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The Impact of Livelihood Asset Accumulation on the Well-being and Psychology of Iban Rural Households in Sarawak

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Abstract

Despite still engaging in subsistence agriculture, the Iban in Pantu are increasingly embracing commercial and non-agricultural pursuits. The accumulation of various assets is crucial for the livelihood and well-being of the Iban community in Pantu. The assets encompass resources and capabilities that households can leverage to enhance their livelihood strategies. This study investigates the determinants of well-being among rural households in Pantu District Sri Aman, Sarawak, by exploring the accessibility to livelihood assets. The study specifically investigated the correlation between livelihood strategies and the accessibility of human, financial, social, capital, and natural assets. To obtain a comprehensive understanding of the wellbeing and livelihood assets of households and communities, this study used a mixed methods approach that combined structured and in-depth interviews. The qualitative method involved conducting in-depth interviews with two community chiefs (*penghulus*) and 12 village heads (*tuai rumah*). A quantitative methodology was utilised in the study, consisting of a structured interview schedule. The collection of data involved the use of disproportionate purposive sampling to reach out to 220 heads of household (*bilik* family) living in 12 longhouses. The study found that the well-being of the local community is positively affected by the availability of social and natural resources. Available schemes, subsidies, and training provided through vertical and horizontal social integrations have helped the Iban community maintain their livelihood. Notwithstanding the depletion of natural resources in Pantu owing to development, natural capital retains its importance to the community. This study provides insights into asset accumulation strategies and the potential for improving Iban livelihoods in rural Pantu through the discovery of the significance of social and natural assets. Policymakers, development practitioners, and researchers working on sustainable rural development and poverty reduction can gain valuable insights from this study.

Keywords: Assets, Household, Iban Community, Livelihood, Rural, Sarawak

Introduction

The Ministry of Rural Development in Sarawak has introduced a range of initiatives and programs aimed at improving the quality of life of the community living in rural areas (Tuah et al., 2022). These include the Rural Electricity Supply Program (BELB), Village Road Lighting Program (LJK), and Rural Water Supply Program (BALB). Additionally, the Rural Transformation Programme (RTP) is committed to boosting rural economies by promoting the development of agro-products and services, as well as connecting rural businesses to urban and global markets. Despite the swift economic growth of Sarawak and the state's continuous endeavors towards rural development, several obstacles persist, hindering the advancement of asset accumulation and overall welfare of rural communities. Significant restrictions still impede the accumulation of social, financial, natural resources, capital, and human assets in rural communities. For example, there are insufficient investment in rural infrastructure, including transportation networks and market facilities, limits market access and opportunities for income generation (Tedong et al., 2022; Tuah et al., 2022; Yap et al., 2020). Additionally, Horn et al. (2021) state that several villages in Sarawak are located in remote areas with inadequate road infrastructure, requiring the utilisation of logging roads.

Rural household livelihood strategies must be adapted based on their accumulated assets to handle risks and shocks; households with more assets have greater options (Walle & Nayak, 2022). Correspondingly, it produces disparities between the community and the household, as diverse categories of assets yield different consequences on their means of livelihood. Scholars have conducted numerous studies on the significance of livelihood asset accumulation for rural welfare, such as Nurul et al. (2023) highlights the crucial role of social capital in the livelihoods of small-scale fishing communities. They suggest that social factors could serve as an alternative solution to poverty reduction. Additionally, according to Ibrahim et al. (2018), human assets were found to be the most crucial contributor to livelihood among vulnerable groups on the east coast of Malaysia when compared to other assets. Despite extensive research on livelihood assets, there's still a gap in research

concerning location and focus. Unlike earlier research, this study concentrates on assessing the impact of the accumulation of livelihood assets on the well-being of Iban Rural community in Pantu, Sri Aman, Sarawak. Originating from Kalimantan, the Iban or Sea Dayak have a traditional lifestyle of living in longhouses along the Kapuas River. Multiple factors, including demographic growth, settlement, and the desire for new land for agriculture, led to the migration of the Iban community. Due to their exceptional riverine travel skills and traditional settlement near the river valley, Iban people are also known as Sea Dayak. After leaving the Kapuas River, the Iban people migrated to Sarawak, which resulted in the emergence of significant Iban communities along the Sarawak River, including Sri Aman (Helbing, 2021). Due to its historical significance as one of the early Iban settlements in Sri Aman, Pantu Sub-District is an ideal location for this study, as it offers extensive information about Iban customs and ways of life.

Understanding the present assets of the Iban community in Pantu is of utmost importance, given that assets play a critical role in their survival. The range of livelihood assets that are available to Iban households in Pantu Sub-District presents a plethora of opportunities for these households to ensure their survival and elevate their standard of living through the adoption of diverse strategies. The mixed methods approach combines both qualitative and quantitative research methods was used in this study to gain a comprehensive understanding of Iban livelihood assets and wellbeing. In-depth interviews with two Iban community chiefs and 12 village heads yielded intricate information that can provide an overview of Iban well-being and livelihood assets, from both the community and village viewpoints. Furthermore, structured interviews were employed to yield quantifiable data that can be statistically analysed to identify patterns, relationships, and overall trends in the accumulation of household livelihood assets.

The research findings on the accumulation of livelihood assets have a noteworthy impact on the livelihood activities of the Iban community in Pantu Sub-District, thereby influencing their choices of income diversification directly. Before initiating any concrete plans for the future, stakeholders must identify the available assets that have an impact on the welfare of the Pantu Sub-District community members. Better insight into the current livelihood assets would assist private sector, government, and non-governmental organisation (NGO) to implement best practices to support and improve the economy of the Iban community in Pantu Sub-District.

Literature review

The Iban, who have traditionally been farmers, trackers, and gatherers, make up the largest indigenous community in the region, particularly in Sarawak. The Iban of Sarawak migrated from Kapuas River to Batang Lupar during the sixteenth to seventeenth centuries, under the concept of *bejalai* (Bulan, 2006). As Kato et al. (2020) pointed out, the Iban people journeyed across the Kelingkang mountain range before finally settling in the river valleys of Sarawak. Longhouses are the primary dwelling of the Iban people, which can be recognised as a village under one roof. *Tuai rumah* serves as the leader of the longhouse, while the *bilik* units, led by *tuai bilik*, represent the rich traditions and culture of the Iban society (Sim & Khan, 2014). For generations, Iban livelihood strategies relied heavily on hill and wet rice cultivation (*bumai*) to sustain their communities. Mertz and Christensen (1997) discovered that the rural Iban have maintained their traditional lifestyle by cultivating rice in conjunction with diverse crops like vegetables and fruits, and cash crops such as rubber, cocoa, and pepper. Apart from their agricultural practices, the Iban community raises pigs and chickens. They rely on natural forests and rivers for gathering wild vegetables, fishing, and hunting wild boar and deer for their consumption (Yi & Mohd, 2020).

Livelihood assets in an Iban rural community denote the assortment of resources and abilities that households and individuals possess to maintain their livelihoods and enhance their overall well-being. To achieve favourable livelihood outcomes, rural communities require a diverse set of assets, including human, social, natural, physical, and financial resources. In their study, Xu et al. (2019) demonstrate that human capital is the most crucial asset. The assumption is founded on the notion that diverse resources are necessary for individuals to achieve favourable livelihood outcomes. In accordance with Ellis (2000), human resources are comprised of abilities, knowledge, work capacity, and household dimensions. Furthermore, Moser (1993) and Gai et al. (2020) have revealed that family size has a significant influence on farmers' decision-making process concerning their livelihood.

Next asset is social capital, represents the social assets that individuals depend on to establish connections, either with more influential individuals (vertical relationship) or with peers through participation in gatherings or associations (horizontal relationship). Trust, communication, and commerce serve as the main components of these connections, which can be utilised by the household in times of necessity (Naithani & Saha, 2020). Furthermore, as demonstrated by Missemer (2018), natural capital pertains to the inventory of diverse resources encompassing the environmental system, including but not limited to, land, air, water, and all the living organisms it encompasses. It has been observed that deforestation presents a significant danger to the

variety of accessible resources. The problem is associated with rural livelihood strategies that involve fuelwood collection, timber exploitation, and cropland expansion (Bateman & Mace, 2020). Physical capital, such as machinery, land, buildings, and vehicles, is a necessary foundation for individuals that provides tangible economic resources (Ebenezer & Abbyssinia, 2018; Oluwatayo & Babalola, 2020). Besides, financial capital encompasses both the available stock and inflow of money. According to Huang et al. (2018), available stock pertains to savings that are kept in different forms like cash and bank deposits. Regular money inflows include income from pensions and remittances. Rural community development heavily relies on financial capital for community resilience (Lu & Luo, 2021).

Moser (2009) notes that the advancement of society enhances rural household physical, financial, and social resources, enabling them to pursue non-agricultural livelihoods and attain varied ways of living. There are five forms of livelihood activities can be integrated to improve rural livelihood opportunities. By acknowledging the numerous development initiatives in Sarawak's rural areas, the researcher agreed with these concepts and believe that the SLF framework's five livelihood assets were the best way to analyse a community's current livelihood capital. Moreover, most of the rural community has embraced a diversified livelihood approach. A holistic approach is necessary for assessing the factors affecting the Iban's well-being. The study uses sustainable livelihood framework (SLF) to concentrate on five factors namely, natural, social, human, physical, and financial.

The accumulation of livelihood assets is essential for sustainable livelihoods. The SLF has been a popular tool for assessing livelihood assets, which scholars have linked to topics including rural occupational diversity and poverty alleviation (Ellis, 2000; Barrett et al., 2001). The SLF conceptual framework, created by DFID, outlines five distinct capitals that serve as livelihood assets and influence community well-being. The SLF framework has been criticized for its excessive emphasis on economics, ambiguous criteria for identifying disadvantaged groups, and inadequate coverage of the political dimensions of human interactions. In addition, it did not fully assimilate rural Indigenous Knowledge. To address these constraints, this study integrates the five assets in the SLF framework with the Lewis Structural Change Development theory (LSCD). This is applicable to the investigation in this study as it can simplify the breakdown of the livelihood capital of rural communities in a clearer and straightforward manner. The dual-sector model, also referred to as LSCD theory, was introduced by Sir W. Arthur Lewis during the 1950s. The current theory strives to explicate the evolution of labor from a traditional to a modern industrial sector (Boianovsky, 2018). The transformation of rural livelihood is associated with two sectors, namely agriculture and non-agriculture. As Herrendorf (2014) points out, non-agricultural livelihoods promote out-migration and draw skilled labor away from the agricultural sector. The LSCD theory highlights that the growth of the non-farm sector can act as a stimulus for the development of related sectors, including infrastructure, services, and supporting industries. As a result, a multiplier effect is produced, leading to the creation of further employment opportunities.

Notwithstanding, the critics' contention is that Lewis's theory presumes a clear-cut division between the customary farming sector and the modern industrial sector, neglecting the complexities that exist among different sectors of the economy. The LSCD theory falls short in comprehensively explaining the significance of technological advancements in the developmental process, which serve as critical catalysts for productivity growth and structural transformation. Despite facing criticisms, the LSCD theory has played a substantial role in advocating for economic development and transforming traditional economies. By employing the theory of structural change, this study investigates the agricultural adaptation and rural livelihoods' livelihood assets in the Iban community. The structural change theory is the ideal framework for this study since it examines the dual economic sector and dynamic nature of rural economic systems that are pertinent to the current livelihood strategies impacted by recent development.

Sustainable development in rural areas can be promoted by grasping the link between the accumulation of livelihood assets and rural well-being. Targeted interventions can be used to address rural community needs and challenges with a comprehensive understanding of their assets. Rural households employ diverse strategies to sustain their livelihoods, which depend on their ability to withstand different pressures and stresses. The importance of livelihood assets should not be underestimated, as they are crucial for survival and for lessening the effects of environmental shocks, which in turn enhances the resilience of household livelihoods. Kuang et al. (2020) have asserted that there are five categories of livelihood assets that support households' livelihoods. These include natural, physical, social, financial, and human capital. Although the accumulation of these assets is necessary, understanding the complex connections between them and rural prosperity is equally vital. The exploration of how various asset types contribute to dimensions of well-being can enhance our understanding of the mechanisms connecting livelihood assets to rural development outcomes. The access to different assets for each household member can be impacted by factors like age, size, and composition, resulting in different livelihoods within the household.

Method and study area

This study aims to analyse the impact of the accumulation of livelihood assets on Iban well-being by utilising a mixed-methods approach that includes structured and in-depth interviews. In order to comprehend the Iban way of life, it is crucial to obtain comprehensive insight from grassroots. Key informants, including the penghulu, tuai rumah, and tuai bilik, have been identified for this purpose.In order to comprehend the Iban way of life, it is crucial to obtain comprehensive insight from grassroots. Key informants, including the *penghulu, tuai rumah*, and *tuai bilik*, have been identified for this purpose.

The reason why Pantu Sub-district was chosen as the research site is due to the fact that the majority of the communities residing here are Iban. Furthermore, Pantu Sub-District is acknowledged as one of the earliest Iban settlements in Sarawak. Therefore, it furnishes a vast amount of information regarding Iban history, livelihood assets and livelihood strategies. Two Iban *penghulu* and one Chinese *kapitan* are responsible for the administration of Mungguh Ubah and Kara Pantu in the Pantu Sub-district. In Pantu, there are 137 Iban longhouses and six Chinese villages. Two phases of in-depth interviews were conducted, one with the *penghulu* and the other with the *tuai rumah*. The in-depth interviews involved two Iban *penghulus* and 12 *tuai rumah.* They were intentionally chosen for their expertise in community resources and well-being, particularly in their respective areas of responsibility. Moreover, structured interviews were carried out with 220 household heads residing in six longhouses, the sample size of which was determined using the Yamane formula. Heads of households have been chosen for their ability to understand their families' livelihood strategies and livelihood assets. During the structured interview, purposive disproportionate sampling was employed since certain families were absent from the longhouse due to *bejalai*, and there were varying numbers of *bilik* among the longhouses. For this study, the longhouse with the most *bilik* was Kampung Selanjan asal with 51 households, whereas the shortest was Kampung Selanjan Sebemban, with only six household.

The application of both qualitative and quantitative data analyses shed light on the study of Iban livelihood and future research. The qualitative data was analysed using thematic analysis. Thematic analysis is a strategy employed to categorise qualitative data. The data collected through the structured interviews using the interview schedule was analysed using IBM Statistical Package for Social Sciences (SPSS) version 23 and SEM SmartPLS3.0, also referred to as Partial Least Squares (PLS) software. The descriptive analysis, which comprised of frequencies, percentage, means, and standard deviation, was performed using SPSS. Then relationship among the constructs of the study was analysed using partial least squares (PLS) with structural equation modelling via bootstrapping.

In order to maintain accuracy and minimize bias in the study, the researcher utilised a multi-method approach, verifying all information and employing triangulation techniques to ensure credibility, reliability, and dependability of the data. Triangulation requires the comparison of various types of data, including quantitative and qualitative, to determine their coherence. Moreover, with regards to discrepancies in findings between qualitative and quantitative data, the researcher selected the middle point of the mixed methods continuum, which is an equivalent selection. The researcher's decisions are influenced by the observations and experiences obtained throughout the study. Henceforth, the data were re-analysed to distinguish the differences and reach a point of integration. The application of the multi-method approach, as a research design, possesses significant worth when the qualitative data gathered functions as a supplement and elucidation of the quantitative results, exposing shared themes. The aim is to acquire a variety of perspectives regarding the subject being investigated.

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Results and discussion

This section presents the findings related to the factors that shape the livelihood strategies among the Iban community. This study explores the impact of asset accumulation on the wellbeing of the Iban community in Pantu Sub-District, as their choice of livelihood strategy is greatly influenced by it. Possessing assets is more likely to lead to positive livelihood choices, given that various activities have varying requirements. Livelihood outcomes can be influenced by several indicators such as income, food security, and environmental sustainability, which may differ from one household or strategy to another. Income was used as a livelihood indicator in the study. The research was carried out by interviewing the heads of households in the longhouses. Moreover, the data gathered from the in-depth interviews with tuai rumah and penghulu contributed to the understanding of livelihood factors.

The role of livelihood factors in the asset accumulation of the Iban community

Human, physical, financial, natural, and social assets are the five types of livelihood factors outlined in the Sustainable Livelihood Framework (SLF). The use of assets in farm and non-farm livelihood activities is crucial for achieving positive livelihood outcomes in Pantu Sub-District.

a. Human assets

The human capital of these longhouses was characterised by the members of *bilik*, gender, age, and the education level of the respondents. The *bilik* family regards its members as the most significant human capital. It has been discovered that the typical *bilik* family size falls within the range of three to five persons, encompassing fathers, mothers, children, and grandchildren. According to the respondents, a significant number of young people have chosen to pursue *bejalai* due to better work prospects in nearby cities. Therefore, the decline in the number of *bilik* families residing in longhouses has caused a decrease in the overall productivity of the household's economic activities, particularly in farming activities in their *kebun* and *umai*. Thus, to meet their farm labour demands, particularly for households actively involved in the cultivation of cash crops, they commonly hire local daily labourers or those from Kalimantan to work in their oil palms and pepper farms. In terms of gender, the proportion of men who become heads of households is 89%, whereas for women, this percentage is significantly smaller, at only 11%. In the Iban *bilik*, the role of household headship has traditionally been male dominated. However, in the absence of some men due to *bejalai* or death, women are required to assume the role of head of the family. As a result, their family's well-being is affected. Women, as household heads, often have to take on multiple roles that include both reproductive and productive responsibilities. The responsibilities related to reproduction consist of performing household chores and providing care for family members, whereas the responsibilities related to productivity entail women's contribution as earners for the family by engaging in either agricultural or non-agricultural activities.

Table 1 indicates that the highest percentage of human capital contribution, 68%, comes from middle-aged men and women, while young adults only contribute 9%. The head of the family role is still held by 23% of senior citizens over 65 years old. The results show that the middle-aged group is typically the core workforce in rural households, since they have gained the experience, skills, and knowledge necessary to lead the family. This group is commonly involved in agriculture, non-agricultural jobs, and entrepreneurship. In addition, this result indicates that young adults are not taking on the role of head of household in the longhouses.

Table 1 : Age and Education Level of Heads of Households

Level of Education	**Young Adult (20-40 Years Old)**	**Middle Age (41-64 Years Old)**	**Senior Citizen (>65 Years Old)**	**Total**
Informal	1%	6%	7%	13%
Primary	3%	21%	5%	29%
Secondary	6%	38%	11%	54%
Tertiary	0%	4%	1%	4%
Total	**9%**	**68%**	**23%**	**100%**

The findings also showed that young adults in Pantu Sub-District had higher levels of education and were more inclined to travel to cities for employment and higher education compared to other age groups. The study's results indicated that migration was a more feasible choice for younger adults than middle-aged groups who had greater familial responsibilities and obstacles that restricted them from relocating far from their families. In some cases, the elder generation had no option but to assume the family's leadership role due to the younger generation's migration. Besides, the study revealed that some families hand over responsibility to their seniors as a sign of respect or trust, given their experience and knowledge. Thereafter, Table 1 also illustrates the level of education of *tuai bilik* based on their respective ages. According to the findings, a significant proportion of household heads (13%) received informal education, and this group was mainly made up of middle-aged villagers and senior citizens who were unable to access formal education due to poor family circumstances and a lack of educational awareness in earlier times. Furthermore, there was an insufficient number of educational institutions in the Pantu region. Nevertheless, as the district progressed, additional schools were constructed, enabling the vast majority of the Iban community to receive a formal education. Therefore, 29% of individuals had completed their primary education, with the majority of household heads having attained secondary education, around 54%. Meanwhile, it is important to note that just 4% of household heads attained tertiary education, comprising diverse levels such as certificates, diplomas, or degrees. The majority of these respondents held positions in the private or government sectors, while a few were pensioners. It is important to acknowledge that both formal and informal education make valuable contributions towards improving the well-being of rural households. Nonetheless, formal education offers structured learning opportunities and the results of the study indicated that household heads who received formal education made constructive decisions regarding the livelihood activities of their households. Formal education has been instrumental in improving their capacity to select high-yielding ventures, keep abreast of modern technologies to

foster entrepreneurship, and ultimately enhance their families' well-being. By comparison, informal education, which incorporates indigenous knowledge and other community-based learning, offers individuals practical skills and knowledge that are relevant to the local context of the Iban people.

b. Financial assets

Financial assets were assessed in the study based on income source and level. The study's findings reveal that the Iban community in Pantu Sub-District depend on both agricultural and non-agricultural sources of income to support their households. Regarding this matter, 70% of households earned their income through farming, which included planting cash crops, subsistence farming, and raising livestock. Non-farm income is received by 30% of the respondents. Out of this, 12.7% of them are private company workers, 6.4% are in government jobs, 5% are unemployed, 2% are in other occupations, and 1.8% are entrepreneurs. The remaining 1.4% are homemakers. Additionally, almost 70% of households residing in these longhouses had a gross monthly income of less than RM2,000, which could be attributed to a greater number of residents engaged in agriculture. Subsequently, a percentage of 28.2 was recorded for those with middle-income (RM2,001 to RM4,000). Following that, only 1.9% of individuals attained a high income of RM4,001 and above. The group with the highest income were those who were permanently employed in the government or private sector, and some of whom were entrepreneurs. Their wages remained consistently stable. In Pantu Sub-District, financial support structures were available to residents, including remittances and government aid like BR1M and E-Kasih for vulnerable groups such as the disabled, single parents, and the elderly. Monthly remittances from family members who migrated from Pantu Sub-District increased the financial assets of some residents. Yet, some *bilik* members who migrated failed to send money back to their families. The amount of household remittance is unpredictable and may exceed or fall short of RM600 due to the high cost of living for immigrants in urban areas.

The financial assets associated with farming and non-farming occupations presented both challenges and opportunities for the Iban rural household. Research has shown that those engaged in farming have direct access to agricultural produce for consumption, thus decreasing their reliance on external food sources. However, agricultural risks such as crop failures and fluctuations in market prices also affect income stability, making them vulnerable to agricultural risks. Accordingly, individuals engaged in non-agricultural pursuits, such as off-farm employment, small-scale entrepreneurship, or remittances, possess a more varied income stream for rural households. This diversification helps reduce reliance on agricultural income and spreads risks. The research found that although most of the Iban population in Pantu Sub-District are low-income earners, they have sufficient food supply from various sources such as subsistence farming, fishing, forest produce and remittances. By diversifying their livelihoods in both farming and non-farming activities, the Iban community was able to supplement their income and bolster their resilience against risks. In Pantu Sub-District, the rural household can fulfill their basic requirements and ensure food security.

C. Physical assets

A study revealed that the Iban community in Pantu Sub-District possesses physical capital like, infrastructures, vehicles and land holdings to support their livelihood. Electricity supply to 11 villages under study is provided by Sarawak Energy Berhad (SEB). Despite this, Kampung Semawa Ili continues to use a generator as their primary electricity source. Participants agreed that a dependable electricity system has improved their economic opportunities and is crucial for their daily lives, including uninterrupted access to light, television, and enabling their children to use computers and laptops. Along with electricity, water was also a vital component of their daily routine. It was discovered that, out of the 12 villages that were sampled, seven of them had access to clean and treated water from the Sarawak Rural Water Supply Department (JBALB). The other five villages were provided water through a gravity feed system. The provision of water was fundamental for both household activities and livelihood in Pantu Sub-District, such as agriculture for irrigation purposes, cultivation of fruits and vegetables, and raising livestock. Additionally, the household exhibited satisfaction with supplementary amenities, including educational institutions, marketplaces, healthcare centers, recreational facilities, and transportation infrastructure. Enhanced physical infrastructure enhances the rural community's accessibility to varied livelihood opportunities. Notably, the area had 11 schools and a health clinic, Klinik Kesihatan Pantu, which offered medical services to the local residents. The villages that are being studied can be reached by way of a tarred road, and the longhouses are situated at varying distances ranging from 1 to 30 km from the main towns, namely Pantu and Lachau. The improvement of road infrastructure connecting the villages and the town has facilitated market accessibility, consequently resulting in heightened household participation in commercial activities. For instance, respondents have stated their ability to vend a diverse range of produce, including fruits, vegetables, fish, and meat, at local markets in Lachau, Pantu, Sungai Tenggang and Sri Aman.

Furthermore, the establishment of highways connecting Pantu with major cities and towns in Borneo has provided an avenue for the residents of Pantu Sub-District to explore markets and employment opportunities. In Pantu Sub-District commuting was facilitated by the fact that a significant proportion of residents (84.5%) had access to personal transportation. Motorcycles were the preferred mode of transportation for 54% of households, with only 22.7% owning a car. Moreover, a van was owned by 6.4% and a lorry by 1.4% of individuals. The van rental business owned by someone in the village became the main transportation option for others to travel to the nearest town. The possession of a truck provides several benefits, as it enables individuals to transport agricultural produce, including oil palm, rice, and pepper, to the market. The results of the study show that transportation between farms and villages was very important to farmers. The results further indicated that 15.5% of the respondents who did not possess a vehicle resorted to rental vehicles and public transport for commuting to nearby towns. A further personal physical asset held by Pantu's villagers was agricultural land. The findings indicate that 95% of the villagers possessed such land, either through inheritance or secondary acquisition. Conversely, 3.7% constituted tenants who had either leased or borrowed the land for cultivation purposes, and only 1.4% did not possess any land. The land was utilised for cultivating crops both for personal consumption and commercial purposes. The existence of physical capital within Pantu Sub-District holds great significance in the advancement of agricultural productivity, income generation prospects, and the facilitation of connectivity, accessibility, and market linkages for the rural populace.

d. Social assets

In Pantu Sub-District, social capital refers to the organisations and groups with which the Iban community engages to facilitate their livelihood plans and resolve challenges for the mutual good of their society. Interaction can be explained in two ways in this study: vertical networks and horizontal networks. The presence of a vertical network in Pantu Sub-District can be seen in the fact that several government departments and agencies have implemented schemes, subsidies, training, and relevant development projects to improve the community's living standards, knowledge, and skills. Respondents report that DOA supported them in the form of seeds, cash subsidies, pesticides, and fertilisers. In addition, DOA also introduces the livestock project in Pantu, namely Livestock Commercial Unit (LCU), which pigs and chickens are given to rural farmers in Pantu. Then MPOB provided subsidies in the form of planting materials (seedlings), fertilisers, pesticides and weed killers. Then the MPB offers various types of schemes and subsidies such as the new pepper scheme, the mature paper scheme, the financing scheme, and marketing development. Also, for the benefit of the Pantu Sub-District community, a pepper store was established by MPB at Kampung Selanjan Asal. Then the RISDA has offered replanting and new planting scheme for rubber smallholder with modern seedlings that produce plentiful yields. It was found that 25 households have benefited from RISDA Rubber Blocks Planting Scheme at Kampung Limau, and a Rubber Group Processing Centre was established in RME Muding.

Furthermore, there are two political representatives in the Pantu Sub-District namely the N.31 Bukit Begunan under YB Datuk Mong Dagang and N.30 Balai Ringin under Datuk Snowdan Lawan. The elected representatives have helped the people of Pantu develop and enhance their level of living by implementing initiatives that the community need through the Rural Transformation Programme (RTP). Furthermore, all 12 villages investigated were members of the State Farmers' Organisation (*Pertubuhan Peladang*), which focuses on assisting farmers rather than producing revenue. Farmers in Pantu Sub-District, for example, are supplied with agricultural items of guaranteed quality and value, such as fertilisers, livestock and aquaculture food, agricultural instruments such as grass cutters, seeds for vegetables, fruits, and rice, through the Famers' Organisation. In addition, the Village Security and Development Committees (JKKK) were formed by longhouse committee members to manage the infrastructure and offer services to the longhouses. Furthermore, *Penghulu* and *Tuai Rumah* contributed to social capital by acting as the longhouse community's spokesperson and communicating their concerns to government representatives. Despite the fact that the majority of families participate in various schemes and subsidies, the number of villagers who enrol in training programmes provided by various training providers such as Agriculture Training Centre (ATC) and KEMAS is quite low. A lack of skills and training is a major impediment to successful agricultural output and has an impact on their ability to diversify their livelihoods. According to this survey, the majority of farmers still fall into the low-income category since they are small-scale farmers with low output. The horizontal network of the Iban community can then be seen in the practise of joint-cooperation or *beduruk. Beduruk* culture restricts agricultural work to family members, such as married children who reside in another *bilik* and assist their parents with rice harvesting. Another example of horizontal integration observed in the study is mutual help in raising funds for special occasions such as weddings, funerals, and hospitalisation of longhouse community members to alleviate their burden.

e. Natural assets

Natural assets are the stock of natural resources from which further resources and services can be developed and which can be used for subsistence. The natural resources owned by the Iban community in Pantu in this study were access to land, river, livestock, and forest. The majority of inhabitants owned land, but the amount of their holdings varied. According to the tuai rumah interviews, each longhouse in Pantu has its own pemakai menoa, which is the land area managed by a specific longhouse. According to the findings, about 45.9% of households held land ranging in size from one to two acres, while 20.5% owned less than one acre. Furthermore, 23.6% of them owned 2.51 to 5 acres of land, 7.3% owned 5.1 to 7.5 acres of land, and only a small number (2.7%) owned more than 7.51 acres of land. According to the size of land ownership of the respondents in this study, the majority of them were small-scale farmers. Aside from that, the majority of Iban in Pantu (77.7%) rely on the forest for a living. According to the responses, they collected various jungle products for their personal sustenance, such as wild veggies and fruits. According to the findings of the observation, a group of women in the hamlet also collected the primary forest goods such as ferns, bamboo shoots, and mushrooms. Some of the wild goods available on Pulau Galau were purposefully reserved by houses or the village community for the community's domestic needs.

Hunting looks to be a source of food, but respondents also stated that hunting is no longer a common pastime because most of them are no longer interested in hunting, and the supply of wildlife species is also dwindling. They preferred to hunt bearded pigs and frequently shared the meat with their families and neighbours. Similarly, the river was another important natural resource aspect for this community, where 12.3% of the people, particularly the Iban of Kampung Semawa Ili, are involved in fishing. However, only a small minority of those respondents stated that fishing is their primary occupation, while others stated that it is a secondary occupation to farming or other sources of income. It was shown that 87.7% of the population did not participate in fishing activities. Sungai Semawa, Sungai Kubau, and Sungai Keranggas are the three main rivers in Pantu. Because of the uncertainty of the catch, the Fisheries Department provided the fishermen with an engine, a boat, and a monthly stipend of RM200 to reduce their financial strain. As a result, it was discovered that the bulk of the Iban continue to rely on natural products from the forests, where they rely on their pemakai menoa and pulau galau to extract natural resources.

The Impact of the Livelihood Factors on Farm and Non -Farm Livelihood Strategies

According to the findings of this study, the Sustainable Livelihood Framework (SLF) organises assets (human, financial, physical, social, and natural) that raise or decrease livelihood constraints or opportunities. In Pantu Sub-District, households' livelihood assets are unequally distributed, and they must find ways to combine what assets they do have in order to assure survival and impact livelihood diversification. The Structural Equation Model (SEM) approach was used to determine the crucial factors in the diversification of livelihood strategies of the Iban population in the Pantu Sub-District in order to fulfill the study's purpose. To complete the analysis in this study, livelihood strategies are classified as non-farm livelihood strategies (LSC1) and farm livelihood strategies (LSC2), which are further classified as livestock livelihood strategies (LSC2) and subsistence and commercial agriculture (LSC3). In Pantu Sub-District, both farm and non-farm livelihood options are crucial for people's livelihoods. It was discovered that farm livelihood strategies (LSC2 = 4.308 and LSC3 = 14.152) outperform non-farm livelihood strategies (LSC1 = 2.373). The mainstay of Iban living is both commercial and subsistence farming. Furthermore, farmers with fewer crops and livestock preferred to diversify their income through non-farm activities.

The Pantu community was able to make money through cultivating crops in order to enhance their financial capacity, which could then be used to fund other income-generating activities. Furthermore, studies show that two asset categories, namely social assets (t-value = 4.879) and natural capital (t-value = 3.860), have a substantial impact on households' choice and adoption of specific lifestyle diversification. The three remaining assets, namely financial assets (t-value = 0.29) and human assets (t-value = 0.822), physical assets (t-value = 0.783), and physical assets (t-value = 0.783), are insignificant. The study's findings demonstrate that Iban's decision to diversify their source of income is positively influenced by the availability of social and natural resources. Social assets, natural resources, human resources, physical assets, and financial assets can be ordered from most important to least essential in terms of importance. The structural equation model explains that social capital was Pantu's most valuable resource.

Conclusion

As a result of this research, five types of assets have been thoroughly examined and characterised. All capital assets have an impact on people's decision to diversify their livelihood, according to the research assumption. This study, however, contradicts this premise, finding that only social and natural capital have a substantial

impact on households' livelihood diversification options. In terms of social capital, Pantu communities are vertically and horizontally integrated with other authorities and communities. Vertical integration is evident in the fact that several government departments and agencies, such as the DOA, MPB, MPOB, RISDA, Famers' Organisation, JKKK, and several local political representatives, aim to introduce programmes, subsidies, training, and relevant development projects to improve the community's living standards, knowledge, and skills. However, this demonstrates a lack of knowledge among Pantu people about the importance of skill development. Furthermore, the JKKK, penghulu, and tuai rumah added to social capital by representing the entire longhouse community in expressing their ideas or concerns to official representatives. Furthermore, horizontal integration can be found in Pantu, where the community works together in other villages through joint collaboration or beduruk in agriculture. Aside from social assets, the Pantu Iban community's natural assets are critical to their access to land, river, animals, and forest. The size of the respondents' land holdings in this survey reveals that the majority of them were small farmers.

The majority of Iban in Pantu, approximately 77.7%, rely on the forest for a living. The majority of respondents claimed that they harvest jungle items such as wild vegetables for their own consumption, with only a few selling them at Pantu and Lachau Town farmers' markets. In addition, residents go hunting for wild animals on occasion. Similarly, another active natural resource factor for this community was the river. Some villages, particularly the Iban of Kampung Semawa Ili, engage in fishing, although their income is volatile because it is dependent on catch and weather. Finally, the structural equation model was utilised to assess how the underlying determinants (factors) influence a household's decision to diversify its sources of income. As the findings indicate, social and natural assets have a substantial impact on a household's decision to diversify their livelihood or not. Various vertical and horizontal integrations, such as available programmes, subsidies, and training, have aided in livelihood diversification. Apart from that, natural capital is still vital to the Pantu community, despite the fact that natural resources are dwindling as a result of development in Pantu.

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