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Participation of Forest Encroachers in Participatory Ecosystem Restoration Program in Dangku Wildlife Reserve, Musi Banyuasin

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Abstract: Land conversion and forest encroachment are one of the causes of environmental degradation, as is happening at the Dangku Wildlife Reserve in Musi Banyuasin Regency. The participatory ecosystem restoration program at Dangku Wildlife Reserve has had several positive impacts. It is necessary to analyze the influence of the level of perception on the level of participation of the forest encroachers in supporting the participatory ecosystem restoration program at Dangku Wildlife Reserve. This research is survey research with a qualitative approach that uses respondents as a sample of a population with a total sample of 118 respondents. Perception and participation scores were obtained from the classification or category of answers or opinions of respondents to the questions given by the researcher. The scoring of each answer from the respondents is obtained using a Likert scale. The results showed that although the community's perception of the program was classified as good, it was not positively proportional to the participation of the forest encroachers which was classified as moderate. One of the factors that influence this condition is that the benefits derived from the program are not in line with the expectations and needs of the forest encroacher communities.
Keywords: conservation area, forest encroachers, participation, perception, wildlife reserve

Abstrak (Indonesian): Alih fungsi lahan dan perambahan kawasan hutan merupakan salah satu penyebab kerusakan lingkungan seperti yang sedang terjadi di Suaka Margasatwa Dangku di Kabupaten Musi Banyuasin. Program pemulihan ekosistem partisipatif di SM Dangku telah memberikan beberapa dampak positif. Maka dari itu perlu dilakukan analisis pengaruh tingkat persepsi terhadap tingkat partisipasi masyarakat perambah dalam mendukung program pemulihan ekosistem partisipatif di SM Dangku ini. Penelitian ini merupakan penelitian survei dengan pendekatan kualitatif yang menggunakan responden sebagai sampel dari suatu populasi dengan jumlah sampel sebanyak 118 responden. Skor persepsi dan partisipasi diperoleh dari klasifikasi atau kategori jawaban atau pendapat responden atas pertanyaan yang diberikan oleh peneliti. Skor setiap jawaban dari responden diperoleh dengan menggunakan skala Likert. Hasil penelitian menunjukkan bahwa walaupun persepsi masyarakat terhadap program tergolong baik, namun tidak berbanding positif dengan partisipasi masyarakat perambah yang tergolong sedang. Salah satu faktor yang mempengaruhi kondisi tersebut yakni keuntungan yang diperoleh dari adanya program kurang sesuai dengan harapan dan kebutuhan masyarakat perambah.
Kata Kunci: kawasan konservasi, partisipasi, persepsi, perambah hutan, suaka margasatwa

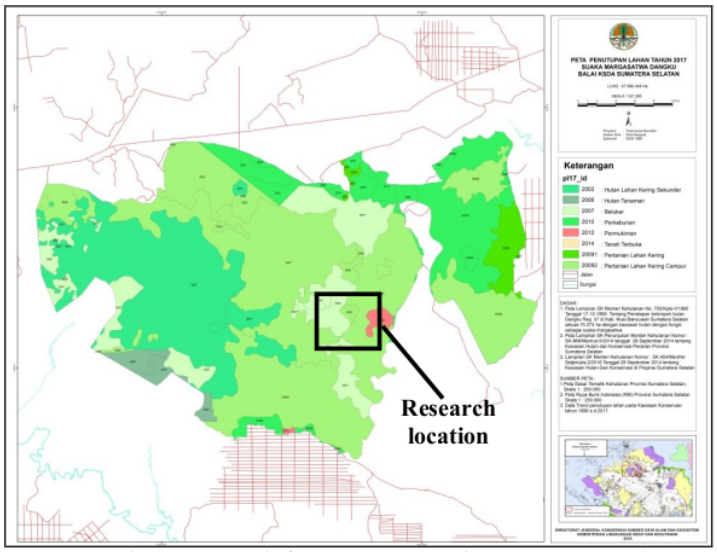
1. Introduction

Indonesia's deforestation rate was 480,000 hectares, including the deforestation of 40,000 hectares in conservation areas for 2016-2017 [1]. The amount of decreasing forest area becomes the reason for the importance of managing the problems to maintaining forest area in Indonesia.

One of the conservation areas in South Sumatra Province that currently deal with serious threats is Dangku Wildlife Reserve at Musi Banyuasin Regency. The conversion and encroachment of forest areas are serious problems that have not been able to be resolved properly.

The damage of the Dangku Wildlife Reserve area has started significantly since 2011. This can be seen from the increasing area of the settlements, dryland agriculture, plantations, and open land in Dangku Wildlife Reserve at that time. This condition increased sharply in 2015 and even up to 2017.

The land cover analysis by satellite imagery showed the total damage area of Dangku Wildlife Reserve was approximately 64% of the total area or equivalent to 30,715.86 hectares in the year 2017. The damage is caused by the conversion of forest to agricultural land, plantations, and settlements dominantly [2]. Encroachment and conversion of conservation areas into settlements and agricultural land are the causes of the degradation of the forest areas in Dangku Wildlife Reserve.



Source: Directorate General of Nature Resources and Ecosystem Conservation

Figure 1. Research Location Map

Ecosystem restoration is one of the right steps to restore the degraded conservation forest areas. Ecosystem restoration activities are long-term and continuous activities until the area can return to its original function.

In response to this forest encroachment problem, the efforts made by the South Sumatra Agency for Conservation of Natural Resources (BKSDA Sumatera Selatan) as the area manager are implementing a participatory ecosystem restoration program at Dangku Wildlife Reserve which has been implemented since 2017. A participatory approach in natural resource management is expected to strengthen the capacity of communities living around natural resources to manage these resources [3].

The implementation of this program is expected to be a new way and solution to the problem of encroachment on conservation forest areas as well as having an impact on the restoration of forest ecosystems and maintaining the function of conservation forest areas as well as improving the economy of the community in this area.

The participatory ecosystem restoration program through community involvement has shown positive changes, it can be seen from the reduction in the number of new land clearing by the community, the increased willingness of the community to plant trees on farming land, and the decrease in the number of encroacher living in the area based on the results of the periodic encroacher hut inventory conducted by the South Sumatra Agency for Conservation of Natural Resources (BKSDA Sumatera Selatan), there has been a 30% decrease in the number of encroacher hut after the program has been running for two years. This program needs to be continuously developed by the government so that it can be applied in other conservation areas in Indonesia that have similar problems.

In order to find out the factors that influence the program, it is important to conduct research on the perception and participation of the encroacher communities in supporting the participatory ecosystem restoration program at Dangku Wildlife Reserve.

This research is expected to provide additional information, lessons learned, suggestions and input to the government in making comprehensive policies and regulations in accordance with real conditions and needs in the field. Especially in an effort to restore conservation areas by increasing the empowerment and welfare of communities whose lives depend on forest areas.

The purpose of this study was to determine the perceptions and participation level of the forest encroachers in Sungai Petai area as a sampling area in the participatory ecosystem restoration program in Dangku Wildlife Reserve.

2. Material and Methods

2.1. Material and Instrument

This research was survey research that used respondents as a sample of a population with a questionnaire as the main tool of data collection. The population of this research was the entire community of forest encroachers who live in the river Petai area, Dangku Wildlife Reserve, Musi Banyuasin Regency,

South Sumatra Province. The location was chosen because it is a residential area of forest encroacher communities. They are the target of a participatory forest ecosystem restoration program implemented by the South Sumatra Agency for Conservation of Natural Resources (BKSDA Sumatera Selatan).

Based on the results of the census of the encroaching communities conducted by BKSDA Sumatera Selatan in 2019 and supported by data verification in 2020, 170 families were living in the area. The sample or target respondent in this study was the patriarch of the family. They were representations of a family that usually tend to follow the opinions and decisions of a patriarch in a family. They were individuals or family members of the patriarchal family.

In determining the total of samples in this study, the researcher referred to the table of the number of samples based on the table Krejcie and Morgan with a 95% confidence level. Based on the table Krejcie and Morgan, if the total population was 170 families, the research sample must be 118 families samples minimally.

The sample selection technique used a simple random sampling technique. The unit of analysis was the patriarchy as the respondent which every respondent in the population has had an equal chance of being selected as a sample. The sampling procedure used sampling without replacement procedure [4].

2.2. Data Analysis

In measuring the perception of the forest encroacher communities, indicators were needed to measure the perceived level of the people affected by the participatory ecosystem restoration program. In an active program, a good perception was needed from the people involved, because it is the basis for forming attitudes and behavior [5]. The indicators were: 1) existence and importance of the Dangku Wildlife Reserve, 2) the existence of conservation programs and partnerships, 3) the existence of farmer groups, 4) social benefits of the program, 5) economic benefits of the program, 6) ecological benefits of the program, 7) program implementation and, 8) community dependence on Dangku Wildlife Reserve.

To measure the participation of the forest encroacher communities, indicators were needed to measure the participation level of the people that affected the participatory ecosystem restoration program. In general, community participation could be seen from the form of participation tangibly given by the community (having a form) and also in the form of participation given in an intangible way (abstract) [6]. The indicators to measure the participation of the forest encroacher communities were 1) community participation at the planning phase, 2) community participation at the implementation phase, 3) community participation at the phase of receiving benefits, 4) and community participation at the monitoring phase.

The determination of perception and participation scores was using the answers given by the respondents by making a classification or category according to the answers or opinions of the respondents to the questions given by the researcher. The scoring of each answer from the respondents was obtained using a Likert scale whose measurements are as follows:

a. Score 3 for high/good answer
b. Score 2 for moderate/fair answers
c. Score 1 for low/poor answer

After the answers from the respondents were collected, the answers to each question contained in the questionnaire were tabulated based on the score value and multiplied by the number of respondents who gave answers to the question. The results of the calculation were then multiplied by 100% to get the scoring value which was used to determine the final category value of each question used in this study. The calculation of the score of respondents' answers was carried out with the following equation (Equations 1)

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$$\text{Scoring value} = ((F1x1) + (F2x2) + (F3x3) \times 100) \quad (1)$$

Information : F1 is the frequency of respondents who answered low/poor
F2 is the frequency of respondents who answered moderate/fair
F3 is the frequency of respondents who answered high/good

The scoring value obtained from the answers to each question was used to determine the results of the assessment based on predetermined categories. The assessment of the respondent's answers or statements was categorized into 3 categories, the determination of the score value of the respondent's statement on each variable was divided from 100% into three levels on the criterion class (ordinal scale), the score value at Table 1.

Table 1. Category by Score Value

No.	Score	Category
1	< 33.3	Poor/ Low
2	33.3 - 66.6	Fair/ Moderate
3	> 66.6	Good/ High

Nonparametric statistics analysis was used to determine the relationship between the perception and the participation of the forest encroachers. Spearman rank correlation analysis was used in this study using the SPSS program.

3. Results and Discussion

3.1. Perception of Forest Encroachers in The Participatory Ecosystem Restoration Program in Dangku Wildlife Reserve

The perception of the forest encroacher community as measured in this study is the view of individuals who represent a family on the implementation and receiving benefits of participatory ecosystem restoration programs in Dangku Wildlife Reserve. Community perceptions observed in this study were assessed based on 6 indicators. The indicators are community perceptions related to the existence and importance of the Dangku Wildlife Reserve, the existence of conservation programs and partnerships, the establishment of farmer groups, social benefits from the program, the economic benefits from the program, the ecological benefits from the program, and the program implementation and community dependence level on Dangku Wildlife Reserve. Perceptions of forest encroacher communities on participatory ecosystem restoration program is shown in Table 1.

The results of the analysis showed that the community's perception of participatory ecosystem restoration activities in Dangku Wildlife Reserve was 93.75, a good category. The communities have a good perception of participatory ecosystem restoration activities at Dangku Wildlife Reserve. The information and knowledge of the programs had been involving the community in the programs. It is important for the community for positioning them as a managing partner. It must be done for conserving the area. This activity will affect the programs successfully.

Table 2. Perceptions of Forest Encroacher on Participatory Ecosystem Restoration Program

No.	Community Perception	Category	Number of Respondent	Percentage (%)	Score (%) and Category
1.	Existence and importance of the Dangku Wildlife Reserve	Poor	0	-	94.92 (Good)
		Fair	18	15.25	
		Good	100	84.75	
2.	Existence of conservation partnerships programs	Poor	0	-	96.61 (Good)
		Fair	12	10.17	
		Good	106	89.83	
3.	Existence of farmer groups	Poor	0	-	95.48 (Good)
		Fair	16	13.56	
		Good	102	86.44	
4.	Social benefits of the program	Poor	1	0.85	94.35 (Good)
		Fair	18	15.25	
		Good	99	83.90	
5.	Economic benefits of the program	Poor	0	-	95.48 (Good)
		Fair	16	13.56	
		Good	102	86.44	
6.	Ecological benefits of the program	Poor	0	-	95.20 (Good)
		Fair	17	14.41	
		Good	101	85.59	
7.	Program implementation	Poor	0	-	93.22 (Good)
		Fair	24	20.34	
		Good	94	79.66	
8.	Community dependence on Dangku Wildlife Reserve	Low	2	1.69	84.75 (Good)
		Moderate	50	42.37	
		High	66	55.93	
	Average				93.75 (Good)

The perception of community to the participatory ecosystem restoration program at Dangku Wildlife Reserve is based on the hope and trust of the community in the government to be able to change the fate of the people whose lives depend on the Dangku Wildlife Reserve area.

Based on interviews conducted with the community, most people understand the importance of protecting the environment such as the Dangku Wildlife Reserve area. The community felt that one of the changes that emerged after the decrease in forest stands in the environment around the community was the difficulty of finding clean water during the dry season so that people were forced to dig deeper wells to get clean water sources. This condition is different from the earliest condition of the area at the beginning of the community living in Dangku Wildlife Reserve when there were still many stands of trees, the air was cool and it was not difficult to get clean water.

The Kemitraan Konservasi program which started in 2019 is one of the efforts by the government to increase the involvement of communities around the

area to play an active role in the management of conservation areas.

Several communities have benefited from the Kemitraan Konservasi program. one of the examples is the farmer group's establishment as community social interaction and also as a source of information related to Dangku Wildlife Reserve. Another social benefit is that the existence of the community in the Dangku Wildlife Reserve area was finally recognized by the village government with the farmer group's establishment with support from the local village government.

The community has understood the benefits that will be obtained if they support the government's programs such as social, economic, and environmental benefits. The community also considered that the implementation of the ecosystem restoration program was going well even though it was constrained by the lack of government budget and the minimum number of officers in the field.

Public perception and participation are still very dependent on the role of community leaders, which is strengthened by the high need for socialization and the intensity of community presence in socialization forums [7].

Most of the people said that they depend on the area because it is a source of livelihood for the people who mostly farming in Dangku Wildlife Reserve. The government must restrict public access to conservation areas in order to maintain its conservation function, but on the other hand, the government must optimally ensure the lives and welfare of the people in and around the conservation areas [8].

3.2. Participation of Forest Encroachers in The Participatory Ecosystem Restoration Program in Dangku Wildlife Reserve

Community participation in this research was consists of participation, involvement, and the contribution of respondents in utilizing and supporting the implementation of the participatory ecosystem restoration program at Dangku Wildlife Reserve. Community participation in this study was measured based on 4 indicators, these indicators are community participation at the planning phase, community participation at the implementation phase, community participation at the phase of receiving benefits, and community participation at the monitoring phase. The participation of forest encroacher communities in participatory ecosystem restoration program in Dangku Wildlife Reserve is shown in Table 3.

Table 3. Participation of Forest Encroacher on Participatory Ecosystem Restoration Program

No.	Community Participation	Category	Number of Respondent	Percentage (%)	Score (%) and Category
1.	Community participation at the planning phase	Low	69	58.47	55.08 (Moderate)
		Moderate	21	17.80	
		High	28	23.73	
2.	Community participation at the implementation phase	Low	99	83.90	40.96 (Moderate)
		Moderate	11	9.32	
		High	8	6.78	
3.	Community participation at the phase of receiving benefits	Low	1	0.85	87.57 (High)
		Moderate	42	35.59	
		High	75	63.56	
4.	Community participation at the monitoring phase	Low	109	92.37	36.44 (Moderate)
		Moderate	7	5.93	
		High	2	1.69	
Average					55.01 (Moderate)

Based on the score, it is known that the average score of the community participation level in the participatory ecosystem restoration program is 55.01. Because the score of participation is in intervals between 33.33 to 66.66, the level of community participation is classified as moderate. The highest level of community participation is in the receiving benefits phase with a score of 87.57 and the lowest participation at the monitoring phase with a score of 36.44. Although the level of community perception of the forest is high, the level of community participation in the program is in the moderate category and tends to be below. There are factors that affect the level of community participation in conservation forest management [9].

Community participation at the monitoring phase is the lowest participation of all forms of participation. This condition occurs due to monitoring activities are usually carried out together with forestry officers and require a lot of energy and time. If people participate in monitoring activities, they must temporarily leave their works for farming.

In contrast to community participation at the monitoring phase, the benefit-receiving phase shows high participation from the community. Community participation occurs due to incentives or subsidies

from the government for each activity (such as procurement of materials and wages) [10]. Related to the perception and acceptance of benefits, the existence of incentives directly forms an understanding in the community where they are willing to work or participate only if incentives are available.

Communities in the research location generally get many benefits from the participatory ecosystem restoration program at Dangku Wildlife Reserve. The direct benefit obtained for the community is the availability of work wages that can be obtained by tree planting activities. In addition, another benefit received by the community that participates in forest management activities is fruit plant seedlings that can be planted in community farmland.

Based on the results of data analysis, community participation at the receiving benefits phase is a form of participation that has the highest value because any form of benefit that can be obtained by the community will be well received by the community, especially those in need.

3.3. The Correlation Between Perception and Participation of Forest Encroachers in The Participatory Ecosystem Restoration Program in Dangku Wildlife Reserve

The Perceptions of the forest encroachers were analyzed in relation to the participation of the forest encroachers in the ecosystem restoration program using Spearman's rank correlation in the SPSS statistics program on the computer.

Table 4. The Correlation between Perception and Participation of Forest Encroachers in The Program

No.	Perception	Participation	
		Rs	P
1.	Existence and importance of the Dangku Wildlife Reserve	0.064	0.489
2.	Existence of conservation partnerships programs	0.260**	0.004
3.	Existence of farmer groups	0.282**	0.002
4.	Social benefits of the program	0.218*	0.018
5.	Economic benefits of the program	0.165	0.074
6.	Ecological benefits of the program	0.281**	0.002
7.	Program implementation	0.215*	0.019
8.	Community dependence on Dangku Wildlife Reserve	0.100	0.283

Rs= Spearman correlation coefficient; P= significance level; ** significant level 1% (very significant correlation);

Based on the results of the correlation analysis, it is known what perceptions have a real impact on the high community participation in the program. The results of the analysis show that the community's perception of the existence of a conservation partnership program, the existence of farmer groups, and the ecological benefits, has a very significant relationship with community participation in the program. This means that if the community increasingly understands the importance of the existence of a conservation partnership program, the existence of farmer groups, and the ecological benefits of the program, it can increase community participation in these existing programs.

Although there were no indicators of perception that cause participation of community to be below, the cause of the low level of participation could be due to other factors outside the perception factors, one of which is those related to community expectations.

Until now, the community hopes that the agricultural land they have obtained illegally by clearing forest areas can be fully handed over to the community. Even though this is contrary to the current law and cannot be provided by the government, so that people feel disappointed with the programs provided by the government which cannot provide what the people want.

There are several things that can be done to increase the participation of forest encroacher communities in ecosystem restoration programs. In addition to increasing public perception of the existence of conservation partnership programs, the existence of farmer groups, and the ecological benefits of the program, is by encouraging the role of group leaders in the community. Besides that, the South Sumatra Agency for Conservation of Natural Resources (BKSDA Sumatera Selatan) as area manager can improving the quality of counseling from forestry extension officer on the field by providing an understanding to the community, that what is currently expected by the community to give the conservation area to the community by the government is not possible for protection and preservation reasons of conservation areas.

4. Conclusion

The results showed that although the community's perception of the program was classified as good, it was not positively proportional to the participation of the forest encroachers which was classified as a moderate category.

This condition shows that although the community has a good perception of the program, it does not have a positive impact on the participation of forest encroachers in the participatory ecosystem restoration program at Dangku Wildlife Reserve. Therefore, increasing public perception of the importance of maintaining conservation areas is not enough to increase community participation in conservation area management.

One of the causes of the lack of forest encroacher participation in forest management is because the expectations and needs of the forest encroacher do not fulfill by the government in participating in the program and it can affect community participation in the participatory ecosystem restoration program at Dangku Wildlife Reserve.

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