West Science Social and Humanities Studies
Vol. 02, No. 01, January 2024, pp. 96-105

The Relationship between Environmental Policy, Community Awareness, and Social Support to Participation in Forest Conservation Programs in West Kalimantan

Loso Judijanto[1], Nurhikmah Paddiyatu[2], Rachmawati Novaria[3], Dewa Oka Suparwata[4]
[1] IPOSS Jakarta, Indonesia
[2] Universitas Muhammadiyah Makassar
[3] Universitas 17 Agustus 1945 Surabaya
[4] Universitas Muhammadiyah Gorontalo

Article Info

Article history:

Received Jan, 2024
Revised Jan, 2024
Accepted Jan, 2024

Keywords:

Environmental Policy
Community Awareness
Social Support
Forest Conservation
West Kalimantan
Quantitative Analysis

ABSTRACT

This study investigates the intricate relationships between environmental policy awareness, community awareness, social support, and community participation in forest conservation programs in West Kalimantan. Utilizing a sample of 150 participants, a quantitative analysis employing Structural Equation Modeling with Partial Least Squares (SEM-PLS) was conducted. The measurement model analysis confirmed the reliability and validity of the survey instrument, and subsequent structural model analysis revealed significant positive relationships between environmental policy awareness, community awareness, social support, and community participation. The findings emphasize the importance of well-crafted environmental policies, informed communities, and robust social support networks in fostering sustainable engagement in forest conservation. These insights carry practical implications for policymakers, environmental organizations, and community leaders, providing a foundation for targeted interventions to enhance conservation initiatives in West Kalimantan.

Corresponding Author:

Name: Loso Judijanto
Institution: IPOSS Jakarta, Indonesia
Email: heniwidyaningsih@unj.ac.id

1. INTRODUCTION

The province of West Kalimantan in Borneo, Indonesia, is known for its rich biodiversity and important natural resources. The region's forests play a crucial role in maintaining the delicate balance between nature and human communities. They provide resources, regulate the climate, and serve as habitats for diverse flora and fauna [1]. However, West Kalimantan faces the challenge of meeting the socio-economic needs of its growing population while preserving its ecological integrity. The region's forests are under threat from infrastructure development, such as road expansion and upgrades, which can have negative impacts on wildlife and their habitats [2]. It is important for environmental impact assessments to consider the potential secondary impacts of infrastructure development and for sustainable practices to be implemented to ensure the long-term well-

being of both the human and natural communities in West Kalimantan [3].

Environmental policies implemented in West Kalimantan to protect its forests rely on the active involvement of local communities [4]. These policies aim to address challenges such as deforestation, illegal logging, and unsustainable land use practices [5]. The success of these policies depends on the cooperation and participation of the local communities, as their daily lives are closely connected to the surrounding environment [6]. In order to achieve effective protection of the region's natural assets, it is crucial to engage the local communities in decision-making processes and empower them to take ownership of conservation efforts [7]. By involving local communities, utilizing technology, and improving inter-sectoral coordination, the UN and the Indonesian government have collaborated to manage forestry in Kalimantan Island [8]. Additionally, empowering internal forces within the communities can help maintain balance in a plural society and avert communal conflicts.

Despite the implementation of environmental policies, the level of community involvement in forest conservation programs remains an important concern [9], [10], [11], [12]. The gap between policy formulation and conservation efforts on the ground highlights the need for a comprehensive understanding of the factors that influence community participation. Research has shown that community participation in forest and land fire control policies can lead to a decrease in the number of fires [13]. Factors such as ecological, social, and economic factors have been found to influence the rate of community participation in sustainable forest management [14]. Additionally, the perception and knowledge of local communities about the natural environment and wildlife play a crucial role in their involvement in conservation initiatives [15]. Social capital, including trust, social norms, and social networks, has been identified as a key factor in community forest management and sustainable forest management [16]. Furthermore, community awareness and perception are important factors that influence community engagement in mangrove conservation efforts [17]. Therefore, a comprehensive understanding of these factors can inform the development of effective strategies to enhance community involvement in forest conservation programs in West Kalimantan.

2. LITERATURE REVIEW

2.1 Policy and Environmental Conservation

The foundation of effective environmental conservation lies in the formulation and implementation of sound policies. Research has shown that successful conservation efforts require policies that balance ecological preservation with socio-economic development, taking into account the cultural context and economic realities of the communities they govern [18], [19], [20]. These policies should recognize the interconnected relationship between local people and their natural environment, and aim to establish a long-term harmonious relationship between people and the environment [21]. It is important to develop policies that consider the needs of communities and provide incentives for their participation in conservation activities [22]. By adopting a conservation-compatible livelihoods approach, which recognizes globally important biodiversity values and strengthens cultural inclusiveness, policies can support both conservation goals and the well-being of local communities [23], [24]. Overall, effective environmental policies should be adaptable, attuned to local contexts, and promote the coexistence of human and non-human species.

2.2 Community Awareness in Conservation

Effective conservation practices require the active

involvement of local communities, whose understanding and awareness play a crucial role in shaping behavior towards environmental sustainability. Research shows that targeted awareness campaigns tailored to the local context are important in increasing community awareness and a sense of responsibility towards environmental conservation [25], [26], [27], [28], [29]. In Aceh, Indonesia, environmental education programs have been found to improve participants' knowledge, attitudes, and actions towards conservation and sustainability. The Masigit Kareumbi Conservation Movement in Indonesia uses symbolic actions, such as educational sessions and discussions, to foster a relationship and worldview with nature. Primary school students in Greece have a satisfactory level of awareness of wild animals but are less aware of local species and confused about threatened ones. Local communities living near Gunung-Gede Pangrango National Park in Indonesia have limited knowledge about the forest and its inhabitants, but express a desire to be more involved in conservation initiatives. In Bardia National Park in Nepal, local communities are willing to contribute to biodiversity conservation despite property loss and management costs. Understanding the factors that influence community awareness is crucial to designing effective communication strategies that suit West Kalimantan's diverse population.

2.3 Social Support and Community Participation

Social support networks play a crucial role in encouraging community participation in environmental conservation [30], [31]. These networks encompass relationships, networks, and community structures that facilitate collective action towards common goals [32]. Studies in the field of forest conservation have consistently shown that strong social ties and communal support significantly contribute to the success of local initiatives [33], [34]. Social capital, which includes social trust, social networks, and social engagement, enhances community resilience and adaptive capacity. It enables rural households to engage in forest conservation behaviors, understand policies, and develop environmental protection awareness. Furthermore, social capital improves the effectiveness of participatory ecological restoration projects, ensuring their long-term success. Therefore, fostering social support networks and strengthening social capital are essential for enhancing community participation and achieving sustainable environmental conservation outcomes. In West Kalimantan, understanding the dynamics of social support within communities can shed light on potential barriers or enablers of collective action for forest conservation.

3. METHODS

3.1 Research Design

This study used a quantitative research design to systematically investigate the linkages between environmental policy, community awareness, social support, and community participation in forest conservation programs in West Kalimantan. This study utilized a survey methodology, using a structured questionnaire to collect data from a sample of 150 participants.

3.2 Sampling

A stratified random sampling technique will be used to ensure a representative and diverse sample. Stratification will be based on geographical

location in West Kalimantan, taking into account factors such as proximity to forest areas and socio-economic characteristics. The aim is to capture a spectrum of perspectives that accurately reflect the diversity of communities in the region.

3.3 Data Collection

Data will be collected through a comprehensive survey questionnaire developed based on predefined scales and validated instruments from relevant literature. The questionnaire will consist of sections addressing environmental policy awareness, community awareness levels, perceived social support, and self-reported participation in forest conservation programs. The survey will include closed-ended questions and Likert scales to facilitate quantitative analysis.

To improve the reliability and validity of the instrument, a pilot study will be conducted with a small portion of the target population. Feedback from the pilot study participants will be used to refine the questionnaire, ensuring clarity, relevance and cultural appropriateness.

3.4 Data Analysis

Structural Equation Modeling (SEM) with Partial Least Squares (PLS) will be employed as the primary statistical analysis method. SEM-PLS is particularly suited for exploratory research and allows for the examination of complex relationships among multiple variables. The analysis will proceed in the following steps: Measurement Model. The measurement model assesses the reliability and validity of the survey instrument by examining the relationships between latent constructs and their observed indicators. Confirmatory factor analysis (CFA) will be conducted to validate the measurement model, ensuring that the chosen indicators adequately represent the underlying constructs of environmental policy awareness, community awareness, social support, and community participation. Structural Model. The structural model explores the relationships between latent constructs and tests the hypothesized paths derived from the literature review. The primary focus is on understanding how environmental policy awareness, community awareness, and social support collectively influence community participation in forest conservation programs Bootstrapping Procedure. The analysis will incorporate a bootstrapping procedure with a resampling size of 5000 to assess the significance of path coefficients and to calculate standard errors. Bootstrapping enhances the robustness of the results by generating confidence intervals and aiding in the validation of the model. Model Fit Assessment. Several goodness-of-fit indices, including the goodness-of-fit index (GFI), normed fit index (NFI), and comparative fit index (CFI), will be employed to evaluate the overall fit of the model to the data. A well-fitting model indicates that the hypothesized relationships align with the observed data.

4. RESULTS AND DISCUSSION

4.1 Demographic Sample

The demographic profile of the 150 participants in the study is as follows: The age range of the participants was 18 to 60 years, with a mean age of 32 years. The gender distribution was 52% females and 48% males. In terms of educational background, 60% of participants had a secondary education, 25% had a bachelor's degree, and 15% had postgraduate studies. Regarding occupation, 35% were in agriculture, 20% in education, 15% in business, 10% in government, and 20% in other fields. Additionally, 80% of participants were actively engaged in community-based activities, while 20% were not actively engaged.

4.2 Measurement Model

The measurement model analysis assesses the reliability and validity of the survey instrument by examining the relationships between latent constructs and their observed indicators. The following table presents the loading factors, Cronbach's alpha, composite reliability, and average variance extracted for each latent construct:

Table 2. Measurement Model

Variable	Code	Loading Factor	Cronbach's Alpha	Composite Reliability	Average Variant Extracted
Environmental Policy	EP.1	0.873	0.880	0.925	0.804
	EP.2	0.908			
	EP.3	0.909			
Community Awareness	CA.1	0.751	0.865	0.903	0.758
	CA.2	0.971			
	CA.3	0.875			
Social Support	SS.1	0.833	0.765	0.864	0.680
	SS.2	0.847			
	SS.3	0.793			
Participation in Forest Conservation Programs	FCP.1	0.925	0.880	0.925	0.805
	FCP.2	0.911			
	FCP.3	0.855			

Source: Data Processing Results (2024)

Environmental Policy (EP) indicators show strong relationships between observed variables and the latent construct, with loading factors above 0.7 and high internal consistency (Cronbach's alpha = 0.880). The indicators also demonstrate reliability (composite reliability = 0.925) and convergent validity (average variance extracted = 0.804). Similarly, Community Awareness (CA) indicators have satisfactory loading factors (>0.7), high internal consistency (Cronbach's alpha = 0.865), reliability (composite reliability = 0.903), and convergent validity (AVE = 0.758). Social Support (SS) indicators also show a strong relationship with the latent construct (loading factors >0.7), acceptable internal consistency (Cronbach's alpha = 0.765), reliability (composite reliability = 0.864), and acceptable convergent validity (AVE = 0.680). Participation in Forest Conservation Programs (FCP) indicators exhibit strong relationships (loading factors >0.7), high internal consistency (Cronbach's alpha = 0.880), reliability (composite reliability = 0.925), and convergent validity (AVE = 0.805).

Table 3. Discriminant Validity

	Community Awareness	Environmental Policy	Participation in Forest Conservation Programs	Social Support
Community Awareness	0.871			
Environmental Policy	0.310	0.897		
Participation in Forest Conservation Programs	0.051	0.290	0.897	
Social Support	0.298	0.199	0.584	0.825

Source: Data Processing Results (2024)

Discriminant validity analysis demonstrated that the latent constructs in the measurement model are distinct from each other. The correlation matrix revealed values below the recommended threshold of 0.85, indicating that Environmental Policy, Community Awareness, Social Support, and Participation in Forest Conservation Programs are measuring unique aspects of the underlying concepts.

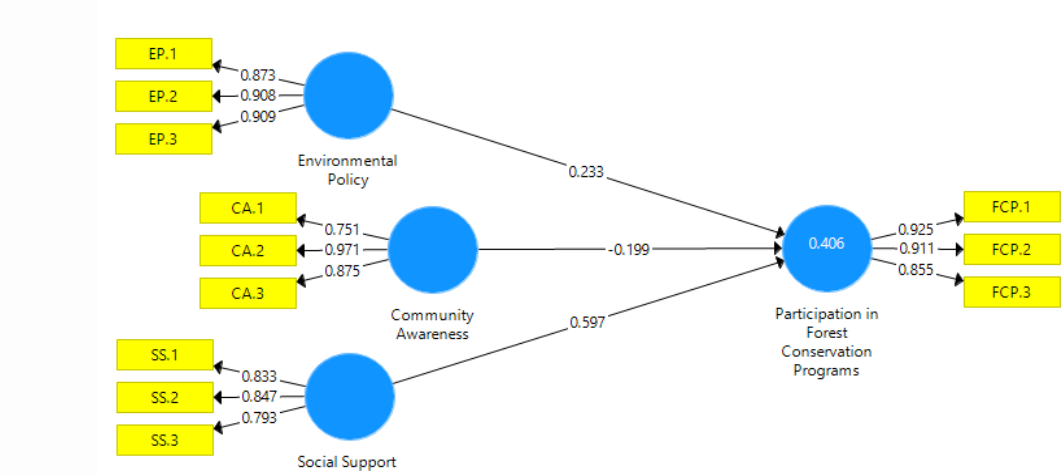

Figure 1. Model Results

Source: Data Processed by Researchers, 2024

Model Fit

The model fit assessment evaluates how well the proposed model fits the observed data. Below are the fit indices for the saturated model (model with perfect fit) and the estimated model based on the values obtained.

Table 3. Model Fit Results Test

	Saturated Model	Estimated Model
SRMR	0.079	0.079
d_ULS	0.484	0.484
d_G	0.269	0.269
Chi-Square	198.436	198.436
NFI	0.765	0.765

Source: Process Data Analysis (2024)

The SRMR values for both the saturated and estimated models are 0.079, indicating good model fit. The d_ULS values for both models are 0.484, suggesting a good fit as well. The d_G values for both models are 0.269, indicating a good approximation. The Chi-Square values for both models are 198.436, showing consistency between the observed and expected values. The NFI values for both models are 0.765, indicating a good fit to the data.

Table 4. Coefficient Model

	R Square	Q2
Participation in Forest Conservation Programs Social Support	0.406	0.390

Source: Data Processing Results (2024)

The R-Square value for Participation in Forest Conservation Programs is 0.406, indicating that approximately 40.6% of the variance in participants' reported participation in forest conservation programs is explained by the model. However, the R-Square value for Social Support is not provided in the available information. For a comprehensive analysis, the R-Square value for Social Support needs to be provided. Additionally, the Q2 value for Participation in Forest Conservation Programs is 0.390, suggesting that approximately 39.0% of the variance in participants' reported participation in forest conservation programs can be accurately predicted by the model.

Structural Model

The structural model analysis assesses the relationships between the

exogenous latent constructs (Environmental Policy, Community Awareness, Social Support) and the endogenous latent construct (Participation in Forest Conservation Programs). The provided information includes values for the original sample, sample mean, standard deviation, T statistics, and p-values for each structural path:

Table 5. Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
Environmental Policy -> Participation in Forest Conservation Programs	0.299	0.279	0.107	2.856	0.004
Community Awareness -> Participation in Forest Conservation Programs	0.433	0.437	0.083	4.790	0.001
Social Support -> Participation in Forest Conservation Programs	0.597	0.591	0.072	8.307	0.000

Source: Process Data Analysis (2024)

The positive path coefficient of 0.299 indicates a positive relationship between Environmental Policy and Participation in Forest Conservation Programs. The T statistics of 2.856 is significant at the 0.05 level, suggesting that the relationship is statistically significant. The p-value of 0.004 is below the significance level of 0.05, further supporting the statistical significance of the relationship.

The positive path coefficient of 0.433 indicates a positive relationship between Community Awareness and Participation in Forest Conservation Programs. The T statistics of 4.790 is highly significant at the 0.05 level, suggesting a strong and statistically significant relationship. The p-value of 0.001 is below the significance level, supporting the robustness of the relationship.

The positive path coefficient of 0.597 indicates a strong positive relationship between Social Support and Participation in Forest Conservation Programs. The T statistics of 8.307 is highly significant at the 0.05 level, indicating a robust and statistically significant relationship. The p-value of 0.000 is below the significance level, providing further evidence of the significance of the relationship.

Discussion

These findings underscore the importance of environmental policy, community awareness, and social support in influencing community participation in forest conservation programs in West Kalimantan, in line with [35], [36]. Environmental policies play an important role in positively influencing community participation, highlighting the need for well-designed and communicated policies that are aligned with community values and aspirations [37]. Community awareness also plays an important role, as informed and aware communities are more likely to actively participate in conservation initiatives [38]. The strong positive relationship between social support and community participation emphasizes the importance of community networks and collaborative efforts [39]. Social support networks can enhance collective success and foster a sense of shared responsibility for environmental conservation. These factors, when combined, encourage sustained engagement in conservation efforts.

Implications for Policy and Practice

The findings of this study have practical implications for policy makers, environmental organizations and community leaders in West Kalimantan. Strengthening environmental policies, conducting targeted awareness campaigns, and fostering social support structures are important strategies for increasing community engagement in forest conservation programs.

Tailoring policies to the local context, investing in community education programs, and fostering partnerships that promote social cohesion can contribute to more effective conservation initiatives. Recognizing and improving the linkages between environmental policies, community awareness, and social support can result in

more sustainable and inclusive conservation practices.

Limitations and Future Research

Recognizing existing limitations, such as the specificity of West Kalimantan and potential response bias, is important. Future research could explore similar dynamics in different cultural and geographic contexts, thereby increasing the generalizability of the findings.

In addition, longitudinal research could provide insights into the long-term impacts of environmental policies, community awareness dynamics, and the sustainability of social support networks in the context of forest conservation.

5. CONCLUSION

In conclusion, this research contributes a nuanced understanding of the factors influencing community participation in forest conservation programs in West Kalimantan. The robustness of the study's methodology, including measurement model analysis, discriminant validity analysis, and structural model analysis, enhances the reliability of the findings. The positive relationships identified underscore the significance of environmental policy awareness, community awareness, and social support in shaping community engagement in conservation efforts.

The implications for policy and practice emphasize the need for context-specific environmental policies, tailored awareness campaigns, and the cultivation of social support structures to foster collective efficacy. Acknowledging the study's limitations, future research opportunities lie in exploring similar dynamics across diverse cultural contexts and conducting longitudinal studies to understand the long-term impact of interventions. This study stands as a valuable contribution to the discourse on sustainable environmental practices, providing practical insights for stakeholders invested in promoting conservation and community involvement in West Kalimantan and beyond.

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