

STAKEHOLDER ANALYSIS IN PRODUCTION FOREST MANAGEMENT AREAS OF FMU DAMPELAS TINOMBO, CENTRAL SULAWESI

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STAKEHOLDER ANALYSIS IN PRODUCTION FOREST MANAGEMENT AREAS OF FMU DAMPELAS TINOMBO, CENTRAL SULAWESI. The forest management unit (FMU) of Dampelas Tinombo was the initial formation of the FMU organization based on the typology of the local area in Central Sulawesi. The organization's growth cycle gradually encourages this FMU model as a strategy for a gradual approach to institutional formation across stakeholders. This research aimed to identify and describe patterns of power and connectivity between stakeholder actors in the management of production forest areas at FMU Dampelas Tinombo (Unit IV). This research used a qualitative approach with a case study method to understand the interests and influence of various stakeholders in managing production forests at the research site. The technique used was a stakeholder analysis matrix involving the categories of Good Relations, Protect, Monitor, and Low Priority, and "3R" (Rights, Responsibilities, and Revenues) analysis. This research revealed an imbalance between rights, responsibilities, and benefits in forest management. Stakeholders with high rights and duties have not received balanced benefits, indicating the problem of unequal distribution of profits. Weak law enforcement and a low public understanding of sustainable forest management were significant obstacles. The policy implications of this research are the need to increase law enforcement, empower communities through education and training regarding sustainable forest management, and review the distribution of rights, responsibilities, and benefits to make them more fair and effective. The findings also provide implications for future research by highlighting the need for comparative and longitudinal studies across different Forest Management Units (FMUs) to evaluate the long-term effectiveness of stakeholder collaboration, institutional governance, and social forestry policies in achieving sustainable forest management.

Keywords: FMU Dampelas Tinombo, stakeholder analysis, sustainable forests, benefit distribution

ANALISIS PEMANGKU KEPENTINGAN DI KAWASAN HUTAN PRODUKSI KPH DAMPELAS TINOMBO, SULAWESI TENGAH. Kesatuan Pengelolaan Hutan (KPH) Dampelas Tinombo merupakan awal terbentuknya organisasi KPH berdasarkan tipologi wilayah lokal di Sulawesi Tengah. Siklus pertumbuhan organisasi secara bertahap mendorong model KPH ini sebagai strategi pendekatan pembentukan kelembagaan secara bertahap di seluruh pemangku kepentingan. Penelitian ini bertujuan untuk mengidentifikasi dan mendeskripsikan pola kekuasaan dan konektivitas antaraktor pemangku kepentingan dalam pengelolaan kawasan hutan produksi di wilayah KPH Dampelas Tinombo, Sulawesi Tengah. Penelitian ini menggunakan pendekatan kualitatif dengan metode studi kasus untuk memahami kepentingan dan pengaruh berbagai pemangku kepentingan dalam pengelolaan hutan produksi. Teknik yang digunakan adalah matriks analisis pemangku kepentingan dengan kategori Hubungan Baik, Melindungi, Memantau, dan Prioritas Rendah serta analisis "3R" (Hak, Tanggung Jawab, dan Pendapatan). Penelitian ini mengungkap adanya ketidakseimbangan antara hak, tanggung jawab, dan manfaat dalam pengelolaan hutan di wilayah pengelolaan hutan. Stakeholder yang mempunyai hak dan kewajiban yang tinggi belum memperoleh manfaat yang seimbang. Hal ini menunjukkan adanya permasalahan ketimpangan distribusi manfaat. Lemahnya penegakan hukum dan rendahnya pemahaman masyarakat terhadap pengelolaan hutan lestari menjadi kendala yang signifikan. Implikasi kebijakan dari penelitian ini adalah perlunya peningkatan penegakan hukum, pemberdayaan masyarakat melalui pendidikan dan pelatihan mengenai pengelolaan hutan lestari, serta peninjauan

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kembali pembagian hak, tanggung jawab, dan manfaat agar lebih adil dan efektif. Temuan ini juga memberikan implikasi bagi penelitian di masa mendatang dengan menekankan perlunya studi komparatif dan longitudinal pada berbagai Kesatuan Pengelolaan Hutan (KPH) untuk mengevaluasi efektivitas jangka panjang kolaborasi pemangku kepentingan, tata kelola kelembagaan, dan kebijakan perhutanan sosial dalam mewujudkan pengelolaan hutan yang berkelanjutan.

Kata kunci: KPH Dampelas Tinombo, analisis stakeholder, hutan berkelanjutan, distribusi manfaat.

I. INTRODUCTION

A Forest Management Unit (FMU) is a crucial component of the national forest management system and plays a significant role in efficient and sustainable forest management. The division of the entire forest area into FMUs, each with its primary function and designation, underscores the importance of FMUs in preserving the public function of forests and serving as the foundation for sustainable forest management (Kim et al., 2016; McGlone et al., 2020).

Based on their primary functions, FMUs are classified into Forest Management Unit for conservation (FMU-Conservation), Forest Management Unit for protection (FMU-Protection), and Forest Management Unit for production (FMU-Production). Institutionally, FMU-conservation and FMU-production fall under the authority of provincial governments and are implemented through Regional Technical Implementation Units (UPTD). According to Decree of the Minister of Forestry Number: 79/2010, Central Sulawesi Province has 21 FMU units, consisting of 5 FMU-conservation and 16 FMU-Production, including FMU Dampelas Tinombo (Unit IV).

However, the formal establishment of FMUs does not automatically guarantee their effective operation at the site level. In practice, many forest areas remain characterized by de facto open access conditions, weak law enforcement, overlapping claims, and limited institutional capacity. These challenges indicate that the existence of FMUs as administrative entities still needs to be strengthened through institutional consolidation, capacity building, and multi-stakeholder engagement (Fisher et al., 2017; Hutabalian, 2023; Kim et al., 2016; McGlone et al., 2020).

This condition has encouraged stronger commitment among stakeholders to operationalize and strengthen forest management institutions at the site level through the effective implementation of FMUs. In other words, the current challenge is no longer the establishment of FMUs per se, but rather ensuring that these institutions function effectively in managing forest resources in a sustainable, inclusive, and equitable manner.

FMU Dampelas Tinombo is a model FMU established in Central Sulawesi Province. The development of this FMU model was an initial form of FMU institution based on the typology of the local area, which was gradually encouraged to develop by the organization's growth cycle. Thus, the FMU Model is a strategy for a gradual approach to the formation of FMU institutions towards the actual situation and conditions of FMUs at the site level, which is indicated, among other things, by an ability to absorb labor (including FMU organizational personnel), investment, producing forestry goods and services that are institutionalized in a sustainable and efficient forest management system. To manage forest resources optimally and fairly, FMU Dampelas Tinombo plays a role in empowering local communities through Village Forest (VF), Community Forest (CF), and Community Plantation Forest (CPF) schemes (Fisher et al., 2018; Kusmana & Sukwika, 2018; McGlone et al., 2020; Sukwika et al., 2016; Sukwika & Fransisca, 2021).

The development of forest potential in the FMU Dampelas Tinombo production forest area (Unit IV) encounters quite serious consequences and challenges due to this situation. The challenges identified include domination by certain actors, the interests of various actors, difficulties in accessing resources,

and uncertainty in obtaining added economic value from the area's development. Those challenges can be resolved if forest management is done with the support of all stakeholders in a mutually beneficial partnership framework. As key stakeholders, the community around the forest plays a crucial role in this process. It is in line with the principle of forestry partnerships that collaboration between stakeholders is essential for the success of sustainable forest management (Attanasio et al., 2022; Boutilier, 2017; Hariram et al., 2023; Mato-Santiso et al., 2021; McComb et al., 2017; Sukwika, 2018; Zubayr et al., 2014).

The implementation of cooperation/partnership schemes for forest utilization and assistance to forest farmer groups carried out by FMU in Central Sulawesi is expected to minimize social conflicts related to forest resources, achieving the goal of sustainable forests and a prosperous society.

The research was designed to identify and describe patterns of strength and connection between stakeholder actors in the Production FMU Unit IV area managed by FMU Dampelas

Tinombo. The research results will be beneficial for determining the appropriate institutional model related to the coordination pattern and involvement of stakeholders in developing the potential of FMU-Production Unit IV in a participatory and sustainable manner.

II. MATERIAL AND METHOD

A. Research Location

The research was conducted in the area managed by FMU Dampelas Tinombo, Central Sulawesi. This location was selected due to its relevance as a model production forest management unit with complex stakeholder dynamics, making it suitable for analyzing stakeholder importance and influence in site-level forest governance. The collection of data was conducted from October 2023 to December 2023.

Based on its administrative boundaries, the working area of FMU Dampelas Tinombo (Unit IV) is located in two regencies, namely Donggala and Parigi Moutong, and is distributed across six sub-districts. These include three

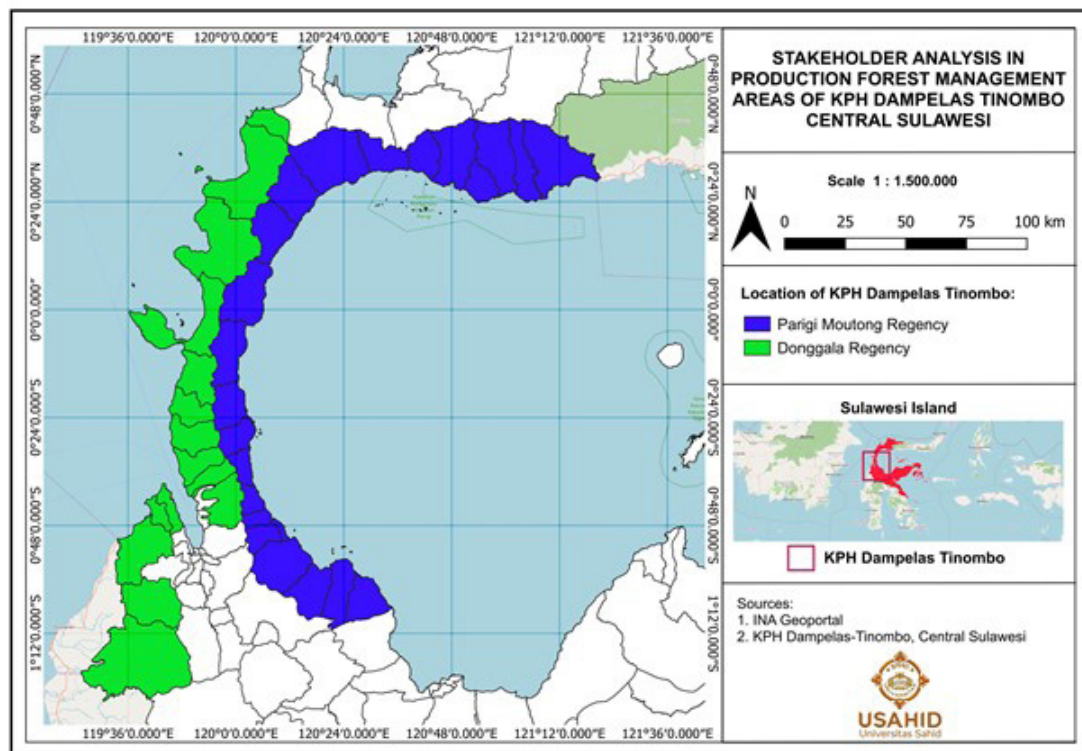


Figure 1. Research location in the Dieng Plateau Protection Forest area

sub-districts in Donggala Regency—Balaesang, Damsol, and Sojol—and three sub-districts in Parigi Moutong Regency—Kasimbar, Tinombo Selatan, and Tinombo.

Geographically, FMU Dampelas Tinombo is located at 119° 35' 54" E to 120° 04' 45" E and 0° 01' 50" N to 0° 43' 57" N. The Forest Management Unit for Production (FMU-Production) Model Dampelas Tinombo has a total forest area of 100,912 hectares. The map of FMU Dampelas Tinombo is presented in Figure 1.

B. Methods

The selection of informants was based on a purposive sampling technique, namely, a research method that ensures that illustrations are quoted using a method that determines a unique identity with a research objective to respond to a research case. This method can also be called a non-random sampling method

(Creswell & Creswell, 2017; Sugiyono, 2017). Several informants, including representatives from the Central Government, Provincial Government, Regency Regional Government, Educational Institutions, and Community Organizations, played a crucial role in this study. Their insights and perspectives, detailed in Table 1, were instrumental in understanding the stakeholder interests and influence in production forest management.

The research method in this study involved several systematic steps: (1) Research Approach: This research used a qualitative approach with a case study method to understand the interests and influence of various stakeholders in production forest management. (2) Data Collection: Data collection included primary and secondary data. Primary data were collected through in-depth interviews with various stakeholders, including the government, local communities, NGOs, forestry companies, and

Table 1. Data on stakeholders involved in the action area at FMU Dampelas Tinombo (Unit IV)

Code	Stakeholder	Code	Stakeholder
1.	Central Government (CG)	PDK8	Regional and Local Police
PPU1	Ministry of Environment and Forestry	PDK9	Regional and Local Indonesian National Armed Forces
PPU2	UPT BPSKL Sulawesi Region		
PPU3	UPT BPKH Wil XVI Palu	4.	Educational Institutions (EI)
PPU4	UPT BPHP XII Palu	LPG1	Higher Education
PPU5	UPT BPDASHL Palu Poso	LPG2	Formal education around FMU
PPU6	UPT BKSDA Central Sulawesi		
PPU7	UPT Balai Gakkum Sulawesi	5.	Mass Organizations and Society (MOS)
2.	Provincial Regional Government (PRG)	ODM1	Community Proposing Social Forestry
PDP1	Governor of Central Sulawesi	ODM2	Seroja Women's Group
PDP2	BAPPEDA Central Sulawesi	ODM3	NTFP taker community
PDP3	Forestry Service of Central Sulawesi	ODM4	Rattan brokers
PDP4	Environmental of Central Sulawesi	ODM5	Rattan buying industry
PDP5	Service FMU Dampelas	ODM6	Illegal logging perpetrators
3.	Regency Regional Government (RRG)	ODM7	Illegal timber buyers
PDK1	Regent of Donggala District	ODM8	Industry uses illegal wood from forests
PDK2	Regent of Parigi Moutong District	ODM9	Planters encroach on forest areas
PDK3	District Env. Service Donggala	ODM10	Mosque Community Figures
PDK4	District Env. Service Parigi Moutong	ODM11	Church Community Figures
PDK5	Head of District in Kab. Donggala	ODM12	Traditional Figure: Tajio, Kaili, Pendau, Lauje
PDK6	Head of District in Kab. Parigi Moutong	ODM13	Indigenous Cmty or Remote Tribes
PDK7	Village and Hamlet Heads around FMU Dampelas	ODM14	Tajio and Kaili Tribe Cmty
		ODM15	Communities outside forest activities

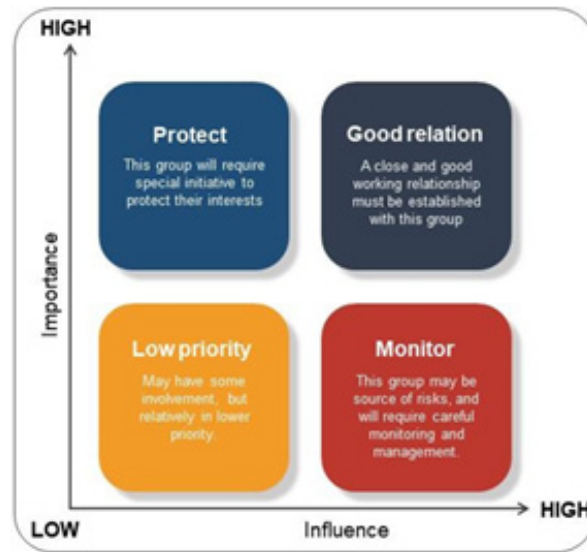


Figure 2 The stakeholder analysis matrix with criteria of protection, good relations, monitoring, and low priority

Table 2. Classification of Stakeholder Influence and Importance Levels Based on Likert Scale

Score Range	Mean Interval	Category	Description
1	1.00 – 1.80	Very Low	No influence/no support in the FMU-Production Unit IV area
2	1.81 – 2.60	Low	Limited influence/limited support in the FMU-Production Unit IV area
3	2.61 – 3.40	Moderate	Sufficient influence/ adequate support in the FMU-Production Unit IV area
4	3.41 – 4.20	High	Strong influence/high level of support in the FMU-Production Unit IV area
5	4.21 – 5.00	Very High	Very strong influence/ very high level of support in the FMU-Production Unit IV area

academics who were selected using a purposive sampling technique to ensure representation from various stakeholder groups that influence production forest management. This interview explored their views, interests, and influence on production forest management. The secondary data were collected through document studies, such as annual reports, government policies, statistical data, and relevant publications. (3) Informants Data Analysis: The data collected were then analyzed using a Stakeholder and Content Analysis approach. Stakeholder analysis aimed to identify and map the interests

and influence of each stakeholder using an interest-influence matrix. Subsequently, the content analysis techniques were used to code and categorize information obtained from interviews and documents. The data were then analyzed to find main themes related to stakeholder interests and influence. The analysis data were presented using a matrix with Protect Good Relations, Monitor, and Low Priority (Figure 2). (4) Data Validity: Data triangulation was carried out by comparing information from various sources to increase the validity of research results. The data analysis technique

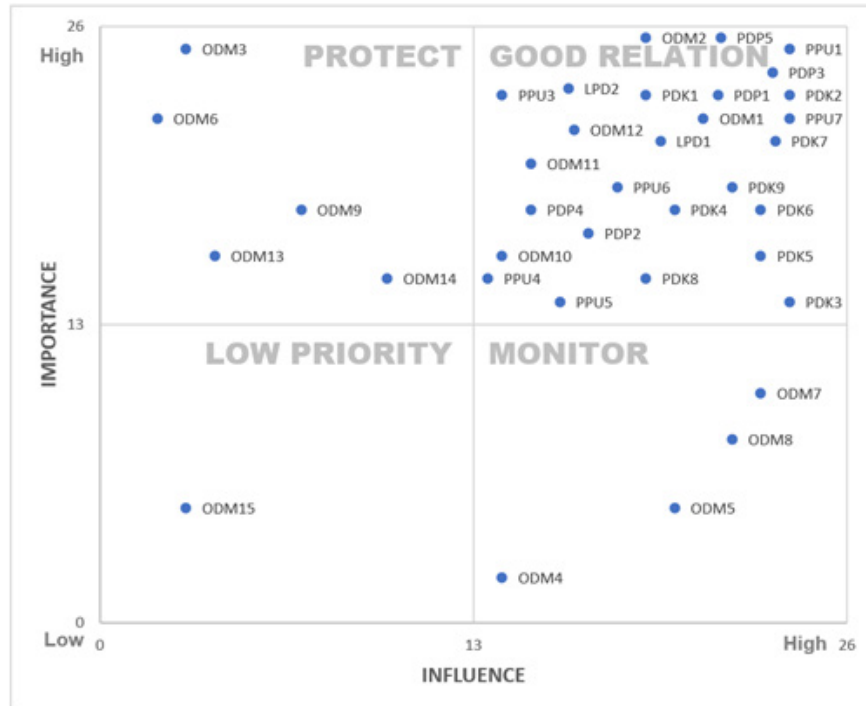


Figure 3. Mapping matrix of stakeholder importance and influence in FMU Dampelas Tinombo

for this research used the Miles and Huberman model, consisting of data collection, data presentation, data reduction, and conclusion (Sugiyono, 2017; Yin, 2018). (5) Reporting Results: Research results were presented as a report that included identification and analysis of stakeholder interests and influences, with strategic recommendations for sustainable and inclusive production forest management.

The level of stakeholder influence and importance was measured using a five-point Likert scale (1 = very low to 5 = very high). The average scores obtained from interviews were then classified into five categories using interval ranges as presented in Table 2, using Eden and Ackerman's stakeholder mapping concept approach (Colvin et al., 2020; Freeman, 2023).

III. RESULT AND DISCUSSION

A. Identify Stakeholder Mapping

According to the Eden and Ackerman concept, stakeholder groups were classified into four categories based on the influence and importance matrix results (Colvin et al., 2020; Freeman, 2023). Influence relates to the

power possessed by stakeholders to control the process and results of a decision using power variables, namely compensation power, individual power, condition power, feasibility power, and organizational power (Colvin et al., 2020; Freeman, 2023; Freeman et al., 2018; Mahajan et al., 2023).

Results of the interviews and secondary data analysis found the roles and positions of stakeholders in the FMU-Production Unit IV area, FMU Dampelas Tinombo, as depicted in Figure 2. There are 36 stakeholders with an interest and influence in the area, spread across four quadrant groups. There are 28 stakeholders in Quadrant I, Good Relationships; five stakeholders in Quadrant II, Protecting; one stakeholder in Quadrant III; and four stakeholders in Quadrant IV.

Based on the level of influence and level of importance, stakeholders can be grouped into four quadrant categories, namely:

- (1) Stakeholders who hold significant influence and have a high level of importance are crucial to the success of the program or project. Their total involvement at all stages is essential to instill confidence that their

support is key to the project's success. This group is not just a group, but a cornerstone that must be approached with respect to establish good cooperation (Good Relations: Quadrant I).

- (2) Stakeholders with little influence but a high level of importance are essential to the project. They require special efforts and unique strategies to ensure they understand that their needs align with the project's goals and that their involvement is significant. This group is not just a group; it needs to be nurtured and protected to foster their ongoing interest in the project (Protect: Quadrant II).
- (3) Stakeholders with little or no influence and importance must also be involved in the program or project but do not need a particular participation or involvement strategy (Low Priority: Quadrant III).
- (4) High-influence stakeholders but with low importance but have high influence are also important. While they may not be the main targets of programs or projects, they will likely be opponents or at least always intervene. Treating their existence as important, providing them with the necessary information, and acknowledging their views are crucial. This needs to be done to prevent trouble and open conflict from arising. This group requires careful supervision and management, acknowledging their potential impact (Monitor: Quadrant IV).

Based on the stakeholder position map in Figure 3, 36 stakeholders are spread across four quadrants. Several stakeholders were found to be key stakeholders, namely: a) In quadrant II, Good Relations, those are: (1) The Central Government, is represented by the Ministry of Environment and Forestry, (2) The provincial government consists of the governor of Central Sulawesi Province, the Forestry Service of Central Sulawesi Province, and FMU Dampelas, (3) The Regency Government is represented by the Regent of Donggala District, the Regent

of Parigi Moutong District, the village head (along with his officials), and the head of the hamlet around FMU Dampelas and (4) Mass organizations and communities i.e. community groups that propose social forestry, for example, the lotus (women) group proposed HPHD in Bondoyong Village, the group proposing CF in Sintuwu Raya Village, and other villages). b) In Quadrant I, Protect, the key stakeholders are: Mass organizations and community groups that take Non-timber forest products (NTFPs) such as rattan, palm sugar and other NTFPs, industries that use illegal wood from the forest, and remote communities or remote indigenous communities of the Pendau and Lauje tribes in the hamlet V Lambani in Silutung Village in the forest area. c) In Quadrant III, Low Priority, the key stakeholders are: the Tajio and Kaili Tribe Communities, who are communities outside of forestry activities. d) In Quadrant IV, Protect, the key stakeholders are: Mass organizations and communities, namely traders, collectors, or dealers who buy rattan from group members; barons or dealers who buy illegal wood from the forest; industrial users of illegal wood from the forest; residents or communities who encroach on or use the forest area for agriculture or plantations. Table 3 presents key stakeholders at the FMU Dampelas Tinombo (Unit IV).

Stakeholders in Quadrant I, who have high importance but relatively low influence, often depend heavily on forest resources for their livelihoods. However, structural imbalances in rights, responsibilities, and benefit distribution, combined with the dominance of top-down decision-making, limit their access to equitable opportunities. This condition may increase their reliance on unsustainable or destructive forest practices. Therefore, reducing dependence on destructive forest resources requires not only livelihood diversification but also strengthening stakeholder inclusion, improving access to rights, and integrating local knowledge into forest management planning to enhance legitimacy and reduce resistance. The role of NGOs and academics cannot influence the solid national interests supported by high authorities. The

Table 3. Results of identification of key stakeholders at FMU Dampelas Tinombo

Code	Stakeholders	Position/Quadrant
Central government		
PPU1	Ministry of Environment and Forestry	Good Relation/II
Provincial Government		
PDP1	Governor of Central Sulawesi Province	Good Relation/II
PDP3	Central Sulawesi Provincial Forestry Service	Good Relation/II
PDP5	FMU Dampelas Tinombo	Good Relation/II
Regent of Donggala Regency		
PDK1	Regent of Donggala Regency	Good Relation/II
PDK2	Regent of Parigi Moutong Regency	Good Relation/II
PDK7	Village Heads and Hamlet Heads around FMU Dampelas Tinombo	Good Relation/II
Mass Organizations and Society		
ODM2	Seroja women's group	Good Relation/II
ODM3	Community groups taking NTFPs	Protect/I
ODM4	Rattan collectors or dealers	Monitor/IV
ODM7	Dealer who buys illegal wood from the forest	Monitor/IV
ODM8	Farming communities encroach on forest areas	Monitor/IV
ODM9	Industry uses illegal wood from forests	Protect/I
ODM13	Remote Indigenous Communities of the Pendau and Lauje Tribes	Protect/I

inequality of responsibilities, rights, and income experienced by forest management stakeholders when they start implementing the policy becomes more of a burden (Kartodihardjo, 2013). Incorporating stakeholder knowledge into land use analysis provides credibility and relevance and can create critical support that can help reduce distrust and resistance during plan implementation (Attanasio et al., 2022; Hariram et al., 2023; Sukwika, 2018).

Apart from providing basic awareness, targeted capacity-building is also needed to improve community livelihoods and economic standards (Boutilier, 2017; Fisher et al., 2017; Hutabalian, 2023). In this context, providing understanding refers to enhancing community knowledge on sustainable harvesting of non-timber forest products (NTFPs), improved cultivation techniques, value-added processing, and relevant regulatory frameworks such as social forestry schemes. For example, at FMU Dampelas Tinombo (Unit IV), the Forest Investment Program II (FIP-2) has supported the processing of patchouli oil in Sibualong and Malonas Villages, as well as palm sugar processing in Oncone Raya Village.

NTFPs such as patchouli, rattan, and sugar palm need to be further developed through improved planting, cultivation, and processing techniques. Strengthening extension services and targeted training programs is therefore essential to increase product value and promote sustainable forest-based livelihoods (Daher et al., 2019; Fisher et al., 2018; McGlone et al., 2020; Sukwika et al., 2016). The regional government and FMU Dampelas Tinombo (Unit IV) must develop similar programs in other areas, especially areas that are prone to encroachment and illegal timber harvesting. Changing professions or livelihoods from illegal logging and forest encroachment to other livelihoods that do not damage forest resources may reduce pressure on the forests (Boiral & Heras-Saizarbitoria, 2017; Fisher et al., 2017; Hariram et al., 2023; Mato-Santiso et al., 2021).

The livelihoods of the community in the Dampelas Tinombo FMU area (Unit IV), apart from collecting NTFPs, are coconut or copra farming and cattle breeding. Cocoa farming, which was the previous primary livelihood source for the communities around the FMU, has been abandoned by many due

to widespread pest and disease attacks. To alleviate community pressure on forests, promoting alternative livelihood options, such as livestock development, especially beef cattle, is crucial. Another viable community activity is silvopastoral, a combination of forestry activities with cattle breeding. It involves planting grass underground or on damaged forest land and keeping cows in pens. Currently, the cattle rearing system involves releasing them to graze, which can contribute to forest pressure.

B. Analysis of Stakeholder Roles

This analysis used the "3R" concept, namely Rights, Responsibilities, and Revenues. This tool helps review, negotiate, and rebuild the roles of stakeholders according to the demands of their needs (Meyer et al., 2014). Furthermore, this tool has the necessary work steps to internalize and strengthen the role of stakeholders by dissecting the 'role' of the components of 'stakeholder rights', 'responsibilities', and 'income', and then exploring and identifying 'relationships' between stakeholders. This analysis is considered a complement to stakeholder power analysis because it has the following characteristics: Exploring relative power between stakeholders, exploring mutual relationships between stakeholders, and providing a basis for negotiating roles

by building dialogue and agreement between stakeholders (Freeman, 2023; Freeman et al., 2018; Kazadi et al., 2016; Meyer et al., 2014; Reed et al., 2018; Sukwika, 2018; Zubayr et al., 2014).

There are three levels of stakeholder influence, namely the macro level (where broader environmental and policy contexts influence stakeholders), the meso level (which reflects interactions between the FMU institution as the focal management entity and other stakeholders, and the micro level (which captures interactions among stakeholders within the same network) (Boutilier, 2017; Colvin et al., 2020; Fares, 2023; Freeman, 2023; Freeman et al., 2018; Mahajan et al., 2023; Mato-Santiso et al., 2021). This analysis consists of two parts: (a) a study of the balance between rights, responsibilities, and revenues, both inter and intra-stakeholder, and (b) a study of the status of relationships between stakeholders. The "3R" analysis identifies who has significant responsibility through joint assessments carried out by community groups with certain weights, who control access (management rights holders), and who receives the benefits or users and custodians of access to FMU forest resources. For greater clarity, the following Table 4 presents the roles of stakeholders in detail from the "3R" analysis assessment results.

Table 4. Rights, responsibilities, and revenues of stakeholders in FMU Dampelas Tinombo

Stakeholder	Right	Score	Responsibility	Score	Revenue	Score
Ministry of Environment and Forestry/UPT	Policy regulations	4	Monitor the implementation of policy regulations	4	Forest Resource Provision (PSDH) Admissions	2
Governor/Forest Service	Supervision, policy	4	Central budgeting	4	Regional original income (PAD) revenue	1
FMU Dampelas Tinombo (Unit IV)	Management of the entire area	5	Management cost budgeting	5	Receive salary/wages as a manager	2

Stakeholder	Right	Score	Responsibility	Score	Revenue	Score
Village Head/Hamlet Head	Access to all resources	3	Controlling management, security	2	Revenue sharing from HTR, rubber, palm sugar, patchouli, etc.	1
Community groups proposing Social Forestry (For example, the Seroja women's group, the group proposing HPHD in Bondoyong Village, the CF Proposing Group in Sintuwu Raya Village, and other villages)	Access to resources and land	4	Maintain and supervise the area	2	Fees, wages	5
Community groups that take NTFPs from rattan, palm sugar, and other NTFPs	Access to Rattan NTFPs	4	Issue permits for planning business work	1	Selling, consuming farming/ planting products	5
Rattan collectors/ dealers who buy rattan from group members	None	0	Planting rattan seeds	3	Selling rattan products	3
Rattan buyer/recipient industry	None	0		0	Receive rattan from local communities	3
Residents/Communities who commit illegal logging (taking wood in the forest)	Access to forest resources (timber)	4	Manage permits, pay PSDH	1	Receive rattan from traders/ middlemen (broker)	5
Dealer who buys illegal wood from the forest	There is none	0	There is none	0	Selling timber forest products	5
Industry uses illegal wood from forests	None	0	Planting tree seedlings, managing permits (in the form of Social Forestry groups)	0	Receive wood from woodcutters	5
Residents/Communities are encroachers/users of forest areas for agriculture/plantations	Access to land resources	4	None	1	Receive wood from wood buyers	5

Stakeholder	Right	Score	Responsibility	Score	Revenue	Score
Remote Communities / Remote Indigenous Communities within Kaw. Pendau and Lauje tribes in V Lambani Hamlet in Silutung Village (11.7 km) in the forest	Access to forest resources	4	None	1	Selling and consuming agricultural/ plantation products	5

Description: 1= very poor, 2= poor, 3= fair/medium, 4= high, 5= very high (maximum)

Table 5. Comparison between stakeholders in terms of rights, responsibilities, and benefits

Highest stakeholder: Rights	Highest stakeholder: Responsibilities	Highest stakeholder: Benefits
1. FMU Dampelas Tinombo 2. Ministry of Environment and Forestry or UPT 3. Governor or Forest Service. 4. Community groups proposing Social Forestry. 5. Community groups that take NTFPs, such as rattan, palm sugar, and other NTFPs 6. Residents or communities carrying out illegal logging (taking wood in the forest) 7. Residents or communities encroaching on or using forest areas for agriculture or plantations 8. Remote Communities or Remote Indigenous Communities in the Area	1. FMU Dampelas Tinombo 2. Ministry of Environment and Forestry or UPT 3. Governor or Forest Service	1. Community groups proposing Social Forestry 2. Community groups that take NTFPs from rattan, palm sugar, and other NTFPs 3. Residents or communities carrying out illegal logging (taking wood in the forest). 4. Dealer who buys illegal wood from the forest 5. Industrial users of illegal wood from forests 6. Residents or communities that are encroachers or users of forest areas for agriculture or plantations. 7. Remote Communities or Remote Indigenous Communities in the Area

Table 5 compares stakeholders regarding different aspects of rights, responsibilities, and benefits. There are eight groups or stakeholders with the highest rights in managing and utilizing forest resources in FMU. The FMU Dampelas management, as a stakeholder, holds the highest rights and has significant authority over management. Five stakeholders have the highest responsibility, namely the FMU Dampelas Manager, the Ministry of Environment and Forestry, and the Governor or Forest Service. Meanwhile, there are seven stakeholders and beneficiaries.

The current condition is that there is still an imbalance between rights, responsibilities, and benefits in forest management in the

FMU Dampelas area. Stakeholders with high rights and duties have not received high benefits. Meanwhile, stakeholders with low or almost no rights and obligations have received high benefits. This shows the importance of enforcement mechanisms or sanctions for violations of applicable regulations. Moreover, understanding of the FMU management program at the community level is still low. Therefore, continuous socialization, followed by accelerated programs that accommodate community rights, are needed so that they do not conflict with applicable regulations. This can be done, for example, by accelerating social forestry permits, both in the form of Village Forest Management and Community Forest.

Table 6. Summary of relationships between stakeholders in FMU Dampelas Tinombo

Stakeholder	Ministry of EF/UPT	Governor/EF Service	FMU Dampelas Tinombo	Head of the village	Seroja women's group	N'TFP takers	Rattan buyers	Rattan buyers	Rattan buyers	Rattan buyers	Rattan buyers	Rattan buyers	Rattan buyers
Ministry of EF/UPT		*****	*****	****	****	*	*	*	*	*	***	*	*
Governor/EF Service			*****	****	****	****	***	***	*	*	***	***	***
FMU Dampelas Tinombo				*****	*****	*****	*****	*	***	*	*	***	****
Head of the village					*****	*****	*****	*	*****	*****	*	*****	*****
Seroja women's group						*****	*****	*	*****	*****	*	*****	*****
N'TFP takers							*****	*	*****	*	*	*****	*
Rattan buyers								*****	*	*	*	*	*
Rattan industry									*	*	*	*	*
Wood Picker										*****	*	*****	*
Lumber baron											*****	*	*
Wood industry												*	*
Encroachers/Cultivators													*
Indigenous Community													

Information:

Relationship quality: Good (*****), Average (****), Poor (***), Poor (**), No interaction (*).

***** : There is personal or institutional interaction and sustainable synergy with a minimum of 3 contacts per 3 months.

**** : There is interaction, synergistic, not sustainable, maximum of three contacts per 3 months.

*** : There is interaction, lack of synergy, polemics, and one contact, and it needs to be more sustainable.

** : There is interaction, which is not synergistic or conflictual.

* : No interaction at all

Table 6 shows the relationship pattern between stakeholders in the management of FMU Dampelas Tinombo (Unit IV). Based on these relationships, two stakeholders have good relationships with almost all parties, namely the Village Head (including hamlet-level leadership) and the Social Forestry Proposing Group. The Proposing Groups include, for example, the Seroja women's group as the proponent of village forest management in Bondoyong Village, the CF proposing group in Sintuwu Raya Village, and other village-based proposing groups. These two stakeholders might function as facilitators in improving relations between

groups (Brouwer et al., 2013; Fares, 2023; Fisher et al., 2017; Hariram et al., 2023; Kartodihardjo et al., 2013; Mato-Santiso et al., 2021; Sahraoui et al., 2021; Tian et al., 2020).

Regarding the fair distribution of benefits to the parties, this study still found inequality among beneficiaries around FMU Dampelas Tinombo (Unit IV). Some parties have high rights and responsibilities in the FMU Dampelas Tinombo (Unit IV) management program but have yet to receive maximum benefits, for example, the manager of FMU Dampelas Tinombo (Unit IV) himself. At the same time, some parties obtain high benefits but have yet to

carry out their rights and responsibilities as they should. For example, illegal wood-takers from the forest, illegal timber brokers (middlemen in illegal timber trade networks), and encroachers on forest land for agriculture or planting. This condition shows that there is a lack of consensus regarding a structural approach to stakeholder influence that considers stakeholder relationship patterns as a determining factor of influence (Colvin et al., 2020; Fares, 2023; Hariram et al., 2023; Kazadi et al., 2016; Reed et al., 2018; Sukwika, 2018; Sukwika et al., 2018; Sukwika & Fransisca, 2021).

Stakeholders with negative roles will influence the sustainability of the unhealthy management of FMU Dampelas Tinombo (Unit IV). For example, illegal loggers and brokers buying wood will drain wood resources from the forest without having a balance of obligations or responsibilities in carrying out replanting, as well as not paying Forest Resources Provision (PSDH) commitments or fees for obtaining forest products. Encroachers who convert forest land into agricultural areas often obtain significant economic benefits from farming activities but do not fulfill formal obligations, such as securing permits through social forestry schemes. The persistence of encroachment and illegal logging, despite routine patrols conducted by FMU Dampelas Tinombo (Unit IV), can be attributed to multiple factors. These include limited law enforcement capacity due to constraints in personnel and resources, high economic dependence of local communities on forest land, unequal distribution of rights and benefits among stakeholders, and limited access to formal forest management schemes. These conditions are consistent with previous studies highlighting that weak enforcement, livelihood pressures, and institutional constraints contribute to ongoing forest encroachment and illegal resource use (Fisher et al., 2017; Fisher et al., 2018; Hariram et al., 2023; Kartodihardjo, 2013; McGlone et al., 2020).

The frequency of communication between officials in different forestry institutions will be higher among those who participate in

stakeholder engagement activities. However, there needs to be more evidence to show that participation in stakeholder engagement activities can increase the frequency of communication between forestry stakeholders. There is also insufficient evidence to conclude that people in forestry institutions will have a higher frequency of communication with stakeholders due to higher levels of concern about future deforestation in the Region (Boiral & Heras-Saizarbitoria, 2017; Colvin et al., 2020; Daher et al., 2019; Fares, 2023; McGlone et al., 2020; Zubayr et al., 2014). Often, what is ideal from a planning perspective fails to meet decision-makers' needs, such as regional forest management area authorities. Although the principles of sustainable forest management have strong appeal in theory, they often fail to be implemented because of the disconnection between what is desired on a large scale and the willingness of individuals to make decisions on a small scale to achieve those outcomes (Attanasio et al., 2022; Boutilier, 2017; Brouwer et al., 2013; Daher et al., 2019; Fisher et al., 2018; Kartodihardjo et al., 2013).

Therefore, FMU Dampelas Tinombo (Unit IV) must also inform the community well about preserving forests. Apart from that, the community should be provided with several facilitation efforts, including: approach the introduction of sustainable livelihood options such as non-timber forest products (NTFPs), agroforestry, and silvopastoral systems; offering technical training on sustainable harvesting, cultivation, and post-harvest processing to increase product value; and facilitating access to social forestry schemes to ensure legal and secure resource use. In addition, technical support for market access, value chain development, and continuous extension services are essential to improve community livelihoods. A persuasive and participatory approach is also needed to encourage encroaching groups to transition toward sustainable economic activities. Collaboration among FMU, local government, NGOs, and communities is crucial to support sustainable forest management and balance

economic and environmental interests (Attanasio et al., 2022; Hariram et al., 2023; Kartodihardjo et al., 2013; Mato-Santiso et al., 2021; McGlone et al., 2020; Zubayr et al., 2014).

So far, FMU Dampelas Tinombo (Unit IV) has made efforts to reach out to illegal logging perpetrators through facilitation assistance through the participation of village heads or hamlet heads. Furthermore, FMU Dampelas Tinombo (Unit IV) also collaborates with social forestry groups to obtain precise information about their activities. The data needed are who the perpetrators are, where they come from, how many people, and how much area is being converted into agricultural land or gardens. In this way, FMU Dampelas Tinombo (Unit IV) can evaluate different livelihood options that may be offered to them and do not conflict with applicable regulations and the objectives of the management of FMU Dampelas Tinombo (Unit IV). For example, continuing to use forest products but not wood, such as switching to palm sugar and planting patchouli. Currently, the culture of raising cattle is entirely developed around FMU Dampelas Tinombo, especially the development of other forest-based businesses such as silvopastoral, namely the development of stable cattle livestock by planting grass under forest stands.

Implementation of the cooperation and partnership scheme for forest utilization by FMU Dampelas Tinombo (Unit IV) includes cooperation in the utilization of environmental services through natural tourism activities and collaboration in the utilization of Non-Timber Forest Products (NTFPs) such as rattan, honey, pine resin, other resins, and more NTFPs. Besides utilizing forests through cooperation schemes, FMU Dampelas Tinombo (Unit IV) has also guided the productive businesses of Forest Farmer Groups (FFG) in the FMU buffer area. Some of the FFG products that have been developed by FMU Dampelas Tinombo (Unit IV) include moringa leaf tea, kahumama leaf tea, granulated palm sugar, coffee, patchouli leaf oil, eucalyptus leaf oil, genitri fruit crafts, as well as several other products. In general, the FMU

Dampelas Tinombo Area (unit IV) has quite a lot of potential for sugar palm stands spread throughout the Donggala Regency and Parigi Moutong Regency. In the Donggala Regency area, there are 2 FFGs, namely FFG Mentai in Malonas Village and FFG Alam Lestari in Siweli Village, that have submitted a proposal for developing a sugar palm processing business through the FIP II program. Meanwhile, in the Parigi Moutong Regency area, FFG Seroja in Bondoyong Village and FFG Puncak Hijau in Sigega Bersehati Village have implemented palm sugar processing businesses, which are supported by funding through the FIP II program. By facilitating palm sugar through FIP II, our KTHs can contribute to increasing the income of villages around the forest in the production business sector.

IV. CONCLUSION

Based on the analysis carried out using the Stakeholder Analysis Matrix and the "3R" method (Rights, Responsibilities, Revenues), this study found several vital findings: (1) There is a significant imbalance between rights, responsibilities, and benefits in production forest management. Stakeholders with high rights and responsibilities, such as the government and forestry companies, have yet to receive comparable benefits. (2) Weak law enforcement is one of the main factors hampering the effectiveness of production forest management. The lack of supervision and firm action against violations leads to illegal practices and forest exploitation that harm all parties. (3) Public understanding of sustainable forest management still needs to be improved. Local communities, which should be one of the essential pillars of forest conservation, still need to gain sufficient knowledge and skills to manage forests sustainably. Their participation in forest management needs to be optimized.

The policy implication of these findings is the need for increased law enforcement and supervision of forest management practices. The government must strengthen regulations

and ensure all parties comply with the rules. In addition, empowering local communities through education and training regarding sustainable forest management is very important. Programs that increase community awareness and capacity to protect and utilize forests responsibly must be implemented. Furthermore, reviewing the distribution of rights, responsibilities, and benefits in forest management is a must. The government and FMU Dampelas Tinombo are eager to develop fair and more inclusive policies to ensure all stakeholders receive balanced benefits according to their roles and contributions. With this, production forest management can run more effectively, fairly, and sustainably, providing maximum environmental and community welfare benefits. Finally, as research partners, stakeholders have a role in evaluating the validity of models, especially for research projecting future changes in forest areas where empirical data is often limited. This study also provides important implications for future research. Further studies should examine the long-term effectiveness of stakeholder collaboration models and policy interventions in improving the balance of rights, responsibilities, and benefits among stakeholders in production forest management. Comparative studies involving different Forest Management Units (FMUs) across regions are recommended to assess whether similar stakeholder dynamics and institutional challenges occur under different socio-ecological contexts. In addition, future research could adopt mixed-method or longitudinal approaches to evaluate changes in stakeholder relationships, community participation, and governance performance following the implementation of social forestry programs, law enforcement improvements, and community empowerment initiatives. Such studies would contribute to the development of more adaptive, inclusive, and evidence-based forest governance strategies for sustainable forest management.

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REFERENCES

- Attanasio, G., Preghenella, N., De Toni, A. F., & Battistella, C. (2022). Stakeholder engagement in business models for sustainability: The stakeholder value flow model for sustainable development. *Business Strategy and the Environment*, 31(3), 860-874. <http://dx.doi.org/10.1002/bse.2922>
- Boiral, O., & Heras-Saizarbitoria, I. (2017). Managing biodiversity through stakeholder involvement: Why, who, and for what initiatives? *Journal of Business Ethics*, 140(3), 403-421. <http://dx.doi.org/10.1007/s10551-015-2668-3>
- Boutillier, R. (2017). *Stakeholder politics: Social capital, sustainable development, and the corporation*. New York: Routledge.
- Brouwer, H., Hiemstra, W., van Vugt, S., & Walters, H. (2013). Analysing stakeholder power dynamics in multi-stakeholder processes: insights of practice from Africa and Asia. *Knowledge Management for Development Journal*, 9(3), 11-31.
- Colvin, R., Witt, G. B., & Lacey, J. (2020). Power, perspective, and privilege: The challenge of translating stakeholder theory from business management to environmental and natural resource management. *Journal of Environmental Management*, 271, 110974. <http://dx.doi.org/10.1016/j.jenvman.2020.110974>
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, California: Sage Publications.
- Daher, B., Hannibal, B., Portney, K. E., & Mohtar, R. H. (2019). Toward creating an environment of cooperation between water, energy, and food stakeholders in San

- Antonio. *Science of The Total Environment*, 651, 2913-2926. <http://dx.doi.org/10.1016/j.scitotenv.2018.09.395>
- Fares, J. (2023). A multi-level typology for stakeholder influence: A systematic literature review using the structural approach. *European Management Journal*, 24. <http://dx.doi.org/10.1016/j.emj.2023.08.004>
- Fisher, Kim, Y.-S., Latifah, S., & Mukarom, M. (2017). Managing forest conflicts: perspectives of Indonesia's forest management unit directors. *Forest and Society*, 1(1), 8-26. <http://dx.doi.org/10.24259/fs.v1i1.772>
- Fisher, Moeliono, M., Mulyana, A., Yuliani, L., Adriadi, A., Kamaluddin, . . . Sahide, M. A. K. (2018). Assessing the new social forestry project in Indonesia: recognition, livelihood and conservation? *International Forestry Review*, 20(3), 346-361. <http://dx.doi.org/10.1505/146554818824063014>
- Freeman, R. E. (2023). The politics of stakeholder theory: Some future directions. R. *Edward Freeman's selected works on stakeholder theory and business ethics* (pp. 119-132). Springer. https://doi.org/10.1007/978-3-031-04564-6_5
- Freeman, R. E., Harrison, J. S., & Zyglidopoulos, S. (2018). *Stakeholder theory: Concepts and strategies*. Cambridge University Press.
- Hariram, N., Mekha, K., Suganthan, V., & Sudhakar, K. (2023). Sustainalism: An integrated socio-economic-environmental model to address sustainable development and sustainability. *Sustainability*, 15(13), 10682. <http://dx.doi.org/10.3390/su151310682>
- Hutabalian, R. (2023). The part of the production forest management unit to the realizing sustainable forest management at the Sarmi Regency Province of Papua. *Bengkoelen Justice: Jurnal Ilmu Hukum*, 13(2), 155-171. <http://dx.doi.org/10.33369/jbengkoelenjust.v13i2.30877>
- Kartodihardjo, H., Jaya, I., & Nugroho, B. (2013). Stakeholders analysis of policy-making process: The case of timber legality policy on private forest. *Journal of Tropical Forest Management/Jurnal Manajemen Hutan Tropika*, 19(2). <http://dx.doi.org/10.7226/jtfm.19.2.156>
- Kazadi, K., Lievens, A., & Mahr, D. (2016). Stakeholder co-creation during the innovation process: Identifying capabilities for knowledge creation among multiple stakeholders. *Journal of Business Research*, 69(2), 525-540. <http://dx.doi.org/10.1016/j.jbusres.2015.05.009>
- Kim, Y.-S., Bae, J. S., Fisher, L. A., Latifah, S., Affi, M., Lee, S. M., & Kim, I.-A. (2016). Indonesia's forest management units: effective intermediaries in REDD+ implementation? *Forest Policy and Economics*, 62, 69-77. <http://dx.doi.org/10.1016/j.forpol.2015.09.004>
- Kusmana, C., & Sukwika, T. (2018). Coastal community preference on the utilization of mangrove ecosystem and channelbar in Indramayu, Indonesia. *AACL Bioflux*, 11(3), 905-918. <http://www.bioflux.com.ro/home/volume-11-3-2018/>
- Mahajan, R., Lim, W. M., Sareen, M., Kumar, S., & Panwar, R. (2023). Stakeholder theory. *Journal of Business Research*, 166, 114104. <http://dx.doi.org/10.1016/j.jbusres.2023.114104>
- Mato-Santiso, V., Rey-García, M., & Sanzo-Pérez, M. J. (2021). Managing multi-stakeholder relationships in nonprofit organizations through multiple channels: A systematic review and research agenda for enhancing stakeholder relationship marketing. *Public Relations Review*, 47(4), 102074. <http://dx.doi.org/10.1016/j.pubrev.2021.102074>
- McComb, E. J., Boyd, S., & Boluk, K. (2017). Stakeholder collaboration: A means to the success of rural tourism destinations? A critical evaluation of the existence of stakeholder collaboration within the Mournes, Northern Ireland. *Tourism and Hospitality Research*, 17(3), 286-297. <http://dx.doi.org/10.1177/1467358415583738>
- McGlone, M. S., McNutt, K., Richardson, S. J., Bellingham, P. J., & Wright, E. F. (2020). Biodiversity monitoring, ecological integrity, and the design of the New Zealand Biodiversity Assessment Framework. *New Zealand Journal of Ecology*, 44(2), 1-12.
- Meyer, S. R., Johnson, M. L., Lilieholm, R. J., & Cronan, C. S. (2014). Development of a stakeholder-driven spatial modeling framework for strategic landscape planning using Bayesian networks across two urban-

- rural gradients in Maine, USA. *Ecological Modelling*, 291, 42-57. <http://dx.doi.org/10.1016/j.ecolmodel.2014.06.023>
- Reed, M. S., Vella, S., Challies, E., De Vente, J., Frewer, L., Hohenwallner-Ries, D., . . . Sidoli del Ceno, J. (2018). A theory of participation: what makes stakeholder and public engagement in environmental management work? *Restoration Ecology*, 26, S7-S17. <http://dx.doi.org/10.1111/rec.12541>
- Sahraoui, Y., Leski, C. D. G., Benot, M.-L., Revers, F., Salles, D., van Halder, I., . . . Carassou, L. (2021). Integrating ecological networks modelling in a participatory approach for assessing impacts of planning scenarios on landscape connectivity. *Landscape and Urban Planning*, 209, 104039. <http://dx.doi.org/10.1016/j.landurbplan.2021.104039>
- Sugiyono. (2017). *Quantitative, qualitative and R&D research methods*. Bandung Alfabeta.
- Sukwika, T. (2018). Actor analysis in formulating institutional models for community-forest development in Bogor Regency. *Journal of Regional and Rural Development Planning*, 2(2), 133-150. <http://dx.doi.org/10.29244/jp2wd.2018.2.2.133-150>
- Sukwika, T., Darusman, D., Kusmana, C., & Nurrochmat, D. R. (2016). Evaluating the level of sustainability of privately managed forest in Bogor, Indonesia. *Biodiversitas, Journal of Biological Diversity*, 17(1), 241-248. <http://dx.doi.org/10.13057/biodiv/d170135>
- Sukwika, T., Darusman, D., Kusmana, C., & Nurrochmat, D. R. (2018). Policy scenarios for managing of sustainability private-forests in Bogor Regency. *Journal of Natural Resources and Environmental Management*, 8(2), 207-215. <http://dx.doi.org/10.29244/jpsl.8.2.207-215>
- Sukwika, T., & Fransisca, L. (2021). The policy model for sustainable community forest: A factor analysis. *Indonesian Journal of Forestry Research*, 8(2), 135-157. <http://dx.doi.org/10.20886/ijfr.2021.8.2.135-157>
- Tian, F., Li, M., Han, X., Liu, H., & Mo, B. (2020). A production–living–ecological space model for land-use optimisation: A case study of the core Tumen River region in China. *Ecological Modelling*, 437, 109310. <http://dx.doi.org/10.1016/j.ecolmodel.2020.109310>
- Yin, R. K. (2018). *Case study research and applications: Design and Methods (6th ed.)* CA: Sage Thousand Oaks.
- Zubayr, M., Darusman, D., Nugroho, B., & Nurrochmat, D. R. (2014). The roles of stakeholders in policy implementation of the use of forest area for mining activity. *Jurnal Analisis Kebijakan Kehutanan*, 11(3), 239-259. <http://dx.doi.org/10.20886/jakk.2014.11.3.239-259>