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REGULAR RESEARCH ARTICLE

The Role of Local Governments in Supporting Social Forestry Implementation in Indonesia: A Social Network Analysis and Evidence from Eastern Indonesia

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ABSTRACT

Social forestry has become an integral part of Indonesia's efforts to balance economic development, conservation of natural resources, and the well-being of local communities. The Jokowi administration has made significant efforts to promote this initiative, including allocating 12.7 million hectares of state forest areas and recognizing it as an instrument to address tenure issues in forest areas through the Omnibus Law on Job Creation with getting support from various regulations by relevant ministries. However, social forestry support is needed down to the local government/regional levels (provincial, regency, and village levels). This study aims to analyze the local government's support for implementing social forestry. We employ Social Network Analysis to identify local government entities and their relationships in implementation processes. Additionally, document analysis is used to assess the extent of local government support through their working documents. The study shows that local government support for the implementation is still limited, with its execution primarily concentrated within a few agencies. Social forestry has not yet fully become a strategy for achieving community well-being around forests, enhancing local economies, or protecting forest resources. Furthermore, stakeholders' understanding of social forestry, resource availability, and local government policies to support it remains limited. Improvements in these three aspects are necessary to ensure successful implementation at the regional levels.

KEYWORDS

Social Forestry; Forest Dependent Communities; Indonesian Job Creation Law; Social Network Analysis (SNA); Local Government.

1. INTRODUCTION

Social forestry has been mainstreamed in Indonesia for several decades, primarily since the Eighth World Forestry Congress held in Jakarta in 1978, focusing on the theme "*Forests for the People*." The terminology used in developing countries under the World Bank and Food and Agriculture Organization (FAO) funding initiatives includes Agroforestry, Community Forestry, and Social Forestry (Awang, 2003). The initial promotion of social forestry was linked to the support of local communities in implementing forest management activities in return for small-value forest products such as firewood and employment (FAO, 1978). In Indonesia, the term "social forestry" was first introduced in 1984 in Java to enhance the "prosperity approach" promoted by Perum Perhutani. Perhutani recruited landless farmers to participate in cultivating staple food crops like rice, cassava, and maize alongside young teak trees for a period of three to five years. When their contracts ended, these farmers were no longer allowed to farm on the teak plantations they maintained (Siscawati, 2013; Peluso, 2013).

In present times, social forestry is being advocated as a forestry practice that directly involves forest-dependent communities, empowering them to set goals and manage forest resources (Sikor et al., 2013; Ragandhi et al., 2021). The Indonesian government defines social forestry as a sustainable forest management system

implemented in state forests or private/customary forests by local communities or indigenous communities to improve welfare, environmental balance, and socio-cultural dynamics in the form of village forests, forest communities, community plantation forests, customary forests, and forestry partnerships (MoEF, 2021). The Initiatives were claimed to have the potential to balance the needs of economic development and natural resource conservation while providing benefits to local communities (Fisher et al., 2018; Purwanto, 2017; Maryudi et al., 2022). Therefore, to achieve this goal, collaborative and participatory approaches between stakeholders need to be encouraged.

The Jokowi administration has undertaken significant efforts to actualize social forestry in Indonesia, focusing on allocating 12.7 million hectares or 10 % of state forested areas for community use. Social forestry constitutes a part of the core component of the economic policy framework, particularly in alleviating land tenure inequality through providing legal access for communities to manage forest resources. The commitment is outlined in the 2014-2019 and 2020-2024 National Medium-Term Development Plans. Moreover, a crucial milestone in the journey towards social forestry was achieved by incorporating social forestry into the provisions of the Job Creation Law (UUCK) No. 11/2020. This legal framework acknowledges the role of social forestry in resolving tenure challenges across production and protection forest zones, thereby bolstering the administration's commitment to advancing social forestry within Indonesia. President Jokowi further solidified this commitment by issuing Presidential Regulation No. 28/2023, which pertains to the Integrated Planning for the Acceleration of Social Forestry Management. This strategic policy measure facilitates a holistic and harmonized approach to social forestry, enhancing collaboration among various ministries, agencies, provincial and local governments, and relevant stakeholders.

The spirit of the policy is also supported by other institutions at the national level. The Minister of Home Affairs issued Circulars to Governors and Regents/Mayors to support the development of Social Forestry businesses. Additionally, the Coordinating Ministry for Maritime Affairs and Investment of the Republic of Indonesia issued Ministerial Degree No. 126/2021 concerning the Formation of the National Working Group for the Acceleration of Social Forestry Management. Further reinforcing this support, The Minister of Villages, Development of Disadvantaged Regions, and Transmigration also issued a regulation, Village Funds (*Dana Desa*) that can be used for Social Forestry through the Minister of Villages, Development of Disadvantaged Regions, and Transmigration Regulation No. 7/2022 concerning Priority for Using Village Funds in 2023. Law No. 6/2014, concerning village governance, provides villages with autonomy to manage their assets, including village-owned forests (Moeliono et al., 2017). These measures demonstrate a growing recognition of the importance of social forestry at the national level in promoting sustainable forest management and supporting the livelihoods of local communities. Nevertheless, as highlighted by Sahide et al. (2020), maintaining proportionate support for social forestry policies is crucial, commencing from the initial planning phase and extending through to the implementation stage. By harnessing support from various institutions up to the implementation phase, the potential for successful social forestry implementation is further heightened.

To effectively implement social forestry in Indonesia, it is crucial to ensure that the policies and support provided at the national level are effectively transmitted and implemented at the regional levels (provincial, regency, and village levels). This requires the active involvement and support of various stakeholders, including government agencies, research institutions, NGOs, and private sector actors (Rahayu et

al., 2023; F, 2022). Local stakeholders play a critical role in the success of social forestry, as they are directly implementing these policies on the ground. In addition, successful implementation is important to ensure coordination and collaboration among stakeholders at the regional levels to build trust and promote a sense of ownership and accountability (Widyaningsih et al., 2022). These actions can help avoid duplication of efforts, ensure efficient use of resources, and increase the overall effectiveness of social forestry policies (Aji & Soejono, 2021; Kark et al., 2015). Pambudi (2020) states that local government agencies play a crucial role in providing the legal and regulatory framework for social forestry implementation at the site level. As it happens in East Java province the governor has issued a Letter of the Synchronization and Implementation of Social Forestry to increase the commitment of the Local Government to accelerate Social Forestry (Nuswardani & Indrayati., 2021). Local governments are the key actors who can ensure the policy objectives are translated into tangible actions and outcomes. Therefore, it is important to ensure support from the local government for social forestry implementation at the site level.

This study examined the extent of the role of the Local Government and stakeholders in East Nusa Tenggara Province in supporting the implementation of social forestry. The study is focused on the roles and levels of support from various stakeholders towards the success of Social Forestry, as well as identifying gaps for the success of the Social Forestry program as areas for improvement.

2. RESEARCH METHODS

2.1 Study location

Figure 1. Research locations in NTT Province.

The study was conducted in the Province of East Nusa Tenggara (NTT Province) (see Figure 1). We selected this Province because it is known that there are 2,308 (70%) poor villages in and around forests (Njurumana et al., 2020). NTT Province has been identified as a priority area for the implementation of social forestry in Indonesia, with a target of developing 79,000 hectares of social forestry by 2024. This underscores the significance of adopting social forestry practices in the region to enhance the well-being of forest-dependent communities. Within NTT Province, Sikka Regency was chosen as one of the four Indonesian locations for expediting social forestry through the Social Forestry Support Programme/Forest Programme V (FPV). This collaborative

initiative between the Indonesian Government and the German Government (G to G) aims to enhance the social, ecological, and economic functions of forested areas for the benefit of local communities. The launch of FPV in Sikka Regency took place in September 2021, making it an integral part of the study area. Furthermore, purposive sampling was conducted at the village level for Wolomotong village in Sikka regency. Wolomotong is the only village that has taken the initiative to allocate village funds (*dana desa*) in order to support the implementation of social forestry at the site level.

2.2 Data collection

The data was collected in November 2022-April 2023. The collected data consisted of primary and secondary data. The primary data was gathered through Focus Group Discussions (FGD) and interviews with informants who are stakeholders of the Social Forestry program at the provincial, regency, and village levels (Annex 1). The secondary data were obtained from documents of policies and working documents from local government activities (Annex 2). These documents are abundant in empirical content, like group constitutions, community forestry rights and agreements, and local maps. Documents can be obtained through offline and online repositories, with a variety of available information and materials (Rahayu et al., 2019).

2.3 Data analysis

First, we identify stakeholders who can support the implementation of social forestry. The identification of stakeholders aims to provide an overview of actors who played a role and have the potential to encourage the implementation of social forestry at the province and site levels in NTT Province. To explain their role, the study used the Social Network Analysis (SNA) approach. SNA can help identify key actors and their roles, the flow of information and resources, and identify potential challenges or opportunities for collaboration. SNA makes it possible to reveal the size of the network, i.e., the number of actors connected in the network, the composition of the network, the level of diversity of actors, general preferences between actors, and the influx of influence (Stoettner & Dhubháin, 2019). For instance, SNA has been employed to identify and assess important actors, collaboration, and their power in studies of the political-economic dimensions of the fire economy and actor networks related to forest and land fires in Indonesia (Purnomo et al., 2017). In addition, SNA is utilized to identify and analyze actors' roles in mitigating forest-based climate change in Brazil, Indonesia, and Vietnam (See Gronow et al., 2021). Therefore, this approach is applicable and can help to identify and analyze key actors, collaborations, and their roles in implementing social forestry in Indonesia.

The network approaches to policy implementation have grown partly due to the complexity of social problems that require collaboration and coordination across various sectors (Stokols, 2006). Through collaboration among networking agencies, multiple interventions and strategies can be coordinated to address the host of factors contributing to the problem. Networks increasingly represent more appropriate structures to implement public policy effectively and synergistically (DeGroff & Cargo, 2009). The network perspective shows that the strength of individual actors is not from individual attributes but from the actor's relationship with other actors (Purnomo et al., 2017). Therefore, roles emerge from occupying a favorable position in a network of policy actors, and social networks are a strategic force that actors can use to achieve their interests. Therefore, SNA is used to analyze the roles of stakeholders by identifying key stakeholders and their positions and analyzing stakeholder relationships supporting social forestry policy implementation at the NTT regional levels (province, regency, and village levels).

SNA provides a set of powerful quantitative graph metrics for understanding networks and the individuals and groups within them (Camacho et al., 2020). These include aggregate network metrics such as graph density and the number of connected components, which characterize the network as a whole (Hansen et al., 2011; Van der Huls, 2009). Connected stakeholders are called "nodes," and the bridges between nodes are called "ties." SNA is performed by generating a square binary matrix of paired actors (Yang et al., 2016). The matrix includes collaboration, exchange of resources, and exchange of information, where '1' indicates significance and '0' represents the absence of meaningful collaboration, information sharing, or resource exchange. SNA was run using the software Ucinet (Annex 3). The level of interaction between stakeholders is described in the form of a sociogram using Netdraw software. The study uses the parameters including network density, degree centrality, betweenness centrality, and eigenvector centrality (the formula below).

2.3.1 Network density

The *Network density* is defined as the "*potential connection*" in the network that could exist between two "*nodes*", regardless of whether or not it does. Density in a network reflects the total compactness of connections between the network and is measured as the ratio of the number of relationships present (Li et al., 2022). The density statistics represent the proportion of potential connections in a network. The closer the value to 100%, the denser the network and the stronger the connections between the nodes in that network. For example, if 10 stakeholders participate, each stakeholder could potentially connect to 9 other stakeholders. Li et al. (2022) shows the network density can be calculated based on the formula as follow:

$$PC = \frac{n*(n-1)}{2} \text{ network density: } \frac{actual\ connection}{potential\ connection} \quad (1)$$

where:
PC = potential connection
n = number of nodes in the network

2.3.2 Degree centrality

The *Degree centrality* tells us the number of connections or interactions that a node has (Ramadhan, 2020). Degree of centrality emphasizes having a greater number of connections to other actors who might occupy advantageous positions and wield substantial influence within the network. However, possessing the highest number of connections also entails the responsibility of coordinating interactions among a larger number of actors (Purnomo et al., 2017; Huang et al., 2019). This study's measurement considers both out-degree (the number of connections going to other nodes) and in-degree (the number of incoming connections). In a way, a node's relevance inside a network increase with its degree of centrality (Lan et al., 2022). The calculation of degree centrality can be accomplished using the following formula:

$$C'd\ (Ni) = \frac{\sum_{j=1}^{n} Xi\ j}{(n-1)(n-2)} (i \neq j) \quad (2)$$

Where:
C'd = degree centrality
Xi j = arc between nodes (1 if there is a connection between i and j and 0 if there is no connection between i and j)

2.3.3 Betweenness centrality

Betweenness centrality is used to measure a network's "*mediation*" role (Zhang & Luo, 2017). The value of this centrality in a social network analysis signifies that this actor holds a critical position in the network's structure due to its ability to serve as a bridge or intermediary between other actors (Hanneman et al., 2005. Betweenness centrality measures the extent to which an actor lies on the shortest path between pairs of other actors in the network (Everett & Borgatti 2005). In other words, it quantifies the extent to which an actor controls the flow of information, resources, or influence between different parts of the network. The calculation of betweenness centrality can be accomplished using the following formula:

$$C'b(Ni) = \frac{2\sum_{j<k} \frac{Gjk(Ni)}{Gjk}}{(n-1)\,(n-2)} \qquad (3)$$

Where:

$C'b$ = betweenness centrality

G_{jk}= set of minimum paths between nodes j and k

$G_{jk}(Ni)$ = set of minimum paths connecting the nodes j to the node k through the node Nib

2.3.4 Eigenvector centrality

Eigenvector centrality is used to measure the influence of a node in a network. Several pathways in the network were examined simultaneously via eigenvector centrality (Marqués-Sánchez et al., 2023). Eigenvector centrality is a more complex concept of centrality, where a person with a few connections could still have high centrality if those connections are with highly central individuals. This measure also considers the varying significance of connections, where some connections can have greater benefits than others (Hansen et al., 2020). In certain situations, having a connection with a popular person is more crucial than having a connection with an unpopular one. The eigenvector centrality metric also evaluates the centrality of the nodes that a vertex is connected to and the number of connections it has. It intuitively grasps that it's not just about the quantity of connections, but also the quality of connections (Hansen et al., 2010). The calculation of eigenvector centrality can be accomplished using the following formula:

$$x_i = \frac{1}{\lambda}\sum_{j=1}^{n} \quad A_{ij}x_j \qquad (4)$$

Where:

x_i= centrality of vertex i

λ = constanta

Or we can rewrite the formula in form of matrix as:

$\lambda x = A.x$, (Newman, 2010)

Second, to further assess the level of policy support for social forestry at the NTT sub-national level (province, regency, and village), the study examined whether the substances of social forestry were reflected in each stakeholder's working document. We conducted a document analysis. Document analysis is a systematic procedure for reviewing or evaluating printed and electronic documents (Bowen, 2009). Document analysis requires examining and interpreting data to elicit meaning, gain understanding, and develop empirical knowledge (Corbin & Strauss, 2008; Rapley, 2007). In this study, the documents examined include policy papers, policy drafts, institutional work plans, work timelines, activity reports, work location maps, and other

related documents. The documents provide information about the priorities and goals of the stakeholder's institutions. We used specific keywords related to social forestry and its objectives to conduct this analysis. These keywords included "social forestry," "community empowerment," "improvement of community welfare," and "poverty reduction." Using these terms, the extent to which social forestry was addressed and prioritized in the official documents of government agencies could be identified. The embeddedness of social forestry in these documents suggests a commitment to its implementation, while its absence may indicate a need for further advocacy or awareness-raising efforts. Moreover, another assessment was on whether the documents outlined the program, funding allocation, and timelines for implementing social forestry initiatives. Furthermore, the presence of actionable measures and strategies to implement social forestry programs effectively was also identified.

3. RESULTS

3.1 Stakeholder Social Network Analysis

3.1.1 Network density

The network density measurements in NTT Province and Sikka Regency with 46 ties showed a value of 0.083 (Table 1), which means 8.3%. The value indicates a low-density level, even less than 10%, which means the stakeholder network tends to have low support for implementing social forestry. It indicates the importance of involving and encouraging other sectors to support the implementation of social forestry in the NTT province. The head of the Division for Capacity Enhancement in Environmental Management and Social Forestry, Environment, and Forestry Agency of NTT Province stated the following:

> *"The implementation responsibility of social forestry at the provincial level is still mostly on us, while we also have to take care of other work with the limited resources we have."*

Table 1. Network Density Measurement

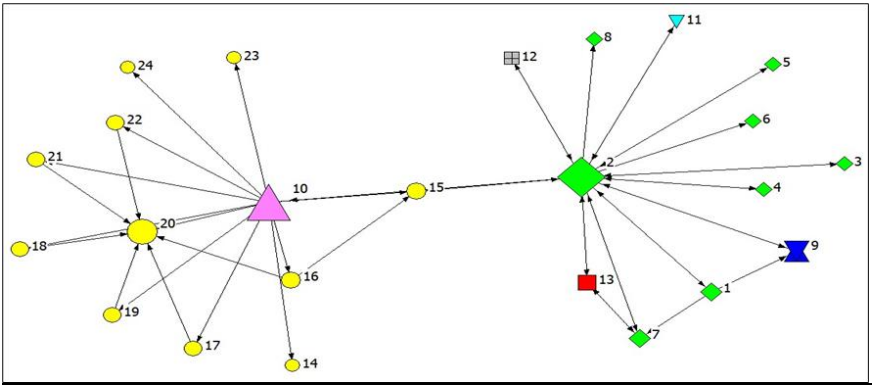
Density Y	No. of Ties
0,083	46

3.1.2 Degree centrality

Based on the total out-degree and in-degree values, no single stakeholder interacts directly with all other stakeholders (Figure 3). The measurement showed that node #2 (Environment and Forestry Agency of NTT Province) has the highest value (Table 2). Node #2 often serves as a communication hub, coordinating the implementation of social forestry in the NTT province. The prominent position of node #2 offers an opportunity to foster collaboration with various stakeholders, given its extensive relationships with relevant actors. For instance, these relationships extend to the agriculture service, tourism agency, village agency, NGOs, and others. Nevertheless, despite the inherent potential for collaboration in the central role of node #2, it is crucial to acknowledge that meaningful cooperation does not occur automatically. It requires the allocation of resources and the consideration of the interests of other actors.

Furthermore, node #20, representing The Planning, Research and Development Agency (Bapelitbang) of Sikka Regency, possesses the second highest in-degree value after node #2. Node #20 has an important role in assisting the Regent in preparing and implementing regional policies, particularly in regional development planning. Therefore, various government agencies and organizations coordinate their programs

through node #20 to ensure the production of effective local-level public policies. Beyond its coordinating role, node #20 serves as a facilitator for public consultations—an integral phase in the creation of the Sikka Regency Regional Development Plan Document (RPD), as directed by the Instruction of the Minister of Home Affairs Number 52 of 2022.



Annotation: Nodes #1: Governor of NTT Province; #2: Environment and Forestry Agency of NTT Province; #3: Forest Area Boundary Demarcation Region XIV Kupang; #4: Environment and Forestry Research and Development Center Region Kupang; #5: Natural Resources Conservation Center of NTT Province; #6 Agriculture Agency of NTT Province; #7: Province Secretary of NTT Province; #8: Tourism and Creative Economic Agency of NTT Province; #9: Social Forestry Working Group of NTT Province; #10: Forest Programme V; #11: World Agroforestry (ICRAF); #12: State Agricultural Polytechnic of Kupang; #13: BRIN; #14: Regent of Sikka Regency; #15: Forest Management Unit of Sikka Regency; #16: Environment Agency of Sikka Regency; #17: Community and Village Empowerment Agency of Sikka Regency; #18: Agriculture Agency of NTT Province; #19: Food Security Agency of Sikka Regency; #20: The Planning, Research and Development Agency of Sikka Regency; #21: Tourism and Creative Economic Agency of Sikka Regency; #22: The Trade, Cooperatives, and SMEs Agency of Sikka Regency; #23: Subdistrict Head; #24: Village Head.

Figure 2. Sociogram based on the degree centrality.

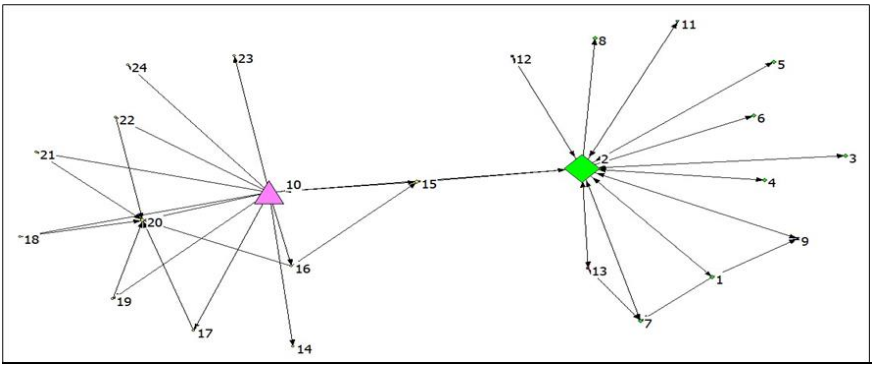
Table 2. Degree centrality Measurement

Node	In degree	Indegree Centrality	Outdegree	Outdegree Centrality
#2	11	0.478	13	0.565
#20	7	0.304	20	0.522

3.1.3 Betweenness centrality

Field data reveals that node #2 (Environment and Forestry Agency of NTT Province) and node #10 (Forest Programme V) had the highest betweenness centrality scores (Table 3 and Figure 4). Node #2 represents government officials playing a pivotal role in linking various actors at the provincial level, including other government agencies, universities, research institutes, and NGOs. Specifically, node #2 collaborates with node #7 (Province Secretary of NTT Province) to formulate social forestry policy support at the provincial level. Node #7, responsible for assisting Regional Heads in policy formulation and coordinating the implementation of tasks and administrative services, serves as a hub for policy-related activities. Presently, these two entities have

facilitated initiatives to bolster the implementation of social forestry in NTT Province. Furthermore, node #10 (Forest Program V) played an important role as a mediator between other actors involved in social forestry, as evidenced by its high betweenness centrality among the 24 nodes analyzed. Forest Program V has facilitated various stakeholders at different levels, from the province, regency, and village government. Further, node #10 has provided technical assistance to local communities through training and capacity-building programs for social forestry facilitators and local government. These efforts promote collaboration and coordination among actors, including government agencies, NGOs, and local communities, to encourage accelerating social forestry implementation in the Sikka Regency.



Provincial Government	Working Group of Social Forestry	Forest Programme V
NGO	University	Research Institutions
Regency government	The larger the node, the greater the degree-centrality value	

Annotation: The description is the same as the picture above.

Figure 3. Sociogram based on betweenness centrality.

Table 3. Betweenness Centrality Measurement

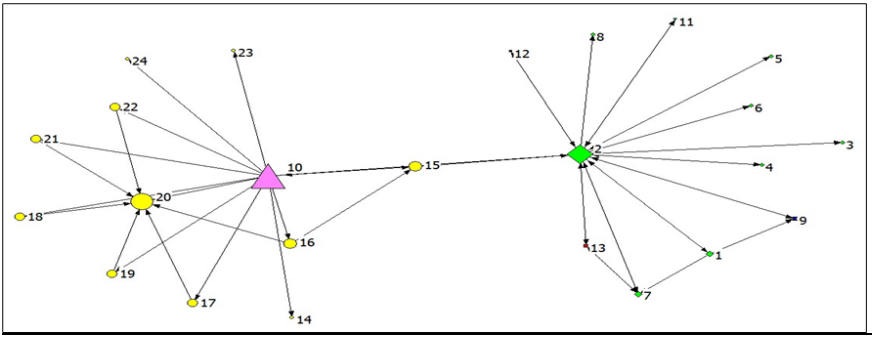
Node	Betweenness Centrality
2	246.5
10	118
15	21
7	0.5

3.1.4 Eigenvector centrality

The eigenvector centrality analysis revealed that node #10 (Forest Programme V) has the highest value (Table 4 and Figure 5). In the last two years, this node has represented an influential actor in the implementation of social forestry initiatives in NTT Province, particularly in the Sikka Regency. Node #10 played a crucial role in speeding up efforts for the implementation of social forestry in the regency by facilitating coordination and communication with stakeholders from the provincial to the village level.

Furthermore, node #10 (Forest Programme V) is crucial in providing extension services for social forestry initiatives in the Sikka Regency. Previously, the FMU Sikka regency only had six forestry extension workers responsible for managing a forest area of approximately 35,000 hectares. However, with the support of Node #10, 30 extension workers have been trained and deployed specifically for social forestry permits in the regency, including 24 HKm permits and six village forests. This has made one social forestry extension available for each social forestry license, significantly improving the quality of extension services and support provided to communities participating in

social forestry programs. Galudra (2019) explained that the involvement of facilitators and extension workers in social forestry was still lacking, especially in terms of capacity building, knowledge, and skills. Moreover Node #10 also facilitates training programs for the frontline service/agency officers involved in social forestry implementation in Sikka regency. The summary SNA interpretations are listed in Table 5.



Annotation: The description is the same as the picture above.

Figure 4. Sociogram based on eigenvector centrality.

Table 4. Eigenvector Measurement

Node	Eigenvector
10	0.530

Table 5. The Summary of Interpretation of Network Density, Degree Centrality, Betweenness Centrality, and Eigenvector Centrality.

Analysis	Value	Interpretation
Network density	0.083 (8.3%)	The network density is low, with most institutions not interacting with each other to support social forestry. Among the 24 institutions, there are only 46 relationships, indicating that, on average, each institution interacts with just one other institution in the network
Degree centrality	Node #2 (Environment and Forestry Agency of NTT Province) has a value. - outdegree centrality 0.565 (56.5%). - indegree centrality 0.478 (47,8%). Node #20 has a value. - outdegree centrality 0.000 - indegree centrality 0.304 (30.4%).	Among the 24 institutions that interact with each other in the network, only one institution is dominant, which is Node #2. Node #2 influences 56.5% of the institutions in the network and is influenced by 47.8% of the institutions. Node #20 receives the second-highest level of influence at 30.4%."
Betweenness centrality	- Node #2 (: Environment and Forestry Agency of NTT	Among the 24 institutions, there are 4 institutions that serve as links for other institutions in the network, namely Node

Analysis	Value	Interpretation
	Province) has a value of 246.5. - Node #10 (Forest Programme V) has a value 118. - Node #15 (Forest Management Unit of Sikka Regency) has a value of 21. - Node #7 (Province Secretary of NTT Province) has a value 0.5	#2, Node #10, Node #15, and Node #7. However, the institutions with the highest link roles are Node #2 and Node #10.
Eigenvector centrality	Node #10 (Forest Programme V) has a value 0.530.	Node #10 has the highest interactions with important institutions in the network.

3.2 Local government policy support

3.2.1 Provincial government policy support

We analyzed policy documents to assess the extent of provincial government support for implementing social forestry in NTT province. These documents include the Medium-Term Development Plan of NTT Province 2018-2023 and the Government Work Plan of NTT Province for 2023. Research findings indicate that the provincial government has embraced the Social Forestry program outlined in both documents. Furthermore, in 2023, the NTT Provincial government targeted adding 313 hectares of community-managed forest areas through social forestry. The provincial government's commitment and expansion of social forestry areas set a positive precedent for regencies, encouraging them to prioritize sustainable practices and community involvement in forest management. It also aligns with broader national and global efforts to expand community access to managing forest resources and efforts to address deforestation and climate change.

Previously, to bolster the Social Forestry program, the Governor of NTT province has taken measures to expedite its implementation. The Governor of NTT pushed for the acceleration of Social Forestry by issuing Governor Decree No. 96/2022 concerning the Working Group on Social Forestry (WG-SF) in NTT Province. The NTT Environment and Forestry Agency Chairperson leads this Working Group, while the Governor and Deputy Governor of NTT serve as the Steering Committee. The Working Group comprises 46 members representing various stakeholders and actors involved in social forestry initiatives. The members consisted of the NTT Environment and Forestry Agency, the Social Forestry and Environmental Partnerships for the Bali Nusa Tenggara Region, the NTT Community and Village Empowerment Office, the NTT Cooperative, Labor and Transmigration Agency, the NTT Agriculture and Food Security Agency, the NTT Industry and Trade Agency, the NTT Animal Husbandry Agency, NTT Regional Development Planning, Research and Development Agency, Regional Secretary of NTT Province, Watershed and Protected Forest Management Agency of Kupang Region, Forest Area Boundary Demarcation Region XIV Kupang, Environmental and Forestry Education and Training Center of Kupang Region, Production Forest Management Office of Denpasar Region, Forest Management Unit, Nusa Cendana University, Polytechnic Kupang State Agriculture, and Social Forestry Activists. The support of these actors is important for the implementation of social forestry. For instance, NGOs and Universities, with the support of the Regent/"Bupati," encouraged the implementation of social forestry pilot schemes for village forests in Bantaeng Sulawesi (Sahide et al., 2020).

The establishment of the WG-SF reflects the proactive approach taken by the Governor of NTT to drive the Social Forestry program forward. Furthermore, the

appointment of the Head of the NTT Environment and Forestry Agency as the Chairperson of the Working Group underscores the significance placed on effective coordination and implementation of social forestry initiatives. Through the collaborative efforts of the Working Group and the commitment of the Governor and Deputy Governor, NTT Province is well-positioned to drive the acceleration of social forestry initiatives. This dedicated approach sets the stage for the successful integration of social forestry in the future.

3.2.2 Regency government policy support

At the regency level, despite the increasing demand for social forestry permits in the Sikka Regency, the issue has yet to be fully incorporated into public policy. For example, the Sikka Regency Regional Medium Term Development Plan 2018-2023 does not explicitly mention Social Forestry management but only mentions sub-district and village community empowerment programs. However, the Sikka Regency government has already allocated a Regional Revenue and Expenditure Budget for community empowerment, targeting those impoverished in forested areas. By empowering rural communities, the government aims to increase the production and productivity of agricultural, plantation, and livestock products to improve the welfare of farmers. However, further efforts are required to ensure the efficient allocation and utilization of resources, with a particular focus on vulnerable populations. Collaborating with relevant stakeholders, including local communities, is essential to designing and implementing effective programs that address the needs and challenges of the region, especially social forestry.

Based on the analysis of the Strategic Plan, Work Plan, and related policies regarding the vision, mission, and work programs of the relevant local government agencies, it is evident that there is significant potential for these agencies to contribute towards promoting the implementation of Social Forestry in Sikka Regency. Suhardjito & Wulandari (2019) find that regency governments can play a strategic role in the sustainability of social forestry by providing support through the Regional Revenue and Expenditure Budget and the involvement of local government agencies. Furthermore, collaboration with local government agencies is identified as one key factor in ensuring the effectiveness of social forestry implementation.

Furthermore, the regency head of Sikka Regency, representing the regency government, has demonstrated support and commitment to expedite the implementation of Social Forestry by entering into a joint agreement with the Directorate General of Social Forestry and Environmental Partnerships. This agreement was formalized on October 28, 2022, during the "Capacity Building Workshop for Policy Makers in the Context of Social Forestry Program Synergy Between Central and Regional Governments" held in Maumere on October 27-28, 2022. The agreement also received signatures from the NTT Province Environment and Forestry Office, the Sikka Regency Environmental Service, sub-district representatives, and village representatives.

The Key Points of Social Forestry Agreement Support in Sikka Regency:

1. Accelerating the implementation of Social Forestry Management in Sikka Regency through program integration and synergy across central and regional sectors, Regional Apparatus Organizations, sub-districts, and villages in Sikka Regency.
2. Facilitating the implementation of the Social Forestry Management Program both before and after the approval of Social Forestry Management (institutional management, area management, and business management).
3. Developing a road map for implementing Social Forestry Management in the

Sikka Regency is necessary, outlining the strategic steps and actions required to achieve the objectives.
4. Encouraging optimisation of the Sikka Regency Integrated Team for Accelerating Social Forestry is crucial to enhancing the coordination and effectiveness of social forestry initiatives.
5. Implementing the Social Forestry Support Program (FP V) in Sikka Regency is one of the supporting programs for accelerating Social Forestry

3.2.3 Village government policy support

An analysis conducted at the village level revealed that Wolomotong Village, as part of its development plan, has incorporated initiatives to safeguard and reforest water resources and watersheds, aligning with the goals of social forestry. Within the framework of the 2023 work plan and the Village Revenue and Expenditure Budget, an allocation of IDR 10,000,000 (ten million rupiahs) has been designated for the acquisition of plant seeds to facilitate the reforestation and conservation strategy. A focus group discussion with the Head of Wolomotong Village unveiled that the decision to engage in reforestation and watershed conservation efforts was driven by environmental concerns, notably the safeguarding of springs. These springs hold a pivotal role in ensuring accessibility to clean water, a fundamental necessity for the Village community. The village administration of Wolomotong Village abides by Sikka Regent Regulation No. 1 of 2020, focusing on aspects like Village Financial Management, Reforestation, and Conservation of Watersheds/Springs. Thus, the Head of Wolomotong Village leverages this regulation to allocate funds towards reforestation and spring conservation within the social forestry domain.

Furthermore, the village head of Wolomotong planned to utilize village funds to maximize the potential of village-owned enterprises by cultivating agricultural products such as cloves, coffee, coconuts, and vanilla through social forestry practices. If the plan is realized, it can increase community participation in social forestry because of the economic benefits of the social forestry program (Resosudarmo et al., 2019). These initiatives align with Regulation Number 8 of 2022 from the Minister of Villages, Development of Disadvantaged Villages, and Transmigration. This regulation emphasizes the priority utilization of village funds for National Economic Recovery, as determined by the village authorities. Village funds function as a valuable resource that indirectly facilitates the advancement of social forestry implementation. This alignment with the Village Sustainable Development Goals aims to enhance well-being, improve human life quality, and reduce poverty. Social forestry implementation requires funding, not only permit distribution (Resosudarmo et al., 2019). Through funding, social forestry groups can leverage forest management permits to engage in productive economic activities (Widyaningsih et al., 2021). One hundred forty-seven villages within the Sikka Regency are currently classified as disadvantaged. As a result, a pressing need exists to enhance the village government's understanding of effectively harnessing village funds to support social forestry endeavors. Wolomotong Village's head stated the following:

> *"There is a limited understanding regarding the utilization of village funds for social forestry, causing village heads in Sikka to hesitate in allocating resources for this purpose."*

Furthermore, to optimize the utilization of village funds, it is imperative to integrate social forestry into the village's overall development planning. However, in practice, it will face challenges because communities tend to choose to use village funds for infrastructure development (Resosudarmo et al., 2019; Watts et al., 2019).

4. DISCUSSION

Based on the stakeholder and policy analysis of social forestry in NTT Province, it appears that support for the implementation of social forestry is still not optimal. This analysis leads us to the conclusion that various challenges confront local governments in their efforts to facilitate the implementation of social forestry in the Province of NTT. These challenges include unequal understanding among stakeholders concerning the implementation of social forestry, insufficient resources within forestry authorities for the effective implementation of social forestry, and limitations in local government policies designed to promote and support social forestry initiatives.

4.1 Unequal stakeholder understanding on social forestry implementation

Based on the analysis of stakeholder network density measurements carried out using Social Network Analysis, the results indicate a low level of density in social forestry initiatives. Social forestry efforts are primarily concentrated in the Environment and Forestry Agency of NTT Province and Forest Management Units. Out of the 24 stakeholders identified with the potential to implement and collaborate on social forestry programs in NTT Province, most of them still lack a comprehensive understanding of technical aspects related to social forestry. These technical aspects include participatory planning, community-based forest management, and monitoring and evaluation.

The limited understanding among stakeholders has significant implications for their roles in the formulation, planning, and implementation of social forestry programs. For instance, the Office of Tourism and Creative Economy in NTT Province has the potential to support the development of natural tourism in forest areas and empower communities around tourist destinations. However, this potential has not yet been fully integrated with social forestry programs. NTT Province boasts various potential tourist destinations situated within forest areas, encompassing 12,321 hectares of wildlife reserves, 151,482 hectares of national parks, 55,536 hectares of nature tourism parks, and 10,072 hectares of mangrove beaches (BKSDA NTT. 2018). On a different note, the agriculture service has an extension program focused on food crops and horticulture cultivation in communities surrounding forests. This extension program is beneficial for social forestry farmers; however, better coordination is required to align it with the social forestry annual work plan, as forest areas necessitate strict arrangements for forest plants and seasonal crops.

Data from the Ministry of Environment and Forestry revealed that the community's understanding of social forestry in Sikka Regency is still low. This lack of understanding has resulted in some protected forest areas in Egon Limendo being used for planting seasonal crops such as dryland rice, cassava, and corn (MoEF, 2022). Therefore, it is essential to enhance understanding and foster coordination among all relevant parties involved in social forestry initiatives. Effective collaboration and knowledge-sharing will contribute to the successful implementation of social forestry programs and the sustainable management of forest resources in NTT Province.

If local governments (province, regency, dan village) do not have an adequate understanding of the benefits and potential of social forestry, policies supporting these programs may not be prioritized or given sufficient attention. In some cases, local governments prefer to use the land for large-scale investments as company concession areas rather than using it for social forestry purposes (Safitri, 2017). To address the lack of comprehensive understanding among various local government agencies, it is crucial to initiate effective communication channels and collaborative platforms.

One key approach is to conduct regular workshops, seminars, and training sessions that bring together representatives from different sectors involved in the social forestry program. There were interviews conducted to determine the knowledge that needs to be imparted to local governments regarding social forestry. From these interviews, the essential information was summarized that should be communicated to the local authorities concerning social forestry. These events can serve as a platform for sharing knowledge, best practices, and success stories related to social forestry, thereby promoting a deeper understanding of its potential benefits.

Furthermore, the establishment of inter-agency working groups can significantly enhance coordination and cooperation. By forming these groups, government agencies responsible for forestry, agriculture, social welfare, and other related sectors can collectively discuss and strategize the implementation of the social forestry program. This can lead to the development of holistic policies that consider the interests and priorities of all involved parties. Additionally, creating open channels of communication through regular meetings, web-based platforms, and shared databases can facilitate the exchange of information and data between different agencies.

4.2 Insufficient resources in the forestry authorities to implement social forestry

4.2.1 Insufficient budget resources

Limited budgets are one of the reasons for the lack of intensive implementation of social forestry in the Province of NTT. Budi et al. (2021) argue that one should facilitate long-term social forestry success by making it easier to access potential support, one of which is access to finance. In the 2023 Work Plan of the Environment and Forestry Agency of NTT Province, there is an absence of budget allocation for social forestry programs, allocations are only designated for agency operational aspects. Insufficient funding has hindered the effective implementation of social forestry programs, including encouraging the establishment of social forestry implementing regulations, empowering local communities, building capacity, and establishing monitoring processes to evaluate the success of implemented activities. In addition, limited financial resources may constrain the provision of essential equipment, infrastructure, and technical assistance to support the implementation of social forestry (Sitanggang et al., 2021). Moreover, the government's lack of incentives further exacerbates the situation, causing facilitators from NGOs and independent entities at the provincial level to be reluctant to assume roles as social forestry facilitators (Galudra, 2019).

Limited funding sources from provincial authorities for implementing social forestry programs have directed provincial authorities, especially the Environment and Forestry Agency of NTT Province, to obtain funding from outside parties, such as donor agencies, non-governmental organizations, or international aid programs. Recently, ICRAF World Agroforestry Institute provided facilities to WG-SF of NTT Province in preparing the 2023 Work Plan. The directives regarding WG-SF were encouraged from the national level through Decree, the Coordinating Ministry for Maritime Affairs and Investment No. 126 of 2021, concerning coordinating with the Regional Government to develop Social Forestry at the site level. However, funding support for implementing its duties and functions is still minimal. Furthermore, in the last two years, stakeholders have acknowledged that FP V has supported accelerating social forestry in the Province of NTT and Sikka Regency. At the level of policymakers, FP V provides support in the form of training, with the aim that the policymakers could understand the implementation of social forestry. The Invitation was intended for the heads of several agency-related social forestry initiatives. Nevertheless, the training tended to be attended by staff not authorized to make policies. In addition, the staff came alternately to each training, so

the information regarding the implementation of social forestry was not received comprehensively by each agency. The head of the Division for Capacity Enhancement in Environmental Management and Social Forestry, Environment, and Forestry Agency of NTT Province stated the following:

> *"We have communicated in the letter invitations for the social forestry training that attendance by heads of each agency is expected, but the attendees are predominantly staff members."*

In addition, coordination between stakeholders tended to occur because there was support from external parties who had funding sources to support social forestry. Although external funding can contribute to supporting social forestry implementation in NTT Province, institutions face some challenges. Reliance on external funding can lead to risky dependency and lack of sustainability if funding sources become unstable or diminish in subsequent years. Therefore, including the social forestry program in the regional medium-term development plan is the duty and authority of the local government (Firdaus, 2018). Furthermore, it is expected to attract more donors to enhance the implementation of social forestry in NTT Province. For instance, we have learned from examples in Nepal and Tanzania that adopting community forests in the national strategy documents, in addition to carbon maximization, can improve social and environmental outcomes, give greater visibility to co-benefits, and may attract an additional set of interested buyers and donors (Newton et al., 2015).

At the regency level, there have also been restrictions on FMU income from social forestry partnerships for social forestry operational activities. The Sikka Regency Forest Management Unit plays a pivotal role in implementing Social Forestry management policies. Previously, FMUs acted as on-site forest managers, able to establish business partnerships with social forestry permit holders. This collaboration allowed the FMUs to generate income for their operations and contribute to the local government's revenue budget. However, through the Job Creation Law No. 11 of 2020 and MoEF No. 9 of 2021 on Social Forestry Management, the responsibilities of FMUs have undergone a significant shift. Under the current policy, FMUs are primarily responsible for facilitating and coordinating social forestry permit holders to collaborate with institutions, local government organizations, Non-Governmental Organizations (NGOs), or Private-Owned Enterprises. This change has implications for the operational implementation of FMUs, as they require a separate budget to fulfil their duties in social forestry.

Tajuddin et al. (2019) state that one of the obstacles to implementing the social forestry program in the regions is the lack of a special budget allocation. A complicated funding source and mechanism is one of the factors affecting the performance of the FMU as a forestry implementing agency in the field (Budiningsih et al., 2022). Therefore, to ensure the effective functioning of FMUs in their new role, it is essential to allocate sufficient budgetary resources. This budget will enable FMUs to carry out their facilitation and coordination tasks, support establishing partnerships between social forestry permit holders and relevant stakeholders and provide the necessary assistance and guidance throughout the implementation process. Additionally, adequate funding will be crucial for capacity-building activities, including training programs for FMU staff to enhance their knowledge and skills in facilitating and coordinating social forestry initiatives. These capacity-building efforts will enable FMUs to effectively assist permit holders in navigating administrative processes, complying with regulations, and accessing necessary resources to implement social forestry projects successfully. Given the evolving role of FMUs in implementing social forestry policies, the central

government must allocate a dedicated budget to support their facilitation and coordination responsibilities.

4.2.2 Capacity constraints of social forestry extension

The limited quantity and quality of extension resources at the Environment and Forestry Agency of NTT Province and FMU have slowed social forestry implementation. This finding aligns with the findings of Tajuddin et al.'s study from 2019, which highlighted the need for more human resource capacity within FMUs to support social forestry implementation effectively. Similarly, Lestari et al. (2019) stated that the inadequate quality and quantity of social forestry extension officers could not provide intensive services to prospective social forestry permit holders. The number of available forestry extension officers within the Environment and Forestry Agency of NTT Province is minimal, with a staff size of fewer than ten individuals. These officers manage various forestry activities, extending beyond social forestry initiatives. The collective impact of these challenges underscores the need for strategic resource allocation and capacity building. The study's results by Jamkar et al. (2023) show that human capital factors contribute to the success of community-based forest management.

KPH Sikka only has six forestry extension workers and then gets an additional thirty facilitators from the FP V program, specifically assigned to handle social forestry. The increase in the number of extension workers from FPV is based on the number of Social Forestry permits in Sikka Regency, as many as 30 permits to March 2023. This additional extension assistance has significantly contributed to the number of extension agents in Sikka Regency. However, it should be noted that the area of social forestry permits in Sikka regency varies, with the smallest size reaching 26 hectares with 59 households and the largest reaching 1587.63 hectares with 361 families. Given these variations, we recommend additional extension agents at social forestry locations with permits with large areas to optimize the Social Forestry facilitation process. This step is expected to increase the effectiveness of the implementation of social forestry in the Sikka Regency area because adequate forestry extension officers will be able to provide assistance and guidance to communities who obtain social forestry permits.

4.2.3 Insufficient spatial data system

Social forestry is closely related to the need for accurate and detailed spatial data. The Indicative Map of Social Forestry Areas / (in Indonesia, known as "Peta Indikatif Perhutanan Sosial"/PIAPS), is a map that designates forest areas explicitly reserved for Social Forestry initiatives. The significance of PIAPS lies in its role as a guiding tool for identifying and delimiting areas where local communities can engage in sustainable forest management and livelihood activities under the framework of a social forestry program. Spatial data is urgently needed. Considering that Indonesia's forest boundaries are mostly unclear, many parties can own and maintain some areas (Salosso, 2018). Fisher et al. (2007) explained that unclear boundaries are the main issue and challenge in establishing legal forest areas in Indonesia. This results in frequent conflicts over land ownership and use of forest resources (De Royer et al., 2014). Therefore, the Environment and Forestry Agency of NTT Province, WG-SF, and related stakeholders down to the site level should have PIAPS.

The policy outlined in MoEF Regulation No. 9/2021 highlights the ownership of PIAPS, which are distributed among various entities, including the Ministry of Environment and Forestry, provincial Governments, district/city Governments, non-governmental organizations, and other actors. However, the NTT Province Environment and Forestry Service stated they did not have spatial data on social forestry. In contrast, they and the WG-SF had the task of facilitating the preparation of the Social Forestry

Management Plan. The office of Forest Area Boundary Demarcation Region Kupang noted that the spatial data pertinent to Social Forestry remains concentrated within the purview of the Directorate General of Social Forestry and Environmental Partnerships.

As a representative of spatial data at the NTT provincial level, they should have PIAPS data. The conditions raise questions about accessibility and the potential for collaboration with other relevant bodies, potentially creating barriers to access and collaboration, especially for local or regional entities actively engaged in the on-ground implementation of social forestry programs. The availability of PIAPS is an aspect that necessitates thorough evaluation by multiple stakeholders. By facilitating data sharing, stakeholders can make well-informed decisions, fostering the effective implementation of social forestry programs. This approach can foster a sense of shared ownership and responsibility, promoting a more holistic and equitable implementation of social forestry initiatives.

4.3 Lack of local government policies to support social forestry initiatives

Policy analysis conducted at the provincial, regency, and village levels in NTT Province shows that policy support for social forestry is still low. This should be a significant concern, given the crucial role and potential that local governments possess in formulating policies to support social forestry, thereby safeguarding and empowering local communities in the sustainable management of forests. Regulatory support at the local level is part of efforts to realize the development of social forestry implementation (Asmin et al., 2019). Therefore, it becomes imperative for local governments to engage in policy reform that bolsters social forestry. Local governments must thereafter ensure that policies are aligned. Many regulations at the regional levels create contradictions and uneven implementation, and local communities are also the subject of policies in other sectors, which are often contradictory or inconsistent (Moeliono et al., 2017) and overlapping between programs (Suhardjito & Wulandari, 2019).

Furthermore, local governments also have authority in budget allocations to support the implementation of social forestry (CIFOR, 2003). Sufficient budget allocation for social forestry will enable the effective implementation of activities, such as mapping, monitoring, community engagement, and mentoring capacity. Through proper budget allocation, local governments can provide the necessary resources for the success of social forestry programs. Nonetheless, to obtain local government support, development assistance programs from the center and outside donors are sometimes needed (Muttaqin et al., 2017). Therefore, creating opportunities for collaboration with external parties can invigorate the implementation of social forestry initiatives.

5. CONCLUSION

The local government of NTT province has declared its support for the social forestry program. However, this support has not been fully translated into the work plan document. Consequently, a comprehensive roadmap for successfully implementing the social forestry program is still absent, including the critical aspect of allocating the necessary funding support. A structured and strategic framework can be established by seamlessly integrating the social forestry program into the working document of the local government. This framework would be instrumental in guiding the various implementation phases, including scheme selection, conflict, prevention/ management, participatory planning, and forest management regarding livelihoods and conservation (Sahide et al., 2020). Moreover, including such a roadmap within the working document would guide local government officials, forestry agencies, and the broader spectrum of stakeholders engaged in this endeavor. Having a clear path

charted out makes it possible to synchronize efforts, enhance collaboration, and establish a cohesive sense of direction.

Furthermore, including the social forestry program in the working document highlights the local government's commitment to sustainable environmental practices and community engagement. It enhances the potential to attract both local and international funding sources. Explicit integration within official planning documents enhances credibility and unlocks avenues for financial support crucial to effectively executing the program's initiatives. In conclusion, incorporating the social forestry program into the working document of the NTT province's local government is crucial for transforming intentions into actions. This integration provides a structured approach to implementation, ensures coordinated efforts among stakeholders, and promotes a culture of transparency and accountability. Ultimately, this commitment would facilitate the sustainable management of resources, empower the community, and contribute to the province's overall development.

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APPENDIX

Annex 1. List of Informant

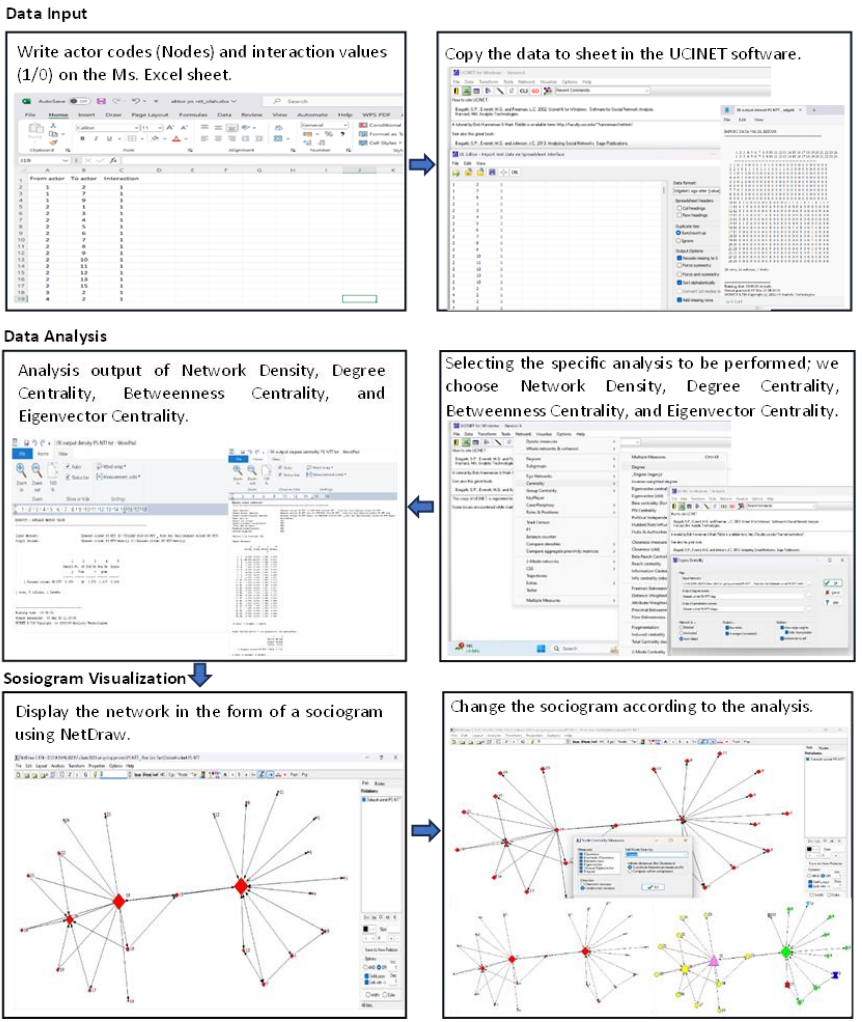
List of Informant in NTT Province	List of Informant in Sikka Regency
The Environment and Forestry Agency of NTT Province	Forest Management Unit (FMU) of Sikka Regency
The Office of Forest Area Boundary Demarcation (BPKH) Region XIV Kupang	The Planning, Research and Development Agency of Sikka Regency
The Environment and Forestry Research and Development Center Region Kupang	Environment Agency of Sikka Regency
Natural Resources Conservation Center of NTT Province;	Community and Village Empowerment Agency of Sikka Regency
Agriculture Agency of NTT Province	Food Security Agency of Sikka Regency
Province Secretary of NTT Province	The Trade, Cooperatives, and SMEs Agency of Sikka Regency
Tourism and Creative Economic Agency of NTT Province	The Tourism and Creative Economic Agency of Sikka Regency
Social Forestry Working Group of East Nusa Tenggara	
The International Council for Research in Agroforestry (ICRAF)	List of Informant in Wolomotong Village
State Agricultural Polytechnic of Kupang	Village Head of Wolomotong
National Research, and Innovation Agency (BRIN)	Social forestry Extension

Annex 2: List of Document Analysis

1	Medium Term Development Plan of NTT Province 2018-2023 (RPJMD)
2	Province Government Work Plan of NTT Province 2023
3	Strategic Plan the Environment and Forestry Agency of NTT Province 2018-2023
4	Long-Term Forest Management Plan of Forest Management Unit Sikka Regency, NTT Province, 2022-2031
5	Strategic Plan the Tourism and Creative Economy Agency of NTT Province 2018-2023
6	Work Plan the Tourism and Creative Economy Agency of NTT Province 2023

7	East Nusa Tenggara Provincial Regulation No. 2/2015 concerning the 2015-2025 NTT Provincial Tourism Development Master Plan
8	Governor Decree No. 404/KEP/HK/2018 concerning Leading Non-Timber Forest Products in the Province of NTT
9	Provincial Regulation No. 6/2017 concerning Management of Non-Timber Forest Products in the NTT Province
10	Governor Regulation No. 60/2018 concerning the Grand Strategy for Leading Non-Timber Forest Product Management in the NTT Province for 2019-2038
11	Governor Decree No. 96/KEP/HK/2022 concerning the Working Group for the Acceleration of Social Forestry in the Province of NTT 2022-2023
12	Governor Decree No. 123/KEP/HK/2021 concerning the Working Group on Non-Timber Forest Products in the NTT Province

Annex 3: SNA data processing and analysis



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