付属資料

付属資料１．要請書

APPLICATION FORM FOR JAPAN'S DEVELOPMENT STUDY PROGRAM

Date of entry: July 2003

Applicant : Government of India

1. Project Digest

(1) Project Title: Augmentation of Water Supply and Sanitation For Goa State

(2) Location: India
Goa (3 hours by air from Delhi ; 45 mins. by air from Mumbai)

(3) Implementing Agency

Name of the Agency: Public Works Department of the Government of Goa, Public Health Engineering Wing

Number of Staff of the Agency:

Public Health Engineering Wing:	
Principal Chief Engineer	1
Chief Engineer I	1
Superintending Engineer	3
Executive Engineer	7
Assistant Engineer	25
Technical Assistant	20
Junior Engineer	100

Organizational chart is enclosed at Annex II .The Principal secretary of the PWD is the Chief Secretary of the Government of Goa.

Budget allocated to the Agency: RS. 5937.62 million in the Tenth Five Year plan(2002-2007) Rs. 934.75 million in the Budget of the State Government for the year 2003-2004

(4) Justification of the Project

Detailed Report on the Concept and Project for Augmentation of Water Supply and Sanitation for Goa State has been submitted separately. The copy of the Executive Summary is given at Annex I.

-Present conditions of the sector

Present demand for treated water for household industry and tourism is 216 MLD in 2003. There is a present shortage of 70 MLD which is adversely affecting public health and limiting employment and constraining industrial development. The only available additional source of water after full and feasible utilization of current water sources is the perennial river Sulauli. From its existing impoundage, water can be spared to sustain supply of additional 220 MLD, which would raise the availability to 366 MLD. This Project is essential to meet current requirements and a substantial part of the demand of 468 MLD that will arise in 2031.

The bulk of treated water after use ends up as waste water. This situation underscores the need of providing sewerage for Goa. Except for the main towns of Panjim, Margao and Vasco the other areas which are centers of industry, tourism and pilgrim density do not have sewerage facilities. The risk of sullage entering the drinking water supply is imminent, especially in the tourist attractions of beaches where the sandy soil does not provide the required filteration of waste water. The project therefore consists of components of wastewater treatment in areas of population and gainful employment concentrations which do not have the facility of sewerage . The development and

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implementation of the project in its integrated water supply and waste water treatment components will proceed in the frame work of a coordinated development plan for the entire State of Goa, the smallness of which is an advantage in ensuring efficient control and management for optimum development of the Project for water supply and sanitation for the state.

- **Sectoral development policy of the National/Local government:**

  The project is accorded among the highest priorities of the State Five Year Plan (2002-2007) which has been approved by the National Planning Commission. It is in the core area of the Tenth Five Year Plan which is to provide "twenty four hour water supply, State-of-the art sewerage and sanitation network covering the entire state". with overall emphasis " on employment generation and environmental upgradation"

- **Problems to be solved in the sector:**

  Shortage of treated water which is adversely affecting public health and constraining employment generation and development of appropriate non-polluting Industries, adversely affecting major sources of income from Tourism and causing adverse impact on quality of life and a short fall in the Human development index which otherwise is the most advanced for Goa.

- **Outline of the project:**

  Developing detailed project report with engineering designs and technology to enable tendering and financing of the project in respect of the Salaulim water project for supply of 220 MLD of water to six talukas out of eleven talukas for Goa State; Preparation and updating of feasibility studies for Sewerage system for concentrations of Industries, Tourism facilities and household in the areas of Margao, Mapusa, Ponda and the Coastal belts of North and South Goa; Preparation of an integrated Development Plan of Water Supply and Sanitation for the entire sate of Goa.

- **Purpose (short-term objective) of the Project:**

  To provide for 220MLD of treated water; and setting up of essential sewerage plants to the extent of 56 MLD.

- **Goal (Long-term objective) of the Project**

  Identification of further projects for implementation arising out of the development plan for water supply and sanitation for the entire State.

- **Prospective beneficiaries**

  The entire population of about 1.3 million will be benefited plus the floating population of about 1.4 million every year. The segments of the population chiefly benefited are in rural areas and semi-urbanised areas and in the areas of tourist and Industrial concentration in the Rural areas. The employment generated by the project is 30,000 (direct) and another 40,000 (indirect).

- **The project's priority in the National Development Plan/Public Investment Program**

  See under 4 above.

- **Desirable or scheduled time of the commencement of the Project:**

  October/November2003.

- **Expected funding source and/or assistance (including external origin) for the Project:**

  Budgetary support from the Government of Goa and possible external funding from the Japan Bank for International Co-operation.

2. **Terms of Reference of the proposed study:**

Developing detailed project report with engineering designs and technology to enable tendering and financing of the project in respect of the Salaulim water project for supply of 220 MLD of water to six talukas out of eleven talukas for Goa State; Preparation and updating of feasibility studies for Sewerage system for concentrations of Industries, Tourism and households in the areas of Margao, Mapusa, Ponda and the Coastal belts of North and South Goa; Preparation of an integrated Development Plan of Water Supply and Sanitation for the entire sate of Goa.

(1) **Necessity/Justification of the Study:.**

As given above particularly under (4) above.

(2) **Necessity/Justification of the Japanese Technical Cooperation:**

Goa has the benefit of long standing Business cooperation with Japan. About 90% of the Iron Ore exported from Goa goes to Japan. Technical mission from Japan has acquainted itself of the prospects of Infrastructure and Industrial development of Goa. Japan has developed special State of art technologies for water treatment and sewage treatment, with special reference to elimination pollution from mining and other rejects.

(3) **Objective of the Study:**

To prepare Bankable project for funding and implementation under the Aegis of Japanese Technical cooperation. The cooperation programme of Japan is in line with the priorities of the project namely water supply for vulnerable section of the population and sanitation also for the vulnerable section of the population and sanitation including those of rural areas and for environmental upgradation and protection. The benefits will accrue to the entire population especially those in Rural areas and will sustain public health and the sources of income generation and employment generation.

(4) **Area to be covered by the study:**

The major part of Goa as indicated in the maps in Annexure III and IV.

(5) **Scope of the study:**

As indicated above

(6) **Study Schedule:**

6 months; In the first period of three months ,the water supply project could be developed for financing, tendering and implementation and simultaneously in the remaining three months other components could be developed for financing and implementation.

(7) **Expected Major Outputs of the Study:**

The financing and implementation of supply of 220 MLD of water and development of sanitation facilities of 56 MLD.

(8) **Possibility to be implemented/Expected funding resources:**

PWD will be the implementing Authority. Funding resources are expected from agencies like the Japan Bank for the International cooperation.

(9) **Request of the study to other donor agencies if any:**

The project has not been posed to any other donor agency.

(10) **Other relevant Information:**

Given in the detailed report submitted separately.

3. Facilities and information for the study

(1) Assignment of counterpart personnel of the implementing agency for the study: (number, academic background, etc)

Principal Chief Engineer	- Shri P. P. Borkar, B. E.(Electrical)
Chief Engineer I	- Shri V.V. Shantanam, BSc, B.E. (Civil) MIE.
Superintending Engineer	- Shri J. N. Ambikar, B.E. (Civil) F.I.E.
	Shri V. L. Karnat, B.E. (Civil)
	Shri P. V. Kundinae, M.E.(Civil)
Executive Engineer	- Shri A. A. Patil, B.E.(Civil), MIE.
	Shri R. M. Kossambe, B.E. (Civil)
	Shri Santhanam, B.E.(Civil)
	Shri Paranjape, B.E. (Civil)
	Shri S. Mandrekar, B.E. (Civil)
Assistant Engineer	- Shri R. Gaigali, B.E. (Civil)
Technical Assistant	- Shri D. Khaunte, B.E. (Civil)

(2) **Available data, information, documents, maps, etc. related to the study: (please attach the list)**

List of Documents attached in Annexure VI.

(3) **Information on the security conditions in the Study Area:**
Safety and security conditions exceptional. Both safety and security are fully assured.

4. **Global Issues (Environment, Gender, Poverty, etc.)**

(1) **Environmental components (such as pollution control, water supply, sewage environmental management, forestry, biodiversity) of the Project, if any.**

The project has the full support and encouragement of the department of environmental as it enhances environmental protection and upgradation and public health.

(2) **Anticipated environmental impacts (both natural and social) by the Project if any.**

The provision of assured treated water supply and related waste water management and treatment has considerable social welfare benefits. The optimum utilization of natural resource of the perrenial river Salauli and the environmental protection of Goa's unique assets of hills, beaches, rivers and creeks is assured and preserved by implementation of the project.

(3) **Women as main beneficiaries or not.**

(4) **Project components which require special considerations for women (such as gender difference, women specific role, women's participation), if any.**

(5) **Anticipated impacts on women caused by the Project, if any.**

Because of the uniform civil code and other factors relating to high literacy and wide spread educational level the Status of women has received special attention and development. The project will provide special benefit to vulnerable sections of the population and mainly to women. Special educational facilities for women will be availed by them by provision of water to specialized educational institutions relating to computers, information technology and commerce and finance. Special employment for women in infrastructure services for tourism, banking and special industries, pharmaceutical and Beverages will be secured. Another important factor is that the drudgery involved mainly in women carrying potable water over long distances in areas where there is scarcity of water will be eliminated and also sanitation problem which effect the health of women and children

(6) **Poverty allevination components of the Project, if any.**

(7) **Any constraints against the low-Income people caused by the Project.**

Vulnerable sections of the population will be benefited as given above.

5. Undertaking of the Government of (the recipient country)
In order to facilitate the smooth and efficient conduct of the study, the Government of Goa shall take necessary measures:

(1) to secure the safety of the Study Team,

(2) to permit the members of the Study Team to enter , leave and sojourn in (the recipient country) in connection with their assignment therein and exempt them from foreign registration requirements and consular fees,

(3) to exempt the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of (the recipient country) for the conduct of the Study.

(4) to exempt the Study Team from income tax and charges of any kind imposed on or in the connection with implementation of the study.

(5) to provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced in (the recipient country) from Japan in connection with the implementation of the study

(6) to secure permission for entry into private properties or restricted areas for the conduct of the Study.

(7) to secure permission for the Study Team to take all data, documents and necessary materials related to the study out of (the recipients country) to Japan and,

(8) to provide medical services as needed. Its expenses will be chargeable to members of the Study Team.

6. The Government of (the recipient country) shall bear claims, If any arise against member(s) of the Japanese Study Team resulting from, occurring in the course of or otherwise connected with discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Study Team.

7. (The implementing Agency) shall act as counterpart agency to the Japanese and non-governmental organizations concerned for the smooth implementation of the study.

8. (The implementing Agency) will, as the executing agency of the project, take responsibilities that may arise from the products of the study.

* In the case that Detail Design Study is requested.

The Government of the recipient country assures that the matters referred to in this form will be ensured for the smooth conduct of the Development Study by the Japanese Study Team.

Signed Sd/-
(D. S. Negi)

Title Chief Secretary

Date : 22nd August 2003.

On behalf of the Government of Goa

EXTERNAL ASSISTANCE FOR AUGMENTATION OF WATER SUPPLY AND SANITATION FOR GOA CONCEPT AND PROJECT

EXECUTIVE SUMMARY

Goa's progress in economic and social development is impressive . In the index of humar development its ranking is among the highest and is shown in the indicators of literacy per capit: income, road connectivity spread of higher education, economic growth, and low birth and death rates The task ahead is to sustain this development. The Tenth five Year Plan (2002-2007) of the state has as its core areas education, sustainable village economy, good governance, tourism and infrastructure development with overall emphasis on employment generation and environmental upgradation. Among the important objectives and targets are providing 24 hour water supply and state of art sewerage and sanitation network covering the entire state. Employment generation and environmental upgradation are the key elements. Water Supply and Sanitation is an area of the Tenth Plan that would require external assistance to supplement the resources of the State. The Concept and Project for augmentation of water supply and sanitation for the state is designed to meet the requirements of urbanization that have grown at a fast rate from 25 % to 50 %. The present population of over a million is almost doubled with another million tourists and visitors attracted by the special

environment and culture of Goa. Most of the urban growth and tourism demand is in concentrations which require environmental upgradation as they contain the fabulous beaches which urgently require sewerage treatment facilities. The demand for potable water has increased exponentially not only for household use, for the international airport, the major sea port, the widespread of higher education and professional institutions but also for the services that support tourism and for industry, especially the majority of food, beverage, pharmaceutical and chemical industries, which are non-polluting and which can expand and provide gainful employment if their requirements of treated water are met.

The demand for potable water has been assessed by an expert group for essential and realistic requirements and is 595 MLD for the year 2011 and 775 MLD for the year 2031. With augmentation of the seven regional water supply schemes to the limits of their capacity and of water availability and not taking into account the envisaged scheme of augmentation of the Salaulim Water supply scheme, the present capacity of 314 MLD can be raised by another 40 MLD to reach 394 MLD in 2003. At present there is critical shortage of potable water both for household and industry, especially manifest during the hot season, March to June. The viable and feasible scheme to meet the gap for 2011 is the augmentation of the Salaulim Water Supply Project. Water is available from the existing impoundage

to sustain the addition of 220 MLD of treated water for house holds, industry, tourism, education and services.

The augmentation of the Salaulim scheme will benefit 6 talukas representing 74% of the urban and 56% of rural population of Goa. It will provide for the needs of industrialism, tourists, services which are the most productive prospects of growth. Against the demand of 216 MLD which is met at present with difficulty, the demand assessed for 2031 is 468 MLD, in the main categories of tourist institutional, and domestic. There is already a present deficit of 70 MLD which is seriously constraining growth and employment. The deficiency would rise to 246 MLD which is seriously constraining growth and employment. The deficiency would rise to 246 MLD by 2031. Hence the criticality of implementation of the Salaulim Augmentation Scheme which would meet the deficit in three years time by an additional supply of 220 MLD.. The head works and water treatment plant will be located on the left bank of the Dam; raw water after treatment will be pumped to the storage reservoir in the hills and conveyed further by gravity to the demand centers. The scheme incorporaters a sanitation component for rural areas by construction of 32,200 pour flush latrines for families below the poverty line. The estimated costs of the entire scheme of augmentation of the Salaulim water supply scheme works out to Rs. 4400 million an investment over a three year period.

The beneficiary project area, the existing water supply schemes and the proposed augmentation scheme are depicted in the map at Annexure ~~II~~ III.

Goa is deficient in the provision of an efficient sewerage system for the three principal towns out of the five –Panajim, Vasco, Margao,. Mapusa and Ponda.The first two have underground sewerage systems. The remaining three comprising the major part of the city of Margao; has to be covered by expansion of the existing project and the remaining two towns of Mapusa and Ponda do not have underground sewerage system. The cites of Mapusa and Ponda with Margao are the hub of the tourist and pilgrim traffic in addition to containing a fast growing concentration of the urbanized domestic population, who do not have sewerage. Only 13 % of Goa's urban population is covered by sewerage much lower than the all India figure of 28%. The essential requirements of these three urbanized concentrations and of the tourist requirements in the concentration of the Calangute beach adjoining Mapusa and of the Colva beach adjoining Margao require urgently a sewerage system. The schemes for the two beaches are essentially environmental upgradation of the coastal belt of North and South Goa and are vital for the maintenance and sustenance of Goa's most beautiful attractions and productive assets.

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The sanitation components of the project which are for external assistance are :

Environmental Upgradation by Seweage Treatment (16 MLD) of the North Coastal Belt.

The project Area, spreading over an area of 17.00 sq. km, covers a beach length of 7.50 km. In North Goa which comprises the world famous beaches of Baga, Candolim, Calangute, and Sinquerim, a major Beach Tourism Destination, both for domestic as well as international tourists. The coastal belt is dotted with a assortment of hotels and eateries, with heavy influx of tourists. The threat f Environmental degradation due to poor or toally absent disposal systems for sewerage and wastewaters generated along the Coastal Belt is real and imminent. Adequate water supply has been made available to this area. The wastewater generated from domestic units and hotels in the project area is generally disposed of using septic tanks of aqua privies and soak away wells. High ground water table, particularly during rainy season, causes some of these units to overflow leading to unsanitary conditions. The estimated average sewage flows to be generated in 2001, 2011, 2021 and 2031 are 6250, 7915, 10775 and 13450 cubic metres/ day respectively. On-site sanitation would not be practicable in many quarters of development. Therefore, pipe system is called for. River Sinquerim is identified as the receiving stream for treated seweage as sufficient land is available along its bank for constructing terminal plants. The treatment process is carefully selected to take care of large variation

of seasonal as well as diurnal flows. The estimated cost of the first phase for 16 MLD capacity is Rs. 410 /-million.

The second component is the Environmental Upgradation by Seweage Treatment (12 MLD) of the South Coastal Belt. The project area, spreading over an area of 60.55 sq. km, and a beach length of about 20.50 km in south Goa comprises the famous beaches of Majorda, Utorda, Betalbatim, Colva, Benaulim Varca, Cavelossism, Mobor and Betul. With the thurst of touristic development in South Goa and a number of star-category hotels coming up along the Coastal Belt, sewerage and disposal of wastewaters is of paramount importance to avoid enyironmental degradation of the Beach Belt, and is essential to maximize its immense touristic potential. At present there is no underground sewerage system or any waste water disposal arrangements in the area. In the upper reaches, about 40% of the population uses septic tanks with soak pits for disposal of domestic seweage. The star-hotels along the beach line have their own limited arrangements some rudimentary treatment plants and/or septic tanks. The poor disposal of sewerage and wastewaters has been causing already some degradation of the beach area. There has been substantial rise in population in the project area from 1961 to 2001, which is 120%. The total projected resident population is 52625 in the year 2031. The total tourist population in the project area for the year 2001 is 7,74,900. and the projected tourist population for the year 2031

is 17,21,956.The total wastewater generation is 13.03(MLD) for the year 2021 and 17.13(MLD) for the year 2031. The sewerage treatment plant is designed for the average flow of about 12.0 MLD in 2021. The cost of the project is Rs. 910/- Millions.

The third component relates to the Sewerage Scheme (8.5 MLD) for Ponda Town. The Town is surrounded by ancient Hindu temples, the Safa Masjid, Churches, etc. which have accounted for pilgrim tourism. The town is surrounded by many Industrial Estates and Mining Zones. Educationa Institutions and commercial activity also add to the growing importance of the Town. The Project is planned for demand upto the year 2021, for a projected population of 46,000. The population projections taken into account the sub-urban areas which are developing at a faster growth rate. The wastewater generation is worked out at 8.5 MLD, including the demand of pilgrim tourism and floating population. The scheme comprises the 8.5 MLD Sewage Treatment Plant, with a sewerage network of 60.0kms and 2 Pumping Stations. The estimated cost of the project is Rs. 300 millions.

The fourth component is the Sewerage System for Mapusa town, the headquarters of Bardez taluka. Mapusa Town, spreading over an area of 14.0 sq.km., occupies a special place, being only 12km. From the capital town of Panaji, and is located on the National Highway NH-17. It is the first well developed town on entry to Goa from Maharashtra on the NH-17. Bardez Taluka is situated in

North Goa District with nearly 44.50% of its area urbanized. In addition some of the most popular and beautiful beaches on the coast lie close to Mapusa Town. With over 100 Industries and a fast pace of Industrialization, Bardez is among the more advanced talukas of Goa. As the Taluka capital Town and a fast developing Muncipal area, Mapusa town requires for its growth and development, an adequate system for sewage and waste water treatment and disposal. There are at present, no sewage or wastewaters treatment and disposal. Households are connected to individual septic tanks with absorption pits. This septic tanks provide at the most only primary treatment, with effluents which contains dissolved and putrescible solids, with pathogens that create unhygienic conditions. Due to hard laterite strata, the soak pits have low absorption capacity and hence the effluents overflow to the surface, creating pools of stagnant water, with breeding grounds for mosquitoes and bacteria, with consequent health hazards and environmental pollution. The Project is planed for a design period of 25 years (upto 2021AD), for a resident population of 73,4000 (including the urbanized fringe area). The Project envisagers a comprensive sewage collection treatment and disposal system, with tertiary treatment for sewage and waste water in order to produce an effluent which can be safely reused for irrigation or disposed into the nalla (creek) on the East of the town, leading to the Mandovi river. The system consists of 12.50MLD Sewage treatment plant, 25km of underground sewerage network with 6

Pumping Stations and an effluents disposal systems to the creek. The estimated cost of the Project is Rs. 350/- million.

The fifth component relates to the Sewerage system for the southern and the most populous city of Margao, considered the intellectual and commercial capital of Goa and of the most productive taluka,of Salcette. The project is designed for population of 150 thousand in the year 2031. The projected sewerage generation works out 21 MLD. The present sewerage system is modular the first module being of a capacity of 7.5 MLD The scheme provides for a second module of 7.5 MLD at an estimated cost of Rs. 420 million.

The Beneficiary Areas for the Sanitation Schemes, and the location of the sanitation schemes are indicated in the maps at Annexure III and IV.

The Development Plan for Water and Sanitation is required to co-ordinate the schemes in progress and provide complementary and catalytic inputs. The main schemes in progress relate to the water impoundage and rain harvesting by construction of bandharas and revival of the traditional systems of reservoirs, water resources projects under investigation in the main river basins of the Madei, Zuari, Talpona, and Gallibag, maintenance of water supplies in traditional wells, recharge of deep confined aquifers, and providing ground water retarding structures. Another major source that is

to be integrated is the reorientation of major irrigation projects in progress in which demand for water for industrial and domestic use has emerged as a major component with irrigation for agriculture.The development plan will also provide for the complementary and essential programme for treatment of wastewater. Augmentation of sewerage facilities is required for the towns and for areas of touristic importance and attraction. But attention is required to be also given to the periphery of urbanized areas which require the extension of sewerage facilities and for their gradual merging with the programme of flush water seal latrines in the rural areas. The development plan will require consultancy to the extent of Rs. 20 million.

The project is ready for implementation the water supply consultancy in terms of state of art technologies and cost effective designing. The implementation period is 3 to 5 years.

ABSTRACT OF COST AND BENEFITS

• Augmentation of Salaulim Water Supply Schemes a) Construction of 220 MLD Treatment Plant and laying the parallel conveying main 1600mm dia M.S. pipeline for length about 22 km.	Rs. 4400.00 Million (including Rs. 66 million for consultancy)
• Environmental upgradation for coastal belt of North Goa (Baga-Calangute-Candolim & Sinquerim area covered) of capacity 16 MLD.	Rs. 410.00 Million (including Rs. 12 million for consultancy)
• Environmental upgradation for coastal belt of South Goa (Utorda to Mobor area covered) of capacity 17MLD.	Rs. 910.00 million (including Rs. 27 million for consultancy
• Sewerage Scheme for Ponda Town.(8.5 MLD)	Rs. 300.00 million (including Rs. 9 million for consultancy
• Sewerage Scheme for Mapusa Town.(12.5 MLD)	Rs. 350.00 Million (including Rs. 10 million for consultancy
• Sewerage Scheme for Margao Town.(7.5 MLD)	Rs. 420.00 million (including Rs. 12 million for consultancy
	Rs. 6790.00 Million
• Consultancy services of preparing Master Plan for Water Supply & Sanitation (dealing with river linking Tillari and Madei schemes, etc)	Rs. 20.00 million
Total	- **Rs. 6810.00 million**

The benefits accrue to the entire population of Goa and the tourist / visitor population which is about double the population of Goa, for a total of two million.The special focus and the project areas of the water supply and sanitation proposed for external assistance is for 60 per cent of the urbanized area, another ten per cent of the rural urbanized periphery, and the entire tourist visitor population.The

other invaluable benefit is the environmental protection and upgradation of among the most productive assets of Goa,namely the fabulous beach attractions. Any deferment of the sanitation schemes for these areas increase the risks to the public health of the entire State which has an excellent record so far. The Project supports the sustained growth of industry and tourism; in fact if the Project is not implemented the effects will be adverse and counterpductive. The Project will critically help both tourism and industry in their growth path and benefits for employment have been assessed at 8000- 12000, direct,and 16000 to 24000 indirect. The indirect employment will be mainly in the tertiary sector of tourism and services. Employment potential is expected to increase further as the project will enhance the enabling environment for investments in the private sector.The bulk of employment benefits which the project will sustain are the opportunities that will be created for the educated unemoployed and for those who come out from the widespread of higher education and professional institutions in Goa. The consideration of the Concept and Project for external assistance is advanced on the grounds that water supply and sanitation for vulnerable areas and population is essential and critical; that technology transfer and financing envisaged for external assistance has substantial benefits in environmental protection, public health, and human resource development, and that it is complementary and catalytic to the efforts of the Small State and will sustain the impressive progress made in economic and social development.

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ORGANISATIONAL CHART OF PUBLIC WORKS DEPARTMENT

The Public Works Department plays a major role in the economic, commercial and touristic development of the State of Goa. Being a service Department, it is entrusted with all the developmental activities like Planning, Design, Construction, Operation and Maintenance of all types of construction works in this State of Goa.

Following are the programmes that come under the purview of the Public Works Department:

1. Buildings (functional and non-functional).

2. Roads and Bridges:-

   i) State Programme.
   ii) Centrally Sponsored Schemes.
   iii) National Highways.
   iv) Western Ghat Development Programme (WGDP)

3. Water Supply and Sanitation:-

   i) State Programme.
   ii) Centrally Sponsored Scheme.

4. Electrical and Mechanical including Govt Garage and Workshop

In addition to the above, the construction programme for most of the other Departments is also executed by Public Works Department, besides the construction programme of Local Bodies and some of the Autonomous Organizations as " Deposit Works".

Work allocation in Public Works Department

The Government has considered the recent developments in different spheres of the Public Works Department. With a view to streamline the existing set-up of the PWD and to ensure the distribution of technical and Administrative management, the Government has approved the creation of the following posts in addition to the existing post of the Chief Engineer.

1. One Post of Principal Chief Engineer.
2. One Post of Chief Engineer.

Consequent upon up gradation and re-designation of two post of Superintending Engineers from the existing pay scale of Rs. 12000-375-18000 to that of Chief Engineer, PWD in the pay scale of Rs. 18400-500-22400, Government of Goa promoted Shri V. V. Santhanam and Shri K. P. Nambiar to the post of Chief Engineer and designated as Chief Engineer I & II respectively.

The distribution of work for the above senior Technical Officers in view of the additional creation of posts, is specified below.

1. <u>Principal Chief Engineer.</u>

He will be the Head of Department under the Goa Delegation of Financial Powers Riles, 1997 and Ex-Officio Additional Secretary to the Government. He will be the budget controlling and appointing authority and he shall ensure proper co-ordination between the two Chief Engineers. The following matters will be under the control of the Principal Chief Engineer:-

(a) Administration and Co-ordination
(b) Quality Control
(c) Vigilance matters
(d) Enlistment of Contractors
(e) Parliament & State Assembly matters.
(f) Budget, Audit & Public Accounts Committee matters.
(g) Any Technical & Financial powers delegated by Government beyond the powers of Chief Engineer for implementing Public Works

The following wings/units will be under the control of Principal Chief Engineer:

(a) Jt. Director of Accounts (for matters related to accounts).
(b) Dy. Director of Administration (for all administrative matters).
(c) S.S.W. (For Planning and Quality Control).
(d) S. E. (Mon & Eva.) (for Monitoring & Evaluation including quality Control.
(e) Engineering Officer (for Liaison & Coordination)
(f) E.E. (Legal) (for co-ordination of legal matters, L.A. Cell, Estate matters, etc.)

2. Chief Engineer – I

He will deal with all the Roads & Bridges in the State including that of National Highways. He shall also deal with the Public Health Engineering Works, which include Water Supply, Sanitation, environmental up-gradation scheme, etc. Matters related to centrally sponsored schemes for the respective areas shall also be looked after by him. He will be Head of Office and Ex-Officio Joint Secretary to the Government. Circles III, IV, IX, V, VIII shall come under his supervision and control along with the relevant Divisions as defined under the existing set-up. The Chief Engineer-I is authorized to report to the Secretary (PWD) for all matters related to all the works entrusted to him.

3. Chief Engineer – II

The Chief Engineer deals with all buildings and all Electrical & Mechanical works under execution within the P.W.D. budget and also the works related to various other Departments of the State. He is authorized to deal with MPLAD Scheme including deposit works in the Building Sector. He is authorized as a Head of Office and Ex-Officio Joint Secretary to the Government. Circles I, II, VII and Chief Architect's Office are under his supervision and control along with relevant Divisions as defined under the existing set-up. The Chief Engineer-II is authorized to report to the Secretary (PWD) for all the matters related to all the works entrusted to him.

The following units/wings working under control of the Principal Chief Engineer are authorized to co-ordinate with the Chief Engineer-I (Roads, Bridges, Public Health Engineering) and Chief Engineer-II (Buildings, Electrical & Mechanical), for matters related to accounts fund certificate, allocation of funds, monitoring of financial and physical progress, legal opinion, land acquisition matters, etc.

(a) Joint Director of Accounts: for Budget, submissions of estimates for A.A. & E.S. & issues of Orders thereof.

(b) S.S.W. : for technical scrutiny and advice.

© S.E. (Mon & Eva) : for monitoring physical and financial progress including centrally sponsored schemes.

(d) E.E. (Legal) & L.A.O. : for all legal and land acquisition matters.

All the aforesaid Chief Engineers are authorized to exercise their Technical Powers as per the procedures laid down in CPWD, Manual & Code and delegation of powers as approved by the Government from time to time. Under the revised set-up, the existing functioning of the Circles/Division/Sub-Divisions in PWD shall remain unaltered.

The Department is divided into Administrative Units called Circles, which are headed by Superintending Engineers. **Each Circle consists of field units known as Works Divisions** headed by Executive Engineers who are entrusted with execution of works. They are in turn assisted by **Sub-Divisional offices** headed by Assistant Engineers. The Department has got 9 Circles, 25 Divisions and 101 Sub-Divisions stationed throughout the State of Goa. Each Sub-Division is provided with Junior Engineers/Technical Assistants who supervise the day-to-day execution of works. Seven Circle offices are presently located in Panaji and two Circle Offices are in Margao. The Divisions are located in various talukas depending upon the jurisdiction of their activities, to enable them to maintain proper and efficient control over the execution of works.

Each Superintending Engineer has under his charge two or more Divisions. He is the Administrative head who exercises the control over the activities of Divisions engaged in investigation, Planning, construction and maintenance of various works. He also maintains liaison with the office of the Chief Engineer with regard to works and all technical matters. The Budgetary control over the Divisions, under each Circle rests with the Superintending Engineer.

The Superintending Engineer is required to examine the books of the Divisional and Sub-Divisional officers during his inspection and to keep a strict watch on expenditure and achievements of the physical targets, for efficient and economical functioning of the Circle.

The Divisional officer headed by an Executive Engineer, is directly responsible for the execution and smooth implementation of various schemes entrusted to his Division. The Divisional Officer is also responsible for exercising proper control and adopting measures to preserve the scheme in good condition, prevent encroachment of Government lands and building under the jurisdiction. The Divisional Accountant who assists the Executive Engineer is primarily responsible for ensuring the correct compilation of the accounts of the Division.

The Assistant Engineer, who is in charge of the Sub-Divisional office, is responsible to the Executive Engineer for getting the works executed according to the approved designs, specifications and estimates.

The work accounts and charge of stores are the responsibility of the Assistant Engineer who is required to keep a proper watch over the stores, including inventory of materials. He is also required to inspect the conditions of buildings and structures under his control periodically.

The Junior Engineer/Technical Assistant is the primary element in the Executive Wing of the Division who is responsible for the execution of works and maintenance of accounts of works, under his control. The Junior Engineer/Technical Assistant is directly responsible for the entire execution of works and the works are supposed to be carried out in his presence. He is also responsible for proper maintenance of muster rolls in respect of labour employed by the Department; watch over the progress of works, record of measurements etc.

Ultimately, the Executive Engineer and his subordinates are entirely responsible for the smooth functioning of the Divisions and they have to account for the budgeted expenditure and consequently achieve the physical targets.

The Chief Architect assisted by Architects, Assistant Architects and Architectural Assistants is heading the Architectural Wing. She is in charge of preparation of plans and furnishing of detailed drawings of the buildings etc., to be undertaken by this Architectural Wing. The Chief Architect and his staff are also required to inspect the building works frequently as required and also to give initial layout and the final completion certificate.

PERSONNEL SUMMARY :-

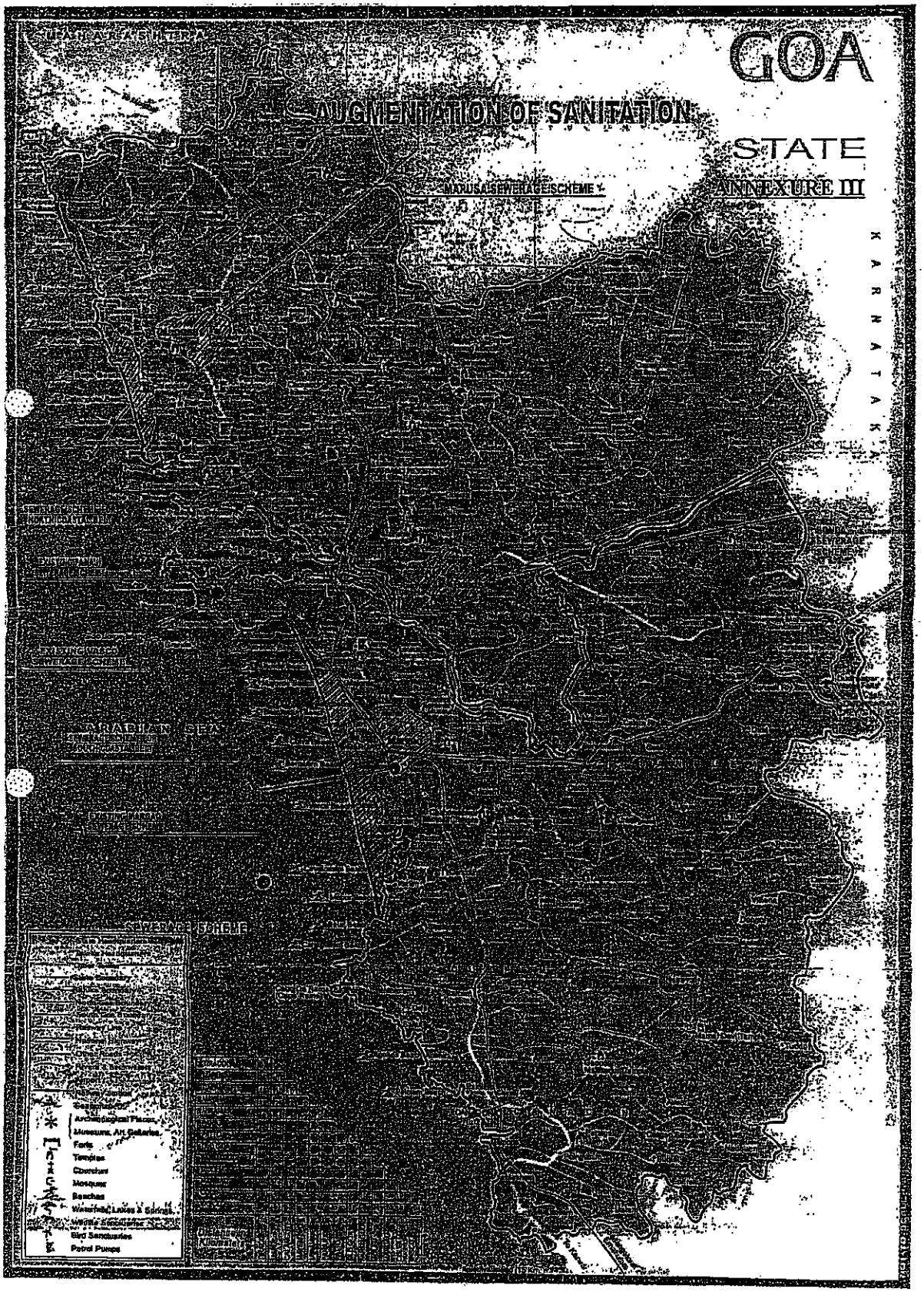
The number of Officers and other Personnel employees in Public Works Department (including Workcharged establishmemnt) as on 31st March, 2003 is given below :-

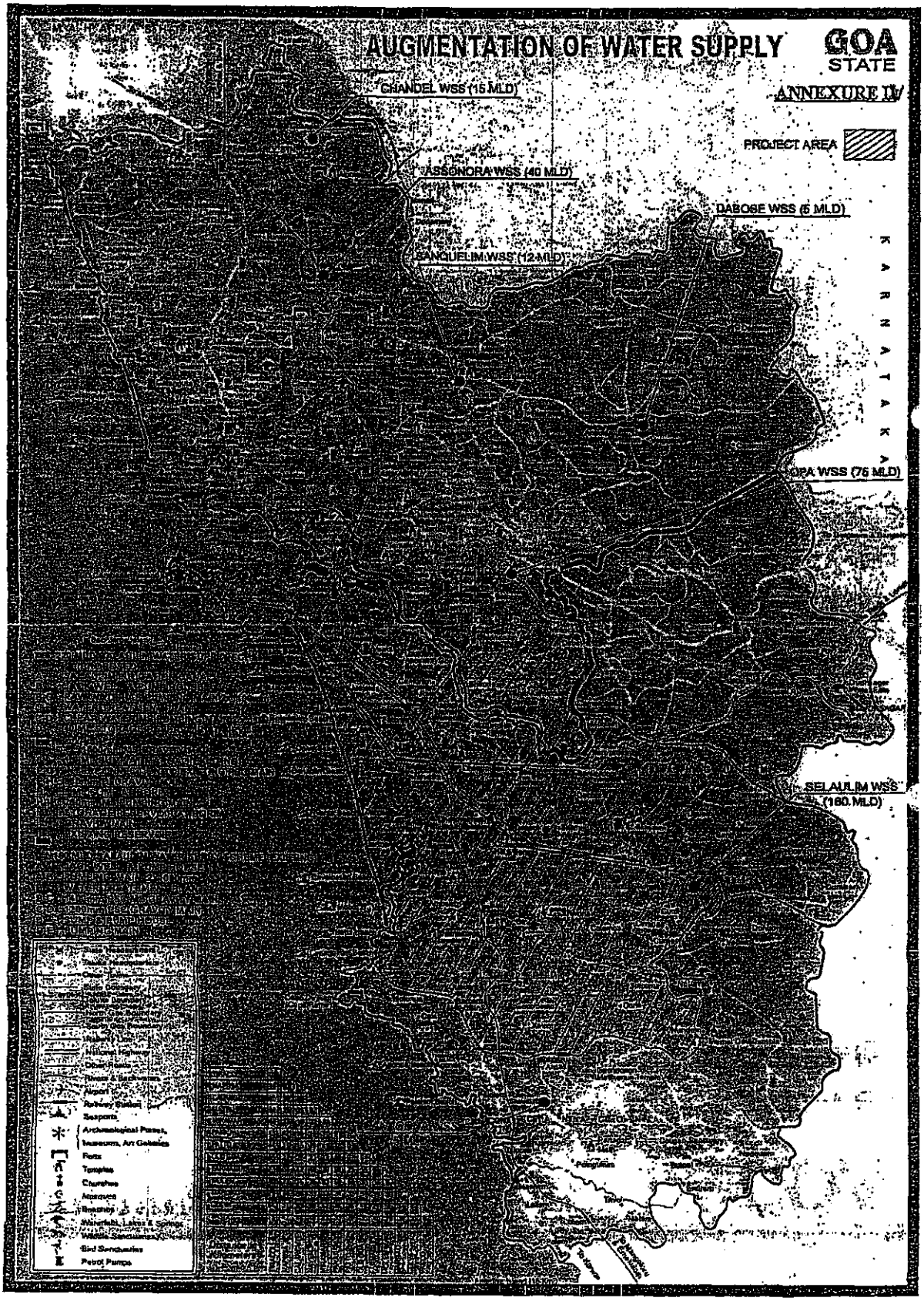
Particulars	As on 31st March, 2003
Regular :	
Officers	168 Nos.
Other Personnel	1637 Nos
WORKCHARGED	
Other Personnel	2880 Nos
NMR	5 Nos
Total :	4690 Nos.

STATEMENT SHOWING THE GROUPING OF DIVISIONS UNDER VARIOUS CIRCLE OFFICES AND THEIR HEADQUARTERS, ETC.

CIRCLE OFFICES	DIVISIONS							
	Panaji	Margao	Ponda	Mapusa	Porvorim	Bambolim	Bicholim	Sanguem
CIRCLE I (Buildings) P.W.D., Panaji	Division V (Bldgs. North) P.W.D., Panaji	Division VIII (Bldgs. South) P.W.D., Margao	Division XVI (Bldgs.Central) P.W.D., Ponda	Amalgeted to Circle II, Panaji with existing Staff Works, along with divisions				
CIRCLE II (Buildings-Project) P.W.D., Panaji	Division I (Buildings) P.W.D., Panaji					Division XIX (Buildings G.M.C. Complex) P.W.D., Bambolim		
CIRCLE III (Roads-North) P.W.D., Panaji	Division II (Roads) P.W.D., Panaji			Division XIII (Roads) P.W.D., Mapusa			Division XXIII (Roads) P.W.D., Bicholim	
CIRCLE IV (Roads-South) P.W.D., Margao		i) Division VI (Roads) P.W.D., Margao ii) Division XXV (Roads) P.W.D., Margao	Division XVIII (Roads) P.W.D., Ponda					
CIRCLE V (Public Health Engineering - North) P.W.D., Panaji	Division III (PHE) P.W.D., Panaji		Division XXIV (PHE) P.W.D., Ponda		Division XVII (PHE-North) P.W.D., Porvorim			
CIRCLE VI (Public Health Engineering Project), P.W.D. Panaji		Division XXI (PHE-Sewerage South) P.W.D., Margao	Amalgeted to Circle VIII, Margao with existing staff and works, along with the divisions					Division XII (PHE-Salaulim Water Supply Project) P.W.D., Sanguem

CIRCLE OFFICES	DIVISIONS							
	Panaji	Margao	Ponda	Mapusa	Porvorim	Bambalim	Bicholim	Sanguem
CIRCLE VII (Mechanical/ Electrical) P.W.D., Panaji	Division IV (Mech/Elect. North) P.W.D., Panaji	i) Division X (Stores) P.W.D., Margao ii) Division XXII (Mech/Elect-South) P.W.D., Margao						
CIRCLE VIII (Public Health Engineering-South) P.W.D., Margao		i) Division IX (PHE) P.W.D., Margao ii) Division XX (PHE South) P.W.D., Margao						
CIRCLE IX (National Highways Entire State) P.W.D., Panaji	Division VII (NH), P.W.D. Panaji	Division XIV (NH) P.W.D., Margao	Division XV (NH) P.W.D., Ponda					
Design and Co-ordination Organisation S.S.W. and Co-ordination and Control, P.W.D., Panaji.	Division XI (Quality Control) P.W.D., Panaji							

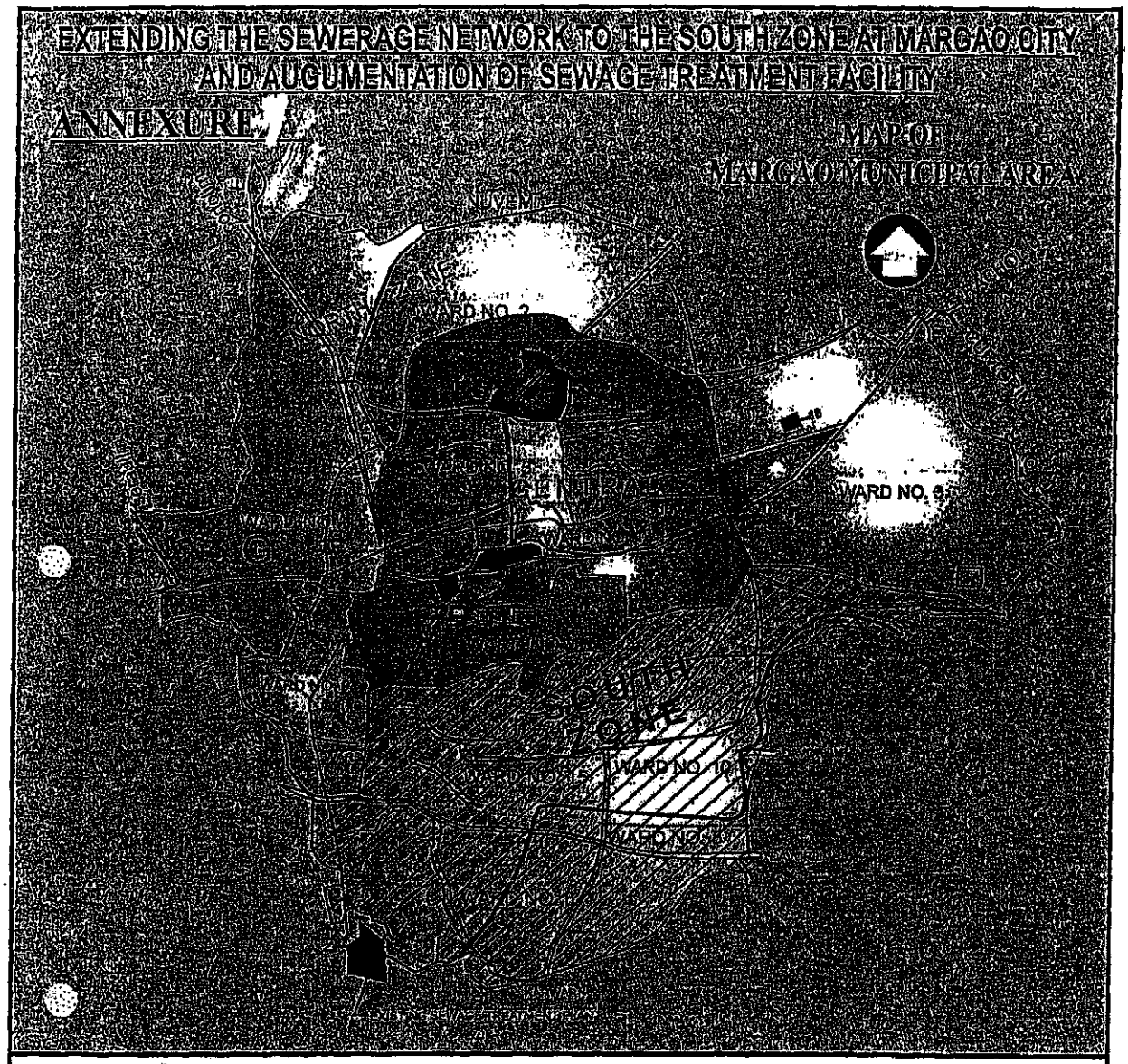

GOA
AUGMENTATION OF SANITATION
STATE
ANNEXURE III
MAPUSA SEWERAGE SCHEME
KARNATAKA
ARABIAN SEA
Forts
Temples
Churches
Mosques
Beaches
Bird Sanctuaries
Petrol Pumps


AUGMENTATION OF WATER SUPPLY
GOA
STATE
ANNEXURE IV
PROJECT AREA
CHANDEL WSS (15 MLD)
ASSONORA WSS (40 MLD)
DABOSE WSS (5 MLD)
SANQUELIM WSS (12 MLD)
KARNATAKA
OPA WSS (75 MLD)
SELAULIM WSS (160 MLD)
Seaports
Archaeological Parks, Museums, Art Galleries
Forts
Temples
Churches
Mosques
Beaches
Waterfalls, Lakes & Springs
Wildlife Sanctuaries
Bird Sanctuaries
Petrol Pumps

EXTENDING THE SEWERAGE NETWORK TO THE SOUTH ZONE AT MARGAO CITY AND AUGUMENTATION OF SEWAGE TREATMENT FACILITY

ANNEXURE A

MAP OF MARGAO MUNICIPAL AREA



INDEX

1	MARGAO MUNICIPAL BUILDING
2	COMMUNIDADE BUILDING
3	GRACE CHURCH
4	MUNICIPAL GARDEN
8	LOYOLA HIGH SCHOOL
6	POLICE STATION
7	POST OFFICES
8	CINE METROPOLE
9	T.B. SANTORIUM
10	MONTE CHAPEL
11	HOSPICIO HOSPITAL
12	HOLY SPIRIT CHURCH
13	DAMODAR SAL
14	COURT
15	FATORDA CHAPEL
16	P.W.D OFFICE
17	HOUSING BOARD COLONY
18	CHOWGULE COLLEGE
19	ELECTRICITY DEPARTMENT
20	CINE VISHANT
21	CARMELITE MONESTARY
22	RAJENDRA PRASAD STADIUM
23	RAILWAY STATION
24	MUNICIPAL MARKET
25	MAHATMA GANDHI MARKET
26	FISH MARKET

SEWERED AREA DIVIDED IN THREE ZONES VIZ:
(a) NORTH ZONE
(b) CENTRAL ZONE
(c) SOUTH ZONE
(a) NORTH ZONE: (COMPLETED)
AREA COVERED : FATORDA (PART), AMBAJI,COMBA & PAJIFOND (PART)
MUNICIPAL WARDS COVERED :PARTS OF WARD No. 1,2,3,9,10,11,13 &15
TOTAL LENGTH OF SEWER LINE LAID: 22.024 KMS.
(b1) CENTRAL ZONE (NORTH SECTOR): (COMPLETED)
AREA COVERED:FATORDA (PART), GOGOL (PART)
MUNICIPAL WARDS COVERED:PARTS OF WARD No.1,2,3
TOTAL LENGTH OF SEWER LINE LAID:10.127 KMS.
(b2) CENTRAL ZONE(SOUTH SECTOR): (IN PROGRESS)
AREA COVERED : BORDA, GOGOL (PART)
MUNICIPAL WARDS COVERED: PARTS OF WARD No. 9,10,11 & 12
TOTAL LENGTH OF SEWER LINE: 17.55 KMS.
(b) SOUTH ZONE (TO BE TAKEN UNDER THIS PROJECT)
AREA TO BE COVERED:AQUEM,MARGAO CITY, KHAREBAND, PAJIFOND (PART), SHIRVODEM & NAVELIM (PART)
MUNICIPAL WARDS COVERED: PARTS OF WARD No. 3,6,7,8,9,10,13,14,15
TOTAL LENGTH OF SEWER LINE: PHASE I : 32.206 KMS.
PHASE II : 34.00 KMS.
SEWAGE TREATMENT PLANT (COMPLETED & COMMISSIONED)
CAPACITY :
PRESENT :7.5 MLD (EXISTING)
ULTIMATE : 15 MLD (TO BE TAKEN UNDER PHASE II)
TREATMENT PROCESS :- ACTIVATED SLUDGE PROCESS

ANNEXURE VI

* Augmentation of Salaulim Water supply scheme (220MLD)	Project was studied with the help of TATA consultancy and the Project Report was prepared in 2001
* Environmental upgradation of coastal Belt of North & South Goa	Preliminary study was conducted by Consultant Engineer Jose J. J. De. Albuquerque & Associates and the same was updated by Public Works Department.
* Sewerage Scheme for Mapusa and Ponda Town	The Consultant Engineer Jose J. J. De. Albuquerque & Associates has prepared Master Plan for the Environmental Upgradation of State of Goa.
* Sewerage scheme for Margao Town	The project Report was prepared by MECON Ltd. Navi – Mumbai in April 2002.

- Concept & Project Report for Augmentation of Water supply and sanitation for Goa State.
- Economic Survey of Goa – 2002-2003
- Relevant maps are given in the above documents.

付属資料２．S/W

SCOPE OF WORK
FOR
STUDY
ON
AUGMENTATION
OF
WATER SUPPLY AND SANITATION
FOR THE GOA STATE
IN THE REPUBLIC OF INDIA

AGREED UPON BETWEEN
PUBLIC WORKS DEPARTMENT,
THE GOVERNMENT OF GOA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

New Delhi, September 22, 2004

Mr. M Rajamani
Joint Secretary
Ministry of Urban Development,
The Government of India

Mr. Omura Yoshiki
Leader
Preparatory Study Team
Japan International Cooperation Agency
(JICA)

22/9/2004

Ms. Debashree Mukherejee
Secretary
Public Works Department,
The Government of Goa

I INTRODUCTION

In response to the request of the Government of the Republic of India (hereinafter referred to as "the Government of India"), the Government of Japan decided to conduct Study on Augmentation of Water Supply and Sanitation for the Goa State in the Republic of India (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Republic of India.

The present document sets forth the Scope of Work with regard to the Study and will be valid after notification of approval by JICA Headquarters. It will be informed through JICA India office to the Government of India.

II OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. To formulate a master plan for augmentation of water supply and sanitation in the Goa state
2. To conduct feasibility study on priority project(s) which will be selected from the master plan
3. To pursue technology transfer to the counterpart personnel in the course of the Study

III STUDY AREA

The Study shall cover the areas shown in the attached sheet of Appendix 1.

IV SCOPE OF THE STUDY

Phase I : Basic Study

A. Review of the existing (current) water supply and sanitation system
   1. Collection and analyses of existing data and information
   2. Survey and investigation of existing water supply system
      (1) Water sources
      (2) Water supply facilities
      (3) Water consumption
   3. Survey and investigation of existing sanitation system
      (1) Sanitation facilities
      (2) Sanitary condition
      (3) Water quality
   4. Survey of present conditions
      (1) Social and economic analysis

(2) Legislation
(3) Institutional structures
(4) Financial conditions
(5) Environmental control and management
(6) Public hygiene, awareness, and participation

5. Problem analyses

Phase II :Formulation of a master plan and conducting feasibility study on priority project(s)

A. Formulation of a master plan
   1. Establishment of scope, goals and strategies for water supply and sanitation
   2. Planning framework
      (1) population growth and urbanization
      (2) social and economic growth
      (3) amount of water source potential, water demand, and sewage quantity
   3. Formulation of master plan
      (1) Water supply and sanitation system
      (2) Institutional structures and duties
      (3) Finance
      (4) Management, operation and maintenance
      (5) Water quality monitoring plan
      (6) Public participation
   4. Technical assistance for initial environmental examination (IEE) and holding of workshop(s)
   5. Preliminary cost estimation and financial plan
   6. Evaluation of the master plan
   7. Selection of priority project(s)

B. *Feasibility Study on priority project(s)*
   1. Supplemental survey
   2. Confirmation of the framework of the plan
   3. Outline of future facilities
   4. Management, operation and maintenance plan
   5. Economic and financial analysis
   6. Project cost
   7. Technical assistance for environmental impact assessment (EIA) and holding workshop(s)
   8. Implementation plan
   9. Project evaluation

C. Seminar(s) for technical transfer

V STUDY SCHEDULE

The Study will be carried out in accordance with the attached tentative work schedule. (Appendix 2)

VI REPORTS

JICA will prepare and submit the following reports in English to the Government of India:

1. Inception Report:
Twenty (20) copies at the commencement of the Study. This report will describe such as study schedule, methodology, and manning schedule.

2. Progress Report
Twenty (20) copies at the first work period in India.

3. Interim Report:
Twenty (20) copies at the beginning of Phase2

4 Draft Final Report:
Twenty (20) copies at the end of the Study in India
The Government of India shall submit their comments within one(1) month after the receipt of the Draft Final Report.

5. Final Report:
Thirty (30) copies

VII UNDERTAKING OF THE GOVERNMENT OF INDIA

1. To facilitate the smooth conduct of the Study, the Government of India shall take the following necessary measures:

(1) To provide security related information on as well as measures to ensure the the safety of the Japanese study team (hereinafter referred to as "the Study Team"),

(2) To permit the members of the Study Team to enter, leave and sojourn in India for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,

(3) To exempt the members of the Study Team from taxes, duties, fees and any other charges on equipment, machinery, vehicles, and other materials brought into India for the conduct of the Study,

(4) To exempt the members of the Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study,

(5) To provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced into India from Japan in connection with the implementation of the Study,

(6) To secure permission for the Study Team to enter into private properties or restricted areas for the implementation of the Study,

(7) To secure permission for the Study Team to take all data and documents including photographs and maps related to the Study out of India to Japan, and

(8) To provide medical services as needed. Its expenses will be chargeable to members of the Study Team.

2. The Government of India shall bear claims, if any arises, against the members of the Study Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or wilful misconduct on the part of the member of the Team.

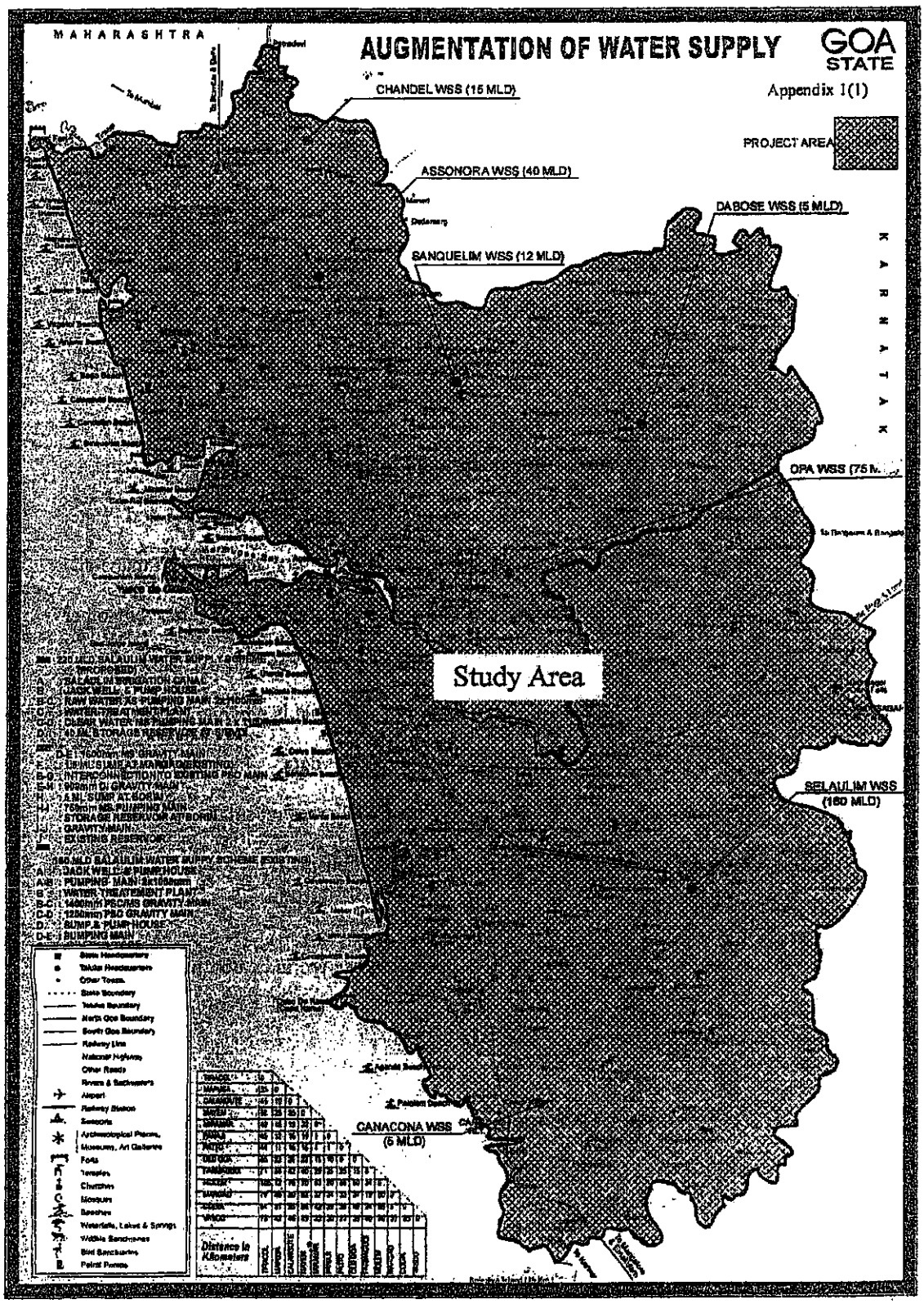
3. Public Works Department of the Government of Goa (hereinafter referred to as "PWD") shall act as a counterpart agency to the Study Team and also as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

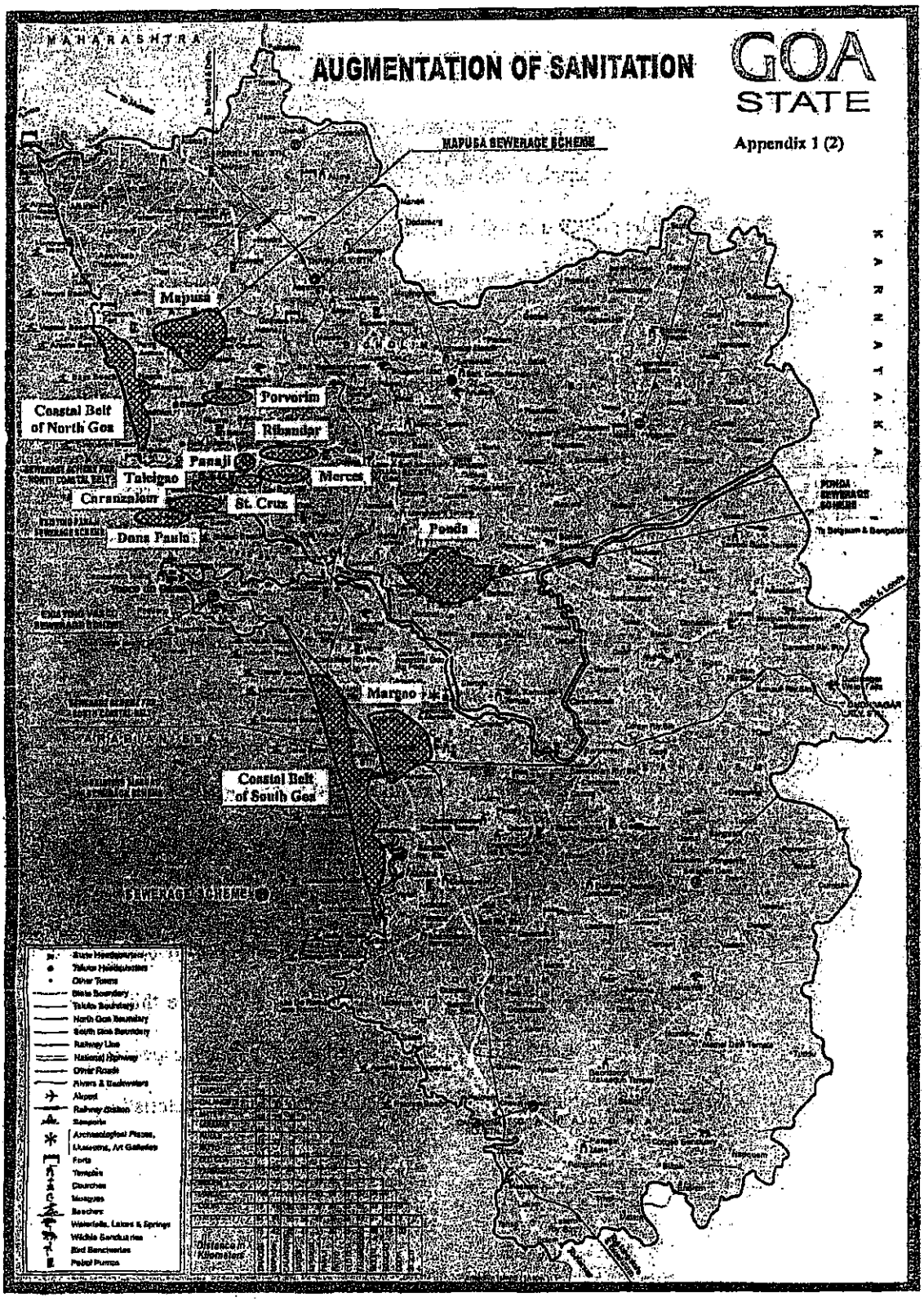
4. PWD shall, at its own expense, provide the Study Team with the following, in cooperation with other organizations concerned:

(1) security-related information on as well as measures to ensure the safety of the Japanese study team
(2) information on as well as support in obtaining medical services
(3) available data and information related to the Study
(4) counterpart personnel
(5) suitable office space with necessary equipment in the Goa State, and
(6) credentials or identification cards

VIII CONSULTATION

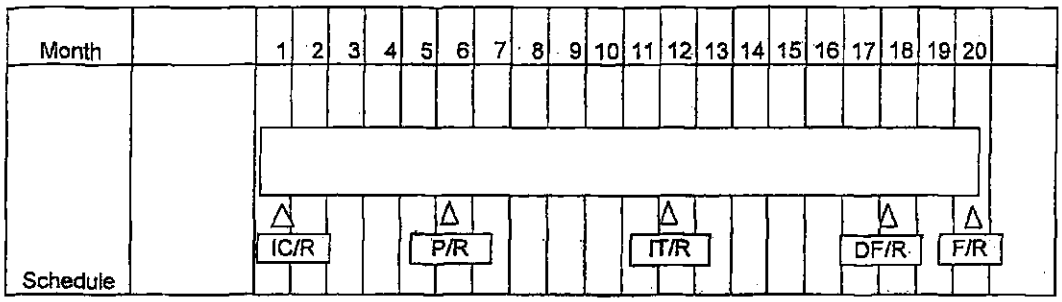
JICA and PWD shall consult with each other in respect of any matter that may arise from or in connection with the Study.


AUGMENTATION OF WATER SUPPLY
GOA STATE
Appendix 1(1)
MAHARASHTRA
CHANDEL WSS (15 MLD)
PROJECT AREA
ASSONORA WSS (40 MLD)
DABOSE WSS (5 MLD)
SANQUELIM WSS (12 MLD)
KARNATAK
ORA WSS (75 M...
Study Area
SELAULIM WSS (160 MLD)
CANACONA WSS (6 MLD)
Distance in Kilometers


MAHARASHTRA
AUGMENTATION OF SANITATION
GOA
STATE
Appendix 1 (2)
MAPUSA SEWERAGE SCHEME
Mapusa
Porvorim
Coastal Belt
of North Goa
Ribandar
Panaji
Taleigao
Merces
Caranzalem
St. Cruz
Dona Paula
Ponda
Margao
Coastal Belt
of South Goa
SEWERAGE SCHEME
KARNATAKA

Appendix 2

TENTATIVE SCHEDULE



Remarks:

IC/R	:Inception Report
P/R	:Progress Report
IT/R	:Interim Report
DF/R	:Draft Final Report
F/R	:Final Report