

Jasa Tirta II Public Corporation Experience In Managing Citarum River Basin

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Abstract

Water resources management for the Citarum River Basin can not be seen separately from land-use and the use of water associated to this land-use. It operates on the interaction between users (population) and resources, users and institutions and resources and institutions.

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 25° C in the low land and of 18° C in the mountainous area.

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 as the main supply source.

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

Keyword: water resources management, Integrated development.

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I. DEVELOPMENT ORIGINS

General

Water resources management for the Citarum River Basin can not be seen separately from land-use and the use of water associated to this land-use. It operates on the interaction between users (population) and resources, users and institutions and resources and institutions.

Integrated water resources management thus applied considers the use of resources in relation to social and economic activities and functions, and the water infrastructure needed. Activities and functions are also considered when laws and regulations for the sustainable use for water resources are set between institutions and users. The infrastructures made available, in relation to regulatory measures and mechanism, will allow for effective use of the resource, taking due account of the environment carrying capacity.

The Citarum River

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 law 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. (**Figure 01.** Citarum 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 (**Table 01.** Potential of water in the basin). 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.

Development of The Citarum River

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, Cibeet, 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.

II. STATUS AND GENERAL FRAMEWORK

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.

III. MISSIONS AND ORGANIZATION

Jasa Tirta II Public Corporation Vision is to realize a well known and high quality company in water management and water resources for wide service in water supply to the various requirement and contributions to national food sufficiency.

Mission to realize the Corporation Vision, the company has Missions as follows (1) Raw water supply for drinking water, electric generation, agriculture, industry, harbor, flushing and other need (2) Electric power generation and supply the electric power (3) To develop Tourism and land use, (4) To maintain the food sufficiency by mean supplying of agriculture water and flood control with effort of preservation environment protection by mean information, recommendation and guidance (5) To maximize the profit and to foster the benefit based on business principle in assuring government asset continuance and service continuity to public.

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.

In line, with the Government Regulation of The Republic No. 94 year 1999 dated 13 October 1999 and the Decree of Minister of Resettlement & Regional Infrastructures No. 18/KPTSM/M/2000 dated 15 December 2000, about the guidelines of Operational

activities of Jasa Tirta II Public Corporation, the tasks, business field and company activities are as follow: (1) To exploit and maintain the infrastructure

Organization and Means

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. (**Figure 02.** Organization Chart of Jasa Tirta II Public Corporation).

Institutional Establishment

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.

Scope of Works (Government Regulation No. 94/1999)

Scope of Works Jasa Tirta II Public Corporation are (1) Exploit ate and maintain water resources infrastructure and hydro-electric power generation.(2) Water resources and hydro-electric power Utilization (3) Watershed management, such as: control, develop and utilize water resources in Citarum River Basin.(4) Rehabilitate water resources infrastructures and hydro-electric power plant as well.

Corporation Aim And Objective (GR No. 94 of 1999, Pasal 6)

Corporation Aim, to operate water for public utilization and its qualifying water sources which sufficient to fulfill the necessity of all the people and to carry out certain tasks given

by the government in managing the river basin and/or its sources including to give information, recommendation, consultation and guidance.

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

Relation with Other Bodies

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 an 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 (**Figure 03**. Chart of Responsibility Citarum River basin Management). 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).

IV. FINANCING

The form of the institution is a public corporation meant that PJT II should extend public service (social service) that free of charge, 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 2001 is about Rp 124.72 billion. (**Table 02.** Trend of Water Balance in Citarum River Basin (From 1990 to 2025)

Operation and Maintenance Budget Requirement

Regarding to the Integrated Water Resources Management the task of PJT II should comprise of: catchment area management, water quantity management, flood and drought management, water quality management, river environment management and water resources infrastructures management. The total operation and maintenance budget Requirement is about Rp. 171 billion, but PJT II capable to profit finding only 30 % of idela Cost (**Figure 04.** Operation and maintenance infrastructure cost (ideal)

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