



FLOOD MANAGEMENT STRATEGY IN MUARA TEWEH CITY, NORTH BARITO REGENCY

Warno*, Muhammad Riduansyah Syafari, Irwansyah, Fitriadi

Masters Program in Development Studies, Postgraduate Program, Universitas Lambung Mangkurat,
Banjarmasin City, South Kalimantan, Indonesia

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***Corresponding author**

Abstract

The problem of annual flooding that never ends is a strategic problem. There are three problems expressed, namely what flood management efforts and strategies have been carried out? What are the obstacles to overcoming it? Qualitative approach method with descriptive type. The data collection procedures are interviews, observation and documentation. data analysis using data reduction, data presentation, and verification/drawing conclusions, as well as SWOT analysis. The results of the research show: there are 4 (four) flood prevention and control programs, namely first, the construction of cliff strengthening buildings. Second, Normalization of River Restoration. Third, Rehabilitation & Maintenance - River Banks and Embankments. Fourth, increased cleaning and dredging of rivers/streams. However, the four programs are based on Edward III's theoretical analysis which includes communication, resources, disposition and bureaucratic structure which are not yet optimal. There are 3 inhibiting factors, namely: lowland areas, settlements on river banks and bodies, limited budget, and depending on the scale of development priorities. SWOT analysis produces 4 alternative strategies, where the SO strategy is the main alternative strategy, namely: Developing a strategic plan for flood disaster management through synergy plans for TAKAKI Development, Siring and Dredging the Barito River watershed which is experiencing silting in collaboration with the private sector and Civil Society in flood disaster management in implementing these 3 development programs.

Keywords: Barito River, Flood Management, Strategy.

INTRODUCTION

The flood disaster in Muara Teweh City, North Barito Regency, has occurred since 1957 until now in 2024. Floods occur almost every year, especially when rainfall is very high. This flood disaster seems to have become an annual routine that occurs very often. During that time, the biggest flood occurred twice, namely in 1957 which hit parts of North Barito Regency and the surrounding regencies. The second major flood occurred in 2024. This flood disaster was recorded as having greatly harmed the people of Muara Teweh City, both materially and non-materially. The economy of Muara Teweh City, North Barito Regency during the major flood and annual flood greatly disrupted the economic activities of the people of Muara Teweh City in particular and the regency in general.

This flood disaster is generally caused by the intensity of very high rainfall, and is also supported by the condition of the Muara Teweh City area which is the lowest lowland and is divided by the Bengaris River, one of the tributaries of the Barito River. This condition is exacerbated by the shallowing of the Barito River and the tributaries of the Barito River, so that high rainfall cannot be accommodated by the Barito River and its tributaries. As a result, the Barito River and its tributaries are unable to accommodate high-intensity rainwater flow, so they overflow and cause flooding in lowland areas, especially in the Muara Teweh City area. Specifically for some of the Bengaris River DAS channels, it is also constrained by the growth of urban settlements in some areas of the banks and body of the Bengaris River DAS. Various flood control programs in Muara Teweh City and its surroundings have been carried out, such as dredging the Bengaris River channel, but have not been able to overcome the annual flooding that continues to hit Muara Teweh City.

The phenomenon of annual flood disasters in the city of Muara Teweh is a very strategic problem, so it requires strategic analysis in order to overcome flood disasters in this city. This research is interesting because the problem is very strategic, and requires strategic analysis. In analyzing the strategic aspects of this problem, the SWOT analysis model approach is used, which is expected to produce 4 alternative strategic plans that are very relevant to the needs of science and the strategic problems of annual flood disasters in the city of Muara Teweh.

RESEARCH METHODS

This study uses a qualitative approach, which is natural setting, and relies on qualitative data collection techniques of observation, in-depth interviews and documents relevant to the research problem. The type used is descriptive, but also does not leave the explanatory pattern required by the study (Afrizal, 2015, Sugiono, 2012, Creswell, 2018, Nawawi, 2007, Suryabrata, 2011). To analyze research data, the following procedural stages are followed: data reduction, data presentation, and verification/drawing conclusions (Miles and Huberman in Afrizal, 2015). For strategy analysis, refer to the SWOT analysis model proposed by Fred R David (2015).

RESULTS AND DISCUSSION

Flood Control Efforts in Muara Teweh City

The new efforts made by the Public Works and Spatial Planning Agency according to the Head of Operations and Maintenance as the Functional Position of Irrigation Engineering in the Water Resources Sector, Mr. H. Puryani, ST., MT said: *"The efforts made by the Public Works and Spatial Planning Agency of North Barito Regency are indeed not comprehensive, the new mitigation steps are in the form of dredging the river at certain points only, not the entire length of the river, be it in the Montallat River, Teweh River, including in the Bengaris River. Especially for the Bengaris River*

which is already overgrown with settlements along the river channel of around ± 3 KM, this condition causes dredging to not be able to be done using heavy equipment (excavators) by using manual methods such as cutting tree trunks and clearing bushes on the right and left of the river and lifting piles of garbage in the river channel. For areas of land that are empty of settlements, we usually use heavy equipment (excavators), so that the dredging channel can be done more and longer, but the entire work cannot be done either, due to the limited budget available". (Interview, April 15, 2024).

Budget constraints cause dredging of the shallowing of the Barito River tributaries, including the Bengaris River tributary, to be suboptimal, so that implementation at certain points is only carried out on the Bengaris River which is already occupied by residential areas along ± 3 km which is done manually, cannot use heavy equipment (excavators), so that the work cannot be done quickly, because it is done manually, and requires a lot of human labor.

There are several activity programs that have been budgeted by the North Barito Regency Government, as a form of effort made in flood control activities can be seen in Table 1 below:

Table 1. Recapitulation of Flood Control Activity Program Total Budget Ceiling Source of Funds for Water Resources Sector for Fiscal Years 2019 to 2023

No	Program Name Activities	Total Funds for Fiscal Year				
		2019 (Rp)	2020 (Rp)	2021 (Rp)	2022 (Rp)	2023 (Rp)
1	Building Construction - Cliff Reinforcement	-	-	-	299.500.000	2.250.455.000
2	River Normalization/Restoration	-	-	199.000.000	245.392.000	3.302.000.000
3	Rehabilitation & Maintenance - Riverbanks and Embankments	1.924.000.000	1.539.700.000	-	-	-
4	Increased Cleaning River and Dredging	1.290.000.000	286.000.000	-	-	-
	Total Amount of Funds	3.214.000.000	1.825.700.000	199.000.000	544.892.000	5.552.455.000

Data source: Research by the PUPR Service of North Barito Regency, 2024.

Based on the secondary data above, it is known that the Public Works and Spatial Planning Agency of North Barito Regency through the Water Resources Sector, has implemented 4 activity programs as an effort to control flooding not only in Muara Teweh City but throughout the entire area of North Barito Regency which is considered prone to flooding and areas that are often affected by flood disasters. However, as explained previously, all flood control activity programs have not been optimal in preventing the dangers of flooding that occur almost every year during the rainy season and the intensity of the rain is very high. The Barito Watershed and the Barito River tributary watersheds are unable to channel water properly to the Barito River estuary, not only because the watershed is shallowing but also because the Barito River water is also high and overflowing, causing the watersheds of the Barito River tributaries to also overflow.

The major flood in 2024 is considered to have the same cause as the major flood in 2005 which was the first major flood event in North Barito Regency in Muara Teweh City. Meeting of the Public Works and Spatial Planning Agency of North Barito Regency in the Water Resources Sector with the Head of the Kalimantan III Banjarmasin River Basin Office (BWS) in South Kalimantan regarding the handling of the major flood disaster in 2024 which was considered the largest flood disaster repeating the major flood disaster in 2005. The results of the meeting recommended that a strategic plan for handling this major flood be immediately analyzed. It was agreed to immediately prepare the formulation of a strategic plan for handling the flood disaster which occurs very often. It is necessary to immediately formulate a Long-Term, Medium-Term and Short-Term Plan, so that the problem of flood disasters in North Barito Regency, including in Muara Teweh City, which has caused the economic activities of the community to stop, especially those directly affected by the flood disaster. Strategic planning is very deep in Development to resolve the problem of Flood disasters comprehensively (Syafari, 2021). The most important thing is that decision making also runs very cleanly, free from various lobbying behaviors that have nuances of shortcomings that are filled with certain interests of profit alone, so that this strategic plan becomes the main priority scale (Wrihatnolo, Randy R. and Riant Nugroho Dwijowijoto. 2006).

Handling of major floods in 2024 and considering the very frequent floods that occur every year, related to the need for strategic planning, which was confirmed by the Head of Water Resources Division, Mr. H. Junaidi, S.Pd. confirmed that there was a meeting with the Head of the Kalimantan III Regional Office (BWS) in May 2024 regarding handling major floods in 2024. (Results of the discussion on May 17, 2024). In order to improve strategic flood disaster management efforts in the future, the Public Works and Spatial Planning Service of North Barito Regency has also planned and discussed at the internal organizational level the idea of a plan to build the Bengaris River Right-Left Embankment, then continued with the construction of a gutter or strengthening the cliff which also functions as a tourist spot and can also be built a jogging track on the embankment, as well as dredging and widening work on the Bengaris River which is narrowing and shallowing. Although still in the planning stage, this idea is very interesting, because flood management efforts have strategic benefits. Head of Operations and Maintenance as the Functional Position of Irrigation Engineering in the Water Resources Sector, Mr. H. Puryani, ST., MT explained: *"Discussion of the idea of the Bengaris River Right-Left Embankment Development Plan, on which there is also a plan to build a gutter building or cliff reinforcement like in Banjarmasin City, in addition to strengthening the foundation of the riverbank so that it does not collapse and erode, it also raises the riverbank to reduce the possibility of river water overflowing, in addition to the embankment being built and gutters, a plan is also being considered to build a jogging track, which is an attractive city tourist entertainment venue, and can also have an impact on improving the regional economy because it can help improve the economy of the community such as small traders (street vendors) who are neatly arranged. This Program Plan can also prevent the increase in residents who intend to build houses on the riverbanks to the point of consuming the body of the Bengaris River, because they can see above the green belt that embankments and gutters will likely continue to be built in the future"*. (Interview, April 15, 2024).

The explanation in the presentation of the Head of Operations and Maintenance as the Functional Position of Irrigation Engineering in the Water Resources Sector is interesting to follow up. According to the researcher, the idea of the program plan is very interesting to note and realize, because the effects of its development can not only have a positive impact in reducing the risk of flooding due to overflowing tributaries of the Barito River including in this case the Bengaris River. If the idea of this plan can be realized by the North Barito Regency

Government through the Public Works and Spatial Planning Service of North Barito Regency, the effect will be great in reducing the danger of flooding and reducing the growth of settlements that take up riverbanks, creating the potential for artificial city tourism that is proud and entertaining for the residents of Muara Teweh City and North Barito Regency, especially local tourism, and Central Kalimantan in general.

Factors Inhibiting Flood Management in Muara Teweh City

Factors that hinder flood disaster management in North Barito Regency are some that come from nature and some are related to social and financial budgets. Based on the results of interviews and field observations, it was found that the factors that hinder flood disaster management in Muara Teweh City, North Barito Regency can be stated as follows:

1. Regional Conditions

Muara Teweh City is an area that is partly lowland, from other areas. This condition causes Muara Teweh City to become the last point of submerged water collection. The very high rainfall conditions and the overflowing of the Barito River Basin and its tributaries cause water to inundate part of Muara Teweh City, and including in this case the main urban area which is the lowest land from other areas.

With this type of area, Muara Teweh City is often a flood area, especially when the rainfall intensity is very high, coupled with the overflowing of the Barito River Basin and the Barito River tributaries. Muara Teweh City, which is irrigated by the Bengaris River watershed, every time this watershed overflows, automatically some of the lowland areas of Muara Teweh City are submerged in floodwater.

The above conditions were also confirmed by the Head of Operations and Maintenance as the Functional Position of Irrigation Engineering in the Water Resources Sector. Based on the results of an interview with Mr. H. Puryani, ST., MT, Public Works and Spatial Planning Office of North Barito Regency: *"You confirmed that the Muara Teweh City area is indeed the lowest lowland area compared to other areas, so that when the weather is extreme in the form of heavy rain with high intensity, the potential for City Flooding is very large, so that Muara Teweh City is often hit by annual floods, in addition to high rainfall coupled with the overflowing of the Barito River and its tributaries. The overflowing of the Barito tributaries is estimated to be due to symptoms of shallowing of the River Watershed, therefore, we have also planned to dredge the Barito tributary watershed, but it has not been comprehensive at all points, either using modern equipment or using human power. Especially for watersheds that already have housing on them, cleaning is carried out manually (human power) without using heavy equipment (excavators), besides that not all points, due to budget limitations"*. (interview, April 16, 2024).

Natural factors in the form of high rainfall, and overflowing Barito River Basin and Barito River Basin, as well as the texture of the lowland area, are the weaknesses of Muara Teweh City which is often hit by annual floods. Another effort, related to the potential for shallowing, is a program to dredge the Barito River tributary basins that cross the water and irrigate the city. However, due to the limited budget for DAU activities, the dredging program is only carried out in certain areas, especially basins that have been used as residential areas, so the dredging work is carried out manually (human power), namely only clearing undergrowth, lifting garbage or cutting tree trunks on the right and left of the river channel.

2. Residents' Disobedience in Building Houses on Riverbanks

The behavior of some city dwellers building houses on riverbanks occurs in many large cities and medium-sized cities in various cities and densely populated areas, including in the city of Muara Teweh. This behavior usually occurs because there are city dwellers who are urban or unable to buy land and residential property which is now quite expensive. However, the existence of settlements on the banks of the Bengaris River greatly disrupts the dredging program, causing river silting, because heavy dredging equipment (excavators) cannot be used, so dredging requires manual labor, namely a lot of human labor, and the results are not optimal.

This was emphasized by Mr. H. Junaidi, S.Pd. as Head of Water Resources Division of the Public Works and Spatial Planning Service of North Barito Regency as follows: *"The Bengaris River is one of the tributaries of the Barito River that irrigates the water of Muara Teweh City which is located in the middle of the city, during the rainy season with very high rainfall coupled with the overflowing of the Barito River and tributaries of the Barito River, causing flooding. The 2024 flood is a very large flood disaster and is estimated to be the same as the major flood in 2005. In addition, Muara Teweh City is a lowland area, so it is very prone to flooding. The efforts we have made include dredging the Barito River tributary watershed, including the Bengaris River. Specifically, the Bengaris River is rather difficult to dredge, because the Bengaris Watershed is already overgrown with residential areas, and many houses have entered the riverbanks. This condition makes it very difficult for us to carry out the dredging program optimally, because we cannot use heavy equipment (excavators) and only in certain locations can it be done optimally. Therefore, we have a plan to try to propose a program to build the Right-Left Embankments of the Bengaris River, so that it is hoped that residents will think about not building houses on the banks of the Bengaris River anymore, in addition, we also plan to continue with the construction of gutters and strengthening the cliffs above it, the plan is to build a jogging track for residents of Muara Teweh City and outside Muara Teweh City which makes it one of the artificial or local tourist attractions. So that this program has multiple benefits for Regional Development in Muara Teweh City in the future"*. (interview, April 16, 2024).

The presentation delivered by Mr. H. Junaidi, S.Pd. Head of Water Resources Division, actually strengthened the explanation from the Head of Operations and Maintenance as the Functional Officer of Irrigation Engineering in the Water Resources Division, Mr. H. Puryani, ST., MT. and made the direction of flood control efforts in Muara Teweh City in the future clearer. The last effort which is still in the idea and planning stage, according to the researcher, is a strategic idea and plan for flood control in Muara Teweh City which has multiple benefits. In addition to being useful for reducing the potential effects of annual floods which cause many material and non-material losses, it is also useful for the development of the artificial tourism sector through city waterway tourist attractions and attractive jogging track locations. The strategic idea of the Public Works and Spatial Planning Service of North Barito Regency through the Water Resources Sector, deserves to be supported and targeted as one of the breakthrough ideas for the Medium and Long Term strategic plans for overcoming the annual flood disaster in Muara Teweh City.

3. Limited Budget

Efforts to overcome the flood disaster that occurs almost every year in Muara Teweh City and its surroundings require strategic efforts. Strategic planning and strategic policy making are needed to reduce and prevent the adverse effects of the annual flood disaster. The flood disaster management program that is often carried out is dredging the Barito tributary watershed, but is only limited to certain areas. Based on researcher observations from 2023-2024, dredging of the

Barito tributary watershed was only in certain areas, not all of them. Even dredging in the Bengaris River watershed is only in areas in the city center and at certain points too, even worse in areas where there are settlements, dredging or cleaning only relies on human physical labor (manual), because the area is narrow due to the presence of residential buildings, so using heavy equipment (excavators) cannot enter and operate in river areas where there are settlements.

This is in accordance with the results of a previous interview with the Head of the Water Resources Division of the Public Works and Spatial Planning Agency of North Barito Regency, that it turns out that river areas with residential areas are very difficult to dredge using heavy equipment (excavators). Another effect is that some residents who live on the banks of the river throw garbage in the river and there is no awareness of residents to throw garbage in its place. Mr. H. Puryani, ST., MT. Head of Operations and Maintenance as the Functional Officer of Irrigation Engineering in the Water Resources Division of the Public Works and Spatial Planning Agency of North Barito Regency explained that: *"Why is it only in certain areas, not all of them, because of budget limitations, so that the finances are focused on certain areas that can be implemented according to the available budget"*. (interview, April 16, 2024).

As previously explained by the Head of Water Resources and Head of Operations and Maintenance as the Functional Officer of Irrigation Engineering in the Water Resources Sector, the Public Works and Spatial Planning Agency of North Barito Regency, attempted to propose ideas and planning related to the Right and Left Embankment Development Plan (TAKAKI), Siring Development, and Jogging Track, as well as comprehensive dredging of the Bengaris River Watershed. However, all of these proposals were delayed in the development budget priority. There were revisions to the development program proposals that were linked to the budget priority scale. Due to the lack of budget, not all discussions of program proposals could be approved and budgeted, or there were programs that were approved, but with a very limited budget, such as the Barito River tributary watershed dredging program which was only limited to certain areas.

There are 4 (four) alternative strategies that can be decided for flood management in Muara Teweh City in particular and North Barito Regency in general. The four alternative strategies can be described as follows:

- 1) Prepare a flood disaster management strategic plan through synergy of TAKAKI Development Plan, Siring and Dredging of Barito River tributary watersheds that are experiencing shallowing in collaboration with the Private Sector and Civil Society in flood disaster management in implementing the 3 Development programs
- 2) Together with the Kalimantan III Center (BWS) to finalize the Flood Management Strategic Plan through synergy of 3 interrelated programs, the comprehensive Barito River tributary watershed dredging program, TAKAKI Program and City Siring.
- 3) Encourage proposing and facilitating the establishment of flood disaster management collaboration (Public Works and Spatial Planning Agency as the main facilitator) with the Private Sector and Civil Society, as well as lobbying for funding sharing other than the APBD, namely the APBN with the Province and the Center.
- 4) Optimization of DAS Dredging of Barito River tributaries, especially Bengaris River by optimizing collaboration with the Private Sector (business world) and Civil Society such as Organizations, Karang Taruna, ABRI in the TMMD Program, and others.

The four strategies can be decided and implemented as very important strategies in overcoming annual flood disasters, especially when entering the rainy season with high intensity. The most important strategic step is to immediately formulate a strategic plan for the Public Works and Spatial Planning Service of North Barito Regency with the Kalimantan III Center (BWS) of South Kalimantan Province, so that this strategic activity plan can be immediately agreed upon and formalized and implemented.

CONCLUSSION

In order to overcome flooding in Muara Teweh City in particular and North Barito Regency in general, 4 (four) flood prevention and mitigation programs have been implemented, namely first, Construction of Cliff Reinforcement Structures. Second, Normalization of River Restoration. Third, Rehabilitation & Maintenance of Riverbanks and Embankments. Fourth, Increasing Cleaning and Dredging of Rivers/Rivers. However, the four programs based on the analysis of Edward III's theory which includes communication, resources, disposition and bureaucratic structure are considered not optimal and have not been able to prevent annual flooding during high rainfall. The factors that hinder the success of the flood mitigation program are first, the condition of the Muara Teweh city area which is lowland, and the lowest of the other areas. Second, the non-compliance of residents who build houses on riverbanks until they enter the river body. Third, the limited budget, so that the program is not comprehensive and depends on the priority scale of the Development program.

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