

# Stakeholder and social networks analysis of conservation partnership in Bantimurung Bulusaraung National Park, South Sulawesi, Indonesia

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**Abstract.** Sabar A, Maulany RI, Yusran, Kurniawan A, Rahmatullah RA, Syam MA, Syawal MA, Halis A, Rafiadi MT. 2023. Stakeholder and social networks analysis of conservation partnership in Bantimurung Bulusaraung National Park, South Sulawesi, Indonesia. *Biodiversitas* 24: 1017-1024. Social forestry or community-based forest management is increasingly promoted to increase the level of welfare of communities living around the forest, especially in many tropical countries, including Indonesia. One form of social forestry in Indonesia is Conservation Partnership (*Kemitraan Konservasi*) which is implemented in conservation areas and nature reserves. Since this scheme is relatively new, not extensive knowledge has been accumulated. This study aimed to identify the stakeholders involved in Conservation Partnerships in Bantimurung Bulusaraung National Park, focusing on the communities in Rompegading Village, Cenrana Sub-district, Maros District, South Sulawesi, Indonesia, and to analyze the pattern of social networks of each stakeholder in the management of the national park. Data were collected using observation, interviews, and literature research. We identify eight stakeholders involved in the Conservation Partnerships, namely Bantimurung Bulusaraung National Park, Sonrea Farmer Group, Rompegading Village Government, an NGO named Community Forest Service Team (TLKM), Center for Social Forestry and Environmental Partnerships (BPSKL Sulawesi), Bulusaraung Forest Management Unit (FMU), Faculty of Forestry Hasanuddin University, and a private company named PT. Adimitra. Each stakeholder involved in the Conservation Partnerships has different interests, goals, power, and legitimacy. The three stakeholders with the most significant interest, power, and legitimacy are Bantimurung Bulusaraung National Park, BPSKL Sulawesi, and TLKM. The results of the social network analysis indicate that the interaction among stakeholders is incomplete since not all stakeholders interact with each other. Thus, this study recommends the stakeholders to facilitate training on forest management and institutional strengthening, and also conduct stakeholder meetings to comprehend institutional roles in conservation partnerships as well as a medium for equal information exchange.

**Keywords:** Conservation partnerships, social network analysis, stakeholder analysis

## INTRODUCTION

The low level of welfare of communities living around forest areas has become an ongoing issue in many tropical countries, including Indonesia. Indonesia has 95.5 million ha of forested areas, equivalent to 50.9% of the country's total land mass (Ministry of Environment and Forestry 2020), with many local communities highly dependent on forest resources. On the other hand, the large extent of forest area in Indonesia should be managed in accordance with environmental sustainability, which does not always align with the preference of forest-dependent communities, as in some cases, they undertake unsustainable practices, such as illegal logging and trade, forest fires, and poaching (Putri and Tresiana 2022). Therefore, there is a need to develop policies and programs for community-based forest management which deliver a win-win situation of achieving environmental sustainability and simultaneously increasing the community's well-being. One form of community-based forest management is through partnerships in conservation.

Various studies have shown the effectiveness of

partnerships in conservation. Andonova and Piselli (2022) found that the conservation partnership program in Brazil and Amazon successfully resolved the conflict by providing legal access to communities to manage the area. Furthermore, a study by Pinheiro et al. (2022) in the Eastern Amazon revealed that the conservation partnership program is the right solution to improve the economy of rural communities. In addition, de Wit and Mourato (2022) found that the program is effective in reducing the number of tenure cases. Another example of conservation partnership in Bolivia showed the increased social capital of rural communities involved in the program (Authélet et al. 2021).

The results of the studies mentioned above agreed that conservation partnership is a win-win solution to protecting conservation areas while improving the welfare of communities living inside and outside the conservation area (Usadolo and Caldwell 2016). However, some problems remain to exist in the implementation of the conservation partnership programs, which might be caused by several factors, such as the conventional management system, lack of local stakeholders involvement, and lack of

understanding regarding the socio-cultural conditions of the stakeholder (Chervier et al. 2019; Mbuvi and Kungu 2021). Therefore, Pelyukh et al. (2021) suggested that studies focusing on stakeholder analysis are necessary to understand the roles and influences of the institutions involved in conservation partnership programs.

In Indonesia, a similar scheme of conservation partnership (*Kemitraan Konservasi*) is also implemented in conservation areas and nature reserves under the policy of social forestry (*Perhutanan Sosial*). It is carried out based on the principles of mutual trust, respect, and benefit (Prayitno 2020). The Conservation Partnership Program began to be established and implemented in 2018 based on the Decree of the Directorate General of Ecosystem and Natural Resource Conservation P.6/KSDAE/SET/Kum.1/6/2018 concerning The Technical Guidelines for Conservation Partnerships. According to Mulyana et al. (2019), the objective of the Conservation Partnership Program is to reduce conflict between the community and the management of conservation areas. Based on the strategic plan of the Directorate General of Ecosystem and Natural Resource Conservation, there will be 5,000 villages that will be approved for the Conservation Partnership Program during the period of 2020-2024.

In the context of forest management in Indonesia, one of the stakeholders at the regional level is the Forest Management Unit (FMU) which acts as an extension of the central government and regional governments. FMU has the function and authority to ensure sustainable and optimal management of forest areas in three aspects, namely social, economic, and ecological (Stryamets et al. 2020). However, it is undeniable that managing a large forest area certainly requires the collaboration of various institutions. This is where one of the problems arises in partnerships, namely institutions or groups that are not fully aligned with other groups, and all stakeholders have not been involved in the agreed objectives of the partnerships. This problem becomes the justification for the importance of conducting a stakeholder analysis as the first step in supporting the effective and sustainable management of conservation partnerships (Rozyłowicz et al. 2017).

Conservation Partnership has been implemented in Bantimurung Bulusaraung National Park, South Sulawesi Province area since 2018. This program has a positive impact on the communities in Rompegading Village, which are directly involved in the partnership program by providing legal access to forest resources. Since such program has been implemented relatively long and is considered among the first implementer of Conservation Partnership in Indonesia, there might be important insights that can be learned. Therefore, this study aims to identify the stakeholders involved in Conservation Partnerships between Bantimurung Bulusaraung National Park and communities in Rompegading Village, Cenrana Sub-district, Maros District, and to analyze the pattern of social networks of each stakeholder in the management of the national park. We expect that the results of this study can serve as input for relevant institutions in developing policies and strategies in the Conservation Partnership program.

## MATERIALS AND METHODS

### Study area

The study was conducted in Rompegading Village, Cenrana District, Maros District, South Sulawesi Province, Indonesia (Figure 1) with an area of 17.97 km<sup>2</sup>. The geographic location is 5.0245977°S 199.738378°E, with the distance of the village from the sub-district center is 6 km and the distances from the district center and provincial capital are 39 and 69 km, respectively. In 2017, Rompegading Village had a population of 1,700 people with a population density of 94.60 people/km<sup>2</sup>. The village is quite high with an altitude of about 350-715 meters above sea level. Then, the rainfall average of the region is 347 mm/month with an average of 16 days of rain with an average air temperature is 29°C.

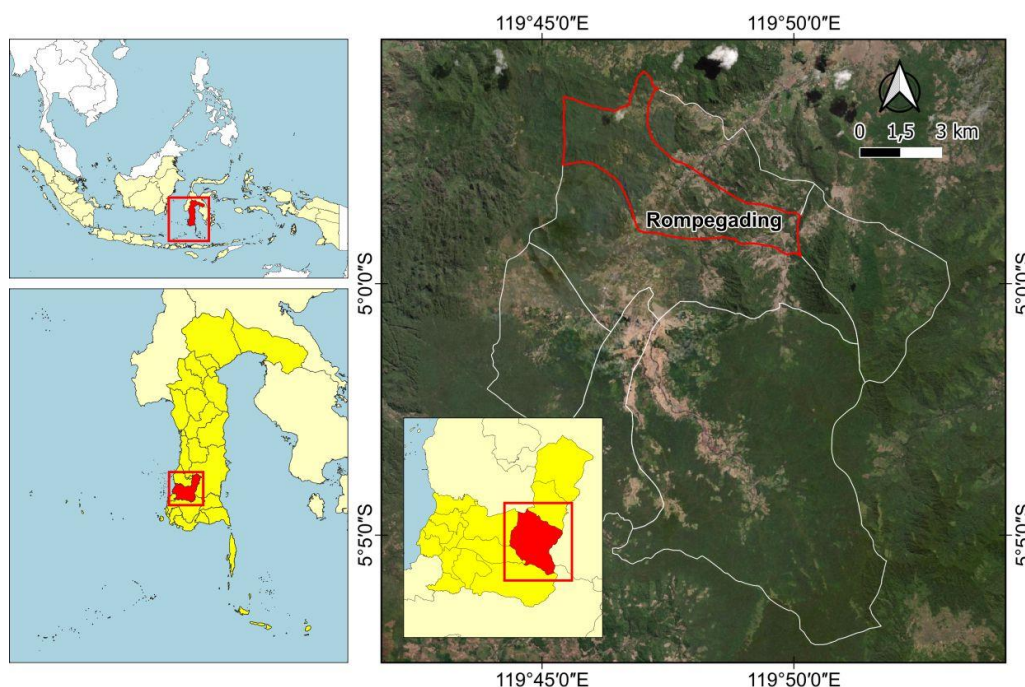
### Data collection

This study used primary and secondary data. Primary data was collected using observation and systematic recording of the phenomena investigated. In a broad sense, that is done directly or indirectly (Borg et al. 2015). Primary data was collected through interviews with respondents and stakeholders following the method by Maryudi and Fisher (2020). On the other hand, secondary data was collected through literature study. Snowball sampling is utilized in this study, which began with a small number of respondents who met the research requirements and asked them to suggest further possible respondents, and so on (Parker et al. 2020). The stakeholders who became respondents were from the governments (i.e., Bantimurung Bulusaraung National Park, Center for Social Forestry and Environmental Partnerships (BPSKL) Sulawesi, Bulusaraung FMU, and Rompegading Village Government), NGOs (TLKM), academics (Faculty of Forestry Hasanuddin University), private company (PT. Adimitra) and community groups (Sonrea Farmer Group). The type of questionnaire used in this research is an open-ended questionnaire that letting the respondents give their opinion without the researcher's influence.

### Data analysis

#### Stakeholder analysis

Stakeholder analysis or actor analysis is an approach to find out the weaknesses and strengths of stakeholders and to identify the attitudes and positions of each stakeholder (Rees and MacDonell 2017). Stakeholder analysis was carried out by identifying which stakeholders are involved in the management of the Conservation Partnership in Rompegading Village through several stages as follows: (i) identify the stakeholders involved in the management of the Conservation Partnership in Rompegading Village; (ii) determine the problems or issues faced in the Conservation Partnership and the stakeholders who can solve the problem; (iii) conduct PIL (Power, Interest, Legitimate) analysis to find out which stakeholders have high power and low power in decision making.



**Figure 1.** Map of the study area in Rompegading Village, Cenrana Sub-district, Maros District, South Sulawesi Province, Indonesia

PIL analysis was conducted to determine stakeholders with a strong interest or influence in the management of Conservation Partnerships in Rompegading Village. According to Grimble and Wellard (1997), the PIL of stakeholders are divided into eight categories, namely: (i) PIL (dominant): power is very strong, interest is affected, and legitimacy is high, (ii) PI (powered): power is very strong, interest is affected, claims are not recognized, or legitimacy is weak, (iii) OT (influential): very strong power, recognized claims or strong legitimacy, interest is not affected, (iv) IL (vulnerable): interest is affected, claims are recognized or have good legitimacy, but without power, (v) P (dormant): very strong power, interest is not affected, and claims are not recognized, (vi) L (concerned): claims are recognized but not affected and not strong, (vii) I (marginal): affected, but the claim is not recognized, and power is not strong, (viii) Miscellaneous: stakeholders who do not have all three aspects

#### *Social network analysis*

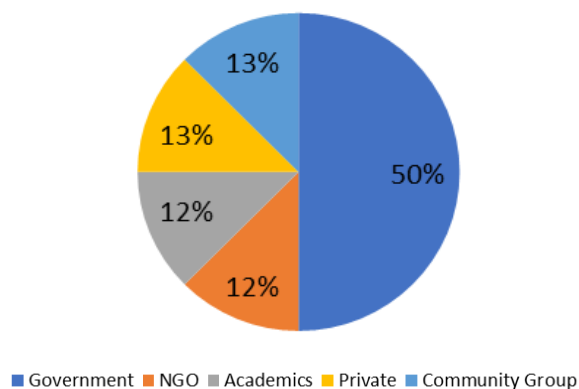
Social network analysis is defined as a set of relationships between social actors. Furthermore, a social network is a set of actors (points or nodes) that may have relationships (edges or ties) with one another. The fundamental perspective on social networks is that through social relations, individuals gain access to information, social support, and other resources (Agneessens et al. 2017). Social network analysis was conducted to find out the pattern of relationships built by each stakeholder and to obtain information about the relationships that each stakeholder built in the management of Conservation Partnerships in Rompegading Village. In doing so, several stages were carried out to determine the social network of each stakeholder as follows: (i) identify the formation of a social network in the presence of more than two

stakeholders who have a social network relationship; (ii) analyze the network structure of each stakeholder and the interrelationships with each other. This study used UCINET to analyze the pattern of information exchange among stakeholders. UCINET is a tool to connect the roles between actors and present or visualize existing relationships (Apostolato 2015). The steps in creating a visualization using the UNICET tool were as follows: (i) tabulate data from the results of the actor interviews; (ii) create an actor matrix in Microsoft Excel, which describes the actors involved on the sides of the matrix; (iii) assign a value of 1 and 0 in which 1 means there is a relationship and 0 means there is no relationship; (iv) convert the Microsoft excel data to UCINET data by copying the excel file into the UCINET spreadsheet tool; and (v) visualize actor relationships using data created with the NetDraw tool.

## **RESULTS AND DISCUSSION**

### **Stakeholder identification**

Based on the Decree of the Minister of Environment and Forestry Conservation Partnership in Rompegading Village, the community was granted a management permit in 2019 covering an area of 71.41 hectares. Sonrea Farmer Group has the right to manage the utilization of Non-Timber Forest Products (NTFPs) in the form of pine resin, bamboo, and traditional cultivation. However, the things that cannot be done by Sonrea Farmer Group in the conservation partnership area permit include: (i) Cannot change the function of the forest; (ii) Cannot sell the land under the permit; (iii) Cannot be collateralized; (iv) Cannot be expanded without the permission of the Minister of Environment and Forestry (KLHK).



**Figure 2.** The proportion of stakeholders based on the category in Conservation Partnerships in Rompegading Village, Maros District, South Sulawesi Province, Indonesia

Stakeholder identification was carried out to find the parties, groups, or organizations with interests and goals, and are involved in the management of Conservation Partnerships in Rompegading Village. The results found that eight stakeholders were involved in the Conservation Partnerships from five different categories, including the government, village community groups, academics, NGOs, and private sectors (Table 1).

The result of the stakeholder identification revealed that four government agencies are involved in managing

conservation partnerships. At the same time, for village community groups, NGOs, entrepreneurs as well as academics, there was only one stakeholder involved each. This result shows that government is more dominant in the management of conservation partnerships in Rompegading Village. Research conducted by Hayter and Clapp (2020) explains that stakeholders from government agencies are more involved in activity compared to civil society or NGOs since the government basically has duties and authorities compared to other stakeholders.

#### Analysis of stakeholder's interests

The results of the analysis of stakeholders' interests in the conservation partnership program in Rompegading Village are presented in Table 2. The result shows that Bantimurung Bulusaraung National Park has four interests in the conservation partnership program, indicating the stakeholder with the broadest interest. This is because Bantimurung Bulusaraung National Park is the authority of the area. This result is in line with what was conveyed by Andyono and et al. (2018), who conducted stakeholder analysis research in Way Kambas National Park (NP) which also found that the NP is the key stakeholder with the most significant interest compared to the other stakeholders. The interests built by stakeholders are also determined by the power relations made by each stakeholder (Chamberland-Fontaine et al. 2022; de Wit and Mourato 2022; Raymond et al. 2022).

**Table 1.** Stakeholders involved in Conservation Partnerships in Rompegading Village, Maros District, South Sulawesi, Indonesia

Category	Stakeholder
Government	Bantimurung Bulusaraung National Park Center for Social Forestry and Environmental Partnership (BPSKL) Sulawesi Region Bulusaraung FMU Rompegading Village Government
Village Community Group	Sonrea Farmers Group
Academics	Faculty of Forestry, Hasanuddin University
NGO	Community Forest Service Team (TLKM)
Private sector	PT. Adimitra

**Table 2.** Analysis of stakeholder's interests in Conservation Partnerships in Rompegading Village, Maros District, South Sulawesi, Indonesia

Stakeholder	Interest
Bantimurung Bulusaraung NP	The conservation partnership program is running Preservation and security of the NP area are maintained Community empowerment around the NP area Increasing the economy of the community around the NP area
Sonrea Farmer Group	Have access to utilize the resources of the NP area Increasing the economy of group members
TLKM	Minimizing conflict between the community and the NP Empowerment of the community around the NP area Improving the economy of the community around the NP area
Rompegading Village Government	Increasing the economy of rural communities No conflict between the community and the NP
BPSKL Sulawesi	Ensuring the implementation of the conservation partnership program Empowering the community around the NP area Increasing the economy of the community around the NP area
Faculty of Forestry Hasanuddin University	The preservation and security of the NP area are maintained Empowerment of the community around the NP area
Bulusaraung FMU	Increasing the capacity of group members
PT Adimitra	Partnering with Sonrea Farmer Group

### Identification of problems or issues

Research conducted in Rompegading Village regarding conservation partnership management revealed problems in managing conservation partnerships and the stakeholders who can resolve such issues (Table 3).

There are six problems identified in the management of conservation partnerships in Rompegading Village in which particular stakeholders might resolve each problem. The six problems faced can potentially be resolved by seven of the eight stakeholders' interests. Similar problems or issues were also found in previous research conducted by Loli et al. (2021), which analyzed the conservation partnership program in Bunaken National Park and explained that the lack of active group members and low knowledge of institutional management were the main problems. The lack of human resource capacity in managing the Conservation Partnership is a fundamental issue that must be addressed (Putri and Tresiana 2022).

### Analysis of PIL (Power, Interest, Legitimate)

PIL analysis was carried out to determine stakeholders with a strong interest or influence in the management of conservation partnerships in Rompegading Village, with the results presented in Table 4.

The result of stakeholder analysis using the PIL (Power, Interest, Legitimate) approach shows that there are only three stakeholders in the PIL (dominant) category, namely Bantimurung Bulusaraung NP, BPSKL Sulawesi Region, and TLKM. According to Aisyah et al. (2017), the stakeholders in the PIL category can significantly contribute to improving management performance. On the other hand, Sonrea Farmer Group is in the IL category (vulnerable). Then, those in the PI (powered) category are the Rompegading Village Government and the Faculty of Forestry Hasanuddin University. The Bulusaraung FMU and PT. Adimitra are in the I (marginal) category. There are differences in category levels in the PIL analysis because each stakeholder has differences in terms of power, responsibility, resources, and capacity (Garcés-Ayerbe et al. 2012).

**Table 3.** Problems or issues in Conservation Partnerships in Rompegading Village, Maros District, South Sulawesi Province, Indonesia

Problem	Stakeholders who can resolve
The potential for pine and sugar palm production is mostly located outside the management permit area	Bantimurung Bulusaraung NP BPSKL Sulawesi
Lack of active farmer group members	Bantimurung Bulusaraung NP BPSKL Sulawesi TLKM Sonrea Farmer Group
The knowledge of group members in terms of institutional management is still low	TLKM BPSKL Sulawesi Bantimurung Bulusaraung NP Bulusaraung FMU
The group's ability in terms of commodity management is still limited	Bantimurung Bulusaraung NP BPSKL Sulawesi TLKM Faculty of Forestry Hasanuddin University
Several communities are actively involved in management but are not included in the farmer group members	Bantimurung Bulusaraung NP BPSKL Sulawesi Rompegading Village Government
Some members of farmer groups do not know what can and cannot be done in conservation partnership management	Bantimurung Bulusaraung NP BPSKL Sulawesi TLKM

**Table 4.** Analysis of PIL (Power, Interest, Legitimate) in Conservation Partnerships in Rompegading Village, Maros District, South Sulawesi Province, Indonesia

Stakeholders	Power		Interest		Legitimate		Category
	Big	Small	Big	Small	Big	Small	
Bantimurung Bulusaraung NP	✓		✓		✓		PIL
BPSKL Sulawesi	✓		✓		✓		PIL
TLKM	✓		✓		✓		PIL
Sonrea Farmer Group		✓	✓		✓		IL
Rompegading Village Government	✓		✓			✓	PI
Faculty of Forestry, Hasanuddin University	✓		✓			✓	PI
Bulusaraung FMU		✓	✓			✓	I
PT. Adimitra			✓			✓	I

### Interactions among stakeholders

The analysis found that the stakeholders involved in managing Conservation Partnerships interact with more than two stakeholders. For example, the Sonrea Farmer Group and Rompegading Village Government interact with all stakeholders. Bantimurung Bulusaraung NP forms networks with seven out of eight stakeholders, while BPSKL Sulawesi region interacts with five stakeholders. Then, TLKM, Bulusaraung FMU, and the Faculty of Forestry Hasanuddin University interact with four stakeholders. PT. Adimitra is the stakeholder with the lowest network, which interacts with three stakeholders. The results also depict that Sonrea Farmer Group and Rompegading Village Government become stakeholders who exchange information with all stakeholders. This is because the farmer group and the village government are considered to be able to realize the goals of each stakeholder involved (Busck-Lumholt et al. 2022). The absence of communication between stakeholders is due to differences in interests and goals, leading to the dominance of particular stakeholders (Zikargae et al. 2022a, 2022b).

### Centrality value of each stakeholder

The results of the analysis on the centrality value of the relationship among the stakeholders in the Conservation

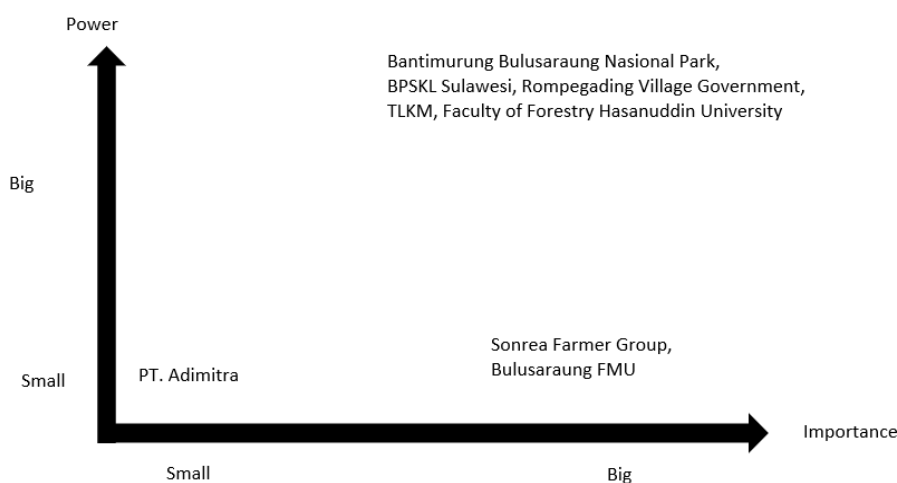
Partnership Program in Rompegading Village are presented in Table 5. This table shows how each stakeholder establishes relationships through exchanges, absorbs, and disseminates information to other stakeholders (Syahputra et al. 2019). The table shows that the Sonrea Farmer Group and Rompegading Village government have the highest centrality, suggesting that these two stakeholders have the most intense communication with all stakeholders involved in the Conservation Partnership program.

### Social networks of stakeholders

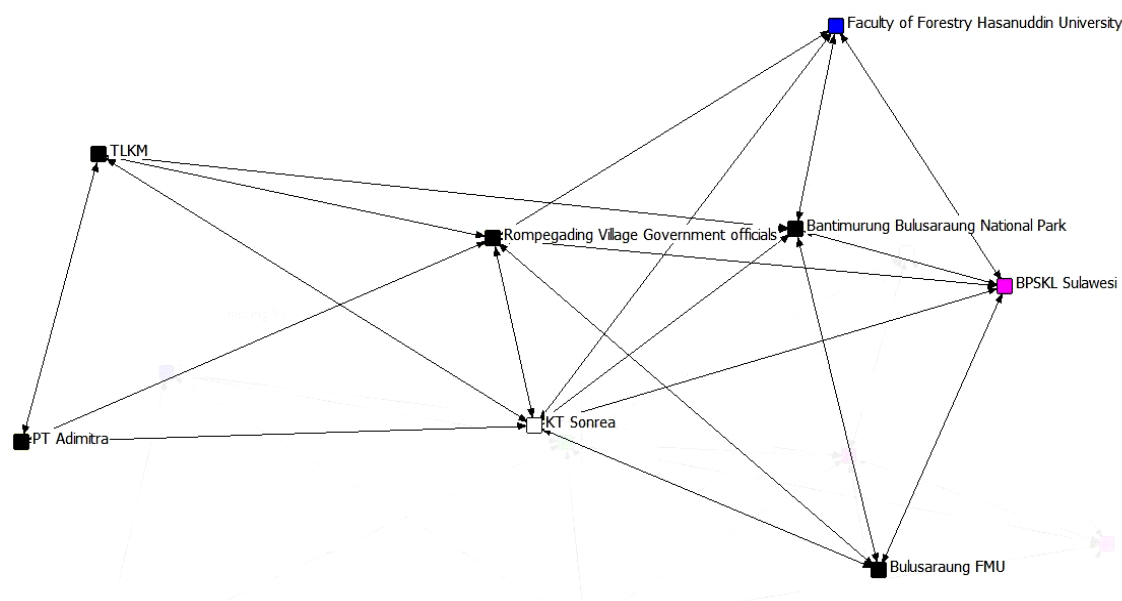
The analysis of the pattern information exchange among stakeholders using the UCINET application shows the density value of 0.439 with the number of interactions as much as 62.136. This result indicates that the relationships among stakeholders in the Conservation Partnerships in Rompegading Village do not resemble a complete network, as shown in Figure 4. Ilham et al. (2016) state that a complete network has a density value of 1. However, a complete network is difficult to realize because stakeholders cannot build a perfect interaction with others.

**Table 5.** Centrality value of stakeholder in Conservation Partnerships in Rompegading Village, Maros District, South Sulawesi Province, Indonesia

Stakeholder	Indegree	Outdegree	Incloseness	Outcloseness	Betweenness
Bantimurung Bulusaraung NP	6.000	6.000	87.000	87.000	1.250
Sonrea Farmer Group	7.000	7.000	100.000	100.000	3.083
Rompegading Village Government	7.000	7.000	100.000	100.000	3.083
BPSKL Sulawesi	5.000	5.000	77.778	77.778	0.333
TLKM	4.000	4.000	70.000	70.000	0.250
Faculty of Forestry Hasanuddin University	4.000	4.000	70.000	70.000	0.000
Bulusaraung FMU	4.000	4.000	70.000	70.000	0.000
PT. Adimitra	3.000	3.000	63.638	63.638	0.000



**Figure 3.** Map of power and interest of each stakeholder in Conservation Partnerships in Rompegading Village, Maros District, South Sulawesi Province, Indonesia



**Figure 4.** Social networks of stakeholders involved in Conservation Partnerships in Rompegading Village, Maros District, South Sulawesi Province, Indonesia

Figure 4 depicts that each stakeholder's interaction pattern is not evenly distributed. This is because only a few parties receive information which only the Sonrea Farmer Group and the Rompegading Village government interact with all stakeholders, while other stakeholders only interact with two or one stakeholder. This result indicates that each stakeholder has not collaborated to achieve common goals. Collaboration and participation of every stakeholder are essential for improving the Conservation Partnerships in the Rompegading Village program (Yamaki 2016).

This study revealed that stakeholders involved in the Conservation Partnerships in Rompegading Village are government agencies, farmer groups, academics, NGOs, and private sectors. Among them, government agencies are the most dominant stakeholders. This is understandable since the Conservation Partnership is implemented in national parks under the authority of the central government, i.e., the Ministry of Environment and Forestry, which has a higher level of protection or supervision status compared to other forest areas, such as protection and production forests. Each stakeholder involved in the Conservation Partnerships has different interests, goals, power, and legitimacy. Such differences cause several problems in the management of the Conservation Partnership in which each stakeholder attempts to take advantage of the power they have to get the interests, either individually or institutionally. There are also stakeholders who have significant interests, power, and legitimacy. This study also found information inequality in the Conservation Partnerships in Rompegading Village. Thus, this study recommends the government to facilitate stakeholder meetings in order to comprehend each other's roles in conservation partnerships as well as a medium for equal information exchange.

Furthermore, stakeholders should work together to facilitate training on forest management and institutional strengthening for farmer groups.

## ACKNOWLEDGEMENTS

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