

Annual Report
Of

Citarum River Basin Organization
2004

(Jasa Tirta II Public Corporation – Indonesia)

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1. Summary

1.1 Organization

1.1.1 Organization Name

Citarum River Basin Organization, Jasa Tirta II Public Corporation (PJT II)

1.1.2 Objectives

Objective in corporation, to develop the national economy by participating in the program of national development in water management, water source and electric power.

1.1.3 History

- **CONSTRUCTION PERIOD**

Jatiluhur Multipurpose Project (1956 - 1967)

- **OPERATION AND MAINTENANCE PERIOD**

Jatiluhur State Owned Company (1967 -1970)

Government Regulation (GR) No. 8/1967, 24 Juli 1967

Jatiluhur Authority Public Corporation

- GR 20/1970, 23 Mei 1970
- GR 35/1980, 13 Oktober 1980
- GR 42/1990, 23 Agustus 1990

Jasa Tirta II Public Corporation

GR 94/1999, 13 Oktober 1999

1.1.4 Organization

President Director of Jasa Tirta II Public Corporation is **Djendam Gurusinga**.

Jasa Tirta II Public Corporation has a 4 (four) director, are : (1) President Director (2) Administration and Finance Director, (3) Technical Director (4), Operation and Maintenance Director. The corporation organization structure is made up of 3 (three) Directorates, each led by a director. Each director direct a number of Division / Bureaus heads.

The number of employees of Jasa Tirta II Public Corporation as per June 1, 2004 is 1,914 people.

1.1.5 Financial

PJT II finances come from beneficiary shares of water and electricity users and subsidies from government. The scale of the budget of PJT II is about 148 billion rupiah in 2004.

1.1.6 Projects

- Based on the study paper written by *Prof.Dr.Ir. W.J.van Blomestein*, presented in Paris Seminar (1948) with the title “Integrated Water Resources Development in the Western Part of Java Island“ (514,000 ha.of paddy field);
- Reviewed by *Ir.van Schravendijk* in 1956 in the form of “Integrated Water Resources Development in Citarum River Basin” (240,000 ha of paddy field);
- Designed and supervision by *Coyne et Bellier Consultant* (COB) of France;
- Construction by *Compagnie Francaise d’Enterprise (CFE)*,Paris of France;
- Financed by Bilateral Loan from France Government.

1.1.7 Installing Law or the articles of Association

- 1) GR No. 8/1967 Jatiluhur State Company
- 2) GR. No. 20/1970 Jatiluhur Authority Public Corporation (POJ)
- 3) GR. No. 35/1980 Jatiluhur Authority Public Corporation (POJ)
- 4) GR. No. 42/1990 Jatiluhur Authority Public Corporation (POJ)
- 5) GR. No. 94/1999 Jasa Tirta II Public Corporation (PJT II)

POJ was established in line with the Government Regulation (GR) Number 20 year 1970 which then it was adapted with the GR. No. 35/ 1980 and Gr. No. 42/1990. With the issues of GR. No. 13/1998 regarding with Public Corporation, then POJ was renamed as Jasa Tirta II Public Corporation in line with GR. No. 94/1999. PJT II provides public services and simultaneously gains profit based on the company management principles.

1.1.8 Related Legal System

(1) Basic Law

- 1) Law No. 19/2002 State Own Company
- 2) Law No. 13/2003 Man Power
- 3) Law no. 7/2004 Water Resources
- 4) Law. No. 32/2004 District of Government
- 5) GR. No. 13 / 1998 Public Corporation
- 6) PP No. 94 / 1999 Jasa Tirta II Public Corporation

(2) Water Use

- 1) GR. No. 6/1981 Cost of Contribution for Exploitation and Maintenance Water Infrastructure
- 2) GR. No. 22/1982 Water Management
- 3) GR. No. 10/1989 Electricity Raw and Benefit
- 4) GR No. 35/1991 River
- 5) GR No. 77/2001 Irrigation
- 6) Law No. 20/2003 Electricity

(3) Environment

- 1) Law No. 23/1997 , Environment Management
- 2) Law No. 7/2004 Water Resources
- 3) GR No. 35/1991 River
- 4) GR. No. 27/1999 Environment Analyze
- 5) GR. No. 82/2001 Water Quality Management & Water Waste Controlling
- 6) Environment Minister Law No. 35/1995 Clean River Program
- 7) Environment Minister Law No. 52/1995 Standard of Quality Liquid Waste Water for Hotel Activity
- 8) Environment Minister Law No. 58/1995 Standard of Quality Liquid Waste Water for Hospital Activity
- 9) Environment Minister Law No. 3/1998 Standard of Quality Liquid Waste Water for Industry zone Activity
- 10) Environment Minister Law No. 111/1998 Compass of Condition and Method Permitted and Compass to Waste Water Discard to Water and Water Source.
- 11) Environment Minister Law No. 112/1998 Standard of Waste for Domestic Activity
- 12) West Java Governor Stipulation No. 6/1999 Standard of Quality Liquid Waste Water for Industry Activity in West Java.

- 13) West Java Governor Stipulation No. 39/2000 For Raw Water and water quality standard in Citarum River Basin.
- (4) Disaster Prevention and Land Conservation
 - 1) Director Stipulation of PJT II No. 1/224/KPTS/2002 Compass of Resembling Flood Control.

1.2 NARBO Activities

PJT II carried out the activity following in 2004:

- (1) PJT II held the First General Meeting of Network of Asian River Basin Organization (NARBO) from February 24 to 26, 2004 in Batu, Malang East Java Indonesia.
- (2) PJT II held the first NARBO training Course on IWRM from July 26 to August 6, 2004 in Thailand with the Ministry of Natural Resources and Environment. Thailand , Thailand Water Resources Association, Asian Development Bank (ADB) and Asian Development Bank Institute (ADBI)
- (3) PJT II as the host of the Small Scooping Workshop of RBO Benchmarking Activity at 12 October, 2004 in Jatiluhur, West Java Indonesia.
- (4) PJT II participated the NARBO Members Consultation of RBO Benchmarking Activity from November 29 to 30, 2004 in Batu, Malang East Java Indonesia.
- (5) PJT II concluded the treaty of friendship with Japan Water Agency at November 29, 2004. (Twinning Program).
- (6) Symposium and Discussion with KOWACO about the Twinning Program at December, 1, 2004 in Jatiluhur , West Java Indonesia
- (7) Signatories Agreement of Exchange of Personnel on Twinning Program between KOWACO , PJT I and PJT II on Desember 15, 2004.

1.3 Topics

1.3.1 Floods

1.3.2 Droughts (Cloud seeding)

1.3.3 Pollution and water quality

1.3.4 Watershed Management

1.3.5 New Projects

1.3.6 International Conferences

- 1) ICOLD 72nd Annual Meeting, Seoul-Korea, 16- 22 Mei 2004
- 2) World Water Forum, Brazil 2004

2. Organization

2.1 Objectives

Citarum River Basin located in tropic area of West Java Province, Java Island of Indonesia Archipelagos. There are two seasons every year, Wet Season or Rainy Season mostly from October to March and Dry Season from April to September. Annual precipitation depth of 3,000 mm in the mountainous area and 2,500 in the lowland, normally 70% falls during rainy season and 30% during dry season. Relative humidity of 80% and daily temperature of 25⁰ C in the low land and of 18⁰ C in the mountainous area.

There are 9 (nine) rivers traversing the area from mountainous range in the South to the North and terminated to Java Sea. Citarum River is the biggest one as the main source of water. The water flows from its spring in Wayang Mountain (El. 2,200 m) down to Java Sea about 300 km length. At the elevation of El. 26.50 m, about 80 km from its estuary Citarum is connected with 4 (four) rivers to the West and 4 (four) other rivers to the East by man-made canals named West Tarum Canal (WTC) and East Tarum Canal (ETC) respectively and formed a unit hydrological boundary of Citarum Integrated River Basin.

Average annual flow of water in the basin is 12.95 billion m³ and by exploiting the existing water resources infrastructures the water that could be regulated is about 7.65 billion m³ annually. Up to present potential of water is still enough to cope with the demands in the basin. However, according to study (BCEOM-1990) others measures should be taken into consideration to full fill the demand beyond 2025.

The basin covered 9 (nine) District administration and 3 (three) Municipalities of West Java and Jakarta Provinces. Most of the source of water initiated from West Java Province and utilized for irrigation, domestics, municipalities and industries in West Java Provincial area. Besides, its also supply water for Jakarta Special District of Capital City, means served across provincial administrative boundary. The basin is considered strategic at national level for which its managed by The Central Government.

2.2 History

After the Proclamation of Independence (1945) the Government of the Republic of Indonesia extended the program of self-supporting national staple food of rice and poverty alleviation. Indonesian archipelago is located in tropic zone with two seasons every year that are rainy or wet season (October to March) and dry season (April to September).

In that moment the population of the Country is about 60 million and more then half of them are living in Java Island. Java is very fertile island with many active volcanoes. Average annual precipitation depth is 3,000 mm normally 70% falls during wet season and 30% falls during dry season. Relative humidity is about 80% and the daily temperature is 25⁰C in the low land and 18⁰C in the mountainous area.

Large-scale water resources development had been done in the North plain of West Java Province during the Dutch Colonial. One of them is Walahar Irrigation System (built in 1925) for 80,000 ha of paddy field by constructing gated weir across Citarum River in Karawang District about 60 km from its estuary. The other one is Salamdarma Irrigation System (1930) for 37,000 ha of paddy field by constructing weir across Cipunegara River in Subang District about 40 km from its estuary. The systems separate each other and rely on run-off water in the rivers that is why the cropping intensity is only achieved up to 130%. It is mean that not all area in the

systems could be irrigated during dry season and often happen the farmers fighting each other for water.

In 1956 Ir. H. Djuanda, the Late Prime Minister of Indonesia declared the commencement of Jatiluhur Multipurpose Project. The main aim of the project is to enhance the rice production to achieved self-supporting national staple food. The project comprised with two major activities. The first one is to construct rock-fill type dam across Citarum River and reservoir behind the dam with impounding capacity of 3.0 billion m³, besides hydroelectric power plant with the install capacity of 150 MW as well. The second is to develop technically irrigation system over the area of 240,000 ha of paddy field in the north plain of West Java Province connected to Walahar and Salamdarma irrigation systems for two crops per year as an integrated technically irrigation area. The project has been finished in 1967, since then the dam, the reservoir and the power plant were named Ir. H. Djuanda dedicated to the Prime Minister who declared the commencement of the project while the irrigation system were named Jatiluhur Irrigation System.

There are 9 (nine) rivers traversing the area from mountainous range in the South to the North and terminated in Java Sea. Citarum River is the biggest one connected with 4 (four) rivers to the West and 4 (four) other rivers to the East by man-made canals namely West Tarum Canal (WTC) and East Tarum Canal (ETC) respectively, formed a unit hydrological boundary of Citarum integrated river basin.

The benefits reveal upon the completion of the project, among other: (1) flood occurs during rainy season that inundated 20,000 ha of fertile land in the plain could be minimized, (2) people have the opportunity to cultivate paddy in technically irrigated area of 240,000 ha two crops per year, (3) raw water available for domestics, municipalities and industries especially for Jakarta the Capital City of Indonesia, (4) hydropower plant with the installed capacity of 150 MW, (5) fresh water as well as brackish water fisheries development in coastal area, and (6) beautiful scenery surrounding the reservoir for tourism and water sport.

In 1970 the Government established Jatiluhur Authority Public Corporation with task and responsibility to maintain sustainability of water resources in the basin and extends operation and maintenance of water resources infrastructures and the hydroelectric power plant. Besides, the entity has to collect contribution from the beneficiaries of water services for running the operation and maintenance of the system. The Jatiluhur "Authority" in fact just a call name, but since the entity's working area is mostly within West Java Province some local people feel there is another "Government" in the Province. There for in 1999 the name of the entity was changed to Jasa Tirta II Public Corporation.

Latter, two other dams were built in Citarum River upstream of Ir. H. Djuanda dam namely Saguling (1984) and Cirata (1988). The main aim of the dams is for power generation with the install capacity of Saguling and Cirata are 700 MW and 1,000 MW respectively. The impounding capacity of Saguling and Cirata reservoirs are 900 million m³ and 1,200 million m³ successively. The dams were constructed by The State Electric Company and recently operation and maintenance extended to Indonesia Power Company and PJB Company respectively, they are the subsidiary of the State Electricity Company.

The Integrated development of water resources in northern West Java has become the hydrology unit with Citarum river as the main resource. The management form of dam/reservoir. Hydro Electric Power Plant and Jatiluhur irrigation since the establishment in 1957 until now is as follow:

- **Jatiluhur Multipurpose Project (1957 – 1967)**

The development of Jatiluhur Multipurpose Project which comprises of Main Dam and Hydro Power Plant as well as its irrigation system was declared to be completed 1967.

Jatiluhur Multipurpose Project as the first stage of the development of water Resources in Citarum area with the main goal of increasing the production of national staple food, rice. The Dam and Jatiluhur Hydro Electric Power Plant is officially named Ir. H. Djuanda, in memoriam one of the best nation son.

- **State Company / Jatiluhur State Company (1967 – 1970)**

In order to optimize the potency of Jatiluhur hydro Electric Power Plant, the State Company named Jatiluhur State Company was established in line with the Government Regulation No. 8/1967 dated 24 July 1967.

- **“Jatiluhur Authority” Public Corporation (1970 – 1998)**

As a Corporation, at that time Jatiluhur State Company, in all its business, is aimed to gain profit. Water supplied socially for the agriculture is carried out commercially, so the management of water resources become unharmonious and the aim of the development is not achieved. The potencies used and develop must be implemented effectively and efficient, for the reason it is implemented based on the economic principles reliable. Based on the above reason, the government establish a public corporation named: ”Otorita Jatiluhur“ (Jatiluhur Authority). Institutions / Project and officials that are under POJ development area and whose task and obligation relate to the goal, task, business of POJ, are merged in POJ. Those institutions are Jatiluhur Irrigation project (Ministry of Public Work); Jatiluhur Tertiary Irrigation Project (Ministry of Home Affair), Jatiluhur State Company (Ministry of Industry), West java Public Work Official for Purwakarta Region (West Java Province).

- **Jasa Tirta II Public Corporation (1998 – present)**

Jatiluhur Authority Corporation (POJ) was established in line with the Government Regulation Number 20 year 1970 which the it was adapted with the Government regulation No. 35/1980 and Government Regulation No. 42/1990. With the issue of Government Regulation No. 13/1998 regarding with Public Corporation, the POJ was renamed as Jasa Tirta II Public Corporation (PJT II) in line with Government Regulation No. 94/1999. PJT II provides public services and simultaneously gains profit based on the corporation management principles.

2.3 Organization Structure

Organization Structure of Jasa Tirta II Public Corporation has a 4 (four) director, are : (1) President Director (2) Administration and Finance Director, (3) Technical Director (4), Operation and Maintenance Director.

The corporation organization structure is made up of 3 (three) Directorates, each led by a director. Each director direct a number of Division (5 Division) and Bureaus heads (7 Bureau).

The number of employees of Jasa Tirta II Public Corporation as per June 1, 2004 is 1,914 people.

2.4 Financial

The form of the institution is a public corporation meant that PJT II should extent public service (social service) that free of chart, i.e.: provides water for irrigation, flood control and protection and drought prevention as well. Besides, to carry on business of water by mean of providing raw water for water supply companies (domestics), municipalities, industries and water potential for electric power generation. However, it is not pure business since all of tariffs were decided by the Government.

The major sources of PJT II revenues are : (1) Electric power production of 900 million kWh per year and sold to State Electric Enterprise with tariff Rp. 90,-/kWh and the total of Rp 81,- billion per year, (2). Provide raw water for Jakarta water supply company of 435 million m³ per year with the tariff of Rp 65,-/ m³ and the total of Rp 28.275 billion, (3). Provide raw water for District water supply company and industries of 300 million m³ per year with the tariff of Rp 23,-/m³ and the total of Rp 6.900 billion, and (4). Other services relating to optimizing the asset potential of the corporation with the total of Rp 8.545 billion. The total revenues of the Corporation in the year 2002 is about Rp 132.68 billion.

2.5 Project

Based on the study paper written by Prof. Dr. Ir. W.J. van Blommestein, presented in Paris Seminar (1948) with the title “Integrated Water Resources Development in the Western Part of Java Island (514.000 ha of paddy field). Reviewed by Ir. Van Schravendijk in 1956 in the form of “Integrated water Resources Development in Citarum River Basin “ (240,000 ha of paddy field).

Citarum integrated river basin located in the north plain of West Java Province, Java Island of Indonesian archipelagoes, covering area of about 12,000 km². Its consist of 12 rivers traversing the area from south to north terminating to Java Sea, namely : Bekasi, Cikarang, Cilemahabang, Cibeeet, Citarum, Ciherang, Cilamaya, Cijengkol, Ciasem, Cigadung, Cipunegara and Cipancuh rivers successively. The mean of total annual flow of water in the basin about 12.95 billion m³ out of which about 7.65 billion m³ have been regulated, employing dams, barrages, canals and the appurtenance structures while the rest of 5.30 million m³ is still wasted to the sea.

Current water use both for irrigation and for domestic, municipal and industrial uses (DMI), and the main water storage and water transfer routes are indicated. The water demand in the downstream area of the SWS is already influenced by the inter-basin transfer to the neighboring Jabotabek region.

Water supply in the Citarum basin will be increasing determinate by the strongly growing water demand in the neighboring Jabotabek regional. The water supply for Jabotabek will be provide by a number of basin located to the East and West, with the Citarum system ad the main supply source.

2.6 Installing Law or the Articles of Association

Upon the completion of the project the Government considered that an institution should be established with the task of operation and maintenance all the output of the project as national assets especially water resources infrastructures. The institution should also capable to collect the fund from the beneficiaries of the existence of water. In 1970 Jatiluhur Authority Public Corporation was established through the Government Regulation Number 20 of the year 1970.

Since then in 1999 the name was changed to Jasa Tirta II Public Corporation (PJT II), Jasa Tirta means water service.

The tasks of the corporation are: (1). Operation and maintenance of water resources infrastructures and Hydro Electric Power Plant, (2). Carry on business of water and electric power, (3). Extend reservation of water resources sustainability in term of conservation, development and utilization of water, (4). Rehabilitation of Hydro Electric Power Plant.

2.7 Related Legal System

For several decades, the basin managements tasks in Citarum River Basin focused on the management of the large Jatiluhur irrigation system and reservoir. This tasks has been carried out by **Jasa Tirta II Public Corporation (PJT II)**. In 1999, the tasks PJT II has been extended to include management for the entire basin. The latest change, following the above mentioned general concept, comprised the transfer of the management of the irrigation scheme, the largest water user in the basin, under the direct control of the province, with the ultimate aim to have and independent /privatized irrigation water user. In view of the importance of the main canal system in the total water supply for the basin and adjacent Jabotabek region, the management of this system will remain under the Basin Technical Management Unit.

It is further intended to institutionalize and underscore the functional role of the Basin Water Management Unit by establishing a basin Balai Pengelola Sumber Daya Air (Balai PSDA) which will replace the present Satgas units.

At the present stage, the roles and responsibilities (policy setting, standards, permits, regulation, enforcement, O&M, monitoring, etc) of the various levels of Government appear to a large extent identified and allocated. However, a further clarification and integration is needed regarding the various management tasks, which at present are scattered among different government agencies. Important aspects comprise groundwater management (Ministry of Mining), water quantity (Ministry of Regional Home and Infrastructure) and quality management (Ministry of Environment), Flood Control (Ministry of Regional Home and Infrastructure), catchments preservation (ministry of Forestry) and hydro energy generation (Electrical Company).

3. NARBO Activities

3.1 NARBO First General Meeting

PJT II held the First General Meeting of Network of Asian River Basin Organization (NARBO) from February 24 to 26, 2004 in Batu, Malang East Java Indonesia.

PJT II carried out the activity following in 2004:

- (1) PJT II held the first NARBO training Course on IWRM from July 26 to August 6, 2004 in Thailand with the Ministry of Natural Resources and Environment. Thailand, Thailand Water Resources Association, Asian Development Bank (ADB) and Asian Development Bank Institute (ADBI)
- (2) PJT II as the host of the Small Scopping Workshop of RBO Benchmarking Activity at 12 October, 2004 in Jatiluhur, West Java Indonesia.
- (3) PJT II Participated the NARBO Members Consultation of RBO Benchmarking Activity from November 29 to 30, 2004 in Batu, Malang East Java Indonesia.
- (4) PJT II concluded the treaty of friendship with Japan Water Agency at November 29, 2004. (Twinning Program).

- (8) Symposium and Discussion with KOWACO about the Twinning Program at December, 1, 2004 in Jatiluhur, West Java Indonesia
- (5) Signatories Agreement of Exchange of Personnel on Twinning Program between KOWACO, PJT I and PJT II on Desember 15, 2004.

3.2 RBO Website

<http://www.Jasatirta2.co.id>

3.3 RBO Center of Excellence

3.4 RBO Exchange Visits, Staff Exchange Programs, Twinning Programs

- 1) Twinning Program between Korea Water Resources Corporation (KOWACO), PJT I and PJT II
- 2) Twinning Program between Japan Water Agency (JWA), PJT I and PJT II

3.5 ISO Certification

- 3) Jasa Tirta II Public Corporation has been certified on the implementation of Quality System ISO 9001 for IWRM since 1997 and improve to ISO 9001:2000 since 2003.
- 4) Water Quality Laboratory of Jasa Tirta II Public Corporation has been certified for National Standard Certification (SNI) 19-17025-2000 since 2003.

3.6 Transboundary Water Management

The Citarum River Basin is covering 11 District in West Java Province, however the water is not only used by the District but also across provincial boundary discharged to Jakarta the Capital City of Indonesia. Jakarta is much depend on the water from Citarum Basin, so far 80 % of raw water for domestic and municipality in the City come from the basin.

4. Topics

4.1 Floods Management

With the existing reservoirs in the Citarum, the occurrence of floods is limited to the Bandung area and the coastal zone the West and East Tarum Canal. To improve the situation, measures will have to be developed that exceed the level of detail in this basin plan. Spatial Planning measures (limits or ban housing and industries in flood prone areas) form an important instrument in flood management.

4.2 Droughts

1) Availability of Surface Water Resources

For the situation expected for the year 2025 and beyond, sufficient surface water resources are available. Provided water is treated as an economic good, and provided that the attitude of water users towards water use and environment issues changes to what in fact is required in a densely populated area like Java., sufficient water can be made available for all demands for the long-term as well, without having to rely on overly stringent demand management.

2) Operational Water Management

Apart from a series of infrastructure measures, this Basin Plan concludes that several operational will not be easy to realize in the current institutional setting. The implementation of the proposed institutional measures aimed at considerable improvements in the water resources situation deserves full attention of those

responsible for basin management. Such operational management may be challenging for the authorities involved, but is relatively inexpensive. The plan incorporates special options regarding opportunities for :

- Sustainable management of the Bandung aquifer
- The development of the Cisangkuy sub-basin, south of Bandung.
- Integrated operational management of the three Citarum reservoirs, and
- Operational management of the lower Citarum system.

3) **Cloud Seeding** : added water resources

4.3 **Polution and Water Quality**

1) **Water Quality and Public Understanding**

Improving water quality will be a major challenge in the years to come. In the current situation, not only is there virtually no waste water treatment in operation, but the understanding of the general public, authorities and industrialists leaves much room for improvement regarding environmental issues. Changing this attitude is perhaps the biggest challenge. Without such change, however the quality of the water will become a limiting factor for the development of the basin, and be the cause for wide spread occurrence of water-borne disease.

2) **Water Quality of the Citarum Reservoirs**

There is evidence that water quality in the reservoirs is deteriorating to the point where the natural treatment capacity of these large bodies of water is being approached and is already exceeded in some cases. This situation represents a “time bomb” that must be defused through measures to reduce contamination of the water before public health is seriously affected. Large-scale waste water treatment for Bandung should be implemented very quickly.

4.4 **Watershed Management**

To keep erosion in the watersheds at acceptable levels, an important effort is required by governmental agencies involved. The on going erosion campaign deserves to continue at full speed. Similarly, considerable efforts will be required in the field of irrigation rehabilitation, the distribution of drinking water, and the collection of sewerage water.

4.5 **New Projects**

Sensitivity checks on some major development factors/trends :

The proposed target development strategy should be robust with respect to a number of uncertain future factors or influences. Major uncertainties at present are associated with the extent of future irrigation in the basin, the increase in industrial/urban demand in the basin and the overall trend in economic development in the longer term future. Those are elaborated below.

It can be concluded that some decrease in irrigation water supply in the future will be likely. A modest decrease in irrigation waater supply is included in the projected water balance for the year 2025. However, this decrease in irrigation water supply may be offset or even more than offset by a larger than expected increase in the demand for DMI. The large urban and industrial complexes (Jonggol, Bukit Indah, Cipunagara) which are being considered and partly being implemented, will strongly boost the demand for water in a

region where groundwater is generally scarce. In the present average regional characteristics have been used.

This implies that the water demands for such special “concentrated” developments have only partly been taken into account (in view of the uncertain stage of those projects). In addition, in case the economy maintains a steady high growth rate, a considerable number of such complexes may be set up. This may push the water demand considerably above the present demand projections. In view of the above, it seems prudent to include a strong emphasis on improved operational water management in the target development strategy for the basin.

The future economic growth rate affects both the demand for water as well as the budget for implementation of the various measures. To some extent, these effects will cancel each other out. Considering a high economic growth rate as the basis for the target development strategy, means that progressively in the future more measures should be included to support this development. The sensitivity for adverse effects (regrets) caused by a potential decrease in economic growth is expected to be minimal. This because of the nature of the priority (and short term) development projects, which are the upgrading and expansion of the conveyance systems in the downstream part of the basin and the provision of extra surface water supply in the upstream part of the basin in order to relieve the pressure on groundwaters. These priority measures can be considered a necessity for the near future regardless of the future economic situation. Therefore, the water supply and water management projects included in both strategies are the same, and the sensitivity for the selection of scenario A (high economic growth) or scenario B (lower economic growth) is only one of the timing of measures, not the implementation order.

Table 1
Overview of indicative sets of measures and implementation schedule for the strategies

Short-term Compliance Strategy	Sustainable Growth Strategy	Name of measure	Measure Implemented by year	Output
-	X	Structural measures DMI Jabotabek		
X	X	Upgrading West Tarum Canal Canal 2, pipes and main trunks	2000	Water quality
		- pipes 1 and 2	2001	Conveyance 9 m ³ /s
		- pipes 3 and 4	2004	Conveyance 9 m ³ /s
		- pipes 5 and 6	2010	Conveyance 9 m ³ /s
		- pipes 7 and 8	2016	Conveyance 9 m ³ /s
		- pipes 9 and 10	2022	Conveyance 9 m ³ /s
X	X	Raising Cirata dam 15 m	2024	15 m ³ /s
X	X	Severage treatment upstream of Saguling	2015	Water quality
Structural measures DMI Bandung				
X	X	Cisangkuy river development		3.76 m ³ /s
		- Improved operational Management	1999	0.86 m ³ /s
		- Cibatarua diversion	2002	0.80 m ³ /s
		- Adapted irrigation	2010	1.50 m ³ /s
		- Santosa reservoir system	2007	0.60 m ³ /s
		- Additional pipes Cisangkuy–Bandung	1999-2003	Conveyance 0.80 m ³ /s
X	X	Cikapundung, 5 small reservoirs	2005	1.46 m ³ /s
X	X	Sukawarna reservoir in Cimahi	2001	0.17 m ³ /s
X	X	Cibeurem river diversion	1999	0.11 m ³ /s
X	X	Bojong Jambu reservoir in Ciwidey	2008	0.12 m ³ /s
		Abstraction from Saguling reservoir		3.8 m ³ /s
		- First installation	2016	1.2 m ³ /s
		- Second installation	2019	1.2 m ³ /s
		- Third installation	2021	1.4 m ³ /s
X	X	Several small reservoirs and diversions	2013	1 m ³ /s
-	X	Bandung Aquifer management	2006	2.4 m ³ /s
Other Structural measures				
X	X	Upgrading East Tarum Canal	2001	Rehabilitation
-	X	Rajamandala run-of-river power plant	2019	51 MW
-	X	Curug run-of-river power plant	2019	6 MW
-	X	Cipunegara/Cibeber reservoirs and diversions	2015	Multi-sectoral
Non Structural Measures				
X	X	Flow prediction	2011	10 m ³ /s
X	X	Drought Control	2016	10 m ³ /s
X	X	On-demand irrigation	2021	5 m ³ /s
X	X	Integrated reservoir management	2024	Assoc with Cirata
X	X	DMI demand management	1999-2025	(annual program)

Figure 1. Proposed Implementation Schedule (Format Excell)

4.6 International Conferences

- ICOLD 72nd Annual Meeting, Seoul-Korea, 16- 22 Mei 2004
- World Water Forum, Brazil 2004

Appendix

Water Resources Management

1. Legal Framework for River and Water Resources Management
 - 1.1 River Management
 - 1.2 Water Resources Management
 - 1.3 Irrigation Agriculture
 - 1.4 Domestic, Municipal and industrial Purpose
2. Implementation Scheme on Water Resources Management
 - 2.1 Water Resources Administration System and Execution Organization

Appendix

Water Resources Management

1. Legal Framework for River and Water Resources Management

1.1 Water Resources Management

Water resources management for the Citarum basin can not be seen separately from land-use and the use of water associated to this land-use. It. Operate on the interaction between users (population) and resources, users and institutional, and resources and institution. Integrated water resources management thus applied considers the use of resources in relation to social and economic activities and functions, and water infrastructure needed. Activities and functions are also considered when laws and regulation for the sustainable use of water resources are set between institutions and users. The infrastructure made available, in relation to regulatory measures and mechanisms, will allow for effective use of the resources, taking due account of the environmnet carrying capacity.

1.2 Irrigation Agriculture

About 380,000 ha of technical, semi-technical and simple irrigated areas are located in Citarum River Basin (1992 inventory by the JWRMS), of which about 220.000 ha are in the Jatiluhur command aea. Cropping intensities are high, due to the favorable climatic and soil conditions, but the second rice crop area is smaller that that of the wet season. Total irrigation demand amounts to some 5,800 million m³ annually (aggregate number). It should be noted, however that drainage water from irrigated agriculture is often recycled many times within the surface waaer system.

Water supply to the Jatiluhur command area is distributed through aset of three primary canals (West, East dan North Tarum Canal) which intercept water from local unregulated rivers and receive supplementary water from Jatiluhur reservoir. The contribution from tha local unregulated rivers is substantial and constitutes about 60% during the wet season and 40 during the dry season, Irrigation demand constitutes by far the largest consumtive water demand in the basin.

Over the last few years irrigated area has been decreasing due to a transformation of agricultural land into urban use in particular around the urban growth poles, This trend is expected to continue in the future.

1.3 Water use for Domestic, Municipal and Industrial Purposes

About half of the current population of the basin – more than 4 million people –live ini urban areas. Current domestic and municipal water demands in the Citarum basin are estimated at 5.30 million m³ annually. Only a part of this demand is actually fulffiled by piped water from public water supply systems. Many people have either no or inadequate access to piped water.

The Industrial sector in the basin is developing rapidly, especially near Bandung, Cianjur and in the area near Cikampek, Karawang and Purwakarta. Accurate account of industrial water use are not available, but the order of magnitude is believed to be arround 100 million m³ annually.

2. Implementation Scheme for Water Resources Management

Based on the Law No. 11 of the year 1974 concerning Water Resources and Government Regulation (GR) No. 22 of the year 1981, the priority ranking of water utilization are as follows: first is for domestics and municipalities, second is for agriculture's including fisheries and animal, third is for industries, and the latter is for power generation. In order to be distributed equally to beneficiaries the Government established Water Resources Management Committee in the provincial level and Water Resources Management Implementation Committee in the basin level. The members of the committee are the representatives of the government institutions, private sectors, Non Government Organizations, universities, professionals, and representatives of farmer associations. In fact the members of the committee are representing of water regulators, basin operators and water users all together are the stakeholder.

Irrigation is the biggest demand of water it is about 90% of the total demand for two crops per year. The first crop is commenced in the first of October or in the beginning of rainy season and the second crop is commenced in the first of April. For which the Committee extend the meeting at least twice a year, once every August for preparing annual water supply program considering the availability of water in the reservoirs and prospective weather in coming year, secondly every April for evaluation of the implementation program and/or analysis of the continuation of the program or preparing the program modification if necessary.

According to the Note for Jatiluhur (Ir. H. Djuanda) Reservoir Operation (Angoedi, 1960) total water demand in the downstream of the reservoir will be supplied during wet season 70% from local resources and 30% from the reservoir, and conversely, during dry season 30% from local resources and 70% from the reservoir. The committee is also prepares integrated reservoirs operation rule curve based on the equal sharing of the three reservoirs in term of water level and hydro electric power production.

Water Resources Sector Reformation Program

Considering the shift of paradigm as mentioned above the Government since 1998 launched Water Resources Sector Reformation Program with regard to national policy, law and regulation, institution, and public participation concerning with water resources development and management. Up to present the reformation is still in progress.

Regarding to the policy of water resources, the Government established National Coordinating Team to prepare the national policy of water resources development and management. The Team is chaired by The Coordination Ministry for Economic Affairs and the members of the Team are 9 (nine) Ministers of the Presidential Cabinet. The Team is in fact an embryo of National Water Council which member will consist of 50% representatives of Government entities and 50% representatives of Non Government or others stakeholder. Further, according to the concept that has been prepared, there will also be a Provincial Water Council and River Basin Water Council for the implementation of National Water Policy in the provincial level and in the river basin level successively.

There are many National Legal Products in terms of Laws and Government Regulations that deal with water resources, however in practice it is twisted each other cause

hesitancy and doubtfulness. In the era of the reformation such laws and regulations will be revised with regard to be clearer and un-doubtful through public consultation.

At present there are about 14 (fourteen) agencies concern with water in the basin, either those agencies that responsible to the Central Government or ones that responsible to Provincial and District Governments as well. Jasa Tirta II as a basin operator is only responsible in in-stream of river courses. Regarding to water quality Jasa Tirta II is obliged to monitor and evaluate the level of water quality and report to the related provincial agencies. Should water user discharge their waste to the rivers beyond the permissible level, Jasa Tirta II has no right to give warning even less to stop on supplying water to them, because the source of pollutant is in off-stream area.

More people have aware the characteristic of water, among other there are relationship between: upstream and downstream, water quality and water quantity, in-stream and off-stream, at present and in future, and water are part of hydrological cycle. The hydrological boundary is not always the same with the administrative boundary. The existent of water depend on time, location, quantity, and quality. For which the water resources management should be extended in a holistic approach, professionally, equally distributed, self supported, and accountable based on the philosophy one river basin, one integrated plan, and one coordinated management.

In the reformation concept, Jasa Tirta II will be strengthened and improved in such way that they should as less as possible dealing with social service, e.g.: Jasa Tirta II should handed over the operation and maintenance of irrigation infrastructures. Besides, Jasa Tirta II will give the opportunity to private sector or other stakeholders to joint in water resources development and management in the basin.

Water management includes: catchment area management, water quantity, water quality, river environment, flood and drought, and water resources infrastructures. For the sustainability of water resources in the catchment area the government will introduce community development program with people in the area. They should not rampant to cut trees in the forest or illegal logging and extended agricultures activity in the slope land that will cause erosion in the catchment area and sedimentation in downstream reach. Besides, it will cause higher flood during rainy season and drought during dry season. The beneficiaries of water mostly are living in the downstream area that is why a mechanism of incentive from the downstream to upstream should be established.

When all of the Water Resources Sector Reformation Program is implemented it is expected that the conflicts in the basin will be resolved and water resources management in the basin will be extended by a proper organization.

JASA TIRTA II PUBLIC CORPORATION

INTEGRATED WATER RESOURCES MANAGEMENT

1. Catchment Area Management

2. Water Quality Management

3. Water Quantity Management

4. River Environment Management

5. Flood & Drought Management

6. Water Resources Infrastructure Management

Water Quality Monitoring

PROKASIH : 82 POINT
INDUSTRY : 102 UNIT

REPORT

1. Kimpraswil
2. BPLHD Prop. Jabar
3. Bakorwil IV Kab. Purwakarta
4. DPRD Kab. Purwakarta
5. PSDA Prop. Jabar
6. Dinas Perindag Prop. Jabar
7. Dinas LH Kab./Kota terkait

CHART OF RESPONSIBILITY CITARUM RIVER BASIN MANAGEMENT

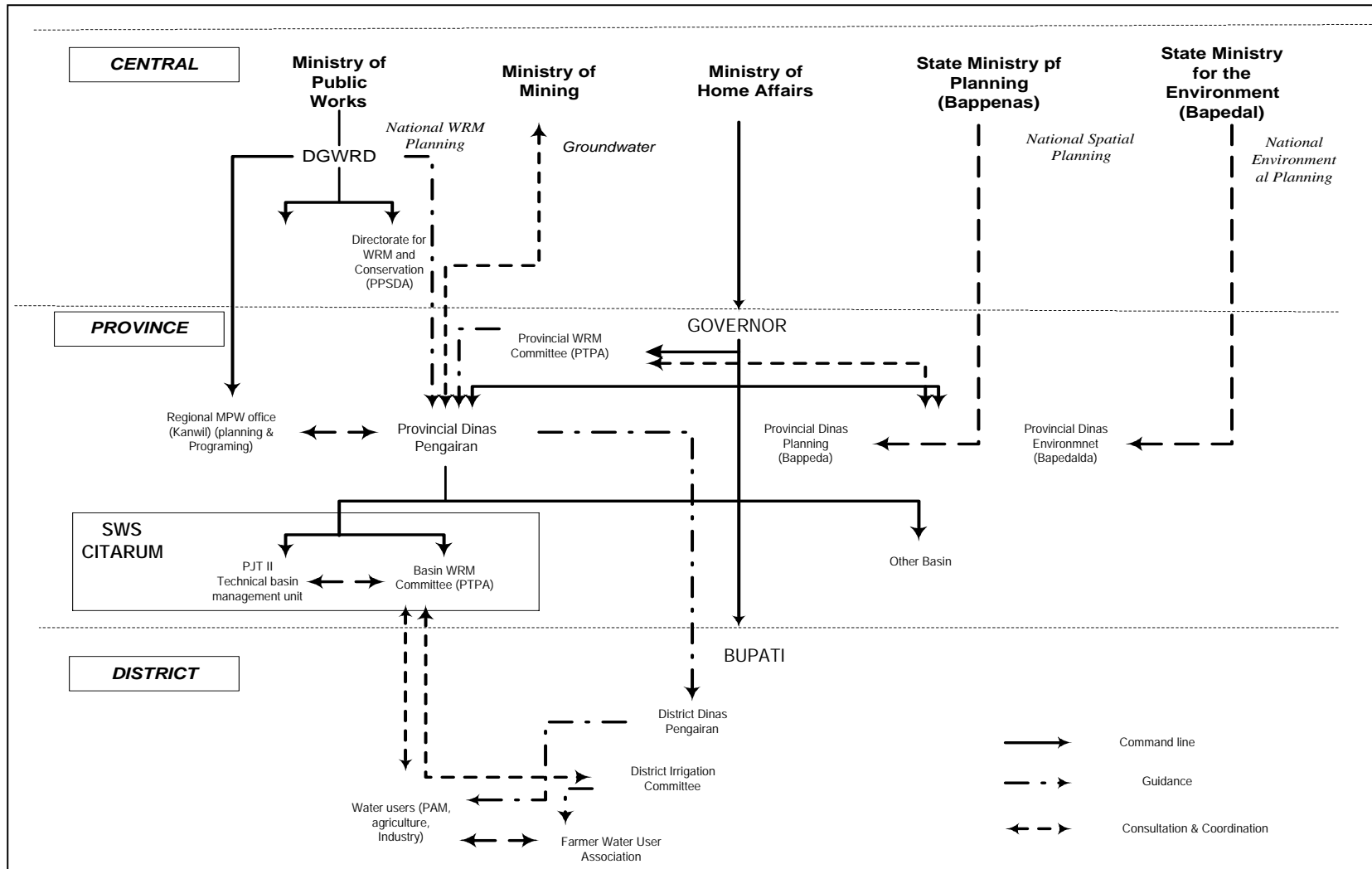


Figure 1.1 Proposed Implementation Schedule

