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Downstream Flood Control Programs By Integrated Water Resources and Flood Management Project for Semarang IP-534

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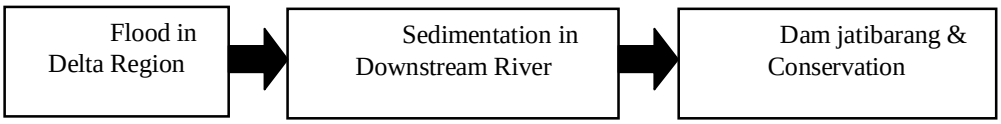
Abstract- Semarang city located in the delta areas. Since 1990 Semarang downtown area increasingly feels the impact of widespread flooding. The flood was caused by two main factors, namely upstream and downstream areas. The high rainfall intensity in the upstream areas is not supported by catchment in the upstream while downstream heavily influenced by sedimentation in the river and people's behavior. Efforts to control the flooding has been done with *Integrated Water Resources and Flood Management Project for Semarang IP-534* through Dam Development with Conservation in the Upper Green Belt, which aim to control flooding and reduce the impact of sediment that will carry over to the downstream area, but these efforts must be balanced with the preservation efforts of flood control infrastructure, as well as the efforts of the community to be aware of the importance of protecting and preserving the environment. Therefore, research is needed to remind and evaluate the management of flood control in the city of Semarang. The data obtained in this study through the literature of various stakeholders, as well as direct observation during a stint in the implementation of development and greenbelt conservation dam Jatibarang. Aspects covered include aspects of institutional, regulatory, community participation as well as the technical and operational aspects.

The results showed that the flood control efforts depends on the institutional aspects of the integrity of all stakeholders to work together, and the role of community participation in maintaining and caring for the environment. Therefore we need a system of management and flood management together that included all the stakeholders from the central government, provincial and municipal governments to jointly support the flood control efforts, and the role of the community in supporting the efforts of the management and flood control Semarang not only downstream communities but also communities in the upper reaches by still maintaining the protected area because it serves as a deterrent catchment areas and sedimentation through conservation efforts.

Keywords: dam Jatibarang and green belt conservation, institutional, community participation

1. Introduction



Semarang is the center of the capital city of Central Java, the very strategic city as connector between western and eastern parts of Java. Since 1990 till now the flooding problem in the city of Semarang is expanding to bring the impact of delays in road transport, especially in the area of the northern coast (northern coast road). As a result of those impacts on the Eastern Java and West Java path ways makes delay the distribution from east path and west lines so a lot of losses in economic such as the destruction of access roads, offices,

homes, facilities and other infrastructure due to waterlogged; as well as for the distribution of goods will be blocked from and to East Java to West Java and vice versa.

Semarang city include into delta region of the Java Island, this area is very prone to high sedimentation. That sedimentation factors much arising from the upstream flow that carries grain sedimentation to downstream/ sea. So that the water catchment areas could catch many volume, but due to increased sedimentation causing the diminishing catchment area and consequently the water will rise or often called as *Rob*.

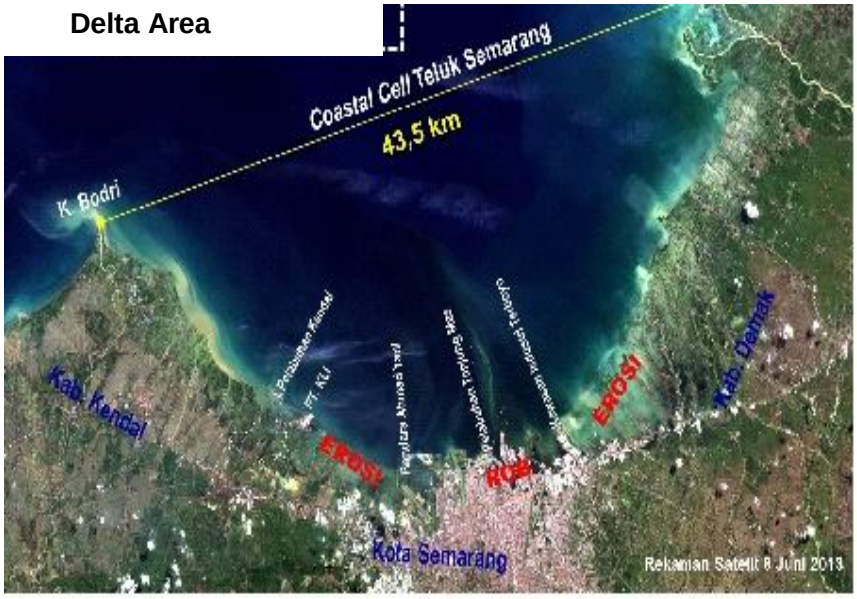


Figure 1. Semarang City is part of the Delta region

One of the efforts of the Ministry of Public Works by Director General of Water Resources BBWS Pemali-Juana and Cipta Karya in dealing with the flooding problems that is **Integrated Water Resources and Flood Management Project for Semarang IP-534** which launched in 2009 and thank God for completion in 2014. There are three components of the IP-534 efforts to control the impact of flooding, namely:

1. Component A: Normalization Kali Garang / BKB
2. Component B: Development Dam jatibarang along with its Green Belt conservation
3. Component C: Semarang Drainage Improvement

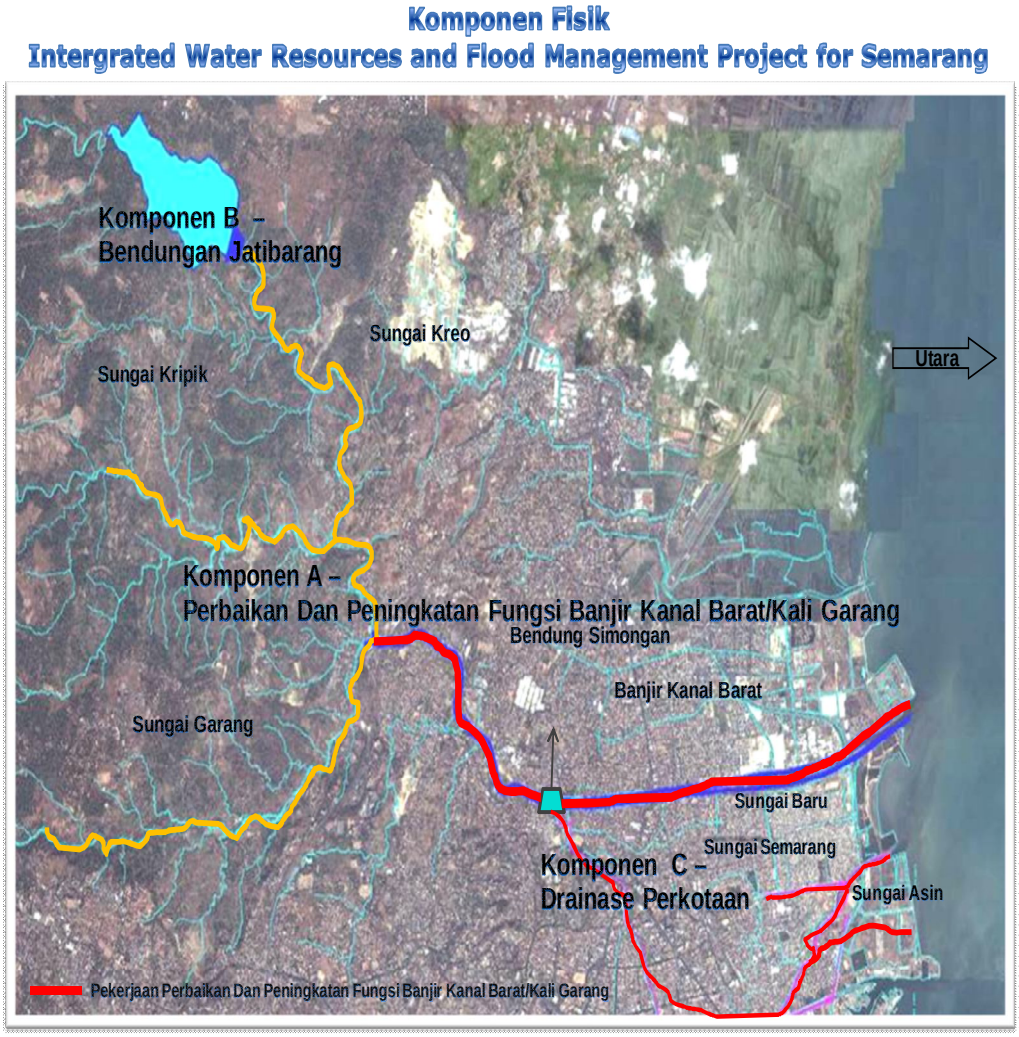


Figure 2. Physical Components of Integrated Water resources and flood management project for Semarang

Tabel 1. Activities Which Financed Through Loan IP-534 (JBIC)

Component A (Ditjen SDA) Repair and Improvement of West Banjir Kanal/ Kaligarang - Widen Channel - Revertment - Floodwallheightening - Dredging the river - Normalization Kaligarang / BKB (9.8 km) - Rehabilitation of weir Simongan **Component B (Ditjen SDA)**	**Component C (Ditjen Cipta Karya)** Semarang River Drainage System Improvement - Construction of drainage pumps - Revertment installation - Dredging the river - Creation Box Culvert - Making Groundsill - Preparation of the inspection road - Construction of retention ponds Salt River Drainage System Improvement

Development of Dam jatibarang The principally benefits: - Flood control Q 50 th - Drink water 1005 l / s - Electric power capacity of 1500 Kw - Tourism place / object - Improving economy - Improve the quality of the environment	- Revertmentinstallation - Dredging the river - Creation Box Culvert - Making Groundsill - Preparation of the inspection road New River Drainage System Improvement - Dredging the New River - Construction of Flood Control Facilities

Source: BBWS Pemali Juana/ Exposure Parliament Flood Controlling 2011

This efforts that require much funds is expected to reduce the impact of flooding in the area of Semarang, especially in downtown area. Specifically in the area upstream is Dam jatibarang Development. Dam that are in the river flow of Kreo has many functions (multipurpose dam) such as; flood control, power generation (hydropower), drinking water supplies and tourism. Dam jatibarang is also equipped with the Green Belt Dam Conservation program or often called as Greenbelt Dam Jatibarang. For it is concerned with the conservation of water resources. Ministry of Public Works through the Directorate General of Water Resources in cooperation with the Central Java Provincial Government and the Semarang Municipal Government, has been pursuing the development of the first dam in Semarang, the Dam jatibarang.

In purpose the dam to be able to use continuously, sempadan area (the area around the dam upstream) should be set as the protected areas and water catchment areas. Construction of dam often constrained with sedimentation. As in Azdan and Samekto'spaper entitled "*Kritisnya Kondisi Bendungan di Indonesia*" (2011), they stated that the according to report of Project Implementation Plan for Dam Operational Improvement and Safety Project (DOISP), described that change has been occurred on the land conversion as much as 60 percent per 100 ha in green belt area (green belt) of dam in Indonesia during the 1990s until the 2000s. This would increase the impact of sedimentation in the bottom of the dam.

Although the construction of Dam jatibarang began in 2009 and flooding had been completed in 2014, there are various issues that would threaten the future sustainability of such dam, located on Ground Water Basin area (CAT). The dam location in the CAT can actually accelerate the absorption of ground water. However, the effect of land use alteration are high, this condition becomes a threat to the dam. Focused on map CAT and Land Use of DAS Kreo (Figure 1 and 2), puddle and border dam are located mostly in the cultivated area, the area is located in the upper watershed affixes Kreo and loose areas in the watershed downstream Kreo (Figure 1). Upstream region which should serve as a protected area, in fact converted into residential areas and dry land farming (Figure 2). So also with the border area and sempadan area. Both are adjacent to residential areas and dry land farming, the future of these conditions can accelerate the rate of sedimentation. Based on the research results of Robert J. Kodoatie (2010), explained that according to the results of sediment calculation in 2008 in the area of construction of Dam Jatibarang. Sediment has reached 486 000 tons of sediment per year at a rate of 136,000 m. Though the capacity of sediment plan (dead storage) is 6,800,000m and design life of 50 years. If the sedimentation rate is directly proportional to the rate of population growth in the upstream region and around the dam, and

the absence of rules governing land conversion, then dam problems can also occur in Dam Jatibarang if not anticipated.

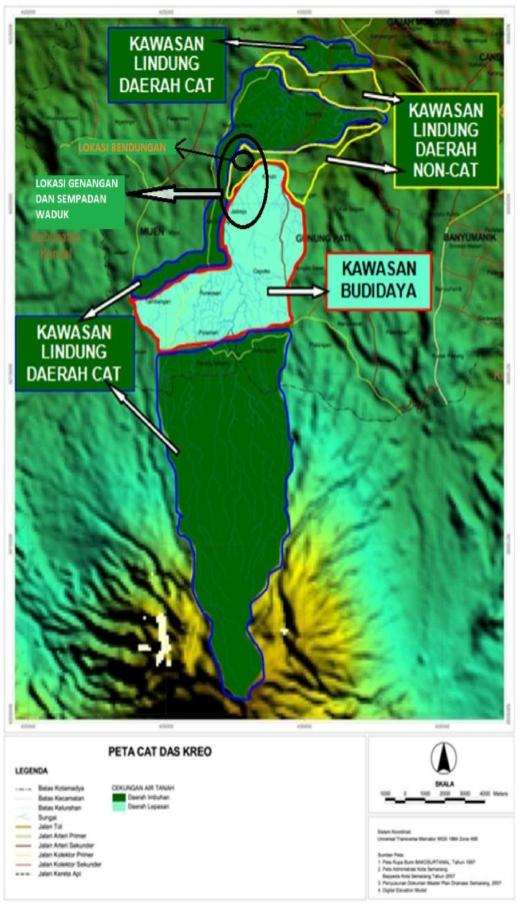


Figure 3. Map of Groundwater Basin (CAT) DAS Kreo

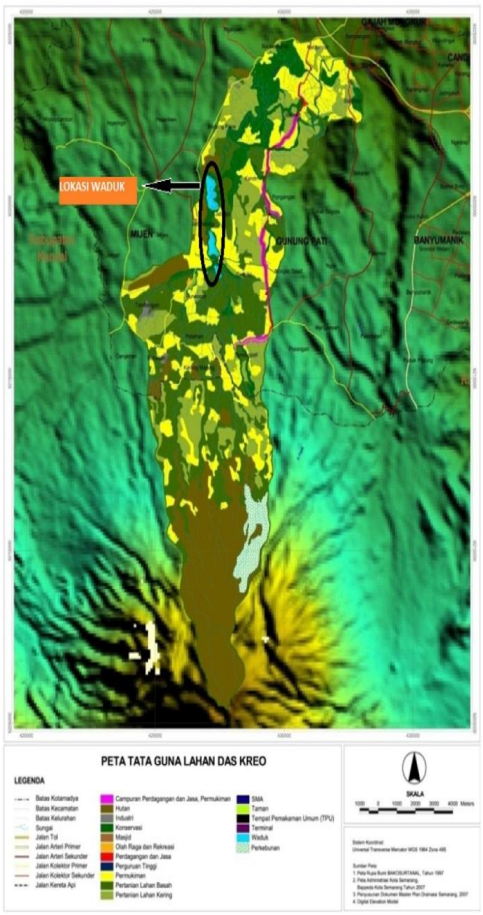


Figure 4. Map of Land Use in the watershed Kreo

Source: PSDA Semarang in Robert .J.Kodoatie presentation on Rapermen of Dam jatibarang Natural Resources Conservation 2010

Not only that, in Semarang City Regional Regulation No. 14 of 2011 on Spatial Planning (RTRW) Semarang in 2011 -2031, mentioned in the second paragraph of Article 115 (b) that the existence of a rule that prohibits the establishment of a building in the border water resources, border rivers, dam, ponds and irrigation networks. More than, if the building was located in areas prone to movement/ landslides and lies in the troubled region, such as the troubled region and dryland agriculture. Even in the Strategic Environmental Assessment (SEA) of Semarang, area Dam jatibarang area (village Jatibarang, Kedungpane, Purwosari, and Kandri) serve as areas prone to ground movements, landslides. Therefore most of the area is possible opportunities Dam jatibarang ground motion. In addition, Government Regulation 37 of 2010 on Dam Article 94 paragraph 4 also confirms that, riparian zones Dam

space utilization is possible only for research, scientific development activities and efforts to maintain the dam border areas. Efforts to maintain this (PP No. 37 of 2010 Article 103 paragraph 1 and 2 and PP 42 Year 2008 on the Management of Water Resources) in the form of rules that prohibit the discharge of waste water that does not meet quality standards, solid waste and/ or liquid waste. As well as the prohibition of building and land use that can disrupt the flow of water, reducing the capacity of the dam capacity or not as intended.

2. Problem Formulation

Efforts conservation Dam jatibarang which was launched in 2014 and was completed yesterday must involve many parties, especially from the public and government:

a) From the community

Community participation in efforts to protect and preserve of the public is not as easy as planned. More than, the upper section has implemented the Green Belt Dam Conservation program, which in the hope to reduce the impact of erosion and sedimentation. Especially in the area of land that is still bare feared to bring soil erosion and consequently the faster high sedimentation in dam dam, so that the life expectancy by age dam Q 50 years plan can be maximized. Community has invited socialization to keep and preserve, especially in the Upper and have formed conservationist groups but has not run optimally

b) From the Government

Application rules and maintenance of protected areas continuously sustainability of conservation programs and maintenance of infrastructure in order to function optimally from the dam runs. Synergy of all stakeholders are still in their own interestlevel.

3. Research Objectives

- Encourage all the related government (SKPD) / stakeholders to synergize each give function and its role in flood control for the sake of success.
- Encourage private parties through CSR to provide mentoring and empowering communities in environmental conservation
- Encourage and provide public awareness about the importance of conservation in the upstream region
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4. Research Methodology

The approach taken is to use a qualitative approach with research phases of data collection through observation, in-depth interview to the agency (Central River Region Pemali Juana; PSDA Semarang and Central Java Province; BLH Semarang and Central Java Province; CTI Consultant) and direct observation during field duty in dam jatibarang

5. Conclusion

a) That the Flood Control in Semarang should involve all stakeholders in both the public and private
b) The active role of the community, especially in the upstream region is expected to support the preservation of the dam in order to avoid the high sedimentation so that the flow of the river leading to downstream/ sea does not bring granular soils which can result in sedimentation/ siltation in the river estuary.

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