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Analysis of social forestry policy in increasing forest farmers' income: case study in west sumatra province

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ABSTRACT

This study analyzes the implementation of social forestry policies in West Sumatra Province in an effort to increase the income of forest farmers. This study uses a quantitative method with a sample of 1,214 respondents from 10 Forest Management Units (KPH), this study shows the dominance of the Nagari Forest scheme (85.17%) which is in accordance with the local social structure. The characteristics of respondents are dominated by men (88%), generation X (50%), and have a high school/equivalent non-agricultural education. The results of the study showed an increase in forest farmers' income by 17.24% in 2023, exceeding the target of 5%, with an achievement of 344.80%. This success is supported by various government efforts, including socialization, capacity building, assistance with productive tools, facilitation of entrepreneurship, and product promotion. The social forestry policy in West Sumatra adapts national policies by considering the important role of the Minangkabau indigenous people in managing natural resources. The Nagari Forest scheme is the most appropriate for the social structure of the Minangkabau people. In the future, the government plans to expand the scope of the program, focus on developing forest product value chains, and integrating with village development programs. This study highlights the importance of policies that consider local contexts in improving community welfare and forest sustainability.

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1. INTRODUCTION

Social forestry can be defined as a forest management approach that involves local communities in the planning, implementation, and supervision of forest resource management (Rakatama & Pandit, 2020). This concept emerged as a response to the failure of conventional approaches to forest management that often ignore the needs and rights of communities living in or around forest areas. Social forestry aims to create a balance between forest conservation and improving the welfare of local communities (Pambudi, 2020; Gunawan et al., 2022). The main objective of social forestry itself is to reduce conflicts between local communities and the government or forest management companies (Rafiq & Sofilda, 2023). By involving the community in forest management, it is hoped that a sense of ownership and shared responsibility for forest sustainability can be created (Luswaga & Nuppenau, 2020). This can

reduce illegal practices such as illegal logging and forest encroachment that often occur when communities feel alienated from the natural resources around them (Tajuddin et al., 2019).

Social forestry also aims to improve the welfare of local communities through better access to forest resources (Octavia et al., 2022). In the social forestry scheme, communities are given the right to utilize non-timber forest products, such as honey, rattan, or medicinal plants, as well as develop forest-based businesses such as ecotourism. This can open up new economic opportunities for communities and reduce their dependence on practices that can damage forests (Ungirwalu et al., 2023; Safitri & Sundawati, 2024). Another important aspect of social forestry is the preservation of traditional knowledge and local wisdom in forest management (Abas et al., 2022). Indigenous and local communities often have in-depth knowledge of forest ecosystems and sustainable management practices. Social forestry seeks to integrate this knowledge with modern scientific approaches to create more effective and sustainable forest management strategies (Chanza & Musakwa, 2021).

West Sumatra is one of the provinces in Indonesia that is famous for its natural wealth, including extensive forests. This province has a diverse topography, ranging from lowlands to mountains, which creates various types of forest ecosystems (Pawera et al., 2020). Forests in West Sumatra include lowland forests, mountain forests, and peat forests, each of which has unique characteristics (Indrajaya et al., 2022). Forest conditions in West Sumatra, like many other regions in Indonesia, face various challenges and pressures (Harrison et al., 2020). Deforestation and forest degradation are serious problems due to various factors. Although the government has made efforts to control the rate of deforestation, illegal practices such as illegal logging are still a threat to the sustainability of forests carried out by the community (Duguma et al., 2019).

The communities around the forests in West Sumatra Province are mostly Minangkabau indigenous people. This community has a strong customary system, including in the management of natural resources (Utami & Oue, 2021). The concept of "ulayat land" or communal land that is inherited from generation to generation is still maintained in many areas, although in practice there is often overlap with government claims over state forest areas (Antonio & Griffith-Charles, 2019). One of the efforts made by the West Sumatra Provincial Government is to implement various social forestry programs as an effort to involve the community in forest management (Sahide et al., 2020). Schemes such as Community Forestry have been implemented in several areas. These programs aim to provide legal access for communities to manage forests and increase the income of forest farming communities (Meijaard et a., 2021; Chandra et al., 2022).

Increasing forest farmers' incomes can drive innovation in sustainable forest management practices (Fatima et al., 2024). With better economic resources, forest farmers can adopt new technologies, experiment with more efficient agroforestry methods, or develop new forest-based products (Xie & Huang, 2021). These innovations not only increase their own productivity and incomes but can also serve as models for replication elsewhere, driving broader transformations towards more sustainable forestry practices (Sheppard et al., 2020). In the context of the Sustainable Development Goals (SDGs), increasing forest farmers' incomes contributes to multiple goals, including poverty alleviation, food security, decent work, reducing inequalities, and climate action (Nambiar, 2019; Miyamoto, 2020). This shows how investing in forest farmers' well-being can have broad and interconnected positive impacts across multiple aspects of sustainable development (Njurumana et al., 2020).

From the description above, the researcher is interested in analyzing the Social Forestry Policy in Increasing Forest Farmers' Income: A Case Study in West Sumatra Province. In this case, the social forestry policy is part of the government's efforts to involve the community in forest management and improve the welfare of people living in or around forest areas (Budi et al., 2021). This policy was officially launched through the Regulation of the Minister of Environment and Forestry Number P.83/MENLHK/SETJEN/KUM.1/10/2016 concerning Social Forestry (Gusliana, 2022).

2. RESEARCH METHOD

Method

The method used in this study is a quantitative method. Quantitative methods are research methods that use numbers or numerical data (Rana et al., 2021). This method refers to specific techniques or procedures used to collect, analyze, and interpret data (Mertens et al., 2017). The instruments used in this study include stationery, questionnaire sheets, laptops, and Microsoft Excel software.

The selection of respondents in this study used the Probability Proportional To Size Sampling method where the probability (chance) of sampling is proportional to the sampling size (Cheung, 2021). The sample was selected proportionally (balanced) with the total population size. The respondents selected were Indonesian forest farmers (individuals) who live in and around the forest, are active in the forestry sector or interact with forests that are members of the Social Forestry Group or Forest Farmer Group in the KPH (Forest Management Unit) managed area.

The distribution of the respondent population in this study was divided into 10 UPTD KPH units within the scope of the West Sumatra Provincial Forestry Service, with a division of 38,933 families from the Pasaman Regency KPH, 33,181 families from the Lima Puluh Kota Regency KPH, 30,378 families from the Agam Regency KPH, 14,821 families from the Bukit Barisan Regency KPH, 26,636 families from the Sijunjung Regency KPH, 11,466 families from the Solok Regency KPH, 20,539 families from the Hulu Batang Hari Regency KPH, 2,949 families from the Dhamasraya Regency KPH, 6,913 families from the Pesisir Selatan Regency KPH and 1,249 families from the Mentawai Islands Regency KPH.

Determining the number of respondents in this study uses the Slovin Formula. The Slovin Formula is a formula used to calculate the minimum sample size of a study that estimates proportions (Tejada & Punzalan, 2012). The notation of the Slovin formula is stated as follows:

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

Information :

n = number of samples
N = population size
E = *margin of error* / *error tolerance* (error tolerance limit)

So the number of samples after being calculated using the Slovin formula obtained a total of respondents of : n = 187.045/(1+(187.045*0,03*0,03)) = 1.105 families.

Time and Place

Data collection in this study was conducted on November 1, 2023 to December 1, 2023 spread across 10 KPH units within the scope of the West Sumatra Provincial Forestry Service. Data collection was carried out by the West Sumatra Provincial Forest Farmer Income Survey Team consisting of: Forestry Extension Workers, Community-based Forestry Extension Workers, Social Forestry Assistants and Forestry Police.

Data analysis

Data processing begins by entering the resulting information/primary data into the Microsoft Excel application. The next step is to check the completeness of the data before being analyzed. The data is then processed to produce a percentage in the form of a table. The analysis stage focuses on descriptions that describe the distribution of respondents, characteristics of respondents, income of forest farmers and policies and programs that support increasing the income of forest farmers.

3. RESULTS AND DISCUSSIONS

Distribution of Respondents

Based on the calculation results, the distribution of respondents is as shown in Table 1 below.

Table 1. calculation results

No	KPH (Forest Management Unit)	Respondents of Each Scheme						Amount
		HN	HKm	HTR	HA	KK	KTH	
1.	KPHL Pasaman Raya	218	19	-	-	-	16	253
2.	KPHL Limapuluh Kota	183	12	-	-	-	11	206
3.	KPHL Agam Raya	167	4	-	-	-	15	186
4.	KPHL Bukit Barisan	88	8	-	-	1	22	119
5.	KPHL Sijujung	153	3	1	-	-	8	165
6.	KPHL Solok	54	6	-	-	-	16	76
7.	KPHL Hulu Batanghari	121	1	-	-	-	4	126
8.	KPHL Dharmasraya	14	-	-	1	-	5	20
9.	KPHL Pesisir Selatan	36	1	2	-	-	7	46
10.	KPHL Kepulauan Mentawai	-	4	-	6	3	4	17
	Total number	1.034	58	3	7	4	108	1.214

***Data source**: West Sumatra Provincial Forestry Service 2023*

The total number of respondents in this study was 1,214, spread across 10 Forest Management Units (KPH) in West Sumatra Province. The social forestry scheme shows that there are 5 schemes, namely HN (Nagari Forest/Village Forest), HKm (Community Forest), HTR (People's Plantation Forest), HA (Customary Forest), and KK (Forestry Partnership). Plus KTH (Forest Farmer Group). The dominant scheme is Nagari Forest/Village Forest (HN/HD) with 1,034 respondents (85.17% of the total). Furthermore, the distribution per KPH shows that KPHL Pasaman Raya has the most respondents, 253 respondents (20.84% of the total).

The distribution of respondents data shows that the implementation of social forestry in West Sumatra is dominated by the HN/HD scheme, which may reflect the suitability of this scheme to the local social and customary structure. There is significant variation in the number and type of schemes between Forest Management Units (KPH), which may be influenced by geographical, social, local wisdom and local policy factors. Schemes such as HTR (People's Plantation Forest), HA (Customary Forest), and KK (Forestry Partnership) are still limited in their implementation and may require special attention for further development.

Respondent Characteristics

Respondent Gender

The first characteristic of the respondents in this study is categorized by gender. The sample is categorized by gender, male and female. The following is a picture of the characteristics of respondents based on gender.

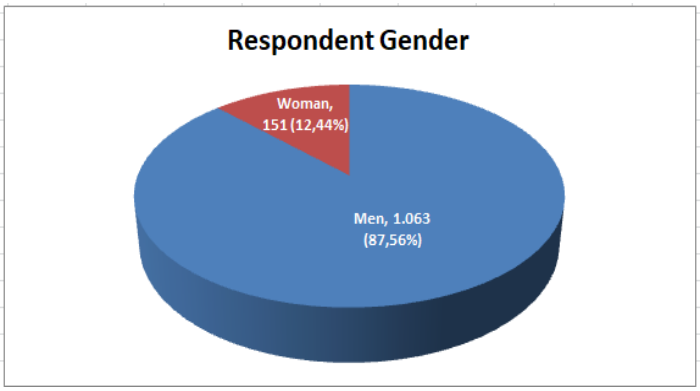

Figure 1. Gender of Farmer Income Respondents

***Data source:** West Sumatra Provincial Forestry Service 2023*

Based on Figure 1 above, it can be seen that the respondents of this study were mostly male. As many as 87.56% or 1,063 respondents who filled out the questionnaire were male. Conversely, as many as

12.44% or 151 people who filled out the questionnaire were female. There are several factors that cause the dominance of men as respondents, such as cultural factors, in some communities, activities related to forests and land are often considered "men's work". Access and control, women may have more limited access to information, resources, or decision-making related to social forestry programs. Traditional gender roles, division of roles in the household may limit women's participation in activities outside the home. Time constraints, women may have other responsibilities that limit their time to participate (Nhem & Lee, 2019; Anugrah et al., 2022).

Respondent Age

Respondents from this study were then categorized by age. Respondents were divided into several generations, generation X with ages (43-58 years) dominated with 50.7% of total respondents, millennials with ages (27-42 years) followed in second place with 28.1%, baby boomers with ages (59-77 years) as much as 17.2%, generation Z with ages (11-26 years) only 2.8% and pre boomers with ages (78+ years) very little, only 1.2%. The majority of respondents were of productive age in generation X and millennials, which shows the potential for program sustainability in the medium term. The following is a picture of the characteristics of respondents based on their age.

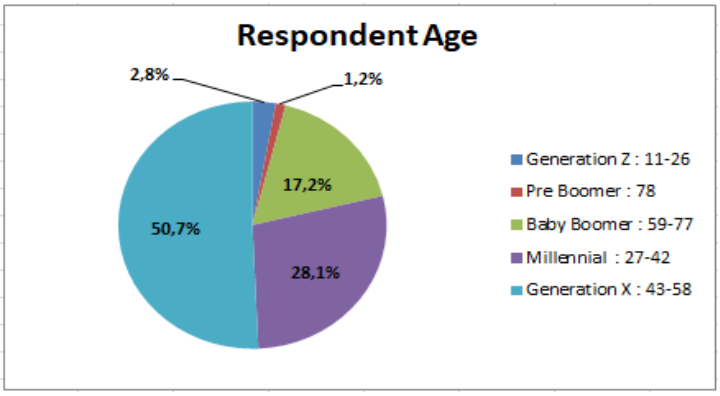

Figure 2. Respondents' Age

Data source: West Sumatra Provincial Forestry Service 2023

Respondent Education

The last respondent characteristics in this study are grouped based on education level. Respondent characteristics based on education level can be seen in Figure 3.

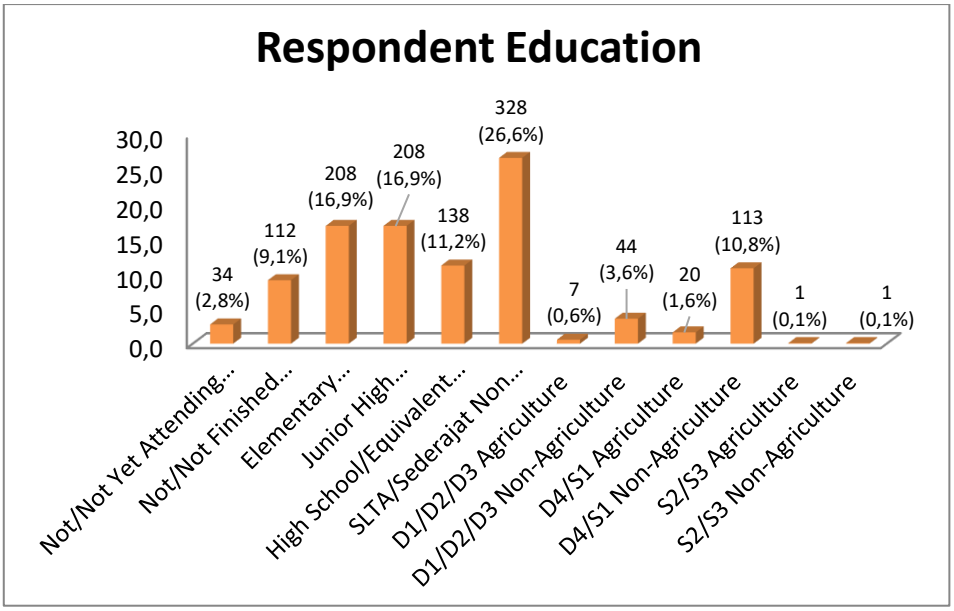

Figure 3. Respondents' Education Level
Data source: West Sumatra Provincial Forestry Service 2023xxx

Based on the image above, it can be seen that the respondents of this study are divided into several levels of education. The education level of high school/equivalent non-agriculture dominates with the number of respondents as many as 328 respondents or 26.6%, elementary school/equivalent and junior high school/equivalent with the same number of respondents, namely 208 respondents or 16.9%, junior high school/equivalent agriculture with the number of respondents as many as 138 respondents or 11.2%, D4/S1 agriculture with the number of respondents as many as 113 respondents or 10.8%, not/not yet graduated from elementary school with the number of respondents as many as 112 respondents or 9.1%, D1/D2/D3 non-agriculture with the number of respondents as many as 44 respondents or 3.6%, not/never attended school with the number of respondents as many as 34 respondents or 2.8%, D4/S1 agriculture with the number of respondents as many as 20 respondents or 1.6%, D1/D2/D3 agriculture with the number of respondents as many as 7 respondents or 0.6%, and S2/S3 agriculture and non-agriculture both have the same number of 1 respondent or 0.1%.

The level of education can indeed have a significant impact on the implementation and success of the Social Forestry Policy in increasing the income of forest farmers (Yuliana et al., 2021; Ojijo et al., 2022). The relationship between the level of education and its impact on the policy, such as understanding the policy. Farmers with higher levels of education tend to understand the complexity of social forestry policies more easily, they can grasp new concepts more quickly and apply them in forest management practices (Sahide et al., 2020). Better education also allows farmers to more easily adopt new technologies and innovations in forest management. This can increase productivity and efficiency, which leads to increased income. In addition, education can open up insights into opportunities for income diversification from non-timber forest products or ecotourism. This can increase the economic resilience of forest farmers (Santosa et al., 2024).

However, it is important to note that formal education is not the only determining factor. Practical experience, local wisdom, and targeted training programs can also play an important role in improving the effectiveness of social forestry policies and forest farmers' incomes. Therefore, a comprehensive strategy needs to consider both increasing access to formal education and

strengthening capacity through tailored non-formal channels (Legilisho-Kiyiapi, 2004; Weiss et al., 2020).

Forest Farmers Income

Based on the calculation results, the income of forest farmers can be seen in Figure 4 and a comparison of the achievements and realization of indicators for increasing forest farmers' income in 2022 and 2023 can be seen in Figure 5.

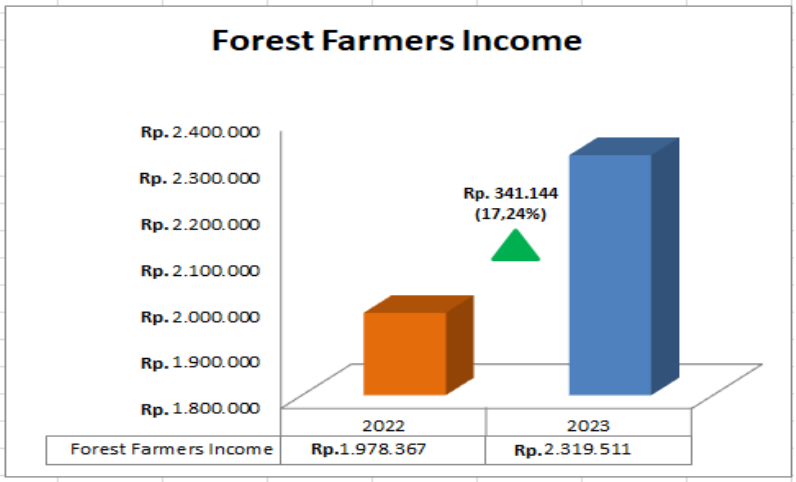

Figure 4. Increase in Forest Farmers' Income in 2023
Data source: West Sumatra Provincial Forestry Service 2023

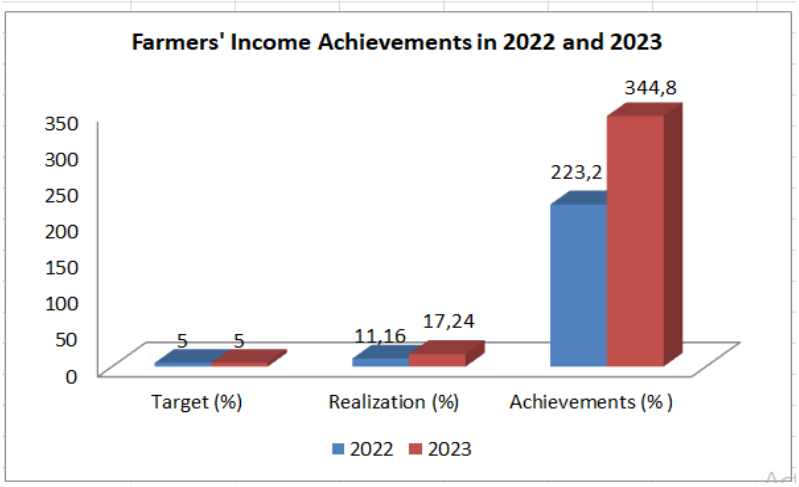

Figure 5. Comparison of Achievements and Realization of Forest Farmer Income Increase Indicators in 2022 and 2023
Data source: *West Sumatra Provincial Forestry Service 2023*

The calculation of the achievement of the percentage indicator of increasing forest farmer income is calculated from the amount of increase in forest farmer income in 2023 compared to forest farmer income in 2022. The percentage increase in forest farmer income in 2023 is targeted to increase by 5% from forest farmer income in 2022. Forest farmer income in 2022 is IDR 1,978,367, if it increases by 5% from that figure, the target for forest farmer income in 2023 is IDR 2,077,285, or an increase of IDR 98,918. However, the increase in forest farmer income in 2023 which can be seen in the picture above

shows an increase of IDR 341,144, from forest farmer income in 2022 or around 17.24% with an achievement level of 344.80%.

Increasing the income of forest farmers is supported by various efforts that have been implemented by the West Sumatra Provincial Government in 2023, these efforts include:

a) Socialization related to the forestry sector to members of the Social Forestry Group totaling 205 groups and Forest Farmer Group totaling 537 groups.
b) Increasing the institutional capacity of KPS (Social Forestry Groups) and KTH (Forest Farmer Groups) through training, workshops and technical guidance as well as field schools with resource persons from Universities, Regional Apparatus Organizations (OPD), Ministries/Institutions, Banking, Business World, NGOs/NGOs, Communities/Associations of Groups and Farmer Group Members who have successfully developed the product.
c) Providing assistance in the form of productive economic tools, honey bee hives and ecotourism infrastructure to PS and KTH groups. In 2023, the West Sumatra Provincial Government has provided 4,239 honey bee hives to 84 groups and 20 ecotourism infrastructure (1 tourist wooden boat, 1 gazebo, 4 drones, 4 glemping tents and equipment, 1 rubber boat and equipment, 4 150 CC ATVs, 2 action cameras, 1 nature tourism road, 1 tourist road/tracking construction, flower seeds for tourism) to 13 groups and 35 units of Productive Economic Tools (5 honey water content reduction tools, 9 honey harvesting tools, 7 Trigona harvesting personal protective clothing, 6 Trigona bee feed seeds, 1 bentor, 1 wet coffee peeling tool, 1 dry coffee peeling tool, 1 grinder, 1 roaster, 1 pinang thumper and 1 coffee processing tool) to 32 groups.
d) Entrepreneurship facilitation, business development, technical guidance and training and field schools.
e) Conducting continuous coaching, monitoring, evaluation and assessment of Social Forestry groups that have been granted permits/approval for social forestry management so that management access increases.
f) Empowering successful forest farmers to share information and knowledge with other KPS and KTH members.
g) Increasing the promotion of KPS and KTH products through product photography training and the potential of Social Forestry.
h) Conducting coaching, monitoring and evaluation of trigona honey bee development activities and ecotourism in order to increase product downstreaming.
i) The Honey Drinking Movement through the Circular of the Governor of West Sumatra Number 522.4/536/DISHUT-2022 dated February 14, 2022 encourages the level of honey consumption.
j) Optimizing Millennial Entrepreneurs in the forestry sector in KPS and KTH in order to develop social forestry businesses.
k) Improving collaboration and good cooperation with various work units of the Ministry of Environment, other OPDs, academics, the business world, legislative and non-governmental organizations and individuals who are interested in the development of Social Forestry in West Sumatra.

Policy Analysis

The Social Forestry Policy in West Sumatra is an implementation of the national policy that aims to provide legal access to communities in managing state forests. In West Sumatra, this policy has special significance considering the vast forest area and the important role of the Minangkabau indigenous community in managing natural resources. The implementation of the Social Forestry

Policy involves several schemes, including Nagari Forest (called Village Forest at the national level), Community Forest (HKm), People's Plantation Forest (HTR), and Forestry Partnership (KK). The West Sumatra Provincial Government has been actively promoting this program through the Forestry Service and in synergy with other related agencies.

Nagari Forest is the most appropriate scheme for the social structure of the Minangkabau community, where nagari is the lowest government unit that has customary authority. Through this scheme, nagari communities are given forest management rights for a period of 35 years and can be extended. In the future, the West Sumatra Provincial Government also plans to expand the scope of the Social Forestry program, with certain targets for the area to be managed by the community. Focus is also given to the development of forest product value chains and integration with village development programs (Anggarwal et al., 2021).

4. CONCLUSION

Based on the discussion and research results, it can be concluded that the Social Forestry policy in West Sumatra has succeeded in significantly increasing the income of forest farmers, exceeding the set target. In 2023, forest farmers' income increased by 17.24% compared to the previous year, far above the target of 5%. This success is supported by various government efforts, including socialization, training, technical guidance, field schools, assistance with productive economic tools, ecotourism infrastructure, development of trigona bee cultivation (galo-galo) and facilitation of entrepreneurship. The implementation of this policy involves several schemes, with the Nagari Forest being the most appropriate for the social structure of the Minangkabau community. Despite challenges such as the dominance of male participation and variations in the level of education of respondents, this policy shows great potential in improving the welfare of communities around the forest and encouraging sustainable forest management in West Sumatra Province.

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