A Comparative View on the Brantas River Basin Development Project and the Citarum River Basin Development Project[1]

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This paper aims to compare the experiences of the Brantas River Basin Development Project (Brantas Project) with those of the Citarum River Basin Development Project (Citarum Project). To find better ways of carrying out river basin development, various differences between the two Projects are comparatively reviewed with institutional development in mind. (Table 1)

(1) Development Area

The Brantas Project is in East Java whose economic center is Surabaya on the Java Sea coast (the second largest city in Java, Indonesia). The Citarum Project is in West Java whose economic center is Jakarta, the capital city of Indonesia, also on the Java Sea coast. The catchment area of the Brantas River is 12,000 km^2 with the Brantas River Basin paddy fields covering some 320,000 ha. Similarly, the Citarum River's catchment area covers 13,000 km^2 with a paddy field area of 320,000 ha (the lower Citarum paddy field area covers 240,000 ha). In addition, the climatic conditions for both rivers are the same. Thus, the geographical conditions for both Projects are quite similar.

This similarity lays the foundation for identifying distinctive differences during development between the Brantas Project and the Citarum Project as discussed below.

(2) Development Principle

It is observed that the Brantas River Basin was developed in line with the development principle, "One River, One Plan and One Management". The principle contributed greatly to the entire project cycle of the development for 40 years. It also paved the way to systematically coordinate development efforts between planning and project implementation. In other words, in a ten-year sequence the four comprehensive Master Plans were formulated in accordance with the changing social, economic and natural conditions of the Brantas Basin. And the projects prioritized and recommended in each Master Plan were constructed accordingly.

On the other hand, the Citarum Project started its development without a particular principle. This might have caused the developing processes of the Citarum Basin to be rather complicated. There was little sequential and coherent coordination between planning and physical project implementation. In other words, the Citarum River Basin was developed on a

[1] This paper was prepared as a chapter of a book entitled, *Aid effective ness to Infrastructure: A Comparative Study of Sub-Sahara Africa and East Asia -Indonesia Case Study-*, JBIC Institute, 2008 and included as Chapter 3. The very issue of this chapter is to critically review differences between Japanese ODA infrastructure assistance which is the Brantas river basin development and the World Bank's infra-assistance which is the Citarum river basin development.

best-choice-at-the-time basis. As a matter of fact, the authorities (of West Java Province) adopted in 2000 a principle “One Resource, One Plan and One Integrated Management” in a kind of integrated development Master Plan called “Pola Induk 2000” (The West Java Provincial Water Resources Policy 2000). In other words, the Citarum Project had to wait for 40 years before the introduction of a developmental philosophy like the one that was established at the outset of the Brantas Project.

(3) Development History

The Citarum Project was inaugurated when the late-prime minister, Ir. H. Djuanda, declared in 1956 the commencement of the Jatiluhur Multipurpose Project which was recommended within the development plan, *Integrated Water Resources Development in Citarum River Basin 1956*. The main aim of the Citarum Project was to achieve self-sufficiency in the national staple food (rice) supply through the increase in production.

The Brantas Project started in 1959 when a Japanese consulting company, by the request of the Government of Indonesia, completed a part of first Master Plan and construction of the South Tulungagung Irrigation Project (Neyama Diversion Tunnel Project) began. The main purpose of the Brantas Project was also to increase the staple food production, rice, to achieve regional as well as national self-sufficiency.

The Jatiluhur Multipurpose Project consisted of the Jatiluhur Dam with a reservoir capacity of 3.0 billion m^3 and hydro electric power plant of 150 MW, Bekasi Weir, Curug Weir (Barrage), West Tarum Canal (WTC), East Tarum Canal (ETC) and North Tarum Canal (NTC). During the Dutch colonial period, the Dutch constructed irrigation facilities such as Walahar Weir, Cikarang Weir, Salamadarma Weir, Macan Weir and Beet Weir. All these structures constitute the Citarum Irrigation System. Besides, it should be noted that there are two huge hydroelectric power dams (Saguling and Cirata) located at the upper stream of the Jatiluhur Dam, which were constructed by the National Power Company (PLN) with the primary objective to increase the electric power generation. These structures also constitute indirectly a part of the Citarum Irrigation System. The Citarum Project did not involve large physical facility projects after the Jatiluhur Multipurpose Project. Instead, it tended to renovate and rehabilitate the old Dutch irrigation facilities. (Table 2)

The Brantas Project took quite a different course. Based on the four Master Plans, the old Dutch structures were replaced by new ones and newly identified projects were also constructed. As the Brantas River is characterized by a steeper contour and an active volcanic mountain, Mt. Kelud, the Brantas Project involved several kinds of and quite a few projects such as Dam and Hydropower Projects, Barrage Projects, Irrigation Projects, River Improvement Projects, and Debris Control/Sabo Projects.

Thus, in the Citarum Project, newly identified large scale structures have not been developed since 1967 (See Table 2), while in the Brantas Project, new large-scale projects have been

formulated and implemented continuously into the 21st century.

(4) Coordination between Planning and Project Implementation

In the case of the Brantas Project, systematic coordination between the four Master Plans and subsequent implementation of 32 projects (9 dam and hydropower projects, 6 barrage projects, 8 irrigation projects, 7 river improvement projects and 2 debris control/Sabo projects) was harmoniously made. In the case of the Citarum Project, the first project, the Jatiluhur Multipurpose Project was coordinated with the first Master Plan, *"Integrated Water Resources Development in Citarum River Basin 1956"*. However, after this initial coordination, it was not possible to coordinate the efforts because no new comprehensive Master Plans were formulated and, accordingly, no subsequent physical projects were proposed in a sequential manner. During the course, however, several development studies were carried out for development objectives such as "Cisadane-Jakarta-Cibeet Study", "Cibeet Irrigation-Flood Control-Water Supply Study", "Upper Jatiluhur Irrigation and Coastal Strip Development Study", "Pola Induk" and "Integrated Citarum Water Resources Management". Among those, however, the last two studies could be regarded as a comprehensive Master Plan, which were formulated quite recently in 2000 and 2007, respectively. (Table 2) This implies that there was no comprehensive Master Plan for the Citarum Project between 1956 and 2000. It appears that the stakeholders concerned eventually realized the importance of the coordination between the comprehensive Master Plan and project implementation.

(5) Project Management Unit

The Brantas Office as the unified Project Management Unit (PMU) of the Brantas Project was established in 1965 and obtained independent and exclusive authority to manage and operate the Brantas Project in 1967 soon after construction of the first couple of projects (Neyama Drainage Tunnel Project and a part of Karangkates Multipurpose Dam Project) was completed. The Brantas Office was entitled to exercise the "Direct Force" authority, which meant that it could directly recruit, hire, train, and supervise the workmen and be responsible for the policies governing the wages and conditions of work. This status has not changed for 40 years. The Brantas Office was part of the Ministry of Public Works and yet almost an independent private company in the way of operation. The Brantas Office made the most use of this status by leaving the entire funding responsibility for development projects and office administration to the Ministry of Public Works.

The Citarum Project has a different picture. The PMU of the Citarum Project changed over time. The first PMU was the Jatiluhur State Own Company who was responsible for the O&M of the Jatiluhur dam and hydroelectric power plant, and the Jatiluhur irrigation system (1967-70). The company was obliged to run the completed Jatiluhur Multipurpose Project profitably by law. It tired to keep this obligation intact and realized that the profit-making approach was not

compatible with optimizing the use of the water resources and achieving the aims of the Citarum Development. Subsequently, in 1970 a new PMU called Jatiluhur Authority Public Corporation (the Corporation) was established. The Corporation received the authority to administer all the existing facilities related to water resources development in the Citarum River Basin. As a matter of fact, the Corporation was an amalgamation of the Jatiluhur Irrigation Project (Ministry of Public Works), the Jatiluhur Tertiary Irrigation Project (Ministry of Home Affairs) and the Jatiluhur State Own Company (Ministry of Industry). The Corporation, thus, could put itself in a position to pursue the development objectives of the Basin in a comprehensive manner. The Corporation is quite like the Brantas Office as the PMU. However, the decisive difference between the two is that the Corporation was not a part of the Ministry of Public Works, but an independent public corporation outside the Ministry. This probably meant that the Corporation was in a more difficult position in securing development funds for new projects for the Citarum Development.

It should be added that in 1999 the PMU of the Citarum Project was again transformed from the Jatiluhur Authority Public Corporation to Jasa Tirta II Public Corpoartion (PJT II). And PJT II turned into simply an O&M organization of the Citarum Project and, therefore, could no longer be responsible for the development of the Basin. Owing partly to the decentralization policy recommended by the World Bank, the development authority was split over various stakeholders such as the Ministry of Public Works (Balai Besar), the Ministry of Home Affaires, the Ministry of Forest, and the West Java Province. As for the Brantas Project, Perum Jasa Tirta Public Corporation (PJT) as water resources management corporation for the Brantas River as well as Indonesia spun out spontaneously from the Brantas Project as early as in 1990. Since then, it has been managing the water resources mostly for the Brantas River. PJT was transformed into Jasa Tirta I Public Corporation (PJT I) in 1999 without much change in its functions and responsibilities. In fact, it is said that the policy to establish several Jasa Tirta Public Corporation for major river basins in Indonesia stemmed from the old Perum Jasa Tirta Public Corporation of the Brantas Project.

(6) Projects (Master Plans/Studies and Physical Projects) Implemented and External Assistance

In the Brantas Development, projects were constructed steadily based on four Master Plans which were formulated in 1961, 1973, 1985/86 and 1998 under a 10-year review basis. Each Master Plan contained several to a dozen feasibility studies. And all together, 32 projects were constructed in the Brantas Basin. In detail, 7 projects (mostly irrigation projects) were supported by the Asian Development Bank (ADB), 1 (one) by the World Bank, 2 by Austria (1 overlapping with ADB) and 1 by the Government of Indonesia. Japan supported the remaining 22 projects. Japanese contractors engaged in constructing the first couple of projects and most of the projects after 1991. During the period between 1965 and 1990, the Brantas Office by way of the Force

Account Method constructed all the projects by itself. Although various financiers were involved, all the consulting/engineering services for the four Master Plans and the 32 projects were provided practically by the sole Japanese consulting company, Nippon Koei Co., Ltd.

In this connection, the Citarum Project has quite a different picture. The first Master Plan (*Integrated Water Resources Development in Citarum River Basin*) was formulated in 1956 by the help of the Dutch Government, in which the Jatiluhur Multipurpose Project was recommended. The developing projects implemented in the Citarum Project were the Jatiluhur Multipurpose Project (Bekasi Weir, Jatiluhur Dam and Hydro Electric Power Plant, Curug Barrage and Pumping Station, WTC, ETC and NTC), a little less than a dozen irrigation projects (incl. extension and rehabilitation) and a few other projects. All the projects except the Jatiluhur Project were implemented on a needs-as-arisen and individual piecemeal basis without any comprehensive Master Plan foundation. France supported the Jatiluhur Project, and other projects including plans/studies and physical projects were supported by the World Bank, the Netherlands, France and ADB. (Table 2) As a natural consequence, various European contractors and consultants were involved on a project-by-project basis in the implementation of the Citarum Project. Take the Jatiluhur Dam, for example, Coyne et Bellier Consultant (COB) of France designed and supervised and Compagnie Francaise d'Enterprise (CFE) of France constructed the facility.

All in all, it can be said that the Brantas Project is the Japanese Aid Project and the Citarum Project is the Euro-World Bank Aid Project.

(7) Performance (Output and Outcome)

The Brantas Project accrued various kinds of outputs such as electric power (268 MW), flood control (area of coverage of 60,000 ha), rice production (irrigated field of 304,000 ha), volcanic disaster prevention and industrial/domestic water supply (129/206 million m^3 in 2000). In addition, it also produced other various kinds of outcomes. They include human resource development (more than 7,000 engineers and technicians), the economic growth and welfare as well as poverty reduction of the Brantas Basin, the modern and contemporary mindset of the people, the replication of various Brantas projects at other locations in the country and an international reference (the Brantas Project is regarded by other LDCs as one of "best practices" in the river basin development).

The Citarum Project also produced various kinds of outputs such as rice production (irrigated field of 240,000 ha), flood control (coverage area of 20,000 ha) and industrial/domestic water supply (164/428 million m^3 in 2000). But it is not known if the Citarum Project accrued such other outcomes as did the Brantas Project. If it is the case, the difference between the Projects occurred partly due to a difference in the development approach between the Brantas Project and the Citarum Project. The Brantas Development was well planned and implemented in a

sequential, harmonious, and optimizing manner, while the Citarum Project was promoted in a discrete manner without a comprehensive long-term vision.

(8) Institutions Created and Developed

During the Branas Development, nine institutions were formed and developed, and contributed to efficient and effective realization of the Brantas Project. They are the “Four Comprehensive Master Plans”, the “Systematic Coordination between Master Plans and Implementation of Projects”, the “Cyclical Pre-Investment Modality”, the “Rules and Systems for Effective and Efficient Project Implementation”, the “Phased Contracting System”, the “Manpower Training Methods”, the “Mutual Trust between Japanese Resident Consultants, Employees of the Brantas Office and Local People”, the “One and Only Consultant Policy” and the “Management of the Brantas Office”.

In the case of the Citarum Project, it is questionable whether similar institutions as developed in the Brantas Project were formed or not. There are ample observations that the institutional development must have been limited in quantity and quality during the development of the Citarum Project. Comprehensive master plans were not formulated in sequence. There was no coordination between master planning and project implementation. Manpower training was not continuously taken place in a sequential manner over the course of the 30 to 40 years of the project. The PMU had quite different characteristics from that of the Brantas Project. The fact that the Citarum Project resulted in limited institutional development must mean, in turn, that it could have produced more output and outcome than we can perceive today if such institutional development took place.

The above comparative review reveals that the Japanese approach was the comprehensive, coherent, and sequential approach and the Euro-World Bank approach was the individualistic, needs-as-arisen, and discrete approach. As far as these two cases are concerned, the Japanese approach would suggest that it is more productive to the growth and prosperity of the target area and the nation of Indonesia in general than the Euro-World Bank approach.

Table 1 Comparison between Brantas River Basin Development Project and Citarum River Basin Development Project

	Bantas River Basin Development	Citarum River Basin Development
Development Principle	Integrated Development based on "One River, One Plan and One Management" Philosophy	Integrated Developmet without Paticular Philosophy
Development Area	Located in East Java Covering 12,000 km^2 of Catchment Area and 320,000 ha of Paddy Field	Located in West Java Covering 13,000 km^2 of Catchment Area and 320,000 ha of Paddy Field
Development History	From 1959 with Japanese Reparation by the Initiative of a Japanese Consultant to the Present	From 1957 by the Initiative of Prime Minister Ir. Djuanda to the Present
Planning and Implementation	4 Master Plans on a Revised Basis and Subsequent Implementation of Many Priority Projects Recommended in the Plans	A Few Mater Plans (in 1956 and 2000) on an Ad Hoc Basis and Selective Implementation of a Limited Number of Projects
Development Management (Project Management Unit)	One Integrated Project Management Unit: Brantas River Basin Development Executing Office (Brantas Office)	A Few Different Project Management Units in Sequence under PLN, Jatiluhur Authority and DGWRD
Projects Implemented (Physical Structures Constructed)	Many Projects: 8 Multi-purpose and 1 Hydropower Dams, 6 Barrages, 8 Irrigation Facilites, 7 River Improvement Projects and 2 Debris Control Projects	1Mulit-purpose and 2 Hydropower Dams, Several Barrages and 3 Cannals
External Assistance	Mostly Japanese Bilateral ODA	Multilateral Assistance by World Bank and ADB, and European Bilateral ODA
Financial Assistance	JBIC (OECF)	World Bank, ADB, Eurocountries
Technical Assistance	JICA (OTCA)	World Bank, ADB, Eurocountries
Consulting Services	One Japanese Consultant: Nippon Koei Consulting Company throughout the Brantas Development	Different Consultants (European Consultants) on a Project by Project Basis
Contractors	Japanese Contractors by Contract-out Method and Indonesian Staff of Brantas Office by Force Account Method	European Contractors by Contract-out Method
Performance in terms of Output and Outcome	Project-specific Output as well as Sectoral, Regional and National Outcome	Mostly Project-specific Output
Institutional Reforms and Development	Project-based Institutions as well as Crosscutting Institutions among Stakeholders and Offshoot Organizations	Project-based Institutions

Source: The Main Report of the Brantas Project, ADB's *Integrated Citarum Water Resources Management* and PJT II's Publication.

Table 2 Summary of External Assistance to the Citarum Project

Development Studies and Development Projects	Financial Sources	Implementation Period
Integrated Water Resources Development in Citarum River Basin (Study/Plan)	Dutch	1956
Jatiluhur Multipurpose Project	France and GOI	1956-67
-Construction of Bekasi Weir	GOI	
-Construction of WTC Bekasi-Jakarta	GOI	
-Construction of Jatiluhur Dam and HEPP	France	
-Construction of Curug Barrage and P. Station	GOI	
-Construction of WTC and ETC	GOI	
Jatiluhur Irrigation Rehabilitation Project	WB	1971-80
North Bekasi Irrigation Extension Project	WB	1977-84
Cipamingkis Irrigation Development	WB	1977-84
Irrigation VII (Tertiary Irrigation Dev.)	WB	1977-79
Irrigation XII (Tertiary Irrigation Dev.)	WB	1979-83
Irrigation V (Tertiary Irrigation Dev.)	WB	1977-83 (approx)
Cisadane-Jakarta-Cibeet Study (Study/Plan)	WB	1976 (approx)
Cibeet Irrigation-Flood Control-Water Supply Study (Study/Plan)	WB	1981 (approx)
Upper Jatiluhur Irrigation and Coastal Strip Dev. Study (Study/Plan)	WB	
Cimanuk-Cisadane IWRPS	Dutch-WB	1981-84 (approx)
WTC Improvement Project	WB	1984-91
Upper Citarum Urgent Flood Control Project	JBIC	1989-93
Upper Citarum Flood Control Project 1st Phase	JBIC	1993-99
North Coast Java Flood Control Project	Dutch	1996-2003
Upper Citarum Flood Control Project 2nd Phase	JBIC	1999-2003
Ciliwung-Cisadane River Flood Control Project	JBIC	1998-2007
Irrigation Special Maintenance	WB	1988-93 (approx)
Dam Safety Project	WB	1994-2002
Jabotabek Water Resources Management Study (Study/Plan)	Dutch-WB	1992 (approx)
Citarum Basin Water Resources Planning (Study/Plan)	Dutch-WB	1997 (approx)
Jatiluhur Water Resources Management Project	WB	1993-97 (approx)
Uprating Ir.H. Djuanda HEPP	France	1994-98 (approx)
Rehabilitation of Curug Irrigation Pumping Station	France	1996-2002 (approx)
Pola Induk	Australia	2000
Integrated Citarum Water Resources Management (Study/Plan)	ADB	2007

Source: ADB's *Integrated Citarum Water Resources Management* and PJT II's Publication.