VI.2 Institutional Study

Recommendations on Water Resources Management Institutions in the Brantas River Basin

VI.2.1 Legislative and Regulatory Issues

The recommendations on organizational issues cover:

- Consolidation of Perum Jasa Tirta with PKB and PGKS,
- Transformation of its organizational status to PERSERO,
- Establishment of Basin Water Management Committee, and
- Demarcation of management responsibility among related agencies.

The recommendations on technical aspects deal with:

- Water quality,
- Watershed management,
- Flood control,
- Water supply and water right.

Some of the recommendations are beyond PJT mandate. Such issues include IPAIR collection and water service fee determination.

The capacity to implement the managerial and technical recommendations should be strengthened. Requirements for capacity building including staffing and human resources development are described in the other experts in the Study Team.

VI.2.1.1 Water Resources Management Institutions in the Brantas River Basin

(1) Consolidation of Perum Jasa Tirta with PKB and PGKS

(a) Activities in Areas Outside the Brantas River Basin

PKB is responsible for dredging work in hydropower generation plant in Sampean Baru. While KANWIL PU has more a coordination role, though PKB has its base on the Brantas river basin, it seems somehow to have been playing a role of "general water resources project implementing office for East Java province.

PGKS has many officials working for debris control for Semeru Mountain which is outside the basin. New PJT shall be responsible for water resources management within the Brantas River basin. Therefore new PJT will be involved in Sabo and other works of Mount Semeru within the boundary of the Brantas River basin.

Such activities outside the Brantas River basin but currently assumed by PKB and PGKS can be remained under the supervision of Directorate of Construction Guidance, Central Region. The new PJT shall be allowed to engage in water resources development and management activities outside the basin. In this case, new PJT should engage in such activities as contracted work basis upon request from the

Ministry of Public Works.

(b) Change of Jurisdiction for Three Organizations

New jurisdiction for three organizations is required. It is necessary to issue Government Regulation providing jurisdictions for the new organization replacing existing Government Regulation No.5 of 1990 and Minister of Public Works Regulation No. 56 of 1991 by the end of 2001. There is a draft of new Ministry of Public Works Decree on the "Designation of Authorities and Responsibilities of PJT" which is under discussion. This draft Decree could be a reference for new Government Regulation to be issued.

Government Regulation is required in stipulating the roles of new river basin management organization for the Brantas River basin. Government Regulations were issued for establishment of Perum Jasa Tirta and Perum Otoritas Jatilufur. The new Government Regulation shall describe such issues as the new PJT task and responsibility and working area

(c) Redefinition of Corporate Mission and Tasks

After the integration with PKB and PGKS, new mission and redefined tasks should be set. New mission and tasks shall be contained in the new Government Regulation of the new organization.

(2) Transformation to Persero Status

There are many areas to be changed when Perum becomes Persero. Such required changes include financial/accounting method and employment status change as mandatory or regulatory changes, and non-regulatory but behavioral change of employees. Non-regulatory, organizational change is described in the other parts of the Report – Organization and Management, Financial Plan and Budget Analysis, and Human Resources Development -. Recommendations for action in terms of organizational status change are described below.

(a) Employment relations

There are 145 government officials working in PJT. Most of them occupy higher positions. In Indonesia, government officials are allowed to work at Perum for maximum four (4) years. Most of the officials now work at PJT more than 4 years. They may continue to work at PJT until 2005.

It is necessary to ask them to choose whether to quit PJT or lose their governmental status and join PERSERO before 2005.

Salary of government officials in principle should be borne by the Perum they work. In case of PJT, it receives some amount of money from the government as PGPS salary (Central government contribution for the salary of government officials at PJT). PJT received 585 million rupiahs from the government as PGPS salary in 1996.

PGPS salary is used as a fund for partial salary of government officials.

Provision of PGPS should be stopped before 2005.

Status of government officials will no longer be available after 2005. Working conditions including salary and pension should be examined before it becomes Persero.

Issue of Government Regulation is necessary for transformation from Perum to Persero. The Government Regulation shall describe the following issues: purpose of transformation, implementation process, goal of the Persero, capital, and organization. Regulatory change including financial arrangement does not require a lot of time as seen in such preceding examples as PT Telkom and PT PLN. It took them about 6 months to become Persero.

(b) Financing Alternatives

As regards financial resources of the new PJT, several options are available for its development activities (construction). The first, the new PJT implements the project utilizing government budget just as present PKB does. Second, the Ministry of Public Works awards the new PJT the project as a contractor. Third, the new PJT is awarded the project from the Ministry of Public Works as a concession. In this case it must be responsible for financing. It has to make a loan arrangement (including two-step loan). Lease contract, management contracting and concession agreement including BOT should be considered in new capital.

(3) Basin Water Resources Management Committee

It is necessary to draft and issue the Minister's Decree on establishment of water management committee for the Brantas river basin. It is proposed that the new organization (new PJT) should assume the role of secretariat of the committee. The proposed Basin Water Resources Management Committee reports to the Minister of Public Works instead of the Governor. New PJT, as a secretariat of the Committee, presents various data and information to the Committee. The Committee members discuss and present their agreements to the MPW as the Committee's proposals.

(4) Demarcation of Responsibility with Related Agencies

As the tasks and responsibilities of the new organization are supposed to expand from the current PJT, demarcation of responsibilities among agencies shall be specified. It is necessary to issue "Joint Ministerial Decree" or "agreement letter" with related agencies in many aspects. Related agencies and their tasks include the following:

Detailed demarcation plan is described in "Organization and Management" part of the Report.

VI.2.1.2 Technical Aspects

(1) Water Quality – Provincial Level Pollution Charge System

Since neither Ministry of Environment nor BAPEDAL plan to set national level regulation on pollution charge, the charge system shall be set as provincial regulation reflecting local situation. New PJT is able to collaborate with BAPEDALDA in establishing pollution charge system.

(2) Watershed Management Including Flood Control

Watershed management issue should be included as an agenda for the proposed Basin Water Management Committee. Perum Jasa Tirta should collaborate in policy formulation and implementation with Ministry of Forestry and Perum Perhutani.

The use of natural retarding basin is proposed as a flood control measure in this study. Land use in such river bank areas as Kali Surabaya and Kali Porong are already regulated by Ministry of Public Works regulation. By this Regulation, Perum Jasa Tirta should provide technical recommendation on the land use in the river bank area. Similar regulation shall be drafted for the other rivers as well Once the pilot flood hazard map is prepared, Perum Jasa Tirta should collaborate in designating the natural retarding basin.

(3) Water Supply and Water Use Right

(a) Review of Water Use Right Ledger

Lack of well-defined water use rights system makes efficient and equitable water use difficult. Once "Brantas River Basin Water Management Committee" is established, it should review the ledger of water use rights holders each year. The PJT should provide technical recommendations on the water use licensing. Necessary information on actual water use both for surface water and ground water should be provided by DPU Pengairan and DISTAMB. The license shall be cancelled or amended in case water use is not in conformity with the license. PJT involvement in water use licensing would be effective in achieving efficient use of water. It is because PJT, together with Caban Dinas, is well informed of actual amount of water taken from rivers.

(b) Priority of Water Allocation

The following three actions are recommended for achieving fair and efficient water allocation.

(i) River Maintenance Flow

River maintenance flow should be included in the list of water allocation priority instead of flushing as stipulated in Law No. 11 of 1974.

(ii) Another Regular Water Management Committee Meeting

Current Reservoir Operation Plan (POLA) mainly presents amount of water to be released by reservoirs. The function of Water Management Committee is focused on discussion of POLA. It is proposed that the Committee should have its another regular meeting in the middle of dry season as an instrument for mid-term review. It should be held for forecasting and preparing for the measures to be taken in the coming season.

(iii) Preparation of Emergency Operation Plan

The Brantas river basin faced with serious drought in the past. The ad-hoc measures for droughts were taken in the past. Perum Jasa Tirta as the responsible agency for managing the basin, should initiate the preparation of emergency drought plans. The emergency plans should include updating mechanism for urban and rural population change and industrial activities. The plan should be established at the water management committee. It must be observed by all agencies involved in water resources management in the basin.

(iv) Long-Term Water Allocation Priority

Law No. 11 of 1974 provides priority order of water use. East Java province as well sets priority of water use. Drinking water is the first priority followed by agricultural water use. No priority is defined in long-term and in emergency water shortages. The Water Management Committee shall review current water priority and set forth long-term water use priority.

(4) River Environment

Perum Jasa Tirta has a mandate for managing 40 rivers and their tributaries in the Brantas River basin. Perum Jasa Tirta is not responsible for off-stream influences on these rivers. The influences include agricultural runoff, domestic wastewater and industrial effluents. The Water Quality Expert of this study proposes demarcation of mandate concerning pollution control.

(a) Public Exposure of Non-Compliance with Environmental Regulations

PROKASIH experience shows that public exposure of organizations not complying with environmental legislation is effective. The exposure of effluent test from many industries proved effective.

(b) Penal Provisions

The 1997 Environmental Law stresses compliance with the stipulations. It includes various penal provisions for negligence and infringement of environmental protection.

Amount of fine stipulated in Law No.11 of 1974 needs re-examination. It stipulates that amount of fine is up to 50,000 rupiahs. Recent Environmental Law (1997) provides that infringement of legal provisions shall be liable to fine up to 150,000,000 (one hundred and fifty million rupiah). Maximum imprisonment is 15(fifteen) years. In this Law another important provision is that it sets the right of community and environmental organizations to bring actions. It is recommended that new PJT shall also take legal actions when they find intentional and serious violation of environmental standards.

Proposed changes in the legal and regulatory framework is summarized in Table VI.2.

VI.2.2 Private Sector Participation in Water Supply

Corporate management becomes important once Perum Jasa Tirta turns to Persero. It is required to achieve efficient operation. There are three major issues to be taken into consideration in regard to water supply projects.

(1) Choice of Arrangement

One is a choice of institutional arrangement. There is a wide spectrum of options including "service contract", which is the biggest involvement of public sector involvement within the privatization options. Concession including BOT, which requires the least involvement of public sector. At this point, it is difficult to identify which arrangement is the best. Preceding foreign privatization examples on water supply are mostly made by municipal water supply organizations. In case of PJT, its main tasks are provision of raw water and operation and maintenance of river structures. There are preceding private sector participation in infrastructure provisions in toll roads (Jasa Marga) and telecommunications (Telkom) in Indonesia. Though new PJT may be able to learn from such examples, it has to establish its own institutional arrangement enabling provision of raw water on one hand and provision of drinking water on other. Both efficiency and equity considerations are required.

(2) Regulatory Mechanisms for Environmental and Equity Considerations

The second issue is to establish regulatory mechanism for privatized operation of water supply. There must be the two concerns when water supply is privatized. The first concern is environmental or resource depletion. Water Supply Company may try to increase its revenue by increasing supply. The company may pursue short-term gain without paying considerations for water resources conservation. This would lead to water resources depletion. The second concern is equity consideration. Water is not only economic goods. It is a source of life as Islamic Law says. Once it is privatized, the Company does not necessarily have a concern for basic human needs. Thus the cost for smaller users may increase. In this aspect, equity must shall be ensured in water supply.

Similarly, selection of contractor often involves corruption. It is therefore not the best company that wins the contract. It is thus not the citizens who get the most benefit.

It is indispensable to have regulatory systems to oversee compliance with contract. The regulatory agency can be independent organization, or central and municipal governments. Quality of water, water resources including surface and groundwater conservation and tariff structure need particular supervision.

(3) Government Support

Responsibility for provision of infrastructure lies upon the Government. Private sector participation shall be made in a manner to preserve public interest. The Government therefore has to ensure that requirements of people and private investors' interest do not contradict each other.

The Government shall issue Government Regulation to guide infrastructure provision. It shall present government commitment to private sector participation. It also presents requirements for contract provisions, processes including bidding procedure for private sector participation. Regulatory arrangements enabling inter-departmental (ministerial) collaboration for private sector participation is also required. Related ministries may include MPW, Ministry of Home Affairs for management of domestic water, Ministry of Environment and Ministry of Finance.

VI.2.3 Water Demand Management

The cheapness of water is not because water provision requires no cost. Many governments have chosen to charge less than costs for water services. This is a governmental subsidy towards water users.

VI.2.3.1 Water Pricing

Costs of water supply consists of variable costs of processing and delivering the water to users and of fixed cost of capital operation and maintenance. Variable costs depend on amount of water delivered and mostly borne by the users. Fixed costs are normally borne by governments. There are several pricing methods for water. Such methods include the following[2]:

Volumetric:Water is charged based on direct measurement of volume of water consumed. Variation of the volumetric approach include a. indirect calculation based on measurement of minutes of known flow from a reservoir and b. a charge for a given minimal volume to be paid for even if not consumed.

Output:Water is charged on per output basis (for example crop)

Per unit area: Water is charged per area

Tiered pricing: This is a multi-rate volumetric method. Water rates vary as the amount of water consumed exceeds certain threshold values.

Two-part tariff: This is to charge a constant marginal price per unit of water used and a fixed annual (admission) charge for the right to use the water.

[2] Yacov Tsur and Ariel Dinal,1995 "Efficiency and Equity Considerations in Pricing and Allocating Irrigation Water" Policy Research Working Paper The World Bank

Betterment levy: Water fees are charged per area, based on the increase in land value accruing from the provision of irrigation

According to the investigations of Bos and Walters (1990), [3] water charges are levied on per unit area basis in more than 60% of the cases studied, while a combination of per unit area and volumetric basis is taken in less than 15% of the cases.

Comparison of various pricing methods is described below. The two most popular pricing practices are Volumetric pricing and Per area pricing. Comparison of Pricing Methods

Pricing Scheme	Implementation	Ability to Control Demand
Volumetric	Complicated	Easy
Output	Relatively easy	Relatively easy
Per area	Easiest	Hard

As summarized above, volumetric levy is most effective in controlling demand. It is however difficult to implement. Output pricing is implemented without measuring water inputs of individual farmers, which is an expensive task in many countries. This pricing method is the second best in terms of ability to control demand. Per are pricing is superior in regard to administrative cost. It can affect water input through its effect on crop choices. Once the crop has been chosen, the water fee has no effect on water demand.

VI.2.3.2 Application to the Brantas River Basin

(1) Cost Recovery from Irrigation Water Users

The principle of "Full cost recovery" shall not be abandoned merely because of implementing difficulty. When the water users have sufficient ability to bear for the cost, they should pay.

The practices of cost recovery in the selected countries were studied. The following three issues are provided for the Brantas River basin as recommendations.

(a) Extension of IPAIR Collection

Though it is not PJT mandate, it is necessary to collect IPAIR in all irrigation areas in the Brantas basin. The amount of IPAIR should be adjusted to recover actual cost for operation and maintenance of irrigation canals by 2001 – ten years after its introduction -. This would reduce financial burden of governments. It would contribute to improvement of farmers' water use as well. This is the beginning of awareness building for farmers concerning cost of water management.

[3] Bos. M G., and W. Walters, 1990, " Water Charges and Irrigation Efficiencies"

(b) Cost Recovery for Reservoir Operation and Maintenance

Farmers do not pay for reservoir operation and maintenance cost. PJT is providing agriculture water at operational loss. Farmers should pay for O&M cost of reservoirs as proposed as "beneficiary to pay" principle. It is thus necessary to set water service fee for agricultural water use as well. The fee should be set based on size of land but it should reflect the actual amount of water distributed. Collection of water service fee should start by 2005 since the new organization is supposed to start its operation as Persero. Persero requires appropriate level of operational profit, to be modest.

Article 3, clause 3 of Government Regulation No. 6 of 1981 on "Contribution for operation and maintenance cost for water resources development infrastructure" should be amended. It releases farmers from paying contribution for operation and maintenance cost of water resources development infrastructure only because farmers pay IPEDA (contribution for regional development, now changed to PBB[4]).

(c) Cost Recovery for Capital Investment

In this study, it is proposed that at first, farmers should bear the cost for O&M of irrigation channel through payment of IPAIR. Second, cost recovery for O&M costs for reservoir is proposed. To this point, farmers are requested to pay for water related costs just as other water users – PDAM Industry and PLN – pay. As agricultural sector is the largest water user, it makes great contribution if farmers could pay for O&M costs.

When these two proposals are being realized, cost recovery for capital investment should also be proposed for all water users. Ability to pay concept should be considered. In 2020, income level of farmers is expected to improve. Cost allocation method should reflect benefit each water user sector receives. The Economic Evaluation Expert in the Study Team describes cost allocation method and cost calculation for capital investment and O & M costs.

(2) Domestic and Industry Water Pricing

(a) Promotion of "Pollution Prevention Pays" Concept

Service cost or operation and maintenance cost required for provision of domestic water and industrial water is the same. "Ability to pay" consideration seems to be reflected in the difference in water service fee between the two. Higher pricing for industrial water has the two negative influences: one is the higher production cost which may lead to decrease in non-oil export for Indonesia, the other is the over use of ground water. Though the retribution for groundwater is higher than surface water, it is more difficult to measure over abstraction compared to surface water. On the other hand, higher cost of water may lead to adoption of "clean technology". This

[4] Law No. 12 of 1985 on Land and Building Tax (PBB)

"pollution prevention pays" concept should be prevailed as well as "Polluters pay principle".

(b) Domestic Water Fee can be increased

Domestic water service fee as well may be increased. Cheapness of domestic water does not mean domestic water provision needs less cost. Governments including Ministry of Home Affairs and East Java governor choose to charge less than cost of service. When water is subsidized either from government or other water user, there is little incentive to conserve. Expansion of service coverage seems to be attempted however financial constraints make the goals being met difficult. It is thus important that further analysis of domestic water pricing should be made though it is neither completely in the hands of PDAM and nor in the scope of business for Perum Jasa Tirta. With the increased financial resources made available from increased water tariff, PDAM may be able to expand its service coverage.

VI.3 Community and Beneficiaries Participation

VI.3.1 Definition and Purpose of Community and Beneficiaries Participation

(1) Definition of Community and Beneficiaries Participation

The community participation in developemnt means community's involvement in all stages in the process of development which includes decision-making, implementation, monitoring, evaluation and management of the development programs. It is a process that improves the economic, social, cultutural and political situation of the people at the grassroots level.

In this Study, the *community participation* is defined as the people's participation in water resources management activities in the Brantas river basin through PJT's public campign activities. Therefore, community participation herein includes the people's awareness building on water scarcity, efficient use and conservation.

In this Study, the *beneficiaries participation* is defined as the involvement of beneficiaries in various aspects of activities in the water resources management. In the process of water resources management which includes such activities as reforestation, land conservation, water quality conservation and O&M activities of irrigation canals, there are many activities for which participation of the beneficiaries are indispensible. Financial supports of the beneficiaries who are benefitted from utilizing river water are also required for sustainable management of water resources.

(2) Purpose of the Participation Activities

When a river is at the stage of "development", the community participation is focused mainly to the involvement in development projects. For example, the participation to public hearings for the environmental impacts of a project implementation may be one of the typical participatory activities. However, when a river system moves from the stage of development to that of "management" where the Brantas river is situated now, the community participation is required in such a wide area of cooperation as saving water consumption, efficient use of water and participation to clean water activities and so on. The awareness and consciousness of the people to the scarecity and preciousness of water are equired as well. While in financial aspects, beneficiaries' financial support in the form of water charge is necessary for the sustainable management of water resources. In these contexts, purposes of the participation activities in the water resources management are categorized as follows.

(a) Financial Aspects

Accompanied by the progress of urbanization and industrialization, the future water demand is projected to increase rapidly in the Brantas river basin. For the construction and maintenance of dam and reservoirs for water supply, an enormous amount of fund is required. If all of this fund is met by Government budget, this is a subsidy to water users. And this causes an inequity between water users and non-water users. Beneficiaries who are benefited from water use are naturally to be requested to pay for their water use: this is the beneficiaries-pay concept. The

concept constitutes the financial bases for sustainable management of water resources. One of the purposes of the participation activities lies in spreading this concept among beneficiaries so that they may accept it and become willing to pay for water service fees. In this regard, the current issuing point is the irrigation water service fee in the Brantas river basin, which is being discussed in the chapter of "Institutions".

(b) Efficient Use of Water

As development works have been approaching to the last stage, the marginal cost of construction is getting more and more costly in the Brantas river basin. Now it is well recognized that "management" is cheaper than "development" of water resources in the Brantas river basin area. This means that the creation of water through nonstructural measures such as water saving, efficient use of water, recyclical water use and so on is studied and reconsidered. These measures can be attained only through the cooperation of water users. In this context, awareness and consciousness of water users to scarecity and preciousness of water are the key-for-success. One of the purposes of participatory activities lies in this fundamental awareness building to efficient use of water.

(c) Water Users' Benefits

All the water users are making every effort to get profit in doing their daily works. When they succeed to get it, then they will be willing to pay for the water supply. This means that the beneficiaries-pay concept can be accepted only when water users appreciate the contribution of water to their profit. In this context, to identify and to meet the real needs of water users are essential matters, which can be attained through good communication between water users and PJT. The participatory activities include to prepare such occasions for both parties, which constitute one of the purposes of the participation in water resources managment activities.

VI.3.2 Participation Activities on Water Resources in Developing Countries

The following examples are showing the performance of beneficiaries participation in water resources management in Indonesia, the Philippines and Sri Lanka. These examples are quoted from Water Resources Management (World Bank, 1995: p.103-105).

INDONESIA. No longer able to afford O&M of its extensive irrigation network, the government instituted major policy changes in the irrigation sector beginning in 1987. One policy was to turnover small-scale irrigation systems of fewer than 500 hectares to water user associations. This was supported by the Bank-funded Irrigation Sub-Sector Project (ISSP). The associations were granted formal legal status enable them to take on management responsibilities. The government carefully prepared the turnover process, bringing farmers in to discuss rehabilitation and redesign and to gain sense of ownership and responsibility. The International Irrigation Management Institute studied two pilot turnover projects under the ISSP and found that, overall, the maintenance performed was more or less what was required and did not pose a long-term threat to deterioration of the canals. By the middle of 1991 the

government transferred control of more than 400 irrigation systems covering 34,000 hectares to associations. Success for the program relied primarily on including farmers early in the design and construction phase and allowing the formation of associations to be flexible. The program demonstrates the competence of associations in managing irrigation systems.

THE PHILIPPINES. About 48 percent of the irrigated area in the Philippines is under the farmer-owned and managed communal irrigation systems. The government has helped to construct and rehabilitate these systems at lease since the 1930s. In the mid-1970s, the NIA began a unique participatory system. The process consisted of introducing an irrigation community organizer into a community to encourage farmers to cooperate in O&M. The organizer acts as a catalyst, providing guidance and advice. The farmers participate in all aspects of new development and rehabilitation. A formal, legally recognized water user association is organized to carry on O&M after the NIA withdraws. The procedures governing the association appear complex but work satisfactorily, farmers are very supportive, and O&M costs are meet entirely by the beneficiaries.

SRI LANKA. In the early 1980s the U.S. Agency for International Development funded the Gal Oya Water Management Project to rehabilitate the left bank of the Gal Oya River. Following the Philippine model, institutional organizers were introduced into the system. Gaining the trust of the farmers, they began to organize larger groups of farmers along the distribution channels. These groups discussed their problems and communicated with the government irrigation department staff. This process has greatly improved communications between farmers and government officials. Conflict among farmers has declined substantially, and the improved system provides more water for farmers at the tail end of the system. Careful to separate their organizations from party politics, the farmers have also eased ethnic tensions. In one area cooperating farmers cleared a canal allowing 1,000 hectares to be cultivated in the dry season, which had previously been left fallow. This benefited more 300 families and demonstrated that participation, flexibility, and consensus were the keys to the project's success.

VI.3.3 Recommendations for Action

VI.3.3.1 General

As stated in previous sub-section III.13, PJT has been making efforts for participation activities of community people and beneficiaries. The participation activities will become more important for PJT when it shifts from Perum to Persero status where it is expected to be financially autonomous management body. The revenue is required to be stable. Besides the efforts to establish the rational water charge system between major clients of PLN, PDAM and industries, it is necessary for PJT to expand the base of water charge payers. In this context, participation activities are to be done intensively in the basin.

In the present Study in prinple, the responsibility of water resources management is shared by sector agencies through delegation of responsibility of implementation. Based on this principle, the responsibility for participation activities in the basin is proposed to be shared as follows:

i) The public campaign toward general town-people and/or village-people for raising awareness and/or increasing consciousness on water is the responsibility of PJT. In other words, community participation activity is within the responsibility of PJT.

ii) The awareness building/raising for beneficiaries-pay concept and for consciousness of users' benefit obtained from water utilization is the responsibility of sector agencies. In other words, beneficiaries participation is within thr responsibility of sector agencies.

VI.3.3.2 Implementation Program

The following implementation program and the action plan are proposed based on the above demarcation.

The master schedule for PJT is planned in this Study as shown below :

- Starting as New PJT after consolidating PKB, PGKS and PJT at the beginning of 2002
- Starting as Persero Jasa Tirta after transforming from Perum to Persero at the beginning of 2005.

Taking into consideration the above, the phasing is made and participatory activities are planned for each phase as shown below:

Implementation Program of Community and Beneficiaries Participation Sector

Items	Phase I			Phase II			Phase III		
	1999	2000	2001	2002	2003	2004	2005	.....	2020
I. Community participation activities by PJT									
A. Preparatory works in PJT									
B. Public network formation									
C. Coordination to related agencies									
D. Implementation of public campaign									
II. Beneficiaries participation by related agencies									
A. Awareness survey in the basin									
B. Awareness map preparation									
C. Identification/formulation of programs									
D. Preparation of long list of participatory programs									
E. Implementation of pilot programs									
F. Implementation of annual programs									

VI.3.3.3 Action Plan

(1) Community participation activities by PJT

(a) Preparatory works in PJT

- Establishment of a group for community participation in the P.R. Section

Under the current organization structure of PJT, no section is designated as responsible section for participation activities. In the actual operation, the Coordinator II of the Bureau of Research and Development implements the community improvement activities through lending fund to small scale industries

(refer Table III.17). The cooperation to "Prokasih" movement is being done by the Water Service Division. As presented in the chapter of "Organization and Management" in this report, the establishment of Section of Public Relations is proposed in this Study. A group for implementing community participation activities is proposed to be built in the Section.

The major framework of this group is as shown below.

a. Purpose

This section will be responsible for implementing community participation activities.

b. Staff requirement

A group leader and four (4) staffs for each sector including irrigation, watershed, water quality and fishery sectors will be required in this group. Some staffs who has the experience of community campaign in Coordinator II in Bureau of Research and Development and/or Water Service Division are better included in these group staffs.

(b) Public network formation

The public campaign of PJT aims at spreading the consciousness of scarcity/importance of water leading to saving water actions of peoples. To let peoples aware that water is not free but is manufactured by dams/reservoirs and conveyance chanels is another important objective. Therefore, the objective peoples will include town-peoples and village-peoples and school students. For the water users in such sectors as irrigation and fishery, the respective agencies in charge are appropriate to be responsible for this public campaign.

The network for PJT's public campaign should be formulated for this campaign to be implemented systematically all through the basin. "Inter-agency Information Networks" proposed in this Study will be useful for this purpose.

The network will be composed of component agencies of "Inter-agency Information Networks" proposed in this Study including sections in charge of community campaign in Government offices of Dati II level (Kabupaten/Kotamadya) and all the educational organization including primary, secondary and middle schools.

(c) Coordination with related agencies

The PJT will be required to coordinate with other sector agencies for implementing beneficiaries participation activities. Familiarity with the sector is indispensible for beneficiaries participation. Therefore the sector agency should take the initiative in implementing the activity. However, since consciousness of scarcity/importance of water is required also for irrigation farmers and/or fishery farmers, PJT is requested to coordinate with sector agencies. The PJT is also in need of monitoring and

evalusting the result of participation activities of sector agencies to reflect it for future planning. For this purpose, the staffs of the group in charge in the Public Relations Section in PJT will be required to be familiar with the sectors.

The coordination requirement of PJT is summarized as follows.

- to cooperate with sector agencies in the sector's beneficiaries participation activities
- to monitor and evaluate the result of the sector's beneficiaries participation activities to reflect it to future planning.

(d) Implementation of public campaign

Major participation activities of PJT in the past can be categorized as follows:

i) Participation to Prokasih activities

ii) Lending activities to small scale enterprises

iii) Coordination to "Technical Team for Water Conservation"

iv) Lectures/speeches at schools on water scarcity

These activities will be recommended to be continued. In addition, the following medias are recommended for public campaign of spreading the consciousness of water scarcity/importance:

i) Public advertisement : Radio, TV, newspaper, posters

ii) Commendation for successful participation activities

iii) Prize essay to be written by school children/students

iii) Inspection tour by general peoples to water related facilities like dams/reservoirs, barrages, river gates and hydropower splants

iv) Inspection tour by high ranking Govt. oficials to environmental sites well-conserved by peoples' effort

(2) Beneficiaries participation activities by related agencies

The beneficiaries participation activities by related agencies shall be implemented by each respective agency by their own responsibilities with the PJT's coordination stated in the preceding sub-section. The following include (i) the actions required commonly to all the related sectors and (ii) some remarks relevant to the sectors. The said related sectors include irrigation, fishery, watershed and water quality management sectors. Since this will be implemented under the responsibility of each related agency, only a broad framework for action is stated herein.

(a) Actions commonly required to all the related sectors

1) Awareness survey in the basin

The data and information on the beneficiaries' awareness to beneficiaries-pay concept, efficiency water use and users' benefit are basic ones for participation activities. At the initial stage, it is necessary for each related agency to conduct it with major components as shown below.

a. Purpose

The purpose of the survey is to investigate the level of awareness to beneficiaries-pay concept, water scarcity and users' benefit obtained from water utilization. These awarenesses constitute the basic willingness to participate in activities related to water resources management and finally leads to the willingness to pay for water.

b. Target area

The survey will cover the areas relevant to each respective sector in the whole Brantas river basin.

c. Target groups

- irrigation farmers through networks of HIPPA
- fishery farmers through fishermens' association to be built in the near future
- mountain farmers organized under the networks of DPKT
- town-peoples organized under the networks of Prokasih.

2) Awareness map preparation

The relevant areas will be classified according to the level of the awareness and an "awareness map" will be prepared. This map will show by each target group.

3) Identification/formulation of programs

Based on the level of the awareness, programs for participation activities of related sectors will be identified and formulated for implementation.

4) A long list of programs for implementation

The identified/formulated programs will be compiled in a long list together with time schedules.

5) Implementation of pilot programs

Programs presented in sub-section (3) in this report will be pilot programs for the respective sectors.

6) Implementation of annual programs

Based on the long list of programs for implementation, annual programs will be selected and implemented by priority.

(b) Some remarks relevant to the sector

The public campaign as a whole is within the responsibility of PJT and beneficiaries participation activities in each sector will be within the responsibility of each related agencies. Since each sector agency is more familiar with the respective sectors than PJT, it is appropriate that concrete programas be planned by each related agency by themselves. Therefore only ideas and/or concepts on the participation activities are presented herein.

1) Irrigation sector

An urgent need is spreading the beneficiaries-pay concept among irrigation farmers. The HIPPA metings should be utilized for this purpose. The newly built BWRMC will be a place for HIPPA representatives to express their opinions to daily practice of water resources management.

2) Fishery sector

a. What to be done with the first priority is to organize fish farmers into a fish farmers association.

b. To know the real needs of fish farmers in running fish ponds is the first step to let them join the participatory activities. The representative of fish farmers should be allowed to attend BWRMC to present their opinions for WRM in the basin.

c. Priority participation activities will include rahabilitation and O&M activities of tertiary and quartery irrigation canals by fish farmers.

3) Watershed and Water Quality sectors

Under the on-going "Regreening program", forestry people is participating in the reforestation activities covering from planting, growing and harvesting trees on the state-owned "critical" land which is lent free to the people. While, the Prokasih movements mobilize school students for cleaning rivers flowing in town areas. An idea of combining the two on-going programs is proposed hereunder.

a. Combination of "Regreening" and "Prokasih"

- Schools having participated to Prokasih activities continuously for one year will be qualified to lend the state-owned critical land (1 ha) for ten (10) years.

- School students under the guidance of teachers will plant young trees given by local government (DPKT's budget) on the land. They will take care of the trees on holidays/vacation. The products will be sold at markets as e.g. fire-woods. The revenue thereof will be collected by schools for their own educational funds like purchasing audio vidual equipment.

- The coordination of BAPEDALDA as secretariat of Prokasih and DPKT Dati II as an implementing agency of Regreening Program is required. A local government office for primary/secondary education is also to be coordinated.

(c) Pilot Programs of each related Sector

Pilot programs are presented in next pages for references' sake. Even though these are prepared after visiting each site, more detailed design/preparation is needed for implementation.

A. Participatory Program in Irrigation Water Management

The irrigation is the single largest water user and it has a basinwide water users' association (HIPPA) in the Brantas river basin. It is desirable to have irrigation water users' participation in the water resources management activities and bear the operation and maintenance costs of the irrigation canals. The irrigation water users' participation in the water resource management will encourage them to increase the efficiency to use and saving irrigation water.

• **Organization** DPU Pengairan would be the responsible agency to implement the irrigation water users' participation in water resources management through HIPPA. The HIPPA should have close coordination with farmers' group (KELOMPOK TANI) and Desa chief.
• **Purpose** The intention of this program is to encourage farmers' participation in irrigation water management in the Brantas river basin. To improve beneficiaries' awareness in this area is necessary for their knowledge and technical skills.
• **Location** Nganjuk irrigation area located under the Nganjuk Regency.
• **Funds sources** Fund for the program should be derived from DPU Pengairan.
• **Estimated number of participants** Estimated number of participants will be 5,000 farmers in Nganjuk
• **Activities required** 1) To increase farmers' awareness through education motivation on irrigation water supply and management activities. 2) HIPPAs' training for O&M and rehabilitation works of the tertiary irrigation canals 3) To form farmers' technical skills on efficient use and conservation of irrigation water

B. Participatory Program in Fishery Water Management

Brackish water fishponds are presently consuming a considerable amount of water, which is mainly derived from the Brantas river. The most serious problems encountered are associated with water shortage in the dry season. The need for good quality water and better water management system is identified to increase fish production. Through participatory program, they can acquire knowledge related to fish farming, technical skills and know-how on modern fishery business.

• **Organization** DPERIKAN would be the responsible agency to implement the fish farmers' participation in fishery water management. The KUD (village cooperative unit) can play an important role as a supporting organization at village level.
• **Purpose** To encourage fishpond owner/farmers to participate in fishery water management in the Brantas river basin. To increase their involvement beneficiaries' Participation and at the same time to improve fish farmers knowledge technical skills in modern fishery business.
• **Location** Sedati fishpond area located in the Sidoarjo of East Java. There are 6 fishpond villages and 250 fishpond owner/farmers. Some of these fishponds had been taking water from the irrigation drainage canals.
• **Fund source** For the program, funds should be derived from the DPERIKAN.
• **Estimated number of participants** Estimated number of participants will be 250 in Sedati fishpond area.
• **Activities required** 1) Awareness building on fishery beneficiary-pay concept for fishery water. 2) Public campaigns for efficient and effective use of water(coordinated by PJT). 3) Training for O&M and rehabilitation works of the fishery/irrigation water canals.

C. Participatory Program in Watershed Management

Most of the sedimentation and soil erosion in the Brantas river basin comes from the mountainous and critical land areas. To reduce sedimentation and protect soil erosion, plantation and land terracing are necessary. Local people would be a full partner for the conservation of forests and land. To gain better cooperation from the community/social groups, it is necessary to motivate local people to realize that they can derive benefits from taking good care of the forest and land conservation.

• **Organization** DPKT would be the responsible agency for the participatory program in watershed management activities. Local based small organizations will be needed to carry out the plantation and terracing of critical land.
• **Purpose** The purpose of this program is to involve people in watershed management activities. To make people aware of soil erosion, flood and other natural disasters. Eventually, these activities would play an important role for soil conservation in the Brantas river basin.
• **Location** Tawangsari and Ngabab villages located in Pujon sub-district. In these two villages there are 9, 000 inhabitants and about 10 hectares of critical land.
• **Funds sources** For the program, funds should be derived from DPKT.
• **Estimated numbers of participants** Estimated number of participants will be 9,000 in Tawansari and Ngabab.
• **Activities required** 1) Increase the inhabitants awareness on critical land area 2) Community/social groups' training for the plantation and growing the trees. 3) Inhabitants' training to improve their knowledge and technical skills on terracing of mountainous land. 4) Coffee plantation is recommended for farmers' incentive

D. Participatory Program in Water Quality Management

Many areas of the Brantas river are becoming waste disposal, which also causes river environment's destruction. There is an essential need to increase peoples' awareness to the river environment issues and water quality management activities. The water users can play a vital role in the natural restoration of the water quality in the river basin.

• **Organization** BAPEDALDA would be the responsible agency for the beneficiaries' participation in water quality management in the Brantas river basin.
• **Purpose** Purpose of this program is to make people aware of water quality management through environmental education and River Clean (Prokasih) activities.
• **Location** Penanggungan (Kelurahan) located in the Malang Municipality.
• **Fund source** For the program, funds should be derived from BAPEDALDA.
• **Estimated number of participants** Estimated number of participants will be 11,000 inhabitants in Penanggungan.
• **Activities required** 1) Increase the beneficiaries awareness on water quality management. 2) Awareness building of the inhabitants at the water polluted area on the environmental issues, quality water and domestic garbage. 3) Community/social groups' participation in River Clean (Prokasih) Program.

VI.4 Water Charge Mechanism

VI.4.1 Objective

An analysis on the water charge mechanism is carried out for the following objectives.

a. To establish a full cost recovery system for PJT for operating and maintaining all the water-related facilities based on cost allocation among sectors. The costs should be recovered by water charges and government subsidy as classified below.

- Costs for watershed management, flood protection, sabo and river maintenance flow are to be borne by government budget and not reflected in water charges.
- Costs for power generation and irrigation, industrial and domestic water supply are to be recovered by water charges.

b. To find out appropriate levels of raw water charges. The objectives of charging raw water at an appropriate level are the following.

- to strengthen and expand the financial foundation of PJT so as to be able to operate and maintain the water-related facilities appropriately and adequately
- to promote an efficient use of water in a tight water supply and demand situation

VI.4.2 Assumptions

The assumptions underlying the analysis are the following.

a. The costs to be recovered by water charges include both investment cost and operation and maintenance costs of the facilities.

b. Water charges are derived for the following two cases.
   - Water tariff for the existing facilities as of 1997
   - Water tariff for the existing and planned facilities as of 2020

c. Water charges for raw water supply and power generation are derived. Costs include those of dams and weirs with functions of creating and supplying raw water. Costs, however, do not include those for water distribution systems such as irrigation intakes and canals, PDAMs' water purification plant and distribution systems and PLN's power station.

d. Water charges are derived as averages for the Brantas River Basin as a whole, not for each facility or area.

e. The present analysis would provide a framework for the methodology and appropriate water charge levels based on the data available within the scope of the study. Prior to the

introduction of a new system, a detailed analysis on water charges would be recommendable.

VI.4.3 Methodology

An analysis on water charges are carried out according to the following steps.

a. Derivation of investment costs of the existing facilities in 1997 price level in Rupiah. The total investment cost of all the water-related facilities in the Brantas River Basin is estimated as follows.

Total Investment Cost of Water-related Facilities in 1997 Price

(Unit : Rp. Million)

Type of facility	Existing	Planned 2020
Dams, weirs	1,188,627	1,458,522
River improvement works	1,300,621	810,915
Total	2,489,248	2,269,437

b. Adjustment of total investment cost of the existing facilities to the last year of investment. The total investment cost of all the existing facilities in Rupiah and 1997 price above are adjusted to the initial year of investment by discounting with 3% discount rate. The total investment costs after discounting are summarized as follows.

Total Investment Cost of Water-related Facilities in 1997 Price

(Unit : Rp. Million)

Type of facility	Existing	Planned 2020
Dams, weirs	1,299,857	1,714,871
River improvement works	1,463,894	1,296,118
Total	2,763,751	3,010989

c. Estimate of operation and maintenance costs. Operation and maintenance costs of all the water-related facilities are estimated. Based on an analysis of the actual OM costs spent for the existing water-related facilities, OM costs are assumed to be 1% annually of the investment cost. The estimated OM costs are as follows.

(Unit : Rp. million per year)

Item	Existing	Ongoing/ proposed	Total
Dams, weirs	11,439	10,426	21,865
River improvement	13,006	8,109	21,115
Total	24,445	18,535	42,980

d. Derivation of the allocation proportions of the river facilities. Allocation proportions are

derived based on the economic benefit produced by each sector (hereafter " Benefit-share approach "). The sectors considered are : power, irrigation water supply, domestic water supply, industrial water supply, flood control and river maintenance. The idea of " benefit share approach " is that the cost should be borne in proportion to the economic benefit received by beneficiaries such as power users, farmers, households and factories, not intermediary organizations such as PLN and PDAM. The "benefit share approach" is adopted as proxy to the " separable cost – remaining benefit approach".

The following table shows the derived proportions for allocating costs of the water-related facilities.

Allocation Proportions for Dams, Weirs and Intakes

(Unit : %)

Sector	1997	2020
Power	13.9	14.0
Irrigation water	68.3	48.5
Domestic water	1.6	15.4
Industrial water	5.0	4.5
Flood control	2.5	2.3
River maintenance	8.7	15.4
Total	100.0	100.0

* excluding river improvement works

e. Allocation of investment cost to respective function. The total investment costs and OM costs derived are allocated to respective function by applying the estimated allocation proportions. The allocation for 1997 is made for the existing facilities as of 1997. The cost allocation for 2020 is made for the facilities operating as of 2020, including both the existing facilities as of 1997 and the facilities proposed for implementation by 2020. The following table summarizes the result.

Allocation of Investment and OM Costs of the Water-related Facilities in 1997 and 2020

(Unir : Rp. Million)

Sector	Existing facilities (1997)		Existing and planned Facilities (2020)	
	Investment	OM	Investment	OM
Total	2,763,751	11,439	5,774,740	21,865
Power	180,810	1,591	422,062	3,061
Irrigation	887,802	7,813	1,462,746	10,609
Domestic	21,188	186	462,761	3,356
Industry	65,123	573	135,663	984
Flood Control	1,495,740	44,852	2,828,145	52,961
River maintenance	113,088	995	463,364	3,361

*including all the facilities, both dams, weirs, intakes and river improvement works

f. Derivation of appropriate water charges. Appropriate water charges are derived for power supply and water supply for irrigation, domestic and industrial water uses. Costs for flood protection and river maintenance are assumed to be covered by government expenditure and not reflected in water charges. Water charges are derived by the following formula.

Water charge = (Investment cost annualized + annual OM cost)
/ annual amount of power or water supplied

Annualization of the sector-wise investment cost is made as follows.

Annual investment cost = (Investment Cost) * Capital Recover Factor

The capital recovery factor for a period of 50 years and 3% discount rate is 0.0389

The amount of power used is 754 GWh in total in 1997 and 851 GWh in total in 2020.

The amount of water supplied in 1997 in 2020 are estimated as follows.

Amount of Water to be Supplied

(Unit : million m^3)

Sector	1997	2020
Irrigation	1,738	1,360
Domestic	108	849
Industry	104	146

VI.4.4 Results

Figure VI.2 shows a concept of water charging and subsidy based on the analysis made.

Cost Allocation between Water Charge Portion and Subsidy Portion

The following table shows the allocation proportions derived based on the cost allocation of the investment cost in 1997 and 2020 and the operation and maintenance costs allocated to water charge portion and subsidy portion.

Operation and Maintenance Costs Allocated to Water Charge Portion and Subsidy Portion

Item	1997	2020
(Investment cost in Rp. 10^6)		
Water charge portion	1,154,923	2,483,231
Government subsidy portion	1,608,828	3,291,509
Total	2,763,751	5,774,740
(%)		
Water charge portion	41.8	43.0
Government subsidy portion	58.2	57.0
Total	100.0	100.0
(OM cost in Rp. 10^6)		
Total	24,445	42,980
Water charge portion	10,218	18,481
Government subsidy portion	14,227	24,499

To operate and manage the non-chargeable facilities appropriately, 58% in 1997 and 57% in 2020 of the total OM costs, or Rp.14,227 million and Rp. 24,499 million, need to be financed by the government expenditure, while the rest should be recovered by water charges.

Derived Water Charges

For the water charge portion, water charges are derived at such a level as to recover investment costs and operation and maintenance costs. Table VI.3 and the following table show the derived water charges.

Appropriate Water Charges

(Unit :Rp/m^3)

Item	Present	1997			2020		
		Investment	OM	Total	Investment	OM	Total
Power (Rp./kWh)	12	9	2	11	19	4	23
Irrigation water	0	20	5	25	42	8	50
Domestic water	30	8	2	10	21	4	25
Industrial water	51	24	6	30	36	7	43
(Average of water supply)	—	(19)	(4)	(24)	(41)	(6)	(47)

Realistic Water Charge Levels

It would be important that water consumers can afford the water charges newly introduced. In this respect, the water charges derived above are further analyzed in the light of affordability for consumers.

Table VI.4 shows the realistic water charge levels for 1997 and 2020 considering the affordability. The following table summarizes the result.

Realistic Water Charge Levels (Rp/m³)

Sector	Present	1997	2020
Power	12	12	23
Irrigation	0	5	26
Domestic	30	30	30
Industrial	51	51	51

The following are the considerations.

a. Irrigation water charges are set considering the affordability for farmers. Table VI.4-2 presents an analysis on the affordability for farmers. It is recommended that PJT starts charging farmers at a level to recover the OM cost portion, at Rp.5 per m³. With this water charge level, expense on water by average farmers is limited to 5.6% of their income. As of 2020, irrigation water charge can be raised to Rp.26 per m³. With this level, the expense on water is about 10% of the farmers' income, the assumed allowable level. Due to the expected rise in income level, an average farmer's income after paying the proposed realistic water charges will rise from Rp. 1.5 million per hectare in 1997 to Rp. 4.1 million hectare in 2020.

b. The deficit in revenue, caused by irrigation water charges set artificially lower than the full cost recovery level, should be covered somehow. It is recommended that the other sectors continue cross-subsidizing the deficit as has been practiced until now. Water charge for the power sector is recommended to remain same as the present level at Rp.12 per kWh for the existing facilities in 1997. An appropriate water charge for the power sector as of 2020 is derived at Rp.23 per kWh. This charge should be levied in 2020. Table VI.4-3 shows a preliminary analysis on the PLN's affordability for the proposed water charge. Even with the proposed level at Rp. 23 per kWh, hydropower generation will be able to make a profit of 69% of power sale as follows.

	(Rupiah per kWh)
- Revenue by hydropower :	139
- Cost of hydropower :	20
- Water charge :	23
- Profit :	96
	(69% of revenue)

c. Water charges for domestic and industrial water are recommended to remain at the present levels until 2020. Theoretically, their water charge levels are lower than the existing levels both in 1997 and 2020. To partly fill the deficit caused by lower irrigation water charges, however, their water charges should be kept at the present level. The fact that domestic and industrial water users have been paying the existing water charges indicate that the present levels are affordable for them.

d. The shortage of revenue below that to be achieved by introducing the appropriate water

charges can, thus, be partly filled by cross-subsidy by power, domestic and industrial sectors to the irrigation sector. The remaining shortfall should be financed by the government. The amounts are estimated to be Rp. 29,662 million in 1997 and Rp.27,227 million in 2020 as shown in Table VI.4.

PJT's Revenue

PJT's revenue in 1995 and 1996 were as follows.

(Unit : Rp. million)

User	1995	1996	Average
PLN	9,673	9,898	9,786
PDAM	2,597	3,683	3,140
Industry	4,066	4,134	4,100
Farmer	0	0	0
Total	16,336	17,715	17,026

Once the realistic water charges derived above are introduced, PJT will experience an increase in revenue. The estimated revenue to PJT will be Rp. 26,282 million for 1997 and Rp. 87,849 million as of 2020 as shown in Table VI.4, an increase of about 54% and 520% respectively. This increased portion of revenue should be appropriately used for the facilities of water charge portion for the following purposes.

- Operation and maintenance works at an adequate level
- Repayment of the fund spent for construction of the facilities

Apart form this increase in revenue, PJT should receive subsidy from the government for an appropriate operation and maintenance of the river facilities for which water charge can not levied such as flood protection works, watershed management measures and sabo works. The repayment of fund of these facilities should be made by the government.

VI.5 Organization Development of Water Resources Management Body

VI.5.1 Organization Development of PJT

Accompanied by the change of roles and responsibility of PJT in water resources management in the Brantas, the organizational development of PJT is required. The time schedule of organization change of PJT is proposed in this Study as shown below:

- Consolidation with PKB and PGKS : in January 2002
- Transformation to Persero : in January 2005

The rationale for the consolidation with PKB and PGKS was already stated in previous sub-section VI.1.2 (4). Therefore, the transformation from Perum to Persero only is stated herein.

VI.5.1.1 Transformation from Perum status to Persero status

(a) Implication of the transformation

There are two managerial aspects for a water resources management body like PJT. These are depicted in the schematics of water resources management in Figure IV.2. (In this figure, PJT's function of water management is pictured under the control of MPW being connected with other relevant agencies. Another function of corporate management is pictured under the control of MOF. The latter function will be added after PJT is transformed to Persero.)

a. water management
b. corporate management

The water management nature requires PJT to be public service oriented and the corporate management nature requires PJT to be profit oriented. Under the current Perum status, PJT is required to fulfill the both. As a matter of natural, the former should go ahead of the latter. The profit seeking should be pursued only after the public service needs are satisfactorily fulfilled. The public service has a higher priority than the corporate management. This is well recognized in the present Study.

However, the privatization of public services like electricity, telecommunication and road is a global trend. Also in Indonesia, the privatization has been progressing by such state companies as P.T. PLN (electricity), P.T. TELCOM (telecommunication) and Jasa Marga (road). It is true that water supply has some difficulties special to the sector i.e. it relates to subsistence of human life, it has the first priority in BHN (basic human needs), state government is requested to supply water even to the poorest group and so on. However, these difficulties can be overcome if some devices to cope with these including regulatory and supervisory measures are realized.

(b) Major differences between Perum and Persero

A comparison between Perum and Persero status in various aspects of management is summarized in Table VI.7. The change required when transformed from Perum to Persero is simply itemized as follows (institutional changes to be required related to the transformation are described in the chapter of "Institutions" in this report) :

a. Enterprise status as state-owned corporation is not changed.
b. Profit oriented management besides public service oriented management is more emphasized in Persero.
c. The policy decision is made by the shareholders general meeting which is controlled by Minister of MOF when all the share is owned by the Government. However, "cultivation" (daily operation) is delegated to Minister of MPW.
d. Main tasks of the company are not changed.
e. The equity capital is still owned by government. Persero ,however, can make public offering and private capital can be introduced for subsidiary company.
f. Formation of joint ventures and subsidiary companies are allowed.
g. The appropriation of profit is changed and Persero becomes more easier to accumulate its profit internally.

(c) Rationale and merits for the transformation

The rationale and merits of the transformation to Persero from the point of view of the overall water resources management is conceived as follows:

a. Privatization is the government's general policy for the public service and PJT is requested to be autonomous as a business oriented body.
b. Facilitation of investment activities may bring the company possible opportunity to expand and bring more profit.
c. The efficiency in supplying water is able to be raised up through the competition with private sector enterprises.
d. Activation of the whole company can be expected through profit oriented management direction. This will induce the activation of the related economic sectors in the country.
e. The increased profit of Persero will bring an increase in tax revenue of the Government though the tax rate itself will be reduced.

(e) Conceived demerits of transforming to Persero

Major demerits to be conceived for transforming to Persero from the point of view of the water resources management are conceived as follows:

a. Possible deterioration of the quality of the public service rendered by Persero. For this, the appropriate supervision of the Ministry in charge will be indispensable.

b. Possible financial problems may be induced from failures in business expansion by investments by bank loans. The role of Commissioner is important.

Through investigating merits and demerits of transforming to Persero, it is proposed in this study for PJT to proceed to Persero status. As stated earlier in this section, there are two different aspects of management in PJT i.e. water management nature and corporate management nature. From the water management nature, PJT cannot expect any profit. It can expect only the full cost recovery. It is corporate management that creates profit to PJT. The profit oriented management can raise efficiency and activate the whole organization, which will induce an activation of water management as well.

VI.5.1.2 Tasks and Organization of New PJT

(1) General

The fundamental management concept of PJT will not be changed even after the change of organization including the consolidation and Persero transformation. The mission and the main tasks of the organization is clearly stipulated in the Minister Regulation No. 56 in 1991 and are arranged as shown below.

i) Mission

a. To provide public service for the benefit of people's life
b. To produce profit through business oriented management

ii) Main tasks

a. Water resources management
   - O&M of water resources infrastructure
   - Conservation of water and water resources
   - Development and rehabilitation of water resources

b. Corporate management
   - Water sales
   - Water related business development
     (including tourism, contracting and consulting, equipment leasing, clean water, waste water treatment etc.)

The PJT after the consolidation with PKB and PGKS is designated as "New PJT" in this Study. And the PJT after transformed to Persero status is designated as "Persero Jasa Tirta". The future target is to establish a Persero Jasa Tirta and the New PJT is a transitory corporation on the way to Persero in 2005. Therefore, in this Study, the organization of Persero Jasa Tirta was designed first and some modification was made to it to obtain a picture of New PJT organization.

Broadly speaking, the tasks of New PJT will be those of current ones to which the construction and rehabilitation of river infrastructures (former PKB's tasks) and land

prevention works (former PGKS tasks) are added. While, the tasks of Persero Jasa Tirta will be those of New PJT to which the commercial base businesses development are added. The structural organization thereof will be designed to effectively implement all the tasks assigned to each unit of the organization.

(2) Tasks of New PJT

Tasks of water resources management required for New PJT and Persero Jasa Tirta are allotted to each Bureau/Sub-Division/Section of the organization as proposed and depicted in Table VI.6.

The job description of each Bureau/Sub-Division/Section of the New PJT in 2002 is proposed in Table VI.5 which is identical with those of Persero Jasa Tirta in 2005.

(3) Organization of New PJT

It is proposed to make an organizational reform during the period of 1999-2001 i.e. before the start of New PJT. A structural organization depicted in Figure VI.1 is referred for the following explanation. The figure shows the organization proposed for Persero Jasa Tirta in 2005. The organization for New PJT in 2002 is identical to this figure except that an Management Development Unit is established attached to the Board of Directors. The number of staff for each organization unit will be naturally changed between the New PJT and the Persero Jasa Tirta..

A new Directorate i.e.Directorate for Business Development is added to the existing three. The expected function of the new Directorate comprises that of corporate planning and devilment of new business areas. Three Bureaus including Bureau of Corporate Planning, Bureau of Corporate Management and Bureau of Marketing will share the function.

In Directorate for Technical Affairs, the current tasks of the Bureau of Research and Development will be distributed to various Bureaus according to their original nature. The Bureau of Research and Development will be specified to its primary function of research and study works. The master plan preparation is allotted to Bureau of Technical Planning. The design works will be done by Bureau of Design. The FFWS and monitoring and control of water supply will be the job of Bureau of Monitoring System.

Directorate for Infrastructure will have two new groups of staff strengthened from PKB and PGKS all of whom is allotted to Division of Development. The staff from PKB is divided in two Sub-Divisions and the staff from PGKS is allotted to a new Sub-Division of Land Conservation. Division of O&M is almost the same Division as the current Division of Water Service. Division of Environment is newly built in this Directorate. This Division is responsible for water quality management, watershed management and river environment management. A number of experts in the respective field have to be reinforced in this Division.

Directorate for Administration and Finance shall be reinforced. The tasks which originally are to be done by this Directorate but have been shared to other Bureaus like Bureau of

Research and Development, Division of Water Services and Bureau of Planning and Controlling are to be allotted to this Directorate. They include legal matters, public relations, MIS, annual budget and work plan of the company and so on. Experts in various fields including legal affairs, public relations and MIS have to be reinforced.

Three Units comprising Internal Auditing Unit, Quality Management Unit and Management Development Unit are to be attached to the Board of Directors. The responsibility of Quality Management Unit will shift from ISO 9001 to Total Quality Control and ISO 14000 in the future. The Management Development Unit is a temporary organization for all the preparatory works of the consolidation and the Persero transformation but other two Units will continue their tasks without any time limit.

VI.5.1.3 Tasks and Organization of Persero Jasa Tirta

(1) Tasks and organization of Persero Jasa Tirta

Tasks in the field of water management will not be changed basically. However, in order to follow the business oriented management, raising efficiency and saving operation and maintenance costs in many aspects of daily activities will be required. The task analysis which aims at determining the appropriate number of staff for each job unit is to be made by employing professional consultants.

Tasks special for Persero concentrate in Bureau of Corporate Management. Commercial projects in various fields are planned and studied in this Bureau. Their realization is also within the responsibility of this Bureau. Some staffs are to be reinforced from private sectors and/or hired under contract bases. Supporting works will be directly required from Sections of Public Relations and Legal Affairs to cope with issues and/or disputes anticipated in the process of implementing commercial projects.

(2) Possibility of Business Expansion

According to the Ministerial Decree No.56/PRT/1991, PJT can carry out additional tasks besides the main tasks that are stipulated in the said decree. In this case, the approval of the Minister of MPW is required. Tourism development is already included in the scope of trading of PJT in this decree.

Recently (February 1996), PJT has made a preliminary study on the seeds of new business by itself. Areas of possible business expansion comprise the following.

(a) Hydropower related projects

- Tulungagung Hydro Electric Power Plant (HEPP)
- Lodoyo HEPP
- Mendalan-Siman Energy Production Enhancement
- Karangkates IV and V HEPP and Kesamben HEPP

(b) Potable Water Supply and Waste Water Treatment

- Potable Water Supply for Kabupaten Sidoarjo
- Potable Water Supply for South Gresik Area
- Potable Water Supply for Mojokerto
- Long Storage Utilization of Wonokromo River for Potable Water Supply for Surabaya Eastern Coastal Area
- Boezem Management of Morokrembangan, North Surabaya
- Waste Water Treatment of Surabaya River

(c) Other fields

- Tourism Development
- Wlingi Sand Utilization
- Labor Training Program on Operator and Heavy Mechanical Equipment
- Packed Drinking Water Business

Out of the above, Wlingi Sand Utilization was already implemented.

As observed from the above, these belong to the area PJT has an advantage in doing business. The structure to tackle with new business in PJT is that the initial survey and feasibility study is being done by Research and Development Bureau and then it will be handed to Corporation Development Bureau where the project will be studied in more detail for preparation for implementation.

Under the Perum status, there is some restriction in financing the investment for projects. Persero status is more convenient for new investment. The shifting from Perum to Persero status would pave the way for implementing new business of PJT.

(3) Possibility of Private Sector's Participation

There is some difficulties for private sector to participate in water resources management of the Brantas because water resources management has a nature of public works. However, it is possible for private sector to participate in the projects PJT is going to implement. Actually, the Wlingi slate slates factory has been started under a joint operation with a private company. The potable water supply to south Gresik is approaching final stage of preparation which is being planned under the joint venture (BOT) with a private firm. All the new projects presented in previous sub-section has the possibility of private sector participation. With the know-how of PJT and with the capital investment of private company, new projects can be implemented more smoothly.

As for tourism development, PJT has tourism resources in many spots in the Brantas. Although some resort development has been promoted by PJT by itself, the achievements are not so good. The number of tourist visiting Selorejo and Karangkates resort areas is decreasing these years. The conceivable reason of this decrease is competition with new private resorts. And another reason may be the lack of hospitality of PJT staff, which has been heard from a private company staff working for a private-run resort facilities.

Tourism sector does not fit for public servants but fits for private sector people. It is recommendable for PJT to entrust the management of tourism spots like Selorejo and Karangkates to private companies.

VI.5.2 Human Resources Development

VI.5.2.1 General

The basic principle of manpower development for the future PJT will be to increase labor efficiency by assigning appropriate number of staff to appropriate sections and provide intensive training for skill development.

VI.5.2.2 Manpower Required for New PJT in the Year 2002

The future manpower requirement for New PJT after the consolidation of PJT, PKB, and PGKS in the year 2002 is examined based on tasks that will be under PJT's responsibility in the overall W.R.M.

(1) Methodology

The manpower for 2002 is estimated by examining the number of staff needed for each task of W.R.M. allocated for each organization of New PJT. The estimation was done by sector experts of the Study Team for each W.R.M. sector. The evaluation of the current manpower done by the chiefs of sections of PJT is also taken into consideration.

The examination was done by using a matrix sheet as shown in Table VI.8, in which tasks required for WRM and organization of New PJT are listed.

Followings are the steps for manpower estimation.

- Examine the amount of work needed for tasks required for W.R.M. per year.
- Place the staffs to the appropriate sections of New PJT.

(2) Conditions for Estimation of Manpower Requirement

Followings are conditions that are made prior to examine the manpower needed for W.R.M.

(a) Sub-contractors and consultants will be fully utilized for works, such as design and constructions.

(b) Cooperasi (Cooperative) will be utilized for housekeeping works such as cleaning and maintenance of buildings, and supporting tasks such as securities and supplying drivers.

(c) Administrative staffs will be assigned to project sites from Bureau of Administration as needed.

(d) The responsibility for works for watershed management and water quality management will be delegated to respective agencies.

(e) G. Kelud projects currently managed by PGKS will be continued and are included in the scople of New PJT. Semeru projects that are in Brantas River basin also are included in the scope of New PJT.

(e) A part of staffs in Wonorejo Project, which is scheduled to be completed by the year 2001, is shifted to Division of O&M of New PJT as O&M staff.

(f) It is hard to estimate the number of staff for water resources and river improvement because future projects, except Beng Dam, are uncertain. The number of staff is estimated by assuming that staffs for one project in construction stage and one project in detail design would be adequate.

(g) For New PJT, one staff is expected to perform more than one task as needed.

(3) Required Number of Manpower for New PJT in the Year 2002

The result of estimation shows that staff needed for the year 2002 (after consolidation of PJT, PKB and PGKS) is 593.

The classification of staff is those 114 staffs for Directorate for Technical Affairs, 388 for Directorate for Infrastructure, 23 for Directorate for Business Development and 43 for Directorate for Administration and Finance. Besides these directorates, 5 staffs for Internal Auditing Unit, 12 staffs for Quality Management Unit, 7 staffs for Management Development Unit, attached to Board of Directors is required.

(4) Staff Arrangement Among PJT, PKB and PGKS

Several sections of New PJT will become responsible for the tasks presently managed by PJT, PKB, and PGKS. Namely, sections of New PJT that will manage the present works of PKB are Sub-division of Water Resources and Sub-division of River Improvement. Sections of New PJT that will manage the present works of PJT and PKB are Sub-division of Up-stream and Sub-division of Down-stream. Sections of New PJT that will manage the present works of PGKS are Sub-division of Land Conservation and Sub-division of Watershed Management.

As a condition for transfer, it is assumed that engineering staffs, especially those who are working at project sites have a priority for transferring to New PJT. The number of staff who will be transferred to New PJT is calculated by examining the work volume and manpower for the works that will be transferred to New PJT.

(a) Number of staff from PJT and PKB

Sub-divisions of Up-stream and Down-stream will have the responsibility for the works that are presently PJT's scope and PKB's scope. Coordination of manpower between these agencies is needed.

Eighty-nine staffs in Sub-division of Up-stream and 72 staffs in Sub-division of Down-stream are transferred from ASA I (up-stream) and ASA II (down-stream) of PJT, respectively, who are presently managing the operation and maintenance.

Thirty-two staffs in Sub-division of Up-stream and 37 staffs in Sub-division of Down-stream, who are considered as O&M staffs for the facilities that are presently under PKB's management and expected to be completed by the year 2002, are transferred from PKB.

(b) Number of staff from PKB

Forty-six staffs in Sub-division of Water Resources and 19 staffs in Sub-division of River Improvement, who are considered as staffs for on going projects that PKB manages and expected to be handed over to New PJT, are transferred from PKB.

(c) Number of staff from PGKS

Twenty-three staffs in Sub-division of Land Conservation and 25 staffs in Sub-division of Watershed Management, who are considered as staffs for continuing sabo works being constructed by PGKS to be handed over to New PJT, are transferred from PGKS.

	Total number of staff required for New PJT	PJT	PKB	PGKS
Sub-division of Water Resources	46		46	
Sub-division of River Improvement	19		19	
Sub-division of Land Conservation	23			23
Sub-division of Up-Stream	121	89	32	
Sub-division of Down-Stream	109	72	37	
Sub-division of Watershed Management	25			25
Total	343	161	134	48

The total number of staff required for these sections and proposal of staff arrangements are listed in table above. The total number of staff required for New PJT, which is the result of manpower estimation, is including the staff for present scope of PJT, PKB, and PGKS that will be transferred to New PJT. Columns for PJT, PKB, PGKS shows the number of staff required for managing the works that will be transferred from respective agencies.

(5) Required Number of Manpower for Persero Jasa Tirta in the Year 2005

Required manpower for Persero Jasa Tirta in the year 2005 is considered the same as the manpower requirement of 2002 for the following reasons.

- Job requirement, composed of development projects, additional O&M, and area to be covered, except for water supply (drinking water) is not expected to change drastically from 2002 to 2005.
- Natural decrease (retirement) of staff is assumed to be supplemented as needed.
- As mentioned in the condition for estimation of manpower, O&M staffs for Wonorejo dam, are already included in the Division of O&M.

(6) Manpower Requirement for the Target Year (2020)

Business development and expansion is expected after changing status to Perseso in 2005; however, manpower required for 2020 is expected to be same as manpower for 2002 because out sources are utilized and labor productivity will improve.

(7) Arrangement Criteria for Manpower Remaining in New PJT

According to the manpower estimate, the number of staff whom New PJT will necessitate is rather limited. Not all staff currently employed by PJT, PKB and PGKS, can be shifted to New PJT. Below are the some criteria for arrangement of manpower.

- A number of securities and drivers currently employed by PJT will be transferred to Cooperasi.
- Organic staffs or government officials are priority staffs to be hired by New PJT since they are well educated and experienced. Contracts of non organic staff or contract staff will be terminated as necessary.
- The age balance will be one of criteria for arrangement of staff. It is beneficial to maintain younger staffs because they can be trained intensively and expected to utilize the skills for New PJT.
- The arrangement of staffs who will not be able to join New PJT is needed to be taken care of before the consolidation. Possibility of transferring to MPW Central Region Office, the central government offices, local government offices, private sectors, and the other options should be considered.

VI.5.2.3 Manpower Training Program

(1) Training Concept

The purpose of training is to develop general technical skills, technical skills for sector, as well as managerial skills. In order for the efficient and effective skill development, the

training program should match with individual needs as well as organizational goals. Two types of training programs are provided to meet the demands for skill development: Intensive training program and routine training program.

(a) Intensive training program

The intensive training program focuses on the sectors that should be strengthened by 2001 for preparation of consolidation of organization. Three training programs are provided for intensive training.

a. Training programs for laws and regulations, corporate management that are mandated for all staff

b. Programs targeting for technical sector: basic engineering skill development, sector training program for engineering staff

c. Programs targeting for administrative sector: basic administrative skill development, sector training program for administrative staff

(b) Routine training program

Routine training program is characterized as training that will be carried out continuing basis. Three programs will be provided for routine training.

a. Training for new employees

b. Training for management

c. Training for new tasks and modification and updating of systems

(c) Training method

The training method should be selected by considering the character of the training. Several methods of training are available: lecture, OJT at site, OJT abroad, attending seminar, training at other agencies. A lecture will be suitable for training for teaching basic knowledge. The OJT will be suitable for training for specific activities. The OJT abroad is effective for the training, which involves new activities that staffs have no experience.

(d) Target for trainee

Target for trainee differs by type of training. Generally speaking, the main target for trainees will be staffs for management position and staffs who have some experiences and will be able to instruct the rest of staff after they are trained. For training in some sectors which require actual activities such as sampling of water and operation of machines, all staffs will be the target for training.

(e) Selection of instructor

Instructors should also be carefully selected. Instructors outside of PJT (including from overseas), such as consultants and government officials, should be fully utilized. Consultants and government officials, who are from countries where water resources management is advanced, will be able to manage most engineering programs better than instructors from Indonesia since many programs will cover activities with which most PJT staffs are not familiar. Consultants and government officials from abroad have comprehensive knowledge about water resources management.

For training for administration, on the other hand, instructors may better be selected from Indonesian side, especially legal sector, where comprehensive knowledge of laws and regulations of Indonesia is required.

(2) Intensive Training Program

The training for intensive training program concentrates on manpower training for the sectors that need an urgent improvement and new tasks, such as construction and O&M, expected after the consolidation. The training should be designed not only for improvement of skills for a technical and a administrative field, but also for improvement of teaching skills, so that the staff who will experience the training, eventually becomes a trainer for the other staffs. Intensive training programs are summarized in tables below.

Sector	Training Items
(a)Laws and regulations	1) Water/river laws 2) Water right 3) Regulations (No.5, No.56)
(b)Corporate management	1) Concept on assets 2) Profit/loss 3) Running company
(c)Management of Inter-agency information system	1) Network computing and internetworking 2) Effective use of information
(d)Hydrology and meteorology (Basic engineering skill development)	1) Basic concept of hydrology and meteorology 2) Hydrological observation and data management / analysis, evaluation 3) Meteorological observation and data management / analysis, evaluation
(e)Operation and maintenance of river facilities (Basic engineering skill development)	1) O&M of river facilities(gate, communication) 2) Supervision of O&M activities
(f)Watershed management (Land use management: Sector training program for engineering staff)	1) Land use management plan 2) Investigation of forest coverage / land use / soil condition/vegetation/ runoff & soil erosion
(g)Land slide and erosion prevention management (Land use management: Sector training program for engineering staff)	1) Preparation of O&M manual 2) Inspection of sabo facilities 3) Making inventory survey of infrastructure 4) Guiding sand mining activities 5) Repairing damaged structure
(h)Management and Operation of FFWS and LWMS (Sector training program for engineering staff)	1) Overview of FFWS (overseas training) 2) Maintenance/modification/update of FFWS & LWM 3) Hydrological data collection and analysis for modification and upgrading of FFWS & LWMS 4) Preparation of FFWS & LWMS operation (operation practice and transmission test) 5) Hydrological data collection and evaluation 6) Evaluation of present hydrological condition 7) Flood forecasting and its evaluation

Sector	Training Items
(i)Water Resources Development (Sector training program for engineering staff)	1) Planning (hydrology, river engineering, dam engineering, electrical engineering, ground water, economist, 2) Design (building, structural engineering, concrete engineering, soil mechanics, dam design, construction plan, cost engineering) 3) Construction (supervision)
(j)Planning and management water quality (Water quality management: Sector training program for engineering staff)	1) Preparation of plans and programs for water quality management 2) Coordination of water quality related agencies 3) Management of water quality monitoring
(k)Actual sampling and analysis (Water quality management: Sector training program for engineering staff)	1) Sampling and analysis for general condition 2) Sampling and analysis for chemical contents 3) Sampling and analysis for bacilli contents
(l)Management of land use (River environment: Sector training program for engineering staff)	1) Overview of land use management (overseas training) 2) Land use planning 3) Land use management 4) Regular inspection of land use
(m)Management of Biota in river area (River environment: Sector training program for engineering staff)	1) Overview of Biota management in rivers (overseas training) 2) Investigation Fauna and Flora 3) Evaluation of present condition 4) Decision making based on evaluation
(n)New business development (Sector training program for engineering staff)	1)Tourism development (tourism planning, facility management, marketing and promotion) 2) Industrial water treatment 3) New business development
(o)Basic administrative skill development	1) Administration 2) Human resources development 3) Finance
(p)Accounting (Sector training program for administrative staff)	1) Financial accounting (profit loss, balance sheet) 2) Managerial accounting (annual bugdget, evaluation, cost management) 3) Assets management 4) Cost allocation 5) Development and operation of MIS
(q)Human resources development (Sector training program for administrative staff)	1) HRD master plan 2) Career planning 3) Training program managemnent 4) Performance evaluation 5) Salary system 6) Organization management 7) Operation of MIS
(r)Administration (Sector training program for administrative staff)	1) Policy making 2) General affairs 3) Legal matters 4) Public relations 5) Community participation

(3) Routine Training Program

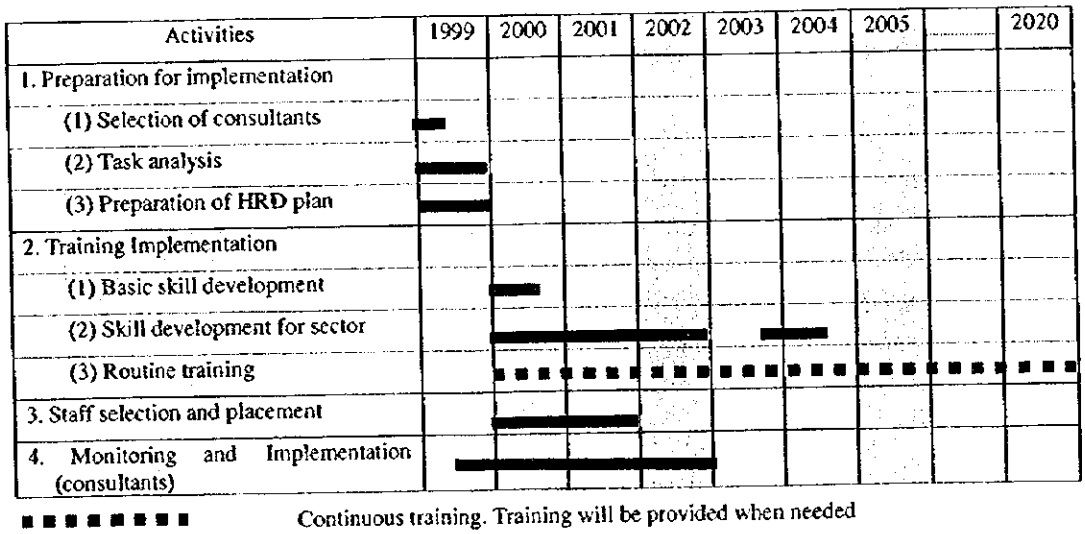
The routine training consists of training for new employees, training for management and training for new tasks and modification/updating of systems. The objective of the training is sustainable skill development and maintaining developed skills. Conditions of W.R.M. keeps changing, so the master plan and systems should be re-evaluated and updated. The training will give chance to review the tasks and skills required. The routine training program is summarized in table below.

Sector	Training Items
(a)Training for new employees	1) Company management 2) Quality control 3) Computer operation 4) Sector training
(b)Training for management	1) Leadership skills 2) Performance evaluation 3) Company management
(c)Training for new tasks and modification and updating of systems	Training will be held regularly upon request from chief of department or HRD

VI.5.2.4 Implementation Program and Action Plan

(1) Implementation Program

Implementation program for human resources development is proposed as shown below.



■■■■■■■■ Continuous training. Training will be provided when needed

(2) **Action Plan**

(a) Preparation for implementation

Preparation of human resources development consists of following items.

- Human resources development for Persero Jasa Tirta is important, so the Section of HRD will be strengthened by changing status to Bureau of HRD.

- Consultants should be selected at early stage of Action Plan because implementation of human resources development requires involvement of consultants, which will support preparing HRD development plan and actual implementation monitoring. For sectors related to W.R.M, consultants from countries where water resources management is advanced would be appropriate. For administration, including laws and regulations, consultants from Indonesia would be appropriate.

- Task analysis should be conducted by Bureau of HRD with consultants for preparation of human resources development implementation plan. Task analysis is including the review of job description, appropriate number of staff, task identification, training course objective, and detail design of the training program.

- HRD development implementation plan, which is based on task analysis, should include detail training programs (selection of training method, coordination for overseas training, coordination with other agencies related to training), staff arrangement, and recruitment. Preparation of implementation plan should be carried out by Bureau of HRD with the support of consultants.

- Preparation for implementation of training is recommended to start from 1999 and completed in a year.

(b) Training implementation

Training starts with basic skill development followed by skill development for sector. Training for laws and regulations, basic training for technical sector, and basic training for administrative sector will be completed in 6 to 12 months, followed by sector training programs, which will last 2 to 3 years. Training programs and schedule are summarized in Table VI.9.

(c) Staff selection and placement

PJT, PKB, and PGKS will be involved in the process of staff selection and placement. Selection of staff who are candidate for joining New PJT and arrangement for the staff who are not able to join New PJT will be considered.

A concern for consolidation is the staffs who will not join New PJT. Possibility of absorbing to MPW Central Region Office, the central government offices, local government offices, private sector, and the other options should be considered.

Selection and placement of staffs should be completed before the consolidation in 2002.

(d) Assignment of consultants

Several types of consultants will be assigned to monitor and implement HRD plan. At least one consultant will be assigned during implementation period for training monitoring. Consultants who will actually implement programs as instructors and supporting staffs will be assigned during the training period.

(e) Responsible agencies

Bureau of Human Resources Development and Management Development Unit are in charge of implementation. Consultants will always be stationed at Management Development Unit for monitoring the implementation.

VI.5.3 Financial Plan and Budget Resources of PJT

VI.5.3.1 Financial Reform Required

PJT is specialized as an O&M corporation as well as a self-supporting unit. Financial reform is required to achieve the target through introduction of cost recovery principle supported by related agencies and back up by upgrading of accounting system, and management information system, according to cost allocation.

(1) Depreciation of Managed assets

Depreciation is calculated by straight line method excluding land. Duration period is 50 years for civil work and 5 years for equipment, consultation and others with no residual value. Yearly depreciation is estimated to amount to Rp. 90 billion from FY2002 to FY2020 including planned investment. Details are shown in Table VI.10.

(2) Management Information system

In July 1997, ASGL started as MIS which is duly integrated to accounting system. Operational flowchart is shown in Table VI.11. It currently soutputs segment information. However more detailed information by MIS is necessary.

Management information system is to be leveled up according to the following principle and concept;

(a) Principles of MIS level up

a. Revenue and expense matching principle: It is essential for management to know amount of income which is defined as (revenue minus expense) by each project to evaluate job efficiency. This principle is also required for tax purpose. Present MIS does not compute amount of income by each project or facility. Total of above revenue, expense should be integrated to P/L of accounting system. It should be

noted that MIS without integration to accounting system has difficulties in maintenance of database.

b. Cost recovery supporting system by computer: Cost recovery principle proposed in this Study should be supported by computer. Allocated cost should be input to every project account.

c. Accounting system for strategic management: In accordance with revenue and expense matching principle, this is self-explanatory. Should a project operation make deficit in income, management must take necessary steps to improve its operation. If matching system is not introduced, income figures might be made up by carrying over a portion either revenue or expense to the next fiscal term. Such adjustment will falsify accounting accuracy and cause misjudgment of management.

d. Profit center vs. cost center: Profit center consists of Water Service Divisions (ASA 1 and ASA 2) and Non Water Service Division. Other divisions than profit centers are categorized as cost center. All the cost of cost centers is to be centralized to head office as indirect cost.

(b) Framework of MIS

Output image is shown in Table VI.12. Income from each facility or project is posed in the right hand box. At present, those figures must be calculated by manual. Computer support is necessary. In order to fill the blank space following process is required.

a. Other direct cost borne by head office should be allocated to each profit unit and indirect cost is to be allotted as over head.

b. Input of revenue and expense should be divided to each facility.

c. Non water resources revenue such as tourism, equipment rental, construction service and others inducing new business, income and cost matching principle should be introduced to MIS.

d. Σ Facility (revenue by source) - Σ Facility (direct cost + depreciation + O.H.)
= P/L (Total Operating Income)

e. Depreciation of managed assets should be integrated into ASGL by the time of the structural consolidation at FY2002.

f. Human resources information system should be revised to build up who's who database.

For improvement of MIS, 2 system analysts are required who are familiar to PJT's business operation. After definition of functional requirement of computer system, capacity of hardware and user programming capability should be consulted to system analyst.

(3) Cost Allocation System

To establish revenue and expense matching system in MIS at cost recovery principle, cost allocation to each facility is necessary.

(4) Establishment of Self Supporting Business Operation System

PJT was established as a self supporting corporation independent to the state budget. It must create profit to run as a going concern. On the other hand, O&M business is cost oriented. Cost of appropriate O&M should be owned by beneficiaries. Cost allocation method and water charge mechanism must be authorized for cost recovery. The establishment of the following is equired for New PJT.

(a) New PJT & Accounting System

At the end of year 2002, the consolidated balance sheet of New PJT will be as shown in Table VI.13. Managed assets are entered in the balance sheet using contradictory suspense account. The balance sheet at the end of year 2005 and 2020 is projected in the same table as well.

(b) Cost allocation method

For the purpose of full cost recovery of water supply, the real and full costs for water supply to beneficiaries have to be computed accurately first.

(c) Water charge mechanism

Water fee calculation was made on the basis of full cost recovery and reported at Section VI.4. Water charge will be applied to all beneficiaries including irrigation and fishery.

(d) Budget control system

Budget should be controlled by RKAP (Government Approved Projection) with income check through revenue and expense matching principle and over head controlled by annual budget. Revenue check system by RKAP as target and over head control system are now working monthly by manual. On-line-system support is desirable for speed-up and avoidance of manipulation.

VI.5.3.2 Development Scenario under New PJT and Persero Jasa Tirta

PJT's projected income statements at the year of 2002, 2005 and 2020 are as follows;

(Rp. billion)

	FY2002	FY2005	FY2020
Operating revenue	163	180	280
Operating expense	150	151	212
Operating income	13	29	68
Non operating income	4	3	6
Income before tax	17	32	74
Income after tax	12	23	52

Details are shown in Table VI.14.

Assumption for preparing the income statements projection is described in the following sub-section from VI.5.3.2 (1) to (4).

(1) Annual Revenue Projection

PLN:

The revenue was projected based on the unit price of Rp23/kWh in FY2020 which was calculated as the price to recover full cost of water. Price in FY1997 is current of Rp. 11.8/kWh. The price is assumed to increase straight line to FY2020 with, as the result, an interpolation of RP 14/kWh in FY2002, and Rp. 16/kWh in FY2005.

PDAM:

As the same manner with PLN, the price was projected for Rp. 30/m^3 in FY2020 as the price to recover full cost and base on current price of Rp. 32.1/m^3 the price is assumed to decrease to Rp. 30/m^3 by FY2002. Water demand will gradually increase to 698MMm^3/year at the year of 2020 according to the projection. Water demand is estimated for 235MMm^3/year in FY2002, 312MMm^3/year in FY2005 and 698MMm^3/year in FY2020.

Industry:

Also the price should be Rp51/m^3 at FY2020 for full cost recovery. Since current price is Rp. 54.5/m^3, the price is assumed to decrease to Rp. 51/m^3 by FY2002. Water demand will increase from present level of 91MMm^3/year to 118MMm^3/year by FY2020 even though saving measures.

Fishery and irrigation:

PJT does not get any fee from these beneficiaries who receive raw water supply from the Brantas river. According to hearings made by the Study Team they are willing to pay for constant supply of water improved in quality suitable for irrigation and fishery. In this projection, it is assumed that the computed water rate for fishery and irrigation will be materialized step by step by FY2020. Conceptual framework of water service fee is required.

Irrigation water price was calculated as Rp. 30/m^3 in FY1997 and Rp. 50/m^3 in FY2020 to recover full cost of water.

However those prices do not seem practical to be imposed to farmers and fisheries.

Based on our estimation of their capability and willingness to pay, figures are projected Rp. 10/m^3 in FY2002, Rp. 12/m^3 in FY2005 and Rp. 26/m^3 in Fy2020, which will amount to about 10% of assumed their income.

The water demand of fishery at present is 40.8 million m^3/year and estimated in FY2020 to 268.7 million m^3/year in normal year and if drought, supply will be a half of that.

The water demand was projected as the average of that in a normal year and a drought year the two. Calculation is shown in under the Table VI.14.

Construction service:

Out of the PKB's turn over of construction service based on the planned investment, 5% income was assumed as the over head cost recovery.

Sabo:

Out of the PGKS's turnover of Sabo project based on the planned investment, 5% income was assumed to overhead cost recovery.

Tourism:

Selorejo and Karangkates are in operation as tourism resorts. Selorejo looks like most promising resort area because of facility. Professionals talented with resort park management is desirable. In the meantime, to employ community residents of the area as operation staff will be helpful for business promotion in the area.

In this projection revenue from tourism is assumed to increase by 20% every year to be Rp. 22 billion and expense is 80% of the revenue.

Sand utilization:

This has been realized in Wlingi reservoir with partnership of PT. Jawa Benton (Concrete) to make construction materials. Technical consultant may be helpful for quality improvement. Revenue from sand utilization was projected for Rp. 1 billion at FY2020.

Consulting service,

Equipment rental:

Effective utilization of resources such as experienced manpower, heavy machine or construction equipment is important source of income. However problems are seen in collection of account receivable for this business. To deal with private corporations or persons, careful attention should be paid to their ability to pay, legal documentation of contract or collection method of payment.

Both business revenue was projected increase by 10% every year and expense was assumed 80% of revenue. Details are shown in Table VI.14.

Community residents:

Residents living along the Brantas river are also beneficiaries of PJT's O&M services in the field of flood control and/or river maintenance. The cost should be recovered by way of government subsidiary to PJT.

However this is not counted in the above income statement.

Non operating income:

Non operating income at FY2002 consists of PGPS salary as government subsidy for government employees for Rp1 Billion which is 15% of personnel cost as same as present PJT's percentage, and interest income for Rp2.5 billion which was assumed at 10% of current assets of B/S.

PGPS salary was assumed to stop in FY2005 of status change to Persero.

(2) Annual Cost Projection

O&M:

O&M direct cost consists of operating cost, materials and sub contractor fee, that projected to increase every year and reaches the peak in the year of 2002. At that time book value of managed asset comes to its peak and 1% of book value for Rp27 billion is projected as O&M direct cost. Book value of the asset decreases thereafter but O&M direct cost is projected to stay at this level up to FY2020.

It is necessary to research adequate maintenance cost for each facility.

In addition, dredging cost is projected Rp19 billion in FY2002, and Rp9 billion each in 2005 and 2020, mainly for Wlingi. Details are shown in Table VI.14.

Personnel cost:

Wage will increase by 6% a year. Until FY2001. But in FY2002 when PKB, PGKS and PJT are consolidated, it is estimated as projection, that New PJT's personnel will be 593 as Organic employee which cost is Rp7.6 billion, and no change thereafter up to FY2020 owing to generation renewal without consideration of inflation element.

(3) Annual income projection

The income after tax of each year is shown in the bottom line of Table VI.14.. Tax rate is estimated at 30% of gross income.

(4) Investment projection

Planned investments are shown in Table VI.10. The planned investment cost amounts to Rp. 3 trillion. Managed assets in total after depreciation will be Rp. 2.7 trillion in FYF2002, Rp. 2.6 trillion in FY2005 and Rp. 2.6 trillion in FY2020.

Depreciation cost in each year will be Rp. 95 million, Rp. 92 million and Rp. 93 million, respectively.

Either New PJT or Persero JT can not afford depreciation cost of managed asset without government subsidy for full cost recovery.

VI.5.3.3 Development of Assets Management by 3 Steps

From the view point of accounting system and capital formation, following 3 steps are recommended according to the planned change of company's legal status.

(1) 1st Step: Bookkeeping of Managed Assets by Off-Balance Sheet

Before the consolidation of PJT, PKB and PGKS, the bookkeeping of managed assets will be made by off-B/S procedure.

Depreciation must be made according to duration period of asset, whose results should be reported to MPW and confirmation of the accumulated depreciation by Government is recommended for the preparation to a case of absorption of managed assets to PJT's the balance sheet by the time of the integration.

(2) 2nd Step: Integration

When PJT, PKB and PGKS are consolidated in 2002, off-balance-sheet asset should be integrated to its new balance sheet. The value of assets will be entered in the debit side and at the same time in the credit side of B/S as contradictory suspense account. Thus posting assets are not reflected to capital account. The book value is reduced every year according to

the depreciation together with suspense account. Depreciation does not reflect to P/L by this manner.

When any rehabilitation or investment is made, the amount is added to increase the value of the assets. In this case if funding is made by government, credit side is suspense account, but if own money is used, credit side should be also its own account.

Thus the management of the assets can be made correctly every year. (Estimated B/S is shown in Table VI.13)

(3) 3rd Step: PERSERO Status

In the year of 2005, status change to Persero is expected. As the third step of accounting method of managed asset, Persero absorbs managed asset on its own B/S. For capital formation, issuance of capital notes is recommended for managed assets to be entrusted by government. Capital notes have different maturity dates, and at the due date, loan is converted to paid in capital. Interest payable for capital notes are not counted in this projection.

Depreciation amount is also covered by Capital notes.

Issuance of capital notes should be consulted by securities firms or investment bankers.

(4) Development of New PJT to PERSERO Status

(a) Government Regulation No. 13

It is understood that Perum is now able to conduct joint venture project with another company or establish a subsidiary company according to Government Regulation No. 13/1998.

However, the followings can be pointed out, as some merits of status change to Persero from the view point of financial aspect.

- Borrowing from financial market: Since its assets cannot be given as collateral, PERUM is difficult to be a main obligor to commercial banks. It may narrow the way to project financing such as "Build, Operate and Transfer" finance without government guarantee.

- Funding in the capital market: Bond issuance by Perum if underwritten by Government is possible. However, regulator may not approve it if proceeds be used for new business with investment risk. In Persero status notes or bonds can be issued with flexibility according to capital market condition and creditability of new projects. In addition, it is preferable to issue notes to be purchased by basin residents for community participation.

- Reserve ratio to equity: Under the status of Persero, the reserve ratio is higher than the Perum status. It is assumed to increase from 25% to 40% in this Study. This reserve is added to that of previous year.

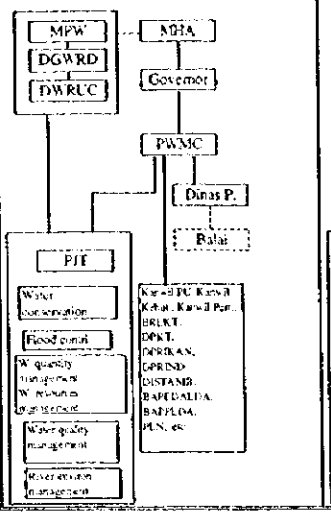
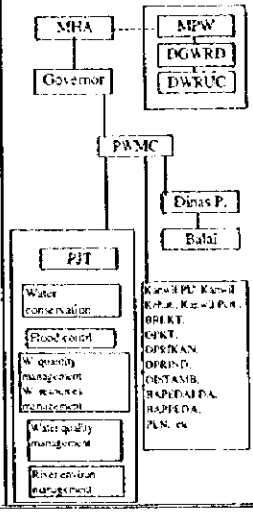
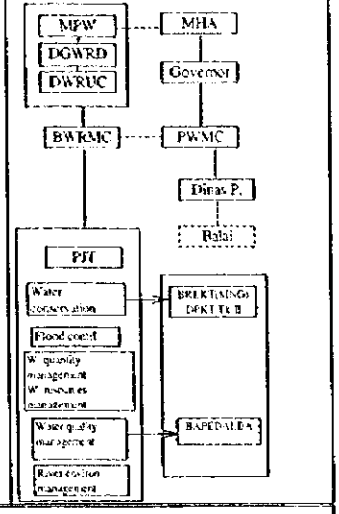
(b) Budget resources of PT PJT

Expected new business field

PJT has various merits of resources in comparison with those of other enterprises. They are huge areas of land including golf course, forests, water to drink or for swimming pools, dam lakes for water sports and others. PJT's operation at large is regionally monopolized in water management and treatment. Weak points would be lack of know-how in new business field and financial funding capability.

Fee income business formation to entrust new business operation to professional corporation or to lease land for new business is advisable. Taking advantage of flexible funding capability by Persero status, investment to new business should be managed to minimize risk and aim at high return. It would be encouraged for Persero Jasa Tirta to tackle with high-return private sector projects utilizing the advantage in find financing.

Table VI.1 Comparison of Alternatives for WRM System in the Brantas

Water Resources Management System	Alternative - A (Present Status)	Alternative - B	Alternative - C (JICA Proposal)
			

Major Elements of Water Resources Management

1.	Primary supervising agency	MPW / MHA	MHA	MPW
2.	Responsible agency			
	-Overall responsibility	Not clear	MHA-PJT	MPW-PJT
	-WRM sector responsibility :			
	-Watershed management	BRLKT(Malang),DPKT Tk-II,Kanwil Kehutanan, PKB,PGKS,PJT	BRLKT(Malang),DPKT Tk-II,Kanwil Kehutanan, PKB,PGKS,PJT	BRLKT(Malang) & DPKT Tk-II (delegated)
	-Flood control management	PJT,PKB,Dinas Pengairan,	PJT,PKB,Dinas Pengairan,	PJT
	-Water supply management	PJT,PKB,Dinas Pengairan,DISTAMB,PWMC	PJT,PKB,Dinas Pengairan,DISTAMB,PWMC	PJT
	-Water quality management	BAPEDALDA,DPRIND,Kanwil PU,PJT	BAPEDALDA,DPRIND,Kanwil PU,PJT	BAPEDALDA (delegated)
	-River environment management	BAPEDALDA,Kanwil PU,PJT	BAPEDALDA,Kanwil PU,PJT	PJT
3.	Water use right license	Governor	Governor	MPW
4.	Demand control	Not being done.	Dinas Pengairan will do through PWMC.	PJT (DWRUC)
5.	WRM Planning	Partly done by PJT	Planning will be done by Dinas Pengairan by collecting information from the WRM related Dinas offices and through PWMC.	PJT
6.	Construction/rehabilitation	PKB, PGKS	PJT	PJT
7.	O&M of river infrastructures	PJT	PJT	PJT
8.	Environment control	Several agencies are involved.	Several agencies are involved.	Unified control can be realized.
9.	"Balai" (Water Resources Management Bureau: PSDA)	Not existing as of December 1997.	Three (3) Balais will be set up in the Basin.	Assuming no Balais in the Brantas Basin.

Problems / Evaluation

1.	Primary supervising agency	MPW/MHA : not clear demarcation.	C	MHA : clear	A	MPW : clear	A
2.	Consistency of WRM(One river, one plan and one management)	May not be realized. Independent planning and independent action.	C	May not be realized. Independent planning and independent action.	C	May be realized. Unified river management.	A
3.	Responsibilities	Not clear and may cause confusion.	C	Not clear and may cause confusion. "Balai" will bring duplication of responsibility between PJT.	C	Clear. Sector management be realized through delegation. "Balai" is to be considered only in the river basin where no management body is built yet.	A
4.	Demarcation of tasks	Not clear. Plan and implementation done by each sector.	C	Not clear. Plan and implementation done by sector.	C	Clear through delegation.	A
5.	Cost minimization	No agency is responsible.	B	Duplication of tasks cannot be avoided.	B	Minimized by consolidation of PKB PGKS. Elimination of duplication promotes economy.	A
6.	Decentralization	To be promoted by "Balai".	A	To be promoted by "Balai".	A	To be promoted by BWRMC.	B
7.	Institution / regulation	Confusion.	C	New regulation required.	B	Consistent with MPW's.	A
8.	Adaptability to change	Non existence of leading agency brings confusion.	C	Non existence of leading agency brings confusion.	C	Counter measures can be comprehensively planned under the sole responsible agency.	A
9.	Overall evaluation		C		B		A

Notes : Denotation for evaluation is as shown below:
A : Effective B : Partly effective C : Of no effect

Table VI. 2 (1/2) Proposed Legal and Regulatory Changes on Water Resources Development and Management in the Brantas River Basin

New regulations to be drafted	Major provisions
• Government Regulation on New PJT (Perum)	• Task, mission, fund, working area, i.e. revision of GR No.5/90
• Government Regulation on Transformation of New PJT to PERSERO	• Objective of transformation, Objective of Persero, and capital and organization
• Ministry of Public Works Regulation on jurisdiction of PKB and PGKS	• Consolidation of PKB and PGKS with PJT requires stipulations on reorganization of PKB and PGKS
• Ministry of Public Works Regulation on establishment of "Basin Water Resources Management Committee"	• Objective, organization and task
• Ministry of Public Works and Ministry of Forestry Decree on watershed management	• Demarcation of scope of work between PJT and BRLKT in the Brantas River basin
• Ministry of Public Works Regulation on water quality monitoring	• Demarcation of water quality monitoring as follows: River water – PJT Domestic waster water – PJT, Cooperated by DPU Cipta Karya Industrial waste water – PJT, cooperated by DPRIND Agricultural waste water – PJT, cooperated by DIPERTA
• Ministry of Public Works Regulation on pollution control	• PJT in collaboration with BAPEDALDA, should prepare overall pollution control plan in the Brantas River basin
• Ministry of Public Works Regulation on designation of natural retarding basin	• Designation of natural retarding basins in the Brantas River basin
• East Java Provincial Governor's Regulation or Decree on Pollution Charge	• PJT should collaborate with BAPEDALDA in drafting pollution charge
Regulations to be changed	**Major provision (s) to be changed**
• <u>Demolition of old river structures</u> No clear stipulation on demolition of old river structures are found.	• Government Regulation No. 35/91 on River shall stipulate demolition of old river structures as the task for the government and/or State-owned corporation.
• <u>Balai in the Brantas River basin</u> Ministry of Home Affairs Decree No. 179/1996 stipulates that 3 Balais to be established in the Basin.	• 3 planned Balais in the Brantas River basin shall be excluded from the list of Balais to be established.

Table VI. 2 (2/2) Proposed Legal and Regulatory Changes on Water Resources Development and Management in the Brantas River Basin

• Penal provisions Penalty for violations of legal provision is stipulated in Law No. 11 of 1974. Penalty is detention up to 3 months and/or a fine up to 50,000 rupiahs.	• Amount of fine can be readjusted for better enforcement of provisions.
• River Maintenance Flow Law No.11/74 and East Java Governor's Decree No.316/88 provides the priority order of water use. No reference is made to river maintenance flow. A little reference is made in POLA.	• River maintenance flow shall be included in the priority order list instead of flushing.
• Farmers' Contribution Art.3 of Government Regulation No. 6 of 1981 on "Contribution for operation and maintenance cost for water resources development infrastructure" excludes farmers from paying contribution for their water use because they pay PBB.	• In view of "beneficiary to pay " principle, this provision should be amended with due consideration for "ability to pay".
Enforcement of Regulations	**Major action (s)**
• Sand mining Sand mining activities without approval is prohibited. Many illegal sand mining activities are observed in the Brantas River basin.	• Identification of sand mining areas.
• Water use right Government Regulation No. 22/82 stipulates that deviation of water use from the license is not allowed. No penalty for overuse of water exists.	• The license shall be cancelled or amended in case the water use is not in conformity with the license. PJT shall provide technical recommendations on the licensing.
• Government obligation principle Government Regulation No. 22/1982 stipulates that Governments and State-owned corporation are responsible for O&M for hydraulic structures. The Central Government has to provide financial assistance. This clause mainly refers to O&M for water utilization. Law No.11/74 stipulates that waterworks or structures intended to serve the public interest shall be undertaken by the Central Government or interested Local Governments.	• Flood prevention, river environmental protection and other issues intended to serve public interest – unspecified beneficiaries – shall be financed by the governments. PJT shall be engaged in such activities with governmental funds.
• Inventory of river structures Government Regulation No. 35/1991 Art.11 stipulates that "inventory and registration of rivers, river structures and other construction located in the river" shall be done by the Local Government or State-owned corporation. No inventory of river structures exits in the Brantas River basin.	• PJT as the State-owned corporation responsible for the management of the Brantas River basin, should prepare the inventory of river structures in the basin.
• Management authority on the Brantas River Basin Ministry of Public Works Regulations No.39/89 and No. 48/90 provides that PJT is given overall responsibility for the management of Basin by the MPW.	• PJT - under the supervision of the Ministry of Public Works - shall implement the tasks required as the responsible agency for the Basin.

Table VI.3
Water Charges Derived by Investment and OM Cost Portions for 1997 and 2020

Assumptions :

a. Water charge is to be levied on water supply and power generation. Costs for flood control and river maintenance are to be covered by government budget.

b. Facility life assumed : 50 years

c. Cost recovery of 100% of investment cost

d. Capital recovery factor : 0.0389 (3%, 50years)

Function	Investment cost allocated (10^6 Rp.)	Annualized investment/ OM cost (10^6 Rp/yr)	Water/power supply volume (million m^3)	Water charge (Rp./m^3)
(1997 : Existing/Investment Cost)				
Power generation	180,810	7,034	753,808,530 kWh	9.3 Rp./kWh
Irrigation water supply	887,802	34,535	1,738	19.9
Domestic water supply	21,188	824	108	7.6
Industrial water supply	65,123	2,533	104	24.4
(1997 : Existing/OM Cost)				
Power generation	-	1,591	753,808,530 kWh	2.1 Rp./kWh
Irrigation water supply	-	7,813	1,738	4.5
Domestic water supply	-	186	108	1.7
Industrial water supply	-	573	104	5.5
(2020 : Existing plus planned/Investment)				
Power generation	422,062	16,418	850,808,530 kWh	19.3 Rp./kWh
Irrigation water supply	1,462,746	56,901	1,360	41.8
Domestic water supply	462,761	18,001	849	21.2
Industrial water supply	135,663	5,277	146	36.1
(2020 : Existing plus planned/OM)				
Power generation	-	3,061	850,808,530 kWh	3.6 Rp./kWh
Irrigation water supply	-	10,609	1,360	7.8
Domestic water supply	-	3,356	849	4.0
Industrial water supply	-	984	146	6.7

Summary of Water Charges derived

(power : Rp./kWh, water : Rp./m^3)

	Proposed			Present
	Investment	OM	Total	Tariff
(1997)				
Power generation	9	2	11	12
Irrigation water supply	20	5	25	0
Domestic water supply	8	2	10	30
Industrial water supply	24	6	30	51
(Average of water supply)	19	4	24	
(2020)				
Power generation	19	4	23	-
Irrigation water supply	42	8	50	-
Domestic water supply	21	4	25	-
Industrial water supply	36	7	43	-
(Average of water supply)	41	6	47	

Table VI.4
Realistic Water Charge Levels in 1997 and 2020

(1997)

Beneficiary	Amount (GWh for power, 106 m3 for water)	Present Water charge (Rp./kWh or m^3)	Full cost recovery		Realistic Cost Recovery		Difference in PJT's revenue ($Rp.10^6$)	Remarks
			Water charge (Rp./kWh or /m^3)	PJT's revenue ($Rp.10^6$)	Water charge (Rp./kWh or /m^3)	PJT's revenue ($Rp.10^6$)		
PLN	754	12	11	8,294	12	9,048	754	Present charge level judged as affordable
PDAM	108	30	10	1,080	30	3,240	2,160	Present charge level judged as affordable
Industries	104	51	30	3,120	51	5,304	2,184	Present charge level judged as affordable
Farmers	1,738	0	25	43,450	5	8,690	-34,760	only OM cost to be recovered
Total	-	-	-	55,944		26,282	-29,662	

Subsidy needed
total 34,760 million Rupiah
cross subsidy by PLN, domestic and industries to farmers 5,098 million Rupiah
government subsidy required 29,662 million Rupiah

(2020)

Beneficiary	Amount (GWh for power, 106 m3 for water)	Present Water charge (Rp./kWh or m^3)	Full cost recovery		Realistic Cost Recovery		Difference in PJT's revenue ($Rp.10^6$)	Remarks
			Water charge (Rp./kWh or /m^3)	PJT's revenue ($Rp.10^6$)	Water charge (Rp./kWh or /m^3)	PJT's revenue ($Rp.10^6$)		
PLN	851	12	23	19,573	23	19,573	0	Rp.23 judged affordable for PLN
PDAM	849	30	25	21,225	30	25,470	4,245	Present charge level judged as affordable
Industries	146	51	43	6,278	51	7,446	1,168	Present charge level judged as affordable
Farmers	1,360	0	50	68,000	26	35,360	-32,640	51% level of full cost recovery charge
Total	-	-	-	115,076		87,849	-27,227	

Subsidy needed
total 32,640 million Rupiah
cross subsidy by domestic and industries to farmers 5,413 million Rupiah
government subsidy required 27,227 million Rupiah

Table VI.4-2
Affordability Analysis on Irrigation Water Charge

1997		
(Full cost recovery)		
1	Irrigation water requirement	18,000 m^3/ha/year *
2	Irrigation water charge	25 Rp./m^3 for investment cost and OM cost
3	Payment for water	450,000 Rp./ha/year
4	Annual income	1,595,000 Rp./ha/year **
5	Proportion of payment for water to income	28% of income ---> impossible to pay
(OM cost recovery)		
6	Irrigation water charge	5 Rp./m^3 for investment cost and OM cost
7	Payment for water	90,000 Rp./ha/year
8	Proportion of payment for water to income	5.6% of income ---> recommended
2020		
(Full cost recovery)		
9	Irrigation water requirement	18,000 m^3/ha/year
10	Irrigation water charge	50 Rp./m^3 for investment cost and OM cost
11	Payment for water	900,000 Rp./ha/year
12	Productivity increase	4.7% per year until 2020 ***
13	Annual income	4,587,000 Rp./ha/year in 2020 as a result of productivity increase
14	Proportion of payment for water to income	20% of income ---> impossible to pay
(Partial cost recovery)		
15	Portion to be recovered	51% of Investment and OM costs
16	Irrigation water charge	26 Rp./m^3 for investment cost and OM cost
17	Payment for water	459,000 Rp./ha/year
18	Proportion of payment for water to income	10.0% of income ---> manageable. (within 10% of income)
(OM cost recovery)		
19	Irrigation water charge	8 Rp./m^3 for investment cost and OM cost
20	Payment for water	144,000 Rp./ha/year
21	Proportion of payment for water to income	3.1% of income ---> no problem

* assumed based on the actual amounts of irrigation water taken at irrigation areas in Brantas
** Rp. 2,138,555/ha (revenue) - Rp. 725,828/ha (production cost) in 1995 adjusted to 1997 price by multiplying 1.129
*** assumed in the "Socio-Economic Framework"

Table VI.4-3
PLN's Affordability for the Proposed Water Tariff in 2020

Item	Value
a. Power generation cost by hydropower	20.13 Rupiah per kWh (1995) *
b. PLN's total power revenue	8,109,711 million Rupiah (1995)
c. PLN's energy production	
Hydro	7,529 GWh (1995)
Others	50,682 GWh (1995)
Total	58,211 GWh (1995)
Hydro	12.9 %
Others	87.1 %
Total	100.0 %
d. Power sale by hydro	1,046,153 million Rupiah (b * c)
e. Revenue per kWh by hydro	139 Rupiah/kWh (d / c)
f. Present profit structure of hydro	(Rp./kWh)
Revenue by hydro	139
Cost of hydro	20
Profit of hydro	119
Profit-revenue ratio	86%
g. Profit Structure under proposed water tariff	(Rp./kWh)
Revenue by hydro	139
Cost of hydro	20
Proposed water tariff for 2020	23
Profit of hydro	96
Profit-revenue ratio	69% profit-revenue ratio
h. Conclusion PLN can afford the proposed water tariff at Rp. 23 per kWh in 2020.	

Source : PLN Statistics 1995, PLN (Persero)
Note *
Fuel and lublicant : 1.31
Depreciation : 14.47
Other expenses : 0.89
Personnel : 3.46
Total : 20.13 Rp./kWh

Table VI.5 Job Description (summary) of Bureaus / Divisions of New PJT in 2002 and Persero Jasa Tirta in 2005

Directorate/Bureau/Division	Job Description(summary)	Current Organization
I. President Director		
II. Directorate for Technical Affairs		
A. Bureau of Research & Development	-Research and development	Bureau of Research & Development
	-Studies	Bureau of Research & Development
B. Bureau of Technical Planning	-Master plan	Bureau of Research & Development
	-O&M manual	Bureau of Research & Development
	-Work program for each unit	Bureau of Planning & Controlling
C. Bureau of Design	-Design of construction works	Bureau of Planning & Controlling
	-Survey	Bureau of Planning & Controlling
D. Bureau of Monitoring System	-FFWS	Bureau of Planning & Controlling
	-Monit. & cont. of W supply	Division of Water Service
III. Directorate for Infrastructure		
A. Division of Development		
-Sub-Division of Water Resources	-Construction & Rehabilitation	PKB / Division of Non Water Service
	-Equipment rental	Division of Non Water Service
-Sub-Division of River Improvement	-River improvement	PKB
-Sub-Division of Land Conservation	-Land prevention & control	PGKS
B. Division of O & M		
-Sub-Division of Up-Stream	-O&M of WR infrastructures	Division of Water Service
-Sub-Division of Down-Stream	-O&M of WR infrastructures	Division of Water Service
C. Division of Environment		
-Sub-Division of Water Quality	-Monit. & cont. of W quality	Division of Water Service
-Sub-Division of Watershed Managemen	-Watershed management	New
-Sub-Division of River Environment	-River environment	New
IV. Directorate for Business Development		
A. Bureau of Corporate Planning	-Long term plan	Bureau of Research & Development
	-Management development	Bureau of Research & Development
B. Bureau of Corporate Management	-Business development plan	Bureau of Corporate Development
	-Tourism development	Division of Non Water Service
	-Consulting service	Division of Non Water Service
C. Bureau of Marketing	-Marketing	Division of Water Service
	-New business marketing	Bureau of Corporate Development
	-Monitoring payment	Division of Water Service
V. Directorate for Administration & Finance		
A. Bureau of Administration		
-Section of General Affairs	-General affairs	Bureau of Human Resources & General Affairs
	-Quality management (ISO)	Quality Management Unit
	-Secretarial & housekeeping matters	Bureau of Human Resources & General Affairs
-Section of Legal Affairs	-Legal matters	Bureau of Research & Development
-Section of Public Relations	-Corporate image	Bureau of Research & Development
	-Public campaign(Prokasih)	Division of Water Service
B. Bureau of HRD	-HR planning & management	Bureau of Human Resources & General Affairs
	-Career planning	
	-Salary computation	Bureau of Human Resources & General Affairs
	-Organizational matters	Bureau of Human Resources & General Affairs
C. Bureau of Finance		
-Section of Finance	-Financial accounting	Bureau of Finance
	-Annual budget and Work Plan	Bureau of Planning & Controlling
	-Management of state/company assets	Division of Water Service
-Section of MIS	-Building & managing MIS	Bureau of Research & Development
	-Managing main computer	Bureau of Planning & Controlling

Table VI.6 Tasks of W.R.M. by Management Unit of New PJT (Proposed) (1/2)

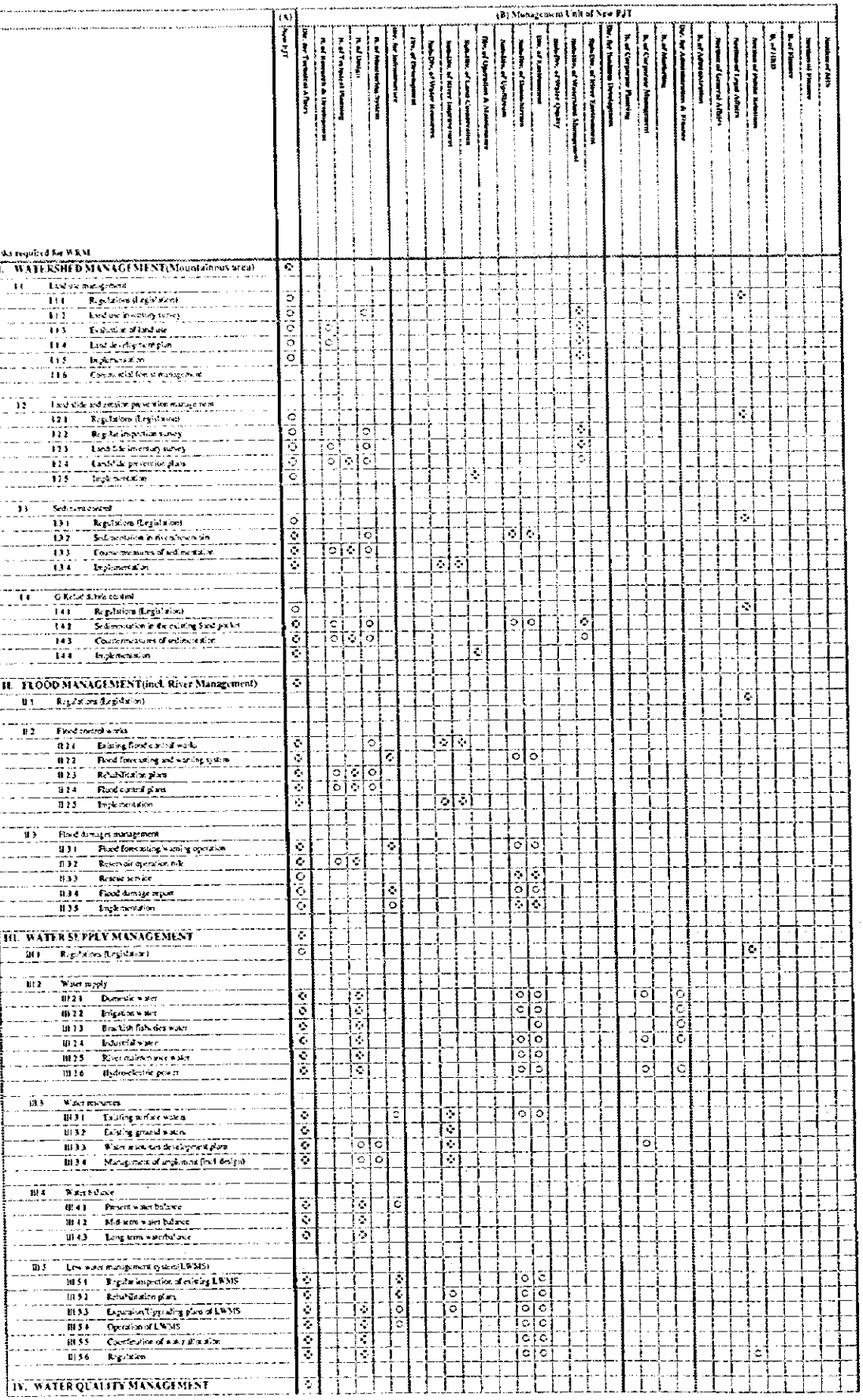
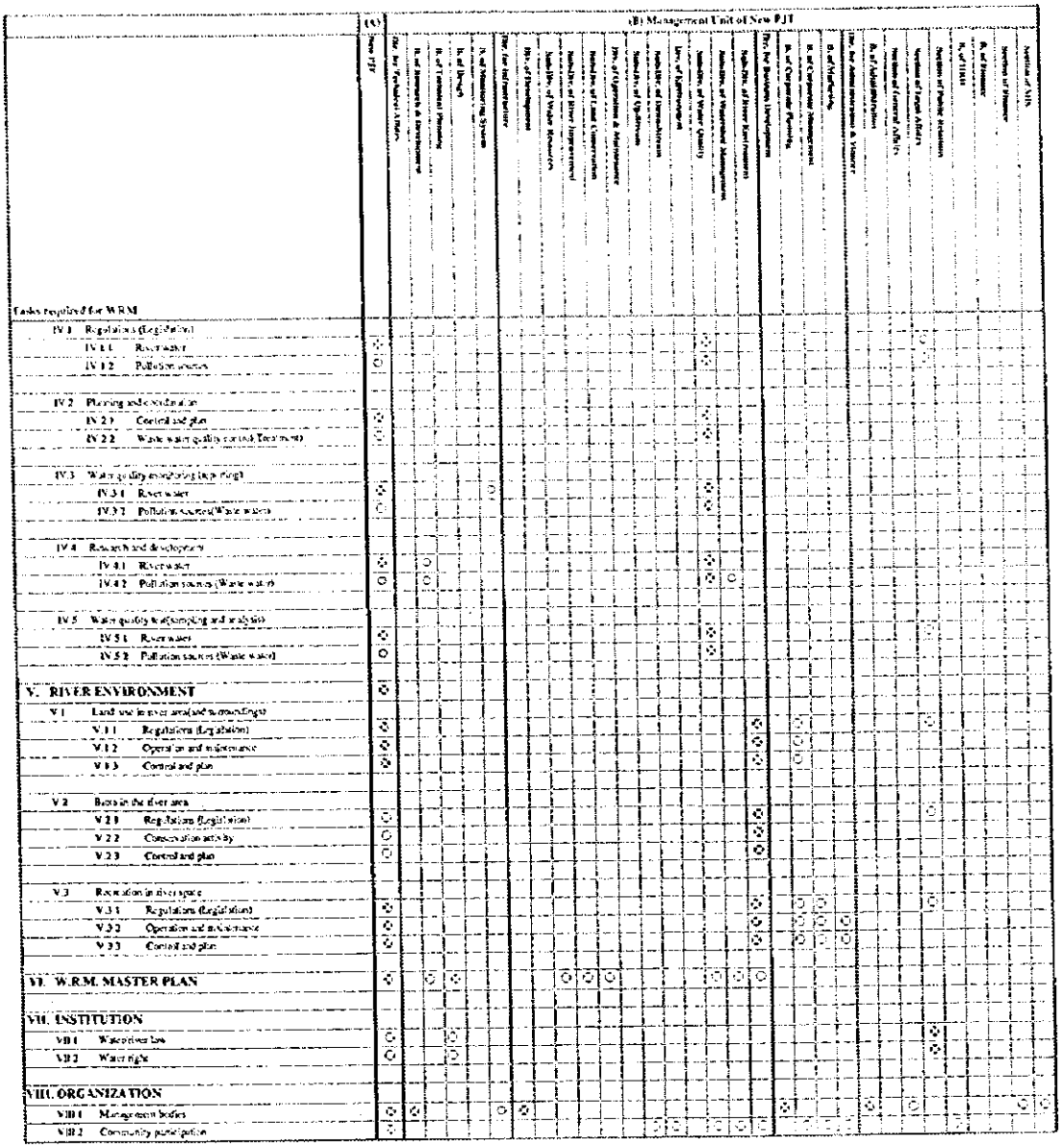


Table VI.6 Tasks of W.R.M. by Management Unit of New PJT (Proposed) (2/2)



Note : 1) Denotation for (A) is as shown below.

◈ Implementing ○ Cooperating (Other agency than New PJT is implementing)

Referred from Table 3

2) Denotation for (B) is as shown below.

○ Implementing ◈ Leading management unit for implementation in New PJT

3) Dir. : Directorate
B. : Bureau
Div. : Division

Table VI.7 Comparison of Perum and Persero

Items	Perum	Persero
1. Enterprise status	Public corporation (State owned)	Partnership (State owned)
2. Liability	Unlimited liability	Limited liability
3. Management direction	social > profit socio-economic welfare with some profit	social = profit profit oriented subject to monopolized public works
4. Policy decision	MOF(*)	SGM(*)
5. Supervise daily operation	Delegated from MOF to MPW(*)	Delegated to MPW(*)
6. Approval of work plan and budget	Legalized by MOF(*) The authority can be delegated to MPW	Legalized by SGM
7. Appointment of Board of Directors	MOF suggested by MPW(*)	By SGM(*)
8. Legal foundation	G.R. No.5 of 1990 M.R. No. 56 of 1991	Notarial Act
9. Supervision to Board of Management	Supervisory Board	Commissioner(*)
10. Main tasks	-O & M -Water dealings -River basin management -Rehabilitation -Construction	-O & M -Water dealings -River basin management -Rehabilitation -Construction
11. Scope of work	-Provision of raw water -Tourism -Consulting service -Sand mining -Clean water supply -Waste water treatment	-Provision of raw water -Tourism -Consulting service -Sand mining -Clean water supply -Waste water treatment
12. Capital		
- Capital	Owned by Govt not divided into shares	Partly or wholy owned by Govt Divided into shares or one share
- Public offering of share	Unallowable	Allowable for subsidiary co.
- State asset management	Book Keeping required	Book Keeping required
13. Business operation		
- Joint operation	Allowable	Allowable
- Joint venture	Allowable(*)	Allowable
- Subsidiary company	Allowable(*)	Allowable
14. Distribution of profit		
- National developm't fund (including social fund)	55%	15-20% (negotiable)
- Social fund	5%	5%
- Reserve ratio	25%	40%possible
- Dividend	-	45%possible
- Income tax for Rp.50 mil. over	30%	30%
15. Financing		
- Foreign/domestic loans	by MOF/BAPPENAS approval	by MOF/BAPPENAS approval
- Issuing of bonds	MOF approval	MOF approval
- Equity finance	Government/private fund	Government/private fund
16. Tariff rate decision	MPW	MPW & MOF

Note: (*) shows changes by new Government Regulations No.12 and No.13 enacted on January 17, 1998.
MPW : Minister of Ministry of Public Works
MOF : Minister of Ministry of Finance
BOC : Board of Commissioners (replaced by "Commissioner" in New GR 1998)
SGM : Shareholders General Meeting

Table VI.8 Estimated Manpower Requirement of New PJT After the Integration In The Year 2002

Tasks required for WRM	(A) New PJT	(B) Management Unit of New PJT: Dir. for Technical Affairs	B. of Research & Development	B. of Technical Planning	B. of Design	B. of Monitoring System	Dir. for Infrastructure	Div. of Development	Sub-Div. of Water Resources	Sub-Div. of River Improvement	Sub-Div. of Land Conservation	Div. of Operation & Maintenance	Sub-Div. of Up-Stream	Sub-Div. of Down-Stream	Div. of Environment	Sub-Div. of Water Quality	Sub-Div. of Watershed Management	Sub-Div. of River Environment	Dir. for Business Development	B. of Corporate Planning	B. of Corporate Management	B. of Marketing	Dir. for Administration & Finance	B. of Administration	Section of General Affairs	Section of Legal Affairs	Section of Public Relations	B. of HRD	B. of Finance	Section of Finance	Section of MIS	Internal Auditing Unit	Quality Management Unit	Management Development Unit
I. WATERSHED MANAGEMENT(Mountainous area)																																		
I.1 Land use management	10	2	2				8								8		8																	
I.2 Land slide and erosion prevention management	24	8	2	4	2		16	11			11				5		5																	
I.3 Sediment control	74	17	2	4	11		57	18	9	9		39	20	19																				
I.4 G.Kelud debris control	40	10	2	4	4		30	10			10	8	7	1	12		12																	
II. FLOOD MANAGEMENT(Incl. River Management)																																		
II.1 Regulations (Legislation)																																		
II.2 Flood control works	71	29	3	9	11	6	42	8		8		34	17	17																				
II.3 Flood damages management	75	10	2	5		3	65					65	36	29																				
III. WATER SUPPLY MANAGEMENT																																		
III.1 Regulations (Legislation)																																		
III.2 Water supply	53	4		4			49					49	24	25																				
III.3 Water resources	54	13		2	8	3	41	34	34			7	3	4																				
III.4 Water balance	3	3		2		1																												
III.5 Low water management system(LWMS)	33	7		3		4	26	2	2			24	12	12																				
IV. WATER QUALITY MANAGEMENT																																		
IV.1 Regulations (Legislation)																																		
IV.2 Planning and coordination	7						7								7	7																		
IV.3 Water quality monitoring (reporting)	6						6								6	6																		
IV.4 Research and development	5						5								5	5																		
IV.5 Water quality test(sampling and analysis)	19						19								19	19																		
V. RIVER ENVIRONMENT																																		
V.1 Land use in river area(and surroundings)	5						5								5			5																
V.2 Biota in the river area	3						3								3			3																
V.3 Recreation in river space	1																		1		1													
VI. W.R.M. MASTER PLAN																																		
VII. NEW BUSINESS DEVELOPMENT	15																		15	5	5	5												
VIII. INSTITUTION																							1	1		1								
VIII.1 Water/river law	1																						1	1		1								
VIII.2 Water right	1																																	
XIX. ORGANIZATION																																		
XIX.1 Administration and Finance	16						4		2	2	2	4	2	2									12		4		2	12		14	3	5	12	7
XIX.2 Inter-agency information system management	11	11				11																												
XIX.3 Community participation	6																						6	6			6							
Total	593	114	13	37	36	28	389	89	47	19	23	230	121	109	70	37	25	8	23	5	13	5	43	14	4	2	8	12	17	14	3	5	12	7

Dir. :Directorate
B. :Bureau
Div. :Division

Table VI.9 Training Programs and Schedule (1/2)

Training Programs and Items	Year							
	1999	2000	2001	2002	2003	2004	2005	2006-2020
I Preparation Phase								
Selection of consultants								
Preparation of HRD master plan and implementation plan								
II Intensive Training Program								
1 Laws and regulations related to W.R.M and corporate management								
1.1 Laws and regulations								
Water/river laws								
Water right								
Regulations (No.5, No.56)								
1.2 Corporate management								
Concept on assets								
Concept on profit loss								
Concept on running company								
1.3 Inter-agency information system management								
Development of system								
Use of system								
2 Skills Development for Technical Sector								
2.1 Hydrology and meteorology (general)								
Basic concept of hydrology								
evaluation								
Meteorological observation and data management/analysis, evaluation								
2.2 Operation and maintenance of river facilities (general)								
O&M of river facilities								
Supervision of O&M activities								
2.3 Watershed management								
2.3.1. Land use management								
land use management plan								
Investigation of forest coverage, land use, soil condition, vegetation, runoff and sild erosion								
2.3.2. Land slide and erosion prevention management								
Preparation of O&M manual								
Inspection of sabo facilities								
Making inventory survey of infrastructure								
Guiding sand mining activities								
Repairing damaged structure								
2.4 Management and operation of FFWS and LWMS								
Overview of FFWS (overseas training)								
Maintenance, modification, update of FFWS & LWMS								
Hydrological data collection and analysis for modification and upgrading of FFWS and LWMS								
Preparation of FFWS & LWMS operation (operation practice and transmission test)								
Hydrological data collection and evaluation								
Evaluation of present hydrological condition								
Flood forecasting and its evaluation								
Decision on flood coming based on evaluation								
2.5 Water resources management								
Planning								
Design								
Construction								
2.6 Water quality management								
2.6.1. Planning and management of water quality								
Preparation of plans and programs for water quality management								
Coordination of water quality related agencies								
Management of water quality monitoring								
2.6.2. Actual sampling and analysis								
Sampling and analysis for general condition								
Sampling and analysis for chemical contents								
Sampling and analysis for bacilli contents								
2.7 River environment								
2.7.1. Management of land use in river area								
Overview of land use management (overseas training)								

Table VI.9 Training Programs and Schedule (2/2)

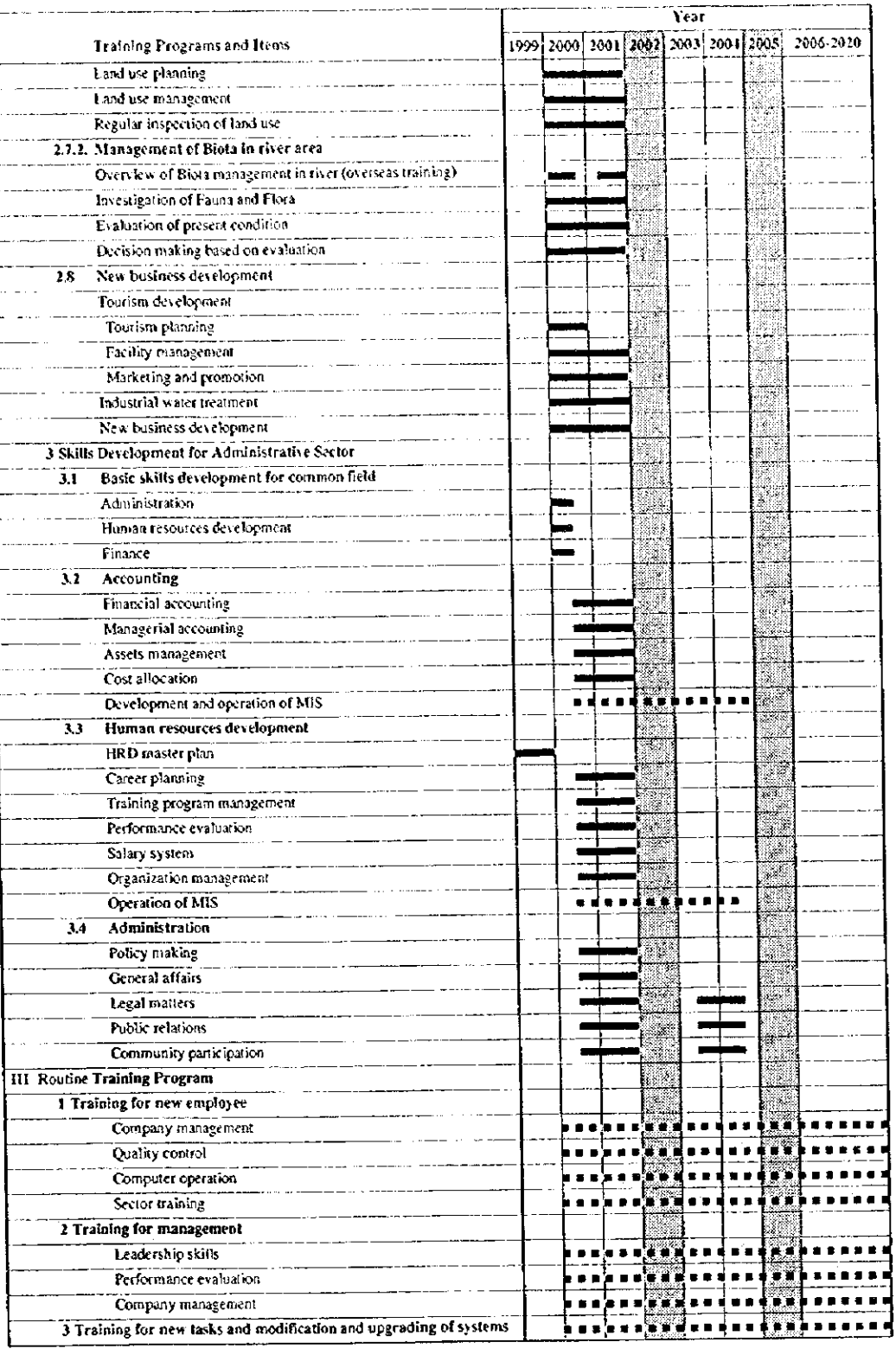


Table VI.10 Depreciation of Managed assets (million Rp.)

	Investment cost		Civil Work t & Others acumulated			5years depreciation	present book value	Depreciation			Remaining yeays	book value in 2002	book value in 2005	book value in 2020
	Completed at	1997 price	Land	Duration 5	Duration 5 straight line	Residudal 0	at1997 end	in 1998	in 1999	in 2000 -	from2000	in 2002		
Karangkates	1973	515,967		507,150	8,817	252,249	263,718	10,143	10,143	10,143	23	10,143	213,003	182,574	30,429
Lahor	1979	140,328		140,328		50,518	89,810	2,807	2,807	2,807	29	2,807	75,777	67,357	25,259
Lodoyo	1984	109,364		108,852	512	28,814	80,550	2,177	2,177	2,177	34	2,177	69,665	63,134	30,479
Selorejo	1975	107,514	5,000	102,424		45,067	62,447	2,048	2,048	2,048	25	2,048	52,205	46,060	15,332
Lengkong	1975	37,912	142	37,770		16,619	21,293	755	755	755	25	755	17,516	15,250	3,919
Wlingi	1996	216,504		194,565	22,039	8,299	208,295	8,299	8,299	8,299	46	3,891	175,027	163,954	105,587
Menturus Rubber Dam	1993	18,350		18,350		1,468	16,882	1,468	367	367	43	367	13,946	12,845	7,340
Jatimulerek	1991	11,714		11,714		1,406	10,308	234	234	234	41	234	9,137	8,434	4,920
Wonokromo	1993	7,038		7,038		563	6,475	563	141	141	43	141	5,349	4,927	2,815
Jagir	1984	459		459		119	340	9	9	9	34	9	294	266	129
Mlirip	1979	1,706		1,706		614	1,092	34	34	34	29	34	921	819	307
Cunungsari	1981	35,046		35,046		11,215	23,831	701	701	701	31	701	20,327	18,224	7,710
Gubeng	1993	5,718		5,718		457	5,261	457	114	114	43	114	4,346	4,003	2,288
Sengguruh	1988	180,716	8,677	108,270	63,769	83,258	97,458	2,165	2,165	2,165	38	2,165	86,631	80,135	47,654
Bening	1984	66,259		66,259		17,227	49,032	1,325	1,325	1,325	34	1,325	42,406	38,430	18,553
Mrican	1992	37,797		37,797		3,780	34,017	756	756	756	42	756	30,238	27,970	16,631
Dam Total		1,492,482	13,910	1,383,435	95,136	521,072	970,810	33,942	32,056	32,077		27,669	817,388	734,282	319,251
River Improvement		at 1997 price													
Porong I	1997	113,466		113,466		0	113,466	2,269	2,269	2,269	47	2,269	102,121	95,313	61,273
Porong II	1994	41,523		26,429	15,094	10,642	30,881	3,547	3,547	529	44	529	22,201	20,615	12,686
Brantas Middle Reach1	1983	363,784		363,784		101,860	261,924	7,276	7,276	7,276	33	7,276	225,546	203,719	94,584
Brantas Middle Reach2	1993	176,143		176,143		14,091	162,052	3,523	3,523	3,523	43	3,523	144,437	133,869	81,026
Surabaya I	1981	141,462		141,462		45,268	96,194	2,829	2,829	2,829	31	2,829	82,048	73,560	31,122
Surabaya II		N/A				0								0	0
Kedurus	1995	95,084	13,888	73,840	7,347	5,693	89,191	2,946	2,946	2,946	45	1,477	77,399	72,968	50,813
Neyama Tunnel	1993	12,486		12,486		999	11,489	250	250	250	43	250	10,240	9,491	5,744
Tulungagung Drainage Project	1981	353,755	319	346,767	6,669	48,281	305,474	6,935	6,935	6,935	41	6,935	270,797	249,991	145,961
Widas Irrigation Project	1990	52,732	6,864	33,307	12,761	17,424	35,308	666	666	666	40	666	31,977	29,979	19,987
Flood forecasting system	1990	27,474		1,493	25,981	26,190	1,284	30	30	30	40	30	1,135	1,045	597
River improvement total		1,377,913	20,671	1,289,190	67,852	270,648	1,107,265	30,272	30,271	27,253		25,784	967,902	890,550	503,793
Total invested		2,870,395													
(planned investment)						depreciation in 2002	acumulated deci up to 2002	book value at2002	depreciation in 2005	book value at2005	duration 5years	duration 50years	depreciation in 2020	book value at2020	
Wonorejo	1999	305,054	17,469	260,084	27,501	10,702	32,106	272,948	5,202	257,343	2,004	2,049	5,202	179,318	
Benk	2010	242,657	132,000	96,221	14,436						2,015	2,060	1,924	207,052	
Kedungwarak	2020	143,847	62,900	70,393	10,554						2,025	2,070		140,328	
Genteng I	2016	288,607	19,120	216,945	32,542						2,021	2,066		214,371	
Bypass channel	2004	50,729		50,729					1,015	47,686		2,054	1,015	33,481	
Improvement of FRWS	2002	56,667			56,667	11,333	11,333	45,334	11,333	11,333	2,007	2,007			
Widas river	2012	124,236		124,236								2,062	2,485	101,874	
Lodoyo diversion tunnel	after2020	421,998													
New lab.	2002	4,500			4,500	900	900	3,600	900	900	2,007	2,007			
Watershed/sabo		586,976		586,976		1,514	2,801	74,206	3,461	170,592			9,039	442,897	
Canal linins	2011	160,365		136,310	24,055						2,016	2,061	2,726	109,048	
Inter agency inf system		17,714				5,905	5,905	11,809	5,905	5,904			5,904	0	
(integration)															
PBK asset exold Wono.150	2002	350,000		350,000		7,000	7,000	343,000	7,000	322,000		2,052	7,000	217,000	
PGKS asset	2002	206,000		206,000		4,120	4,120	201,880	4,120	189,520		2,052	4,120	127,720	
Total planned		2,019,350	231,489	2,077,894	170,255	41,474	64,165	952,777	38,956	1,005,278			39,415	1,773,089	
Grand Total		5,789,745	266,270	4,750,519	333,244	94,926		2,736,067	92,408	2,630,210			92,667	2,596,234	

Watershed management/Sabo	Total	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	566,976	1,890	19,537	20,106	35,474	34,961	34,963	34,966	64,623	47,615	47,615	18,653	18,653	19,348	18,653	18,653	18,653
	total invest		21,427	41,533	77,007	111,968	146,931	181,897	246,520	294,135	341,750	360,403	379,056	398,404	417,057	435,710	454,363
	depreciatic	38	428	821	1,514	2,183	2,839	3,481	4,704	5,563	6,404	6,949	6,889	7,136	7,368	7,594	7,815
	accumulation		466	1,287	2,801	4,985	7,824	11,305	16,009	21,572	27,975	34,924	41,813	48,950	56,319	63,912	71,727
	book value	1,852	20,961	40,246	74,206	106,983	139,107	170,592	230,511	272,563	313,775	325,779	337,543	349,754	361,038	372,098	382,936
		2015	2016	2017	2018	2019	2020										
		18,653	19,348	18,653	18,653	18,653	18,653										
	total inves	473,016	492,364	511,017	529,670	548,323	566,976										
	depreciatic	9,460	9,230	8,438	8,042	8,843	9,039										
	accumulat	80,868	89,117	97,555	105,198	115,040	124,079										
	book value	392,128	403,247	413,462	423,472	433,283	442,897										

Table VI.11 Operational Flow Chart of MIS

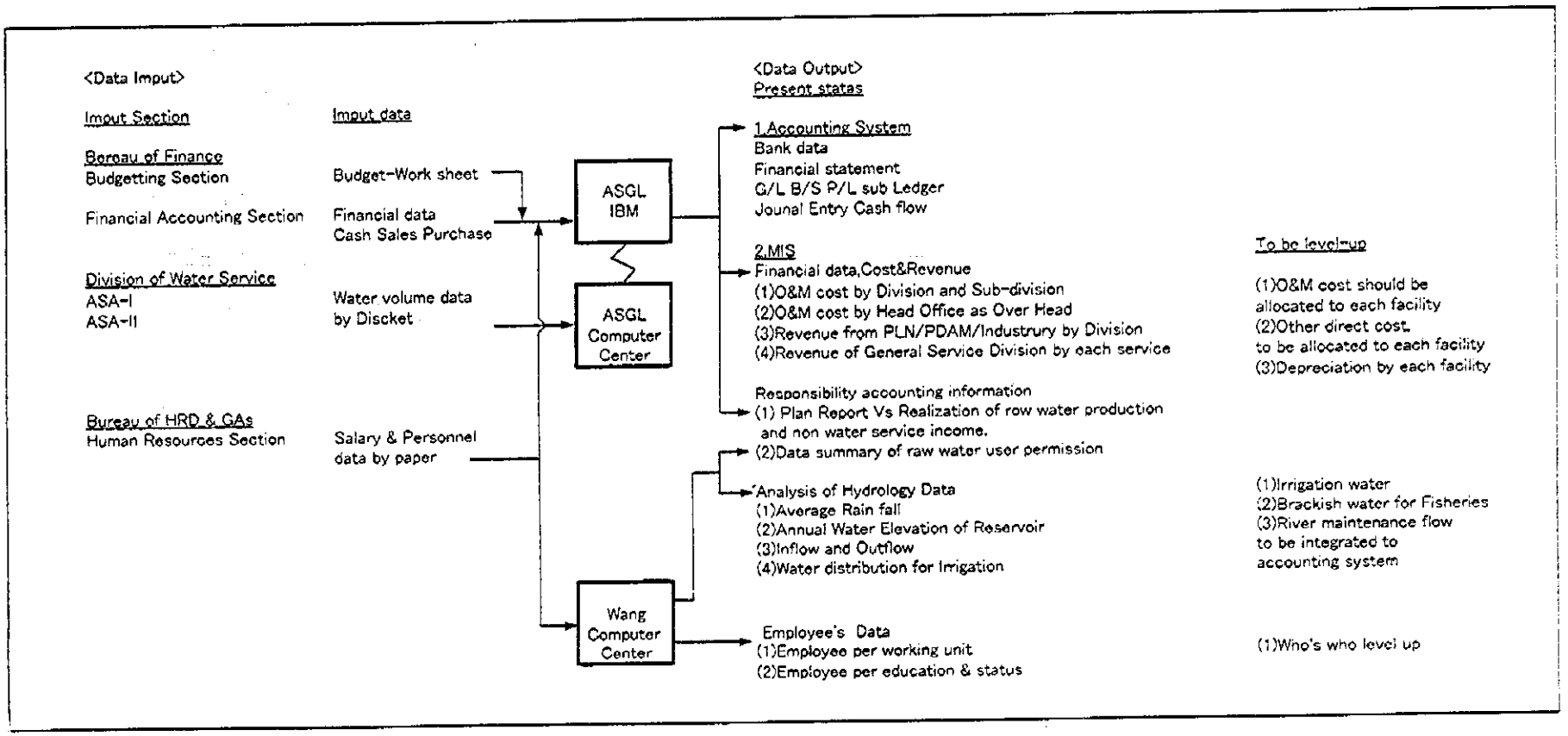


Table VI.12 Framework of MIS

Management Information Syster 1.Profit Center Unit/Cost vs R	Direct cost O&M cost (A)	Business Trip	Direct Personnel	General Affairs	Depreciati	Others	Total Direct Co	Total Indirect cost	Total Cost	Cost Recovery Revenue PLN	PDAM	Industry	Others Sand L. Rent	Total Revenue	Income
Water Service Division I	569						569		569				86	86	-483
Sub-division 1	3,063						3,063		3,063	6,022		386		6,408	3,345
Senggurub										849				849	849
Sutami&Lahor										5,173				5,173	5,173
south Malang															
Sub-division 2	1,096						1,096		1,096	2,422		4		2,426	1,330
Wlingi&Lodoyo										2,169			55	2,224	2,224
Lodoyo Irrigation										253				253	253
Seloreyo															
Blitar															
Sub-division 3	435						435		435	1,455		131		1,586	1,151
Tulungagung Hydro P.										1,455				1,455	1,455
Tulungagung Drainage															
Sub Total	5,163						5,163		5,163	9,899		521	141	10,561	5,398
Water Service Division II	545						545		545				18		-545
Sub-division 1	886						886		886			846		846	-40
Kediri															
Nganjuk Widas															
Jombang															
Sub-division 2	452						452		452		566	2,017		2,583	2,131
Mojokerto															
New Lengkong											566			566	566
Porong															
Sidoarjo															
Sub-division 3	720						720		720		3,118	750		3,868	3,148
Surabaya river											3,045			3,045	3,045
Gresik Mas river											73			73	73
Sub Total	2,603						2,603		2,603		3,684	3,613	18	7,315	4,712
Total	7,766						7,766			9,899	3,684	4,134	159	17,876	10,110

2 Profit Center Unit/Cost vs Re	Direct cost O&M cost (B)	Direct Personnel	General Affairs	Depreciati	Others	Total Direct cos	Total Indirect Cost	Total Cos	Revenue Ticket sol	Others	Total Revenue	Income
General Service Division	71					71		71				-71
Tourism	52					52		52	479		479	427
Seloreja									322		322	322
Karanketes									157		157	157
Others												
Equipment Rental	276					276		276	Fee income 1,332		1,332	1,056
Construction Service	2					2		2	Fee income 1,049		1,049	1,047
Consulting Service	0					0			Fee income 316		316	316
Sub Total	401					401		401	3,176		3,176	2,775
											21,052	12,885 (J)

	Direct cos O&M (C)	Business Trip	Direct Personnel	General Affairs	Depreciati	Others	Total H.O. Direct Co	Total H.O. Indirect Cost	
3. Head Office/Cost Center	714	85	790	214	1,027	1,405	4,235 (E)		
Total Direct cost (D)	8,881	85	790	214	1,027	1,405	12,402 (F)		
H.O.Indirect cost		339	3,206	726	618	772		5,661 (G)	
Total								18,063 (H)	

(I) O&Mcost (D)=(A+B+C)
Direct cost(F)=O&M cost+other direct cost
Total cost(H)=(F+G)
(I)=Total operating Revenue
(J)=Total Revenue(I)-(A+B)
Total Income(K)=(I-H) 2,989 (K)

Table VI.13 Projected Balance Sheets

FY1996

Billion Rp.

PJT

asset		funding	
Current	14	Current	12
		Others	9
Fixed	14	Equity	27
Total	28	Total	48
Expense	18	Revenue	23
Profit	5		

Managed asset FY2002

asset		funding
Land	52	
Construction	2,123	
Equipment&		
Consulting&		
Other Expense	113	
Depreciation	95	
Total in Net	2,193	

PKB FY1996

asset		funding	
Land	48	Gov't Fund	131
Construction	340	Overseas Loan	349
Equipment	16	Others	20
Consulting	73		
Other Expense	23		
Total	500		500
Land Purchase	10		
Construction	53		
Equipment	1		
Consulting	5		
Other Expense	2	Payment from	
Total	71	Gov't	71

PGKS FY1996

asset		funding	
Land	8	Gov't Fund	91
Construction	159	Overseas Loan	96
Equipment	13	Others	19
Consulting	21		
Other Expense	5		
Total	206		206
Land Purchase	2		
Construction	10		
Equipment			
Consulting	1		
Other Expense	1	Payment from	
Total	14	Gov't	14

FY2002 Perum (after consolidation)

Billion Rp.

asset		funding	
Current	25	Current	12
Fixed	25	Other	9
Sub total	50	Equity	29
Managed asset*	2,738	Contradictory A/C	2,738
Total	2,788		2,788
Depreciation	95	Contradictory A/C	95

*PJT Managed asset 2,193
PBK asset (exold Wonorejo150) 343
PGKS asset 202

Total 2,738

FY2005 Persero

Billion Rp.

asset		funding	
Current	28	Current	14
Fixed	28	Other	10
Sub total	56	Equity	32
Construction	2,630	Capital Note for Gov't Loan	1,305
		Reserve for Depreciation	1,325
Total	2,686		2,686
Depreciation	92	Reserve deduction	92

FY2005 Shadow A/C

asset		funding
Loan Investment to PJT	1,305	Overseas Loan Out to MOF
Deferred asset	1,325	Amotizationn
Total	2,630	Total 2,630
Depreciation	92	

FY2020 Target year

Billion Rp.

asset		funding	
Current	63	Current	31
Fixed	63	Other	33
Sub total	126	Equity	62
Construction	2,596	Capital Note	2,596
Total	2,722		2,722
Depreciation	93	Reserve deduction	93

FY2020 Shadow A/C

asset		funding
Loan Investment to PJT	2,596	Overseas Loan Out to MOF
		Amotizationn
		Total 2,596
Depreciation	93	

Table VI.14 Profit & Loss Statement Projection

projection FY	1997 estimate	2002			2005			2020		
Operating revenue	23,978	163,434 price/Comp demand/year			180,384 price/Comp demand/year			280,081 price/Comp demand/year		
PLN	7,300 Rp11.76/Kwh	13,495 Rp14/Kwh	964	Sengguru 81	15,424 Rp16/Kwh	964	Sengguru 81	22,057 Rp23/Kwh	958	Sengguru 81
PDAM	5,939 Rp32.1/m³	7,050 Rp30/m³	235	Sutami 465	9,360 Rp30/m³	312	Sutami 464	20,940 Rp30/m³	698	Sutami 459
Industry	8,284 Rp54.5/m³	4,998 Rp51/m³	98	Wlingi 154	5,151 Rp51/m³	101	Wlingi 165	6,018 Rp51/m³	118	Wlingi 165
Fishery		2,199 Rp30/m³	73	Lodoyo 38	3,230 Rp34/m³	95	Lodoyo 38	10,100 Rp50/m³	202	Lodoyo 38
Irrigation		40,668 Rp30/m³	1,356	Selorejo 23	43,826 Rp34/m³	1,289	Selorejo 23	47,750 Rp50/m³	955	Selorejo 23
sub total	21,523	68,411	0.44	Tulungagu 130	76,991	0.04	Tulungagu 130	106,865		Tulungagu 130
Sand utilization	360	258	0.12	Wonolejo 63	288	0.04	Wonolejo 63	1,200	0.21	Wonolejo 63
Clean water	10	13	0.06		17	0.10		71	0.21	Berg 11
Water quality lab	10	10	0.00		12	0.07		47	0.19	
Pressed roof	10	10	0.00		12	0.07		47	0.19	
Land rent	105	170	0.12		226	0.11		941	0.21	
Tourism	560	984	0.15		1,558	0.19		21,997	0.87	
Equip rental	800	1,250	0.11		1,513	0.07		6,316	0.21	
Consulting service	400	1,485	0.54		1,976	0.11		8,254	0.21	
Construction service	400	53,052	26.33		58,934	0.04		109,705	0.06	
Sabo		37,341			36,806	0.00		19,635	-0.03	
New business		500			2,000	1.00		5,000	0.10	
FY	1997	2002			2005			2020		
Operating expense	18,984	149,843	1.39		150,762	0.00		212,315	0.03	
Direct cost	13,068	139,455	1.93		139,943	0.00		199,762	0.03	
O&M excl dredging	7,400	23,335	0.43		27,381	0.06		27,381	0.00	
Sengguru	1,200	649	-0.09		649	0.00		649	0.00	
Sutami										
Wlingi		14,426 dredg total			7,879 dredg total			7,679 dredg total		
Lodoyo		3,637	18,714		595	8,923		595	8,923	
SABO		35,434			34,965			18,653		
total O&M+dredg&sabo	8,600	77,523	1.60		71,270	-0.03		54,957	-0.02	
Personnel	1,300	3,579	0.35		3,579	0.00		3,579	0.00	
General affairs	240	365	0.10		473	0.10		1,719	0.18	
Business trip	30	315	1.90		1290	1.03		5,369	0.21	
Equipment service	640	989	0.11		1334	0.11		3,052	0.19	
Consulting service	320	1,189	0.54	By-Pass 12,980	1,581	0.11		6,603	0.21	
Construction service	320	50,399	31.30	Widas 19,245	58,035	0.04	Berg 27,950	104,220	0.06	FFWS 5,047
Tourism	448	787	0.15	Inter-Agenc 2,583	1,246	0.19	Widas 13,034	17,598	0.87	Lodoyo 99,173
Sub total General-others	1,998	54,053	5.21	Canal Irrig. 15,691	61,959	0.05	Canal Irrig. 15,951	140,581	0.08	
Depreciation	1200	4300	0.52		3135	-0.09		645	-0.05	
Depreciation of Assets cost of new business	0	400			1600			4000		
Indirect										
personnel cost	3,900	4,015	0.07		4,015	0.00		4,015	0.00	
Other indirect Cost	2,618	5,813	0.23		6,064	0.03		7,779	0.02	
general affairs	848	1,000	0.04		1,000	0.00		1,000	0.00	
business trip	370	2,795	1.31		3,000	0.02		3,000	0.00	
depreciation&a	730	1,000	0.07		1,000	0.00		1,000	0.00	
marketting	150	293	0.13		390	0.11		1627	0.21	
supervision cos	220	225	0.00		299	0.11		300	0.00	
guidance cost	200	200	0.00		242	0.07		300	0.02	
up grading cost	70	100	0.09		133	0.11		552	0.21	
HRD cost 3)	170	759	0.69		759			759		
Total indirect	5,786	10,387	0.16		10,838	0.01		12,553	0.01	
Total op income	5,094	13,641	0.34		29,602	0.39		67,766	0.09	
Non operating revenue										
PGPS sara	645	1,139	0.15		0	-0.33		0		
Interest&Divide	2,000	2,500	0.05		2,800	0.04		6,300	0.08	
Non operating expense	0	0			0			0		
Non operating income	2645	3,639	0.08		2,800	-0.08		6,300	0.08	
Income before tax	7,739	17,280	0.25		32,402	0.29		74,066	0.09	
Income after tax 30%)	5,417	12,096	0.25		22,681	0.29		51,846	0.09	

Note for computation of unit water rates applied and water demand

	actual/VI.4.4Main R				actual/V42								
	1997	2002	2005	2020	1996	2002	2005	2020			FY2002	2005	2020
Fishery	price Rp/m3				Demand/MMm³/yr				water demand MMm³/year		30	34	50
normal	25	30	34	50	408	978	1263	2687	x {408+(268.7-408)×(2002-1996)/(2020-1996)}		2,978	4,254	13,455
drought	25	30	34	50	204	489	631	1343	x {204+(134-204)×(2002-1996)/(2020-1996)}		1,488	2,127	6,715
average					306	733	947	2015		Appropriat Rp million	2,232	3,191	10,075
realistic	5	10	12	28							10	12	28
											935	1,554	6,966
											468	777	3,492
										Realistic Rp million	701	1,165	5,239
Irrigation											30	34	50
normal	25	30	34	50	1,943.2	1,776.9	1,696.8	1266.1		Rp million	40,689	43,921	47,750
drought	25	30	34	50	1,035.1	932.3	889.9	824			10	12	28
average	25	30	34	50	1,489.2	1,355.6	1,268.9	955.1		Rp million	13,556	15,486	24,831
realistic	5	10	12	28						difference Rp million	26,643	30,380	27,757
PLN	12	14	15	23	620	964	964	959			13,873	15,256	22,057
PDAM	32.1	30	30	30	108	313.5	418.3	930					
drought		30	30	30	54	156.8	208.1	465					
average		30	30	30	81.0	235.1	312.2	697.5		Rp million	7,054	9,388	20,925
Industry	54.5	51	51	51	104	114.5	119.8	146					
drought		51	51	51	78.9	81.4	82.7	89.3					
average		51	51	51	91.4	98.0	101.2	117.7		Rp million	4,995	5,163	6,000

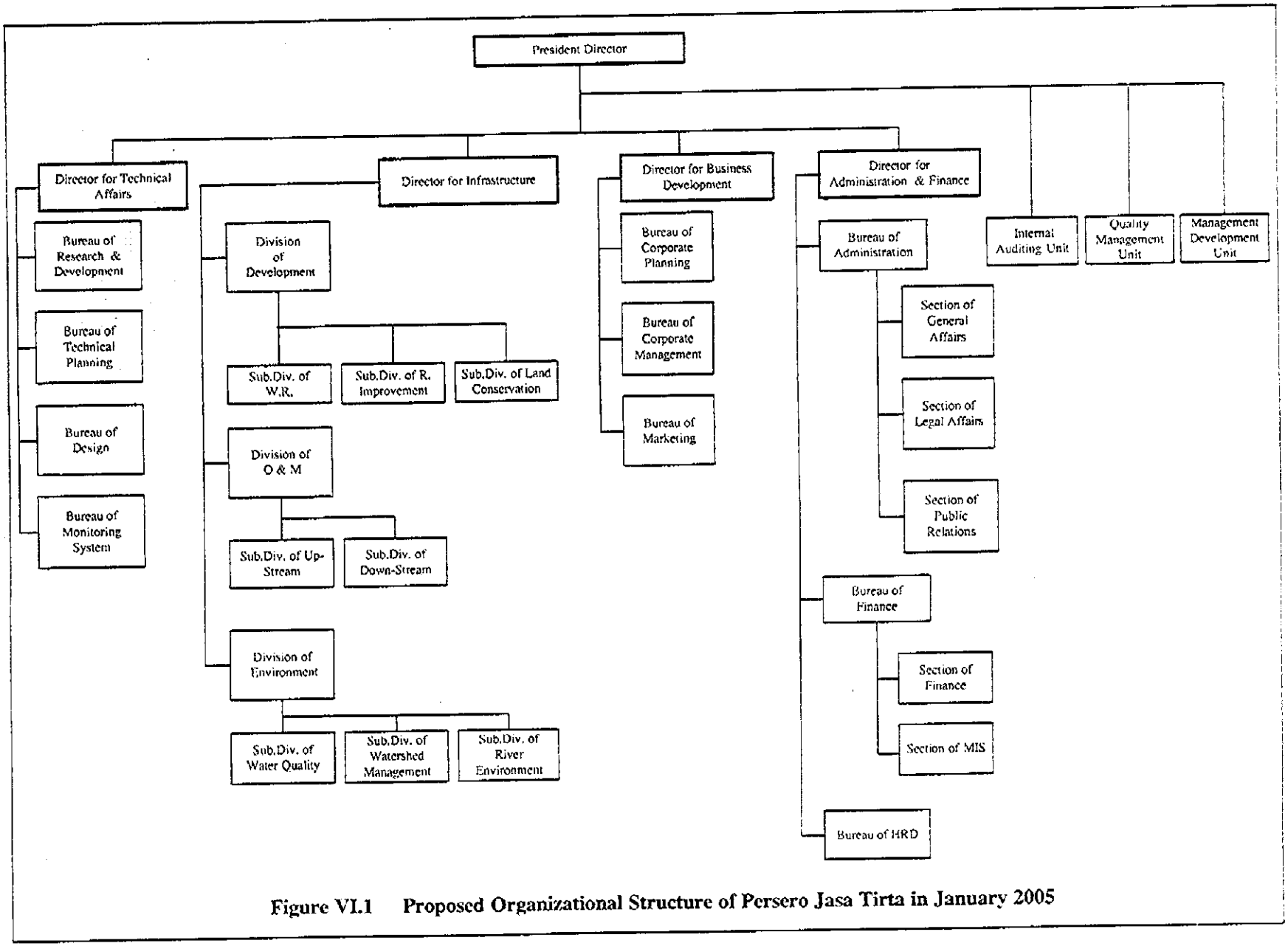
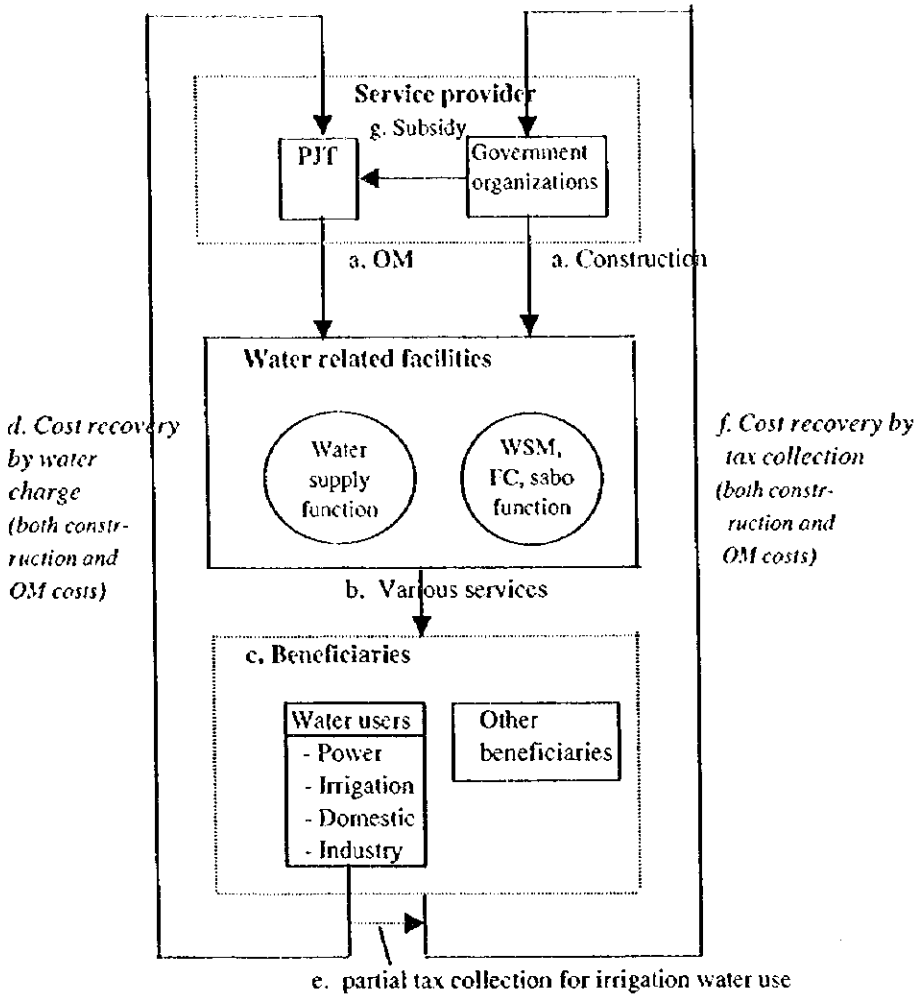


Figure VI.1 Proposed Organizational Structure of Persero Jasa Tirta in January 2005



Note :
WSM : watershed management, FC : flood control, OM : operation and maintenance

a. PJT's main work is operation and maintenance of the water-related facilities, whereas the government is engaged in construction of the facilities.
b. Various services are provided by water-related facilities such as water supply, WSM, FC and sabo.
c. There are beneficiaries of these water services including water users and others.
d. For water supply function, the costs for construction and OM are recovered by collecting water charge.
e. However, irrigation water charge is set lower than the full cost recovery level, considering the farmers' affordability. The shortfall in revenue should be met by tax collection.
f. Tax is collected to recover costs, both construction and OM costs, for such services as WSM, FC and sabo, for which water charge can not be collected due to difficulty in specifying the beneficiaries.
g. PJT recovers all the costs, both construction and OM costs, by water charge and government subsidy. PJT may pay the construction cost portion to the government under a PJT-government arrangement.

Figure VI.2
Concept of Water Charging and Subsidy