



Community-Based Management of Sub-Watershed Batang Masumai Sustainable

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Abstract. The development paradigm so far, where efforts to improve ecosystem conditions in various watersheds are carried out with a top-down approach must be shifted to community involvement so that they play a role and are responsible for maintaining river sustainability. Therefore, community empowerment as an effort to increase community understanding, skills, and sense of belonging to the Batang Mesumai sub-watershed must be carried out to increase community participation in creating a sustainable watershed. This study aims to map the social, economic, and cultural potential of the community as well as actors and stakeholders as a basis for community-based management of the Batang Mesumai sub-watershed. The research uses a case study approach and is analyzed qualitatively. The results of this study recommend community-based restoration of the Batang Mesumai sub-watershed through participatory conservation involving the community. Such conservation can be carried out with a participatory approach through the stages of Mapping social, economic, and cultural potentials; extracting the potential of local knowledge; and mapping stakeholders in the management of the Batang Mesumai sub-watershed.

Keywords: Participation · Sustainable · Watershed

1 Introduction

As a water system unit, the watershed is influenced by upstream conditions, especially the biophysical conditions of the catchment areas and water catchment areas where many places are vulnerable to the threat of human disturbance. This reflects that watershed sustainability is determined by behavioral patterns, socio-economic conditions, and the level of management which are closely related to institutional arrangements [1].

Watersheds (DAS) give importance to the community, especially regarding the services provided by a watershed as a hydrological and ecological function. Errors in managing the watershed have an impact on decreasing the quality and carrying capacity of resources in the upstream (on-site) and resulting in losses in the downstream area (off-site). Therefore, watersheds must be managed comprehensively and appropriately. Mismanagement of the watershed will cause the watershed to become critical.

Watershed management should be based on the relationship between human needs and the availability of resources to meet those needs. Management is needed, both if the availability of resources is not sufficient to meet all needs, and if the availability is abundant [2]. Given the importance of the Batang Mesumai sub-watershed service for the community, it is necessary to formulate and take concrete steps that can overcome the degradation of rivers and the environment around the area.

The management of the Batang Mesumai sub-watershed is closely related to the people who have been active in the area. Community empowerment as an effort to increase community understanding, skills, and sense of belonging to the Batang Mesumai sub-watershed is expected to increase community participation in creating a sustainable and sustainable watershed. The development paradigm so far, where efforts to improve ecosystem conditions in various watersheds are carried out using a physical approach (project pattern) must be shifted by involving the community to play a role and be responsible for keeping the Batang Mesumai sub-watershed sustainable. For this reason, it is necessary to carry out participatory conservation involving the community, starting from building ideas/opinions/ideas, and planning and implementing activities, so that there will be harmony in development in the physical, biological, and human aspects.

This study aims to map the social, economic, and cultural potential of the community as well as actors and stakeholders as a basis for community-based management of the Batang Mesumai sub-watershed.

2 Literature Review

2.1 Community Empowerment

States that empowerment is one of the alternative paradigm paths in development communication besides PAR (Participatory Action Research). The empowerment approach is widely used in community organizing, education, and community psychology. Therefore, empowerment can be interpreted in many ways and can be observed at various levels, namely individuals, organizations, and communities. At the community level, empowerment means the process of increasing control of groups over important consequences for group members and others in the wider community. Meanwhile, at the individual level, empowerment is defined as “a psychological feeling regarding control or personal influence and concern for actual social influence, political power, and legal law.

[3] also agrees and states empowerment as a process of helping disadvantaged individuals and/or groups of people to compete effectively with other interest groups by helping them learn to use a lobbying approach, use the media, engage in political action, and provide understanding to others. Them to work systematically, and so on.

The shift to the issue of empowerment has implications for changes in ethics, methodology, and philosophy of concepts in development communication theories. In terms of ethics, researchers are encouraged to care for oppressed groups: women, the poor, ethnic and linguistic minorities, refugees, and others. Attention to practical and ethical matters (axiology) takes precedence over epistemological issues such as objectivity and the separation between the researcher and the researched (detachment).

2.2 Watershed

A Watershed is an area that is bordered by mountain ridges where rainwater that falls on the area will be accommodated by the mountain ridges and will be channeled through small rivers to the main river. In general, the watershed is understood as a stretch of area/area that is bounded by a topographic barrier (ridge) that functions to receive, and collect rainwater, sediment, and nutrients and drain it through tributaries and out at one point.

The watershed ecosystem is formed from a collection of various elements, such as vegetation, soil, water, humans, and all the efforts made in the area. Therefore, the watershed components can be divided into two major groups. The first watershed component is the physical environment, which includes: the shape of the area (topology, shape, and area of the watershed); soil (soil type, physical-chemical properties, ability class); water (quality and quantity); vegetation or forest (type, density, distribution). While the second watershed component is humans, which includes: the total population around the watershed; and necessities of life.

Watershed Management and Conservation Objectives An increase in the number of people who live or work around the watershed, which is often accompanied by the growth of activities to meet the needs of life, can give rise to destructive aspects of river flows. These negative aspects can create pressure on the physical environment of the watershed. If the pressure gets bigger, the environmental carrying capacity in the watershed will also decrease. Watersheds actually always bring many benefits to living things, including humans. However, the use of natural resources around the watershed by humans is often excessive. As a result, land and forest degradation occurs in the watershed area which causes serious impacts. This of course affects the function and balance of the environment, including in the hydrological process. This means that although rivers provide benefits to humans and the surrounding environment, they can also have negative impacts, as a consequence of environmental damage or disasters. Negative impacts such as flooding, and bring sedimentation or pollutant waste.

Various negative impacts are more likely to occur if the carrying capacity of the environment in the watershed decreases. Therefore, watershed management efforts are needed. So the goal of watershed management is to increase the use of the watershed and at the same time minimize its negative impact. In other words, the purpose of watershed management is to control the reciprocal relationship between the two components of the watershed, namely human activities and the environment. Good watershed management can produce positive impacts such as agricultural production, forest products, animal husbandry, water recreation, and the fulfillment of other life needs.

3 Research Method

This study uses a qualitative method with a case study approach. This method originates from the disciplines of sociology, anthropology, and humanity to explain data more specifically in a study [4].

The research location is upstream of the Batang Mesumai sub-watershed, including Tiga Alur Village, Bukit Perentak Village, and Baru Pangkalan Jambu Village, Pangkalan

Jambi District, Merangin Regency. Primary data collection was carried out through in-depth interviews, FGDs, and field observations. In-depth interviews were conducted with key informants consisting of village heads, community leaders, traditional leaders, heads of farmer groups, and representatives from the village community. Data and information were also collected from research reports, media, BPS, and other relevant documents. To obtain data, the researcher emphasized the dialectical interaction between the researcher and the source to confirm from reading various literature relevant to the research topic. This research was conducted from July to September 2022. The data collected were analyzed descriptively and qualitatively. Qualitative descriptive analysis is by providing a review or interpretation of the data obtained so that it becomes clearer and more meaningful. The steps are data reduction, data presentation with charts and text, then drawing conclusions to reveal facts, circumstances, phenomena, variables, and circumstances that occurred during the research.

4 Result and Discussion

4.1 Characteristics of the Batang Mesumai Sub-Watershed Community

1. People's Livelihoods

Generally, the work of the people in the study area is as a farmer, especially rubber and lowland rice commodities. However, this work in the last 10 years began to shift. The low price of rubber latex is between Rp. 8,000-Rp.10,000 was considered unable to meet the needs of the community so the community began to abandon rubber plantations. While the results from the lowland rice sector, people prefer to consume it themselves or share the results with relatives. Currently, most of the community is doing gold panning/mining activities.

In fact, since their ancestors have been panning for gold in the traditional way, Since 2015 people have started to abandon traditional gold mining and shift to using heavy equipment, namely Dompeng, and using excavators so that it is possible to get more gold to produce gold on their land. For local people, panning/mining for gold is quite promising because of the gold contained in their land and the price of gold which is fairly high, which ranges from Rp. 700,000 – Rp. 900,000 Per Gram. People who do not own land or there are no signs of gold in their land, are also workers in other people's gold mines and get a 10% share of the mining products. In the distribution of mining products on land that is being mined, the land owner and those who have capital will get 60% of the results from the mine, and the land owner or people in elders in the family who own the land will get 30% share, and the last one who gets the distribution is workers/community who participate in mining gold as much as 10% of the mining results obtained.

Illegal gold mining activities are generally located in rice fields and areas around rivers that are carried out by residents, which have a negative impact on river sustainability. The real and visible impacts of Illegal gold mining activities on the Batang Mesumai sub-watershed include sedimentation, riverbank damage, decreased water quality (cloudy), and threats to the sustainability of aquatic biota.

Even though at this time, villagers still depend on gold mining for their livelihoods through illegal gold mining activities, in fact, the study area also has the potential for natural resources which, if managed properly, are very prospective to add value and improve their welfare, and do not have a serious impact on environmental sustainability. Especially the condition of the river which is increasingly worrying. These potentials include farming coffee, cinnamon, lowland rice, and rubber.

However, according to residents, the community still cannot focus on the agricultural sector because there are several obstacles they face, for example, for coffee cultivation, only a few village communities are interested and start it. For the cinnamon commodity, the community has just started planting and has not yet experienced the results, while in lowland rice farming, the orientation of farmers is only limited to fulfilling family consumption, even if it is sold only for the surrounding community because rice production has only met the needs of the surrounding community. Generally, people sell more brown rice than ordinary rice. From rubber farming, the community feels that sales of rubber latex are very low and currently the price of rubber is very low. This condition encourages them to look for other sources of livelihood, including illegal gold mining activities to fulfill their daily needs. In addition to panning/mining gold, rubber farmers have also shifted to farming lowland rice by cultivating their own agricultural land or on other people's land, either renting or lending it to be managed with an agreement that the harvest is owned by the tenant because the average land is borrowed or leased. Belongs to a close family or relative.

2. Customs, Local Knowledge, and Local Wisdom in the Management of the Batang Mesumai Sub-Watershed

In general, the people of Tiga Alur Village, Bukit Perentak, and Baru Pangkalan Jambu have relatively the same customs, because they still have the same ancestry, namely the Jambi Malay tribe.

A very thick custom that is always carried out regularly every year is the Mantai Adat event. Mantai Adat is an activity carried out by the people of the Pangkalan Jambu sub-district 5 days before the fast of Ramadan. The activity is in the form of cutting buffalo donated by residents and distributing 1 bushel or 2.5 kg of buffalo meat to each house. On the tenth day of the month of Ramadan, young people will flock to carry out Bedi Buluh or generally called Reed Cannon which is carried out at night until the night of Eid takbiran. Then on the 15th day before Eid al-Fitr, people will make a special meal, namely Gelamai. Gelamai is one of the snacks with the basic ingredients of glutinous rice flour, palm sugar, and coconut milk, in other areas it is commonly called dodol or jenang. Gelamai will be served at every home during Eid with the aim of honoring the guests who come.

The next activity that has become a tradition for the local community when a flood occurs is Nanggok Shrimp or looking for shrimp in the river, Nyalo, which is fishing for fish in the river, and Gintang, which is stretching out river leaflets to catch fish. During the summer, residents will catch fish in holes used for illegal gold mining activities and some residents will pan for gold traditionally.

The customs related to farming activities, namely Baarin, are mutual cooperation activities for farmers when planting rice and harvesting. Baarin is carried out alternately

from one farmer to another with the aim of lightening the work as well as motivating each other to continue farming lowland rice.

Customary institutions in the study area are still very strong. Most strategic decisions are made by customs, such as customary forest management rights, permits, and prohibition of forest use, the community is generally still very obedient to customary norms that have existed since their ancestors, and the community is very obedient to customary rules and respects religious leaders - traditional figures. In addition to customary norms, they are also obedient to village government institutions.

The two leadership institutions go hand in hand or respect each other's duties and functions. However, as a norm, the community prioritizes customary ethics before entering formal government, and the village government itself recognizes this in which traditional values and local wisdom must take precedence. Village administration is more about carrying out regional administrative functions while traditional institutions function related to preserving local wisdom, culture, and existing social institutions.

Local knowledge is divided into 2 forms, namely pragmatic forms and supernatural forms. The pragmatic form involves knowledge about the use of natural resources, whether recognized as private property, public/collective, or government assets, which have a direct impact on landscape changes and changes in the functions of the agroecosystem components. Local knowledge in a pragmatic form owned by the people of Tiga Alur Village, Bukit Perentak, and Baru Pangkalan Jambu, one of which is the restoration of land used for illegal gold mining activities or commonly referred to by local people as Nuko Lahan. This activity is purely local knowledge that comes from the surrounding community, in an effort to restore land around watersheds. The restored land was caused by gold mining carried out on the land, according to Mrs. Nurlaila as the main originator of Nuko Lahan, this activity has been carried out since 2014 when all the land has been mined so that there is no more land for farming so that there will be economic difficulties after that, this is what became the motivation of Mrs. Nurlaila to carry out the land restoration.

Nuko Lahan is traditionally done by: (1). The former illegal gold mining activities land is leveled and the stones contained in the land are buried into and covered with the soil surrounding the land; (2). The land is fed by water from rivers through irrigation that has been facilitated by the local government or they make canals or streams from various nearby springs; (3). The land is left for approximately 2–6 months to produce mud that is ready to be planted with rice; (4) The land is ready to be planted with rice.

Along with technological developments, several farmers, starting with Mr. Budri-ansyah, carried out modern land restoration using heavy equipment such as excavators. This activity was first carried out in 2016, making it easier for farmers to restore land and can do it quickly.

According to residents, the experience of Nuko Lahan activities greatly influenced the increase in rice yields compared to before, which increased on average from 500 quintals to 1 tonne, this was due to the expansion of rice fields by leveling the rice fields increased the number of rice plants and made it easier farmers in the process of planting to harvest.

The next local knowledge is that the community has implemented a terracing system on rice fields since their ancestors and continues to be maintained until now.

Local knowledge in the form of the supernatural can be traced through the basic forms of rules/norms generated by the beliefs, religion, morals, and culture of the local community. Local knowledge in the form of a supernatural that is believed by the community is the Sorcerer Mountain which is believed to be able to send a message of impending harm or danger. The message sent was in the form of animals that descended into the residents' settlements, such as large fish that were caught in the fishing nets belonging to residents and wild animals such as monkeys and others. When the residents realize the message, the traditional leaders will hold a Gatik Jalan Tolak Balak or tahlilan conducted by the community specifically for men only. The tahlilan is carried out around the village and the women will stay at home by closing the doors and windows.

The village of Baru Pangkalan Jambu has local wisdom that is still maintained now, the local wisdom found in this village is the Customary Forest which is very closely guarded by the residents of the Baru Pangkalan Jambu village. This customary forest is located 4–5 km upstream with an area of about 700 Ha.

4.2 Identification of Stakeholders/Actors in Batang Mesumai Sub-Watershed Management

Influential stakeholders in the study area villages are the village head and traditional leaders or commonly called Nenek Mamak. The role of customary leaders: Relates to the preservation of customary norms, customary regulations, and customary law in accordance with those passed down by ancestors. Traditional leaders are also the organizers of all activities related to customs, while the role of the village government is related to village administration issues and civil registration of residents, but still, the village head and lurah still play a legal role as regional leaders. The collaboration between traditional and formal leadership creates a balance and harmony of development in the three villages.

4.3 Batang Mesumai Sub-Watershed Restoration Based on Community Empowerment

River restoration is to restore the size of both the width and depth of the river according to its initial condition. According to [5], river restoration is aimed at increasing the river's capacity and facilitating flow. Restoration is an attempt to return something to its original condition [6]. River restoration includes the re-establishment of the condition of a watershed which emphasizes the integration of factors that affect the condition of a watershed such as the interaction between humans, land, land, water, and culture. According to Maryono in Apriando (2015), there are five concepts of river restoration including (1) hydrological restoration (2) ecological restoration (3) morphological restoration (4) socio-economic restoration (5) institutional and regulatory restoration.

1. By referring to the social, economic, cultural, and local knowledge potential as well as the presence of stakeholders, watershed management activities whose carrying capacity will be restored can be carried out through the following:
2. Optimization of land use, in accordance with the function and carrying capacity of the region;

3. Utilization of local knowledge of Nuko Lahan in land restoration ex illegal gold mining activities as good practice in soil and water conservation is carried out in the context of maintaining the continuity of water catchment areas, maintaining water quality, quantity, continuity, and distribution
4. Vegetation management, especially the Pangkalan Jambu Indigenous Forest based on local wisdom in the context of preserving biodiversity, increasing land productivity, ecosystem restoration, rehabilitation, and land reclamation;
5. Increased awareness and participation of stakeholders in a participatory and sustainable manner, where they are expected to influence and be involved in overseeing initiatives and making decisions on land restoration and resource use that will affect the management of the Batang Mesumai sub-watershed;
6. Initiation and development of watershed management institutions to improve coordination, integration, and synergy in the recovery of the Batang Mesumai sub-watershed.

5 Conclusion

Illegal gold mining activities in rice fields and areas around rivers carried out by residents have had a negative impact on the sustainability of the Batang Mesumai sub-watershed, namely sedimentation, damage to riverbanks, decreased water quality (cloudy), and threats to the sustainability of water biota. The recovery activities for the degraded sub-watersheds can be carried out through optimizing land use, utilizing local knowledge of nuko land, local wisdom in protecting customary forests, participatory and sustainable stakeholder involvement, and institutional development of sub-watershed management to improve coordination, integration, and synergy in recovery of Batang Mesumai sub-watershed.

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