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Assessing the sustainability of community livelihoods: An ecological approach to enhancing livelihoods in forest area

Supriadi[1],*, Emi Roslinda[1], Gusti Hardiansyah[1]

[1] *Faculty of Forestry, Tanjungpura University, Pontianak, West Kalimantan 78121, Indonesia.*
Correspondence: ucupsupriadi2002@gmail.com

ABSTRACT

Background: This study aims to assess the level of sustainable livelihoods in a village with significant natural resource potential, analyze the assets affecting the community's livelihoods, and propose strategies to enhance sustainability. **Methods:** This research was conducted in Piantus Village, Sejangkung District, over four weeks, using surveys, interviews, and questionnaires. A sample of 86 families from 598 was selected through Random Sampling. Descriptive analysis, processed with Microsoft Excel, assessed five livelihood assets: human, natural, social, financial, and physical. **Findings:** The results of this study indicate that based on the community livelihood asset indicator index in Piantus Village, Sejangkung District, Sambas Regency, the average index scale score obtained from community livelihood assets was 0.62 with moderate criteria which means not yet sustainable. **Conclusion:** The strategy carried out by the Piantus Village community is the Accumulation Strategy, the condition of the assets owned by the Piantus Village community is not yet sustainable and can be said to be relatively unsustainable so that accumulation needs to be carried out to improve its condition. **Novelty/Originality of This Study:** By incorporating both qualitative and quantitative methods, it provides fresh insights into the challenges and opportunities for enhancing livelihood sustainability in resource-dependent communities, offering a new strategic framework for ecological-driven livelihood improvement.

KEYWORDS: livelihood assets; strategy; sustainable livelihood.

1. Introduction

Livelihood is a concept of community survival by relying on all available resources and how much these resources affect community livelihoods. Livelihood depends on five resources/assets, namely human resources, natural resources, financial resources, physical resources, and social resources (Wulandari, 2017). Forests are one of the ecosystems that have important functions for human development and life, both ecological functions as a place for the ecological cycle to take place (Arofah & Rohimah, 2019; Hogarth et al., 2013). Aditiawati et al. (2016) said that local potential is the wealth of natural, cultural, and human resources in an area. The natural potential of an area depends on the geographical conditions, climate, and landscape of the area. These different natural conditions result in differences and characteristics of the local potential of each region. The characteristics of the landscape, the attitudes and culture of the local community, and the welfare of the community form a triangle of interrelated interactions. Therefore, the development of the local potential of an area must consider these three elements.

Villagers still rely on agriculture as their livelihood. The land used is the principle of the plow itself. The livelihood strategies of the people living in this village are not only from the agricultural sector, but also the non-agricultural sector. There are various ways to implement livelihood strategies, ranging from intensification of one sector, income diversification or multiple livelihood patterns, spatial engineering or migration. However, all permanent income sectors utilize assets. The five assets, namely natural resources, social assets, human assets, financial assets, and physical assets are used as a way to support the sustainability of their livelihood strategies. Even over time, people tend to rely more on the non-agricultural sector. However, the basis of their livelihood is as farmers. It can be concluded that there has been a social transformation where the value of agriculture for society is decreasing (Fridayanti & Dharmawan, 2013).

One of the approaches used in the social mapping process is the sustainable livelihood approach. The sustainable livelihood approach is an approach that identifies assets owned by the community to improve welfare. Sustainable livelihood is a combination of two words, namely sustainable which means sustainable and livelihood which means livelihood which includes natural, human, financial, social and physical livelihoods (Mulyani et al., 2020; Sabiham & Sukarman, 2012). The sustainable livelihood approach focuses on understanding the practical realities and priorities of poor men and women in terms of what they actually do to earn a living, the assets they can utilize, and the problems they face in doing so (Farrington., 2002) .

Studying livelihoods not only emphasizes asset ownership and structural boundaries in society, but also examines the ways in which people manage access and the means they use to survive. Livelihoods include assets, individual characteristics, and the activities they undertake in utilizing available resources (Rohmah., 2019) .

To realize livelihood results, a number of assets are needed, including various strategies to process and utilize available assets. There are several terms related to assets, including capital, resources, and assets, all of which have great value and benefits in the livelihoods of individuals, families/households, and communities. Sustainable livelihoods, as part of the participatory research method, in addition to detecting the vulnerabilities faced by the community, are also intended to categorize the assets owned by the research object. These assets include human resources, natural resources, social conditions, financial conditions and physical assets (Wigati & Fitrianto, 2013). Syarifuddin et al. (2021) stated that the dominant factors influencing the level of community livelihood consist of two main factors in the level of community livelihood, namely the first factor is social variables, human resources, while the second factor is financial variables.

The Village Development Index is a composite formed from three indices, namely the Social Resilience Index, the Economic Resilience Index, and the Ecological/Environmental Resilience Index. A higher IDM value indicates that the village's condition is getting better in terms of social, economic, and ecological aspects. IDM can determine the status of a village as Independent, Advanced, Developing, Underdeveloped, and Very Underdeveloped based on the values of these indices. Piantus Village is a village that is included in the Independent Village based on what is on (https://sid.kemendesa.go.id/) that in 2022 Piantus Village was designated as an Independent Village with an IDM value of 0.8171. The SGDs score of Piantus Village as of Wednesday, February 16, 2022 was at a score of 33.83 which was taken from the average score of 18 SGDs Village Targets. Piantus Village is also known as a rattan craftsman village, because many residents who work as farmers also process rattan for crafts. The purpose of this study is to describe the level of sustainable livelihoods in Piantus Village, analyze the assets that influence the level of livelihoods of the community in Piantus Village, and formulate strategies that can be implemented to increase the level of sustainable livelihoods in Piantus Village, Sejangkung District, Sambas Regency.

2. Methods

This research was carried out for approximately 4 weeks in the field located in Piantus Village, Sejangkung District, Sambas Regency. The tools used in this study were stationery,

cameras/cellphones for research documentation, Microsoft Excel software and the materials used for this study were questionnaires. Primary data used in this study consists of characteristics and livelihood assets . While primary data is data that is directly excavated from field reality while secondary data used in this study includes regional maps, demographic data. Secondary data is collected from various parties such as related agencies, or existing documentation centers.

The survey method is used in this study, the survey method is a primary data collection based on communication between researchers and respondents (subjects). Data collection techniques used in this study are observation techniques, interviews, questionnaires and documentation. Most of the data obtained are descriptive data from respondents by stating attitudes, opinions, and characteristics individually or in groups.

The determination of the number of respondents was carried out using the Slovin Formula. The selection of respondent samples was carried out using Random Sampling . This study was conducted by taking several respondents from a group of populations. In this context, a group of populations that were the subjects of the study were the people of Piantus Village, Sejangkung District, Sambas Regency. Based on data obtained from the Piantus Village office, there are 2 hamlets, namely Kenanai Hamlet and Parit Cegat Hamlet, with a total of 598 families in Piantus Village. To determine the sample size in this study, it is calculated using the Slovin Formula:

$$n = \frac{N}{1+N.e^2} \qquad \text{(Eq. 1)}$$

The formula includes several key components: n represents the number of samples, N denotes the total population size, and e refers to the error tolerance limit, which is set at 10%. These variables work together to determine the appropriate sample size needed to ensure the results accurately reflect the population within an acceptable margin of error.

$$n = \frac{598}{1+598\,(0,10\%)^2} = 86 \qquad \text{(Eq. 2)}$$

Based on the methods and techniques used, the respondents obtained from 598 families in the two hamlets of Piantus Village were sampled from only 86 families.

Table 1. Number of samples in each hamlet

No	Name of Hamlet	Population Size
1	Kenanai	364
2	Intercept Ditch	234
	Amount	598

Analyzing the assets that affect the level of community livelihood in Piantus Village, Sejangkug District, Sambas Regency, a descriptive analysis will be conducted to determine these factors. Descriptive analysis is a research method by collecting data according to the actual data, then the data is compiled, processed and analyzed to provide a picture of the existing problems (Sugiyono, 2010).

The data obtained from the field is processed mathematically and presented in tabular form, after which it is explained descriptively. Data processing and calculation are carried out with the help of Microsoft Excel software, namely measuring the condition of sustainable livelihood assets. These assets can be measured through 5 indicators, namely: (1) human assets with 5 questions, (2) natural resource assets with 5 questions, (3) social assets with 6 questions, (5) financial assets with 7 questions, (5) physical assets with 6 questions. Data is measured using an ordinal scale based on research scores, namely, score 1 for low criteria, score 2 for moderate criteria, and score 3 for high criteria.

The index value is determined by dividing one by the difference between the maximum and minimum scores, and then multiplying the result by the difference between the score achieved and the minimum score. This method allows for normalization, ensuring that the index reflects the relative position of the achieved score within the defined range of possible scores. It provides a standardized way to assess performance or outcomes in relation to established minimum and maximum benchmarks. The indicator index value is in the range of 0 – 1. The assessment criteria are divided into three classifications with an interval length of 1/3 = 0.33. Score interval and conversion (Nirwana., 2019).

Table 2. Intervals and criteria

Score Value	Index Value	Criteria
1	$0.00 < x < 0.33$	Low
2	$0.34 < x \leq 0.66$	Currently
3	$0.67 < x \leq 1.00$	Tall

(Nirvana, 2019)

The level of sustainable livelihood is obtained from the accumulation of the sustainability level of five assets (financial assets, human resource assets, natural resource assets, physical assets, social assets) where unsustainable (score 1), not yet sustainable (score 2) and sustainable (score 3). Meanwhile, the level of sustainable livelihood is also divided into three categories, namely unsustainable, not yet sustainable, and sustainable. This category is in accordance with the Kavanagh & Pitcher (2004).

Meanwhile, to answer the third objective, namely formulating a strategy that can be carried out to improve the level of sustainable livelihoods in Piantus Village, Sejangkung District, Sambas Regency, a strategy analysis will be carried out. What strategies can be carried out to improve the level of sustainable livelihoods. The consolidation strategy will be used if the community's assets are in a condition of less or relatively sustainable so that it is necessary to develop the assets owned to achieve sustainability. While the accumulation strategy is used if the assets owned by the community are relatively sustainable and need to be accumulated to improve their condition. The art of diversification management is used to increase the variety of efforts carried out by the community to increase their assets, the migration strategy is used if the resources owned in the area are lacking and must move to another area to improve their livelihoods. And the survival strategy is used if in In this study, the living conditions of the community are included in the description of less sustainable and relatively sustainable (Pradnyaswari et al., 2022).

3. Results and Discussion

3.1 Respondent characteristics

The characteristics in this study used in the respondents according to the age, gender and education of the respondents. The total number of respondents who were the objects of the study was 86 people whose characteristics of the respondents were described as follows.

3.1.1 Age

Age is the age of the respondent in years calculated from the time of birth to the year the research was conducted. In this study, the respondents taken had very varied ages, ranging from 25 years to 76 years. Based on Table 3, it can be seen that the Age of Respondents in Piantus Village, Sejangkung District, Sambas Regency, which is the largest in number, is in the age group of 46 years and above with a total of 49 people and a percentage of 56%, while the second largest age group is in the age group of 26 years to 45 years, totaling 35 people with a percentage of 40.70%, while the age group with the smallest

number is in the age group of 12 years to 25 years, totaling 2 people with a percentage of 2.33% of all Respondents totaling 86 people.

Table 3. Respondents' age characteristics

No	Age	Number of people)	Percentage (%)
1	12-25	2	2.33%
2	26-45	35	40.70%
3	46>	49	56.98%
Total		86	100.00%

3.1.2. Education

The level of education is one of the factors that helps people's livelihoods, basically the level of community education affects how to make decisions or solve a problem (Nirwana 2019). Based on the table above, it can be seen that the level of education of the Piantus Village Community who graduated from Elementary School/No school, which amounted to 64 people with a percentage of 74.42%, while for those who graduated from Junior High School there were 4 people with a percentage of 4.65%, and for graduates of High School/Diploma, there were 18 with a percentage of 20.93%.

Table 4. Characteristics of respondents' education level

No	Level of education	Number of people)	Percentage (%)
1	Elementary School/No School	64	74.42%
2	Junior High School	4	4.65%
3	High School/Diploma	18	20.93%
Total		86	100.00%

Based on Table 4 above, it can be seen that the level of education of the Piantus Village Community who are Elementary School graduates/not attending school, totaling 64 people with a percentage of 74.42%, while for those who are Junior High School graduates, there are 4 people with a percentage of 4.65%, and for Senior High School/Diploma graduates, there are 18 with a percentage of 20.93%.

3.2 Piantus village community livelihood assets

Quantitative assets such as availability and resources and incalculable assets such as claims and access. The concept of sustainable *livelihood* is defined as the ability, assets (markets, resources, ownership claims, and assets), and activities needed to support life (Syarifuddin et al., 2021). Activities that aim to improve community welfare by relying on their needs for environmental conditions and natural resources in the surrounding area (Sabiham & Sukarman, 2012).

Piantus Village Has various potentials that are quite good for a village. The potential can be seen from the natural resources, human resources, and industry. Piantus Village is known as a rattan weaving center. Most of the people of Piantus Village have the skills to make rattan and bamboo crafts. There are also some people who depend on their income from rattan and bamboo crafts. The results of the community's weaving are supplied to the Rattan and Bamboo UKM center building. The residents of the village inherited the blood of their ancestors who were skilled at making rattan and bamboo weaving. Based on the results of direct observations and interviews with the people of Piantus Village related to the use of rattan, it was found that the rattan used by the people of Piantus Village is Seuti Rattan (*Calamus ornatus Blume*) Dahanan Rattan (*Korthalsia flagellaris*) and Sega Rattan (*Calamus caesius Blume*). These 3 types of rattan are the main materials that are always used to make basic materials for crafts. While the other rattan is Marau Rattan (*Korthalsia rigida Blume*).

3.3 Piantus village community livelihood indicators

Livelihood is *the* ability of an individual or household consisting of assets (natural, physical, human, financial, and social), activities and access mediated by institutions and social relations together determine the life of a particular individual or household (Arman & Hariyadi, 2017). The livelihood of the community is inseparable from the livelihood assets which are an inseparable whole, these assets consist of Human Assets, Natural Assets, Financial Assets, Social Assets, and Physical Assets. These five assets are needed by the community to support and help the survival of each individual in the community.

Piantus Village is a village that is included in the Independent Village based on (https://sid.kemendesa.go.id/) that in 2022 Piantus Village was designated as an Independent Village with an IDM score of 0.8171. The SGDs score of Piantus Village per day/date Wednesday, February 16, 2022, is at a score of 33.83 taken from the average score of 18 Village SGDs Goals. In this study, there are several different parameters and are not parameters in calculating the level of livelihood in Piantus Village.

The five livelihood assets of the community in Piantus Village, Sejangkung District, Sambas Regency (Table 5). Human assets are measured based on community health, last education, job skills training and community skills. The second is natural resource assets measured based on agricultural productivity, land ownership and natural resources. The third is financial assets measured based on community income, savings ownership, investment ownership, access to borrowing/debt, and government assistance. The fourth is social assets measured based on trust, kinship relationships, community participation and community social networks and the fifth is physical assets measured based on residential conditions, vehicle ownership, road access conditions, water access conditions, sanitation access conditions.

Table 5. Index value of the indicator of the livelihood assets of the Piantus Village community

No	Asset Indicators	Index Value	Criteria
1	Human Assets	0.70	Tall
2	Natural Resource Assets	0.55	Currently
3	Financial Assets	0.52	Currently
4	Social Assets	0.67	Tall
5	Physical Assets	0.68	Tall
Index Scale Score		0.62	Currently

Community livelihood is a concept of survival of a community by relying on all available resources and how much influence the resources have on the community in their livelihood. Relying on the five resources/assets, namely human resources, natural resources, financial resources, physical resources and social resources (Wulandari., 2017). Based on the index value of the indicator of the Piantus Village Community Livelihood Assets above, it shows that the condition of the Piantus Village community's livelihood is dominant in Human Assets and is still lacking in Natural Resource and Financial Assets. While in Social Assets and Physical Assets are still classified as good. The average index scale score obtained from the Community's Livelihood Assets is 0.62 with moderate criteria which means Not Sustainable, based on the results of research conducted by researchers in the field that is true, seen from the criteria score referred to by researchers in this study where the condition of the Piantus Village Community's Livelihood Assets is still classified as moderate criteria.

Based on the pentagon image of the assets of the Piantus Village community, Sejangkung District, Sambas Regency, based on the results of research conducted by researchers in the field that it is true, seen from the criteria scores referred to by researchers in this study where the condition of the livelihood assets of the Piantus Village community is still classified as moderate. Human assets the index value obtained is 0.70 with a high category, in natural resource assets the index value obtained is 0.55 with moderate criteria, in financial assets the index value obtained is 0.52 with moderate criteria, in social assets

the index value obtained is 0.67 with high criteria and the last physical assets with an index value obtained is 0.68 with high criteria.
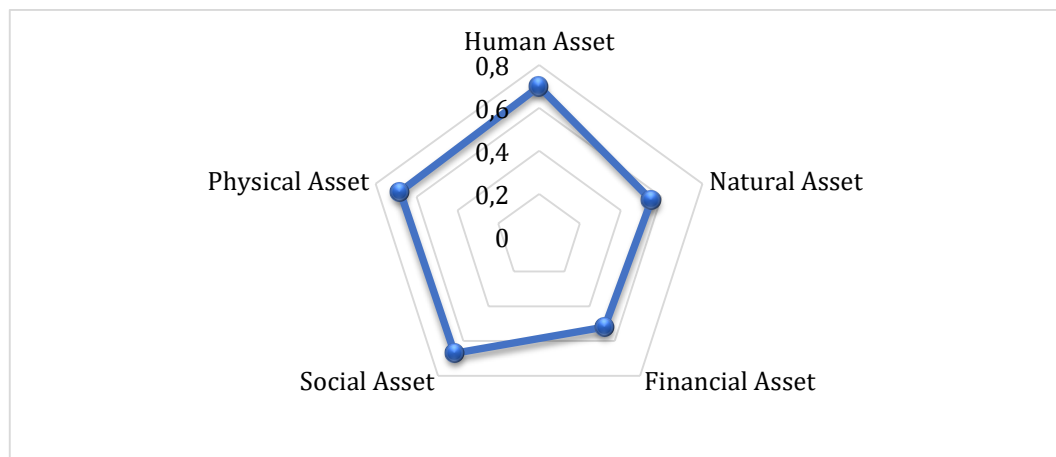

Fig. 1Piantus Village Asset Pentagon

3.4 Assets that affect the livelihoods of the piantus village community

The theory of livelihood is described about the level of livelihood owned by a person seen from the assets that are useful for each household or individual in the sustainability of their livelihood. Thus, assets in livelihood are interrelated or mutually continuous in achieving sustainable livelihood efforts (Febriharjati & Setyono, 2015). In the livelihood assets of the community in Piantus Village, there are assets that affect Human Assets, Natural Resource Assets, Social Assets, Financial Assets and Physical Assets. These assets certainly have an influence on the livelihood assets of the Piantus Village community.

3.4.1. Human assets

Human assets are in the form of human resource abilities, skills and capacities (Dharmawan, 2007). Human resources are the most important component in life, the knowledge and skills they have are needed to manage the other four livelihood assets. Humans also have the ability to develop strategies for optimal utilization of each type of resource, while human behavior greatly influences the sustainability of other resources. Important factors that determine the condition of human assets are education and health (Tuhumury et al., 2015) . Based on research conducted by (Hidayat et al., 2022), it is stated that human quality needs to be continuously improved so that asset management is efficient and sustainable.

Human Assets are public health, last education, job skills training and community skills. Human Assets in this study are classified into five parameters, namely, public health conditions regarding infectious diseases, public health conditions regarding stunting, last level of education, number of trainings attended by the community, and ownership of special skills. The results of measuring the livelihood indicators of the Piantus Village community on Human Assets can be seen in Table 6.

In general, Human Assets in Piantus Village have a score of 0.70 which is included in the high criteria. This shows that the condition of Human Assets in Piantus Village is in good condition, it can be said that it is quite optimal so that it needs to be maintained and needs to be improved. The description of each Human Asset and the factors that influence it are in accordance with the following scores:

The public health condition related to infectious diseases received a score of 0.98, which means it was in very good condition in the last 1 year. This was because only 3.49% of the community experienced infectious diseases, or 3 people in the last 1 year. Meanwhile, the public health condition regarding stunting obtained a score of 0.99, which indicates that

no community member has been affected by stunting in the last year. For the stunting management program in Piantus Village, there is the Provision of Additional Food (PMT) for Pregnant Women and Toddlers, as well as the Provision of Additional Food (PMT) for malnourished children.

Table 6. Human asset indicator index values in Piantus Village

No	Human Asset Indicator	Respondent Frequency						Index score	Criteria
		Low		Currently		Tall			
		$\sum$	%	$\sum$	%	$\sum$	%		
1	Public health conditions regarding infectious diseases	0	0.00	3	3.49	83	96.51	0.98	Tall
2	Public health conditions regarding stunting	0	0.00	0	0.00	86	100.00	0.99	Tall
3	Last level of education	64	74.42	4	4.65	18	20.93	0.48	Currently
4	The number of training courses attended by the community	75	87.21	11	12.79	0	0.00	0.37	Currently
5	Possession of special skills	31	36.05	16	18.60	39	45.35	0.69	Tall
	Average Human Assets score							0.70	Tall

In terms of education, as much as 74.42% of the people of Piantus Village had their last education only at the Elementary School level, with some even not graduating from Elementary School or not attending school at all. Meanwhile, 4.65% of the population had their last education at the Junior High School level, while 20.93% had completed High School or held a Diploma. Based on the results of data collection in the field, most of the reasons for this low educational attainment were due to poor economic conditions at the time, which led people to choose to work and help their parents financially. Additionally, the distance from home to school was another factor, as many did not have access to a vehicle.

For the Job Skills Training indicator, it received a score of 0.37, which falls into the moderate category. This was due to the lack of diversity in job training programs held by the Piantus Village government, with the most frequent training being Handicraft Training (Rattan and Bamboo). Based on data collection in the field, the community also stated that information related to training often does not reach them, which further contributes to the issue. Regarding the possession of special skills, as many as 45.35% of the Piantus Village community have skills related to processing rattan, while 18.60% have skills but are not focused on them, and 36.05% do not have skills related to rattan processing. This resulted in a score of 0.69, which falls into the high criteria.

3.4.2 Natural resource assets

Natural Assets are related to the community's ability to access resources provided by nature (Setyaningrum & Nugroho, 2022). Based on research conducted by (Rahmawati & Rudiarto, 2022), it was stated that natural assets have an important role considering that the Dieng Plateau farming community carries out its livelihoods based on natural resources, namely agriculture. In order to be able to carry out their activities, the most basic natural asset that the Dieng Plateau farming community must have is agricultural land.

Natural Resource Assets are agricultural productivity, land ownership and natural resources. Natural Resource Assets in this study are classified into five parameters, namely, agricultural productivity, agricultural land area, agricultural land ownership, access to water resources and Forest Products. The results of measuring the livelihood indicators of the Piantus Village community on Natural Resource Assets can be seen in Table 7.

Based on the Table 7 regarding the value of the Natural Resource Asset Indicator Index in Piantus Village, Sejangkung District, Sambas Regency, it got a score of 0.55 which means

it is included in the moderate criteria, with this criterion indicating that the condition of Natural Resource Assets in Piantus Village is still classified as not optimal but not in bad condition. The description of each Human Asset and the assets that influence it is in accordance with the following scores. The agricultural productivity of the community in Piantus Village is still classified as low. This is evidenced by the fact that 90.70% of farmers obtain a harvest of less than 2,400 kg, while farmers who obtain agricultural yields of exactly 2,400 kg are only 6.98%. Meanwhile, those who achieve a harvest of 2,400 kg in a single harvest are only 2.33%.

Table 7. Value of natural resource asset indicator index in Piantus Village

No	Natural Resource Asset Indicators	Respondent Frequency						Index score	Criteria
		Low		Currently		Tall			
		∑	%	∑	%	∑	%		
1	Agricultural productivity	78	90.70	6	6.98	2	2.33	0.37	Currently
2	Area of agricultural land	78	90.70	7	8.14	1	1.16	0.36	Currently
3	agricultural land ownership	20	23.26	39	45.35	27	31.40	0.69	Tall
4	access to water resources	0	0.00	27	31.40	59	68.60	0.89	Tall
5	Forest Products	53	61.63	31	36.05	2	2.33	0.46	Currently
Average score of Natural Resource Assets								0.55	Currently

The area of agricultural land for each farmer is also very diverse, which contributes to the low agricultural yields of the community. On average, 90.70% of farmers have agricultural land areas of less than 240 m^2, whereas 8.14% have agricultural land areas of exactly 240 m^2. Only 1.16% of farmers have land areas above 240 m^2, further emphasizing the disparity in land ownership.

Most of the people of Piantus Village work as farmers, which is reflected in the score index value for agricultural land ownership that received a score of 0.50, indicating a moderate classification. This is because around 31.40% of agricultural land is privately owned by farmers, while 45.35% of farmers use agricultural land without rent, and 23.26% of farmers rent agricultural land. Based on field data collection, access to water sources for the people of Piantus Village is very good, with an index value of 0.89. This is supported by the fact that 68.60% of the community states that access to water resources is easy, as many houses are located along the river, making water access convenient. Meanwhile, 31.40% of the community considers water access to still be quite difficult due to the considerable distance between their homes and the river, which influences their perception of accessibility.

Forest products, specifically rubber and rattan crafts, received a score of 0.46, which places them in the moderate criteria. This is because 61.63% of the community considers their forest products to be slightly productive, while 36.05% of the community states that they are quite productive, and 2.33% of the community claims that they are very productive. The variation in these statements is due to the fact that some people depend on their income from forest products while others do not, in addition to the fluctuating prices of these products, which also play a significant role.

3.4.3 Financial assets

Financial assets are the most flexible resources, can be exchanged for various conveniences according to the applicable system, and can also be used directly to meet livelihood needs (Thumury et al., 2015). Based on research conducted by (Rahmawati & Rudiarto, 2022), it was stated that the income of the community that is just enough has implications for the low ability of most respondents to set aside part of their income for savings. The low ability of most respondents to set aside their income for savings is because the income generated is the same as the costs that must be incurred for survival, the

ownership of savings in the farming community is a picture of how the community prepares for unexpected events that may occur in the future.

Table 8. Financial asset indicator index values in Piantus Village

No	Financial Asset Indicators	Respondent Frequency						Index score	Criteria
		Low		Currently		Tall			
		$\sum$	%	$\sum$	%	$\sum$	%		
1	Source of income	8	9.30	51	59.30	27	31.40	0.73	Tall
2	Income in a month	71	82.56	13	15.12	2	2.33	0.40	Currently
3	Side job	63	73.26	23	26.74	0	0.00	0.42	Currently
4	Provision of Income for savings	70	81.40	16	18.60	0	0.00	0.39	Currently
5	Investments made from savings	77	89.53	9	10.47	0	0.00	0.36	Currently
6	Ease of borrowing/debt	0	0.00	74	86.05	12	13.95	0.71	Tall
7	Receiving government assistance	49	56.98	2	2.33	35	40.70	0.61	Currently
Average Financial Assets score								0.52	Currently

Financial Assets are people's income, savings ownership, investment ownership, access to borrowing/debt, and government assistance. Financial Assets in this study are classified into seven parameters, namely, income in a month, sources of income, side jobs, allocation of income for savings, investments made from savings, ease of borrowing/debt and receiving government assistance . The results of measuring the livelihood indicators of the Piantus Village community on Financial Assets can be seen in Table 8 above.

In general, Financial Assets in Piantus Village have a score of 0.52 which is included in the moderate criteria. This shows that the condition of Financial Assets in Piantus Village is in a condition that is not yet sustainable, with this criterion indicating that the condition is classified as not optimal. The description of each Financial Asset and the assets that influence it is in accordance with the following scores. As much as 9.30% of the community's income only depends on rice farming, while 59.30% of the community's income depends on non-rice farming and farming products such as forest products, namely rubber and rattan crafts. Meanwhile, 31.40% of the community's income comes from sources outside of non-rice farming, such as casual laborers, construction workers, shop employees, teachers, and civil servants.

In relation to the source of community income, the results of community income in one month show that the majority of the income of the Piantus Village community is below the UMR of Sambas Regency. Specifically, 82.56% of the community earns below the UMR, while 15.12% of the community earns an amount equivalent to the UMR, and only 2.33% of the community earns above the UMR. The number of jobs in the community also affects the community's income. Based on data taken in the field, 73.26% of the community does not have a side job, while 26.74% of the community has one side job, and no community members have more than one side job.

Based on data collection in the field, it is shown that the majority of the people of Piantus Village do not set aside their income for savings, which is as much as 81.40%. This is due to the small amount of income earned by the community, which is only enough to meet daily needs, leaving nothing to be saved. Meanwhile, 18.60% of the community sometimes sets aside their income for savings. Based on data related to savings ownership, a very small percentage of people invest their money or gold from savings, which is only 10.47%, while 89.53% of people do not invest from savings. This is due to the large percentage of people who do not set aside their income for savings.

In terms of access to borrowing or debt, the people of Piantus Village can be said to have relatively easy access, with 86.05% stating that borrowing is easy and 1.16% considering it very easy. Regarding government assistance, 58.98% of the Piantus Village community receives assistance from the government, which indicates that there are still

many underprivileged families. Meanwhile, 40.70% of the community does not receive government assistance, and 2.33% of the community initially received government assistance but had it revoked.

3.4.4 Social assets

The intended social assets are social resources that are useful and used by the community to achieve their livelihood goals, which are generally intangible and not easy to measure because they are related to changes in structure and process, but have value for the community (Tuhumury et al., 2015). Based on research conducted by (Rahmawati & Rudiarto, 2022) it was stated that like most rural communities, the Dieng Plateau community has close kinship ties. The Dieng Plateau farming community still develops a rural social culture in the form of mutual assistance, mutual cooperation and deliberation. Geographical conditions and limited facilities make community relationships close. Social interaction with other farming communities provides opportunities for farmers to achieve their livelihood goals.

Table 9. Social asset indicator index values in Piantus Village

No	Social Asset Indicators	Respondent Frequency						Index score	Criteria
		Low		Currently		Tall			
		∑	%	∑	%	∑	%		
1	Kinship relations in society	0	0.00	62	72.09	24	27.91	0.75	Tall
2	Availability of mutual assistance	0	0.00	57	66.28	29	33.72	0.77	Tall
3	Relations between ethnic groups and religions	0	0.00	50	58.14	36	41.86	0.80	Tall
4	Mutual cooperation	0	0.00	55	63.95	31	36.05	0.78	Tall
5	Number of organizations/institutions joined	74	86.05	12	13.95	0	0.00	0.38	Currently
6	Resources	58	67.44	6	6.98	22	25.58	0.52	Currently
	Average Social Assets score							0.67	Tall

Social Assets are based on kinship, trust, community participation and social networks. Social Assets in this study are classified into six parameters, namely, kinship in the community, availability of mutual assistance, relations between ethnic groups and religions, mutual cooperation, the number of organizations/institutions followed and sources of information. The results of measuring the livelihood indicators of the Piantus Village community on Social Assets can be seen in Table 9 above.

Based on the table regarding the Social Asset Indicator Index value in Piantus Village, Sejangkung District, Sambas Regency, it got a score of 0.67 which means it is included in the high criteria, with this criteria indicating that the condition of Social Assets in Piantus Village is in a fairly good condition. The description of each Social Asset and the Assets that influence it is in accordance with the following scores. According to the results of data collection in the field, the percentage of kinship relations in the village community is 27.91%, and the most dominant is the relationship between communities in the hamlet, with a percentage of 72.09%. There is no community that considers their kinship relations sufficient only within the hamlet.

In terms of the level of community availability in helping each other, the condition is very good because the people of Piantus Village highly uphold the culture of mutual assistance, both in the form of labor and financial support. This is proven by the high index value of the community's willingness to help with money or labor, which is 0.77, with 66.28% of the community willing to help with money or labor and 33.72% of the community

willing to help in both forms. The relationship of trust with people of different ethnicities, beliefs, tribes, and religions is also very good, as the community highly respects and tolerates differences. This is evidenced by the results of data collection in the field, which show that 41.86% of the community stated that their relationship with people of different ethnicities, beliefs, tribes, and religions is very good, while 58.14% consider it quite good. Thus, this score indicator receives a score of 0.80, which falls under high criteria.

The people of Piantus Village still strongly adhere to the culture of mutual cooperation, as seen in various activities such as mutual cooperation during weddings, community service events, and in times of disaster. However, the level of community participation in village institutions or organizations can be considered low. This is because the community perceives these organizations as less interesting and sees no tangible benefits or reciprocity from participating in them, which is not in line with what they expect. This is evidenced by a score of 0.38, which falls under the moderate criteria. In terms of access to sources of information, the majority of the community obtains information through socialization, with a percentage of 67.44%. Meanwhile, 6.98% of the community obtains information through reading, and 25.58% obtains information through the internet.

3.4.5 Physical assets

Infrastructure and service facilities are one of the elements that can support the achievement of a condition that allows humans to organize their lives and meet their needs in the context of sustainable livelihoods (Martopo et al., 2012). Based on research conducted by (Hidayat et al., 2022) it was stated that physical assets indicate the ownership of physical assets by a person in a household. Lemongrass farmers in Kedungrandu Village generally have physical assets so that they are able to achieve the expected sustainable livelihood and are able to intensify and diversify their livelihood strategies.

Table 10. Physical asset indicator index values in piantus village

No	Physical Asset Indicators	Respondent Frequency						Index score	Criteria
		Low		Currently		Tall			
		$\sum$	%	$\sum$	%	$\sum$	%		
1	Residential Ownership Status	0	0.00	19	22.09	67	77.91	0.88	Tall
2	Physical Condition of Residence	40	46.51	10	11.63	36	41.86	0.64	Currently
3	Number of Private Vehicles	13	15.12	56	65.12	17	19.77	0.68	Tall
4	Ease of Access	51	59.30	23	26.74	12	13.95	0.51	Currently
5	Water Access Used	86	100.00	0	0.00	0	0.00	0.33	Low
6	Sanitation Access Used	0	0.00	0	0.00	86	100.00	0.78	Tall
Average Physical Assets score								0.68	Tall

Physical Assets are based on residential conditions, vehicle ownership, road access conditions, water access conditions, and sanitation access conditions. Physical Assets in this study are classified into six parameters, namely, Residential Ownership Status, Physical Condition of Residence, Number of Private Vehicles, Ease of Access, Water Access Used, and Sanitation Access Used. The results of measuring the livelihood indicators of the Piantus Village community on Physical Assets can be seen in Table 10 above.

In general, Physical Assets in Piantus Village have a score of 0.68 which is included in the High Criteria. This shows that the condition of Physical Assets in Piantus Village is in good condition, it can be said to be optimal so it needs to be maintained and needs to be improved. Based on field data, the majority of the Piantus Village community owns their own homes, with a percentage of 77.91%, while 22.09% of homes are owned without rent. This is because many community members still live with their parents even after getting

married, and some reside in houses owned by family members who have more than one home.

In relation to home ownership, the physical condition of residences in the community is also quite good. This is evidenced by the fact that 41.86% of homes are built with a mixture of cement and wood, while 11.63% of homes are made entirely of wood. Meanwhile, 46.51% of homes are constructed using cement, which indicates that the overall condition of housing in Piantus Village is in good shape. Regarding vehicle ownership, as many as 19.77% of the people in Piantus Village own more than one private vehicle, which generally includes motorbikes, bicycles, or cars. However, the majority of the population, at 65.12%, only own one private vehicle such as a motorbike or bicycle, while 15.12% of the community does not own a private vehicle at all.

The road conditions in Piantus Village consist of three types, namely rocky roads, asphalt roads, and cement roads. The community considers road access to be quite good, and the roads that are still rocky are planned to be asphalted in the near future. In terms of water access conditions, data collection in the field shows that all families in Piantus Village rely on lakes and rivers for their water supply, as PDAM water access has not yet reached the village. Meanwhile, sanitation access conditions in Piantus Village are considered good, as the entire community has personal access to toilets, and no one depends on public facilities or borrows toilets from others.

3.5 Livelihood strategy of piantus village community

Livelihood strategies are choices formed by assets, access and activities that are also influenced by the capabilities of a person or household to do so (Baiquni., 2007) . The condition of community livelihood assets, both Human Assets, Natural Assets, Financial Assets, Social Assets and Physical Assets can influence the strategies used by the community in carrying out life in Piantus Village.

Overall, the condition of livelihood in Piantus Village, Sejangkung District, Sambas Regency is at a score of 0.62, which means that the condition of livelihood in Piantus Village is not yet sustainable, so an Accumulation Strategy is needed, the condition of assets owned by the Piantus Village community is relatively sustainable and needs to be accumulated to improve its condition. In a study conducted by Virgin et al., (2022) . The accumulation strategy is a strategy to fulfill basic needs or household subsystems, social, and fertilizing investment capital by increasing income for future savings. The accumulation category is a household that has been able to improve its welfare, where in addition to its income being much greater than before, the household is also able to make investments. The accumulation strategy is a survival strategy to simply meet daily needs, this strategy also contains efforts to accumulate investment capital as a way to ensure the survival of individuals and groups expansively. This strategy is also applied in the Nanga Lauk Village community in managing their Village Forest (Roslinda et al., 2024) .

Human assets scored 0.70 with high criteria so it is necessary to increase the number of people with higher education Elementary School to overcome the challenges in improving the quality of education in the village, collaboration between various parties is very important. The government, community, business world, and social organizations must work together to create a conducive and sustainable educational environment in the village. This cooperation can include the provision of supporting facilities. teacher training, and community empowerment programs and the Piantus Village government can increase more specific and varied job training to increase the attractiveness of the community to take part in job training, with the many trainings that the community takes part in, the community's work skills will improve and increase, one of the trainings that has been routinely carried out is Traditional Dance training, namely the RADDAT Dance where the participants are elementary and junior high school children. Natural resource assets scored 0.55 with moderate criteria so that it is necessary to increase agricultural output by optimizing the use of agricultural land by forming Farmer Groups and Farmer Group Associations (GAPOKTAN) which will greatly affect the increase in agricultural productivity,

in addition to having to maintain or increase the area of agricultural land and need to conduct fertilizer making training because farmers still often complain about the difficulty of getting fertilizer and optimizing natural resource results in the form of rubber and rattan crafts as superior village products. Financial Assets scored 0.52 with moderate criteria, related to Human Assets increasing job training that can be followed by the community so that the source of community income is not only from agricultural products, rubber and rattan crafts but outside non-rice farming businesses, meaning here that is combining work with workers outside the sector, increasing the number of side jobs is also needed. Social assets scored 0.67 with high criteria, it is necessary to increase community involvement within the village scope so that it will form good social conditions for the community. Physical assets scored 0.68 with high criteria, the condition of the physical assets of Piantus Village is quite good so that it only needs to be improved in access to the water used. Although the water access used by the community still depends on lakes/rivers, the water needs of the Piantus Village community have been met.

4. Conclusions

The most influential assets on each asset are those on Human Assets, namely the last level of education and the number of trainings attended by the community, both of these factors are still in the moderate criteria so that they affect Human Assets. In natural resource assets, the influencing factors are the productivity of agricultural land and the area of agricultural land owned by the community is still classified as low. In financial assets, the influencing factor is that community income is still relatively small with a percentage of 82.56% of community income below the UMR of Sambas Regency, this small income has an impact on only a few people saving and investing from their income. In social assets, the influencing factor is that there are still many people whose kinship is only within the scope of Neighborhood Association/Residents Association and Hamlet and the lack of interest in the community in Organizations/Institutions in the village. And the last physical asset, the influencing factor is the condition of water access used by the community which is still relatively low.

Livelihood Levels in Piantus Village, Sejangkung District, Sambas Regency, it can be concluded that the level of community livelihood in Piantus Village is classified as unsustainable with an Index Score of 0.62. The condition of the Piantus Village community's livelihood assets is highly dependent on Physical Assets. It can be seen that Human Assets occupy the highest position, namely 0.70 compared to the other four Assets. Natural assets occupy the lowest position with a value of 0.55. Human assets occupy the highest position because they are supported by several categories such as Very good community health conditions and many people still have special skills related to processing rattan. Natural assets occupy the lowest position, this is because there are still many farmers who only have less than 240 m^2 of land area, the community also considers that Forest Products such as rubber and rattan crafts only produce a little, making Natural Assets the lowest Asset of the other four assets.

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Biographies of Authors

Supriadi, Faculty of Forestry, Tanjungpura University, Pontianak, West Kalimantan 78121, Indonesia
- Email: ucupsupriadi2002@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Emi Roslinda, Faculty of Forestry, Tanjungpura University, Pontianak, West Kalimantan 78121, Indonesia.
- Email: emiroslinda@fahutan.untan.ac.id
- ORCID: 0000-0002-0115-7486
- Web of Science ResearcherID: N/A
- Scopus Author ID: 57160148700
- Homepage: https://fahutan.untan.ac.id/profilemiroslinda/

Gusti Hardiansyah, Faculty of Forestry, Tanjungpura University, Pontianak, West Kalimantan 78121, Indonesia.
- Email: gustihardiansyah@fahutan.untan.ac.id
- ORCID: 0000-0001-8196-1097
- Web of Science ResearcherID: N/A
- Scopus Author ID: 57045903700
- Homepage: https://fahutan.untan.ac.id/profilgustihardiansyah/