

# Policy Strategy for Watershed Rehabilitation Activities towards Community Empowerment in Belangian Village, Banjar Regency, South Kalimantan Province, Indonesia

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## ABSTRACT

Watershed Rehabilitation activities are an obligation that must be carried out by holders of Forest Area Use Agreements that not only have a good impact on the environment but can also provide tangible benefits to the community, especially in the economic sector. Existence of watershed rehabilitation activities is expected to help the community to increase their income while empowering the surrounding community. Descriptive analysis and SWOT analysis are the method of this study. The results of this study, the strengths are the existence of supporting regulations, the availability of adequate land, block and plot system patterns, carrying capacity and productivity, and the funds used are very large. Weaknesses in this study include inadequate facilities and infrastructure, slow disbursement of activity funds, poor seedlings, and limited access. Opportunities in this study include the availability of job opportunities, increasing people's purchasing power, improving people's standard of living, and improving people's mindset. Meanwhile, threats in this study include plant pests, forest fires, and implementation that still uses vendors and third parties. The SWOT matrix in the study

is in quadrant I so that the suitable strategy is aggressive strategy. The policy strategy that can be taken in this study is to optimize several factors such as optimizing regulations and rules that apply and are adjusted to local wisdom, making optimal use of land and optimizing workers from the community and implementing self-management so that the community can participate in watershed rehabilitation activities and increase the success of watershed rehabilitation activities.

**Keywords:** community empowerment, economic, strategy, SWOT analysis, watershed rehabilitation

## INTRODUCTION

A watershed is defined as a land area that forms a unified system of a main river and its tributaries, functioning to collect, store, and channel rainfall runoff naturally toward lakes or the sea. The land boundary of a watershed is determined by topographic divides, while the marine boundary extends to the aquatic area still influenced by terrestrial activities <sup>[1]</sup>. Watershed management refers to the human-driven efforts to regulate the reciprocal relationship between natural resources and human activities within the watershed area, aiming

to ensure ecosystem sustainability, harmony, and the enhanced utility of natural resources for human benefit in a sustainable manner<sup>[2]</sup>. The primary objective of watershed management is to prevent degradation and rehabilitate already damaged watershed areas.

One of the strategies for watershed management involves land rehabilitation or forest restoration. The benefits of forest restoration include halting and reversing environmental degradation, mitigating climate change, and addressing unsustainable development practices<sup>[3-5]</sup>. Restoration is crucial for rehabilitating degraded landscapes and enhancing biodiversity and ecosystem services, as well as for preventing soil erosion and regulating water flow. Additionally, restored forest cover can rejuvenate the fertility of degraded lands<sup>[5-6]</sup>. Watershed Rehabilitation activities are an obligation that must be carried out by holders of Forest Area Use Agreements that not only have a good impact on the environment but can also provide tangible benefits to the community, especially in the economic sector. The purpose of Watershed Management is to prevent destruction by maintaining carrying capacity and restoring damage, by making good planning and watershed management must unite institutional, social, economic and biophysical factors to achieve sustainability with many forms of land use within the watershed that are technically appropriate and safe, economically feasible, environmentally healthy, and socially, there is no rejection from the community. A well-managed forest area can provide many benefits, one of which is a place for people living around the forest to improve their livelihoods and welfare.

In addition to bringing jobs, watershed rehabilitation activities also bring business opportunities, namely the nursery business and the provision of plant stakes, in this case the forest farmer group community runs the business. Suryana said that opportunities depend on individuals who

recognize, find/build patterns and concepts that can be formed into an idea<sup>[7]</sup>. He further said that the resulting vision and insight of discovery or creation is an idea or idea that may be evaluated as an opportunity. The ability to see an opportunity is a separate skill, which in its exploitation of course requires continuous practice and habit.

The unemployment rate of the community in the Riam Kanan sub-watershed, especially in Belangian Village, is 3.98%. This is due to the high number of people who drop out of school only until elementary or junior high school. The majority of the people of Belangian Village work as farmers, planters, livestock breeders and fisheries, with per capita income from IDR 800,000/month to IDR 3,000,000/month. The dominant economic sector is agriculture and rubber plantations, the challenges faced are critical land and frequent forest fires that disrupt agricultural and plantation businesses. Behind these challenges, Belangian Village has natural tourism potential that can be developed to increase village income and the watershed rehabilitation site area can also be a source of additional income for the Belangian Village community.

The watershed rehabilitation program is expected to become one of the economic supports for the community in Belangian Village, Banjar Regency. This activity involves various stakeholders including holders of Forest Area Use Agreements, vendors implementing Forest Area Use Agreements, communities that are directly involved or directly or indirectly affected by this watershed rehabilitation activity. There are at least 7 companies holding Forest Area Use Agreements that carry out watershed rehabilitation in Belangian Village, Banjar Regency. Therefore, this research analyzes watershed rehabilitation activities and their influence on the empowerment of forest communities in Belangian Village, Banjar Regency, South Kalimantan Province, Indonesia.

## MATERIALS & METHODS

### Research Location

This research was conducted in Riam Kanan Sub-watershed, Belangian Village. This location is included in the administrative area of Aranio District, Banjar Regency, South Kalimantan Province. This research

was conducted over a period of 3 (three) months, which included literature review, preparation of a research proposal, data collection, data verification in the field, data analysis and final report writing. The map of the research location can be seen in Figure 1.

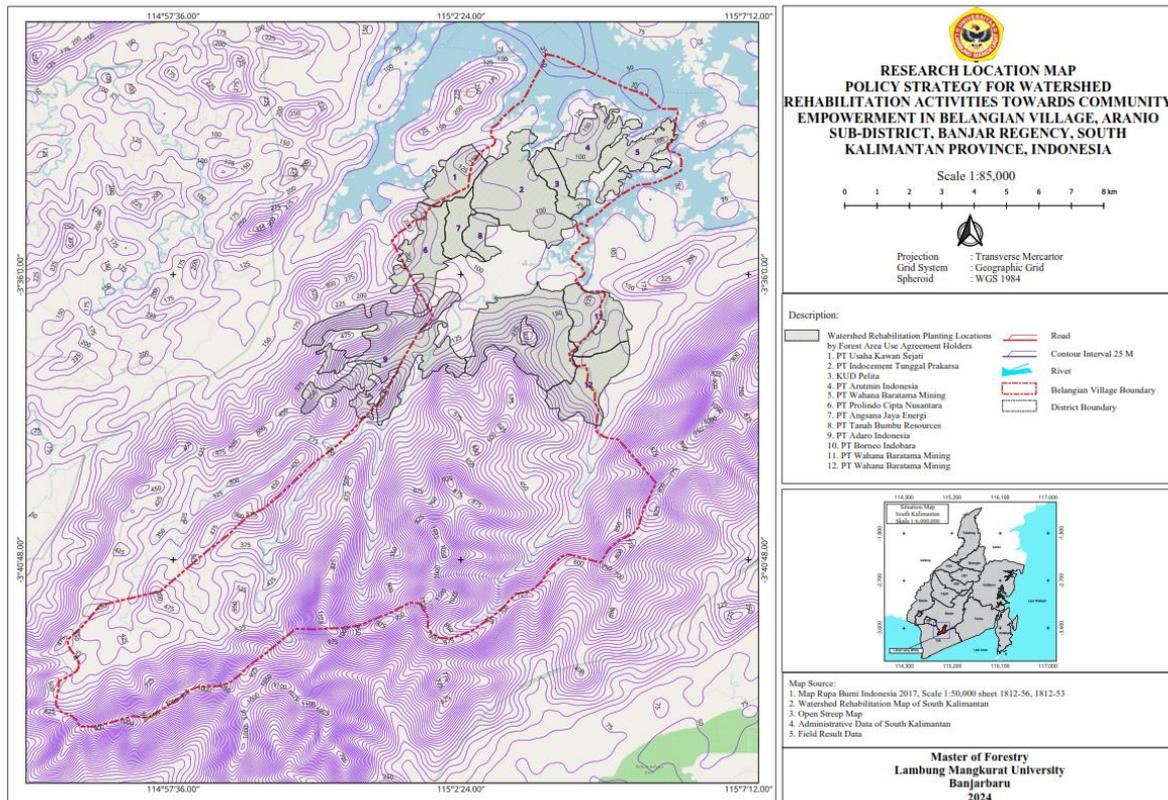


Figure 1 – Map of Research Location in Belangian Village

The tools and materials used in this research are stationary, camera laptop, village database, calculator questionnaires, and location map of watershed rehabilitation in Belangian Village.

The object of this research is the holder of the Forest Area Use Agreement and the implementing vendor in watershed rehabilitation activities and the community in Belangian Village whose village has watershed rehabilitation activities and is directly or indirectly involved in watershed rehabilitation activities.

### Research Procedure

The data taken in the research is divided into two, namely primary and secondary

data. Primary data was obtained through interviews with key informants and respondents while secondary data was obtained from documents that support research data such as government policies, management block documents, management plans, village statistical data, and previously conducted research. Primary data collection was carried out using interview techniques using a semi-structured questionnaire guide. A semi-structured questionnaire is a form of question in which respondents have been provided with certain answers so that when giving answers they are directed. Each answer will be given a score between 1 to 5. Questions are arranged based on 5 aspects and indicators on each aspect with the

calculation of the weight and value of each question. The purposive sampling method was used to determine and obtain research data from informants. The sample taken from the total population at the research location reached 350 people using the Slovin formula as follows:

$$n = \frac{N}{1 + Ne^2}$$

Description:

- n : minimum total sample
- N : total population
- e : error margin (10%)

Based on the existing data (the number of people living in Belangian Village is 350 people), the minimum number of samples that must be taken in the study is 78 people.

### Data Analysis

The analysis used in this research is an analysis of the effect of watershed rehabilitation policies on community income through descriptive analysis and analysis of watershed rehabilitation policy directions for community empowerment and income through SWOT analysis. The descriptive analysis used in this study will be explained in Figure 2.

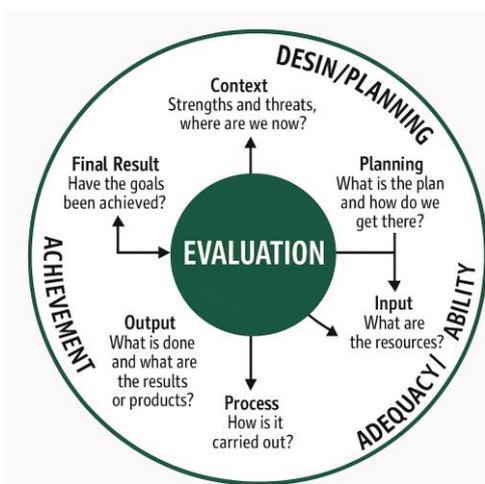


Figure 2. Sequence of the assessment process of the Belangian Village watershed rehabilitation program

The initial stage of descriptive analysis is to assess the effectiveness of the main elements that have an important role in management. Furthermore, planning for the management of the area and allocating existing resources to enter the activity process. The process that has been carried out is expected to provide output in the form of products and services that are in accordance with the plan. The SWOT analysis used is to determine the internal and external factors of the unit being analyzed. The most important activity in the analysis process is to understand all the information contained in a case, analyze the situation to find out what issues occur, and decide what actions must be taken immediately to solve the problem<sup>[8]</sup>. The internal factors observed are the strengths and weaknesses of watershed rehabilitation activities towards community empowerment while the external factors observed include opportunities and threats that may be faced in watershed rehabilitation activities in empowering communities around the activity location. The SWOT analysis model can be seen in Figure 3.

	Strengths	Weaknesses
Threats	<b>ST</b> Utilize strengths to face threats	<b>WT</b> Minimize weaknesses to face threats
Opportunities	<b>SO</b> Utilize strengths to seize opportunities	<b>WO</b> Overcome weaknesses to seize opportunities

Figure 3. SWOT Analysis Model

## RESULT

### Internal Factor Analysis of Watershed Rehabilitation Management

Internal factors of watershed rehabilitation management are divided into strengths and weaknesses with each having 5 strength factors that can be seen in Table 1 and 4 weakness factors that can be seen in Table 2.

**Table 1. Internal Strength Factors of watershed rehabilitation activity management**

No	Internal Strength Factors	Weight	Rating	Score
1	Existence of laws and regulations (e.g., Laws and Ministerial Regulations of Environment) supports smooth watershed rehabilitation process	0.20	5	0.910
2	Availability of large land areas in Belangian Village	0.17	4	0.748
3	The block and plot system is economically and ecologically designed to ensure sustainability of the environment and community around the watershed area	0.08	4	0.344
4	Carrying capacity, productivity, and role in maintaining life support systems	0.03	4	0.104
5	Large amount of funding allocated for watershed rehabilitation implementation	0.03	4	0.104
	<b>Total Strengths (S)</b>	<b>0.50</b>		<b>2.210</b>

**Table 2. Internal Weakness Factors of watershed rehabilitation activity management**

No	Internal Weakness Factors	Weight	Rating	Score
1	Supporting facilities and infrastructure for field implementers are still inadequate compared to those in mining operations	0.20	3	0.660
2	Delay in disbursement of funds to field implementers can hinder watershed rehabilitation process	0.13	3	0.416
3	The seedlings planted are not from superior (high-quality) seeds	0.10	3	0.305
4	Limited access to distant planting areas often results in neglect	0.07	3	0.210
	<b>Total Weaknesses (W)</b>	<b>0.50</b>		<b>1.591</b>

### External Factor Analysis of Watershed Rehabilitation Management

External factors of watershed rehabilitation management are divided into opportunities

and threats with each having 4 opportunity factors which can be seen in Table 3 and 3 threat factors which can be seen in Table 4.

**Table 3. External Opportunity Factors of watershed rehabilitation activity management**

No	External Opportunity Factors	Weight	Rating	Score
1	Provides employment opportunities for local communities and people from other regions	0.20	4	0.890
2	Improves regional economy as incoming workers increase village income through higher local purchasing power	0.13	4	0.553
3	Increases the standard of living for poor communities around forest areas	0.10	4	0.420
4	Improves community mindset to be more creative and innovative in sustainably developing natural resources	0.07	4	0.291
	<b>Total Opportunities (O)</b>	<b>0.50</b>		<b>2.153</b>

**Table 4. External Threat Factors of watershed rehabilitation activity management**

No	External Threat Factors	Weight	Rating	Score
1	Pests attacking crops may also affect watershed rehabilitation plants	0.20	3	0.640
2	Land fires	0.16	3	0.488
3	Watershed rehabilitation projects conducted by PPKH still rely on third-party vendors and supervisors, which should ideally use a self-managed implementation system	0.14	3	0.420
	<b>Total Threats (T)</b>	<b>0.50</b>		<b>1.548</b>

### Determination of SWOT Matrix and Quadrants

The SWOT matrix combines the analysis of internal factors (strengths and weaknesses) with external factors (opportunities and threats). From the results of the arrangement of the internal and external factors above, it

results in the following series of scores: strength (S) = 2,210; weakness (W) = 1,591; opportunity (O) = 2,153; and threat (T) = 1,548. The value of the SWOT matrix in this study will be entered into the SWOT quadrant to determine the direction of policies or strategies needed to develop the

economy of the Belangian Village community. The x value in the quadrant shows internal factors (S-W) while the y

value shows external factors (O-T). So that the SWOT quadrant value in this study is (0.62; 0.61).

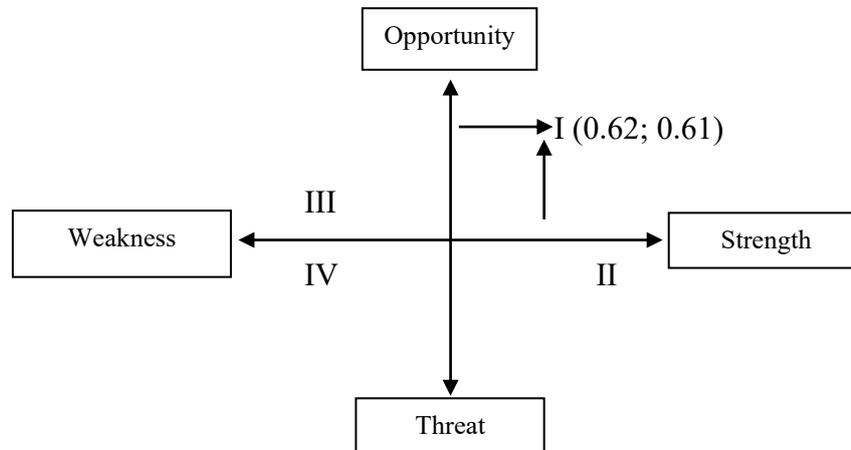


Figure 4. SWOT Analysis Diagram

Based on the IFAS and EFAS calculations, the SWOT analysis position is in quadrant I with (Aggressive Strategy), namely with the strengths that the company has, it must be able to take advantage of existing

opportunities while overcoming emerging weaknesses and is a favorable situation, the company has opportunities and strengths so that it can take advantage of existing opportunities.

Table 5. SWOT Matrix of Management of Watershed Rehabilitation Activities to Improve the Economy of the Belangian Village Community

INTERNAL		Strength (S)	Weakness (W)
EXTERNAL	Opportunity (O)	1. The existence of supporting regulations 2. The availability of adequate land 3. Carrying capacity and productivity 4. The funds used are very large	1. Inadequate facilities and infrastructure 2. Slow disbursement of activity funds 3. Poor seedlings 4. Limited access
	Threat (T)	Strategy (S-O) a. Carry out watershed rehabilitation in accordance with applicable rules and regulations as legitimization to the government and adjust to local wisdom in determining its policies; b. Utilizing the availability of large enough land as a planting location can be collaborated with agricultural crops to support the community's economy; c. Implementing a block system watershed rehabilitation planting pattern so as to improve the standard of living of the poor; d. Provide facilities and infrastructure in accelerating the watershed rehabilitation process because the success target must be 75% and can be handed over in 3 years; e. Utilization of large funds in accordance with their allocation and	Strategy (S – T) a. Adding pest control equipment in the form of herbicides and insecticides; b. Increase awareness of forest and land fires by socializing to the community not to burn and carry out activities that have the potential to cause forest fires; c. Increasing fire awareness community patrols by using fire monitoring towers as fire prevention media and maximizing hedgerows; d. Doing self-management and no longer using vendors or third parties in supervising and implementing watershed rehabilitation.

	<p>accountability in terms of reporting so that they can be accounted for;</p> <p>f. Procurement of superior seeds to be planted in the watershed rehabilitation area so that the results are maximized.</p>	
<p>Threats (T)</p> <p>1. Plant pests 2. Forest fires 3. Implementation that still uses vendors and third parties</p>	<p>Strategy (W-O)</p> <p>a. Utilize the availability of adequate development sites to set plant spacing; b. Utilize community support to disseminate information and access to planting, maintenance, and marketing of watershed rehabilitation production results; c. Accelerate the partnership process with forest village communities through the formation of Forest Farmer Groups with a collaboration/partnership pattern d. Utilize skilled human resources in the implementation of watershed rehabilitation so that it can be completed in accordance with the timeline that has been made by the Forest Area Borrowing Permit company.</p>	<p>Strategy (W-T)</p> <p>a. socialization to the community regarding the prohibition of land occupation and the planting pattern of watershed rehabilitation; b. utilization of natural enemies of pests and plant diseases; c. conducting watering to reduce the impact of hot weather; d. effectivizing the planting of Gamal and Kaliandra to prevent excessive pests attacks; e. streamlining the budget by not using vendors of third parties in a self-managed manner is a solution to accelerate the process of completing watershed rehabilitation in Belangian Village.</p>

## DISCUSSION

Strategies to improve the success of watershed rehabilitation are determined based on management indicators including ecological, economic and social aspects. Strategy is generally a tool used to achieve goals<sup>[9]</sup>. The formulation of strategies to improve the success of watershed rehabilitation results in variables that are summarized to obtain alternative development strategies through an internal-external matrix and determine the position of the business.

The results of the strength analysis for watershed rehabilitation activities in Belangian Village revealed several important factors of rules and policies in the impact of these watershed rehabilitation activities on the economic development of the community in Belangian Village. First, there are rules and regulations that support the watershed rehabilitation process to run well. The rules regarding watershed rehabilitation can be said to be complete, starting from the rules on the obligation to Approve the Use of Forest Areas to carry

out watershed rehabilitation as stipulated in Government Regulation No. 23 of 2021, the location or land for watershed rehabilitation is carried out on critical land inside or outside the forest area, the planting pattern for watershed rehabilitation with intensive or agroforestry patterns in forest areas and various other explanations contained in the Minister of Environment and Forestry Regulation No. 59 of 2019. In addition, the clarity of land tenure status that will be carried out watershed rehabilitation activities is also explicitly mentioned in Government Regulation No. 87 of 2014. Furthermore, the availability of large enough land in Belangian Village is a favorable strength in watershed rehabilitation activities. The availability of large tracts of land allows for measurable long-term planning in accordance with the principles of sustainable land management<sup>[10]</sup>. The block and plot system planting pattern is a strength in watershed rehabilitation activities in Belangian Village because the system can be a benchmark in assessing environmental stability while

integrating local economic benefits. The existence of watershed rehabilitation activities can also help the carrying capacity and land productivity in Belangian Village. The soil type in Belangian Village, which consists of acidic soil types, namely latosol and lithosol<sup>[11]</sup>, makes watershed rehabilitation activities good for helping to manage and maintain land fertility. In addition, the funds used in the implementation of watershed rehabilitation are very large so that implementation activities can run well. Without adequate financial resources, watershed rehabilitation activities may be fragmented, have poor results and thus not be efficient and optimal in activities that aim to improve and conserve the environment<sup>[12-13]</sup>. This impact is particularly important in rural areas such as Belangian Village, where alternative livelihood opportunities may be limited. Funding-driven programs that employ local labor and use locally sourced materials are likely to generate greater community support and long-term engagement<sup>[14]</sup>. Internal factors of weakness that must be faced in watershed rehabilitation activities include supporting facilities and infrastructure for field implementers of watershed rehabilitation that are still not appropriate. Operational support is needed for the achievement and sustainability of watershed rehabilitation activities<sup>[12]</sup>. The slow disbursement of funds to field implementers is also a weakness in watershed rehabilitation activities. The late disbursement of these funds can result in a halt in activities due to the absence of logistics and goods that can be delivered for the smooth running of activities<sup>[15]</sup>. Seedlings that are planted are not from superior seeds and there is limited access to far-flung planting areas. The use of seedlings that are not superior can cause problems or impacts in the future such as the susceptibility of seedlings to various diseases<sup>[12]</sup> which can make the activity budget swollen and can hamper watershed rehabilitation activities.

Opportunities from watershed rehabilitation activities for community empowerment in Belangian Village are the availability of jobs for the surrounding community. This opportunity to work in watershed rehabilitation activities can reduce poverty and increase household income. This is in line with the first (no poverty) and eighth (decent work and economic growth) sustainable development goals. In addition, an increase in household income can improve the standard of living of poor people living around the forest area. The increased standard of living is also expected to improve the mindset of the community to be more creative and innovative in downstreaming the development of natural products in a sustainable manner<sup>[16]</sup>.

The threat that must be faced in watershed rehabilitation activities is that pests that attack plants will also have an impact on watershed rehabilitation plants. Pest attacks on these plants must be handled from the beginning of watershed rehabilitation activities and can be overcome by using superior seeds so that their survival is better and can also be given appropriate fertilizers so that plants can be protected from external factors. In addition, there is also the threat of forest fires due to both ecological and human factors. Ecological threats such as pest and disease attacks are common in activities such as watershed rehabilitation, which require integrated management<sup>[15]</sup>. The current reliance on third-party vendors and supervisors rather than implementing self-management systems poses risks related to accountability, quality control and sustainability. Research has shown that local community-based or participatory management tends to have better long-term outcomes or sustainability than excluding local communities from activities<sup>[14]</sup>.

### **Determining the Direction of Watershed Rehabilitation Policy Strategy towards Community Empowerment**

The people of Belangian Village can implement the following strategies or

aggressive strategies to improve their economy, including:

1. Carry out watershed rehabilitation in accordance with applicable rules and regulations as legitimization to the government and adjust to local wisdom in determining its policies;
2. Utilizing the availability of large enough land as a planting location can be collaborated with agricultural crops to support the community's economy;
3. Implementing a block system watershed rehabilitation planting pattern so that it can improve the standard of living of the poor;
4. Provide facilities and infrastructure in accelerating the watershed rehabilitation process because the success target must be 75% and can be handed over in 3 years;
5. Adding pest extermination tools in the form of herbicides and insecticides;
6. Utilize the availability of adequate development sites to adjust the planting distance;
7. Utilize community support to disseminate information and access to planting, maintenance, and marketing of watershed rehabilitation products;
8. Accelerate the partnership process with forest village communities through the formation of Forest Farmer Groups with a collaboration/partnership pattern;
9. Socialization to the community regarding the prohibition of land occupation and planting patterns of watershed rehabilitation.

## CONCLUSION

The strategy for the policy direction of watershed rehabilitation activities towards community empowerment in Belangian Village is to optimize the implementation of watershed rehabilitation activities in accordance with applicable rules and regulations by adjusting local wisdom in determining policies, optimally utilizing the availability of critical land for watershed rehabilitation activities and collaborating with intensive cropping systems and

agroforestry so that the community can participate in watershed rehabilitation activities and increase community income from agroforestry products, increase awareness of forest fires and plant pests and diseases by providing adequate facilities and providing socialization to the surrounding community to participate in preserving forests, optimally utilize available funds and allocate them in accordance with their allocation and accountable in terms of reporting so that they can be accounted for, start changing the pattern of activities from vendors and third parties to self-management so that the community is involved in managing watershed rehabilitation plants, utilize community support to disseminate information and access to planting, maintenance, and marketing of watershed rehabilitation production, optimizing the use of skilled human resources in watershed rehabilitation activities so that activities can be completed in accordance with the timeline made by the company, utilizing natural enemies of pests and plant diseases to overcome damage caused by pests, and optimizing workers from local communities to participate in watershed rehabilitation management activities.

## Declaration by Authors

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