

# RISK ANALYZE : MANAGEMENT WATER QUALITY CISADANE RIVER BY PROJECT APPROACH

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## Abstract

Cisadane River is an important river of Banten Province Java Island Indonesia. Cisadane River water is used for irrigation, industry and municipal water supply. However, there are fundamental problems in the river, which is the low quality of the water. The government has been any treatment through several projects, including the normalization of rivers, construction of embankments, parks, and other facilities. The approach of these projects has yet exerted great influence in the management of river water quality, because of the high pollution of the river water. Implementation of project construction has a risk that can lead to poor water quality management. For the risks that may arise need to be analyzed so that the project assets and infrastructure can function. The process of analyzing possible risks may use a risk management approach. This research aims to identify risk on projects that have been carried out in the handling of Cisadane River, analysis of significant risks, and determine the type of response to significant risks. The research process is done by conducting a survey. The series begins with the identification of risk analysis through the study of literature, after it carried out a risk analysis performed by assessing risks on the project - a project that has been built before. The risk analysis is done by estimating the likelihood that the biggest risk will occur and the resulting impact. Based on the analysis results will be known which variables significant risks in project implementation and management are of project assets. So expect this study could provide a significant response in river water quality management through project approach that has been awakened.

**Keywords:** Quality water; Risk management; Project approach; Risk responses

## 1.0 INTRODUCTION

In Indonesia there are 15 rivers handling priorities, one of which is the Cisadane river. This river crosses five cities in the province of West Java and Banten Province, namely, Bogor, Bogor Regency, South Tangerang, Tangerang and Tangerang Regency. For Tangerang city, this river very important, because,

the main source of raw water for the fulfillment of Municipality Water Supply (PDAM). Water is the source of life, a necessity of production, and the fundamental element of ecology. Water resources have been the basic natural resource and a strategic economic resource necessary for human

society to progress [1], the river is a source of raw water that we have to keep the water quality and water quantity.

For the segment of Tangerang City, this river crossing along 15 km, the problems that occurred in this river is significant, one of which is water quality problems which do not meet the clean water standards. Besides the sedimentation is high, solid waste into the river, and the number of industries in the city of Tangerang which potentially adds to the pollution load of the river. Cisadane river water quality degradation is inseparable from land use change, population growth and urban development so rapidly. Population growth and urban development so rapidly will bring changes in land use, it can cause negative effects in the form of high pollution load [2]. Within a period of 8 years (2008-2016), the intervention of construction projects already undertaken by the government, but that does not mean the water quality of the river can be ignored. Data owned by Regional Environmental Agency of Tangerang (BLH Tangerang) years 2010-2015 demonstrate that contamination of the river water. For this reason, the necessary studies on the success of physical intervention that has been done on the river bodies. Studies conducted in the form of risk analysis. Through the analysis of risk to the project that has been and will be done, so that it can minimize the impact of project failure in the management of water quality Cisadane. Here is the location of the Cisadane River Segment Tangerang City (fig. 1).

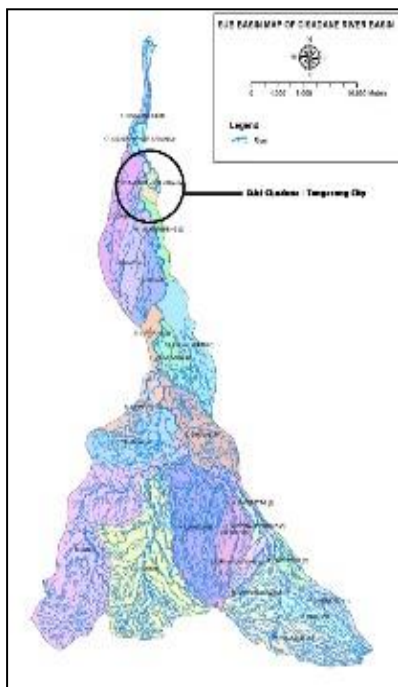


Fig. 1. Location of research in DAS Cisadane Segment Kota Tangerang (source: Bakosurtanal)

## 2.0 EXPERIMENTAL

The research process is done by conducting a survey. The series begins with the identification of risk analysis through the study of literature, after it carried out a risk analysis performed by assessing risks on the project - a project that has been built before. The risk analysis is done by estimating the likelihood that the biggest risk will occur and the resulting impact.

This research is motivated by the poor quality of Cisadanewater River in Tangerang City of Banten province.

## 3.0 RESULTS AND DISCUSSION

The construction project is an attempt to achieve a result in the form of buildings or infrastructure. Processes that occur in a project will not be repeated in other projects. It is caused by conditions that affect the process of a construction project different from each other. What is risk? Risk is a pervasive part of all actions. It would seem on the surface that the term "risk" is a simple well-understood notion. However, its definition is elusive, and its measurement is controversial [3].

The project risk is an event or condition that is uncertain, if it happens, have a positive or negative effect on one or more objectives of the project, such as scope, schedule, cost, and quality. Risks may have one or more causes and, if it happens, it may have one or more impact. The cause may be granted or potential requirements, assumptions, constraints, or conditions that create the possibility of a negative or positive result. For example, causes could include environmental permit requirements to do the job, or after the limited personnel assigned to design the project [4].

The shape of the risk is that the permitting agency may take longer than planned to issue permits. If one of the events is not inevitable, there may be an impact on the project, scope, cost, schedule, quality, or performance. Risk conditions may include these aspects of the project or environmental organizations that contribute to the risk of the project, such as project management practices are not yet mature, the lack of a unified management system, the burden of multiple projects simultaneously, or dependency on external participants who are outside the direct control of the project. The possibilities that there are also projects are carried out in stages every year, so it appears the distance of time can cause a risk.

The project risk has its origins in the uncertainty present in all projects. Unknown risks are those that have been identified and analyzed, making it

possible to plan responses to these risks. Known risks that cannot be managed proactively, should be given the contingency reserve. Unknown risks cannot be managed proactively and therefore may be assigned backup management. A negative project risks that have occurred are considered a problem. [4].

### Data Projects had been done

During the period of 8 years (from 2009 until 2016), the approach of construction projects been done by governments to address the issue of river water quality. That was done by Government through Centre Office of Ciliwung-Cisadane Watershed (BBWS Ciliwung-Cisadane), The Ministry Public Work & Human Settlements, and Local Government in Tangerang. Here is a list of projects that have been carried out (Table 1, 2, 3, and 4).

Table 1. Project Data in 2009

PROJECT CONSTRUCTION	LOCATION	OWNER	VOL (m)
Normalization riverbank Cisadane, retaining wall	Benteng Jaya Street	Regional Office of Hygiene and Parks (DKP Tangerang)	1190
Normalization riverbank Cisadane, retaining wall	Dadang Suprpto Street and Berhias Street	Regional Office of Hygiene and Parks (DKP Tangerang)	1270
Embankment construction	Cisadane River Tangerang City	Minister Public Work & Human Settlement	5720
Normalization riverbank Cisadane, retaining wall	Kalipasir Street	Regional Office of Hygiene and Parks (DKP Tangerang)	1788

Table 2. Project Data in 2009

PROJECT CONSTRUCTION	LOCATION	OWNER	VOL (m)
Normalization riverbank Cisadane, retaining wall	GJA Street	Regional Office of Hygiene and Parks (DKP Tangerang)	1173.25
Normalization riverbank Cisadane, retaining wall	Perintis Kemerdekaan Street	Regional Office of Hygiene and Parks (DKP Tangerang)	1690
Normalization riverbank Cisadane, retaining wall	UNIS Brigde	Minister Public Work & Human Settlement	828
Normalization riverbank Cisadane, retaining wall	Bojong Districk (GJA)	Minister Public Work & Human Settlement	675
Embankment construction	Cisadane River Tangerang City	Minister Public Work & Human Settlement	1500

Table 3. Project Data in 2016

PROJECT CONSTRUCTION	LOCATION	OWNER	VOL (m)
Box Culvert of Konstruktion	Kali Sabi	Minister Public Work & Human Settlement	470
Normalization riverbank Cisadane, retaining wall	Panunggan Barat Distric	Minister Public Work & Human Settlement	1000
Normalization riverbank Cisadane, retaining wall	Sukajadi Distric and Bojong Jaya Distric, Karawaci	Minister Public Work & Human Settlement	2105
Normalization riverbank Cisadane, retaining wall	Mekarsari Distric, Neglasari	Minister Public Work & Human Settlement	1053
Normalization riverbank Cisadane, retaining wall	Kampung Baru Distric and Koang Jaya, Karawaci	Minister Public Work & Human Settlement	1052

Table 4 Project Data Parks \Construction and Waste Water Offsite System (2009-2015)

PROJECT CONSTRUCTION	LOCATION	OWNER	VOL (m)
WWTP	Karawaci Distric	Regional Office Cipta Karya and Spatial Planning (DCKTR Tangerang)	1 units
WWTP	Tanah Tingi Distric	Regional Office Cipta Karya and Spatial Planning (DCKTR Tangerang)	1 units
Parks and Play Ground (Cisadane Walk)	Benteng Jaya Street	Regional Office of Hygiene and Parks (DKP Tangerang)	1 units
Parks and Play Ground	Dadang Suprpto Street and Berhias Street	Regional Office of Hygiene and Parks (DKP Tangerang)	1 units
Parks and Play Ground (Tangerang River Promenade)	Kalipasir Street	Regional Office of Hygiene and Parks (DKP Tangerang)	1 units

The table above shows the construction project approach to the management of river water quality is already quite a lot. For the normalization of work already done on the whole river. As for the other supporting the construction work has not been fully implemented. To Cisadane based on the quantity of project construction approach, still less than the priority of the Ciliwung river. In general, watershed management be the responsibility of the Ciliwung-

Cisadane BBWS Minister of Public Work and Human Settlement. Until now, pollution still occurs in the Cisadaneriver.

The stages that need to be done in the following risk analysis (fig 2),

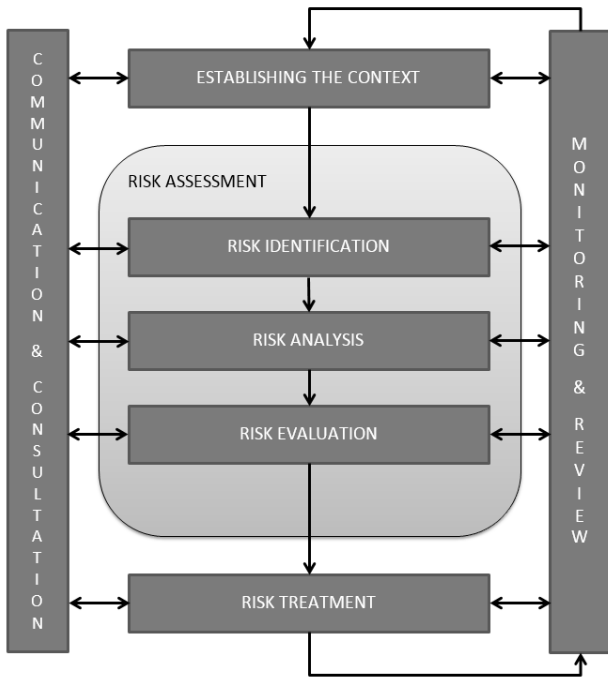


Figure 2. Diagram Process Risk Analysis

**Risk Identification**

The identification of the risk incurred is,

1. The work of retaining walls, not thoroughly completed, could lead to landslides on the banks of rivers that have not yet been constructed retaining wall.
2. Construction of the park by the river to beautify the river, but the people who visit the park can throw garbage in the garden area so they can get into water bodies.
3. Construction of WWTP basin Cisadane new Tangerang City serves 2% only, so that the rest can potentially contaminate the river Cisadane.
4. Construction of a gradual, if not in the maintenance properly and does not involve public participation could undermine the construction of the building.

5. The construction is done in Cisadane not complete and has not been maximized, even the river is losing priority to the Ciliwung river.

The output of risk identification is the risk register, the following table lists the risk register

Table 5(a). Table Risk Register

Category (1)	Risk Description (2)	Root Cause (3)
Environment	Erosion in the river bodies that have not been built retaining wall	Erosion or landslides
Environment	The presence of solid waste that goes to the river body of society activities in the park	People throw garbage
Environment	Service WWTP only 2% can cause water pollution from household waste	The low coverage of services
Quality	Damage to building assets	Lack of good planning and a lack of community participation
Political	In priority outdone by the Ciliwung River, so that the development undertaken not optimal	Ciliwung river compared with losing priority

Table 5(b). Continue Table of Risk Register

Impact (4)	Potential responded (5)	Risk Owner (6)
River pollution	Build retaining wall totally	Government (BBWS)
River pollution	Socialization and education to the public	Local Government (DKP Tangerang)
River pollution	The WWTP service coverage up to 20%	Local Government (DCKTR Tangerang)
Construction is not functioning optimally	Construction work is made sustainable	Government (BBWS)
Lack of comprehensive physical development (management of water quality was not optimal)	Strengthening coordination among stakeholders, especially local governments and the central government (BBWS Ciliwung-Cisadane)	Local Government

**Analysis Risk**

Of the risk register above, to respond to the risk it is done, point 1 (erosion) → retention, point 2 (solid waste) → reduction, point 3 (WWTP) → Transfer, point no 4 (quality) → Avoid, and point 5 (political) → Avoid. Positive and negative risks are often referred to as the opportunities and threats. The project is

acceptable if the risks are within tolerances and balanced with rewards that can be gained by taking the risk. Positive risk offers the opportunity within the limits of risk tolerance can be pursued to produce enhanced value.

For example, adopting an aggressive resource optimization technique is a risk taken with the anticipation of using less resources. Risk approach should be developed for each project, and communication about risk and its handling should be open and honest. Risk response reflects the perceived organizational balance between risk taking and risk avoidance.

#### 4.0 CONCLUSION

1. To be successful, an organization must be committed to address risk management proactively and consistently throughout the project. A conscious choice must be made at all levels of the organization to actively identify and pursue effective risk management during the project period. Project risk may exist at the starting time project. Moving forward on a project without a proactive focus on risk management tends to cause more problems arising from the threat without management.
2. Risk management should be considered in a construction project, so that the potential risks that might occur in the project can be predicted accurately and be able to do a strategic plan dealing with risks before they occur.
3. Water pollution control strategies due to effluent domestic and industrial waste water is one of the efforts undertaken in the framework of the prevention and reduction of water pollution and restore the quality of water according to their natural state so that the water quality maintained in accordance with the designation. Public participation is also needed to control the pollution load. For that needed treatment is complex and multi-dimensional.

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