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STAFF APPRAISAL REPORT

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

MAY 10, 1990

Infrastructure Division
Country Department V
Asia Region

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CURRENCY EQUIVALENTS

(As of January 1990)

Currency unit	=	Rupiah (Rp)
US\$1.00	=	Rp 1,795
Rp 100	=	US\$0.06
Rp 1 million	=	US\$557

WEIGHTS AND MEASURES

Metric Units

FISCAL YEAR

Government of Indonesia: April 1 - March 31

Public Enterprises: January 1 - December 31

PRINCIPAL ABBREVIATIONS AND ACRONYMS USED

BAPPEDA	-	Regional Government Development Planning Board
BAPPENAS	-	National Development Planning Agency
BKSP	-	Jabotabek Level I Planning Coordination Unit
BPAL	-	Interim Sewerage Unit
DAB	-	Directorate of Water Supply
DEG	-	Directorate of Environmental Geology, Ministry of Mines and Energy
DGCK	-	Directorate General Cipta Karya (Ministry of Human Settlements)
DGWRD	-	Directorate General of Water Resources Development
DKI-Jakarta	-	Jakarta Special Capital Province
GOF	-	Government of France
GOI	-	Government of Indonesia
GON	-	Government of the Netherlands
INPRES	-	Central Government Grant to Local Governments
IUIDP	-	Integrated Urban Infrastructure Development Program
Jabotabek	-	Region comprising Jakarta, Bogor, Tangerang and Bekasi local government administrative areas
JUPCO	-	Jabotabek Urban Project Coordination Office
JSSP	-	Jakarta Sewerage and Sanitation Project (Loan 2632)
KIP	-	Kampung Improvement Program
MHA	-	Ministry of Home Affairs
MOF	-	Ministry of Finance
MPW	-	Ministry of Public Works
O&M	-	Operations and Maintenance
OECF	-	Overseas Economic Cooperation Fund of Japan
PBJR	-	Jakarta Flood Control Project
PDAL	-	Jakarta Sewerage Enterprise
PDAM Jaya	-	Jakarta Water Enterprise
PDAM Tangerang	-	Tangerang Water Enterprise
PJSIP	-	PDAM Jaya System Improvement Project
PIU	-	Project Implementation Unit
PMU	-	Project Management Unit
POJ	-	Perum Otorita Jatiluhur (Jatiluhur Authority)
PSJ	-	Jatiluhur Project Office
REPELITA	-	National Five-year Development Plan (Repelita V 1989-94)
TKPP	-	Tim Koordinasi Pembangunan Perkotaan (Interagency Coordinating Team for Urban Development)

INDONESIASECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)Loan and Project Summary

Borrower: The Republic of Indonesia

Beneficiaries: DKI Jakarta, PDAM Jaya, PDAM Tangerang

Amount: US\$190.0 million

Terms: Repayable in 20 years including five years of grace, at the standard variable rate.

On-lending Terms: Part of the proceeds of the loan, the equivalent of US\$124.0 million will be onlent by the Government to (a) DKI Jakarta (US\$19.0 million), (b) PDAM Jaya (US\$92.0 million) and PDAM Tangerang (US\$13.0 million) for 20 years, including five years' grace, at 9.25 percent per annum interest, including 0.25 percent bank fee, and 0.75 percent commitment charge on undisbursed amount. The interest and commitment charges will be accumulated and capitalized during the grace period. The Government will bear the foreign exchange risk.

Project Objectives and Description:

Project objectives are to develop and implement a coordinated program of physical investments, technical assistance and policies for urban water supply, waste water disposal, drainage and water resource/quality management which: (a) balances the existing treatment capacity with required transmission and distribution networks; (- b) increases the piped water supply from about 28 percent to 56 percent of population; (c) results in improved service for the urban poor through construction of standpipes and increasing competition among vendors; (d) improves waste water disposal and drainage; (e) strengthens the management, staffing and financial viability of water supply and sewerage institutions; and (f) strengthens water resources planning capabilities. These objectives would be achieved through: (a) the PDAM Jaya System Improvement Project (PJSIP) including primary distribution facilities, rehabilitation, extension of service mains and institutional improvement covering a four-year program from July 1990 to June 1994; (b) the raw water pipeline to Pejompongan and related measures to protect the quality of water; (c) the treated water transmission main from the Cisadane I Water Treatment Plant to the PDAM Jaya distribution network; (d) the extension of Jakarta Sewerage and Sanitation Project (JSSP) Stage I Sewerage Works covering about 170,000 people and including

demonstration projects of lower-cost technologies; (e) priority drainage and flood control components in Jakarta; and (f) technical assistance for water resources management studies; project implementation; institutional development for the enterprises; planning and pricing studies; and future project preparation. The project will reduce water-related environmental pollution in Jakarta. Possible environmental risks from increased water flows will be mitigated through agreed project design, implementation and monitoring procedures.

Benefits and Risks: The project will: (a) improve the quality and reliability of water supply and increase quantity, particularly in poor areas; (b) increase use of piped water and partly replace groundwater use to reduce the deterioration of the groundwater resource; (c) decrease flooding; (d) decrease the pollution of groundwater by extending the sewerage network; and (e) initiate discussion on institutional framework and strategy for integrated water resource management, including pollution control and conjunctive use of ground and surface water. Shorter transport distances and more water as a result of more than 3,000 new public hydrants should lead to greater accessibility and lower end price of water for low-income people. Implementation risks are: (a) cost overruns, larger unaccounted for water (UFW), insufficient equity contribution, and delayed tariff increases; (b) lower than expected demand for piped water (especially in the nonresidential sector, which might keep on using the increasingly scarce groundwater resource if DKI is not able to enforce the increased groundwater fee); (c) institutional bottlenecks which slow down implementation (for PDAM Jaya it might take longer than expected to build up necessary implementation capacity). In order to reduce the impact of these factors, project design is based on a concept which maximizes the flexibility during implementation and monitors developments by regularly collecting and evaluating cost and consumer information.

<u>Estimated Cost: /a</u>	<u>Local /b</u>	<u>Foreign</u>	<u>Total</u>
	----- (US\$ million) -----		
PDAM Jaya Water System Improvements	57.4	65.1	122.5
PDAM Jaya Water System Improvements (OECF)	22.2	19.3	41.5
Pejompongan Raw Water Pipeline	21.8	26.2	48.0
Cisadane Treated Water Trans. Main	10.0	5.5	15.5
Jakarta San. Sewerage Ext. Project	10.0	7.6	17.6
Waste Water Disposal (Microdrainage)	1.3	0.0	1.3
Priority Major Drainage	13.9	5.9	19.8
Water Resources Management Study	1.4	5.3	6.6
Miscellaneous Studies	1.0	2.3	3.3
Overall Project Coordination	1.5	1.5	3.0
<u>Total Base Cost</u>	<u>140.5</u>	<u>138.7</u>	<u>279.2</u>
Physical Contingencies	14.3	13.3	27.6
Price Contingencies	23.6	18.2	41.8
<u>Total Project Cost</u>	<u>178.4</u>	<u>170.2</u>	<u>348.6</u>

/a Totals may not add up because of rounding.

/b Includes taxes and duties estimated at US\$33.3 million equivalent and land acquisition of US\$11.9 million equivalent.

/c Consultants' services costs for design and implementation are included in the costs of the respective components.

<u>Financing Plan:</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
	----- (US\$ million) -----		
GOI	43.8	-	43.8
DKI Jakarta	1.4	-	1.4
PDAM Jaya	59.2	-	59.2
PDAM Tangerang	6.1	-	6.1
OECF	6.2	38.5	44.7
Netherlands	-	3.4	3.4
IBRD	61.7	128.3	190.0
<u>Total</u>	<u>178.4</u>	<u>170.2</u>	<u>348.6</u>

<u>Estimated Disbursements:</u>	<u>IBRD Fiscal Year</u>						
	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>
Annual	23.6	62.8	52.6	31.8	14.0	3.9	1.3
Cumulative	23.6	86.4	139.0	170.8	184.8	188.7	190.0

Economic
Rate of Return: Water Supply Component: 12 percent

Maps: IBRD Nos. 21674, 21675, 22039

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This report is based on findings of an appraisal mission which visited Indonesia during October/November 1989. The mission consisted of Ali Nawaz Memon (Leader), A. Bruestle, A. Saravanaspavan, E. Pancaroglu, H. Unger, K. Homanen, L. Lovei, M. Nuch, S. O'Humay, T. Pereira, Y. Prasta, J. Van der Gun (Consultant), W. Barker (Consultant), and W. Lane (Consultant).

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1. IBRD No. 21674: Jabotabek Location Map and Water Supply (PJSIP)
2. IBRD No. 21675: Sewerage Component
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I. THE URBAN SECTOR

A. Sector Overview

Demographic Trends

1.1 Some 45 million, or about one quarter of Indonesia's total population now live and work in urban areas. Net migration and natural growth combined to produce an overall urban population growth rate of about 4.7 percent per annum in the 1980s--more than double the overall national population growth rate. If current trends continue, urban areas are projected to continue to grow almost as rapidly at about 4.4 percent and fully two thirds of total future population growth will take place in the nation's towns and cities. By the year 2000 the urban population is expected to reach 75 million. About 50 percent of the total urban population is located in the 12 largest cities.

Institutional Framework for Sector Development

1.2 Sector Agencies. Urban development and administration in Indonesia is synonymous with local government development. There are over 300 local governments including 54 municipalities and 247 regencies which are responsible for providing services to meet the basic needs of local communities.^{1/} The 26 provincial governments (level I) are not generally involved in the direct provision of urban services except DKI Jakarta but, instead, oversee the performance of the level II local governments. The Provincial Development Board (Bappeda) examines and approves the programs prepared by the cities and evaluates their priority and linkages in relation to other development programs both for the city/town and the province. The Regional government in Jakarta has been designated as a special province (Daerah Khusus Ibukota or DKI Jakarta). Provincial governors and local mayors are appointed and, in practice, except in the largest cities the development of local services continues to be guided, and sometimes implemented, by an extensive central government institutional apparatus.

1.3 The National Development Planning Agency (BAPPENAS) is responsible for overall planning and allocation of resources, with focus on the Five-Year Development Plans (Repelita) and Annual National Development Budgets (APBN). The Ministry of Home Affairs (MHA) has overall responsibility for regional government affairs, primarily through its Directorate General for Public Administration and Regional Autonomy (DGPUOD) and Directorate General Regional Development (DGBangda). The Ministry of Public Works (MPW) is responsible for oversight, planning, and, sometimes, implementation of infrastructure. Within

^{1/} Government Regulation No. 14/1987.

MPW, the Directorate General for Human Settlements ((DGCK--Cipta Karya) is responsible for city planning and for guiding development of water supply, sewerage and sanitation, solid wastes management and integrated programs of low-income community upgrading (Kampung Improvement Program--KIP) through four separate implementing directorates. Also within MPW, the Directorate General for roads (DGBM--Bina Marga) is responsible for urban roads and bridges and the Directorate General of Water Resource Development (DGWRD) is responsible for urban flood control and bulk water supply. The Ministry of Finance (MOF) is responsible for central and local finance through its Directorate General of Monetary Affairs (DGMDN), though the Director General of Budget (Angaran) actually administers grant transfers; property tax administration through its Director General of Taxation (DGP--Pajak); and analysis of local finance through its Agency for Financial Analysis (BAK--Badan Analisa Keuangan). Other concerned agencies include the National Land Agency (BPN), Director General for Land Transport of the Ministry of Communications, The Ministry of State for Population and the Environment (KLH), the Ministry of State for Housing and the Ministry of Health. Pollution monitoring and enforcement is the responsibility of Provincial Governments, guided by central government agencies. All key agencies are represented in the Interagency Coordinating Team for Urban Development (TKPP--Tim Koordinasi).

Sector Constraints and Priorities

1.4 The Bank's 1984 Urban Services Sector Report (No.4800-IND) estimated conservatively that total expenditures by central and local governments on urban services investment, operation and maintenance (O&M) during Repelita IV (1984-89) should be about Rp 900 billion per year (1986 prices) to overcome service backlogs at minimal levels of service and meet reasonable growth needs for the additional 2.2 million urban residents each year, together with and for the associated growth in economic activity. Actual expenditures have doubled to an average of Rp 700 billion per year with initiation of the Bank's Urban Sector Loan (USL I--Loan 2816-IND). Current estimates indicate that about 76 percent of the urban population does not have direct access to a piped water supply. Almost two thirds of all urban households still rely on wells, and about 11 percent are dependent on a system of water vendors. About 65 percent of low-income groups share toilets and use of canals remains common. In the larger cities inadequate industrial water supply and waste disposal is a serious problem. In terms of GOI's service and equity objectives, more low-cost, local or tertiary systems investment is needed in existing undeserved urban areas. However, as well as the concomitant need for O&M of the expanding networks, there is a growing need for public investments in, and rehabilitation of, primary and secondary systems to support local infrastructure needs adequately, particularly for sanitation, water supply, flood protection and transport in larger centers.

1.5 While average incomes in urban area have risen substantially over the past eight years, distribution of income remains unequal and in 1987, over 20 percent of urban dwellers were estimated 2/ still to be poor or near poor. The problem of income distribution is exacerbated by the deficiencies in basic services and degradation of environmental conditions leading to poor health

2/ Central Bureau of Statistics (BPS) as reviewed in the Bank's Poverty Report.

among the low-income population in particular. These conditions are particularly severe in the large coastal cities such as Jakarta where flooding, inadequate drainage and poor sanitation, together with high residential densities combine to produce high levels of gastroenteritis, pulmonary and skin diseases, particularly in children.

1.6 Sector Finances. The finances of regional/local governments have long been dominated by central government transfers and characterized by weak local resource mobilization, low per-capita budgets and very limited use of credit for capital investment.^{3/} In 1983/84, explicit central government transfers ^{4/} financed over three quarters of aggregate recurrent expenditures and almost 80 percent of capital investments. By 1986/87, budgetary constraints caused by falling oil revenues led to a severe curtailment of local investment programs financed by central government transfers, which were reduced from almost half of local budgets, on average, in 1983/84 to less than one quarter in 1986/87. Thus a marked deterioration had taken place in the structure of local budgets and the contribution of local governments to overall sector development. The high level of growth (18.5 percent) in locally generated revenues ^{5/} failed to significantly improve local finances. Only a small reduction was discernable in the relative importance of grants and borrowing, at 1.2 percent of total local receipts, continued to be an insignificant feature of the financing system for local services.

1.7 A well-managed expansion of credit holds the key to increasing investment in the sector if the budgetary impact and inflationary pressures are to be minimized. Recognizing the need for a guideline more in line with GOI policy of inducing a higher level of credit financing in Repelita V, GOI is proposing to adopt a Debt Service Coverage Ratio (DSC) of not less than 1.5 for local government general fund operations and not less than 1.3 for local enterprises such as water supply. This would bring the legal borrowing capacity for local governments in line with their considerably higher paying capacity.

1.8 In summary, the large number of agencies and the often uncoordinated specific programs and policies supported by them in an attempt to improve urban infrastructure and services during earlier Repelitas, have led to a fragmented and inefficient approach to urban development. Key urban infrastructure deficiencies are found in water supply, roads and transport, waste disposal (human, solid and industrial), drainage and other micro-infrastructure. Lack of access to water supply, sanitation and housing is particularly severe for the urban poor. Much of the future urban growth from migration will be unskilled rural laborers from lower income groups which have limited ability to pay for even basic urban services. Shifting urban policies towards a priority for accommodating this growth represents a key policy

^{3/} Related primarily to foreign assisted projects in the large cities.

^{4/} Including SDO grants for local governments and Inpres, but not including DIPs (grants-in-kind on central government implemented projects, primarily by the Ministry of Public Works, which are subsequently handed over to local governments).

^{5/} Property taxes and other local taxes and charges.

imperative in most urban areas, and GOI has given increased emphasis to poverty alleviation programs in Repelita V. To support the increased level of investment needed, financial and management capability in local governments must be strengthened if they are to become an effective agent for sector development.

B. The Water Supply and Sanitation Subsector

1.9 In spite of some progress to date, the water supply and sanitation subsectors are faced with (a) low service coverage particularly for the poor, combined with restrictive practices which increase the price of water supplied by vendors well above cost; (b) weak, fragmented and understaffed sector agencies at all levels from water resource management down to water enterprises; (c) inefficient procurement procedures; (d) questionable financial data with late and heavily qualified audits; (e) limited cost recovery and self-financing confined to a few major cities; (f) high unaccounted-for water (UFW); (g) laws discouraging self-financing by water enterprises; (h) low quality of water piped and groundwater and depletion of the groundwater aquifer; and (i) inadequate arrangements for wastewater and garbage disposal and drainage in major cities, which, together with industrial pollution of surface and groundwater cause major environmental hazards for the urban population.

C. The Jabotabek Urban Region

1.10 Jabotabek is GOI's mnemonic for the urban region consisting of the Province of DKI Jakarta, and the surrounding Kabupatens of Bogor, Tangerang and Bekasi together with Kotamadya Bogor. Jakarta is the national capital and seat of government, and commercial and administrative hub of the country. A disproportionate amount of the burden of population growth falls on metropolitan Jakarta. Between 1960 and 1980, the population of DKI Jakarta doubled and by 1986 fully 20 percent (8 million) of the urban population, 5 percent of the total national population, lived and worked in the city. However, urbanization has outgrown the administrative boundaries of DKI Jakarta and, with the spread of industrial and informal sector residential development (much of which lacks infrastructure and utility services), the surrounding "fringe" areas now contain a further 2.3 million people. The metropolitan area now ranks among the 25 largest conurbations in the world. Jabotabek's size and rapid growth have helped to provide employment opportunities for surplus rural labor and has expanded the production base for Indonesia's industrial sector and 17 percent of GDP is now generated there. By the year 2005 metropolitan Jakarta is projected to have a total population approaching 20 million compared to 13 million in 1990. For Jabotabek as a whole, the current population of about 15 million is expected to exceed 26 million by the year 2005.

Environmental Conditions in Jabotabek

1.11 This rapid urban growth and associated industrialization in the Jabotabek area is placing increasing stress on the natural resources of the region, with domestic and industrial wastes causing severe degradation of ground, surface and coastal waters, air pollution and contamination of soils. This adversely affects the health and quality of life of its residents and the economy of the region. Fully 40 percent of the population still depend on groundwater and the quality of this source is already poor in many areas and

is threatened in others. As the region expands, and in the absence of pollution control, safe water must be brought from more distant sources, and the costs of transmission and treatment are high. Poor solid waste management practices also exacerbate environmental problems. Although solid waste collection service coverage in Jakarta is reportedly very high (85 percent), 15 percent is randomly dumped and, of that which is collected, only about 50 percent is disposed of in a controlled manner in suitable landfills. As a consequence of shortcomings in the secondary collection and transportation system, solid wastes are disposed of in informal dumps and in drains and canals causing pollution of waterways (Jakarta's raw water source), groundwater pollution and flooding due to clogging of the primary and secondary drainage system. Aquaculture and coastal fishing--important employment and food sources--are threatened, especially by industrial pollution. Incidence of infant mortality and of gastroenteric, pulmonary and viral diseases caused, in part, by polluted and congested conditions is high, especially among the poor and those living in the northern, flood-prone areas of the city. In addition to health and quality of life problems, the environmental conditions impose higher infrastructure development and maintenance costs. Finally, in the absence of a rigorous pollution control and enforcement strategy and program, industries continue to use inefficient and outdated technologies with wasteful consumption of raw materials, rendering them less competitive in international markets as well as imposing health and economic costs on others.

Towards a Planning Framework for Development

1.12 Concern over the relatively high level of investment in the capital region on the one hand, and the continuing serious deficiencies in basic services in the capital on the other, particularly for the urban poor, has long been expressed at the highest level. Consequently, in line with Presidential Instruction INPRES 13/1976 and with Bank assistance from Loan 1336-IND (Second Urban Development Project) the development priorities and options of Jabotabek were studied during 1979-82, and in 1984 recommendations were adopted into the Jakarta Metropolitan Development Plan of DKI Jakarta/West Java interprovincial coordinating body (Jabotabek BKSP). The main features of the JMDP included: (a) an integrated growth and investment strategy; (b) a more environmentally sound, east-west alignment for future development in order to avoid further pollution of the important aquifer recharge areas to the south of the city, and high development costs in the environmentally sensitive wetlands and poor soils in northern coastal areas; and (c) a major emphasis on water supply, sanitation, Kampung improvement and flood protection together with guided development of land for residential and industrial areas focused on primary infrastructure deficiencies (including roads). The plan was to be implemented through short-term subsectoral action programs complemented by longer-term institutional development efforts.

1.13 Jabotabek BKSP has not matured as an effective locus for metropolitan issues and there is a lack of synthesized information on the nature, scale and location of changes which have occurred since then; the Jakarta Metropolitan Development Plan now needs updating. The population has increased much faster than projected. Whilst some designated growth areas show few signs of significant growth, major developments not foreseen in the JMDP have occurred (e.g. new towns at Bekasi and Serpong) and much development is occurring outside the designated areas including in environmentally

sensitive areas (e.g. the aquifer recharge areas south of Jakarta). Even though much of the recent population growth has occurred in the fringe areas bordering DKI Jakarta, and considerable additional property tax revenues accrue to the Botabek local governments as result, they have yet to endorse key programs to address the public infrastructure needs of this growth. At the same time, however, important policy initiatives have been undertaken by GOI which will help strengthen land use and intersectoral investment planning and implementation in the Jabotabek region. These include the establishment of the BPN (Land Agency Badan), the Spatial Planning Decree (Kepres 57/89) and the recent Industrial Estates Decree.

1.14 Urban Infrastructure Expenditure in Jabotabek. Expenditures on urban infrastructure (including public transport) in Jabotabek during Repelita IV totalled some Rp 1.7 trillion or over 60 percent of the national total. With expenditures of Rp 465 billion in 1989/90, Jakarta clearly continues to dominate infrastructure expenditure allocations in the sector. Nevertheless, there appears to be a substantial imbalance among service expenditures, with 70 percent of expenditures in Jakarta over the period going to investments and operating subsidies for transport (commuter rail, roads and bus) and very little towards Kampung infrastructure, sanitation, water supply, flood protection or solid waste collection, and none towards control of industrial pollution. The Repelita V program is not yet fully detailed and depends on progress with preparing donor supported projects.

Infrastructure Development Issues for Jabotabek

1.15 Investment in Jakarta's infrastructure has not kept pace with needs and considerable deficiencies remain both in coverage and quality, viz:

- (a) inadequate transport infrastructure to link major parts of the metropolis and to guide urban growth;
- (b) inadequate investment in water distribution while the investment in water treatment plants has proceeded on the basis of the master plan, resulting in excess treatment plant capacity (e.g., Buaran II and Cisadane treatment plants);
- (c) poor cost recovery, organization and management which results in an inadequate water supply network causing severe problems, primarily in the northern half of the city where groundwater is not potable, and restrictive practices for distributing water through vendors which leads to excessive prices to the poor;
- (d) severe pollution of surface water and increasingly of groundwater, from human and municipal wastes and from a rapidly rising volume of industrial and toxic wastes;
- (e) inadequate micro-infrastructure and services and inadequate awareness and use of effective and safe low-cost sanitation techniques in the urban Kampung, where most low-income people live, resulting in an unhealthy environment which limits the social and economic potential of the human capital resources of the capital region;

- (f) inadequate policies and operational programs for: (i) O&M of infrastructure and utility services; (ii) revenue generation and the use of municipal borrowing; and (iii) private sector participation in delivery of municipal services; and
- (g) unclear relationships between municipal and central government authorities with respect to assignment of responsibilities for preparation, appraisal, financing and implementation and O&M of infrastructure services.

1.16 These problems raise important issues for GOI policy and call for an efficient metropolitan development strategy matched with a balanced intersectoral investment program using low-cost technologies where practicable. Much of the growth will inevitably continue to take place at the periphery and the need to initiate investments there, particularly in basic services, is urgent since the cost of these services rises rapidly over time as settlement consolidates and densities increase. Without adequate spatial planning, this will continue to increase the agglomeration costs of infrastructure development in metropolitan Jakarta and degrade environmental conditions even further. Nevertheless, Jabotabek local governments have significant manpower resources and growing experience to address many of these challenges. Given GOI budgetary constraints, the relatively high average incomes in Jakarta and the substantial needs elsewhere in the country, local taxes and user charges should pay for financing most of the urban infrastructure in Jabotabek. A series of World Bank and Overseas Economic Cooperation Fund (OECF) assisted projects described in paras 2.2 to 2.12 attempt to address the issues outlined above in a coordinated and integrated manner.

II. SECTOR STRATEGY AND BANK EXPERIENCE

A. Government Strategy

2.1 GOI has recognized the shortcomings outlined above, and current sector goals emphasize integrated and decentralized/deconcentrated management of urban development as the strategic solution. Bappenas has been designated to lead a high level interagency team (Tim Koordinasi--TKPP) representing the concerned agencies and ministries and charged with the responsibility of sector policy development and coordination.

Strategic Agenda for the Sector

2.2 The policy priorities for urban development in Indonesia were articulated in 1984 in the Bank's Urban Services Sector Report (Report No. 4800-IND) and the 1986 Local Government Finance Report. To address these priorities, the government issued, in 1987, a Statement of Policies for Urban Development which represents a consolidated view of the principal constraints arising and the objectives prescribed for the development effort in the sector. This Policy Statement includes: (a) strengthening local governments to assume the leading role in developing, operating and maintaining local services; (b) carrying out planning, programming and identification of investments on the basis of a decentralized and integrated (Integrated Urban Infrastructure Development Program--IUIDP) concept; (c) mobilizing local

revenues and optimizing their use; (d) implementing a coordinated financing system for the development and administration of local services; and (e) strengthening the consultative process at various levels of government. Until then, GOI priorities for the sector had focused primarily on expanding provision of basic services. Repelita V also promised greater attention to operation and maintenance of local infrastructure and services and the welfare of the urban poor. To this end, integration of urban kampungs more fully into their respective urban systems through a community oriented Kampung Improvement Program (KIP) has been adopted as the principal GOI policy for alleviating urban poverty.

2.3 The Policy Statement was translated into an Action Plan of institutional reforms and improvements in local resource mobilization, sector planning and financing arrangements, which were incorporated explicitly into the Urban Sector Loan (USL I, Loan 2816-IND) and which, since then, has provided a strategic framework to guide the focus and process of urban development in Indonesia. In addition, and under USL I, strategies were formulated for the major urban service subsectors of water supply, drainage and flood protection, human and solid wastes, roads and KIP.

2.4 With regard to pollution control, the Ministry of Population and Environment (KLH) has prepared a draft law to establish a Pollution Control Authority. The authority would consolidate the powers for control of water and air quality presently fragmented amongst several ministries; would establish national policies and standards; and would strengthen the powers and capability to prepare and implement pollution control strategies at the provincial level. The law is currently under discussion in government and is expected to be put into effect shortly as amended. Monitoring ambient and point source water quality has been underway for some time in a few provinces, the most experienced agency being P₄L in DKI Jakarta.

P. Bank Experience in the Sector

2.5 Since 1975, the Bank has financed five completed and eight ongoing urban projects in Indonesia touching over 50 local governments and their water enterprises. Project experience in large cities has generally been good. Most physical targets have been achieved, and in some cases surpassed. There has been compliance with most loan covenants despite some delays. Project implementation and monitoring systems have steadily improved, and a fruitful dialogue with local and concerned central government officials has been maintained and strengthened.

2.6 The most recently completed urban projects (Urban III, Loan 1653-IND and Urban IV, Loan 1872-IND) were focused mainly on poverty-related KIPs (basic infrastructure improvements), city-wide upgrading of drainage and solid waste services, institutional development and revenue generation at the municipal level. The combined Project Completion Report (PCR) for these two projects (dated June 30, 1989) highlighted current key issues of urban development in Indonesia: (a) operation and maintenance (O&M) budgets and institutional capacities are inadequate at all levels; (b) coordinated planning and programming of urban infrastructure is essential for functioning systems; (c) improved local resource mobilization is the only viable basis for sustaining urban development programs; and (d) decentralization of urban development program implementation requires strengthened municipal management,

technical manpower and operational systems. Some of the functional requirements and policy reform options to address these issues are now being explored in Urban V (Loan 2408-IND), and the first Urban Sector Loan (USL I) on a national basis. The need for coordinated infrastructure planning was the key to the development of the IUIDP concept, which is being implemented through evolving GOI financial and program management intermediation under a series of regional urban development projects currently under preparation.

2.7 JUDP I (Loan 2932-IND) is proceeding well and on schedule. JUDP I is designed to improve urban transport conditions in the Jabotabek area within a framework of integrated infrastructure planning and programming. Particular attention has been given to improving project coordination and a Jabotabek Urban Project Coordination Office (JUPCO) was established in May 1988. From its inception, JUPCO has been particularly effective in managing a relatively new and complex project execution process. As a result, a significant number of diverse, but complementary activities have been initiated on schedule and within budget. Although the experience with project implementation only dates back to September 1988 and much remains to be done, a basis exists for the continuation of effective project management and coordination in future. JUPCO's experience has been taken into account in the design of the project for which the role of JUPCO would be expanded to ensure monitoring and coordination.

2.8 Progress on Strategic Sector Goals. The performance of USL I in supporting priority expenditures and increasing disbursements in the sector has been satisfactory. Provision of counterpart financing through USL I has enabled Indonesia to expand sector expenditures in keeping with (but not yet achieving) the recommendations of the Bank's Urban Services Sector Report. However, implementation of the policy agenda under USL I has lacked clear direction and has not been coordinated effectively. As a result, institutional development objectives have not yet been brought fully to fruition and preparation of a pipeline of viable investments has been slow. A full evaluation of the impact of USL I is pending. Nevertheless, a preliminary assessment indicates that good continuing progress is being made in local resource mobilization--PBB has increased by about 25 percent per year and other local taxes and charges by about 10 percent in real terms in recent years. However, GOI has yet to take action on the "structural" changes envisaged under the USL I policy agenda. A new draft law to reform local taxes has been prepared for legislative action but little progress has taken place to clarify the incentive framework for local fiscal and financial management through measures to rationalize the system of grants and to articulate the policies for financing of local infrastructure. Medium-term Integrated Urban Infrastructure Development Plans have been produced in over 60 local governments, including the major urban centers where the majority of the urban population resides. However, it will be some time before the process is sufficiently mature to produce consistently high quality expenditure and financing plans.

2.9 A local government loan fund (the Regional Development Account--RDA) is also being made operational. RDA as yet, lacks a clearly defined relationship with grants, and the additional collateral support which would be provided by the new taxes and charges law and would make it fully effective. Moreover, a clear indication of how RDA should be related to the reformed financial system has yet to emerge. The 9 percent initial interest rate set

for RDA is more in line with onlending of foreign assistance in the sector over the last year or so than with recently announced GOI policy of moving broadly towards market interest rates. However, an understanding was reached during the negotiations of this loan that GOI will adjust interest rates over time in line with market conditions.

2.10 External Assistance in Jakarta. GOI and DKI Jakarta, with assistance from the Japanese International Cooperation Agency (JICA) and the Overseas Economic Cooperation Fund (OECF) as well as the Bank, have begun to implement the Jakarta Metropolitan Development Plan (updated where required) although an integrated expenditure plan has yet to be adopted. OECF had assisted in developing sewerage and solid waste master plans and is providing assistance for the construction of three water treatments plants (a fourth is funded by French assistance), for the Jakarta Flood Control Project, for the Jakarta Outer Ring Road and the Jabotabek Commuter Railway. Before the JMDP was developed, the Bank had assisted DKI Jakarta's Kampung Improvement Program (KIP) through the first three Bank-financed urban projects which also included serviced sites for new low-income housing. Urban transport has been assisted through the first Jabotabek Urban Development Project (JUDP I) which followed the Jabotabek Master Development Plan Strategy. The water and wastewater sectors were addressed through the West Tarum Canal Improvement Project (Loan 2560-IND) which expanded raw water supply and the Jakarta Sewerage and Sanitation Project (Loan 2236-IND). The already negotiated Third Jabotabek Urban Development Project (JUDP III), which complements this project, responds to the Jabotabek Master Development Plan priorities by addressing the environmental, housing and income generation needs of low-income people in Metropolitan Jabotabek's expanding Kampung and establishing the basis for improved environmental planning and management in the metropolitan area.

2.11 Implementation of Water Supply and Sanitation Projects. OED's review of the two completed water supply projects is probably most relevant for the major water supply component of this project. The main objectives pursued under past water projects were: (i) rapid provision of safe water supply to unserved or inadequately served urban areas, (ii) the strengthening of the institutions responsible for development of water supply services, and (iii) enhancing the concept of cost-recovery and financial self-sufficiency of water enterprises. These objectives were to be achieved through (a) establishment of autonomous water enterprises, (b) capital funding of projects by mixture of loans and equity, and (c) investments always for complete systems, including source, treatment and distribution.

2.12 OED Report No. 6256 of June 10, 1986 on the Five Cities Water Supply Project (Loan 1049-IND) was generally favorable on achievement of project physical objectives and institutional goals. The Report did, however, point out that: (a) physical implementation of project components took over three years longer than estimated due mainly to bureaucratic procurement bottlenecks and partly to unrealistic scheduling; (b) distribution facilities and service connections did not keep pace with developments of water production and transmission; and (c) the financial performance goals were generally not met but the tariff reform efforts were commendable.

2.13 A draft OED Report on the Second Water Supply Project (Loan 1709-IND) commended the early and sustained attention to training of sectoral staff. It also commented on (a) delays in project implementation arising from

cumbersome GOI procurement procedures, delays in appointment of consultants and splitting up the civil works into some 100 contracts; (b) overoptimistic expectations for improvement in unaccounted for water; (c) the need for taking into account the alternative sources of supply (i.e., water from shallow wells) in preparing water demand projections; and (d) the unsuitability of the financial covenant which was based on "Rate of Return on Assets" in comparison to internal cash generation covenant. The Report recommended more technical assistance to improve project implementation performance.

2.14 The lessons from the above projects have already been taken into account in subsequent projects. The First and Second East Java Water Supply Projects focused on institutional strengthening of PDAMs, provision of potable water to about 125 medium-to-small sized towns in East Java, establishment of permanent training unit, specific assistance to PDAM Surabaya and technical assistance for project implementation and institutional development. The implementation so far indicates that most physical targets and progress have been achieved. However, difficulties in the provision of counterpart budget, delays in the procurement of works and goods, increases in TA, management issues and preparation of audit reports were seen to be continued problems.

2.15 In the proposed project (a) implementation is scheduled over six years (even though the main beneficiary, i.e., the utility intends to complete construction in four years); (b) procurement arrangements already tested under JUDP I, and found to be a substantial improvement over past practices/procedures, will be adopted; (c) emphasis has been placed on cost recovery, and a cash flow covenant i.e., contribution towards capital expenditure, has been introduced with a commitment from the relevant authorities that tariffs would be reviewed and adjusted at least every three years (instead of the present five); (d) adequate account is taken of competition from other sources and unaccounted for water in the preparation of demand projections; and (e) a substantial amount of technical assistance (including manpower development) has been provided.

2.16 In summary, Bank experience with implementation in DKI Jakarta has been mixed, but generally good where the local government has had a strong commitment and close control over project management (e.g., Urban I, II and III). The KIP has been successful and popular, especially when controlled and implemented by local governments. OED reports also confirmed that the Jakarta KIP unit (Bappem MHT), which consolidated implementation of this multisectoral program has been a key element in the success of the program there and that expansion and acceleration of the program nationwide has been due, in part to the establishment of similar units elsewhere. By contrast JSSP has experienced serious problems due, in large part, to DKI Jakarta's inadequate involvement. Under JUDP III, the community-based design of the KIP would address the shortcomings of previous phases, particularly with regard to the design and maintenance of MCKs and incorporation of a range of on-plot sanitation options together with health information and education efforts for which participation from NGOs will be mobilized.

C. Bank Strategy in the Sector

2.17 Planning and Implementation. The Bank fully supports the IUIDP approach adopted by GOI as the best way to address urban sector issues in Indonesia in a coordinated and well-planned manner. However, based on experience gained under the five completed and eight ongoing projects, the Bank recognizes that implementation of the IUIDP approach would require flexibility depending on the degree of institutional capacity of individual local governments. For example, in provinces such as East Java and Bali and large cities such as Surabaya and Semarang, where institutional capacity is relatively more advanced, a programmatic or time-slice type of operation through the IUIDP approach would be justified. This approach could not be applied fully in provinces such as Irian Jaya and Southeast Sulawesi, however, where institutional capacities are too weak. In such cases, traditional project lending focused on a single or selected group of subsectors such as water supply or a combination of KIP and solid waste management. Jakarta and surrounding areas (Jabotabek) comprise a special case, where subsectoral requirements are so large and complex that the best approach would be to finance them separately or in groups.

2.18 Poverty. In addition, and also consistent with the findings of the Urban Services Sector report, subsequent sector work and the GOI policy statement for the sector, a high priority is attached to helping GOI to establish effective efforts through community-based programs to alleviate poverty and assist the small enterprise and informal business sector. Although the Jakarta area has a relatively high-income level and share of public expenditures, its service deficits are very high by comparison with other similar developing country cities, particularly in view of the high expected population growth rate. The Bank is therefore supporting a comprehensive and coordinated program to improve service levels in transport (JUDP I), sewerage and sanitation (JSSP), kampung improvement, solid waste management and pollution control (the proposed JUDP III) and water supply (the proposed project). As this program is largely financed through borrowing by the local governments, the financial burden on the central government is reduced significantly.

2.19 Finance. The Urban Services Sector Report emphasized the importance of local resource mobilization and a rational system of transferring central government funds to local governments. These issues continue to be key strategic objectives and have shaped the Bank's position on local government borrowing through the Regional Development Account (RDA). Given the substantial grant component of the financing system for local services in Indonesia, the question of RDA's onlending rate must be viewed in the context of overall sector finances.^{6/} Many local governments have little or no experience with credit financing--having preferred instead to rely on central government transfers. This, in spite of the very low (2.5 to 4 percent) or, in some cases zero, interest rate terms on domestic loans until the last two years or so. The initial RDA interest rate of 9 percent reflects the widespread concern for the need to induce local governments to adopt a more

^{6/} Central government grants finance less than 35 percent of DKI's general fund operations compared to about 50 percent in other large local governments and over 70 percent for regional governments as a whole.

active borrowing posture, within prudent limits. If GOI strategy, under Repelita V, of increasing the relative importance of credit in the sector succeeds, it will help encourage more efficient allocation of resources to and within the sector. The Bank accepts the gradual approach initiated by Government. However, RDA's initial rate is well below market rates and maintains a degree of interest rate segmentation which will inhibit the ability of the sector to mobilize loan funds from domestic savings. The Bank will therefore support a program geared to measured progress towards market-related rates of lending by RDA. The Bank will also support a concept of RDA: (i) based on a strong capacity for economic and financial evaluation of subprojects to be financed; and (ii) independent of the grant finance system, providing an incremental source of financing for qualifying local governments and projects--criteria for qualification to be based on economic and financial considerations.

2.20 Environment. The Bank is committed to assisting GOI develop economically efficient approaches to urban and industrial pollution abatement. The already negotiated JUDP III would address the problem of environmental degradation at the community level in Jabotabek area and would provide assistance for strengthening of local governments capacity to monitor pollution. A proposed Industrial Efficiency and Pollution Control (IEPC) Project, which would build on efforts to strengthen institutional capability for pollution control at the local level through that project, and to establish a Pollution Control Authority at the central level, also with Bank assistance, is under preliminary discussion with GOI.

III. THE PROJECT

A. Project Origin and Formulation

3.1 Project Origin. The nationwide deficiencies of water resources management, contaminated raw water sources, unsafe drinking water, inadequate disposal arrangements for liquid and solid wastes especially in low-income kampungs, are especially true of Jakarta and have been a cause of concern to GOI. It has also been generally known that the operation of the Jakarta water distribution network is not up to usually accepted standards. Although it has not been possible to make accurate measurements, based on studies in selected areas of Jakarta, the unaccounted-for water (UFW) is estimated to be about 50 percent, pressures are generally low and interruptions to service are frequent. For a service area of about 5 million people, there were less than 150,000 official connections in 1988 and there was evidence to suggest that there were many illegal connections and that many consumer meters were broken.

3.2 In 1985 a Master Plan for the development of the Jakarta water supply system was prepared which recommended an ambitious program of new treatment plants and primary distribution facilities. It was realized that to have any hope of achieving those targets, a major effort would be required to strengthen PDAM Jaya, the Jakarta water enterprise. Consultants were appointed in 1986 to prepare the PDAM Jaya System Improvement Project (PJSIP) in order to strengthen PDAM Jaya and upgrade the water distribution network via a comprehensive, integrated approach consisting of (a) rehabilitating the existing distribution network; (b) infilling and extending the secondary and

tertiary distribution mains; (c) increasing the number of connections; and, (d) institutionally strengthening PDAM Jaya.

3.3 In line with the new GOI policy for integrated planning and programming of urban infrastructure (IUIDP), it was decided in November 1987 to prepare a larger, more comprehensive project called the Jabotabek Urban Development Project II (JUDP II), in which the PJSIP would still be the largest component but which would include other related and complementary components: the Pejompongan Raw Water Pipeline, the Cisadane I Treated Water Transmission Main, the Primary Distribution Facilities for Zone 4 in Western Jakarta, the continuation of the pilot sewerage project, Priority Drainage and Flood Control, and Water Resources Studies and Institutional Development.

3.4 Developments During Project Preparation. While the project preparation phase has been long, the ongoing dialogue with GOI during this period has resulted in a number of actions to date: (a) water supply issues in Jabotabek have been thoroughly reviewed by the Governor of Jakarta and concerned GOI Ministers, deficiencies have been noted, and commitment to resolve the issues reaffirmed; (b) PDAM Jaya tariffs were tripled in April 1988; (c) groundwater charges were substantially increased thus making piped water more competitive and resulting in protection of the aquifers; (d) water availability in the Cisadane river for the treatment plant has been investigated and confirmed; (e) a much needed institutional development action program at PDAM Jaya has been started, e.g., improvement in personnel procedures, strengthening of Finance Department including preparation of projections and some updating of accounting system, inventory of installed water meters, improved procedures of meter reading, have already been initiated; (f) the service connection program has been accelerated based on reduction in connection fees, increase in groundwater charges and removal of administrative bottlenecks; (g) DKI Jakarta and Tangerang local governments have agreed to allow their respective PDAMs to retain and reinvest their share of profits for required system expansion; (h) PDAM has agreed to permit all households to sell water to neighbors and to distributing water vendors; (i) discussion on water resources institutional development has been initiated within DGWRD; and (j) awareness of environmental issues has been increased within the sectoral agencies.

B. Rationale for Bank Involvement and Project Objectives

3.5 In accordance with Government and Bank strategy and in an effort to address the critical sector issues the project objectives are to develop and implement a coordinated program of physical investments, technical assistance and policies for urban water supply, wastewater disposal, drainage and water resource/quality management which: (a) balances the existing treatment capacity with required transmission and distribution networks; (b) increases the piped water supply from about 28 percent of population to about 50 percent; (c) results in improved service for poor through construction of standpipes and removal of monopoly on water sales to vendors; (d) improves wastewater disposal; (e) strengthens the management, staffing and financial

viability of water supply and sewerage institutions; and (f) strengthens Jabotabek water resource planning capabilities. In view of the large requirements, water and sewerage related components would be processed under this project while additional sanitation and selected activities for pollution control would be covered under JUDP III, which has been processed in parallel with this project.

3.6 The rationale for Bank involvement with the project is based on the following considerations: (a) it will be the first time that GOI is attempting a coordinated approach to water resources management, water supply, drainage and flood control, sewerage and sanitation, and industrial and environmental pollution in the Jabotabek area; (b) it is the first step in a long-term program for closer integration of environmental activities in the water resources sector; (c) it would assist GOI in focusing on institutional development including cost recovery of the enterprises; (d) it would result in substantial increase of water supply to the urban poor through break-up of water-hydrant operator monopoly, provision of more than 3,000 new hydrants for the poor and cheaper connections for the lower middle class population. Because of its long association with the sector the Bank is well placed to help the Government in these areas.

C. Project Description

3.7 The project would support a program of high-priority investments in physical infrastructure complemented by a human resources development program to promote institutional development of the implementing agencies. In summary, the project comprises the following components:

- (a) PDAM Jaya Water System Improvements consisting of six main subcomponents:
 - (i) System Rehabilitation through repair or replacement of the distribution system aimed at reducing UFW from about 50 percent to 37 percent by 1995;
 - (ii) Infill/extension of secondary and tertiary mains, and the provision of service connections to cover about 70 percent of Jakarta;
 - (iii) Institutional Development of PDAM Jaya through improvement of operations and maintenance, distribution system management, improvement of water treatment capabilities, strengthening financial and personnel management, and training of managers, engineers, accounting staff and operators;
 - (iv) Primary Distribution Facilities for Zones 4 and 5 (Western and Southwestern Jakarta), including transmission main from DKI Jakarta boundary, R5 (Lekabulus) distribution center (reservoir and pumping station), and primary distribution mains;
 - (v) Primary Distribution Mains for Zones 1, 2, 3 and 6 in central, northeastern and eastern Jakarta;
 - (vi) Implementation (Administration) of the PJSIP;

- (b) Pejompongan Raw Water Pipeline. Twin 1,600 mm diameter pipelines, 11.3 km long would be laid from the West Tarum Canal and 6.2 cum/sec of improved quality raw water pumped to the water treatment plants at Pejompongan, thereby replacing the existing highly polluted source on the Banjir canal. A fence, together with appropriate sanitation services, would be provided upstream of the new intake pumping station to prevent local pollution of the water. POJ staff would be trained in operating and maintaining the pipeline. POJ would also benefit from technical assistance for institutional development;
- (c) Cisadane Treated Water Transmission Main. Construction by PDAM Tangerang of a 14.5 km low pressure pipeline (1,500 mm diameter) from Cisadane I Water Treatment Plant (partially financed by Government of France) to the southwestern boundary of DKI Jakarta from where bulk treated water will be supplied to R5 (and the future R4) distribution center;
- (d) Jakarta Sewerage and Sanitation Project Extension. The proposed sewerage component will help to fully develop the ongoing JSSP pilot project aimed at demonstrating the feasibility and effectiveness of appropriate sewerage and sanitation technologies suitable for the city of Jakarta. A mixture of service levels including sewerage and drainage works and low-cost sanitation facilities are under implementation to improve the health status of the communities served and the general environmental conditions existing. The works under this project include a sewage pumping station, construction of main sewers, house and building service connections, drainage improvements and a low-cost sewerage demonstration project. Institutional development would include establishment of an appropriate sewerage enterprise (PDAL), training of PDAL staff and support for improved institutional arrangements to manage and operate the sewerage system as a viable entity;
- (e) Priority Drainage and Flood Control. Dredging and upgrading of some 36 km of major canals and drains; construction of two tidal gates and a diversion channel at Ancol Canal; construction of a diversion channel and a tidal gate in the West Sunter area; and dredging of the Pluit storm water retention basin and rehabilitation of its inlet system and pumping station;
- (f) Water Resources Management. This includes a water resources management study and support for improved institutional arrangements for water resources management in the Jabotabek region. The water resources management study would ascertain the optimum long term water resource development strategy taking into account domestic, industrial, agricultural and water quality needs. The study would also prescribe a management program to optimally use the groundwater resource in conjunction with surface water and with due regard to environmental parameters;

- (g) IUIDP Studies and technical assistance including project preparation funds for future IUIDP projects, support and management training for DGCK, and human resource development in the water supply sector; and
- (h) Overall Project Coordination Support for JUPCO, comprising technical assistance, training facilities and equipment.

3.8 The physical infrastructure components (a) to (e) above (including subcomponents which would be cofinanced) comprise provisions for consultants to carry out detailed engineering design, preparation of tender documents, supervision, construction management, contract administration during construction and overall project coordination for all three Jabotabek projects. These services estimated to amount to about US\$28 million (8 percent of total cost). Terms of reference for the design and supervision consultancies stipulate development and training of public sector staff and of Indonesian consultants. Approximately US\$6 million would be provided for technical assistance in support of institutional development and training (mainly for PDAM Jaya, but also covering POJ, PDAM Tangerang and BPAL). Other technical assistance includes about US\$6.5 million for a water resources management study (supported by a US\$3.4 million grant by GON), and about US\$5 million for future project preparation and related policy and development studies. Bank financing of consulting services, technical assistance and training would amount to about US\$29.5 million. The above amounts and percentages include OECF financed consulting services and technical assistance which total US\$8.5 million equivalent. Management and supervision of consultants will be done by the individual implementing agencies and the project implementation units (PIUs) responsible for the specific project components; the arrangements and procedures are described in more detail in Chapter IV (para. 4.6). A detailed description of engineering services and technical assistance by component and type of use is presented in Annex 9.

D. Human Resources Development and Training

3.9 The scope of the proposed project covers almost every aspect of the hydrological cycle and will generate a diverse variety of training needs. Despite the integrated nature of the project, each component will generate its own set of project-related staff and training needs, many of which will be new to the sector. The aggregate of identified training programs required to meet these needs, whether provided on- or off-the-job, numbers over 100 discrete training activities or programs, some of which will need to be repeated many times in order to meet the consolidated training demand. The consolidated demand for basic skills training for new staff, and retraining and refresher training for existing staff amounts to between five to six thousand. The overall base cost of the Consolidated Training Component is estimated to be US\$3.0 million, representing 1 percent of estimated project costs. Excluding the cost of specialized overseas training and R&D, the average unit cost per person trained is expected to be about US\$300. This is reasonable in light of the diverse technological content of the training portfolio.

3.10 To ensure the provision of an adequate, timely and continuing supply of trained staff, the training programs will not be limited solely to meeting project-related training needs. Equal importance will be given to strengthening agency training capacity within the context of their longer-term plans for institutional development and improvement. In the case of PDAM Jaya

a permanent training unit will be established within the proposed new Human Resources Department.

3.11 Emphasis throughout will be on using local training facilities and resources. Although on-the-job training, supported by technical assistance, will be the predominant training mode, agency training programs will benefit from the commissioning in early 1991, of a substantial new multipurpose Water Resources Central Training Institute, currently under construction, with OECF assistance, at Bekasi. Some special training needs will be met through the provision of short, practical, overseas attachments and study tours. These will be limited to those needs for which in-country programs or experience are not readily available. Key features of this substantial training component, covering training objectives, principal target audiences, training methodology, implementation and costs are summarized in Annex 10.

E. Project Costs

3.12 The total project cost is estimated to be about Rp 626 billion (US\$349 million equivalent) including estimated direct and indirect foreign exchange costs of about Rp 305 billion (US\$170 million equivalent) or about 49 percent of total, and estimated taxes equivalent to about Rp 60 billion (US\$33.3 million). Base costs are estimated as of January 1, 1990. Physical contingencies have generally been estimated at 10 percent for civil works and equipment. Price contingencies are estimated at 7.0 percent for 1990 and 6.0 percent in 1991 and thereafter on domestic costs, and at 5.4 percent in 1990, and 4.3 percent in 1991 and thereafter on foreign costs. Price contingencies total Rp 75 billion (US\$42 million equivalent) or 14 percent of total base costs plus physical contingencies. Land acquisition costs estimated at about Rp 20 billion (US\$11 million) are included in the base costs. The cost summary is shown in Table 3.1, and detailed cost estimates are given in Annex 14.

3.13 Cost estimates are mainly based on preliminary engineering designs for the civil works components. The cost estimates for the Pejompongan Raw Water Pipeline are based on detailed designs prepared by PSJ and their consultants and were ready by December 1989. The cost estimates for the Sewerage Extension are based on preliminary designs and experience gained from recent bids for similar works carried out under the ongoing JSSP. The cost estimates for most of the drainage works are based on surveys of volume to be dredged and on unit costs for current contract works.

Table 8.1: PROJECT COST SUMMARY

	Rp million			US\$ million			% Foreign exchange	% Total base costs
	Local	Foreign	Total	Local	Foreign	Total		
PJSIP Phase 1 (IBRD)								
Rehabilitation	17,517	28,992	46,510	9.8	16.2	25.9	62.3	9.8
Infill/extension serv. mains	44,074	35,348	79,422	24.6	19.7	44.2	44.5	15.8
Institutional development	2,101	4,465	6,567	1.2	2.5	3.7	68.0	1.3
Distribution control S	10,224	6,591	16,815	5.7	3.7	9.4	39.2	3.4
Prim. dis. mains zones 1+2	10,861	17,092	27,953	6.1	9.5	15.6	61.1	5.6
Prim. dis. mains zones 4+5	11,892	21,907	33,800	6.6	12.0	18.7	64.5	6.7
Administration	6,380	2,720	9,100	3.6	1.5	5.1	29.9	1.8
Subtotal	103,052	116,817	219,870	57.4	65.1	122.5	53.1	43.9
PJSIP Phase 1 (JECF)								
Rehabilitation	7,854	6,851	14,705	4.4	3.8	8.2	46.3	2.9
Infill/extension serv. mains	16,370	8,628	24,998	9.1	4.8	13.9	34.5	5.0
Inst. dev./tech. asst.	5,478	7,010	12,488	3.1	3.9	6.9	58.5	2.5
Prim. dis. mains zones 3+6	8,745	12,215	20,960	4.9	6.8	11.7	58.1	4.2
Administration	1,478	0	1,478	0.8	0.0	0.8	0.0	0.3
Subtotal	39,921	34,704	74,625	22.2	19.3	41.5	46.5	14.9
Pojompongan R.W. Pipolino								
Poj. raw water pipolino	38,633	46,933	85,566	21.5	26.1	47.7	54.9	17.1
Inst. dev. for POJ	492	175	667	0.3	0.1	0.4	28.2	0.1
Subtotal	39,125	47,108	86,234	21.8	26.2	48.0	54.6	17.2
Ciadano Water Supply								
Ciadano T.W. trans. main	18,750	9,833	25,584	9.3	4.9	14.3	34.5	5.1
Prim. mains for Sorpong	1,260	1,020	2,281	0.7	0.6	1.3	44.7	0.5
Subtotal	18,011	9,854	27,865	10.0	5.5	15.5	35.4	5.6
JSSP Extension								
JSSP extension	17,997	13,589	31,586	10.0	7.6	17.6	43.0	6.3
Wastewater Disposal								
W/Water disposal (IBRD)	1,695	0	1,695	0.9	0.0	0.9	0.0	0.3
W/Water disposal (OECE)	565	0	565	0.3	0.0	0.3	0.0	0.1
Subtotal	2,260	0	2,260	1.3	0.0	1.3	0.0	0.4
Priority Major Drainage	25,005	10,612	35,618	13.9	5.9	19.8	29.8	7.1
Water Res. Management Study	2,428	9,503	11,932	1.4	5.3	6.6	79.6	2.4
Miscellaneous Studies	1,804	4,209	6,013	1.0	2.3	3.3	70.0	1.2
Overall Coordination (JUPCO)								
	2,738	2,622	5,361	1.5	1.5	3.0	48.9	1.1
Total Base Cost /a	252,345	248,022	501,367	140.5	138.7	279.2	49.7	100.0
Physical contingencies	25,721	23,874	49,595	14.3	13.3	27.6	48.2	9.9
Price contingencies	42,293	32,632	74,925	23.6	18.2	41.8	43.5	15.0
Total Project Cost	320,359	305,528	625,886	178.4	170.2	348.6	48.8	124.9

/a Includes taxes and duties amounting to US\$ 33.3 million equivalent and land acquisition for US\$11.9 million equivalent to consulting services and technical assistance have been included under the applicable components/subcomponents; more details are given in the detailed cost tables in Annex 14.

3.14 Project Financing. The proposed Bank loan of US\$190 million would finance about 64 percent of the total project cost, or 70 percent of the project cost net of identifiable taxes and duties (excluding the OECF-financed portion of the project). The proposed Bank loan would cover foreign exchange costs estimated at about US\$128 million and local costs of US\$62 million equivalent. Counterpart funds would be provided by Central Government (US\$44 million), DKI Jakarta (US\$1.4 million), PDAM Jaya (US\$59 million), and PDAM Tangerang (US\$6 million). The proposed Bank loan includes US\$16 million (about 10 percent of PJSIP costs) which would be onlent to DKI Jakarta to be passed on as its equity contribution to PDAM Jaya.

3.15 Parallel Cofinancing would be provided by the Overseas Economic Cooperation Fund (OECF) of Japan and by the Government of the Netherlands: (a) subsequent to project appraisal, agreement in principle was reached between GOI, OECF and the Bank with respect to parallel cofinancing of the PJSIP component by OECF with a loan amount of about US\$45 million equivalent (Japanese Yen 6,446 million). OECF loan funds would be used for distribution works in Zones 3 and 6 (the zones to be supplied from the Buaran Water Treatment Plants) and for institutional development support for operation, management improvement and computerization. Full agreement on basic objectives, implementation arrangements, coordination and supervision, sharing of physical and institutional development elements has been reached and recorded in an agreed tripartite Memorandum of Understanding (see Annex 3); (b) the Government of the Netherlands has agreed in principle to provide about US\$3.4 million equivalent (Dutch Guilders 7.3 million) in grant financing for the preparation of a major water resources management study (see Annexes 8 and 15). An agreed tripartite Memorandum of Understanding covering project scope and objectives, cost sharing, implementation, coordination and supervision arrangements has also been executed. OECF and GON are expected to sign their respective financing agreements with GOI around October/November 1990. Confirmation has been obtained from GOI that it would provide funds from its own resources to cover any financing gap.

3.16 Flow of Funds. For components implemented by PDAM Jaya, DKI Jakarta (for equity in PDAM Jaya), and PDAM Tangerang, IBRD loan proceeds totalling US\$124 million will be onlent under subsidiary loan agreements (SLA) with the remainder coming from DKI Jakarta (US\$1.4 million), PDAM Jaya (US\$59 million) and PDAM Tangerang (US\$6 million). For components implemented by DGWRD and DGCK part of the Bank loan proceeds (about US\$66 million) and government funds totalling US\$44 million would flow as Central Government contributions. OECF loan funds for the PJSIP component will be onlent to PDAM Jaya under a subsidiary loan agreement, and the GON grant funds will be part of the Central Government contribution.

3.17 Onlending Terms. GOI will bear the foreign exchange and interest rate risks, and will onlent the proceeds to the various executing agencies at an interest rate of 9.25 percent per annum (and a 0.75 percent commitment charge on disbursed amounts) for 20 years including five years grace period. Execution of satisfactory subsidiary loan agreements, between GOI on the one part and PDAM Jaya, DKI Jakarta, and PDAM Tangerang on the other part, satisfactory to the Bank will be a condition of loan effectiveness.

IV. IMPLEMENTATION ORGANIZATIONS AND ARRANGEMENTS

A. Organization

4.1 Overall Project Coordination. The project coordination and monitoring office (JUPCO) has proven effective in its prescribed role under JUDP I, and has matured sufficiently to accommodate an expanded scope of oversight. A two-level organizational structure will therefore be established in JUPCO to: (a) retain the high-level Technical Committee with representation from central ministries and constituent local governments to provide a forum for policy formulation, reviewing and resolving interinstitutional issues and ensuring cross-project linkages are addressed; and (b) a technical staff divided into three divisions to coordinate overall programming and implementation of JUDP I, JUDP II and JUDP III, respectively. The need to create a new agency will thus be avoided and a proven institutional mechanism is being mobilized to provide the required level of coordination within and between this package of Bank-financed investment programs.

4.2 The division for this project will consolidate and analyze information provided from the various Project Management Units (PMUs) and prepare regular progress reports, project accounts and project audits, periodic evaluation reports, status of procurement and disbursement operations, updating of project costs and financial forecasts, and report on the status of covenants for review and action by the concerned managers. JUPCO will have an important overall review function to foresee potential delays, alert PMUs and suggest corrective action and coordination with the proposed JUDP III and other ongoing projects, particularly the Bank-financed JUDP I (transport improvements) and the Telecommunications III Project. JUPCO would also be responsible for coordinating the preparation of the Project Completion Report and will work closely with line agencies in DKI Jakarta, West Java and the central government in preparing future phases of regional development projects in water supply, sanitation, drainage and environmental management. Consultants would assist JUPCO with its expanded role in overall project coordination, monitoring and project accounting. The organizational structure for the project is illustrated in Annex 11.

4.3 The first Jabotabek Urban Development Project was concerned almost entirely with DKI Jakarta, and JUPCO was established by a decree of the Governor of Jakarta. This project and the proposed JUDP III incorporate development efforts in the adjacent jurisdictions and it will be necessary to reconstitute JUPCO by a new joint decree by the Governors of Jakarta and West Java to specify JUPCO's expanded responsibilities for both new Jabotabek urban projects, establish the respective divisions and define the nature of the relationship between JUPCO and BKSP. Confirmation has been obtained at negotiations: (i) on the provisions of a draft new joint decree to revise the organization and staffing structure of the expanded JUPCO and establish the division for the project; and (ii) that the decree will be implemented. Appointment of JUPCO key staff (Division Manager, Financial Accountant and Monitoring Officer) will be a condition of Loan Effectiveness.

4.4 The JUPCO technical support team would have regular briefing meetings with Jabotabek Planning Team (BKSP) to inform them of progress.

Particularly for the policy studies, the responsibilities of JUPCO and BKSP Jabotabek could overlap and there should therefore be a strong link between JUPCO and BKSP. The relations between JUPCO and BKSP will be specified in the joint decree expanding the responsibilities of JUPCO.

4.5 Above JUPCO's overall coordination functions at the Provincial level, Central Government through DGCK within MPW will retain overall responsibility and supervision for the project (including policy direction and guidance).

4.6 Implementation. Each project execution agency has already established and staffed project implementation units (PIU) to be responsible for the management and execution of their respective projects. Agencies responsible for major components such as PDAM Jaya will also set up a central PMU to coordinate and oversee the activities of the different PIUs.

- (a) PDAM Jaya, with assistance from JUPCO, DKI Jakarta-Bappeda and DGCK, will be responsible for hiring all technical assistance and consulting services for the PJSIP, for procurement of civil works and goods, and, via the newly established PJSIP PIU, for carrying out minor works by force account. A parallel, separate PIU will be established for the OECF-financed part of PJSIP.
- (b) PSJ, with assistance from DGWRD, will be responsible for hiring all technical assistance and consulting services for the Pejompongan RWP, and for procurement of civil works and goods.
- (c) PDAM Tangerang, with assistance from Directorate of Water Supply will be responsible for procurement of services, civil works and goods for the Treated Water Transmission Main and related facilities.
- (d) The existing JSSP PMU under the Directorate of Environmental Sanitation, DGCK will be responsible for procurement of services, civil works and goods for the JSSP Extension.
- (e) PBJR, under the direction of DGWRD, will be responsible for procurement of services, civil works and goods for the Priority Major Drainage Components.
- (f) DGWRD will be responsible for procurement of technical assistance and consulting services for the Jabotabek Water Resources Management Study and Institutional Development.

4.7 JUPCO and the various PMUs will set up sound project management procedures and management information systems acceptable to IBRD by August 1990 to enable each unit to carry out its tasks according to the agreed implementation schedule, and to facilitate procurement, disbursement operations and IBRD reporting requirements. Training in project management will be provided as necessary for PMU and PIU managers.

B. Implementing Agencies

4.8 PDAM Jaya. Water supply facilities are owned and operated by PDAMs under the direction and ownership of the local governments in which they are located. Law No. 5 of 1962, Law No. 5 of 1974, the Ministry of Home Affairs Decree 26 of 1975 and the joint Ministry of Home Affairs and Ministry of Public Works Decrees 3, 4 and 5 of January 23, 1984 provide the legal framework for PDAMs. The regulation of each PDAM is approved by the respective People's Council of the local government and it is ratified by the Governor. PDAM Jaya serves the special capital province (DKI Jakarta). It is headed by a Board of Directors composed of a President Director and three other Directors (Production and Distribution, Commercial, and Administration and Finance). The Board of Directors reports to a Board of Supervisors consisting of the Governor of DKI Jakarta as chairman and members from the public service and private sector. It is responsible for operating and maintaining the Jakarta piped water supply system. So far PDAM Jaya has not had the responsibility for implementing large projects: these have always been handled by DGCK. However it has experience in designing and executing small extensions to the service main networks under the regional budget (APBD) and for the last two years has been carrying out pilot rehabilitation projects. PDAM Jaya will be responsible for the implementation of PJSIP. However PDAM Jaya is likely to encounter difficulties with the scale of the PJSIP and will therefore require adequate technical assistance in project management, design, contract administration and data processing techniques in order to ensure successful project execution and to develop its in-house capabilities. The required technical assistance has been included in the project.

4.9 Jatiluhur Project Office (PSJ). Currently POJ is only responsible for operating and maintaining works. Contract administration and construction supervision are handled by PSJ (Proyek Serbaguna Jatiluhur--Jatiluhur Multi-purpose Project) which is an existing project office under DGWRD. PSJ is currently implementing the West Tarum Canal Enlargement and the Pulogadung Pipeline under Loan 2560 IND. PSJ was also the executing agency for detailed design of the Pejompongan Pipeline. In early 1989 DGWRD decided that PSJ would also implement this component to be financed under JUDP II.

4.10 PDAM Tangerang. PDAM Tangerang is similar to PDAM Jaya in that it is responsible for O&M of the Tangerang water supply facilities and has little experience in the implementation of large projects. However PDAM Tangerang is the implementing agency for the Cisadane I production facilities (funded by the Government of France loan) which are under construction and will be strengthened accordingly. Due to the strategic importance of the pipeline to Jakarta's water supply, technical assistance with substantial expertise in construction of large pipelines will be provided to the Cisadane PMU.

4.11 JSSP PMU. This PMU under Directorate of Environmental Sanitation, DGCK, is currently implementing the JSSP. BPAL, which currently has the status of a PIU under this PMU, will have responsibility for operating the JSSP extension works. The responsibility for the operation and maintenance of the sewage pond system which is currently shared between DKI Jakarta and DGWRD has been clearly defined in a mutual agreement between the two parties to ensure compliance with requisite operating procedures and environmental requirements. BPAL is currently implementing the sewer connection program

under JSSP. There is a close interaction between property connections and low-cost sewers and therefore BPAL will also implement the low-cost sewer component of the JSSP Extension directly. The existing Sewerage and Drainage PIU of the JSSP PMU will implement the remaining works.

4.12 Jakarta Flood Control Project (PBJR). PBJR has considerable experience in both designing and executing flood control works and is therefore capable of handling the implementation of the Priority Major Drainage Works for DKI Jakarta. On completion, these works will be handed over to DKI Jakarta for O&M.

4.13 Directorate of Planning and Programming, DGWRD. The water resources study will be managed by the Directorate of Planning and Programming of DGWRD and that directorate will be designated the Project Management Unit. A steering committee chaired by the Director General for Water Resources Development, and with the Director of Planning as Secretary, will be established by October 1990 (prior to commencement of the study) to provide policy guidance and approvals on major recommendations flowing from the study. The committee membership will include representatives of MPW, DGCK, DGWRD, POJ, the BAPPEDAs of DKI Jakarta and West Java, PDAM Jaya, West Java Water Board, Directorate of Environmental Geology, and the Ministries of Home Affairs, Health, Industry and Environment. Decisions reached will be reported to the MPW Minister for approval.

C. Implementation Arrangements

4.14 The JUDP II will be implemented over a six-year period from July 1990 through June 1996 in accordance with the implementation schedule shown in Annex 11. Most components are however expected to be completed within four years. The PJSIP is the component most susceptible to delays due to its size, number of contacts, tight sequence of activities and spatial dispersion. Therefore, a six-year implementation period for the PJSIP has been assumed. PDAM Jaya has appointed the PIU Manager and is currently making arrangements for the prequalification of contractors for the first stage of the six-year pipe-laying program, for the publication of the Specific Procurement Notices and to select international engineering consultants for detailed design, supervision, construction management and institutional development.

4.15 Part of the PJSIP component will be cofinanced by OECF and specific implementation arrangements have been reviewed and found acceptable to GOI, OECF and the Bank. The OECF financing will cover system improvements in Distribution Zones 3 and 6, geographically distinct areas from the Bank-financed zones. A separate PIU will be established within PDAM Jaya to deal with Zones 3 and 6, but there will be adequate coordination through the PDAM management and the construction management support team. The involvement of two financing agencies--directing their support and supervision at geographically separate areas--will spread the burden and risk of implementing this large project. The OECF-financed portion is likely to employ turnkey contract and similar approaches to reduce demands on implementation capacities.

4.16 Most of the important preliminary implementation arrangements needed for problem-free project execution and timely project completion are expected to be concluded to the point of bids being received and evaluated in readiness for contract signing with consultants and contractors to coincide with

loan effectiveness. Summarized below are the implementation arrangements specific to each project component.

4.17 PJSIP - Rehabilitation and Infill/Extension. Except as noted below, PDAM Jaya will be responsible for procurement of civil works, supply of goods and services, including overall engineering and construction management services, required for the project. The terms of reference for the bridging consultants have been amended to ensure that resources are available to cover pre-implementation planning and procedures. These consultants will assist PDAM Jaya in preparing detailed terms of reference for all technical assistance services to be financed under the project. Separate consultants, supply and contract arrangements will be made by PDAM Jaya for the OECF-financed works in Zones 3 and 6.

4.18 PJSIP - Primary Distribution Facilities for Zones 4 and 5. PDAM Jaya will make arrangements for reviewing the detailed designs and bid documents for all PDAM Jaya facilities (Cisadane Treated Water Transmission System and R5 Distribution center) lying within DKI Jakarta's boundaries which are now under preparation by consultants appointed by DGCK.

4.19 PDAM Jaya and PDAM Tangerang, with assistance from JUPCO and DGCK will arrange for the hiring of all technical assistance for supervision of construction and for inviting international bids for the construction of the treated water transmission pipeline, connecting the Cisadane Water Treatment Plant in Tangerang (West Java) to (ultimately two) distribution center(s) in Jakarta. Since one set of contractors and consultants will likely be responsible for the works on this ICB contract the allocation of supervision and disbursement responsibilities will require careful review. To this effect a memorandum of understanding between DKI Jakarta and West Java will be prepared, which will also cover BKSP's role in coordinating activities between the two provinces, specifically in regard to the coordination of road closings and traffic management. Ownership and future O&M responsibilities will be allocated according to the jurisdiction where assets are located.

4.20 DGWRD will make arrangements for procurement for (a) the Pejompongan Pipeline Consulting Engineering Services and Civil Works Construction contracts, (b) consultant and advisory services for the water resources management study components identified for IBRD funding and will also complete the design and environmental studies for the dredging works in the drainage component and prepare LCB and ICB bidding documents for IBRD clearance. DGCK and BPAL will make their best efforts to complete the arrangements for the construction of the sewerage works involving the hiring of construction supervision consultants and tendering of contracts and have the contracts cleared by IBRD by time of loan effectiveness.

4.21 Preparations are being made to ensure a smooth implementation of the project. By mid-1990 the contracts for the engagement of consultants for detailed engineering design, construction supervision including project management, institutional development and training, and the pipe-laying contracts for the first year of the PJSIP program are expected to be signed and notices to proceed issued. The designs will be based on actual field surveys; BKSP approvals for the works will be obtained. Similarly, for the other components, contract preparation will take place in accordance with the project implementation schedule reviewed at project appraisal and

negotiations. The project will fully be launched at the time of loan effectiveness. By that time, PMUs and PIUs and their staffs will be in place in order to receive training in project management, procurement and disbursement operations, quality control and any other matters that have been identified as causes for project implementation delays in the past on similar projects.

D. Procurement and Disbursement

Procurement

4.22 Civil Works. The estimated total value of civil works to be procured for this project is about US\$202 million including contingencies. Large contracts (over US\$3.0 million each) for reservoirs, pumping stations, sewers and the laying of large diameter pipelines, totalling about US\$110 million, will be procured following international competitive bidding (ICB) in accordance with IBRD guidelines. A 7.5 percent margin of preference will be given to eligible domestic bidders. Smaller and scattered contracts for water distribution system rehabilitation, installation of small diameter secondary and tertiary mains, sewerage and drainage works totalling about 50 in number (US\$61 million equivalent) will be awarded through local competitive bidding (LCB) procedures acceptable to the Bank. Foreign contractors will be eligible to bid on contracts to be awarded under LCB procedures. Works valued about US\$4.5 million for the installation of house connections and public taps will be executed by PDAM Jaya force account. These works are not suitable for ICB or LCB contracts due to the difficulty in specifying the work to be performed.

4.23 Goods. Some pumping station and pipeline equipment, pipe materials and fittings totalling about US\$39 million equivalent in contracts exceeding US\$200,000 value each, will be procured under ICB procedures for goods in accordance with IBRD guidelines. Qualifying domestic manufacturers will receive a margin of preference in bid evaluation of 15 percent or the import duty, whichever is less. Pumping equipment totaling about US\$3.5 million in value may be procured under contracts awarded through limited international bidding (LIB) on the basis of evaluation and comparison of bids invited from at least three qualified suppliers. Miscellaneous goods costing less than US\$100,000 equivalent each and totalling not more than US\$1.5 million may be procured by prudent shopping.

4.24 Procurement arrangements for the project are summarized in Table 4.1. The proposed contract packaging arrangements have been reviewed and are satisfactory to the Bank (see Annex 16).

4.25 Procurement Reviews. Bidding documents for all civil works contracts exceeding US\$1.5 million equivalent in value, and equipment contracts exceeding US\$500,000 in value (representing about 80 percent of the total value of procurement) would be subject to prior review by IBRD. The balance of contracts for goods and civil works will be subject to selective post-review by IBRD. A unit price analysis with supporting documents will be submitted for IBRD review before the first reimbursement for force account works is claimed. Contractors for major civil and structural works will be prequalified in accordance with procedures satisfactory to IBRD. All technical assistance under the IBRD loan will be procured in accordance with

IBRD guidelines for the use of consultants and all technical assistance contracts will be subject to IBRD's prior review. A summary of review procedures is given in Annex 16.

4.26 Disbursement. Funds for project implementation will come from one or more of the following sources: (a) IBRD loan proceeds via MOF on the basis of Subsidiary Loan Agreements (SLA) or directly through the DGWRD or DGCK budgets; (b) Rupiah loan from Central Government in the form of Pinjaman Dalam Negeri (PDN) or National Loan Fund; (c) equity from Local government (ABPD); (d) equity from Central government; and (e) funds generated internally by the implementing agency.

Table 4.1: PROCUREMENT ARRANGEMENTS
(all amounts in \$ million)

Expenditure Category	Procurement Procedure /a				Total
	ICB	LCB	Other /b	N.A. /c	
Civil works	109.6 (76.4)	61.1 (1.6)	5.2 (3.0)	26.5 (0.0)	202.4 (121.0)
Goods /d	30.4 (30.0)	8.7 (8.0)	1.6 (1.5)	17.4 (0.0)	58.1 (39.5)
Consulting services, technical assistance and training	-	-	31.0 (29.5)	12.5 (0.0)	43.5 (29.5)
Land and taxes	-	-	-	44.6 (0.0)	44.6 (0.0)
<u>Total</u>	<u>140.0</u> <u>(106.4)</u>	<u>69.8</u> <u>(49.6)</u>	<u>37.8</u> <u>(34.0)</u>	<u>101.0</u> <u>(0.0)</u>	<u>348.6</u> <u>(190.0)</u>

- /a Figures in parentheses are the amounts to be financed from Bank loan.
/b Includes force account contracts, local/international shopping, and selection of consultants following Bank guidelines.
/c Includes expenditures covered by parallel cofinancing by OECF and GON, PIU support costs.
/d Some goods supply contracts may be combined with civil works contracts.

4.27 In respect of the IBRD loan onlent through an SLA, disbursements would be made through the Special Account and/or following IBRD direct payment procedures (para. 4.29). Regarding Rupiah loans, each implementing agency will have a specific project account for the PIU. The signatories for this account will be the heads of the PIU and the implementing agency. The PIU will draw funds on the basis of its disbursement schedule. The implementing agency will also provide funds (from its own internally generated funds) to the PIU when the need arises by transferring funds to a second project account of the PIU. All disbursements by the PIU will be recorded in the project accounts of the PIU and will be referenced to the account of the implementing agency at the end of each month. Grant funds will be disbursed through the Special Account and/or following direct payment procedures to be

drawn on by DGWRD and DGCK for authorized national government budget expenditures (ABPN DIP).

4.28 IBRD loan disbursements would be made against the following categories of expenditures:

- (a) 62 percent of the cost of civil works executed under contract;
- (b) 50 percent of the fixed, agreed unit cost of installing house connections and public taps carried out under force account by PDAM Jaya and low-cost sewer works carried out under force account by JSSP-PMU;
- (c) 100 percent of the CIF cost of directly imported goods, 100 percent of ex-factory net of tax costs of goods supplied by local manufacturers, and 65 percent of the cost of other items locally supplied; and,
- (d) 100 percent of the net of tax costs of technical assistance and training related expenditures.

4.29 In order to facilitate disbursements, a Special Account would be opened in Bank Indonesia for the purposes of the project by the Ministry of Finance. The use of the Special Account would be for withdrawals, in all categories, relating to : (a) local currency expenditures for contracts to be paid wholly or partly in local currency, and (b) foreign-currency expenditures for training and other small items below \$50,000 equivalent. The account would be maintained in US\$ and an initial deposit of US\$5 million (equivalent to expected average eligible disbursements during a four-month period) would be made. Advances to PDAM Jaya for works carried out under force account can not be authorized directly from the special account. Instead, this cost will have to be prefinanced and reimbursed from the special account after the expenditures incurred and the accountability report (SPJ) has been submitted to DG Budget Administration (TUA). Withdrawals would be made on the basis of (a) SPMs (Orders-to-Pay in respect of APBN DIP expenditures or SLA funded expenditures) issued by the MOF's Directorate TUA or its relevant KPN offices for eligible project expenditures, and (b) debit advices issued by Bank Indonesia.

4.30 At the initiative of GOI, replenishments of the Special Account would be made quarterly or whenever the balance reaches 50 percent of the initial deposit amount, whichever occurs first. The estimated replenishment schedule and related disbursement schedule is shown in Annex. Disbursements would be made on the basis of Statements of Expenditure (SOEs) procedures satisfactory to IBRD, or full documentation, in the case of expenditures related to contracts procured subject to the Bank prior review, i.e. civil works contract valued above US\$1.5 million, equipment contracts valued above US\$500,000 and technical assistance contracts. Supporting documentation for the SOEs would be maintained by TUA and JUPCO.

4.31 Disbursements against expenditures in respect of contracts involving foreign currency payments would be made following IBRD direct payment withdrawals and special commitment procedures, but they are subject to a minimum of US\$50,000 equivalent per application.

4.32 The proposed disbursement period of 6½ years is generally consistent with the disbursement profile for the urban sector in Indonesia (see Annex 17), considering that the main component (the PJSIP) is the first phase of a nine-year program. This somewhat accelerated disbursement schedule is considered reasonable since the PJSIP is of a programmatic nature (i.e. preparation of detailed designs will be ongoing throughout the implementation period) and land acquisition has been substantially completed. Project preparation efforts which have been made since 1988 will also help to have a number of major contracts a few months after Board presentation ready for award at loan effectiveness. Due to the need for additional preparation services (detailed engineering design), it is proposed that IBRD retroactively finance eligible expenditures incurred after February 28, 1990 up to a maximum of US\$2.0 million. The loan closing date will be December 31, 1996.

E. Land Acquisition

4.33 Land acquisition under the project is limited as most of the components provide underground facilities in existing streets. The main land acquisition requirements are for the PJSIP, and notably the sites for the R5 Distribution Center, and parts of the alignment of the Pejompongan Raw Water and the Cisadane Treated Water Pipelines. For the Pejompongan right-of-way, land acquisition has been almost completed following approval by the Governor's decree and compensation payments are scheduled to be completed by June 1990. Land acquisition for the Cisadane pipeline is at an advanced stage and scheduled to be completed by July 1990. All rights-of-way for the first year's program of implementation will therefore be available by mid-1990.

F. Relocation and Resettlement

4.34 About 44 families (less than 200 people) along the right-of-way of the Pejompongan Pipeline and about five families along the Cisadane Pipeline will require relocation. A detailed survey and relocation plan has been prepared. All property owners affected by the right-of-way hold ownership rights to the properties to be acquired. A Governor's decree has been issued following the assessment of such properties and compensation will be provided. The compensation, determined on the basis of the market value of the properties including land and improvements, would allow the displaced families to re-establish residence under comparable conditions. Except for monitoring the relocation, no further actions or assistance are needed.

G. Project Accounts and Audits

4.35 JUPCO as the overall project coordination unit (para. 4.1), will have the responsibility for establishing and monitoring the use of a uniform project accounting system. Financial records and accounts for each component will be maintained by JUPCO based on copies of financial and supporting documents obtained from the PIU managers and relevant external agencies concerned with project funding, payment and reimbursement. JUPCO will transmit to the Bank on at least a quarterly basis up-to-date account records consolidated into a single project account for monitoring purposes and annually for audit purposes. The audit statements will deal with the Central, and DKI Jakarta government funds provided as well as disbursements by the Bank, and will include opinions on all expenditures including those made

against Statements of Expenditures. Accountants will be appointed as part of the advisory assistance to JUPCO (para. 4.1). It was agreed during negotiations that: (a) the consolidated project accounts, including SOEs, will be audited annually by independent auditors satisfactory to the Bank; and (b) JUPCO would submit the audited accounts to the Bank not later than nine months after the end of each fiscal year commencing in FY90/91.

H. Project Supervision

4.36 GOI will appoint staff for project implementation and coordination according to an agreed schedule. GOI also confirmed during negotiations that: (a) JUPCO will be responsible for preparing and submitting the quarterly report on basis of input from all Project Implementation Units (PIUs); and (b) the report include chapters on physical progress of each subproject, progress on institutional development action programs, technical assistance; compliance with loan agreement covenants; administration and finance including project cost, commitment, and disbursement schedule; list of executive actions to be taken by each of the parties (GOI, DKI JAKARTA, TANGERANG local Government, PDAM TANGERANG, PDAM JAYA, BPAL/PDAL, DGWRD, POJ and JUPCO); Overall Summary; and linkages between the proposed Third Jabotabek Urban Development Project (JUDP III) and this Project, particularly with regard to water distribution works programmed under this Project and the KIP under the proposed JUDP III. The first quarterly report will cover July-September 1990 and be submitted to the Bank by November 15, 1990.

4.37 It was also agreed during negotiations that the impact of the directive permitting connected households to sell water (see para. 5.11) will be reviewed annually. The first review will be based on a survey carried out by the Bank, the following reviews will be based on PDAM Jaya surveys. After three years, the respective local government regulation will be modified to reflect the experience gained during the reviews.

4.38 The project will require about 25 staff-weeks of Bank staff and consultant input annually for supervision, comprising mainly financial, technical (urban infrastructure construction) and environmental expertise. The latter will be especially concerned with ensuring the implementation of the environmental management and monitoring plans (see Annex 24 for Supervision Plan).

V. FINANCIAL ASPECTS

5.1 Overview. All four enterprises--PDAM Jaya, PDAM Tangerang, POJ and BPAL--are financially weak organizations particularly in relation to the magnitude of responsibilities ahead. PDAM Jaya, which is the main beneficiary of the project, would increase its fixed assets fourfold over next six years while in the process of meeting the vast backlog in its distribution system. PDAM Tangerang, solely because of its location, has been assigned by GOI the responsibility of undertaking the large Cisadane investment (a water treatment plant) of which 93 percent of the production is set aside exclusively to meet the needs of Jakarta (PDAM Jaya). POJ is too weak to assume direct financial responsibility and therefore would receive completed assets as equity from GOI. BPAL is a new organization set up to take over and operate

the pilot sewerage project. An essential objective of this lending operation is, therefore, to protect and improve the financial and institutional viability of the enterprises. However, financial viability can be achieved only in a phased manner, and it would extend beyond the project period (1990-96).

A. PDAM Jaya

5.2 Past Performance and Present Situation of PDAM Jaya is characterized by: (a) late and qualified audit meaning that the financial data presented below should be considered somewhat indicative rather than precise; (b) low income in 1986 and net loss in 1987; (c) partly implemented accounting system; and (d) high accounts receivable particularly from GOI agencies. The poor operating performance was due to rising expenses which were not matched by tariff increases for a period of five years. During the project appraisal process, (i) tariff structure has been simplified, (ii) a large tariff increase became effective in April 1988, with the average tariff almost tripling, (iii) an institutional development action program relating to tariffs, accounting system, meter reading, bill collection and personnel policy has been discussed and agreed with the PDAM. Notwithstanding, progress towards financial viability will be slow and can be expected to be achieved in phases. Highlights of past financial performance/results are shown in Table 5.1.

5.3 Major changes in financial results between 1987 and 1988 are due to: (a) almost tripling of tariffs effective April 1, 1988; (b) commissioning of Pulogadung treatment plant resulting in, inter alia, increased production capacity, O&M and depreciation expenses, inventories and debt service; and (c) completion of asset revaluation in April 1988 resulting in increased value of gross assets, depreciation, and equity. During 1988 which was the first full year of tariff increases, the revenue from water sales increased by 39 percent. Operating expenses during the same period went up by 51 percent, primarily due to increase in maintenance expenses and new connection cost.

Table 5.1: FINANCIAL PERFORMANCE INDICATORS: PDAM JAYA, 1986-89
(Rp million)

	Audited /a			Estimated 1989
	1986/b	1987	1988	
Volume sold (Million m ³)	73	107	110	113
Total revenues	21,811	29,747	61,738	85,146
Operating expenses	16,131	25,682	38,380	58,036
Depreciation	3,218	3,872	16,102	12,770
Operating income (loss)	2,462	193	7,256	12,700
Operational interest	1,156	1,255	3,392	7,297
Nonoperating income-net	837	458	1,289	862
Provision for income tax	689	-	347	2,761
Net income (loss) after tax	1,454	(604)	4,806	3,504
Average tariff Rp/m ³	235	235	516	700
Ave. op. expenses/m ³ sold (Rp)	221	239	348	516
% Operating ratio	89	99	88	85
% Rate of return	6.0	1.6	10.9	11.0
Current ratio	2.7	2.4	2.8	2.0
% Debt (debt-equity)	44	61	46	54
Days accounts receivable	79	84	83	76
% Contribution to investment (Annual)	7	16	20	18

/a Qualified audits.

/b Nine months (April-December).

5.4 PDAM's latest audit (CY1988) conducted by government auditors (BPKP) had qualifications related to (a) accounts receivable, (b) inventory records, (c) provision for income tax, (d) approval of valuation of fixed assets and resulting capital by the Governor of DKI Jakarta and by Ministry of Finance. Since then, the PDAM management and BPKP are working together to resolve issues (a), (b) and (c). On issue (d), the Ministry of Finance, Governor of DKI Jakarta and PDAM are in the process of determining valuation of fixed assets and equity.

5.5 Financial Management. A detailed review of PDAM financial management indicated that several areas needed improvement particularly the accounting system, auditing, metering, billing and collections, inventory control and personnel policy and procedure. Therefore, an institutional development action program with a detailed actions has been drawn up and agreed with GOI, DKI Jakarta and PDAM Jaya management in order to improve financial management and remove the audit qualifications (details in Annex 22). A substantial amount of technical assistance including provision of a financial/commercial advisor for a three-year period has been earmarked under the proposed project. Assurances were obtained during negotiation that the action program would be implemented.

5.6 Profit Distribution. As permitted under the existing laws, but contrary to 1985 guidelines issued by the Ministry of Home Affairs, DKI Jakarta has been withdrawing funds from PDAM equivalent to 50 percent of PDAM's "net income after taxes". The remaining 50 percent is distributed by PDAM among various other funds, e.g., staff bonus, general reserves and pension fund. DKI Jakarta has decided that in the future, its share of the "net income" would be retained within the PDAM as DKI Jakarta equity until 75 percent of DKI Jakarta population is served by distribution network. PDAM has also indicated that it intends to limit the staff bonus to three months salary.

5.7 Investment Program of the PDAM through 1997 is large (detailed in Annex 19) and comprises of (a) PJSIP Phase I to be funded by OECF and the Bank through the proposed project; (b) PJSIP Phase II to be funded by a future foreign loan and implemented starting 1995; (c) rehabilitation and optimization of existing treatment plants funded by internal cash generation over 1990-95 period; (d) completion of Buaran I treatment plant funded by OECF and scheduled for completion in 1992; (e) Buaran II treatment plant funded by OECF and GOI; and (f) routine expenditures funded by internal cash generation. Funds for the treatment plants have already been committed by GOI. The distribution is urgently required to use the water from the existing and the new treatment plants in order to increase the percentage of population served from about 30 percent in 1989 to about 50 percent in 1997.

5.8 Financial Projections. The financial projections are based on several assumptions (details in Annex 19) of which the key ones are: (a) provision of a large number of additional connections (20,000 in 1990, 25,000 in 1991, and 30,000 each year thereafter) mostly in lower-income households facilitated by (i) the recently adopted aggressive and sustained marketing campaign in the service area, (ii) recently implemented over 50 percent reduction in house connection charges, and (iii) minimum delay in providing connections; (b) systematic and timely extension of the distribution system (mainly secondary and tertiary) to meet the above targets; (c) adhering to construction schedule (and cost) of the investment program mentioned above; (d) accurate monitoring of "deep well" water consumption and effective implementation (and regular increase) of consumption charges to induce present and potential users to switch over to PDAM Jaya supply; (e) improved operating efficiency through reduction in UFW, staffing ratio, collection period for accounts receivables, etc.; (f) tariff increase every three years, the next one effective in April 1991, is presently estimated to result in an average increase of 40 percent;^{7/} (g) plowing back DKI's share of PDAM's "net income" as equity in PDAM; (h) 100 percent loan financing for Buaran II (implementation period 1987 to 1995) and debt service charges being accumulated until PDAM is able to cover the charges from its incremental water sales which is currently estimated to start in 1999; and (i) provision of equity contributions by DKI Jakarta to support the large investment program.

^{7/} DKI Jakarta and PDAM Jaya accept the principle of annual tariff review and adjustment. They are exploring mechanisms for the annual review and the proposed mechanisms will be discussed with the Bank by December 31, 1990.

5.9 Based on the above assumptions which are realistic, PDAM's financing plan over the project period (1990-96) indicates total capital expenditure (excluding Buaran II) of Rp 696 billion (US\$388 million) to be funded through: (a) internal cash generation of Rp 255 billion (US\$142 million) or 37 percent;^{8/} (b) borrowings of Rp 386 billion (US\$215 million) or 55 percent; (c) GOI equity contribution of Rp 22 billion (US\$12 million) or 3 percent, primarily for public hydrants; and (d) DKI Jakarta equity contribution of Rp 82 billion (US\$46 million) or 12 percent. The balance is accounted for by the cash increase during the period. Without the DKI Jakarta equity, the "internal cash generation" would amount to about 50 percent and would impose a heavy burden on current consumers because it would require large tariff increases every three years.

5.10 The analysis indicate that PDAM Jaya would have a positive net income after taxes during the project period and beyond, and satisfactory rates of return. With the infusion of equity contribution, cash balances would remain at a comfortable level. The debt service ratio remains above 1.9 which is satisfactory. Result of the financial projections for selected years are summarized below.

^{8/} Buaran II investment is excluded because it is fully funded by OECF and GOI. If Buaran II investment is included, net internal cash generation would amount to about 23 percent over 1990-96 period.

Table 5.2: FINANCIAL PROJECTIONS: PDAM JAYA, 1990-96

(In Billion Rp)	1990	1991	1992	1993	1994	1995	1996
Volume sold (Million m ³)	125	138	153	167	184	201	218
Total Operating revenues	92	129	154	168	221	242	262
Operating expense	53	71	79	89	109	131	159
Depreciation (Fiscal)	14	16	22	35	49	57	91
Operational interest	7	7	6	14	14	32	33
Nonoperating income-net	0.9	1	1	1	1	1	1
Provision for income tax	6	13	16	11	18	7	0
Net income (loss) after tax	15	28	39	37	58	43	29
Average tariff Rp/m ³	700	910	980	980	1,176	1,176	1,176
Ave. op. expenses/m ³ sold (Rp)	428	515	521	532	591	650	730
% Operating ratio	70	64	60	64	60	67	77
% Rate of return on revalued assets	16	22	19	10	9	8	6
Current ratio	2.3	1.9	2.1	2.6	2.6	2.8	2.9
% Debt (debt-equity)	60	59	63	64	62	61	58
Days accounts receivable	76	76	76	76	76	76	76
Debt service coverage ratio	3.4	5.3	6.9	3.3	4.6	2.1	1.9
% Contribution to investment with Buaran II, average of 3 years	19	19	23	18	37	23	21
% Contribution to investment with- out Buaran II, average of 3 years	24	30	37	33	66	36	30

5.11 Assurances were obtained during negotiations that there would be: (a) tariff adjustment at least every three years, the next adjustment scheduled for April 1991 in order to achieve agreed financial objectives listed below; (b) three-yearly adjustment of groundwater abstraction fee based on the results of the ground-water study; (c) increase in equity through passing of a part of IBRD loan as equity and by additional amount from DKI Jakarta's own resources, totalling approximately 10 percent of total capital expenditure); (d) sufficient internal cash generation to achieve an annual average of not less than 30 percent contribution towards capital expenditure; (e) balanced capital structure limiting debt to no more than 70 percent of total capitalization, and debt service coverage to no less than 1.5; and (f) implementation of agreed institutional and financial development action program. Assurance were also obtained that GOI would provide all the financing for Buaran II with grace period up to year 2000. Interest and commitment fees would be accumulated during the period. GOI would consider waiving the accumulated interest when it becomes due if the financial position of the PDAM warrants it. Similarly, GOI will also consider a shorter grace period if the demand materializes earlier (see para. 5.28).

5.12 Risk and Sensitivity. The projected financial results are sensitive to: (a) delays in tariff adjustments (for example, a delay by nine months in the proposed tariff increase in April 1991 would mean a net income of some Rp 29 billion foregone in that year); (b) failure or even delay in providing equity capital or failure to provide extended grace period related to Buaran

II would result in severe cash deficits; (c) unforeseen operating costs increases; (d) increase in investments without corresponding increase in net revenue; and (e) failure to market planned quantities of water. Several actions such as general water tariff and groundwater extraction fee increases and an aggressive campaign to increase the number of connections have already been taken which demonstrate DKI Jakarta's/GOI's commitment to the financial viability of PDAM Jaya. The assurances already given with regard to tariff, equity, GOI responsibility for funding certain investments, and generally the standards and schedule for implementation should also contribute to reducing the financial risks.

B. Perum Otorita Jatiluhur (POJ)

5.13 Present Situation. POJ is operated as an integral part of GOI through DGWRD. GOI (a) determines tariff charged by POJ and its operating budget and (b) provides capital on basis of equity and operating subsidy as needed. POJ was the beneficiary of a previous Bank Loan (2560-IND) under which the construction of the relevant assets (principally Pulogadung pipeline) are being carried out by DGWRD and would be passed on as equity. Even though POJ would be somewhat strengthened under the proposed project, it will continue to have limited autonomy and limited role in implementing investments.

5.14 Financial Management. A review of POJ indicates shortcoming in key areas of financial management: (a) inadequate accounting and budgeting systems; (b) delay in the preparation of financial and operational reports; and (c) inadequately trained and motivated personnel. The review also indicates that MOF has not yet approved POJ's fixed assets and capital following capital structuring proposed by GOI auditors (BPKP). In order to overcome the above shortcomings and also to implement manpower planning and training, and management improvement system, an action program has been developed (details in Annex 22). Assurances were obtained from GOI that the action plan would be implemented.

5.15 In view of its currently weak position both institutionally and financially, GOI has decided to continue the past practice of (a) funding POJ's investment program including the proposed pipeline through 100 percent equity (b) implementing the physical works through the existing PMU in DGWRD, (c) transferring the completed assets to POJ for O&M, and (d) providing O&M subsidy as needed.

5.16 Since the proposed project would cover a small part (one-fourth) of POJ's fixed assets on its completion in 1995, it is proposed that the financial conditionality be limited to those directly related to the Pejompangan pipeline to be financed under the project. POJ's projections of income statement assume that overall revenue will equal expenses. The projections are available in the project files. Under an existing agreement between POJ and PDAM Jaya, the price of water delivered through both pipelines would be based on cost recovery factors using (a) a uniform 30-year repayment schedule with 12 percent interest for the civil works and (b) O&M equipment over ten years with 15 percent interest and would amount to about Rp 40/m³. Because the pipelines are fully funded by GOI as equity to POJ, PDAM Jaya has proposed and DGWRD has accepted modification to the existing agreement. Under the revised agreement PDAM Jaya would pay POJ for O&M expenses and

depreciation estimated at Rp 22/m³. GOI has concluded that the earlier agreement was too ambitious and has endorsed the new agreement as the first realistic step to cost recovery. Assurances were obtained during negotiations that the new raw water tariff would become effective on completion of the first pipeline (Pulogadung) and would be adjusted every three years until the cost recovery outlined in the existing agreement is achieved.

C. PDAM Tangerang

5.17 Past Performance. Past performance has been satisfactory. It has been helped by (a) a relatively high tariff for water sales to the new airport; (b) rising volume of sales to the airport; and (c) significant increases in both airport and non-airport tariffs in 1987. The highlights are shown in Table 5.3.

5.18 Audit and Financial Management. The 1988 audit report had qualifications partly arising from a weak Internal Audit Unit. The qualifications relate to : (a) balances of cash, accounts receivables and inventories; (b) recording of fixed assets; and (c) land values. A detailed review of PDAM's financial management confirmed the above and also identified additional shortcomings namely delayed financial reporting, and the accounting system which has been only partly implemented. Since then, progress has been made in resolving some of the above issues and the Internal Audit Unit has been strengthened. Furthermore, recommendations on corrective action have been reviewed with the PDAM management and a detailed action plan agreed in order to not only overcome the above shortcomings but also to raise the overall quality of PDAM's financial management (see Annex 22 for full details). The major features of the plan are: full implementation of the accounting system with computerization of accounting applications, for inventory control, general ledger, etc., and recruitment of staff. Assurances have been obtained during negotiations that the above action plan would be implemented.

Table 5.3: FINANCIAL PERFORMANCE INDICATORS: PDAM TANGERANG, 1985-89

(In Billion Rp)	Audited				Estimate
	1985	1986	1987	1988	1989
Volume sold (Million m ³) - Total	2.53	3.56	3.79	4.43	5.31
Total Operating Revenues	744	1,173	2,223	2,775	3,636
Total Operating Expenses	394	545	946	1,243	1,702
Operational Interest	215	469	562	579	551
Net Nonoperating Income	49	74	166	298	189
Provision for Income Tax	2	3	0	0	164
Net Income (Loss) After Tax	18	29	85	298	507
Average Tariff Rp/m ³ - non-airport	155	183	358	401	401
Average Tariff Rp/m ³ - airport	1,012	1,000	1,244	1,250	1,250
Ave. Expenses per m ³ Sold in Retail	155	153	249	281	320
% Operating ratio	75	64	78	79	72
RoR on Revalued Assets	11	21	11	9	10
Current Ratio	2.1	1.4	2.0	2.6	2.8
% Debt on Debt plus Equity	0.0	0.0	57.6	52.9	75.6
No. Days Accounts Receivable	73	82	78	41	62
Debt Service Coverage Ratio	NA	NA	NA	3.7	3.3
% Contribution to Investment-Annual	94	86	-29	21	10

5.19 Cisadane Investment. About three years ago, GOI decided that PDAM Tangerang would be the owner and operator of this large investment (about six times the size of existing assets) because the plant and the pipeline would be located in Kabupaten Tangerang even though PDAM Jaya would use about 93 percent of the water. Accordingly, GOI has (a) arranged for a French Government loan on behalf of PDAM Tangerang for the treatment plant; (b) awarded contracts for the plant; (c) requested the proposed loan for the transmission line to Jakarta expansion of distribution in Tangerang; and (d) arranged a contract for sale of water between the two entities on the basis of recovering prorated investment and O&M costs with no allowance for the risk that PDAM Jaya might buy less than the planned 93 percent. The Plant is expected to be completed in 1993.

5.20 To compensate PDAM Tangerang for their risk during the sales build-up period after consideration of several alternatives, GOI has decided to (a) extend the grace period relating to Cisadane treatment plant subsidiary loan agreements for the French and the local currency loans to the year 2000; (b) accumulate the interest and commitment charges during the grace period; and (c) consider waiving the interest when it becomes due if the financial position of the PDAM warrants it. Likewise if the PDAM Jaya demand materializes earlier, GOI will also consider shorter grace period. Assurance have been obtained from GOI confirming their decisions.

5.21 PDAM Tangerang would be responsible for the proposed loan for the transmission line and the distribution. GOI would on-lend the amount to the

PDAM at 9.25 percent interest including a bank fee of 0.25 percent based on GOI's already announced RDA interest rate for these types of urban projects; 0.75 percent commitment fee; 20 years repayment including five years grace period. Interest charges and commitment fees would be accumulated and capitalized during the grace period. GOI would bear the foreign exchange risk.

5.22 Financial Projections. Key assumptions are given in Annex 21. Cisadane is about six times the present assets of PDAM, and has a very large impact on overall results. GOI has confirmed during negotiations that as financial objectives for the PDAM Tangerang there should be: (a) tariff adjustments at least every three years, the latest one being an already approved average of 25 percent increase effective May 1, 1990;9/ (b) internal cash generation sufficient to cover at least 30 percent of its non-Cisadane capital expenditure program; (c) debt service coverage of at least 1.5 for non-Cisadane debt and debt limit of 70 percent. PDAM would be permitted to retain the entire Tangerang share of PDAM's profits.

5.23 With Cisadane, PDAM Tangerang's contribution to its investment program would be low during the 1990-93 period as indicated by the summary of the financial projections shown below. However, by extending the grace period on debt service related to Cisadane treatment plant, GOI has in fact assumed responsibility for that investment. Financial results of the PDAM by excluding Cisadane would be satisfactory.

9/ Tangerang local government and the PDAM accept the principle of annual tariff review and adjustment. They are exploring mechanisms for the annual review. The proposed mechanisms will be discussed with the Bank by December 31, 1990. In the financial projections the 25 percent tariff increase is assumed to be effective July 1, 1990.

Table 5.4: FINANCIAL PROJECTIONS: PDAM TANGERANG, 1990-96
(Rp billion)

	1990	1991	1992	1993	1994	1995	1996
Volume sold (mln m ³) - Total	6.39	7.29	8.19	9.11	10.23	11.38	12.53
Total Operating Revenues	4.8	5.7	6.3	11.6	20.3	28.4	37.5
Total Operating Expenses	1.7	2.1	2.5	4.3	6.6	9.1	11.7
Operational Interest	0.54	0.53	0.52	0.51	0.50	2.4	2.6
Net Income (Loss) After Tax	1.1	1.4	1.5	3.4	5.6	8.1	12.2
Average Tariff Rp/m ³							
Airport	1,406	1,563	1,563	1,875	1,875	1,875	2,250
Non-airport	451	501	501	602	602	602	722
% Operating ratio	55	54	56	51	57	49	44
RoR on Revalued Assets (%)	13.6	14.3	14.0	5.0	4.3	6.9	9.2
Current Ratio	2.3	2.0	1.8	1.8	1.9	1.8	1.8
% Debt on Debt Plus Equity	84	88	89	86	82	77	73
No. Days Accounts Receivable	76	76	76	76	76	76	76
Debt Service Ratio	5.2	6.0	6.3	11.5	21.7	5.4	6.7
% Contribution to Investment, Average of 3 Years	6	7	11	28	33	39	34
Without Cisadane							
% Debt on Debt Plus Equity (without Cisadane)	43	47	52	56	57	56	54
% Contribution to Investment, Average of 3 Years (Exclud- ing Cisadane WTP and Capital Interest)	56	35	30	40	57	53	69

D. BPAL/ISU - Sewerage Entity Financial Aspects

5.24 Entity for the Sewerage Services. BPAL is a temporary organization pending the establishment of an appropriate sewerage enterprise. An enterprise of DKI Jakarta called Perusahaan Daerah Air Limbah (PDAL) will be established with appropriate degree of autonomy provided under DKI Laws. In the meantime interim arrangements have been made to give temporary powers to the BPAL to charge tariff, make connections and retain revenues for its operational purposes. Agreement has been reached with GOI to permit the BPAL to function fully under this arrangement until DKI Jakarta completes the establishment of the PDAL to take over the responsibilities of the sewerage service. To ensure that this lengthy procedure gets underway as soon as possible, assurance was obtained during negotiations that PDAL would be established by March 31, 1991.

5.25 The present finances of the BPAL/ISU are controlled through DG Cipta Karya of Public Works which is implementing the JSSP project. It is expected to provide funds for any operating deficits until March 1991, by which time BPAL's revenues should cover its O&M expenses as agreed in negotiations. Total financing requirement would be about US\$28.6 million equivalent to cover

investment under remaining JSSP works and the JUDP II sewerage extension which will be provided principally from both World Bank loans (61.5 percent) and the balance from GOI/DKI Jakarta. The proposed loan under JUDP II will finance estimated US\$16 million of the costs.

5.26 Financial Projections. Main assumptions which have been agreed with GOI/DKI Jakarta are: (a) recently approved tariff structure and a base rate of Rp 40 per m²; (b) connections of up to 3,670 customers, including highrise buildings along Jl. Jen. Sudirman and Jl. Rasuna Said; (c) the initial capital of the sewerage entity for the JSSP and JUDP II projects will be in the form of equity; and (d) tariff adjustment by an acceptable rate effective April 1991 and thereafter as required. The financial objectives of the sewerage entity are twofold. In the short to medium term the PDAL/EPAL should achieve at least a break-even point (O&M) in its operating results on a cash basis by March 31, 1991 as agreed during negotiations. In the long term PDAL should be able to generate its own funds through the tariff mechanism to contribute significantly towards future investments in Jakarta's sewerage service. With these assumptions the finances of the BPAL are satisfactory. Operating deficits are expected in FY89/90 and possibly in FY90/91. But operating surpluses would increasingly be generated effective FY91/92. The basis and detailed assumptions used for making financial projections are shown in Annex 18.

5.27 All funds applied to the construction of the sewerage system will be transferred to the PDAL as equity.

E. Cost Recovery

5.28 GOI has agreed to two basic principles of cost recovery for the two water enterprises namely, PDAM Jaya and PDAM Tangerang: (a) tariff review and adjustment if necessary every three years in order to achieve about 30 percent contribution from internal cash generation to their respective capital expenditure; and (b) balanced capital structure limiting debt to 70 percent of total capital and debt service coverage ratio of not less than 1.5. All debt would be on RDA's announced terms even though RDA is not fully operational as yet. Applying these principles would result in an acceptable rate of return on revalued fixed assets and in manageable tariff levels and equity injections for the two PDAMs under the investment program agreed. As an exception to these principles, GOI has proposed and the Bank agreed that in the case of Buaran II and Cisadane treatment plants all the financing (with extended grace period for debt service) would be provided by GOI. GOI has also agreed to consider waiving of interest when it becomes due at the end of the grace period if (a) demand for the water from the plants is slow in materializing as indicated by the Bank projections and (b) financial position of the two enterprises warrants it. The reason for this exception is that the Buaran II and Cisadane works which are undertaken by the central government are likely to come on stream before the PDAMs have completed the distribution works and are ready to sell the water.

5.29 In practice, it means that (a) there would be full cost recovery on the basis of the above principles, with immediate effect for (i) all existing assets (treatment plants and network) of both enterprises; (ii) assets financed from the proposed project; and (iii) other ongoing and planned investments; and (b) there may be phased cost recovery for Buaran II and

Cisadane plants on the basis of actual marketing of water resulting in delayed full cost recovery by three to five years.

5.30 In the case of Pulogadung raw water pipeline under construction and Pejompangan pipeline to be funded under the project and operated by POJ, full O&M and depreciation would be recovered on completion of assets. These pipelines are expected to be fully utilized from the beginning because they will substitute for (polluted) water currently drawn directly from rivers. There is, therefore, no issue of unused capacity. The Government has, however, proposed and the Bank accepted, a temporary exemption from including interest payments in the pricing formula. The Government has agreed to adjust tariff at least every three years until full cost recovery is achieved (see para. 5.17).

5.31 For BPAL which would operate the pilot sewerage scheme, a break-even on cash operating basis would be achieved by March 31, 1991. Full cost recovery would be possible at later stages after further expansion of sewerage beyond the scope of the current project.

5.32 The cost recovery arrangements may be summarized as follows:

	Value of Assets Rp. (B)	US\$(M)	Cost Recovery	Timing
A. PDAM Jaya				
Existing Assets (1989)	194	108	Full	Immediately
Proposed Project	393	219	Full	Immediately on compl.
Buaran II	304	169	Full	3-5 yrs after compl.
Other ongoing/ proposed investments (1996)	414	231	Full	On completion
B. PDAM Tangerang				
Existing Assets (1989)	15	8	Full	Immediately
Proposed Project	35	19	Full	Immediately on compl.
Cisadane	128	71	Full	3-5 yrs after compl.
Other ongoing/ proposed investments	31	17	Full	On completion
C. POJ				
Pipelines	97	54	Full	3-6 yrs after compl.
D. BPAL				
	49	27	O&M	On completion of pilot.

Source: Based on the assumptions listed in annexes 19 through 21 and assurances obtained from GOI during negotiations.

5.33 The above indicates that assets valued at about US\$602 million equivalent or 65 percent of the total will be subject to immediate cost recovery; about US\$294 million equivalent (32 percent) of mostly committed assets will be subject to full cost recovery over three to six years; and the balance representing completion of pilot sewerage scheme will break-even by 1991.

F. Enterprise Audit

5.34 It will require time and planned technical assistance in order to remove audit qualifications and ensure timely preparation of audits. Based on the detailed action program for each enterprise (see paras. 5.5, 5.14, and 5.18) assurances were obtained that annual audit would be carried out for PDAM Jaya, PDAM Tangerang and BPAL/PDAL by independent auditors in respect of each enterprise starting not later than end-1989 and made available to the Bank within 15 months for 1989 to 1990; within 12 months for 1991; and within 9 months each year thereafter; GOI will send a summary including the action taken to carry out recommendations of the auditors not later than three months after completion of each audit, each year.

VI. PROJECT JUSTIFICATION AND RISKS

A. Economic Analysis of Water Supply Component

6.1 The benefits of the water supply component can be divided into three categories: (a) quantified benefits of incremental water use; (b) quantified cost savings which are a result of lower amounts of nonpiped water use (since piped water replaces other water sources, e.g., groundwater); and because these two categories only partly capture the benefits from higher quality water, (c) nonquantified cost savings or benefits as a result of better quality water use. In principle, these benefits together should be compared with the cost of the project to determine economic viability. Calculations of net present value or economic rate of return can deal with the first two categories only, while it is difficult to obtain estimates of the full impact of better quality water use.

6.2 The analysis of economic benefits coming from the incremental water use concentrated on residential consumption. DKI Jakarta households were divided into three consumer groups based on household income in 1987. The consumer groups were further assigned to three zones corresponding to the availability of groundwater. Water consumption of households covered by the economic analysis included the following: (a) water for drinking, which can be bottled water, water from the piped system or from shallow wells; and (b) other water consumed from the piped system or shallow wells. At first, quantity and costs of the water consumption of households in each consumer group and zone were estimated for the year 1987. Costs covered prices paid (for bottled water, for water purchased from vendors or from the piped system), boiling costs (for nonbottled drinking water) and variable costs of groundwater extraction. The estimates obtained that way were used to deter-

mine the parameters (price and income elasticities) of a water-demand curve. "With project" and "without project" scenarios of prices/costs of water supply were developed, which, together with the a demand curve, were used to forecast the quantity of water consumed from each water source by the households in year 1995 and 2005. Water consumption patterns for the periods 1988-94 and 1996-2004 were established by simple linear interpolation. Benefits of the incremental water use in a particular year are represented by the summation of the valuations placed by consumers on each additional unit of water use, i.e., the aggregate willingness to pay for the full increment in water use. (As shown in Annex 13, this measure of benefits corresponds to the area below the demand curve between the "with project" and "without project" estimates of water consumption.) The present value of such benefits was calculated as the discounted sum of benefits in years 1990-2010 (annual benefits were assumed constant after 2005); the result was Rp 40 billion. Calculations were carried out using constant 1987 prices and a discount rate of 10 percent. Despite the large (116 percent or 342,000 m³/day) difference in the consumption of piped water in 2005 between the "with" and "without" alternatives, the difference in total water consumption was relatively modest, ranging from 2-27 percent for the different zones and income groups. This indicates that the project primarily substitutes piped surface water for groundwater and only secondarily generates an increase in overall water consumption.

6.3 Similar to the analysis of incremental water benefits, "with project" and "without project" scenarios of economic costs of water use were developed for the period of 1990-2010 based on cost data for 1987, on the investment schedule of the project and on assumed changes in groundwater availability. In the analysis, piped water supply investment costs included the costs of raw water supply and treatment, distribution network and new connections. The present value of additional investment and O&M costs (i.e., the difference between the "with" and "without" scenarios) was estimated at Rp 265 billion and Rp 217 billion, respectively. As a result of system rehabilitation and improved raw water supply, safe water can be delivered through house connections to an increasing number of households under the "with project" scenario. It was assumed that boiling of drinking water by connected households would be gradually eliminated by the year 2005. This resulted in a saving of Rp 29 billion (present value) for the connected households during the entire 1990-2010 period. It was also assumed that higher income connected households would purchase less bottled water, which similarly save Rp 56 billion. These savings capture partly the benefits of better quality water use. External health benefits, such as reduction in the incidence of certain communicable diseases (in spite of boiling) outside the consumers' household, were not quantified. Both the investment and O&M costs of residential groundwater use were lower in the "with project" case than without the project (partly because of lower consumption and partly because of better availability of groundwater). Present value of total savings was Rp 65 billion investment costs and Rp 104 billion O&M costs for residential consumers. These cost savings, since are the direct result of the substitution of piped water for groundwater by the project, are also part of project benefits.

6.4 Nonresidential consumers (industry, commerce, services and government) were handled in a very simplified manner throughout the whole economic analysis. The assumption was that the project made no difference in the quantity of water consumed by that group of consumers. This can be justified assuming that the price of piped water (including connection cost) is exactly the same as the cost of groundwater. This situation can be regarded as a satisfactory approximation, since groundwater cost to nonresidential users already includes an extraction fee determined by DKI Jakarta and collected by the water company. This groundwater tax will be adjusted so as to make piped water a slightly lower cost alternative source than groundwater. The piped water delivered to nonresidential consumers was assumed to have two effects; on the one hand it substituted for groundwater and saved the extraction cost, on the other hand, it reduced the scarcity of groundwater compared to the "without project" scenario and saved part of the extraction cost for those nonresidential consumers, who were still not connected to the piped supply system. Direct and indirect cost savings were estimated at Rp 150 billion and Rp 89 billion, respectively.

6.5 Based on the above, it was estimated that the project has Rp 49 billion net present value or a 11.7 percent economic rate of return (ERR). A sensitivity analysis was carried out to assess the robustness of the project and to indicate priority areas for GOI actions during implementation. A 20 percent investment cost overrun would lower the ERR to 9.6 percent. If the system did not deliver potable water or all consumers, despite the fact that the water was safe for drinking, continued the practice of boiling and buying bottled water, the ERR would be lowered to 8.6 percent. If the groundwater tax for nonresidential consumers was not enforced effectively and 50 percent of targeted future customers were continuing using deep wells, the ERR would be lowered to 7.3 percent. If the deterioration of the deep aquifer was faster in the "without project" scenario than estimated, the ERR would increase to 13.4 percent. The internal financial rate of return based on the projected tariffs and water sales is 8.1 percent and would fall to 6.1 percent if project costs increased by 20 percent. (See details in Annex 13.)

B. Economic Justification of the Drainage and Sewerage Components

6.6 Drainage. No new major drainage/flood control investments are envisaged. The drainage works to be carried out are mostly rehabilitation (dredging of existing major drains and a reservoir, replacement of pumps), while a smaller share of these works will increase the capacity of certain segments of the drainage network (lining improvement and widening of one major drain, upgrade of inlet systems, improvement of deficient primary and secondary microdrains). These works are considered to be of the highest priority among a large backlog of necessary flood control activities in the city. The probable range of economic rate of return of the proposed works can be estimated by looking at the economic analysis of two kinds of activities at the opposite end of the scale. A feasibility study carried out for major drainage canal improvements in Jakarta estimated the rate of return at 17 to 22 percent, based on a detailed estimate of avoided property damages. A small survey carried out for assessing the economic viability of microdrainage improvements in a high density, low income area which was flooded several times each year estimated the rate of return at 159 percent. In this survey, the benefits were approximated with the increase in rental values, estimated

on the basis of observed rents of similar properties in areas which do not experience frequent flooding.

6.7 Sewerage. The conventional sewerage component, by further extending the pilot sewerage system constructed under the Jakarta Sewerage and Sanitation Project (Loan 2236-IND), will provide wastewater disposal service to 816 residential properties, 118 small commercial establishments (restaurants, retail shops, etc), 43 small to medium size industrial establishments (mostly batik factories) and 40 large office buildings. This extension will utilize excess treatment capacity which appeared as the result of postponement of certain portions of the originally conceived pilot sewerage scheme. Medium and high income families live in those houses which will be connected; according to a survey, the average monthly income of these households was about US\$200 in 1989. External benefits will accrue, however, to low income families as well in the area where the sewerage service is extended, since sanitary disposal of wastewater has a positive impact on public health. Justification of the component is based on a) health benefits arising from the protection of the immediate urban environment from pollution caused by human and industrial waste; b) demonstration of technical, financial, institutional viability of conventional sewerage as an important component of the solution to the sanitation problem of the Jakarta metropolitan area.

6.8 The small low cost pilot sewerage component intends to test possible solutions for the wastewater disposal problem of lower income households who live in densely populated inner-block areas without street frontage. This pilot effort, which would construct small bore sewers/shallow sewers in an area of 50 ha, will attempt to demonstrate the viability of these low capital cost schemes. The primary benefit of that component will be the demonstration effect, which embodies the main risk as well, since the technology, which requires more maintenance than conventional sewerage, might prove not to be feasible in Indonesian circumstances.

C. Poverty Impact of the Project

6.9 The water supply component has a subcomponent which is targeted towards the lower income households in Jakarta: the water hydrant program. It is assumed that low-income families cannot afford a house connection, because the price of the connection is too high and/or the quality of their housing (in a densely populated kampung), the insecurity of their tenure are obstacles which are too difficult to overcome. At the end of 1988, there were 1,160 hydrants in Jakarta, delivering on the average 13.6 m³/day/ hydrant water. The hydrants are usually privately owned and operated. The owner receives water from the water company at a heavily subsidized rate (Rp 150/m³) and sells it to distributing vendors for Rp 800-1,000/m³. The vendors then deliver the water to the households who pay a price of Rp 4,000-7,000/m³, depending on the distance from the hydrant and on the season (dry or rainy). According to a recently carried out housing survey, 32 percent of households rely on vendors for drinking water in Jakarta. More than 40 percent (about 250,000) of these households belong to the low income group defined here as households with less than Rp 130,000/month income (see Annex 13).

6.10 The hydrant program is a very ambitious attempt to improve the availability of water in water-stressed areas of the city in general, and for

low-income households, in particular. The program plans to provide by 1995: (a) a 2,000 "Hidran Umum" (water hydrants owned and operated by an individual who paid for the facility); (b) 1,000 "Hidran Contoh" (hydrants provided free-of-charge and operated by an individual who pays only for the water); (c) 100 "Terminal Air" (water tanks with taps provided free-of-charge by the water company and operated by an individual who pays a subsidized rate for the water delivered by company trucks to the facility); and (d) 19 "Stasiun Air" (outlets where the water company sells water to private tanker trucks).

6.11 The program will substantially decrease the average distance from consumers to the nearest outlet. In order to avoid a situation when hydrant operators coordinate their strategy and maintain the present level of the end-user price of water to maximize their profit, an agreement was reached with DKI Jakarta that, in the future, all households with a metered connection will be permitted to sell water to neighbors and to distributing vendors. A directive to this effect was issued by PDAM Jaya in April 1990. Based on the investment program and on the deregulation effort, it was assumed that the average end-user price of water purchased from the hydrants would go down and stabilize at Rp 2,000/m³ by 1995 (measured in 1987 prices) in contrast to a "without project" scenario average price of Rp 5,000/m³ in 1995 and Rp 6,000/m³ in 2005. Part of the difference came from lower hauling costs ("with project" hauling costs are Rp 1,000/m³ less in 1995 and Rp 1,500/m³ less in 2005) and from the elimination of economic rents collected by vendors/hydrant operators (the latter are expenditures for the households but are only transfer payments in the broader context of the whole society). Present value of cost savings by low-income households as a result of the price difference (based on the quantity of hydrant water consumed in the "without project" scenario) was Rp 33.8 billion. Their overall water consumption was also higher in the "with project" scenario; the present value of incremental water consumed was Rp 11.8 billion and Rp 1.2 billion of that can be considered consumer surplus. As a result the present value of net benefits accruing directly to low-income households was estimated at Rp 35 billion or an average of Rp 140,000/household. Naturally, that outcome is very sensitive to the practically achievable decrease in the price of water sold by vendors and to the extent people will begin purchasing water directly from nearby hydrants or neighbors.

D. Environmental Impact

6.12 The Second and Third Urban Development Projects, while individually justified, are complementary projects and support each other in the delivery of major environmental benefits. JUDP II will do so through the provision of safe piped water and the improvement of wastewater disposal and drainage. This will increase personal and household cleanliness and convenience, improve sanitary conditions and aesthetics, decrease odor and decrease flooding. Surface and groundwater quality will be enhanced and the depletion of the groundwater aquifer will be slowed. Improvements in health and quality of life, while difficult to quantify, would occur. The development of the sewerage agency will enable future expansion of the sewerage system. The water resources studies would guide efficient development of surface and groundwater with due regard to water quality.

6.13 The following table, composite for JUDP II and JUDP III, shows the benefits by component.

<u>Project</u>	<u>Component</u>	<u>Environmental Benefits</u>
JUDP II	Piped water supply	Improved convenience, quality, safety and reliability of supply. Increased water quantity for household use and personal cleanliness. Reduce groundwater depletion; improved protection of aquifer.
JUDP II	Sewerage	Improved convenience, sanitation, surface and groundwater quality and aesthetics. Reduce local flooding, odors and disease vectors. Develop viable sewer agency for sustainable expansion of system.
JUDP II	Major drain improvement	Reduced flood frequency and severity, improved sanitation and aesthetics.
JUDP II	Water resources study	Future increased water availability, improved surface and groundwater quality.
JUDP III	On-site or community sanitation	Improved convenience, sanitation, surface water quality and aesthetics; reduced odor and disease vectors.
JUDP III	Solid wastes	Improved convenience, sanitation, surface water quality management and aesthetics. Reduced flooding.
JUDP III	Industrial wastes management	Improved ecology and aesthetics. Reduced odor.

6.14 Despite largely favorable impacts, certain components of the project, if improperly designed and implemented, could have adverse impacts. For example, the introduction of additional water supply may compound drainage problems; materials from dredged drains and sludges from existing treatment plants would require environmentally sound disposal; vehicular and pedestrian traffic may be disrupted during construction; and some 50 urban families will require relocation. These and other impacts were identified during project preparation and component designers were required to incorporate measures to minimize or mitigate them and project supervision and coordination staff will guide their implementation, e.g., funding has been provided for construction of micro drainage as needed. Programs were prepared to monitor impacts during construction and post-construction phases and the implementation of such programs will be monitored during project supervision. Adverse impacts, mitigating measures and monitoring programs are more fully explained in Annex 12 and the other annexes which describe individual components.

6.15 In addition to the above measures, preliminary environmental assessments (PIL/PEL) have been completed for all components of the program, in accordance with newly enacted environmental review procedures by GOI. Environmental management plans (RKL) and environmental monitoring plans (RPL)

are being prepared as part of normal implementation. These plans, which constitute the blueprints for environmentally sound project implementation and the necessary monitoring, are available at least in final draft form, subject to GOI review and approval. Only one component, i.e. major drainage, requires additional, detailed environmental studies: GOI procedures necessitate the preparation of a full environmental assessment (ANDAL). The issues involved are the identification of the types of sediments which will be dredged from the existing flood-retention basin and drainage channels and the various options for their disposal and end-use. A reliable data base has been developed already and the sediment types have been fully characterized. A management and handling strategy has been prepared by a specialist consultant. This strategy will be used by GOI for the ANDAL preparation. An outline of the implementation strategy has been provided by GOI in April 1990. Supervision and monitoring of the implementation of the strategy has been integrated into the component.

6.16 The rapid preparation of generally satisfactory preliminary environmental assessment reports demonstrates the beneficiaries' commitment to examine and address environmental impacts of the project. In areas where the reports did not fully address all environmental issues, Bank expert consultants (supported by the special environmental trust fund) cooperated with implementing agencies and their consultants to refine the recommendations for the environmental management strategies and plans. This being the first application of the GOI's environmental assessment procedures, MPW had taken the lead in preparing ANDALs, RKLs and RPLs, but it is expected that with support from them and JUDP III, DKI Jakarta will quickly develop the capacity to take on responsibility for preparing environmental assessments, as well as management and monitoring plans for projects within its jurisdiction.

6.17 DKI Jakarta and MPW's environmental assessment processes and the organizational units, staff and procedures for implementing them, have only been established in 1989 with ADB and bilateral support. While the Bank's operational directive covers a wider range of subjects, the objectives of GOI and the Bank's processes are the same, i.e., to design, build and operate projects in an environmentally sound way. DKI Jakarta and MPW's procedures were initiated late in the project cycle--at project appraisal. Nevertheless, once committed to the process, the beneficiaries rapidly produced generally satisfactory preliminary assessment reports. The Bank and GOI now understand that for future projects GOI procedures would prevail and the Bank would assist--using the special consultant trust fund--in implementing them to the satisfaction of both parties. DKI Jakarta and MPW procedures are described in more detail and compared with the Bank's in Annex 12. Additional support for adequate environmental management and monitoring will be provided through especially targeted technical assistance for component supervision and overall project coordination.

E. Benefits and risks

6.18 The proposed project will: (a) improve the quality and reliability of water supply and increase quantity particularly in poor areas; (b) increase use of piped water and partly replace groundwater use to reduce the deterioration of the groundwater resource; (c) decrease flooding; (d) decrease the pollution of groundwater by extending the sewerage network; and (e) initiate discussion on institutional framework and strategy for integrated water

resource management, including pollution control and conjunctive use of ground and surface water. Shorter transport distances and more water as a result of more than 3,000 new public hydrants should lead to greater accessibility and lower end price of water for low-income people. Financial risks and mitigating measures for PDAM Jaya are discussed in Chapter V. Implementation risks are: (a) cost overruns, larger UFW, insufficient equity contribution, and delayed tariff increases; (b) lower than expected demand for piped water (especially in the nonresidential sector, which might keep on using the increasingly scarce groundwater resource if DKI Jakarta is not able to enforce the increased groundwater fee); (c) institutional bottlenecks which slow down implementation (for PDAM Jaya it might take longer than expected to build up necessary implementation capacity). Action programs have been agreed and technical assistance would be provided in order to reduce the impact of these factors. Furthermore, project design would be based on a concept which maximizes the flexibility during implementation and monitors developments by regularly collecting and evaluating cost and consumer information.

VII. AGREEMENTS CONCLUDED

7.1 Assurances were obtained from GOI during negotiation on the following points:

General

- (a) GOI will make funds available from cofinancing or its own sources to cover financing gap if any (para. 3.15).
- (b) GOI shall cause DKI Jakarta to be responsible for overall project coordination, accounting and monitoring and shall cause required expansion of JUPCO under DKI Jakarta's Bappeda (para. 4.1).
- (c) Agreement on project implementation arrangements for each component including cofinanced components and overall coordination (para. 4.4 to 4.7).
- (d) Implementation of technical, institutional and financial development action program for PDAM Jaya, PDAM Tangerang, POJ and BPAL (paras. 5.5, 5.14, 5.18).
- (e) GOI will (i) provide all the financing (funds) for Buaran II and Cisadane plants (ii) amend the existing subsidiary loan agreements with PDAM Jaya and PDAM Tangerang respectively to extend the existing grace period until year 2000, (iii) accumulate interest and commitment fees during the grace period, and (iv) review the question of payment of the interest and fees when it becomes due in year 2000 on basis of financial position of the two PDAMs. GOI will consider a shorter grace period if the water demand from the two plants materializes earlier (paras. 5.11 and 5.20).

7.2 PJSIP (PDAM Jaya)

- (a) Impact of the new policy on water sales to neighbors and distributing vendors will be reviewed annually during the next three years (para. 4.37).
- (b) Achievement of the following financial targets for PDAM Jaya:
 - (i) about 30 percent contribution to investment program through net internal cash generation (based on average of last, current and next years);
 - (ii) about 10 percent through equity contribution from DKI Jakarta and GOI; and
 - (iii) balanced capital structure limiting debt to 70 percent of debt plus equity and debt service coverage no less than 1.5 (para. 5.11).
- (c) DKI Jakarta will review and adjust PDAM Jaya tariffs every three years starting April 1, 1991, to achieve agreed financial objectives (para. 5.11).
- (d) DKI Jakarta will review and adjust if necessary, the groundwater abstraction fee at three-year interval (para. 5.11).

7.3 Pejompongan Raw Water Pipeline

Tariffs for raw water will become effective on completion of the first pipeline in 1991 and will be reviewed and adjusted if necessary, every three years until full cost recovery is achieved (para. 5.16).

7.4 Cisadane (PDAM Tangerang)

- (a) Tangerang will allow PDAM Tangerang to review and adjust its tariffs at least every three years (the latest adjustment effective May 1, 1990, estimated at 25 percent increase) to achieve the agreed financial objectives (para. 5.22).
- (b) Financial objectives for PDAM Tangerang (excluding Cisadane operations) will be:
 - (i) 30 percent contribution to investment (other than Cisadane) from internal cash generation (based on average of last, current and next years); and
 - (ii) balanced capital structure limiting debt to 70 percent of debt plus equity and debt service coverage ratio of not less than 1.5. (para. 5.22).

7.5 Sewerage

- (a) The sewage ponds will be operated and maintained in a satisfactory manner (para. 4.9).
- (b) PDAL will be established by March 31, 1991 (para. 5.24).

- (c) BPAL will achieve at least a break-even point in its operating results on a cash basis by March 31, 1991 (para. 5.26).
- (d) Tariffs will be reviewed and adjusted if necessary effective April 1991 (para. 5.26).

Conditions of Effectiveness

- 7.6 (a) Execution of satisfactory subsidiary loan agreements between GOI and (i) DKI Jakarta (ii) PDAM Jaya, and (iii) PDAM Tangerang. Drafts of the agreement were agreed during negotiations (para. 3.17).
- (b) Establishment of a separate division in JUPCO responsible for overall coordination of the project and appointment of key staff. (para. 4.4).

Recommendation

7.7 Subject to the above agreements and conditions, the proposed project is suitable for a Bank loan of US\$190 million to the Republic of Indonesia for 20 years, including five years' grace at the Bank's standard variable interest rate.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Documents in the Project File

1. General

1. JUDP II Consolidated Project Preparation Report (CPPR) + Annexes (March 1989)
2. JUDP II Consolidated Project Preparation Report (CPPR) + Annexes (June 1989)
3. JUDP II - Draft Project Implementation Report (PIR) (October 1989)
4. Review of JUDP II Water Supply Subprojects, Directorate of Investment Funds (DDI), MOF (June 1989)
5. JUDP II - Overall Economic Analysis of the Water Supply Subprojects (Annex 18 of the JUDP II CPPR) (March 1989)

2. PDAM Jaya System Improvement Project (PJSIP)

1. Jakarta Water Supply Development Project - Master Plan and Feasibility Study (March 1985)
2. PJSIP Project Preparation Report (PPR) (December 1988)

Main Report

Annex A: Network Rehabilitation and Wastage Control

Annex B: Network Analysis and System Expansion

Annex C: Institutional Development

3. Report on the PJSIP Rehabilitation Pilot Projects (August 1988)
4. Hydraulic Analysis of the Secondary Network in the Pulogadung Area (February 1989)
5. PJSIP Bridging Consultancy - Inception Report (February 1990)

3. Pejompongan Raw Water Pipeline

1. West Tarum Canal Improvement Project - Design Report, Nedeco/Wirama Karya (May 1985)
2. Pejompongan Pipeline Definitive Plan Report, Wirama Karya/Nedeco (January 1987)
3. Pejompongan Pipeline - Design Report, Wirama Karya/Nedeco (December 1989)

4. Cisadane Treated Water Transmission Main

1. Cisadane Water Supply Project - Feasibility Study, Sogreah (November 1985)
2. Cisadane Water Supply Project - Supplementary Feasibility Study, Sogreah (February 1988)
3. Water Demand in West and Southwest Jakarta, Sogreah/P.T. Sehati (October 1989)
4. Cisadane Treated Water Transmission Main (Annex 5 of JUDP II CPPR) (March 1989)

5. Jakarta Sewerage and Sanitation Project (JSSP) Extension

1. JSSP Extension - Final Report, Revision 2, P.T. Encona/Alpinconsult (Annex 6 of JUDP II CPPR) (June 1989)
2. JUDP II - Component 4 - Sewerage, Part II: Master Plan Review and TOR for Future Sewerage, P.T. Encona/Alpinconsult (December 1988)

6. Priority Major Drainage

1. Master Plan for Drainage and Flood Control of Jakarta, Nedeco/PBJR (December 1973)
2. East Jakarta Flood Control Project, PBJR/DGWRD (January 1987)
3. Project Proposal for Flood Control Component Under JUDP II, PBJR (April 1988)
4. Presentation of Sarinal Thamrin Drainage Pump Works, PBJR (April 1988)
5. Analysis of Bed Material Samples from Major Drains in Jakarta, CV Gelar Buana Survey (August 1988)
6. Project Description of Priority Major Drainage Works in DKI Jakarta (for inclusion in JUDP II), PBJR (March 1990)

7. Jabotabek Water Resources Project Component

1. Cisadane River Basin Development, Indec/Lavalin International/Nippon Koei (September 1987)

Feasibility Study
Main Report and Annexes
2. BTA-155 Project Reports (1988 and 1989)
3. Water Resources Management Studies and Technical Assistance (Annex 9 of JUDP II CPPR), DGWRD (March 1989)

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

PDAM Jaya System Improvement Project (PJSIP)

Background

1. The capital city of Jakarta covering 649 km² is the core of the Jabotabek region which has an area of 6,150 km². Jakarta had a 1988 population of 8.4 million which is expected to exceed 10 million by the year 2000. The city obtains its drinking water partly from shallow wells in unconfined, unsafe or brackish aquifers to the north and partly from PDAM Jaya's leaky piped water system that covers less than half the populated area and provides an intermittent service. PDAM Jaya's service area is 213 km² with an estimated 1985 population of 4.7 million, of which 27 percent are served. Overpumping by the unserved population has caused saline intrusion in the coastal areas. Though water production capacity was increased recently, a corresponding improvement in service levels was constrained by the 50-year-old network being unable to withstand the increased pressures, causing unaccounted-for water (UFW) to exceed the present level of about 50 percent in the distribution system. There are also institutional shortcomings within PDAM Jaya which are in the process of being addressed.

Project Genesis

2. The most recent Master Plan study for the development of Jakarta water supply was completed in March 1985. The study for the design of the distribution system recommended the concept of dividing the service area into six service areas or "distribution zones" each fed from an independent distribution center. This is a technically sound concept. However, implementation delays have occurred, especially in regard to preparing the necessary detailed studies for making improvements to the distribution system. These studies were interrupted in October 1988 but are scheduled to continue as of November 1989. These studies also included a pilot waste control project which was carried out from March 1987 to November 1989. Guidance was also obtained from the Bank's Technical Paper No. 72 on the Reduction and Control of Unaccounted-for Water (UFW). The study results call for a carefully designed methodological approach to be followed which is a part of the implementation plan for this component.

3. The proposed component is the first phase of a long-term program of physical works in primary, secondary and tertiary distribution systems, service connections, introduction of new techniques and procedures in distribution system management, network analysis, reduction and control of UFW and related institutional improvements to provide a safe and uninterrupted water supply. This project includes a transmission pipeline for improving the quality of the raw water provided to the Pejompongan water treatment plant serving Central Jakarta and major treated water transmission and distribution facilities to the newly developing areas in West Jakarta from a treatment plant to be owned and operated by PDAM Tangerang.

Objectives

4. In conformity with the overall objectives of the PJSIP, i.e., to double water supply coverage in Jakarta, improve service, especially for the poor, and institutionally strengthen PDAM Jaya, the first phase of the nine-year PJSIP program will be launched in July 1990 with the following elements:

- (a) Rehabilitation of the PDAM Jaya distribution system through a waste-age control and repair/replacement program, based upon agreed criteria and proven methodology, aimed at a linear reduction of UFW from the current level of about 50 percent to 40 percent in 1995 and 30 percent by 2000;
- (b) Infill/Extension of the secondary and tertiary distribution network (and parts of the primary network) based on agreed criteria, to achieve a target of 34,000 connections per year with a corresponding increase in revenues; and
- (c) Institutional Strengthening of PDAM Jaya in sound public utility practices.
- (d) Primary Distribution Facilities for Zones 4 and 5, a water-distressed area in western and southwestern Jakarta.
- (e) Primary Distribution Mains for Zones 1, 2, 3 and 6 in central, northeastern, and eastern Jakarta, mainly consisting of extending and completing the primary network in these areas.

Detailed Description

5. Integrated Approach. Identification, design and execution of the infill/extension and rehabilitation works of the existing network will follow an integrated approach (within each primary cell), in which rehabilitation and infill/extension are closely associated. For each primary cell, this approach involves four phases, i.e., Phase 1: design the infill of the secondary infill works and install district meters; Phase 2: execute the secondary infill works and install district meters; Phase 3: execute the detailed rehabilitation investigation in the field; Phase 4: detailed design and execution of the tertiary infill/extension and pipe replacement works. Under JUDP II (four-year time slice of the nine-year program), Phases 1 and 2 will be completed for 67 primary cells, whereas Phases 3 and 4 will be completed for 90 elementary zones (about 36 primary cells). Based on the results of district metering and economic, financial and social criteria, the primary cells will be prioritized for implementation of Phases 3 and 4, in order to maximize returns to PDAM Jaya. The physical elements of their PJSIP component are shown on IBRD Map No. 21674.

6. Repair/Rehabilitation and UFW Reduction/Control Program (Phase 2). This is a difficult phase to implement and should therefore strictly follow the methodology derived from the Pluit and Tanjung Duren pilot studies. PDAM Jaya's existing network area has been divided into about 200 "elementary" zones (usually 3 or 4 per primary cell), each having about 1,000 service con-

nections and 20 km of mains. The work will be undertaken by a special UFW Task Force and decisions on the proposed investments will be based on cost benefit analysis. Further details of the program are in the Project Implementation Report and the PJSIP Project Preparation Report.

7. Infill/Extension of Tertiary Mains. This program will in most cases be one step behind the repair/rehabilitation program. The field surveys in the repair/rehabilitation program will also identify sections where the tertiary network needs to be infilled and where there is a demand for new connections. The schematic design of the distribution network is based on a primary grid layout with an average spacing of about 1,500 m. Within each primary will be smaller secondary loops of about 500 m square. The secondary network is usually of diameters 150 mm to 250. The tertiary network consists of 100 mm, 75 and 50 mm diameter pipes and is designed to fit the street patterns and maximize the number of service connections or public hydrants to serve the low-income groups, especially where the groundwater is saline.

8. Institutional Strengthening. This subcomponent will consist of in-house technical assistance, training and studies to improve the efficiency of PDAM Jaya's current operations and strengthen its capability to handle the enlarged system. It will include on-the-job training of accounting staff in financial management and of engineers and operators in distribution system management, utilizing network analysis for continuous surveillance of UFW, including the operation and maintenance of both water distribution and water production facilities. The action program is at Annex 22.

9. Primary Distribution Facilities (Zones 4 and 5) comprise the construction of a 2.4 km long, 1,200 mm diameter treated-water transmission main to convey flow coming through the Cisadane Treated Water Transmission Main (Component D) from Cisadane Water Treatment Plant (operated by PDAM Tangerang) to the R5 distribution center in the southwestern part of DKI Jakarta. The distribution center, which also forms part of the primary facilities, consists of a 22,500 m³ reservoir and a 1.8 m²/s pumping station for supplying parts of Zones 4 and 5, comprising approximately 38,000 m of 300 to 1,200 mm diameter lines.

Implementation Arrangements

10. Because of the complex nature of the project and the need to ensure perfect coordination, so that the planned step-by-step approach proceeds according to plan, a construction management consultant will be appointed to take responsibility and assist the project manager in implementing the project. This consultant will also be responsible for training the small local contractors in construction administration. In addition, the usually engineering design and supervision consultants will be appointed.

Environmental Aspects

11. Bridging consultants appointed in November 1989 have prepared a strategy for mitigating the consequences of the additional drainage water from households and standpipes arising from the project. The implementation of their recommendations will be included in the terms of reference of the construction management consultant and of the engineering design and supervision

consultants. GOI has also in accordance with its own procedures produced a preliminary environmental assessment (PIL) and is preparing preliminary environmental management (RKL) and monitoring (RPL) plans which will be used to minimize and monitor environmental impacts during project implementation.

12. In brief, the RKL is an environmental management plan which will address the issues identified in the PIL so that during implementation, the impacts will be either reduced or eliminated. For the PJSIP, the most significant issues identified as:

- (a) microdrainage in poorly drained areas;
- (b) traffic congestion caused by pipeline construction; and
- (c) the need to implement a public participation program targeted at giving and increasing awareness for people along the corridor.

13. For each stage of the project the RKL will consist of:

- (a) an inventory of the area's existing drainage and soil types;
- (b) the incidence of proposed new public hydrants;
- (c) a review of major traffic corridors with specific strategies for each section of pipe to the installed addressing the need for detours during road closures, the need for traffic control areas, the areas necessary for night-shift construction only, and the roads where pipe-jacking construction will be necessary;
- (d) an action program for implementation of public information and awareness on a section-by-section basis; and
- (e) coordination with the agencies involved in Public Traffic Control (Bina Marga).

14. To deal with the special case of those low-income areas with poor existing drainage due to topography and impermeable soil conditions, there is an allowance in the project budget to reduce standing wastewater that may accumulate in the vicinity of public hydrants and residences. This drainage work will involve the construction of small leaching pits which will be connected to the nearest tertiary drain (if practicable). These works will also give low-income people a reasonably convenient means of disposal of domestic wastewater. The work will be carried out by DKI Jakarta's Dinas Pekerjaan Umum (DPU) which is the local Public Works Department. Review of sites for new microdrainage will be completed on a stage-by-stage basis as part of the ongoing program to be identified in the RKL for each stage of implementation.

PDAM Computerization, Network and Database

15. The project will finance limited, specialized TA, basic equipment and initial operating costs for the computerization of PDAM and the preparation of a graphic/alphanumeric network database to meet the needs of the first two years of the PJSIP program. This subcomponent will be integrated with the proposed OECF-assisted Geographic Information System (GIS) project for DKI Jakarta. It is considered to be of a transitional, preparatory nature and will be subsequently integrated into the global solution of an Urban Mapping and Information System (UMIS), i.e., common up-to-date digital base maps, linked to a database, to be developed over time, starting with the project referred to above.

OECF Cofinancing

16. In view of OECF's current, substantial investments in PDAM Jaya water production facilities (Buaran I & II Water treatment Plants) GOI invited OECF to participate in the financing of the PJSIP component. Shortly after Bank appraisal of JUDP II on OECF special project formation mission identified and prepared the OECF financed component which will comprise system improvements for Distribution Zones 3 and 6 (supplied by Buaran I and II).

17. Prior to negotiations, agreement was reached between GOI, OECF and the Bank on the sharing of financing, implementation and coordination arrangements, and the major objective of PJSIP; this agreement was recorded in a memorandum of understanding (see Annex 3). The OECF and IBRD components will pursue identical objectives, and will complement each other, especially in their support for the institutional development of PDAM Jaya. Construction management assistance will be provided to both components. The involvement of two financing agencies is expected to distribute the workload and increase PDAM Jaya implementation capacities. As the works will be in geographically separate areas, coordination is not an issue.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Memorandum of Understanding for PDAM System Improvement Project
Between GOI, OECF and IBRD

1. This memorandum is written based on the discussions which were aimed at coordination between GOI and the two agencies.
2. The schedules for loan processing from IBRD and OECF are as follows:

Year	Month	IBRD	OECF
1990	Feb		Discussion with Cipta Karya/ PDAM Jaya on Draft Final Report
		Tripartite meeting among GOI/OECF/IBRD	
1990	Mar/Apr	Negotiation	Appraisal
	May	Board approval	
	Jun	Loan signature	Board approval
	Aug		Loan agreement
	Sep		Effectiveness of loan

3. PJSIP Implementation Program. The earlier proposal was for a six-year implementation program of the PDAM Jaya System Improvement Project (PJSIP) to cover all of Jakarta. It was agreed between GOI and IBRD to split the program into two phases because of (a) financial implications for PDAM Jaya; and (b) implementation capacity limitations. The first phase will be implemented over the 1990-96 period. The second phase will be implemented over the 1995-2000 period. The OECF/SAPROF team studied the implementation of the project independently. As a result, they took the same position for the implementation, dividing the project into two phases. The project mentioned in this memorandum refers to phase 1 of PJSIP, which will be a component of the Jabotabek Water and Sanitation Project (JWSP).

4. Sharing of Zones Between IBRD and OECF. Based on the JICA Master Plan completed in 1985, water supply areas in DKI Jakarta are divided into six supply zones. According to the zoning, GOI proposed that IBRD finance Zones

1, 2, 4 (part), and 5 (part); and proposed that OECF finance the remaining zones 3 and 6. Both IBRD and OECF accepted the proposal.

5. Cost Estimate and Sharing of Financing. Total cost of the project (i.e., PJSIP Phase 1) in current terms, net of taxes, is estimated at Rp 363,964 billion. OECF would finance 85 percent and IBRD would finance 60 percent of their respective components. The financing plan is as shown below.

OECF	85% of Rp 99,073 billion = Rp 84,212 billion
IBRD	60% of Rp 264,891 billion = Rp 158,935 billion
GOI Agencies	= Rp 120,817 billion
	<u>Total</u> = <u>Rp 363,964 billion</u> ^{1/}

6. Implementation Organization. An implementation organization will be established. Cipta Karya is the guiding agency which has water supply sector responsibility. PDAM Jaya is the executing agency under the supervision of DKI Jakarta, and will implement and control this project during design construction and operation. The Project Management Unit (PMU) for the project will be headed by DKI Jakarta staff. The Project Implementation Unit (PIU) will be headed by PDAM Jaya staff. Cipta Karya will provide staff and support as required to assist the PMU and PIU.

7. Because of the complexity of the project, GOI implementation arrangements relating to IBRD- and OECF-funded components allow for a construction management consultant to work closely with PDAM Jaya.

8. Concerning the physical implementation of the project, DKI Jakarta/ PDAM Jaya has proposed establishment of two separate PIUs to deal with the components funded by each of the financing agencies. The reason for the separation into two units is mainly due to the different administrative procedures of IBRD and OECF. PJSIF implementation will be monitored and coordinated through the Jabotabek Urban Project Coordination Office (JUPCO) for JUDP II.

9. Procurement. All the procurement of goods, works and services will be made according to the respective guidelines for procurement of IBRD and OECF.

10. Environment Issues. Both IBRD and OECF will include adequate provisions to deal with potential negative environmental impact of the project. Based on results of the preliminary government assessment, both agencies will include funds in their respective components for wastewater disposal as needed on the basis of detailed design. The required drainage will be implemented through DKI Jakarta.

11. Sharing of Institutional Development. Sharing of technical assistance for institutions development between IBRD and OECF will be as follows:

- (a) Technical assistance for operation and maintenance IBRD, OECF

^{1/} The exact amounts of the respective project shares will be finalized on the basis of loan negotiations and lending agency approvals.

(b) Technical assistance for project management	IBRD, OECF
(c) Technical assistance for management improvement	OECF
(d) Technical assistance for accounting system	IBRD
(e) Technical assistance for personnel management	IBRD
(f) Technical assistance for training	IBRD, OECF
(g) Technical assistance for computerization (including MIS)	OECF
(h) Technical assistance for consumer survey	IBRD

Terms of reference for the technical assistance have been agreed in principle and will be updated as required. (OECF may be asked to provide additional technical assistance.)

12. PDAM Jaya Finance. IBRD review indicates that PDAM Jaya is faced with a very large investment program. The current proposal to fund it entirely through borrowing and internal cash generation will cause a heavy burden for current consumers. Approximately 10 percent of the funding should be provided through new equity from the owner, i.e., Pemda DKI Jakarta. Borrowing and internal cash generation may roughly provide 60 percent and 30 percent, respectively.

13. IBRD is prepared to increase its loan amount from 60 percent of the cost of the PJSIP, net of taxes, to 70 percent provided the additional amount is passed on as equity to PDAM. OECF would welcome the same arrangement by DKI Jakarta, e.g., 10 percent out of the 85 percent OECF funding may be passed on by DKI Jakarta as equity to PDAM Jaya.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Pejompongan Raw Water Pipeline

Background

1. The present sources of drinking water for the Jakarta area are: (a) groundwater which, unless controlled, may soon be depleted or become brackish; (b) surface water from the Jatiluhur reservoir conveyed by the recently improved (IBRD Loan 2560-IND) 68 km long, 19 cumec capacity West Tarum Canal originating from the Citarum River near Curug; and (c) the Cisadane River to supply 3 cumecs under JWSP (Component C) to newly developing areas in West Jakarta. In the future, the 40 cumec capacity Tarum Jaya Canal, to be used exclusively to convey raw water for domestic and industrial use in Jakarta, would be built in parallel to the West Tarum Canal. At its terminus, the West Tarum Canal currently discharges into the Sunter and Ciliwung rivers.

2. Intakes situated on the West Tarum Canal provide raw water for the Buaran I water treatment plant (2 cumecs) now under construction to serve southeast Jakarta and the future Buaran II water treatment plant (3 cumecs), which when constructed would serve the northeast coastal area of Jakarta. West Tarum Canal is the raw water supply source for the existing Pejompongan treatment plans (5.6 cumecs) and Pulogadung treatment plant (4 cumecs) serving central and east Jakarta respectively.

3. The Sunter River, downstream of its confluence with the highly polluted Cipinang River, conveys West Tarum Canal water to the Pulogadung plant. However, a new pipeline providing a direct link from West Tarum Canal would be completed in mid-1990, thereby considerably increasing the safety of the water supplied by the treatment plant. West Tarum Canal water is within the health limits for use as a source for domestic water supply.

Project Genesis

4. The West Tarum Canal water that discharges into the Ciliwung River is diverted into the Banjir Canal, on which is located the intake for the Pejompongan treatment plants. During its passage through highly urbanized, low-income areas, the canal is being polluted and the water is below local and international standards as a treatable source of raw water for municipal (potable) use. This component involves building a raw water pipeline to provide a direct link from the West Tarum Canal to the Pejompongan water treatment plants.

Description

5. The alignment of the twin 1,600 mm diameter 11 km long pipeline is shown in IBRD Map No. 21674. Over most of its length, it would be laid in the median strip of the Sudirman-Jatinegara arterial road to be constructed under JUDP I. The intake works and 6.2 cumec pumping stations, to be equipped with four 2.1 cumec raw water pumpsets, is located on the West Tarum Canal just upstream of its crossing over the Cipinang River. The raw water will be chlorinated and at the outlet works there would be a surge protection device and meters at the connections to the two treatment plants. The design is satisfactory and two pipelines are justified because the Pejompongan water treatment plant serves the core areas of the city where long service interruptions cannot be tolerated in the event of a failure of a single pipeline. Upon completion, the pipeline will be handed to POJ. There is provision for the training of POJ staff in O&M. Land acquisition arrangements are well advanced and no special problems are anticipated.

Implementation Arrangements

6. Engineering Consultants (EC) would be appointed to assist the DGWRD Project Manager (PimPro) in the supervision of construction. The PimPro will be assisted by an Engineer's Representative (ER) and a Resident Engineer (RE). The relationship between the ER, RE and EC would be as follows: (1) all payment certificates for claims made by contractors would be approved by the ER and RE; (2) the EC would certify that the work done is to specifications and recommend payment. When the EC does not recommend payment, (a) the payment will be stopped, (b) a meeting will be held with the contractor, and (c) the minutes of the meeting included with the claim, when approved. In addition, the daily logs of work done would be signed by both the EC and the RE. Weekly site meetings attended by the supervisory team would also be held to review progress and to take corrective action. The Team Leader of the EC will report to the PimPro.

7. The works have been divided into two packages: Schedule 1, for Pumping Station and Structures, and Schedule 2, for the Pipeline. There will be a Co-Team Leader for the Pipeline package. The project costs and implementation schedule area at Annexes 14 and 15.

Environmental Aspects

8. The main issue for this component which required resolution was the relocation of 44 families with legal tenure who would be displaced by the project. POJ presented the Bank with an action plan which outlined the process and the proposed timetable for implementation. The POJ project manager confirmed that a Governor's Decree has been issued (the Governor's decree for approval of the pipeline alignment cannot be issued unless all of the displaced residents have agreed to the compensation package). The basis for compensation is an assessment of the market value of the property including land and buildings compared to property of similar age, condition and neighborhood. The compensation so determined would allow the displaced families to re-establish residence under comparable conditions.

9. The other issues concerning this component were local construction impacts which relate to traffic management, dust control, noise and sediment run-off control. These issues were canvassed in the PIL and have been addressed in the RKL and RPL. The RPL is a monitoring plan and is seen as a means to ensure the long-term effectiveness of the management of specific issues. For the Pejompongan pipeline water quality monitoring in the West Tarum and Banjir Canals would continue so that overall performance of the project may be quantitatively measured upon project completion.

Institutional Strengthening

10. POJ will be trained by the consultants and contractors in the operation and maintenance of the pipeline, and for surveillance of water quality. POJ staff would also be trained in accounting and financial management.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Cisadane I Treated Water Transmission Main

1. PDAM Tangerang located within the Jabotabek area in Kabupaten Tangerang, West Java Province, is preparing for the construction of the Cisadane I Water Treatment Plant with a production capacity of 3.0 m³/s. The proposed plant, located some 12 km southwest of the DKI Jakarta boundary, comprises a raw water intake on the Cisadane River, a raw water pumping station and transmission main, the treatment plant, a treated water reservoir, a treated water pumping station with 3.0 m³/s capacity (+50 percent standby) and an elevated regulating tank. All these facilities, including design and construction supervision are being financed by a concessional loan from the Government of France (GOF) under the GOI-GOF financial protocol signed in November 1987.
2. Since only 0.2 m³/s of Cisadane I production would be required by PDAM Tangerang for distribution to the town of Serpong, PDAM Jaya and PDAM Tangerang concluded an agreement on the supply of 2.8 m³/s of treated water to PDAM Jaya for distribution to the northwestern and western (Zone 4) and southwestern (Zone 5) parts of DKI Jakarta. This agreement requires PDAM Tangerang to deliver the agreed flow to the DKI Jakarta boundary.
3. This component therefore comprises the construction, by PDAM Tangerang, of a 11.4 km long 1,500 mm diameter low pressure pipeline from the regulating tank at Cisadane I to a branch point from where a 2.8 km long 1,200 mm diameter pipeline would convey about 50 percent of the flow to the R5 distribution center. Only 1.8 km of the 1,000 mm branch pipeline to the future R4 distribution center and 1.4 km of the 1,200 mm pipeline to R5 up to the DKI Jakarta boundary would be constructed by PDAM Tangerang under this component. The sections of the two transmission mains inside DKI Jakarta are the responsibility of PDAM Jaya as part of the primary distribution facilities for Zones 4 and 5 under the PJSIP component. About 2.5 km of 300 to 500 mm diameter primary distribution main branching off the pipeline to the town of Serpong in Kabupaten Tangerang are also included in this component.
4. Allocation of the flows from Cisadane I between R4 and R5 distribution centers will be regulated by PDAM Jaya from downstream through remote controlled flow meters and valves which will be installed at the DKI Jakarta boundary. Sufficient flexibility would be built into the design of the transmission facilities to allow diversion of up to 2.0 m³/s to either of the distribution centers, depending on actual demand in the zones.
5. Preparations for land acquisition of the pipeline right-of-way are well in hand; the notice to acquire the land has been published and no objections were received. Only about 6 legal residential properties would have to be acquired and full compensation will be paid to the owners in accordance with GOI procedures. The transmission line will be buried with about 1.5 m cover so that no permanent environmental impact is anticipated in the rural

and peri-urban areas where it will be laid. Based on the preliminary environmental assessment (which has been completed) and the environmental management and monitoring plans, disruptions during construction will be kept to a minimum through strict contract conditions and specifications, and close supervision and enforcement of good construction methods.

6. Design of the Cisadane I Treated Water Transmission Main is also being financed by the GOF loan, but construction supervision will be covered under this component.

7. Institutional development of PDAM Tangerang will be supported through the provision of limited TA (electrical/mechanical engineer and management expert) and a training budget for the staff of the utility.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Sanitary Sewerage Extension

1. The sewerage subproject includes the following main components: (i) construction of sewerage works; (ii) drainage works; (iii) environmental monitoring; (iv) institutional development; and (v) technical assistance. The project area remains the same as in JSSP covering the Setia Budi and Tebet/Manggarai areas. The project area and a schematic presentation of the physical components are shown on IBRD Map No. 21675.

Sewerage Works

2. In the original plan under the JSSP and sewerage system consisting of nine sewers, two treatment ponds, and a sewage pumping station were envisaged. The construction of most of these sewer works is substantially complete except for three sewer packages and a pumping station which have been deferred. The sewerage components deferred together with the additional sewer works and related property connections identified were incorporated into the scope of JUDP II. These packages are mainly those in the western portion of the project area and will result in the full utilization of the ponds' treatment capacity. The proposed works are:

- Sewer construction Packages 7 and 8,
- Parts of Package 18 (microtunneling),
- Property sewer connections,
- Krukut sewage pumping station (construction Package 9),
- Macro- and microdrainage works,
- Sewer maintenance equipment.

3. Some of the sewers in Package 7 have already been constructed under JSSP. Likewise, pumps and most of the mechanical and electrical equipment for the Krukut Sewage Pumping Station have also been procured and stored in Jakarta. Waste waters collected through sewer packages 7 and 8 will be pumped by the Krukut pumping station and discharged into the main sewer collector (Package 18) for conveyance to the West Pond.

4. As called for under the JSSP Action Plan, the project identified additional sewerage works which are now proposed under Component E of JWSP. The underlying objective for the additional works is the need to enhance the effectiveness of the pilot sewerage scheme and further strengthen the organization responsible for its operation and maintenance. The additional works proposed are:

- Sewer mains E and F along Jl. Rasuna Said,
- Property connections to sewers E and F,
- Low cost sewerage demonstration.

Both of the sewers E and F have been selected primarily for their potential to service buildings along Jl. Rasuna Said. No increase in the load to the ponds is anticipated from the proposed new sewers E and F as wastewaters from this area are already estimated flowing to the East Pond via the surface drainage system. In an attempt to provide alternative low-cost solutions instead of conventional sewer systems in densely populated inner-block areas it is proposed to demonstrate the feasibility and suitability of small bore sewers and shallow sewers. Low cost sanitation (pit latrines, septic tanks) will be implemented as part of the KIP under JUDP III.

5. Plan for property sewer connections proposed under JUDP II and targeted under JSSP are broken down as follows:

Type	JSSP Target	JUDP II Plan	Total
Residential	2,500	816	3,316
Commercial	87	116	203
Industrial	24	43	67
High rise	26	40	66
<u>Total</u>	<u>2,637</u>	<u>1,017</u>	<u>3,652</u>

In addition to the above, connections to 1 hotel and 16 social institutions will be completed under the JSSP completion plan.

6. Flows expected under the ongoing JSSP Project will total to 206 lps or 52 percent of the design treatment capacity of 395 lps. Flows from JSSP pilot stage and from JUDP II completion works are shown below. It is to be noted that the largest portion of the total flow (116 lps) will come from sewer Packages 7 and 8 via the Krukut Pumping Station (package 9).

Sewerage Package	Wastewater Flows, Liter Per Second	
	JSSP Packages	JUDP II completion
2,5 and (18)	77	103
3,4	40	54
1,12,14	35	47
Surface drains	24	35
7,8 and 9	0	116
<u>Total</u>	<u>206</u>	<u>396</u>

Drainage Works

7. Macrodrainage improvement works are proposed under the sewerage component to eliminate the flooding caused by Saluran Bukit Duri and Kal' Baru Barat. These channel improvements will help to achieve the original JSSP macrodrainage drainage objective of 4 km of macrodrainage improvements.

8. As reported by the JSSP Project, deficiencies still exist in the primary and secondary microdrains within the project area. Preliminary designs for the priority microdrainage improvements are being prepared by the project.

Institutional Development

9. The project will provide assistance to extend the work started under the JSSP of establishing an appropriate sewerage entity, PDAL (Perusahaan Daerah Air Limbah) that will be charged with the responsibility of operating and future development of sewerage services for Jakarta. PDAL will be a local government enterprise under the DKI Jakarta government equipped with adequate financial and operational autonomy. An Interim Sewerage Unit established under JSSP, with the help of consultants, is developing sewerage ordinance and operating procedures which will be embodied in the operating authority of PDAL. The government of DKI Jakarta has already approved the draft sewerage ordinance and the establishment of PDAL. It is expected that the PDAL will become operational by March 1991 when all completed sewerage works currently under the JSSP will be transferred to it. DGWRD and DKI Jakarta are cooperating for the operation of the Setia Budi ponds which have a dual function--as flood retention basins and sewage treatment periods. A mutual agreement setting out the respective responsibilities has been executed on the basis of an understanding reached between the Director-General of Water Resource Development and the Vice-Governor of DKI Jakarta.

Technical Assistance

10. Technical assistance will be provided by the consultants in cooperation with the designated counterpart staff to: (i) review the revised designs of sewer construction packages 7 and 8 including a detailed inventory of sewer pipe materials and fittings available; (ii) prepare detailed engineering designs for additional sewer mains E and F; (iii) review Krukut Pumping Station and Force Main design drawings and specifications and revise accordingly BPAL/PDAL with technical matters related to the property sewer connection program including preparation of guidelines for inspection, design and approval of connections; (v) prepare preliminary work for pilot low-cost sewer program for surveying and site selection and prepare all detailed engineering design for the works; (vi) assist in all stages of procurement and tender processes by providing technical support; (vii) assist BPAL in the design and implementation of an environmental monitoring program covering the legitimate concerns and responsibilities of the BPAL.

Environmental Aspects

11. A preliminary environmental assessment for the entire JSSP project has been completed and comments received from the Komisi Daerah (DKJ Jakarta). This agency has requested a number of issues be addressed during implementation as part of the RKL and RPL preparation. It was recommended that:

- (a) Setia Budi ponds were not to be used for disposal of industrial waste;
- (b) the full design flow of wastewater to be discharged (about 20,000 m³/day) may be too high for adequate treatment;
- (c) hotel and high rise buildings in vicinity should be reviewed whether there is a need for connection (as these facilities may have on-site treatment); and
- (d) the need to carry out a public participation program to explain to potential consumers why they should connect to the sewerage system.

There is also a need to consider site-specific impacts around the ponds during preparation of the RKL and RPL. Specifically:

- land use management in buffer zone
- control of odor during dry season
- noise control of pumping and aeration equipment
- visual impact control by landscape development

Master Plan

12. A sewerage and drainage master plan for Jakarta is under preparation financed by the Japanese International Cooperation Agency (JICA). The plan is scheduled for completion by mid-1990 and is expected to recommend comprehensive approaches and solutions to deal with Jakarta's wastewater problems. The JSSP sewerage works would be integrated into a future city-wide sewerage scheme.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Priority Drainage and Flood Control

Background

1. This component is for the rehabilitation of selected major drains which flow through Jakarta from south to north to the Java Sea. The drains were built many years ago in naturally occurring water courses. They have fallen into disrepair and are in need of rehabilitation and dredging. This component would do that with the objective of restoring and increasing their original carrying capacity.

2. The Jabotabek regional drainage basin covers some 6,110 km² of land mass bounded on the south by mountains and the north by the Java Sea. It measures some 80 km north-south and 103 km east-west. Thirteen large and smaller rivers flow through it to the sea. Occupying some 5,246 km² (86 percent) of the region and with some 93 km of coast, DKI Jakarta lies at the north central portion of the region.

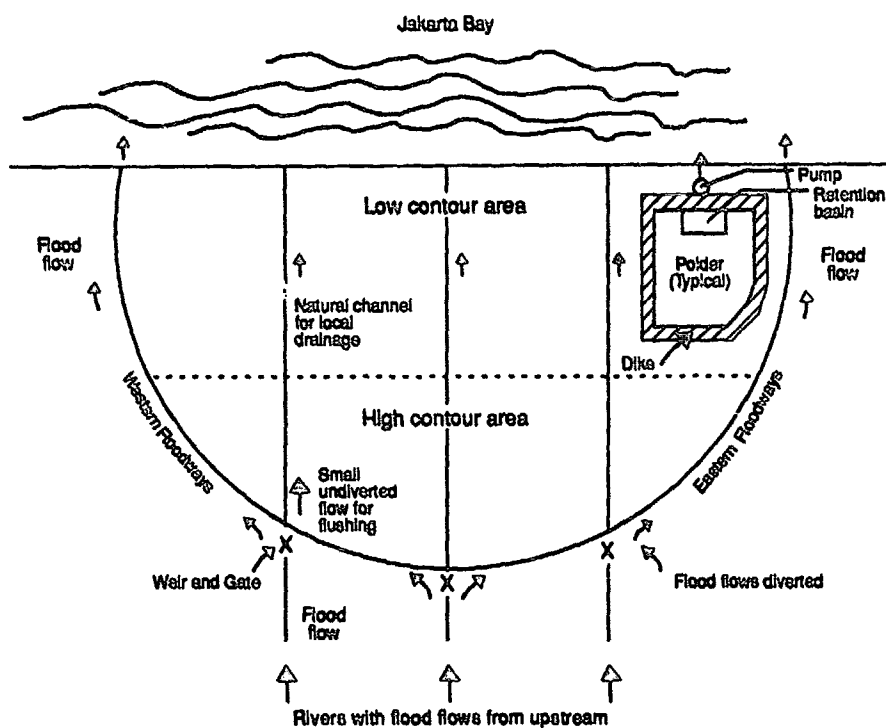
3. DKI Jakarta suffers from periodic flooding with two main causes: (i) localized rainfall (average rainfall is 2000 mm/yr) is not adequately and quickly removed; and (ii) the main north-south drains do not have sufficient capacity. The localized flooding is caused by silted and inadequately designed, constructed and maintained minor drains; flat topography, high tides and land subsidence; and increased runoff due to rapid urbanization.

4. The floods of larger extent and severity are caused by the reasons given in para 3 and by the inadequate capacities of the major drains. The capacity shortfalls are due to crumbled sidewalls, silt and refuse deposition, and legally and illegally constructed obstructions.

Flood Prevention and Control Program

5. A Master Plan was prepared in 1973 which conceived and presented Jakarta's long term strategy for flood protection and control. The strategy has three key elements. First is to intercept and divert flood flows around to the east and west of the city. To accomplish this requires construction of two major flood-ways and the gating of natural channels so water may be diverted from them to the floodways. Second is to use the natural channels as drains for local rainfall and wastewater, yet to allow some flow through them from outside for flushing and dilution purposes. Third is to create polders in low-lying areas. Such polders consist of dikes, gates, retention basins and pumps; the dikes and gates keep floodwaters and high tides out, the retention basins temporarily store the runoff, and pumps gradually remove local rainwater. The system is illustrated in Fig. 1.

Figure 1 - SCHEMATIC OF DRAINAGE AND FLOOD CONTROL SYSTEM



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Existing and Proposed Facilities

6. The first floodway was constructed in 1919/20. It starts at and intercepts the Ciliwung River, diverting flood waters to the west of the city. In 1966 a series of polders were constructed and additional polders were added in the 1970s and 1980s. In 1983 improvements were made on several western rivers and drains to improve protection of the city's western flank. At present some 25,000 ha, representing 35 percent of DKI Jakarta, are adequately protected against flooding. Design work funded by AICA is in progress for systems which would protect an additional 27,000 ha, largely in eastern Jakarta. OECF has been the principal funding source for works since 1983, having invested some Rp 150 billion. OECF continues to participate in this sector and it is likely that it will fund the bulk of the next stage facilities. These are expected to cost some Rp 65 billion over the next 4 years. The Bank has and, under this project, will continue to be a minor funding source. The First Urban Sector Loan funded improvements to part of the Grogol River (supplementing OECF funds) with a total cost of Rp 8.3 billion and a loan amount of Rp 7.2 billion.

Facilities and Work Proposed for Funding

7. DGWRD has requested the Bank to fund some of the facilities and works which are key to and part of the overall system. The bulk of the pro-

posed work is to dredge, clean and repair existing major drains which have fallen into disrepair through neglect. The purpose is to restore their original carrying capacity. Construction and O&M of the subject drains are the responsibility of the Central Government, but, in line with divesting O&M responsibility to local governments, DGWRD and DKI Jakarta have agreed that upon restoration of the drains, DKI Jakarta would thereafter be responsible for their O&M. Most of the proposed works involve dredging of a routine nature. Rehabilitation of the Pluit reservoir pumping station and construction of two tidal gates at the Ancol Canal complement these works to achieve overall improved drainage flows and reduced incidence of flooding. The facilities and works to be funded are described in Table 1 and shown on IBRD Map No. 22039.

Table 1: PRIORITY DRAINAGE AND FLOOD CONTROL

Description	Package	Type of Contract
Excavation of K. Ciliwung : 14.13 km	1	LCB
Excavation and lining improvement of Ancol Canal : 6.50 km	1	LCB
Excavation and lining improvement of West and East Pademangan Canal : 5.50 km	4	LCB
Dredging of Pluit Reservoir : 80 ha, and replacement of old pumps (3 units) and garbage facilities (4 units) of Pluit Pumping Station	4	ICB
Excavation of K. Besar, Parkin Canal, K. Jelakeng, K. Duri and rehabilitation and upgrading Pluit Reservoir Inlet System : 10.50 km	5	LCB
Construction of Pekapuran Tidal Gate, Sentiong Diversion Channel and Ancol Gravity Gate	6	ICB
Construction of 0.5 km Papanggo Drain and Lagoa Tidal Gate (as part of West Sunter Drainage Scheme)	7	LCB

Remarks: ICB = International Competitive Bidding
LCB = Local Competitive Bidding

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDF II)

Water Resources Management Study and Institutional Development

1. Jabotabek's rapid population growth, urbanization and industrialization has placed enormous pressure on its water resources. This is manifested in numerous ways including competition between users, contamination of surface, ground and coastal waters with resultant ecological impacts, and increased development costs. GOI and Jabotabek officials recognize the situation and need for action, and some near-term measures (including those of this project, JCEIP and other donors) are being implemented. But divergent interests, unclear remedies and high costs complicate the development and implementation of long-term strategies and solutions. This Annex briefly profiles Jabotabek's urbanization, describes the natural and man-made water resource systems, lists the issues faced in the water resources sector and describes how they are addressed under the studies component of this project.

2. Jabotabek is comprised of DKI Jakarta, with some 8 million people, and the surrounding urbanizing towns and districts of West Java with 1.3 million people. The overall growth rate is about 4 percent. Population growth has stabilized in the central city but continues to increase in the inner suburban ring and around markets through density increases. The outer areas of DKI Jakarta and the surrounding districts are growing rapidly through extensive settlement in unregulated and poorly serviced kampungs. Over the next 12-15 years DKI Jakarta's population is expected to reach 12 million and adjacent urban areas to triple in size, leading to a population of about 17 million by the year 2005.

3. Historically, apart for a small urban core, the Jabotabek geographical region was largely agricultural. This is rapidly changing. Of a total area of 7,200 km², some 920 km², (13 percent) are now urbanized and by the year 2005 the figure is expected to be 18 percent. Agriculture activity consists primarily of irrigated paddy and aquaculture, both of which require large amounts of unpolluted water.

4. In addition to the rapid increase of population and urbanization, the Jabotabek region is the most heavily industrialized in Indonesia and still growing. Thus the water resource issues are defined: rapidly increasing demands for domestic and industrial water, competition for water between traditional and new users, and deteriorating water quality which adversely impacts on all users as well as the region's ecology.

5. The Jabotabek region is blessed with an abundance of naturally occurring surface and groundwater. There are some large and smaller rivers which flow from the upland south, through or in the vicinity of the region, and thence to the Java Sea. In addition there is groundwater of natural good quality underlying much of the region in shallow and deep aquifers. These resources have been tapped extensively--in some instances beyond their sustainable yield. And they have become the sinks for domestic and industrial wastes, thereby limiting their usefulness as sources of supply.

6. The primary sources for Jakarta's urban water supply are (i) the Jatiluhur Dam's impoundment of the Citarum River, linked to the PDAM Jaya water treatment plant at Pejompongan by the West Tarum Canal, and (ii) groundwater which is largely exploited by the private initiatives of households and industries. The surface water system produces some 0.7 million cu m per day. Groundwater use in DKI Jakarta is variously estimated at 0.07-0.13 million cu m per day from deeper (confined) aquifers and 0.32 million cu m per day from shallow aquifers. It is estimated that some 2.75 million people use the PDAM Jaya surface water system, 4.4 million rely upon shallow groundwater and about 1 million use untreated surface water. The Jabotabek region outside of DKI Jakarta relies mainly on groundwater for its potable needs, drawing an estimated 0.15 million cu m per day from shallow and deeper aquifers.

7. The current and projected raw water demand and supply situation for the Jabotabek region is as shown in Table 1.

Table 1: RAW WATER DEMAND AND SUPPLY FOR JABOTABEK REGION

	1985	1995	2005	2025
	----- cu m per sec -----			
<u>Demand</u>				
Jakarta		24.2	34.4	55.2
Eastern Suburb		1.1	1.8	4.9
Western Suburb		4.5	7.7	15.2
Flushing <u>/a</u>		14.0	14.0	14.0
<u>Total</u>		<u>43.8</u>	<u>59.9</u>	<u>89.3</u>
<u>Supply</u>				
West Tarum Canal		14.5	14.5	14.5
Tarum Jaya Canal <u>/b</u>		22.1	24.3	28.4
Cisadane		3.2	3.2	3.2
Groundwater <u>/c</u>		3.6	3.6	3.6
<u>Total</u>		<u>43.4</u>	<u>45.6</u>	<u>49.7</u>
<u>Surplus or Shortfall</u> <u>/d</u>		<u>-0.4</u>	<u>-14.3</u>	<u>-39.6</u>

/a Flushing demand requires further study.

/b Tarum Jaya Canal is under design and is proposed for construction in Repelita VI, 1994-99.

/c Groundwater sustainable yield to be confirmed in groundwater study under this project.

/d Water resources study under this project would ascertain source to be developed to meet shortfall.

8. Paras. 1 and 4 briefly mention the issues in the water resources sector. Table 2 elaborates on this and lists tentative means for addressing them.

Table 2: WATER RESOURCES ISSUES AND MEANS FOR ADDRESSING THEM

Item	Issues	Measures for Addressing Issue	Vehicles for Addressing Issues
Surface water quantity	Competing use among agricultural, industrial, municipal, power and fishery sectors; increased costs for development; wasteful practices of agricultural, municipal and industrial sectors; improper upper watershed management	Improved planning with due regard to economic considerations; improved technologies; improved operations; consumer awareness raising; pricing; reuse; development projects	Water resources study, urban water system capital expansion, improved operations of PDAM Jaya and increased urban water price under JUDP II. Improved agricultural practices under ----.
Surface water quality	Contamination from agricultural, domestic and industrial sources impacts on health through direct consumption and bio-accumulation, decreases quality of life and ecology of rivers and coastal waters; productivity of agricultural and fisheries sectors reduced; development and operation costs to all users increased	Awareness raising in agricultural and industrial sectors; improved regulations, monitoring and control; land use plans and controls; industrial waste minimization; domestic and industrial waste systems; pricing	Water resources study and sewerage extension under JUDP IIP; sanitation extension and industrial wastes management under JUDP III.
Groundwater quantity	Excessive withdrawals lower water levels and increases abstraction costs; contributes to land subsidence (and hence increased flooding), and deteriorates water quality	Reserve groundwater for high quality needs; introduced piped surface water supplies; restrict development in recharge areas; license or otherwise regulate withdrawals; pricing	Improved licensing, increased levies, improved land use practices, increased reliance on surface water and groundwater management study under JUDP II.
Groundwater quality	Aquifers contaminated by agricultural, domestic and industrial wastes and salinity. Caused by excessive withdrawals, improper waste disposal and urbanization of recharge zones	Awareness raising in agricultural, domestic and industrial sectors; improved regulations, monitoring and control; land use plans and controls; industrial waste minimization; domestic and industrial waste systems; pricing	Since groundwater quantity and quality are affected by the same parameters such as excessive withdrawal, the same vehicles as under groundwater quantity apply. In addition the expansion of sewerage and improved industrial wastes management under JUDP II and JUDP III respectively will help to protect aquifers.
Water resource management	Policies, development strategies and institutional arrangements inadequately defined or inconsistent and not suited to rapidly changing conditions	Review and revise policies, regulations and institutional arrangements; improve coordination; rationalize planning; improve operational efficiency	Water resources study under JUDP II and institutional development under JUDP III and Bank's sector study.

9. The objective of the water resources management study is to prepare a medium to long term water resources development strategy for the Jabotabek region taking into account the needs of multiple users and with regard to protection of water quality. The study will identify, evaluate and recommend among alternative physical and policy measures, considering technical feasibility, costs benefits, social and environmental impacts and risks. The study would employ the planning methodologies developed under the Cisadane-Ciminuk Water Resources Project funded by the Netherlands in 1986-88.

10. The groundwater study component will prescribe a management program to optimally use the resource in conjunction with surface water and with due regard to environmental parameters. A detailed list of groundwater issues and draft terms of reference are in the Project File. Annex 15 presents a more detailed description of groundwater in the Jabotabek area and of the related economic, technical, environmental and institutional issues.

11. The report entitled "Indonesia - Forest, Land and Water: Issues in Sustainable Development," No. 7822-IND, dated June 5, 1989" and prepared by the Bank points out the efficiency benefits of regionally integrated water resources planning and management and suggests the need for adjustments in institutional arrangements to facilitate this. This work was followed by two studies (one funded by the Bank, one by the Government of the Netherlands), a Bank staff note and several GOI workshops on the subject. The Bank is currently conducting a more detailed sector study to further examine the merits of alternative arrangements. This project has a small allocation of funds to support additional GOI workshops to help Indonesian staff build a consensus for new arrangements.

Table 5.1.1 BREAKDOWN OF PROPOSED T.A. FOR JUDP II
(All costs in Billion Rp)(1)

Sub-Project	Sub-Project Components	Estimated T.A. costs					Total cost		FED/Superv/Remainder		
		Project Cost	FED/Supervision	Institot./Develop	Policy Training	Policy studies	Prep.	in BRp	in Rs	as % of S-P Cost	as % of S-P Cost
SP-1 PAN JAYA SYSTEM IMPROVEMENT PROJECT (PJSIP - IBRD part)	a. Comp. A (Rehabilitation)	64.0	12.60					12.60	* 7.02	19.72	
	b. Comp. B (Infill/Extension)	104.5	6.00					6.00	3.34	5.63	
	c. Comp. C (Institot./Development)	7.3		5.43	0.70			6.13	3.42		84.0%
	d. Comp. D (Prio./Dist./Facil./Zone 3)	20.5									
	e. Comp. E (PDR 1 & 2)	36.5	1.60					1.60	0.89	0.42	
	f. Comp. F (PDR 4 & 5)	42.1									
4 - Year Time-slice of 9 - Year Program	Project Administration (PTD)	14.4	10.76					10.76	* 5.99	74.71	
(PAN JAYA)	Sub-total PJSIP (IBRD)	291.3	30.96	5.43	0.70			37.09	* 20.66	10.62	2.1%
SP-1 PAN JAYA SYSTEM IMPROVEMENT PROJECT (PJSIP - OECF part)	a. Comp. A (Rehabilitation)	19.0	4.17					4.17	* 2.32	21.92	
	b. Comp. B (Infill/Extension)	45.5	2.21					2.21	1.23	4.92	
	c. Comp. C (Institot./Development)	5.2		4.36				4.36	2.43		83.8%
	d. Component D (PDR 3 & 6)	35.6	2.08					2.08	1.16	5.62	
	Project Administration (PID)	3.6									
	4 - Year Time-slice of 9 - Year Program (PAN JAYA)	Sub-total PJSIP (IBRD)	108.9	8.46	4.36				12.82	* 7.14	7.61
SP-2 PEJUSPASAN RAW WATER PIPELINE (Pej. RWP)	a. Raw Water Pipeline	103.6	4.54					4.54	* 2.53	4.42	
	b. Institutional Devel. of PQA	0.0		0.28	0.31			0.59	0.33		73.8%
	(DGBRD)	104.6	4.54	0.28	0.31			5.13	* 2.86	4.32	0.6%
SP-3 CISINGARE TREATED WATER TRANS. MAIN (Cis/TMTH) (PDR Tangerang)	a. Treated Water Trans. Main	31.7	1.45	0.25	0.69			2.59	1.44	5.22	3.0%
	b. Primary Distribution for BSD	2.9	0.11					0.11	0.06	3.62	
	Sub-total Cised. TMTH	34.6	1.76	0.25	0.69			2.70	1.50	5.12	2.7%
SP-4 JSSP EXTENSION WASTE WATER DISPOSAL	(D.B. Cipta Karya)	39.3	2.67	0.43	0.70			5.80	2.12	6.62	2.9%
	(Ponda DKI Jakarta)	3.2	0.25					0.23	0.13	7.22	
SP-6 PRIORITY MAJOR DRAINAGE	(DGBRD)	39.6	2.30					2.30	1.28	5.82	
SP-7 WATER RESOURCES MANAGEMENT PROJECT (4)	(DGBRD)	11.9	0.13	0.74		2.99		3.86	2.15	1.11	31.3%
SP-12 MISCELLANEOUS STUDIES AND T.A. (D.B. Cipta Karya) (D.B. Bangdal)	(D.B. Cipta Karya)	9.1	1.33		0.43	4.12	3.06	8.94	* 4.98	14.62	85.6%
	(D.B. Bangdal)	10.2	5.38					5.38	2.99	52.72	
Totals in Billion Rp		652.5	57.76	11.49	2.83	7.11	3.06	82.25	* 43.82	8.92	3.6%
Totals in Million US \$		363.5	32.18	6.40	1.58	3.96	1.70	45.82			% of Project Loans
Project loans in Million US \$ (4)		212.0								15.22	6.4%

(1) Cost estimates are total project costs and include taxes, physical contingencies & price contingencies (1 US \$ = 1795 Rp)
 (2) The budgets for FED/Supervision of each sub-project include an allowance for environmental assessment.
 (3) All 10 budgets include 10% physical contingencies but have no provision for price escalation.
 (4) The TA for the Jabotabek Water Resources Management Study is funded by GdR (6.0 BRp) and is not included here.
 (5) Full cost tentatively assumed to be covered by JUDP II Loan but only 60% "charged" to JUDP II in this table.
 (6) Including 26.5 BRp (IBRD) and 9.9 BRp (OECF) on-lent to Ponda DKI and passed on to PAN Jaya as equity.

PROPOSED TECHNICAL ASSISTANCE UNDER JUDP 11

Sub-Project 1 : PJSIP (Zones 1,2,4 & 5 - IBRD assisted)

NO.	TITLE OF T.A.	PURPOSE OF T.A.	Executing Agency	BRIEF DESCRIPTION.	Man-Months Intern. Nat	Estimated cost US\$11. Rp/ Mill. \$	TYPE	STATUS OF TOR	COMMENTS
Group 1: FED/Supervision of Construction									
1	TA for rehabilitation works	To help PAN Java plan and execute the rehabilitation program.	DBCK/ PAN Jaya	Assist PJSIP Task Force in planning and executing the rehabilitation investigations.	119 1160	12.75 * 7.10	FED	Draft ToR prepared in July 1989.	
2	TA for FED of infill/extension works.	To prepare FEDs and TDs for infill/extension.	DBCK/ PAN Jaya	Design infill/extension works according to agreed implementation methodology.	55 396	6.07 * 3.38	FED	Draft ToR prepared in July 1989.	
3	TA for FED of Primary Distribution Mains in Zones 1 & 26		DBCK/ PAN Jaya	Prepare designs and tender documents.	33 48	1.62 0.90	FED	ToR not yet available.	
4	TA for construction management & supervision.	To strengthen the PIU.	DBCK/ PAN Jaya	Assist PIU in scheduling, contract administration and supervision of all conventional contracts for Zones 1,2,4 & 5.	103 189	7.19 * 4.00	CS	Draft ToR prepared in July 1989. Reviewed & approved in Feb. 1990.	
Sub-Total Group 1 *****					310 1784	27.63 15.39			
Group 2: Institutional Development									
5	TA for institutional development.	To improve PAN Java's overall operations.	PAN Java/ DBCK/PUUD	In-house assistance for: - dist.system management - financial management - human resources development - WTP operation	122 142	5.07 * 2.83	ID	Job descriptions given in Annex 16 of CPPR.	There are currently 2 sets of ToR that need to be harmonised.
6	Consumer survey.	To improve PAN Java's knowledge of water consumer behaviour.	PAN Jaya	- Identify representative sample of consumers. - Regular surveys of representative sample. - Set up Economic Monitoring Unit in PAN Java.	6 12	0.38 0.21	FED	Description of approach in Annex C; Appendix 33 of PJSIP PPR and Annex 18; Attachment E of CPPR.	Detailed ToR need to be prepared.
Sub-Total Group 2 *****					128 154	5.45 3.04			
7	TA for training.	To develop PAN Java's in-house training unit.	PAN Jaya/ DBCK/PUUD		9 54	1.33 0.74	T		
Totals					447 1992	34.41 19.17			

FED = Final Engineering Design
CS = Construction Supervision
ID = Institutional Development
T = Training
PS = Policy Studies
FPP = Future Project Preparation

06-Mar-90
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PROPOSED TECHNICAL ASSISTANCE UNDER JUDP II

Sub-Project 1 - PJSIP (Zones 3 & 6 - DECF assisted)

NO.	TITLE OF T.A.	PURPOSE OF T.A.	Executing Agency	BRIEF DESCRIPTION.	Man-Months Intern. Mat	Estimated cost Bill. Rp: Mill. \$:	TYPE	STATUS OF TOR	COMMENTS
Group 1: FED/Supervision of Construction									
1	TA for rehabilitation works	To help PAN Jaya plan and execute the rehabilitation program.	DGCK/ PAN Jaya	Assist PJSIP Task Force in planning and executing the rehabilitation investigations.	56	288 4.51 2.51	FED	Draft TOR prepared in July 1989.	
2	TA for FED of infill/extension works.	To prepare FEDs and TDs for infill/extension.	DGCK/ PAN Jaya	Design infill/extension works according to agreed implementation methodology.	33	108 2.61 1.45	FED	Draft TOR prepared in July 1989.	
3	FED/supervision for Primary Distribution Lines in Zones 3 & 6.		DGCK/ PAN Jaya	Prepare designs and tender documents. Supervise construction. and supervision.	119	155 5.41 3.01	FED CS	TOR not yet available.	Man-months as proposed in Saprop report.
Sub-Total Group 1 *****					208	549 12.53 6.98			
Group 2: Institutional Development									
4	TA for institutional development.	To improve PAN Jaya's overall operations.	PAN Jaya/ DGCK/PUOD	In-house assistance for: - water quality control - WTP operation - inventory control - D & R information system	53	72 2.46 1.37	ID	Job descriptions given in Saprop report.	
5	Computerisation study including network database.	To computerize PAN Jaya's activities. To computerize PAN Jaya's network records in order to improve network management.	PAN Jaya/ DGCK/PUOD PAN Jaya/ DGCK	Master Plan (6 months) 1st Phase of implementation. - Install network database system. - Train PAN Jaya staff to use the system. - Create the initial database.	17 14	77 1.54 0.75 48 0.84 0.47	ID ID	Outline TOR given in Annex C; Appendix E32 of PJSIP PPR. Draft TOR prepared by PPS Team Urban Mapping expert.	Revised by PPS Team to be compatible with TOR for network databases. To be reviewed and appraised by DECF.
Sub-Total Group 2 *****					86	197 4.64 2.59			
Totals					294	746 17.17 9.56			

FED = Final Engineering Design
CS = Construction Supervision
ID = Institutional Development
I = Training
PS = Policy Studies
PPP = Future Project Preparation

06-Mar-90
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Sub-Project 2 : Pejaponggan Pipelines

PROPOSED TECHNICAL ASSISTANT UNDER JOMP II

NO.	TITLE OF T.A.	PURPOSE OF T.A.	Executing Agency	BRIEF DESCRIPTION.	Man-Months latera. dat	Estimated cost (bill. Rp/ Mill. \$)	TYPE	STATUS OF TOR	COMMENTS	
1	Consulting services for supervision of construction of the Pejaponggan Pipelines	To support the PIU.	PSJ	Conventional supervision services.	70	4.51	CS	Comprehensive TOR already prepared (October 1989)		
2	Management Improvement Study	To improve financial condition of PIU.	PSMD/PIU	Develop improved management procedures for PIU.	3	0.26	ID	Draft TOR available. Further discussion needed on scope.	TOR prepared in April 1988; need to be updated to reflect reduced budget agreed on 17/11/89.	
3	TA for training.	To strengthen the Training Unit at PIU with specific emphasis on training for O & M of the Pejaponggan Pipelines.	PSMD/PIU	Analyze training needs, assist PIU Training Coordinator and train part-time trainers.	4	20	0.30	1	To be prepared.	
Totals					77	298	5.07	2.86		

Sub-Project 3 : Cisadane Treated Water Transmission Main

NO.	TITLE OF T.A.	PURPOSE OF T.A.	Executing Agency	BRIEF DESCRIPTION.	Man-Months latera. dat	Estimated cost (bill. Rp/ Mill. \$)	TYPE	STATUS OF TOR	COMMENTS	
1	Consulting services for supervision of construction of the Transmission Main	To support the PIU.	PSCT/PSM Tangerang	Conventional supervision services.	30	63	1.70	CS	Draft TOR already prepared (October 1989)	Man-months only tentative.
2	Management Improvement Study	To improve management organization & capability of PSMT Tangerang	PSCT/PSM Tangerang	Prepare recommendations to adjust PSMT Tangerang's management organization to its larger size.	3	18	0.23	ID	Draft TOR already prepared. Further discussion needed on scope.	
3	TA for training.	To develop training program.	PSMT Tangerang	Analyze training needs, assist PSMT Tangerang Training Coordinator & train trainers.	12	30	0.72	1	To be prepared.	
Totals					45	111	2.66	1.50		

PSJ : Final Engineering Design
 CS : Construction Supervision
 ID : Initial Technical Development
 T : Training
 PS : Policy Studies
 PPT : Future Project Preparation

PROPOSED TECHNICAL ASSISTANCE UNDER JUMP II

Sub-Project 4 : JSSP Extension

NO.	TITLE OF T.A.	PURPOSE OF T.A.	Executing Agency	BRIEF DESCRIPTION.	Man-Months Intern. Nat	Estimated cost Bill. Rp; Mill. \$	TYPE	STATUS OF TOR	COMMENTS
1	Consulting services to review designs and supervise construction	To support the PIU.	DBCK	Conventional supervision services.	36 150	2.47 1.40	CS	Draft TOR given in Annex 6 of CPPA (June 1989)	
2	Organization development	To develop BPM/PPML.	DBCK	analyze training needs, assist BPM/PPML training Coordinator & train trainers.	4 36	0.38 0.22	ID	Draft TOR being prepared. Further discussion needed on scope.	IBRD could like scope to take into account results of previous studies.
3	TA for training.	To develop training program.	DBCK		12 18	0.54 0.31	T	To be prepared.	
Totals					52 204	3.40 1.92			

FED : Final Engineering Design
 CS : Construction Supervision
 ID : Institutional Development
 T : Training
 PS : Policy Studies
 PP : Future Project Preparation

PROPOSED TECHNICAL ASSISTANCE UNDER JUMP II

Sub-Project 6 : Priority Major Drainage

NO.	TITLE OF T.A.	PURPOSE OF T.A.	Executing Agency	BRIEF DESCRIPTION.	Man-Months Intern. Nat	Estimated cost Bill. Rp; Mill. \$	TYPE	STATUS OF TOR	COMMENTS
1	Consulting services for finalization of designs, preparation of tender documents and construction supervision.	To support the PIU during tendering and execution of the works.	PAJB, DBCK	Finalization of designs. Preparation of tender documents for 9 packages. Assistance in tender evaluation. Construction supervision.	48 56	7.16 1.22	FED/CS	Comprehensive TOR (including detailed cost estimates) prepared.	detailed cost estimates submitted on 11/11/89.
2	TA for training.	To develop training program.	PAJB, DBCK	Provide training to supervisory personnel on the job training courses for 0 & II.	10	0.04 0.02	T	To be prepared.	
Totals					48 66	2.19 1.24			

FED : Final Engineering Design
 CS : Construction Supervision
 ID : Institutional Development
 T : Training
 PS : Policy Studies
 PP : Future Project Preparation

PROPOSED TECHNICAL ASSISTANCE UNDER JUDP II

PIR JUDP-2
Table 3.7.1

Sub-Project 7 : Water Resources Management Studies

NO.	TITLE OF T.A.	PURPOSE OF T.A.	Executing Agency	BRIEF DESCRIPTION.	Man-months		Estimated cost		TYPE	STATUS OF TOR	COMMENTS
					Intern.	Ext.	Bill	Rp. Mill. \$:			
1	Jabotabek Water Resources Management Study (JURMS)		DSKRD		160	320	2.99	1.69	PS	Comprehensive ToR revised following decision in December 1989 to merge the surface water and groundwater studies.	Total cost of the combined study is Rp 10.05 billica of which: SUI : 6.00 ERp IBRD : 2.99 ERp EOI : 1.05 ERp
2	Jabotabek Institutional Study (JIS)	Advisory services for Institutional Development and Water Resource Study coordination.	DSKRD		18	18	0.74	0.42	ID	Fully discussed comprehensive ToR available.	
3	Water Data Centre		DSKRD		4	4	0.13	0.07	CS		Total cost is 0.53 ERp of which 0.40 ERp is for equipment.
Totals					182	342	3.86	2.18			

FED = Final Engineering Design
CS = Construction Supervision
ID = Institutional Development
T = Training
PS = Policy Studies
FPP = Future Project Preparation

09-Feb-90
File: P25571.2

PROPOSED TECHNICAL ASSISTANCE UNDER JUDP 11

Sub-Project 12 : Miscellaneous Studies (JUDP 11) (B01 Proposal)

NO.	TITLE OF STUDY	PURPOSE OF STUDY.	Executing Agency	BRIEF DESCRIPTION.	Man-Months Intern. Mat	Estimated cost Bill. Rp. Mill. \$	TYPE	STATUS OF TOR	COMMENTS
1	National Programme preparation and management assistance for Urban Development.	Institutional strengthening in central government, assistance to programme preparation and management assistance to local governments.	DGKY			1.26 * 0.70	FPP	Standard TORs available for programme preparation, others can be progressively submitted.	
2	EPMD MIS.	Assistance to Project Monitoring in DGCK.	DGCK	Improvement of MIS and assistance to EPMD for supervision of DGCK's components under JUDP 11 & 111		0.45 0.25	CS	Outline TOR available dated 26/6/89	TOR needed to be adjusted to fit reduced budget.
3	DGCK/DKI Management training Project.	Upgrading of Project/ Programme Development and Management.	DGCK	Technical training to Cipta Karya and DKI to improve their Project Management capability.	16 28	0.45 0.25	T	Outline budget only - to be detailed out.	
4	Metro & Large Cities JUIDP.	Future Urban Development in Metro and Large Cities.	DGCK	Detail design of JUIDP program components in Semarang, Surakarta and Surabaya.		3.16 * 1.75	FPP	Project digest to be supplied.	
5	RWD in the Water Supply sector (PROJUs, GoR counterparts, etc)		DGCK			0.90 * 0.50	CS	Comprehensive TOR available.	Matching funds to BDR grant.
Sub-total for page						6.75 * 3.76			

FED = Final Engineering Design
 CS = Construction Supervision
 ID/T = Institutional Development/Training
 PS = Policy Studies
 FPP = Future Project Preparation

PROPOSED TECHNICAL ASSISTANCE UNDER JUDP 11

Sub-Project 12 : Miscellaneous Studies (JUDP 11) (GDI Proposal) (continued)

NO.	TITLE OF STUDY	PURPOSE OF STUDY	Executing Agency	BRIEF DESCRIPTION	Non-Monthly Intero. Rat	Estimated cost Bill. Rp	Bill. \$	TYPE	STATUS OF TOR	COMMENTS
7	Planning & management of New Large Scale Urban Settlement Developments in Jabotabek Area.	Policy & guideline development; establishment of mechanisms and pilot application in Jabotabek area.	DJCK	Compilation of planning and land management information in the selected areas; identification of existing policies, procedures and controls, preparation of action plans, guidelines and development briefs related to the urban development program; and formulation of legal institutional and financial mechanisms.		1.60	1.00	FPP, ID/T	Detailed project digest prepared for TKPP & Bank review.	Scope requires refinement prior to finalizing TOR.
8	Development of Private Sector Participation in Jabotabek Urban Services.	To identify opportunities and the mechanisms for private sector participation in provision of urban services, particularly in Jabotabek.		Identification of opportunities and existing enabling mechanisms in each sector; identification of principal legal and institutional changes desirable in the medium term; preparation of a program outline and action plan for facilitating public-private and private sector initiatives.		0.54	0.30	FPP, ID	Project Digest prepared for TKPP & Bank review.	
Sub-total 5-P 12						9.08	5.06			

FED = Final Engineering Design
 CS = Construction Supervision
 ID/T = Institutional Development/Training
 PS = Policy Studies
 FPP = Future Project Preparation

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INDONESIA

SECOND JABO^ABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Minimization of Technical Assistance (TA)

1. The above staffmonths and budget amounts represent consultants services, technical assistance and training requirements as determined at project appraisal.
2. In line with GOI's new policy to minimize the need to borrow for technical assistance, GOI and Bank agreed to reduce the total amount of technical assistance from approximately \$40 million as estimated at appraisal to about \$30 million. It was agreed that these reductions would not affect the fundamental objectives of the project. GOI confirmed that the specific reductions for each component have been agreed with the respective implementing agencies and that these reductions will have no adverse effects on the timing and quality of project implementation. The cost savings will be achieved through a combination of the following measures: (i) more efficient use of TA through closer supervision by GOI agencies; (ii) reduction of consultants staffmonths; (iii) increased inputs from GOI staff; (iv) substitution of international experts by Indonesian experts; (v) decreased budget for policy studies; and (vi) reduction of TA-related budgets for equipment and other support. Additional corrective actions, if required, will be determined during project implementation. Funding for these additional TA needs will be agreed between GOI and the Bank.
3. The detailed cost tables in Annex 14 present the reduced budget amounts available for consultants' services. Internal reallocation between different components may be needed to ensure adequate technical assistance support for critical project activities, such as direct implementation support, training and project coordination.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Human Resource Development and Training

Scope

1. The scope of the proposed project covers almost every aspect of the hydrological cycle. It follows that project implementation therefore will generate an unusually disparate variety of training needs, distributed among the several implementing agencies. Despite the integrated nature of the project, each component will generate its own set of project-related manpower and training needs, many of which will be new to the sector. The aggregate of identified training programs, to be provided both on- and off-the-job, numbers about 100 discrete training activities or programs. Some programs will need to be repeated many times to meet the total training demand.

2. To ensure the provision of an adequate, timely, and continuing supply of trained manpower, the training component to be financed under the project will not be limited solely to meeting project-related training needs. Equal importance will be given to strengthening agency training capacity within the context of their overall plans for longer-term institutional development and improvement. This support will range from assisting PDAM Jaya to establish a permanent in-service training unit, to improving the skills of managers and supervisors of smaller agencies in planning and organizing informal on-the-job training activities. In each case particular emphasis will be given to developing sustainable programs for improved operations and maintenance of plant and equipment.

Objectives

3. The broad training component objective is to assist in the development of the attitudes, knowledge and skills required, either individually or collectively, by existing or new staff of the project agencies, to help ensure that:

- (a) project implementation will not be constrained by an inadequate supply of trained manpower, and
- (b) project benefits will be realized and more likely be sustainable.

4. More specifically, project training objectives reflect key themes of both urban and water supply and sanitation sector training strategies directed at:

- (a) strengthening sectoral policy planning capacity, institutional and financial systems, manpower planning, and community participation;

- (b) strengthening the programs of water and sanitation enterprises to achieve more systematic management of operation and maintenance, and pollution control;
- (c) improving the financial viability of water enterprises, with emphasis on improved cost recovery, and substantial reduction of unaccounted-for-water; and
- (d) assisting to create more attractive career development avenues for sector managers and professional staff.

Training Beneficiaries

5. The target audiences of the compendium of training programs to be provided by the project will be drawn from the complete range of functions (i.e., management, technical, financial, administration, maintenance, personnel, monitoring, public relations, etc.) collectively performed by project agencies. Likewise, the employment categories of respective training target groups will span the full range of staffing levels from senior managers through system operators. Consolidation of the estimated number of persons who will receive training under the project gives an order of magnitude total of between 5-6,000 staff, of whom about 60 percent will be from PDAM Jaya. A detailed breakdown of respective training target groups, by component, is given in the Consolidated Training Component (CTC) at Annex 15 of the Project Implementation Report (PIR) prepared by GOI (Project File).

Program Content

6. The main thrust of the training program for each project component is summarized hereunder. The Attachments to this Annex provide supporting details.

- (a) PDAM Jaya System Improvement (PJSIP). The training under this component has been prepared as an integral part of the proposed overall PJSIP institutional development program. Under this program a small, permanent, in-service training unit will be established within the planned new Human Resources Department. Priority training programs will support the massive program for the extension and rehabilitation of the existing water distribution system and its facilities. In addition to management development, training will comprise a mix of basic skills programs for about 800 new staff, and refresher and retraining programs for most of the existing complement of about 2,200 staff. Much of this lower-level skill training will be decentralized to Branch and Rayon locations. A short, intensive, PJSIP orientation program will be attended by all PDAM Jaya staff. Finally, English language training will be provided for all managerial and supervisory staff. The provision of permanent in-house training facilities is not contemplated (para. 8).
- (b) Pejompongan Raw Water Pipeline (PejRWP). Project-related training (PRT) needs associated with the operation and preventive maintenance of pipeline regulating and control valves, and pumping stations, will be provided by the contractor in accordance with explicit terms

of reference. Project-related training will be supplemented by training provided for institutional strengthening of the operating agency, POJ. This will focus on the improvement of key administrative and financial services including financial and accounting systems, the preparation of financial projections, revenue collection and human resource development. About 250 staff will receive training under this component.

- (c) Cisadane 1 Treated Water Transmission Main (Cis1TWTM). Project-related training support will focus on the management and operation of the production and treatment facilities supplying the transmission main, together with the routine inspection and preventive maintenance of the transmission main. Training will largely be skill-oriented for pipeline inspectors, and mechanical, electronic, and laboratory technicians responsible for plant operation and maintenance, and process monitoring and control, including telemetering. During construction and commissioning phases, training will be provided mostly on-the-job by a team of technical experts under technical assistance arrangements. A program covering maintenance management will be provided by the Bekasi Water Resources Central Training Institute for branch managers and supervisors. Proposed PRT programs will form part of the proposed, DG Cipta Karya (DGCK) assisted, PDAM Tangerang System Improvement Program and will complement training to be provided by respective contractors.
- (d) Sewerage. Training support for this subproject also will have twin thrusts. One will be directed at organizational development, and focussed on assisting the Interim Sewerage Unit (BPAL) to achieve the status of a Level 1 institution in preparation for adoption by DKI Jakarta. The second will provide training in pollution control, and the management, operation, and maintenance of the sewerage system, including the extensions to be financed under this component. Since the anticipated size of the sewerage enterprise would not justify the creation of a permanent in-house training function, the personnel staff will receive training to assume these responsibilities. Project-related training support will be incorporated, under separate terms of reference, in the proposed technical assistance component.
- (e) Priority Drainage and Flood Control. Under this component DGWRD will restore and rehabilitate selected drainage and flood control facilities, for transfer to DKI Jakarta for subsequent operation and maintenance. Training support will focus on two sets of training needs common to all selected facilities. These are training in construction supervision, and the identification and development of on-the-job training modules for the operation and preventive maintenance of each facility in preparation for their hand-over to DKI Jakarta. Training support will be provided by the Directorate for Training of DGWRD, reinforced with local technical assistance.
- (f) Jabotabek Water Resource Studies and Institutional Development. This component will generate a variety of training needs related to techniques of water resources monitoring and evaluation, data analy-

sis, and water quality management. These will be identified within the scope of the technical assistance portion of the component and addressed jointly by DGWRD and GON, through the provision of local seminars and workshops, and selective overseas study tours and short courses in The Netherlands.

(g) Studies and Technical Assistance. Technical assistance support for associated PRT activities will be provided for:

- (i) technical training for DGCK and DKI Jakarta to strengthen their project management capacity; and
- (ii) development of special, nonstandard training programs by DGCK's new Water Resources Central Training Institute at Bekasi, required to support other training activities.

Training Modes

7. Although PRT programs will be delivered to target groups using, where appropriate, the complete range of training modes, the dominant mode will be in-house, on-the-job training conducted by implementing agencies with guidance from technical assistance. Where training tasks are included in technical assistance contracts they will be defined by separate terms of reference.

8. Among the project components the PJSIP training program will contain the largest element of off-the-job training. For this purpose PDAM Jaya will continue to use, as needed and on reimbursement, DGCK's training center at Pejompongan. Additionally, a substantial, multipurpose, Water Resources Central Training Institute (WRCTI--currently under construction, financed by OECF), located at Bekasi and managed by DGCK, will be commissioned by April 1991. WRCTI facilities will be relevant and available to all project agencies. Core training programs for the first year of operations, covering water supply and environmental sanitation have been identified and are currently being developed. These will be augmented by supplementary programs designed to meet special training needs.

9. The Jakarta Institute for Management Education and Development will provide the venue for most senior management training.

10. Some special training needs will be met through the provision of short, practically-oriented, overseas attachments and study tours. These will be limited to those needs for which in-country programs or experience are not readily available. They will include programs of about four week's duration for Departmental, Branch, and Rayon Heads of PDAM Jaya, to assist in preparing them for their new, enlarged, and decentralized responsibilities under the project. Other programs will focus on general, financial, and maintenance management, technology transfer (e.g. telemetering), and human resource development. A description of the overseas training programs is given in the GOI Project Implementation Report.

Implementation

11. Training implementation will conform with agreed arrangements for overall project implementation. This will mean that within the structure proposed for coordination and monitoring, i.e. Overall Project Coordinating Office (OPCO)--Project Management Units (PMU)--and Project Implementation Units (PIU)--the PIUs will assume responsibility for training implementation. Accordingly, where technical assistance has been provided to support project-related training, it will be mobilized in the respective PIU. Training tasks and responsibilities will be specified in consultant terms of reference. An indication of the planned timing of the respective training program implementation is given in Table 3.

12. Attention will be given to ensuring that the training needs of the respective staffs of PIU, a number of whom will be junior staff recruited from high school graduates, receive commensurate attention. Generally these needs will be identified on an individual basis and addressed as such through on-the-job-training within the scope of PIU technical assistance support. In many instances PIU staff will be matched with local consultants on a one-to-one basis to facilitate transfer of knowledge and on-the-job training. The cost of this training will be treated as an overhead within technical assistance budgets and, therefore, has been excluded from training component cost estimates.

Costs

13. The overall base cost of the consolidated training component is estimated at US\$2.937 million, of which US\$1.994 million represents foreign expenditures. A cost breakdown is given in Table 1, detailing costs per major category of training expenditure and unit costs of training activities. Table 2 presents details of training-related technical assistance in terms of staff-months, phasing and costs.

Table 1: OVERALL COST ^{/a} ESTIMATE PER CATEGORY OF TRAINING BY SUBPROJECT (US\$'000) ^{/b}

Subproject	External training ^{/a}		In-house training ^{/e}	Technical assistance ^{/b}		Equipment/aids		Total	
	Over-seas ^{/c}	Local ^{/d}		Foreign ^{/f}	Local ^{/g}	Foreign	Local	Foreign	Local
PDAM Jaya (PJSIP)	218	92	40 ^{/h}	437	52	168	18	819	202
PQJ (PoJRWP)	50	40	30	77	49	20	5	147	124
PDAM Tangerang (Cio1TWTM)	27	7	2	270	63	10	2	307	74
Sewerage (ISU/BPAL)	27	22	12	154	32	5	2	198	68
Priority drainage works	-	25	8	-	17	-	-	-	50
Water resources management	75 ^{/i}	60	5	-	-	-	-	85	75
Studios & TA	250 ^{/j}	300 ^{/k}	-	200 ^{/l}	50 ^{/m}	-	-	450	350
Total	645	546	97	1,138	263	211	37	1,994	943

Grand total: US\$2.937 million

^{/a} Base costs.

^{/b} US\$1 = Rp 1,795.

^{/c} All-in unit costs, US\$4,500 per staff-month.

^{/d} Unit costs vary according to level and category of training. (Unit training costs of Bekasi WRCTI estimated to be US\$100 per person-week.)

^{/e} Unit costs: US\$100 per course-week.

^{/f} Unit costs: US\$12,850 per staff-month (foreign).

^{/g} Unit costs: Rp 3.00 million per staff-month.

^{/h} Includes allowance for English language training.

^{/i} GON bilateral assistance.

^{/j} Technical training for CK and DKI Jakarta in project management.

^{/k} R&D for Bekasi WRCTI.

Table 2: COST ESTIMATE AND PHASING OF TA FOR TRAINING

Subproject	Phasing of staff-months by calendar year										Total staff- months		Cost (US\$'000)	
	1990		1991		1992		1993		1994		L	F	L	F
	L	F	L	F	L	F	L	F	L	F				
PDAM Jaya (PJSIP)	12	8	10	16	4	6	4	4	-	-	30	34	52	437
POJ (PejRWP)	3	3	20	3	5	-	-	-	-	-	28	6	49	77
PDAM Tangerang (CisITWIM)	-	-	-	-	24	12	6	6	6	3	36	21	63	270
Sewerage (ISU/ BPAL)	4	4	8	5	6	3	-	-	-	-	18	12	32	154
Priority drainage works	-	-	6	-	4	-	-	-	-	-	10	-	17	-
Water resources management	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Studies & TA	6	6	18	10	4	-	-	-	-	-	28	16	50	200
<u>Total</u>	<u>25</u>	<u>21</u>	<u>62</u>	<u>34</u>	<u>47</u>	<u>22</u>	<u>9</u>	<u>10</u>	<u>6</u>	<u>3</u>	<u>149</u>	<u>90</u>	<u>263</u>	<u>1,138</u>

Total cost: US\$ 1.401 million

Note: L = Local TA
F = Foreign TA

Table 3: TRAINING IMPLEMENTATION SCHEDULE

Subproject	1989	1990				1991				1992				1993				1994			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. PDAM Jaya (PJSIP)	=====																			
2. POJ (PejRWP)		-----																			
3. PDAM Tangerang (CislTWTM)		-----																			
4. Sewerage	=====																			
6. Priority Drainage Works		-----																			
7. Water resources Management		-----																			
8. Studies and TA	=====																			

Key

..... Pilot & preliminary training activity (separately funded).

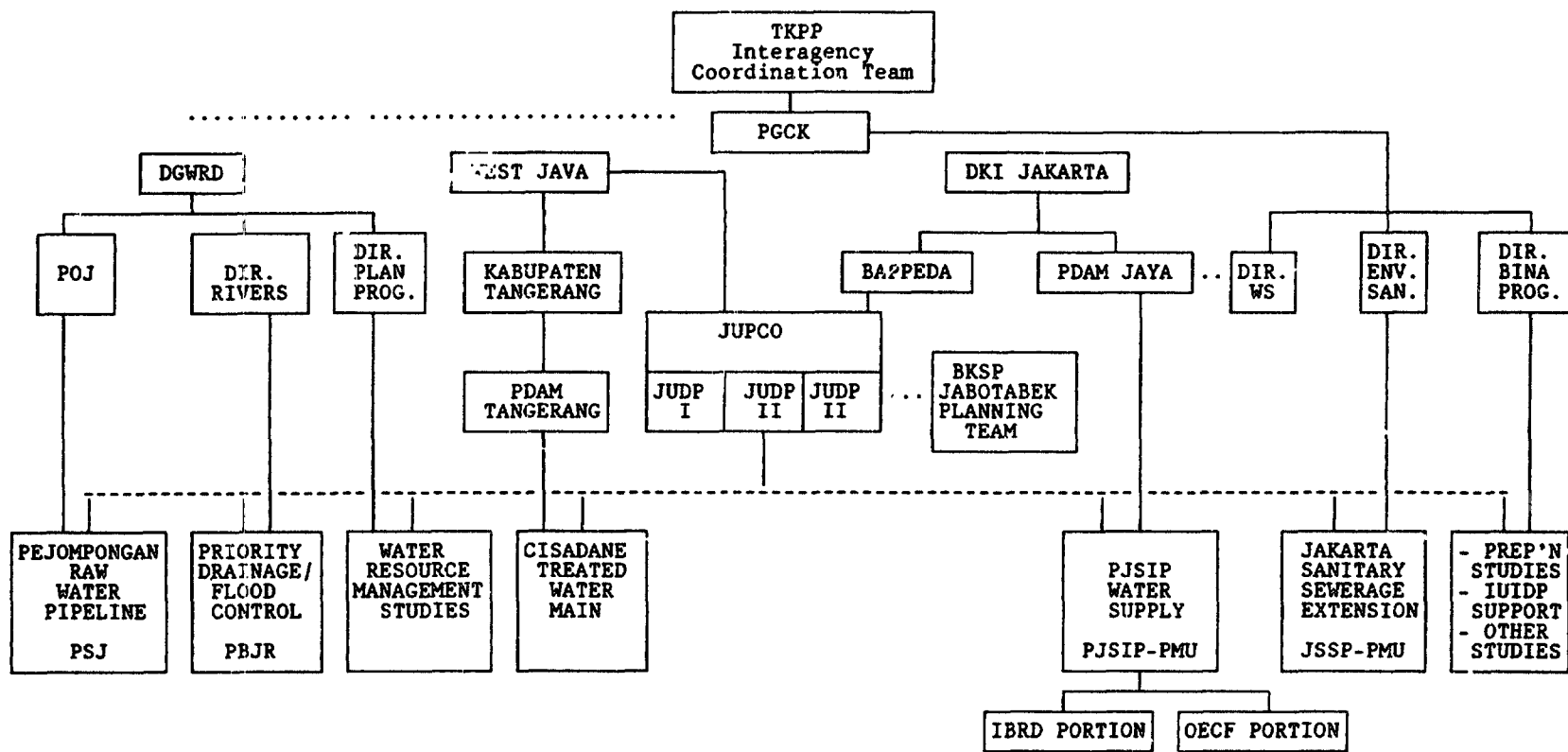
===== Priority and "crash" PRT training programs.

----- Other PRT training programs.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Organization Structure for Project Implementation



..... Overall Supervision
 ===== Direct responsibility
 ----- Monitoring, coordination, accounting, disbursement, procurement, reporting

Implementation Schedule

CY	90	91	92	93	94	95	96
<u>PJSIP</u>	:	:	:	:	:	:	:
<u>Rehabilitation</u>	:	:	:	:	:	:	:
Supply of vehicles & equipment	:	OTA:ASSS:SS	:	:	:	:	:
Supply of valves & meters	:	OTA:ASSS:SSSS:	:	:	:	:	:
Supply of pipe materials	:	OOTT:ASSS:SSSS:SS	:	:	:	:	:
Rehabilitation works	:	OOT:TAAC:CCCC:CCCC:CCCC:CCCC:CC	:	:	:	:	:
Pipe replacement	:	OOT:TACC:CCCC:CCCC:CCCC:CCCC:CC	:	:	:	:	:
<u>Infill/Extension</u>	:	:	:	:	:	:	:
Supply of tertiary pipes	:	OT:TAAS:SSSS:SS	:	:	:	:	:
Laying of tertiary mains	:	OO:TTAA:CCCC:CCCC:CCCC:CCCC:CC	:	:	:	:	:
Construction of secondary mains	:	OOTT:AACC:CCCC:CCCC:CCCC:CCCC:CC	:	:	:	:	:
Public taps and house connections	:	OP:OPOP:OPOP:OPOP:OPOP:OPOP:OP	:	:	:	:	:
<u>Institutional Development</u>	:	:	:	:	:	:	:
Studies	:	TT:AAEE:EEEE:EE	:	:	:	:	:
Training and TA	:	OP:OPOP:OPOP:OPOP:OP	:	:	:	:	:
<u>Primary Distribution 1,2,3 & 6</u>	:	:	:	:	:	:	:
Supply and laying of mains	:	DD:TTAA:CCCC:CCCC:CCCC:CC	:	:	:	:	:
<u>Primary Distribution Zones 4 & 5</u>	:	:	:	:	:	:	:
Construction of primary mains	:	DDOT:TACC:CCCC:CCCC:CC	:	:	:	:	:
Construction of reservoir & PS	:	DOTT:AACC:CCCC:CC	:	:	:	:	:
<u>Pejompongan Pipeline</u>	:	:	:	:	:	:	:
Supply of pipe	:	DDTA:ASSS:SSSS:	:	:	:	:	:
Construction of pipeline	:	DDTT:AACC:CCCC:CCCC:	:	:	:	:	:
Construction of PS	:	DDDT:TAAC:CCCC:CCCC:CC	:	:	:	:	:
Construction of fencing	:	DD:TTAA:CCCC:CCCC:	:	:	:	:	:
<u>Cisadane Treated Water Main</u>	:	:	:	:	:	:	:
Supply of pipe	:	DDT:TAAS:SSSS:	:	:	:	:	:
Construction of pipeline	:	DOOO:TTAA:CCCC:CCCC:CC	:	:	:	:	:

Implementation Schedule cont'd

CY	90	91	92	93	94	95	96
<u>San Sewerage Extension</u>	:	:	:	:	:	:	:
Supply of pipe & equipment	:	O:TAAS:SSSS:	:	:	:	:	:
Construction of sewers	:	O:OTAA:CCCC:CCCC:	:	:	:	:	:
Construction of PS	:	D:DDTA:CCCC:CCCC:CC	:	:	:	:	:
Property connections	:	:	DP:TTAA:CCCC:CC	:	:	:	:
Macro- & microdrainage	:	:	DD:TTAC:CCCC:CCCC:	:	:	:	:
Low cost sewer demonstration	:	:	DDDD:CCCC:CCCC:CCCC:	:	:	:	:
<u>Priority Drainage/Flood Control</u>	:	:	:	:	:	:	:
Dredging of Fluit reservoir	:	DD:TTAA:CCCC:CCCC:CC	:	:	:	:	:
Supply of pumping equipment	:	DD:DTTA:SS	:	:	:	:	:
Rehabilitation of PS	:	:	DDTT:AACC:	:	:	:	:
Excavation of major drains	:	DD:TTAA:CCCC:CCCC:CCCC:	:	:	:	:	:
<u>Water Resources Studies</u>	:	TT:AAEE:EEEE:EE	:	:	:	:	:

AAAA Award
 CCCC Construction
 DDDD Design
 EEEE Execution
 OPOP Ongoing Program
 SSSS Supply
 TTTT Tendering

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Environmental Assessments

1. The project was appraised within two months of the Bank's OD on environmental assessment becoming effective and as DKI Jakarta and MPW were developing and beginning to apply their own EA processes. MPW and Bank staff and consultants during project identification determined the major environmental issues and suggested alternative minimization and mitigating measures (see Table 1 of this Annex and the respective Annexes which describe the individual components). These were further studied by the project preparation consultants and incorporated as appropriate into project planning and design--which for some components is still ongoing. Meanwhile, during the appraisal phase, EA work was initiated by MPW resulting in a number of preliminary environmental assessments (PIL) concluding that the project has no major environmental impacts; environmental management plans (RKL) and environmental monitoring plans (RPL) identify and mitigate minor impacts during the implementation of individual components. The project is, therefore, environmentally sound.

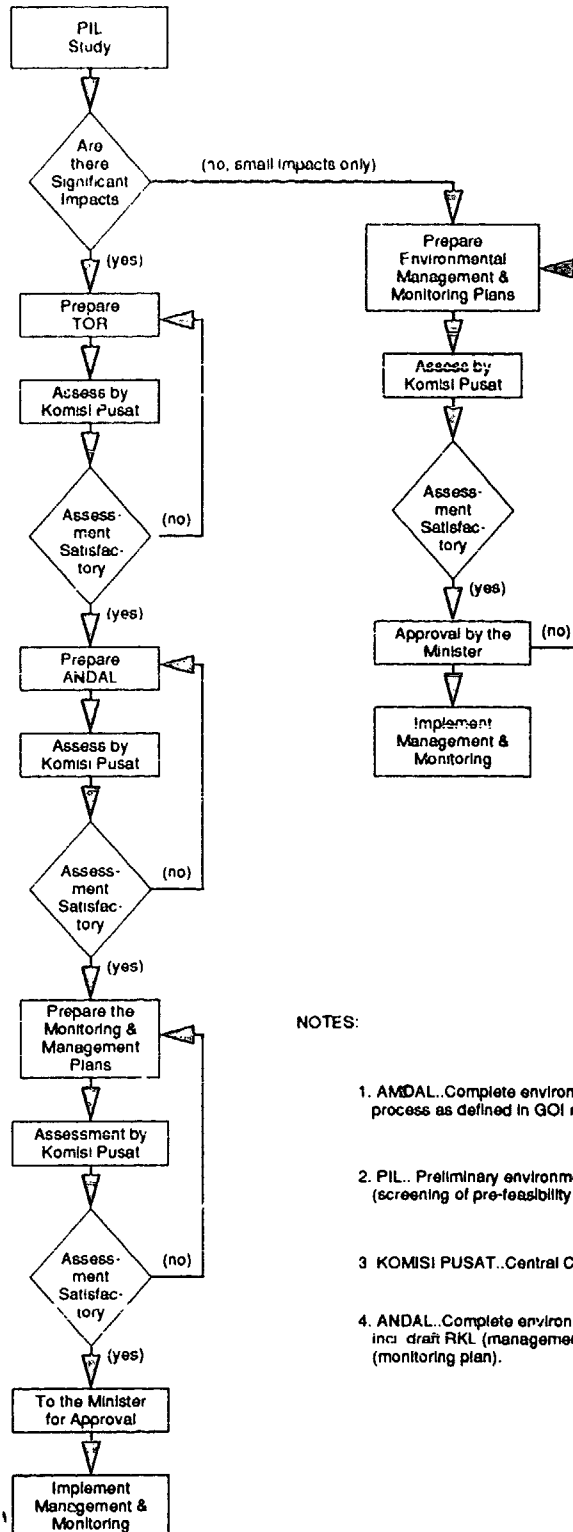
2. MPW environmental assessment procedures are prescribed by GOI Law 4 of 1982, Regulation PP 29 of 1986, other supplemental decrees and MPW guidelines. (Details are in Attachment 1). An analysis was made to compare the Bank's OD with GOI/MPW procedures. It was concluded that if environmental issues were addressed, with some expansion of subjects and in accordance with GOI/MPW procedures faithfully applied, the requirements of the Bank's OD would be satisfied. Key subjects of the Bank's OD and GOI/MPW regulations and guidelines are compared in Table 2.

3. Reliance on GOI procedures will require further development of GOI agency capabilities and will entail some risk. Firstly, Bank sectoral staff must become conversant with the relevant central and local government laws, regulations, procedures and organizational units so they may better support Indonesian staff (Indonesian staff are also in the learning stage on this). Next, the process must be started as early in the project cycle as possible so there is adequate time to mobilize staff and consultants and so key decisions (such as the location of the project site) are not preempted. Finally there are constraints of funding and expertise which operate on both GOI and the Bank. These subjects are on the agenda for continuing dialogue with GOI.

4. This being the first application of the GOI's new ANDAL procedures, MPW took the lead and assumed responsibility for preparing the EAs for all project components, thereby assisting DKI Jakarta where the EA capabilities are not yet fully available. It is expected though that with support from them and JUDP III, DKI Jakarta will develop the necessary competence and expertise for preparing and reviewing EAs, PKL and RPL for projects under its jurisdiction.

5. Selected impacts as identified in the EA process (para. 1) would be monitored during the implementation and operation stages of the project. The key features of the monitoring program are summarized in Table 3 and details are in the Project File.

MPW ADMINISTRATIVE PROCEDURES FOR ENVIRONMENT OF ASSESSMENT (AMDAL) OF PROJECTS AND PROJECT COMPONENTS



NOTES:

1. AMDAL..Complete environmental assessment process as defined in GOI regulations pp 29/B6.
2. PIL.. Preliminary environmental assessment (screening of pre-feasibility stage)
3. KOMISI PUSAT..Central Commission of MPW.
4. ANDAL..Complete environmental impact statement, incl draft RKL (management plan) and RPL (monitoring plan).

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

AMDAL Procedures in MPW 1/

1. The principal Amdal procedures to be incorporated into preparation of urban, highway, water supply and irrigation projects are as follows.

2. Environmental Screening of Projects. Environmental working groups (kelompok kerja) in the Planning and Programming Directorates of DGWRD, DG Human Settlements and DG Highways are responsible for screening projects in their respective subsectors according to: (i) significance of potential adverse impacts; and (ii) stage of project preparation.^{2/} Projects are screened by the following categories:

- (a) new projects with potentially significant adverse impacts, which require an Andal/Analisa Dampak Lingkungan (detailed EA);
- (b) new projects with limited or unknown impacts, which require a PIL/Penyajian Informasi Lingkungan (preliminary/simplified EA);
- (c) post-feasibility or ongoing projects with significant adverse impacts, which require a SEL/Studi Evaluasi Lingkungan (detailed EA);
- (d) post-feasibility or ongoing projects with limited or unknown impacts, which require a PEL/Penyajian Evaluasi Lingkungan (preliminary/simplified EA); and
- (e) projects with little or not adverse impact, which do not require an EA.

3. Categories (a), (b) and (e) correspond to the Bank's A, B and C categories respectively. Bank and MPW screening results may differ, in which case agreement on the magnitude of the EA will need to be reached. It should be noted that the Bank's EAOD provides for two kinds of EAs which are not provided for under GOI/MPW arrangements but may be appropriate for some projects: (a) sectoral EAs, which assess sector-wide environmental impacts and mitigatory options; and (b) regional EAs, which assess cumulative and intersectoral impacts in a given region.

^{1/} AMDAL is the acronym for the environmental review and assessment process; ANDAL is the acronym for the EA document.

^{2/} "New" projects are those for which feasibility studies have not yet been carried out.

4. Screening should take place as soon as possible after project identification, to ensure that the required studies are initiated sufficiently early and results are available for timely incorporation into project design.

5. Procedures for Preparation and Review of Environmental Assessments of Projects with Limited or Unknown Impacts. In the case of projects with limited or unknown impacts, the Working Group (kelompok kerja) in the concerned DG should prepare a preliminary/simplified environmental assessment (PIL or PEL). The PIL should briefly identify potential adverse impacts, based on available project data and MPW technical guidelines. The PIL should be completed before the feasibility study, preferably during prefeasibility. The PIL should either:

- (a) recommend management and mitigation measures for incorporation into project design (RKL, Rencana Kelolaan Lingkungan) and a monitoring plan (RPL, Rencana Pemantauan Lingkungan); or
- (b) where impacts appear more significant than expected, recommend preparation of a detailed Andal study.

6. The draft PIL, including management and mitigation measures and monitoring plan, should be forwarded to the concerned Director Genera' for approval. Upon approval by the Director General, the project can proceed to the detailed design stage.

7. Procedures for Preparation and Review of Environmental Assessments of Projects with Significant Adverse Impacts. In the case of projects with potentially significant impacts, the project proponent should draft terms of reference of the Andal study, which should be reviewed and approved by the Central Commission. The terms of reference should direct the consultant to:

- (a) identify baseline environmental conditions and predict impacts of the proposed project, based on primary monitoring data and MPW technical guidelines; and
- (b) recommend specific management and mitigation measures (RKL) and a detailed monitoring plan (RPL), which should specify which agencies are to implement the mitigation measures and monitoring, and costs of mitigation and monitoring.

8. In order to ensure timely completion of the Andal study, the terms of reference should be drafted and approved as early as possible, and should be incorporated into the terms of reference of the project feasibility study.

9. MPW technical guidelines covering environmental impacts of dams, irrigation and flood control, water supply, drainage, wastewater treatment, solid waste disposal, roads and bridges, and resettlement under public works projects should be made available to the consultant during preparation of the Andal. The ANDAL, RKL and RPL should be completed as part of the feasibility study.

10. The draft ANDAL, RKL and RPL should be submitted to the Central Commission for review, and if found adequate, forwarded to the Minister for his approval. Upon approval by the Minister, the project can proceed to the detailed design stage.

INDONESIA
JABOTABEK URBAN DEVELOPMENT PROJECT II

Potential Environmental Impacts, Mitigating Measures and GOI/KPW EA Procedures

Project Component	GOI Project Proponent	Item	Impact	Solution	GOI EA Category	KPW Draft Guidelines and documents
A. PDAM Jaya System Improvement Project	DKI Jakarta and PDAM Jaya	Water distribution system	Introduction of piped water may create water disposal problems	Clean and survey drains. Improve drains as necessary	Category 1, PIL procedure completed	Water supply projects other than multipurpose dams
			Disruption of pedestrian and vehicular traffic; construction problems	Selection of routes, timing of construction, good management during construction, include mitigating measures in construction contracts.		
			Ensure that treated water, once in distribution system, does not become contaminated	Good design, construction, and operations; monitoring of water quality. Provide adequate budget for above, train staff		
			Supply during interruption of existing service, especially long interruptions	Timing of interruptions, use of water transporters if necessary		
			Ensure that water produced meets drinking water standards	Good plant design and operations, monitor; and control plant outputs; train staff	Water supply projects other than multipurpose dams	
B. Pajompongan Raw Water Pipeline	DKI Jakarta and PDAM Jaya	Pipeline route	Relocation of approximately 40 families	Apply DKI compensation procedures. Completed: Governor's decree issued.	Category 1, PIL procedure completed	Resettlement, water supply guidelines of KPW and World Bank
			Construction impacts	Timing of construction; good management during construction; include mitigating construction contracts	RKL and RPL being prepared	
C. JSSP Extension	CK, BPAL and DKI Jakarta	Treatment process	Odor and aesthetic issues regarding aerated ponds, water quality issues regarding pond effluent	Proper pond design, visual screens, good operation; train staff, provide adequate O&M budget	Category 1, SEL has been completed and approved. RKL and RPL being prepared	Waste water treatment UNDP expert Report of 11/89

Project Component	GDI Project Proponent	Item	Impact	Solution	GDI EA Category	MPD Draft Guidelines and other documents
			Issues relating to disposal of sludges and spoil from construction and operation of existing and new sewerage structures; location of disposal; disposal site design; transport of material	Proper location of sludge disposal and spoil placement sites, proper design of leachate drainage to surface and subsurface environments. Proper transport planning for removing materials to disposal, control of contractor, monitor on- and off-site water quality		Waste water treatment Solid waste disposal
		Construction	Description of vehicular and pedestrian traffic during construction	Identify population centers near works and major roads and interactions and select routes, timing of construction, and employ management during construction. Include mitigating measures in construction contracts		
D. Priority Major Drainage	DCSRD	Dredging and drain improvement	Spoil removed from drains may impact on land and water quality	Analyze spoil chemistry; assess assimilative capacity and impacts on Jakarta Bay and possible land disposal sites. Dispose of spoil in environmentally acceptable location and manner	Category 2, PIL procedure completed. ANDAL under preparation. RKL and RPL outline prepared	Urban drainage and flood control. MB-INVJ Report 54 on Environmentally-Sound Disposal of Dredged Materials. Consultants Report on this subject
			Nuisance compensation issues relating to lost business, noise, dust and traffic	Check previous projects for nuisance claims. Ensure project budget adequate for mitigating measures		
			Traffic impacts from movement of heavy equipment and tip trucks	Identify possible traffic trouble spots, areas of construction near dense residential areas and public support infrastructure (schools, hospitals, etc.), licenses and levels of abstraction. Selection of routes, timing of construction, good management during construction		Urban drainage and flood control

Project Component	GDI Project Proponent	Item	Impact	Solution	GDI EA Category	KPW Draft Guidelines and other documents
E. Cisadane I Treated Water Transmission Main	PDAM Tangerang	Cisadane I treated water transmission main	Minor local construction impacts	Mitigating measures for traffic, noise, dust sediment control	Category 1, PIL procedure completed. RKL and RPL prepared	Reynolds report on diversion impacts dated December 1988
	DGMRD	Groundwater study	Study to address groundwater overdraft and contamination	Study will generate numerous means for addressing CW issues	No impacts, ANDAL not applicable	Resettlement water supply projects, van der Gun Issues Paper of 11/89
Wast Tarub	DKI Jakarta and BAPPEDA Bekasi. Fence under JMSF, other measures under JCEIP		Protect water quality	Consider on- as well as off-site impacts related to disposal of spoil, traffic impacts, public health, safety and nuisance. Provide fence, sanitation facilities, education. Monitor and enforce. Budget for adequate O&M		Water supply projects other than multipurpose dams Urban drainage and flood control

- Notes: (1) Category is determined by nature of project and potential impact; see Table 2. GDI's categories 1, 2 and 3 correspond to Bank Categories A, B and C.
 (2) Environmental management (EML) and monitoring (RPL) plans are required for all projects.
 (3) Definitions:
 EML : Environmental management plan
 RPL : Environmental monitoring plan
 ANDAL: Full environmental assessment procedure for projects, at or before feasibility study stage.
 SEL : Full environmental assessment procedure for projects which are beyond feasibility stage or are already completed and operational.
 PIL : Preliminary environmental assessment for projects at or before feasibility stage. Purpose is to determine if ANDAL is required and, if so, to prepare TOR. If ANDAL is not required, prepare EML and RPL.
 PEL : Same as PIL but for projects beyond feasibility stage.

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JUDP II

Comparison of Bank and GOI/MPW EA Processes

Procedure	Bank	GOI/MPW
Categorizing projects (or components of projects)	<p>Category A - Major impacts, do EA.</p> <p>Category B - Limited impact, do limited EA.</p> <p>Category C - Little or no impact, no EA.</p> <p>Category D - Environmental project, no EA.</p>	<p>Category 1 - Same as Bank's Category A) - Significant impacts; do detailed EA (ANDAL or SEL)./a</p> <p>Category 2 - Impacts, but the magnitude uncertain; do preliminary assessment (PIL or PEL /b). If PIL/PEL indicates significant impacts, do detailed EA (ANDAL or SEL).</p> <p>Category 3 - No impacts (same as Bank's Category C).</p>
When to do EA	<p>During project preparation. IEPS identifies key issues, type of EA to be prepared, sets preliminary schedule. Agree this with the borrower. Incorporate minimization/mitigation measures in EA and include in feasibility and design. EA available at appraisal.</p>	<p>Feasibility do PIL; possibility stage do ANDAL; detailed design or later do SEL or PEL. Management plan (RKL) and monitoring plan (RPL) /c are included as one part of package with ANDAL/SEL, and with PIL/PEL if they are stand-alone studies.</p>
Responsible for EA	<p>Borrower.</p>	<p>Project proponent (DGWRD, DG Human Settlements, DG Highways, DKI Jakarta, PDAM Jaya, JSSP.</p>
Funding sources	<p>Conventional project preparation sources or environmental grant facility. However, more staff time will be required during preparation, appraisal and supervision stages of the project cycle.</p>	<p>EA part of project preparation cost, post-project management and monitoring part of operations cost. Government may provide funds for golongan lemah (weak economic groups) project proponents.</p>
Review and approval of EA	<p>EA procedures and findings described in SAR, cleared by CD and RED. RED clearance required for invitation to negotiate. Large complex projects may require environmental panel of experts to advise regarding preparation of EA. May be conditionality, if necessary.</p>	<p>ANDALs/SELs are reviewed by Central Environment Commission (Komisi Pusat) of MPW, then to the Minister for signature. PILs/PELs are reviewed by DG Environmental Working Group, then to Director General for signature. Minister of Environment to be consulted where appropriate if intersectoral issues involved. This is usually done through KLH membership on the Central Environment Commission of MPW.</p>
Environmental management and monitoring plans	<p>Required as integral part of EA. Described in SAR.</p>	<p>Required. Prepare management and monitoring plans for both preliminary assessments and detailed EAs.</p>
Environmental guidelines and training of staff	<p>Bank has some guidelines, is preparing more for inclusion in an EA source book. Bank designing training, more required.</p>	<p>Guidelines prepared with ADB assistance are under consideration by Minister. Additional guidelines to be prepared with ADB and EMDI (Canadian bilateral) assistance.</p>

Procedure	Bank	GOI/MPW
Consultation with affected groups	Required. Describe in SAR. NGOs should participate and should assess impacts and acceptability of proposed mitigatory measures. Also, interagency cooperation is required through meetings with affected government agencies.	Required. Public notification of planned AMDAL (preliminary or detailed EA) needed. Public should also have access to EA studies, except for "state secrets". Public have right to make comments to Central Environmental Commission, either in writing or verbally.
Resettlement	Bank guidelines TP 80 very detailed and require thorough consideration of impacts and needs of affected people.	Draft guidelines similar to Bank's, but may not apply to squatters. Resettlement, land compensation plans may not always be the responsibility of the project proponent. It may rest with the provincial government, Transmigration, etc.
Content of EA	<p>Regional or sectoral EAs to address cumulative impacts may be required, and may be attached to projects.</p> <p>EA should compare alternative sites, technologies and designs.</p> <p>EA should include mitigatory measures if needed.</p> <p>EA should quantify capital and recurrent costs, staff requirements, training and monitoring needs, and benefits associated with mitigatory measures.</p> <p>EA should include assessment of environmental capability of borrower institutions.</p>	<p>EA can take into account the suitability of the site and require selection of new site, if needed.</p> <p>EA monitoring and management plans are separate documents in many ministries. In MPW, they are included in one package with PIL, ANDAL, PEL or SEL.</p>

- /a ANDAL (Analisis Dampak Lingkungan) is a detailed EA for a new project with potentially significant impacts; SEL is a detailed EA for a post-feasibility existing project with significant impacts.
- /b PIL (Penyajian Informasi Lingkungan) is a preliminary/simplified EA for a new project with limited or unknown impacts; PEL (Penyajian Evaluasi Lingkungan) is a preliminary simplified EA for a post-feasibility project.
- /c RKL (Rencana Kelolaan Lingkungan) is an environmental management plan; RPL (Rencana Pemantauan Lingkungan) is an environmental monitoring plan.

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APP II

Program for Monitoring Impacts of Project Components

Item	Issue	Monitoring Parameter	Monitoring Location	Monitoring Frequency	Unit	Corrective Action	
Water treatment and distribution system	Water disposal problem as consequence of piped water	Localized ponding and flooding	Where piped water is introduced	Annual survey	DKI Jakarta	Improve drainage systems	
	°	Pedestrian and vehicular traffic disruption during construction	Construction areas	Random 24-hour traffic surveys	PDAM Jaya	Improved routing, protective fencing, signs; timing of construction and construction management	
	°	Safety of supply	Chlorine residual, E-coli bacterial count	Random points of distribution system	Weekly	PDAM Jaya, DKI Jakarta Health Unit	Upgrade water treatment and distribution operations; increase chlorination
	°	Reliability of supply	Continuity of service	Selected points of distribution system		PDAM Jaya, DKI Jakarta Health Unit	Upgrade water treatment and distribution operations
	°	Disposal of wash water sludges		At water treatment plant	Semiannual	PDAM Jaya and PDAM Tangerang	Proper use of facilities as designed, train staff
Pejacampeng pipeline	Relocation of families	Compliance with relocation plan. Timing, compensation		Weekly	MHA		
Waste water treatment	Characteristics of average quality of effluent, controls	Suspended solids, BOD and dissolved oxygen. Neighbor complaint	Inflow and effluent of ponds; Banjir Canal	Monthly in dry season	BPAL, P4L	Improve pond operations; train staff; future planning	
	°	Disposal of sludges	Security of disposal site; characteristics of sludge (organic and toxic substances)	Annually	BPAL, P4L	Future planning; modify disposal practice	
Sewer construction	Pedestrian and vehicular traffic disruption during construction	Inconvenience, time delays	Construction areas	Random 24-hour survey	DKI Jakarta	Improved routing, temporary routing, protective fencing, signs, timing of construction management	
Restoring major drains	Disposal of dredged materials	Compliance with disposal plan; leachate	Construction areas and disposal site	Daily during construction; monthly thereafter	DKI Jakarta	Include in construction and disposal contracts, enforce contracts	
Ciadano water diversion	Adequacy of flow after abstraction	Water quantity, crop yields and farm income	Serpong weir, downstream agricultural areas	Flow: continuously; agricultural impacts: monthly	DGHRD	Construct additional infrastructure, improve agricultural practices	

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Economic Analysis of Water Supply Subprojects

1. Analysis of the benefits of incremental water consumption concentrated on residential consumers. DKI Jakarta households were divided into three consumer groups based on household income in 1987:
 - (a) Group 1 includes households with less than Rp 130,000/month income in 1987 prices (the three lower deciles of the income distribution in 1987).
 - (b) Group 2 includes households with income from Rp 130,000/month to Rp 308,000/month (4th to 7th deciles of the income distribution in 1987).
 - (c) Group 3 consists of households with income above Rp 308,000/month in 1987 prices (the three upper deciles of the income distribution in 1987).

2. Proportion of the number of households in each consumer group was assumed to be changing over time because the average household income in Jakarta is increasing (in real terms). The consumer groups were further assigned to three zones corresponding to the availability of groundwater:
 - (a) Zone 1 is the area where the phreatic aquifer is saline.
 - (b) Zone 2 is the area where the risk of fecal pollution in the phreatic aquifer is high since the water table is closer than five meters to the surface.
 - (c) Zone 3 is the remaining area where the water extracted through shallow wells is relatively unpolluted.

3. Water consumption of households covered by the economic analysis includes the following:
 - (a) water for drinking, which can be bottled water or water from the piped system (through house connection or hydrant) or from shallow wells (equipped with handpump or electric pump). The quantity of drinking water use was assumed to be 1.5 liter per capita per day uniformly across all zones and income groups;
 - (b) other water consumed from the piped system or shallow wells.

4. At first, the water consumption of households in each consumer group and zone were estimated for the year 1987. A small household survey, field

observations, data from PDAM Jaya (the water company) and from the Cisadane River Basin Study were used to estimate the quantity and cost of water consumed.^{1/} The estimates obtained that way for the nine consumer subgroups (three subgroups in each zone) were used to determine the parameters of one simplified water demand curve to be applied to all households in Jakarta. Water demand was assumed to depend on income and on the price/cost of water consumed; the water demand curve (covering both drinking and other water) was assumed to be a loglinear function of income and price. An income elasticity level of 0.6 and price elasticity of (-0.5) were selected, based on reasonable fit (ability to explain the variation in the estimated quantity of water consumption of the different income groups in the three zones).

5. "With project" and "without project" scenarios of prices/costs of water supply were developed, which, together with the demand curve, were used to forecast the quantity of water consumed from each water source by the households in year 1995 and 2005. Water consumption patterns for the periods 1988-94 and 1996-2004 were established by simple linear interpolation and for the period 2006-2010 by linear extrapolation (based on the 1995-2005 trend).

6. Benefit of the incremental water use in a particular year may be assumed to be equal to the aggregate willingness to pay by consumers for the full increment in water use. This corresponds, in Figure 1, to the area AQ_0Q_wB below the demand curve between the "with project" (Q_0) and "without project" (Q_w) estimates of water consumption.^{2/} Present value of benefits was calculated as the discounted sum of benefits in years 1990-2010 (as a conservative assumption, annual benefits of incremental water use were kept constant after 2005). All calculations were carried out using constant 1987 prices and a discount rate of 10 percent. Despite the large (116 percent or 342,000 m^3 /day) difference in the consumption of piped water in 2005 between the "with" and "without" alternatives, the difference in total water consumption is relatively modest, ranging from 2 to 27 percent for the different zones and

^{1/} Consumers' cost of water consumption covered prices (of bottled water, water purchased from vendors, water from the piped system), boiling costs (of nonbottled drinking water) and variable costs (of groundwater extraction, including the value of time spent operating handpumps).

^{2/} It is important to understand that the usual reference to "additional health benefits" does apply only marginally here. Those water related individual health benefits, which are well understood by the consumers, are "captured" by the demand curve, since the latter reflects all the information on observed willingness to pay for water of varying quality, i.e., the premium consumers paid for good quality water (bottled water or water purchased from vendors and boiled) was fully taken into account. In Jakarta, people generally understand quite well the connection between good quality drinking water and health, as reflected by the uniform practice of boiling. This leaves us with two kinds of nonquantified health benefits: (a) decrease in the incidence of certain water washed diseases which are not related to water supply in the public mind (skin infections may be an example) and (b) external health benefits, i.e., prevention of infections caused to others (outside of someone's own household).

income groups. This indicates that the project primarily substitutes piped surface water for groundwater and only secondarily results in an increase in overall water consumption (the increase is largest in zone 1). Forty billion rupiahs was the estimated present value of benefits accruing to residential consumers. It was assumed that the quantity of water consumed by nonresidential consumers in the "with" project scenario is equal to their consumption in the "without" project scenario.

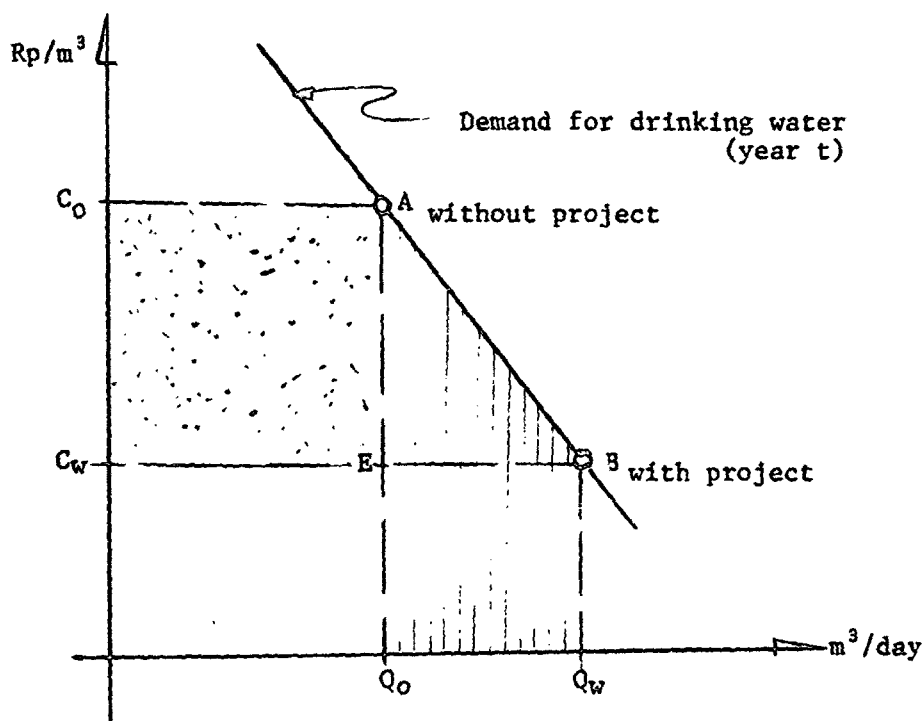


Figure 1

7. Similarly to the analysis of incremental water use benefits, "with project" and "without project" scenarios of economic costs of water use were developed for the period of 1990-2010 based on data for 1987, on the investment schedule of the project and on assumed changes in groundwater availability. There are three areas where the project makes a difference:

- (a) piped water supply (including the distribution of water from the hydrant) and consumption (boiling of drinking water)
- (b) residential consumption of groundwater and bottled water
- (c) nonresidential consumption of groundwater

8. Both the investment and O&M costs of piped water supply can be expected to be higher in the "with project" scenario, while substantial cost savings should appear in private groundwater use. These cost savings, since are the direct result of the substitution of piped water for groundwater by the project, are also part of project benefits. The cost savings, for existing levels of water use are depicted in Figure 1, by the area C_0AEC_w . C_0C_w represents the reduction in unit water cost achieved "with" the project.

9. In the analysis, piped water supply investment costs included the costs of:

- (a) raw water supply structures
- (b) treatment plants
- (c) transmission main and distribution centers
- (d) rehabilitation and extension of primary, secondary and tertiary network
- (e) new connections

10. Both the "with" and "without" scenarios included the Pulogadung raw water pipe and the Buaran I and Cisadane treatment plants, which are already under implementation. The Buaran II treatment plant and transmission pipe, although not yet under implementation, were also included under both scenarios as investments in the 1990-95 period.^{3/} The "with project" scenario was based on a least cost investment program to serve demand by combining system rehabilitation (reducing water losses, increasing reliability of service) with system extension (utilizing excess treatment capacity). The "without project" scenario, in so far as the distribution network is concerned, was based on past trends which means that water sales would catch up with production capa-

^{3/} The decision to include it under both scenarios was made after the government made clear its intentions to go ahead with construction of the plant now, although according to Bank projections, demand is unlikely to warrant the beginning of construction until about 1995.

city much later. The present value of additional investment and O&M ^{4/} costs in the "with project" case was estimated at Rp 265 billion and Rp 217 billion, respectively.

11. Both the investment and O&M costs of residential groundwater use were lower in the "with project" case than without the project. It was assumed that the connecting households would progressively give up drilling new shallow wells. Apart from the quantity of groundwater consumed being substantially lower in the "with" case, the variable unit cost of extraction was also assumed to be lower (by 5-25 percent). As a matter of fact, this cost was assumed to increase under both the "with" and "without" alternatives, but the groundwater conditions were assumed to deteriorate more rapidly under the "without" alternative. Present value of total savings was Rp 65 billion investment costs and Rp 104 billion O&M costs for residential consumers.

12. An important difference between the two scenarios can be found in the quality of piped water delivered to the consumers. As a result of system rehabilitation and improved raw water supply (Pejompongan raw water pipe), safe water can be delivered through house connections to an increasing number of households under the "with project" scenario. It was assumed that boiling of drinking water by connected households would be gradually eliminated by the year 2005. This resulted in a saving of Rp 27 billion (present value) for the connected households during the entire 1990-2010 period. It was also assumed that connected higher income households would purchase less bottled water, which resulted in a saving of Rp 56 billion (present value). The impact of possible further differences in consumed water quality arising from substitution of piped water for groundwater was not quantified. This may result in a slight underestimation of cost savings/benefits (see footnote no. 2).

13. Nonresidential consumers (industry, commerce, services and government) were handled in a very simplified manner throughout the whole economic analysis. As it has already been mentioned in para (6) above, the assumption was that the project made no difference in the quantity of water consumed by that group of consumers. This can be justified either by assuming that the price elasticity of their water demand is zero or that the price of piped water (including connection cost) is exactly the same as the cost of groundwater. The latter situation can be approximated, since their groundwater cost already includes an extraction fee determined by DKI Jakarta and collected by the water company. In theory, this groundwater tax can be adjusted so as to make piped water a slightly lower cost alternative source than groundwater. However, this assumes not only the parallel adjustment of groundwater tax and piped water tariff, but effective enforcement of the tax, as well. The piped water delivered to nonresidential consumers was assumed to have two effects; on the one hand it substituted for groundwater of similar quality and saved the extraction cost, on the other hand, it reduced the scarcity of groundwater

^{4/} O&M costs of piped water supply included the distribution cost of hydrant water. In spite of larger volume of water distributed, significant cost savings were forecasted in the "with" project scenario as a result of higher density of hydrants which was translated into shorter transport distances.

compared to the "without project" scenario for those nonresidential consumers, who were still not connected to the piped supply system and saved part of the extraction cost (18 percent in 2000 and 34 percent in 2010) for them, too. Direct and indirect cost savings were estimated at Rp 150 billion and Rp 89 billion, respectively (present value).

Net Present Value

14. Based on the above discussion, economic impact of the project can be summarized as the difference between the "with project" and "without project" scenarios.

15. The result is Rp 49 billion net present value or an 11.7 percent economic rate of return (ERR):

- (a) Present value of incremental water consumption: Rp 40 billion (see Table 1)
- (b) (plus) Present value of saved boiling and bottled water costs: Rp 83 billion (see Table 2)
- (c) (plus) Present value of saved groundwater extraction costs for residential consumers: Rp 169 billion (see Table 3)
- (d) (plus) Present value of saved groundwater extraction costs for non-residential consumers: Rp 239 billion (see Table 4)
- (e) (minus) Additional investment and O&M cost of piped water supply: Rp 482 billion ^{5/} (see Table 5).

Financial Internal Rate of Return

16. For the sake of comparison, another internal rate of return calculation was carried out for the water supply components assuming that consumer benefits were equal to the difference in revenue (from water sales and connections) between the "with project" and "without project" scenarios. The result is an FIRR of 8.1 percent (see Table 6), which is lower than the ERR, since water sales to hydrants and to residential consumers (especially in the first two consumption blocks) are heavily subsidized.

^{5/} If Buaran II was not considered given with a very early investment schedule in the "without project" scenario but was scheduled optimally (commissioned in year 2007), the additional investment and O&M costs of piped water supply in the "with" case would increase to Rp 576 billion, which results in a 9.0 percent ERR. If, at the same time, Buaran II was also scheduled optimally in the "with" project scenario (commissioned in year 2000), the ERR would be 10.05 percent.

Risks

17. There are several factors which can make the water supply subprojects either uneconomic or more attractive. A 20 percent investment cost overrun would lower the ERR to 9.6 percent. If the system did not deliver potable water to all consumers, despite the fact that the water was safe for drinking, continued the practice of boiling and buying bottled water, the ERR would be lowered to 8.8 percent. If the groundwater tax for nonresidential consumers either was not increased to the necessary level (see para. 13 above) or was not enforced effectively and 50 percent of targeted future customers were continuing using deep wells, the ERR would be lowered to 7.3. However, if the deterioration of the deep aquifer was faster than the assumption used for the "without project" scenario, (e.g. the difference between extraction cost of nonresidential consumers in the "with" and "without" cases was 50 percent more than originally assumed), the ERR would increase to 13.4 percent. If simultaneously, the same was assumed for the shallow aquifer, the ERR would reach 14.8 percent.

ECONOMIC ANALYSIS OF THE WATER SUPPLY COMPONENTS

TABLE 1. BENEFITS OF INCREMENTAL WATER USE
(Million Rp 1987)

YEAR	INCREMENTAL WATER USE (000'm3)	CONSUMER BENEFIT	DISCOUNTED AT 10%
1990	137.1	140.0	105.2
1991	182.8	300.1	205.0
1992	228.5	460.2	285.8
1993	274.2	620.3	350.2
1994	319.9	780.4	400.5
1995	365.6	940.5	438.8
1996	4,309.5	2,359.4	1,000.6
1997	8,253.3	3,778.4	1,456.7
1998	12,197.2	5,197.3	1,821.6
1999	16,141.1	6,616.2	2,108.1
2000	20,084.9	8,035.1	2,327.5
2001	24,028.8	10,302.9	2,713.1
2002	27,972.7	12,570.7	3,009.3
2003	31,916.5	14,838.5	3,229.3
2004	35,860.4	17,106.3	3,384.4
2005	39,804.2	19,374.1	3,484.6
2006	39,804.2	19,374.1	3,167.8
2007	39,804.2	19,374.1	2,879.8
2008	39,804.2	19,374.1	2,618.0
2009	39,804.2	19,374.1	2,380.0
2010	39,804.2	19,374.1	2,163.7
TOTAL	239,191.1	200,290.9	39,530.0

ECONOMIC ANALYSIS OF THE WATER SUPPLY COMPONENTS

TABLE 2. BOILING AND BOTTLED WATER COSTS FOR RESIDENTIAL CONSUMERS
(Billion Rp 1987)

YEAR	WITH PROJECT		WITHOUT PROJECT		UNDISCOUNTED DIFFERENCE			DISCOUNTED DIFFERENCE AT 10%		
	BOILING	BOTTLED	BOILING	BOTTLED	BOILING	BOTTLED	TOTAL	BOILING	BOTTLED	TOTAL
1990	24.05	4.88	24.05	4.88	0.00	0.00	0.00	0.00	0.00	0.00
1991	24.66	4.77	24.97	5.79	-0.31	-1.02	-1.33	-0.21	-0.70	-0.91
1992	25.27	4.67	25.89	6.70	-0.62	-2.04	-2.66	-0.38	-1.26	-1.65
1993	25.88	4.56	26.81	7.61	-0.93	-3.05	-3.98	-0.52	-1.72	-2.25
1994	26.49	4.45	27.73	8.52	-1.24	-4.07	-5.31	-0.64	-2.09	-2.73
1995	27.10	4.35	28.65	9.43	-1.55	-5.09	-6.64	-0.72	-2.37	-3.10
1996	27.36	4.44	29.77	10.88	-2.41	-6.44	-8.85	-1.02	-2.73	-3.75
1997	27.62	4.53	30.89	12.32	-3.27	-7.79	-11.06	-1.26	-3.00	-4.27
1998	27.88	4.62	32.01	13.76	-4.13	-9.15	-13.28	-1.45	-3.21	-4.65
1999	28.14	4.71	33.13	15.20	-4.99	-10.50	-15.49	-1.59	-3.34	-4.93
2000	28.40	4.80	34.25	16.65	-5.85	-11.85	-17.70	-1.69	-3.43	-5.13
2001	28.65	4.89	35.36	18.09	-6.71	-13.20	-19.91	-1.77	-3.48	-5.24
2002	28.91	4.98	36.48	19.53	-7.57	-14.55	-22.12	-1.81	-3.48	-5.30
2003	29.17	5.07	37.60	20.97	-8.43	-15.91	-24.34	-1.83	-3.46	-5.30
2004	29.43	5.16	38.72	22.41	-9.29	-17.26	-26.55	-1.84	-3.41	-5.25
2005	29.69	5.25	39.84	23.86	-10.15	-18.61	-28.76	-1.83	-3.35	-5.17
2006	29.95	5.34	40.96	25.30	-11.01	-19.96	-30.97	-1.80	-3.26	-5.06
2007	30.21	5.43	42.08	26.74	-11.87	-21.31	-33.18	-1.76	-3.17	-4.93
2008	30.47	5.52	43.20	28.18	-12.73	-22.67	-35.40	-1.72	-3.06	-4.78
2009	30.73	5.61	44.32	29.63	-13.59	-24.02	-37.61	-1.67	-2.95	-4.62
2010	30.99	5.70	45.44	31.07	-14.45	-25.37	-39.82	-1.61	-2.83	-4.45
TOTAL	635.73	112.75	766.83	366.60	-131.10	-253.85	-384.95	-27.14	-56.33	-83.47

ECONOMIC ANALYSIS OF THE WATER SUPPLY COMPONENTS

TABLE 3 GROUNDWATER EXTRACTION COSTS FOR RESIDENTIAL CONSUMERS
(Billions Rp 1987)

YEAR	"WITH PROJECT" ALTERNATIVE			"WITHOUT PROJECT" ALTERNATIVE			UNDISCOUNTED DIFFERENCE BETWEEN "WITH" AND "WITHOUT"			DIFFERENCE DISCOUNTED AT 10 % BETWEEN "WITH" AND "WITHOUT"		
	INVEST. COSTS	O & M COSTS	TOTAL COST	INVEST. COSTS	O & M COSTS	TOTAL COST	INVEST.	O & M	TOTAL	INVEST.	O & M	TOTAL
1990	18.32	76.86	95.18	26.21	76.86	103.07	-7.89	0.00	-7.89	-5.93	0.00	-5.93
1991	18.32	78.07	96.39	26.21	80.40	106.61	-7.89	-2.33	-10.22	-5.39	-1.59	-6.98
1992	18.32	79.29	97.61	26.21	83.94	110.16	-7.89	-4.65	-12.55	-4.90	-2.89	-7.79
1993	18.32	80.51	98.83	26.21	87.48	113.70	-7.89	-6.98	-14.87	-4.46	-3.94	-8.39
1994	18.32	81.72	100.04	26.21	91.03	117.24	-7.89	-9.30	-17.20	-4.05	-4.77	-8.83
1995	22.27	82.94	105.21	33.13	94.57	127.70	-10.86	-11.63	-22.49	-5.07	-5.43	-10.49
1996	22.27	85.02	107.29	33.13	98.63	131.76	-10.86	-13.61	-24.48	-4.61	-5.77	-10.38
1997	22.27	87.09	109.36	33.13	102.69	135.82	-10.86	-15.59	-26.46	-4.19	-6.01	-10.20
1998	22.27	89.17	111.44	33.13	106.75	139.98	-10.86	-17.58	-28.44	-3.81	-6.16	-9.97
1999	22.27	91.25	113.52	33.13	110.81	143.94	-10.86	-19.56	-30.42	-3.46	-6.23	-9.69
2000	27.05	93.33	120.38	48.35	114.86	163.22	-21.30	-21.54	-42.84	-6.17	-6.24	-12.41
2001	27.05	95.40	122.45	48.35	118.92	167.28	-21.30	-23.52	-44.82	-5.61	-6.19	-11.80
2002	27.05	97.48	124.53	48.35	122.98	171.34	-21.30	-25.50	-46.81	-5.10	-6.11	-11.21
2003	27.05	99.56	126.61	48.35	127.04	175.39	-21.30	-27.49	-48.79	-4.64	-5.98	-10.62
2004	27.05	101.63	128.68	48.35	131.10	179.45	-21.30	-29.47	-50.77	-4.21	-5.83	-10.04
2005	28.01	103.71	131.72	51.40	135.16	186.56	-23.39	-31.45	-54.84	-4.21	-5.66	-9.86
2006	28.96	105.79	134.75	54.44	139.22	193.66	-25.48	-33.43	-58.91	-4.17	-5.47	-9.63
2007	29.92	107.86	137.78	57.48	143.28	200.76	-27.57	-35.41	-62.98	-4.10	-5.26	-9.36
2008	30.87	109.94	140.81	60.53	147.34	207.86	-29.65	-37.40	-67.05	-4.01	-5.05	-9.06
2009	31.83	112.02	143.85	63.57	151.40	214.97	-31.74	-39.38	-71.12	-3.90	-4.84	-8.74
2010	32.79	114.10	146.88	66.61	155.46	222.07	-33.83	-41.36	-75.19	-3.78	-4.62	-8.40
RESID.	381.24	0.00	381.24	664.85	0.00	664.85	-283.61	0.00	-283.61	-31.67	0.00	-31.67
TOTAL	572.03	2,115.63	2,687.66	945.28	2,562.81	3,508.09	-373.25	-447.18	-820.43	-65.19	-104.04	-169.24

TABLE 4: GROUNDWATER EXTRACTION COST SAVINGS FOR NON-RESIDENTIAL CONSUMERS
(Billions Rp 1987)

YEAR	COST SAVINGS			EXTERNALITIES			NON-RESIDENTIAL COST SAVING	
	(1) (Rp/M3)	(2) (H.M3/an)	COST SAVINGS	(3) (Rp/M3)	(4) (H.M3/an)	EXTER- NALITIES	UNDIG- COUNTED	DISCOUNTED AT 10%
1988	430.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
1989	439.21	0.00	0.00	0.00	106.00	0.00	0.00	0.00
1990	448.43	1.86	0.83	3.07	110.50	0.34	1.17	0.88
1991	457.65	3.82	1.75	6.14	115.28	0.71	2.46	1.68
1992	466.86	6.42	3.00	9.21	119.83	1.10	4.10	2.55
1993	476.07	9.16	4.36	12.29	124.66	1.53	5.89	3.33
1994	485.29	12.29	5.96	15.36	129.57	1.99	7.95	4.08
1995	494.50	15.83	7.83	21.50	134.53	2.89	10.72	5.00
1996	516.75	20.87	10.79	39.02	138.51	5.41	16.19	6.87
1997	539.00	25.92	13.97	56.54	143.03	8.09	22.06	8.50
1998	561.26	30.97	17.38	74.07	148.12	10.97	28.35	9.94
1999	583.51	36.01	21.01	91.59	153.82	14.09	35.10	11.18
2000	605.76	41.06	24.87	109.11	160.16	17.48	42.35	12.27
2001	628.01	49.79	31.27	126.63	163.50	20.71	51.97	13.69
2002	650.27	58.52	38.06	144.16	167.57	24.16	62.21	14.89
2003	672.52	67.26	45.23	161.68	172.40	27.87	73.10	15.91
2004	694.77	75.99	52.79	179.20	178.05	31.91	84.70	16.76
2005	717.03	84.72	60.75	196.72	184.56	36.31	97.05	17.46
2006	739.28	93.45	69.09	214.25	191.98	41.13	110.22	18.02
2007	761.53	102.18	77.82	231.77	200.38	46.44	124.26	18.47
2008	783.78	110.92	86.93	249.29	209.80	52.30	139.24	18.81
2009	806.03	119.65	96.44	266.81	220.31	58.78	155.22	19.07
2010	828.29	128.38	106.34	284.34	231.97	65.96	172.30	19.24
TOTAL			776.47			470.15	1,246.62	238.59

ECONOMIC ANALYSIS OF THE WATER SUPPLY COMPONENTS

TABLE 5: COMPARISON BETWEEN THE "WITH" AND "WITHOUT" ALTERNATIVES
INVESTMENT AND O&M COSTS OF PIPED WATER SUPPLY

YEAR	"WITH PROJECT" ALTERNATIVE			"WITHOUT PROJECT" ALTERNATIVE			UNDISCOUNTED DIFFERENCE BETWEEN "WITH" AND "WITHOUT"			DIFFERENCE DISCOUNTED AT 10% BETWEEN "WITH" AND "WITHOUT"		
	INVESTMENT COSTS	O & M COSTS	TOTAL COST	INVESTMENT COSTS	O & M COSTS	TOTAL COST	INVEST	O & M	TOTAL	INVEST	O & M	TOTAL
1988	18.39	25.53	43.92	18.39	25.53	43.92	0.00	0.00	0.00	0.00	0.00	0.00
1989	53.31	28.69	82.00	53.31	28.69	82.00	(0.00)	0.00	(0.00)	(0.00)	0.00	(0.00)
1990	123.35	32.75	156.10	88.24	29.84	118.08	35.11	2.91	38.02	26.38	2.19	28.57
1991	170.48	44.69	215.17	108.18	32.59	140.77	62.30	12.11	74.40	42.55	8.27	50.82
1992	148.71	49.39	198.10	54.99	34.70	89.69	93.73	14.69	108.41	58.20	9.12	67.32
1993	181.80	55.95	237.74	76.97	36.88	113.85	104.83	19.07	123.90	59.17	10.76	69.94
1994	107.95	65.67	173.62	33.53	39.13	72.66	74.42	26.54	100.96	38.19	13.62	51.81
1995	71.70	71.25	142.95	5.67	41.51	47.18	66.04	29.74	95.77	30.81	13.87	44.68
1996	52.09	76.79	128.89	5.67	44.61	50.28	46.43	32.18	78.61	19.69	13.65	33.34
1997	43.79	82.67	126.46	7.44	49.60	57.03	36.35	33.07	69.43	14.02	12.75	26.77
1998	41.69	88.38	130.07	30.83	54.42	85.25	10.66	33.96	44.82	3.81	11.90	15.71
1999	13.26	94.10	107.36	47.40	58.41	105.81	(34.14)	35.69	1.55	(10.88)	11.37	0.49
2000	16.01	99.82	115.83	30.47	61.51	91.98	(14.45)	38.31	23.85	(4.19)	11.10	6.91
2001	24.33	107.07	131.40	18.44	64.88	83.33	5.88	42.19	48.07	1.55	11.11	12.66
2002	39.08	113.82	152.90	14.52	68.10	82.62	24.56	45.72	70.28	5.88	10.95	16.83
2003	43.52	120.57	164.09	27.37	71.31	98.59	16.15	49.25	65.40	3.51	10.72	14.23
2004	37.69	127.32	165.01	37.68	74.53	112.21	0.01	52.79	52.80	0.00	10.44	10.45
2005	33.43	134.07	167.49	35.46	77.54	113.00	(2.03)	56.52	54.49	(0.37)	10.17	9.80
2006	23.22	140.81	164.03	23.14	81.07	104.21	0.08	59.74	59.82	0.01	9.77	9.78
2007	19.11	147.56	166.67	14.83	84.09	98.92	4.28	63.48	67.75	0.64	9.44	10.07
2008	12.18	154.31	166.49	6.90	87.10	94.00	5.28	67.21	72.49	0.71	9.08	9.80
2009	12.31	161.06	173.37	6.90	90.11	97.02	5.41	70.94	76.35	0.66	8.72	9.38
2010	12.44	167.81	180.25	6.90	93.13	100.03	5.54	74.68	80.22	0.62	8.34	8.96
RESID	735.41	0.00	735.41	507.10	0.00	507.10	228.31	0.00	228.31	25.20	0.00	25.20
TOTAL	1,299.84	2,190.08	3,489.92	753.21	1,329.30	2,082.51	546.64	860.78	1,407.42	265.17	217.32	482.49

ECONOMIC ANALYSIS OF THE WATER SUPPLY COMPONENTS

TABLE 6. Financial internal rate of return (FIRR) calculation based on difference in water costs and sales between "with" and "without" and on projected tariff (1987 prices)

YEAR	HYDRANTS			RESIDENTIAL			NON-RESIDENTIAL			TOTAL SALES	CONNEC. REV.	TOTAL COSTS	DIFF. (billRp)
	(No3)	(Rp/m3)	value	(No3)	(Rp/m3)	value	(No3)	(Rp/m3)	value				
1990	1.32	121.00	0.16	4.88	380.00	1.85	1.86	870.00	1.62	3.63	1.50	38.02	-32.89
1991	2.64	140.00	0.37	9.76	421.00	4.11	3.82	960.00	3.67	8.15	2.00	74.40	-64.26
1992	3.96	147.00	0.58	14.64	430.00	6.30	6.42	978.00	6.28	13.16	2.00	108.41	-93.26
1993	5.27	140.00	0.74	19.52	410.00	8.00	9.16	931.00	8.53	17.27	2.00	123.90	-104.63
1994	6.59	133.00	0.88	24.40	479.00	11.69	12.29	1087.00	13.36	25.92	2.00	100.96	-73.04
1995	7.91	127.00	1.00	29.28	485.00	14.20	15.83	1099.00	17.40	32.60	2.00	95.77	-61.17
1996	7.97	121.00	0.96	37.98	462.00	17.55	20.87	1047.00	21.85	40.36	2.00	78.61	-36.25
1997	8.04	129.00	1.04	46.68	510.00	23.81	25.92	1150.00	29.81	54.65	2.00	69.43	-12.78
1998	8.10	137.00	1.11	55.38	550.00	30.46	30.97	1250.00	38.71	70.28	2.00	44.82	27.45
1999	8.16	130.00	1.06	64.08	524.00	33.58	36.01	1190.00	42.85	77.49	3.00	1.55	78.94
2000	8.23	125.00	1.03	72.78	500.00	36.39	41.06	1000.00	41.06	78.48	3.00	23.85	57.62
2001	8.29	135.00	1.12	81.47	500.00	40.74	49.79	1000.00	49.79	91.65	3.00	48.07	46.57
2002	8.35	135.00	1.13	90.17	500.00	45.09	58.52	1000.00	58.52	104.73	3.00	70.28	37.45
2003	8.41	135.00	1.14	98.87	500.00	49.44	67.26	1000.00	67.26	117.83	3.00	65.40	55.43
2004	8.48	135.00	1.14	107.57	500.00	53.79	75.99	1000.00	75.99	130.92	3.00	52.80	81.12
2005	8.54	135.00	1.15	116.27	500.00	58.14	84.72	1000.00	84.72	144.01	3.00	54.49	92.52
2006	8.60	135.00	1.16	124.97	500.00	62.48	93.45	1000.00	93.45	157.10	3.00	59.82	100.27
2007	8.67	135.00	1.17	133.67	500.00	66.83	102.18	1000.00	102.18	170.18	3.00	67.75	105.43
2008	8.73	135.00	1.18	142.37	500.00	71.18	110.92	1000.00	110.92	183.28	3.00	72.49	113.79
2009	8.79	135.00	1.19	151.07	500.00	75.53	119.65	1000.00	119.65	196.37	4.00	76.35	124.02
2010	8.86	135.00	1.20	159.77	500.00	79.88	128.38	1000.00	128.38	209.46	4.00	80.22	133.24
RESID.												-228.31	228.31
FIRR	8.1%												

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Summary Cost Table 1 (Totals Including Contingencies)
(US\$ million)

	1988/89	1989/91	1991/92	1992/93	1993/94	1994/95	1995/96	Total
<u>PJSIP Phase 1 (IBRD)</u>								
Rehabilitation	0.0	4.4	11.3	8.5	5.0	2.0	0.9	32.2
Infill/exten. serv. mains	0.0	5.1	8.9	11.2	16.9	11.5	5.7	59.8
Institutional development	0.0	1.8	1.2	0.7	0.3	0.0	0.0	4.1
Distribution control	0.0	3.6	5.3	2.5	0.0	0.0	0.0	11.4
Prim. dis. mains zones 1+2	0.0	0.0	0.9	9.4	7.4	2.6	0.0	20.4
Prim. dis. mains zones 4+5	0.0	0.0	11.4	9.0	3.1	0.0	0.0	23.5
Administration	0.0	1.7	1.5	1.3	1.2	0.1	0.0	6.8
Subtotal	<u>0.0</u>	<u>16.7</u>	<u>40.5</u>	<u>42.7</u>	<u>34.0</u>	<u>16.2</u>	<u>6.6</u>	<u>156.7</u>
<u>PJSIP Phase 1 (OECD)</u>	0.0	2.7	6.7	14.3	19.1	8.5	1.4	52.6
<u>Pojompongan R.W. Pipeline</u>								
Pej. raw water pipeline	0.5	17.7	23.0	16.5	0.0	0.0	0.0	57.7
Inst. dev. for POJ	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.4
Subtotal	<u>0.5</u>	<u>18.1</u>	<u>23.1</u>	<u>16.5</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>58.1</u>
<u>Cisadane Water Supply</u>								
Cisadane T.W. trans. main	0.0	2.2	8.1	6.4	1.0	0.0	0.0	17.6
Prim. mains for Serpong	0.0	0.0	0.8	0.6	0.1	0.0	0.0	1.6
Subtotal	<u>0.0</u>	<u>2.2</u>	<u>8.9</u>	<u>7.0</u>	<u>1.1</u>	<u>0.0</u>	<u>0.0</u>	<u>19.2</u>
<u>JSSP Extension</u>								
JSSP extension	0.0	2.8	10.0	6.3	2.8	0.0	0.0	21.9
<u>Wastewater Disposal</u>								
W/Water disposal (IBRD)	0.0	0.0	0.1	0.2	0.6	0.4	0.1	1.3
W/Water disposal (OECD)	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.5
Subtotal	<u>0.0</u>	<u>0.0</u>	<u>0.1</u>	<u>0.2</u>	<u>0.7</u>	<u>0.6</u>	<u>0.2</u>	<u>1.6</u>
<u>Priority Major Drainage</u>	0.0	2.7	9.9	8.0	4.5	0.0	0.0	25.0
<u>Water Res. Management Study</u>	0.0	2.1	3.4	1.1	0.0	0.0	0.0	6.6
<u>Miscellaneous Studies</u>	0.0	1.7	1.7	0.0	0.0	0.0	0.0	3.3
<u>Overall Coordination</u>								
JUPCO running cost	0.0	1.3	1.1	0.6	0.4	0.0	0.0	3.4
<u>Total Project Costs</u>	<u>0.5</u>	<u>50.2</u>	<u>105.4</u>	<u>96.6</u>	<u>62.5</u>	<u>25.4</u>	<u>6.2</u>	<u>346.6</u>

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Summary Cost Table 2 (Totals Including Contingencies)
(Rp million)

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	Total
<u>PJSIP Phase 1 (IBRD)</u>								
Rehabilitation	0	7,928	20,812	15,280	9,019	3,830	1,646	57,798
Infill/exten. serv. mains	0	9,148	16,039	20,027	30,391	20,720	10,178	108,502
Institutional development	0	3,300	2,163	1,328	520	0	0	7,311
Distribution center 5	0	6,444	9,514	4,575	0	0	0	20,534
Prim. dis. mains zones 1+2	0	0	1,599	16,951	13,325	4,855	0	36,531
Prim. dis. mains zones 4+5	0	0	20,447	18,072	5,815	0	0	42,134
Administration	0	3,125	2,671	2,419	2,103	136	0	10,456
Subtotal	0	<u>29,945</u>	<u>72,747</u>	<u>76,832</u>	<u>60,975</u>	<u>29,142</u>	<u>11,822</u>	<u>281,266</u>
<u>PJSIP Phase 1 (OECD)</u>	0	4,808	12,017	25,590	34,195	15,334	2,458	94,400
<u>Pejompongan R.W. Pipeline</u>								
Pej. raw water pipeline	839	31,830	41,336	29,544	0	0	0	103,550
Inst. dev. for PBJ	0	583	99	72	0	0	0	755
Subtotal	<u>839</u>	<u>32,413</u>	<u>41,436</u>	<u>29,616</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>104,306</u>
<u>Ciadano Water Supply</u>								
Ciadano T.W. trans. main	0	3,944	14,514	11,450	1,767	0	0	31,675
Prim. mains for Serpong	0	58	1,520	1,145	130	0	0	2,856
Subtotal	0	<u>4,002</u>	<u>16,035</u>	<u>12,595</u>	<u>1,897</u>	<u>0</u>	<u>0</u>	<u>34,531</u>
<u>JSSP Extension</u>								
JSSP extension	0	4,972	17,893	11,324	5,112	0	0	39,292
<u>Wastewater Disposal</u>								
W/Water disposal (IBRD)	0	73	156	284	996	740	130	2,382
W/Water disposal (OECD)	0	0	0	0	199	403	238	841
Subtotal	0	<u>73</u>	<u>156</u>	<u>284</u>	<u>1,195</u>	<u>1,144</u>	<u>369</u>	<u>3,224</u>
<u>Priority Major Drainage</u>	0	4,757	17,807	14,270	8,046	0	0	44,881
<u>Water Res. Management Study</u>	0	3,754	6,169	2,008	0	0	0	11,932
<u>Miscellaneous Studies</u>	0	3,008	3,008	0	0	0	0	6,013
<u>Overall Coordination</u>								
JUPCO running cost	0	2,383	1,902	1,001	749	0	0	6,036
<u>Total Project Costs</u>	<u>839</u>	<u>90,116</u>	<u>189,162</u>	<u>173,325</u>	<u>112,172</u>	<u>45,621</u>	<u>14,650</u>	<u>625,885</u>

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (AIDP II)
Table 101. PDAM JAYA SYSTEM IMPROVEMENT PROJECT Phase 1 (IBRD)
 Rehabilitation in Zones 1,2,4 and 5
 Detailed Cost Table
 Rp

	Totals Including Contingencies US \$								Totals Including Contingencies							
	88/90	89/91	91/92	92/93	93/94	94/95	95/96	Total	88/90	89/91	91/92	92/93	93/94	94/95	95/96	Total
I. INVESTMENT COSTS																
A. VEHICLES/EQUIPMENT																
Pikjong ² type minibuses	0.0	0.8	0.7	0.0	0.0	0.0	0.0	1.0	0.0	479.8	1283.0	0.0	0.0	0.0	0.0	1717.8
Pick-up Trucks	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	228.8	0.0	0.0	0.0	0.0	228.8
Tools & misc. equipment	0.0	0.2	1.5	0.0	0.0	0.0	0.0	1.6	0.0	301.9	2800.1	0.0	0.0	0.0	0.0	2800.1
Sub-Total	0.0	0.4	2.3	0.0	0.0	0.0	0.0	2.7	0.0	781.7	4070.6	0.0	0.0	0.0	0.0	4852.3
B. BOUNDARY VALVES																
Bound. valve install. KD200	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.4	0.0	81.7	141.8	185.1	283.7	112.1	0.0	784.4
Bound. valve install. KD150	0.0	0.1	0.2	0.3	0.4	0.2	0.0	1.2	0.0	90.1	408.3	528.3	749.9	818.8	0.0	2089.8
Bound. valve install. KD100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	8.7	89.1	51.1	72.3	30.9	0.0	202.6
Bound. valve install. KD80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	8.2	88.7	47.9	69.2	29.0	0.0	199.9
Sub-Total	0.0	0.1	0.3	0.5	0.6	0.3	0.0	1.8	0.0	188.8	620.9	810.4	1164.6	491.0	0.0	3215.6
C. REPLACEMENT LARGE METERS																
Strainer installation	0.0	2.7	2.9	1.5	0.0	0.0	0.0	7.1	0.0	4889.1	5110.6	2975.4	0.0	0.0	0.0	12955.1
Turbine meters KD150	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.0	218.4	228.6	119.3	0.0	0.0	0.0	566.3
Sub-Total	0.0	2.8	3.0	1.6	0.0	0.0	0.0	7.4	0.0	5087.6	5339.2	2794.7	0.0	0.0	0.0	13221.4
D. REPLACEMENT SMALL METERS																
Class C water meter 15mm	0.0	0.1	0.4	0.6	0.4	0.2	0.1	1.8	0.0	111.4	788.5	1014.4	762.4	853.8	184.7	3165.1
Stopcock 20 mm	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.3	0.0	18.6	124.4	173.2	132.0	62.1	32.8	548.1
PVC pipe 20mm	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	10.2	68.0	93.7	70.7	32.9	17.2	292.7
Sub-Total	0.0	0.1	0.5	0.7	0.5	0.2	0.1	2.2	0.0	140.2	980.9	1281.3	965.1	448.7	234.7	4000.9
E. VALVES, WASTE NET, PIPE REP																
Valve rehabilitation	0.0	0.2	1.3	1.8	1.4	0.6	0.3	5.6	0.0	351.9	2338.9	3221.5	2428.2	1129.8	591.4	10061.8
Waste meter installation	0.0	0.0	0.2	0.2	0.2	0.1	0.0	0.7	0.0	42.0	279.9	386.3	291.8	136.0	71.4	1207.6
Pipe repair	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.6	0.0	39.8	258.4	359.6	272.3	127.6	67.3	1122.8
Sub-Total	0.0	0.2	1.6	2.2	1.7	0.8	0.4	6.9	0.0	432.6	2977.2	3966.4	2992.2	1393.5	730.1	12392.0
F. PIPE REPLACEMENT																
DCI pipe replacement	0.0	0.1	0.8	1.1	0.8	0.4	0.2	3.3	0.0	208.8	1886.7	1809.3	1437.1	688.0	349.4	5858.4
GI pipe replacement	0.0	0.1	0.6	0.9	0.7	0.3	0.2	2.8	0.0	171.9	1152.5	1601.8	1219.4	572.1	302.2	5016.8
PVC pipe replacement	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.3	0.0	17.1	114.7	159.5	121.3	57.0	30.1	499.8
Sub-Total	0.0	0.2	1.5	2.0	1.6	0.7	0.4	6.4	0.0	397.8	2853.9	3669.7	2778.8	1297.1	681.7	11477.0
G. REHAB. OF PRIMARY NETWORK																
Butterfly valve + chamber	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.9	0.0	0.0	1580.3	0.0	0.0	0.0	0.0	1580.3
Gate valves with chamber	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	475.2	0.0	0.0	0.0	475.2
Gate valves with surf. box	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.0	0.0	0.0	0.0	88.0
Additional chambers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	76.1	0.0	0.0	0.0	76.1
Add. air-release valves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3	0.0	0.0	0.0	17.3
Sub-Total	0.0	0.0	0.9	0.4	0.0	0.0	0.0	1.2	0.0	0.0	1580.3	658.6	0.0	0.0	0.0	2218.9
H. EXPERTS FOR REHAB. WORKS																
Senior Distribution Eng.	0.0	0.2	0.2	0.2	0.2	0.0	0.0	0.8	0.0	358.4	358.4	358.4	358.4	0.0	0.0	1433.6
Distribution Engineers	0.0	0.0	0.5	0.5	0.0	0.0	0.0	1.1	0.0	0.0	967.6	967.6	0.0	0.0	0.0	1935.2
Civil Engineers	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	117.3	148.6	0.0	0.0	0.0	0.0	265.9
Senior Sanitary Engineers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	66.8	66.8	66.8	66.8	0.0	0.0	267.2
Sanitary Engineers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.2	0.0	0.0	1.1
Technicians	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.5	28.1	0.0	0.0	0.0	0.0	58.6
Field Inspectors	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.4	0.0	0.0	261.4	261.4	261.4	0.0	0.0	784.1
Draughtsman	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.4	0.0	166.8	214.9	209.1	226.5	0.0	0.0	807.3
Sub-Total	0.0	0.4	1.1	1.0	0.6	0.0	0.0	3.1	0.0	730.0	2042.1	1883.5	913.3	0.0	0.0	5548.9
I. OFFICE COSTS FOR REH. CONS																
	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.5	0.0	217.8	217.8	217.8	217.8	0.0	0.0	871.2
Total INVESTMENT COSTS	0.0	4.4	11.3	8.6	5.0	2.0	0.9	32.2	0.0	7926.4	20312.9	15260.5	9019.7	3630.3	1646.5	57782.3

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
(JUDP II)

Table 102. PDAM JAYA SYSTEM IMPROVEMENT PROJECT Phase 1 (IBRD)
Infill/Ext. of Serv. Mains + New Connect. in Zones 1,2,4 + 5
Detailed Cost Table
Rp

	Totals Including Contingencies US \$								Totals Including Contingencies							
	89/90	90/91	91/92	92/93	93/94	94/95	95/96	Total	89/90	90/91	91/92	92/93	93/94	94/95	95/96	Total
I. INVESTMENT COSTS																
A. DISTRICT METERS																
District motor install.	0.0	0.3	1.2	1.6	2.3	1.0	0.0	6.4	0.0	493.2	2214.7	2900.9	4148.4	1770.6	0.0	11627.7
B. SECONDARY MAINS																
Supply uPVC KD 150mm	0.0	0.1	0.4	0.5	0.7	0.3	0.0	2.0	0.0	161.5	682.8	697.6	1288.2	651.8	0.0	3571.9
Lay uPVC KD 150mm	0.0	0.1	0.3	0.4	0.6	0.2	0.0	1.6	0.0	117.6	533.5	708.1	1020.4	440.1	0.0	2817.7
Supply uPVC KD 200mm	0.0	0.2	0.9	1.1	1.6	0.7	0.0	4.5	0.0	389.3	1529.2	2010.2	2884.9	1235.7	0.0	7999.3
Lay uPVC KD 200mm	0.0	0.1	0.4	0.6	0.8	0.4	0.0	2.3	0.0	175.2	795.0	1052.4	1520.7	655.9	0.0	4199.2
Supply uPVC KD 250mm	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.4	0.0	34.0	153.2	201.4	289.0	123.8	0.0	801.3
Lay uPVC KD 250mm	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	11.6	52.5	69.6	100.5	43.4	0.0	277.6
Sub-Total	0.0	0.5	2.1	2.8	4.0	1.7	0.0	11.0	0.0	829.2	3748.2	4937.1	7103.7	3050.6	0.0	19386.9
C. TERTIARY MAINS																
Supply uPVC KD 50mm	0.0	0.1	0.2	0.3	1.1	0.8	0.1	2.6	0.0	144.3	305.0	552.0	1920.7	1421.3	249.8	4593.2
Lay uPVC KD 50mm	0.0	0.2	0.4	0.7	2.4	1.8	0.3	5.8	0.0	321.5	683.1	1242.8	4346.2	3232.6	571.1	10897.3
Supply uPVC KD 75mm	0.0	0.0	0.1	0.2	0.5	0.4	0.1	1.3	0.0	71.0	150.0	271.5	944.5	699.0	122.9	2259.8
Lay uPVC KD 75mm	0.0	0.0	0.1	0.2	0.6	0.4	0.1	1.4	0.0	80.0	169.9	309.1	1080.9	803.9	142.0	2585.7
Supply uPVC KD 100mm	0.0	0.0	0.1	0.2	0.6	0.4	0.1	1.3	0.0	74.3	157.0	284.1	988.3	731.4	128.6	2383.5
Lay uPVC KD 100mm	0.0	0.0	0.1	0.1	0.4	0.3	0.1	1.0	0.0	54.1	115.9	210.8	737.1	548.2	96.8	1782.2
Sub-Total	0.0	0.4	0.9	1.6	5.6	4.1	0.7	13.3	0.0	745.5	1580.9	2870.2	10017.7	7436.3	1311.2	23931.8
D. NEW CONNECTIONS																
Public hydrants	0.0	0.3	0.2	0.2	0.2	0.2	0.3	1.4	0.0	493.7	371.8	392.1	413.5	436.0	459.9	2557.0
Household connections	0.0	2.5	3.3	3.8	4.0	4.2	4.4	22.3	0.0	4548.5	5973.8	6885.2	7188.2	7526.8	7881.7	39981.9
Non-resident connections	0.0	0.2	0.2	0.3	0.3	0.3	0.3	1.8	0.0	415.0	435.5	456.0	477.5	500.0	523.5	2807.5
Sub-Total	0.0	3.0	3.8	4.3	4.5	4.7	4.9	25.3	0.0	5445.1	6780.9	7713.2	8079.1	8482.8	8865.1	45846.4
E. INT. EXP. FOR DD INFILL/EXT																
Senior Hydraulic Engineer	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.6	0.0	358.4	358.4	358.4	0.0	0.0	0.0	1075.1
Hydraulic Engineer	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.4	0.0	234.8	205.2	205.2	0.0	0.0	0.0	645.1
Sub-Total	0.0	0.3	0.3	0.3	0.0	0.0	0.0	1.0	0.0	592.9	563.6	563.6	0.0	0.0	0.0	1720.2
F. MAT. STAFF FOR DD INF/EXT																
Sanitary Engineers	0.0	0.3	0.3	0.3	0.3	0.0	0.0	1.2	0.0	534.3	601.1	534.3	534.3	0.0	0.0	2204.1
Technicians	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.5	0.0	209.1	235.2	209.1	209.1	0.0	0.0	862.5
Draughtsman	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.0	189.4	156.8	139.4	139.4	0.0	0.0	575.0
Sub-Total	0.0	0.5	0.6	0.5	0.5	0.0	0.0	2.0	0.0	932.8	993.2	882.8	882.8	0.0	0.0	3641.6
G. OFF. COST FOR INF/EX CONS.																
	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.4	0.0	159.5	159.5	159.5	159.5	0.0	0.0	638.0
Total INVESTMENT COSTS	0.0	5.1	8.9	11.2	18.9	11.5	5.7	59.3	0.0	9148.3	16039.0	20027.4	30391.2	20720.4	10176.4	106502.6
Total	0.0	5.1	8.9	11.2	18.9	11.5	5.7	59.3	0.0	9148.3	16039.0	20027.4	30391.2	20720.4	10176.4	106502.6

- Values scaled by 1000000.0 4/28/1990 17:11

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
(JUDP "I")

Table 103. PDAM JAYA SYSTEM IMPROVEMENT PROJECT Phase 1 (IBRD)
Institutional Development
Detailed Cost Table
Rp

	Totals Including Contingencies							Totals Including Contingencies US \$						
	89/90	90/91	91/92	92/93	93/94	94-96	Total	89/90	90/91	91/92	92/93	93/94	94-96	Total
I. INVESTMENT COSTS														
A. TECHNICAL ASSISTANCE														
Principal Tech. Advisor	0.0	358.4	358.4	358.4	0.0	0.0	1075.1	0.0	0.2	0.2	0.2	0.0	0.0	0.6
Sen. Technical Advise. (Nat)	0.0	81.2	81.2	81.2	81.2	0.0	324.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Senior Wat. Supply Eng.	0.0	358.4	358.4	358.4	358.4	0.0	1433.5	0.0	0.2	0.2	0.2	0.2	0.0	0.8
Sen. Sanitary Eng. (Nat)	0.0	81.2	81.2	81.2	81.2	0.0	324.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Senior Financial Advisor	0.0	358.4	358.4	358.4	0.0	0.0	1075.1	0.0	0.2	0.2	0.2	0.0	0.0	0.6
Senior Financial Adv (Nat)	0.0	88.6	88.6	88.6	0.0	0.0	265.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Human Resources Export	0.0	195.5	195.5	0.0	0.0	0.0	391.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2
Hum. Resources Export (Nat)	0.0	92.4	46.2	0.0	0.0	0.0	138.6	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Sub-Total	0.0	1813.9	1587.7	1326.1	520.8	0.0	5028.5	0.0	0.9	0.9	0.7	0.3	0.0	2.8
B. TECH. ASSIST. FOR TRAINING														
Senior Training Consult.	0.0	195.5	0.0	0.0	0.0	0.0	195.5	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Sen. Training Consultant	0.0	88.6	44.3	0.0	0.0	0.0	132.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Training Consultant (Nat)	0.0	92.4	46.2	0.0	0.0	0.0	138.6	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Traitor for Works Superv.	0.0	97.7	0.0	0.0	0.0	0.0	97.7	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Train. for Works Sup. (Nat)	0.0	88.6	44.3	0.0	0.0	0.0	132.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sub-Total	0.0	562.8	134.8	0.0	0.0	0.0	697.5	0.0	0.3	0.1	0.0	0.0	0.0	0.4
C. TRAIN SESSIONS O/S P. JAYA														
Training for Sen. Management	0.0	60.9	0.0	0.0	0.0	0.0	60.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Training abroad	0.0	0.0	293.1	0.0	0.0	0.0	293.1	0.0	0.0	0.2	0.0	0.0	0.0	0.2
Train. for supervisory mgr	0.0	51.8	99.1	0.0	0.0	0.0	150.9	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Tr. for p.-fitter foremen	0.0	53.3	22.7	0.0	0.0	0.0	76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Train. for WTP maintenance	0.0	35.3	0.0	0.0	0.0	0.0	35.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	0.0	201.4	414.8	0.0	0.0	0.0	616.2	0.0	0.1	0.2	0.0	0.0	0.0	0.3
D. OTHER TRAINING														
Training sect. runn. cost	0.0	43.4	46.1	0.0	0.0	0.0	89.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Training equipment	0.0	417.2	0.0	0.0	0.0	0.0	417.2	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Training aids	0.0	56.4	0.0	0.0	0.0	0.0	56.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedag. training of trainer	0.0	9.1	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	0.0	526.1	46.1	0.0	0.0	0.0	572.1	0.0	0.3	0.0	0.0	0.0	0.0	0.3
E. CONSUMER SURVEY														
International experts	0.0	195.5	0.0	0.0	0.0	0.0	195.5	0.0	0.1	0.0	0.0	0.0	0.0	0.1
National professionals	0.0	92.4	0.0	0.0	0.0	0.0	92.4	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Technicians	0.0	108.9	0.0	0.0	0.0	0.0	108.9	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Sub-Total	0.0	396.8	0.0	0.0	0.0	0.0	396.8	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Total INVESTMENT COSTS	0.0	3300.9	2183.4	1326.1	520.8	0.0	7311.1	0.0	1.8	1.2	0.7	0.3	0.0	4.1
Total	0.0	3300.9	2183.4	1326.1	520.8	0.0	7311.1	0.0	1.8	1.2	0.7	0.3	0.0	4.1

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
 Table 104. PDAM JAYA SYSTEM IMPROVEMENT PROJECT Phase 1 (IBRD)
 Lebakbulus Distribution Centre (Zone 5)
 Detailed Cost Table
 Rp

	Totals Including Contingencies US \$						Totals Including Contingencies					
	88/90	90/91	91/92	92/93	93-98	Total	88/90	90/91	91/92	92/93	93-98	Total
I. INVESTMENT COSTS												
A. LAND ACQUISITION												
R5 Distribution Centre	0.0	2.9	0.0	0.0	0.0	2.9	0.0	5286.7	0.0	0.0	0.0	5286.7
B. R5 DISTRIBUTION CENTRE												
Site Preparation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	9.0	9.5	0.0	22.7
Civil Works	0.0	0.5	1.1	1.2	0.0	2.8	0.0	926.5	1935.4	2079.7	0.0	4971.6
Pumping Station Equipment	0.0	0.0	3.5	0.9	0.0	4.4	0.0	0.0	6245.9	1630.1	0.0	7876.0
Pilot Line (Tangerang)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	30.3	64.4	68.3	0.0	163.0
Pilot Line (DKI)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	31.7	67.4	71.4	0.0	170.6
Spare Parts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	16.5	17.5	0.0	41.7
Chlorination equipment	0.0	0.0	0.2	0.1	0.0	0.3	0.0	0.0	375.1	97.9	0.0	473.0
Genset	0.0	0.1	0.1	0.2	0.0	0.4	0.0	119.8	254.6	289.9	0.0	644.4
Yard piping	0.0	0.0	0.1	0.1	0.0	0.3	0.0	0.0	237.6	248.6	0.0	486.3
Commissioning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	33.6	35.2	0.0	84.9
Landscaping	0.0	0.0	0.0	0.0	0.0	0.1	0.0	20.9	44.4	47.1	0.0	112.4
Sub-Total	0.0	0.6	5.2	2.5	0.0	8.4	0.0	1157.3	9313.9	4675.4	0.0	16046.6
C. POWER SUPP. TO DIST. CENTRE												
Power supply to R5	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	201.0	0.0	0.0	201.0
Total INVESTMENT COSTS	0.0	3.6	5.3	2.5	0.0	11.4	0.0	8444.0	9514.8	4675.4	0.0	20534.2
Total	0.0	3.6	5.3	2.5	0.0	11.4	0.0	8444.0	9514.8	4675.4	0.0	20534.2

- Values scaled by 1000000.0 4/26/1990 17:21

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
Table 106. PDAM JAYA SYSTEM IMPROVEMENT PROJECT Phase 1 (IBRD)
 Primary Distribution Mains for Zones 1 + 2
 Detailed Cost Table
 Rp

	Totals Including Contingencies							Totals Including Contingencies US \$						
	89-91	91/92	92/93	93/94	94/95	95/96	Total	89-91	91/92	92/93	93/94	94/95	95/96	Total
I. INVESTMENT COSTS														
A. PDM12														
Pipe materials	0.0	0.0	12669.1	9841.2	8424.6	0.0	25834.9	0.0	0.0	7.0	5.5	1.9	0.0	14.4
Pipelaying	0.0	0.0	4382.6	3484.2	1281.1	0.0	9097.8	0.0	0.0	2.4	1.9	0.7	0.0	5.1
Sub-Total	0.0	0.0	16951.6	13325.3	4655.7	0.0	34932.7	0.0	0.0	9.4	7.4	2.6	0.0	19.5
B. FED for PDM Zones 1 + 2														
International Experts	0.0	1075.1	0.0	0.0	0.0	0.0	1075.1	0.0	0.6	0.0	0.0	0.0	0.0	0.6
National Engineers	0.0	267.2	0.0	0.0	0.0	0.0	267.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Technicians	0.0	104.5	0.0	0.0	0.0	0.0	104.5	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Draughtsmen	0.0	69.7	0.0	0.0	0.0	0.0	69.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Supp. Staff + Office Costs	0.0	82.5	0.0	0.0	0.0	0.0	82.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	0.0	1599.0	0.0	0.0	0.0	0.0	1599.0	0.0	0.9	0.0	0.0	0.0	0.0	0.9
Total INVESTMENT COSTS	0.0	1599.0	16951.6	13325.3	4655.7	0.0	36531.7	0.0	0.9	9.4	7.4	2.6	0.0	20.4
Total	0.0	1599.0	16951.6	13325.3	4655.7	0.0	36531.7	0.0	0.9	9.4	7.4	2.6	0.0	20.4

- Values scaled by 1000000.0 4/28/1990 17:23

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
 Table 108. PAM JAYA SYSTEM IMPROVEMENT PROJECT Phase 1 (IBRD)
 Primary Distribution Mains for Zones 4 + 5
 Detailed Cost Table
 Rp

	Totals Including Contingencies US \$						Totals Including Contingencies Rp					
	89-91	91/92	92/93	93/94	94-98	Total	89-91	91/92	92/93	93/94	94-98	Total
I. INVESTMENT COSTS												
A. PDM45												
Pipe Materials	0.0	8.5	8.6	2.3	0.0	17.4	0.0	15220.3	11918.9	4148.9	0.0	31284.2
Pipe Laying	0.0	2.9	2.3	0.8	0.0	6.0	0.0	5228.6	4155.2	1468.2	0.0	10850.0
Sub-Total	0.0	11.4	9.0	3.1	0.0	23.5	0.0	20447.0	16072.1	5615.1	0.0	42134.1
Total INVESTMENT COSTS	0.0	11.4	9.0	3.1	0.0	23.5	0.0	20447.0	16072.1	5615.1	0.0	42134.1
Total	0.0	11.4	9.0	3.1	0.0	23.5	0.0	20447.0	16072.1	5615.1	0.0	42134.1

- Values scaled by 1000000.0 4/28/1990 17:26

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SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
(JUDP II)
Table 201. PEJOMBONGAN RAW WATER PIPELINE + WTC FENCING
Raw Water Pipeline
Detailed Cost Table
Rp

	Totals Including Contingencies					Totals Including Contingencies US \$						
	89/90	90/91	91/92	92/93	93-95	Total	89/90	90/91	91/92	92/93	93-95	Total
I. INVESTMENT COSTS												
A. LAND ACQUISITION												
Land acquisition	889.2	6911.1	1622.6	0.0	0.0	11272.9	0.5	4.9	0.9	0.0	0.0	6.3
B. PUMPING STATION & STRUCT.												
Earth Works	0.0	224.9	213.0	24.9	0.0	462.8	0.0	0.1	0.1	0.0	0.0	0.3
Piles & Sheet Piling	0.0	564.6	396.1	0.0	0.0	960.8	0.0	0.3	0.2	0.0	0.0	0.5
Concrete Works	0.0	716.5	1809.9	475.1	0.0	3001.5	0.0	0.4	1.0	0.3	0.0	1.7
Miscellaneous Works	0.0	429.6	1507.2	1107.7	0.0	3044.6	0.0	0.2	0.8	0.6	0.0	1.7
Eqpt. for Inlet & Pump St.	0.0	1653.5	4214.5	5072.0	0.0	10940.1	0.0	0.9	2.3	2.8	0.0	6.1
Eqpt. for Headroom Div. Chamb	0.0	240.8	613.9	738.8	0.0	1593.4	0.0	0.1	0.3	0.4	0.0	0.9
Eqpt. for Valve Chamber	0.0	212.6	541.8	652.1	0.0	1406.6	0.0	0.1	0.3	0.4	0.0	0.8
Eqpt. for Outlets	0.0	245.8	626.6	764.0	0.0	1626.4	0.0	0.1	0.3	0.4	0.0	0.9
Eqpt. for Pipe Bridges	0.0	274.1	698.5	840.7	0.0	1813.2	0.0	0.2	0.4	0.5	0.0	1.0
Spare Parts	0.0	106.3	270.9	326.1	0.0	703.3	0.0	0.1	0.2	0.2	0.0	0.4
Installation of Equipment	0.0	101.1	260.6	317.2	0.0	678.9	0.0	0.1	0.1	0.2	0.0	0.4
Freight/Loc. Transp. + Incur	0.0	184.4	469.9	565.5	0.0	1219.8	0.0	0.1	0.3	0.3	0.0	0.7
Sub-Total	0.0	4954.2	11823.1	10874.1	0.0	27451.4	0.0	2.8	6.5	6.1	0.0	15.3
C. RAW WATER PIPELINE												
Removal of Excav. Trench Mt	0.0	814.7	1027.1	844.4	0.0	2686.2	0.0	0.5	0.6	0.5	0.0	1.6
Trench Excav. Mt to Spoil	0.0	489.8	617.4	507.6	0.0	1614.8	0.0	0.3	0.3	0.3	0.0	0.9
Splice Comp. Grnir. Bodd. Mt.	0.0	238.0	301.5	249.2	0.0	788.7	0.0	0.1	0.2	0.1	0.0	0.4
Pipe Backfill incl. Compact	0.0	181.3	228.8	188.4	0.0	598.5	0.0	0.1	0.1	0.1	0.0	0.3
Conc. Pipe Mfg. D. 1.8/L2.5	0.0	4839.5	8581.5	6115.5	0.0	19536.5	0.0	2.7	4.8	3.4	0.0	10.9
Transport of Pipes	0.0	528.3	934.9	664.8	0.0	2128.0	0.0	0.3	0.5	0.4	0.0	1.2
Laying of Pipes	0.0	1163.9	2062.7	1469.1	0.0	4695.7	0.0	0.6	1.1	0.8	0.0	2.6
Epoxy Coating of Pipe I/O	0.0	2828.4	4647.7	3305.2	0.0	10579.3	0.0	1.5	2.6	1.8	0.0	5.9
Manholes	0.0	74.1	132.1	94.7	0.0	300.9	0.0	0.0	0.1	0.1	0.0	0.2
Dewatering of Trenches	0.0	142.3	253.3	181.2	0.0	576.9	0.0	0.1	0.1	0.1	0.0	0.3
Testing of Pipes & Joints	0.0	49.9	89.2	84.2	0.0	203.2	0.0	0.0	0.0	0.0	0.0	0.1
Patch/Prot./Fence/Temp Road	0.0	1297.2	2315.3	1661.0	0.0	5273.5	0.0	0.7	1.3	0.9	0.0	2.9
Mech. Eqpt. Pipeline	0.0	289.3	512.0	364.1	0.0	1165.6	0.0	0.2	0.3	0.2	0.0	0.6
Install/Freight/Miscell.	0.0	43.2	76.9	55.0	0.0	175.1	0.0	0.0	0.0	0.0	0.0	0.1
Sub-Total	0.0	12777.8	21780.5	15764.2	0.0	50322.6	0.0	7.1	12.1	8.8	0.0	28.0
D. WTC FENCING AND LINING												
Protective Fencing	0.0	1229.4	1306.2	0.0	0.0	2535.6	0.0	0.7	0.7	0.0	0.0	1.4
Canal Lining & Side Drno	0.0	1524.3	1614.5	0.0	0.0	3138.9	0.0	0.9	0.9	0.0	0.0	1.7
Sub-Total	0.0	2753.8	2920.7	0.0	0.0	5674.5	0.0	1.5	1.6	0.0	0.0	3.2
E. T.A. FOR SUPERVISION												
Team Leader	0.0	358.4	358.4	358.4	0.0	1075.1	0.0	0.2	0.2	0.2	0.0	0.6
Other Internat. Experts	0.0	322.5	381.2	381.2	0.0	1084.9	0.0	0.2	0.2	0.2	0.0	0.6
Senior Nat. Engineers	0.0	73.8	73.8	73.8	0.0	221.4	0.0	0.0	0.0	0.0	0.0	0.1
National professionals	0.0	334.0	478.7	467.5	0.0	1280.2	0.0	0.2	0.3	0.3	0.0	0.7
National technicians	0.0	52.3	52.3	52.3	0.0	156.8	0.0	0.0	0.0	0.0	0.0	0.1
Inspectors/Draftsmen	0.0	43.6	61.0	61.0	0.0	165.5	0.0	0.0	0.0	0.0	0.0	0.1
Office costs	0.0	312.9	122.9	122.9	0.0	558.8	0.0	0.2	0.1	0.1	0.0	0.3
Sub-Total	0.0	1497.4	1528.2	1517.1	0.0	4542.8	0.0	0.8	0.9	0.8	0.0	2.5
F. ADMINISTRATION												
Admin. for PS Structures	0.0	250.9	588.9	588.1	0.0	1415.9	0.0	0.1	0.3	0.3	0.0	0.8
Admin. for RW Pipeline	0.0	647.3	1118.4	820.5	0.0	2586.2	0.0	0.4	0.6	0.5	0.0	1.4
Admin. for WTC Fnc. & Lining	0.0	137.9	146.5	0.0	0.0	284.5	0.0	0.1	0.1	0.0	0.0	0.2
Sub-Total	0.0	1036.2	1851.8	1388.6	0.0	4286.6	0.0	0.6	1.0	0.8	0.0	2.4
Total INVESTMENT COSTS	889.2	81830.7	41338.9	29544.0	0.0	103550.7	0.5	17.7	23.0	16.5	0.0	57.7

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
(JUDP II)

Table 202. INSTITUTIONAL DEVELOPMENT FOR PERUM OTORITA JATILUHUR
Technical Assistance for Supervision
Detailed Cost Table
Rp

	Totals Including Contingencies						Totals Including Contingencies US \$						Breakdown of Totals Incl. Cont. US \$			
	89/90	90/91	91/92	92/93	93-98	Total	89/90	90/91	91/92	92/93	93-98	Total	F.Exch	Local	Taxes	Total
I. INVESTMENT COSTS																
A. TA FOR TRAINING																
Training Surveyor	0.0	130.3	0.0	0.0	0.0	130.3	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1
Training Advisor	0.0	81.8	15.4	0.0	0.0	77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trainers of Tech.Trainers	0.0	77.0	0.0	0.0	0.0	77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Office Costs	0.0	15.4	15.4	0.0	0.0	30.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	0.0	284.3	30.8	0.0	0.0	315.1	0.0	0.2	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.2
B. OTHER TRAINING COST																
Sessions Outside PDJ	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Running Costs	0.0	12.9	41.2	72.8	0.0	128.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
Equipment & Training Aids	0.0	0.0	27.5	0.0	0.0	27.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	0.0	12.9	69.0	72.8	0.0	154.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
C. MANAGMT. IMPROV. STUDY																
Managemt. Improvemt. Study	0.0	286.0	0.0	0.0	0.0	286.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.2
Total INVESTMENT COSTS	0.0	583.2	99.8	72.8	0.0	755.8	0.0	0.3	0.1	0.0	0.0	0.4	0.1	0.3	0.0	0.4
Total	0.0	583.2	99.8	72.8	0.0	755.8	0.0	0.3	0.1	0.0	0.0	0.4	0.1	0.3	0.0	0.4

- Values scaled by 1000000.0 4/28/1990 17:33

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SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
(JUDP II)
Table 301. CISADANE TREATED WATER TRANSMISSION MAIN
Detailed Cost Table
Rp

	Totals Including Contingencies							Totals Including Contingencies US \$						
	89/90	90/91	91/92	92/93	93/94	94-98	Total	89/90	90/91	91/92	92/93	93/94	94-98	Total
I. INVESTMENT COSTS														
A. LAND ACQUISITION														
Land acquisition	0.0	3741.8	0.0	0.0	0.0	0.0	3741.8	0.0	2.1	0.0	0.0	0.0	0.0	2.1
B. CONSTRUCTION														
Pipe materials	0.0	0.0	10085.2	7062.3	0.0	0.0	17147.5	0.0	0.0	5.6	3.9	0.0	0.0	9.5
Pipe laying	0.0	0.0	2017.0	2133.0	1133.2	0.0	5283.2	0.0	0.0	1.1	1.2	0.6	0.0	2.9
Equipment for pipeline	0.0	0.0	205.9	145.5	0.0	0.0	351.5	0.0	0.0	0.1	0.1	0.0	0.0	0.2
Pipeline structures	0.0	0.0	91.9	97.4	51.6	0.0	240.9	0.0	0.0	0.1	0.1	0.0	0.0	0.1
Branch point structures	0.0	0.0	35.4	37.8	19.9	0.0	92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Road reinstatement	0.0	0.0	42.9	45.5	24.1	0.0	112.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Pipe Bridges	0.0	0.0	126.2	133.8	70.9	0.0	330.9	0.0	0.0	0.1	0.1	0.0	0.0	0.2
Pilot Line	0.0	0.0	29.5	31.2	16.5	0.0	77.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inspection Track	0.0	0.0	64.7	274.1	0.0	0.0	338.8	0.0	0.0	0.0	0.2	0.0	0.0	0.2
Sub-Total	0.0	0.0	12898.7	9955.4	1316.2	0.0	23970.4	0.0	0.0	7.1	5.6	0.7	0.0	13.4
C. TA FOR SUPERVISION														
Team Leader	0.0	0.0	358.4	351.4	130.3	0.0	847.1	0.0	0.0	0.2	0.2	0.1	0.0	0.5
Other Int. Experts	0.0	0.0	0.0	117.3	0.0	0.0	117.3	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Senior Nat. Experts	0.0	0.0	81.2	89.6	29.5	0.0	199.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Other Nat. Experts	0.0	0.0	92.4	92.4	92.4	0.0	277.2	0.0	0.0	0.1	0.1	0.1	0.0	0.2
Inspectors/Draftsmen	0.0	0.0	23.2	23.2	23.2	0.0	69.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Office costs	0.0	0.0	69.3	69.3	0.0	0.0	138.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sub-Total	0.0	0.0	624.5	749.2	275.5	0.0	1649.1	0.0	0.0	0.3	0.4	0.2	0.0	0.9
D. TA FOR TRAINING														
Senior Training Consult.	0.0	0.0	130.3	0.0	0.0	0.0	130.3	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Electrical Engineer	0.0	0.0	130.3	65.2	65.2	0.0	260.8	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Training experts (Nat.)	0.0	0.0	132.9	44.3	44.3	0.0	221.4	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Office costs	0.0	0.0	27.5	27.5	0.0	0.0	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	0.0	0.0	421.0	138.9	109.4	0.0	667.4	0.0	0.0	0.2	0.1	0.1	0.0	0.4
E. OTHER TRAINING COSTS														
Overseas train. for managers	0.0	0.0	29.3	45.9	0.0	0.0	75.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Overseas train. for electr.	0.0	0.0	44.0	45.9	0.0	0.0	89.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sessions for Managers	0.0	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sessions for Supervisor	0.0	0.0	0.0	3.9	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sessions for Operators	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	0.0	0.0	73.3	99.6	0.0	0.0	172.8	0.0	0.0	0.0	0.1	0.0	0.0	0.1
F. MANAGEMENT IMPROV. STUDY														
Management Expert	0.0	97.7	0.0	0.0	0.0	0.0	97.7	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Management Experts (Nat.)	0.0	92.4	46.2	0.0	0.0	0.0	138.6	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Office costs	0.0	12.1	5.5	0.0	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	0.0	202.2	51.7	0.0	0.0	0.0	253.9	0.0	0.1	0.0	0.0	0.0	0.0	0.1
G. ADMINISTRATION														
Administration	0.0	0.0	845.5	508.9	65.8	0.0	1220.2	0.0	0.0	0.4	0.3	0.0	0.0	0.7
Total INVESTMENT COSTS	0.0	3944.0	14514.7	11450.0	1767.0	0.0	31875.7	0.0	2.2	8.1	6.4	1.0	0.0	17.6
Total	0.0	3944.0	14514.7	11450.0	1767.0	0.0	31875.7	0.0	2.2	8.1	6.4	1.0	0.0	17.6

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
Table 302. PRIMARY DISTRIBUTION MAINS FOR SERPONG
 Detailed Cost Table
 Rp

	Totals Including Contingencies US \$							Totals Including Contingencies						
	89/90	90/91	91/92	92/93	93/94	94-98	Total	89/90	90/91	91/92	92/93	93/94	94-98	Total
I. INVESTMENT COSTS														
A. LAND ACQUISITION														
Land Acquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.7	0.0	0.0	0.0	0.0	58.7
B. CONSTRUCTION														
Pipe Material	0.0	0.0	0.7	0.5	0.0	0.0	1.1	0.0	0.0	1173.7	820.7	0.0	0.0	1994.5
Pipe Laying	0.0	0.0	0.1	0.1	0.1	0.0	0.3	0.0	0.0	195.2	206.9	109.7	0.0	511.8
Equipment for Pipeline	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.7	19.8	10.5	0.0	49.0
Sub-Total	0.0	0.0	0.8	0.6	0.1	0.0	1.4	0.0	0.0	1387.6	1047.5	120.2	0.0	2555.2
C. TA FOR SUPERVISION	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	62.2	44.6	4.7	0.0	111.6
D. ADMINISTRATION														
Administration	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	70.6	53.7	6.0	0.0	130.3
Total INVESTMENT COSTS	0.0	0.0	0.8	0.6	0.1	0.0	1.6	0.0	58.7	1520.4	1145.8	130.9	0.0	2855.8
Total	0.0	0.0	0.8	0.6	0.1	0.0	1.6	0.0	58.7	1520.4	1145.8	130.9	0.0	2855.8

- Values scaled by 1000000.0 4/28/1990 17:41

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
Table 401. SEWERAGE (JSSP EXTENSION)
 Sewers and Drains in the JSSP area
 Detailed Cost Table
 Rp

Totals Including Contingencies
 US \$

Totals Including Contingencies

	Totals Including Contingencies US \$							Totals Including Contingencies						
	89/90	90/91	91/92	92/93	93/94	94-98	Total	89/90	90/91	91/92	92/93	93/94	94-98	Total
I. INVESTMENT COSTS														
A. SEWERAGE														
Sewers (Pkgs 7,8,18)	0.0	0.0	1.6	1.0	0.7	0.0	3.3	0.0	0.0	2865.1	1809.6	1270.0	0.0	5944.7
Sewer Mains E,F	0.0	0.0	1.4	1.1	1.2	0.0	3.7	0.0	0.0	2552.6	2004.5	2098.8	0.0	6655.9
Krukut Pump Stat. (Pkg 9)	0.0	1.5	1.6	0.8	0.0	0.0	3.9	0.0	2710.6	2855.0	1500.0	0.0	0.0	7085.6
Property connections	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	807.2	0.0	0.0	807.2
Deep Low-cost sewers	0.0	0.3	0.6	0.7	0.0	0.0	1.6	0.0	543.3	1146.5	1208.9	0.0	0.0	2898.6
Sewer maintenance equipm.	0.0	0.2	0.8	0.0	0.0	0.0	0.9	0.0	324.2	1357.1	0.0	0.0	0.0	1681.2
Sub-Total	0.0	2.0	6.0	4.1	1.9	0.0	14.0	0.0	3578.0	10776.3	7428.1	3368.8	0.0	25151.3
B. DRAINAGE														
Macrodrainage	0.0	0.0	0.7	0.4	0.3	0.0	1.4	0.0	0.0	1232.2	783.7	553.8	0.0	2569.8
Microdrainage	0.0	0.0	1.2	0.8	0.5	0.0	2.5	0.0	0.0	2178.8	1385.7	979.3	0.0	4543.8
Sub-Total	0.0	0.0	1.9	1.2	0.9	0.0	4.0	0.0	0.0	3411.1	2169.4	1533.1	0.0	7113.6
C. ENVIRONMENTAL														
Desludging and monit.equ.	0.0	0.2	0.8	0.0	0.0	0.0	0.9	0.0	324.2	1357.1	0.0	0.0	0.0	1681.2
D. TRAINING														
Training	0.0	0.1	0.2	0.2	0.0	0.0	0.4	0.0	130.7	277.8	294.5	0.0	0.0	703.0
E. TECHNICAL ASSISTANCE														
FED/Sup.for Sewers/Drain.	0.0	0.3	0.7	0.5	0.0	0.0	1.5	0.0	592.3	1184.7	888.5	0.0	0.0	2665.6
Organisation Development	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.0	130.3	217.2	88.9	0.0	0.0	434.4
Sub-Total	0.0	0.4	0.8	0.5	0.0	0.0	1.7	0.0	722.7	1401.9	976.4	0.0	0.0	3100.0
F. ADMINISTRATION														
Administration	0.0	0.1	0.4	0.3	0.1	0.0	0.9	0.0	216.6	659.1	457.4	210.6	0.0	1543.7
Total INVESTMENT COSTS	0.0	2.8	10.0	6.3	2.8	0.0	21.9	0.0	4972.2	17893.2	11324.9	5112.4	0.0	39292.8
Total	0.0	2.8	10.0	6.3	2.8	0.0	21.9	0.0	4972.2	17893.2	11324.9	5112.4	0.0	39292.8

- Values scaled by 1000000.0 4/28/1990 17:44

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
Table 501. WORKS FOR WASTEWATER DISPOSAL IN DISTRIBUTION ZONES 1,2,4,5
 Miscellaneous Small Drainage Works associated with the PJSIP
 Detailed Cost Table
 Rp

	Totals Including Contingencies US \$								Totals Including Contingencies							
	89/90	90/91	91/92	92/93	93/94	94/95	95/96	Total	89/90	90/91	91/92	92/93	93/94	94/95	95/96	Total
I. INVESTMENT COSTS																
A. CONSTRUCTION																
Microdrainage	0.0	0.0	0.1	0.1	0.5	0.4	0.1	1.2	0.0	65.2	138.5	252.0	881.4	655.6	115.8	2103.6
B. TA FOR FED/SUP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	5.2	11.1	20.2	70.5	52.4	9.8	168.7
C. ADMINISTRATION																
Administration	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.3	6.9	12.6	44.1	32.8	5.8	105.4
Total INVESTMENT COSTS	0.0	0.0	0.1	0.2	0.6	0.4	0.1	1.3	0.0	73.7	156.6	284.8	996.0	740.8	130.9	2382.7
Total	0.0	0.0	0.1	0.2	0.6	0.4	0.1	1.3	0.0	73.7	156.6	284.8	996.0	740.8	130.9	2382.7

- Values scaled by 1000000.0 4/26/1990 17:48

Table 502. WORKS FOR WASTEWATER DISPOSAL IN DISTRIBUTION ZONES 3 + 6
 Miscellaneous Small Drainage Works associated with the PJSIP
 Detailed Cost Table
 Rp

	Totals Including Contingencies					Totals Including Contingencies US \$				
	89-93	93/94	94/95	95/96	Total	89-93	93/94	94/95	95/96	Total
I. INVESTMENT COSTS										
A. CONSTRUCTION										
Microdrainage	0.0	176.7	356.8	211.2	744.8	0.0	0.1	0.2	0.1	0.4
B. TA FOR FED/SUP	0.0	14.1	28.5	16.9	59.6	0.0	0.0	0.0	0.0	0.0
C. ADMINISTRATION										
Administration	0.0	8.8	17.8	10.6	37.2	0.0	0.0	0.0	0.0	0.0
Total INVESTMENT COSTS	0.0	199.7	403.2	238.6	841.4	0.0	0.1	0.2	0.1	0.6
Total	0.0	199.7	403.2	238.6	841.4	0.0	0.1	0.2	0.1	0.6

- Values scaled by 1000000.0 4/26/1990 17:51

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
 Table 601. Priority Major Drainage in DKI-Jakarta
 Detailed Cost Table
 Rp

	Totals Including Contingencies US \$							Totals Including Contingencies						
	89/90	90/91	91/92	92/93	93/94	94-96	Total	89/90	90/91	91/92	92/93	93/94	94-96	Total
I. INVESTMENT COSTS														
A. LAND ACQUISITION	0.0	0.6	0.0	0.0	0.0	0.0	0.6	0.0	1038.0	0.0	0.0	0.0	0.0	1038.0
B. DREDGING KALI CILIRANG														
Excav.Dredging & Disposal	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1886.8	0.0	0.0	0.0	0.0	1886.8
C. DREDGING ANCUL CANAL														
Excav.Lining+Improvement	0.0	0.0	1.3	0.0	0.0	0.0	1.3	0.0	0.0	2340.9	0.0	0.0	0.0	2340.9
D. DREDGING PADEHANG.BAR/TIM														
Excav.Disposal + Lining	0.0	0.0	1.1	0.0	0.0	0.0	1.1	0.0	0.0	1899.5	0.0	0.0	0.0	1899.5
E. DREDGING PLUIT BASIN														
Excav.Dredging + Disposal	0.0	0.0	2.2	2.3	0.0	0.0	4.6	0.0	0.0	3977.0	4201.1	0.0	0.0	8178.2
F. REPL.PUMPS AT PLUIT P.Stn														
Repl.Pumps at Pluit P.Stn	0.0	0.0	1.4	1.5	0.0	0.0	2.9	0.0	0.0	2504.1	2617.1	0.0	0.0	5121.2
G. DREDGING MAJOR DRAINS														
Excav.Roh.Upgr.Pluit Rovr.	0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	882.7	0.0	0.0	0.0	0.0	882.7
H. PEKAPURAN/SENTIONG/ANCOL														
Pekapuran Tidal Gato	0.0	0.0	1.4	1.5	1.6	0.0	4.5	0.0	0.0	2520.0	2362.0	2697.3	0.0	6079.2
Sentiong Cut-off Channel	0.0	0.0	1.2	1.3	1.4	0.0	4.0	0.0	0.0	2241.0	2367.2	2576.5	0.0	7184.7
Ancol Gravity	0.0	0.0	0.2	0.2	0.2	0.0	0.7	0.0	0.0	389.9	411.8	448.2	0.0	1249.9
Sub-Total	0.0	0.0	2.9	3.0	3.3	0.0	9.2	0.0	0.0	5150.8	5441.0	5922.0	0.0	16513.8
I. PAPANGO DRAIN/LAGOA TIDAL	0.0	0.0	0.6	0.6	0.6	0.0	1.7	0.0	0.0	940.9	993.9	1081.8	0.0	3016.6
J. ADMINISTRATION	0.0	0.2	0.2	0.2	0.3	0.0	1.0	0.0	395.2	418.4	442.0	466.9	0.0	1722.4
K. TA FOR FED/SUPERVISION														
TA for T/D+Constr.Suprv	0.0	0.3	0.3	0.3	0.3	0.0	1.3	0.0	575.6	575.6	575.6	575.6	0.0	2302.3
Total INVESTMENT COSTS	0.0	2.7	9.9	8.0	4.5	0.0	25.0	0.0	4767.8	17807.2	14270.7	8046.3	0.0	44881.0
Total	0.0	2.7	9.9	8.0	4.5	0.0	25.0	0.0	4767.8	17807.2	14270.7	8046.3	0.0	44881.0

- Values scaled by 1000000.0 4/26/1990 17:55

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
Table 701. JABOTABEK WATER RESOURCE PROJECT
 Detailed Cost Table
 Rp

	Totals Including Contingencies US \$						Totals Including Contingencies					
	89/90	90/91	91/92	92/93	93-98	Total	89/90	90/91	91/92	92/93	93-98	Total
I. INVESTMENT COSTS												
A. STUDIES												
Job.W.R. Managmnt.Study	0.0	1.7	2.8	1.1	0.0	5.6	0.0	3012.0	5020.0	2008.0	0.0	10040.0
Job. Water Data Center	0.0	0.2	0.1	0.0	0.0	0.3	0.0	372.4	159.6	0.0	0.0	532.0
Jabotabek Institut.Study	0.0	0.2	0.2	0.0	0.0	0.4	0.0	370.0	370.0	0.0	0.0	740.0
Pasar Baru Weir Equipment	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	620.0	0.0	0.0	620.0
Sub-Total	0.0	2.1	3.4	1.1	0.0	6.8	0.0	3754.4	6169.6	2008.0	0.0	11932.0
Total INVESTMENT COSTS	0.0	2.1	3.4	1.1	0.0	6.8	0.0	3754.4	6169.6	2008.0	0.0	11932.0
Total	0.0	2.1	3.4	1.1	0.0	6.8	0.0	3754.4	6169.6	2008.0	0.0	11932.0

- Values scaled by 1000000.0 4/26/1990 17:57

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
 Table 121. STUDIES AND FUTURE PROJECT PREPARATION
 Detailed Cost Table
 Rp

	Totals Including Contingencies				Totals Including Contingencies US \$				Breakdown of Totals Incl.Cont. US \$			
	89/90	90-92	92-93	Total	89/90	90-92	92-93	Total	F.Exch	Local	Taxes	Total
I. INVESTMENT COSTS												
A. CPMD MAN.INF.SYS.	0.0	224.4	0.0	448.7	0.0	0.1	0.0	0.3	0.2	0.1	0.0	0.2
B. PREP. FOR URBAN DEV.	0.0	448.7	0.0	897.5	0.0	0.3	0.0	0.5	0.3	0.1	0.0	0.5
C. PROJ.MAN.TRAIN. DKI/DGCK	0.0	224.4	0.0	448.7	0.0	0.1	0.0	0.3	0.2	0.1	0.0	0.2
D. LARGE CIT.IUIDP	0.0	1032.1	0.0	2064.2	0.0	0.6	0.0	1.1	0.8	0.2	0.1	1.1
E. HRD.IN W.S. SECTOR	0.0	359.0	0.0	718.0	0.0	0.2	0.0	0.4	0.3	0.1	0.0	0.4
F. NEW L.S. URB.DEV.IN JABOT	0.0	448.7	0.0	897.5	0.0	0.3	0.0	0.5	0.3	0.1	0.0	0.5
G. PRIV.SEC.PART IN URB.DEV.	0.0	289.2	0.0	578.5	0.0	0.1	0.0	0.3	0.2	0.1	0.0	0.3
Total INVESTMENT COSTS	0.0	3008.6	0.0	6013.2	0.0	1.7	0.0	3.3	2.3	0.7	0.3	3.3
Total	0.0	3008.6	0.0	6013.2	0.0	1.7	0.0	3.3	2.3	0.7	0.3	3.3

- Values scaled by 1000000.0 4/26/1990 18:01

Indonesia
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT
 (JUDP II)
 Table 990. OVERALL COORDINATION FOR JUDP II
 Detailed Cost Table
 Rp

	Totals Including Contingencies							Totals Including Contingencies US \$						
	89/90	90/91	91/92	92/93	93/94	94-99	Total	89/90	90/91	91/92	92/93	93/94	94-99	Total
I. INVESTMENT COSTS														
A. INITIAL INVESTMENTS														
Initial investments	0.0	491.1	0.0	0.0	0.0	0.0	491.1	0.0	0.3	0.0	0.0	0.0	0.0	0.3
B. OPERATING COSTS														
Government staff	0.0	130.4	138.5	146.9	155.7	0.0	571.5	0.0	0.1	0.1	0.1	0.1	0.0	0.3
Other office costs	0.0	39.1	41.6	44.1	46.7	0.0	171.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sub-Total	0.0	169.5	180.1	190.9	202.4	0.0	742.9	0.0	0.1	0.1	0.1	0.1	0.0	0.4
C. EXPERTS														
Project Coord. Advisor	0.0	391.0	391.0	0.0	0.0	0.0	781.9	0.0	0.2	0.2	0.0	0.0	0.0	0.4
Planning/Inct. Advisor	0.0	280.6	290.6	130.3	0.0	0.0	661.6	0.0	0.1	0.1	0.1	0.0	0.0	0.4
Hydraulic/Sanitary Engr.	0.0	391.0	391.0	0.0	0.0	0.0	781.9	0.0	0.2	0.2	0.0	0.0	0.0	0.4
Specialists	0.0	325.8	325.8	325.8	325.8	0.0	1303.2	0.0	0.2	0.2	0.2	0.2	0.0	0.7
Coordinator/Team Leader	0.0	88.6	88.6	88.6	88.6	0.0	354.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Senior Professionals	0.0	265.7	265.7	265.7	132.9	0.0	930.3	0.0	0.1	0.1	0.1	0.1	0.0	0.5
Sub-Total	0.0	1722.6	1722.6	810.4	547.2	0.0	4802.9	0.0	1.0	1.0	0.5	0.3	0.0	2.7
Total INVESTMENT COSTS	0.0	2383.2	1902.7	1001.3	749.6	0.0	6036.8	0.0	1.3	1.1	0.6	0.4	0.0	3.4
Total	0.0	2383.2	1902.7	1001.3	749.6	0.0	6036.8	0.0	1.3	1.1	0.6	0.4	0.0	3.4

- Values scaled by 1000000.0 4/28/1990 7:32

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Groundwater in Jabotabek Area

A. Importance of Groundwater in the Jabotabek Area

1. Groundwater is a major source for water supply in the Jabotabek area. An indicator for this is the fact that the centralized public water supply of Jakarta--which is mainly based on surface water--covers currently only some 30 to 35 percent of the urban area, thus serving not more than half the urban population (supply by public standpipes included). This means that millions of people in this metropolis have to rely on other sources to satisfy their water demands: these sources consist largely of groundwater.

2. At present, some 200 to 250 million m³ per year (approximately 7 m³/s) are abstracted in DKI Jakarta and at least 50 million m³ per year (approximately 1.6 m³/s) in Botabek. These abstractions are from both shallow and deep wells: the major part (60-80 percent) is pumped from shallow wells of less than 15 m of depth.

3. In spite of ongoing projects that have the objective to increase substantially the supply of surface water to the urban centers of Jabotabek, groundwater will remain an important source of water in the future as well, because part of the population might never be able to afford a connection to the piped system or might prefer groundwater over the water provided by PDAM. Moreover, complete coverage of the area by a central water supply network is possibly beyond reach of the water supply companies, certainly in the near future.

B. The Jakarta Groundwater Basin

4. The main groundwater reservoir in the Jabotabek area consists of a fan-shaped basin filled with unconsolidated quaternary deposits, like alluvial and deltaic sands and clays, and volcanic breccias. This dominantly alluvial-coastal basin extends from the foothills north of Bogor to the Java Sea and includes the entire area of DKI Jakarta and part of the Kabupatens Bogor, Tangerang and Bekasi. North of Depok, a distinction between shallow and deeper aquifer zones is meaningful: the shallow zone (upper 50 m) is more or less phreatic and its water table is likely to recover completely during the rainy season, whereas groundwater in the deeper zones is confined and may have a piezometric level that does not correspond to the local water table.

5. Different hydraulic interpretations of the basin's lithology can be observed in technical reports on the Jakarta groundwater basin. Some investigators assume the presence of four distinct aquifers separated by regionally continuous aquitards, as indicated in figure 1: an upper unconfined one (above 50 m below ground surface), two confined aquifers containing fresh water, and a lower confined aquifer filled with saline groundwater. Others,

however, see the basin as one continuous and nearly homogeneous aquifer system characterized by a very low vertical hydraulic conductivity.

6. Deep groundwater in the unconsolidated aquifer beds used to be artesian in the earlier days. Nowadays, however, these resources are being intensively exploited, which has caused considerable declines of the groundwater levels. These declines are still increasing year after year (indicating a state of nonequilibrium) and have already reached 40 m in some zones. In a 5-10 km wide continuous belt along the coast, groundwater is brackish or saline. Bacteriological contamination of the shallow groundwater is widespread.

C. Other Groundwater Systems

7. Outside the area covered by the described unconsolidated quaternary aquifer system, groundwater conditions are different. The mountainous area in the southern part of Kabupaten Bogor is largely composed of young volcanic rocks, characterized by highly variable groundwater conditions. Several rather large springs are present in a few zones, but poor aquifer conditions are observed elsewhere. In general, the topographically higher zones are practically unproductive, whereas the lower slopes are the most promising parts, although limited in areal extent. The remaining parts of the Jabotabek area are largely composed of rocks of little significance for groundwater development, although there might be scope for local abstractions.

D. Groundwater Abstraction and Use

8. At present, some 200 to 250 million m³ of groundwater per year are abstracted in DKI Jakarta (approximately 7 m³/s). There is some contradiction between different sources of information on groundwater abstraction: e.g., PDAM Jaya indicates that the number of deep wells was around 2,500 in 1985, with a total abstraction rate of 25.1 million m³/year, but the GHAG/DEG study (1985) suggests that an abstraction of 47 million m³/year from deep aquifer layers is more plausible. Indec *et al.* (1987), on the other hand, conclude from their model study that some 3.6 m³/s is being abstracted from the confined aquifer beds in the Jakarta groundwater basin, i.e., 114 million m³/year, most of which is pumped in DKI Jakarta.

9. Accurate data on shallow groundwater abstraction do not exist. All sources, however, agree that abstraction of groundwater by shallow wells is larger than deep groundwater abstraction. A recent survey (P.T. Inertia Ampak Engineers, 1986) estimates that in 1986 approximately 4.4 million people in DKI Jakarta were served by shallow wells, at an aggregate consumption rate of 3.7 m³/s (117 million m³/year). The number of registered deep wells in Botabek is 560; the total rate of groundwater abstraction (by shallow and deep wells) in that area is at least 50 million m³/year. This brings the total groundwater abstraction in Jabotabek to 220-300 million m³/year (7-9.5 m³/s).

10. The production costs of groundwater are very much dependent on the type and depth of the well, the pump used and the intensity of use. Typical values for nonmanually pumped wells range from Rp 300 (shallow wells) to Rp 500/m³ (deep wells). In addition to these production costs, the groundwater users have to pay other costs. For deep wells, fees have to be paid

upon well completion and there are additional charges per m⁵ of water pumped. Users of groundwater from shallow wells have the cost of boiling this water, because of the bacteriological contamination hazard.

E. Groundwater Abstraction vs. Aquifer Potential

11. Although it is difficult to give a quantitative estimate of the maximum abstraction that could be sustained by the aquifer system, more can be mentioned regarding the balance between groundwater abstraction and the aquifer's potential as a source of groundwater. To this end, the conditions in the three main zones are characterized briefly below.

12. In the 5-10 km northern zone along the coast, overexploitation of groundwater is considered to be severe. Piezometric levels of deeper aquifer zones have declined up to several tens of meters and phreatic levels apparently are declining as well. In connection to groundwater abstraction, salinization of formerly freshwater zones has been observed.

13. Overexploitation is also evident for the deeper aquifer beds in the second zone covering most of central and southern DKI Jakarta, which is testified by continuously falling piezometric levels. The shallow groundwater, however, is rather easily replenished during the rainy seasons and phreatic levels probably do not (yet) have a significant long-term declining trend.

14. In the southern zone (mainly situated outside DKI Jakarta boundaries in Botabek), the balance is more favorable, which can be explained by the much lower intensity of groundwater abstraction. The West Java Groundwater Survey (IWACO/WASECO) concludes that there is scope for some additional groundwater development in this zone. The amounts concerned, however, are only modest. Hence, the potential additional development of groundwater may be important for local water supplies, but at the same time insignificant compared to the present total groundwater abstraction in Jabotabek.

15. It is obvious that optimum abstraction rates of groundwater are not only dependent on the fluxes of groundwater, but even more on the environmental conditions present and on the environmental impacts of groundwater abstraction. The latter aspects are discussed below.

F. Groundwater-Associated Problems

16. As pointed out above (see Section B), groundwater development has changed drastically the hydrogeological regime of the confined groundwater beds in the alluvial-coastal aquifer: piezometric levels have declined and flow directions and patterns have changed accordingly, in particular in the northern and central zones.

17. These changes have very important practical economic and environmental consequences:

- (a) artesian flow has stopped in the Jakarta area (but can still be observed in the northern parts of Kabupatens Tangerang and Bekasi) and groundwater has to be lifted from greater depths, which constitutes an economic loss;

- (b) the southern part of the basin is no longer the only recharge zone for the confined groundwater: its recharge is even exceeded now by downward leakage of groundwater from the shallow zone in the Jakarta area. This has very important implications:
- increased recharge of the deeper groundwater zone;
 - increasing groundwater pollution risks: protection of recharge (in particular from the point of view of water quality) is not only needed in the southern part of the basin, but almost over the total area covered by unconsolidated quaternary deposits;
 - the downward leakage may bring about permanent declines of the water table, which renders users of shallow wells more vulnerable to seasonal water-table variations;
- (c) inversion of groundwater flow directions triggers groundwater salinization, both by intrusion and by mobilization of connate saline/brackish groundwater, which may turn part of the aquifer useless;
- (d) declining piezometric levels in a basin containing plenty of clay is likely to produce land subsidence, which may actually cause damage to buildings, pipelines, drainage systems, etc. and stagnation of natural drainage; and
- (e) declining groundwater may lead as well to reduction of base flow of streams (it is not clear whether this would cause any problem).

18. In addition to its increased vulnerability (as explained), the aquifer system is exposed to steadily increasing pollution intensities and risks. Furthermore, it is important to observe that part of the potential impacts mentioned above are physically irreversible (e.g., pollution, salinization and subsidence) and thus may cause a permanent economic loss. Hence, the need for careful development and management of the groundwater resources in the Jabotabek area is evident.

19. Although there may be some scope for additional groundwater development in the Botabek area (as mentioned above), the emphasis of groundwater management activities in Jabotabek undoubtedly has to be on conservation and protection of the groundwater resources. In this respect, major issues for consideration are:

- (a) control of groundwater abstraction;
- (b) selective reduction and/or relocation of groundwater abstractions;
- (c) protection of the recharge (water quality and quantity) by proper urban and industrial planning; and
- (d) adequate activities in the fields of sanitation and pollution control.

The scope for artificial recharge is probably very limited, due to the low hydraulic conductivity of the aquifer system.

G. Groundwater Management

20. Groundwater resources management setting in Jabotabek should be seen from different angles:

- (a) groundwater as a source of water supply (traditional point of view);
- (b) environmental threats to groundwater (risks for sustainability of groundwater as a source of water); and
- (c) environmental impacts of groundwater abstraction and development.

Current groundwater management in Jabotabek is focusing on (a) and to a certain extent on (b) as well (as far as environmental threats to groundwater are produced by groundwater abstraction). This explains the dominant role at present of organizations such as DEG and PDAM Jaya.

21. Environmental threats to groundwater may be produced by many factors that are not directly controlled by groundwater abstraction, e.g., waste disposal, urban planning, sanitation, etc. Furthermore, impacts of groundwater abstraction may not only be related to groundwater as a source of water, but also to rather different aspects such as land subsidence. Hence, organizations responsible in those fields should participate in the process of groundwater management strategy development, and commit themselves to the resulting measures, while at the same time taking care that these measures should duly respect their sectoral interests as well.

22. Existing legislation and regulations concerning groundwater resources management is more or less restricted to the control of groundwater abstraction. However, additional legislation and procedures will be required to implement new categories of measures which are not intended to control groundwater abstraction, but to control other factors affecting the groundwater resources (urban planning, land development planning, sanitation, waste disposal, etc.). New groundwater resources management measures agreed upon need to be incorporated in standard planning practices of different government organizations. It is important to define procedures for this purpose and for monitoring whether this is done.

23. Day-to-day implementation of groundwater management measures such as collecting fees and charges for well drilling and groundwater abstraction is currently done by PDAM Jaya in DKI Jakarta and by BAPAIR in West Java. It is not accurately known how exhaustively this work is carried out; the heavy workload may for PDAM Jaya not always be compatible with the organization's first priority: supply of water. To the extent that groundwater management measures will become more complex, e.g., imposing restrictions to activities of different government agencies (urban planning, sanitation, etc.), more people of more diverse disciplines will be required to impose these measures or to verify that agreed restrictions are respected. This means that the implementing agencies will need to extend personnel and--furthermore--it needs

to be examined whether the extension of tasks still fits within the institutional competence of the acting agencies.

24. The proposed Water Resources Management Study Component with its associated activities (see Annex 8) has been conceived and designed to address the major groundwater related issues identified above. The Study is expected to produce a comprehensive management strategy for groundwater together with specific priority measures--which could still be implemented under this project--to protect and conserve the Jabotabek regional water resources.

INDONESIA
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

ANNEX 16
PAGE 1

COMPONENT "A" CIVIL WORKS
PJSIP

PROCUREMENT ARRANGEMENT

	COMPONENT	AGENCY RESPONSIBLE	NO/ TYPE	TOTAL COST B. RP.	IBRD FINANCING	PQ		TENDER DOC.		PROCUREMENT PLAN		BID EVALUATION	AWARD
						A	NA	A	NA	P/Q	TENDER CALLING		
4	PULDGADUNG 6 PRIMARY CELLS (18 EZ) Rehabilitation	PDAM Jaya	2 - LCB	5.2	3.2 (62)	A		A		Feb. 1990			Feb. 1991
5	IMMEDIATE ACTION AREA 5 Primary Cells (18 EZ) Rehabilitation	Do.	2 - LCB	4.4	2.7 (62)	A		A		Feb. 1990			July 1991
8	ZONES 1, 2 800 Large Meters	Do.	4 - LCB	9.2	5.7 (62)				NA	Feb. 1990			July 1991
9	(30 EZ, 10 PC) ZONES 1, 2, 5 Rehabilitation	Do.	2 - LCB 2 - LCB 1 - LCB	3.8 2.4	2.4 (62) 1.5 (62)	A A A			NA NA NA	July 1991 Dec. 1993 Dec. 1994			July 1992 Jan. 1994 Jan. 1995
11	Primary Network Rehabilitation	Do.	1 - LCB	2.9	1.8 (62)	A			NA				July 1992
	SUB-TOTAL 1	Do.											
1	PULDGADUNG 6 PRIMARY CELLS (18 EZ) Primary, Secondary and Tertiary Infill/ Extension, District Meters, House Connections	Do.	2 - LCB	9.0 2.1	5.6 (62) 1.3 (62)	A		A		Feb. 1990			Dec. 1991
2	IMMEDIATE ACTION AREA 6 PRIMARY ZONES (5 EZ) District Metering plus Relevant Secondary Infill/Extension	Do.	1 - LCB	5.4	3.3 (62)	A		A		Feb. 1990			July 1991

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SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

ANNEX 16

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COMPONENT "A" CIVIL WORKS
PJSIP

PROCUREMENT ARRANGEMENT

COMPONENT	AGENCY RESPONSIBLE	NO/ TYPE	TOTAL COST B. RP.	IBRD FINANCING	PQ		TENDER DOC.		PROCUREMENT PLAN			
					A	NA	A	NA	P/Q	TENDER CALLING	BID EVALUTION	AWARD
6 IMMEDIATE ACTION AREA	Do.	2 - LCB	4.3	2.7 (62)	A			NA	Feb. 1990			July 1992
		HC	1.0	0.6 (62)	A			NA	Feb. 1990			Dec. 1992
7 (30 EZ, 10 PC) ZONE 1, 2 District Meters. Relevant Infill/Extension	Do.	1 - LCB	2.1	1.3 (62)	A			NA	Feb. 1990			June 1991
		4 - LCB	9.4	5.8 (62)	A			NA	Feb. 1990			June 1992
10 (39 EZ, 13 PC) ZONES 4, 5 Infill/Extension	Do.	2 - ICB	14.1	8.7 (62)	A			NA	Feb. 1990			June 1992
		2 - ICB	4.1	2.5 (62)	A			NA	Feb. 1990			Dec. 1992
		1 - ICB	2.8	1.7 (62)	A			NA	Feb. 1992			June 1993
A (78 EZ, 25 PC) ZONES 4, 5 Extension	Do.	3 - ICB	21.7	13.4 (62)	A			NA	Feb. 1992			Sept. 1993
		2 - LCB	4.3	2.7 (62)	A			NA	Feb. 1992			July 1992
		3 - LCB	6.5	4.0 (62)	A			NA	Feb. 1992			Dec. 1992
		2 - LCB	2.6	1.6 (62)	A			NA	Feb. 1992			Dec. 1993
		HC				A			NA	Feb. 1992		
SUB-TOTAL 2												
B R5 Distribution Center	Do.	1 - ICB	8.4	5.2 (62)	A		A		June 1990			July 1991
SUB-TOTAL 3												
12 Primary Network Extension ZONES 1, 2	Do.	3 - ICB	4.2	2.6 (62)	A			NA	June 1991			July 1991
		1 - LCB	7.1	4.4 (62)	A			NA	June 1992			Jan. 1992
		1 - LCB	0.9	0.6 (62)								Jan. 1993
		1 - LCB	0.8	0.5 (62)								Jan. 1994
SUB-TOTAL 4												
C Primary Distribution Mains ZONES 4, 5 - Cisadane Resource Supply Area	Do.	2 - ICB	30.2	18.7 (62)	A		A		May 1990			March 1991
		4 - LCB	10.5	6.5 (62)	A		A		May 1990			Aug. 1991
SUB-TOTAL 5												
TOTAL		LCB 38 ICB 13	179.4	111.2 (62)								

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SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

ANNEX 16

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COMPONENT "C" CIVIL WORKS - PEJORANGAN PIPELINE

PROCUREMENT - ARRANGEMENTS

PARTS	DESCRIPTION	AGENCY RESPONSIBLE	TYPE OF PROC.	NOS. OF CONTRACTS	TOTAL COST IN B. RP	IBRD FINANCING B. RP %	STATUS OF DOCS.				PROCUREMENT PLAN					REMARKS	
							P/Q		TENDER DOC.		P/Q	TENDER CALLING	BID OPENING	EVALUATION OF BID	TENDER AWARD		
							A	NA	A	NA							
1	Pumping Station & Structures	PSJ	ICB	1	20.4	12.6 (62)	X		X			1 April 1990	1 July 1990	1 Sept. 1990	1 November 1990	1 January 1990	Combined Contract Multi Years
2	Pipe Line, 11 km	PSJ	ICB	1	48.6	30.1 (62)	X		X			Ditto	Ditto	Ditto	Ditto	Ditto	NYC
3	WTC Protection works	PSJ	LCB	1	5.0	3.1 (62)	X		X			1 April 1991	1 May 1991	25 May 1991	30 June 1991	1 Sept. 1991	
Part "B" Total					74.0	45.8											

A - Available
NA - Not Available

INDONESIA
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

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COMPONENT "D" - CISADANE PIPELINE

PROCUREMENT - ARRANGEMENTS

TANGERANG

PARTS	DESCRIPTION	AGENCY RESPONSIBLE	TYPE OF PROC.	NOS. OF CONTRACTS	TOTAL COST IN B. RP	IBRD FINANCING B. RP %	STATUS OF DOCS.				PROCUREMENT PLAN					REMARKS	
							P/Q		TENDER DOC.		P/Q	TENDER CALLING	BID OPENING	EVALUATION OF BID	TENDER AWARD		
							A	NA	A	NA							
1	SUPPLY OF PIPES AND ACCESSORIES FOR TRANSMISSION MAIN SERPONG TO BOUNDARY OF DKI (14.430 M)	PDAM TANGERANG	ICB	1	17.1	15.6 (91)	X		X			7/90	7/90	8/90	9/90	12/90	Supply Contract
2	SUPPLY OF PIPES AND ACCESSORIES FOR TRANSMISSION MAIN FOR SERPONG	PDAM TANGERANG	LCB	1	1.6	1.5 (91)	X		X			7/90	12/90	1/91	2/91	5/91	Ditto
3	PIPE INSTALLATION FOR TRANSMISSION MAIN SERPONG TO BOUNDARY OF DKI	PDAM TANGERANG	ICB	1	13.1	8.1 (62)			X			12/90	2/91	3/91	4/91	7/91	Combined Civil Works Contract
4	PIPE INSTALLATION FOR TRANSMISSION MAIN FOR SERPONG	PDAM TANGERANG	LCB	1	0.3	0.2 (62)						5/91	10/91	11/91	12/91	12/91	Ditto

Part "C" Total

32.1 25.4

A - Available
NA - Not Available

INDONESIA
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

ANNEX 16

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COMPONENT "E" - JSSP EXTENSION

PROCUREMENT - ARRANGEMENTS

PARTS	DESCRIPTION	AGENCY RESPONSIBLE	TYPE OF PROC.	MOS. OF CONTRACTS	TOTAL COST IN B. RP	IBRD FINANCING B. RP %	STATUS OF DOCS.				PROCUREMENT PLAN				
							P/Q		TENDER DOC.		P/Q	TENDER CALLING	BID OPENING	EVALUATION OF BID	TENDER AWARD
							A	NA	A	NA					
1	Supply of Environ & maint. equipment	JSSP-PMU	ICB	2	3.4	3.1 (91)		X		X		January 1991	February 1991	March 1991	August 1991
2	Krukut PS	JSSP-PMU	ICB	1	7.1	4.4 (62)		X		X	Nov. 1990	March 1991	May 1991	June 1991	August 1991
3	Constr. of Sewer Mains (E,F,7,8,18)	JSSP-PMU	ICB	1	12.6	7.8 (62)		X		X	Nov. 1990	June 1991	August 1991	September 1991	Nov. 1991
4	Property Connections	JSSP-PMU	LCB	1	0.9	0.6 (62)		X		X		July 1991	August 1991	September 1991	Nov. 1991
5	Drainage Works	JSSP-PMU	LCB	2	7.1	4.4 (62)		X		X	Jan. 1991	May 1991	June 1991	August 1991	Sept. 1991
6	Demo Low-Cost Sewer Pilot Project	JSSP-PMU	F/A		2.9	1.4 (50)									
				Part "D" Total	34.0	21.7									

A - Available
NA - Not Available

INDONESIA
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

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COMPONENT "G" - DRAINAGE WORKS

PROCUREMENT - ARRANGEMENTS

PARTS	DESCRIPTION	AGENCY RESPONSIBLE	TYPE OF PROC.	NOS. OF CONTRACTS	TOTAL COST IN B. RP	IBRD FINANCING B. RP %	STATUS OF DOCS.				PROCUREMENT PLAN					REMARKS	
							P/O		TENDER DOC.		P/O	TENDER CALLING	BID OPENING	EVALUATION OF BID	TENDER AWARD		
							A	MA	A	MA							
1	Dredging of Pluit Reservoir & Rehab. Pump Station	PBJR	ICB	1	(*) 14.1	5.0 (62) 5.6 (91)		X		X		1 April 1991	1 June 1991	1 August 1991	1 October 1991	1 Dec. 1991	Multi years Combined contract w/LIB for supply of Pumps & Screens
2	Pakempuran Tidal Gate	PBJR	ICB	1	8.2	5.1 (62)		X		X		Ditto	Ditto	Ditto	Ditto	Ditto	Multi years
3	Excavation of Ciliwung River, 14 km	DO.	LCB	1	2.0	1.2 (62)	X		X			15 August 1990	1 Sept. 1990	22 Sept. 1990	1 October 1990	25 October 1990	
4	Excavation & Lining of Ancol Canal, 6.5 km	DO.	LCB	1	2.1	1.3 (62)		X		X		15 August 1991	1 Sept. 1991	22 Sept. 1991	1 October 1991	25 October 1991	
5	Excavation & Lining at Pedemangan Canals 5.5 km	DO.	LCB	1	1.8	1.1 (62)		X		X		10 August 1991	25 August 1991	17 Sept. 1991	25 September 1991	20 October 1991	
6	Excavation of K. Besar, Pakin, Jelakeng & Duri Canals, 10.5 km	DO.	LCB	1	1.1	0.7 (62)	X		X			10 August 1990	25 August 1990	17 Sept. 1990	25 September 1990	20 October 1990	
7	Sentiong Cut off Channels	DO.	LCB	1	5.0	3.1 (62)		X		X		1 June 1991	1 August 1991	1 October 1991	1 December 1991	15 January 1992	Multi years
8	Ancol Gravity	DO.	LCB	1	1.5	0.9 (62)		X		X		1 April 1992	15 April 1992	7 May 1992	22 May 1992	15 June 1992	
9	Papanggo Drain & Lagoa Tidal Gate	DO.	LCB	1	3.0	1.9 (62)	X		X			1 April 1991	15 April 1991	7 May 1991	22 May 1991	15 June 1991	
Part "E" Total					38.8	25.9											

A - Available
MA - Not Available

(*) This amount consist of:

- (a) Civil works and installation/errection costs Rp. 8 billion - (Civil works category)
- (b) Supply of pumps, screens, and mechanical parts Rp. 6.1 billion - (Category of goods)

INDONESIA
JABOTABEK WATER AND SANITATION PROJECT (JWSP)

Procurement Guidelines
Procurement Review Procedures

	Procurement procedure	Aggregate limit (\$)	Prior review requirements						Post-board review requirements (contr. documents, bid eval. & award)	
			Advertisement	Instr. to bid/gen. cond.	Tech. specs. & plans	Bill of quantities	Contr. doc.	Bid eval. & award		Proqualif. procedures
Equipment										
> 8500,000	ICB	no limit	<i>La, Lb</i>	<i>Lc</i>	<i>Lf</i>	<i>La</i>	<i>Lh</i>	<i>Lh</i>	none	Not applic.
> 8200,000	ICB	no limit	<i>La</i>	<i>Lc</i>	none	none	none	none	none	Not applic.
< 8200,000	LCB	no limit	<i>La</i>	<i>La</i>	none	none	none	none	none	<i>Li</i>
< 8 50,000	LCB (prudent shopping)	81 million	<i>La</i>	<i>La</i>	none	none	none	none	none	<i>Li, Lh</i>
Civil Works										
> 88,000,000	ICB	no limit	<i>La, Lb</i>	<i>Ld</i>	<i>Lf</i>	<i>La</i>	<i>Lh</i>	<i>Lh</i>	<i>Li</i>	Not applic.
> 81,000,000	LCB	no limit	<i>La</i>	<i>La</i>	<i>Lf</i>	<i>La</i>	<i>Lh</i>	<i>Lh</i>	<i>Li</i>	Not applic.
< 81,000,000	LCB	no limit	<i>La</i>	<i>La</i>	none	none	none	none	none	<i>Li, Lh</i>
---	Forco account	85 million	<i>La</i>	<i>La</i>	none	none	none	none	none	<i>Li, Lh</i>
Technical Assistance	-	no limit	<i>La, Lb</i>	<i>La</i>	-	-	<i>Lh</i>	<i>Lh</i>	<i>Li</i>	Not applic.

La General advertisement placed in "Development Business".

Lb Optional specific advertisement placed in "Development Business".

Lc Documents to conform to provisions of Bank's "Sample Bidding Documents for Procurement of Goods".

Ld Documents to conform to provisions of Bank's "Sample Bidding Documents for Procurement of Works".

Le Bank concurrence initially required on advertising procedures and general conditions. Then Bank prior review necessary only if changes are made in the procedures of standard agreements.

Lf Standard specifications to be used; specific provisions to be used as and when necessary.

La Nonstandard documents specific to contracts and not previously reviewed by Bank.

Lh All bid evaluations and award recommendations.

Li Procedures to be reviewed by Bank.

Li Review by World Bank, Jakarta Office.

Lh Recording and reimbursement by Statement of Expenditure (SOE) procedure.

Li Bank review of consultant short lists.

Ld Documents to conform to Bank's Guidelines for the use of consultants by World Bank borrowers.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Disbursement Schedule
(US\$ million)

Semester	Semester ending	Amount	Estimated disbursements		Profile /a (Cum. %)/c
			Cumulative Amount	%	
1	12/90	5.8	5.8	3.1	6
2	06/91	17.8	23.6	12.4	11
3	12/91	23.9	47.5	25.0	20
4	06/92	38.9	86.4	45.5	29
5	12/92	29.7	116.1	61.1	40
6	06/93	22.9	139.0	73.2	52
7	12/93	17.0	156.0	82.1	62
8	06/94	14.8	170.8	89.9	73
9	12/94	9.1	179.9	94.7	79
10	06/95	4.9	184.8	97.3	85
11	12/95	2.3	187.1	98.5	90
12	06/96	1.6	188.7	99.3	95
13	12/96 /b	1.3	190.0	100.0	98

/a Urban sector profile for Indonesia.

/b Loan closing date.

/c Profile reaches 100% in Semester 14.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

Notes and Assumptions Used in the Financial Projections
of BPAL/Interim Sewerage Unit

1. VALUE ADDED TAX

The VAT is assumed to be equal to 10 percent of all operating cost excluding the personnel cost when BPAL users an agent for its purchases.

2. CONNECTED CUSTOMERS ON MARCH 31, 1989

	Group	1989	1990	1991	1992	1993	1994	1995	1996
Residential	A	200	1,000	1,800	2,507	3,323	3,323	3,323	3,323
Commercial (S)	B	10	28	50	87	205	205	205	205
Industrial	C	-	21	21	24	69	69	69	69
Commercial (L)	D	5	17	24	26	41	43	42	43
Hotel (L)	E	-	-	1	1	3	3	3	3
Social	F	-	2	7	16	16	29	29	29
Total		215	1,068	1,903	2,661	3,657	3,672	3,671	3,672

4. TARIFFS

BPAL has proposed a tariff and rate structure for approval by DKI Jakarta. The following tariffs have been approved by DKI Jakarta:

<u>Type of Customer</u>	<u>Tariff</u> <u>(Rp per month)</u>
Residential	2,400
Commercial	6,000
Industrial	10,000
Large Commercial	3,200,000
Large Hotel	7,900,000
Social Institutions	7,000

The above tariffs are based on average floor area for each type of customer. They will be reviewed in March 1991 and thereafter will be adjusted every three years.

(a) Tariff Revenues

The billing to generate tariff revenues will be based on the approved rate of Rp 40/m² of agreed floor area served for each connected customer .

(b) Income from New Connections

The new connection charges for residential customers are assumed to average Rp 360,000 per customer and assumed to be paid over a 15-year period.

Nonresidential customers will not be charged new connection fees but will have to provide their own sewer connections.

(c) Revenues from Discharge License Fees

Revenues from discharge license fees are computed by multiplying the number of nonresidential customers in the unsewered part of BPAL's Service Area by Rp 12,000 per year or Rp 1,000 per month. This income source for BPAL/PDAL will not be effective before March 1991.

(d) Revenues from Environmental Charges

Revenues from environmental charges are computed by multiplying the number of water consumers (about 70 percent of projected PDAM Jaya customers) by Rp 12,000 per or Rp 1,000 per month. This income source will not be effective before March 1991.

The estimated number of water consumers, based on PDAM Jaya connections is as follows:

<u>Year</u>	<u>Number of consumers</u>
1993	196,000
1994	204,000
1995	212,000
1996	210,000

5. OPERATING EXPENSES

(a) Personnel

Based on the institutional review of the personnel requirements of BPAL and the study of personnel costs, the projected personnel costs of BPAL in current 1989 prices are as follows:

<u>Year</u>	<u>No. of staff</u>	<u>Amount (Rp million)</u>
1989	30	81.48
1990	40	114.11
1991	50	150.57
1992	50	191.47
1993	50	236.81
1994	60	257.52
1995	70	266.08
1996	70	282.05

(b) Power and Fuel

This refers to the cost of power needed to run the seven aerator units with a capacity of 37 kW each. It is assumed that the cost of fuel is Rp 200 per kW and that 413.5 kWh will be needed daily. The cost of power will increase at the same rate as inflation.

(c) Repair and Maintenance

Repair and maintenance expenses are projected to be 0.5 percent of total fixed assets.

(d) Administration and Other Cost

This amount includes travel expenses, insurance, registration fees, office expenses and communication expenses. Administration and other costs are assumed to be 35 percent of personnel costs throughout the projected period.

(e) Customer Account Expenses

Customer account expenses include (i) 10 percent fee to be paid to PDAM Jaya starting in 1993 for the preparation and collection of bills for environmental charges; (ii) 10 percent fee to a collection agent for the collection of bills for discharge license fees; and (iii) expenses for the preparation and collection of sewerage bills.

(f) Bad Debts

It is expected that a number of customers may not pay their bills. Bad debts are assumed to be 5 percent of gross sewerage revenues for each year throughout the projection period.

6. SOURCES AND APPLICATION OF FUNDS

It is assumed that the funds for the construction of the sewerage system will be provided to BPAL as equity contribution in both JSSP I and the proposed extension. Additionally, it is assumed that any operating deficits until 1991 will be financed by GOI through CK. BPAL is expecting to attain a cash break-even point by 1991 through appropriate tariff measures.

7. BALANCE SHEET

Balance sheet of the BPAL was constructed for those expenditures which are related to the assets of the sewerage system only.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

PDAM Jaya

Assumptions Used in Financial Projections

1. The inflation for the entire period is 7 percent per annum in 1990 and 6 percent per annum thereafter.

Major Assumptions (under the Control of GOI and DKI Jakarta)

2. GOI assumes full financial responsibility for investment in Buaran II (which is 100 percent Loan financed), through year 2000. Grace period would be extended to year 2000. Interest would be accumulated. GOI has agreed to consider waiving the interest during the grace period if the financial position of the PDAM warrants it in year 2000.
3. DKI Jakarta would contribute Equity Funds to PDAM Jaya approximately equal to 10 percent of investment program in order to limit the financial burden (e.g., higher tariffs) on current PDAM consumers. The assumed contribution from DKI Jakarta are as follows: 1990--Rp 4.4 billion; 1991--Rp 10.0 billion; 1992--Rp 14.3 billion; 1993--Rp 17.0 billion; 1994--Rp 12.8 billion; 1995--Rp 11.2 billion; and 1996--Rp 12.7 billion.

Other Assumptions

Income Statement

4. Population Served. An average of 10 persons are assumed to be served connection.
5. Consumer Connections. The number of connections are assumed to increase by 20,000 in 1990, 25,000 in 1991, and 30,000/year thereafter. Distribution of the connections is shown in the demand projections shown below. These assumptions, in turn, are based on the expectation that: (1) an aggressive and sustained marketing campaign which presently includes: (a) direct appeal to consumers; (b) recently announced about 50 percent reduction in household connection charges; and (c) minimum delay in providing connections; (2) systematic and timely extension of the distribution system (mainly secondary and tertiary pipes) for which funds have been allocated under the project; and (3) charges for water abstraction through deep wells (which have recently been increased), would lead to some deepwell users switching to PDAM supply.
6. Production Capacity. The total treatment plant capacity available for PDAM Jaya at the beginning of each year is given below (where some plants e.g., Cisadane come "on stream" in the middle of the year, the total plant capacity has been prorated): 1989--6,900 l/s; 1990--8,850 l/s; 1991--

10,030 l/s; 1992--12,230 l/s; 1993--13,230 l/s; 1994--14,930 l/s; 1995--14,930 l/s; 1996 and thereafter--17,930 l/s. Annual production capacity is arrived at by multiplying the production by the plant utilization factor.

7. Plant Utilization Factor (PUF). Plants need to be taken out of service for maintenance, etc., during the year. The amount of the time that the plant is available for production in a year is known as PUF. The current PUF is estimated at 93 percent. This percentage is assumed throughout the projections.

8. Maximum Volume of Water Available for Sale. This is arrived at by combining the production capacity of PDAM Jaya, as adjusted by the PUF, and the production capacity of Cisadane for PDAM Jaya, as adjusted by the PUF, and then deducting from the total the UFW.

9. Forecast Volume Sold. This is arrived at by multiplying the number of connections by the average consumption. The results are summarized below:

DEMAND PROJECTIONS												
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
<u>Number of Connections ('000)</u>												
Households	161.1	178.9	202.0	230.1	258.2	286.3	314.4	342.5	370.6	398.7	426.8	454.9
Hydrants	1.4	2.1	2.5	2.9	3.3	3.7	4.1	4.5	4.9	5.3	5.7	6.1
Nonresidential	26.1	37.6	29.1	30.6	32.1	33.6	35.1	36.6	38.1	39.6	41.1	42.6
Total	168.6	208.0	233.6	263.6	293.6	323.6	353.6	383.6	413.6	443.6	473.6	503.6
<u>Unit Consumption (m³/day)</u>												
Households	1.00	1.00	1.00	1.00	1.00	1.02	1.04	1.06	1.07	1.09	1.11	1.13
Hydrants	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Nonresidential	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Average	1.64	1.64	1.62	1.59	1.56	1.56	1.56	1.56	1.57	1.57	1.58	1.59
<u>Total Consumption ('000 m³/d)</u>												
Households	161.1	178.9	202.0	230.1	258.2	291.6	326.1	361.6	398.1	435.7	474.4	514.0
Hydrants	16.8	25.2	30.0	34.8	39.6	44.4	49.2	54.0	58.8	63.6	68.4	73.2
Nonresidential	130.5	188.0	145.5	153.0	160.5	168.0	175.5	183.0	190.5	198.0	205.5	213.0
Total	308.4	342.1	377.5	417.9	458.3	504.0	550.6	598.6	647.4	697.3	748.3	800.2
<u>Total Consumption/Forecast Volume Sold ('000,000 m³/yr)</u>												
	112.57	124.87	137.79	152.53	167.28	183.96	201.04	218.49	236.30	254.51	273.13	292.09

Forecasts of volume sold made by OECF and GOI consultants are available in project files. For summary, see SAPROF (OECF) report.

10. Unaccounted-For-Water (UFW). Presently, the estimated UFW is 51.2 percent. For the purposes of these projections, the reduction in UFW is somewhat conservatively assumed as follows (in contrast to the PDAM's targeted reduction in UFW which is shown in parentheses): 1990--50 percent (48.8 percent); 1991--49 percent (46.5 percent); 1992--48 percent (44.1 percent); 1993--47 percent (41.8 percent); 1994--46 percent (39.4 percent); 1995--45 percent (37.1 percent); 1996--44 percent; and 1997--43 percent. UFW is presented as a percentage of the difference between total water (i.e., produced plus purchased) and water billed, and the result is divided by total water.

11. PDAM Jaya Production. This represents the volume of water to be produced by PDAM Jaya after allowing for UFW to fulfill the demand in the areas served by the existing PDAM treatment plants.

12. Purchased Water from Cisadane. This represents the volume of water to be purchased from PDAM Tangerang produced by the Cisadane treatment plant, after allowing for UFW to be allocated to areas not covered by the existing PDAM Jaya treatment plants.

13. Average Tariffs. These were increased substantially in April 1988, and averaged about Rp 700/m³ between April-September 1989. For the purposes of the projections, they are assumed to average Rp 700/m³ through March 31, 1991, and increased by 40 percent on April 1, 1991, and increased again by 20 percent in January 1994 and again by 15 percent in January 1997.

14. Tariff Revenues. This is arrived at by multiplying the forecast volume sold by the average tariff.

15. Income from New Connections. For households this fee (which has been reduced by about 50 percent) is now Rp 83,000/connection. The fee for industrial users is Rp 275,000/connection. These fees are assumed to be adjusted along with tariff increases.

16. Other Income. This includes fees such as meter maintenance, administration, etc. The fees are expected to increase every three years in constant prices and adjusted by inflation factors.

Expenses

17. Personnel. The total number of personnel at end-1988 was 2,200 and the average cost/employee (i.e., unit cost) in 1988 was Rp 3.51 million/year, i.e., about US\$2,000. It is assumed that this unit cost will remain constant in real terms, i.e., it will keep pace with inflation (even though the salaries are adjusted every two years or so). It is also assumed that the number of staff would increase, but at a lesser pace (because of improvements in efficiency) with the utility's increasing number of connections.

18. Fuel and Power. This is proportional to water produced by treatment plants (excludes Cisadane). In 1988, the unit cost was Rp 24.07/m³. The cost of electricity was raised by some 30 percent in 1989. This unit cost, which is assumed to keep pace with inflation, is used in the projections, except for years 1990-1992, where the costs are based on the best estimates.

19. Chemicals, etc. This is proportional to water produced. In 1988 the unit cost was Rp 25.5/m³. The cost of electricity was raised by some 30 percent in 1989. This unit cost, which is assumed to keep pace with inflation, is used in the projections, except for years 1990-1992, where the costs are based on the best estimates.

20. Maintenance Materials. This is assumed to be proportional to revalued fixed assets in operation. Between 1985 and 1988 this cost averaged at 2 percent; this figure is used in projections, except for the years 1990-1992, which are based on the best estimates.

21. Purchase of Raw Water (from PJ). The volume of water purchased is a function of water sales (see forecast volume sales). The unit price for water is based on the agreement recently revised between PDAM Jaya and PJ, and

amounts to Rp 22/m³ from 1991 to 1993. It is assumed to be Rp 27/m³ from 1994 to 1996; Rp 31/m³ from 1977 to 1999, and Rp 37/m³ in 2000.

22. Purchase of Treated Water (Cisadane). The volume is based on the PDAM Jaya demand, and the unit price is based on the methodology indicated in the agreement recently signed between PDAM Jaya and PDAM Tangerang. The price amounts to Rp 375/m³ from 1993-97, and Rp 410/m³ thereafter.

23. Sales Expenses. They are assumed to be proportional to the number of connections and keep pace with inflation. In 1988 these costs amounted to Rp 20,500 per connection per year. For projection purposes the sales expenses is assumed at Rp 26,100 per connection per year, except for the years 1990-1992, which are based on the best estimates.

24. New Connection Cost. This is included in the capital expenditure.

25. Bad Debts. These amount to about 3 percent of water revenues.

26. General Administration. This consists of office expenses, etc. and is assumed to be 70 percent of personnel expenses.

27. Nonoperating Income. It is the income from sale of forms, penalty charges to customers, interest income, etc. This amounts to about Rp 862 million in 1989 end is assumed to increase annually un line with the inflation factor.

28. Depreciation. (A) The straight line method is used, and two sets of depreciation rates have been developed, one based on useful life and the other based on fiscal (tax) regulation (shown in parenthesis) which are as follows: (a) transportation equipment--12.5 percent and (50 percent); (b) office furniture etc.--10 percent and (25 percent); office buildings, etc.--3.33 percent and (5 percent); and (d) installed pipes--2 percent and (10 percent). The composite depreciation rate on the basis of useful lives is around 5 percent. (B) ROR calculations is based on fiscal regulation through 1995. Ministry of Finance is expected to move closer to economic life approach by that time. (C) In the 1988 Audit Report, an additional depreciation of Rp.4.7. billion is charged to Net Income. Since this charge does not affect the 1988 cash flow nor is it expected to do so in the future, it does not show up in the Financial Statements which for 1988 were prepared on the basis of Final Draft Audit Report.

29. Authorization of Deferred Expenses. These represent consultant fees for technical assistance, studies, etc. being authorized over a period of five years.

30. Operational Interest. This represents interest on outstanding loans. Interest expense is charged to operations after the grace period. Under the existing Subloan Agreements interest during the grace period are accumulated and paid annually together with the principal after the grace period. These terms are also assumed to be applied to the new loans for PJSIP I and PJSIP II.

Sources and Application of Funds

31. Central Government Equity. In 1991 equipment etc., worth Rp 22.5 billion, is to be received from GOI as equity. This would be funded from OECF.
32. Local Government Equity (Own Funds). These represent the funds to be received from DKI Jakarta (as a contribution towards PDAM Jaya capital expenditure) and will shown on the balance sheet at DKI Jakarta equity in PDAM Jaya.
33. Local Government Equity (IBRD). These amount to 10 percent of total PJSIP project cost financed by IBRD and are expected to be passed on to PDAM Jaya as DKI Jakarta equity in PDAM Jaya.
34. Local Government Equity (OECF). Their amount to 10 percent of total PJSIP project cost financed by OECF and are expected to be passed on to PDAM Jaya as DKI Jakarta equity in PDAM Jaya.
35. Reinvestment by PEMDA. Pemda's entire share of PDAM Jaya's profit would be reinvested as equity in PDAM Jaya.
36. Borrowing. The funds borrowed by GOI for PJSIP I and PJSIP II, Buaran I and assumed to be on lent to PDAM Jaya. The details of the loans to PDAM and loan terms are as follows:

Loan	Interest Rate p.a. <u>/a</u>	Grace period (No. of years)	Repayment Period (No. of years)
PJSIP I - IBRD	9.40%	5	15
PJSIP I - OECF	9.40%	5	15
PJSIP II (Unidentified yet)	9.40%	5	15
Buaran I - OECF Foreign Costs	9.40%	6	24
Buaran I - OECF Local Costs	9.40%	5	15
Buaran II- OECF Foreign Costs	9.40%	13	24
Buaran II- OECF Local Costs	9.40%	11	15

/a Include 0.40 percent fee charged by the banks administering the loans. GOI has indicated that the fee would be only 0.25% for PJSIP I. PDAM Jaya is also required to pay a commitment charge of 0.75% on IBRD and OECF Loans for PJSIP I.

The loan terms for Buaran I and Buaran II funds borrowed by the PDAM from GOI (PDN--Pinyamar Dalam Negeri) are as follows: interest rate of 9.25 percent per annum, 5 years grace period (10 years for Buaran II); and 15 years repayment period.

and the borrowing may be decreased by about 10%. If such an agreement is finalized, it would have no adverse impact on the Bank financed project or PDAM's finances.

Balance Sheet

38. Fixed Assets in Operation. These are revalued on an annual basis at the assumed inflation rate.
39. Work in Progress. This includes all ongoing construction, and rehabilitation and expansion.
40. Cash. The minimum cash requirements are assumed to be one sixth of annual cash operating expenses and annual debt service charges.
41. Accounts Receivable (Water). These are projected at 2.5 months of annual billings for water.
42. Other Accounts Receivable. These are miscellaneous items such as advances for staff, billings for new connections, etc.
43. Advances. These represent advances for office rent, payment of bonus in anticipation of profit, etc., and the amount is assumed to remain constant from 1989.
44. Inventory. These are assumed to be equal to six months of annual expenses for materials.
45. Deferred Expenses. These refer to technical assistance, training, etc.
46. Other Assets. Deposits to PLN and Perumtel, etc., and is assumed to remain constant at Rp 377 million (1988 figure).
47. Other Liabilities. Customer Deposits held by PDAM to cover possible unpaid bills.
48. Accounts Payable. Assumed to be equivalent to about 1.5 months operating expenses excluding bad debts.
49. Income Tax. This is based on the current tax rate (on Net Income) which is 15 percent on the first Rp 10 million, 25 percent on the next Rp 40 million and 35 percent thereafter excluding bad debts.
50. Other Current Liabilities. These represent collections received in advance, miscellaneous payable, etc., and are assumed to be about 0.5 month operating expenses.

	PDAM JAYA INCOME STATEMENT										BASE CASE: Buaran 2 (with 100% loan funding, and implementation from 1987 to 1995 and amortization to start in 2000)			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
	Audited	Audited (9 months)	Audited	Audited	Estimate	Budget								
627														
628 (Million Rupiah in current prices)														
629 20% tariff increase in April 1991, 20% in January 1994 and 15% in January 1997														
630														
631														
632														
633														
634														
635 Population in Service Area - 000	4,142	4,659	5,240	5,613	6,012	6,439	6,897	7,178	7,471	7,776	8,093	8,257	8,425	
636 Population Served (%)	24.54	27.60	27.60	26.40	30.00	32.40	33.87	36.73	39.30	41.62	43.70	46.46	49.10	
637 Consumer Connections - 000	155.22	154.90	146.09	158.52	188.63	208.63	233.63	263.63	293.63	323.63	353.63	383.63	413.63	
638 % Unaccounted-for Water (UFM)	54.24%	52.76%	51.20%	51.20%	51.20%	50.00%	49.00%	48.00%	47.00%	46.00%	45.00%	44.00%	43.00%	
639 PDAM Jaya Production Capacity - Million M3	194.71	211.93	234.19	234.19	261.02	259.56	294.16	358.69	388.02	437.87	437.87	525.86	525.86	
640 Max. Water Available for Sale - Million M3	91.83	72.92	114.28	114.28	127.38	129.78	150.02	186.52	221.19	290.80	286.00	340.47	346.55	
641 Forecast Volume Sold - Million M3	91.83	72.92	107.35	110.28	112.57	124.87	137.79	152.53	167.28	185.96	201.40	218.49	236.60	
642 PDAM Jaya Production - Million M3	200.68	154.36	219.98	225.98	230.68	249.74	270.18	293.33	305.75	311.54	318.00	325.56	339.09	
643 Purchased from Cisadane - Million m3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.87	9.13	48.18	64.60	76.00	
644 Average Tariff (Rp/m3) - Current prices	247.68	235.01	234.88	515.67	700.00	700.00	910.00	980.00	980.00	1176.00	1176.00	1176.00	1352.40	
645														
646 OPERATING REVENUES:														
647 Tariff Revenues	22,744	17,137	25,214	50,870	78,799	87,409	125,389	149,479	163,934	216,337	236,846	256,944	319,978	
648 Income from New Connections	3,255	4,021	4,133	4,543	6,105	3,613	3,179	3,122	4,146	4,384	4,635	4,902	5,184	
649 Other Income	226	653	400	325	242	500	322	364	405	493	539	584	701	
650														
651 TOTAL OPERATING REVENUES	26,225	21,811	29,747	61,738	85,146	91,522	128,891	153,766	168,486	221,213	242,020	262,430	325,863	
652														
653 OPERATING EXPENSES:														
654 Personnel	4,971	4,068	6,070	7,069	9,009	10,432	11,767	12,865	14,028	15,232	16,778	18,395	20,147	
655 Fuel and Power	3,395	2,835	4,242	5,634	7,750	9,020	13,392	15,714	16,310	17,559	23,652	25,667	28,337	
656 Chemicals used	2,784	2,296	4,666	5,730	8,297	8,393	9,490	10,071	10,831	11,660	12,616	13,691	15,115	
657 Maintenance Material	3,256	962	1,571	3,816	8,855	5,044	8,550	10,439	11,956	14,827	17,522	31,026	35,412	
658 Purchase of raw water from PDJ	335	394	957	1,258	1,966	4,196	6,241	6,776	7,086	8,832	9,015	9,230	11,037	
659 Sales Expense	1,282	754	1,026	3,261	5,170	6,492	8,558	9,540	10,672	12,469	14,443	16,608	18,981	
660 Purchase of treated water from Cisadane	0	0	0	0	0	0	0	0	3,326	10,924	18,068	24,225	28,500	
661 New Connection Cost (Non-PJSIP)	1,798	1,101	3,004	3,980	7,152	0	0	0	0	0	0	0	0	
662 Bad Debts	1,586	1,398	463	1,141	2,694	2,622	3,762	4,464	4,918	6,490	7,105	7,708	9,599	
663 General Administrative Expenses	2,671	2,352	3,584	5,892	7,142	7,302	9,237	9,505	9,819	10,662	11,744	12,877	14,103	
664														
665														
666 TOTAL OPERATING EXPENSES	21,979	16,131	25,682	38,380	58,036	53,501	70,997	79,394	88,548	108,655	130,942	159,427	181,232	
667 Income (Loss) before Depreciation	4,246	5,680	4,065	23,358	27,110	38,021	57,894	74,372	79,938	112,559	111,078	103,004	144,631	
668 Depreciation	4,398	3,218	3,872	16,102	14,410	10,332	11,404	13,362	18,297	23,988	28,312	40,976	56,340	
669 Amortization of Deferred Expenses	0	0	0	0	0	0	0	0	0	0	2,297	2,297	2,297	
670														
671 Operating Income (Loss)	(1,079)	2,462	193	7,256	12,700	27,689	46,490	61,009	61,240	88,570	80,469	59,734	85,994	
672 Operational Interest	926	1,156	1,255	3,392	7,297	6,968	6,660	6,364	14,125	13,892	31,793	32,505	31,859	
673														
674 Net Operating Income (Loss)	(1,079)	1,306	(1,063)	3,864	5,403	20,722	39,830	54,645	47,115	74,679	48,676	27,229	54,136	
675 Non-Operating Income - Net	826	837	458	1,289	862	926	986	1,046	1,108	1,175	1,245	1,320	1,399	
676														
677 Net Income (Loss) before Tax	(253)	2,143	(604)	5,153	6,265	21,648	40,816	55,691	48,223	75,854	49,922	28,549	55,535	
678 Depreciation (Fiscal Rule)						12,770	13,578	15,763	22,076	34,608	48,792	57,061	91,928	
679 Net Fiscal Income	(253)	2,143	(604)	5,153	7,905	18,401	36,457	46,976	31,913	51,050	21,173	(22,406)	(16,943)	
680 Provision for Income Tax	0	689	0	347	2,761	6,434	12,754	16,436	11,163	17,861	7,404	0	0	
681														
682 Net Income (Loss)	(253)	1,454	(604)	4,806	3,504	15,214	20,062	39,255	37,060	57,992	42,517	28,549	55,535	
683														
684 RATIOS AND COMPARATORS:														
685 Operating Ratio - Line (666+668+669)/651	101%	89%	99%	88%	85%	70%	64%	60%	64%	60%	67%	77%	74%	
686 Increases in Tariffs		-5%	0%	120%	36%	0%	30%	8%	0%	20%	0%	0%	15%	
687 Average Asset's Rate Base	33,628	43,810	41,898	75,427	113,384	117,758	135,386	196,804	341,397	496,325	598,108	956,663	1,339,847	
688 R o R on Rev. Assets Excl. Int. &	2.0%	6.0%	1.6%	10.9%	11.0%	16.1%	22.4%	18.8%	10.2%	9.5%	7.6%	6.4%	6.5%	
689														
690 (Note: Through 1995 the ROR is computed by using Fiscal (instead of Economic) Depreciation.)														
691														

693 694 695 696 697 698 699 700	Total 1990-1996	PDAM JAYA SOURCES AND APPLICATIONS OF FUNDS												
		1985 Audited	1986 Audited (9 months)	1987 Audited	1988 Audited	1989 Est.ate	1990 Budget	1991	1992	1993	1994	1995	1996	1997
701 SOURCES OF FUNDS:														
702 Income (Loss) before Depreciation	576,465	4,246	5,680	4,065	23,358	27,110	38,021	57,894	74,372	79,536	112,559	111,078	103,004	144,631
703 Other Non-operational Income-Met	7,807	826	837	458	1,289	862	926	986	1,046	1,198	1,175	1,245	1,320	1,399
704														
705 Gross Internal Cash Generation	584,271	5,071	6,517	4,523	24,647	27,971	38,947	58,880	75,417	80,646	113,733	112,324	104,324	146,030
706 Central Government Equity	22,500	0	0	0	0	0	0	22,500	0	0	0	0	0	0
707 Local Gov't. Equity - Own Funds	43,994	1,610	0	17,993	14,605	0	2,183	4,748	6,783	8,851	6,187	6,494	8,749	7,698
708 Local Gov't. Equity - IBRD loan	28,398	0	0	0	0	0	1,546	3,839	5,528	6,010	4,954	3,605	2,914	0
709 Local Gov't. Equity - QECF loan	9,907	0	0	0	0	0	1,594	1,387	1,981	2,180	1,684	1,096	991	0
710 Reinvestment by Local Gov't	124,324	0	0	0	0	1,752	7,607	14,031	19,627	18,530	28,996	21,259	14,274	27,767
711 Total Equity	229,124	1,610	0	17,993	14,605	1,752	11,932	46,505	33,919	35,571	41,821	32,447	26,928	35,466
712 BORROWINGS:														
713 PJSIP I - IBRD	163,459	0	0	0	0	0	8,911	22,099	31,917	34,596	28,512	20,752	16,772	0
714 PJSIP I - QECF	74,305	0	0	0	0	0	4,458	10,403	14,861	16,347	12,632	8,174	7,450	0
715 PJSIP II	26,594	0	0	0	0	0	0	0	0	0	0	8,713	17,881	26,944
716 Pulo Gadung II	7,057	0	24,362	46,000	5,582	25,555	7,057	0	0	0	0	0	0	0
717 Buaran I	48,522	0	0	2,036	1,050	23,496	25,107	13,908	9,507	0	0	0	0	0
718 Buaran II	304,297	0	0	652	1,624	586	30,737	26,350	88,398	70,414	44,199	44,199	0	0
719 Interest Accumulated	176,973	0	0	129	363	2,172	9,150	15,976	25,885	29,726	38,563	23,165	30,489	32,595
720 BPD Loan	0	0	0	0	331	68	0	0	0	0	0	0	0	0
721														
722 Total Borrowing	801,207	0	24,362	48,667	8,970	51,877	85,420	88,735	170,468	151,083	123,927	109,003	72,571	59,539
723														
724 TOTAL SOURCES OF FUNDS	1,614,602	6,681	30,879	71,385	46,422	81,801	156,299	194,121	279,804	267,300	279,481	253,774	203,823	241,035
725														
726 APPLICATION OF FUNDS														
727 PJSIP I - IBRD Portion	283,980	0	0	0	0	0	15,482	38,393	55,276	60,104	49,535	36,052	29,138	0
728 PJSIP I - QECF Portion	108,920	0	0	0	0	0	5,539	16,078	16,526	20,335	19,616	19,988	10,898	0
729 PJSIP II	75,983	0	0	0	0	0	0	0	0	0	0	24,895	51,088	76,983
730 Plant Optimization - PG & Pej.	9,753	0	0	0	0	0	9,753	0	0	0	0	0	0	0
731 Rehab. of Pejoopangan I and II	26,500	0	0	0	0	0	0	5,005	5,360	8,925	3,850	2,760	0	0
732 Pulo Gadung II	7,057	0	24,362	63,341	20,388	25,555	7,057	0	0	0	0	0	0	0
733 Buaran I	60,133	0	0	2,086	1,798	26,871	20,000	26,067	14,066	0	0	0	0	0
734 Buaran II	304,297	0	0	652	1,624	586	30,737	26,350	88,398	70,414	44,199	44,199	0	0
735 Pra-Dist.Network Financed by GDI	22,500	0	0	0	0	0	22,500	0	0	0	0	0	0	0
736 Routine Expenditure/Future Invest	35,402	7,755	1,189	13,005	5,681	11,999	3,901	3,521	2,489	3,985	6,499	7,158	7,849	24,096
737 Capitalized interest	176,973	0	0	0	0	2,172	9,150	15,976	25,885	29,726	38,563	23,165	30,489	32,595
738														
739 Total Capital Expenditures	1,111,558	7,755	25,551	79,084	29,490	67,183	101,619	154,490	208,000	193,489	162,282	162,217	129,462	133,674
740														
741 Loan Amortizations on L/T Loans	78,508	143	333	73	2,928	4,822	4,575	4,525	4,544	10,096	10,597	21,299	22,872	23,785
742 Operational Interest on L/T Loans	112,307	482	992	433	3,392	7,297	6,968	6,660	6,364	14,125	13,892	31,793	32,505	31,859
743														
744 Total Debt Service of L/T Loan	190,815	625	1,325	506	6,320	12,119	11,543	11,185	10,909	24,221	24,489	53,092	55,377	55,643
745 Working Capital Needs	40,609	(1,876)	2,859	2,058	12,475	2,596	1,814	8,692	6,487	3,070	10,211	2,981	7,354	13,274
746 Payment to Local Gov't (Prnt Dist	124,324	0	916	600	0	1,752	7,607	14,031	19,627	18,530	28,996	21,259	14,274	27,767
747 Other Assets/Liabilities Changes	(2,202)	95	(181)	(11,109)	(25)	(332)	(232)	(282)	(338)	(338)	(338)	(338)	(338)	(338)
748 Profit Distribution to Employees	24,874	0	0	360	0	1,051	2,608	2,942	3,216	3,507	3,808	4,194	4,599	5,037
749 Direct Correct'ns to Ret.Earnings	0	2,167	60	(161)	(4,718)	0	0	0	0	0	0	0	0	0
750 Payment of Income Tax	74,814	0	689	0	0	569	2,761	6,434	12,754	16,456	11,163	17,861	7,404	0
751														
752 TOTAL APPLICATIONS OF FUNDS	1,564,793	8,766	31,218	71,340	43,543	84,939	127,719	197,492	260,655	258,915	240,612	261,267	218,132	235,058
753 CASH INCREASE (DECREASE)	49,809	(2,085)	(339)	42	4,879	(3,138)	8,580	(5,371)	19,149	8,385	38,869	(7,493)	(18,309)	5,977
754 Cash Balance, Beginning	3,919	1,834	1,495	1,495	1,537	6,605	3,267	11,847	8,476	27,625	36,010	74,879	67,385	53,076
755 Cash Balance, End	1,834	1,495	1,537	6,605	3,267	11,847	8,476	27,625	36,010	74,879	67,385	53,076	59,053	69,053
756 Minimum Cash Requirements														
757														
758 Debt Service Ratio - Line 705/744				8.9	3.9	2.3	3.4	5.3	6.9	3.3	4.5	2.1	1.9	2.6
759 Contribution to Investment (Annual)				167	201	182	202	192	202	172	402	217	232	342
760 Cont to 3-Year Ave.Inv. (Last, Curr. & Next)				92	352	182	192	192	232	182	372	232	212	522
761 Cont to Inv w/o Buaran 2				162	212	182	292	212	352	272	552	292	232	542
762 Cont to Inv w/o Buaran 2 - Ave at 3 Years				92	372	222	232	282	342	282	542	282	292	522
763 Cont to Inv w/o [Buaran 2 + Interest Cap.]				162	212	182	302	242	392	322	672	392	302	692
764 Cont to Inv w/o [Buaran 2+Int Cap] 3-yr. Ave.				292	102	222	242	302	372	332	662	362	302	662
765														

769 770 (Million Rupiah in current prices)	PDAM JAYA BALANCE SHEET											BASE CASE: Buaran 2 (with 100% loan funding, and implementation from 1987 to 1995 and amortization to start in 2000)		
	771 40% tariff increase in April 1991, 20% in January 1994 and 15% in January 1997	1985 Audited	1986 Audited (9 months)	1987 Audited	1988 Audited	1989 Estimate	1990 Budget	1991	1992	1993	1994	1995	1996	1997
772														
773														
774														
775														
776														
777 Fixed Assets in Operation	64,636	66,021	67,975	168,526	194,487	212,139	262,523	371,974	597,823	741,334	876,081	1,551,305	1,770,605	
778 Accumulated Depreciation	19,909	23,127	26,973	58,575	77,671	93,439	110,450	130,439	156,563	189,944	229,654	284,406	357,811	
779														
780 Net Fixed Assets	44,726	42,893	40,902	109,951	116,816	118,699	152,073	241,535	441,260	551,389	646,427	1,266,898	1,412,795	
781 Works in Progress	365	24,531	98,895	70,665	125,849	220,784	334,299	448,807	443,368	500,706	575,020	99,654	110,742	
782														
783 Cash	1,834	1,495	1,537	6,605	3,267	11,847	8,476	27,625	36,010	74,879	67,385	53,076	59,053	
784 Accounts Receivable - Net	4,311	3,695	5,817	12,916	16,416	18,210	26,123	31,142	34,153	45,070	49,345	53,530	66,662	
785 Other Accounts Receivable	567	9	16	14	1,230	781	1,182	4,686	1,833	1,988	2,153	2,328	2,513	
786 Advances	0	1,869	1,469	2,609	3,839	3,839	3,839	3,839	3,839	3,839	3,839	3,839	3,839	
787 Inventories	5,068	5,954	5,445	10,574	12,555	9,800	12,904	15,147	16,579	18,740	20,895	28,534	31,810	
788 Prepaid Expenses	0	0	0	0	627	960	960	960	960	960	960	960	960	
789														
790 Total Current Assets	11,780	13,021	14,284	32,718	37,934	45,437	53,483	80,399	93,374	145,476	141,576	142,267	164,837	
791 Deferred Expenses	0	0	0	0	0	2,783	7,199	9,720	11,045	11,483	9,451	7,460	5,203	
792 Other Assets	305	355	380	377	383	377	377	377	377	377	377	377	377	
793														
794 TOTAL ASSETS	57,177	80,801	154,461	213,710	280,982	388,079	547,431	780,836	989,423	1,209,431	1,375,851	1,516,656	1,693,954	
795														
796														
797 Assets Revaluation Surplus	0	0	0	38,135	47,411	55,725	63,944	75,797	96,217	125,828	151,541	218,462	298,152	
798 Retained Earnings	9,789	11,183	9,571	9,065	9,766	14,765	25,854	42,266	57,289	82,477	99,541	109,216	131,947	
799 Central Government Equity	18,289	18,289	18,289	18,289	18,289	18,289	40,789	40,789	40,789	40,789	40,789	40,789	40,789	
800 Local Government Equity	13,708	12,792	30,785	45,590	47,342	59,274	83,280	117,199	152,770	194,591	227,038	253,966	289,432	
801														
802 TOTAL EQUITY	41,787	42,264	58,765	111,080	122,809	148,053	213,867	276,050	347,065	443,685	528,909	622,433	760,320	
803														
804 Other Liabilities	1,006	1,236	1,434	1,786	2,124	2,349	2,631	2,969	3,307	3,644	3,982	4,320	4,658	
805 Long-Term Debt : Interest Accumulated (Net)	0	0	10,936	10,605	12,027	20,634	36,067	60,288	88,236	122,212	144,789	170,651	198,638	
806 Long-Term Debt : Principal Loan (Net)	9,103	32,459	77,276	78,441	125,189	197,478	266,236	402,386	514,924	583,576	647,149	670,055	676,823	
807														
808 Total Long-Term and Other Liabilities	10,109	33,690	89,646	90,833	139,341	220,461	304,934	465,643	606,467	709,432	795,901	845,025	880,119	
809														
810 Short-term Borrowings	0	0	0	0	0	0	0	0	0	0	0	0	0	
811 Due to PERDA DKI	1,982	1,008	202	126	175	126	126	126	126	126	126	126	126	
812 Accounts Payable	1,245	1,378	1,896	819	6,918	6,360	8,404	9,364	10,504	11,771	15,480	18,965	21,454	
813 Income Tax Payable	0	0	0	569	2,761	6,434	12,754	16,436	11,163	17,861	7,424	0	0	
814 Other Current Liabilities	1,438	1,001	451	2,495	2,306	2,120	2,801	3,121	3,501	4,257	5,160	6,322	7,151	
815 Interest and Bank Charges Payable	445	609	1,545	2,099	2,099	0	0	0	0	0	0	0	0	
816 Current Maturing Long-Term Debt	171	850	1,955	5,689	4,575	4,525	4,544	10,096	10,597	21,299	22,872	23,785	24,784	
817														
818 Total Current Liabilities	5,281	4,846	6,050	11,797	18,833	19,565	28,630	39,143	35,892	56,314	51,042	49,197	53,515	
819														
820 TOTAL EQUITY AND LIABILITIES	57,177	80,801	154,461	213,710	280,982	388,079	547,431	780,836	989,423	1,209,431	1,375,851	1,516,656	1,693,954	
821														
822 Current Ratio	2.2	2.7	2.4	2.8	2.0	2.3	1.9	2.1	2.6	2.6	2.8	2.9	3.1	
823 Working Capital, excl. cash & current LTD	4,836	7,531	8,653	20,573	23,169	24,984	33,676	40,162	43,233	53,444	56,425	63,779	77,053	
824 % Debt on Debt plus Equity	18%	44%	61%	46%	54%	60%	59%	63%	64%	62%	61%	58%	54%	
825 % Debt on Debt+Equity (excl. Asst Rev.Surp.)	18%	44%	61%	56%	65%	71%	67%	70%	71%	70%	69%	68%	66%	
826 % Debt (w/o Buaran 2) on Debt+Equity														
827 % Debt (w/o Buaran 2 & excl. Asst Rev.Surp.)	18%	44%	60%	56%	65%	67%	62%	61%	59%	56%	54%	52%	49%	
828 # Days Accounts Receivable	69	79	84	83	76	76	75	76	76	76	76	76	76	
829 % Debt/(Net Fixed Assets +MIP)	21%	49%	64%	52%	58%	56%	63%	68%	69%	69%	67%	63%	59%	
830 Cash = # Months Operating Expenses	1	1	1	2	1	3	2	4	5	9	7	4	4	
831														
832	0.00	-0.24	0.00	(0.24)	0.00	0.00	0.00	(0.00)	0.00	0.00	0.00	0.00	0.00	
833 Note : Other assets amounting to Rp 12.89 Million in FY 85-86 and Rp 43.83 Million in CY 86 which are shown in the audited financial statement are not included in the above balance sheets. See accompanying assumptions used in the financial projections.														
834														

838	POAN JAYA FINANCING PLAN				BASE CASE: Buaran 2 (with 100% loan funding, and implementation from 1987 to 1995 and amortization to start in 2000)									
	TOTAL w/o BUARAN 11		TOTAL		1987	1990	1991	1992	1993	1994	1995	1996	1997	
839	(Million Rupiah in current prices)													
840	40% tariff increase in April 1991, 20% in January 1994 and 15% in January 1997													
841														
842		TOTAL w/o BUARAN 11	TOTAL											
843		1990-1996	1990-1996	% OF TOTAL	% OF TOTAL									
844														
845	Income Before Depreciation	576,465	576,465	82.83%	51.86%	27,110	38,021	57,894	74,372	79,538	112,559	111,078	103,004	144,631
846	Other Non-operational Income-Net	7,807	7,807	1.12%	0.70%	862	926	986	1,046	1,108	1,175	1,245	1,320	1,399
847														
848	Gross Internal Cash Generation	584,271	584,271	83.95%	52.56%	27,971	38,947	58,880	75,417	80,646	113,733	112,324	104,324	146,030
849	Minus:													
850	Amortization	78,508	78,508	11.28%	7.06%	4,822	4,575	4,525	4,544	10,096	10,597	21,299	22,872	23,785
851	Operational Interest	112,307	112,307	16.14%	10.10%	7,297	6,968	6,660	6,364	11,125	13,892	31,793	32,505	31,859
852														
853	Total Debt Service	190,815	190,815	27.42%	17.17%	12,119	11,543	11,185	10,909	24,221	24,489	53,092	55,377	55,643
854														
855	Working Capital Needs (+)	40,609	40,609	5.84%	3.65%	2,576	1,814	8,692	6,487	3,070	10,211	2,981	7,354	13,274
856	Other Assets (+) or Liab.Needs	(2,202)	(2,202)	(0.32%)	(0.20%)	(332)	(232)	(282)	(338)	(378)	(338)	(338)	(338)	(338)
857	Profit Distribution to Employees	24,874	24,874	3.57%	2.24%	1,051	2,608	2,942	3,216	3,507	3,808	4,194	4,599	5,037
858	Payment of Income Tax	74,814	74,814	10.75%	6.73%	569	2,761	6,434	12,754	16,436	11,163	17,861	7,404	0
859														
860	Net Internal Cash Generation	255,361	255,361	36.69%	22.97%	11,968	20,453	29,909	42,389	33,750	64,400	34,532	29,928	72,414
861														
862	Cash Increase (Decrease)	49,809	49,809	7.16%	4.48%	(3,338)	8,580	(3,371)	19,149	6,385	38,869	(7,493)	(14,309)	5,977
863														
864	Capital Expenditures:													
865	PJSIP I - IBRD Portion	283,980	283,980	40.80%	25.55%	0	15,482	38,393	55,276	60,104	49,535	26,052	29,138	0
866	PJSIP I - OECF Portion	108,980	108,980	15.66%	9.30%	0	5,537	16,078	16,526	20,335	19,616	18,988	10,898	0
867	PJSIP II	75,983	75,983	10.92%	6.84%	0	0	0	0	0	0	24,895	51,088	76,983
868	Plant Optimization - PG & Pej.	9,753	9,753	1.40%	0.88%	0	9,753	0	0	0	0	0	0	0
869	Refab. of Fejoopongan I and II	26,500	26,500	3.81%	2.38%	0	0	5,605	5,360	8,925	3,850	2,700	0	0
870	Pri.Dist.Network Financed by GOI	22,500	22,500	3.23%	2.02%	0	0	22,500	0	0	0	0	0	0
871	Pulo Gadung II	7,057	7,057	1.01%	0.43%	25,555	7,057	0	0	0	0	0	0	0
872	Buaran I	60,133	60,133	8.64%	5.41%	26,871	20,600	26,067	14,066	0	0	0	0	0
873	Buaran II	0	304,297	0.00%	27.38%	586	30,737	26,350	88,398	70,414	44,199	44,199	0	0
874	Routine Expenditure/Future Investment	35,402	35,402	5.09%	3.18%	11,999	3,901	3,521	2,489	3,985	5,499	7,158	7,889	24,096
875	Capitalized interest	65,669	176,973	9.44%	15.92%	2,172	9,150	15,976	25,885	29,726	38,583	27,165	30,489	32,595
876														
877	Total Capital Expenditures	695,957	1,111,558	100.00%	100.00%	67,183	101,619	154,490	208,000	193,489	162,282	162,217	129,462	133,674
878														
879	Net to be Financed	490,405	906,006	70.46%	81.51%	51,877	89,745	121,210	184,759	168,124	136,751	120,192	85,225	67,238
880														
881	Financed by :													
882	Borrowing													
883	PJSIP I - IBRD	163,459	163,459	23.49%	14.71%	0	8,911	22,099	31,617	34,576	28,512	20,752	16,772	0
884	PJSIP I - OECF	74,305	74,305	10.68%	6.68%	0	4,458	10,403	14,861	16,347	12,632	8,174	7,430	0
885	PJSIP II	26,594	26,594	3.82%	2.39%	0	0	0	0	0	0	8,713	17,881	26,944
886	Pulo Gadung II	7,057	7,057	1.01%	0.43%	25,555	7,057	0	0	0	0	0	0	0
887	Buaran I	48,522	48,522	6.97%	4.37%	23,496	25,107	13,908	9,507	0	0	0	0	0
888	Buaran II	0	304,297	0.00%	27.38%	586	30,737	26,350	88,398	70,414	44,199	44,199	0	0
889	IBRD Loan	0	0	0.00%	0.00%	68	0	0	0	0	0	0	0	0
890	Interest Accumulated	65,669	176,973	9.44%	15.92%	2,172	9,150	15,976	25,885	29,726	38,583	27,165	30,489	32,595
891														
892	Total Borrowing	385,606	801,207	55.41%	72.08%	51,877	85,420	88,735	170,468	151,083	123,927	109,003	72,571	59,539
893														
894	Central Government Equity	22,500	22,500	3.23%	2.02%	0	0	22,500	0	0	0	0	0	0
895	Local Gov't. Equity - Own Funds	43,994	43,994	6.32%	3.94%	0	2,183	4,748	6,783	8,851	9,187	6,474	8,749	7,598
896	Local Gov't. Equity - IBRD loan	28,398	28,398	4.08%	2.55%	0	1,548	3,839	5,528	6,010	4,954	3,605	2,914	0
897	Local Gov't. Equity - OECF loan	9,907	9,907	1.42%	0.89%	0	594	1,387	1,981	2,180	1,684	1,090	791	0
898														
899	Total Equity	104,799	104,799	15.06%	9.43%	0	4,325	32,474	14,292	17,041	12,825	11,189	12,654	7,698
900														
901	Total Financed	490,405	906,006	70.46%	81.51%	51,877	89,745	121,210	184,759	168,124	136,751	120,192	85,225	67,238
902														
903	Cont. to Inv. w/o [Buaran 2 + Interest]						30%	24%	39%	32%	67%	38%	30%	69%
904	Cont to Inv w/o [Buaran 2 +Int] 3-yr Ave						24%	30%	37%	32%	65%	36%	30%	66%
905														

910 911 (Million Rupiah in current prices) 912 913 914 915 916	PDAM JAYA MONITORING INDICATORS												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
917 DEMAND													
918													
919 Population in Service Area - 000	4,142	4,659	5,240	5,613	6,012	6,439	6,897	7,178	7,471	7,776	8,093	8,257	8,425
920 Population Served	24.5%	27.6%	27.6%	28.4%	30.0%	32.4%	33.9%	36.7%	39.3%	41.6%	43.7%	46.5%	49.1%
921 Motor Connections - 000	155.2	154.9	146.1	158.6	188.6	208.6	233.6	263.6	293.6	323.6	353.6	383.6	413.6
922 Total Eff. Production Capacity-Liters/second	6,785	7,385	7,985	7,985	8,900	8,850	10,030	12,230	13,230	14,930	14,930	17,930	17,930
923 Total Eff. Production Capacity - Million M3	213.97	232.89	251.81	251.81	286.67	279.09	316.31	385.69	417.22	470.83	470.83	565.44	565.44
924 % Unaccounted-for Water (Target)	54.2%	52.8%	51.2%	51.2%	51.2%	50.0%	49.0%	48.0%	47.0%	46.0%	45.0%	44.0%	43.0%
925 Max. Water Available for Sale-Million M3	91.83	72.92	114.28	114.28	127.38	129.78	150.02	184.52	221.19	280.80	286.00	340.47	346.55
926 Forecast Volume Sold - Million M3	91.83	72.92	107.35	119.28	112.57	129.87	137.79	152.33	167.28	183.96	201.40	218.49	236.60
927 Volume Produced and Purchased - Million M3	200.68	154.36	219.98	225.98	230.68	249.74	270.18	293.33	315.62	340.67	368.18	390.16	415.09
928 Cisadane Production Capacity - Million M3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.33	82.12	82.12	82.12	82.12
929 PDAM Jaya Production - Million M3	200.68	154.36	219.98	225.98	230.68	249.74	270.18	293.33	306.75	311.54	318.00	325.56	339.09
930													
931 MANAGEMENT:													
932													
933 # Days Accounts Receivable	69	79	84	83	76	76	76	76	76	76	76	76	76
934 Number of Employees	2,060	13.3	2,038	2,204	2,371	2,554	2,705	2,790	2,870	2,940	3,055	3,160	3,265
935 Employees per 1000 connections	13.3	14.0	13.9	12.6	12.2	11.6	10.8	9.8	9.1	8.6	8.2	7.9	7.9
936 % Increase # of employees	0.0%	-1.1%	8.1%	7.6%	7.7%	5.9%	3.1%	2.9%	2.4%	3.9%	3.4%	3.3%	3.3%
937													
938 PROJECT DEVELOPMENT													
939													
940 Cumulative Project Cost (FJISIP 1 IBRD Portion)	0	0	0	0	15,482	53,875	109,151	169,255	218,790	254,842	283,980	283,980	283,980
941 Cumul. Project Cost (US\$ Million)	0.00	0.00	0.00	0.00	8.63	30.01	60.81	94.29	121.89	141.97	158.21	158.21	158.21
942 Cumulative Bank Loan (US Million)	0.00	0.00	0.00	0.00	4.96	17.28	35.00	54.27	70.16	81.72	91.06	91.06	91.06
943 Disbursement Profile	0%	0%	0%	0%	0%	5%	19%	38%	60%	77%	90%	100%	100.00%
944													
945 FINANCIAL													
946													
947 Average Tariff in current prices	248	235	235	516	700	700	910	980	980	1,176	1,176	1,176	1,352
948 Average tariff increase	-5%	0%	120%	36%	0%	30%	8%	0%	20%	0%	0%	0%	15%
949 Working Ratio	0.84	0.74	0.86	0.62	0.68	0.58	0.55	0.52	0.53	0.49	0.54	0.61	0.56
950 Contribution to investment (Annual)	0%	0%	16%	21%	18%	29%	23%	35%	27%	55%	29%	23%	54%
951 Cont. to Invest. (Ave. of 3 Years)	0%	0%	9%	37%	22%	23%	28%	34%	28%	54%	28%	24%	52%
952 Rate of Return	2.0%	6.0%	1.8%	10.9%	11.0%	16.1%	22.4%	18.8%	10.2%	9.5%	7.6%	6.4%	6.5%
953 Debt Service Ratio	0.0	0.0	8.9	3.9	2.3	3.4	5.3	6.9	3.3	4.6	2.1	1.9	2.6
954 Debt on Debt plus Equity	18%	44%	61%	46%	54%	60%	59%	63%	64%	62%	61%	58%	54%
955													
956 1988 CONSTANT PRICE ANALYSIS:													
957													
958 Tariff	247.68	235.01	235.08	515.67	646.65	601.54	734.27	745.99	703.77	796.72	751.62	709.07	769.28
959 Tariff Increase	-5.1%	0.0%	119.4%	25.4%	-7.0%	22.1%	1.6%	-5.7%	13.2%	-5.7%	-5.7%	8.5%	8.5%
960 Salary '000 Rp/employee/year	0.00	1,974.98	2,978.34	3,478.22	3,510.00	3,510.00	3,510.00	3,510.00	3,510.00	3,510.00	3,510.00	3,510.00	3,510.00
961 Operational Expend./a3 Sold	239.3	221.2	239.2	348.0	476.3	368.2	415.8	396.2	381.9	400.1	415.5	440.0	435.7
962													
963 CRITICAL FINANCIAL INDICATORS													
964													
965 VARIABLE OR INDICATOR	MINIMUM	MAXIMUM	AVERAGE										
966													
967 Cash	1,495	74,879	21,906										
968 Tariff Increase, constant prices	-7.0%	119.4%	15.8%										
969 Working ratio	49%	86%	63%										
970 Rate of Return	2%	22%	11%										
971													
972													

VARIABLE OR INDICATOR	MINIMUM	MAXIMUM	AVERAGE
Debt Service Ratio	2.1	8.9	4.5
Contribution to investment	24%	67%	37%
Days Accounts Receivable	69	84	77
Debt/(debt + equity)	18%	64%	54%

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

POJ

Assumptions Used in Financial Projections

1. The inflation for the entire period is 7 percent per annum in 1990 and 6 percent per annum thereafter.

Operating Revenues

2. Electricity Produced and Sold. Electricity (kWh) produced over the last six years averaged 927 kWh, of which 36 kWh was used for internal purposes, the balance of 897 kWh being sold to PLN. Future annual sales are projected at 902 kWh.
3. Electricity Tariffs. Tariffs are assumed to increase from the present Rp 13.5/kWh to Rp 18/kWh in April 1990 and increased to Rp 26/kWh in 1993.
4. Electricity Power Revenues. It is the product of energy sales and tariff.
5. Water Revenues. Raw water sold to PDAM Jaya is based on the latter's forecasts. The tariff, effective in 1991, is based on a recently revised agreement between PDAM Jaya and GOI (on behalf of POJ) and amounts to Rp 22/m³. To other customers (non-PDAM Jaya) the rate varies with the type of customer and the kind of water (e.g., industrial treated).
6. Other Income. This includes rental income, other miscellaneous income, and an allocation (from West Java Government) of Rp 250 million from the land tax (PBB).

Operating Expenses

7. Personnel Expenses. In 1988, the number of personnel was 4,026 and the unit cost was Rp 1.68 million/employee. POJ, which is considered to be overstaffed, does not plan to replace staff who are retiring. The projections use an optimistic assumption that only half of the retirees would not be replaced even though the assets would triple between 1989 and 1995. The unit cost is assumed to remain constant in real terms, i.e., keep pace with inflation.
8. Repair and Maintenance. Based on past experience, these expenses are projected to be 2.8 percent of revalued assets.
9. General and Administration. These cover travel, insurance, registration fees, land and building tax, etc. They remain unchanged but keep pace with inflation.

10. Materials and Supplies. These are assumed to remain constant in real terms, even though the assets are increasing.
11. Survey, Research and Upgrading. These include expenses for staff training, training materials and for consultant services. Survey, research and upgrading expenses are projected on the basis of the cost prevailing in FY87/88 and assumed to follow the inflation rates. An additional cost equivalent to 100 percent of the cost in FY87/88 is also assumed in 1989.
12. Hotel-Related Expenses (arising from hotel business operation). In the absence of separate records, these expenses are assumed to be 78 percent of projected revenues.
13. Bad Debt. It is assumed to be 10 percent of miscellaneous revenues (rental of equipment and land, etc.)
14. Depreciation. The composite depreciation rates based on useful lives is around 4.5 percent of assets in operation, and based on tax regulation, is about 5.8 percent.
15. Other Nonoperating Income. This item includes interest income from bank deposits, income from rental of employees' houses, road inspection fees, etc. In addition, for projection purposes, this account includes the Rp 2,400 million annual payroll subsidy from the Central and West Java Governments.
16. Special Subsidy from GOI. It is assumed that GOI would provide funds to POJ to cover its operational deficits. They would amount to Rp 1.2 billion, Rp 5.1 billion and Rp 4.7 billion in 1993, 1994 and 1995, respectively.
17. Balance Sheet Account. Fixed assets include existing dams, hydroelectric power installations, land and office buildings, etc., as well as the new transmission pipes to be installed. The decrease in fixed assets in FY96/87 is brought about by the "capital restructuring" proposed by BPKP in April 1986. While this has not been formally accepted by MOF, the formality is expected to be completed soon.
18. Works in Progress. Includes all ongoing construction projects and will include the Pejompongan pipeline and fencing projects.
19. Advances. Travel fund advances to staff, etc. No change.
20. Accounts Receivables. Based on past experience, they are currently estimated to be about two months of gross billings for electric power and water.
21. Other Accounts Receivables. Receivables from employees, interest receivable, and miscellaneous receivables. For project purposes, it is assumed that the balance of this account will be equal to one month of the interest on bank deposit plus Rp 2,000 million representing miscellaneous receivables.

22. Inventory. This is equivalent to six months of the projected materials and supplies expense, and repair and maintenance expense plus 50 percent of the previous year's inventory balance.

23. Prepaid Expenses. The prepaid expenses account balance of Rp 332 million in March 1988 is assumed to remain constant.

24. Other Assets. Prepaid taxes and advances for fixed assets. For projection purposes the amount of Rp 3,095 million in FY87/88 is assumed to decrease by 20 percent the following year and that Rp 650 million is added to this account each year until 1990.

25. Retained Earnings. This account represents the undistributed profits of POJ. POJ incurred losses in previous years such that a deficit account was shown each year until 1985/86. The change from a deficit to a retained earnings account in FY86/87 is brought about by the "capital restructuring" in April 1986.

26. The Central Government will finance the Pejompongan Pipeline Project and the "West Tarum Canal Improvement Project" and that upon completion of the projections, disbursements of the Central Government for the project will be recorded in the books of POJ as Central Government equity. The disbursements corresponding to the WTC Project cover the West Tarum Canal Enlargement. It is assumed that the Central Government's share in POJ's profits, starting in 1989 and thereafter, will be retained to finance new investment. It is further assumed that profit distribution to employees will be limited to a maximum amount equivalent to three months of annual personnel cost.

27. Other Liabilities. Annual contribution of Rp 650 million to POJ retirement fund.

28. Accounts Payable. Accounts payable are assumed to be equivalent to one-half month operating expenses.

29. Other Current Liabilities. Retention payable, accrued expenses, taxes payable and miscellaneous payable. It is assumed to be equivalent to about one month operating.

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

PDAM Tangerang

Assumptions Used in Financial Projections

1. The inflation for the projection period is 7 percent per annum in 1990 and 6 percent per annum thereafter.

Major Assumption (under the Control of GOI)

2. GOI has decided to (a) extend the grace period relating to Cisadane treatment plant subsidiary and local currency loans to year 2000; (b) accumulate the interest during the grace period; (c) consider waiving the interest when it becomes due if the financial position of the PDAM warrants it.

Other Assumptions

Income Statement^{1/}

3. On the anticipation of extension of the distribution system through funds from various sources, including contributions (about 30 percent of the cost) from consumers and real estate developers, and extension for Cikokol II treatment plant capacity, the number of connections, mainly in the residential sector, are assumed to increase annually by 4,000-5,000 as compared to 3,700 in 1988.

4. Average monthly consumption for non-airport connection is 16.3 million m³ for the entire project period. This level of consumption is based on the recent results and on the fact that the increase in the number of connections would be mainly in the residential sector.

5. Due to the expected increase in traffic at the airport (and the current major airport expansion), airport consumption is assumed to increase by 10 percent per year.

6. Projected Volume Sold. The projected volume of retail sales is derived from the average consumption per connection multiplied by the number of connections. The volume sold from the Cisadane I WTP (Water Treatment Plant) is based on the expected buildup of demand from PDAM Jaya. (1993--9 million m³; 1994--29 million m³; 1995--48 million m³; 1996--65 million m³; 1997 and thereafter--76 million m³.)

^{1/} The figures shown for 1988 were taken from the Draft Final Audit Report. In a few instances those figures differ slightly from those in the Audit Report (subsequently received) but do not make a material difference to the financial results or performance.

7. The average tariffs in 1988 for retail water sales and sales to the airport were Rp 346/m³ and Rp 1,250/m³ respectively. These tariffs are assumed to increase in July 1, 1990 and again in January 1, 1993 and every three years thereafter. The increase is 25% in 1990, and 20% thereafter.

8. Tariff for treated water to PDAM Jaya (from Cisadane) is based on the methodology indicated in the recent agreement between PDAM Tangerang and PDAM Jaya, and amounts to Rp 375/m³ through 1997 and Rp 410/m³ thereafter.

9. Income from New Connections. This includes primarily consumer contribution towards cost of materials, and also fees for registration, documentation, and inspection. They amount to Rp 152,000/connection and are assumed to keep pace with inflation. They are treated as income.

10. Other Operating Income. Includes meter maintenance, administration fees and pipe maintenance.

Operating Expenses

11. Expenses such as fuel, power, and chemicals are proportional to water production. Water production is estimated as follows:

$$\text{Water production} = \frac{\text{Volume sold}}{(1 - \text{UFW})}$$

where UFW (Unaccounted-for water) is currently estimated to be in the range of 28-30 percent, is expected to stabilize at 25 percent of production.

12. The existing WTPs (660 l/s) are expected to satisfy demand certainly through 1995, and probably well beyond. The extension of the Cikokol WTP (+500 l/s) is therefore tentatively scheduled for 1993 to 1996.

13. The Cisadane I WTP is expected to be completed in 1993 and its total output is assumed to be fully utilized by 1997.

14. Personnel Costs. In 1988 the total number of staff was 300 and the average annual cost per employee was Rp 2.15 million. The number of staff is assumed to increase in proportion to the number of connections, and the annual cost per employee would keep pace with inflation.

15. The Cisadane Branch is treated separately. The staffing level and unit cost for the Cisadane I Project were estimated in the feasibility study i.e., 70 staff; annual cost Rp 3 million per employee (in 1987 prices). On average, the tasks for the Cisadane Branch will be more technical and it is reasonable to assume that the average cost per employee will be higher than for the rest of PDAM Tangerang's operations.

16. Fuel and Power. The cost for all plant (other than Cisadane) is proportional to volume of water produced and the unit cost in 1988 was Rp 28/m³. The cost keeps pace with inflation. For Cisadane WTP, the cost is as follows:

- (i) a fixed cost of Rp 104 million/year

(ii) a variable cost of Rp 18/m³ (in 1987 prices).

17. Chemicals Used. The unit cost in 1988 was Rp 14/m³. It is proportional to volume produced and keeps pace with inflation.

18. Maintenance. For the present plant, the actual cost in 1988 was Rp 6/m³ and keeps pace with inflation.

19. For the Cisadane, the total annual maintenance cost increases gradually from almost zero in the first year to Rp 870 million (in constant price) in the eighth year.

20. BAPAIR Fee. It is Rp 20/m³ and is applied to the volume of water produced.

21. Overhead. About 50 percent of the personnel cost.

22. Bad Debts. Five percent of water sales in 1989 and 1990, and 4.5 percent thereafter.

23. Depreciation and Amortization. The straight-line method is used and two sets of depreciation rates are derived; one based on economic useful lives, and the other on tax regulation, (shown in parenthesis for tax computation). They are:

1. Transportation equipment	12.5%	(50%)
2. Office furniture and equipment	10.0%	(25%)
3. Office buildings and staff houses	3.33%	(5%)
4. Installed pipes	2.0%	(10%)

24. Deferred Expenses. Fees for consultants, costs of training and studies; these are amortized over a five-year period starting in 1993.

25. Interest Expenses. Interest and bank charges on the subsidiary loan agreements entered into between GOI and PDAM Tangerang, corresponding to foreign loans from IBRD and the Government of France. This account also includes interest on the proposed loans from the Central Government and from future (as yet unidentified) foreign loans (see Section 2--Sources and Application of Funds). The on-lending interest on Bank loan is 9.4% for a 20-year period with 5 years grace, and a commitment charge of .75%.

Nonoperating Income

26. Includes penalty charges to customers and interest income. For projection purposes, it is the interest income from funds deposited in interest-bearing accounts.

Balance Sheet

27. Work in Progress. Includes all ongoing construction projects.

28. Accounts Receivable. Currently estimated around 2.5 months of the gross billings for water.
29. Other Accounts Receivable. Advances to supplies, receivables from new connections, etc.
30. Inventory. It is equivalent to six months of the annual expenses for chemicals and maintenance materials plus 75 percent of the previous year's inventory balance.
31. Cisadane Replacement Fund. An investment account to be set up in 1996.
32. Deferred Expenses. Expenditures for consultants, training, and studies, amortized over a ten-year period starting in 1990.
33. Accounts Payable. Equivalent to about 1.5 months operating expenses.
34. Other Current Liabilities. Advances received, deposits and miscellaneous payables, and are equivalent to half a month's operating expenses less bad debts.
35. Interest Payable. Under an existing arrangement between the PDAM and the Ministry of Finance interest on some existing loans will be paid in two installments of Rp 500 million in 1990; and the balance in 1991, such that payment of debt service will be up to date by 1992.
36. Other Liabilities. Represents customers' deposits which are held by PDAM Tangerang to cover possible unpaid bills.
37. Central Government Equity. Contributions from Central Government for the construction of the Serpong.
38. Customers' Contributions. Contributions for homeowners or real estate developers to PDAM Tangerang for the installation of water distribution pipes.
39. Local Government Equity. Starting in 1990 and thereafter, PEMDA Tangerang's share in the PDAM's profit will not be paid to PEMDA but will be credited as equity.

PDAM TANGERANG INCOME STATEMENT													
Base Case: Grace period on Cisadane loan extended through 2000													
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	Audited	Audited	Audited	Audited	Estimated				Projections				
429 (Million Rupiah in current prices)													
430 25% tariff increase in July 1990, and 20% in January 1993 and 1996													
431													
432													
433													
434													
435 OPERATING REVENUES													
436 Retail water sale - Non-airport	332	542	1,092	1,409	1,727	2,384	3,041	3,434	4,591	5,180	5,769	7,629	8,335
437 Retail water sale - Airport	389	586	920	1,143	1,260	1,559	1,905	2,095	2,766	3,042	3,347	4,418	4,866
438													
439 Total	721	1,128	2,012	2,554	2,986	3,943	4,946	5,529	7,357	8,222	9,115	12,047	13,195
440 Revenues from sales in bulk to PDAM Jaya	0	0	0	0	0	0	0	0	3,326	10,924	18,068	24,225	28,506
441 Revenues from sales in bulk to others	0	0	0	0	0	0	0	0	0	0	0	0	0
442													
443 Total Revenues From Water Sales	721	1,128	2,012	2,554	2,986	3,943	4,946	5,529	10,684	19,146	27,183	36,272	41,695
444 Income From New Connections	12	44	210	221	621	861	725	761	798	1,048	1,101	1,158	1,217
445 Other Income	11	0	1	0	29	40	46	52	67	76	84	107	117
446													
447 TOTAL OPERATING REVENUES	744	1,173	2,223	2,775	3,636	4,844	5,717	6,342	11,549	20,270	28,368	37,536	43,029
448													
449 OPERATING EXPENSES													
450 TANGERANG SERVICE AREA:													
451 Personnel cost	149	270	381	588	561	652	797	954	1,126	1,347	1,590	1,857	2,151
452 Fuel and Power	129	101	166	176	205	261	313	373	440	524	617	721	835
453 Chemicals	41	37	82	85	102	131	157	187	220	262	308	360	418
454 Maintenance	26	34	43	69	100	80	96	115	135	161	190	222	257
455 Administration cost	48	103	274	323	568	391	478	572	676	808	954	1,114	1,291
456 Bad Debts	0	0	0	0	90	112	148	166	221	247	273	361	396
457 Value Added Tax	0	0	0	0	73	86	104	125	147	175	207	242	280
458 SUB TOTAL TANGERANG SERVICE AREA	394	545	946	1,243	1,699	1,713	2,094	2,491	2,965	3,524	4,140	4,878	5,628
459													
460 CISADANE WATER SUPPLY FACILITIES:													
461 Personnel cost									292	310	329	348	369
462 Fuel and Power									0	0	369	2,120	2,612
463 Chemicals									0	0	190	521	1,299
464 Maintenance									0	0	151	321	721
465 Repair Fee									0	0	250	869	2,166
466 Overhead									0	0	146	155	174
467 SUB TOTAL CISADANE WATER SUPPLY FACILITIES									0	0	1,359	3,111	4,973
468													
469 TOTAL OPERATING EXPENSES	394	545	946	1,243	1,699	1,713	2,094	2,491	4,323	6,635	9,113	11,705	14,068
470													
471 Income before Depreciation	350	627	1,278	1,532	1,936	3,130	3,624	3,851	7,226	13,635	19,255	25,831	28,960
472 Depreciation (Useful lives after 1987)	164	201	797	953	901	955	1,020	1,058	1,551	4,851	4,855	4,860	4,733
473 Amortization of Def. Expense	0	0	0	0	0	407	407	407	407	303	303	303	303
474 Operating Income	186	426	481	579	1,036	1,770	2,176	2,386	5,267	8,481	14,097	20,668	23,924
475 Operational Interest	215	469	562	579	331	542	532	521	509	496	2,604	2,599	11,554
476													
477 NET OPERATING INCOME (-)	(29)	(43)	(81)	(10)	485	1,228	1,644	1,865	4,758	7,985	11,493	18,069	12,371
478 Net Non-Operating Income	49	74	166	299	189	234	225	212	229	354	467	556	572
479													
480 Net Income before tax	20	31	85	298	674	1,462	1,890	2,076	4,987	8,339	12,160	18,624	12,943
481 Depreciation (Fiscal Rule)	0	0	0	0	1,085	1,236	1,404	1,507	2,038	5,351	5,370	5,373	5,286
482 Net Fiscal Income	0	0	0	0	490	1,179	1,504	1,628	4,500	7,839	11,645	18,111	12,389
483 Provision for Income Tax	2	3	0	0	165	407	520	564	1,569	2,737	4,070	6,333	4,330
484													
485 NET INCOME	18	29	85	298	509	1,056	1,369	1,513	3,418	5,601	8,090	12,791	8,612
486													
487 RATIOS AND COMPARATORS:													
488 Average Tariff/m3 - Non-airport	155	183	358	401	401	451	501	501	602	602	602	722	722
489 Average Tariff/m3 - Airport	1012	1000	1244	1250	1250	1406	1563	1563	1875	1875	1875	2250	2250
490 Average Tariff/m3 - Bulk Sale to PDAM JAYA	0	0	0	0	0	0	0	0	375	375	375	375	375
491 Average Expenses per M3 Sold in retail	155.35	153.41	249.75	280.70	319.82	267.98	287.32	304.06	325.50	344.33	363.93	389.19	410.58
492 Average Expenses per M3 Sold in bulk	6.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	15.18	106.80	103.22	105.69	111.06
493 Working Ratio -Line 469/447		47%	43%	45%	47%	35%	37%	39%	37%	33%	32%	31%	33%
494 Operating Ratio -Line (469+472)/447		75%	64%	78%	79%	72%	55%	54%	56%	51%	57%	49%	44%
495 Net Income on Revenues -Line 477/447		-4%	-4%	-4%	-4%	13%	25%	29%	41%	39%	41%	48%	29%
496 Tariff Increase/Bulk to P3 (const.prices)									0.0%	0.0%	0.0%	0.0%	0.0%
497 Average Asset's Rate Base	2057	2361	6122	9586	10461	11771	13294	14533	77795	142079	151868	162243	166957
498 R n R on Rev.Assets Excl. Int.	11.3%	21.1%	10.6%	9.1%	18.2%	13.6%	14.3%	14.0%	5.0%	4.3%	6.9%	9.2%	12.1%
499 RoR on Rev Assets Excl. Int. & Taxes	11.4%	21.2%	10.6%	9.1%	11.8%	17.6%	18.2%	17.9%	7.1%	6.2%	9.6%	13.1%	14.7%
500													
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503
504
505 (Million Rupiah in current prices)
506 25% tariff increase in July 1990, and 20% in January 1993 and 1996

PDAM TANJERANG
SOURCES AND APPLICATIONS OF FUNDS

Base Case: Grace period on Cisadane loan
extended through 2000

	Total 1990-1996	1985 Audited	1986 Audited	1987 Audited	1988 Audited	1989 Estimated	1990	1991	1992	1993	1994	1995	1996	1997
SOURCES OF FUNDS:														
512 Income before depreciation	76,553	350	627	1,278	1,532	1,936	3,130	3,624	3,891	7,226	13,635	19,255	25,831	28,960
513 Other income	2,276	49	74	166	298	189	234	225	212	229	354	467	556	572
GRAND INTERNAL CASH GENERATION														
514		400	702	1,443	1,830	2,125	3,364	3,849	4,063	7,454	13,989	19,723	26,386	29,532
515 Control Government Equity	0	0	6	2,386	239	0	0	0	0	0	0	0	0	0
517 Local Government Equity Contr. (land)	1,675	0	0	0	0	30	1,675	0	0	0	0	0	0	0
518 Customers' Contributions (net)	5,095	0	0	294	0	1,041	872	788	680	611	674	714	757	1,003
519 Profit Reinvestment by Local Gov't	18,336	0	0	0	0	280	581	753	832	1,880	3,081	4,450	6,760	4,737
520 Total Equity		0	6	2,600	239	1,351	3,127	1,562	1,512	2,490	3,754	5,164	7,517	5,740
BORROWINGS														
523 Proposed Sub-Project Loan - IBRD	18,655	0	0	0	0	0	1,119	2,072	3,137	3,310	4,305	2,646	1,866	0
524 Proposed Sub-Project Loan - PDB	6,495	0	0	0	0	0	0	767	1,162	1,300	1,595	980	691	0
525 Cisadane Prod. Facility - French	51,540	0	0	0	0	18,689	28,133	14,532	8,875	0	0	0	0	0
526 Cisadane Prod. Facility - PDB	20,432	0	0	0	0	1,022	3,701	9,119	5,612	0	0	0	0	0
527 Extension WST - Foreign Loan	8,279	0	0	0	0	0	0	0	92	1,208	3,295	2,428	1,236	0
528 Prod. Trans. & Dist. Proj. (1993-2000)	10,000	0	0	0	0	0	0	0	0	0	0	4,000	6,000	6,000
529 Cukokol - IBRD	0	0	0	6,130	0	0	0	0	0	0	0	0	0	0
530 Exist. Gov't Loan	0	0	0	118	0	0	0	0	0	0	0	0	0	0
531 Repayable Gov't Equity	0	0	0	1,173	1,154	0	0	0	0	0	0	0	0	0
532 Interest Accumulated	60,114	0	0	0	0	965	3,734	6,707	8,875	10,049	10,741	9,677	10,331	2,032
533 Total Borrowing	175,516	0	0	7,421	1,154	20,676	38,688	33,197	27,753	16,068	19,935	19,731	20,143	8,032
534 TOTAL SOURCES OF FUNDS		400	708	11,504	3,223	24,152	45,179	38,988	33,328	26,013	37,678	44,618	54,046	43,304
APPLICATIONS OF FUNDS:														
539 Proposed IBRD Sub-Project	34,347	0	0	0	0	0	2,073	3,837	5,809	6,450	7,973	4,900	3,455	0
540 Cisadane Prod. Facility - French	73,557	0	0	0	0	19,891	35,419	23,651	14,487	0	0	0	0	0
541 Extension WST Component	13,799	0	0	0	0	0	0	0	194	2,014	5,491	4,047	2,093	0
542 Distribution Network Expansion	16,983	0	0	0	0	0	2906	2628	2266	2,035	2,245	2,380	2,523	3,343
543 Prod. Trans. & Dist. Proj. (1993-2000)	25,000	0	0	7,708	0	0	0	0	0	0	0	10,000	15,000	15,000
544 Other Capital Investments	146	91	350	0	1,338	2,301	0	0	0	33	35	38	40	42
545 Capitalized Interest - Cis. French Pr	53,912	0	0	0	0	965	3,380	6,378	8,228	8,931	8,931	8,931	8,931	0
546 Capitalized Interest - Other	6,203	0	0	0	0	0	154	329	647	1,118	1,809	746	1,399	2,032
547 TOTAL CAPITAL EXPENDITURES	224,146	91	350	7,708	1,338	23,157	44,132	36,823	31,591	20,632	26,465	31,042	33,440	20,417
549 Loan Amortization	3,224	0	0	0	111	180	105	115	125	136	149	1,228	1,366	1,452
550 Operational Interest	7,603	0	0	0	545	454	542	532	521	509	496	2,400	2,599	11,534
551 TOTAL DEBT SERVICE		0	0	0	656	634	647	646	646	645	645	3,632	3,965	13,006
552 Correction of Retained Earnings	0			37	168	(1,150)								
554 Payment of Income Tax	10,032	0	0	0	0	0	165	407	520	564	1,369	2,737	4,070	6,333
555 Profit Distribution to Local Gov't	18,336	0	0	0	0	280	581	753	832	1,880	3,081	4,450	6,760	4,737
556 Profit Distribution to Employees	2,401	0	0	0	0	127	163	199	238	335	414	480	551	630
557 Working Capital Needs	5,900	316	527	1,589	1,283	(880)	(198)	(91)	2	861	1,670	1,684	1,972	1,269
558 Other Assets/Liabil. Changes	(422)	(12)	(126)	2,122	(396)	(54)	(66)	(53)	(53)	(53)	(66)	(66)	(66)	(66)
559 Allocation of cash to Replacement Fun	481												481	584
560 TOTAL APPLICATIONS OF FUNDS	271,700	405	751	11,461	3,048	22,114	45,424	38,684	33,778	24,884	33,798	43,959	51,174	46,868
561 CASH INCREASE (+) OR DECREASE	7,750	(15)	(43)	44	175	2,038	(245)	(96)	(449)	1,129	3,881	659	2,872	(3,565)
564 Cash Balance, Beginning		69	84	21	64	239	2,277	2,032	1,936	1,486	2,615	6,496	7,155	10,027
565 Unadjusted Cash Balance				64	239	2,277	2,032	1,936	1,486	2,615	6,496	7,155	10,027	6,462
566 Min.own Cash					475	561	562	648	743	1,187	1,758	3,118	3,827	6,870
567 Short Term Borrowings					236	0	0	0	0	0	0	0	0	207
568 Cash Balance, End		64	21	64	239	2,277	2,032	1,936	1,486	2,615	6,496	7,155	10,027	6,462
569														
570 Debt Service Ratio - Line 515/555		NA	NA	NA	2.8	3.4	5.2	6.0	6.3	11.5	21.7	5.4	6.7	2.3
571 Contribution to Investment		942	862	-291	211	101	61	72	91	251	371	361	461	381
572 Contr to Inv.-Ave of 3 yrs (Last, Curr & Next)			-1802	-71	81	81	61	71	111	281	371	391	341	561
573 Cont to Inv [w/o Cisadane Prod.Fac.]		942	861	-291	211	701	301	211	161	251	371	361	461	381
574 Cont to Inv [w/o Cisadane Prod.Fac.] 3-yrs Ave.			-1802	-71	111	391	271	191	141	221	361	451	571	341
575 Cont to Inv [w/o Cisadane Prod.Fac. + Int.Cap.]		942	861	-291	211	1001	521	401	311	431	561	511	631	381
576 Cont to Inv [w/o Cisadane Prod.Fac. + Int.Cap.] 3-yrs Ave.			-1802	-71	81	761	561	401	301	401	571	531	691	381
577														

578 Note: Project and the corresponding Loan are in the process of being identified (The 1987 figures refer to First IBRD "Cukokol" Project)
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		PDAM TANGERANG BALANCE SHEET				Base Case: Grace period on Cisadane loan extended through 2000									
		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		Audited	Audited	Audited	Audited	Estimated				Projections					
581	(Million Rupiah in current prices)														
582	2% tariff increase in July 1990, and 20% in January 1993 and 1996														
583															
584															
585															
586															
587															
588	Fixed Assets in Operation	2,345	2,229	10,936	11,907	14,605	16,922	20,138	22,108	150,060	158,073	180,783	190,645	202,621	
589	Accumulated Depreciation	286	562	1,358	2,312	3,398	4,588	5,884	7,295	9,284	14,691	20,428	26,514	32,839	
590															
591	NET FIXED ASSETS	2,057	2,666	9,577	9,595	11,207	12,334	14,254	14,813	140,776	143,382	160,355	164,131	169,784	
592	Works in Progress	7	0	0	0	20,492	62,580	96,371	125,925	21,514	47,964	65,169	98,570	117,467	
593															
594	Cash	64	21	64	239	2,277	2,032	1,936	1,486	2,615	6,496	7,155	10,027	6,462	
595	Time Deposit	175	500	1,000	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	
596	Accounts Receivable - Water	149	264	478	514	622	821	1,030	1,152	2,226	3,989	5,663	7,557	8,686	
597	Other Accounts Receivable	54	69	98	74	256	156	96	56	56	56	56	56	56	
598	Advances	51	63	63	156	140	140	140	140	140	140	140	140	140	
599	Inventories	0	69	1,000	1,416	809	510	382	341	499	882	1,402	2,002	2,626	
600	Other Current Assets					400	400	400	400	400	400	400	400	400	
601															
602	TOTAL CURRENT ASSETS	493	985	2,703	4,279	5,554	5,109	4,994	4,625	6,986	13,012	15,866	21,232	19,421	
603															
604	Replacement Fund					0	0	0	0	0	0	0	481	1,025	
605	Deferred Expenses	0	0	2,038	2,037	2,037	1,430	1,222	815	1,516	1,213	910	607	303	
606	Other Assets				153	153	153	153	153	153	153	153	153	153	
607	TOTAL ASSETS	2,557	3,651	14,318	16,064	39,442	81,606	116,693	146,331	170,945	205,724	242,452	285,172	308,153	
608															
609															
610	Accounts Payable	0	0	54	54	268	267	324	387	684	1,065	1,473	1,891	2,279	
611	Other Current Liabilities	6	15	47	165	67	67	81	97	171	266	368	473	570	
612	Current Matur. Long-Term Debt	0	0	0	0	105	115	125	136	149	1,228	1,366	1,452	2,140	
613	Income tax payable	14	17	12	12	165	407	520	564	1,569	2,737	4,070	6,333	4,330	
614	Interest Payable	215	685	1,247	1,405	1,405	1,405	1,405	1,405	1,405	1,405	1,405	1,405	1,405	
615	Short Term Borrowing	0	0	0	0	0	0	0	0	0	0	0	0	0	
616															
617	TOTAL CURRENT LIABILITIES	236	717	1,360	1,636	2,011	2,260	2,456	2,589	3,977	6,701	6,682	11,553	10,724	
618															
619	Other Liabilities	32	157	73	622	676	742	795	847	900	966	1,032	1,098	1,164	
620	Long-Term Debt	0	0	7,421	7,369	27,787	66,356	99,428	127,045	142,964	161,672	180,077	193,723	204,621	
621															
622	TOTAL LIABILITIES	32	157	7,494	7,931	28,459	67,398	100,222	127,892	143,864	162,678	181,069	195,826	205,784	
623															
624	Assets Revaluation Surplus	0	455	455	455	1,477	1,313	1,120	1,001	4,581	12,002	19,994	28,590	37,456	
625															
626	Retained earnings	52	81	128	922	1,024	1,336	1,757	2,195	3,379	5,485	8,666	13,625	16,871	
627	Central Government Equity	1,768	1,774	4,161	4,398	4,398	4,398	4,398	4,398	4,398	4,398	4,398	4,398	4,398	
628	Customers' Contributions	0	0	254	254	1,295	2,166	2,955	3,635	4,245	4,919	5,633	6,389	7,392	
629	Local Government Equity	470	470	470	470	779	3,035	3,788	4,620	6,500	9,581	14,030	20,790	25,527	
630															
631	TOTAL EQUITY	2,289	2,777	5,465	6,497	8,973	12,248	14,014	15,849	23,103	36,385	52,701	73,793	91,645	
632															
633	TOTAL EQUITY AND LIABILITIES	2,557	3,651	14,318	16,064	39,442	81,606	116,693	146,331	170,945	205,724	242,452	285,172	308,153	
634															
635	Current Ratio	2.1	1.4	2.0	2.6	2.8	2.3	2.0	1.8	1.8	1.9	1.8	1.8	1.8	
636	Working Capital, exclud. cash	425	949	2539	3821	2942	2744	2652	2655	3516	5186	6870	8841	10110	
637	% Debt on Debt plus Equity (620/(620+631))	0.02	02	582	531	762	842	882	892	862	822	772	732	692	
638	% Debt on Debt plus Equity (excl Asst Rev Surp)	0.02	02	602	552	792	862	892	902	892	872	852	812	792	
639	% Debt (w/o Cis.Prod.Fac.) on Debt plus Equity	0.02	02	602	552	492	432	472	522	562	572	562	542	522	
640	(w/o Cis. Prod.Fac. and excl. Asst Rev Surp)														
641	0 Days Accounts Receivable	75	85	87	45	76	76	76	76	76	76	76	76	76	
642	% Debt/(Net Fixed Assets +WIP)	02	02	772	762	882	892	902	902	882	852	802	762	722	
643	Cash = 0 Months Operating Expenses	2	0	1	2	14	14	11	7	7	12	9	10	6	
644															
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649 650 (Million Ru'iah in current prices)	TOTAL EXCL CISADANE		TOTAL		Base Case: Grace period on Cisadane loan extended through 2009										
	1990-1996	ZDF TOTAL	1990-1996	ZDF TOTAL	1989 Es'olated	1990	1991	1992	1993	1994	1995	1996	1997		
651 25% tariff increase in July 1994, and 20% in January 1997 and 1998	-----														
652	-----														
653	-----														
654	-----														
655	-----														
656 Income before Depreciation	76,553	9,192	76,553	34,152	1,936	3,120	3,624	3,851	7,226	13,635	19,255	25,831	28,960		
657 Net Non-Operating Income	2,276	2,352	2,276	1,022	189	234	225	212	229	354	467	556	572		
658	-----														
659 Gross Internal Cash Generation	78,829	81,542	78,828	35,172	2,125	3,364	3,849	4,063	7,454	13,989	19,723	26,386	29,532		
660	-----														
661 MINUS:	-----														
662 Loan amortization	3,224	3,332	3,224	1,442	180	105	115	125	136	149	1,228	1,366	1,452		
663 Operational interest	7,603	7,862	7,603	3,392	454	542	532	521	509	496	2,404	2,599	11,554		
664	-----														
665 Total Debt Service	10,827	11,202	10,827	4,832	634	647	646	646	645	645	3,632	3,965	13,006		
666	-----														
667 Working Capital Needs (+)	5,900	6,102	5,900	2,632	(880)	(198)	(91)	2	861	1,670	1,684	1,972	1,269		
668 Other Assets (+) or Liab. Needs	(422)	-0.442	(422)	-0.192	(54)	(66)	(53)	(53)	(53)	(66)	(66)	(66)	(66)		
669	-----														
670 Profit Distr. to Employees	2,401	2,482	2,401	1,072	127	163	199	238	355	414	480	551	630		
671 Correction of Retained Earnings	0	0.082	0	0.002	(1,150)	0	0	0	0	0	0	0	0		
672 Payment of Income Tax	10,032	10,362	10,032	4,482	0	165	407	520	564	1,569	2,737	4,070	6,333		
673 Allocation of cash to Replacement Fund	461	0.502	461	0.212	0	0	0	0	0	0	0	461	544		
674	-----														
675 Net Internal Cash Generation	49,611	51,322	49,611	22,132	3,449	2,653	2,741	2,709	5,082	9,757	11,256	15,413	7,817		
676	-----														
677 Cash Increase (Decrease)	36,674	37,932	7,750	3,462	2,038	(245)	(96)	(449)	1,129	3,881	659	2,872	(3,565)		
678	-----														
679 CAPITAL EXPENDITURE	-----														
680 Proposed IBRD Sub-Project	34,547	35,732	34,547	15,412	0	2,073	3,837	5,809	6,500	7,973	4,900	3,455	0		
681 Cisadane Prod. Facility - French			73,557	32,922	19,891	25,419	23,651	14,487	0	0	0	0	0		
682 Extension MST Component	13,799	14,272	13,799	6,162	0	0	0	154	2,014	5,491	4,047	2,092	0		
683 Distribution Network Extension	16,983	17,572	15,983	7,582	0	2,906	2,628	2,266	2,075	2,245	2,780	2,523	3,743		
684 Prod. Trans. & Dist. Proj. (1995-2000)	25,000		25,000	11,152	0	0	0	0	0	0	10,000	15,000	15,000		
685 Other Capital Investments	146	0.152	146	0.072	2,361	0	0	0	33	35	38	42	42		
686 Capitalized Interest - Cis. French Proj.			53,912	24,052	965	3,580	6,378	8,228	8,931	8,931	8,931	8,931	0		
687 Capitalized Interest - Other	6,203	6,422	6,203	2,772	0	154	329	647	1,116	1,309	745	1,399	2,032		
688	-----														
689 Total Capital Expenditure	96,677	100,002	224,146	100,002	23,157	44,132	36,823	31,591	20,632	26,485	31,042	32,440	20,417		
690	-----														
691 NET TO BE FINANCED:	87,741	86,672	182,236	81,772	21,747	41,224	33,986	28,433	16,679	20,609	20,445	20,900	9,075		
692	-----														
693 Financed by:	-----														
694 Proposed Sub-Project Loan - IBRD	18,655	19,302	18,655	8,322	0	1,119	2,072	3,137	3,510	4,305	2,646	1,866	0		
695 Proposed Sub-Project Loan - PDM	6,495	6,722	6,495	2,902	0	0	767	1,162	1,390	1,595	980	691	0		
696 Cisadane Prod. Facility - French			51,540	22,992	18,689	28,133	14,532	8,875	0	0	0	0	0		
697 Cisadane Prod. Facility - PDM			20,432	9,122	1,022	5,701	9,119	5,612	0	0	0	0	0		
698 Extension MST - Foreign Loan	8,279	8,562	8,279	3,692	0	0	0	92	1,208	3,295	2,428	1,256	0		
699 Prod. Trans. & Dist. Proj. (1995-2000)	10,000	10,342	10,000	4,462	0	0	0	0	0	0	4,000	6,000	6,000		
700 Interest Accumulated	6,203	6,422	60,114	26,822	965	3734	6707	8875	10049	10741	9677	10331	2032		
701	-----														
702 Total Borrowing	49,632	51,342	175,516	78,302	20,678	38,688	33,197	27,755	16,068	19,935	19,731	20,143	8,032		
703	-----														
704 Central Government Equity	0	0.002	0	0.002	0	0	0	0	0	0	0	0	0		
705 Local Government Equity	1,575	1,732	1,675	0.752	30	1,675	0	0	0	0	0	0	0		
706 Customers' Contributions (net)	5,095	5,272	5,095	2,272	1,041	872	788	680	611	674	714	757	1,003		
707	-----														
708 Total Equity Contributions	6,770	7,084	6,770	3,022	1,071	2,547	788	680	611	674	714	757	1,003		
709	-----														
710 Total Financed	56,402	183,132	182,286	81,522	21,747	41,224	33,986	28,433	16,679	20,609	20,445	20,900	9,035		
711	-----														
712 Contribution to Investment					102	62	72	92	252	372	362	462	382		
713 Cont to Inv [w/o Cisadane Prod.Fac. + Int.Cap.]						52	402	312	432	562	512	632	382		
714 Cont to Inv [w/o Cisadane Prod.Fac. + Int.Cap.] 3-yrs Ave.						562	402	302	402	572	532	692	382		
715	-----														
716	-----														
717 BN-Inv: Project and the corresponding loan are in the process of being identified (The 1997 figures refer to First IBRD "Cikokol" Project)															
718 File Name: PDAM TANG.; TP/AM/RB/DB															

PDAM TANGERANG MONITORING INDICATORS														
Base Case: Grace period on Cisadane loan extended through 2000														
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
	Audited	Audited	Audited	Audited	Estimated				Projections					
778 DEPEND														
780	Tangerang Water Production - Million M ³ /Y	3.6	5.2	5.6	6.2	7.3	8.6	9.7	10.9	12.1	13.6	15.2	16.7	18.3
781	Cisadane Bulk Production - Million M ³ /Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	29.4	48.7	65.3	76.8
782	Volume Produced - Million M ³ /Y	3.6	5.2	5.6	6.2	7.3	8.6	9.7	10.9	21.1	43.1	63.8	82.0	95.0
783	% Unac'd for water (U.F.W) incl. Cisadane	30.0%	32.0%	32.0%	28.0%	27.0%	26.0%	25.0%	25.0%	26.0%	26.0%	26.0%	26.0%	26.0%
784	Volume Sold to Tangerang - Million M ³	2.5	3.6	3.8	4.4	5.3	6.4	7.3	8.2	9.1	10.2	11.4	12.5	13.7
785	Volume Sold to PDAM JAYA - Million M ³	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	29.1	48.2	64.6	76.0
786	Total volume sold - Million M ³ /Y	2.5	3.6	3.8	4.4	5.3	6.4	7.3	8.2	18.0	39.4	59.6	77.1	89.7
788 MANAGEMENT														
790	0 Days Accounts Receivable	75	85	87	45	76	76	76	76	76	76	76	76	76
791	Number of Employees	133	191	284	300	330	329	378	427	546	607	668	729	790
792	% Increase of Employees		44%	49%	6%	10%	0%	15%	13%	28%	11%	10%	9%	8%
793	Number of Empl/No of Conec x 1000	13	16	20	17	15	12	12	12	12	12	12	12	12
795 PROJECT DEVELOPMENT														
797	Cap. Proj. Cost - Proposed IBRD Sub-Project	0	0	0	0	0	2,073	5,909	11,719	18,219	26,192	31,092	34,547	34,547
798	Cap. Proj. Cost (US\$ Million)	0.00	0.00	0.00	0.00	0.00	1.21	3.45	6.83	10.62	15.27	18.13	20.14	20.14
799	Cumulative Bank Loan (US\$ Million)	0.00	0.00	0.00	0.00	0.00	0.65	1.86	3.69	5.74	8.25	9.79	10.88	10.88
800	Disbursement Profile	0.00	0.00	0.00	0.00	0.00	11%	32%	64%	100%	144%	171%	190%	190%
802	Cap. Proj. Cost - Cisadane Treatment Plant	0	0	0	0	19,091	55,310	78,961	93,448	93,448	93,448	93,448	93,448	93,448
803	Cumul. Bank Loan - French Protocol	0	0	0	0	18,689	46,822	61,354	70,229	70,229	70,229	70,229	70,229	70,229
804	Disbursement Profile	0.00	0.00	0.00	0.00	21%	59%	84%	100%	100%	100%	100%	100%	100%
806 FINANCIAL														
808	Overall Retail Tariff (in current prices)	285	317	531	533	562	582	679	675	808	803	801	961	963
809	Average retail tariff increase		11%	67%	0%	5%	4%	17%	-1%	20%	-1%	0%	20%	0%
810	Bulk Tariff (in current prices)									375	375	375	375	375
811	Average bulk tariff increase									0%	0%	0%	0%	0%
812	Working ratio	0%	47%	43%	45%	47%	35%	37%	39%	37%	33%	32%	31%	33%
813	% Cont to Inv w/o Cisadane Production Facility													
814	and Int. Capitalized Average of 3 Yrs		-180%	-7%	8%	76%	56%	40%	30%	40%	57%	53%	69%	38%
815	Rate of return based on net income	11.4%	21.2%	10.6%	9.1%	11.8%	17.0%	18.2%	17.9%	7.1%	6.2%	9.6%	13.1%	14.7%
816	Debt service ratio	NA	NA	NA	2.8	3.4	5.2	6.0	6.3	11.5	21.7	5.4	6.7	2.7
817	% Debt (w/o Cis.Prod.Fac.) on Debt plus Equity													
818	(w/o Cis. Prod.Fac. and excl. Asst Rev Surp)	0%	0%	60%	55%	49%	43%	47%	52%	56%	57%	56%	54%	52%
1987 CONSTANT PRICE ANALYSIS														
822	Retail Tariff	285	317	531	533	519	501	548	514	580	544	512	580	548
823	Tariff increase		11%	67%	0%	-3%	-4%	9%	-6%	13%	-6%	-6%	13%	-6%
824	Operational Expend./M ³ sold	155	153	250	281	320	268	287	304	326	344	364	389	411
1987 CONSTANT PRICE ANALYSIS														
828	Bulk Tariff									269	254	240	226	213
829	Tariff increase									0%	-6%	-6%	-6%	-6%
830	Operational Expend./M ³ sold									153	107	103	106	111
CRITICAL FINANCIAL INDICATORS														
834	VARIABLE OR INDICATOR	Minimum	Maximum	Average										
835														
836	Cash	21	10027	3713										
837	Retail Tariff increase (constant prices)	-6%	67%	6%										
838	Bulk Tariff increase (constant prices)	-6%	3%	-4%										
839	Working ratio	0%	47%	35%										
840	Rate of return	6.2%	21.2%	13.5%										
841														
842														
843	File Name: PDAM TANG.; TP/AR/BB/DB	03-May-90 11:16 AM												

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

A. PDAM Java System Improvement Project: Proposed Action Program

Issues	Status	Corrective action	Time frame	Monitoring indicators/comments	
<u>Issue: Personnel Policy</u>					
PM.1	Improvement of recruitment procedures	Job description is made down to Chief of Subsection. Job description for the other staff is made by respective working unit.	The job description is systematically revised	1991	The job description has already been improved. Job description for lower levels under preparation.
		Recruitment test is made and conducted by PAM or by Personnel Dept. of DKI Jakarta Administration in accordance with the existing regulations, including psychotest	Conducting additional professional tests	1991	The recruitment test consists of: completion of supporting data; written test; interview; psychotest/medical check
PM.2	Improvement of personnel income policy	Income structure not sufficiently linked with effective work; insufficient incentives	Increased allowances for improved performance	1990	Budget for staff allowances
			Computerize employee files	Dec 1990 In progress	Percentage of employee files computerized
			Strengthen administration department through appointment of human resources adviser	Dec 1990	Report on incentives
PM.3	Overall implementation of personnel policy	Present Personnel Department inadequate	Create a Human Resources Unit	Activity Report of Human Resources Department	
PM.4	Field personnel safety	Complete lack of safety	Provide field staff with required equipment	(It is a continuous process)	The required equipment is now provided but supervision is needed
			Train field supervisors in safety	1990 Is a continuous process	Number of field supervisors trained
<u>Issue: Financial Management</u>					
FM.1	Tariff	Low tariff for hydrants not passed on to final users	Set the maximum amount that the concessionaire can charge the users, strictly monitor and impose penalties in case of noncompliance./	Progressing (Continuous process)	Increase the number of hydrants; also label with water price is stuck to each hydrant
			Periodically review and adjust the water rate structured and tariff rates		IERD considers it important for tariffs to be reviewed and adjusted more frequently and, in any case, no longer than every 3 years. PDAM Jaya agrees to review every 3 years.
FM.2	Planning and budgeting	Full implementation of revised system is required	Modify presentation of the budget in order to show projected expenditure by month or quarter	End-1990	Monitoring implemented through monthly and quarterly reports. More detailed presentation is in process
			Break the sales budget down into types of customers	1991	Presently sales budget is prepared as a joint effort between head office and rayon and by type of customer. However, there is no overall summary by type of customer

Issues	Status	Corrective action	Time frame	Monitoring indicators/comments
FH.3 Water meters	No inventory of meters; broken meters are not always replaced	Immediately repair malfunctioning water meters and replace those that can no longer be repaired	1990-93 Under way	Number of meters replaced each year by Cabang will be directed in accordance with PJSI ² program. Continuously implemented.
	Many customers without meters	Install water meters for all consumers	1993	Water meter installation already implemented to consumers where the condition of the location permits. (As of September 1989, only about 0.5 percent of total connections were without meters.)
FH.4 Meter reading		Instruct all water meter readers to indicate the water meter readings in the water meter cards kept at the customer's place. (This will give the consumers the chance to immediately verify the correctness of the water meter readings.)		Being implemented.
FH.5 Meter reading	Uneven workload for meter readers	Readjust workload by transferring some of the meter readers assigned to areas where the workload is light to areas where the workload is heavy	1992	At present, PDAM Jaya is trying to employ private meter readers for residential consumers only. If it is a success, this program will be continued
FH.6 Bill collection	Very few sanctions for bad payers	Strictly enforce the penalties and sanctions for late payment of water bills. This will increase collection and reduce the risks of uncollectible accounts. ^{2/}	Continuous process	Already implemented by Rayons. Average age of accounts receivable must be monitored
		For better control and for more efficient use of cash resources, have all cash collections remitted to the cashier the following day		The cash collections in the rayons are every day
FH.7 Implementation of accounting system	Need for technical assistance	It is recommended that the accounting system be further improved and be fully implemented with assistance for Financial Management and staff trained in the use of the accounting and management information systems.	1991	TOR for TA Financial Management. Technical Assistance for Financial Management is necessary, including training in accounting and Management Information System and computerization
FH.8 Account audit	(a) Very late audit (b) Several qualifications	(i) Expedite closing of books and preparation of draft financial statements (ii) Agree on annual schedule of audit with BPKP (iii) Expedite issue of audit report by BPKP (iv) Provide TA through the proposed project to ensure timely preparation of draft statements (v) Financial advisor to work with PDAM, MOF and DKI Jakarta to remove audit qualifications	1990-92	Draft Financial Statements should be finished in not more than 3 months after the yearly closing. Submit audited accounts to IBRD by June 30, 1990 for CY1988; by March 30, 1991 for CY89; by March 30, 1992 for CY90; by December 31, 1992 for CY91; by September 30, 1993 for CY92. By September 30 each year thereafter.

^{1/} PDAM Jaya should determine penalties for noncompliance of user charges and: (i) hydrant concessionaires should be fully apprised of the penalties and (ii) users should be encouraged to report noncompliance to PDAM Jaya. (The label should also include address or phone number for consumers to report noncompliance by concessionaires.)

^{2/} PDAM Jaya should also consider developing other sources (e.g., bank, post office, etc.) where the customer could pay his water bill.

B. Perum Otorita Jatiluhur (POJ): Proposed Action Program

Issues	Status	Corrective action	Time frame	Monitoring indicators/comments
Accounting and budgeting systems	Manuals prepared by Hans Kartikahadi	Assistance by Hans Kartikahadi in the implementation for which funds are available	Full implementation including staff training to be completed by Dec 1990	Implemented systems
Inventory control system	Manual prepared by Unisystem Consultants	Assistance by Hans Kartikahadi in the implementation. Own funds to be used	To be completed by Jun 1990	Implemented system
Organization restructuring, manpower planning, management information systems including computerization, manpower training including internal audit staff	Consultants needed	Assistance by consultants. Funding proposed under the loan	Implementation during Jul 1990 to 1992	Implemented systems
Water quality management, pollution control	Consultants needed	Assistance by French Government	Implementation during July 1990 to 1992	Improved water quality
Future audit	Late audit	Follow schedule of audit report submission. (For FY1988/89 Draft Accounts, completed. Auditing Nov 1989-Mar 1990.)	FY1988/88 - 16 months after end of year 1/ FY1988/89 - 7 months Apr-Dec 1989 - 6 months	Up-to-date submission of audit report
Capital restructuring	Fixed assets and capital need to be approved by Ministry of Finance	Ministry of Finance to approve POJ fixed assets and capital	Under discussion between MOF and POJ	Qualification on audit report regarding the need for MOF approval is removed
PBB share	Result of mapping already submitted to West Java Government by Tax Directorate March 23, 1989	POJ to follow up with West Java Government regarding POJ's share in PBB	Under discussion between MOF and POJ	Fair share of PBB to POJ.

1/ Depending on the availability of BPKP budget.

C. PDAM Tangerang: Institutional Development Action Plan

Issues	Status	Corrective action	Time frame	Monitoring indicators/comments
<u>Sub-theme: Financial Management</u>				
FM.A Accounting system	Only partly implemented Need for technical assistance	Complete implementation of the system, and recruit necessary staff. TA is included in Loan.	1991	Elimination of problems with balances of inventory, and accounts receivable, and of delays in financial reporting.
FM.1 Collection report	Collection reports from IKGs are not received on time for recording in the Head Office	Follow the schedule for submitting collection reports to the Head Office	1990/91	Reconciled reports on collections between the bank and the accounting unit (Internal Audit in following up each month)
FM.2 Physical progress report on construction	Some contractors overpaid or paid in advance	Verify work done before payment	1990/91 Under way	Payment to contractor in accordance with terms of the contract
FM.3 Fixed asset ledger card		Fixed asset ledger cards should be updated including the location of the assets	1990/91 Under way	Fixed assets shown in the records can be verified. (Action under way)
FM.4 Accounts receivable for water sales	The accounts receivable balance shown in the general ledger does not tally with the total of individual customer's accounts receivable balances	Use suitable computer program for accounts receivable. Reconcile accounts receivable by branch and by customer	1990/91	Reconciled accounts receivable balances. (Action under way. Also, PDAM is seeking Bupati's approval for charging the difference to losses)
FM.5 Accounts receivable for non-water sales	Accounts receivable for nonwater sales are sometimes recorded without the supporting bills. Some bills for new connections are not recorded in the Bill Registers	The internal audit staff should test check whether recording of accounts receivable is supported with bills	1990/91	Accounts receivable supported with bills. (Situation in STATUS is improving)
	There is no aging of accounts receivable for nonwater bills	Computerization of accounts receivable should include all types of receivables	1990/91	All accounts receivable are aged for better collection efforts
FM.6 Provision for bad debts	Bad debts are not provided for in accounts receivable from both water and nonwater sales	Provide for bad debts in the accounts	1990/91	Establish some policies to solve the accumulation of bad debts including preparation of aging status Reconciliation of debts for approval of State Auditor (BPKP)
FM.7 Accounts receivable from employees and other accounts receivable	Supporting documents for some accounts receivable from employees and also for other accounts receivable are not available	Review individual accounts receivable. Write off the accounts, where necessary	1990/91	Valid accounts receivable are shown in the books
FM.8 Inventory control	The inventory balance shown in the general ledger does not tally with the total of the stock card balances which also do not tally with the physical count balances	Reconcile the inventory balances first before proceeding with the computerization plan for inventory.	1990/91	Reconcile inventory balances. (Two different auditors apparently have given different views)
	Some inventory items have no assigned costs. There is no proper control for repaired water meters	Segregate obsolete inventory items from good ones. Assign costs to good inventory items	1990/91	Valid inventory items with assigned costs
FM.9 Salary deductions for social insurance	Salary deduction for the employees' insurance and the subsequent remittance to ASTEK are not in the books	Record salary deduction and remittances to ASTEK in PDAM Tangerang's books	1990/91	All transactions are recorded in the books
FM.10 Deferred expenses	Expenditures for consultants which may be capitalized or charged to fixed asset accounts are not yet segregated	Segregate amounts which are chargeable to fixed asset accounts. The balance of the deferred expenses after deducting amounts capitalized should be amortized	1990/91	All expenditures are properly classified. (Progress is slower than expected)
FM.11 Payment of interest payable	Interest due on loans for the Cikokol project has been accumulated because there were no payments in previous years, except in 1988. PDAM has not received from GOI a schedule of loan payments	To avoid bigger interest payments, pay the outstanding interest payable. Also, GOI should provide a loan payment schedule	1989	No build-up of interest payments due;

Issue	Status	Corrective action	Time frame	Monitoring indicators/comments
FM.12 Profit distribution	Partial payment of Rp 25 million in March 1988 represents PENDA's share in the profit of PDAM Tangerang	Retain PENDA's share in the profits of PDAM Tangerang as equity of PENDA.	1990/91	(a) Compliance with letter of guarantee from Bupati/Mayor stating that the profit would be used for the extension of water systems. (b) Increased PENDA equity in PDAM Tangerang (PDAM expects PENDA to adhere to guidelines. Bupati appears supportive of above)
FM.13 Cash advance	Cash advances are not promptly liquidated nor some have supporting receipts	Put a limit of, say, two weeks within which cash advances should be liquidated	1990/91	Cash advances are liquidated within a reasonable period of time. (Internal Audit to follow up progress made)
FM.14 Account Audit	(a) Very late audit (b) Several qualifications	(i) Expedite closing of books and preparation of draft financial statements (ii) Agree on annual schedule of audit with BPKP (iii) Expedite issue of audit report by BPKP (iv) Provide TA through the proposed project to ensure timely preparation of draft statements (v) Financial advisor to work with PDAM, MOF and DKI Jakarta to remove audit qualifications	1990-92	Draft Financial Statements should be finished in not more than 3 months after the yearly closing. Submit audited accounts to IBRD by March 30, 1991 for CY89; by March 30, 1992 for CY90; by December 31, 1992 for CY91; by September 30, 1993 for CY92. By September 30 each year thereafter.
FM.15 Policy on capital expenditure	There is no written policy as to what expenditures are to be capitalized or charged to fixed assets and those which are to be charged to expenses	Prepare a written policy on what expenditures are to be capitalized	1990/91	Written policy
TM.1 Maps of secondary and tertiary network	Inaccurate	Updating by Chief of I/D Dist. (consultants are assisting)	1990	Periodical report from Technical Director Final report of Mapping should be updated
TM.2 Equipment of pipe fitters	Equipment very poor, not adapted and absolute	Each team should be provided with proper tools	1991	Report from Technical Director
TM.3 Stock control system	Existing system covers pipes, fittings and chemicals, etc. manually Stock unit cost updating due to present condition/price	Extend the system to all goods: computerized updating system	1990/91	Full application of accounting systems and procedures: Stock Status Report periodically; develop level of stock.
TM.4 Purchase of goods from supplier	Possibility of purchasing directly from suppliers	Allow PDAM to purchase directly from supplier up to a maximum amount of Rp 5 million	1990/91	Report from Board Director

INDONESIA

SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)

PDAM Jaya System Improvements

Monitoring Indicators

Annual Targets	1989	1990	1991	1992	1993	1994	1995	
Public Hydrant House Connections	33,000	700 33,000	700 33,000	700 33,000	700 33,000	700 33,000	700 33,000	
Household Behavior Study		Prepare TOR	Do Study	Implementation				
Field Personnel Safety		Appoint Safety Engineer	Appoint 4 Supervisors	Staff training	Staff training			
PDAM Jaya Mapping	(1) Mapping	Section and Documentation will send quarterly reports on as built drawings made ready for digitizing.						
	(2)	Digitizing to start	Complete 50% backlog	Complete 50% backlog	Complete all of backlog			
Pejompongan I & II Rehabilitation		Completed						
Production								
Pej I	1,700 l/s	2,000 l/s						
Pej II	3,000 l/s	3,600 l/s						
Pulogadung	2,500 l/s	4,000 l/s						
Primary Network Valves		50%	100%	(program and quarterly reports to be provided)				
Water Meters	Bulk procurement to be studied - Report to be issued by 1990 Replacement strategy to be studied Check every 3 years--Guidelines to be issued by 1990.							

INDONESIA

SECOND JABOTABEK PROJECT (JUDP II)

Supervision Plan

Bank Supervision Input

1. The staff inputs in the table indicated below are in addition to regular supervision needs for the review of quarterly progress reports, procurement actions, correspondence, etc. These routine requirements at Bank headquarters are estimated to be about eight staff-weeks during FY 1991, and approximately six staff-weeks per year from FY 1992 to FY 1994, and five staff-weeks per year thereafter. Staff input during the field supervisions is indicated in Table 1. Accordingly the total Bank supervision input is estimated at about 25 staffweeks during FY91 and about 20 staffweeks in FY92 and 17 staffweeks in FY93 through FY96.

GOI's Contribution to Supervision

2. Progress reports will be submitted as follows:

- (a) generally following the format being used for Ln. 2632-IND (Second Java Water-Supply Project);
- (b) or a quarterly basis and within 45 days of the end of each quarter with the first report for the period July through September 1991 due by November 15, 1990;
- (c) prepared by JUPCO using inputs from all implementing agencies.

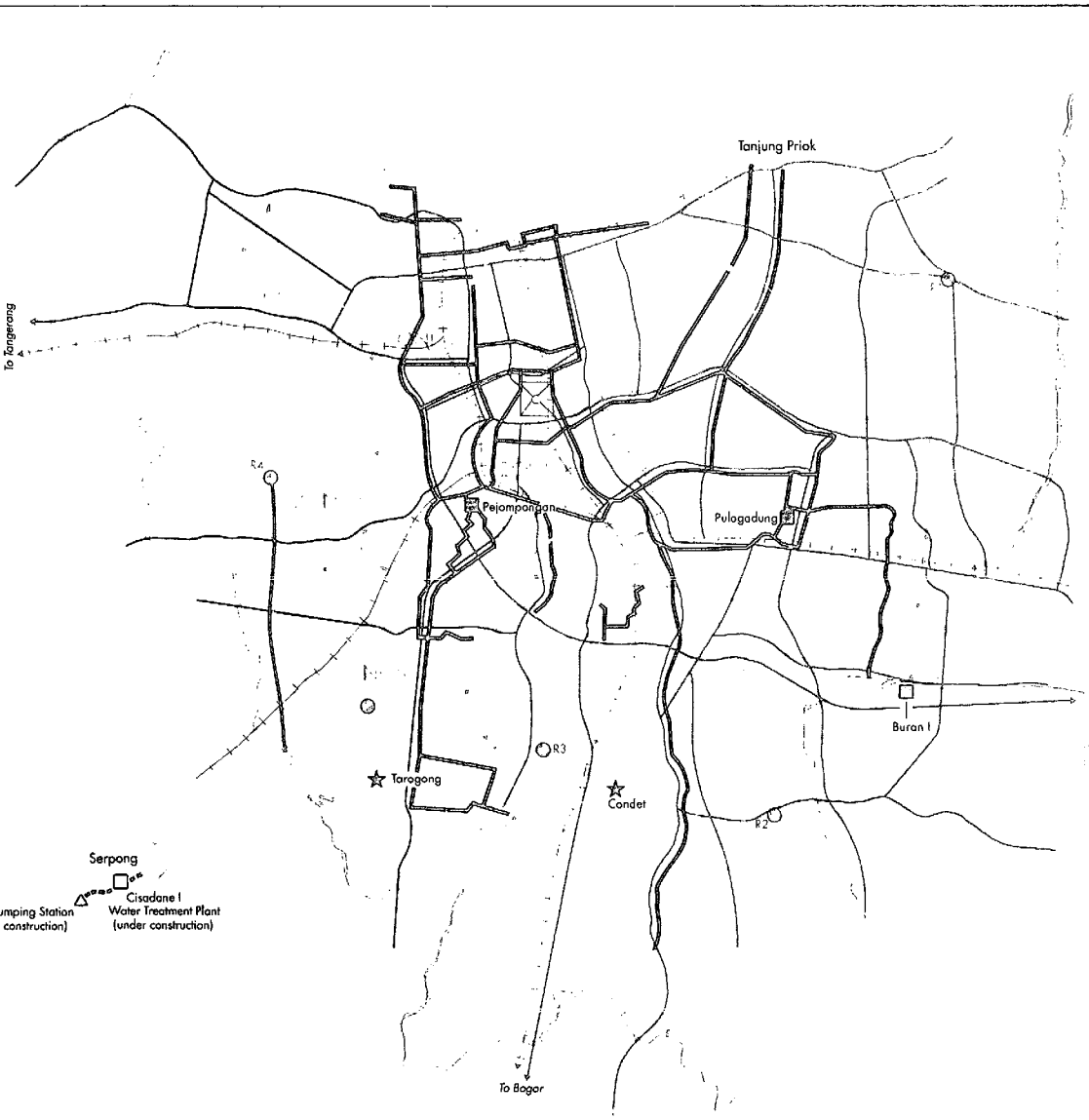
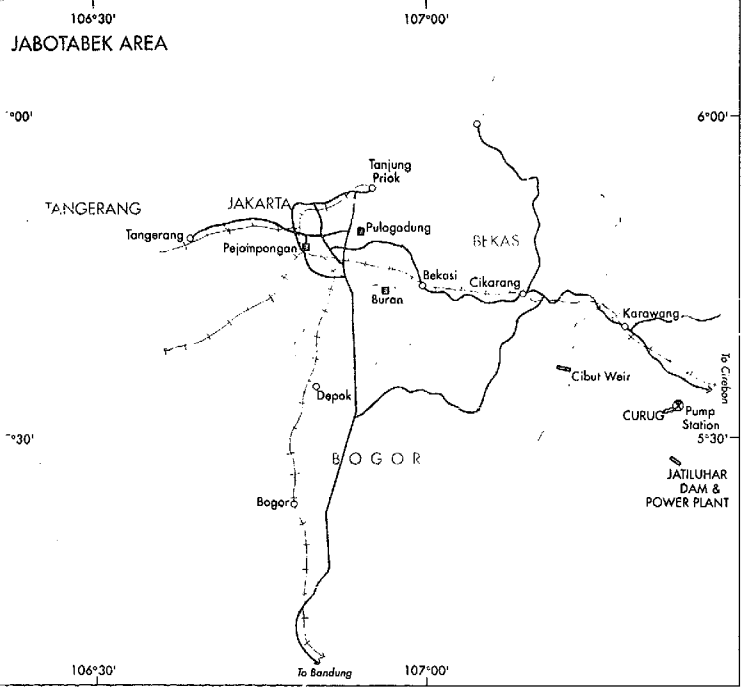
3. Project monitoring and coordination will be the responsibility of JUPCO. Review meetings with the participation of representatives of all implementing agencies will be held three times a year in February/March, June/July, and October/November. The meetings will be chaired by the Executive Secretary of TKPP, and will be attended by a Senior Representative of DGCK, responsible for overall supervision by the Central Government.

4. JUPCO, assisted where necessary by TKPP, will be responsible for coordinating arrangements for Bank Supervision missions and for providing information requested by missions.

Table 1: BANK SUPERVISION INPUT

Approximate dates	Activity	Expected skill requirements	Staff inputs (SW)
06/90	Supervision Mission (Project start-up)	Financial analysis Engineering/procurement	4.0
10-11/90	Supervision Mission (Project launch workshop)	Institutional development/ training, environmental management, financial analysis, engineering/ procurement	7.0
12/90-01/91	Review of tender documents, proposal evaluation	Engineering, procurement	2.0
02-03/91	Supervision Mission (progress review, setup of systems and accounts, start of construction)	Financial analysis, sanitary engineering, project management	4.0
04-05/91	Review of contract documents, consultants' agreements	Engineering, procurement	1.5
06-07/91	Supervision Mission (review progress of studies, check environmental management and monitoring, pilot low-cost sewer project)	Financial analysis, sanitary engineering, environmental and water resource engineering	5.0
10-11/91 and 4-5/91	Supervision Mission (progress of civil works review, quality control, coordination of institutional development and training)	Engineering, institutional development/training, project management	4.0
1992 to 1996	Three Supervision Missions annually (last one to prepare PCR)	Financial analysis, engineering, procurement, environment, institutional development	4.0

MAP SECTION

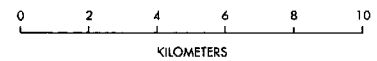


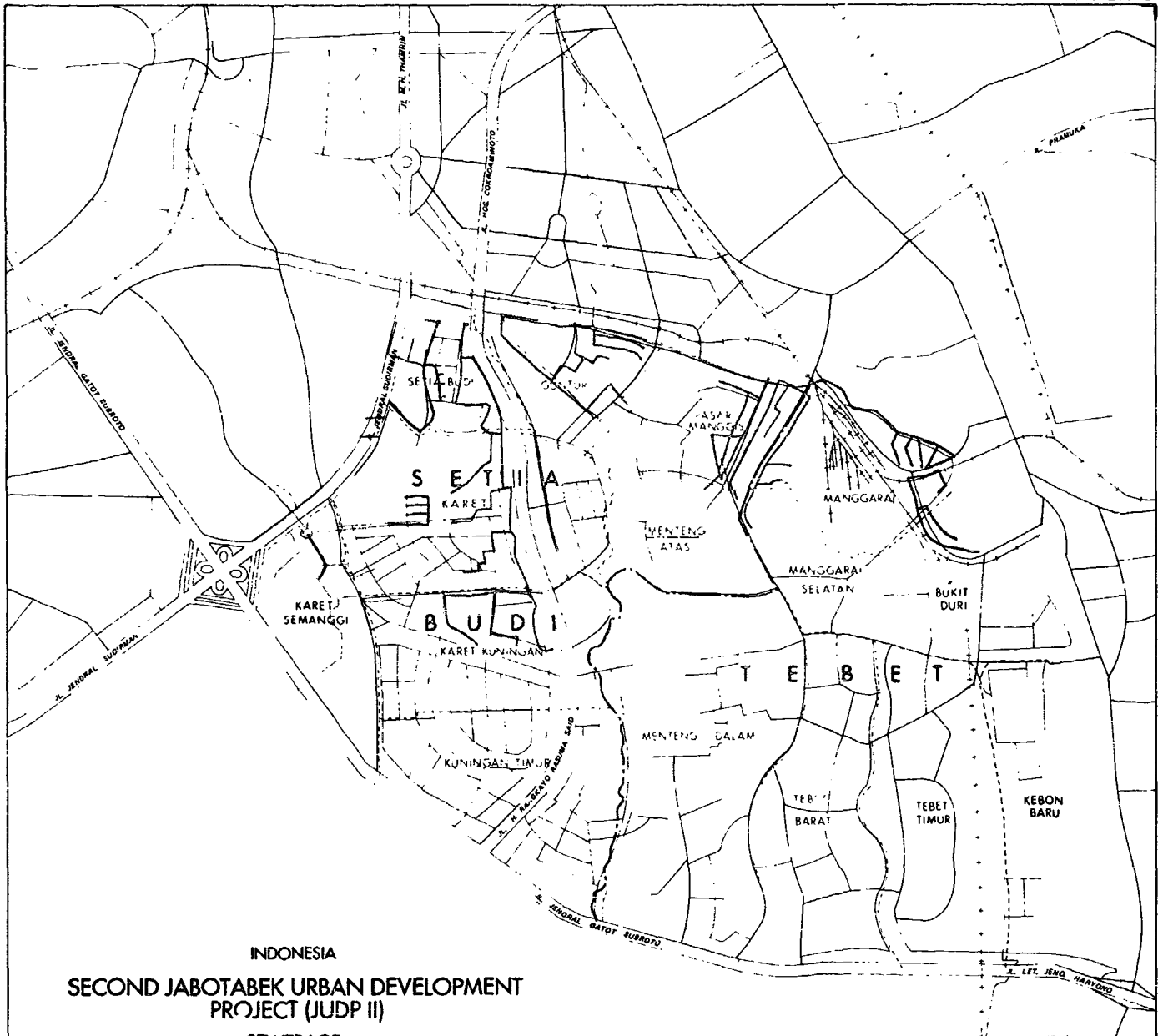
INDONESIA
SECOND JABOTABEK URBAN DEVELOPMENT PROJECT (JUDP II)
PDAM JAYA SYSTEM IMPROVEMENT PROJECT (PJSIP)

- | | | | |
|-----------------|---------------|-----------------|----------------------------|
| <u>EXISTING</u> | <u>FUTURE</u> | <u>PROPOSED</u> | Primary Pipelines |
| | | | Water Treatment Plants |
| | | | Future Distribution Center |
| | | | Mini Plants |

Serpong
 Intake Pumping Station (under construction)
 Cisadane I Water Treatment Plant (under construction)

- ZONE 2**
- Bank Financed Zone of Distribution System
 - Water Supply Zone Boundaries
 - D.K.I. Boundary
 - Roads
 - Railroads

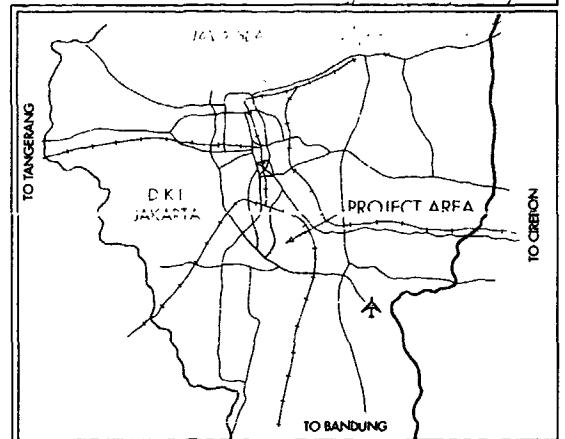
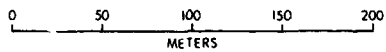




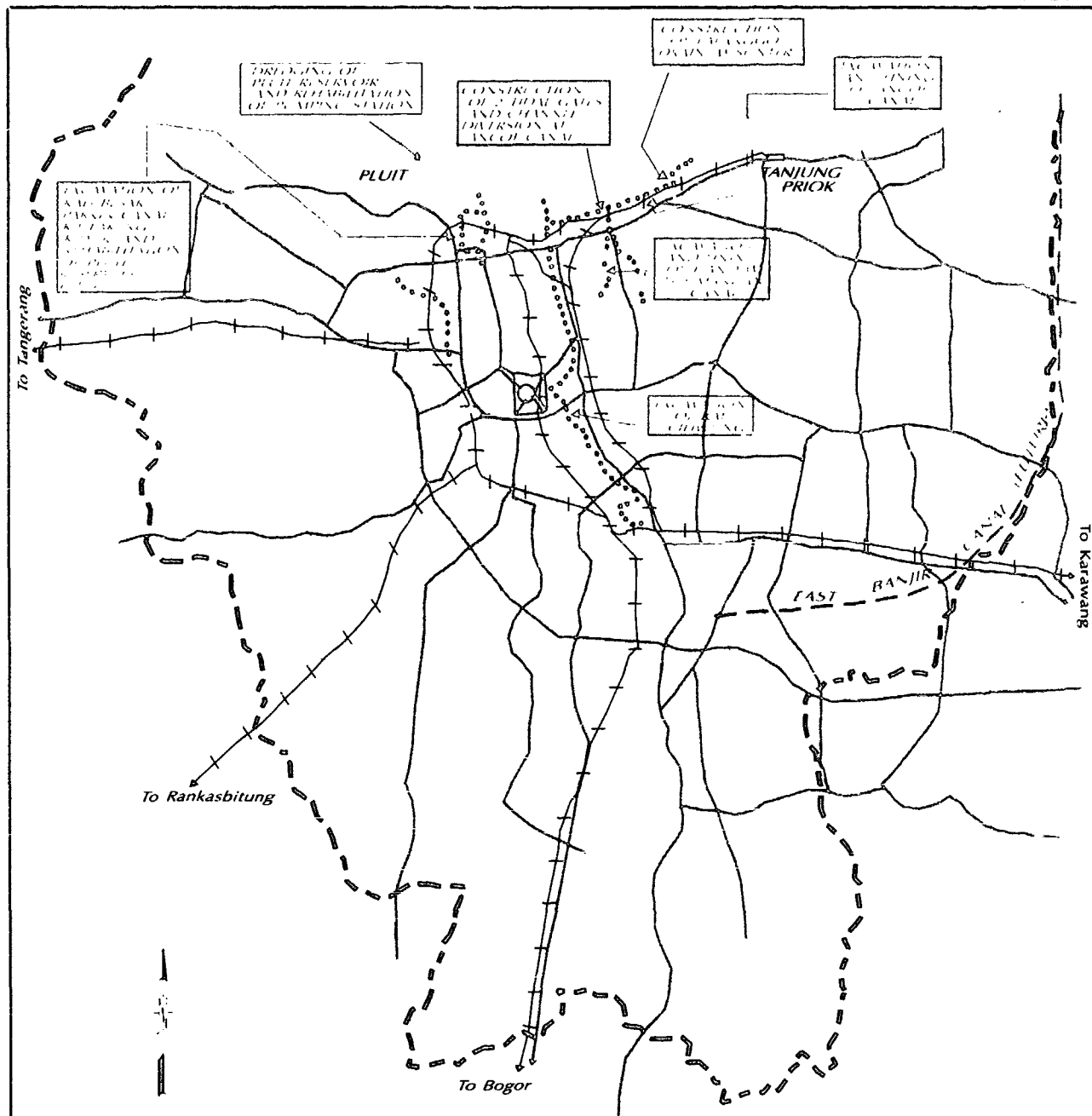
INDONESIA
**SECOND JABOTABEK URBAN DEVELOPMENT
 PROJECT (JUDP II)**

SEWERAGE

- Sewerage Works
- JSSP Completed
- JSSP in Progress
- JUDP II Proposed Project
- Krukut Sewage Pumping Station
- Roads
- Railroads
- Rivers
- - - Kefurahan Boundaries
- - - Kecamatan Boundaries



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INDONESIA
**SECOND JABOTABEK URBAN DEVELOPMENT
 PROJECT (JUDP II)
 DRAINAGE**

- Drains
- Future Canal
- Major Rivers or Canals and Drains
- Roads
- +—— Railroads
- ==== DKI Jakarta Boundary

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