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APPRAISAL

OF THE

IKK WATER SUPPLY SECTOR PROJECT

IN THE

REPUBLIC OF INDONESIA

November 1984

R022-6165

CURRENCY EQUIVALENTS
(As of 31 October 1984)

Currency Unit	-	Rupiah (Rp)
\$1.00	-	Rpl,061
Rp1.00	-	\$0.000943

- (i) Since 16 November 1978 the exchange rate of the Rupiah has been determined using a basket of currencies of Indonesia's major trading partners as one of the variables. On 30 March 1983 the rupiah was devalued by 28 per cent to Rp970 to the US dollar.
- (ii) In the Appraisal Report, a rate of \$1.00 = Rpl,000 has been used. This was the rate generally prevailing during the appraisal of the Project.

ABBREVIATIONS

BAPPEDA	:	Regional Development Planning Agency
BAPPENAS	:	National Development Planning Agency
BNA	:	Basic Needs Approach
BPAM	:	Bendan Pengada Air Minum - Transitional Water Supply Management Unit
Cipta Karya	:	Directorate General of Human Settlements (Former Directorate General of Housing, Building, Planning and Urban Development)
DIP	:	Annual Government Budget
Dinas PU	:	
Cipta Karya	:	Provincial Public Work Office
DGWRD	:	Directorate General of Water Resources Development
DS	:	Directorate of Sanitation
DWS	:	Directorate of Water Supply
IKK	:	Ibu Kota Kecamatan (subdistrict capital)
INPRES	:	Funds provided directly by Presidential Decree to local government
Kabupaten	:	District
Kecamatan	:	Subdistrict
MHA	:	Ministry of Home Affairs
MME	:	Ministry of Mines and Energy
MOH	:	Ministry of Health
MPW	:	Ministry of Public Works
PDAM	:	Perusahaan Daerah Air Minum - Semi-autonomous Regional Water Enterprise
PMP	:	Central Government Equity Funds
PUOD	:	Directorate General Pemerintah Uman Otonomi Daerah - Directorate General of Public Administration and Regional Autonomy
Repelita III	:	Third Five-Year Development Plan (1979/80-1983/84)
Repelita IV	:	Fourth Five-Year Development Plan (1984/85-1988/89)
cu m	:	cubic meter
cu m/day	:	cubic meters per day
km	:	kilometer
lpcd	:	liters per capita per day
l/sec	:	liters per second
sq km	:	square kilometer

NOTES

- (i) The Fiscal Year (FY) of the Government ends on 31 March.
- (ii) In this Report "\$" refers to US dollars.

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PROJECT FOCUS, DESIGN AND RATIONALE

The Government of Indonesia through its Five-Year Development Plans has placed increasing emphasis on the supply of safe water to communities outside major urban areas. One of the programs adopted by the Government to achieve this objective relates to subdistrict capitals called Ibu Kota Kecamatan (IKKs). In support of this Program, the Bank gave technical assistance for the preparation of a water supply sector project in selected provinces. Based on the report of the consultants engaged under the Bank's technical assistance, the proposed Project aims at providing safe piped water supply to about 125 IKKs in about 32 districts (subprojects) in the provinces of Central Java, Yogyakarta, South Sumatra and Lampung. The proposed Project has been formulated to contribute to the development of the water supply sector in terms of both physical facilities and institutional capabilities.

The Executing Agency for the Project will be the Directorate General of Human Settlements (Cipta Karya) of the Ministry of Public Works. In each district (Kabupaten) one Semi-autonomous Regional Water Enterprise (PDAM) will be set up (if not already in existence) which will own the water supply facilities and operate and maintain them under the supervision of Cipta Karya through the provincial governments. If no PDAM is established, a Transitional Water Supply Management Unit (BPAM) will be set up by Cipta Karya to operate water supply systems pending the formulation of a PDAM within four years. Each BPAM (or PDAM) will levy in an IKK community under the Project sufficient tariff to cover all operating and maintenance costs.

Once PDAMs are in operation, the tariffs would also recover depreciation in addition to operation and maintenance costs of all piped water supply systems within the district including the project communities. This arrangement may provide for cross subsidy from larger systems in more affluent communities in favor of smaller IKK systems.

Feasibility studies will be carried out to formulate each IKK scheme under the Project to confirm its technical feasibility and ensure that agreed socioeconomic and financial criteria are met. Local consultants to be appointed under the Government's standard procedures will prepare IKK feasibility studies, detailed designs, bid documents and carry out construction supervision. Consultants to be engaged under the Bank's Guidelines will assist Cipta Karya in preparing IKK appraisal reports. They will also provide guidance to local consultants, help in training of personnel and in the supervision of construction.

The Bank's prior approval for subproject under the Project will be obtained by Cipta Karya based on appraisal reports. Delegation of responsibility to Cipta Karya for the approval of subprojects will be considered by the Bank after the submission of at least six satisfactory subproject proposals covering the four Project provinces. The Project will be completed in five years.

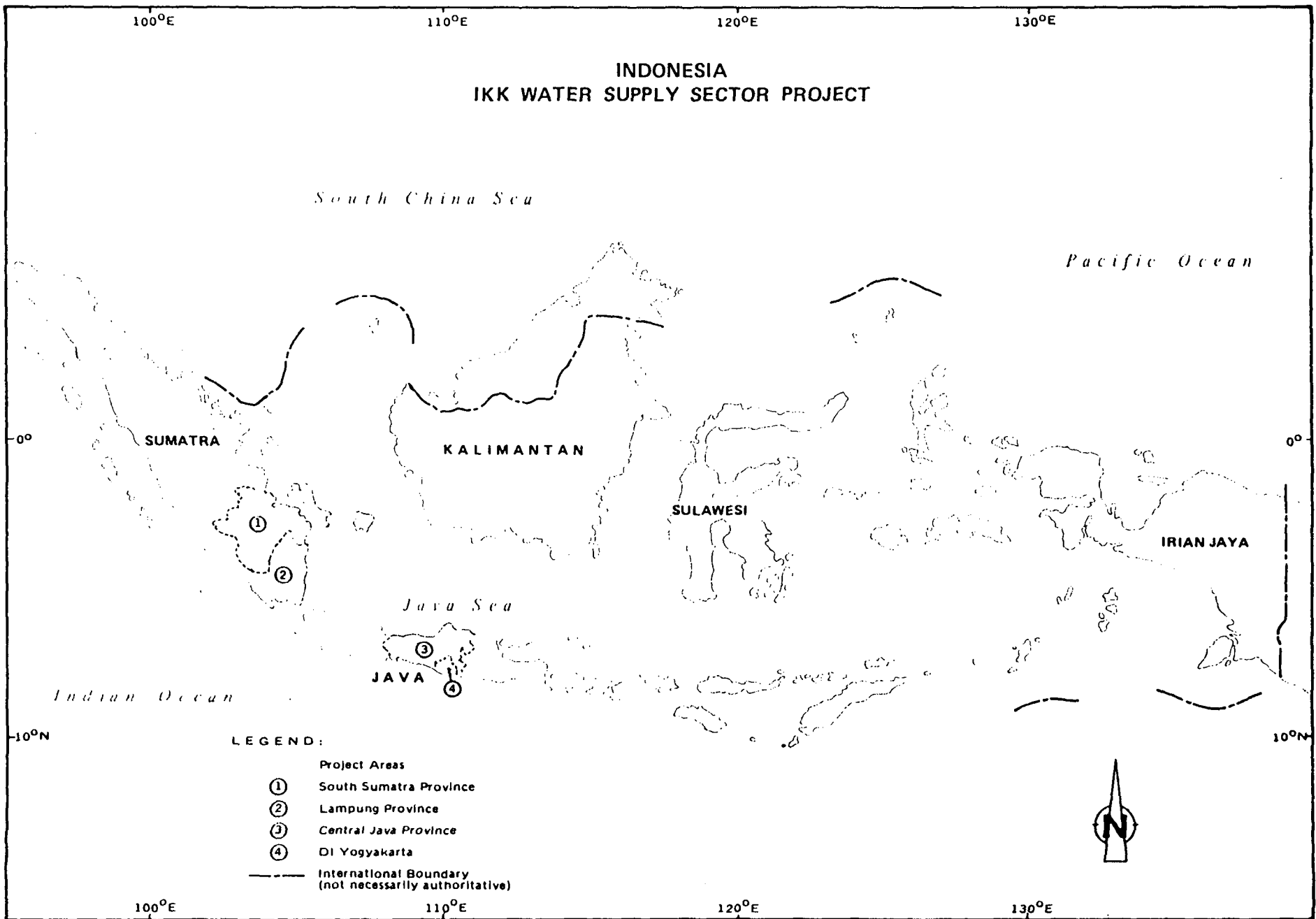
The Project will benefit about 1.04 million people out of an estimated population of 1.4 million in about 125 IKKs within about 32 districts by 1990 when the system capabilities are fully utilized. The Project will provide an average supply of 30 liters per capita per day for public standpipes and 600 liters per day per house connection. Of the population to be benefited, 50 per cent will be served by house connections and the rest by public standpipes. By the use of flow restrictors, each house connection as well as a standpipe will receive only a fixed amount of water on a 24-hour basis. The use of the flow restrictors is expected to reduce the per capita investment on water supply facilities. The Project will include consultant services for the preparation of another project for about 125 additional IKKs for possible external financing.

The total Project cost is estimated at about \$66.0 million (inclusive of taxes and duties) of which the foreign exchange cost is \$40.2 million including \$7.11 million for interest during construction. The proposed Bank sector loan of \$40.2 million will be from the ordinary capital resources repayable over a period of 25 years (including a grace period of five years) and will cover the entire foreign exchange cost of the Project. The Borrower will be the Republic of Indonesia.

The main risks associated with the Project are: (i) the acceptance of the flow restrictors by the communities; (ii) the capacity of PDAMs to operate and maintain properly the water supply facilities; and (iii) delay in Project implementation. To minimize these risks, an education and public information program is being provided to communities on flow restrictors and Government regulations regarding their use. Each subproject will be selected only if the community and the local government agree to be included in the IKK Water Supply Program. The Project includes institutional development and training programs to be administered by Cipta Karya for the benefit of the staff of IKKs, BPAMs and PDAMs. The Government has assured the Bank that Project consultants will be engaged within six months of loan approval.

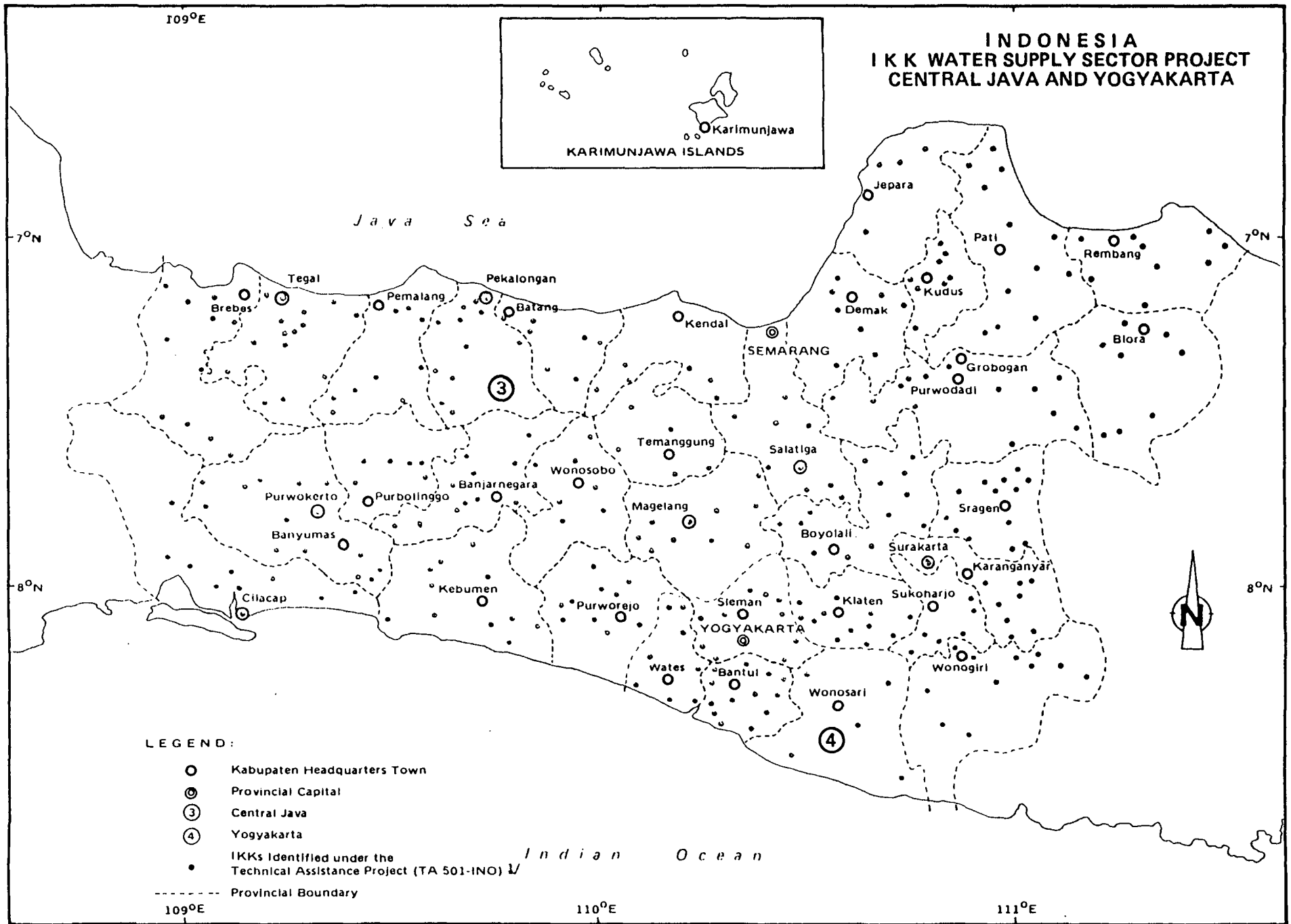
TABLE OF CONTENTS

	<u>Page</u>
Map 1 - Indonesia - Project Area	(ii)
Map 2 - Central Java and Yogyakarta	(iii)
Map 3 - South Sumatra and Lampung	(iv)
I. INTRODUCTION	1
II. INSTITUTIONAL FRAMEWORK AND ASSESSMENT	
A. Organization	2
B. Water Supply Sector	5
C. The Sewerage and Sanitation Sector	13
III. THE PROJECT	
A. Objectives	15
B. Project Approach, Criteria and Guidelines	15
C. Criteria For Subproject Selection	16
D. Project Scope	17
E. Project Description	17
F. Cost Estimates	21
G. Financing Plan	21
H. Project Implementation Disbursement	23
I. Environmental and Energy Aspects	23
J. Project Benefit Monitoring and Evaluation	23
IV. IMPLEMENTATION	
A. Implementation Arrangements	25
B. Consultant Services	26
C. Procurement	26
D. Land and Water Rights	27
E. Implementation Status of Previous Water Supply Projects	27
V. OPERATION AND MAINTENANCE	
A. General	30
B. Financial Management	30
VI. SOCIAL, ECONOMIC AND FINANCIAL EVALUATION	
A. Objective	35
B. Benefits and Beneficiaries	35
C. Financial Performance	35
D. Project Risks	36
VII. CONCLUSIONS AND RECOMMENDATIONS	37
APPENDIXES	39



(ii)

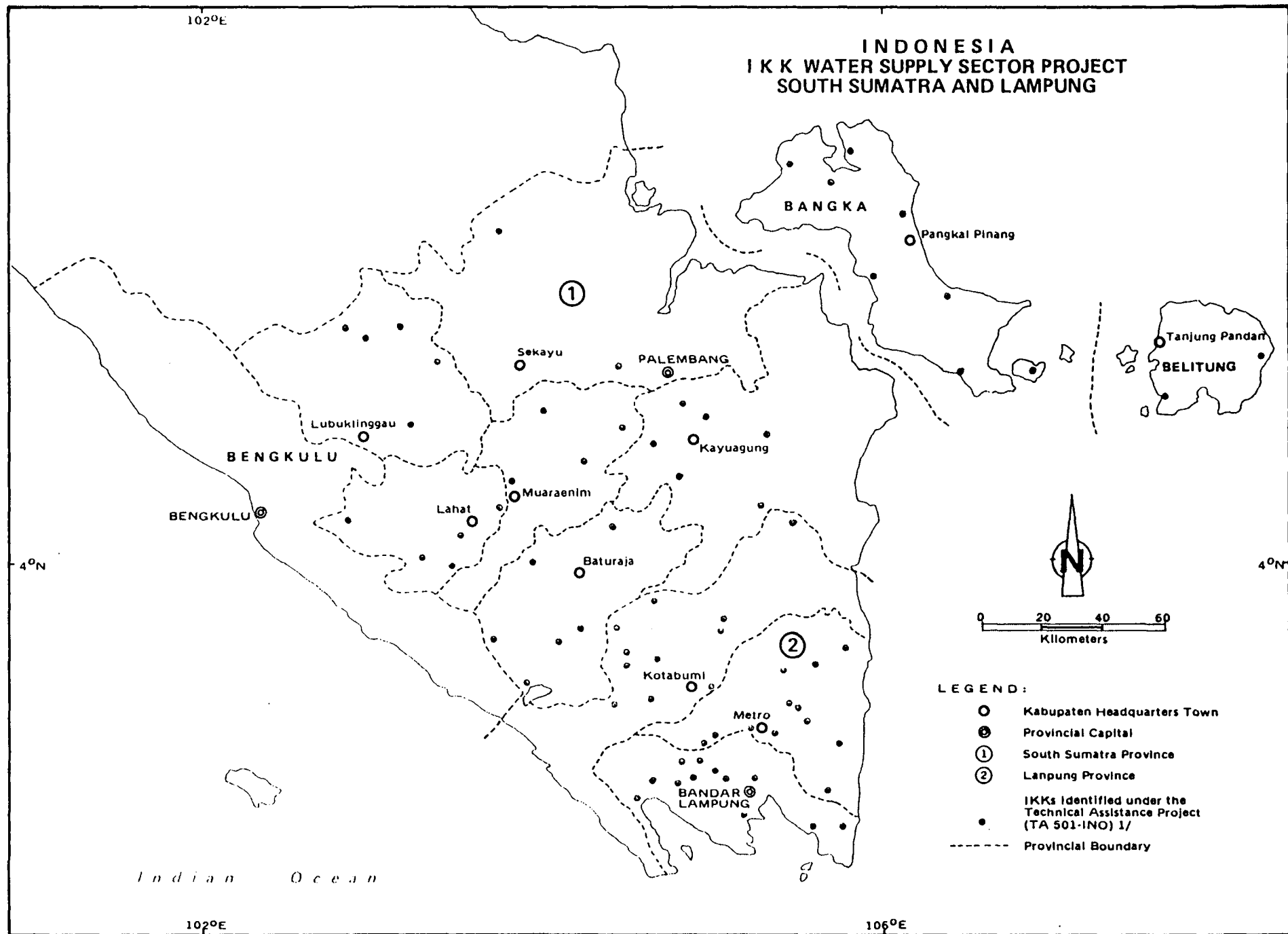
Map 1



✓ About 125 IKKs will be selected for inclusion in the Project (See appendix 5 for details).
Under the Second IKK Water Supply Project, about additional 125 IKKs will be selected.

(iii)

Map 2



LEGEND:

- Kabupaten Headquarters Town
- ⊙ Provincial Capital
- ① South Sumatra Province
- ② Lampung Province
- IKKs Identified under the Technical Assistance Project (TA 501-INO) 1/
- - - Provincial Boundary

1/ About 125 IKKs will be selected for inclusion in the Project (See appendix 5 for details). Under the Second IKK Water Supply Project, about additional 125 IKKs will be selected.

I. INTRODUCTION

1. The Government of Indonesia has placed increasing emphasis on improving the living environment in small towns through various measures including the provision of water supply and sanitation. Under the current Fourth Five-Year Development Plan, Repelita IV (1984/85-1988/89), the Government has accorded high priority to the implementation of water supply schemes in 1,800 subdistrict capitals (Ibu Kota Kecamatan or IKK). In response to the Government's request to assist in the IKK and Small Towns Water Supply Programs, the Bank approved technical assistance (No. 501-INO for \$250,000) in December 1982 to prepare a water supply project in the provinces of Central Java, Yogyakarta, South Sumatra and Lampung.

2. In May 1984 a Bank Fact-Finding Mission comprising G. H. Goh (Project Engineer) Mission Chief, A. Knudsen (Senior Project Engineer), B. Purdue (Counsel) and H. Schempp (Country Officer) visited Indonesia and discussed the Consultant's Report with the Government and confirmed that the Project was suitable for a sector loan from the Bank as it met the criteria and implementation requirements under the Bank's policy for such financing (Doc. 52-80, Sector Lending, May, 1980). A Fact-Finding Follow-up Mission which was later upgraded to an Appraisal Mission, visited Indonesia from 3 to 18 September. The Mission comprised J. M. Gomez (Manager) Mission Chief, C. Coe (Senior Financial Specialist) and T. K. Vedaraman (Project Engineer), assisted by P. Wallum (Project Economist) at the Bank's Headquarters. Discussions were also held in Manila from 1 to 3 October 1984 with the Director General of the Executing Agency (Cipta Karya). As a result, the Project was reformulated in regard to the number and selection of subprojects, tariffs and other related matters. The small towns component was deleted from the scope of the Project. This report is based on the findings of the Bank Missions, their discussions with the representatives of the Government agencies and on the preparatory work carried out under the Bank's technical assistance.

II. INSTITUTIONAL FRAMEWORK AND ASSESSMENT

A. Organization

1. General

3. Indonesia is an archipelago consisting of more than 13,000 islands which stretch over a distance of 5,100 kilometers from Sumatra in the west to Irian Jaya in the east, with a total population of about 160 million (1983). The population growth in the last decade was estimated at about 2.3 per cent per annum. The total population is projected to reach 217 million by the year 2000 when its annual growth rate is expected to decrease to 1.7 per cent. About 63 per cent of the country's population^{1/} lives in the densely populated islands of Java, Bali and Mandura and about 19 per cent in Sumatra; the remaining (about 18 per cent) live in Sulawesi, Timor and other Islands. The country's urban population is about 40 million, [recording an annual growth rate of about 3.9 per cent]. The country has a tropical climate with intense rainfall occurring during the monsoon period from December to March. There is also a distinct dry season from June to September.

4. Administratively, the country is divided into 27 provinces and special administrative regions, subdivided into 247 districts (Kabupatens).^{2/} The districts are further divided into about 3,350 subdistricts (Kecamatans).^{3/} Each of the district and subdistrict units has an administrative center located in one of the cities or towns often bearing the same name. The administrative capital of a subdistrict is called Ibu Kota Kecamatan (IKK).

5. Water-borne and other communicable diseases are prevalent in Indonesia (see Appendix 1). Diarrhoea is almost endemic and accounts for 18.8 per cent of the total deaths. One out of every three children and one out of every ten adults are reported to be suffering from the disease. The health statistics indicate that consumption of polluted water and contact with polluted environment contribute to the heavy incidence of water-borne, water-related and parasitic diseases.

^{1/} Urban population includes people living in communities with population over 20,000; IKKs with population between 3,000 to 20,000 are considered as semi-urban (in transition from rural to urban) the remaining population is considered to be rural.

^{2/} There are about 3,350 IKKs (population 3,000-20,000), 395 small towns (population 20,000-100,000), 30 medium cities (population 100,000-500,000), four big cities (population 500,000-1,000,00) and five metro-politan areas (over 1,000,000).

^{3/} Below the subdistricts, the administrative units are further subdivided in "villages" (desas).

2. Central Government

6. Three ministries of the Central Government are principally responsible for the water supply sector. The Ministry of Public Works (MPW) is responsible for the development of water supplies in urban and semi-urban areas, while the Ministry of Health (MOH) is in charge of the work in rural areas^{1/}. The operation and maintenance of water supply schemes is done by the Ministry of Home Affairs (MHA) by virtue of its responsibility for local government and local government enterprises. Other Central Government agencies with a role in the water supply sector include the Ministry of Mines and Energy (MME) which is in charge of groundwater exploration and relevant data collection through its Directorate of Environmental Geology, the National Development Planning Agency (BAPPENAS) which makes funds available for water supply and sewerage projects through the Government's annual development budget, and the Ministry of Finance (MOF) which channels funds to the executing agencies and establishes the terms under which funds are provided.

3. The Directorate General of Human Settlement (Cipta Karya)

7. Cipta Karya, one of the three Directorates General of MPW, is the executing agency for the development of urban and semi-urban subsectors for water supply, sanitation and drainage (see Appendix 2 for organization structure). Cipta Karya is responsible for project planning and selection, fund allocations, preliminary and detailed engineering, construction supervision, technical and management assistance to regional water enterprises and, in some cases, operation and maintenance of urban water systems.^{2/}

8. In view of the increased importance given by the Government to the sanitation subsector, the former Directorate of Sanitary Engineering was split into two directorates in April 1984: the Directorate of Water Supply (DWS) and the Directorate of Sanitation (DS). At present the Directorates employ a total staff of about 500 in their headquarters at Jakarta, of which about one quarter are university graduates. The recent formation of a separate Directorate of Sanitation has called for additional qualified personnel in that Directorate, which now employs a staff of about 100 staff. It is foreseen that this number would grow in the near future to at least 150 in order to cope with the increasing workload in sanitation development. In view of the countrywide operations and variety of activities, both Directorates have Regional Project Offices in most of the provincial capitals. For the IKK Water Supply Program, a Central Project Office was established in 1980 under the direct supervision of Cipta Karya, and some provincial IKK offices have been formed which are responsible for the IKK programs in their respective provinces.

^{1/} Rural water supply and sanitation is handled through the Directorate General of Communicable Diseases Control and Environmental Health, which has the Directorate of Water and Sanitation and the Directorate of Environmental Health.

^{2/} The others being the Directorate General of Highways (Bina Marga) and the Directorate General of Water Resources Development (DGWRD).

4. Directorate General of Public Administration and Regional Autonomy (PUOD)

9. Within MHA, the Directorate General of Public Administration and Regional Autonomy (PUOD) supervises and monitors the proper functioning of all local governments and performance of their principal personnel. At the regional level, provincial representative councils headed by a governor in each of the provinces are responsible for the functions of local governments under their jurisdiction, welfare of the population and the formulation and execution of regional development programs. At the local level, the heads of districts (Kabupatens) have similar responsibility and authority. One Semi-autonomous Regional Water Enterprise (PDAM) in each Kabupaten, established by the local government, assumes responsibility for the operation and maintenance of waterworks and for the extension of the distribution systems. Where necessary, Transitional Water Supply Management Units (BPAMs), under the supervision of the DWS Regional Project Office, look after the operation and maintenance of the systems until PDAMs are established.

5. Directorate General of Domestic Monetary Affairs and Directorate General of International Monetary Affairs

10. Within MOF, the provision of local funds, financing plans and terms of conditions of project funding are decided by the Directorate General of Domestic Monetary Affairs. Funding by external resources is authorized by the Directorate General of International Monetary Affairs. For sectoral development projects, funds are provided in the national and provincial development budgets. Annual government budgets are channelled through concerned ministries. For specific development projects approved by the Government, INPRES funds,^{1/} equity contribution or loans are provided by the Central Government to local governments to augment their normal budgets. These types of funding can elicit participation and cooperation from the end users in the development projects selected. For projects under provincial governments, the funds are normally channelled through their budgets.

6. Other Government Agencies

11. Other Government agencies involved in the sector development include: Bank Indonesia (for award of contract and disbursement), the State Secretariat (SEKNEG) (for consultant services and procurement), local representative councils (for land acquisition, staff recruitment, salary structure, organizational arrangement, tariffs, system expansion and financing plans), Regional Development Planning Agency (BAPPEDA), and municipalities (for solid waste management).

^{1/} Funds provided directly by Presidential Decree to local government.

B. Water Supply Sector

1. Overview

12. Provision of drinking water, which is a basic need, has received high priority in the Government's successive national development plans. At the beginning of the First Five-Year Development Plan (Repelita I - 1969/70-1973/74), the Government faced a serious situation in the sector because of a marked decrease in water supply resulting from lack of maintenance and increasing shortage of new supply in the wake of inadequate investments in the sector (see para 29). To correct this imbalance and to use the limited resources of the Government more efficiently, the sector policies have been suitably modified during the succeeding plans.

2. Sector Policies

13. The basic philosophy of development in Indonesia is incorporated in "Garis Besar Haluan Negara" (G.B.H.N. - Main Guidelines of National Development). This states that development should be directed towards achieving equality of prosperity among the people. Based on this, the Government has decided that the provision of piped water supplies should not be limited to urban population, but should include semi-urban and rural populations who are generally lower on the economic scale. As a result, during the third Five-Year Development Plan (Repelita III - 1979/80-1983/84), the Government proceeded to expedite the provision of water supplies to small semi-urban communities throughout the country. One of the means by which it is achieved is through the IKK Water Supply Program.

14. The philosophy of the IKK water supply program is set out in the Cipta Karya publication "IKK Water Supply Program, Strategy and Scope". The program is based on three premises:

- (i) Cost-effective facilities will be designed and constructed for those IKKs which are considered to be capable of supporting a water system;
- (ii) The long-term operation and maintenance of these systems will be as important as their construction; and
- (iii) The institutional capacity to ensure (i) and (ii) is to be developed.

The program aims at the provision of potable, reticulated water supply to 75 per cent of the 1990 population of some 2,200 IKKs throughout Indonesia. Low-cost water supply systems with capacities of 2.5 lps, 5 lps and 10 lps have been developed to serve towns with a population of 3,000 - 20,000. In order to achieve the requirements of minimum cost, simplicity of design, construction, operation and maintenance, the system utilizes some novel features. Daily peak flows are eliminated by serving all consumers at a constant rate on 24-hour basis through flow restrictors (see Appendix 3). This eliminates the need for water meters. Float valves are provided to stop the overflow from the storage tanks that are provided to households and in public standpipes (see para 19). Standardization has been introduced in the design, construction and materials.

15. The Government's policies for the water supply sector development support the national development strategy. Sector development aims at providing one of the essential urban infrastructure needs for economic development, improving the standards of living, and particularly in case of small towns and rural areas, promoting greater social equity. The gradual shift in emphasis from major urban population centers to small towns and to rural water supply is a clear manifestation of the country's development policies. Other measures taken such as institutional and manpower development to improve efficiency, financing and pricing policies that are designed to encourage local resource mobilization, coordination and cooperation with other development programs, and the adoption of differentiated service levels are closely interrelated to the overall sector development program. All projects, whether funded locally or financed by external aid agencies including the Bank, have conformed to the broad sector policies.

16. At present, only the urban and semi-urban water supply subsectors have policy guidelines. Guidelines for other subsectors such as sewerage and sanitation are expected to be developed gradually as more and more investments are channelled to these subsectors. In the urban and semi-urban water supply subsectors, the Government is increasingly aware of the need to decentralize decision-making to the lowest level feasible, particularly in the areas of administration, management, operation and maintenance of the local systems. For major sector projects, planning and financing are still concentrated at the central level because of resource constraints, though project implementation has increasingly been transferred to the local level. Training programs are also highly centralized for reasons of efficiency.

3. Sector Plans

17. During the three Five-Year Development Plan periods (Repelitas I, II and III), there has been some progress in the provision of piped water supply to urban and semi-urban communities. At the end of Repelita III in early 1984, it was estimated that about 40 per cent of the urban and semi-urban population had access to safe potable water through piped network, while the installed production capacity could cover 60 per cent of the population. Rural communities rely to a large extent on handpumps and it is estimated that about 32 per cent of the rural population relies on such point supplies.

18. Repelita IV (1984/85-1988/89) has set water supply targets both in terms of coverage of population and standards of service level. For urban and semi-urban communities the target is 75 per cent coverage of the 1990 population, while for rural areas the target is 55 per cent at the end of Repelita IV. The construction of new water supply systems in 150 small towns and 1800 IKKs and increasing water supplies in 350 towns are included in the sector program. The standards of service levels for urban and semi-urban supplies are as follows: (i) all towns above 20,000 population are to be served under the Basic Needs Approach (BNA) system with a minimum

average domestic supply of 60 liters per capita per day (lpcd); and (ii) subdistrict capitals or Ibu Kota Kecamatan (IKK) with a population ranging between 3,000 and 20,000 are to be served with an average domestic supply of 45 lpcd.^{1/}

19. The BNA system is designed to work on a metered basis, while the IKK system has a different approach as it introduces flow restrictors which ensures a fixed amount of water for each connection on a 24-hour basis. The other components of the IKK system are: (i) each house connection (50 per cent of population served) receives 600 liters with an in-house storage tank^{2/} with capacity of 0.6 cu m; and (ii) each public standpipe (covering 50 per cent of population served) is supplied with 6,000 liters (200 persons at 30 lpcd) and storage tank^{2/} with a capacity of 3.5 cu m. The basic aim of the IKK system is to reduce the per capita investment level for achieving the Repelita IV coverage target.

A. Financing of Facilities

20. The financing policy relates to the level of service to be provided (see para 21). The terms of financing are generally determined on socio-economic considerations. The more affluent population centers are expected to receive a larger proportion of funds in the form of a loan, while poor population centers will get water supply facilities on a grant basis. A progressive tariff structure has been adopted to provide cross-subsidization within each PDAM from industrial and commercial to domestic consumers and from high-income to low-income groups (see para 23).

(a) Capital Costs

21. The policy adopted by the Government on the mode of financing capital costs is as follows:

Capacity 30-60 lpcd

- (i) For IKK and small town water supply system with a capacity to provide through public standpipes up to 30 lpcd and through house connections up to 60 lpcd, and serving an average of 75 per cent of the population, the project cost would be met as a Central Government grant to PDAMs. The funds may be made available either entirely from local sources or from a combination of proceeds from external loans and local counterpart funds (normally 60 per cent external financing and 40 per cent local funds);

^{1/} House connections - 60 lpcd; public standpipes - 30 lpcd.

^{2/} In-house and public standpipe storage tanks substitute storage reservoir(s) in towns.

Capacity 60-125 lpcd

- (ii) For towns (with a population of above 20,000) under the BNA approach (see para 18) the project cost of a water supply system with capacity to provide 60 - 125 lpcd, will be met partly through Central Government equity and partly through a Central Government loan (normally 60 per cent equity and 40 per cent loan with 10.75 per cent interest and a repayment period of 25 years including a grace period of up to 5 years); and

Capacity above 125 lpcd

- (iii) For water supply systems with a capacity to provide more than 125 lpcd, the Project cost will be funded partly from a Central Government loan (normally with 10.75 per cent interest and a repayment period of 25 years including a grace period of up to 5 years) and partly from internally generated funds (from PDAMs water sales), without any grant or equity from Central Government.

(b) Financial and Management Policies

(i) Tariff Policies

22. In the past, there was virtually no cost recovery of capital investment in water supply systems, but for a few exceptions. The general policy has been that as far as possible recurrent expenditures should be recovered through user charges. This policy has been based up on grounds of affordability. Subsidies have been justified on the plea of "basic needs" and the need to prevent water-borne and water-related diseases.

23. The present policy of the Government with respect to cost recovery for water supply operation is that water tariffs should cover operation, maintenance and depreciation. Consideration has been given to improve cost recovery in view of the budgetary constraints of the Government and the major investment needs of the sector. In the mid-1970s Cipta Karya issued a Guideline for Tariff Structure which prescribed unit price ratios to be adopted in the computation of water charges for various consumer groups and levels of consumption. The basic objective of this Guideline is to discourage wasteful consumption of water through a progressive tariff structure (block system). The guidelines for metered connections are presently being revised jointly by Cipta Karya and Ministry of Home Affairs aiming at a reduction of the basic monthly consumption level^{1/} from 15 cu m/month per household to 10 cu m/month per household (or from 90 lpcd to 60 lpcd). The standard metered tariff schedule is presented in Table 1. An average low-income household consuming 60 lpcd would spend Rp 432 or about 0.9 per cent of their monthly income for water supply. It is assumed that water charges levied on big consumers and commercial,

^{1/} Basic monthly consumption level is the volume of water consumed per connection per month, to which a minimum monthly water charge is levied.

industrial and harbor consumers will allow for cross-subsidy to domestic low-income consumers in large systems and to all consumers supplied by IKK systems. The consumer will bear the cost of house connections which works out on an average to Rp 50,000 per connection. This would cover the cost of materials, including pipes and a water meter as well as labor.

Table 1: Standard Metered Tariff Schedule^a
(Rp per cum per month)

Cu m per month	Stand pipes	Domestic/ Government	Social	Commercial	Industrial	Harbor
0 - 15	40	50	40	100	150	250
15 - 30	40	75	60	150	200	250
30 and above	40	150	80	200	250	250

Source: Cipta Karya 1984.

For the IKK Water Supply Program, the Government has proposed the minimum monthly tariff which is presented in Table 2. According to the policy, a consumer receiving water from a standpipe would be charged about one third the amount payable by a consumer with a house connection.

Table 2: Proposed Minimum Monthly Tariff for IKK Systems
(Rp in 1984 prices)

Tariff	Per household served by house connection	Per household served by house connection
Gravity Flow System with Minimum Treatment	1,000	300
Pumped Spring Source or Deep Well System with Minimum Treatment	2,000	700
Water Treatment Plant System and Pumped Supply	2,500	850

Source: Cipta Karya, 1984.

(ii) Billing and Collection

24. Under the present billing and collection procedures of BPAMs and PDAMs, consumers are billed and water charges are collected on a monthly basis. For household connections, bills are issued every month, and the consumers are expected to pay their bills by the end of the month. The collection efficiency relative to current bills for household connections is about 95 per cent.

25. The individual consumers who receive their water from standpipes are not directly billed. Each standpipe is billed on a monthly basis by a concessionaire who is responsible for the billing and collection of water charges for the standpipes. The concessionaire collects from all the beneficiary households of a standpipe and pays the bill to BPAM/PDAM.^{1/} The monthly bill is divided among the beneficiary households in proportion to the number of persons in a household.

(iii) Accounting Policies

26. The Government's policy in the water supply sector is to require an established BPAM/PDAM within the district to introduce standardized management and reporting systems. Detailed financial management and accounting manuals have been designed for BPAMs/PDAMs. The procedures prescribed in the manuals require the preparation of regular monthly reports on the operation and finances of BPAM/PDAM. The financial reports are based on double entry accrual basis accounting system. Foreign Consultants have been assisting Cipta Karya since 1975 in establishing management systems in PDAMs and in regularly monitoring their implementation. BPAM/PDAM personnel have received training at the Cipta Karya Training Center in Jakarta since 1975 in establishing management systems in BPAMs/PDAMs and in regularly monitoring their implementation. Courses include finance, administration, technical operation, public relations, and organizations of BPAMs/PDAMs. Between 1975 and 1984, about 2,500 personnel have attended training courses, seminars, and conference sponsored by Cipta Karya.

5. Operation and Maintenance Procedures

27. On the basis of a study made in 1973 to improve organizational and management strength of the water supply sector institutions, the Government decided that Semi-autonomous Regional Water Enterprises (PDAM) should be established to assume responsibility for operation and maintenance of existing and future water supply systems. Accordingly, PDAMs are now established by local ordinance, issued under Law Number 5 of

^{1/} The concessionaire receives either a salary or a percentage of the collection depending on the number of users.

1974 as Perusahaan Daerah Air Minum (PDAM). Each district (Kabupaten) will have one PDAM responsible for operation and maintenance, and for the improvement and augmentation of water supply schemes within the district. As local government agencies, PDAMs are under the jurisdiction of the Ministry of Home Affairs. However, they have a substantial degree of managerial and financial autonomy.

28. A PDAM is controlled by a supervisory board composed of representatives of the local and central government chaired by the Head of the district (Kabupaten). The Board appoints a Managing Director who, with the assistance of a Finance/Administration Director, and a Technical Director, implements policy and is responsible for day-to-day management and operations. The inclusion of the Head of the district and local officials in PDAM's supervisory boards ensures close coordination between PDAMs and the local governments.

6. Water Supply Sector Investment

29. Finance for planning, design and construction of the water supply systems is provided to Cipta Karya through allocations from the Government's annual budget. During 1969/70-1988/89 the budget allocations for the sector under Repelita I to IV have been as follows:

Table 3: Water Supply Sector Budget Allocations
(Rp billion)

	Investment	Urban & Semurban Subsectors	Rural Subsectors	Percentage of Development Expenditure
Repelita I (1969/70-1973/74)	17			0.9
Repelita II (1974/75-1978/79)	140	140	26	2.5
Repelita III (1979/80-1983/84)	462	385	77	2.1
Repelita IV (1984/85-1988/89)	1,477 ^{a/}	1,215	262	3.7

a/ In addition, 509.5 billion is allotted for the sanitation subsector.

Source: Cipta Karya, 1984.

Table 3 indicates that the water supply sector's share of development expenditure has been low despite its increase over the period. Under the Repelita IV the allocation was increased to 3.7 per cent of total development expenditure at about Rp1,477 billion reflecting an increased priority for the sector.

30. The utilization of the budgetary allocations has been relatively low at an average of about 60 per cent during 1974/75-1978/79, partly due to delays in the supply of materials and equipment, time-consuming procedures for concluding contracts and constraints on manpower. The situation has however improved in recent years as utilization has gone up from about 55 per cent in 1975/76 to 80 per cent in 1982/83.

7. Foreign Assistance

31. Foreign assistance to projects in the water supply and sanitation sector has been mainly provided by the Bank, IBRD, and the Governments of Federal Republic of Germany, Netherlands, France, Japan, Australia and Netherlands. In regard to the proposed Project, the following projects financed by external resources are relevant to the IKK program:

(a) IBRD

32. Since 1974 IBRD has financed four urban water supply and sanitation projects which cover a total of 25 cities and 37 IKK towns besides the Jakarta Sewerage System. In addition to the construction of the water supply facilities, the objectives of the projects include strengthening of Cipta Karya, establishment and development of PDAMs and training of staff in project implementation, operation and maintenance.

(b) Australia

33. The Australian Government has financed since 1981 water supply systems in five towns and is presently providing the services of three senior engineering advisors to assist the Planning Subdirectorates of the Directorates of Water Supply and Sanitation of Cipta Karya, in the planning, design and evaluation of water supply construction projects. The advisors are assisting in the daily work of Cipta Karya and are also developing manuals for planning, organizing, implementing and supervising water supply development programs. They are providing on-the-job training to their counterpart staff.

(c) Netherlands

34. The Netherlands Government is financing 60 IKK systems in West Java, North Sumatra and Aceh and supporting the development of a national Manpower Development Program for the urban water supply sector. The objectives of the Program are to train personnel in operation and maintenance and accounting procedures of the water supply systems in 150 IKKs and small towns.

(d) Bank Financing

35. The Bank has assisted the water supply and sanitation sector in Indonesia with six technical assistance projects amounting to a total of \$955,000, and with four loans amounting to a total of \$87.0 million (see Appendix 4). The Bank-assisted projects provide for water supply, rehabilitation of existing water supply systems, system expansion, and

facilities for reducing water losses. The Bank has also fostered sound institutional development and sought further improvement in financial management and independence of the concerned executing agencies. In terms of targets, the Bank's emphasis has been shifted from major cities to smaller towns in recent years. The Bank has also steadily widened its sectoral coverage from water supply to integrated urban development including sewerage and sanitation. The Bank's involvement in the rural water supply subsector is at present limited to the areas under the Bank-financed irrigation projects.

C. The Sewerage and Sanitation Sector

1. Existing Facilities

36. The sewerage and sanitation sector has not received substantial investments because of limited availability of financial and manpower resources. Historically, urban sanitation has been the responsibility of the Local Government in Indonesia and rural sanitation has been handled by the Ministry of Health through the Directorates of Water and Sanitation and Environmental Health. Studies carried out by the Government in the past emphasized the need for the formulation of a national policy on sanitation and the interdependence of the components of sewerage, drainage and solid waste management.^{1/} There has also been an increasing awareness of the interrelation between water supply and sanitation. The urban poor development program or Kampung Improvement Program (KIP) undertaken during Repelita III was the first national effort in urban sanitation. In line with the policy of environmental protection of towns and improvement of physical conditions of low-income groups, the program included microdrainage in the housing areas, garbage disposal boxes and collection carts, construction of units for communal bathing, washing and toilet facilities (MCKs) and individual latrines. Under a program on rural sanitation, the construction of pit latrines (intended to be demonstration units) is undertaken with INPRES funds. A parallel health education program has been taken up to encourage the public to construct their own latrines.

2. Sanitation Sector Policy

37. In the context of the current International Drinking Water Supply and Sanitation Decade (IDWSSD), important policy directives have been formulated for the sectoral activities under Repelita IV. The directives emerged from a national workshop held in Yogyakarta in December 1982. As a result, following guidelines are being pursued in protecting the environment and promoting public health:

^{1/} Under Bank Loans No. 400: Bandung Urban Development Project and No. 550: Medan Urban Development Project, improvement of these components has been emphasized.

- (a) decentralization of decision-making at the Local Government level (provincial as well as kabupaten levels);
- (b) development of self-financing schemes within the urban sanitation subsector with adequate measures for cost recovery;
- (c) promotion and integration of the components of the sanitation program; and
- (d) development of appropriate technologies as well as provision of technical guidance and funds by the Central Government.

A physical target of covering 60 per cent of the urban population with sanitation facilities has been set under Repelita IV.

38. According to the sanitation program of Cipta Karya, drainage and facilities for collection and disposal of solid wastes are planned in 200 large, medium and small-sized towns through labor-intensive programs. Furthermore, the improvement and extension of macrodrainage systems in metropolitan cities, (each with more than one million population) and/ large cities (population ranging from 500,000 to 1,000,000) will be continued and sewerage schemes will be taken up for implementation. In addition, other programs^{1/}, such as the INPRES program^{2/} for construction of latrines and grey water^{2/} disposal are in progress.

D. Sector Assessment

39. The development policies relating to the water supply sector are in line with the Government's Program for the Drinking Water and Sanitation Decade (1981-1990) and are embodied in its Five-Year plans. The activities of all the Government institutions operating in the sector are coordinated in terms of three decrees issued in March 1984 by the Ministries of Public Works and Home Affairs. Other sector policies such as those governing project financing and tariffs have been formulated. The institutions implementing the projects in the sector have gained considerable experience. Appropriate institutional arrangements for undertaking operation and maintenance of water supply schemes have been formulated (and many have been established and are operating satisfactorily). Adequate consideration is being given to environmental issue, and plans are being developed to reduce or eliminate problems of pollution. In view of the sector policy pursued by the Government and its implementing capacity, it is considered appropriate to provide a Bank loan to assist the Government in implementing a water supply sector project.

1/ Funds provided directly by Presidential Decree to local government.

2/ Wastewater from kitchen and other household uses without human waste.

III. THE PROJECT

A. Objectives

40. The proposed Project seeks to provide safe piped water in about 32 districts in the provinces of Central Java, Yogyakarta, South Sumatra and Lampung in Indonesia to cover about 125 IKKs (see Maps 1 to 3, pages II-IV and Appendix 5) and forms both an area slice and time slice^{1/} of the ongoing long-term IKK Water Supply Program of the Government. The Project aims at providing safe drinking water supply facilities to a population of about 1.04 million out of an estimated 1.4 million people (by 1990) in the 125 IKKs to be selected by the Executing Agency in consultation with the Bank. It will also provide some amount of water for non-domestic use by consumers such as schools, health centers, religious institutions, markets and traders. The Project aims at serving about 75 per cent of the projected population in the selected towns in 1990. Out of the population to be benefited, 50 per cent will be served by house connections and the rest by public standpipes.

41. A major objective of the Project is to improve the capacity of the Government agencies and local governments concerned with the sector development to implement a large number of water supply systems, and to promote institution development through the timely establishment and training of personnel of BFAMs/PDAMs. The Project will also make effective use of the scarce skilled manpower available for sector development.

B. Project Approach, Criteria and Guidelines

42. The proposed Project has been prepared on the basis of a sector approach to development. Sector lending is appropriate since the IKK Water Supply Project involves 32 districts (subprojects) and a large number of individually small communities (about 125), homogenous in nature but scattered over a wide area. General criteria have been developed for identification, design and appraisal of sub-projects (see Appendixes 6 and 7).

43. The Executing Agency proposed, Cipta Karya, has extensive experience in the implementation of water supply projects, many of which have been assisted by external assistance agencies (see paras 31-35). The Executing Agency will be able to implement the Project with technical assistance from the consultants proposed under the Project. Each subproject (or substitutions) will be selected and appraised by Cipta Karya for inclusion in the Project with assistance from the Project Consultants and in consultation with the Bank.

^{1/} During Repelita III, 53 schemes were completed and 346 schemes were reported to be under various stages of implementation. A target of covering 1,800 IKKs has been envisaged during Repelita IV (1984/85-1988/89).

C. Criteria for Subproject Selection

44. After detailed discussions between the Executing Agency (Cipta Karya) and the Bank, it was decided that each subproject will cover one district (Kabupaten) and will include selected IKKs taken up for the service within that district. The subprojects will be selected by Cipta Karya for subsequent appraisal in accordance with the following criteria:^{1/}

- (a) The proposed subproject must be approved in principle by the concerned district (Kabupaten) authorities;
- (b) The district (Kabupaten) authorities concerned must agree to establish a PDAM in the subproject area and to assist in the acquisition of all lands necessary for the subproject;
- (c) BPAM or PDAM and each IKK concerned must be financially viable based on the financial covenants contained in the Loan Agreement; and
- (d) Each IKK to be included in the subproject shall (i) cover a population of 3,000 - 20,000; (ii) run a risk of waterborne diseases or exhibit a demonstrable economic need; (iii) have a viable source of water; ^{2/}
- (e) The water supply scheme to be installed in each IKK shall be approved by the subdistrict (Kecamatan) authorities indicating the support of the community.

45. Each one of the selected subprojects (or their substitutes) under the proposed Project will be subject to detailed appraisal by Cipta Karya^{3/} with the assistance of the consultants engaged under the Project (see para 48). The appraisal of subprojects shall be carried out in accordance with criteria to be agreed between Cipta Karya and the Bank and shall include detailed technical and financial investigations and topographic and socio-economic surveys. A separate appraisal report shall be prepared by Cipta Karya for each subproject in accordance with sound engineering, financial and public utility practices incorporating technical, economic and institutional data, including:

- (a) a description and justification for the works to be carried out under the subproject;
- (b) preliminary designs for the facilities for each IKK within the subproject which shall be the least-cost technical solution to provide water to an average of 75 per cent of the anticipated 1990 population of the IKKs;

^{1/} Loan Agreement Schedule 5, para 6.

^{2/} Based on available data, water sources for various subprojects have been tentatively identified by the Government but will be confirmed during the detailed feasibility studies under the Project.

^{3/} Loan Agreement, Schedule 5, para 7.

- (c) detailed cost estimates, financing plan and disbursement schedules;
- (d) procurement methods and schedule;
- (e) implementation arrangements, including details of acquisition of land and water rights;
- (f) environmental impact assessment for each IKK within the subproject;
- (g) financial viability, economic and social justification;
- (h) evidence that the proposed subproject has been approved by the concerned Kabupaten authorities;
- (i) evidence that the water supply scheme for each IKK has been approved by the concerned Kecamatan authorities indicating the support of the concerned community; and
- (j) evidence of agreement to establish PDAM.

D. Project Scope

46. The proposed Project would consist of the following major components:

- (i) construction of new piped water supply systems in about 125 IKKs^{1/} located in about 32 districts with an estimated design population of about 1.04 million. The system capacity will be designed to provide water to an average of 75 per cent of the anticipated 1990 population of the IKKs on the^{2/} basis of an average use of 600 liters per household connection^{2/} and 30 lpcd for public standpipe users.
- (ii) provision of consultant services for Project implementation; and preparation of a Second IKK Sector Project for about 125 IKKs for possible external financing; and
- (iii) provision of institutional development program and manpower training program, primarily oriented to train BPAM or PDAM personnel in administration, finance and systems operation.

E. Project Description

1. Water Supply System

47. About 32 subprojects - one in each selected district - will be implemented and they will consist of piped water supply systems to cover

^{1/} Population ranging from 3,000 to 20,000 inhabitants.

^{2/} Equivalent of 60 lpcd served by house connection. An average of 10 persons will be served per house connection.

about 125 IKKs (see para 45 and Appendix 8). The subprojects will derive water from various sources and require the drilling of about 85 deep wells, construction of about 37 spring captures and development of about 22 shallow well installations.^{1/} The main features of each water supply system will be as follows:

- (i) a supply source development consisting of a water intake pumping station, or one or two deepwells or a spring capture; treatment facilities and high lift pumping station will be provided only if needed;
- (ii) a bulk flow meter and a set of chlorinators;
- (iii) a small balancing tank at each high-lift pumping station;
- (iv) a generator house and a pumphouse;
- (v) a transmission main (average two km) with pipe diameter ranging from 100 to 250 mm from the source developed outside the town to its distribution system with a small break pressure tank on route if needed;
- (vi) a distribution system (average of nine km) with pipe diameters ranging from 25 to 250 mm and standpipes;
- (vii) an average service line (10 mm) of 20 m per connection;
- (viii) provision of a flow flushable restrictor and storage tanks at each house connection and public standpipe; and
- (ix) an IKK operating office.

2. Consultant Services

48. Consultant services for the Project will be provided by Advisors (Individual Consultants), Principal Consultants (firms)^{2/} and a Consortia of local consultants as follows:^{3/}

(i) Individual Consultants

49. (a) Two individual consultants recruited under Bank Guidelines will be stationed at Jakarta and will be consultants to Cipta Karya's Project Management Unit (PMU). One consultant will be the Chief Technical/Project Management Consultant and the other will be the Financial Management Consultant and they will assist the Executing Agency in Project monitoring and review and approval of feasibility studies, appraisal reports and detailed designs for all the subprojects prepared by the

^{1/} Studies made by Consultants indicate that treatment for removal of iron/manganese will be required for about seven subprojects.

^{2/} Total number of man-months: 276.

^{3/} Outline Terms of Reference for Consultant are given in Appendix 9.

Principal Consultants and four Consortia of local consultants. These consultants will also assist the Executing Agency regarding technical/financial aspects pertaining to the supervision of construction and coordination with the Bank. In the recruitment of the Chief Technical/Project Management Consultant (24 man-months) as well as the Financial Management Consultant (24 man-months) it will be stipulated that they will be recruited as individual experts and should not be associated in any aspect to the firms of Consultants who will be appointed as Principal Consultants or Consortia.

50. (b) One Institutional Development Consultant (12 man-months) and one Manpower Training Consultant (12 man-months) will be recruited under the Bank's Guidelines. The two consultants will prepare and implement an institutional development program and a training program in identified critical areas (see para 53) for Cipta Karya's Project Management personnel and Manpower Training Specialists, and key personnel from IKKs, BPAMs and PDAMs.

(ii) Principal Consultants

51. Two firms of consultants (a total of 204 man-months)^{1/} will be engaged as Principal Consultants. The two consulting firms (one stationed in Central Java and the other in South Sumatra) recruited under the Bank's Guidelines will act as Principal Consultants and will assist Cipta Karya's Project Managers stationed in the four Provincial headquarters. The responsibilities of the firms will be as follows:

- (a) to prepare model feasibility studies for subprojects - one for each water source for each province - and assistance to Cipta Karya in preparing appraisal reports for all subprojects;
- (b) to carry out detailed hydrogeological surveys in order to decide appropriate source for each subproject;
- (c) to provide guidance to the Consortia Consultants to carry out detailed designs and prepare tender documents, evaluate bids, prepare contract documents and monthly progress reports; and
- (d) to assist in the supervision of construction.

(iii) Consortia

52. Four consortia of local consultants (a total of 1230 of man-months) will be stationed in the four Provinces to assist the four Project Managers of Cipta Karya in preparing detailed feasibility studies for all the IKKs under their charge along the lines of the model feasibility studies prepared by the Principal Consultants and function in close consultation with the Principal Consultants on all works as required. They will also prepare detailed designs, tender documents and carry out construction supervision. They will be guided by the Principal

^{1/} 189 man-months for Project implementation and 15 man-months for Project preparation (see para 55).

Consultants. The Consortia will be recruited in accordance with the procedures prescribed by the Government for the use of local consultants and subject to shortlisting procedures as agreed to between the Government and the Bank.

3. Training

53. ^{1/} A tentative institutional development program and training program prepared by the Consultants under the Project Preparation Technical Assistance have been reviewed and accepted by Cipta Karya and the Bank. The programs have been formulated to coordinate with other training programs (see paras 32 to 34) and to meet the needs in the areas of: (i) construction management; (ii) materials management; (iii) operation and maintenance; (iv) community participation and health education; (v) financial management of water supply systems; and (vi) general administration. Cipta Karya's project personnel, PUOD personnel for management of PDAMs, manpower training specialists from Cipta Karya, the project and subproject managers and key personnel from the staff of IKKs, BPAMs and PDAMs will receive training from the Institutional Development Consultant and the Training Consultant (see para 50) through classroom lectures and on-the-job training. The practical training will be provided at existing IKK sites and later within the various subproject sites. The training of 1,500 trainees^{2/} to suit the particular requirements of the Project and the IKK Water Supply Program will be undertaken by the personnel who would have themselves received training from the consultants. Institutional Development and training courses ranging from three to six weeks will be developed to suit the particular requirements of the IKK Water Supply Program. About 5,100 trainee weeks have been envisaged. The salient features of the institutional development program and the training program are: two-week courses in planning, management, administration and finance for staff concerned with the operations of the IKK Water Supply Systems and six-week courses (consisting of two weeks of classroom training and four weeks of practical training) for operators.

4. Office Accommodations, Equipment and Vehicles

54. Allowance has been made under the Project for provision of office accommodation. Each IKK water supply scheme will include an office for use by the operational and management personnel and constitute a local focal

1/ Final institutional and development training programs will be prepared by Cipta Karya with the assistance of consultants under the Project in consultation with the Bank within one month after commencement of the field work by the training Advisors (Loan Agreement, Schedule 5, para 18).

<u>2/</u> Year	<u>No. of Trainees</u>	<u>To be trained by</u>
1986/87	450	consultants
1987/88	450	consultants
1988/89	400	Cipta Karya staff
1989/90	200	Cipta Karya staff

point for liaison between consumers and operational staff to expedite resolution of routine problems and also have various administrative records. Provisions have also been made for the development of storage areas at the Kabupaten centers complete with workshop, office and training facilities. These will be transferred to the managing organizations on completion of the subprojects. About 149 transport vehicles will be needed, of which approximately 24 will be four-wheel drive vehicles fitted with radio communications equipment and the remaining vehicles will be motorcycles.

5. Project Preparation

55. In conjunction with the Project, it is proposed that the consultant services include the preparation of a Second IKK Water Supply Sector Project to provide water supply facilities to about 125 IKKs^{1/} for possible external financing. This project preparation will require about 15 man-months^{2/} of professional staff from the Principal Consultants and 30 man-months^{2/} of the four Consortia recruited under the Project^{3/} and the final report is expected to be ready by the middle of 1986.

F. Cost Estimates

56. The total cost of the proposed Project is estimated at \$66.0 million equivalent (inclusive of taxes and duties), of which \$40.2 million or 60.9 per cent is the foreign exchange cost including \$7.11 million for interest and other charges on the Bank loan during construction (IDC), and \$25.8 million (or 39.1 per cent) is the local currency cost. The cost estimates are based on mid-1984 prices and include appropriate provisions for physical contingencies and price escalation. Recovery of the project preparatory technical assistance (TA No. 501-INO), over and above the grant provision of \$150,000, has been taken into account. Table 4 is a summary of the cost estimates; a detailed breakdown is given in Appendix 10.

G. Financing Plan

57. It is proposed that the Bank provide a loan of \$40.2 million (including interest and other charges in the Bank loan during construction) from its ordinary capital resources, which represents about 60.9 per cent of the total cost of the Project. The loan would finance the total foreign exchange cost of \$40.2 million, including the interest and other charges on the loan during construction.

1/ Preselected following the criteria described in Appendix 7.

2/ These man-months are included in the total estimates (see paras 51 and 52).

3/ The outline terms of reference for consultants are given in Appendix 9.

Table 4. Summary of Cost Estimates^{a/}
(\$ Million)^{b/}

Item	Foreign Currency	Local Currency	Total
<u>A. Project Components</u>			
1. Land	-	1.00	1.00
2. Civil Works	5.83	8.04	13.87
3. Materials and Equipment	15.40	2.02	17.42
4. Vehicles	-	0.25	0.25
5. Administrative/Operational Costs	-	0.70	0.70
6. Consultant Services			
a) Feasibility Study/detailed design	1.80	1.42	3.22
b) Supervision of Construction	1.02	2.10	3.12
c) Project Preparation	0.18	0.17	0.35
7. Training	<u>0.30</u>	<u>1.85</u>	<u>2.15</u>
Subtotal	<u>24.53</u>	<u>17.55</u>	<u>42.08</u>
<u>B. Contingencies</u>			
8. Physical Contingencies ^{c/}	2.45	1.76	4.21
9. Price Escalation ^{d/}	<u>6.07</u>	<u>6.49</u>	<u>12.56</u>
Subtotal	<u>8.52</u>	<u>8.25</u>	<u>16.77</u>
Total Base Cost (A+ B)	<u>33.05</u>	<u>25.80</u>	<u>58.85</u>
<u>C. Recovery</u>			
10. Prior Costs of Technical Assistance	<u>0.04</u>	-	<u>0.04</u>
Subtotal	<u>0.04</u>	-	<u>0.04</u>
<u>D. Interest and Other Charges During Construction (IDC)</u>			
11. IDC on Bank Loan	<u>7.11</u>	-	<u>7.11</u>
Subtotal	<u>7.11</u>	-	<u>7.11</u>
<u>E. Total Project Cost</u>	<u>40.20</u>	<u>25.80</u>	<u>66.00</u>

a/ Second quarter 1984 prices.

b/ \$1.00 equivalent to Rp1,000.

c/ Physical contingency of 10 per cent.

d/ Foreign price contingency: 3.5 per cent for 1984; 8.0 per cent for 1985; 9.0 per cent for 1986-1988 and 7.5 per cent for 1989. Local price contingency: 12 per cent for 1984 and 10 per cent for 1985-1989.

58. The Borrower will be the Republic of Indonesia. The proposed Bank loan will have an amortization period of 25 years, including a grace period of five years, with interest at the rate of 10.25 per cent per annum. These terms are considered to be appropriate, taking into account the nature of the Project and the period required for its implementation. The Government has assured the Bank that all other funds required to implement the Project will be made available to the Executing Agency from its own resources on a timely basis.

H. Project Implementation Disbursement

59. The proposed Bank loan of \$40.2 million will be disbursed to finance the foreign exchange cost of the Project (excluding interest and other charges) of \$33.09 million and the balance amount of \$7.11 million will be disbursed to meet part of the local expenditure on civil works and consultants.

I. Environmental and Energy Aspects

60. During subproject appraisal, attention will be given to the environmental impact particularly to ensure that the abstraction of the relatively small quantity of water to be provided under the Project compared with the base flow of the identified surface water sources, springs and aquifers (especially in Central Java where there is competition for available water sources) will not have adverse effects on the environment. With only the minimum requirements of part of the population being met, the disposal of wastewater arising from the supply provided is expected to have an insignificant environmental impact. The consultants will be required to assess the likely environmental impact of all subprojects with emphasis on waste water disposal and recommend detailed designs. In cases where the discharge of waste water may cause environmental problems, the consultants will identify remedial works required. In the absence of sources of water to provide gravity supply to most subprojects, mainly pumped supply is required. The need for economy in the use of energy will be considered in designing the schemes.

J. Project Benefit Monitoring and Evaluation

61. Benefit monitoring and evaluation activities will be undertaken by the Borrower to ensure that the subprojects are managed efficiently and the Project benefits are maximized. The data to be collected and analyzed under such activities will include the following: a socioeconomic benchmark survey, baseline data regarding population and service connections, statistics on water-borne diseases and technical problems and successes in design, construction and operation and maintenance. Project benefit monitoring and evaluation will be undertaken by DWS through its regional offices. The monitoring and evaluation system for the Project

will be formulated by DWS with the assistance of the Project consultants and would be reviewed by the Bank and the results of the evaluations will be submitted to the Bank for comments.^{1/} A Project Completion Report shall be prepared by Cipta Karya and submitted to the Bank within three months of Project completion. This report shall describe in detail, inter alia, the Project scope achieved, project components completed, record of progress of all the major work items, record of disbursements of loan proceeds and local funds, institution building, training and water tariff implementation.

1/ Loan Agreement, Schedule 5, para 19.

IV. IMPLEMENTATION

A. Implementation Arrangements

(i) Executing Agency

62. The Director General of Cipta Karya, through its Directorate of Water Supply (DWS), will be responsible for the execution of the Project.^{1/} A Project Management Unit (PMU)^{2/} to be established within DWS will manage and coordinate project activities. PMU will be headed by a senior official of DWS as Project Director and liaise with the Bank in respect of all matters concerning the implementation of the Project and will provide the Bank with all reports, audited financial statements and other related documents. PMU will also supervise the functions of each Project Manager stationed in the existing four Provincial Public Works Office (Dinas PU Cipta Karya) who will be responsible for day-to-day implementation of the Project. Prior to commencement of construction under any subproject, a Subproject Office will be established in each concerned district (Kabupaten). The Subproject Office will be headed by a full-time Subproject Manager.^{3/} The duties and responsibilities of PMU are given in Appendix 11, and its organization is presented in Appendix 12. The overall organization for Project implementation is presented in Appendix 13.

(ii) Approach to Project Implementation

63. About 32 subprojects are to be implemented in three groups sequentially (see Appendix 8). In general, subprojects with reliable sources of water and where the financial viability of the subprojects at kabupaten level has been established during the preliminary financial assessment will be taken up first for detailed feasibility study. The provincial and local governments will provide assistance in obtaining the necessary water rights (from DGWRD) as well as the land required for the Project. Necessary action will be taken by the Provincial IKK Project Offices (Project Offices) to firm up the data regarding the dry weather flows of the proposed springs and rivers before taking up subprojects for implementation. Detailed appraisal will be made to establish the financial viability of the subprojects at the kabupaten level to ensure the viability of PDAM.

1/ In addition to being the Executing Agency for projects financed by the Bank (three in the Water Supply and Sanitation Sector), Cipta Karya has also been the Executing Agency for water supply projects involving bilateral and multilateral assistance.

2/ Loan Agreement, Schedule 5, para 2.

3/ Loan Agreement, Schedule 5, para 5.

(iii) Implementation Schedule

64. The Project will be implemented over a five-year period from mid-1985 to mid 1990 and the subprojects will be taken up sequentially. The first group of subprojects (about six) is expected to have about 26 IKKs while the second group (about nine) will cover about 39 IKKs and third group (about 17) will cover the remaining IKKs (see Appendix 8). Implementation of subprojects sequentially in groups will ensure that the experience gained in the initial subprojects can be utilized in the execution of subprojects taken up later. In order to accelerate the implementation of subprojects, the Bank may delegate the Executing Agency greater responsibility in approval procedures. Following the submission of at least six satisfactory subproject proposals covering the four Project provinces within one year of the signing of the contract of the consultants concerned, the Bank will consider delegation of the authority to approve the remaining subprojects to Cipta Karya.

B. Consultant Services

65. Consultant services will be provided to assist in the implementation of the Project as follows:

- (i) Project Implementation - Chief Technical/Project Management and Financial Management Consultants (48 man-months), Principal Consultants (189 man-months) and Consortia (1,200 man-months) will be provided to assist the Project Director and the Project Managers to carry out investigations (including groundwater studies); financial studies and appraisal reports; prepare feasibility reports, detailed designs, tender and contract documents as well as monthly progress reports. The consultants will also assist Cipta Karya's Project Managers in the evaluation of bids, procurement and supervision of construction as well as in the operation and maintenance of completed subprojects.
- (ii) Institutional Support - An Institutional Development consultant (12 man-months) to review and prepare Institutional Development Program for the Project as a Manpower Training Consultant (12 man-months) will provide the necessary institutional support and training. The consultant will prepare institutional development and training programs for Project personnel as well as IKK staff in fields relevant to their respective responsibilities and functions.

C. Procurement

(i) Equipment and Materials

66. The DWS Headquarters Office in Jakarta with the assistance of the Project implementation consultants will be responsible for the procurement of materials, plant and equipment in bulk. Procurement will be carried out in accordance with the Bank's Guidelines for Procurement.

67. To the extent possible, procurement will be arranged in such a way that each bid package or contract will be appropriate in size for international competitive bidding. Before the start of procurement, Cipta Karya will furnish the Bank with a list of materials and equipment to be procured, and the proposed grouping of such materials and equipment. Contracts estimated to cost less than \$300,000 equivalent will be awarded on the basis of international shopping. The major items of materials and equipment to be procured are listed in Appendix 14. In view of the sector nature of this Project its total cost estimates are based upon extrapolation of the costs developed for sample communities studied under the Project preparation technical assistance. Goods and services (including transport vehicles) to be financed from the Government's own resources will be procured in accordance with the Government's procurement procedures.

(ii) Civil Works

68. Civil works contractors will be prequalified in accordance with prequalification criteria approved by the Bank. Bids will be invited from prequalified contractors in accordance with the Government's standard procurement procedures. Local competitive bidding is proposed for the following reasons: (i) the communities are distributed in various parts of Indonesia; and (ii) the nature, size and number of contracts for the civil works proposed are such that it is extremely unlikely that international contractors is interested in bidding for the subprojects.

69. The estimated cost, of the total civil works inclusive of physical and price contingencies amounts to about \$19.64 million (equivalent) consisting of \$7.82 million in foreign exchange and \$11.82 million equivalent in local currency. The average civil works contract including physical and price contingencies for each of the 32 subprojects will amount to about \$0.610 million equivalent (foreign and local cost).

70. The Government has agreed that because of a large number of small contracts involved, it will as far as feasible, standardize bidding procedures and establish standard form contracts for all civil works.

D. Land and Water Rights

71. The Government will ensure that all land, and rights or privileges relative to land and water required for the Project are acquired or otherwise made available on a timely basis.

E. Implementation Status of Previous Water Supply Projects

72. Bank assistance to the water supply sector, has included four loans totalling \$87.0 million and six technical assistance projects totalling \$955,000. One loan each for the Small Towns Water Supply Sector Project and the Semarang Water Supply Project and two loans for the Bandung Water Supply Project have been provided (see Appendix 15). In addition, several of the Bank's projects relative to urban development, regional

development and irrigation include components of water supply and in some cases sanitation. Most of the Bank's technical assistance to the sector has been for project preparation.

73. The Small Towns Water Supply Sector Project was the Bank's first sector loan project in the water supply sector. The project was approved in December 1980 (for a loan amount of \$32 million) and became effective in January 1981. The project is designed to provide water supply systems to 33 small towns (subprojects). It was expected to be completed by the end of March 1984 at the time of appraisal. As of October 1984, the Bank had approved 31 subprojects. The detailed designs for approved subprojects are under preparation and civil works for some subprojects will be taken up during 1984-1985. The award of contracts and disbursements has been expedited and the Project is now expected to be completed by March, 1988.^{1/} The implementation of the Project has been behind schedule due to:^{2/}

- (i) the delay in the recruitment of the principal and local consultants;^{3/}
- (ii) the shortage of adequate technical personnel in the Executing Agency, the Directorate of Water Supply (DWS) for the appraisal of subprojects; and
- (iii) need of in depth guidance by the principal consultant and Bank staff in the preparation of the feasibility studies and appraisal reports for the subprojects to the local consultants^{4/} and the Executing Agency.

74. Although Cipta Karya has extensive experience in the implementation of water supply projects many of which have been financed by bilateral and multilateral assistance, the increasing level of activity in the sector placed heavy demands on Cipta Karya's staff and preparation of the appraisal reports of the subprojects under the Small Towns Water Supply Sector Project (which was Cipta Karya's sole responsibility) had to be carried out mainly by the Consultants with Bank staff assistance. Considerable assistance is being provided by bilateral and multilateral agencies for strengthening institutional capabilities (see paras 31 to 35). The Bank is also making a substantial contribution to projects in the education sector aimed at augmenting the supply of trained manpower

^{1/} A Special Loan Administration Mission (August 1984) concluded that the project's revised implementation schedule is feasible.

^{2/} See paras 74 and 75 for remedial actions proposed under this Project.

^{3/} Late recruitment of Principal Consultant and the time required for settlement of disputes over the Project implementation periods.

^{4/} The Terms of Reference of the local consultants stipulate that their work shall be carried out in consultation with the principal consultants.

with technical skills.^{1/} However, to overcome any risk in Project implementation arising from shortage of qualified personnel within Cipta Karya, the Consultants under the Project will assist Cipta Karya in appraising the subprojects.

75. The subprojects to be implemented under the Project will require preparation of feasibility studies, detailed engineering design and construction supervision. The number of local consultants in the field of sanitary engineering has increased and by transfer of technology, local consultants have gained substantial experience during the implementation of the first sector loan project. Local consultants have been given major responsibilities in the implementation of similar water supply projects financed by bilateral and multilateral agencies. In addition, Principal Consultants under the Project will provide guidance to the Consortia Consultants and will prepare model feasibility studies (see para 51). It is expected that the local consulting firms to be provided under the Project will not encounter problems as before and will render their services in a satisfactory manner and avoid delays in Project implementation.

76. It is, therefore, envisaged that with the assistance of the Project Consultants, Cipta Karya will be able to implement the Project according to schedule.

^{1/} Loan 244-INO: Surabaya Institute of Technology for \$14.5 million approved on 2 December 1975; Loan 356-INO(SF): Senior Technical Schools for \$24.0 million approved on 28 September 1978; Loan 402-INO(SF): University of Hasanuddin for \$25.0 million approved on 7 June 1979; Second Senior Technical Schools for \$26.0 million approved on 27 November 1980; University of North Sumatra, \$26.0 million approved on 24 September 1981; Vocational Education \$40.0 million approved on 29 June 1982; TA No. 633-INO: Manpower Training Project for \$150,000 approved on 18 October 1984.

V. OPERATION AND MAINTENANCE

A. General

77. PDAM will manage the operation and maintenance of Project facilities in each Kabupaten. Where a PDAM does not exist, a PDAM or a BPAM will be established and fully staffed under the Project not later than six months prior to the commissioning of the first subproject.^{1/} Training of staff of PDAM/BPAM and IKK operators will begin immediately after the award of the first civil works contract of a subproject.

78. Cipta Karya through its Project Offices will provide assistance to PDAMs in taking over IKK systems. For this purpose and for any future addition of small piped water supply systems, the Bank and the Government will consult each other on the approach and policy,^{2/} to be adopted in amalgamating their operations. The same sector policy,^{2/} adopted under the Project (see para 82) will be applied in each of BPAMs/PDAMs irrespective of the types of systems included.

B. Financial Management

1. Accounts and Audit

79. The Government will ensure that Cipta Karya:

- (i) maintains separate accounts for the Project reflecting the accounts of each BPAM under the Project;^{3/}
- (ii) has such accounts and related financial statements audited annually, in accordance with sound and consistently^{3/} applied auditing standards, by auditors acceptable to the Bank;^{3/}
- (iii) furnishes to the Bank, as soon as available but in any event not later than six months after the end of each related fiscal year, unaudited copies of accounts and related financial statements, and not later than nine months after the end of each related fiscal year, certified copies of audited financial statements.^{3/}
- (iv) submits to the Bank any other information concerning the accounts and financial statements^{3/} and the audit thereof as required by the Bank from time to time.^{3/}

^{1/} Loan Agreement, Schedule 5, para 11.

^{2/} In some cases, small piped water supply systems provided under bilateral assistance do not presently require cost recovery.

^{3/} Loan Agreement, Section 4.06(b).

80. The Government will forward to the Bank reports and information as the Bank will request concerning (i) the Loan and the expenditure of the proceeds and maintenance of the service thereof; (ii) the goods and services financed out of the proceeds of the Loan; (iii) the Project and each subproject; (iv) the administration, operations and financial condition of Cipta Karya and, to the extent relevant to the^{1/} Project, any other agency responsible for the carrying out of the Project.-

2. Proposed Tariff

81. Unless otherwise agreed to with the Bank, the Government will ensure that upon commissioning of Project facilities for a subproject, the concerned BPAM or PDAM levies tariffs at least sufficient to enable corresponding IKKs to cover operating and maintenance costs of their respective water supply facilities.^{2/}

82. The Government will, as necessary, provide to any BPAM a sufficient cash subsidy to cover any shortfall between the operating and maintenance costs of the Project facilities of any IKK and the tariff charged by the concerned BPAM. Except as the Bank and the Government shall otherwise agree, this cash subsidy scheme for any BPAM shall be phased out within four years from the commencement of the^{3/} first full year of operations of relevant IKK water supply facilities.-

83. Unless the Bank and the Government otherwise agree, the Government will ensure that within each PDAM, water tariffs will be charged sufficient to cover operating and maintenance costs including depreciation of all piped water supply systems within^{4/} the respective Kabupaten except those operated by the Ministry of Health.-

84. In addition, the Government will require that each PDAM or BPAM will not transfer surplus funds accrued from the operation and maintenance of the Project facilities to any other accounts of the Kabupaten and will utilize such funds exclusively for the replacement, improvement, maintenance and expansion of its water supply facilities.^{5/} Tariffs collected within a Kabupaten shall be sufficient to permit cross-subsidization by some larger and more prosperous communities within the respective Kabupaten thereby providing sufficient revenue to cover the depreciation charges in communities where tariff is based on only operating and maintenance costs. The Government will monitor the adequacy of the tariffs charged by BPAMs and PDAMs^{6/} and will furnish the Bank with the analysis and data of such monitoring.-

- 1/ Loan Agreement, Section 4.07.
2/ Loan Agreement, Schedule 5, para 15(a).
3/ Loan Agreement, Schedule 5, para 15(b).
4/ Loan Agreement, Schedule 5, para 16.
5/ Loan Agreement, Schedule 5, para 14.
6/ Loan Agreement, Schedule 5, para 17.

85. Table 5 shows calculation of average monthly operation and maintenance costs per household for representative communities comprising small, medium and large populations under different water supply systems. The average water charges to cover operation and maintenance costs would be Rp795 per month per household for public standpipe users and Rp2,385 per month per household for individual connections. The operation and maintenance costs will vary with the size and type of water supply systems.

86. Based on the income and expenditure statistics for 1983 and weighted average tariffs proposed for the Project, a typical household with a household connection would spend about 1.6 per cent of its average monthly income in 1990 on water. This would rise to 1.7 per cent in real terms by 1995 if there is no increase in real disposable income. Those in the lowest income bracket, with average household income of Rp50,000 per month and assumed to be served by public standpipes, would also spend about 1.6 per cent of their 1990 income, rising to 1.7^{1/} per cent by 1995 if there is no increase in real disposable income.^{2/} The results of these calculations indicate that the charges associated with the Project will remain a small portion of total household income and will, therefore, be affordable.

87. The affordability of water provided by subprojects to low-income households and the sensitivity of the subprojects to changes in major variables (such as increases in operating costs) can best be measured in terms of the effect of such changes on the cost of the service to the low-income households in each of the sample subprojects.

88. The sensitivity analysis for representative subprojects (Table 6 and Appendix 17) shows that the postulated adverse changes in operation and maintenance costs and reduction in the population served would have proportionate detrimental effects on water charges in the case of small village and piped water supply systems with full treatment. The postulated percentage increase in the costs of the water supply, while undesirable, does not significantly affect the affordability test since the cost of the service is^{3/} still within the capability-to-pay of the low-income households,^{3/} irrespective of any possible Government subsidy.

1/ It is assumed that low-income households will be served with public standpipes. If these households are given house connection, they would spend about 4.7 per cent of the income on water supply in 1990 and 5.0 per cent in 1995.

2/ In the most adverse case (increase of operational maintenance cost by 10 per cent and reduction of served population by 10 per cent) the low-income household would spend 3.3 per cent of their 1990 income if served by a small system with complete water treatment.

Table 5: Operation and Maintenance Cost Analysis
(1984 Prices)

Item	Size of Scheme		
	Small	Medium	Large
<u>Estimated Population (1990)</u>			
Total	5,440	10,880	21,760
Served	4,080	8,160	16,320
<u>Number of Households Served (1990)</u>			
Households with house connections	340	680	1,360
Households served with standpipes	340	680	1,360
<u>Monthly Operation & Maintenance Costs (Rp'000) ^{a/}</u>			
Gravity System ^{b/}	487	602	788
Pumped System ^{c/}	1,372	2,133	3,266
Water Treatment System ^{d/}	1,823	2,893	4,726
<u>Cost Per Household Per Month (Rp) ^{e/}</u>			
<u>House Connections</u>			
Gravity System	1,074	664	435
Pumped System	3,026	2,353	1,801
Water Treatment System	4,021	3,191	2,606
<u>Stand Pipes</u>			
Gravity System	358	221	145
Pumped System	1,009	784	600
Water Treatment System	1,340	1,064	869

a/ For detailed operation and maintenance cost calculation, see Appendix 17.

b/ Gravity flow with minimum treatment.

c/ Pumped spring source or deep well with minimum treatment.

d/ Water treatment plant and pumped supply.

e/ Water charges for public standpipes are assumed to be about one-third of house connections.

Table 6. Sensitivity/Affordability Analysis

System ^{a/} Assumptions	Small		Medium		Large	
	Monthly Charge (Rp) b/	Percentage of Household Income c/	Monthly Charge (Rp) b/	Percentage of Household Income c/	Monthly Charge (Rp) b/	Percentage of Household Income c/
1. Base Case	1,009	2.0	78.4	1.6	600	1.2
2. Increase in Operation and Maintenance Costs by 10 per cent	1,110	2.2	863	1.7	660	1.3
3. Reduction in served population by 10 per cent	1,121	2.2	871	1.7	667	1.3
4. Combination of 2 and 3 above	1,233	2.5	958	1.9	734	1.5

a/ Pumped Spring Source or Deep Well with Minimum Treatment (for details of Gravity Flow Systems and Water Treatment with Pumped Supply, see Appendix 16).

b/ Standpipe water charge per household expressed in real terms. Households with low-income are assumed to be served by standpipes.

c/ Assumed to be Rp50,000 (based on Government statistics for 1983).

3. Financial Projections

89. Financial projections have been made for nine representative subprojects comprising small, medium and large communities, and water supply systems with gravity flow, pumped supply and water treatment plant. The projections cover a time span of ten years indicating the financial conditions which are likely to apply as tariffs are increased in accordance with loan covenants.

90. The underlying assumptions and the Projected Income Statements are shown in Appendix 18. Projected Income Statements have been prepared based on the setting of water charges from the first year of operation to cover at least operation and maintenance costs and allowing for cross-subsidy within each BPAM or PDAM from large and more prosperous communities to small IKK systems. Any Government subsidy scheme will be phased out within four years from the first full year of operation.

VI. SOCIAL, ECONOMIC AND FINANCIAL EVALUATION

A. Objective

91. The proposed Project covers about 32 subprojects designed to provide cost-effective water supply facilities in terms of both capital and operating costs. About 1.04 million people in about 125 IKKs will directly benefit from the Project through the availability of potable water at a moderate cost. Half of the total number of people will obtain their water from public standpipes and this will benefit a substantial proportion of the lower income group. The Project will also provide a small amount of water for non-domestic consumers such as schools, health clinics, religious institutions, markets, commercial establishments, and traders, thereby contributing to the improvement of public health. The consultant services and training included under the Project will help in developing institutional capabilities at the national, provincial and district levels.

B. Benefits and Beneficiaries

92. Improvement in the quality of public water supply is expected to be followed by an improvement in public health. The improved state of health will produce secondary socioeconomic benefits to the community through improved productivity and reduction in the demand for capital investment and recurring cost of public health facilities. The provision of safe piped water would contribute to the reduction in mortality and morbidity, particularly among children caused by water-borne, water-related and parasitic diseases. Even though it may be difficult to quantify the benefits of the Project in specific economic terms it will be reasonable to assume that the social benefits of the Project will be significant.

93. The implementation of the subprojects will provide local employment. The training of personnel to be recruited from the local communities to operate and maintain the subprojects would also encourage local involvement and participation in the development effort.

C. Financial Performance

94. The financial projections for the subprojects indicate that the water supply operations will be financially viable in the sense that they will be able to fulfill the financial objectives of recovering operation and maintenance costs, beginning with the commissioning of the respective subproject facilities^{1/}. Considering the significant social and economic benefits derived from the implementation of the subprojects, the Project benefits will be substantial.

^{1/} After a gradual phasing out of Government subsidy over a four-year period, cost recovery at PDAM level will include depreciation in addition to operation and maintenance costs. Affordable water tariffs of each PDAM will allow for cross subsidization from larger and more affluent larger communities to smaller and poorer IKKs.

D. Project Risks

95. The main risks associated with the Project are: (i) the acceptance of the flow restrictors (see Appendix 3) by the communities; (ii) the capacity of the individual PDAMs to operate and maintain properly their water supply facilities; and (iii) delay in Project implementation.^{1/} Several measures have been proposed to minimize these risks. First, complete information through an education and public information program is being provided to communities regarding flow restrictors and Government regulations^{2/} regarding their use; second, each subproject will be selected only if the community and local government agree to its inclusion in the IKK Water Supply Program of the Government.^{3/} Third, the Project includes a training component to be administered by Cipta Karya to train operational staff of Cipta Karya, IKKs, BPAMs or PDAMs to ensure proper operation and maintenance of subproject facilities; Fourth, the Government has given an assurance it would engage the Project consultants within six months of loan approval, and adequate consulting services to assist Cipta Karya in appraising the subprojects will be provided.

1/ Based on past experience in the implementation of the ongoing Project No. 493-INO: Small Towns Water Supply Sector (11 December 1980 - \$32.0 million) which experienced delays in the recruitment of consultants and preparation of subproject appraisal reports.

2/ Disconnection of supply and payment of reconnection fee will be enforced if flow restrictors are tampered with.

3/ Communities will be fully advised of the technical and financial aspects related to the IKK Program.

VII. CONCLUSIONS AND RECOMMENDATIONS

96. In accordance with the aims of the U.N. Drinking Water and Sanitation Decade, the Government reviewed its water supply program under Repelita III and incorporated a program to speed up the provision of piped water supply to all IKKs throughout the country. The Government initiated with its own finances the construction of limited systems in 380 IKKs and the Government of Netherlands agreed to finance 60 IKK systems in West Java, North Sumatra and Aceh. Further the IBRD-assisted East Java Water Supply Project included 13 small towns and 37 IKK systems. The program is now well under way with many schemes in operation.

97. During Repelita IV a target to cover additional 1,800 IKKs has been set. None of these IKKs has an adequate supply of potable water. The objective of the proposed Project is to provide about 125 IKKs in about 32 districts with safe supply of piped water. The Project also provides assistance for further developing the institutional capabilities in the water supply sector and for the preparation of a Second IKK Sector Project. The Government has requested Bank financial assistance in implementing water supply schemes in about 32 districts to cover about 125 IKKs in the provinces of Central Java, Yogyakarta, South Sumatra and Lampung.

98. The cost of the proposed Project is estimated at \$66.0 million equivalent (inclusive of taxes and duties), consisting of \$40.2 million in foreign exchange (60.9 per cent) including \$7.11 million for interest and other charges during construction, and \$25.8 million in local currency (39.1 per cent). The local currency component will be financed by the Government through its Development Budget and provided directly to the Executing Agency (Cipta Karya). It is proposed that the Bank provide a sector loan to the Government of \$40.2 million equivalent from its ordinary capital resources. The loan would have a repayment period of 25 years, including a grace period of five years.

99. In addition to the standard provisions and requirements embodied in Bank loan documents, the following specific assurances have been obtained from the Government:

- (i) Cipta Karya will establish a Project Management Unit (PMU) not later than one month after the effective date of the loan agreement (Loan Agreement, Schedule 5, para 2);
- (ii) Subprojects will be selected for consideration on the basis of selection criteria agreed to between the Government and the Bank (Loan Agreement, Schedule 5, para 6);

- (iii) Subprojects will be appraised and submitted to the Bank for approval on the basis of agreed technical, financial and economic criteria (Loan Agreement, Schedule 5, para 7);
- (iv) Subprojects will be designed in accordance with agreed criteria and documents covering particulars of the designs and implementation schedules will be submitted to the Bank for approval before construction is undertaken (Loan Agreement, Schedule 5, para 9);
- (v) In consultation with the Bank a training program will be prepared by Cipta Karya with the assistance of the consultants and implemented for appropriate staff of each BPAM or PDAM (Loan Agreement, Schedule 5, para 18);
- (vi) Upon commissioning of Project facilities for a subproject, the concerned BPAM or PDAM charges tariffs at least sufficient to enable each concerned IKK to cover all operating and maintenance costs of such facilities (Loan Agreement, Schedule 5, para 15(a));
- (vii) The Government will, as necessary, provide or cause to be provided to any BPAM sufficient cash subsidy to cover any shortfall between the operating and maintenance costs of the Project facilities of any IKK and the tariff charged by the concerned BPAM. Except as the Borrower and the Bank will otherwise agree, this cash subsidy scheme for any BPAM will be phased out within four years from the commencement of the first full year of operations of the relevant IKK water supply facilities (Loan Agreement, Schedule 5, para 15(b));
- (viii) Except as the Government and the Bank will otherwise agree, the Borrower will ensure that each PDAM charges tariffs sufficient to cover all operating and maintenance costs including depreciation of all piped water supply systems, except piped water supply systems operated by the Ministry of Health (Loan Agreement, Schedule 5, para 16); and
- (ix) The Government will monitor the adequacy of the tariffs charged by BPAMs and PDAMs and will furnish the Bank with the analysis made by BPAMs and PDAMs and data of such monitoring (Loan Agreement, Schedule 5, para 17).

LIST OF APPENDIXES

<u>No.</u>	<u>Title</u>	<u>Page</u>
1	Health Statistics	40
2	Organization Charts	41
3	Flow Restrictor	45
4	Bank's Assistance to Indonesia for the Water Supply and Sanitation Sector	46
5	List of Preselected IKKs	47
6	Preselection Criteria of IKKs	50
7	Design Criteria	51
8	Implementation Schedule	52
9	Terms of Reference for Consultant Services	54
10	Cost Estimates of the Project	59
11	Responsibilities of PMU	61
12	Organization for PMU	62
13	Organization for Project Implementation	63
14	Materials and Equipment to be Procured under ICB	64
15	Implementation Status of Previous Water Supply Projects and Compliance with Existing Loan Covenants	65
16	Sensitivity/Affordability Analysis	69
17	Operation and Maintenance Cost for IKK Systems	72
18	Projected Income Statements	73

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

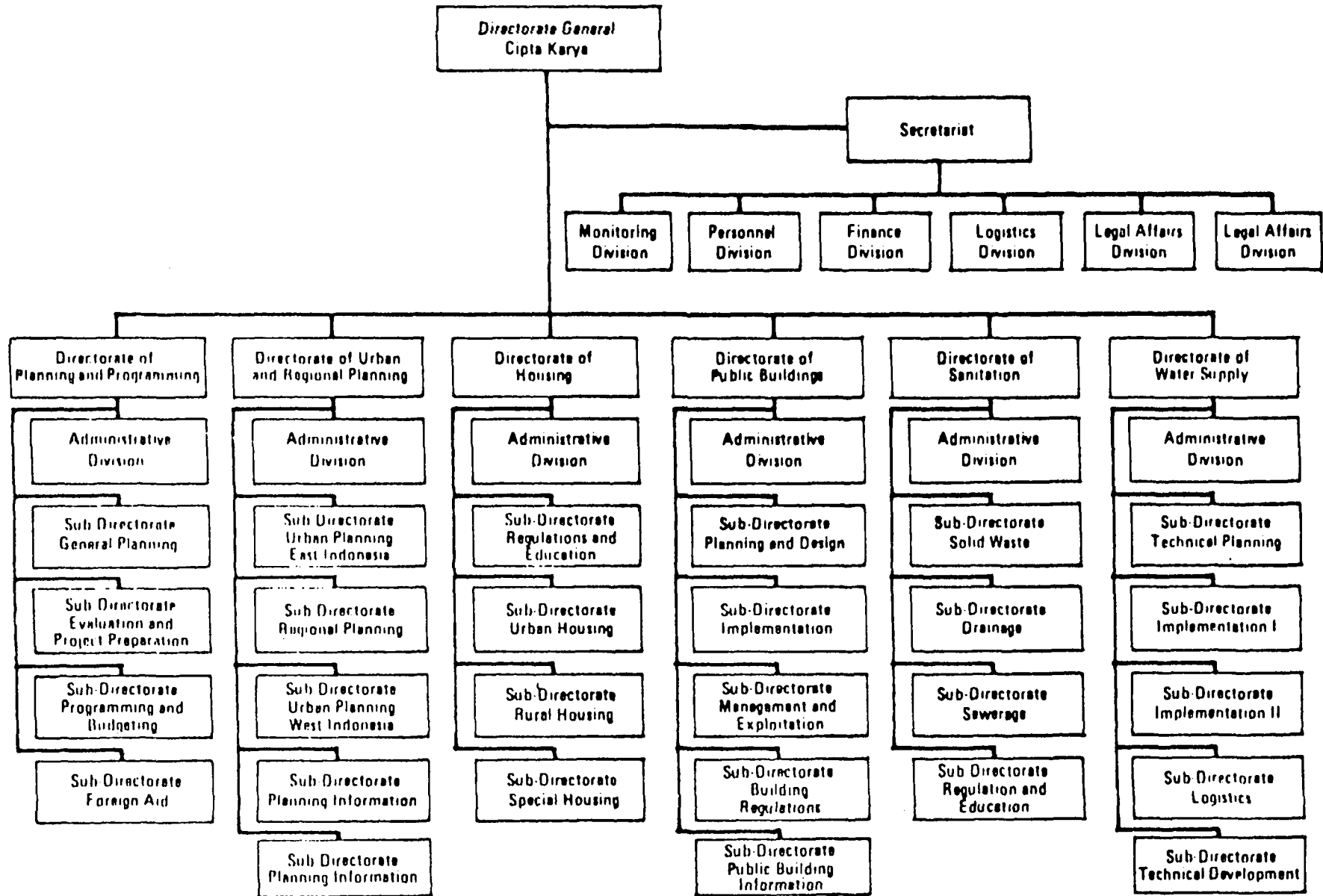
HEALTH STATISTICS IN INDONESIA, 1960-1982

	1960	1975	1982
Expectation of Life at Birth for Males	47.5	46.4	51.3
Expectation of Life at Birth for Females	47.5	48.7	54.4
Crude Birth Rate	43.0	42.9	35.9
Crude Mortality Rate	21.4	16.9	12.5
Child Mortality Rate	21.5	17.0	13.5
Death by Cause in (Percentage of total death)		1972 and 1980	
Lower Respiratory Tract Infection		12.0	19.9
Diarrhea		17.0	18.8
Cardiovascular		5.1	9.9
T.B.C.		6.0	8.4
Tetanus		4.6	6.5
Nervous System Diseases		5.1	5.0
Typhoid		2.1	3.3
Parasitic Diseases		3.0	3.0
Others		48.1	25.2

Source: Ministry of Health, 1984.

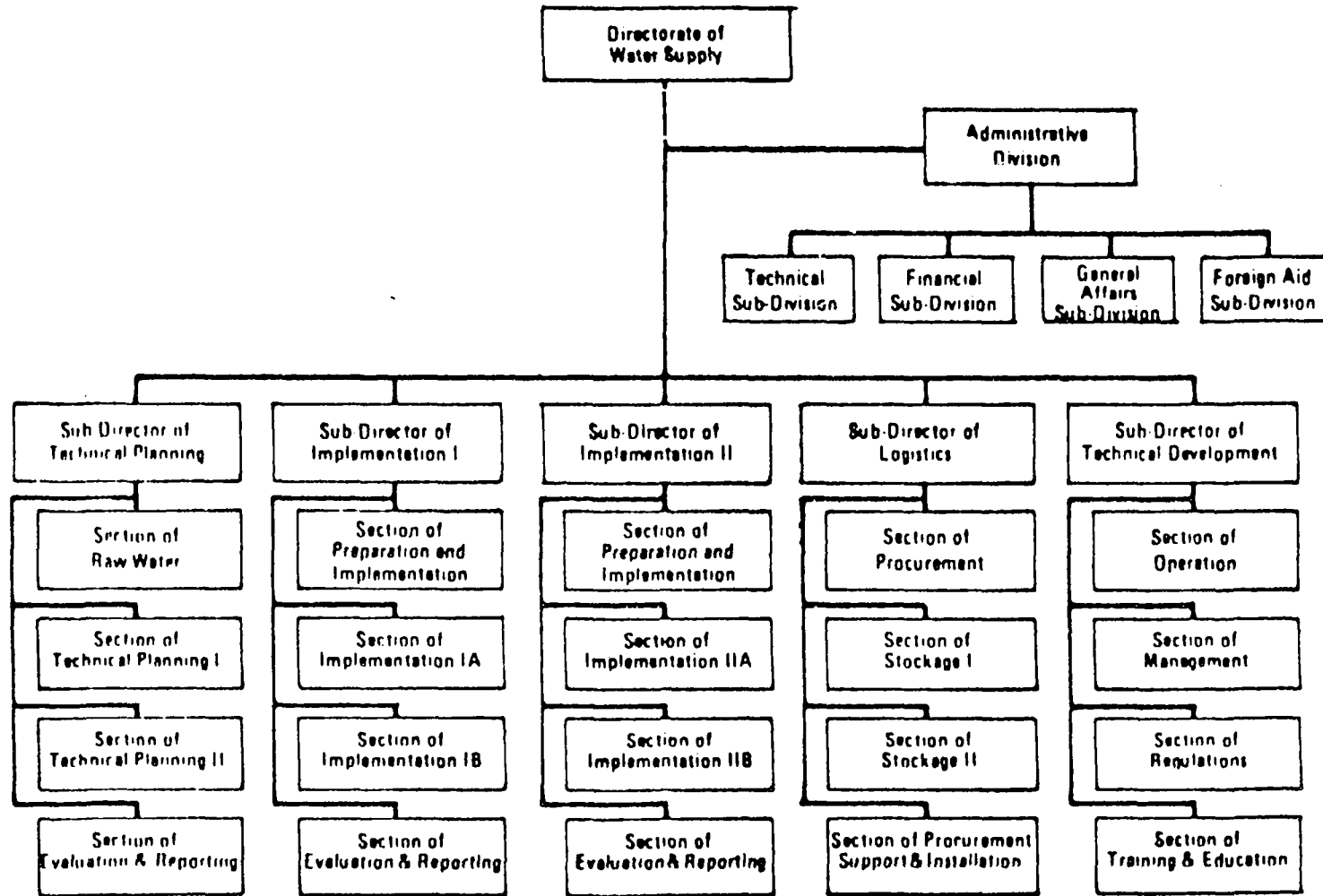
(Reference in text: page 2, para 5)

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT
 ORGANIZATION CHART: CIPTA KARYA

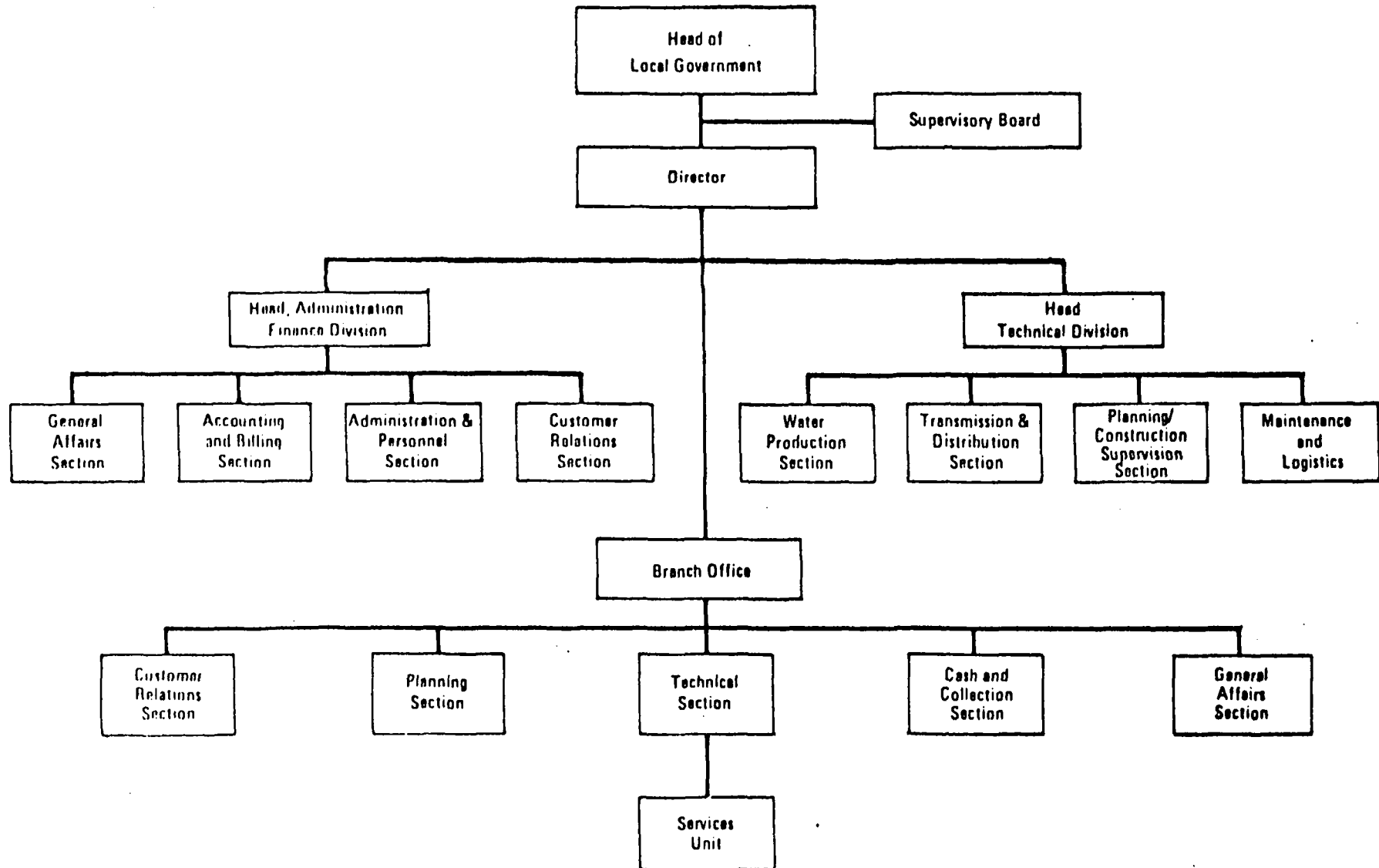


(Reference in text: page 3, para 7)

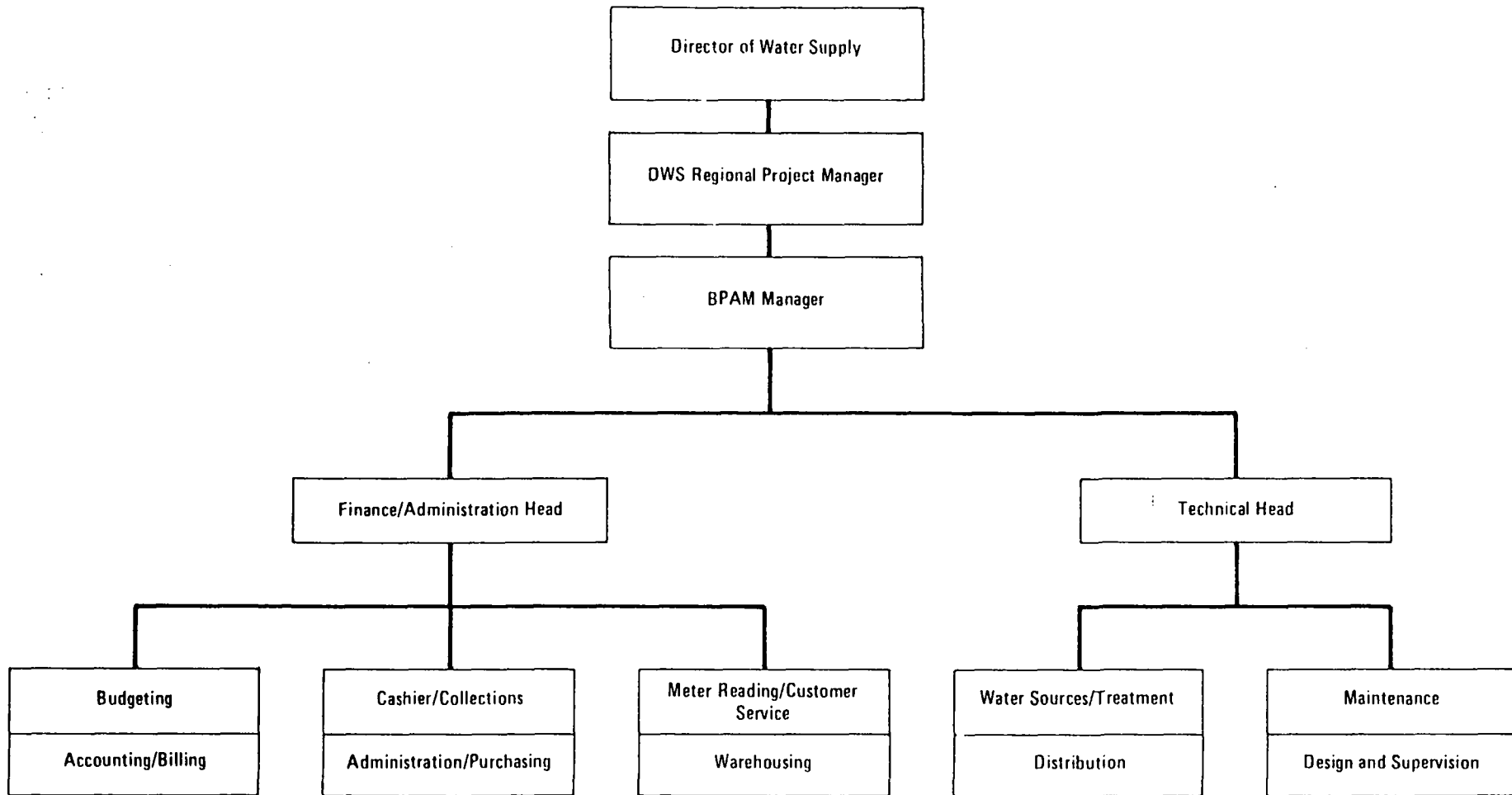
INDONESIA: IKK WATER SUPPLY SECTOR PROJECT
 ORGANIZATION CHART: DIRECTORATE OF WATER SUPPLY



INDONESIA: IKK WATER SUPPLY SECTOR PROJECT
ORGANIZATION CHART: TYPICAL PDAM
(SEMI-AUTONOMOUS REGIONAL WATER ENTERPRISE)



**INDONESIA: IKK WATER SUPPLY SECTOR PROJECT
 ORGANIZATION CHART: TYPICAL BPAM (TRANSITIONAL WATER SUPPLY MANAGEMENT UNIT)**



INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

FLOW RESTRICTOR

General

1. Flow restrictors probably have their origin in industrial application where fairly constant rates of dosing or mixing of various chemical solutions or liquors are often required in industrial processing. This device was introduced in the recent years in the Philippines in barangay water supply systems and this design concept was introduced in Indonesia in 1980. The chief aim of using restrictors is to have positive control over pipe flows in the distribution system and to dispense with service water metering for very low water usage. Two main types of restrictors are known to have been produced on a commercial scale: one having a flushing arrangement and the other without such an arrangement. The non-flushable restrictors come in two makes: one that has a rubber membrane to control the flow and is not affected by variation in service pressure; and the other that resembles small orifice plat which has some control over the flow rates.

Advantage of Using Restrictors

2. The use of flow restrictors in a water supply system will smooth out the pipe flows over the design operating period chosen (e.g. 24 hours). This would mean that pipe sizes of the distribution system can be significantly reduced (at least by 25 per cent to 35 per cent in diameter) depending on the peak hour demands that would otherwise have to be met from the system. Since all the discharges are controlled at reasonably constant rates, there is no need to install service meters, thus effecting a saving of \$15 to \$25 per connection. This in turn would permit the introduction of uniform tariff and monthly billing, resulting in large saving in time and effort in billing, collection and record keeping. In towns where the water supply has to be pumped into the distribution system, the need of electrical and mechanical plant/equipment can be substantially reduced.

Disadvantage of Using Restrictors

4. The main drawback of using flow restrictors is the inconvenience the beneficiaries would experience from time to time when the demand exceeds the available supply (either drawn from private storage or directly from the connection). In case where non-flushable restrictors are used, clogging could arouse objection from the beneficiaries. This could also lead to tampering if the problem is left unattended for too long.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

BANK'S ASSISTANCE TO INDONESIA FOR THE
WATER SUPPLY AND SANITATION SECTOR a/
(As of 30 September 1984)

No.	Title	Date of Approval	Amount (in \$ Million)
A. <u>LOANS</u>			
1.	195 Bandung Water Supply	07 Nov 74	11.5
2.	401 Bandung Water Supply (Suppl.)	29 May 74	8.0
3.	493 Small Towns Water Supply Sector	11 Dec 80	32.0
4.	547 Semarang Water Supply	25 Nov 81	<u>35.5</u>
			<u>87.0</u>
B. <u>TECHNICAL ASSISTANCE</u>			
1.	66 Bandung Water Supply	06 Jun 72	.295
2.	93 Irian Jaya Water Supply	18 Jul 73	.050
3.	254 Semarang Groundwater Investigation and Development	31 Oct 78	.210
4.	346 Water Supply Sector	21 Mar 80	.100
5.	501 IKK & Small Towns Water Supply Sector	23 Dec 82	.250
6.	601 Water Supply and Sanitation Sector Profile	28 May 84	<u>.050</u>
			<u>.955</u>
		TOTAL	<u><u>87.955</u></u>

a/ The Bandung Urban Development Project (Loan No. 400-INO, \$32.3 million, 1979) and the Medan Urban Development Project (Loan No. 550-INO, \$39.3 million, 1981) contain sanitation components amounting to \$12.03 million and \$9.99 million, respectively, and the latter also contains a water supply component amounting to \$9.63 million. A sanitation component is also included in the Bandung Urban Development and Sanitation Project (TA-Loan No. 271-INO, \$1.15 million, 1976). In addition, rural water supply components are contained in the irrigation projects Loans Nos. 243-INO (\$12.2 million, 1975), 301-INO (\$20.5 million, 1977), 352-INO (\$18.0 million, 1978), 475-INO (\$35.0 million, 1980), and 479-INO (\$55.2 million, 1980).

(Reference in text: page 12; para 35)

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

List of Preselected IKKs

Province	Kabupaten	IKK	Projected Population (1990)	Source	Capacity l/sec
CENTRAL JAVA	Banyumas	Tanjung	9,201	Spring	5.00
		Bandar	10,113	D. Well	5.00
	Batang	Tambakboyo	10,820	Spring	5.00
		Jati	11,944	D. Well	5.00
	Blora	Ngawen	8,886	D. Well	5.00
		Jiken	8,637	D. Well	5.00
		Jepon	9,619	Spring	5.00
		Kundurana	8,370	Spring	5.00
		Randuslatung	12,187	S. Well	5.00
		Mendenrejo	9,149	S. Well	5.00
		Tonjong	8,502	D. Well	5.00
	Brebès	Klamplok	9,769	D. Well	5.00
		Bantarkawung	9,282	D. Well	5.00
		Bumiayu	17,353	D. Well	10.00
		Adirala	8,916	D. Well	5.00
	Cilacap	Kawungaten	12,389	D. Well	5.00
		Kritik Kulon	10,054	Spring	5.00
		Cimangu	14,917	Spring	10.00
		Panduian	15,163	Spring	10.00
		Gandung Manis	20,550	S. Well	10.00
		Kuriran	14,443	S. Well	10.00
		Payem	8,320	S. Well	5.00
		Mrangen	8,462	D. Well	5.00
	Demak	Wedung	8,877	D. Well	5.00
		Tawangharjo	7,306	Spring	5.00
	Grobogan	Ngaringan	9,635	Spring	5.00
		Panunggalan	9,537	D. Well	5.00
		Pecagaan Kulon	12,460	D. Well	5.00
	Jepara	Sowan Lor	9,694	D. Well	5.00
		Bangsri	17,520	S. Well	10.00
		Tuban	9,141	Spring	5.00
	Karang Anyar	Malangjiwan	11,199	Spring	5.00
		Mringgo	19,642	D. Well	10.00
		Gondosari	9,557	D. Well	5.00
Kudus	Mejobo	15,655	S. Well	10.00	
	Kayen	9,595	D. Well	5.00	
Pati	Rowokembu	12,422	D. Well	5.00	
Pekalongan	Kesesi	18,256	D. Well	10.00	
	Doro	11,813	D. Well	5.00	
	Tirto	16,499	Spring	10.00	
	Kajen	11,857	Spring	5.00	

(Reference in text: page 15, para 40)

Province	Kabupaten	IKK	Projected Population (1990)	Source	Capacity l/sec	
CENTRAL JAVA	Pemalang	Bantar Bolang	11,001	D. Well	5.00	
		Mendelem	10,939	D. Well	5.00	
		Randudongkal	17,395	S. Well	10.00	
	Rembang	Sarang	14,347	Spring	10.00	
		Pamotan	8,583	S. Well	5.00	
	Sukoharjo	Cemani	10,564	Spring	5.00	
		Palur	7,651	Spring	5.00	
		Kartosura	14,289	Spring	10.00	
	Tegal	Balapulang	11,635	Spring	5.00	
	YOGYAKARTA	Bantul	Argorejo/Argosa	17,242	Spring	10.00
Donotirto			13,951	Spring	5.00	
Triharjo/Wijiha			13,988	D. Well	5.00	
Triwidadi			8,855	Spring	5.00	
Mulyodadi			11,652	D. Well	5.00	
Plered			8,605	D. Well	5.00	
Gunung Kidul		Nglipar	14,440	Spring	10.00	
		Kemijing/Semin	13,058	Spring	5.00	
		Kampung	6,930	D. Well	2.50	
		Sidoarjo	6,407	D. Well	2.50	
		Pringombo	4,881	D. Well	2.50	
		Kulon Progo	Hargowilis	10,078	Spring	5.00
Giripurwo			8,358	Spring	5.00	
Gerbosari			10,707	D. Well	5.00	
Kanoman			9,042	D. Well	5.00	
Bendungan			6,768	D. Well	2.50	
Temon Wetan			6,925	D. Well	2.50	
Jatirejo			6,541	S. Well	2.50	
Banjarharjo			9,965	S. Well	5.00	
Sleman			Ambarketawang	12,846	D. Well	5.00
			Binangon	10,538	D. Well	5.00
		Margomulyo	14,908	Spring	10.00	
		Sumber Agung	11,112	D. Well	5.00	
		Tegaltirio	19,110	Spring	10.00	
		Triharjo	13,309	D. Well	5.00	
		Ukirkari	9,741	D. Well	5.00	
		Donojerta	16,230	Spring	10.00	
		Widodomartini	6,961	S. Well	2.50	
		Sendangrejo	8,784	S. Well	5.00	
		Bokoharjo	7,382	D. Well	5.00	

Province	Kabupaten	IKK	Projected Population (1990)	Source	Capacity 1/sec	
SOUTH SUMATRA	Bangka	Belinyu	16,049	Spring	10.00	
		Koba	9,266	D. Well	5.00	
		Taboali	9,920	D. Well	5.00	
		Baturusa	9,920	D. Well	5.00	
		Sungai Selam	4,386	S. Well	2.50	
	Delitung	Kelapa Kampit	16,210	D. Well	10.00	
		Manggar	20,000	D. Well	10.00	
	Lahat	Arahan	7,833	Spring	5.00	
		Muara Pinang	7,737	Spring	5.00	
		Padang Tepung	7,756	D. Well	5.00	
	Muara Enim	Talang Ubi	8,552	D. Well	5.00	
		Tempirai	8,552	D. Well	5.00	
		Ujan Masi	7,386	D. Well	5.00	
	Musi Banyu Asin	Pangkalan Balai	8,409	D. Well	5.00	
	Musi Rawas	Bingin Teluk	13,007	D. Well	5.00	
		Muara Rupit	10,146	D. Well	5.00	
	O. K. I.	Sarolangun	6,533	S. Well	2.50	
		Pemulutan	14,447	Spring	10.00	
		Tulung Salapan	8,118	D. Well	5.00	
		Tanjung Batu	7,980	S. Well	5.00	
		Tanjung Lubuk	7,614	S. Well	5.00	
	O. K. U.	Paninjauan	8,452	D. Well	5.00	
		Kurungang Nyawa	11,104	D. Well	5.00	
Banding Agung		6,273	S. Well	2.50		
LAMPUNG	Lampung Selatan	Simpang	5,177	S. Well	2.50	
		Jati Baru	16,850	Spring	10.00	
		Gading Rejo	12,800	Spring	5.00	
		Sukdharjo	15,810	Spring	10.00	
		Bangunan	9,201	Spring	5.00	
		Bawang	9,570	S. Well	5.00	
		Putih Doh	6,673	S. Well	2.50	
		Recelaran	7,108	S. Well	2.50	
		Lampung Tengah	Negara Batin	16,141	D. Well	10.00
			Gaya Baru 1,2	7,758	D. Well	5.00
	Sumber Gede		10,054	D. Well	5.00	
	Sukadana Darat		20,138	D. Well	10.00	
	Braja Sakti		20,448	D. Well	10,00	
	Bangun Rejo		7,274	D. Well	5.00	
	Lampung Utara	Tanjung Harapan	6,030	D. Well	2.50	
		Kasui Pagar	11,733	D. Well	5.00	
		Kalibalangan	9,263	D. Well	5.00	
		Negara Ratu	11,581	D. Well	5.00	
		Bukit Kemuning	20,000	D. Well	10,00	
		Piuh Balak	18,349	Spring	10.00	
Pasar Banjit	6,904	Spring	2.50			

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

Preselection Criteria of IKKs

The method of subproject selection adopted by the Executing Agency is based on a priority ranking of social and economic factors. In general the following criteria are applied:

- (i) Size: IKK with larger population have priority
- (ii) Need: frequency of water borne diseases; availability of water; income (low income IKK have priority)
- (iii) Cost: IKK with high population density have priority as well as those with a low cost for water resource development
- (iv) Other: IKK with at least two other kind of infrastructure development projects (road, electricity, etc.) have priority.

(Reference in text: page 15, para 42)

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

Design Criteria

Item	Criteria
Population Served	75% of the projected 1990 population
Ratio of population served by public standpipes to those served by house connections	50%/50%
Demand at public standpies	30 liters/capita/day
Delivery to a house connection	600 liters/day
Allowance for non-domestic demand	5% of domestic demand
Allowance for "unaccounted-for" flow	15% of total demand
Peak hydraulic factor for pipelines	2.0
Number of persons served by public standpipes	200 persons/unit
Minimum pressure in distribution system	10 meters head

(Reference in text: page 15, para 42
and page 21, para 55).

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

IKK Water Supply Sector Project
Implementation Schedule

The Project is expected to begin during FY 1985/86 and be completed by the end of FY1989/90. During 1985/86 the preparation of feasibility studies/appraisal reports will be taken up and the implementation of subprojects will be according to the following schedule:

Province	Group A		Group B		Group C		TOTAL	
	IKK	Kabupaten Subproject	IKK	Kabupaten Subproject	IKK	Kabupaten Subproject	IKK	Kabupaten Subproject
Central Java	10	3	11	4	29	9	50	16
Yogyakarta	5	1	13	2	12	2	30	5
South Sumatra	5	1	8	2	12	5	25	8
Laupung	6	1	7	1	7	1	20	3
TOTAL	26	6	39	9	60	17	125	32

(Reference in text: page 18, para 47;
page 25, para 63;
and page 26, para 64)

**IKK WATER SUPPLY SECTOR PROJECT
IMPLEMENTATION SCHEDULE**

	Y E A R					
	1985	1986	1987	1988	1989	1990
A. Preparatory Activities						
1. Appointment of Individual Consultants	■					
2. Appointment of Principal Consultants	■					
3. Appointment of Local Consultants	■					
4. Establishment of PMU	■					
5. Establishment of Project Offices	■					
6. Establishment of Subproject Offices	■	■				
7. Planning Project, Monitoring Mechanisms, etc.	■	■				
8. Preparation of Formats for Reports ^{1/} and Procedures	■	■				
9. Collection of Information ^{2/}	■	■				
10. Preparation of ICB Documents and International Tendering	■	■				
11. Planning of Local Consultancy Work Inputs	■	■				
12. Preparation of Standard Tender Documents	■	■				
B. Group A Subprojects						
1. Feasibility Study		■				
2. Appraisal by Cipta Karya		■				
3. Approval by Bank		■				
4. Detailed Design		■				
5. BPAM/PDAM Establishment		■				
6. Local Tendering		■				
7. Construction Works ^{3/}		■	■			
8. Trial Run/Commissioning			■			
C. Group B Subprojects						
1. Feasibility Study		■				
2. Appraisal by Cipta Karya		■				
3. Approval by Bank		■				
4. Detailed Design		■				
5. BPAM/PDAM Establishment		■				
6. Local Tendering		■				
7. Construction Works ^{3/}		■	■			
8. Trial Run/Commissioning			■			
D. Group C Subprojects						
1. Feasibility Study		■				
2. Appraisal by Cipta Karya		■				
3. Approval by Bank		■				
4. Detailed Design		■				
5. BPAM/PDAM Establishment		■				
6. Local Tendering		■				
7. Construction Works ^{3/}		■	■			
8. Trial Run/Commissioning			■			
E. Preparation of Second IKK WS Sector Project						
1. Study	■					
2. Preliminary Report	■					
3. Draft Final Report	■					
F. Training		■	■	■	■	■

1/ Progress Reports, Feasibility Study Reports, Appraisal Reports for Subprojects, Detailed Design Reports, Tendering Evaluation.

2/ For preparation of conditions of tendering, conditions of contract and preparation of engineering specifications.

3/ Including installation of equipment.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

CONSULTANT SERVICES - OUTLINE TERMS OF REFERENCE

The consultant services will include, but not limited to the following:

I. INDIVIDUAL CONSULTANTS

A. Chief Technical/Project Management Consultant

1. Assist the Project Director and PMU in supervising the Principal and Local Consortia Consultants in respect of all technical/engineering aspects of the Project, i.e., detailed engineering design, preparation of specifications, tender, award of contract, bulk procurement, construction and subsequent operation and maintenance of the completed schemes;
2. Review available technical manuals which had been developed, if necessary, make required modification to make them adaptable for use on the subprojects;
3. Prepare quarterly progress reports required by the Bank regarding the implementation of the Project as well as other reports needed by Government agencies;
4. Formulate systems and procedures for the proposed centralized servicing of repair facilities and make recommendations for the technical and financial operations of such facilities;
5. Coordinate and supervise the activities of the two Principal Consultants stationed in Sumatra and Java; and
6. Carry out in consultation with the Project Director any other assignment deemed necessary during the implementation of the Project as directed by the Executing Agency.

B. Financial Management Consultant

1. Provide management assistance to Project Director and PMU on all financial aspects and guidance to the Project Managers in the preparation of subproject appraisal reports as well as in unified accounting systems for the Project;
2. Assist in the preparation of budget proposals for the Project;
3. Assist in expediting loan reimbursement and disbursement applications;

(Reference in text: page 18, para 48
and page 21, para 55).

4. Develop and design appropriate construction cost accounting systems to keep a systematic record of construction cost, control of expenditures and budget of the Project in accordance with a standard unit cost and upon Project completion prepare the project accounting report;
5. Train Government counterpart personnel in the preparation and use of construction cost accounting systems; and
6. Assist in the preparation of reports showing financial and corresponding physical achievements as well as in the preparation of reports regarding financial matters as specified in the Loan Agreement.

C. Institutional Development Consultant

1. Development institutional development program for Cipta Karya Project Management personnel and PUOD personnel for management of PDAMs, manpower training specialists of Cipta Karya, the Project and Subproject Managers in all aspects relating to their functions and responsibilities;
2. Review the organization of Provincial Project Offices and subproject offices in each kabupaten in Central Java, Yogyakarta, South Sumatra and Lampung, offer appropriate recommendations regarding their organization and staffing to enable them to cope up more efficiently with their expanded operations and develop job descriptions for key positions;
3. Review manuals, regulations, instructions and other procedures relating to the operation of Provincial Project Offices and Subproject Offices in each kabupaten and develop manuals and standard operating procedures for these offices as well as assist in their implementation; and
4. Review the organization and systems and procedures used by existing BPAMs and PDAMs, develop appropriate recommendations with a view to further simplifying them for the use by the similar PDAMs which will operate the subprojects covered by the Project as well as assist in the implementation of the necessary systems and procedures.

D. Manpower Training Consultant

1. Development training programs for Cipta Karya Project Management personnel and PUOD personnel for management of PDAMs, manpower training specialists of Cipta Karya, the Project and Subproject Managers and IKK staff in all aspects related to the function and responsibility of each of the above target personnel;

2. Review and develop manuals and standard procedures for these offices and assist in their implementation; and
3. Assess the manpower requirements of every PDAM/BPAM which will manage the operation and maintenance of Project facilities and tender advice regarding proper recruitment and training of personnel who will ultimately operate and maintain the Project facilities.

II. PRINCIPAL CONSULTANTS

1. Guidance to the local consultants in the investigation of alternative water sources to the extent that such investigations have not been satisfactorily covered in previous studies;
2. Investigation of groundwater resources for the subprojects; (no drilling of trial bores shall be recommended in areas where groundwater is very unlikely to provide a viable source, or in areas where existing data is sufficient to give evidence of good groundwater potential. The Principal Consultant shall be responsible for all aspects of test well design, drilling and pumping tests);
3. Assistance to the Provincial Project Offices in the preparation of Appraisal Reports for each subproject/IKK based on the feasibility studies prepared by the Local Consultants;
4. Guidance to the Local Consultants to assess the likely environmental impacts of proposed subproject with emphasis on waste disposal and recommend required detailed designs;
5. Review of the detailed designs and drawings, specifications and tender documents prepared by the local consultants for each subproject;
6. Review of evaluation of tenders prepared by local consultants for all Project works;
7. Guidance to local consultants in the supervision of construction of all Project works;
8. Bulk procurement following Bank's Guidelines for Procurement; and
9. Preparation of progress reports, project monitoring and programming.

III. LOCAL CONSULTANTS

1. Investigation with the guidance from the Principal Consultants of alternative water sources to the extent that such investigations have not been satisfactorily covered in previous studies;
2. Review of existing reports relevant to each subproject to determine additional works required and prepare a satisfactory master plan of works to meet projected water supply requirements for each subproject IKK;
3. Preparation of feasibility study for each subproject IKK recommending works to be taken on the basis of least cost solution considering both capital cost and operations, maintenance and replacement; assistance in the preparation of the appraisal reports;
4. Assess the likely environmental impacts of each subproject with emphasis on waste water disposal and recommend required detailed designs;
5. Preparation of detailed design and drawings, specifications and tender documents for each subproject;
6. Evaluation of tenders for all Project works;
7. Supervision of construction of all Project works. In this activity, the consultant will receive considerable support from the Principal Consultants as well as the staff of the Executing Agency;
8. Assistance to the Principal Consultants to determine the precise scope of materials to be bulk procured to cover all stages of the project until construction is completed; and
9. Assistance to the Principal Consultants in the preparation of progress reports, project monitoring, programming, coordination etc.

PROJECT PREPARATION FOR THE PROPOSED
SECOND IKK WATER SUPPLY SECTOR PROJECT

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

- (i) To carry out a comprehensive review of the semi-urban water supply subsector development for the provision of piped water supply to IKKs in Central Java, Yogyakarta, South Sumatra and Lampung, and based on this review, recommend about 125 IKKs to be included in the proposed Project;
- (ii) To select one representative Kabupaten in each of the provinces of Central Java, Yogyakarta, South Sumatra and Lampung (each Kabupaten shall contain about 5 IKKs to be included in the proposed Project) and prepare comprehensive feasibility studies (including pre-designs) for the supply of piped water supply facilities to the aforesaid selected IKKs and prepare detailed financial analyses for the selected subprojects; and
- (iii) To formulate a Project suitable for consideration for possible external financing to provide piped water supply facilities to about 125 IKKs in the provinces mentioned in (ii) above.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

COST ESTIMATES OF THE PROJECT
(\$ Million)

Component	Foreign	Local	Total
A. Land	-	1.00	1.00
B. Source Development			
1. Deepwells			
Civil Works	0.86	1.19	2.05
Materials and Equipment	1.92	0.22	2.14
2. Springs			
Civil Works	0.14	0.18	0.32
Materials and Equipment	0.08	0.01	0.09
3. Shallow Wells			
Civil Works	0.24	0.33	0.57
Materials and Equipment	0.22	0.03	0.25
C. Treatment			
Civil Works	0.06	0.07	0.13
Materials and Equipment	0.34	0.05	0.39
D. Pumping Stations			
Civil Works	0.12	0.17	0.29
Materials and Equipment	0.62	0.07	0.69
E. Transmission Main			
Civil Works	1.88	2.60	4.48
Materials and Equipment	6.06	0.67	6.73
F. Distribution System			
Civil Works	1.77	2.45	4.22
Materials and Equipment	5.69	0.63	6.32
G. Stores/Workshops/Training Rooms/Offices			
Civil Works	0.76	1.05	1.81
Materials and Equipment	0.31	0.30	0.61
H. Communications Equipment	0.16	0.04	0.20

Component	Foreign	Local	Total
I. Vehicles	-	0.25	0.25
J. Administration/Operational Costs	-	0.70	0.70
K. Consultant Services			
1. Feasibility Study/detailed design	1.80	1.42	3.22
2. Supervision of Construction	1.02	2.10	3.12
3. Project Preparation	0.18	0.17	0.35
4. Training	<u>0.30</u>	<u>1.85</u>	<u>2.15</u>
Sub-Total	24.53	17.55	42.08
L. Contingencies			
1. Physical (10%)	2.45	1.76	4.21
2. Price Contingency	<u>6.07</u>	<u>6.49</u>	<u>12.56</u>
TOTAL	33.05	25.80	58.85
M. Recovery of excess grant portion of prior Technical Assistance	0.04	-	0.04
N. Interest During Construction	<u>7.11</u>	<u>-</u>	<u>7.11</u>
GRAND TOTAL	<u>40.20</u>	<u>25.80</u>	<u>66.00</u>

Appendix 11

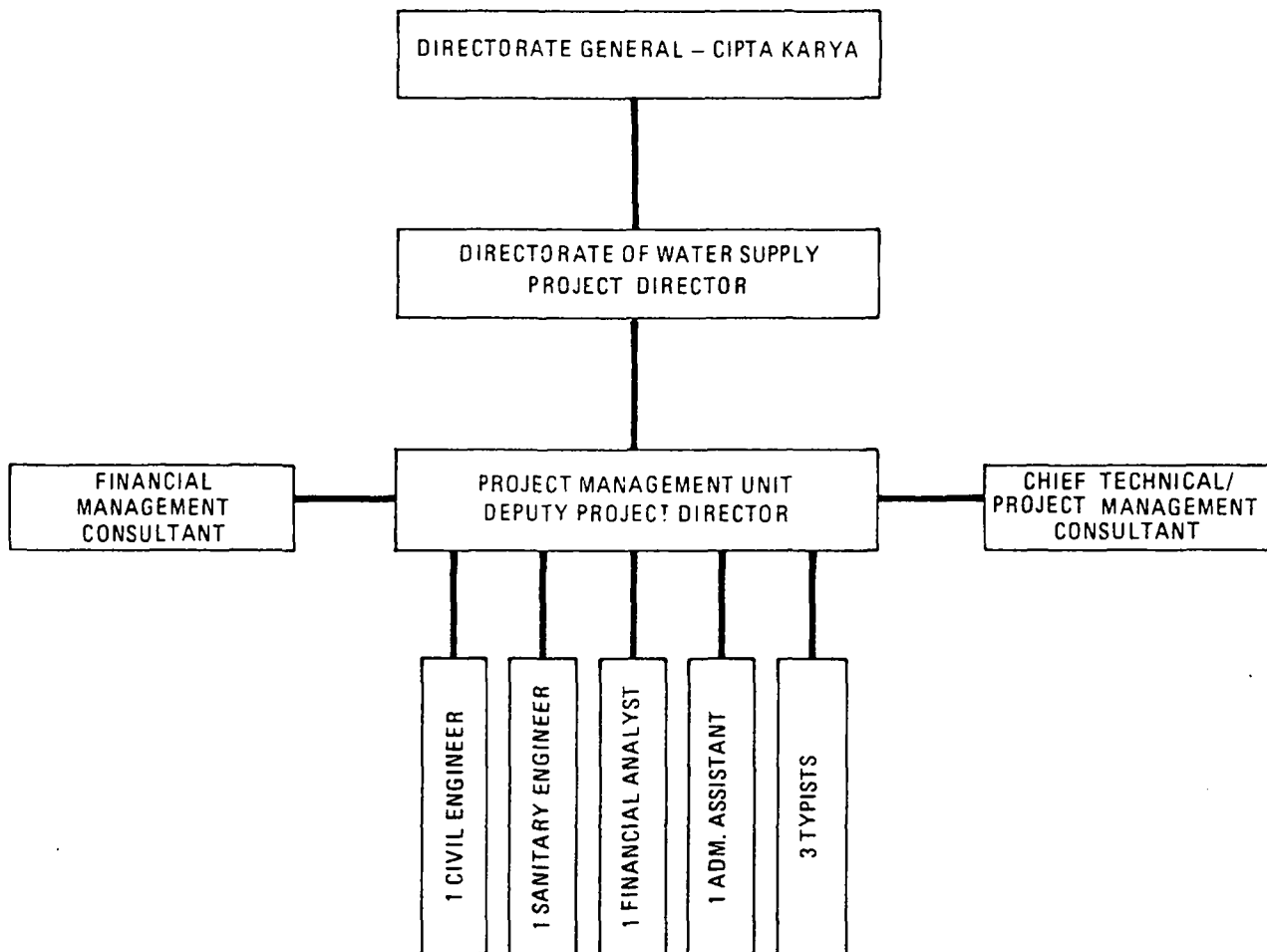
INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

Responsibilities of the Project Management Unit

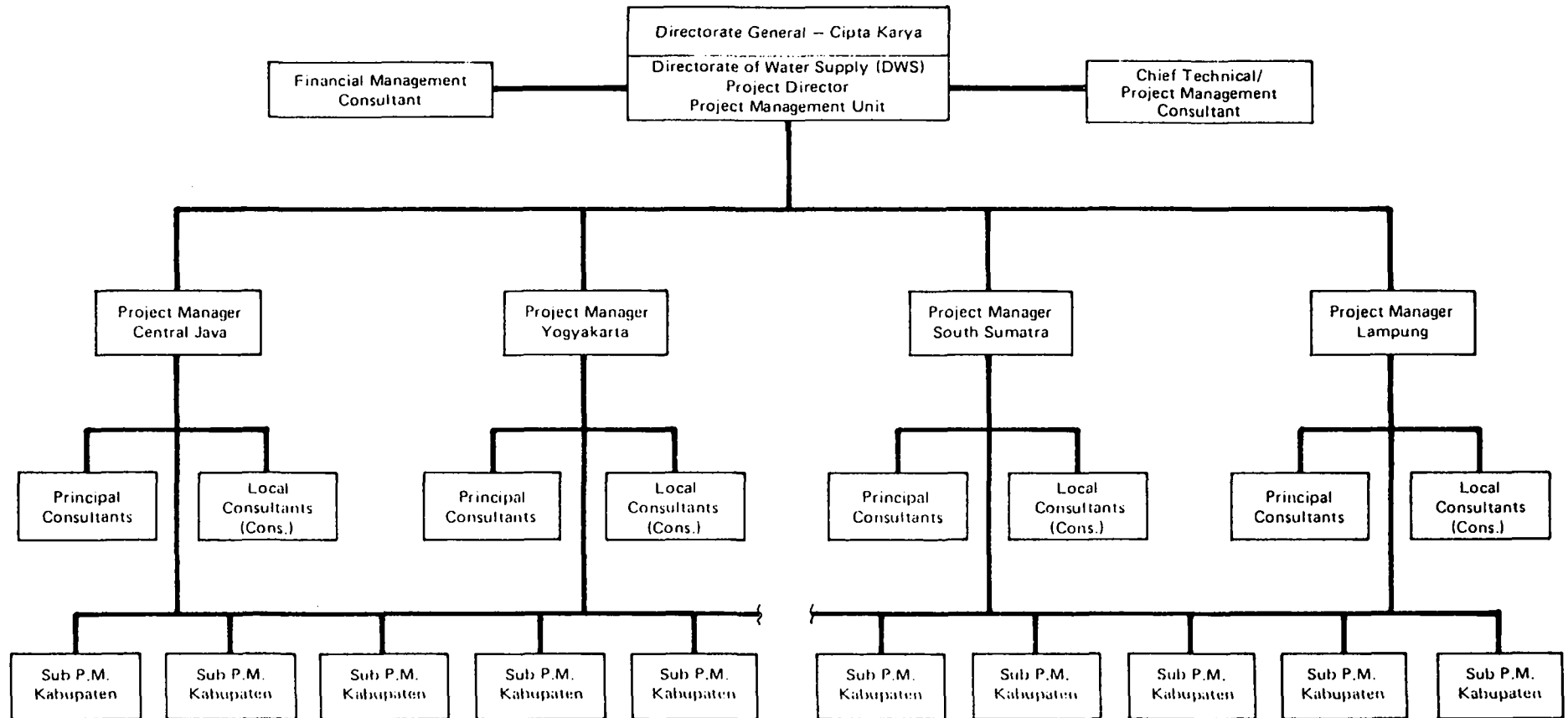
1. Overall coordination, planning, supervision, monitoring and guidance for the implementation of the Project.
2. Supervision of the activities of the consultants appointed to carry out the preparation of the feasibility studies, detailed appraisal of subprojects, detailed design and supervision of construction of the Project.
3. Coordination of:
 - (i) ongoing physical construction work under the Project;
 - (ii) allocation of funds to individual subprojects;
 - (iii) suppliers of materials and equipment; and
 - (iv) other government agencies, if any, involved in the implementation of the Project.
4. Preparation of budget and budgetary control of the overall Project.
5. Liaison with the Bank with respect to all matters concerning the implementation of the Project.
6. Preparation and submission to the Bank of appraisal reports and all necessary withdrawal applications and other related documents.
7. Submission to the Bank of inception, quarterly, preliminary and final reports and other related documents prepared by the consultants.
8. Recommendation of actions to alleviate implementation problems.
9. Revision and approval of feasibility studies, detailed design, tender documents and prequalification of tenders.

(Reference in text: page 25, para 62)

IKK WATER SUPPLY SECTOR PROJECT
ORGANIZATION FOR PROJECT MANAGEMENT UNIT



IKK WATER SUPPLY SECTOR PROJECT ORGANIZATION FOR PROJECT IMPLEMENTATION



Reference in text: page 25, para 62

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

List of Major Items for
Procurement by International Competitive Bidding

	<u>Preliminary Estimated Quantity</u>
A. <u>Pipe</u>	
Diameter 100 mm - 250 mm	625 km
Diameter 25 mm - 150 mm	1,150 km
B. <u>Pumps and Controls</u>	
Water Intake Facilities)	To be prepared as part of subproject Feasibility Studies
Booster Stations)	
C. <u>Other Mechanical Equipment</u>	
Flow Restrictors)	To be prepared as part of subproject Feasibility Studies
Valves and Fittings)	
D. <u>Electrical Equipment</u>	
Generators)	To be prepared as part of subproject Feasibility Studies
Transformers)	
Switchgear and cabling)	
E. <u>Storage Tanks</u>	To be prepared as part of subproject Feasibility Studies

(Reference in text: page 27, para 67)

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

IMPLEMENTATION STATUS OF PREVIOUS WATER SUPPLY PROJECTS
AND COMPLIANCE WITH EXISTING LOAN COVENANTS

1. Bandung Water Supply (Loan Nos. 195(SF)/401-INO)

The principal Loan 195(SF) was approved by the Bank on 7 November 1974 and supplementary Loan 401 was approved on 29 May 1979 for \$11.50 million and \$8.0 million, respectively. The loans were to finance the foreign exchange component of the expansion of Bandung Water Supply System. The Project components included: (i) construction of 24 production wells; (ii) 370 km of transmission and distribution mains, 200 public bath houses, 200 public standpipes and 13,000 water service meters; and (iii) 3 water treatment plants with total capacity of 66,200 cu m/day and 3 service reservoirs with a total capacity of 19,000 cu m. All civil works are completed and Bandung is getting the benefit of the Project. The Project was to be completed by December 1981. However, the Project is now expected to be completed by the middle of 1987, because of delays as a result of cost overrun and procurement of additional pipes and bulk flow meters from the loan savings in an amount of \$651,000.

Compliance with Loan Covenants (Loan Nos. 195(SF)/401-INO)

<u>Covenant</u>	<u>Status</u>
(i) Water Enterprise will have its accounts and financial statements audited annually and have them forwarded to the Bank not later than six months after the close of the fiscal year (L.A. 4.11(b)).	Statements for previous years have been completed on time. However, due to delay in translation from Indonesian to English, submissions have been delayed.
(ii) All water supplied by the Water Enterprise through public standpipes and public bath houses will be paid (L.A. 4.9(a)).	Not yet applicable. Only few have been installed.
(iii) Auditors will undertake a comprehensive review annually of the internal financial procedures of the Water Enterprise. Recommendation will be implemented (L.A. 4.10(b)).	Complied with although reviews have been conducted by financial management consultants.
(iv) Water Enterprise to recruit an adequate number of additional qualified staff acceptable to the Bank, to carry out responsibility for operation and maintenance of the water supply system of Bandung, including the Project facilities (Schedule 5.2(a), S.L. 4.8(b)).	The existing organization is capable of operating and managing the existing facilities. A new organizational structure is under implementation with all key personnel employed. Increased salary levels have facilitated recruitment.

- (v) Water Enterprise shall prepare an appropriate and adequate financial management reporting system to be submitted for the Bank's review and approval by 1 January 1980 (Schedule 5.4). A manual has been approved.

2. Semarang Water Supply (Loan No. 547-INO)

A loan for an amount of \$35.5 million was approved by the Bank on 25 November 1981. The Project covers the development of additional water supply from groundwater source transmission and expansion of distribution system including replacement of existing defective pipelines. The Project component included: (i) construction of about 45 deep wells and collecting systems of about 38 km of pipes; (ii) construction of about 29 km of transmission main; (iii) construction of 42 km of trunk main, 250 km of distribution pipelines and 40,000 water service meters; and (iv) construction of service reservoirs of total capacity of 12,500 cu m and replacement of about 100 km of old distribution pipes. When completed the supply capacity will be increased from 72,000 cu m/day to 132,500 cu m/day and the population provided with an adequate 24-hour water supply, as compared to the present intermittent supply, will increase from around 300,000 to about 490,000. There are no major problems associated with the implementation of the Project and is expected to be completed by mid-1987 (9 months behind schedule), because of late appointment of consultants.

Compliance with Loan Covenants (Loan 547-INO)

<u>Covenant</u>	<u>Status</u>
(i) Submission of the audited Project accounts (L. A. 4.06(b)).	Not yet complied with; but separate accounts have been kept for the Project.
(ii) Submission of quarterly progress report on the Project (L. A. 4.07(b)).	Not complied with. However, the Bank had been kept informed on the Project implementation through various missions and progress reports are under preparation.
(iii) Periodic review of SWE's tariffs (L.A. 4.12(b)).	Complied with, but needs further revision (for increased tariffs).
(iv) To complete an overall survey of the distribution pipelines and the related records by 30 June 1983. Preparation of a phased rehabilitation program for defective pipelines (L. A. 6.12(i)).	Substantially complied with; but leakage survey has yet to be carried out to locate major leaks. The first phase pipe replacement program has been formulated.

(v) Preparation of a water metering improvement program by 30 June 1983.

This program will be submitted by 30 November 1984.

3. Small Towns Water Supply Sector Project (Loan No. 493-INO)

The loan was approved on 11 December 1980 in the amount of \$32.0 million to finance the foreign exchange component of the development of water supply systems in 33 small towns located in the provinces of Central Java and South Sumatra. Most of the towns did not have piped water supply facilities earlier. The Project components include: (i) intake works; (ii) treatment plants; (iii) transmission mains; (iv) storage tanks; (v) primary distribution mains; (vi) secondary and tertiary mains; (vii) house connections; (viii) public standpipes; (ix) office buildings; and (x) utility vehicles for all the aforesaid subprojects.

The implementation of the Project has been behind the original schedule because of: (i) delay in the recruitment of the principal and local consultants; (ii) lack of technical expertise in the Executing Agency and local consultants for appraisal of subprojects; and (iii) necessity to give guidance to the local consultants for the preparation of feasibility reports and appraisal reports. As of October 1984, the Bank had approved 31 subprojects. The Project was expected to be completed by March 1984 but due to the previously stated delays completion date is estimated on March 1988.

Compliance with Loan Covenants (Loan No. 493-INO)

<u>Covenant</u>	<u>Status</u>
(i) Subprojects will be selected for consideration on the basis of agreed selection criteria (L.A. 5(4)).	This has been fully complied with. The Executing Agency has selected 33 subprojects on the basis of agreed criteria.
(ii) Subprojects will be appraised and submitted to the Bank for approval on the basis of agreed technical, financial and economic and environmental criteria (L.A. 5(5)).	This is being complied with. The Executing Agency has submitted Appraisal Reports for 31 subprojects and the Bank has approved all of them.
(iii) Subprojects will be designed in accordance with agreed criteria, and documents covering particulars of the designs and implementation will be submitted by the Bank following approval by the Bank of the subprojects and before construction is undertaken (L.A. 5(8)).	This is being complied with by the Executing Agency. Detailed designs are being prepared by the Principal and Local Consultants based on the design criteria approved by the Bank.

- (iv) The Executing Agency will be responsible for the commissioning of the subprojects prior to the establishment of autonomous Water Enterprises (L.A., Schedule 5, para 3). Compliance not yet due.
- (v) Autonomous Water Enterprises shall be established not later than two years after the completion of subprojects (L.A., Schedule 5, paras 9 and 10). Compliance is not yet due.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

Sensitivity/Affordability Analysis

SMALL SYSTEM, 1990

	Gravity Flow with Minimum Treatment				Pumped Spring Source or Deep Well with Minimum Treatment				Water Treatment and Pumped Supply			
	House Connection		Standpipe		House Connection		Standpipe		House Connection		Standpipe	
	Monthly Charge (Rp)	Percentage of Average Household Income b/	Monthly Charge (Rp)	Percentage of Low Household Income b/	Monthly Charge (Rp)	Percentage of Average Household Income b/	Monthly Charge (Rp)	Percentage of Low Household Income b/	Monthly Charge (Rp)	Percentage of Average Household Income b/	Monthly Charge (Rp)	Percentage of Low Household Income b/
1. Base Case	1,074	0.7	358	0.7	3,026	2.0	1,009	2.0	4,021	2.7	1,340	2.7
2. Increase in Operation & Maintenance Costs by 10 per cent	1,182	0.8	394	0.8	3,329	2.2	1,110	2.2	4,423	2.9	1,474	2.9
3. Reduction in Served Population by 10 per cent	1,194	0.8	398	0.8	3,363	2.2	1,121	2.2	4,468	3.0	1,489	3.0
4. Combination of 2 and 3 above	1,314	0.9	438	0.9	3,699	2.5	1,233	2.5	4,914	3.3	1,638	3.3

a/ Expressed in real terms.

b/ Assumed to be Rp150,000 (based on Government statistics for 1983).

c/ Assumed to be Rp50,000 (based on Government statistics for 1983).

Reference in text: page 32, para 88)

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

Sensitivity/Affordability Analysis

MEDIUM SYSTEM, 1990

	Gravity Flow with Minimum Treatment				Pumped Spring Source or Deep Well with Minimum Treatment				Water Treatment and Pumped Supply			
	House Connection		Standpipe		House Connection		Standpipe		House Connection		Standpipe	
	Monthly Charge a/ (Rp)	Percentage of Average Household Income b/	Monthly Charge a/ (Rp)	Percentage of Low Household Income b/	Monthly Charge a/ (Rp)	Percentage of Average Household Income b/	Monthly Charge a/ (Rp)	Percentage of Low Household Income b/	Monthly Charge a/ (Rp)	Percentage of Average Household Income b/	Monthly Charge a/ (Rp)	Percentage of Low Household Income b/
1. Base Case	664	0.4	221	0.4	2,353	1.6	784	1.6	3,191	2.1	1,064	2.1
2. Increase in Operation & Maintenance Costs by 10 per cent	730	0.5	243	0.5	2,588	1.7	863	1.7	3,510	2.3	1,170	2.3
3. Reduction in Served Population by 10 per cent	738	0.5	246	0.5	2,614	1.7	871	1.7	3,545	2.4	1,182	2.4
4. Combination of 2 and 3 above	811	0.5	270	0.5	2,875	1.9	958	1.9	3,900	2.6	1,300	2.6

a/ Expressed in real terms.

b/ Assumed to be Rp150,000 (based on Government statistics for 1983).

c/ Assumed to be Rp50,000 (based on Government statistics for 1983).

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

Sensitivity/Affordability Analysis

LARGE SYSTEM, 1990

	Gravity Flow with Minimum Treatment				Pumped Spring Source or Deep Well with Minimum Treatment				Water Treatment and Pumped Supply			
	House Connection		Standpipe		House Connection		Standpipe		House Connection		Standpipe	
	Monthly Charge a/ (Rp)	Percentage of Average Household Income b/	Monthly Charge a/ (Rp)	Percentage of Low Household Income b/	Monthly Charge a/ (Rp)	Percentage of Average Household Income b/	Monthly Charge a/ (Rp)	Percentage of Low Household Income b/	Monthly Charge a/ (Rp)	Percentage of Average Household Income b/	Monthly Charge a/ (Rp)	Percentage of Low Household Income b/
1. Base Case	435	0.3	145	0.3	1,801	1.2	600	1.2	2,606	1.7	869	1.7
2. Increase in Operation & Maintenance Costs by 10 per cent	478	0.3	159	0.3	1,981	1.3	660	1.3	2,867	1.9	958	1.9
3. Reduction in Served Population by 10 per cent	483	0.8	161	0.3	2,001	1.3	667	1.3	2,896	1.9	965	1.9
4. Combination of 2 and 3 above	531	0.4	177	0.4	2,202	1.5	734	1.5	3,186	2.1	1,062	2.1

a/ Expressed in real terms.

b/ Assumed to be Rp150,000 (based on Government statistics for 1983).

c/ Assumed to be Rp50,000 (based on Government statistics for 1983).

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

Table A: Operation and Maintenance Cost for IKK Systems
(Rp'000 in 1984 prices)a/

Item	Size of System <u>b/</u>								
	Small			Medium			Large		
	G	P	W	G	P	W	G	P	W
1. Personnel <u>c/</u>	150	200	250	150	200	250	150	200	300
2. Administration <u>d/</u>	30	40	50	30	40	50	30	40	60
3. Chemicals	40	40	210	80	80	420	160	160	840
4. Fuels	-	415	415	-	780	780	-	1,310	1,310
5. Maintenance <u>e/</u>	55	80	105	80	105	135	105	135	160
TOTAL (1984)	275	775	1,030	340	1,205	1,635	445	1,845	2,670
TOTAL (1990) <u>f/</u>	487	1,372	1,823	602	2,133	2,893	788	3,266	4,726

a/ Monthly cost for 24 hours' operation and utilizing full capacity.

b/ Capacities of proposed system are 2,5 L/sec, 5 L/sec and 10 L/sec, respectively.

c/ For details of manpower, see Table B.

d/ 20 per cent of personnel cost.

e/ 0.25 per cent of investment cost.

f/ Price contingency: In accordance with Bank Guidelines.

Notes: G - Gravity flow with minimum treatment.

P - Pumped spring source or deep well with minimum treatment.

W - Water treatment plant and pumped supply.

Table B: Manpower Demand for IKK Systems a/

Item	Size of System		
	Small	Medium	Large
G	3	3	3
P	4	4	4
W	5	5	6

a/ Number of persons required for 24 hours' operation.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

PROJECTED INCOME STATEMENT

(in Rp'000)

SMALL SYSTEM (Gravity Flow With Minimum Treatment)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
1. Population ^{a/}	5,025	5,126	5,288	5,333	5,440	5,549	5,660	5,773	5,888	6,006
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	2,010	2,409	2,928	3,520	4,080	4,162	4,245	4,330	4,416	4,505
4. Water Tariff ^{c/} (Rp/month) ^{b/}										
5. Standpipe ^{c/}	347	354	360	367	373	402	434	468	505	544
6. House Connection	1,041	1,062	1,080	1,101	1,119	1,207	1,302	1,404	1,514	1,632
7. <u>Operating Revenues</u>										
8. Income from Standpipes	697	853	1,054	1,292	1,522	1,674	1,842	2,026	2,228	2,451
9. Income from House Connections	2,092	2,558	3,162	3,876	4,566	5,022	5,524	6,076	6,685	7,353
10. Income from Water Sales	2,789	3,411	4,216	5,168	6,088	6,696	7,366	8,102	8,913	9,804
11. Less: Bad Debts (4%)	112	136	167	207	244	268	295	324	357	392
12. Other Operating Revenues ^{d/}	8,500	8,500	8,500	8,500	8,500	10,200	10,200	10,200	10,200	10,200
13. Total Revenues	11,177	11,775	12,549	13,461	14,344	16,628	17,271	17,978	18,756	19,612
14. <u>Operating Expenses^{e/}</u>	2,677	3,275	4,049	4,961	5,844	6,428	7,071	7,778	8,556	9,412
15. Income before ^{f/} Depreciation	8,500	8,500	8,500	8,500	8,500	10,200	10,200	10,200	10,200	10,200
16. Depreciation	8,500	8,500	8,500	8,500	8,500	10,200	10,200	10,200	10,200	10,200
17. <u>Operating Income</u>	0	0	0	0	0	0	0	0	0	0

a/ Population growth is assumed to be two per cent annually.

b/ Based on tariff level in 1986/87 of Rp347/month for standpipe and Rp1,041/month for household connections.

c/ Water charges for public standpipes are assumed to be about one-third of house connections.

d/ Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

e/ For details of Operation and Maintenance Costs see Appendix 14.

f/ Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.

PROJECTED INCOME STATEMENT
(in Rp'000)

SMALL SYSTEM (Pumped Spring Source or Deep Well With Minimum Treatment)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
1. Population ^{a/}	5,025	5,126	5,228	5,333	5,440	5,549	5,660	5,773	5,888	6,006
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	2,010	2,409	2,928	3,520	4,080	4,162	4,245	4,330	4,416	4,505
4. Water Tariff ^{c/} (Rp/month) ^{b/}										
5. Standpipe ^{c/}	977	996	1,014	1,033	1,051	1,133	1,222	1,318	1,421	1,533
6. House Connection	2,932	2,988	3,042	3,099	3,153	3,399	3,666	3,954	4,264	4,598
7. Operating Revenues										
8. Income from Standpipes	1,964	2,399	2,967	3,636	4,288	4,716	5,188	5,707	6,277	6,905
9. Income from House Connections	5,891	7,198	8,907	10,908	12,863	14,149	15,563	17,120	18,832	20,715
10. Income from Water Sales	7,855	9,597	11,874	14,544	17,150	18,865	20,751	22,827	25,109	27,620
11. Less: Bad Debts (4%)	314	384	475	582	686	755	830	913	1,004	1,105
12. Other Operating Revenues ^{d/}	12,333	12,333	12,333	12,333	12,333	14,800	14,800	14,800	14,800	14,800
13. Total Revenues	19,874	21,546	23,732	26,295	28,797	32,910	34,721	36,714	38,905	41,315
14. Operating Expenses ^{e/}	7,541	9,213	11,399	13,962	16,464	18,110	19,921	21,914	24,105	26,515
15. Income before Depreciation	12,333	12,333	12,333	12,333	12,333	14,800	14,800	14,800	14,800	14,800
16. Depreciation ^{f/}	12,333	12,333	12,333	12,333	12,333	14,800	14,800	14,800	14,800	14,800
17. Operating Income	0	0	0	0	0	0	0	0	0	0

^{a/} Population growth is assumed to be two per cent annually.

^{b/} Based on tariff level in 1986/87 of Rp977/month for standpipe and Rp2,932/month for household connections.

^{c/} Water charges for public standpipes are assumed to be about one-third of house connections.

^{d/} Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

^{e/} For details of Operation and Maintenance Costs see Appendix 14.

^{f/} Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

PROJECTED INCOME STATEMENT
(in Rp'000)

SMALL SYSTEM (Water Treatment Plant and Pumped Supply)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
1. Population ^{a/}	5,025	5,126	5,288	5,333	5,440	5,549	5,660	5,713	5,888	6,006
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	2,010	2,409	2,928	3,520	4,080	4,162	4,245	4,330	4,416	4,505
4. Water Tariff ^{b/} (Rp/month)										
5. Standpipe ^{c/}	1,298	1,323	1,348	1,372	1,396	1,506	1,627	1,751	1,889	2,037
6. House Connection	3,895	3,969	4,044	4,116	4,189	4,517	4,871	5,254	5,666	6,110
<u>7. Operating Revenues</u>										
8. Income from Standpipes	2,609	3,187	3,947	4,829	5,697	6,267	6,893	7,583	8,341	9,175
9. Income from House Connections	7,827	9,561	11,841	14,488	17,091	18,800	20,680	22,748	25,023	27,525
10. Income from Water Sales	10,436	12,748	15,788	19,317	22,788	25,067	27,573	30,330	33,364	36,700
11. Less: Bad Debts (4%)	417	510	632	773	912	1,003	1,103	1,213	1,335	1,468
12. Other Operating Revenues ^{d/}	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
13. Total Revenues	27,019	29,238	32,156	35,544	38,876	44,464	46,870	49,517	52,429	55,632
<u>14. Operating Expenses^{e/}</u>	10,019	12,238	15,156	18,544	21,876	24,064	26,470	29,117	32,029	35,232
15. Income before Depreciation ^{f/}	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
16. Depreciation	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
17. Operating Income	0	0	0	0	0	0	0	0	0	0

a/ Population growth is assumed to be two per cent annually.

b/ Based on tariff level in 1986/87 of Rp1,298/month for standpipe and Rp3,895/month for household connections.

c/ Water charges for public standpipes are assumed to be about one-third of house connections.

d/ Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

e/ For details of Operation and Maintenance Costs see Appendix 14.

f/ Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

PROJECTED INCOME STATEMENT
(in Rp'000)

MEDIUM SYSTEM (Gravity Flow With Minimum Treatment)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1995/95	1995/96
1. Population ^{a/}	10,051	10,252	10,458	10,667	10,880	11,098	11,320	11,546	11,777	12,012
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	4,020	4,818	5,856	7,040	8,160	8,324	8,490	8,660	8,833	9,009
4. Water Tariff ^{b/} (Rp/month)										
5. Standpipe ^{c/}	215	219	223	227	231	249	268	289	312	336
6. House Connection	644	657	699	681	692	746	804	867	936	1,009
7. Operating Revenues										
8. Income from Standpipes	864	1,055	1,306	1,598	1,881	2,069	2,276	2,504	2,755	3,030
9. Income from House Connections	2,593	3,165	3,918	4,794	5,644	6,208	6,829	7,512	8,264	9,089
10. Income from Water Sales	3,457	4,220	5,224	6,392	7,525	8,277	9,105	10,016	11,018	12,119
11. Less: Bad Debts (4%)	138	169	209	256	301	331	364	401	441	485
12. Other Operating Revenues ^{d/}	12,333	12,333	12,333	12,333	12,333	14,800	14,800	14,800	14,800	14,800
13. Total Revenues	15,652	16,384	17,348	18,469	19,557	22,746	23,541	24,415	25,377	26,434
14. Operating Expenses^{e/}	3,319	4,051	5,015	6,136	7,224	7,946	8,741	9,615	10,577	11,634
15. Income before Depreciation ^{f/}	12,333	12,333	12,333	12,333	12,333	14,800	14,800	14,800	14,800	14,800
16. Depreciation	12,333	12,333	12,333	12,333	12,333	14,800	14,800	14,800	14,800	14,800
17. Operating Income	0	0	0	0	0	0	0	0	0	0

a/ Population growth is assumed to be two per cent annually.

b/ Based on tariff level in 1986/87 of Rp215/month for standpipe and Rp644/month for household connections.

c/ Water charges for public standpipes are assumed to be about one-third of house connections.

d/ Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

e/ For details of Operation and Maintenance Costs see Appendix 14.

f/ Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

PROJECTED INCOME STATEMENT

(in Rp'000)

MEDIUM SYSTEM (Pumped Spring Source or Deep Well with Minimum Treatment)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
1. Population ^{a/}	10,051	10,252	10,458	10,667	10,880	11,098	11,320	11,546	11,777	12,012
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	4,020	4,818	5,856	7,040	8,160	8,324	8,490	8,660	8,833	9,009
4. Water Tariff ^{c/} (Rp/month) ^{b/}										
5. Standpipe ^{c/}	760	774	789	803	817	821	950	1,024	1,105	1,192
6. House Connection	2,279	2,322	2,367	2,409	2,450	2,642	2,850	3,073	3,315	3,575
7. <u>Operating Revenues</u>										
8. Income from Standpipes	3,055	3,729	4,620	5,653	6,666	7,332	8,065	8,872	9,579	10,735
9. Income from House Connections	9,166	11,187	13,861	16,959	19,997	21,997	24,196	26,616	29,277	32,206
10. Income from Water Sales	12,221	14,916	18,481	22,612	26,663	29,329	32,261	35,488	39,036	42,941
11. Less: Bad Debts (4%)	489	597	739	904	1,067	1,173	1,290	1,420	1,561	1,718
12. Other Operating Revenues ^{d/}	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
13. Total Revenues	28,732	31,319	34,742	38,708	42,596	48,556	51,371	54,468	57,875	61,623
14. <u>Operating Expenses^{e/}</u>	11,732	14,319	17,742	21,708	25,596	28,156	30,971	34,068	37,475	41,223
15. Income before Depreciation ^{f/}	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
16. Depreciation ^{f/}	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
17. <u>Operating Income</u>	0	0	0	0	0	0	0	0	0	0

a/ Population growth is assumed to be two per cent annually.

b/ Based on tariff level in 1986/87 of Rp760/month for standpipe and Rp2,279/month for household connections.

c/ Water charges for public standpipes are assumed to be about one-third of house connections.

d/ Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

e/ For details of Operation and Maintenance Costs see Appendix 14.

f/ Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

PROJECTED INCOME STATEMENT
(in Rp'000)

MEDIUM SYSTEM (Water Treatment Plant and Pumped Supply)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
1. Population ^{a/}	10,051	10,252	10,458	10,667	10,880	11,098	11,320	11,546	11,777	12,012
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	4,020	4,818	5,856	7,040	8,160	8,324	8,490	8,660	8,833	9,009
4. Water Tariff (Rp/month) ^{b/}										
5. Standpipe ^{c/}	1,030	1,044	1,059	1,073	1,108	1,195	1,288	1,389	1,499	1,616
6. House Connection	3,091	3,132	3,177	3,219	3,324	3,584	3,865	4,168	4,496	4,848
7. Operating Revenues										
8. Income from Standpipes	4,141	5,030	6,202	7,554	9,041	9,945	10,939	12,033	13,237	14,560
9. Income from House Connections	12,422	15,090	18,605	22,662	27,122	29,834	32,817	36,099	39,709	43,680
10. Income from Water Sales	16,563	20,120	24,807	30,216	36,163	39,779	43,756	48,132	52,946	58,240
11. Less: Bad Debts (4%)	663	805	992	1,209	1,447	1,591	1,750	1,925	2,118	2,330
12. Other Operating Revenues ^{d/}	21,333	21,333	21,333	21,333	21,333	25,534	25,534	25,534	25,534	25,534
13. Total Revenues	37,233	40,648	45,148	50,340	56,049	63,772	67,540	71,741	76,362	81,444
14. Operating Expenses^{e/}	15,900	19,915	23,815	29,007	34,716	38,188	42,006	46,207	50,828	55,910
15. Income before Depreciation ^{f/}	21,333	21,333	21,333	21,333	21,333	25,534	25,534	25,534	25,534	25,534
16. Depreciation	21,333	21,333	21,333	21,333	21,333	25,534	25,534	25,534	25,534	25,534
17. Operating Income	0	0	0	0	0	0	0	0	0	0

a/ Population growth is assumed to be two per cent annually.

b/ Based on tariff level in 1986/87 of Rp1,030/month for standpipe and Rp3,091/month for household connections.

c/ Water charges for public standpipes are assumed to be about one-third of house connections.

d/ Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

e/ For details of Operation and Maintenance Costs see Appendix 14.

f/ Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

PROJECTED INCOME STATEMENT
(in Rp'000)

LARGE SYSTEM (Gravity Flow With Minimum Treatment)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
1. Population ^{a/}	20,103	20,505	20,915	21,333	21,760	22,195	22,639	23,092	23,554	24,025
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	8,041	9,637	11,712	14,080	16,320	16,646	16,679	17,319	17,666	18,019
4. Water Tariff ^{b/} (Rp/month)										
5. Standpipe ^{c/}	140	143	146	149	151	163	179	189	204	220
6. House Connection	421	429	438	447	453	488	536	568	612	660
7. <u>Operating Revenues</u>										
8. Income from Standpipes	1,126	1,378	1,710	2,098	2,463	2,709	2,980	3,278	3,606	3,966
9. Income from House Connections	3,377	4,134	5,130	6,294	7,388	8,126	8,939	9,832	10,816	11,898
10. Income from Water Sales	4,503	5,512	6,840	8,392	9,850	10,835	11,919	13,110	14,422	15,864
11. Less: Bad Debts (4%)	180	220	274	336	394	433	477	524	577	635
12. Other Operating Revenues ^{d/}	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
13. Total Revenues	21,323	22,292	23,566	25,056	26,456	30,802	31,842	32,986	34,245	39,629
14. <u>Operating Expenses^{e/}</u>	4,323	5,292	6,566	8,056	9,456	10,402	11,442	12,586	13,845	15,229
15. Income before Depreciation	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
16. Depreciation ^{f/}	17,000	17,000	17,000	17,000	17,000	20,400	20,400	20,400	20,400	20,400
17. <u>Operating Income</u>	0	0	0	0	0	0	0	0	0	0

a/ Population growth is assumed to be two per cent annually.

b/ Based on tariff level in 1986/87) of Rp140/month for standpipe and Rp421/month for household connections.

c/ Water charges for public standpipes are assumed to be about one-third of house connections.

d/ Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

e/ For details of Operation and Maintenance Costs see Appendix 14.

f/ Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.

PROJECTED INCOME STATEMENT
(in Rp'000)

LARGE SYSTEM (Pumped Spring Source or Deep Well with Minimum Treatment)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
1. Population ^{a/}	18,421	18,974	19,543	20,129	20,733	21,355	21,996	22,656	23,335	24,035
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	8,041	9,637	11,712	14,080	16,320	16,646	16,979	17,319	17,666	18,019
4. Water Tariff ^{b/} (Rp/month)										
5. Standpipe ^{c/}	581	592	603	614	625	674	740	784	846	912
6. House Connection	1,744	1,776	1,809	1,842	1,876	2,023	2,221	2,353	2,538	2,737
7. <u>Operating Revenues</u>										
8. Income from Standpipes										
9. Income from House Connections	14,015	17,115	21,187	25,935	30,619	33,680	37,048	40,754	44,829	49,312
10. Income from Water Sales	18,687	22,820	28,249	34,580	40,825	44,907	49,398	54,339	59,772	65,749
11. Less: Bad Debts (4%)	747	913	1,130	1,383	1,633	1,796	1,976	2,174	2,391	2,630
12. Other Operating Revenues ^{d/}	21,333	21,333	21,333	21,333	25,534	25,534	25,534	25,534	25,534	25,534
13. Total Revenues	17,940	21,907	27,119	33,197	39,192	43,111	47,422	52,165	57,381	63,119
14. <u>Operating Expenses^{e/}</u>										
15. Income before Depreciation	21,333	21,333	21,333	21,333	25,534	25,534	25,534	25,534	25,534	25,534
16. Depreciation ^{f/}	21,333	21,333	21,333	21,333	25,534	25,534	25,534	25,534	25,534	25,534
17. <u>Operating Income</u>	0	0	0	0	0	0	0	0	0	0

a/ Population growth is assumed to be two per cent annually.

b/ Based on tariff level in 1986/87 of Rp581/month for standpipe and Rp1,744/month for household connections.

c/ Water charges for public standpipes are assumed to be about one-third of house connections.

d/ Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

e/ For details of Operation and Maintenance Costs see Appendix 14.

f/ Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.

INDONESIA: IKK WATER SUPPLY SECTOR PROJECT

PROJECTED INCOME STATEMENT
(in Rp'000)

LARGE SYSTEM (Water Treatment Plant and Pumped Supply)

	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
1. Population ^{a/}	20,103	20,505	20,915	21,333	21,760	22,195	22,639	23,092	23,554	24,025
2. Population Served (%)	40	47	56	66	75	75	75	75	75	75
3. Population Served	8,041	9,637	11,712	14,080	16,320	16,646	16,679	17,319	17,666	18,019
4. Water Tariff ^{b/} (Rp/month) ^{c/}										
5. Standpipe	842	853	864	875	905	976	1,052	1,135	1,224	1,320
6. House Connection	2,525	2,559	2,592	2,625	2,715	2,928	3,157	3,405	3,672	3,960
7. <u>Operating Revenues</u>										
8. Income from Standpipes	6,771	8,220	10,119	12,320	14,769	16,246	17,870	19,657	21,623	23,785
9. Income from House Connections	20,312	24,661	30,358	36,960	44,306	48,736	53,661	58,972	64,869	71,356
10. Income from Water Sales	27,083	32,881	40,477	49,280	59,075	64,982	71,481	78,629	86,492	95,141
11. Less: Bad Debts (4%)	1,083	1,315	1,619	1,971	2,363	2,599	2,859	3,145	3,460	3,806
12. Other Operating Revenues ^{d/}	25,500	25,500	25,500	25,500	25,500	30,600	30,600	30,600	30,600	30,600
13. Total Revenues	51,500	57,066	64,358	72,809	82,212	88,817	96,146	104,162	112,932	122,529
14. <u>Operating Expenses^{e/}</u>	26,000	31,566	38,858	47,309	56,712	62,383	68,622	75,484	83,032	91,335
15. Income before Depreciation ^{f/}	25,500	25,500	25,500	25,500	25,500	30,600	30,600	30,600	30,600	30,600
16. Depreciation	25,500	25,500	25,500	25,500	25,500	30,600	30,600	30,600	30,600	30,600
17. <u>Operating Income</u>	0	0	0	0	0	0	0	0	0	0

^{a/} Population growth is assumed to be two per cent annually.

^{b/} Based on tariff level in 1986/87 of Rp842/month for standpipe and Rp2,525/month for household connections.

^{c/} Water charges for public standpipes are assumed to be about one-third of house connections.

^{d/} Cross-subsidy necessary to cover depreciation costs. Any Government subsidy will be phased out after four years.

^{e/} For details of Operation and Maintenance Costs see Appendix 14.

^{f/} Estimated life of civil works is 30 years and electrical/mechanical equipment at 15 years. In FY1991/92 it is assumed an additional capital investment is made to maintain average consumption of 45 lpcd and a service level of 75 per cent up to 1995/96.