

ANALYSIS OF COMMUNITY PARTICIPATION IN THE FOREST AND LAND REHABILITATION PROGRAM IN TOTOPU VILLAGE, BILATO SUBDISTRICT, GORONTALO REGENCY

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ABSTRACT. *The primary objectives of this study were twofold: to evaluate the extent of community engagement in Forest and Land Rehabilitation (FLR) initiatives and to identify the factors driving this public involvement. Adopting a quantitative research design, primary data were gathered via questionnaire distribution and subsequently analyzed using descriptive statistics alongside multiple linear regression. The empirical results demonstrated that overall community participation in the FLR program stood at 57.66%, falling into the "fairly good" classification. Looking closely at individual dimensions, planning and supervision registered lower scores of 50.00% and 51.94% respectively, placing both in the poor category. Conversely, implementation scored 54.17% (good), while the evaluation stage achieved the highest mark at 74.54% (fairly good). Furthermore, the simultaneous analysis confirmed that age, formal education, household size, financial income, and managed land area collectively exerted a significant influence on FLR participation, accounting for a coefficient of determination of 20.80%. The remaining variance of 79.20% (epsilon) was shaped by unexamined elements, including community competence, individual commitment, local leadership encouragement, financial incentives, and other external variables.*

Keywords: Forest, Participation, Rehabilitation

ABSTRAK. Studi ini bertujuan untuk mengevaluasi tingkat peran serta masyarakat, faktor-faktor penentunya, sekaligus merumuskan strategi peningkatan keterlibatan dalam program Rehabilitasi Hutan dan Lahan (RHL). Pendekatan kuantitatif diaplikasikan dalam riset ini, di mana data primer dikumpulkan lewat teknik survei kuesioner. Analisis data dilakukan melalui metode deskriptif statistik dan regresi berganda. Temuan empiris mengindikasikan bahwa pada level indikator, tahap perencanaan (50,00%) dan pelaksanaan (54,17%) tergolong dalam kriteria "buruk", monitoring (51,94%) masuk kategori "kurang baik", sedangkan evaluasi (74,54%) dinilai "cukup baik". Secara bersama-sama, faktor usia, pendidikan, jumlah anggota keluarga, pendapatan, dan luas lahan kelolaan memberikan dampak signifikan terhadap kontribusi masyarakat dengan R-squared sebesar 20,80%. Sebaliknya, sisa varians sebesar 79,20% (epsilon) diterangkan oleh aspek lain yang tidak diteliti, seperti kompetensi dan komitmen masyarakat, dukungan pemuka wilayah/desa, stimulan insentif, serta variabel luar lainnya.

Kata kunci: Hutan, Partisipasi, Rehabilitasi

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INTRODUCTION

Land resources play an important role for a country as they are classified as key assets whose quality and quantity determine the survival of future generations. The Government of Indonesia is committed to implementing soil and water conservation as a key development program to prevent the degradation of these natural resources, which could have a negative impact on the country's development. The government has established policies to control land degradation in Indonesia through the Rehabilitation and Quality Improvement of Natural Resources and Environment

programme. The program aims to address and predict land resource degradation in a technical, biological, and spatial manner through soil remediation and soil protection. planning and management (Salote et al., 2022).

The rate of forest and land degradation in Gorontalo Regency is quite high. In reference to the results of review of data and maps of critical land in Gorontalo Province in 2018, the area of land in the Critical category was $\pm 36.596,12$ Ha, and the very critical category was $\pm 106.588,02$ Ha. The area of critical land is estimated to increase due to an expansion of settlements, mining outside and inside forest areas, farming and vegetation damage

due to natural disasters (KEPMENLHK, 2019).

Following national environmental policies, the Gorontalo Regency Government has incorporated Forest and Land Rehabilitation (FLR) into its regional development agenda. One of the programs undertaken to mitigate land degradation was the rehabilitation of 150 hectares of land in Totopo Village, Bilato District. Forest and land rehabilitation seeks to restore and strengthen ecosystem functions by ensuring the sustainability of land productivity, ecological carrying capacity, and support for biological processes (PERMENLHK, 2021). These rehabilitation activities may involve reforestation, afforestation, vegetation maintenance, species enrichment, and the implementation of vegetative and engineering approaches to soil conservation on degraded lands (Purwanti et al., 2022).

Several factors, both technical, institutional, and socio-economic factors of the target community, strongly influenced the success of Land Forest Rehabilitation program as previously described. (Bempah et al., 2022) In the technical aspect, the obstacles encountered included climate condition, soil and other ecological aspects, while from the institutional aspect, the program often experienced obstacles due to the program must follow project procedures. (Latif et al., 2019) From the socio-economic aspect, the program was successful as it was influenced by participation and behavior. Community involvement is one of the key elements in supporting and ensuring the success of the FLR program (Indhasari & Kuddus, 2021). From the description, we can see that the level of participation determines the success of the program.

While the generic technical and structural bottlenecks of forest and land rehabilitation programs are heavily emphasized in prior research, the intersection between local socioeconomic profiles and public engagement remains largely understudied. Specifically, how this dynamic relationship

ultimately shapes the actual effectiveness and sustainability of FLR initiatives at the community level has received the lowest academic review. Most of the current literature views involvement as a supplementary factor, and does not examine in detail the behavioral, social and institutional components that impact community involvement in rehabilitation programs. Therefore, the uniqueness (state of the art) of the study is the effort to embed socioeconomic, institutional and community engagement characteristics into a broader analytical framework to explain the efficacy of FLR implementation. The present study further contributes to the literature by offering empirical evidence on the influence of engagement behavior on the effectiveness of the program.

Consequently, the compelling issues outlined above prompted this investigation into public engagement within localized ecological initiatives. Assessing the extent of local involvement stands as a cornerstone of this inquiry, as it directly shapes the trajectory of forest rehabilitation, restores degraded lands into productive assets, enhances water management systems, and safeguards environmental sustainability. To systematically explore this dynamic, this study targets two primary goals: first, to measure the current level of community participation in FLR programs in Totopo Village, Bilato Subdistrict, Gorontalo Regency; and second, to dissect the specific factors that drive or hinder community involvement in these rehabilitation efforts.

METHODS

Research location and date

Centered in Totopo Village, Bilato District, Gorontalo Regency (Figure 1), this research was conducted from January to April 2024. The underlying methodology was operationalized into three sequential steps, namely the preliminary survey, data collection, and data analysis.

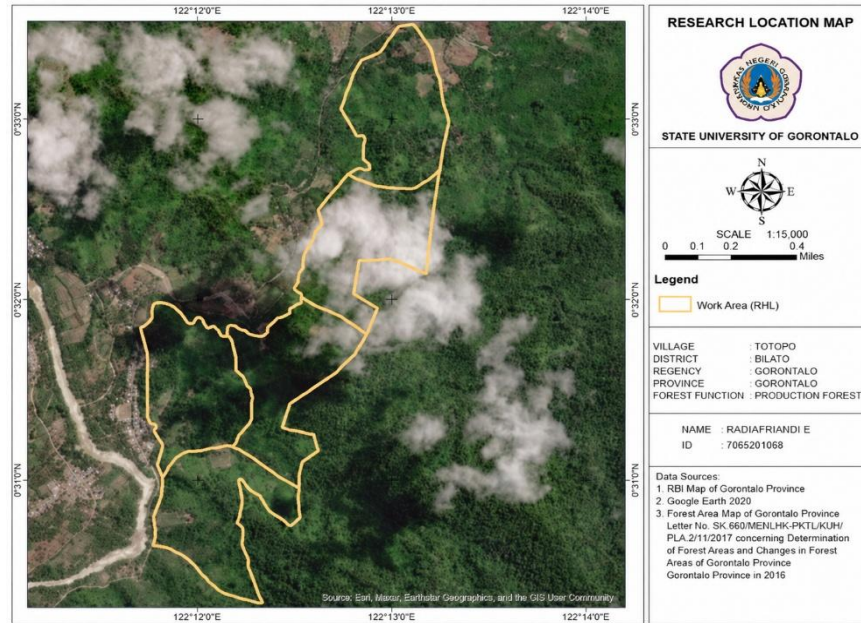


Figure 1. Research Location Map

Population and Sample

The populations in this research were 173 farmers in Totopo Village, Bilato Subdistrict, Gorontalo Regency, then from the total population, and samples were taken using the slovin formula with $e = 5\%$.

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

$$n = \frac{173}{1 + 173(0,05)^2}$$

$$n = \frac{173}{1,4325}$$

$$n = 120,76 \text{ (sampil 121 people)}$$

Research Method

1. Observation, namely making direct observations on the environment of the farming community to determine the level of involvement in the development of the forestry sector.
2. Questionnaires, namely data collection techniques by compiling a list of questions that must be answered by respondents.
3. Interview, namely conducting interviews directly with respondents.

Technique of Data Analysis

Descriptive Analysis

The technique of data analysis used to determine community participation in the FLR program was a descriptive statistical

approach. Score interpretation criteria based on respondent responses can be determined using a scale of 1 to 3 for each questionnaire. Scale ranges could therefore be determined by multiplying the highest score by the number of respondents and the lowest score by the number of respondents.

- a. Determine the frequency of respondents' achievements for each questionnaire item with the following formula:

$$P = \frac{F}{n} \times 100\%$$

Explanation:

P = Percentage

F = Frequency in classification

N = Number of respondents

100% = Fixed Number

- b. Calculate the percentage in the form of a score was used in the formula as follows:

$$\% \text{ Statement Scor} = \frac{\text{Actual Score}}{\text{Ideal Score}} \times 100\%$$

Information:

- a. Actual Score

The actual score is the cumulative score obtained from all completed questionnaires submitted by the respondents.

b. Ideal Score

The ideal score refers to the maximum possible score that can be achieved when all respondents choose the highest-scoring response for each questionnaire item.

Hence, in accordance with the scale range, an assessment was made referring to Sugiyono (2013) as presented in the following interpretation table:

Table 1. Interpretation Table

No	Participation	Score
1.	Often	3
2.	Neutral	2
3.	Never	1

Source: Sugiyono (2013)

Multiple Linear Regression

A multiple linear regression model was utilized to ascertain the factors driving public engagement in the FLR program. The regression equation expressing the impact of the independent variables (X) on the dependent variable (Y) is structured below:

$$Y = \alpha_2 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Explanation: Y = Community Participation
A = Constant
B = Regression Coefficient
X1 = Age
X2 = Education

X3= Number of Family Members
X4 = Income
X5 = Area of Cultivated Land
 ε = Margin of Error

RESULTS AND DISCUSSION

This research employed descriptive statistics analysis to describe the conditions of the research variables as a complement to the inferential results obtained through multiple regression. Maximum score is 3 points, the minimum score is 1. The results of the descriptive statistics for each variable in this research are displayed as follows:

Table 2. Descriptive Results Variable

No	Statement Score			Indicator Score	Criteria	
	Actual	Ideal	%		Statement	Indicator
P1	166	360	46.11%	50.00%	Poor	Poor
P2	175	360	48.61%		Poor	
P3	199	360	55.28%		Poor	
P4	195	360	54.17%	54.17%	Poor	Poor
P5	198	360	55.00%		Poor	
P6	192	360	53.33%		Poor	
P7	214	360	59.44%	51.94%	Poor	Poor
P8	176	360	48.89%		Poor	
P9	171	360	47.50%		Poor	
P10	196	360	54.44%	74.54%	Poor	Very Good
P11	271	360	75.28%		Very Good	
P12	338	360	93.89%		Good	
Total	2,491	4,320	57.66%	Fairly Good		

Source: Processing Excel Data (2022)

The previous table denotes that the overall percentage of the score for the variable "community participation" in the Forest and Land Rehabilitation (FLR) program is 57.66%, which falls into the category of "fairly good". The result shows that the community in Totopo Village, Bilato

Subdistrict, Gorontalo Regency, has not been maximally involved in various activities and programs to improve forest and land rehabilitation regardless of its impact on the community environment.

Rehabilitation is considerably beneficial to create an environment that is friendly and free from various possible disasters.(Hananto et al., 2022) The low participation signifies that community participation still needs to be increased with various efforts both in increasing competence and commitment to bureaucratic support for the community in Totopo Village, Bilato Subdistrict, Gorontalo Regency. The efforts to restore, maintain and enhance forest and land functions so that their carrying capacity, productivity, and role in supporting life support are maintained (Setiawan et al., 2020).

According to Podungge et al. (2020), the triumph and enduring sustainability of forest management within Forest and Land Rehabilitation (FLR) frameworks heavily rely on public participation. This participatory approach entails engaging local stakeholders directly in identifying alternative remedies for existing issues, executing interventions, actively managing problem-solving processes, and monitoring the subsequent transformations.

In the past, funding from the government or international funds for rehabilitation activities was controlled by the government and was more focused on technical aspects. The arrangements for program implementation in the field have not been developed, so rehabilitation techniques are not well understood by the community (Sulastiyo et al. 2016). Community participation is crucial because it positively impacts forest management and rehabilitation so that it can provide more benefits to the community and not create negative impacts from various deforestation carried out by certain parties (Gunawan et al. 2019). The score results for each indicator, the benefits of participation in forest and land restoration efforts are described as follows:

1. Planning

The planning indicator obtains a score of 50,00% which is in the poor category where it denotes that the activeness of community of Totopo Village, Bilato Subdistrict, Gorontalo Regency in planning various tentative activities and Forest and Land Rehabilitation (FLR) program remains not optimal, so it is necessary to maximize this planning in the RPJMDes (Village Medium-Term Development Plan) so that it can involve many communities. This predicament evolved because the community was not fully

engaged in the planning process, particularly during the stages of determining planting locations and selecting plant species. As a result, program planning failed to adequately reflect the local population's needs, preferences, and ecological expertise. To support the continuity of the rehabilitation program, it is necessary to carry out planning steps in advance. This activity is important because it is closely related to the successful implementation of a community-based rehabilitation program.(Kadek, 2022)

2. Implementation

The implementation indicator obtains a score of 54,17% which is in the poor category, it denotes that the community of Totopo Village, Bilato Subdistrict, Gorontalo Regency is not fully willing and able to take part in being involved in the Forest and Land Rehabilitation (FLR) program which has many benefits for preventing various environmental problems. Implementation in general has the task of forming a link that makes it easier for program objectives to be realized as a result of a government activity (Iwan et al., 2018).

3. Supervision

The evaluation of the supervision dimension revealed a low performance score of 51.94%, signifying that residents of Totopo Village, Bilato Subdistrict, Gorontalo Regency, are not dynamically engaged in monitoring the FLR program. This lack of participation presents a significant gap, as continuous oversight is paramount to ensuring that all rehabilitation activities progress in strict conformity with planned objectives.

4. Evaluation

The evaluation indicator obtains a score of 74,54% which is in a fairly good category where it denotes that the community of Totopo Village, Bilato Subdistrict, Gorontalo Regency is quite involved in evaluation activity. The community carries out the evaluation activity when various incidents occur as a result of the Forest and Land Rehabilitation (FLR) program not being optimal. Performance evaluation aims to determine the results of work to improve or increase organizational performance by improving the performance of the organization's human resources. (Eka, 2021)

This previous research (Rahma, 2020) show that high community participation will affect a development program. This is

possible because development is not only determined by development organizers, but community participation also contributes to whether or not a development program that has been planned is achieved or not, so there is a need for quality human resources.

It is necessary to strengthen the capacity of institutions, both government agencies, and community organizations in the context of forest conservation. Ideally, community institutions, in this case, the Forest of Farmers Group (KTH) that have been formed, can be used as a forum for community empowerment that takes place continuously in the context of efforts to

rehabilitate forests and land.(Mamuko et al., 2016)

Factors Affecting Community Participation in Forest & Land Rehabilitation in Totopo Village, Bilato Subdistrict, Gorontalo Regency

Multiple Regression Equation

Multiple regression is a statistical test used when there is more than one independent variable. The findings of the multiple regression analysis, conducted using SPSS, were presented in the table below:

Table 3. Results of Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	-52.746	24.322		-2.169	.032
Age	-.064	.043	-.136	-1.499	.137
Level of education	1.479	0.588	0.217	2.513	.013
Number of Members Family	0.491	0.414	0.104	1.185	.238
Income	4.592	1.653	.232	2.778	.006
Area of Cultivated Land	2.789	.950	.269	2.937	.004

Source: SPSS 21 processed data (2022)

In line with the previous results of the analysis, the equation for the multiple linear regression model is:

$$Y = \alpha_2 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Drawing from the multiple linear regression analysis, the specific impacts exerted by the independent variables on public participation within the Totopo Village (Bilato Subdistrict, Gorontalo Regency) Forest and Land Rehabilitation (FLR) project can be outlined as follows:

1. Constant Value Interpretation

The regression model yields a constant value of -52.746. This coefficient represents the baseline level of community participation in the FLR program when all independent variables, namely age, education level, family size, income, and cultivated land area, are absent or equal to zero.

2. Interpretation of Age Coefficient Value

The value of the coefficient regression for X_1 variable (Age) is -0,064, indicating that any change in the age variable by 1 unit will affect

participation in the Forest and Land Restoration (FLR) program by -0.064 times of unit if the other variables are constant (*Ceteris Paribus*). The negative connection suggests that older community members may have less physical capacity, less flexibility of time and less incentive to actively participate in labour demanding FLR activities such as land preparation, planting, maintenance and monitoring. Younger members of the community tend to be more physically active, adaptable to new program tactics and responsive to participatory activities

3. Interpretation of Education Coefficient Value

The regression value for the X_2 variable (Education) is 1.479, indicating that any change in the education variable by 1 unit will affect community participation in the Forest and Land Rehabilitation (FLR) program by 1.749 times of unit if other variables are constant (*Ceteris Paribus*). A crucial factor in promoting active participation in FLR activities is the positive coefficient of education. The more educated a person is, the higher is the level of information, awareness and understanding about environmental conservation, sustainable land

management and long-term benefits of rehabilitation programmes.

4. Interpretation of Number of Family Members Coefficient Value

With a positive regression coefficient of 0.491, the household size variable (X₃) significantly contributes to public involvement in the FLR framework. Under ceteris paribus conditions, a one-unit increase in the number of family members leads to a rise of 0.491 units in program participation. Because FLR tasks are inherently demanding of both time and manual labor, household demographics play a crucial role. Larger families benefit from superior labor flexibility, enabling them to distribute roles efficiently, ensuring that livelihood or domestic responsibilities are maintained while specific members engage in rehabilitation activities. Ultimately, a greater number of family members enhances participation by providing the necessary human resources for physically demanding operations, including land preparation, cultivation, maintenance, and oversight.

5. Income Coefficient Value

The regression analysis shows a coefficient of 4.592 for the income variable (X₄). This positive value implies that for every single-unit increase in community income, participation in the Forest and Land Rehabilitation (FLR) program is expected to expand by 4.592 units, provided all other explanatory variables are held constant (ceteris paribus).

6. Interpretation of Area of Cultivated Land Coefficient Value

The value of regression coefficient for X₅ Variable (area of cultivated land) is -2.789, indicating that any change in the area of cultivated land variable by 1 unit will affect community participation in the Forest and Land Rehabilitation (FLR) program by 2.789 times of unit if the other variables are constant (*Ceteris Paribus*).

This result is to the opinion (Nurbaiti & Bambang, 2017) that there are various factors for community participation, including age; a person's ability has certain limits which are determined by age, both physical ability to work and think. In general, the implementation of government activities and the implementation of development in the regions need community participation, especially in encouraging the relatively limited government (Fauzi, 2019).

CONCLUSION

Based on the research finding and discussion in the previous chapter, the following research conclusions are draw. The level of community participation in the Forest and Land Rehabilitation (RHL) Program was 57.66%, which falls into the fairly good category. The results for each indicator show that: (a) the planning indicator scored 50.00%, which is classified as poor; (b) the implementation indicator scored 54.17%, which is also categorized as poor; (c) the monitoring indicator scored 51.94%, which falls into the poor category; and (d) the evaluation indicator scored 74.54%, which is classified as fairly good. Simultaneously, the combination of age, education, household size, income, and managed land area holds a statistically significant impact on community participation in the Totopo Village FLR project, explaining 20.80% of the variance. When examined partially, the determinants show distinct behaviors. Three factors, education, income, and cultivated land area, exert a positive and highly significant influence on public compliance and action. In contrast, the remaining two variables do not reach statistical significance; family size shows a positive but insignificant trend, whereas age demonstrates a negative and statistically negligible effect on overall community involvement.

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