

The Resources Ownership And Livelihood Strategies Of Rubber Farmers In Nagari Tanjung Bonai Indonesia

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Abstract – A livelihood strategy contains steps to do something wisely and appropriately to achieve goals. To survive, rubber farmers cannot rely solely on rubber plantations; they must look for alternatives outside rubber farming. This study aimed to describe the livelihood resources and analyze the livelihood strategies of rubber farmers' households in Nagari Tanjung Bonai Aur Selatan during the rainy season. This study used a survey method, and the respondents were rubber farmers in Nagari Tanjung Bonai Aur Selatan, with a total of 40 respondents. The data analysis employed for this research was a quantitative and qualitative descriptive analysis. The results showed that the ownership of resources among rubber farmers in Nagari Tanjung Bonai Aur Selatan was in the medium category. In the rainy season, the livelihood strategy was primarily focused on increasing yields by intensifying agricultural land through clearing. The extensification strategy was carried out by becoming laborers, accounting for 13 (32,5%) households, while the diversification strategy involved activities such as sand collection and fish catching, representing 8 (20%) households of the respondents. However, migration was not a chosen strategy among rubber farmers in Nagari Tanjung Bonai Aur Selatan.

Keywords – Rubber Farmers; Livelihood Strategies; Livelihood Assets.

I. INTRODUCTION

Currently, agriculture is still an essential sector of the Indonesian economy, with a contribution of 11.8% to Gross Domestic Product. Forty people are working in the agricultural sector (Hariani, 2023). One of the agricultural subsectors with considerable potential is the plantation subsector. This subsector provides raw materials for the industrial sector, absorbs labor, and earns foreign exchange. Rubber is one of the plantation commodities that has an essential role in economic activities in Indonesia. Indonesia is ranked second after Thailand as the largest rubber-producing country in the world (Wulandari, 2023). Of the 19 districts in West Sumatra Province, Sijunjung Regency has the most rubber producers, totaling 48,196.00 tons per year. For rubber land area, Sijunjung Regency is the second largest after Dharmasraya Regency, 34,158.00 Ha ((BPS, 2022)

Farmers are exposed to a variety of dangers in their agricultural production as a result of resource and capacity limitations. Natural and market hazards are the two biggest threats to farmers' livelihoods in the study area (Foyuan et al., 2020). Likewise, in Nagari Tanjung Bonai Aur Selatan, Sumpur Kudus District, Sijunjung Regency, land tenure status, production, and the prevailing price of rubber will affect the income of rubber farmers, and this will cause farmers to determine the choice of livelihood strategies other than rubber farming to meet their daily needs. This strategy is carried out by rubber farmers when income from rubber farming has yet to be able to meet household needs.

In the dry season, the production of rubber latex can increase because the latex produced is a byproduct produced by rubber trees to adapt to the dry season so that the latex produced has good quality. In contrast, the latex produced in the rainy season will produce poor quality. The latex produced in the rainy season contains much water, so the latex becomes damaged, and the selling price decreases. Rain that falls in the morning will thwart tapping activities, reduce production, and even risk disease attacks that

will cause the rubber not to be tapped again because the sap does not come out and spots that can eventually die and the emergence of fungal diseases (Effendi, 2021; Harun et al., 219 C.E.).

One of the efforts to overcome the problems of rubber farmers is to use a specific approach to sustain farmers' livelihoods. One of them is the sustainable livelihood approach, which is an approach in which the community optimizes the use of existing assets to meet a decent livelihood. Livelihood assets are everything that is valuable or is a collection of resources that is used to earn a living. These assets consist of natural assets, physical assets, social assets, financial assets, and human assets (DFID, 1999). It is, therefore, essential for households to build resilience (livelihood strategies) for such conditions so that they can cope with such shocks or conditions that may occur at any time (Amfo & Ali, 2020).

Based on the background and problem formulation that has been described, the objectives of this study are (1) To describe the livelihood resources ownership of rubber farmer households in Nagari Tanjung Bonai Aur Selatan, (2) To analyze the livelihood strategies of rubber farmers in Nagari Tanjung Bonai Aur Selatan.

II. MATERIAL AND METHODS

This research was conducted using the survey method from January to February 2022 in Nagari Tanjung Bonai Aur Selatan, Sumpur Kudus District, Sijunjung Regency, West Sumatra. The location selection was carried out purposively because Nagari Tanjung Bonai Aur Selatan has the largest area of rubber farmland in the Sumpur Kudus sub-district, namely 455 Ha.

The sample was taken using the Slovin method of as many as 40 farmers with the following formula (Sugiyono, 2013):

$$n = \frac{N}{21 + N(e)^2}$$

n = sample size or number

N = total population

e = expected precision (15%)

Data were collected using a survey method using a questionnaire. The variables for the first objective refer to the DFID concept (DFID, 1999), namely: human resources, natural resources, financial resources, social resources, and physical resources. First, indicators for livelihood assets were identified and formulated by the above variables. Then, the asset valuation was depicted through a Pentagon radar diagram. Each variable was given a weighted value and adjusted to the actual situation in the field. From each respondent's answer, a score of 1 to 5 is given, assuming that the higher the score, the greater the livelihood assets.

The following are the assessment criteria for livelihood assets (Tabel 1):

Tabel 1. Criteria for assessing livelihood assets

No	Score interval	Percentage	Criteria
1	1 – 1.7	20-35%	Poor
2	1.8 – 2.5	36-51%	Not Good
3	2.6 – 3.3	52-67%	Moderate
4	3.4 – 4.1	68-83%	Good
5	4.2 – 5.00	84-100%	Very Good

The second objective variable refers to (Liu et al., 2023a; Scoones et al., 2020): intensifikasi, extensifikasi, diversifikasi, and migration. The data analysis used is qualitative descriptive analysis. This qualitative descriptive analysis is used to describe the strategies that rubber farmers use to fulfill their needs.

III. RESULTS AND DISCUSSION

3.1 Famers rubber profile in Nagari Tanjung Bonai

The farmer profile will provide information on social and economic aspects. The following data (Tabel 2) on the profile of rubber farmers in Nagari Tanjung Bonai.

Table 2. The profile rubber farmer in Nagari Tanjung Bonai

No	Characteristic	Total	
		N	percentage
1	Gender of household head		
	a. Female	2	5%
	b. Male	38	95%
2	Age		
	a. 33 – 45 years	25	62,5%
	b. 46 – 58 years	8	20%
	c. 59 years ≤	7	17,5%
3	Number of household members		
	a. 2 – 3	14	35%
	b. 4 – 5	26	65%
4	Age of rubber plants		
	a. 10 – 20 years	13	32.5%
	b. 21 – 30 years	16	40%
	c. 31 years ≤	11	27.5%
5	Farming working status		
	a. Main job without any side jobs	9	22,5%
	b. Main job with side jobs	31	77,5%
	c. Side jobs	0	0%

Heads of rubber farming households are mostly men with a relatively young age of 33 - 45 years. Most rubber farming households have rubber plants that are over 31 years old. Rubber plants can produce at the age of 5 years. Although rubber plants can produce up to 35 years of age, latex production will decline at age 26 years (Kumalawati et al., 2019). The relatively young age will allow farmers to have side jobs. This can be seen from the data that most household heads (77.5%) have a second job.

3.2 The Livelihood Resources of Rubber Farmer Household In Nagari Tanjung Bonai

The characteristics of rubber farmer households are seen from access to and use of assets. Assets include various resources (human resources, natural, financial, social, and physical), which are inseparable units. Livelihood resources refer to how individuals and communities sustain their lives and secure economic well-being.

Human capital can include education, training, and health. Natural resources include land, water, forests, and minerals, while physical resources include buildings and machinery. Additionally, social capital is another crucial aspect of livelihood resources. Social capital refers to the relationships, networks, and social norms that facilitate cooperation and collaboration within a

community. Physical capital refers to the infrastructure, equipment, and technology individuals and communities use to transform raw materials into finished products or services (Islam et al., 2014) (Zhang et al., 2023). Furthermore, farmers must have access to appropriate financial resources to manage a farming operation and ensure its economic sustainability effectively. Financial resources refer to the funds and assets available to farmers to manage their agricultural operations (Gadédjisso-Tossou, 2015).

The following is a description of the resource ownership of rubber farmers in Nagari Tanjung Bonai Aur Selatan.

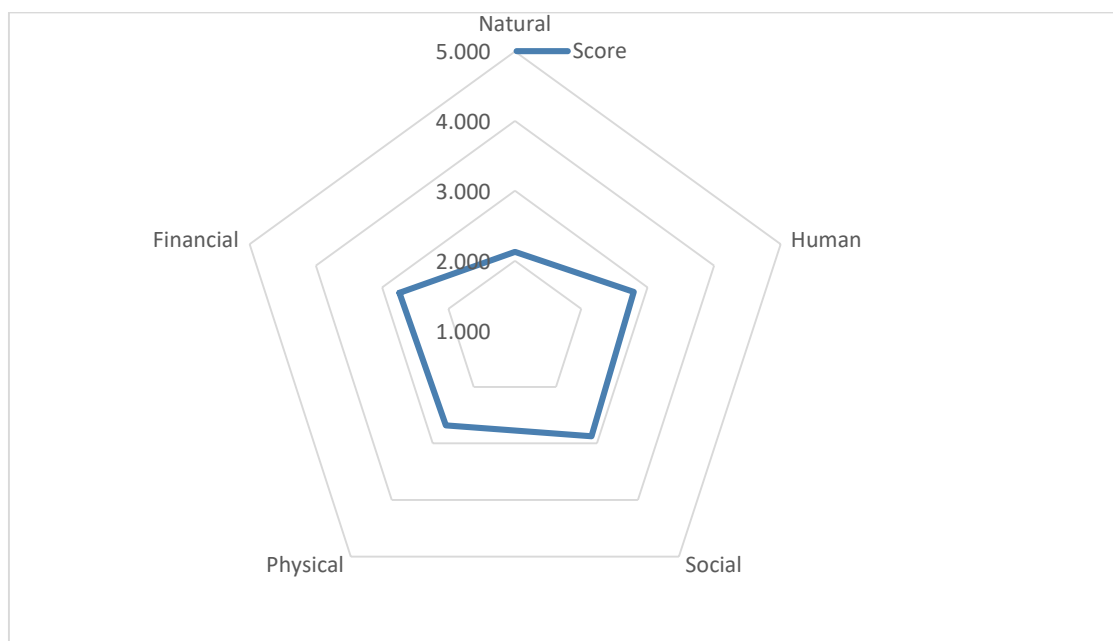


Figure 1. Asset Pentagon

The various relationships and interconnections among livelihood resource components are depicted in the asset pentagon. The pentagon's triangular shape and interconnecting lines with a center point in the middle of the pentagon illustrate the variation in the level of community ownership and access to resources (DFID, 1999). The figure above shows that the lowest value of rubber farmer household assets is natural resources, with a score of 2.79 (not good), and the highest is social resource assets, with a value of 2.87 (moderate). The value of financial resources is as much as 2.74, human resources 2.79, and physical resources as much as 2.68. The criteria for resources owned by rubber farmer households can be seen in the following Table 1:

Table 3. Resources owned by rubber farmer households in Nagari Tanjung Bonai South Aur

No	Types of resources	Average Score	criteria
1	Human resources	2.79	Moderate
2	Natural resources	2.13	Not Good
3	Social resources	2.87	Moderate
4	Financial resources	2.74	Moderate
5	Physical resources	2.68	Moderate
	Average	2.64	Moderate

3.2.1 Human Resources

Human resources refers to individuals' knowledge, skills, and abilities, which can be used to create economic value. Unlike physical or financial capital, human capital is intangible and cannot be easily bought or sold (Davis et al., 2021). It is also unique to each individual and cannot be replicated or duplicated.

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The agricultural sector is heavily reliant on the human capital of farmers. These individuals possess unique skills and knowledge essential for their farms' success. They are experts in crop management, animal husbandry, and equipment maintenance. Farmers also profoundly understand the land they work on and the natural resources available. In addition to their technical expertise, farmers are known for their strong work ethic and resilience. They are accustomed to long hours and hard physical labor and can adapt to changing weather conditions and market demands. Their problem-solving ability to think creatively is also critical in a constantly evolving industry (Davis et al., 2021).

The following data describes the human resources of rubber farmer households (Table 4).

Table 4. The component of human resources of rubber farmer households

No	Component	Score	criteria
1	Family labor	1.57	Poor
2	Health conditions	4.79	Very Good
3	Household head education	2.63	Moderate
4	Farming experience	2.72	Moderate
5	Training experience	2.25	Not Good
	Average	2.79	Moderate

Family labor involved in rubber farming activities is classified as "poor". Rubber farming generally only involves husbands and wives in the household because farming activities are not considered to require much labor. The use of family labor is optimized without using labor outside the family (Ankrah et al., 2023).

The lowest component of human resources are family labor and training experience. This data indicates that farmers still manage their farms based on skills passed down from generation to generation.

3.2.2 Natural Resources

Natural resources, such as land, water, and organisms, are essential for farmers to carry out their agricultural activities effectively (Kouelo et al., 2020). These resources play a crucial role in the agricultural sector, particularly for farmers who heavily rely on these resources for their livelihood. The availability and quality of natural resources directly impact farmers' ability to cultivate crops, raise livestock, and sustain their agricultural activities.

The following is data (Table 5) on the ownership of natural resources of rubber farmers in Nagari Tanjung Bonai.

Table 5. The component of natural resources of rubber farmer households

No	Component	Score	criteria
1	Rubber plantation area	2.08	Not Good
2	Number of rubber trees	1.95	Poor
3	Types of crops cultivated other than rubber	1.00	Poor
4	Land area other than rubber	1.15	Poor
5	Number of poultry	1.53	Poor
6	Livestock and fish ownership (buffalo, cow, goat and fish)	3.50	Good
10	Water source ¹	3.70	Good
	Average	2.13	Not Good

The size of rubber farms owned by farmers is categorized as unfavorable (narrow). The narrow agricultural area makes the number of rubber plants also small (in the poor category). Limited land and crop ownership requires farmers to choose off-farm livelihood strategies.

The average natural resource ownership of rubber farmer households in Nagari Tanjung Bonai is "not good". However, there is a source of water, namely the river, which can be utilized as a source of income in the rainy season (when rubber is not produced), namely as a fisherman and traditional sand miner. The data in Table 5 shows that although few farmers cultivate crops other than rubber, livestock and fish ownership is categorized as "good".

3.2.3 Social Resources

In today's world, farmers face a multitude of challenges. From unpredictable weather (Bryan et al., 2013) patterns to fluctuating market prices, it can be difficult for farmers to stay afloat. However, resources are available to help them navigate these challenges and build a thriving farm business. One such resource is the network of social connections (Lin et al., 2021) farmers can tap into. By building relationships with other farmers, industry experts, and community members, farmers can access valuable knowledge, support, and resources (Kreft et al., 2023). Whether it is learning about new farming techniques, finding buyers for their products, or simply having someone to talk to when times get tough, social connections can make all the difference for farmers (Uphoff & Wiyaratna, 2000; Padapotan & Silalahi, 2019).

The following (Table 6) is data on the condition of the social resources of rubber farmer households in Nagari Tanjung Bonai.

Table 6. The data on the social resources of rubber farmer households in Nagari Tanjung Bonai.

No	Component	Score	criteria
1	Participation in farmer groups	2.05	Not Good
2	Benefits obtained from farmer groups	2.45	Not Good
3	Relationship with intermediary traders	4.07	Good
4	Relationship with big traders	2.89	Moderate
	Average	2.87	Moderate

Farmers who live in close proximity will join a group and use the group as a means of information exchange among farmers and resource mobilization. The data in the Table 6 shows that farmers' participation in the group is still low, and the group's utilization is still lacking. One of the reasons for low farmer participation is the absence of economic benefits from group activities. Economic factors are one of the factors that cause farmers to be unwilling to participate (Astuti et al., 2023).

3.2.4 Financial Resources

Farmers must have access to appropriate financial resources to manage a farming operation and ensure its economic sustainability effectively. These resources are essential for purchasing inputs such as seeds, fertilizers, and machinery and covering operational costs, including labor and irrigation. Moreover, with the increasing impacts of climate change on agriculture, farmers also need financial resources to adapt and implement management practices that can mitigate these effects (Gadédjisso-Tossou, 2015).

Financial resources are all financial resources that can be utilized and used by the community to achieve its livelihood goals which include reserves or inventories, both owned by themselves and financial institutions and in the form of routine funds (DFID, 1999). The following data on the financial resources of rubber farmers include sources of capital, sources of household income, and savings.

Table 7. The financial resources of rubber farmers' households in Nagari Tanjung Bonai

No	Types of resources	Score	criteria
1	Source of capital	4.18	Good
2	Source of household income	1.77	Poor
3	Savings	2.27	Not Good
	Average	2.74	Moderate

Sources of capital for rubber farming received "good" criteria. The "good" assessment is because farmers generally meet rubber farming capital independently. This rubber farming does not require significant funds because it is not fertilized. The data in the table shows that savings and income sources outside of rubber farming are still low. The low-income source from outside rubber farming indicates that rubber farming is still households' primary income source (Dalimunthe et al., 2021; Nguyen & Dang, 2016)

3.2.5 Physical Resources

In addition to social connections, farmers also need access to physical resources to succeed. These resources include land, equipment, and capital. Without these resources, it can be difficult for farmers to produce crops efficiently and profitably. Equipment is also crucial, allowing farmers to plant, harvest, and process crops. The following data regarding physical resources owned or accessible by rubber farmers in Nagari Tanjung Bonai.

Table 8. The physical resources of rubber farmers' households in Nagari Tanjung Bonai

No	Component	Score	criteria
1	Farm road conditions	3.37	Moderate
2	Transportation to the farm area	2.33	Not Good
3	Equipment owned	2.65	Not Good
4	Vehicles owned	2.43	Moderate
5	Warehouse	4.07	Good
	Average	2.68	Moderate

3.3 The Livelihood Strategy of Rubber Farmers Household

In addition to needing resources, farmers also need solid livelihood strategies (Yin et al., 2020). The livelihood strategy means planning how they will earn income from their family. One common strategy is diversifying their crops or products to have multiple income sources (Astuti et al., 2021). Another strategy is to focus on high-value crops or niche markets, which can command higher prices.

The following Table 9 is data on rubber farmers' livelihood strategies based on the concept created by Scoones.

Table 9. The livelihood strategy of rubber farmer households in Nagari Tanjung Bonai

No	Strategy	Number of households	resources used
1	Intensification		
	a. fertilization	0	
	b. Land clearing	40	Natural resources, physical resources, human resources
	Extensification (farm laborers)	13	Human resources
2	Diversification		
	a. sand miner laborers	6	Natural resources (river), human resources, physical resources
	b. fisherman	2	Natural resources (river), human resources, physical resources
3	Migration	-	

Natural resources and human resources are the most widely used resources in livelihood strategies by rubber farmers in Nagari Tanjung Bonai. Adoption of climatic variability techniques including mixed crops, manure application, and irrigation was significantly influenced favorably by human capital (household labor) (Liu et al., 2023b).

3.3.1 Intensification Strategy

The rainy season does not allow farmers to tap rubber. This condition is utilized for all rubber farmer households to do land clearing. This activity falls into the intensification category. The extensification of work in agriculture is also chosen as one of the strategies, namely by becoming a farm laborer on rice fields. None of the farmers fertilize because the rubber plants are still at a productive age. All farmers do land clearing, which shows the amount of attention to agricultural land as the primary income source is a natural phenomenon. Farm clearing activities are part of the on-farm strategy (Astuti et al., 2021; Chmieliński et al., 2023).

3.3.2 Difersification Strategy

The diversification of off-farm work done by rubber farmers during the rainy season is by utilizing natural resources, namely rivers, by becoming fishermen and traditional sand miners.

The adaptive capacity of family farms is confirmed when facing shocks. It also shows that the flexibility of these households depends heavily on the rubber farming system through possible technical changes and work adaptations (Nicod et al., 2020).

It's essential for farmers to continually evaluate and adjust their livelihood strategy based on changing market conditions and other factors. This requires a deep understanding of their strengths and weaknesses, as well as the needs and preferences of their

customers. Farmers can increase their chances of long-term success and sustainability by developing a solid livelihood strategy (Liu et al., 2023b).

3.3.3 Migration Strategy

Every person aspires to better their quality of life, and as a result, they build coping mechanisms to deal with the challenging circumstances of their daily lives. One such tactic to deal with unanticipated disruptions to their way of life is whether to migrate or stay (i.e., not migrate) (Mallick et al., 2020).

No rubber farming families in Nagari Tanjung Bonai migrate during the rainy season. The decision to stay is because the rainy season is not too long (October - December), so economic activities are more focused within the village by utilizing natural, human, and physical resources.

IV. CONCLUSION

The ownership of household resources of rubber farmers in Nagari Tanjung Bonai is in the medium category. The livelihood strategy that is most widely used during the rainy season is intensification, namely cleaning rubber land. Meanwhile, the extensification strategy chosen is to utilize human resources in the form of labor by becoming farm laborers on other farmers' farms. Another livelihood strategy chosen is job diversification by utilizing the existing natural resources, namely the river, by becoming traditional fishers and sand miners.

DECLARATION OF COMPETING INTEREST

The authors affirm that they have no known financial or interpersonal conflicts that might have looked to have influenced the research presented in this study.

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