever appropriate specific fund allocation has been recommended for programmes benefitting the islanders.

The District Collector, Ernakulam suggested the Centre-State Team continue to function even after the submission of the report to ensure monitoring and effective implementation of the proposals. The Convenor of the Team clarified that a suitable mechanism has already been contemplated in the report, and the proposed Joint Coordination Committee headed by the Chief Secretary of Kerala with representatives from Central Ministries, State Departments and GCDA could go into periodic review and monitoring of the recommendations of the Team. He also drew attention of the members to the Team's suggestions regarding institution of an Area Level Coordination Committee under the Chairmanship of Secretary, Local Administration (Urban Development) of the State Government and to the necessity of GCDA drawing up Five Year Development Plans and Annual Action Plans in keeping with the requirements of integrated development.

The Team unanimously adopted the Draft Report subject to the above observations.

The Chairman concluded the meeting by thanking the members and the officials in attendance for their hard work and active cooperation which resulted in the timely completion of the report of the Team and expressed the hope that the recommendation made by the Team would be implemented expeditiously.

#### LIST OF PARTICIPANTS

- 1 Shn Xavier Arakal Chairman
- 2 Shn Premananda Tnpathy Adviser (SP) Planning Commission & Convenor
- 3 Shn D P Gupta Chief Engineer M/O Surface Transport
- 4 Shn V S Ramaswamy Chief Engineer (Constrn ) Southern Railway
- 5 Shn Philipose Thomas Secretary Local Admn Kerala
- 6 Smt T Padmavathy Amma Adtl Secretary P W D Kerala
- 7 Rear Admiral P P Sivamani Naval Hqr Cochin
- 8 Shn P Ramachandran Chief Engineer Roads & Bldges Trivandrum
- 9 Capt. TK Mathew Dock Master Cochin Port Trust
- 10 Shn S C Meeran Engineer Liaison Officer (NH) Min of Surface Transport
- 11 Dr N S Sreenivasan Director NATPAC Trivandrum
- 12 Shn K R Rajan Distt Collector Ernakulam & Chairman GCDA
- 13 Shn Elias George Commissioner Cochin Corporation Cochin
- 14 Smt. Aruna Sundararajan Secy Greater Cochin Dev Authority, Cochin

