

APPLICATION OF LOCAL COMMUNITY WISDOM IN REHABILITATION OF RIVER EROSION IN KAMPAR DISTRICT

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ABSTRACT: Research on applying local wisdom in rehabilitating river erosion was carried out in the Kenegarian Rumbio Kampar District. The aim of this research is to identify efforts to rehabilitate river erosion, identify factors that are inhibiting in rehabilitating river erosion, identifying factors that are inhibiting in rehabilitating river erosion, as well as identifying and evaluating efforts made in overcoming the obstacles of river erosion rehabilitation at Kenegerian Rumbio Kabupaten Kampar. Results of research local wisdom are obtained 1) effort rehabilitation of river erosion has been good because it has been run down hereditary by the community, 2) factors resistor there are 4, the hat is household waste dumped into the river, replacement plants of river cliff, mining activities, and land clearing In river banks, and 3) efforts undertaken to overcome the obstacles of river erosion rehabilitation done in 2 ways that are by the method of vegetative and method of civil engineering.

Keywords: Local Wisdom, Rehabilitating, River Erosion, Kenegerian Rumbio.

1. INTRODUCTION

As a tropical country with a rich natural power source, Indonesia is vital in ensuring the quality and continuity of life on earth. However, Indonesia and several other tropical countries, such as Brazil, Zaire, and Mexico, have the most biological diversity (mega biodiversity). Pressure to source power naturally is due to the increased number of residents involved in all his activities, such as managing the power river. Efforts to recover and maintain the function of the river that experienced degradation are usually known with conservation efforts in the form of rehabilitation area flow river (D.A.S.). In general, conservation with methods to rehabilitate area-flow rivers is a method of protection that can improve and maintain the river's return to its original function. Changes in a river's condition often occur because of natural factors and human beings do not consider conservative land management [1].

The acceleration of liver damage is a pressing issue, outpacing recovery efforts. The increasing damage to the river, year after year, is a cause for concern. This deterioration negatively impacts the quality of river water and its ecology. Without Government action and integration between related

elements, the situation will only worsen, posing a significant threat to the river's health. Effective conservation requires the active participation of various elements, including society, Government, and conservation actors. Public awareness of the importance of environmental protection is crucial [1].

The public can voluntarily contribute to environmental protection when empowered with this knowledge. However, in some areas, competing interests can hinder such participation. The Government plays a crucial role in conservation. The agency facilitates, controls, and provides solutions to environmental problems. When the government takes conservation seriously, it can effectively handle river rehabilitation, providing a sense of reassurance and confidence in the system. Frequent efforts in implementation activity rehabilitation from the former until now are still relevant for implementation in the field. Conservation is carried out by two methods: system technique civil and system use of vegetation (vegetative) [3].

The system technique is civil and directed at development construction, whereas the system is directed at activity planting. Conservation system vegetation like This is Already done by grandma

ancestors, in a way hereditary in group public. Mainland Riau Malays, who live on the edge of four big rivers, such as the Siak River, Rokan River, Kampar River, and Indragiri River, have done this for a long time [4, 8, 9].

[5-7] revealed that the people of Kampar, especially in Kenegarian Rumbio, already know local wisdom in a hereditary way for the conservation and rehabilitation of the cliff river with bamboo, angsana, and hibiscus plant trees. The Kampar Regency Regional Government has made various efforts to prevent and overcome erosion in the Cliff River. Generally, Government business rehabilitation is a civil system technique. Constructing retaining walls and dams has become the most appropriate choice to overcome the problem. However, businesses still need to be capable of overcoming the problems because more dots, dots, or locations along the Kampar River Basin are experiencing erosion of cliff rivers [10-12].

As In The Country of Rumbio, the erosion cliff river Still Keeps going. Broad land agriculture and several vital buildings such as the market, street highway, school, home residents, and house worship are already very worrying because they are already near the lips of the river. Phenomenon This No may leave alone Keep going happen. This Can be confirmed to impact the sustainability source of the Power Kampar watershed, economy, And society. Profound, integrated, sustainable, and quality must be quickly searched for and implemented. In the business frame, protect the Cliff River from the threat of erosion [13-14].

2. METHODS

This study uses a survey method that directly captures data from on-site observation research. The data collected is classified as a qualitative approach to study. Location research was conducted in the country of Rumbio, which includes the region Kampar District, namely Padang Mutung Village and Village Rumbio, and the region Subdistrict Rumbio Jaya, namely Village Natural Length and Village Island Umbrella, Kampar Regency, Riau Province.

The materials and tools used in data collection are divided into observation area flow river (D.A.S.) and perception society and stakeholder policy. Respondents or key figures: This is determined on purpose by the researcher (purposive). Respondents in the study This consists of (a) the Head of the Village or customs figure, (b) Society figures, (c) Society and (d) Government Apparatus. Appointment Respondents or key figure from The Headman or custom figure that is Progenitor Godang as leader or shoot custom Statehood Rumbio, Datuk Ghindo Marajo, Datuk Your Highness Sindo, Datuk The Malinth Camp, and Progenitor Ghindo Spado. Determination Respondent.

3. RESULTS AND DISCUSSION

Kenegarian Rumbio is an area of several villages led by a traditional leader called ninik mamak. The division of Kenegarian Rumbio is not the same as the administrative division made by the Government, so when viewed from the Government's administration, Kenegarian Rumbio is divided into two sub-districts, namely Kampar Sub-district and Rumbio Jaya Sub-district.

The topography of Kenegarian Rumbio consists of small hills and rivers. The hills contain freshwater reserves that are used by the local community, and the river that flows in Kenegarian Rumbio is used for fishing activities. The people of Kenegarian Rumbio primarily work as traders, fish farmers, and gardeners, and a small number work as fishermen, sand and river stone miners, civil servants, and other jobs. The large number of traders, farmers, and gardeners is influenced by Kenegarian Rumbio's strategic and fertile location.

Local Wisdom Rehabilitates River Erosion in Rumbio Regency

The application of local wisdom to rehabilitate river erosion in Rumbio Regency began with the community's habits and behaviors, which became a daily culture and habit. Local wisdom develops in everyday life and is passed on to children and grandchildren [5]. In addition, immigrant communities influence the habits of local communities, both positively and negatively. Local wisdom that has emerged in the Rumbio Kenegarian community in river erosion rehabilitation activities is spread across four villages: Alam Panjang Village, Pulau Payung Village, Rumbio Village and Padang Mutung Village. In addition to plants planted by the community, some plants already exist and grow naturally in the riverbank area. These natural plants play a vital role in preventing erosion on riverbanks. From field observations, we can see that several types of plants are growing on riverbanks. For more precise data on plants on riverbanks, see Table 1 below:

Table 1. Precise Data on Plants on Riverbanks

Local Name	Common Name	Distribution		Nature of Life	
		Lots	Rare/ Step	Experience	Planted
Langsono**	Angsana	-	√	-	√
Agho*	Fig Wood	√	-	√	√
Balanti**	Berlanti	-	√	√	√
Kalimpiang**	-	-	√	√	√
Pimpiong*	Pimping	√	-	√	-
Baghigin**	Beringin	-	√	-	√
Awu Biaso**	Water Bamboo	√	-	√	√
Awu Batu**	Aur Batu / Bamboo Batu	√	-	√	√
Awu Kuuning**	Yellow Aur / Yellow Bamboo	-	√	-	√
Poyong**	Bamboo	-	√	-	√
Tobu Owau / Tabowau*	Reeds / Sala sugar cane	√	-	√	√

Source: Primary Data 2024 Information :

* = Development can be good naturally

** = Development is better planted than natural

The community often uses plants to hold cliffs and prevent erosion, such as reeds or sugar cane (*Saccharum spontaneum*) and aur batu or bamboo batu (*Dendrocalamus strictus*). These plants are chosen because they can prevent erosion on riverbanks and even form new land on riverbanks. In addition to reeds and aur batu, some people also plant angšana (*Pterocarpus indicus*), banyan (*Ficus benjamina*), yellow aur (*Bambusa vulgaris*) and poyong. The method used with these plants is called the agronomic method because it utilizes vegetation to reduce the rate of land erosion. Planting these plants has been carried out for generations in Rumbio. There are several reasons why people choose reed and aur batu plants. Reed plants are chosen because they grow densely and have flexible stems, so they do not break easily when blown by strong winds in areas along the river. Aur batu is chosen because the stems and clumps of aur Batu are not too large, so they are lighter and more resistant to strong winds.

This plant is an option for rehabilitating riverbanks because, in addition to functioning as a retainer for riverbanks from erosion, this plant also has other benefits. Reeds that grow thickly on the banks of rivers are usually nesting places for several types of fish and birds. At the same time, poyong (local) can be processed into raw materials in making fishing gear such as bubuk (Pangilau and Lukah: local), food ingredients, especially young shoots or bamboo shoots from aur batu, raw materials for crafts, and building materials. Because there is so much use of this type of poyong (local) bamboo, its existence along the Kampar River is decreasing and becoming rare. Apart from the bamboo or poyong plant species which are becoming rare, the Belanti (Balanti: local), angšana (langsono: local), fig tree (agho: local), yellow aur, and Kalimpaian (local) plants are also rarely found. There are several stages of planting cliff- supporting plants. Specifically for planting

gelagah, aur batu, aur kuning, poyong and angšana plants, the Kenegarian Rumbio community has a traditional way of planting. In addition, in the planting treatment, plant sorting is carried out in order to obtain plants that are suitable for planting.

Inhibiting Factors in Rehabilitating River Erosion

River erosion rehabilitation activities in the Rumbio Regency area are inseparable from threats of damage to rivers and riverbanks. Threats come from within and outside the Rumbio Regency area. Threats within the Rumbio Regency area come from community members, such as throwing household waste into the river, replacing riverbank plants, illegal mining and land clearing. Threats from outside the Rumbio Regency include household waste being washed away from the river upstream and river sand and stone mining.

All the threats that arise can have direct or indirect impacts, and the process of change in the river can also be felt quickly or slowly. The impacts caused by these threats include river shallowing, decreasing water quality (pH, brightness, and odour), damage to river banks and the loss of several types of animals and plants around the river. The types of threats mentioned are explained as follows:

Household Waste Thrown into the River.

Many rivers worldwide are not free from pollution due to human activities. One of the most significant contributors to river pollution is garbage. Garbage is a threat to rivers because there is still a habit of throwing garbage into rivers and assuming that the garbage will drift and disappear.

Uncontrolled household waste causes pollution, especially river pollution because, in the

garbage, there are organic and non-organic substances that become one; in addition, household waste causes dangerous germs that cause significant epidemics in the community. Household waste that enters the Kampar Kenegarian Rumbio River waters is carried chiefly away from the upstream.

In addition, household waste made of plastic can cover the surface and bottom of river waters so that the roots and leaves of aquatic plants are covered. As a result of the covering of the roots and leaves of aquatic plants, these aquatic plants die slowly because they have difficulty absorbing nutrients and carrying out the process of photosynthesis.

Therefore, household waste threatens river erosion rehabilitation, even though mitigation has been carried out through local wisdom and civil engineering. However, the principle of efforts to prevent and minimize erosion is to cover the surface of the soil as tightly as possible, either by tiered plant crowns or litter on the floor of the land, and increase water can enter the soil.

River Bank Plant Replacement.

River erosion can also occur due to the conversion of river banks. The conversion of land here is a change in the arrangement of plants on the riverbank, with plants that cannot withstand erosion by river water. Plants planted as a replacement for reeds and stone are cassava (*Manihot utilisima*) and oil palm (*Elaeis guineensis*). Substitute plants such as cassava cannot maintain riverbanks because the roots of cassava are tubers that loosen the soil, and the tubers will be harvested after they are complete and about one year old. In addition, cassava stems are easily tilted and broken if exposed to strong winds. The oil palm plants are not very strong in binding soil particles on the cliff, so the riverbank is easily eroded and even carries the oil palm itself. and selected as most appropriate for river cliff protection. However, not all vegetation on the riverbank is suitable for various places because soil factors, water flow dynamics, sunlight, temperature, and microclimate influence this type of plant.

Mining Activities

Mining activities in the Kampar River have been ongoing for a long time and have existed since the 60s. This mining activity also occurs in the Rumbio region. Due to replacing reeds and aur batu plants with cassava and oil palm plants, several river banks have experienced erosion. The worst erosion was found in Alam Panjang Village and Rumbio Village. In Alam Panjang Village, the local community has arranged retaining walls from sacks on the riverbank. This effort was made to prevent landslides and erosion on the riverbank. The efforts

could only temporarily hold the riverbank and would only last long if the reeds and aur batu vegetation were replanted. Another alternative is to carry out revetment using civil engineering, namely constructing permanent retaining walls.

Riverbank Land Clearing

Land clearing is also a threat in the riverbank area of Kenegarian Rumbio. As a result of this land clearing, the riverbank can change from supporting plants to settlements, ports, bridges, plantations, livestock and others. In addition, this land clearing also causes riverbanks to collapse and become shallow. This shallowing is caused by the influence of river water flow and water from land to the river, which erodes the surrounding soil until it is washed away into the river.

This erosion significantly affects the riverbanks because there are no more plants that bind the soil so that rainwater does not carry it away to lower areas (rivers). In Kenegarian Rumbio, land clearing on the riverbanks has been used to construct swallow houses, ferry ports, and settlements. Several communities in Kenegarian Rumbio have experienced the negative impacts of riverbank erosion. The impacts felt by several communities include Village roads being cut off due to landslides in riverbanks, cracked houses, especially those around the river, and sinking of yard land due to river erosion landslides.

The boundaries of small rivers without embankments outside the city must be ± 50 meters from the right and left banks of the river. This regulation prohibits any building standing less than 50 meters from the river. Therefore, this regulation should be continuously socialized so that the community becomes more aware of the appropriate distance limits for opening settlements and other businesses so as not to have a significant material loss impact on the community and entrepreneurs who come to Kenegarian Rumbio.

Prevention Efforts to Reduce the Threat of Riverbank Erosion Based on Local Wisdom

Various methods have been used to prevent riverbank erosion in Rumbio Regency. These efforts come not only from the community but also from the government. The efforts have been made using biological (vegetative) and civil engineering methods. In implementing riverbank erosion prevention efforts, the community usually provides reports verbally or in writing to the Ninik Mamak of Kenegarian Rumbio. After receiving reports from the community, a meeting will be held by the traditional leaders of Kenegarian Rumbio to discuss the collapsed riverbank. Usually, from the results of the decision of the traditional leaders' meeting,

cooperation will be carried out to make a semi-permanent embankment from sacks filled with sand. This civil engineering method is carried out by placing sacks under the collapsed riverbank to prevent a broader collapse of the cliff (Figure 8. A). In addition, the Ninik Mamak also submitted assistance to the local Government to be given financial and physical assistance to overcome riverbank erosion.

At the same time, reforestation is also carried out using vegetative or biological methods. (Figure 8. B), while the Government is carrying out riverbank erosion control using civil engineering methods. The civil engineering methods include embankments and retaining walls. Both of these methods have been implemented to prevent riverbank erosion. Chemical methods have never been used in Rumbio.

In Kenegarian Rumbio, there are rules for maintaining rivers, both utilizing and maintaining them. However, the current rules that regulate river erosion rehabilitation activities have not been stated in written rules. Although there are no written rules that regulate local wisdom in Kenegarian Rumbio in rehabilitating river erosion, the people of Kenegarian Rumbio still follow the rules given by the ninik mamak even though they are verbal.

The rules made by the ninik mamak since ancient times and still apply today are that people are only allowed to cut down plants that support the cliff once they become extinct but can take as much as they need. Likewise, residents who work as sand and stone seekers are prohibited from mining too close to the riverbank. In addition, other efforts are made to provide sanctions to rule violators. However, because there are still no written rules, it is difficult to enforce customary law against violators who come from outside the Rumbio region. This makes existing law enforcement still not very strong.

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5. CONCLUSION

The study results showed that the local wisdom of Kenegarian Rumbio in implementing river erosion rehabilitation efforts is sound because it has been carried out from generation to generation by the community, even though there are no written rules. Four inhibiting factors in rehabilitating river erosion in Kenegarian Rumbio are household waste dumped into the river, replacing riverbank plants, mining activities, and clearing riverbank land. Meanwhile, efforts to overcome obstacles to river

erosion rehabilitation in Kenegarian Rumbio are carried out in two ways, namely by vegetative or biological methods and civil engineering methods. At this time in Kenegarian Rumbio, it is necessary to create customary rules on rehabilitating river erosion in written form.

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