

NARBO



Network of Asian River Basin Organizations

**Annual Report
of
Jasa Tirta I Public Corporation (PJT I)
2004**



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Foreword

This report presents annual report of 2004 of Jasa Tirta I Public Corporation as member of Network of Asian River Basin Organizations (NARBO).

As an activity of NARBO Work Plan 2004-2005, that agreed at the First General Meeting of NARBO held in Batu – Indonesia on February 24 to 26, 2004, RBO Annual Report is intended as one of the efforts to promote advocacy, raising awareness, and exchange of information and good practices on Integrated Water Resources Management (IWRM).

It is hoped that the report will provide useful information for us in strengthening the capacity and effectiveness of River Basin Organizations (RBOs) in promoting IWRM and improving water governance.

Malang, February 2005

Socheh

President Director
Jasa Tirta I Public Corporation

Table of Contents

1. Summary
 - 1.1. Organization
 - 1.2. NARBO Activities

2. Organization
 - 2.1. The Purpose of *PJT I* and the Extension of the Projects
 - 2.2. The Legislation Backing up *PJT I* and Related Ministries and Agencies
 - 2.3. The History of *PJT I*
 - 2.4. The Constitution of *PJT I* and the Number of Staff
 - 2.5. The Financial System and the Size of Annual Budget
 - 2.6. The Outline of Implementing Tasks
 - 2.7. The Mid-term Project Master plan
 - 2.8. The Challenges for Implementation of Tasks

3. NARBO Activities
 - 3.1. NARBO First General Meeting
 - 3.2 NARBO Training
 - 3.2. RBO Website
 - 3.3. RBO Exchange Visits, Staff Exchange Programs, Twinning Programs
 - 3.4. ISO Certification

4. Topics
 - 4.1. Floods
 - 4.2. International Conferences
 - 4.3. Certification of SNI-19-17025-2000 (ISO/IEC 17025) for *PJT I* Water Quality Laboratory

- Appendix
 - 1.1. Legal Framework for River and Water Resources Management
 - 1.2. Implementation Scheme for Water Resources Management

1. Summary

Jasa Tirta I Public Corporation (hereinafter referred to as PJT I) was established based on Government Regulation No. 5 of 1990 and revised by Government Regulation No. 93 of 1999. Then Presidential Decree No. 129 of 2000 stipulating additional basin of Bengawan Solo to be managed. The responsibility of PJT I is to manage and conserve the water resources and the infrastructures in the Brantas River and Bengawan Solo River basins for the regional and national development benefit.

Main tasks of PJT I are as follows: perform operation and maintenance of the water resources infrastructures, economic dealings in water utilization, river basin management including water resources conservation, development and utilization, and rehabilitation of the water resources infrastructures.

PJT I provides the water service (supply) to Municipal Drinking Water Enterprise (PDAM), State Electric Company (PLN), industries, plantation, fisheries, flushing and other utilization.

1.1. Organization

PJT I was established based on Government Regulation No. 5 of 1990 and revised by Government Regulation No. 93 of 1999. The responsibility of PJT I is to manage and conserve the water resources in the Brantas River and Bengawan Solo River basins for the regional and national development benefit.

The purpose and objective of *PJT I* are to conduct public utilization on water resources in sufficient and high quality manner for fulfilling public needs, and carry out specific tasks given by the Government in performing river basin management and to join national economic development by participating on national development program especially in water resources management sector.

Financial source for undertaking of the main tasks in water resources management in the basin carried out by *PJT I*, are secured from the beneficiaries participation. Beneficiaries gradually bear the operational cost of the assigned corporate body. Basically, beneficiaries render their participation in the following sources: beneficiaries pay for water services, rendered in form of water fee and tax; polluters are obliged to pay pollution fee and tax (not yet implemented but legal background is being drafted); Government finances social services like flood control, water quality control, and water resources conservation.

Main tasks of *PJT I* based on Ministry of Public Works Regulation No. 56/PRT/1991 on General Policy of *PJT I* Management (Article 6) are as follows:

- Perform operation and maintenance of the water resources infrastructures
- Economic dealings in water utilization
- River basin management including water resources conservation, development and utilization
- Rehabilitation of the water resources infrastructures

PJT I has vision and mission as follows:

Vision: Government Owned Company that capable to manage water resources in professional, innovative and sustainable manner supported by all stakeholders.

Mission:

- To conduct services for public utilization on water resources in sufficient and high quality manner for fulfilling public needs
- To manage water resources effectively and efficiently including O&M activities of water resources infrastructures, conservation, making efficient use of water and controlling destructive force of water according to the task given by the Government based of stakeholders' participation.

- To conduct corporation management in order to reach healthy condition.

PJTI's responsibilities include supervision of water resources master plans, review of existing master plans, monitoring of both river water quality and industrial effluent, data analysis and modeling. *PJTI* is also involved in increasing public awareness and is concerned with pollution issues, inform and educate the public through public campaigns. *PJTI* provides the water service (supply) to Municipal Drinking Water Enterprise (PDAM), State Electric Company (PLN), plantation, fisheries, maintenance flow and other utilization.

1.2. NARBO Activities

In 2004, *PJTI* carried out the activities as summarized below:

- (1) The first General Meeting of Network of Asian River Basin Organization (NARBO) from February 24 to 26, 2004 in Batu, East Java, Indonesia (Organizing Committee).
- (2) *PJTI* participated in the first NARBO training on IWRM from July 26 to August 6, 2004 in Thailand.
- (3) *PJTI* participated in the Workshop on NARBO Web Design and Development from August 7 to 8, 2004 in Thailand.
- (4) *PJTI* participated in the Small Scoping Workshop of RBO Benchmarking Activity at 12 October 2004 in Jakarta, Indonesia.
- (5) *PJTI* participated in the NARBO Members Consultation of RBO Benchmarking Activity from November 29 to 30, 2004 in Jakarta, Indonesia (Organizing Committee).
- (6) *PJTI* participated actively in Indonesian NARBO Secretariat (Vice Executive Director).

2. Organization

PJT I was established as a pilot of a new concept of corporatization in water resources management, i.e.: a river basin that is managed by a neutral and professional institution who applies in balanced between healthy corporation principles and accountable public service norms on water resources, based on the principle of “One River, One Plan, One Integrated Management” supported by public, private and stakeholders participation. Many aspects of Integrated Water Resources Management and water governance system were developed and implemented in these basins. River infrastructures are in better condition, basin productivity and public awareness as well as user’s contributions for financing O&M activities increase significantly.

2.1. The Purpose of *PJT I* and the Extension of the Projects

In the framework of performing the main task to perform operation and maintenance of the water resources infrastructures, in the field of operation, *PJT I* has a vital role in the activities as follows: licensing for water resources utilization, water allocation, flood control, and pollution control. In performing these activities, *PJT I* coordinates and cooperates with related institutions, particularly with Local Government in the operational matters. Considering available laws and regulations, the scope of activities and roles of *PJT I* are as follows:

Activity	Role
Licensing for water resources utilization	Provide technical recommendation
Water allocation	Prepare water allocation pattern for East Java Water Management Committee, perform and control water allocation by conducting reservoir operations in accordance with the pattern and licenses given to the users
Flood control	Prepare flood control manual and perform flood control using facility of FFWS
Pollution control	Provide technical recommendation on licensing for waste water discharge, monitor water quality and report to the Governor

Implementation of the main task of *PJT I* in the field of maintenance covers maintenance of water resources and its infrastructures (consisting of preventive, corrective and emergency maintenance of the infrastructures, sand mining control, sedimentation control, rehabilitation of critical watershed, land use arrangement in river corridor area). The scope of activities and roles of *PJT I* in the field of maintenance are as follows:

Activity	Role
Maintenance and rehabilitation of infrastructures	Prepare annual program and implement the works
Sand mining control	Provide technical recommendation in licensing for sand mining, monitor and control the implementation of sand mining with related agencies
Sedimentation control	Prepare annual program and implement the works
Critical watershed	Prepare soil and water conservation program, implement the works in cooperation with related agencies
River corridor control	Prepare land use planning and technical recommendation in licensing for river corridor utilization

2.2. The Legislation Backing Up *PJT I* and Related Ministries and Agencies

PJT I was established based on Government Regulation No. 5 of 1990 and revised by Government Regulation No. 93 of 1999. Others legislation back up *PJT I* are: 1) Ministry of Public Works Regulation No. 56/PRT/1991 on General policy of PJT management; 2) Presidential Decree No. 58 of 1990 on the designation of PJT as an agency which can collect and receive the contribution for operation and maintenance of water resources infrastructures.

For administrative and financial matters, *PJT I* is supervised by Ministry of Finance, Ministry of State Owned Company and Ministry of Public Works; for technical matters is supervised by Ministry of Public Works (Directorate General of Water Resources); and for operational matters supervised by Regional Government of East Java and Middle of Java.

2.3. The History of *PJT I*

The history of *PJT I* can not be separated from Brantas River basin development commenced in 1961. The development is conducted on a series of master plans that involves stage-wise planning in accordance to the national development requirements. These master plans are summarized below:

- **Master Plan I** was prepared in 1961, emphasizes on flood control by developing dams at the upper reaches and river improvements to increase flood relief capacity.
- **Master Plan II** was prepared in 1973 after most objectives of the first master plan were achieved. This master plan was founded in accordance to the government policy on food sustainability, by emphasizing on irrigation development.
- **Master Plan III** was prepared in 1985 after irrigation schemes were developed in the basin and as result of the irrigation development, agricultural intensification was made possible. The third master plan emphasizes on water supply for domestic and industrial uses, as more urban area is evident in the basin.
- **Master Plan IV** was prepared in 1998, to emphasize on effective water resources conservation and management.

Development in the basin resulted into 8 (eight) reservoirs (Sengguruh, Sutami, Lahor, Wlingi, Lodoyo, Selorejo, Bening and Wonorejo), four river-improvement-schemes, four barrages, and three rubber dams. Total investment in water resources infrastructure is priced Rp 7.63 trillion based on the year 2003 price level (US\$ 0.097 billion, Yen 78.8 billion, Rp. 258.9 billion).

After construction period in Brantas River basin, it is necessary to maintain function of the completed infrastructures in order to ensure maximum benefit to achieve the designated technical life span and to achieve sustainable development. Adequate operation and maintenance activities are necessary to be conducted by a permanent institution, with professional staff and adequate budget. Further, it is necessary to maintain the function of the water resources infrastructures to ensure optimum benefit at their planned lifetime. Adequate operation and maintenance (O&M) activities are necessary to be performed; however, these activities encountered specific problems as follows:

1) Institution

Until 1990, the Brantas River basin has no permanent institution that could perform O&M activities in a conceptual and sustainable manner. Brantas River Basin Development Project (BRBDP) is a temporal institution whose duty is only to carry out the construction and not the O&M. Since there are many sectors in utilization of water resources in the basin, and in the other hand, the water availability is much influenced by climate and human activities, this condition will lead to conflict among uses and users. Then it is required a neutral institution to manage water resources in the basin to meet the various needs.

2) Funding

BRBDP who had then to carry out the O&M, encountered problems in obtaining fund for these activities due to the limited National Government Budget.

3) Water Resources Degradation

Lack of O&M budget resulted in degradation of the water resources infrastructures, and less coordination among related agencies complicated the water resources management. This scheme posed risk of water resources degradation, which in the long run shall harm economic development of the basin. Whereas water degradation is evident, sustainable resources are at risk.

PJT I was established in 1990, having working area in the Brantas River basin consist of its main river and 39 tributaries. Based on Presidential Decree No. 129 of 2000, Bengawan Solo River basin consist of its main river and 24 tributaries was added as *PJT I* working area. Figure 1 depicts the working area of *PJT I* in Brantas River and Bengawan Solo River basins. List of the rivers under jurisdiction of *PJT I* and water resources infrastructures managed by *PJT I* are shown in Table 1 and Table 2.

2.4. The Constitution of *PJT I* and the Number of Staff

The current organization structures of *PJT I* is as stipulated in Figure 2. Under the President Director (Mr. Socheh), there are 4 (four) directors are assumed to be responsible for Technical Affairs (Mr. Soekistijono), Operation for Brantas River (Mr. Tjoek W. Subijanto), Operation for Bengawan Solo River (Mr. Sutioso Budirahardjo) and Administration and Finance (Mr. Hanief Zamzam).

a. Directorate for Technical Affairs

In the Directorate for Technical Affairs, all technical matters are handled. They include surveys and investigations, research and feasibility studies, planning and controlling program, technical guidance, environmental planning including wastewater treatment and water quality.

b. Directorate for Operations

In the Directorate for Operations, all the routine operations are handled. They include O&M activities, water resources management, consulting and constructing services and equipment utilization. The daily O&M of rivers and the infrastructures, monitoring and control of flood, water supply in the field, sand mining and land utilization are being done by Division of Water Services.

c. Directorate for Administration and Finance

In the Directorate for Administration and Finance, managerial matters related to administration and finance is handled. The financial reporting, budgeting and accounting are being done by Bureau of Finance. The human resources development and general affairs are being dealt by Bureau of Human Resources Development and General Affairs.

The number of staffs of *PJT I* as of December 2004 is 540 consist of Malang headquarters (166), Division (324) and Solo Office (50). There are 4 (two) types of employment in *PJT I*, organic staff, non-organic staff, honorary and outsourcer. An organic staff is considered as a permanent that can be divided into a government official and non-government official. A non-organic staff is considered as non-permanent staff that divided into the staff with concrete contract period and staff without concrete contract period.

2.5. The Financial System and the Size of Annual Budget

PJTI is a self-supporting corporation independent of the State budget. The detail of revenues and expenses of *PJTI* in 2004 are summarized as follows:

Detail of 2004 Revenues by Source

The 2004 revenue of *PJTI* by each source is shown in table below. The revenue amounted to Rp. 54,496 million consists of water service sector Rp. 45,536 million (83.6%) and non-water service Rp. 8,960 million (16.4%). Of the total revenue, that State Electric Company (*PLN*) occupied the largest share of 45.9 %, followed by PDAM of 19.0% and by industries of 18.7 %.

No.	Source	Revenue	Percentage
A	Water Service	45,536.0	83.6
1	State Electric Company (PLN)	24,996.0	45.9
2	Municipal Drinking Water Enterprise (PDAM)	10,360.0	19.0
3	Industries	10,180.0	18.7
B	Non Water Service	8,960.0	16.4
1	Tourism	2,010.0	3.7
2	Equipment service	2,008.0	3.7
3	Constructing service	4,006.0	7.4
4	Consulting service and others	936.0	1.7

Detail of 2004 Expenses

The 2004 operating expense is shown in the table below. The total 2004 operating expenses amounted to Rp. 49,426.0 million. The O&M cost was Rp. 23,296 million of which share was the largest in the total operating expenses with 47.13 % followed by the personnel cost of 20.42 %.

No.	Source	Expenses	Percentage
A	Water Service	43,761.0	88.54%
1	O&M	23,296.0	47.13%
2	Watershed conservation	950.0	1.92%
3	Depreciation	3,304.0	6.68%
4	Personnel	10,093.0	20.42%
5	Bonus	1,326.0	2.68%
6	Duty fee	1,460.0	2.95%
7	General expenses	2,182.0	4.41%
8	Marketing	865.0	1.75%
9	Research and development	285.0	0.58%
B	Non Water Service	5,665.0	11.46%
1	Business expenses	5,445.0	11.02%
2	Consulting service and others	220.0	0.45%

2.6. The Outline of Implementing Tasks

The outline of implementing tasks are summarized below:

1. Perform operation and maintenance of the water resources infrastructures

a. Operation

- Flood control in Brantas River

Using FFWS, *PJTI* conducted water quantity monitoring in Brantas basin in order to control flood of 50 year period. In December 2004 high discharges recorded at some points are as follows: Wlingi Dam (1,745 m³/s), Lodoyo Barrage (2,047 m³/s), Mrican Barrage (1,768 m³/s) and New Lengkong Barrage (950 m³/s). Locations of rainfall gaugings and water level gauging within the

telemetry system of FFWS can be seen in Figure 3 and Figure 4.

- Water allocation and distribution

Present major water uses in the Brantas River and Bengawan Solo River and its main tributaries are for the various purposes as follows: electricity generation, irrigation (as the largest consumer), brackish water fish ponds (in the coastal belt of the Delta), domestic water supply, industrial water supply and river maintenance flow.

- Water quality control

In 2004, *PJT I* carried out water quality monitoring in Brantas River basin via 23 on-line water quality-monitoring stations along the river and at 51 sampling points off-line monitoring stations along the river and 56 points at potential industries pollution sources, 11 point at domestic disposal outlets of hospital, hotels and public sanitations. Location of online water quality monitoring stations can be seen in Figure 5. The water quality monitoring results in 2004 can be seen in Figure 6 to Figure 8.

b. Maintenance

Maintenance works of the water resources infrastructures done by *PJT I* in 2004 consists of sediment dredging in reservoir, intake of PDAMs and Industries; repair of revetment in many stretches of Brantas River and its tributaries under jurisdiction of *PJT I*, etc. List of some O&M works had done by *PJT I* in 2004 can be seen in Table 3.

2. Economic dealings in water utilization

In 2004, total electricity production in the Brantas basin and Bengawan Solo basin were 979 million kWh and 33.712 million kWh respectively. Total water volume used for Domestic Water Supply Companies in Brantas basin and Bengawan Solo basin were about 272 million m³ and 0.6 million m³ respectively. Total water volume used for industries in Brantas basin and Bengawan Solo basins were about 124 million m³ and 22 million m³ respectively.

3. River basin management including water resources conservation, development and utilization

In 2004, *PJT I* carried out some activities related to watershed conservation in Brantas basin i.e. construction of 21 (twenty one) check dams and 13 (thirteen) gully plugs and greening in critical areas of about 11.2 hectares.

4. Rehabilitation of the water resources infrastructures

The rehabilitation of water resources infrastructures in Brantas basin in 2004 mainly done by Brantas River Development Project under finance of JBIC loan.

2.7. The Mid-term Project Master Plan

The 2004 project plan as part of Long Term Plan of *PJT I* for 2004-2008 are summarized as follows:

1. Perform operation and maintenance of the water resources infrastructures

The target for performing operation and maintenance of the water resources infrastructures are summarized as follows:

- increasing the guarantee of water allocation reaching the users by conduction O&M gradually based on priority. The project plan in 2004 was to increase the quality of O&M activities.
- promoting more reliable flood control by advancing flood-forecasting capability in cooperation with related agencies. The project plan in 2004 was to strengthen and develop the system.
- increasing budget for O&M activities and Government aid to finance preventive O&M. The project plan in 2004 was to submit the proposal and program to Government and establish internal teamwork in realizing public service obligation.

2. Economic dealings in water utilization

Total electricity production in the Brantas basin and Bengawan Solo basin in 2004 were planned 995 million kWh and 47 million kWh respectively. Total water volume used for Domestic Water Supply Companies in Brantas basin and Bengawan Solo basin were planned about 245 million m³ and 2.52 million m³ respectively. Total water volume used for industries in Brantas basin and Bengawan Solo basins were about 135 million m³ and 22.54 million m³ respectively.

3. River basin management including water resources conservation, development and utilization

The target for river basin management including water resources conservation, development and utilization are summarized as follows:

- Promoting water resources conservation by assisting related agencies in arranging conservation master plan, assisting the implementation of water resources conservation and greening activities done by related agencies in area where affect reservoir sedimentation.
- Increasing water quality in main streams by assisting local governments in developing and implementing waste water discharge licensing, raising public awareness on pollution control and developing communal domestic waste treatment plant in cooperation with local government and universities. In 2004, it was proposed to have planning study and 1 (one) implementation project.

4. Rehabilitation of the water resources infrastructures

The target for Rehabilitation of the water resources infrastructures are summarized as follows:

- Realization of rehabilitation of the water resources infrastructures gradually based on priority, which directly related to increasing the corporate revenue (using internal budget), safety and welfare of the public (using Government budget). The project plan in 2004 was to have budget from Government for rehabilitation of the water resources infrastructures intended to promote safety and welfare of the public.

2.8. The Challenges for Implementation of Tasks

The challenges for implementation of projects based on the main task are summarized below:

1. Perform operation and maintenance of the water resources infrastructures

- Limited budget

In implementing the projects of O&M, *PJTI* has problem with limited budget. The revenue from beneficiaries in financing O&M of the infrastructures could cover only about 34.87% of the total cost. This condition will cause deferred maintenance and leads to degradation of the infrastructures.

- Old equipment

Most the equipments e.g. dredger, crane etc. are old and prone to malfunction. The existing Flood Forecasting and Warning System is also prone to malfunction. The system was completely installed and established at the end of 1990 and started its operation from the beginning of 1991. The hardware and software set in *PJTI* was the first generation, and this situation may cause difficulties and problems in operation and maintenance of the system.

2. Economic dealings in water utilization

- Sedimentation of Reservoirs

It has been estimated that Sutami Reservoir has lost nearly 50% of its gross storage and 40% of its active storage since construction in 1972 due to sedimentation, and Sengguruh Reservoir, which was completed in 1988 primarily to serve as a sediment trap for Sutami, has lost over 80% of its original gross storage. New storage is considerably more difficult and expensive to develop than were existing reservoirs. Solutions to the ongoing problem of reservoir sedimentation involve intensive dredging and expanded upland conservation efforts, such as the Sabo (check-dam) development and rehabilitation occurring on Mt. Kelud.

- Water Quantity

The quantity of water available in the dry season is currently barely sufficient to meet existing demand, particularly when in stream water quality objectives are considered. This is particularly (but not exclusively) a concern in the high-consumption region below New Lengkong Barrage, which includes the Brantas Delta irrigation systems, the Greater Surabaya municipal area and a high percentage of Brantas Basin industries.

- Water Quality

Water quality problems are currently primarily related to biochemical oxygen demand (BOD) from domestic waste, agriculture and industry. Problems are not limited to dry season flows. Significant elevations in BOD have been observed during wet season runoff, suggesting that animal and other wastes accumulate during the dry season and are mobilized during the wet season.

- Low Water Use Efficiency

It has estimated that overall efficiency of irrigation water use is quite low in the Brantas Delta, around 27%, and this inefficiency contributes to the frequently observed water shortages in this region. Return flows in the delta cannot in general be reused, although they may provide flushing flows to the brackish fishponds. Inefficiencies for irrigation systems above New Lengkong have less profound consequences, since most return flows from upstream systems can be recycled in the Delta and Surabaya. Primary factors contributing to inefficiency include poor timing of deliveries and deteriorating infrastructure. Domestic water use efficiency is also low, with system losses in the Surabaya area estimated to be 30% - 45% of gross deliveries.

- Poor Cost Recovery in Irrigation

Indonesian farmers do not pay directly for irrigation water, as domestic (PDAM) and industrial users do. It is noted that the fact that *PJT I*'s revenues are largely derived from the sale of water to non-agricultural users creates an allocation bias against agricultural users. Although an ISF (irrigation service fee) system exists, collections are sporadic, and insufficient to cover irrigation-related O&M. The observation that many farmers within Brantas surface irrigation systems invest in powered pump sets to augment surface water deliveries demonstrates that they are not unwilling to pay for irrigation water, however, provided that the timing and quantity are calibrated to their cropping requirements.

3. River basin management including water resources conservation, development and utilization

- Lack of coordination with related agencies

In conducting river basin management in Brantas basin including water resources conservation, development and utilization, there are many agencies concerned, each has function and responsibility. Sometimes, duplication and lack of coordination occur in the implementation stages.

4. Rehabilitation of the water resources infrastructures

- Limited budget

In implementing rehabilitation of the water resources infrastructures, *PJT I* has problem with limited budget. The expected fund from Government as realization of Government obligation principle to finance public service and safety could only cover small part of the total budget for rehabilitation.

3. NARBO Activities

This chapter describes NARBO Activities done by *PJT I* in detail as follows:

3.1. NARBO First General Meeting

At the first General Meeting of Network of Asian River Basin Organization (NARBO) from February 24 to 26, 2004 in Batu, East Java, Indonesia, *PJT I* acted as the Co-Organizing Committee.

3.2 NARBO Training

PJT I dispatched 2 (two) personnels i.e. Mr. Soegiarto (Chief of Water Service Division V) and Ms. Kusmartini (Chief of Program Planning Section, Planning and Controlling Bureau) to participate in the NARBO Training Program on IWRM and Strengthening of River Basin Committees (RBC), 26 July – 6 August 2004, in Bangkok and Chiang Mai, Thailand. In this first training, NARBO Secretariat requested *PJT I* to dispatch the lecturer (Mr. Alfian Rianto) allotted to the lecture on “ISO & IWRM” scheduled on 27 July 2004.

3.2. RBO Website

PJT I dispatched 1 (one) personnel i.e. Ms. Kusmartini (Chief of Program Planning Section, Planning and Controlling Bureau) to participate on Workshop on NARBO Web Design and Implementation, 7 – 8 August 2004, in Bangkok, Thailand.

3.3. RBO Exchange Visits, Staff Exchange Programs, Twinning Programs

In order to realize this activity, Indonesian NARBO (*PJT I* as one of the members) and Japan Water Agency signed Memorandum of Understanding of Twinning Program between them. Under this MOU, Agreement of Exchange of Information on Twinning Program between Indonesian NARBO and Japan Water Agency and Agreement of Exchange of Personnel on Twinning Program between *PJT I* and *PJT II* and JWA were signed. Furthermore, Indonesian NARBO and Korea Water Resources Corporation (KOWACO) signed Memorandum of Understanding of Twinning Program between them. Under this MOU, Agreement of Exchange of Information on Twinning Program between Indonesian NARBO and KOWACO and Agreement of Exchange of Personnel on Twinning Program between *PJT I* and *PJT II* and KOWACO were signed also.

3.4. ISO Certification

PJT I disseminated ISO certification at NARBO Training Program in Thailand. At that time, *PJT I* presented a presentation with the title of “Implementation of the Quality Management System ISO 9001 : 2000 in IWRM in the Brantas River Basin – Indonesia”.

4. Topics

4.1. Floods

Flood and debris flow took place in Brangkal sub basin and Brantas Origin area on February 3-4, 2004 due to devastated watershed in the upper part of Brantas basin. The debris flow destroyed some part of conservation area belongs to *PJT I* and human settlements in Tulungrejo Village. The recorded rainfall data at some stations at that time showed very high magnitudes such as recorded at Wonosalam 105 mm (10 hours) and Trawas 242 mm (8 hours).

Due to heavy rains in the Brantas River basin on December 3-4, 2004, the tributaries capacity could not retain the rainwater, then flood occurred in some areas in the middle reach of the basin at that time. Those areas are located in Blitar, Kediri, and Tulungagung Regencies. The discharge has caused the riverbanks collapsed in some points and inundation occurred and caused damages of housing, bridges and paddy fields. The recorded rainfall data within 24 hours at some stations in December 3, 2004 showed very high magnitudes such as recorded at Tunggorono (441 mm), Wlingi (366 mm), Sumberagung (244 mm), Semen (217 mm), Doko (277 mm), Wates Wlingi (267 mm) and Birowo (371 mm). The recorded discharges at some points also showed very high magnitudes as recorded at Lengkong Barrage (950 m³/sec) and Porong River (1,194 m³/sec). These magnitudes are considered high compared to the 50 year-flood discharge that is only 900 m³/sec.

4.2. International Conferences

In 2004, *PJT I* participated in some international conferences e.g. International Conference on IWRM in Tokyo on 7 December 2004 organized by Japan Water Forum and International Conference on Monitoring, Prediction and Mitigation of Water-Related Disasters (MPMD-2005), in Kyoto, on 12-15 January 2005, organized by Disaster Prevention Research Institute (DPRI), Kyoto University.

4.3. Certification of SNI-19-17025-2000 (ISO/IEC 17025) for *PJT I* Water Quality Laboratory

Based on the assessment result carried out by National Accreditation Committee (this committee has been acknowledged by Asia Pacific Laboratory Accreditation Cooperation (APLAC) and International Laboratory Accreditation Cooperation (ILAC) for test laboratory accreditation system) on May 17-19, 2004, the Water Quality Laboratories of *PJT I* have fulfilled the conditions as test laboratory and have the rights to obtain its Certification of SNI 19-17025-2000.

The consideration of *PJT I* to implement quality system of SNI 19-17025-2000 is to anticipate the stakeholders' requests and management necessity toward augmentation of the service and to create water quality analysis and monitoring system that fulfilled the International standards that finally would yield precise water quality data, efficient, effective and consistent monitoring system in order to improve the best performance of the Corporation.

4.4. International Cooperation

PJT I has international cooperation with some research agencies e.g. Disaster Prevention Research Institute (DPRI) of Kyoto University (started in 2000), Yamanashi University and National Institute for Land and Infrastructure Management (NILIM) – Ministry of Land, Infrastructure and Transport, Japan, in many research area e.g. forecasting and monitoring of flood, debris flow, rainfall characteristic in volcanic area of Asian Monsoon Area especially in Brantas basin.

1. Legal Framework on Water Resources Management

Basic Regulation

The Constitution of the Republic of Indonesia 1945 states that water, as a natural resource, shall be controlled by the State and shall be used for the maximum welfare of the people (1945 Constitution, Article 33, Paragraph (3)). Water cannot be owned, but the right to use is recognized, which is governed by regulations of the Government. The most specific clauses related with water resources include the following.

- Water and its resources, as well as the natural contents contained therein, is considered as a grace of the Almighty God;
- Soil, water resources and the natural contents contained therein shall be regulated by the State and utilized for the optimum welfare of the people; and
- Utilization of water resources shall be in the interest and welfare of people.

Basic Water Legislations

a. Law No. 7 of 2004 on Water Resources

The Law declares that water resources are a blessing of the One and Only God that give benefits for the welfare of the whole people of Indonesia. Water resources shall have social, economic and environmental functions and shall be implemented and realized in a balanced manner. The Law stipulates that water resources are controlled by the State and are used for the maximum benefits of the people in a fair manner. The State's control is undertaken by the National Government and/or Regional Governments while recognizing and respecting the traditional communities such as the *ulayat* (traditional) right of the local, traditional community and any other similar rights as long as such rights are still acknowledged in line with the community's development and the principle of the Unitary State of the Republic of Indonesia. Based on technical consideration, the Law states that water is actually dynamic resource by nature, flowing to lower places without distinguishing the administrative regions. The nature of water follows the hydrological cycle that is closely associated with the climatic conditions of the area, causing inequality in the availability of water by period of time and region. The Law No. 7 of 2004 on Water Resources has covered water resources management in a complete and comprehensive manner that consist of water use right, institutional aspects (including distribution of responsibility and authority, coordination, public consultation and involvement), water utilization, water resources conservation, planning, management of irrigation system, water resources information system and financing.

b. Government Regulation No. 22 of 1982 on Water Management

Government Regulation No. 22 of 1982 on Water Management provides several key principles in water resources management. Water management activities are confined to the spatial area of river basin. River basins include smaller drainage areas when necessary. Comprehensive water resources management plan is formulated for each basin. All surface water usage requires license from the provincial government. As for abstraction of ground water, it is necessary to obtain the approval from the Ministry of Mining and Energy along with provincial license. According to the Government Regulation No. 22 of 1982, Water Use Right is the right to utilize water for certain interests.

In general items, use of water and/or water resources utilization consist of:

1. Water and/or water resources utilization without permit
 - Everybody has the right to use the water for daily activities and or to raise cattle.
 - Water use from its resources is acceptable as far as it do not cause damage on the spring and its environment.
 - Water abstraction from irrigation structure should be with permission from the authorized institutions.
 - Any person who owned a land in the downstream part is obliged to let any flow be conducted naturally from upstream area.
 - Any person has not the right to execute activities causes trouble on natural flow.
2. Water and/or the water resources utilization with permit
 - Water utilization for urban operations, agriculture, power, industry, mining, water traffic, floating, recreation, healthy and others.
 - Water for agriculture purposes shall be executed with respect to the usual tradition of the people, whereas there is no contradiction with general interests of the people and any prevail to the legislation.
 - Water and/or water resources utilization for power generation can not be executed more than the possible capacity and shall not disturb any water development.
 - Water and/or water resources utilization for industry and mining, including oil mining and natural gas shall be arranged by the related Minister.
 - Permit for water and/or water resources utilization can be cancelled if it does not apply to the actual condition of utilization.
 - Permit on water and/or water resources utilization can be cancelled if the water availability is not sufficient.

c. Government Regulation No. 35 of 1991 on River

Government Regulation No. 35 of 1991 provides stipulations on management of river problems. It stipulates that river shall be under the authority of the government. It includes the stipulations on the following issues: river corridor, river function, river planning, exploitation and maintenance of river and river infrastructures. This Government Regulation confirms that river basin development pattern shall be based on the river basin unit. Authority and responsibility of the said river development can be authorized to regional authority and/or to state corporations, which are established to execute river development and operation in conformity with the regulations. The river infrastructure is developed with the aim for public welfare and safety shall be undertaken by Government or state-owned corporation. Similarly, operation of river and/or river infrastructures development shall be performed by government or state-owned company.

d. Government Regulation No. 77 of 2001 on Irrigation

Government Regulation No. 77 of 2001 on Irrigation stipulate that irrigation management is given high priority for the sake of the farmers by putting the Irrigation Water Users Association (WUA) as decision maker and act as a main agent in irrigation management. In order to reach this target, it is necessary to strengthen the irrigation WUA either in continuity and sustainability. Irrigation management is implemented based on principle: a single irrigation system is undertaken by one management, that pays attention to the balance of upstream, middle and downstream water users. The institution for irrigation management covers central and regional government agencies, farmers water user association and related agencies suitable with their authority in planning, development, operation and maintenance, rehabilitation, improvement and financing for irrigation system.

In order to fulfill the water demand for all needs, the Regent or Mayor shall establish Irrigation

Committee. This Committee will assist the Regent or Mayor on irrigation management, especially in allocating and distributing irrigation water for paddy field and other users.

Authority delegation in irrigation management from the Regional Government to the legal water users association is conducted democratically based on the principle of one irrigation system - one unity management, determined by written agreement. However, the assets (irrigation infrastructures) are not handed over in terms of ownership.

e. Government Regulation No. 6 of 1981 on Contribution for the Cost of Operation and Maintenance of Water Resources Development Infrastructures

This regulation requires project beneficiaries to bear water-development cost. It provides guidelines for creating public corporations – such as municipal water-supply utilities and river basin organizations to manage water infrastructure and recover their O&M costs through water use and pollution charges. This regulation also includes policy principles such as water-abstracting licensing, beneficiaries’ participation in O&M and its financing, river basin management and water-service fees.

2. Implementation Scheme on Water Resources Management

2.1. Water Resources Administration System and Execution Organizations

Water resources have played a major role in the development of Indonesia. During the first 25 years of development (PJP I: 1969-1994), water resources policies were directed at supporting the development of different sectors, with the primary emphasis on increasing rice production by expanding irrigation. Indonesia started its second 25 years of development (PJP II: 1994-2019) in April 1994, which, inter alia, emphasizes the development of comprehensive, integrated and sustainable strategies for water resources development and management.

In Indonesia, some ministries and agencies are allocated various aspects of water resources management. Their responsibilities, activities and interaction are summarized in table below.

For water sector, the most important ministries are Ministry of Public Works (MPW) and Ministry of Finance (MoF) as the former is responsible for most water resources and irrigation matters under its mandate, while MoF’s Director of Budget determines the ultimate MPW annual budget and operational fund release. The Ministry of Home Affairs (MoHA) falls under Coordinator Ministry of Economy and Finance (*Menko Ekuin*) and, inter alia, for regulating provincial and district government structure, financial revenues, fiscal transfers from national government and regional/local government. As such, it has a major influence on the organization of the Provincial Water Resources Services and on the central funding they receive for their O&M and other water-related activities. The Ministry of Mines and Energy (MoME) also falls under *Menko Ekuin*: this is relevant for water sector as MoME is legally responsible for groundwater abstracting licensing (an important groundwater regulatory tool), mining regulation (a major cause of water pollution), and oversight of the public and private hydropower subsector (important for coordination in river regulation and Basin Water Resources Management). The Ministry of Environment (MoE) is responsible for the formulation and coordination of environmental policies. However, the implementation and management of pollution control measures, regulation and water quality are done through its Environmental Protection Agency (*Bappedal*).

The Ministry of Agriculture (MoA) and Ministry of Forestry – both of them have some importance to the water resources and irrigation subsectors. The MoA liaises with MPW for water supply for agriculture and has program for tertiary level irrigation. Integrated watershed management is done through the National Soil Conservation Program that involves the Ministries above.

The Directorate General of Water Resources (DGWR) of MPW is assigned responsibilities for

water resources development and management, including providing support in these areas to nation's provinces and river basin authorities. DGWR is mainly responsible for the following:

- To set up policy concept on water resources including planning, management, maintenance and conservation.
- To guide the implementation of water resources policy.
- To guide and set up water balance and water permits recommendation.
- To assist the operation and maintenance of completed water resources infrastructure.
- To assist and implement the management of state-owned property.
- To guide and set up the master plan on water resources.

Water sector activities and responsibilities	MPW			MoA			MoF			MoME			MoE			MoH			
	Pr	Us	Ot	Pr	Us	Ot	Pr	Us	Ot	Pr	Us	Ot	Pr	Us	Ot	Pr	Us	Ot	
Overall water resources and quality management and administration of surface water policy coordination	√	√																	
Overall management and guidance of irrigation	√				√	√													
Management of upper watershed area							√		√										
Water use management, power generation and groundwater management											√	√							
Water use management for industry and industrial waste water pollution abatement													√						
Water quality standard management for various water uses																			√

Note:

Provider (Pr) = Water resources provider for concerned use

User (Us) = Water resources for related purposes

Other (Ot) = Administration/management supervision

Related Institution at the Provincial Level

Water resources development and management policies in the entire region of Indonesia must follow the broader Indonesian policy framework. In East Java Province, besides stipulation of priority of water allocation by the fundamental water law of Indonesia, water utilization licensing is set through regulations.

At present, there are many institutions involved in irrigation water allocation in the Brantas River Basin Irrigation System. The institutions involved in water allocation management in Brantas River Basin. The institutions among others are: *Dinas Pengairan Propinsi Jawa Timur* (East Java Water Resources Services Agency), *Balai Pengelolaan Sumberdaya Air/Balai PSDA* (Regional Office of Water Resources Management - ROWRM), *PJT I, Panitia Tata Pengaturan Air - PTPA* (Provincial Water Resources Management Committee - PWRMC), Irrigation Committee, and *Himpunan Petani Pemakai Air - HIPPA* (Farmer Water User Association).

- East Java Water Resources Services Agency - EJWRSA (*Dinas Pengairan Jawa Timur*)

In accordance with decentralization policy as stipulated by Law No. 22 of 1999 and Government Regulation No. 25 of 2000, the organization and responsibilities of EJWRS was revised by *Peraturan Daerah (Perda, Local Government Regulation)* of East Java Province No. 23/2000.

EJWRS that established an inventory of the quality and quantity of river water and also regulates responsibilities for giving permission for water abstraction from the river. Up to present, the EJWRS consist of 9 (nine) ROWRM. The main task of EJWRS is to assist the Governor for implementing the government administration and water resources development.

- Regional Office of Water Resources Services- ROWRS (*Balai Pengelolaan Sumberdaya Air/Balai PSDA*)

ROWRS was established by East Java Province Government Regulation No. 9 of 1996. There are functional groups for river basin water resources management in the following fields:

- Irrigation schemes which cross Regency/Municipality administrative boundaries
- Raw water availability for various uses
- River, lakes, reservoirs, ponds, swamps and small dams
- Flood control and overcoming water shortages
- Water pollution control
- Protection of coasts, estuaries and deltas.

The main objective of ROWRS is to implement part of EJWRS tasks in management of surface water in the designated basin. To implement the objective mentioned above, ROWRS undertakes the following functions:

- Implementation of service operation for the public on irrigation
- Implementation of water conservation operation and surface water resources
- Maintenance of surface water resources and irrigation structure
- Flood control and drought control
- Water pollution control
- Implementation of administration, etc.

- *Panitia Tata Pengaturan Air - PTPA* (Provincial Water Resources Management Committee - PWRMC)

PWRMC was established under East Java Governor's Decree No. 59 of 1994, for the Brantas, Pekalen Sampen and Madura river basins. However, the committee has so far only been active for the Brantas River basin. The Committee meets minimum twice a year to decide the reservoir operation and water allocation. The main objective of the PWRMC is to assist the Governor with the following tasks:

- Finalizing priority plans for water use and water resources.
- Finalizing the order of priority for water use take into account the conservation, development and use of water resources.
- Regulating concerning water use and water resources.
- Regulating concerning effluent discharges to rivers, and other effluent materials.
- Regulating construction of water abstraction structures.

- *Panitia Pelaksana Tata Pengaturan Air - PPTPA* (River Basin Water Resources Management Committee - RBWRMC)

RBWRMC was set up under East Java Governor's Decree No. 131/1997. The objective of RBWRMC is to support PWRMC in implementing water management for designated river basin. The function of RBWRMC can be summarized as follows:

Data collection needed by PWRMC and concerned agencies.

- Compilation of water use priorities, water demands and annual allocation plans.
- Compilation of plans for raw water supply, water use, effluent standards and pollution loads within the framework of water pollution control.
- Prepare of plans for the use of river banks and river corridors.
- Finalization of the problem of sand mining in the rivers concerning the effect on water resources and groundwater abstraction.

- Implementation of an integrated program concerning water resources and land conservation.
- Implementation of measures to increase public awareness and community participation about water resources protection, development, water uses and control.

The working areas of each RBWRMC are as follows:

- The working area of Assistant to Governor in Madiun: Madiun River Basin: Regency and Municipality of Madiun, Regencies of Pacitan, Ponorogo, Magetan and Ngawi.
- The working area of Assistant to Governor in Bojonegoro: Bengawan Solo River Basin: Regencies of Bojonegoro, Tuban and Lamongan.
- The working area of Assistant to Governor in Kediri: Puncu-Selodono River Basin: Municipality of Kediri, Regencies of Kediri and Nganjuk, Bango-Gedangan River Basin: Municipality of Blitar, Regencies of Blitar, Tulungagung and Trenggalek.
- The working area of Assistant to Governor in Malang: Bango-Gedangan River Basin: Municipality and Regency of Malang, Gembong-Pekalen River Basin: Municipality and Regency of Pasuruan and Regency of Probolinggo, Bondoyudo-Mayang River Basin: Regency of Lumajang.
- The working area of Assistant to Governor in Surabaya: Buntung-Paketingan River Basin: Municipality Surabaya, Municipality and Regency of Mojokerto, and Regency of Sidoarjo, Bengawan Solo Hilir River Basin: Regency of Gresik, Puncu-Selodono River Basin: Regency of Jombang.
- The working area of Assistant to Governor in Pamekasan: Madura River Basin: Regencies of Sampang, Pamekasan, Sumenep and Bangkalan.
- The working area of Assistant to Governor in Jember: Sampean Baru River Basin: Regency of Bondowoso, Banyuwangi and Situbondo, Bondoyudo-Mayang River Basin: Regency of Jember.

Working area of RBWRMC for the Brantas Basin covers rivers that are not under *PJT I* management, in the areas of the three Assistants to Governor that have jurisdiction in the Basin: Malang, Kediri and Surabaya.

- *Panitia Irigasi* (Irrigation Committee)

Panitia Irigasi (Irrigation Committee) of the East Java Province was established under East Java Governor's Decree No. 180/1992. The Irrigation Committee is a coordination body that is responsible to the Governor and has the main objective fulfilling irrigation water demand in East Java Province. Relationship between the Provincial Irrigation Committee and the Regency/Municipality Irrigation Committee is more in consultative matters. Irrigation Committee at the Regency/Municipality level may deliver their problems the Provincial Irrigation Committee.

2.2. Flood Control

In Indonesia, flood control as part of water destructive control had been covered in Law No. 7 of 2004 on Water Resources. According to the Law, water destructive control is under responsibility of Government, local government, river basin management agency and the public.

Flood control system in the Brantas River basin comprises various control measures, technical and non-technical. Technical measures comprise structural utilities, such as: reservoirs, dikes/levees, diversion, floodway, and river shortcuts/rectification and river improvement. Non-technical measures cover management of flooded areas; operation of Flood Forecasting and Warning System (FFWS) and flood insurance.

Flood control is carried out through coordination with the local government agencies and in cooperation with other concerned agencies. The FFWS facility is operated as a hydrology telemetering system, since 1990, and is well maintained to control flood. As technical guidance flood control, a flood alert manual is prepared, at every rainy season. This guidance consist of information on the Brantas River basin condition, as well as existing flood control infrastructure; information of the repairs (flood mitigation materials, heavy equipment etc.); information of related

institutions, flood-alert posts, flood-alert level, staff on duty, communication system and flood control coordination.

Principle of Flood Control System

Generally, flood control in the Brantas River basin is carried out by regarding a basic principle:

- Flood retention: retarding basins and reservoirs

Retarding basins: Several retarding basins has been constructed in the Brantas River basin, like Morokrempangan retarding basin in north of Surabaya; Paras retarding basin in Jombang Regency; Widas retarding basin, Ulo retarding basin and Kedungsoko retarding basin in Nganjuk Regency and Ngrowo retarding basin in Tulungagung Regency.

Reservoirs: flood control is conducted through an attempt to conserve the naturally supplied surface water by means of management of surface water collected and the distribution process of available water according to necessity. Flood control through reservoirs are conducted by temporarily storing water in the reservoirs, then releasing it gradually to control flood and supply required water discharge to the downstream area.

- Floodway and river improvement

At present, there are 5 (five) floodways of considerable size at Brantas River basin, which are constructed in Dutch period (Porong River, diverting flood from Brantas River, by bifurcating the flood to the sea through Lengkong Baru Barrage to protect Surabaya River; Wonokromo River/Canal, diverting flood from Surabaya River by bifurcating the flood to the sea through Jagir Gate in order to protect the Surabaya City from flood) and constructed after Brantas River Project Development established (Nganjuk/Ulo Flood Diversion, diverting flood from Kali Ulo and it's surroundings to Widas River in order to protect Nganjuk City; Parit Raya River, Parit Agung, and South Tulungagung Tunnel, to drain the southern Tulungagung area from flood coming from Ngasinan, Kalidawir, and other rivers, by bifurcating the flood to the south sea through Bendo (Ngasinan River) Gate and South Tulungagung Tunnel; Shortcut of Putih River, to divert the flood/sediment coming from Mt. Kelud directly to downstream area of Lodoyo dam).

- River Improvement

Several rivers in the Brantas River basin have been improved, such as Brantas mainstream, Porong, Surabaya, Wonokromo, Ngasinan, Ngrowo, Widas, Kedungsoko and Mas River.

Flood Control Management

Major flood control facilities in the Brantas River basin and its tributaries are mostly water management facilities as well monitoring equipment. In order to control high flow it is necessary to have a real time hydrology monitoring system which gives accurate information of precipitation thickness as well as surface run off discharge in the river's water body. *PJT I* as the managing agency in the Brantas River basin operates a real time monitoring system which is directly connected through a radio frequency link to provide hydrology data for flood forecasting.

Flood Forecasting and Warning System is telemetering system that measure and has the ability to predict incoming flood. This system is equipped with a public announcement mechanism to inform inhabitants that might be affected by the flood, in order reduce the loss affected by flood. Generally, principle of warning consist of:

- Rainfall warning/alert: This warning will be active if the accumulation of rainfall has reached the height of 100 mm, in the form of ringing bells and flashing displays on the panel.
- Water elevation warning/alert: This warning will be active if the water elevation has a reached a certain height, with three danger levels: Green, Yellow and Red Alert.
- Sirene: Located at Lodoyo Dam, and is intended to provide early warning to the inhabitants living downstream of Lodoyo dam. This sirene is operated when Lodoyo's outflow reached a certain dangerous amount.

The existing FFWS facility is operated as a hydrology telemetering system since 1990 consists of stations for rainfall monitoring (at 26 locations), stations river elevation monitoring (at 10 locations), stations for water level monitoring (at 11 locations), stations for outflow monitoring of dams (at 10 locations), radio communication system at a frequency of 150 MHz (at 12 locations), warning signal system (early warning). Additional FFWS facility built by Brantas River Water Quality and Pollution Management Project (2000), consists of stations for rainfall monitoring (at 7 locations), stations for water level monitoring (at 7 locations). The system monitors Brantas River basin from its upper stream downwards, including every major water resources facility.

Agencies involved in the flood control are almost the same as that seated in Water Resources Management Committee, which discuss at least every dry season. Coordination was conducted through the committee by means of planning the reservoir operation rule for the rainy season. If flood occurs, the Natural Disaster Mitigation Task Force (*Satkorlak Penanggulangan Bencana Alam – PBA*) will take over the mitigation action.

Structural Organization

The flood fighting structural organization, both at the central and regional level, is prepared as guidance mechanism in the effort of mitigating the flood.

a. Central Task Force for Disaster Mitigation (*Satgas PB Pusat*)

This task force is responsible to mitigate disasters, and is stationed at the Office of Settlement and Infrastructure Department. This task force is established at the central level by the Decree of the Minister of Public Works No. 392/KPTS/1998 dated September 21, 1998. The Director General of the Water Resources is appointed as Chairman of the Central Task Unit for Overcoming Disasters.

b. Provincial Task Force for Disaster Mitigation (*Satgas PB Propinsi*)

This task force is part of the central disaster mitigation scheme, established by the Decree of the Provincial Office of the Public Works, No. 99/KPTS/W.13/1998 dated September 23, 1998.

c. Natural Disaster Mitigation Task Force (*Satkorlak PB*), the Province of East Java

This task force is part of the flood disasters mitigation organization at the provincial level established by the Governor of East Java under the Decree Number: 188/390/SK/014/1998 dated November 9, 1998, that involves various governmental elements.

d. Operational Unit for Disaster Mitigation, the Province of East Java (*Satlak PB*)

This unit responsible for coordinating various actions on flood hazard mitigation at the municipal or regency level. The unit is established by the Governor of East Java under the Decree Number 17 the year of 1996, where the regents/mayors are appointed as the Chairman.

e. Provincial Center for the Coordination & Control of Natural Disaster Mitigation

This coordination center is responsible for organizing mitigation on natural disasters occurrence, and was established by the Governor of East Java under the Decree Number: 59 the year of 1996 dated June 13, 1996. This center functions as the coordinating institution for the reception, collection, distribution, and evaluation of information in an attempt to make decisions about overcoming disasters. Appointed as chairman is the chief of administration, at the Headquarters of the Provincial Civilian Defense of East Java.

f. Disaster Task Force for the Brantas River Basin (*Satgas PB*)

This task force is organized to act on overcoming disasters in the Brantas River basin, which functions as a coordinating institution in the activities of flood control in the Brantas River basin.

2.3. Water Use Rights

Water Use Right (WUR) is an organized means of managing a planned sharing of water for benefit of a community. WUR in Indonesia is the rights are only limited use and to utilize the amount of water for various purposes that users is allowed to take at any particular time from common water resources such as river, lake, canal or aquifer.

The kernel of Indonesian WUR is found in the Basic Constitution of 1945, stipulating that water resources, although governed by the state, must be utilized for the welfare of the people. Water Use Rights *per se* are first suggested in the Basic Agrarian Law No. 5/1960, but this document does not indicate precisely how a WUR is defined. As consistent with Water Resources Law No. 11/1974, water is identified as a gift of the Almighty and everyone has a right to its use, although certain uses require permission and others do not.

Law No. 7 of 2004 on Water Resources states that WUR does not mean the right to own water, but the right to obtain and use or utilize water an amount (quota) of water following the allocation determined by the Government for the water users, comprising users required to have permits and those who are not so required. The volume of allocation determined in this respect is not conclusive and must be in compliance with the volume stated in the permit, but this may be reviewed if the requirements and conditions used as the basis for determining the permit and the condition of water availability in the related sources has changed significantly compared to the water availability condition at the time when the allocation was decided.

WUR to fulfill the basic daily needs of individuals and the people's agriculture activities located within an irrigation system will be protected by the Government or the regional governments. Basic daily needs means water required to keep a healthy, clean and productive living, such as water for praying, drinking, cooking, bath and toilet. People's agriculture means agriculture activities of growing foods crops, fishery, livestock, developing and common people plantation and forestry, undertaken by the people on land of particular area with water requirement of not more than 2 liters per second per family.

The basic principle of a water right emerges from Government Regulation No. 22 (1982) which establishes the principles and the basis for water management: (1) In water management regulations the principle of public utility, harmony and conservation shall be applied; (2) Water Right is interpreted as Water Use Right. Moreover, Government Regulation No. 22 states that everybody has a right to use water for their basic need in daily life, for domestic purposes and for domestic livestock. This Government Regulation establishes the basis for water use permits, but does not address the process by which water rights *per se* are established. In principle, the structure of property rights in water that would facilitate the efficient allocation of water would include the following characteristics: (1) *universality*, which means that all water resources are subject to some claim status, and property rights claims to water resources, including the nature and contents of these rights, are clearly identified, consistently applied and universally respected, (2) *exclusivity*, which means that all benefits and costs arising from the rights are exclusively owned; and exclusively borne, respectively, by the rights holder, (3) *transferability*, which means that specific components of the right can be transferred through freely negotiated, legally transparent transactions, and (4) *enforceability*, which means that all rights shall be secure from unlawful takeover or violation, via a well-defined process of grievances and remedies. In establishing the structure of water rights, however, a clear justification must be provided for the initial distribution of claims. On this matter, unfortunately, there is no universal consensus along either historical or ethical lines.

In the Brantas Basin, water allocation is based on a water allocation plan, which is discussed and agreed upon by representatives of various categories of water users, as well as by *PJT I*, in a coordinated forum called Provincial Water Resources Management Committee (*PTPA*). The Water Allocation System (WAS) currently practiced in the Brantas Basin is based on the Decree of the

Governor of East Java No. 649 of 1991 and No. 668 of 1991 that are improved by Governor Decree No. 74 of 2002 on Water Licensing System and O&M fee within the *PJT I*'s Working Area (Brantas Basin.) As describe above, the Water Licensing System (WLS) is a form of acknowledgment of WUR as well as an instrument through which it is regulated. The content of WLS can be summarized as follows: (1) All water users shall have a license from the Governor of East Java, (2) *PJT I* (the river basin authority) will guarantee the supply of water, as feasible considering available discharge, (3) The WLS will be issued following issuance of technical recommendations from *PJT I*, recommendation from Chief of Regency as Chief of Irrigation Committee and consideration from "Considerance Group on Surface Water Licensing", (4) other relevant rules and regulations stipulated in WLS are fulfilled and (5) the beneficiaries shall pay "Operation and Maintenance of Water Resources Infrastructures" fee.

Regulation over the implementation of WLS will be the responsibility of agencies involved, including the East Java Provincial Government, Provincial Water Resources Services, *PJT I* and others. Control over the implementation of WLS will be done by the designated agencies, which in the Brantas Basin include the Government of East Java, Water Resources Services and *PJT I*.

Table 1 List of Rivers Under Jurisdiction of *PJT I*

NO.	Brantas basin	Bengawan Solo basin
1	Brantas River *)	Bengawan Solo River *)
2	Amprong River	Tirtomoyo River
3	Lesti River	Keduwang River
4	Metro River	Walikan River
5	Lahor River	Dengkeng River
6	Bambang River	Blora River
7	Lekso River	Ceper River
8	Semut River	Ujung River
9	Jari River	Lohgede River
10	Putih River	Siwaluh River
11	Ewuh River	Grompol River
12	Badak River	Tempuran River
13	Tugu River	Mungkung River
14	Tawing River	Gambiran River
15	Ngasinan River	Madiun River
16	Bodeng River	Ketegan River
17	Parit Agung River	Cemer River
18	Parit Raya River	Catur River
19	Dawir River	Brangkal River
20	Song River	Gandong River
21	Ngrowo River	Kukur River
22	Kedak River	Jungke River
23	Serinjing River	Ketonggo River
24	Konto River	Trinil River
25	Bening River	Floodway Plangwot-Sedayulawas
26	Kuncir River	
27	Ulo River	
28	Kedung Soko River	
29	Widas River	
30	Beng River	
31	Brangkal River	
32	Marmoyo River	
33	Watudakon River	
34	Sadar River	
35	Kambing River	
36	Porong River	
37	Surabaya River	
38	Mas River	
39	Wonokromo River	
40	Kedurus River	

Table 2 Water Resources Infrastructures in Brantas River Basin Managed by *PJT I*

No	Structure	River	Purpose
A	Large Dams (Year of Operation)		
1	Selorejo Dam (1970)	Konto	Water supply for irrigation, hydro power generation, flood control, recreation
2	Sutami Dam (1972)	Brantas	Water supply for domestic, irrigation, industry, hydro power generation, flood control, recreation
3	Lahor Dam (1975)	Lahor	Water supply for domestic, irrigation, industry, flood control
4	Wlingi Dam (1978)	Brantas	Afterbay of Sutami Hydro power, water diversion for irrigation, hydro power generation, flood control, recreation
5	Bening Dam (1984)	Widas	Water supply for irrigation, hydro power generation, flood control, recreation
6	Sengguruh Dam (1988)	Lesti	Sediment control to Sutami reservoir, hydro power generation
7	Wonorejo Dam (2000)	Bodeng Song	Water supply for domestic, hydro power generation, flood control
B	Barrages (Year of Operation)		
1	New Lengkong (1974)	Porong	Water diversion for irrigation, domestic, and industry
2	Gunungsari (1981)	Surabaya	Water diversion for irrigation
3	Jagir (1981) (rehabilitation)	Wonokromo	Water diversion for domestic
4	Lodoyo (1983)	Brantas	Afterbay of Wlingi hydro power, hydro power generation
5	Tulungagung Gate(1986)	Ngrowo/Parit Agung Canal	Water regulation for domestic, hydro power, and flood control
6	Wonokromo (1990)	Mas	Flood control
7	Mrican (1992)	Brantas	Water diversion for irrigation
C	Rubber dams (Year of Operation)		
1	Gubeng (1990)	Mas	Water diversion for domestic
2	Jatimlerek (1993)	Brantas	Water diversion for irrigation
3	Menturus (1993)	Brantas	Water diversion for irrigation

Table 3 List of Some Maintenance Works Done by PJT I in 2004

No.	Work items	Unit	Volume
I	Water Service Division I		
A	Sengguruh Dam & Reservoir		
1	Sediment dredging (first stage)	m ³	110,000
2	Sediment dredging (second stage)	m ³	50,155
3	Repair of trashboom	unit	2
4	Repair of penstock wall (L)	m'	35
5	Repair of canopy	unit	3
6	Dam leakage checking	ls	1
7	Repair of Kedung Rejo Check Dam	unit	1
8	Extention of Mergosono waste water treatment plant	unit	1
B	Sutami Dam & Reservoir		
1	Sediment dredging (first stage)	m ³	100,000
2	Spoil bank dyke (u/pengerukan 400.000 m3)	m	400
3	Sediment dredging (second stage)	m ³	30,000
4	Repair of tourism facility	unit	5
5	Reservoir echo sounding	cross	37
C	Lahor Dam and Reservoir		
1	Repair of trashboom	unit	1
2	Repair of D/S revetment	m'	50
3	Repair of tourism facility	unit	9
II	Water Service Division II		
A	Wlingi Dam & Reservoir		
1	Sediment dredging (fisrt stage)	m ³	110,000
2	Repair of trashboom	unit	1
3	Sediment dredging (second stage)	m ³	20,000
4	Sediment dredging (third stage)	m ³	65,000
5	Repair of side spillway of Lodagung	ls	1
B	Lodoyo Barrage		
1	Sediment dredging	m ³	65,000
C	Selorejo Dam and Reservoir		
1	Repair of trashboom	unit	1
2	Repair of irrigation intake U/S Tokol Check Dam	unit	1
3	Maintenance intake of Siman HEPP	unit	2
4	Repair of Mendalan Bridge (L = 15 m, W = 1.5 m)	unit	1
5	Rip rap of temporary check dam	m ³	200
6	Konto R. improvement & sediment dredging of U/S Mendalan Sabo Dam	ls	1
7	Sedimen dredging of D/S Mendalan Sabo Dam	m ³	3,600
8	Sedimen dredging of KTH Siman	m ³	10,000
9	Sedimen dredging of KTH Mendalan	m ³	1,000
10	Cleaning area of Selorejo - Mendalan - Siman tunnel	m ²	7,000
III	Water Service Division III		
A	Brantas Middle Reach		
1	Maintenance of industrial intakes	unit	1
2	Dyke of Brantas River	m ³	1,550
3	Emergency work revetment of Brantas River (Brodot village)	m'	120
4	Emergency work revetment of Brantas River (Juwet village)	m'	50
5	Emergency work revetment of Brantas River (Ngrombot village)	m'	121
6	Emergency work revetment of Brantas River (Juwet village – stage II)	ls	1
7	Emergency work revetment of Brantas River Ds Ngrombot (thp II)	ls	1
8	Repair of AWLR gauging	unit	4
B	Mrican Barrage		
1	Repair of electro-mechanic equipment	ls	1
2	Repair hand rail & fence	ls	1
3	Painting of control flushing gate	ls	1
4	Repair of revertment foundation D/S of Mrican Barrage	m	40

Table 3 List of Some Maintenance Works Done by PJT I in 2004 (continued)

No.	Work items	Unit	Volume
C	Serinjing River		
1	Repair of revetment (Minggiran Village)	m'	40
2	Repair of drop structure	m'	
D	Batan River		
1	Emergency repair of revetment D/S Batan River	Ls	1
E	Bening Dam & Reservoir		
1	Repair and painting control house & view point	Unit	1
2	Drainage work	m'	300
3	Reservoir sounding	Cross	42
F	Kuncir Kanan River		
1	Repair of revetment (Sumberwindu Village, Brebek)	m	50
G	Widas River		
1	Installation of ST bench mark	point	110
2	Repair of Culvert ST. 198	m'	26
IV	Water Service Division IV		
A	Surabaya River & Wonokromo River		
1	Arragement of Wonokromo River (stage II) and Surabaya River	Ls	1
2	Sediment dredging in the front of PDAM & industrial intakes	m ³	1,027
3	Repair and painting of Gunungsari Barrage (Canopy)	m ²	3,000
4	Renovation of lifting beam & stoplog Jagir Barrage	Ls	1
5	Repair of fence & landscaping Gunungsari Barrage	Ls	1
6	Repair of revetment of Surabaya River (SU 05 R)	m	65
B	Mas River		
1	Sediment dredging	Ls	1
2	Repair of revetment in the front of Monkasel Monument	Ls	1
3	Arrangement of riverbank	Ls	1
C	Brantas River		
1	Painting canopy of Lengkong Baru Barrage	Unit	5
2	Sediment dredging in the front of industrial intakes	Ls	1
3	Repair of revetment along Brantas River in Gempolkrep Village, Mj.kerto	m'	170
4	Repair of revetment along Brantas River at KB. 54,2 L Gedek	m'	25
5	Repair of Lengkong Baru tourism facility	m'	280
D	Porong River		
1	Repair of revetment at Kedungbocok	m'	200
2	Repair of revetment at KP. 152 (L) Pejarakan Village	m'	50
E	Brangkal River		
1	Temporary construction of repair of revetment	Ls	1
2	Repair of revetment in Pulorejo Village	M	50
F	Sadar River		
1	Temporary construction of repair of revetment	m'	101
V	Water Service Division V		
A	Parit Agung Canal		
1	Repair of revetment of Parit Agung in Kedungsoko Village	m'	200
2	Repair of revetment of confluence of Ngrowo River & Klantur River	m'	20
B	Parit Raya Canal		
1	Emergency repair of revetment of Ngadirejo Village	m'	250
C	Tunnel		
1	Painting gate, stoplog & trashboom	Unit	1
D	Wonorejo Dam & Reservoir		
1	Echo Sounding	Cross	32
2	Repair of panel of gallery pump	Unit	1
3	Repair of joint crack gallery	Unit	1
4	Road improvement Wonorejo and installing handrail & portal.	Ls	1
E	Repair of drain outlet & dyke in Kiping Gondang Village	Unit	1
F	Repair of revetment of Munjungan River, Kandekan Villahe – Gandosari	m ³	290
G	Repair of revetment of Wudhu River, Sedayu Village	m'	40