

APPLICATION FOR JAPAN'S DEVELOPMENT STUDY

1. Date of entry: September, 2003
2. Applicant : The Government of Indonesia
3. Project title : Regional Water Supply Plan in Greater Yogyakarta
4. Sector : Regional water supply
5. Project type : Development study on regional water supply plan
6. Target site : *(province/country name)*: Yogyakarta Special Province
(city/town/village name): Yogyakarta Municipality, Sleman Regency,
and Bantul Regency (hereinafter called as
"Greater Yogyakarta")
(from the metropolis) : One hour flight from Jakarta

The project site and the area are shown on Appendix 1. "Project
Location Map"
7. Project Cost (Stage - 1): Japanese Yen 4,920,000,000.
8. Desired fiscal year of implementation :
Survey & Study : FY 2004 - 2005
Implementation : FY 2006 - 2008
9. Implementing agency :
Ministry of Settlement and Regional Infrastructure
Person in charge : *(full name)* Ir. Budiman Arief
(affiliation) General Director of
Directorate General of Urban and Rural
Development
Address : 3rd Floor, Gedung B1c,
No. 20, Jln. Pattimura, Jakarta.



Telephone No. : (021) 7279-6158

Fax No. : (021) 7297-6155

10. Outline of the implementing agency.

The Directorate General of Urban and Rural Development, one of five directorate generals under the Ministry of Settlement and Regional Infrastructure, is an implementing agency for the present project.

The Directorate General of Urban and Rural Development is to promote and expedite development of urban and rural areas by providing infrastructure including water supply and sanitation, providing supports in agribusiness, small and home industry and assisting in utilizing natural resources within the framework of the community empowerment. Its goals to be achieved include:

- 1) to help the poor improve their living standards
- 2) to ensure equality in development in area and people
- 3) to obtain sustainable food supply
- 4) to promote sustainable natural resource management and conservation

Appendix 2 presents "Organization chart of Ministry of Settlement and Regional Infrastructure".

(3) Personnel (Staff numbers of Implementing Agency)

As of September 2002, a total of 9,182 employees are engaged in the respective works under The Ministry of Settlement & Regional Infrastructure.

(4) Budget (Revenue and Expenditure)

Annual budget appropriated for the year 2002 is shown on Appendix "2002 Budget Allocation, the Ministry of Settlement and Regional Infrastructure".

(5) Related Agencies in Greater Yogyakarta

Appendix 3 shows the organization chart of the PDAM Tirtamarta(Yogyakarta).

11. Background of the request.

Provide detailed information on the importance, necessity, and urgency of the

requested project in terms of the current situations of and problems found in the target sector; the current situations of and problems found in intended sites of the requested project, etc. by referring to related statistics and data.

(1) Current situation of the Sector

Greater Yogyakarta, in the present plan, covers a combined administrative area of Yogyakarta Municipality, Sleman Regency, and Bantul Regency, with an area of 1,200 (=574,827) km² in total. Sleman Regency, on the southern slope of Mt. Merapi, is located north of Yogyakarta Municipality, while Bantul Regency extends its area to the southern alluvial plain facing the Indonesian Sea. Yogyakarta Municipality is a rather small central area, bordered by these Regencies.

Major industry of the Region relates to tourism, commercial, and agriculture. Yogyakarta Province rich in historic ruins and temples attracts many Japanese and Western tourists. Borobudur temple, Prambanan temples and Ratu Boko palace constructed in 8th and 9th centuries are their main destination. Yogyakarta Municipality has the sister-town relationship with Kyoto Japan. Cultural exhibition has been held in major cities in Japan these years. In October 2003, the Municipality starts accepting direct flights from Singapore. Thus, the Government is pushing development of the Municipality as international center of culture and tourism.

In the Region two major rivers run from north to south. They are the Progo River and the Opak River. There are plenty of groundwater available in the aquifer stretched between these two rivers. This is a major reason why the large-scale water supply system has not been developed to date. Along with the population growth, groundwater was first exploited. Currently, there are more than 200 boreholes and numerous numbers of hand-dug wells constructed in the Region (20 boreholes for Yogyakarta Municipal water supply, and 18 boreholes for Sleman regency constructed in 1980s). It was 1987 when the Wadung spring water on the southern slope of the Mt. Merapi (in Sleman Regency) has been diverted to Yogyakarta.

Due to the excessive groundwater withdrawal and the immune geotechnical nature of the aquifer, however, the water quality becomes contentious claiming high concentration of iron and manganese. It may be less room to exploit good quality groundwater in the Region.

Regional population has grown remarkably from 1,400,000 in 1985 to

2,101,000 in 2000. To meet the increase of the water demand, many IKK water supply projects have been constructed in 1980s and 1990s, i.e., 23 projects in Sleman Regency and 13 projects in Bantul Regency. More than 60% of them, however, require rehabilitation of the installed pumps and generator sets, and need new treatment facilities due to the deteriorated source water quality.

There are three PDAMs in the Region, each for Yogyakarta Municipality, Sleman and Bantul regencies. PDAMs Sleman and Bantul operate their respective IKK water supply systems, while PDAM Yogyakarta runs one municipal water supply. Under these PDAMs, a large number of 656 (=323+206+127) employees are engaged in daily routine services. Appendix 4 illustrates flow diagram of the existing water supply system in the Region.

In accordance with the development concept presented in the Five-Year National Development Plan 1995 - 1999, the central government is now attempting to promote structural reshuffling and reform of any governmental agencies and institutions throughout the country. It is of the local government's opinion that the above PDAMs shall combine into one with the aim of promoting an integrated water resource management and improving the efficiency of the water supply services. It is, therefore, necessary to carry out the water resource study and formulate a long-term integrated water supply plan on the regional base.

Service coverage is stable at a low level of around 20 -25%. Increase of the served population slowed down these years. As of December 2000, 495,700 population out of 2,101,000 are served. This implies the service coverage of 23.6%, far below the government's target, 70 % envisaged in the Five-year National Development Plan.

The remaining who does not have an access to the piped water relies mainly on unsafe shallow well groundwater. It is the government's stated policy to help the people improve the living environment and upgrade the standard.

(2) Problems to be solved in the Sector

Independent organization of PDAMs Sleman, Bantul and Yogyakarta encounters technical, managerial and financial problems as described below:

- 1) Plural numbers of the independent water supply system and organization in one catchment area will not benefit from economies of scale. Many

boreholes constructed in Sleman Regency are operated separately by the respective organization of PDAM Sleman and Yogyakarta. Many small-scale service reservoirs generally require a number of operators or vigilance staff. Number of employees of these PDAMs reaches to 656 personnels in 2002, or equivalent 90 connections/personnel (300 connections/personnel or more is preferable). The sole water supply system integrated under control and management of one organization will be beneficial to the effective operation and maintenance.

- 2) Groundwater is a major water source of the region. Frequent power outage has been affecting the borehole operation resulting in empty service reservoirs. PDAM, under the circumstances, is obliged to stop operation of the whole water supply system.
 - 3) High concentration of iron and manganese is commonly observed in the groundwater, resulting in unfavorable tastes and color in the tapped water. It is desirable to reduce these contents within an allowable limit at the treatment works before supply to the customers.
 - 4) The existing storage reservoirs have not enough capacity to cater for the maximum daily water demand, causing water shortage particularly during the peak water demand and the power outage.
 - 5) Many people do not afford to pay for water. Water tariff and the service type should be carefully designed reflecting customers' willingness and ability to pay. Due to vast amount of accumulated delinquent bills, PDAMs have been suffering from shortage of funds, not sufficient to recover costs even for operation and maintenance.
 - 6) At present, funding sources are not available to overcome the above problems due to the present financial constraint of the PDAM and local and central governments.
- (3) Necessity and importance of improvement in the Sector which lead to the formulation of the Project

Merely 48.5% of the population obtain the piped water in Yogyakarta Municipality. Water supply conditions in Sleman and Bantul regencies are far worse with a service coverage of around 10%. This implies the majority of the population are depending on unsafe water of rivers and dug wells. The

Region is in urgent need of implementing the regional water supply development project to provide safe and clean water to the public as early as possible.

(4) Reasons why Japan's Grant Aid is requested for the particular Project.

The Government of Indonesia attempts to establish "Greater Yogyakarta Regional Water Supply" that covers three administrative areas of Sleman Regency, Yogyakarta Municipality and Bantul Regency. At present, independent PDAM organized on a regency base manages and operates the water supply system separately.

It is certain that the administrative boundary does not reflect geographical condition of the area. As is the case, groundwater resources for Yogyakarta are located outside boundary of the Municipality. In Sleman Regency, good quality groundwater is no more available due to the over-exploitation for the public and commercial uses. Bantul Regency also suffers a shortage of safe and clean water sources. The Government of Indonesia attaches the utmost importance of promoting and developing the integrated management, control and conservation of water resources on a regional (Greater Yogyakarta) base.

Japan has the long-term experience in this engineering. Regional water supply plans/projects on a river catchment base have been intensively formulated and implemented since mid 1980s to date. It is most desirable that the technology, design concept and experiences obtained and accumulated through the past projects would be reflected to the present planning.

Furthermore, this project requires considerable amounts of funds for procurement of mechanical and electrical equipment and the civil work. In view of the present financial constraints, the central government has many hurdles to allocate sufficient funds for implementation of this Project. The Government of Indonesia wishes to express a desire that the Government of Japan assists in implementing the present project from the technical and administrative points of view.

12. Relation with the government's development plan and other factors.

Name of the Plan : National Development Plan

Period : from 1999 to 2004

The National Policy Guidelines (GBHN: Garis-Garis Besar Haluman Negara) issued on October 19, 1999 by the new Government, stipulates the strategic direction toward national economic development, including promotion of the free market mechanism, healthy and fair competition, public transparency, and enhanced competitiveness in the national economy.

Under these directions, the Government lays emphasis on the following policies:

- 1) Stabilization of macro-economic environment required for making a better ground for operation of the national economy,
- 2) Relief of current economic hardships faced by poor people and programs for social safety net, and
- 3) Enabling the national economy to move forward.

Based on stipulation in GBHN, the National Development Plan during the period 1999-2004 (PROPENAS) has been approved and become effective on November 20, 2000 by the act No. 25/2000. The national resources and environment targets of PROPENAS are:

- 1) To manage the natural resources and to maintain the supporting forces in order that it is benefit for increasing the people's welfare from generation to generation,
- 2) To increase the utilization of the potential natural resources and environment with performing conservation, rehabilitation and saving the use by implementing a friendly technology,
- 3) To implement indicators which enable conversing the ability to get the newest in managing natural resources is renewable to avoid damage which can not be repaired,
- 4) To delegate by stages the authority of the central government to regional government in implementing the management of the natural resources in a selective way and maintenance of the environment so that the quality of the ecosystem is maintained which is regulated by laws, and
- 5) To utilize the natural resources for the biggest welfare of the people with observing the preservation of the function and balance of environment, continuous development, economic interest and culture of the local society and ordering of space, of which laws regulate the enterprising.

Name of the plan : **National Policy for Development of Community-managed Water Supply and Environmental Sanitation Facilities**

Appendix 2.

Organization Chart of Ministry of Settlement and
Regional Infrastructure and Budget Allocation for
2002

and Services (Draft 3, 2002)

Ministry of Settlement and Regional Infrastructure

Ministry of Health

Ministry of Home Affairs

Ministry of Finance

BAPPENAS

The aim of Water Supply and Environment Sanitation (WSES), as set forth in the GBHN 1999-2004, is to improve and maintain public utility installation and services, including water supply and environment sanitation in residential communities. This is especially important in stimulating equity participation in development, satisfying the demand of the community, and improving the quality human and environment resources in health related approach. To reach a long-term WSES program goal, it is crucial that the following aspects, listed in the order of priorities, are established:

1. Sustainability

Sustainability refers to ability of WSES provision program to produce a continuing benefit in favor of community. Sustainability must take into account the planning, implementation, operation and maintenance, and management of the SES facilities and services. When measuring the success of the WSES program, the ability of an activity to result in sustainable community behavior changes is equally important as the implementation of the program itself. Several aspects considered in sustaining WSES activities are: Sustainability of financing; know-how; environmental management; infrastructure management organization; and social interaction.

2. Use of WSES facilities and services considered effective when the availability facilities are appropriately placed and soundly constructed respects to technical, health, institutional, operational, and behavioral (change of behavior) aspects. Effective use of WSES facilities and services includes two facets: (a) ease of access and (b) equity.

The availability of adequately constructed facilities does not necessarily and immediately improves neither health conditions nor other welfare benefits, unless it is followed with improved awareness and change of behavior within the community. The community benefits from the processes implemented to establish community empowerment in WSES development.

• Ease of Access

Effective use is directly linked with the accessibility of the WSES facilities and services to the community; the facilities and services should therefore be readily accessible for either individual households or the general public, properly

constructed with the appropriate and available technology, easily operated and maintained, and conveniently located near daily activities.

- Equity

Equity refers to the use and availability of WSES facilities and services to every community member without gender, religious, age, racial, and social class preference. With equity, the community considers and involves everyone, including the poor group and women are the target recipients of these development programs.

The requested project/sector to promote regional-based water supply system in an effort to strengthening financial management of PDAM and extending and improving water supply services, fully complies with the policy stated above.

13. Objectives (*Itemize as concretely as possible*)

(1) Objectives/purpose of the project.

- To improve and expand the water supply services within the Greater Yogyakarta Region and seek most effective operation and management of the water supply system by combining three PDAMs into one,
- To upgrade the service coverage from the present 24% to 60% by the year 2020, a national target set up by the Government, by supplying water to the area where no piped water is currently available,
- To promote water conservation and system efficiency,
- To foster integrated water resource management on a regional base,
- To organize financially feasible and independent water supply enterprise in the region.

(2) Overall goal/medium and long-term objectives.

- To improve the living environment and enhance the public health and social welfare in the Region by providing safe and treated water to the public,
- To promote tourism industry and commercial activities in the Region,
- To ensure stable and sustainable development of the socio-economy in the Region.

14. Outline of the project and request (*Itemize as concretely as possible*)

(1) a. In the case of facilities construction project.

Outlines of Planned Facilities (*such as the name and address of the*

project site, site-selecting criteria, supporting photographs, design drawings with dimensions and area, number of requested facilities, and desired materials to be used).

The present Project aims at developing the regional water supply in the Greater Yogyakarta area by establishing the sole entity responsible for system operation and management, and improving the system efficiency and the water supply services.

Due to the limited capacity and poor quality of the groundwater in the area, the existing water sources have no room for expansion. The Progo river is considered as one of the promising water sources for the Greater Yogyakarta region. The Provincial government gives the official permission for diverting water with maximum rate, 1,800L/sec from the Progo river for public supply.

Appendix 5 shows the estimated water demand up to the target year 2020. The required water production by the year 2010 is 1,800 L/sec, tentatively estimated from the 2010 water demand and the water production capacity of the existing water sources. By the year 2020, additional 3,500 L/sec is required as incremental production capacity to meet the increasing water demand on daily maximum basis.

Under Stage I project (up to the year 2010), raw water is to be abstracted at the intake rate, 1800 L/sec, via intake channel diverted from the Progo River. Treatment facilities will be constructed nearby intake point. In view of the seasonal fluctuation in quality, the treatment process may consist of a grit chamber, a mixing basin, four series of flocculation basins, sedimentation basins, filters (each 500 L/sec) and storage reservoirs ($9,700\text{m}^3 = 1.8 \times 86,400 \times 1.5\text{hour}/24\text{hours}$ in total) with transmission pump sets, all of which are reviewed in the course of further studies and analyses to be carried out.

Treated water at the treatment works will be fed by gravity through two series of 1,000mm diameter pipelines, one directing for north and the other for south (at the target year 2010). These pipes are interconnected for emergency although separated by valves.

Service reservoirs will be constructed at strategic points close to the demand zone. Appendix 6 illustrates proposed sites and storage capacity of the planned reservoirs.

Trunk mains, as the existing distribution pipe network lacks, will be installed under the major streets of the Region to achieve stable and continuous supply. As for secondary and tertiary mains, the existing pipelines will be utilized as much as possible.

After completion of the Project in 2020, the population of 1,880,0000 accounting for 60 % of the total population in the Greater Yogyakarta region will be served with sufficient and safety water of 310 liter per capita per day on daily maximum basis.

- a. In the case of equipment supply project.

List of requested equipment (such as the name and address of the site to install the equipment, equipment-selecting criteria, name, specifications, quantity, unit price, total amount, etc. of the equipment).

Not applicable

- b. Method to operate, manage, and maintain the facilities or equipment, expected number of persons to be secured, together with their technical levels, and prospect to secure necessary budget.

The operation and maintenance of this Project after completion will be left to PDAM (Water Supply Enterprise) Greater Yogyakarta, which is planned to be established after the project commencement under authority of the Yogyakarta Special Province. A large number of skilled staff and operators are available, mobilized from the existing PDAMs.

- c. Financial sources for management and maintenance after completion of the requested project.

Fully borne by the government;

/ Partially borne by beneficiaries;

Fully borne by beneficiaries (estimated amounts and number of persons).

- (2) Breakdown of the estimated total project cost (only for Stage-I project)

<u>Description</u>	<u>Amount (x 1000 Yen)</u>
1) Intake diversion channel and intake pumps and pump house with necessary	Japanese Yen 170,000.-

appurtenances	
2) Treatment facilities (2,000 L/sec)	1,300,000.-
3) Storage reservoirs (5,000m ³ x 2 basins), office and chemical buildings	180,000.-
4) Transmission pipeline (1,000mm x 2 x 12km)	1,530,000.-
5) Service reservoirs (7 reservoirs)	440,000.-
6) Distribution trunk mains (800mm x 18km)	970,000.-
7) Engineering expenses	330,000.-
Total	Japanese Yen 4,920,000.-

(3) Additional information.

a. Existing facilities :

No / Yes *Current situations of the existing facilities plans, specifications, supporting photographs, materials used, etc.*

It was in 1988 to 1990 that 22 boreholes (out of which 4 wells are for observation purpose) were constructed in Sleman Regency to supply groundwater to Yogyakarta Municipality under technical and financial assistance of the Switzerland government. Production capacity jumped more than four times from 160 L/sec to 680 L/sec. Since then, any full scale expansions have not been undertaken.

b. List of existing equipment covering the name, quantity, year purchased, country of origin of the equipment, together with the manufacturer's name and operating conditions (A = operable, B = partially operable, and C = not operable) and reason(s) for such inoperability.

Also attach photographs of the equipment so that the current conditions can be grasped.

c. Project site preparation for treatment plant
Land :

Secured

Name of the landowner :

Area :

Not yet secured

Name of the landowner :

Area :

Minimum area of 10,000 m² to be required. However, it doesn't require more than 6 months after approval of the project initiation

- Current situations of the project site, such as leveling, drainage availability of power, water supply, telephone, etc.

Not applicable

- Data on natural conditions.

Concretely specify the names, years prepared, and agencies published of such data.

The climatic conditions in Greater Yogyakarta is tropical climate and characterized by two seasons; wet season from October to July and dry season from August to September. The monthly mean temperature slightly changes within a range between 28oC and 31oC throughout the year, and the monthly mean rainfall varies from 33 mm in August to 556 mm in March as shown below;

Monthly Mean Temperature and Rainfall in Kulonprogo District

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature (oC)	28	28	28	29	29	29	31	31	31	30	29	29
Rainfall (mm)	257	327	556	249	114	270	180	33	72	267	308	394

- Security situation.

Give concrete information related to each project site, if more than one site is involved.

No security problem has been reported.

- d. Related development study by the Government of Japan in the past.

a) FY 1988 – 1989

Title : The Project for Construction of Water Supply and
Environmental Sanitation Training Center

Amount : Yen 1,114 million

Target area : *(specify the names of provinces, cities, etc.)*

Bekasi, West Java Province

Assessment on level of utilization of the project :

/ A (Good)

B (Passable)

C (Bad)

D (Not utilized)

b) FY 1993 – 1994

Title : Rural Water Supply Project in Sulawesi Island

Amount : Yen 2,200 million

Target area : *(specify the names of provinces, cities, etc.)*

Rural areas in Central, South and South-east Sulawesi Province

Assessment on level of utilization of the project :

/ A (Good)

B (Passable)

C (Bad)

D (Not utilized)

c) FY 2000 – 2001

Title : Rural Water Supply Project in Sulawesi Province
(Phase II)

Amount : Yen 1,571 million

Target area : *(specify the names of provinces, cities, etc.)*

Rural areas in North, Central, South and South-east Sulawesi Province

Assessment on level of utilization of the project :

/ A (Good)

B (Passable)

C (Bad)

D (Not utilized)

15. Benefit and effects of the project.

(1) Area that will benefit from the project (specify the total area, if possible) :

800 km² of the southern urban area in Sleman regency and the northern flat area of Bantul regency and the whole of Yogyakarta Municipality directly and 1,200 km² of Greater Yogyakarta region indirectly benefited from the Project.

(2) Population that will benefit *(directly and indirectly)* :

1,888,000 people directly and 2,951,00 people in the whole of Yogyakarta Region indirectly benefited from this Project.

(3) Expected social and economic effects *(itemize concretely)* :

- Relief of women and children from going for water distant from their houses.
- Improvement of the living environment in the Region.
- Improvement of the public health in the Region.
- Enhancement of the social welfare in the Region.
- Mitigation of poverty in the Region.
- Promotion of the socio-economic development in the Region.

16. Relation with technical cooperation, etc.

(1) Feasibility study :

Already effected/being effected.

From month year to month year

Conducted by : JICA

other agency (specify :)

/ Not yet effected.

(2) Technical cooperation.

Which of the following forms of assistance do you require?

- 1) project-type technical cooperation
- 2) long-term experts : persons
- 3) short-term experts : 2 persons
- 4) JOCV : persons
- 5) acceptance of trainees : 5 persons
- 6) not needed

When the technical cooperation is underway.

Title :

Period : from month year to month year

- 1) project-type technical cooperation
- 2) long-term experts : persons
- 3) short-term experts : persons
- 4) JOCV : persons
- 5) acceptance of trainees : persons

17. Request to other donors for same project.

If yes, please specify donors.

Nil

18. Aid by third countries or international organizations in the same or related fields.

Name of donor	Period	Type	Amount	Outline (concretely)	Relationship with the present project

IBRD	1995 to 1999	Loan	US\$ 111.9 million	Surabaya urban development in East Java	No Relationship
IBRD	1994 to 1999	Loan	US\$ 61.2 million	Semarang Surakarta urban development project in Central Java	No Relationship
IBRD	1996 to 2000	Loan	US\$ 42.0 million	Second East Java urban development project in East Java	No Relationship
ADB	1995 to 2000	Loan	Rp 138,108 million	Rural water and sanitation at 150(IKK), 360(DPP), 2,750(DT) in 76 Regencies of 12 Provinces of Sumatera and Kalimantan	No Relationship
ADB	1994 to 1999	Loan	US\$ 15.0 million	Urban development (sector) project at NTT and NTB in Maluku, Irian Jaya and Timor Timur	No Relationship
ADE	1996 to 2002	Loan	Rp 48.4million	Urban development (sector) project at 22 cities and 16 Regencies in West Java	No Relationship

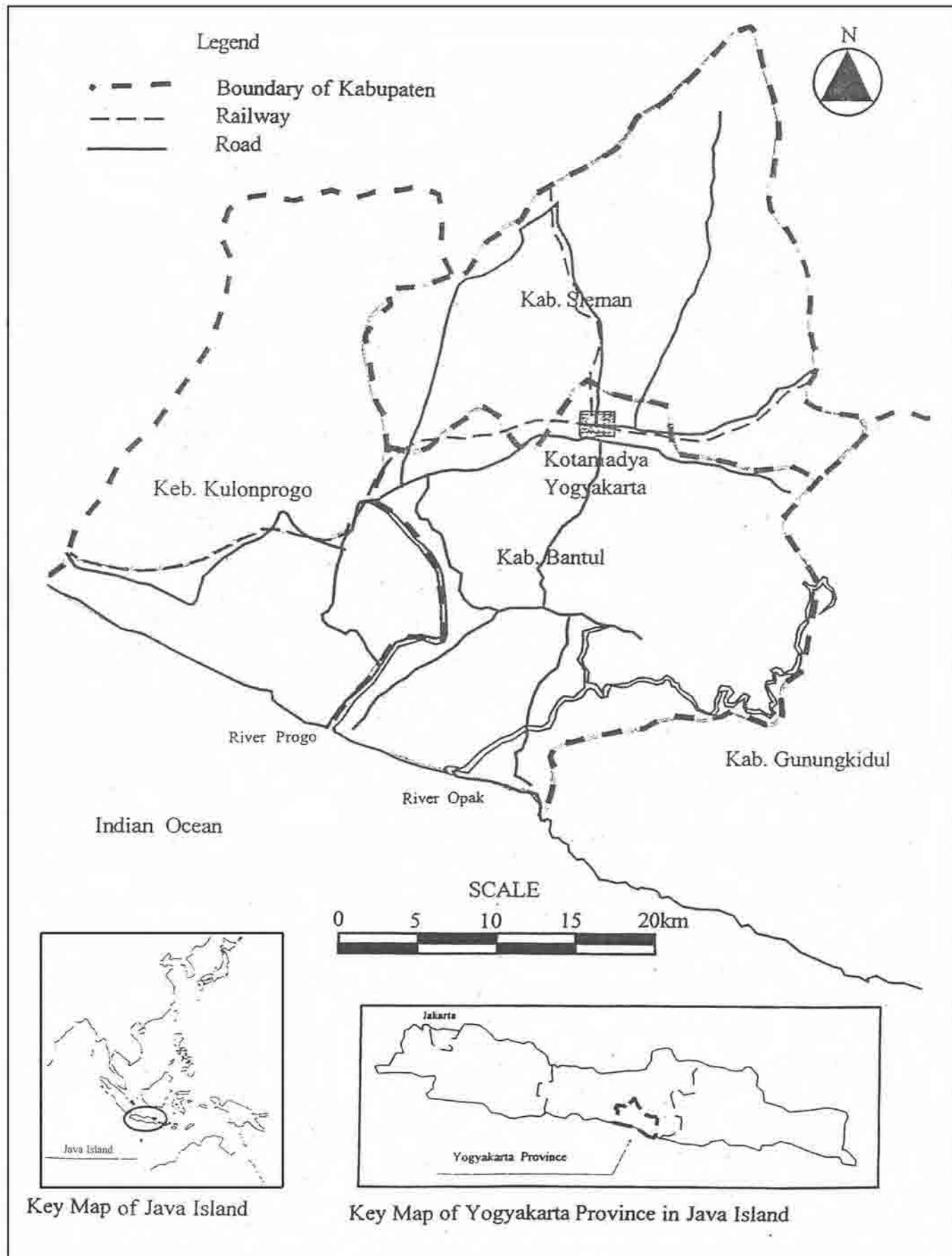
19. Other information with special remark (whether or not privatization policy is effected. If yes, indicate the relationship with the requested project.)

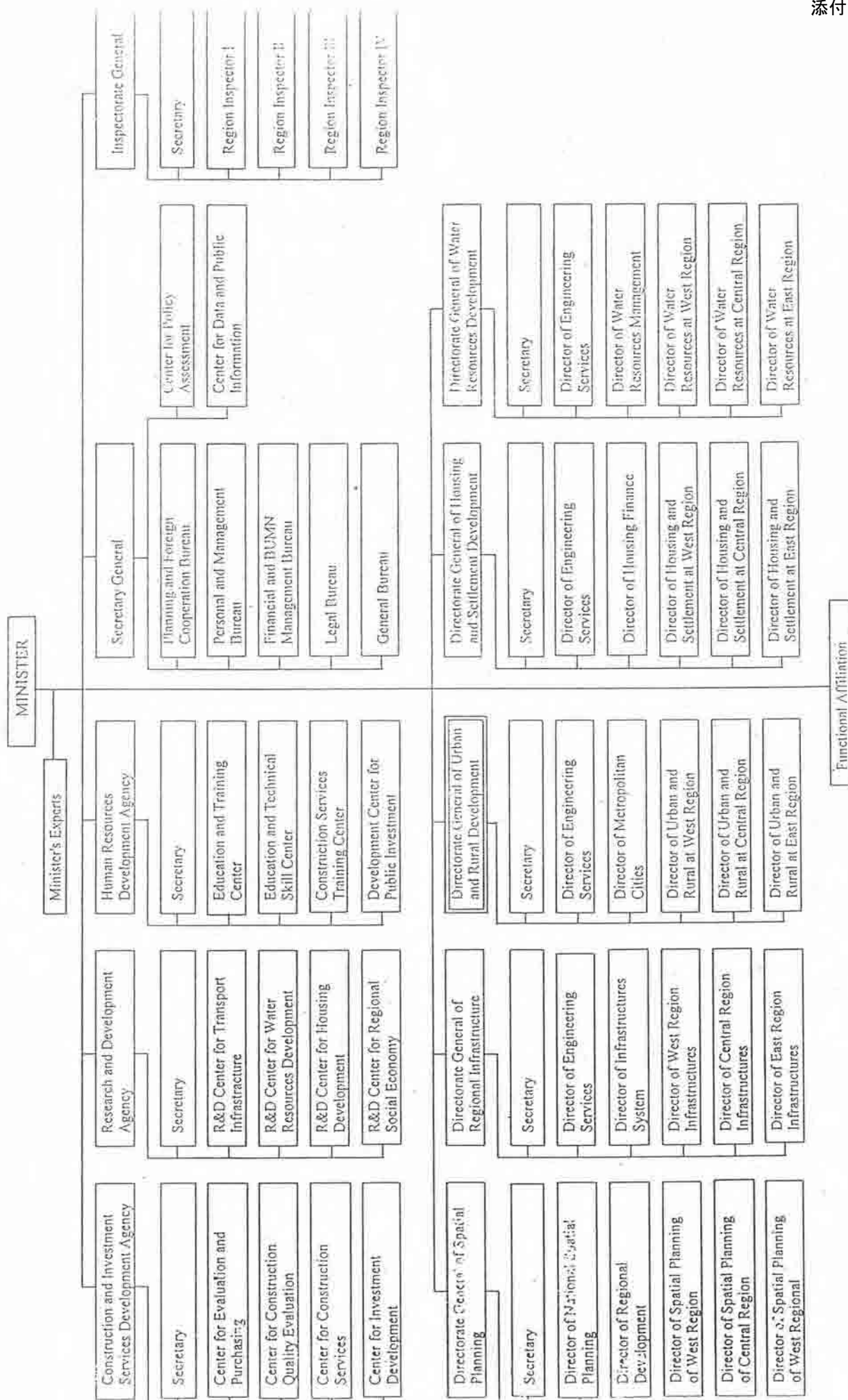
Privatization of Yogyakarta Regional Water Supply has not been planned.

APPENDICES

- Appendix 1. Project Location Map
- Appendix 2. Organization Chart of Ministry of Settlement and Regional Infrastructure and Budget Allocation for 2002
- Appendix 3. Organization Chart of PDAM in Greater Yogyakarta
- Appendix 4. Flow Diagram of The Existing Water Supply System in Greater Yogyakarta
- Appendix 5. Water Demand Projection up to the Year 2020
- Appendix 6. Water Supply System Development Plan in Greater Yogyakarta
- Appendix 7. Photographs
- Appendix 8. Terms of Reference for the Consulting Services on Master Plan and Feasibility Study on Greater Yogyakarta Regional Water Supply

Appendix 1. Project Location Map





REPUBLIC OF INDONESIA

OF

MINISTRY OF SETTLEMENT AND REGIONAL INFRASTRUCTURE

No.	Description	Development (Rupiah)	Routine (Rupiah)	Total (Rupiah)
1.	Directorate General of Spatial Planning	43,446,764,000	9,492,768,000	52,939,532,000
2.	Directorate General of Regional Infrastructure	3,790,365,905,000	29,557,343,000	3,819,923,248,000
3.	Directorate General of Urban & Rural	1,139,384,204,000	22,030,579,000	1,161,414,783,000
4.	Directorate General of Water Resources	3,492,087,939,000	24,556,521,000	3,516,644,460,000
5.	Directorate General of Housing & Settlement	308,843,232,000	9,117,613,000	317,960,845,000
6.	Balitbang (Research and Development Agency)	15,180,876,000	26,625,743,000	41,806,619,000
7.	BPSDM (Human Resources Development Agency)	27,526,482,000	31,029,864,000	58,556,346,000
8.	Bapekim	12,097,038,000	7,500,551,000	19,597,589,000
9.	Secretary General	33,493,845,000	38,275,517,000	71,769,362,000
10.	Inspectorate General	1,667,847,000	11,053,838,000	12,721,685,000
TOTAL		8,864,094,132,000	209,240,337,000	9,073,334,469,000

Source:

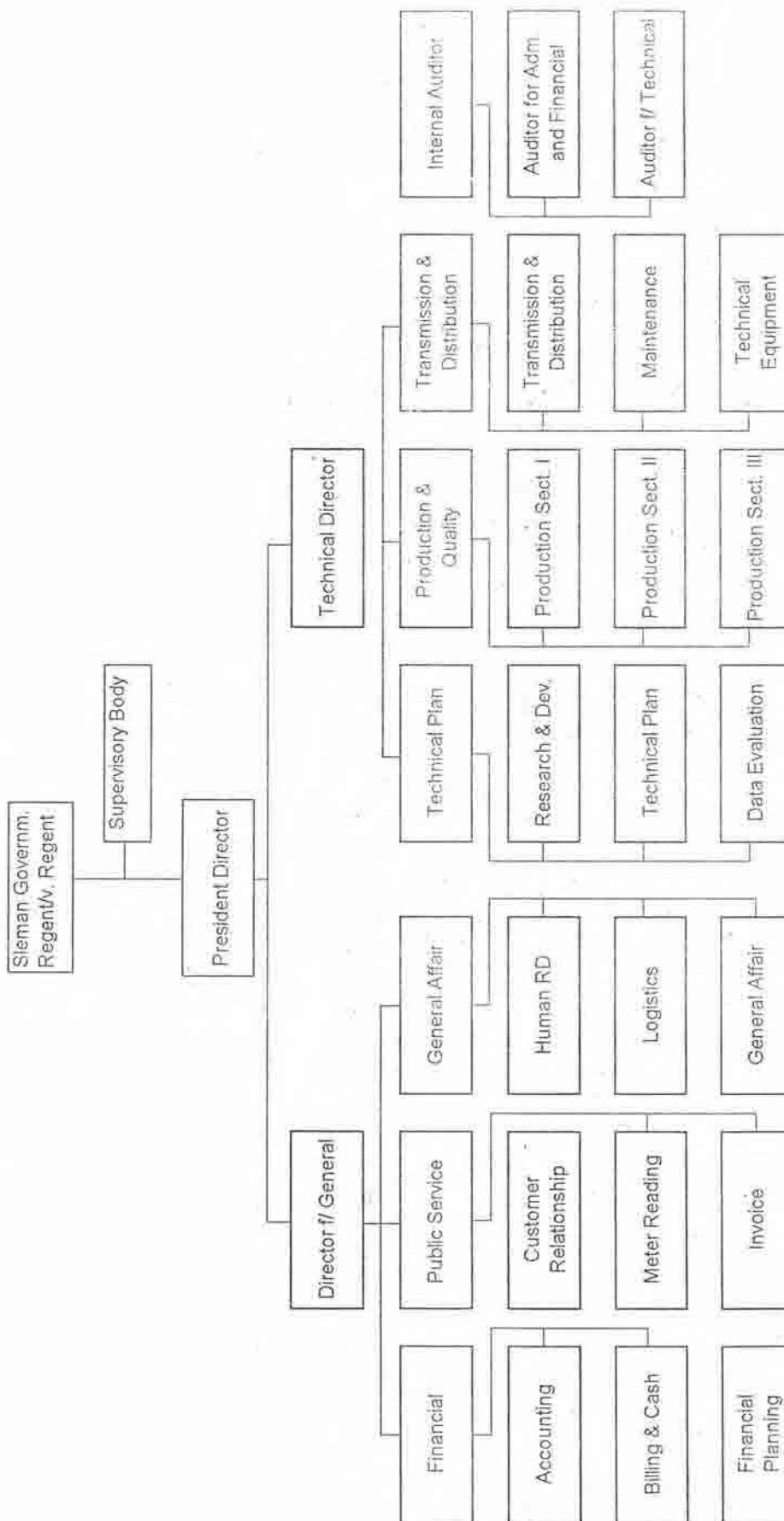
Planning and Foreign Cooperation Bureau

Finance Bureau

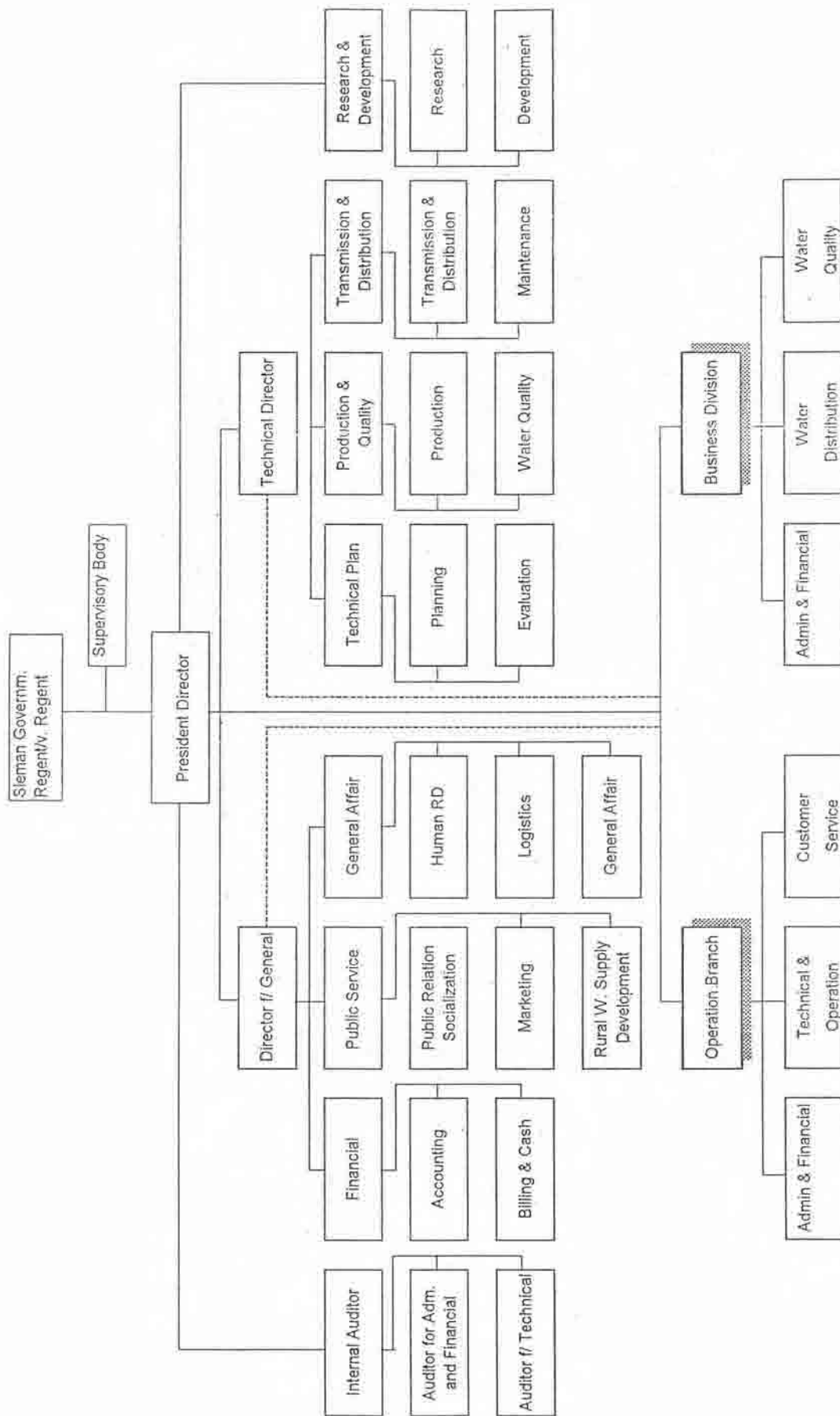
Ministry of Human Settlement and Regional Infrastructure (K/infrastrwil)

Appendix 3. Organization Chart of PDAM in Greater Yogyakarta

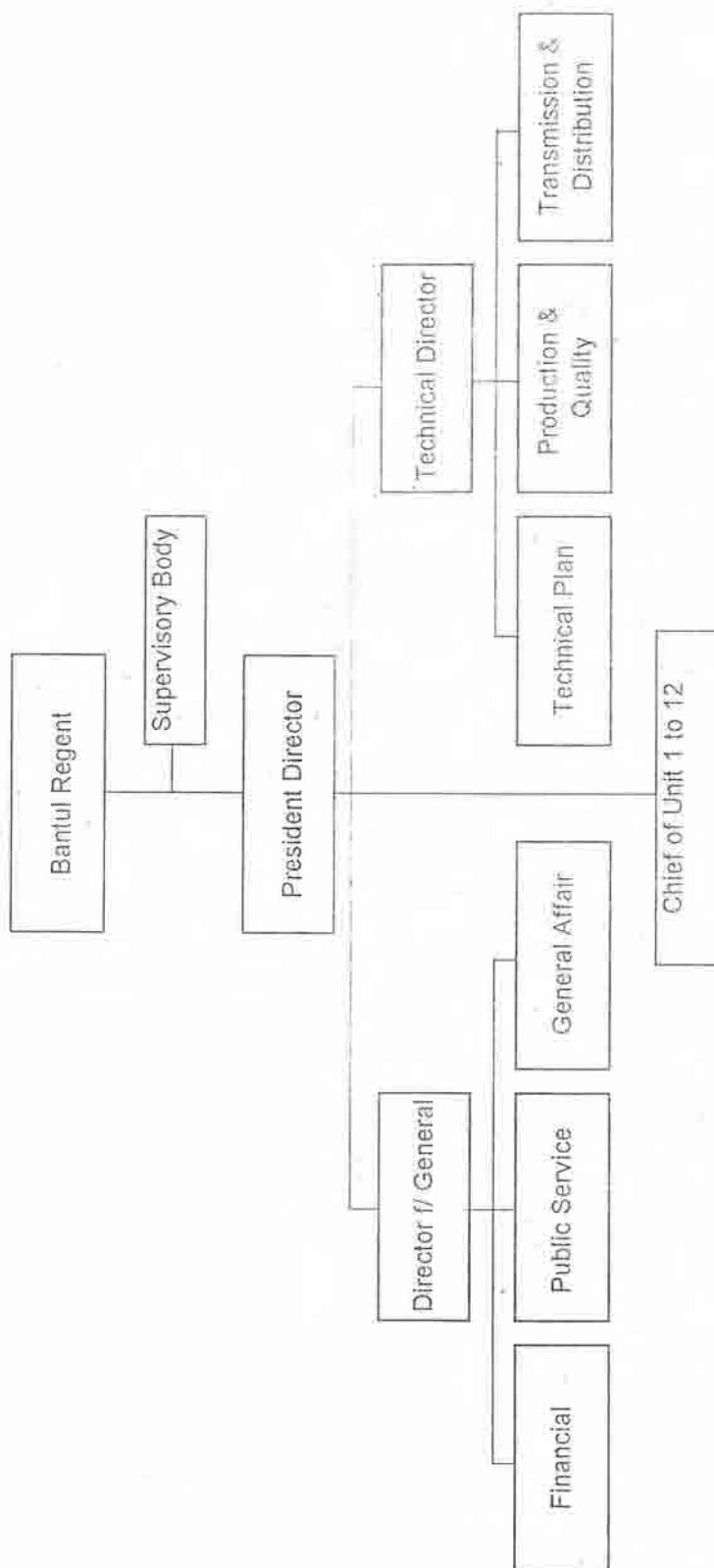
ORGANIZATION STRUCTURE
 REGENT WATER SUPPLY ENTERPRISE
 TIRTAMARTA YOGYAKARTA



SLEMAN REGENCY



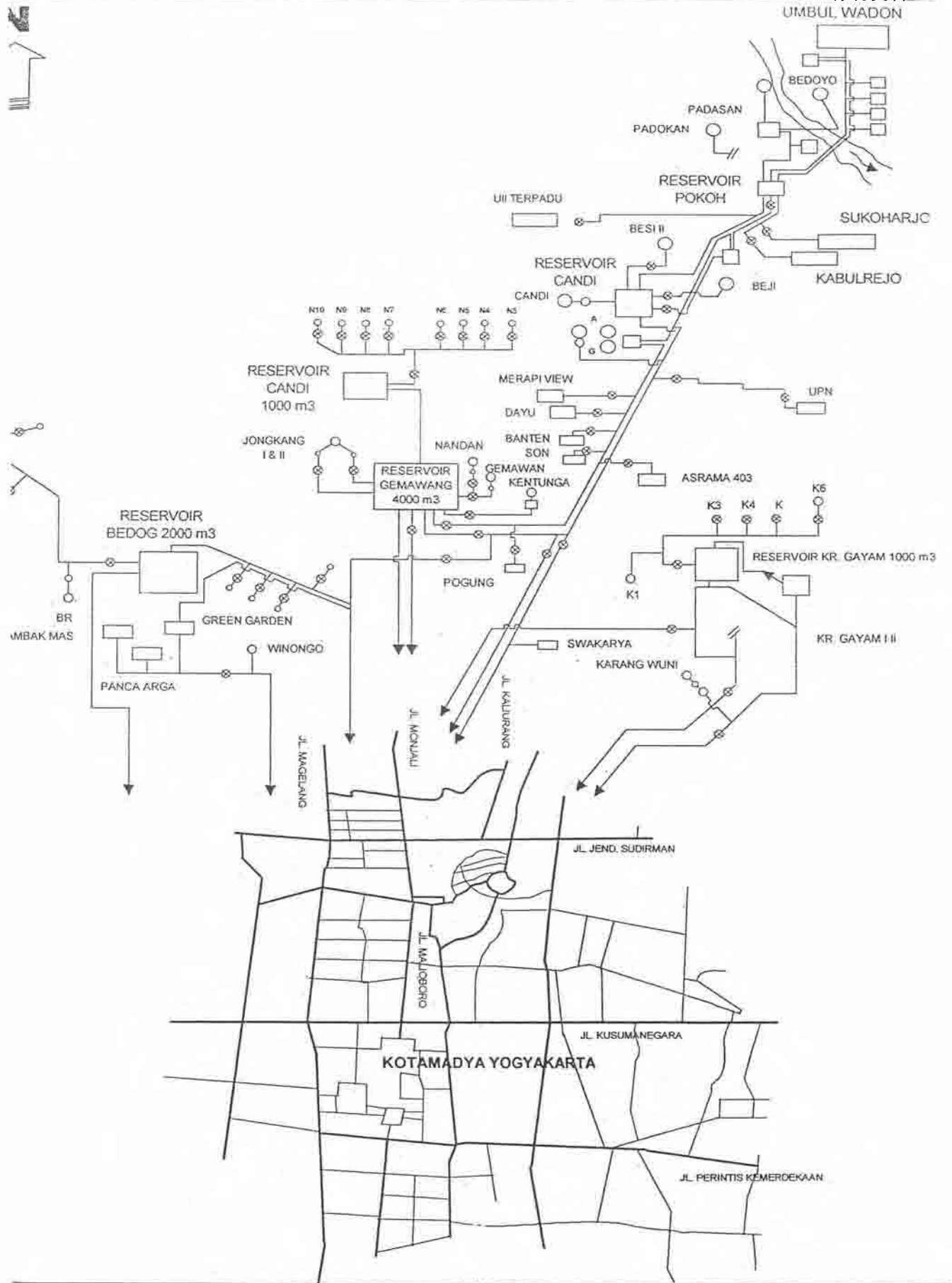
ORGANIZATION STRUCTURE
REGENT WATER SUPPLY ENTERPRISE
BANTUL REGENCY



Appendix 4. Flow Diagram of the Existing Water Supply System in Greater Yogyakarta

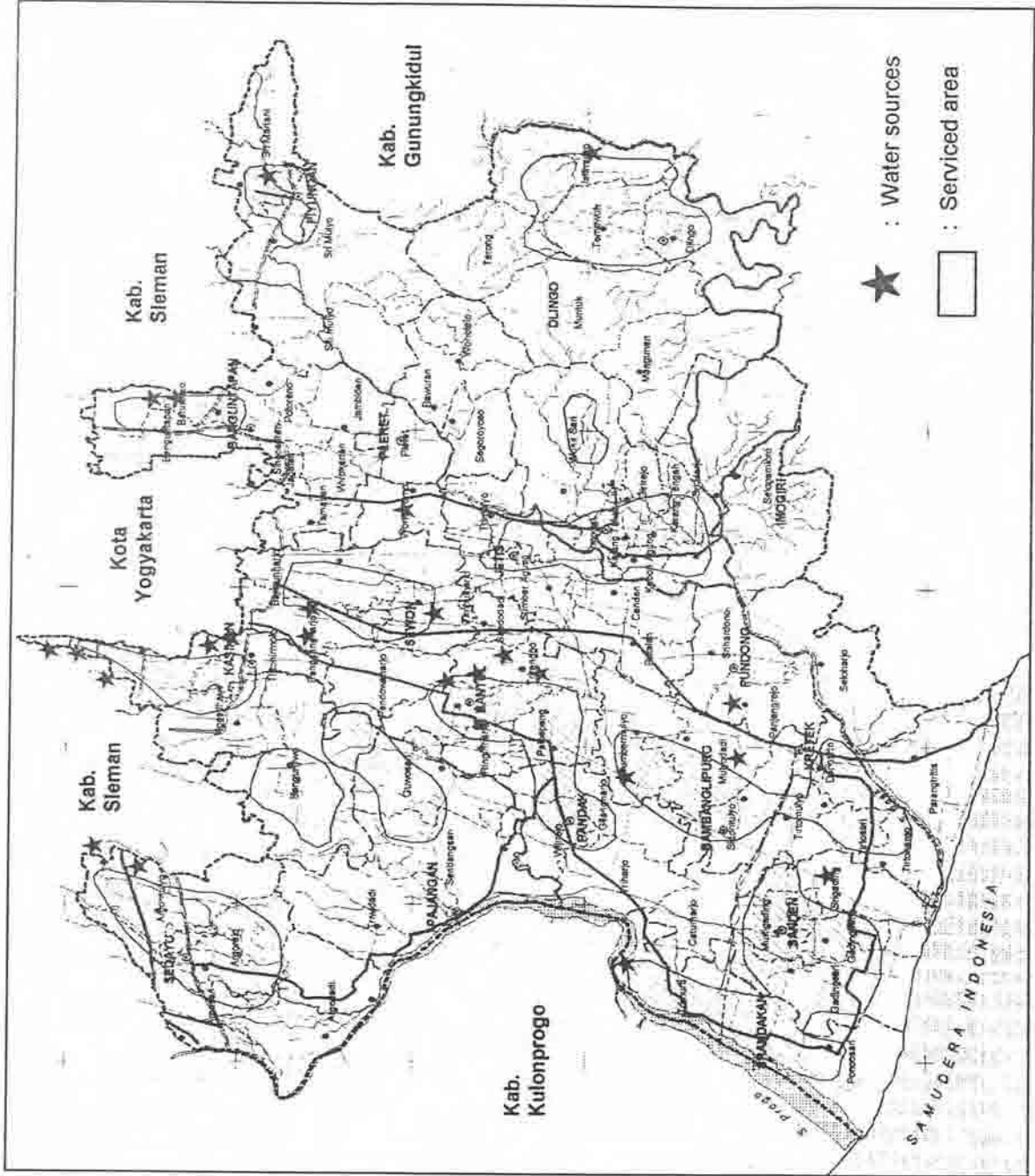


MAP OF SERVICED AREA
BY PDAM TIRTAMARTA YOGYAKARTA CITY



EXISTING WATER SUPPLY SYSTEM
PDAM TIRTAMARTA YOGYAKARTA CITY





EXISTING WATER SUPPLY SYSTEM
PDAM BANTUL

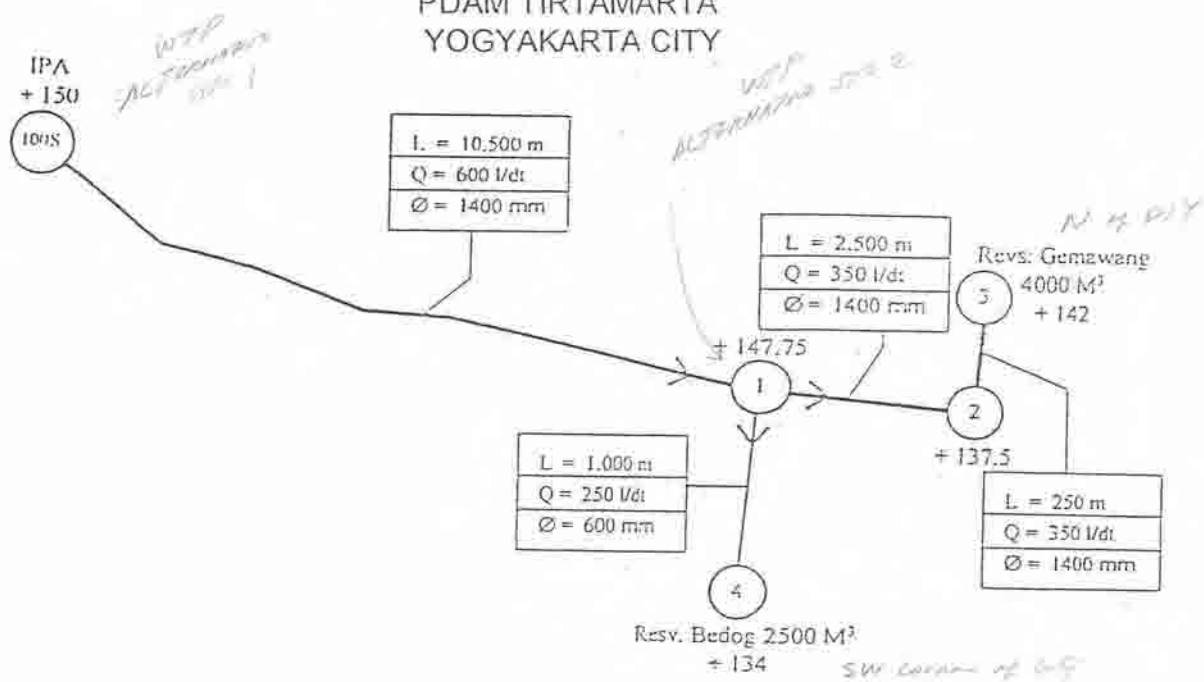
Appendix 5. Water Demand Projection up to the Year 2020

Water Demand Projection Up To The Year 2020

Item	Unit	Year				
		2000	2005	2010	2015	2020
Yogyakarta						
Population		490,433	528,336	569,168	613,155	660,542
Served Population		239,752	258,252	318,252	402,252	492,252
Service Coverage	%	48.9	48.9	55.9	65.6	74.5
Unit Domestic Consumption	Lpcd	114	115	145	155	165
Domestic Water Demand	m3/day	27,278	29,647	46,147	62,349	81,222
Non-domestic	40%-50% of Domestic	10,911	11,859	20,766	29,304	40,611
Water losses	35%-25% of Average	20,563	17,268	24,748	30,551	34,363
Average Day Demand	m3/day	58,752	58,774	91,661	122,204	156,195
Maximum Day Demand	m3/day	Restricted	Restricted	119,159	158,865	203,054
Sleman Regency						
Population		838,662	916,908	1,002,455	1,095,983	1,198,236
Served Population		103,038	148,038	328,038	523,038	718,038
Service Coverage	%	12.3	16.1	32.7	47.7	59.9
Unit Domestic Consumption	Lpcd	90	95	100	115	120
Domestic Water Demand	m3/day	9,273	14,064	32,804	60,149	86,165
Non-domestic	23%-35% of Domestic	2,133	3,516	9,841	19,849	30,158
Water losses	35%-25%	6,142	7,534	15,773	26,666	32,809
Average Day Demand	m3/day	17,548	25,114	58,418	106,665	149,131
Maximum Day Demand	m3/day	22,813	Restricted	75,943	138,664	193,870
Bantul Regency						
Population		764,663	836,005	914,003	999,279	1,092,511
Served Population		152,934	158,934	323,934	497,934	677,934
Service Coverage	%	20.0	19.0	35.4	49.8	62.1
Unit Domestic Consumption	Lpcd	45	47	100	115	120
Domestic Water Demand	m3/day	6,882	7,470	32,393	57,262	81,352
Non-domestic	23%-35% of Domestic	1,583	1,867	9,718	18,897	28,473
Water losses	35%-25%	4,558	4,002	15,575	25,386	30,976
Average Day Demand	m3/day	13,023	13,339	57,687	101,545	140,802
Maximum Day Demand	m3/day	Restricted	Restricted	74,993	132,009	183,042
Total Greater Yogyakarta						
Population		2,093,758	2,281,249	2,485,626	2,708,417	2,951,289
Served Population		495,724	565,224	970,224	1,423,224	1,888,224
Total Average Day Demand	m3/day	89,323	97,227	207,766	330,414	446,128
Day Demand	m3/day	Restricted	Restricted	270,095	429,539	579,966

Appendix 6. Water Supply System Development Plan in
Greater Yogyakarta

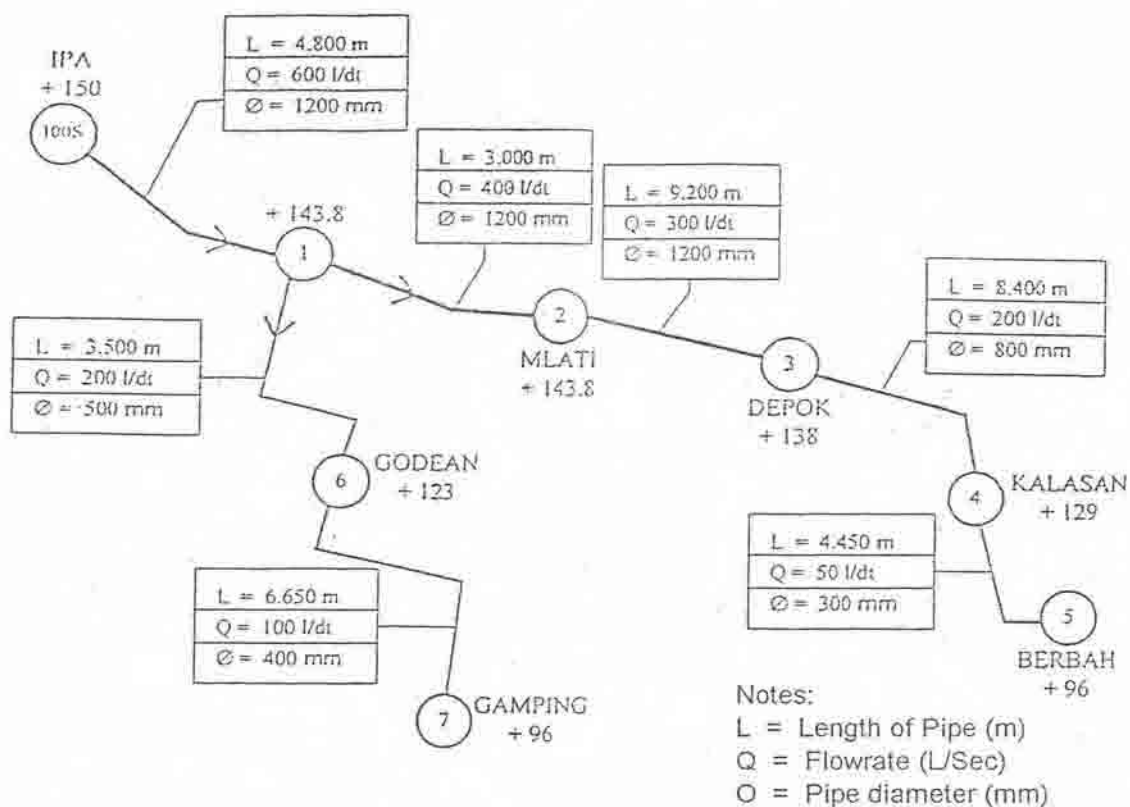
TRANSMISSION PIPE NET
 INTEGRATED WATER SUPPLY SYSTEM
 PDAM TIRTAMARTA
 YOGYAKARTA CITY



Notes:
 L = Length of Pipe (m)
 Q = Flowrate (L/Sec)
 Ø = Pipe diameter (mm)

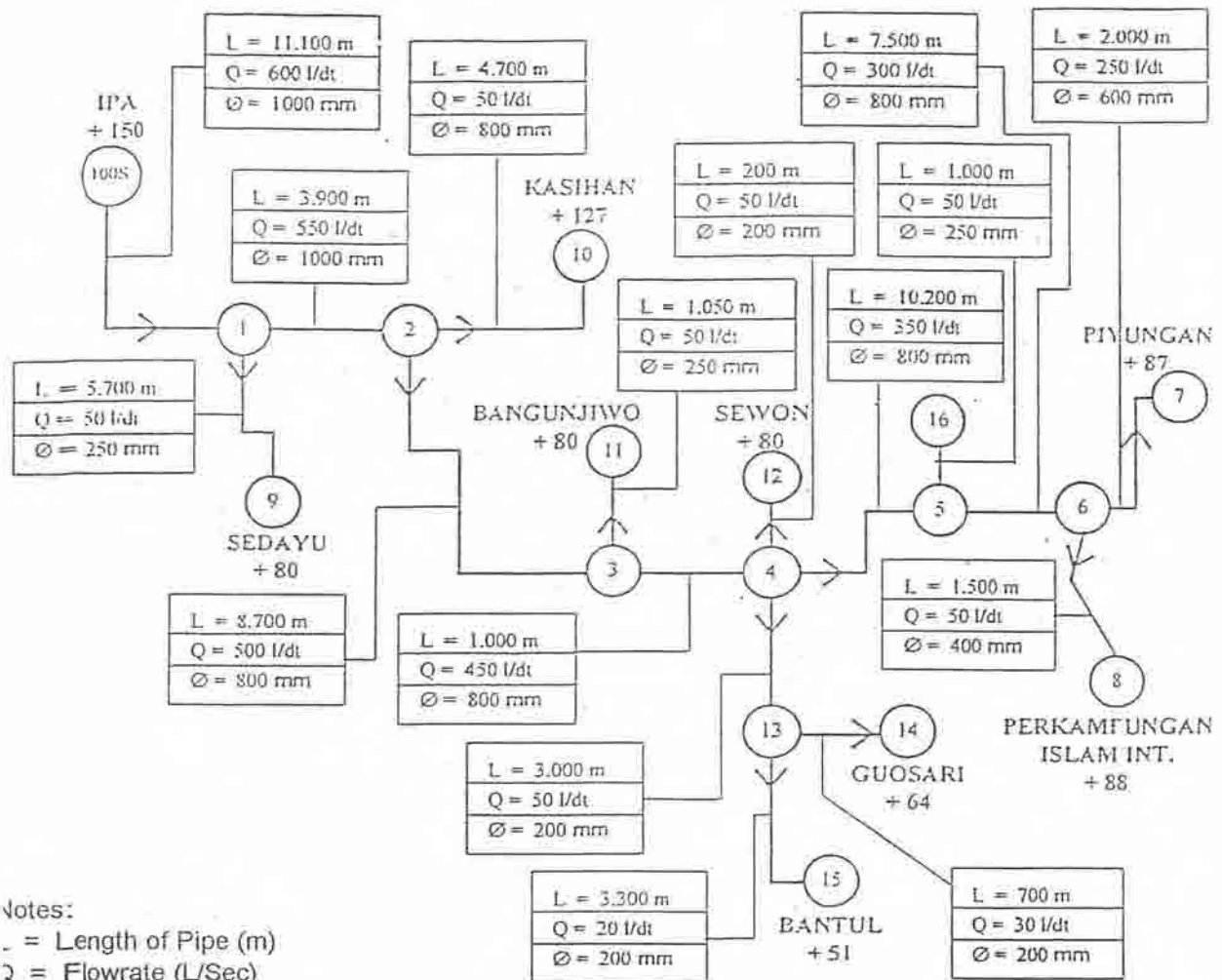
POINT No.	FLOWRATE (L/Sec.)	ELEVATION (m)	HGL (m)	PRESSURE (m)	TYPE OF PIPE
100S	600	150.00	150.00	0.0	GIP
1	600	143.75	148.60	4.8	GIP
2	350	137.50	148.50	11.0	GIP
3	350	142.00	148.50	6.5	GIP
4	250	134.00	146.90	12.9	GIP

TRANSMISSION PIPE NET INTEGRATED WATER SUPPLY SYSTEM PDAM SLEMAN



POINT No.	FLOWRATE (L/Sec.)	ELEVATION (m)	HGL (m)	PRESSURE (m)	TYPE OF PIPE
100S	600	150.00	150.00	0.0	PVC
1	600	143.80	148.80	5.1	PVC
2	400	143.80	148.50	4.7	PVC
3	300	138.00	147.90	9.9	PVC
4	200	129.00	146.00	17.0	PVC
5	50	96.00	136.70	40.7	PVC
6	200	123.00	140.90	17.9	PVC
7	100	96.00	128.60	32.6	PVC

TRANSMISSION PIPE NET INTEGRATED WATER SUPPLY SYSTEM PDAM BANTUL

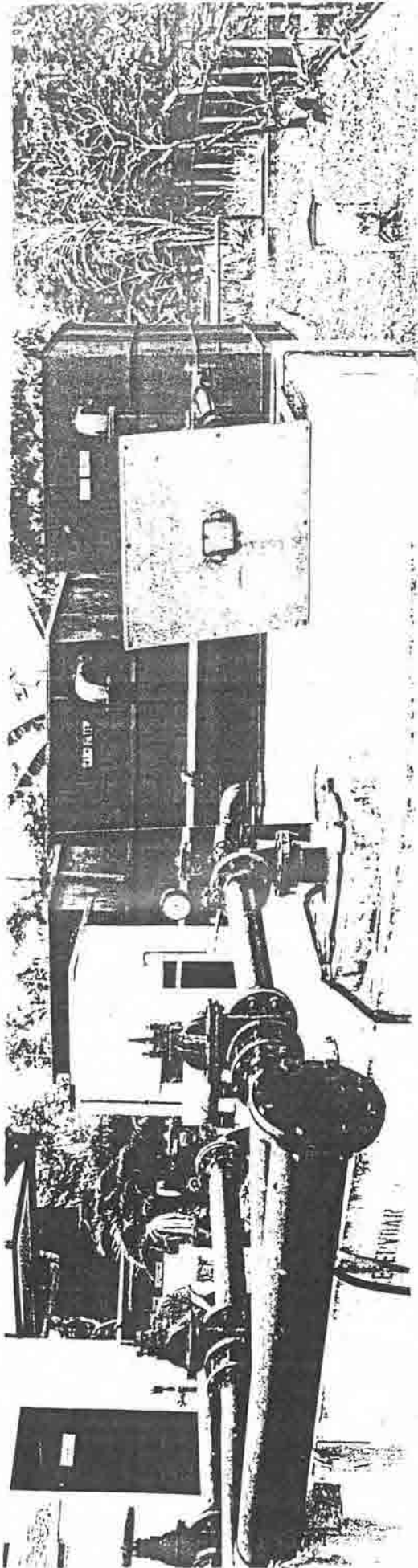


Notes:

- L = Length of Pipe (m)
- Q = Flowrate (L/Sec)
- Ø = Pipe diameter (mm)

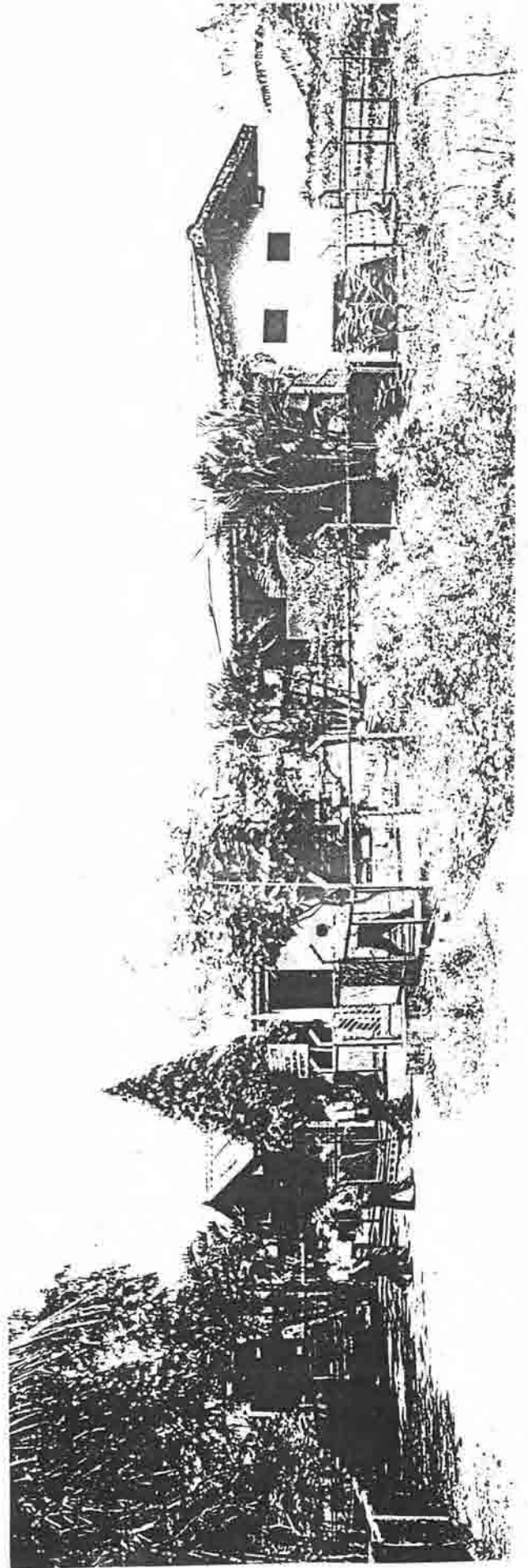
POINT No.	FLOWRATE (L/Sec.)	ELEVATION (m)	HGL (m)	PRESSURE (m)	TYPE OF PIPE
100S	600	150.00	150.00	0.0	PVC
1	600	123.00	143.50	20.5	PVC
2	550	118.00	141.50	23.5	PVC
3	450	81.50	130.70	49.2	PVC
4	350	80.00	129.60	49.6	PVC
5	300	85.00	123.10	38.1	PVC
6	250	85.00	119.40	34.4	PVC
7	50	87.00	116.60	29.6	PVC
8	50	85.00	118.70	33.7	PVC
9	50	80.00	114.50	34.5	PVC
10	50	127.00	141.40	14.4	PVC
11	50	80.00	125.30	45.3	PVC
12	50	80.00	126.60	46.6	PVC
13	50	64.00	84.50	20.5	PVC
14	30	64.00	80.40	16.4	PVC
15	20	51.00	75.30	24.3	PVC
16	50	82.00	118.00	36.0	PVC

Appendix 7. Photographs



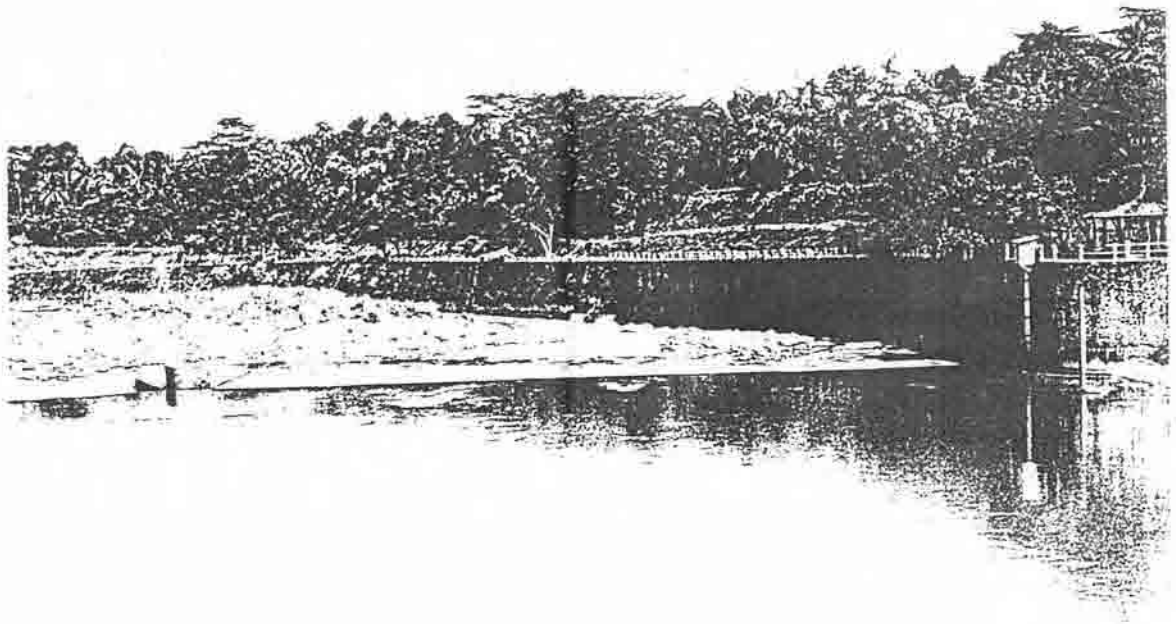
2ND
1K/R 54/5
ADB 1991

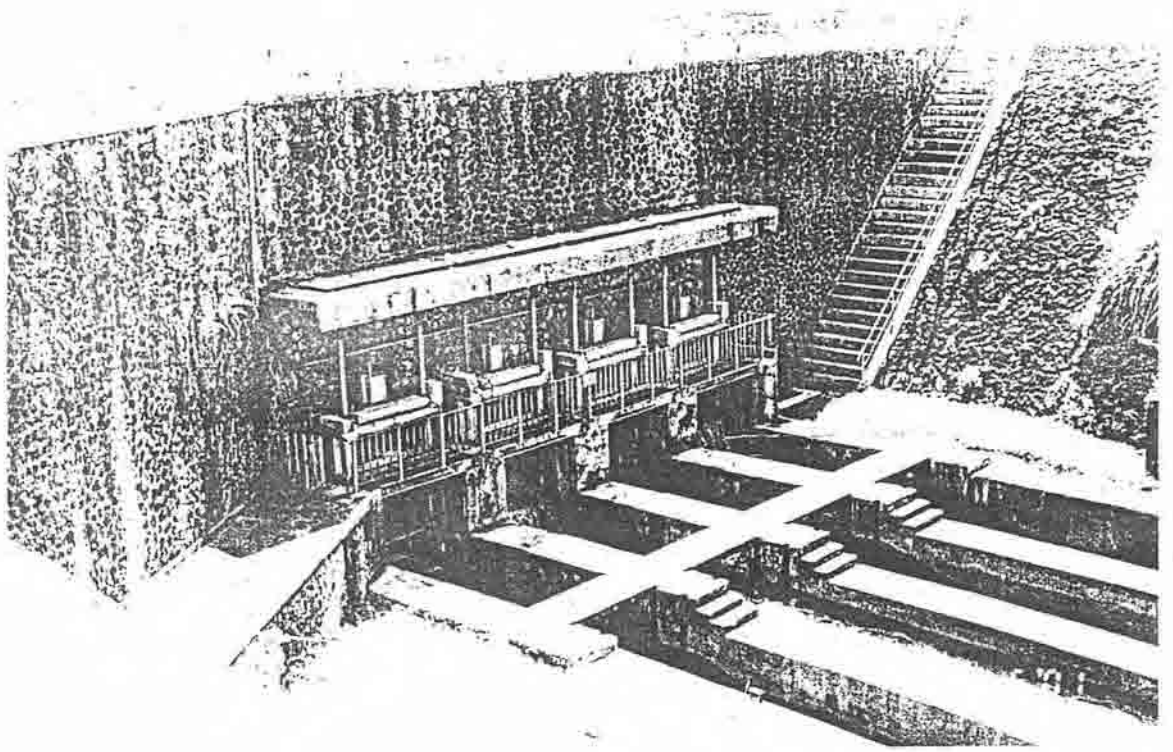
Water Treatment Plant in SLEMAN



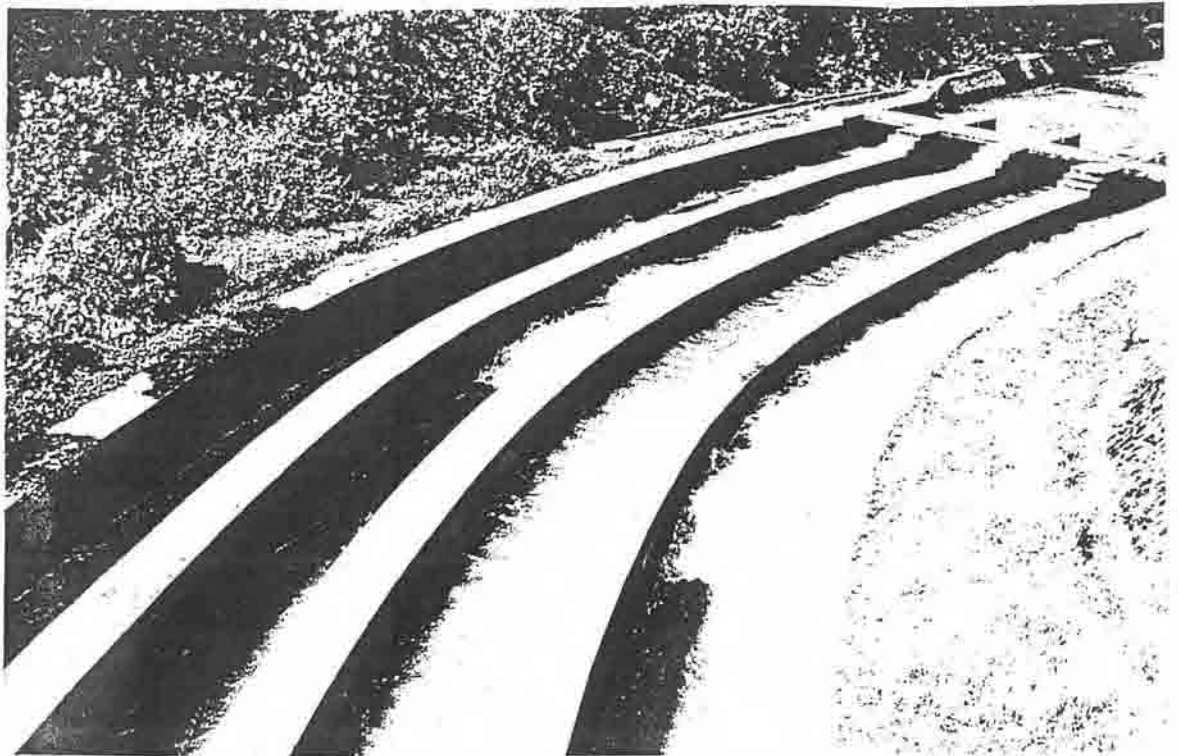


Kali Progo



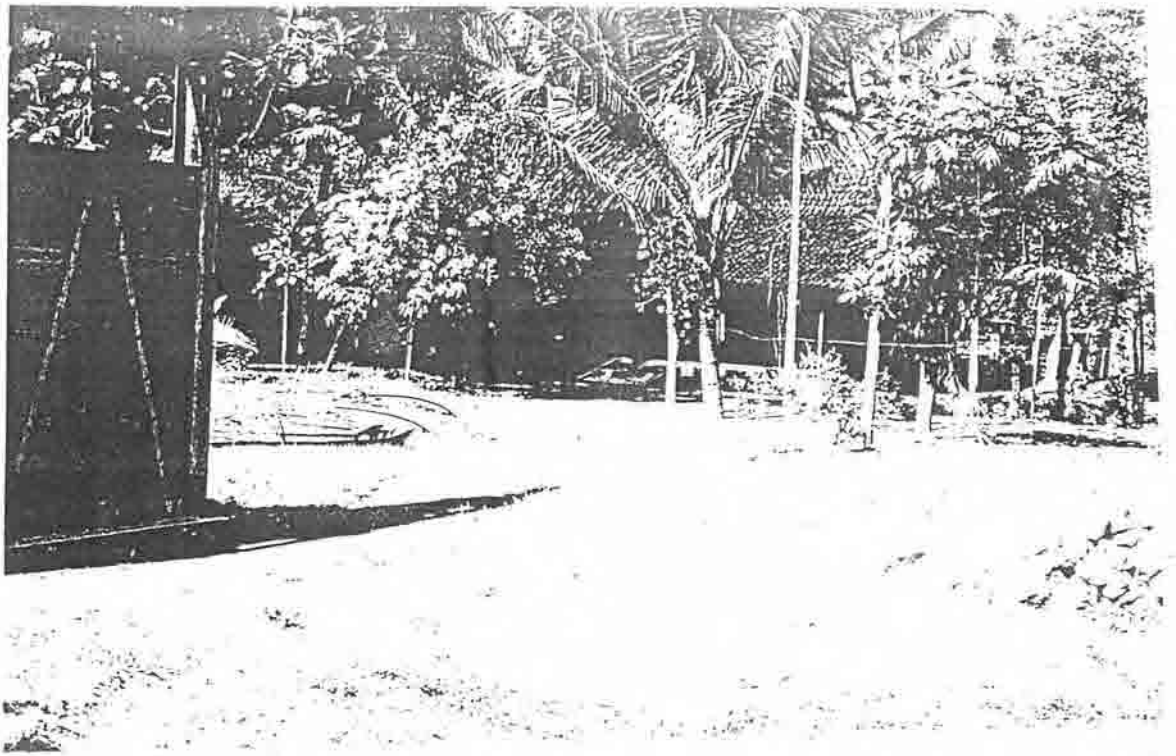


Intake Structure from
Kali Progo





Planned Area for
Treatment Plant



Appendix 8. Terms of Reference for the Consulting Services
on Master Plan and Feasibility Study on Greater
Yogyakarta Regional Water Supply

Terms of Reference for the Engineering Services on Master Plan and Feasibility Study on Greater Yogyakarta Regional Water Supply

1. Background

In response to the request of the Government of the Republic of Indonesia (hereinafter referred to as “the Government of Indonesia”), the Government of Japan decided to conduct the Study on the Regional Water Supply in Greater Yogyakarta 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 Government of Indonesia.

2. Objectives of the Study

The objectives of the Study are:

- (1) to prepare Master Plan on Regional Water Supply Development Project in Greater Yogyakarta (Yogyakarta Municipality, Sleman Regency and Bantul Regency) with a target year 2020
- (2) to select a priority project for feasibility study to be carried out during the second phase of the Study
- (3) to carry out technology transfer to the local counterpart personnel through on-the job training in the course of the study.

3. Study Area

Study area of the present project covers administrative areas of Yogyakarta Municipality, Sleman Regency and Bantul Regency.

4. Scope of Work

With an aim to attain the objectives set forth above, the engineering consultant shall carry out the following:

Phase I: Regional Water Supply Master Plan

- (1) to collect and update the available data and information regarding:
 - Socio-economy (household income, industrial and commercial products, tourism industry, number of tourists, hotels, restaurants, major factories and other water dependent industries, water reuse practice, sewerage system, drainage channel, garbage disposal, industrial water consumption, agricultural products, water consumption for irrigation, power plant, recreation, etc.)
 - City planning and land use
 - Existing water supply facilities
 - Water resources (potential water sources, yields, water demand and consumption, water rights, flow records, rainfalls, run-off coefficient, catchment area, forestation, irrigation area, etc.)
- (2) to conduct necessary field surveys, water sampling and testing, and a pilot wastage control project (pressure distribution, flow rate, leakage, wastage, etc.) at the designated area in the Yogyakarta distribution pipe network
- (3) to carry out surveys on water resource availability, including geological and hydrogeological investigation
- (4) to carry out inventory survey on the existing water supply facilities and the questionnaire surveys on water supply services, operation and maintenance with a view to system performance and operation, and to propose scope of the urgent rehabilitation
- (5) to formulate regional water supply master plan up to the target year 2020, including:
 - set up goals and formulates development concept and strategies of regional water supply
 - estimate future water demand up to 2020
 - identify required capacity for future expansion
 - comparative study on technical options
 - layout of the planned facilities
 - capacity building for O&M
 - cost estimates
 - project development and implementation schedule

- construction planning including survey on availability of contractors, equipment and materials
- institutional plan for regional water supply and financial management plan
- environmental examination of the projects

(6) to select the priority project for the feasibility study

Phase II: Feasibility Study of Priority Project

- (1) to confirm planning framework
- (2) to conduct surveys and data collection in addition
- (3) to prepare preliminary design of the project facilities including intake facilities, treatment plants, service reservoirs and transmission and distribution mains
- (4) to prepare O&M plan and institutional development plan as sole entity for the regional water supply
- (5) to estimate project costs and formulate financial plan
- (6) to carry out environmental impact assessment
- (7) to evaluate the project viability from technical, financial and economical points of view
- (8) to formulate implementation program and construction schedule

5. Implementation Program

The study will be completed within eighteen (18) months. During the course of the study, the following reports shall be submitted by the Consultants in English. An implementation schedule is shown in the attached sheet.

(1) Inception Report (20 copies)

The report shall be submitted within one (1) month after commencement of the study. The report contains the study program and schedules.

(2) Progress Report (1) (10 copies)

The report shall be submitted within six (6) months after commencement of the study.

The report contains the results of the field survey in Indonesia

(3) Interim Report (20 copies)

The report shall be submitted within seven (7) month after commencement of the study. The report contains the results of the Master Plan Study.

(4) Progress Report (2) (10 copies)

The report shall be submitted with in twelve (12) months after commencement of the study. The report contains the results of the field survey and design criteria for the feasibility study.

(5) Draft Final Report (20 copies)

The report shall be submitted within sixteen (16) month after commencement of the study.

The report shall include all engineering studies for the feasibility study.

(6) Final Report (50 copies)

The report shall be submitted within two (2) months after receiving comments from the Indonesia side.

6. Expertise Requirement

The study will be carried out by a team of expatriate consultants. The staff requirement for a satisfactory completion of this study is as follows ;

	M/M
(1) Team Leader	7
(2) Water Supply Planner	12
(3) Civil Engineer	8
(4) Mechanical / Electrical Engineer	5
(5) Hydrogeologist	4
(6) Pipeline Planner	4
(7) Organization and Institutional Specialist	4
(8) Socio-Economist	3
(9) Cost Estimator	3
	<hr/>
	50

Undertakings of the Government of Indonesia

to facilitate the smooth implementation of the study, the Government of Indonesia shall provide the following support to the Japanese study team.

- (1) provide all available data, information and documents related to the study
- (2) provide counterpart personnel and support staff to assist the study team in conducting technical and administrative works
- (3) provide suitable office space adequately furnished with the necessary furniture and fixtures, office equipment, electric supply and facilities such as lighting, telephone and air-conditioning
- (4) secure the safety of the study team
- (5) permit the members of the study team to enter, leave and sojourn in Indonesia for the duration of their assignment
- (6) exempt the members of the study team from taxes, duties, fees and any other charges on equipment and other materials brought into Indonesia for the conduct of the study
- (7) exempt the members of the study team from tax and charges of any kind imposed on or in connection with any emolument or allowance paid to the members of the study team for their services in connection with the implementation of the study
- (8) secure permission for entry into private properties or other area for the conduct of the study
- (9) secure permission to take all data and documents related to the study to Japan by the study team

Undertakings of the Government of Japan

For the implementation of the study, the Government of Japan will undertake the following measures ;

- (1) dispatch, at its own expense, a study team to Indonesia
- (2) submit reports prepared by the study team to the Government of Indonesia

