

Faculty of Social Sciences and Humanities

Livelihood Strategies of the Iban Community in Pantu Sub-District, Sri Aman, Sarawak

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Livelihood Strategies of the Iban Community in Pantu Sub-District, Sri Aman, Sarawak

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

……

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ABSTRACT

The overall aim of this research is to examine the livelihood strategies of an Iban community in Pantu Sub-District, Sri Aman, Sarawak. Specifically, this research analyses the determining factors in the diversification of the livelihood strategies of the Iban community in Pantu. Accordingly, this study also analyses the role of gender in the decision-making process to determine the livelihood strategies of the Iban community in Pantu besides evaluating the changing role of gender in affecting activities participated by both men and women in Mungguh Ubah and Kara Pantu. Finally, the study also explores how indigenous knowledge among the Iban community in Pantu Sub-District influences the choice of livelihood strategies in response to changes of their livelihood susceptibility to environmental alteration. This study is based on a mixed method approach. In-depth interviews were conducted with two Iban Penghulu and 12 Tuai Rumah, while structured interviews with 220 bilik family heads, and focus group interviews with 15 men and 15 women besides direct observation. The findings showed that the major income share of the Iban communities in Pantu Sub-District is from farming activities since it is the primary economic source of the households there. The study indicated that majority of the households have improved earnings through diversifying their livelihood strategies by adopting both farm and non-farm activities such as involving in small-scale trading, hunting, fishing, and forest collection. Despite the broader frame of livelihood diversification, farmers in Pantu widely practiced agricultural diversification and depended on livestock husbandry. Almost all farmers in Pantu Sub-District perform crop diversification by cultivating more than one type of crop on their farmland such as rice, a variety of fruits and vegetables, rubber, oil-palm, and pepper. In terms of the income distribution, no significant difference was observed among the Iban households in Pantu Sub-District where a 70% majority fall under the low-

income (monthly income less than RM2,000) category. Most households secure adequate food for themselves (subsistence) and only sell the farm surplus at the local markets. Apart from agriculture, rural Iban households in Pantu still depend on natural resources for a living by involving in forest produce collection, hunting wild game and fishing. Some of the low-income households depend on remittances sent by their family members as their secondary income. An interesting finding of this study is that there are cross border informal trade activities due to Pantu's proximity to the border between Sarawak and West Kalimantan. This creates an economic and socio-cultural effect especially in supplementing the labour shortage faced in carrying out various economic activities in Pantu, providing varieties of goods sold to the local Iban and cross border marriage. The results of the study also suggest that social and natural assets, which significantly influence household decisions in diversifying livelihood strategies, enable households to enhance food security and increase agricultural production by smoothing capital constraints. Next, the women in Pantu Sub-District are actively involved in agriculture as well as in non-farm activities such as handicraft making, running small enterprises and forest produce collection as their livelihoods. Women in Pantu do play triple roles. Except for domestic tasks, there is gender equality in livelihood decision making particularly on utilisation of livelihood assets there. Almost 96% of the Iban households admit the importance of indigenous knowledge (IK) in their livelihood strategies such as farming, handicraft making, forest resources collection, hunting and fishing. IK provides Iban communities with ideas for tackling local problems. The findings of this study provide several policy implications for promoting sustainable and effective development of rural households.

Keywords: Livelihood strategies, diversification, indigenous knowledge, gender role, livelihood assets

Strategi Kelangsungan Hidup dalam Masyarakat Iban di Daerah Kecil Pantu, Sri Aman, Sarawak

ABSTRAK

Kajian ini dijalankan dalam kalangan masyarakat Iban di daerah kecil Pantu. Tujuan keseluruhan penyelidikan ini adalah untuk mengkaji strategi kelangsungan hidup dalam masyarakat Iban di daerah kecil Pantu, Sri Aman, Sarawak. Secara khusus, penyelidikan ini menganalisis faktor penentu dalam kepelbagaian strategi kehidupan masyarakat Iban di Pantu. Sehubungan itu, kajian ini juga menganalisis peranan jantina dalam proses membuat keputusan untuk menentukan strategi kehidupan masyarakat Iban di Pantu selain menilai perubahan aktiviti yang disertai oleh golongan lelaki dan wanita. Akhirnya, kajian ini juga menerokai bagaimana pengetahuan ilmu peribumi di kalangan masyarakat Iban di daerah kecil Pantu mempengaruhi pemilihan strategi kehidupan sebagai respons terhadap perubahan kerentanan kehidupan mereka terhadap perubahan persekitaran. Penyelidikan ini menggunakan kaedah campuran dengan menggunakan kaedah temu ramah mendalam yang melibatkan dua Penghulu dan 12 Tuai Rumah, temu bual berstruktur dengan 220 ketua isi rumah, temu bual kumpulan berfokus dengan 15 lelaki dan 15 wanita, dan pemerhatian langsung. Hasil kajian menunjukkan bahawa pendapatan utama masyarakat setempat di daerah kecil Pantu adalah dari aktiviti pertanian. Selain daripada terlibat dalam aktiviti pertanian, masyarakat setempat juga mempelbagaikan strategi kehidupan mereka dengan melibatkan diri dalam aktiviti perniagan kecil, berburu, memancing, dan pengumpulan hasil hutan untuk meningkatkan pendapatan mereka. Mereka juga mengamalkan kepelbagaian pertanian secara meluas dan bergantung kepada penternakan. Tiada perbezaan yang ketara diperhatikan dari segi agihan pendapatan memandangkan majoriti penduduk setempat (70%) daripada responden yang ditemu bual berpendapatan rendah iaitu pendapatan

bulanan kurang daripada RM2,000. Ini dapat dijelaskan di mana sebahagian besar isi rumah menjalankan aktiviti ekonomi sara diri sahaja dan mereka hanya menjual lebihan hasil pengeluaran di pasaran tempatan untuk mendapatkan pendapatan tunai. Selain pertanian, masyarakat Iban di luar bandar Pantu masih bergantung kepada sumber semula jadi seperti pengumpulan hasil hutan, memburu haiwan liar dan perikanan. Sebilangan isi rumah terutamanya golongan berpendapatan rendah bergantung kepada kiriman wang ahli keluarga dari luar sebagai pendapatan sekunder mereka. Seterusnya, terdapat aktiviti perdagangan tidak rasmi merentas sempadan berikutan dengan lokasi Pantu yang berdekatan dengan sempadan Sarawak dan Kalimantan barat. Ini memberikan kesan terhadap kehidupan penduduk dari segi budaya, ekonomi dan sosial terutamanya dari segi menampung kekurangan tenaga buruh di Pantu, bekalan kepelbagaian barangan dan perkahwinan rentas sempadan. Aset sosial dan aset semulajadi didapati mempengaruhi keputusan isi rumah dalam pilihan mempelbagaikan strategi kehidupan untuk meningkatkan keselamatan makanan dan pengeluaran pertanian mereka. Seterusnya, golongan wanita di daerah kecil Pantu terlibat secara aktif dalam pertanian dan juga kegiatan bukan pertanian seperti pembuatan kraf tangan, perusahaan kecil dan pengumpulan hasil hutan. Mereka juga memainkan tiga peranan utama dalam masyarakat. Selain tugasan domestik, terdapat kesaksamaan di antara jantina dari segi membuat keputusan sara hidup umpamanya dalam penggunaan sumber aset mereka. Hampir 96% isi rumah Iban mengakui pentingnya pengetahuan ilmu peribumi dalam strategi kehidupan seharian mereka. Hasil kajian ini memberikan beberapa implikasi dasar dalam mempromosikan kepelbagaian strategi kelangsungan hidup dalam pembangunan masyarakat luar bandar.

Kata kunci: *Strategi kelangsungan hidup, kepelbagaian, ilmu pengetahuan peribumi, peranan jantina, aset modal*

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LIST OF ABBREVIATIONS

BR1M	Bantuan Rakyat 1Malaysia
FAMA	Federal Agricultural Marketing Authority
IADA	Integrated Agricultural Development Area
IADP	Integrated Agricultural Development Project
IDS	Institute of Development Studies
IK	Indigenous Knowledge
JKKK	Jawatankuasa Kemajuan dan Keselamatan Kampung
JKMM	Jabatan Kebajikan Masyarakat Malaysia
JKR	Jabatan Kerja Raya
KEMAS	Jabatan Kemajuan Masyarakat
KPWKM	Ministry of Women, Family and Community Development
MANRED	Ministry of Modernisation of Agriculture, Native Land and Regional Development
MPB	Malaysian Pepper Board
MPOB	Malaysian Palm Oil Board
MRB	Malaysian Rubber Board
MRD	Ministry of Rural Development
NCR	Native Customary Rights
SESCO	Sarawak Electricity Supply Corporation
SLF	Sustainable Livelihood Framework

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Rural development has gained increasing attention both locally and internationally. In particular, the issues of livelihood strategies, livelihood factors, gender and indigenous knowledge have led various researchers to study rural communities and different aspects of development (Dao, 2004; Hoe et al., 2018; Khatiwada et al., 2017; Liau et al., 2017; Melor et al., 2017). The livelihood strategies are often considered as part of a rural economy and an important factor in approaches to poverty reduction in developing countries (Ding et al., 2018; Jiao et al., 2017; Xu et al., 2019). Rural communities in particular will develop a wide range of activities and social support systems to survive (Ellis, 1998). As a result, they engage in different activities to generate income and create multiple sources of income at a given time (Hart, 1994; Saleth, 1997). This argument is the basis for the various livelihood choices that people make such as crop and livestock farming, fishing, and other non-agricultural activities.

According to IFAD (2011), more than half of the income of rural farming populations in emerging economies come from non-farm sources. Extensive empirical studies consistently show that diversification to non-farm strategies enables households to earn better wages, increase agricultural production, and improve food security (Barrett et al., 2001; Hoang et al., 2014; Liu et al., 2008). Therefore, diversified livelihood systems are more likely to persist over time as they are less vulnerable compared to undiversified systems (Carney, 1998). Low-income households that focus only on agricultural activities are more vulnerable to certain shocks and seasonal fluctuations because they depend on only one

source of income. Previous studies have also shown that diversification helps households to achieve a higher income profile and improve livelihood security by using available resources and skills in an appropriate manner (Hart, 1994; Saleth, 1997).

In rural areas, indigenous people pursue various strategies, including farm and non-farm livelihood diversification (Shumetie & Alemayehu, 2018; Whelan et al., 2018). Moreover, indigenous people have a unique way of life based on the natural resources around them (Butt et al., 2019). Indigenous people in Sarawak are collectively referred to as the natives, with the Iban being the largest group of indigenous people. Ngidang (2002) found that the Iban, also known as the "Sea Dayak" community, live in longhouses spread throughout the rural areas of Sarawak. Traditionally, the livelihood of the Iban community revolves around the natural resources in their settlements, so they use their environmental resources effectively and any changes in the environment have a direct effect on their livelihood (Hosen et al., 2019). Cramb et al. (2009) showed that modernity and development have caught up with the other indigenous groups in the nation state, resulting in several changes in their livelihoods. In Sarawak, economic growth in the larger cities stimulates rural-urban migration. The introduction of new schemes by government agencies, mainly related to oil palm plantations and cash crops, as well as large-scale commercial farming, has led to a change in the livelihood strategies of Iban households in rural areas (Cramb, 2013; Kato & Soda, 2020; Rigg, 2006). In addition, the Iban have also diversified their income generating activities. They engage in tourism, collection of non-timber forest products and some depend on remittances. They have also replaced traditional crops with modern high-yielding varieties (Fong et al., 2017; Izzah & Wan, 2019). Therefore, this study was conducted to investigate the current livelihood strategies of the Iban community in Pantu

Sub-District, Sri Aman, Sarawak by incorporating roles of gender and indigenous knowledge into the analysis.

A livelihood can be sustained or enhanced based on its ability to cope with various stresses and shocks, both now and in the future (Chambers & Conway, 1992). This definition thus provides additional attention to the types of assets and gives a strong voice to the concept. Ellis (2000) describes livelihood as consisting of assets (physical, human, financial, natural, and social capital) and access to these reciprocally regulates the livelihood adopted by an individual. Likewise, the chosen or access to the combination of assets and events in a household is often referred to as the household's livelihood strategy (Ajayi et al., 2016; Ellis, 1998; Ellis, 2000; Scoones, 2015). Chambers and Conway (1992) stated that the livelihood of rural communities is often complicated and diverse. Consequently, one household member's choice of livelihood may differ from another. Access to different assets is also influenced by the structure of a household, which includes the elements of age, size, and composition of them. Other factors that influence a household's access to assets include the market, availability of essential services and the prevailing political environment (Barrett et al., 2001; Sarou, 2009). There are five factors involved in livelihood diversification namely human capital, social capital, financial capital, physical capital, and natural capital. These factors were analysed to determine their influence on livelihood diversification activities in Pantu Sub-District, Sri Aman.

Household livelihood decision making is about making one choice over another, and this differs according to gender roles (Ngigi et al., 2017; Ragasa et al., 2019). Men and women have different access to resources and face different vulnerabilities depending on their roles in the household. All these influence the choice of work and the nature of

engagement at household and community levels (Huyer & Partey, 2020; Solana & Rooks, 2018). In rural areas, women are responsible for a variety of work such as farming and domestic work. However, their work is considered less important compared to men and their contribution to the well-being of the household is not fully recognised. Men and women also participate in community activities, yet women spend less time on community activities as they also have responsibilities for household chores (Alshami et al., 2018; Jabeen et al., 2020; Jaka & Shava, 2018; Kimengsi et al., 2019). Therefore, this study examines gender perspectives and its role in decision making in the context of livelihood strategies determination.

Indigenous knowledge has evolved over time and is specific to a particular culture and community (Fre, 2018; Hyes, 2020). Indigenous knowledge is important because it is tailored to the needs of the local situation and helps local communities make decisions in many aspects of their livelihood, such as how to obtain food and survive in difficult situations (Ashton, 2019; Austin et al., 2018; Jawol et al., 2018; Yi & Mohd, 2020). Indigenous communities in Sarawak have developed highly specialised indigenous knowledge in hunting, fishing, agriculture, craft making and other traditional practices (Hidayati et al., 2018; Ting & Rose, 2018). Originally, the indigenous community in Sarawak depended on the accessibility of natural resources in the area where they live (Sadiq, 2009). However, various trends and shocks in socio-economic and environmental changes have led to deprivation of flora and fauna (Carson et al., 2018; Chowdhury & Lahiridutt, 2018). Therefore, this study assesses the role and the use of indigenous knowledge in the choice of livelihood strategies among the Iban community in the Pantu Sub-District in response to changes of their livelihood susceptibility to environmental alteration.

The findings of this study provide a comprehensive understanding of the rural livelihood strategies of the Iban community in Pantu Sub-District, by answering the question of whether a household can increase its well-being by constructing its livelihood portfolio from various available farm and non-farm options by taking into account role of gender and indigenous knowledge in its analysis. The result would help in developing household poverty alleviation strategies that would ultimately have a good impact on the overall economy.

1.2 Problem Statement

The Iban are the largest ethnic group in Sarawak (Kato et al., 2020; Ting & Rose, 2014). However, their tradition and culture are gradually disappearing due to modernisation (Berma, 2001; Mertz et al., 2013). Modernisation in rural areas is mainly associated with the transformation of agriculture and in livelihood strategies (Aellah & Okoth, 2019; Reeve et al., 2018). In a study by Freeman (1970), 89% of the Iban population engaged in rice cultivation as their livelihood. Rice cultivation was at the core of Iban custom, in which their welfare is depended on good rice harvest every year. Along the way, Iban men invoked the journey called bejalai to improve their livelihood and quality of life (Kedit, 1993; Sebli, 2009; Yapp et al., 2009). In this case, some return to their homeland while others take the opportunity to establish a new settlement in a new area that promises a better livelihood. In the past, the Iban men were also known to be fearsome head hunters, or ngayau. Meanwhile, the Iban women were housewives. However, they also contributed to household livelihood by gathering jungle produce and selling vegetables (Davenport, 2000; Wadley, 2007). All these livelihood strategies are closely linked to the customs and traditions of the Iban in the past. Do the Iban still maintain this livelihood concept today? What is the role played by the women in this context? This study examines the existing and current livelihood concepts of the Iban community. Furthermore, Hock and Kesawapany (2006) reported that poverty is

largely confined to rural communities. Lee (2019) and Shi et al. (2020) found that there is still a wide gap in income levels and economic status between rural and urban areas in Sarawak. Additionally, Berma (2001) and Rock (2018) reported that the main causes of rural poverty in Sarawak are minimal productivity, lack of non-agricultural job opportunities, increase in unemployment, increasing rural-urban migration, and lack of valuable assets and inaccessibility issues. As a result, policy makers in Sarawak face difficulties in eradicating poverty and providing productive jobs and income-generating opportunities for rural communities, the majority of whom are Iban (Hata & Ali, 2013; Kwok et al., 2018). Various initiatives have been undertaken to strengthen the social and economic well-being of the community (Berma et al., 2006; Booth, 2019; Sim & Khan, 2014). For example, the government focused on developing large-scale land development, improving urban-rural linkages, strengthening the rural entrepreneurial community, and providing better basic rural infrastructure (Bulan, 2006; Ghazali, 2011). This can affect the livelihood strategies and agricultural practices of the rural community. As Pantu is earmarked for massive agricultural development, it raises the question of whether this will have a significant impact on the livelihood strategies of the local communities. It is not easy to develop a large land, where it requires large capital investment, land and availability of the workforce. The pertinent question now is that how the land development and plantation affected the livelihood of the Iban communities in Pantu. Was this development advantageous to the locals by providing them with income and employment opportunities? Considering this scenario, how the livelihood strategies of the local Iban in Pantu Sub-District would have changed after the introduction of large-scale development? Therefore, this study is important to fill the literature gap by examining the current livelihood strategies of the Iban community in Pantu Sub-District by incorporating role of gender and indigenous knowledge in the decision

making process. The Iban community is experiencing significant changes in their livelihood as a result of external trends such as demographic change, expansion of commercial agriculture and other social and cultural trends.

Livelihood assets can be classified into five categories, namely human capital, natural capital, financial capital, physical capital, and social capital. Rural livelihood strategies are highly dependent on the availability of livelihood assets and their livelihood strategies can be related to agricultural and non-agricultural activities (Bailey, 2019). However, scarcity of assets is an acute problem in rural areas, for example, they tend to have less access to social facilities such as health, sanitation, and education (Munanura et al., 2018; Ramirez & Pinkerton, 2009). As a result, households' decisions about their livelihood strategies have been altered depending on their assets to cope with risks and shocks (Brown, 2006; Xiao et al., 2019). The more livelihood assets the household owns, the more options it has. Similarly, it creates inequalities between the community and the household as different types of assets have different impacts on their livelihood strategies (Asfaw et al., 2017; Babatunde & Qaim, 2010). Many scholars have conducted studies on the importance of livelihood assets on livelihood activities. Riman (2015) in the study of Ibans in Rumah Bangkit Rembai, Spaoh, Betong found that financial, social, human, material and natural assets influence the livelihood of the Iban community there. Moreover, Ibrahim et al. (2018) found that human assets are the most important assets that contribute to livelihood compared to other assets when focusing on the vulnerable group in the east coast of Malaysia. Despite much past studies on livelihood strategies, yet, the research gap remains in terms of location and focus. Unlike previous studies, this study focuses on the Iban communities in Pantu Sub-District, by identifying the current assets and how they influence their choice of livelihood diversification activities by incorporating role of gender and indigenous knowledge

simultaneously in the decision making process. It is very important to understand the current assets of the Iban community in Pantu Sub-District because assets are critical to their survival. Among the numerous livelihood assets, Iban households in Pantu Sub-District can adopt various strategies to ensure their survival and improve their standard of living. Therefore, this study provides an insight into the factors that cause the changes in their livelihood, which ultimately are crucial in improving and developing the welfare of the Iban in Pantu Sub-District by taking into account the role of gender and indigenous knowledge in the analysis.

The role of men and women in decision making can vary and has changed over time. There are several studies that show how gender plays a role in the decision-making process. In fact, gender has been identified as a dimension of difference in decision making process. There is an unequal distribution of resources that generally benefits men more than women, and researchers have attempted to determine its impact on women and men (Luhaorg & Zivian, 1995; Noraida et al., 2020; Wang, 2019). There are gender inequalities in rural employment due to traditions, customs and social norms that limit women's activities (Chowdhury et al., 2019; Glazebrook et al., 2020; Jabeen et al., 2020). As such, women are underrepresented in decision-making processes despite the recognition that gender equality has a positive impact on the overall economy (Folberg, 2020; Hamrick, 2009; Mohamad, 2018; Qian, 2020). Despite the plethora of studies demonstrating the link between gender roles and decision-making, the changing role of gender in the context of the current livelihood of the rural Iban family is not specifically examined. Considering the above gap, this study aims to analyse the role of gender and how changing roles between gender affect the activities in which both men and women participate in Pantu Sub-District Sri Aman. Traditionally, decision making at the household level may relate to childcare and housework.

At the occupational level, it always depends on what type of occupation a person chooses. Farming is one of the most important occupations in rural families. Both men and women participate in farming. Since it is a daily job, decisions must also be made frequently (Cramb, 2011; Hoe et al., 2018; Yusof, 2015). However, new economic demands have created new opportunities and impact the roles of men and women in making livelihood decisions. The gender stereotype of role specialisation does not necessarily implicate the current roles of men and women. In fact, individuals differ in terms of their capabilities, and this determines their role in family livelihood decision making.

In addition, indigenous knowledge (IK) is widely regarded as one of the most important resources of rural society (Carson et al., 2018; Hemming, 2017; Tang & Gavin, 2016). The traditional livelihoods of the indigenous community are based on a unique relationship with land and natural resources (Anderson et al., 2008; Bohensky et al., 2013). In Sarawak, various indigenous communities depend on natural resources such as forest, freshwater and living organisms for their livelihood. In the past, the basic requirement for the Iban community was to have sufficient land and availability of virgin forests. The Pemakai Menoa, Temuda, Tembawai and Pulau Galau are important aspects in the livelihood of the Iban (Azima et al., 2015; Bulan, 2006). Indigenous knowledge is not static as it is challenged by various stressors such as social, economic, and environmental changes, which puts the livelihood of the indigenous community in a vulnerable state. For example, when natural resources are scarce, the livelihood of the indigenous community is severely affected, such as through overharvesting, loss of traditional medicinal knowledge, and forest degradation (Halim et al., 2012; Joseph, 2015). Many researchers have pointed to the erosion of indigenous knowledge in the Iban community as a result of development, adoption of modern religion and reduction of natural resources (Jarvie & Perumal, 1994; Jawol et al.,

2018; Riman, 2015; Sait et al., 2018). Nonetheless, the discussion of how indigenous knowledge of the Iban community influences livelihood strategy choices in response to changes in their livelihoods has not focused specifically on the Iban community in Pantu Sub-District. Therefore, it is necessary to examine the relationship between indigenous knowledge and livelihood strategy choice in response to changes in the vulnerability of their livelihoods.

Regardless of the numerous findings that attempt to describe how the Iban in Sarawak cope with a variety of changes, there are still research gaps, particularly in relation to the factors that influence Iban livelihood strategies in Pantu Sub-District. Unlike previous studies, this study focuses on gender mainstreaming and the use of indigenous knowledge as additional determinants in shaping the livelihood strategies of the Iban in Pantu Sub-District. Therefore, from this study, the livelihood problems of the Iban population could be identified to increase productivity and reduce income inequality.

1.3 Research Questions

The research questions for this study are as follows:

i. What are the local livelihood strategies of the Iban in Pantu Sub-District, and how are these strategies chosen?
ii. How do the capital assets influence the livelihood diversification activities in Pantu Sub-District?
iii. To what extent do men and women play a role in decision-making to determine livelihood strategies, and how have their roles changed over time?

iv. How does the indigenous knowledge among the Iban community in Pantu Sub-District influence the choice of livelihood strategies in response to changes of their livelihood susceptibility to environmental alteration?

1.4 Research Assumptions

A range of research assumptions was inferred based on the research questions as listed below:

i. The Iban community has diversified their livelihood strategies to farm and non-farm activities.
ii. The five assets (human, financial, social, natural, and physical) influence the diversification of livelihood strategies.
iii. Men and women play a role in decision making and there are changing roles of men and women in decision making on livelihood activities.
iv. Indigenous knowledge influences the choice of livelihood strategies of the Iban community in response to changes in the vulnerability of their livelihoods to environmental change.

1.5 Objectives of the Study

The objectives of this study are fourfold as follows:

i. To examine the livelihood strategies of an Iban community in Pantu Sub-District, Sri Aman, Sarawak.
ii. To identify the determining factors in the diversification of the livelihood strategies of the Iban community in Pantu.
iii. To analyse the role of gender in the decision-making process in order to determine the livelihood strategies of the Iban community besides evaluating the changing role

of gender in affecting activities participated by both men and women in Pantu Sub-District, Sri Aman.

iv. To explore how indigenous knowledge among the Iban community in the Pantu Sub-District influences the choice of livelihood strategies in response to changes of their livelihood susceptibility to environmental alteration.

1.6 Significance of the Study

This section addresses the significance of this study. This study is significant from two perspectives, namely practical and methodological. In the practical perspective, this study contributes to the body of knowledge in the field of rural development with its thorough analysis of Iban livelihood strategies, identifying determinants of decision making process by incorporating role of gender and indigenous knowledge. The findings of the current study on Iban livelihood strategies could provide meaningful and timely insights to policy makers to develop appropriate policies and strategies to alleviate poverty and improve the welfare of the rural community in Pantu Sub-District, Sri Aman. This study establishes an empirical relationship between livelihood diversification strategies and well-being of Iban communities in Pantu Sub-District, Sri Aman, Sarawak. The preferred livelihood activities are thoroughly studied so that policy makers know where to intervene. In this regard, policy makers can identify the appropriate policies to be implemented in Pantu Sub-District. Policy measures aimed at increasing the income of rural households would be possible with concrete empirical data collected from the field.

Moreover, the findings on the factors (financial, natural, human, social and physical) that influence the livelihood activities of the Iban community in Pantu Sub-District have a remarkable impact as they influence livelihood diversification choices and income. It is imperative for the various stakeholders to identify the critical factors that influence the well-

being of community members in Pantu Sub-District before more concrete planning can be done for the future. A more accurate understanding of the current livelihoods would help the 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.

Furthermore, this study is essential as it provides information on the current role of gender in the decision-making process and discusses the activities in which both men and women are involved. Gender analysis is important to ensure that men and women are not disadvantaged by certain activities and strategies for successful rural development and to promote gender equality. The decisions of the rural community to adopt a particular livelihood strategy are influenced by gendered power relations within the household. Consequently, policy makers may benefit from these findings as they may be able to implement more effective policies by considering gender roles and the different needs of men and women.

In addition, the indigenous knowledge possessed by the rural community influences their choice of livelihood strategies. Indigenous knowledge is challenged by various aspects of modernisation such as technology, modern lifestyles, and education. Therefore, this study is significant because an in-depth and up-to-date analysis of indigenous lifestyles was conducted at the right time to understand the Iban community's way of life, which is increasingly threatened by the forces of modernisation. The Iban community still has its own distinct concepts of development based on their traditional values, visions, needs and priorities. In fact, they also make important contributions to the economy. For example, the effective use and conservation of their lands, forests, and natural resources to protect and mitigate risk, especially in relation to climate change and disaster reduction. Indigenous

knowledge is yet to be fully utilised in the development process. This has resulted in overlooking the potential in local experiences and practices. For this reason, the detailed study would enhance the understanding of the influences of indigenous knowledge in relation to the vulnerability of Iban livelihoods to environmental change. More broadly, this study could provide guidance for the public and private sectors who may also be interested in providing more support to rural communities without ignoring their culture and traditional customs.

In terms of methodological perspectives, this study is significant because it adopts a mixed methodology by simultaneously incorporating the factors that influence livelihood strategies, including the role of gender and indigenous knowledge, to examine the livelihood strategies of the Iban community in Pantu Sub-District. In livelihood studies, all these elements are too often discussed separately by different researchers. Many scholars have analysed the role of livelihood assets in livelihood strategies (Kamwi, et al., 2015; King, 2011; Liu et al., 2018; Nawrotzki et al., 2012; Pur et al., 2018). Notwithstanding, the role of gender in the decision-making process and livelihood strategies is also widely discussed (Farnworth et al., 2018; Rap & Jaskolski, 2019; Summer et al., 2017; Verma et al., 2014). Moreover, indigenous knowledge has been studied in different ways in different spaces and is widely known as traditional knowledge used by local people to make a living in a particular place (Carson et al., 2018; Che & Omar, 2017; Lambin et al., 2018; Lyndon et al., 2020; Markkula et al., 2019; Wahab et al., 2020).

However, there are no studies to date that have examined the combination of the above methods to investigate Iban livelihood strategies. It was also noted that a study should adopt a mixed methodological approach to better understand the subject matter (Johnson &

Onwuegbuzie, 2004). The previous studies used only one approach and leaves a gap where the researcher may not be able to get in-depth information and knowledge about the issues. In this study, the combined methodology allowed the researcher to examine the livelihood strategies of the Iban in Pantu Sub-District in a more holistic and context-specific manner.

Overall, this study is unique from a practical and methodological perspective and could serve as a foundation for future research in this area by providing detailed information to future researchers interested in conducting this type of study.

1.7 Conceptual Framework

The structural change development theory is used as a fundamental basis in this study. Moreover, this study uses Sustainable Livelihood Framework (SLF) as a guide to explain Iban livelihood strategies and livelihood assets. In addition, Moses triple roles theory was used to explain the role of gender and its influence on livelihood decision making. Finally, indigenous concepts were used to explore how indigenous knowledge (IK) influences livelihood strategy choices. The conceptual framework of this study is shown in Figure 1.1.

Referring to Figure 1.1, livelihood is influenced by structural changes and in the Iban community, there is a specific social hierarchy that plays various important roles and influences the livelihood strategies of the Iban, namely *Penghulu* (Chief Community), *Tuai Rumah* (Longhouse Leader), Village Security and Development Committee (JKKK), and *Bilik* Family (household), which is usually headed by the head of household or *Tuai Bilik*. In addition, livelihood also includes different types of livelihood strategies, capital assets, gender triple roles, and indigenous knowledge required for certain livelihood outcomes, namely income, vulnerability, and well-being, either in positive or negative ways.

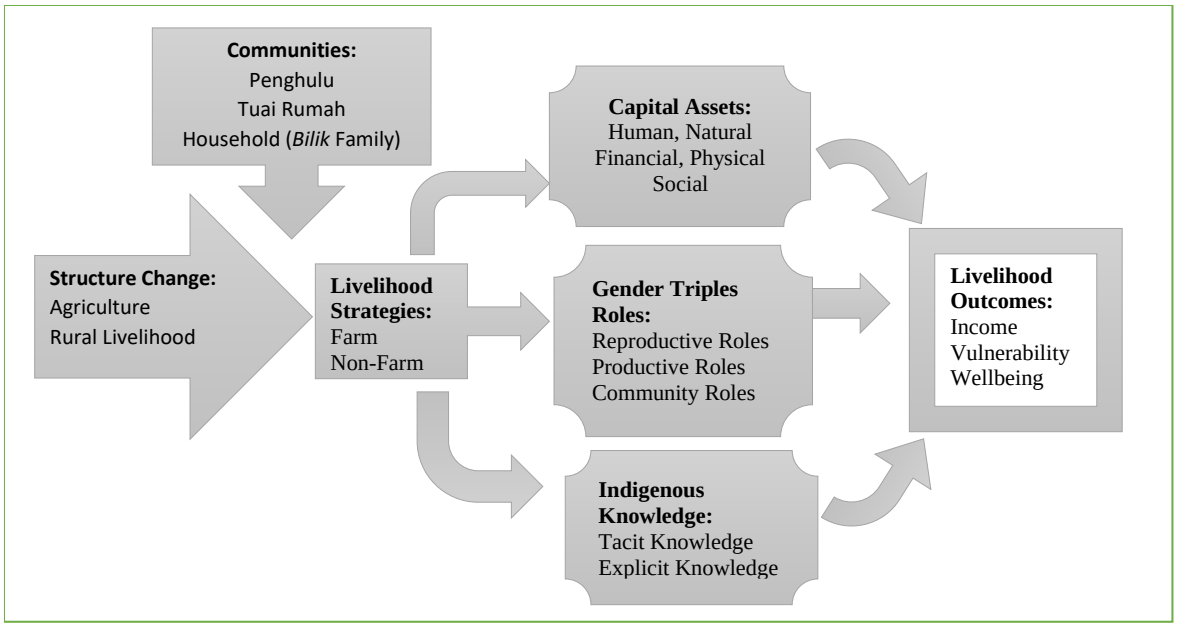


Figure 1.1: Conceptual Framework

Specifically, this study employs the development theory of structural change to examine structural changes in farm and rural livelihoods of Iban communities in Pantu Sub-District. Structural change emphasises the changes in livelihoods, which refers to how one earns a living or livelihood strategies. For this study, livelihood strategies are divided into farming and non-farming activities, whereby farming livelihoods involve both traditional and commercial farming. Apart from these, growth in various sectors of an economy is a direct cause of structural change. Increased labour productivity in agriculture and expansion of non-farm employment opportunities due to general economic growth can further accelerate employment shifts. This is also related to internal and external migration and employment shifts to the non-farm sector. In addition, farm growth is also associated with greater economic efficiency, which can be described as a structural shift towards integrated agriculture and larger farms. In such cases, the presence of non-farm employment may in turn facilitate structural change if the unproductive farm labour force can seek alternative employment.

In addition, farm households also rely on diversified income. They are assumed to combine activities to meet their different needs at different times, and different members of a household may live and work in different places, either temporarily or permanently. Basically, their diversification into rural non-farm sectors is driven by necessity based on push and pull factors. For example, the non-farm sector may draw well-educated labour from the farm sector, which further increases the exit rate from agriculture.

In addition, livelihood strategies depend on the five capital assets. The general capital assets for rural livelihood in Sustainable Livelihood Framework (SLF) are human, financial, physical, social, and natural capital. This framework serves as an analytical tool to provide insights into what assets are available at the household level and how these assets are used to determine their livelihood strategies and transform them into positive livelihood outcomes. It is believed that most rural households lack capital assets to improve their livelihood. However, they can substitute for the lack of other assets to some extent. For example, social capital in the form of cooperation may impact diversification of employment. Similarly, when considering livelihood strategies, it is important to note that people compete for jobs, networks, and natural resources, thus making it difficult to achieve simultaneous improvements. In short, if they have better access to assets, they have greater capacity in choosing their livelihood. For this reason, all these factors are assessed in this study as they form the basis of a household's livelihood strategy. Subsequently, this study also uses the Structural Equation Modelling to further analyse the influence of livelihood asset in the choice of their livelihood diversification strategies. Analysing these factors and defining their implications can be useful for rural household policy and promoting sustainable livelihood strategies.

Apart from the aforementioned factors, this study incorporates gender, which is not included in the Sustainable Livelihood Framework (SLF), although some might argue that gender is part of human capital. Indeed, the SLF has also been criticised for not taking into account power dynamics especially when it comes to the triple role of gender. In this respect, this study is unique compared to previous work in that it analyses the influence of gender on the livelihood decision-making process. The nature of livelihood strategies is not similar between men and women due to differences in their roles and responsibilities and access to livelihood resources. Men and women tend to have different livelihood options, adaptation, coping and mitigation strategies. This study uses triple role model to gain an understanding of the dynamic nature of the gender division of labour, namely productive, reproductive, and community roles in accessing resources and power relations within the Iban *Bilik* family (household). These insights can promote women's empowerment and improve women's practical ability to care for themselves and their families and can also provide a strategic pathway for change in other aspects of their lives.

Indigenous knowledge (IK) also influences Iban livelihood strategies. It is defined in this study as the local knowledge that encompasses the culture, traditions, beliefs, and practices of the Iban community. As shown in the framework, IK can be divided into explicit and tacit knowledge. In this study, explicit IK consists of evidence, rules and guidelines that can be faithfully codified in paper or other form. It is recognised in proper language or in a formal way. As such, explicit knowledge is easy to articulate and record. Tacit knowledge, on the other hand, can only be gained from personal practise and experience, which is more difficult to express and is not in formal form. In the Iban community, both explicit and tacit indigenous knowledge play an important role in various aspects of their daily lives, especially livelihood. Although the Iban have experienced profound social, economic, and

technological changes, IK has shaped their lives. Moreover, the livelihood of the rural Iban community is highly dependent on the availability of natural resources in their environment. Any changes in the environment affect their livelihood strategies, hence their IK revolves around the use and management of these resources. Moreover, IK forms the basis for problem-solving strategies in their livelihoods and is seen as an alternative way of promoting local development among the Iban community. For this reason, the influence of indigenous knowledge on Iban livelihood strategies is investigated in this study.

Livelihood outcomes are the results or productions of livelihood strategies in SLF. As can be seen from the framework these outcomes can lead to the identification of potential livelihood transformations that either positively or negatively affect income, well-being, and vulnerability. To be precise, the Iban community is more likely to improve its livelihood if it has more assets. However, in a broader perspective, the external environment in which they live, including shocks and seasonality, has a direct impact on the sustainability of people's livelihood outcomes. For example, broader economic conditions may create more or fewer opportunities, while an illness in a family may cause them to sell their assets or lose their main source of income.

The framework for this study provides an understanding of the flexibility of a rural Iban household's livelihood strategy over time. In summary, this study uses the development theory of structural change as a foundation and conceptualises the Sustainable Livelihood Framework (SLF) with the integration of gender and indigenous knowledge factors to gain an understanding of rural livelihood strategies in Pantu Sub-District.

1.8 Organisation of the Chapters

This thesis is organised into five chapters. Chapter 1 consists of the background of the study, problem statement, research questions, research assumptions, research objectives, significance of the study, and conceptual framework.

The following chapter, Chapter 2, presents the review of past research work. It critically analyses published body of knowledge by way of justification and comparison to prior research studies. It thus comprises a review of empirical studies, methodological issues as well as conceptual framework. Chapter 3 discusses the methodologies employed in this study. It provides a description on methodology comprising of the study design, sample size and selection survey instruments and how the data is analysed.

Chapter 4 discusses the findings and discussion on livelihood strategies of Iban communities of the Iban in Pantu Sub-District. Chapter 5 deliberates on the main conclusions that can be drawn from the study and in addition it also explains the implication and contribution of the study. This chapter also recommends on ways on how to improve Iban livelihood strategies based on the findings of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The related literature reviewed in this chapter is to provide a clear understanding of livelihood strategies with the associated concepts and theories that underlie this study. This chapter focuses on several important areas, namely the concepts, the background of Sarawak and the Iban community, factors influencing rural livelihood strategies, gender and livelihood, indigenous knowledge, as well as agricultural and rural development transformation.

First, this chapter discusses the different concepts, namely livelihood, livelihood strategies, livelihood diversification, rural communities, sustainable livelihood, and household income. Secondly, the history and background of Sarawak is discussed in relation to the Iban as an indigenous community in Sarawak. Thirdly, it explains various livelihood strategies including discussion on indigenous community livelihood strategies, livelihood decision making in the Iban community, Sustainable Livelihood Framework (SLF), rural livelihood categories, the role of rural livelihood strategies in poverty alleviation, rural livelihood diversification, agriculture in livelihood strategies, migration (*bejalai*), natural resource utilisation and Iban land rights. Fourth, this chapter explains the factors that influence the choice of community livelihood strategies, namely livelihood assets including human, social, financial, physical, and natural capital. Fifth, this chapter explains gender roles as well as Moses' triple role model. Following that, this chapter presents the importance of indigenous knowledge of the Iban community. It also includes the discussions on the previous empirical studies. Finally, this chapter highlights the transformation of agriculture

and rural development, including the development theory of structural change that underpins this study.

2.2 Concept Definitions

The study of Iban livelihood strategies is based on several key concepts and involves an abstraction from the relevant studies. All concepts are of great importance in creating a unified understanding of Iban livelihood strategies.

2.2.1 Definition of Livelihood

In social science, the term livelihood is often used in the study of poverty and rural development. Many definitions have been proposed to illustrate the abstract idea of livelihood. Chambers (1995) states that livelihood is a method of earning a living, including physical assets, non-physical assets, and occupational skills. Thus, it can refer to the factors that influence the choice of livelihood strategies of the Iban community. Similarly, to strengthen the concept of livelihood assets, the researcher combines variations of the livelihood definition. According to Ellis (2000), livelihood capital includes natural, physical, human, financial and social capital, activities, and access to them (mediated by endowments and social relations), which together decide the livelihood that the individual or family takes up. In fact, this new definition focuses more explicitly on the utility and accessibility of livelihood capital. In addition, the researcher agrees with the work of Ellis (2000) that the role of institutions should be included in the definition because the importance of work could affect the lives of individuals and raise the issues of social relations. Moreover, the more general definition of livelihood is the adequate development of assets to meet the basic needs of individuals and their admission to social foundations identified with connection, family, and neighbourhood (Davis, 2003; Devereux, 2000; Pour et al., 2018).

Some research addresses that livelihood is dynamic and changes in response to different challenges and opportunities (Gallaher, 2015; Li et al., 2021; Quandt et al., 2017; Su et al., 2018). Subsequently, Kalinda and Langyintuo (2014) characterised that livelihood is related to resources, activities, and opportunities. Individuals use their resources to participate in various activities which are influenced by various factors such as environment, institutions, frameworks, innovations, and finances. In addition, Erni (2015) defines livelihood as an ability to approach assets, innovation, information, food, income, and it is expected of individuals to have resources, skills, information, and alternatives. From the various livelihood definitions, it is clear that there are many perspectives on the concepts of livelihood. The definition adopted by this research is inspired by the work of these eminent researchers and emphasises livelihood as a set of actions performed by a rural household that include the decisions, assets, and activities required to earn a livelihood in response to changes in livelihood vulnerability. This definition fits very well with the research objectives.

2.2.2 Definition of Livelihood Strategies

Extensive literature exists explaining the concept of livelihood strategies. Nevertheless, this study has adopted the Department for International Development (1999) definition which emphasises that livelihood strategies are a mix of activities that individuals choose to engage in to achieve their work goals. It includes useful activities and decision making. In the rural community, it is critical to recognise that these decisions are influenced by various resources to achieve positive livelihood outcomes (Ellis & Allison, 2004; Hua & Zhang, 2017; Nath et al., 2020; Nielsen et al., 2013). Delali et al. (2005) and Norshida (2009) argued that livelihood systems involve various methods of supporting life and in some societies the community works together to meet the needs of the whole group.

Another area in this research is to look at livelihood strategies on the activities and inclinations of households or families (Fang et al., 2013; Yobe et al., 2019). The researcher also focuses on gender roles in the family because within households, men and women often take on different responsibilities to sustain the family (Anugwa et al., 2020; Gebru, 2012; Omolo & Mafongoya, 2019). In terms of measuring income levels, the researcher is aware that there are various methods of distinguishing livelihood techniques; however, livelihood analysts usually examine the livelihood systems of family units using portions of income from different sectors of the rural economy (Brown et al., 2006; Ren et al., 2018). This guides the establishment of research parameters on income sources such as gross income, remittances and government grants as reflected in this study. Finally, rural individuals were found to develop their livelihoods through two primary strategies, namely farm and non-farm activities (Ajayi et al., 2016; Li et al., 2020). These terms are used in the analysis of livelihood activities in this study.

2.2.3 Definition of Livelihood Diversification

The concept of livelihood diversification is a complex phenomenon and encompasses various forms. According to Ellis (1998), livelihood diversification is defined as the process by which rural families build a diverse portfolio of activities and social supports in their struggle to survive and improve their standard of living. The factors and effects of diversification are mainly in the areas of poverty, income distribution, livelihood assets and gender (Ellis, 1998). However, in some cases, poverty is not the main factor for livelihood diversification as it may be caused by demographic factors such as migration of the younger generation and limitation of arable land (Desherbinin et al., 2008; Jedwad et al., 2017).

Many studies highlight that livelihood diversification is an attempt to find innovative ways to increase income and reduce environmental problems (Seidu & Onel, 2016; Tshabalala & Sidique, 2020). In livelihood diversification, households maintain existing activities, add new activities, or abandon others so that they have a diverse and changing livelihood portfolio (Asravor, 2018). Diversification strategies generally involve a mix of farm and non-farm activities (Hanh & Boonstra, 2018; Irfany et al., 2020). Income from non-agricultural activities is also invested in agricultural activities through intensification and extensification (Gramm et al., 2019; Sharma et al., 2017). Agricultural intensification is done by increasing agricultural productivity through the use of existing agricultural land through a more efficient farming system, while extensification refers to the increase in agricultural productivity through the expansion of cultivated land to increase production (Caraveli, 2000; Ollenburger, 2016).

This study therefore recognises that diversification is an important means of adapting to change and the concept of diversification used in this study is based on the notion that rural communities engage in multiple agricultural (farming) and non-agricultural (non-farming) activities to both make a living and earn money. Moreover, agricultural diversification refers to activities such as growing different crops or raising animals on farms (Joshi & Cummings, 2007; Nyantakyi, 2017; Waha et al., 2018). Additionally, rural livelihood is not limited to income derived solely from agriculture but can also be derived from various non-farm sources. Therefore, the rural non-farm economy encompasses a variety of activities that may differ from place to place (Dary & Ustarz, 2020; Dorosh & Thurlow, 2018; Lanjouw, 1999; Yan et al., 2017). In this study, rural non-farm economy is defined as livelihood activities that are not based on agriculture nor exclusively on wage

labour or self-employment as it also includes unearned income such as remittances and other traditional activities related to natural resource use and fisheries.

2.2.4 Definition of Rural Community

The existence of different definitions reflects the reality that rural communities are multidimensional and defined differently from one scholar to another. Typically, livelihood activities, geographic remoteness, living conditions, and population density are used to define rural communities (DeRosa et al., 2019; Li et al., 2019; Ross, 2019).

Rural communities are essentially workers whose main occupation is agriculture, and they are closely linked to natural resources (Martin et al., 2013). Rural communities are also classified according to their physical location and economic activities, such as settlements in river valleys, settlements in high mountains, farming families and non-farming families (Aluma, 2004; Dorward et al., 2007; Singha, 2013). Moreover, rural populations are characterised by typical living conditions as they are generally more underprivileged than their urban counterparts and face numerous challenges to achieve sustainable livelihoods (Chen et al., 2020; Rashid et al., 2019). As a result, urban-rural income inequality is still an ongoing issue (Andress & Fitch, 2016; Howell, 2017; Wan & Zhou, 2005). A rural area is classified as an area with a population density of below 150 people per km^2, with most of the population consisting of indigenous communities that maintain a unique culture and tradition (Dijkstra & Poelman, 2014; Errico, 2017; OECD, 1993). In this study, the rural community studied refers to the Iban community in Pantu Sub-District. The communities are classified according to livelihood category where the activity that contributes the most to the family income was considered as the predominant livelihood.

2.2.5 Definition of Sustainable Livelihood

The idea of sustainable livelihoods is a focus of discussion in the field of rural development and has been explored by various authors from multidimensional perspectives. A notable definition is that livelihoods are sustainable when they can adapt to and recover from stresses and shocks and maintain their capabilities and resources (Chambers & Conway, 1992; Ellis, 1999; Morse, 2013). It is assumed that the Iban community in this study faces the challenge of choosing a sustainable livelihood. Moreover, sustainable livelihood is based on the idea that development activities should be consistent with the community's goals, scope, and priorities (Kamaruddin & Shamsuddin, 2014). Sustainable livelihood is particularly relevant in disadvantaged communities where individuals earn their livelihood through various activities instead of a steady job (Gallaher et al., 2015; Pandey et al., 2017). To support the importance of sustainability, Scones (2015) also asserted that livelihood for individuals should be socially capable, monetarily powerful, and environmentally feasible.

Although numerous studies have characterised the idea of sustainable livelihood, there is no established standard in the literature to define sustainable livelihood in relation to indigenous communities and the rural context. This study therefore fills the gap by theorising that livelihood is sustainable if it is prepared to meet their basic needs and enrich access to subsistence and income generating activities both now and in the long term. It includes ownership or access to assets, income-generating activities, and empowerment (decision-making and gender roles) to respond to change to mitigate risk and environmental change. At the same time, livelihoods are sustainable when rural communities could preserve and apply their indigenous knowledge in more creative ways without compromising natural resources. This definition fits well with the research objectives of the study.

2.2.6 Definition of Household Income

In examining rural livelihoods, it is important to consider the sources of income available to each household. Household income includes cash and in-kind income received by the household or a family member either daily, weekly, monthly or in a given period of time (Tittonell et al., 2010). Similarly, income consists of all income received from more than one job at a time, which includes all income from primary, secondary and any additional jobs (Alawode et al., 2017; Meng et al., 2020). In addition, income includes income from sources other than work, such as remittances and government assistance (Apatinga, 2021; Bastagli, 2019, Ilman, 2020). Sibhatu and Qaim (2017) informed that income from agriculture still accounts for the largest share of total income of rural households. In addition, rural communities also derive income from non-farm activities such as trading, manufacturing, and handicrafts (Amare & Shiferaw, 2017; Nnadi et al., 2020). Several studies have shown that rural communities have mixed incomes from various agricultural and non-farm activities (Davis et al., 2010; Kassie, 2018).

There are two approaches to income measurement, namely the objective and subjective approaches (Veenhoven, 2017). The objective approach focuses on a certain standard of income. In Malaysia, the Federal Government has classified the income group into three objective standards, namely B40, income below RM3,860; M40, income between RM3,860 and RM8,319; and T20, income greater than RM8,319 (Department of Statistics Malaysia, 2014). However, Sarawak was found to be lagging behind in all income categories as it is still far from representing the wealth of the community in Sarawak (Habibullah et al., 2017). Various factors such as ethnic distribution, education level, employment structure and household size can influence the income disparity among the states (Tey, 2019). Sarawak also faces a major challenge in terms of income equality and there are wide disparities

between household incomes in urban and rural areas (Islam et al., 2017). Per capita income in urban areas was about 1.8 times higher than that in rural areas. Thus, it was found that the measurement of income is subjective and may vary depending on time, place, and well-being. Considering the subjective measures of well-being, income in this study can be divided into high-, middle-, and low-income groups. This indicator is also used by different studies such as by Yan et al. (2017), Zia et al. (2017), Latimaha et al. (2019), and Horton (2020) with different measurements. In this study, income also refers to income from farm and non-farm livelihood strategies

2.3 The History and Background of Sarawak

Sarawak is the largest among the states of Malaysia and is known as the "Land of the Hornbills". Moreover, Kuching is the capital of Sarawak and the economic centre of the state. Sarawak was founded in 1841 by Sir James Brooke. Previously, Sarawak was under the administration of the Sultanate of Brunei from the fifteenth to the mid-nineteenth century (Brunero, 2020; Munan, 2015; Runciman, 2011; Yaakop & Mayudin, 2020). There are several ethnic communities in Sarawak. These include the Iban, Bidayuh, Kenyah, Kayan, Kedayan, Murut, Punan, Bisayah, Kelabit, Berawan and Penan. The Iban form the largest ethnic group in Sarawak, accounting for 30.3% of Sarawak's population (DOSM, 2010). Traditionally, the Iban are farmers who live in communal longhouses and practise swidden rice farming (Pringles, 2010; Said et al., 2017).

In terms of administration in Sarawak, the head of state is the Yang di-Pertua Negeri (Governor) who acts on the advice of the Chief Minister. In addition, the State Cabinet includes the Chief Minister and other ministers who are accountable to the assembly. In addition, the Sarawak State Legislative Assembly has a total of 82 legislators who act as

intermediaries between the government and communities to plan, implement and monitor all policies (Loh, 2020; Salleh et al., 2019; Sulam et al., 2018). There are twelve divisions in Sarawak and each division is headed by a Resident. Each division is further divided into districts and sub-districts which are governed respectively under the District Officers (DO) and Sarawak Administrative Officers (SAO). They are the main representatives of the government in the areas of administration and development at the local level. At the village level, the *Penghulu* (chief) and the *Ketua Kaum* (village head) are also delegated by the government (Anggum et al., 2016; Reinhardt, 2001; Sarok, 2013). In this study, Pantu Sub-District was selected as the study area on livelihood strategies of the Iban. Several studies have argued that rural agropolitan areas are most suitable for the study of rural livelihoods (Ahmad & Saleh, 2019; Aiken et al., 2011; Davis, 2003). Myint (2014) expressed that rural agropolitan areas have diverse agricultural activities, diverse infrastructures, and different livelihood patterns.

2.3.1 The Iban Community in Sarawak

The Iban are an indigenous community in Borneo. The Iban are also referred to as Sea Dayak and belong to the Proto-Malay group (Anggo & Laja, 2018). The word Dayak comes from the Malay word "Daya" which refers to the interior areas and denotes all indigenous communities (Pringles, 2010; Wahed & Pitil, 2018). However, this definition is considered inaccurate as it was never used to define other indigenous communities in Sarawak outside of the Iban (Sea Dayak) and Bidayuh (Land Dayak) such as Kelabit, Kayan and Kenyah. Boyle (2016), Beginda and Bala (2018) argue that the Dayak in Sarawak are divided into Land and Sea Dayaks based on their early settlement patterns, with the Land Dayaks occupying the interior of Sarawak while the Sea Dayaks remain along the riverbank. In another study, the term Dayak refers to all non-Muslim natives and distinguishes them

from the Malays (Lang, 2019). However, this definition contradicts the current situation as some of the Dayak are Muslims. Similarly, as described in various studies, the Ibans were traditionally animists, even though nowadays most of them are Christian, with some being Muslims (Hasegawa, 2018; Jelani & Muhammad, 2018). In addition, Talita et al. (2010) and Haddon and Start (2011) found that the Ibans can be divided into different sub-ethnic groups depending on the area or the name of the rivers; for example, Iban Balau, Iban Undup, Iban Sebuyau, Iban Rajang and Iban Saribas. Interestingly, they also speak in different dialects and intonations. Overall, the Iban Saribas dialect has a softer intonation, it is more formally used and is becoming the standardised Iban language. For example, it is used in Sarawak Iban radio station (Sandai & Ong, 2016). This study however covers the Iban Balau as it focuses specifically on the Iban in Pantu Sub-District Sri Aman.

The Iban are the largest population group in Sarawak and a small portion of the Iban are found in Sabah, West Malaysia, and some in Brunei and Indonesia. The Iban were originally farmers, trackers, and gatherers. Historically, Iban communities were known to be the feared headhunters (*ngayau*), and the head trophies represent the status of the men in the longhouse community. The era of headhunting ended and most Iban converted to Christianity when the British White Rajahs took over the rule in Sarawak (Helbling, 2021; Pringle, 2010; Weinlein, 2017). Under the concept of *bejalai*, the Iban of Sarawak migrated from Kapuas River to Batang Lupar during the sixteenth to seventeenth centuries (Bulan, 2006; Ryoji, 2001). Kato et al. (2020) also noted that the Iban crossed the Kelingkang mountain range and settled in the river valleys of Sarawak. The Kelingkang mountain range became a natural border between Malaysia and Indonesia.

The Iban usually dwell in longhouses, which can be recognised as a village under one roof, led by the head of the longhouse, known as *Tuai Rumah* (Sim & Khan, 2014). The Iban family units within the longhouse, known as *Bilik,* and the longhouse represent the beliefs, tradition, and culture of the Iban society. Many studies consistently report that in Iban tradition, as a symbol of wealth in the family, heirlooms such as gongs (*tawak*), snare (*bendai*) and jars (*tajau*) are readily kept in the *Bilik* (Kiyai & Tugang, 2020; Ling et al., 2018). Some Iban communities still practice this tradition. Nowadays, the Iban also build modern longhouses using simple row house construction (Pringle, 2010; Ugeh et al., 2015). Bilon and Tugang (2018) noted that while Gawain Dayak is the main festival in Iban society, the Iban also celebrate other types of *Gawai* (festivals) such as *Gawai Mangkung Tiang, Gawai Lelabi* and *Gawai Antu*. From the extensive evidence in the literature, the Iban community serves a traditionally brewed rice wine and spirits known respectively as *Tuak* and *Langkau* during the festivals. *Tuak* is made from the fermentation of yeast and rice, while *Langkau* is made through the distillation process of fermented rice that is cooked in a barrel and has a stronger alcohol content compared to *Tuak* (Amit et al., 2013; Kortteinen, 2008). In addition, Iban society has a famous traditional dance called *Ngajat*, which was originally performed to welcome warriors after battle and to give thanks for the rice harvest.

A recent study by Kiyai et al. (2020) states that *Ngajat* is mainly performed during festivals or events such as Gawai Dayak and wedding ceremonies to entertain the guests present. Moreover, the *Pua Kumbu* (hand-woven textiles) signifies the heart of Iban culture. There are several studies that have investigated the traditional use of *Pua Kumbu* which found that the *Pua Kumbu* is used in traditional ritual ceremonies such as the healing ritual, funerals as well as in a ritual to interact with the spirit world (*menoa petara*) (Chelum et al., 2018; Islam & Abdullah, 2016). Magiman et al. (2018) notes that *Pua Kumbu* have different

motifs and designs such as crocodile, snake, and anthromorphic figures (*engkeramba*). To show ethnic affiliation, modern Iban use *Pua Kumbu* as decoration. Besides *Pua Kumbu,* Iban women are also known for their expertise in making different types of handicrafts such as mats (*tikai*), and baskets. These types of handicrafts are made from natural raw materials such as *Donax canniformis* (*bemban*), rattan and bamboo. The traditional Iban tattoo also characterises the unique cultural heritage of the Iban. To justify this claim, Gladys et al. (2020) established that traditional Iban tattoos are considered a fearsome symbol and are used to protect the individual from evil spirits (*antu*). In addition, major studies have confirmed that tattoos symbolise strength, achievements, spirituality, and attractiveness (Faulkner & Bailey, 2018; Jumpo & Bedit, 2020). Eggplant flower (*bunga terung*) is a tattoo commonly identified with the Iban community in Sarawak.

Traditionally, Iban livelihood strategies were heavily dependent on hill and wet rice cultivation (*bumai*). It was highlighted some time ago by Freeman (1955) and Cramb (1985) that the Iban are rice farmers, with each *Bilik* family keeping their own specific seed bank of rice and managing their farm as an independent unit. Moreover, Mertz and Christensen (1997) reported in their study that the rural Iban still follow this lifestyle by combining rice cultivation with cash crops such as cocoa, rubber and pepper. In addition to rice, the Iban also plant pumpkins, maize, and cassava. The Iban community also rear livestock such as chicken and pigs for domestic use (Ibil et al., 2021). Natural forests and rivers serve as an indispensable source of food for the Iban community in rural areas (Saupi et al., 2020). Helbling (2021) notes that the Iban are involved in the activities of gathering wild vegetables and fishing. They also hunt wild boar and deer for their own consumption (Yi & Mohd, 2020).

Overall, there are various studies describing the Iban communities in Sarawak. Most Iban still dwell in rural areas and build more modern types of longhouses. There are also some Iban who are found in urban areas due to the *bejalai* culture. Therefore, it is of interest to conduct a current study on the Iban community.

2.4 Livelihood Strategies

The livelihood strategies of the Iban community are often complex and varied. Agriculture and natural resource dependent activities occupy a significant role for rural individuals, but rural family units additionally expand into various activities, some of which are related to agriculture and the normal wealth sector and some of which are not (Denham, 2015; Fabusoro et al., 2010).

2.4.1 Livelihood Strategies of Indigenous Communities

There are approximately 370 million indigenous communities worldwide with diverse cultures, languages, and beliefs (Halim et al., 2012; Harton, 2006; Lauderdale & Natividad, 2010; Moro & Hardison, 2000). Global examples of indigenous communities include the Iban (Sea Dayak) in Malaysia, Ainu People in Japan, Maori in New Zealand, Saami in Sweden, and Mayas in Guatemala (Alia, 2009; Carstens, 2016; Decosta, 2014; Hata & Wahab, 2018; Waikato, 2005). Several studies show that indigenous communities have a variety of social practices, rituals, and events to mark special occasions, specific seasons, and the agricultural calendar (Hefler et al., 2019; Leu, 2019; Salmón, 2000; Tomaquin, 2013). They also have a deep spiritual connection with the natural environment (Davis & Wali, 1993; McGregor, 2004). Despite these differences, indigenous peoples around the world share some basic characteristics. Many of the indigenous communities usually live in the mountains, fields, floodplains, forest areas, and marine regions. Most of them practice

agriculture as their characteristic livelihood. Many indigenous communities living in the forest participate in hunting wildlife. For indigenous communities living near water catchment areas such as streams, rivers, lakes and seas, fishing is a major customary occupation (Kusiluka, 2011; Nath et al., 2010; Rautela & Karki, 2015).

In Malaysia, indigenous communities refer to the Orang Asli or Orang Asal (Lasimbang, 2021). The Orang Asli in Peninsular Malaysia consists of three primary sub-ethnic groups known as Negrito, Senoi and Aboriginal Malay (Masron et al., 2013). Moreover, the indigenous communities in Sarawak refer to the various aboriginal peoples such as Iban, Bidayuh, Kenyah, Kayan, Kedayan, Murut, Kelabit, Berawan and Penan. In addition, Sabah has tremendous indigenous diversity which refers to the natives or Orang Asal. The Kadazan-Dusun and the Murut are the two largest indigenous groups in Sabah (Latip, 2018; Pringles, 2010).

Studies by Beynon (2013) and Latip (2018) found that most of the indigenous communities in Malaysia live in the rural areas and have mixed economic activities. They still depend on natural resources for their food, medicines, building materials and income for livelihood. Previous studies have also shown that the Orang Asli, for example, harvests agarwood and rattan for commercial value and indigenous purposes (Ab Manaf et al., 2021; Abdullah et al., 2020; Odani, 2017; Salim et al., 2021; Zen et al., 2020). Agarwood has remunerative prices due to its high demand in perfume production and medicinal purposes. The Orang Asli also harvest rattan for house construction, baskets, accessories, furniture, and handicrafts (Abdullah et al., 2020).

Additionally, several studies have shown that hunting and fishing are important components of indigenous livelihoods (Halim et al., 2013; Rahim et al., 2009). Hunting was

primarily for self-consumption and sharing with the community (Aziz et al., 2013). For example, the Orang Asli of the Jahai community, hunts various species such as giant squirrels, barking deer, Malay tapirs and wild boar. This community uses both traditional and modern tools such as blowguns, spears, shotguns, and fire traps in their hunting activities (Loke, 2020). In addition, the indigenous community living in coastal settlements depend on fishing for their consumption and income. For example, a previous study showed that the Melanau people in the coastal area of Igan, Mukah, Balingian and Tatau are known to be skilled fishermen (Long & Chik, 2020; Yin, 2018). To mark the end of the monsoon season in April, they celebrate the Kaul Festival, a traditional ritual of Sea God Worship and thanksgiving to appease the spirits of the sea and ask for wealth on their fishing trips. Numerous studies consistently report that in the fishing community, men usually worked as fishermen while women supplemented the family income by participating in processing and selling sago-based foods and fish, such as salting and smoking the fish (Ishak et al., 2017; Sukirman et al., 2020; Taibi et al., 2018).

Indigenous communities are also involved in various agricultural activities which include cultivating fruits, rice, cash crops and mixed farming. Mixed farming involves both crop cultivation and livestock rearing, mostly for subsistence and sale of surplus (Saifullah et al., 2021; Wook, 2019). In Sabah, indigenous communities such as the Bajau, Dusun and Iranun practice small-scale farming. It was pointed out that smallholder agriculture mostly depends on family labour. The main crops grown include rice, sweet potato, tobacco, rubber, and oil palm. Previous studies have shown that the Kimaragang Dusun in Sabah follow a special traditional calendar known as Momiwulan. Based on this traditional calendar, they refer to the phases of the moon before starting agricultural activities such as land clearing and cultivation. This helps them to increase agricultural yield and reduce pests and diseases

(On & Pugh-Kitingan, 2015). Recent research by Adam (2019) showed that nowadays, indigenous communities in Sabah mostly practice modern agriculture by using modern equipment and techniques such as tractors, chemical fertilizers, and pesticides to improve their yield.

Indigenous communities are also involved in various types of local businesses as the Malaysian government has made various efforts to encourage the participation of indigenous people in the economy. Simpong (2018) reports that the Malaysian government has created more business opportunities to help Orang Asli expand their tourism-related businesses, such as to market their handicrafts and other culture-related products.

The extensive evidence in previous studies has shown that livelihood poverty and wealth are still an issue. Indigenous peoples in rural areas find themselves lagging far behind other communities in various aspects such as poorer health care, higher unemployment rates, and lack of infrastructure (Aiken & Leigh, 2011). Therefore, this study is crucial as more research is needed to understand the livelihood strategies of indigenous people, especially the Iban community.

2.4.2 Livelihood Decision Making in Iban Community

Rural development is not only limited to the household but is also a set of social interactions aimed at improving the living conditions of rural society (Kole, 2007; Usadolo & Caldwel, 2016). In addition, Horlings et al. (2018) and Yang (2018) argue that the grassroots community and their respective leaders have some important functions in the decision-making process to guide the development and livelihood activities that take place in their communities. In the rural context, the integration of different stakeholders such as village head, village organisation, and household head determine the success of a

development activity, especially in aspects that affect the livelihood of the community (McComb et al., 2017; Rustinsyah & Prasetyo 2019; Sisto et al., 2018). In the Iban community, there are some decision makers based on their hierarchy and authority in the village and household, namely the community head (*Penghulu*), village head (*Tuai Rumah*), Village Security and Development Committee (JKKK) and household head (*Tuai Bilik*). To achieve the research objectives, researchers need to identify their role in Iban livelihood strategies to ensure that this research is conducted with the right decision makers and influencers at the research sites.

2.4.2.1 Penghulu in the Iban Community

In Malaysia, the institution of the *penghulu* (community chief) is the oldest in history, beginning as early as 1600 (Roshidi, 2021; Zain & Ahmadi, 2016). Aman et al. (2019) mentions in their study that during the Malay Sultanate, the appointment of a *penghulu* must be approved by the Sultan. *Penghulu* are known as traditional leaders who enjoy higher prestige in society and are responsible for the welfare of the local people, such as acting as mediators to settle disputes between communities (Aman et al., 2019; Kratoska, 1984). In Sarawak, a Temenggong is the main elected leader representative of each race. The title of Temenggong was first conferred by the third Rajah Sir Vyner Brooke to Penghulu Koh of Baleh in 1924. The Iban *penghulu* is the most notable role at the community level overseeing the management of some longhouses. The title of *penghulu* in Sarawak was originally known as *pengarah*. Pengarah Ringkai was the first elected *pengarah* in 1886. Since then, the Pengarah is elected by the Resident, and subsequently the title *pengarah* was changed to *penghulu*. The *penghulu* has the legal capacity to assist the District Officer in court cases (Colchester, 1993; Morrison, 1949). position of the *penghulu* corresponds to the elements of Iban leaders at the community level (Cramb, 2007; Hazis, 2011). Today the *penghulu* is

appointed by the State Government and is responsible for several villages. The *penghulu* directs and controls compliance with standard laws to maintain harmony and unity. In addition, the *penghulu* performs duties and responsibilities according to Sarawak customs and traditions. To aid in development of their jurisdiction, the *penghulu* acts as an intermediary for the government and disseminates information about the policies and aids to the community under their jurisdiction (Aman et al., 2019; Boyle, 2016; Sandin, 1968).

2.4.2.2 Tuai Rumah in The Iban Community

The *tuai rumah* plays out various significant roles and responsibilities. Under Brooke rule and to the present day, they are the guardians of the standard law (*adat*), adjudicators in land debates, and acts as a middleman between his longhouse and the administration (Pringle, 2010). Traditionally, the position of *tuai rumah* was based on kinship. The founding family in the longhouse has the most influence in the choice of *tuai rumah*. Usually, the eldest son assumes the position of *tuai rumah* if he can gain the trust of his longhouse community. In addition, to become *tuai rumah*, a person in the past must prove his bravery and successfully capture a human skull in a head hunt. Moreover, many *tuai burong* (chief augur) are in fact also *tuai rumah* (Freeman, 1961; Helbling, 2021). Previous research has also shown that the Iban believe that birds and animals send messages in the form of warnings and guidance. Thus, the *tuai burong* plays an important role in predicting upcoming events, for example, before the start of major activities such as those associated with rice cultivation (Jelani & Muhammad, 2018; Postill, 2003).

In present day, the longhouse is still led by a longhouse leader or *tuai rumah* who has been designated to lead the Iban community in their respective longhouse (Pang, 2018). The *tuai rumah* are responsible for the welfare of the community of their respective longhouse. As such, they should have superior leadership qualities and a high level of

commitment to the entire longhouse community. The *tuai rumah* is elected based on popularity and are mostly men. *tuai rumah* oversees the *adat* and always consults with the community elders before making decisions in disputes (Beynon, 2013; Jawan, 1996).

2.4.2.3 The JKKK in the Iban Community

The Security and Development Committee (JKKK) was formally established in Sarawak in 1987. The JKKK plays an important role in assisting the *tuai rumah* in the management of the longhouse and is involved in the planning, monitoring and implementation of rural projects covering various aspects such as economics, education, security and more. The JKKK consists of residents of the longhouse and the *tuai rumah* would usually act as the chairperson of the JKKK (Pringles, 2010; Puaat, 2017). Members of the JKKK include the secretary, treasurer, women's committee leader, and many more depending on the size of the longhouses or villages. In addition, some JKKK members also hold other positions in certain organisations such as the People's Volunteer Corps (RELA), Farmers Association, and political groups. This position gives them advantages and facilitates communication between the JKKK and different authorities (Hoe et al., 2018; Puaat, 2017). The JKKK are also responsible for keeping proper record of the village profile, events, and all related activities. Many studies have addressed the issues and problems in the JKKK administration, for example, Kamaruddin and Saad (2017) and Puaat (2017) found that the JKKK have limited financial resources, limited training, and low commitment. Moreover, Sadeka et al. (2020), and Manaf and Abdullah (2021) mentioned that effective JKKK administration is important to strengthen the management, and effective members should be selected to create social and established networks to improve the economic activities in the villages. On the other hand, Abdullah et al. (2011) and Hassan et al. (2011) argues that experienced committee members are important as they are more competent due

to exposure to external development. The JKKK also promotes economic and infrastructural development in the villages.

2.4.2.4 Bilik in the Iban Community

The *bilik* family is the essential unit in the Iban community. The *bilik* can be defined as an apartment or room in the longhouse occupied by a group of family members. The Iban have generally lived in longhouses that resemble houses under one roof. They can range in size from four families with 25 occupants to 80 families with 500 occupants. The *bilik* family of the Iban generally consists of the grandparents and their children and grandchildren. Iban *bilik* family is related to the concept of "*pun*" which means the origin or founder of the *bilik*. To maintain the concept of "*pun*", the Iban community measures the continuity of *bilik* members. Membership in the *bilik* family can be acquired through birth, marriage, and adoption. Elders are responsible for building their *bilik* family and oversee their own financial ventures (Kendawang et al., 2005; Hatta & Wahab, 2018; Pringles, 2010; Sim & Khan, 2014).

Traditionally, at least one child would remain (*tampong*) in the *bilik* to take care of the parents and maintain the continuity of their *bilik* from generation to generation. This child is the custodian of the *bilik* inheritance and has rights and property in his *bilik* family. Nevertheless, due to the rural exodus of the younger generation, there are more and more parents who do not have adult children living with them. However, the children would always fulfil their filial responsibility by visiting their family and sending the remittances to them (Soda, 2010). When they succeed the *bilik*, they would return to the longhouse after retirement and continue the "*pun*" of the *Bilik*. In addition, some of the children, when married, may choose to leave their original *bilik* (*mechah ari pun bilik*) and start a new *bilik* family in the same village. Consequently, in the Iban tradition, the continuous succession of

pun in *bilik* represents the permanent life of the *bilik* family. As such, the *bilik* family is considered "*punas*" if they are childless or do not have an adopted child to continue *bilik* membership (Chua et al., 2019; Helbing, 2021; Sather, 1996).

In terms of decision making, the *bilik* family gives freedom to both men and women to make decisions and have a say. Therefore, the *bilik* leader can be either male or female (Freeman, 1992). Moreover, due to the Iban culture of elder respect, they also consider the views and opinions of elders, such as parents or the *bilik* leader, before making the final decision. Decision making in Iban families can vary such as instrumental, emotional, social, financial, and specialised. Many families have an ongoing routine process that they use to guide decision making. Each family unit divides the work and then delegates authority based on individual capabilities. On the other hand, under Iban customary law (*adat),* all individuals are considered equal *(sama sebaka*) even though there are differences in wealth and power for each *bilik* family (Islam et al., 2020; Jelani & Muhammad, 2018; Sather, 1996).

2.4.3 Sustainable Livelihoods Framework (SLF)

Sustainable livelihood is an important concept in development policy as it provides the understanding of various dimensions of livelihood to reduce poverty (Jiao et al., 2017; Kaija, 2007). Numerous researchers have explored various issues in sustainable livelihood, for example, occupational diversity in rural areas (Ellis, 2000), poverty alleviation (Barrett et al., 2001), and asset characteristics (Esethu, 2016). In addition, the Institute for Development Studies (IDS) started developing the Sustainable Livelihoods Analysis (SLA) in the mid-1980s (DFID, 1999). The SLA focuses on distinguishing the essential resources (physical, natural, human, financial and social) identified with livelihood. The SLA is a

useful strategy to understand the interrelationships between livelihood assets and livelihood activities.

Moreover, Sustainable Livelihoods Framework (SLF) is the most widely used and thoughtful of all livelihood models. SLF has been used in a number of studies and has been applied in the funding agencies through the Department for International Development (DFID) and the United Nations Development Program (UNDP). In addition, various non-governmental organisations (NGOs) such as the Cooperative for Assistance and Relief Everywhere (CARE) and the Oxford Committee for Famine Relief (OXFAM) have applied the SLF in their studies (Brocklesby, 2003; Yuniarti, 2017).

The best-known livelihood structure used is the British Department for International Development (DFID) livelihood framework. The livelihood assets include five unique capitals that can be accessed at individual and community levels, and it shapes the environment from which different systems are targeted. In addition, the structure helps identify barriers experienced by communities and the weaknesses that affect their current and potential livelihood systems. Therefore, the researcher relies on this framework to identify livelihood assets and their function in characterising the scope of livelihood decisions. The DFID framework is illustrated in Figure 2.1.

The framework illustrates the different contexts of livelihood, and sustainable livelihood is achieved by accessing a variety of these contexts of livelihood. The five basic contexts in the livelihood system are explained. First, the vulnerability context in which individuals are exposed to shocks, trends, and seasonality. Vulnerability occurs when individuals are exposed to a damaging threat and are insufficiently able to respond effectively. Second, the livelihood asset. It is the essential stage upon which the livelihood

of the family can be constructed. The benefits are articulated by the accompanying five types of assets, namely human, physical, social, financial, and natural capital to attain optimistic livelihood outcomes. Third, the policies, institutions, and processes. These elements are critical because they operate at all levels, determine access to assets, and influence decision-making procedures. Fourth, livelihood strategies. They include the activities by which the family unit attempts to generate income to meet their livelihood goals. Livelihood strategies focus on increasing the various types of assets to which the household has access (Carney et al., 2000; DFID, 1999).

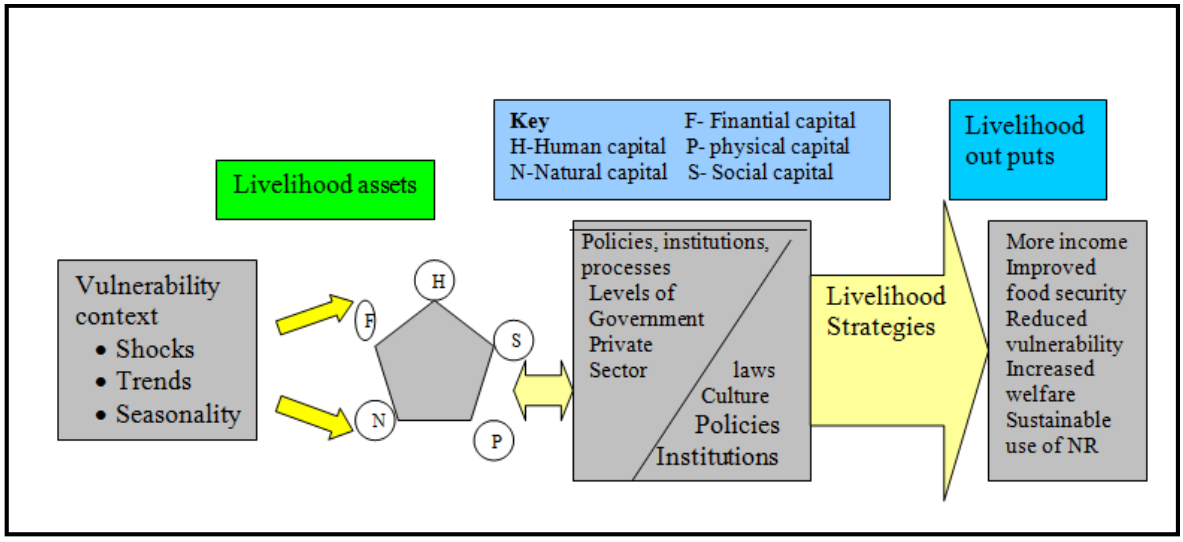


Figure 2.1: DFID Livelihood Framework

Finally, this section will discuss the concept of livelihood outcomes. This refers to the achievements of livelihood systems, such as increased income, expanded wealth, reduced vulnerability, improved food security and more sustainable use of natural resources (DFID, 2000; Lewins, 2004). Farrington et al. (1999) established that people adopt different types of livelihood strategies to increase income and reduce vulnerability. The DFID framework focuses on the livelihoods of disadvantaged people to identify problems that need to be addressed to eradicate and overcome poverty (Al Azad et al., 2019; Mwamfupe, 2017). However, some criticise the DFID framework for focusing too much on economics and not

considering certain issues such as conflict and gender (Levine, 2014). Another limitation of DFID's framework is the unclear guidelines for classifying the disadvantaged group in terms of their relationship to informal structures and processes (Valdés & Pérez, 2011).

In addition to DFID, another important framework is the CARE Livelihood Framework. It was developed based on the dimensions of livelihood proposed by Chambers and Conway (1992), which includes the possession of human capabilities, access to tangible and intangible resources and the existence of financial activities. CARE focuses on empowering people and believes that people can build their own livelihoods and are not overly dependent on support or assistance from the government or other parties (Quandt, 2018). The CARE Livelihood Framework is shown in Figure 2.2.

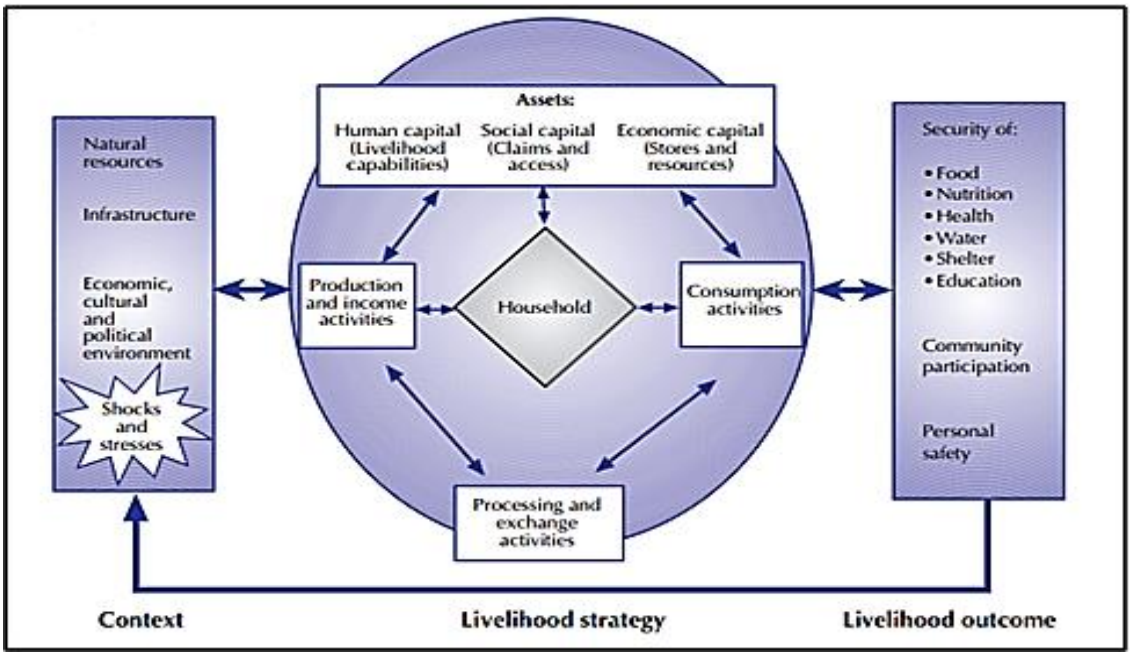


Figure 2.2: CARE Livelihood Framework (DFID, 1999)

The CARE framework revolves around the livelihood strategies of a household or family. There are three basic components in this framework, which include context, livelihood strategy, and livelihood outcome. First, contextual factors include natural resources, infrastructure, economic, cultural, and political environment that influence

livelihoods. They also include the main shock and stress factors that can affect livelihoods. Second, livelihood strategies explain the human, social, economic and natural capital held by different types of social units, as well as the nature of production, financial gain and exchange activities. Thirdly, consumption activities can be explained in terms of the livelihood outcome of the household that produces the different types of livelihoods such as food, nutrition, and health (Brocklesby & Fisher, 2003; Krantz, 2001; Obrist et al., 2007). CARE 's livelihood strategies explain the dynamic interactions between different parts of the system. Both DFID and CARE address the needs of the poor to improve their livelihoods.

However, compared to DFID, CARE's framework focuses largely on aiding at the local level and therefore neglects structures and processes (Knutsson, 2006; Toner, 2003). This framework is not adopted in this study because it does not focus on physical capital such as land, which is a critical factor for the Iban community in strategically planning their livelihood activities.

Another important framework is the United Nations Development Programme (UNDP) livelihood framework, whereby sustainable livelihoods are characterised as the ability to adapt to and recover from stuns and stresses. The UNDP framework, illustrated in Figure 2.3, proposes a programming framework to reduce inconsistencies with sustainable development.

The framework contains three main elements, namely drivers, entry point and outcome. The UNDP framework brings together poverty, power, and environmental issues. It also takes an asset-based approach, highlighting the need to understand response and adaptation strategies to analyse the use of different types of assets. Given the importance of technology in lifting people out of poverty, it draws on adaptation strategies that people can

use in their livelihoods (Carney et al., 2000; DFID, 2000). As such, it differs somewhat from DFID, which focuses on assets, structures, and procedures. In summary, DFID, CARE and UNDP all have their own strengths and weaknesses. The livelihood approach should be flexible and adaptable to meet local circumstances and explain livelihoods holistically.

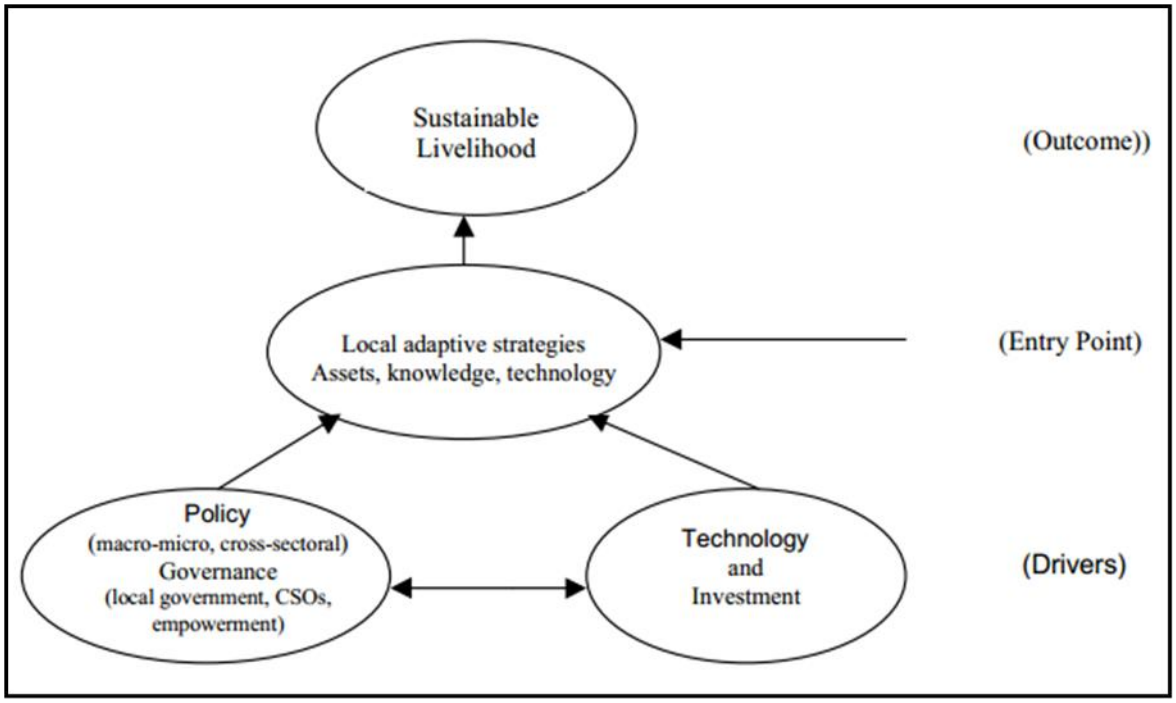


Figure 2.3: UNDP Livelihood Framework (DFID, 1999)

2.4.3.1 The Selection of Livelihood Framework

Based on the research objectives, the researcher concludes that the structures of UNDP and CARE are not quite suitable to be applied in this study. This is because livelihood systems, whether farm or non-farm, depend on decision factors aimed at achieving the most ideal outcomes in terms of economic livelihood. As such, it cannot be considered as an empirical model for the real situation, but merely provides an important perspective for the researcher to consider when investigating possible livelihood strategies based on livelihood capital, namely human, natural, physical, financial, and social capital. Therefore, this study uses DFID Sustainable Livelihood Framework (SLF) as a guide. It is relevant to the

investigation in this study as it can break down the livelihood capital of rural communities in a clearer and straightforward manner.

However, the DFID approach does not adequately capture the political dimensions of human interactions (gendered decision making). Moreover, it did not fully integrate Indigenous Knowledge. In response to these limitations, this study combines the Sustainable Livelihood Framework (SLF) with structural change development theory, the concept of gender and indigenous knowledge. Until recently, there has been no study that has simultaneously used this framework to examine the livelihood strategies of the Iban in Pantu Sub-District.

2.4.4 Categories of Rural Livelihood Strategies

Rural families participate in numerous activities to improve their livelihood and income while limiting weaknesses and hazards. These activities may include both agricultural and non-agricultural activities. Furthermore, rural communities are regularly linked to traditional livelihoods. Their activities include food production and cash crops, which include both farm and non-farm activities (Bryon, 1999). Moreover, rural livelihoods also relate to various stakeholders such as landowners, the landless, workers, private firms, farmers' associations, and Non-Governmental Organisations (NGOs). Subsequently, there are variety of rural livelihood activities that include a mix of agriculture, fishing, tourism, and other non-agricultural activities (Jiao et al., 2017; Mphande, 2016).

Ellis (1999), in examining rural livelihood, noted that gender is an essential component of rural livelihood. He further asserted that people have different resources, access to assets and opportunities. Ellis (2000) found that there are more economic livelihood opportunities for rural men than women. Moreover, due to prejudice and

discrimination, most women did not own property, had less education and training. In addition, profitable economic activities occurred through the intervention of men, thus women naturally have less scope with lower wages (Ahmed et al., 2015; Djurfeldt, 2018).

According to Ellis (1998) and Barrett et al. (2001), the arrangement of rural livelihood strategies gives a clear picture of how the family is involved in different types of livelihood activities. Livelihood activities may be based on the farm such as raising domestic animals and growing crops, and non-farm such as wage employment in various farms, non-agricultural sources of wages, self-employment, and remittances. Likewise, Warren (2002) posits that livelihood strategies also can be categorised into farm versus non-farm, on-farm versus off-farm activities, local versus transient, and independent labour versus wage labour. Each of these characterisations is valuable in providing an idea of the choices required for rural livelihood.

In addition, Shackleton et al. (2008) distinguished three types of livelihood practices, namely specialisation, decision to diversify, and coping approaches. Specialisation is when individuals focus or concentrate on certain income generating activities. There are some advantages of specialisation such as higher efficiency and development opportunities. In contrast, the decision to diversify refers to the efforts of individuals and families to find better approaches to increase income and reduce ecological hazards. This includes both on-farm and off-farm activities to generate additional income in agriculture and non-agricultural sectors, such as small-scale wage labour, as well as various techniques to mitigate hazards or risks. Finally, coping approaches refer to people's ability to deal with food shortages in the family. Fenton et al. (2017) and Fazana et al. (2017) found that the choice of coping

approaches depends on the diversity and steadiness of family finances, such that people with higher education are more likely to have stable income and can cope with food shortages.

In another study, Aluma (2004) found that there are different types of livelihood strategies, some of which are associated with agriculture and others are not. Non-agricultural activities are becoming increasingly important in Africa, for example, because non-agricultural sources constitute a large part of a normal family income. Furthermore, Angelo (2016) categorises livelihood strategies into farm only, farm and non-farm, and non-farm only. Farm is an area of land used for growing crops and rearing animals, whereas non-farm employment includes small-scale industry and trade, such as discount stores and retail stores. Non-farm employment also includes wage sources from severance pay, pensions, and social premiums. At this point, Xu et al. (2015) found that infrastructure and environmental conditions influence households' decision whether to switch to non-farm employment.

In rural family units, livelihood depends on a mix of farm and non-farm activities that generate sources of income (Ellis 2000). Farm activities include logging, farming, and animal husbandry. Non-farm activities include income sources from compensatory work, pensions, and private enterprise. Numerous intentions in the form of push and pull factors influence family units to expand their resources, salaries, and activities. For example, some families expand because they have minimal choices, while better-off families expand because they have many choices (Barrett, et al. 2001; Ellis 2000; Lemaire, 2015). Other studies have shown that expansion can occur either as a deliberate family unit strategy or as an automatic response to hardship; it can serve both as a safety valve for the rural poor and as a method of gathering for the rural rich (Ding, 2018; Ellis, 1998; Waha et al., 2018). In addition, livelihood strategy includes extension to various activities that generate food and

income. For example, in rural areas, many families engage in non-agricultural activities such as wage labour and self-employment in small ventures (Ellis, 2000; Firman, 1994). Others are engaged in occasional or permanent migration to urban areas. Travellers send remittances back to rural areas, hence remittances become another source of livelihood (Asfaw, 2017; Bebbington, 1999; Li & Zhou, 2015).

In order to clearly reflect the research objectives and facilitate the research process with villagers, the researcher adopted the dual mode of description which is the farm and non-farm category in rural livelihood strategies.

2.4.5 The Role of Livelihood Strategies in Poverty Alleviation

Poverty has been characterised in different ways over the years, which has affected the nature of planned poverty reduction interventions (Angelo, 2016). The link between livelihood strategies and poverty is the most important aspect for sustainable poverty alleviation (Liu et al., 2017; Wang et al., 2020). Abdullahi (2019) found that rural poverty could be alleviated through non-farm activities rather than focusing solely on agriculture. Additionally, researchers such as Seng (2015) and Sarou (2019) asserted that diversification from agriculture to non-farm activities in rural areas is another way to alleviate poverty. However, poverty alleviation must go beyond promoting general monetary development and adapt a broader plan of activities that includes providing targeted financial opportunities to the poor, developing physical facilities and facilitating their empowerment to reduce their vulnerability to various dangers and difficulties (Odoh et al., 2019; World Bank, 2001).

Furthermore, Byron and Michael (1999) contend that the forest as a natural resource is used as an adaptive technique in which individuals draw on available resources to solve problems between seasons or in times of crisis. The use of natural resources serves to

alleviate hardship and protect individuals from hunger and loss of income. For example, wildlife and plants provide a stable supply of nutritionally adequate food. In addition, the use of wood products helps to lift the family out of poverty by serving as a source of reserves, collections and resource accumulation (Newton et al., 2016; Ofoegbu et al., 2016).

Other non-agricultural activities include agribusiness, transportation, retail, tourism, manufacturing, and self-employment activities such as handicrafts, bakery, and mechanics (Odoh et al., 2019; Rantso, 2016). However, extensive studies show that in order for the poor to benefit from opportunities within the rural non-farm economic system, they must overcome many constraints, which include limited access to connectivity, education, applicable skills, finance, and property rights to land (Drall & Mandal, 2021; Imai et al., 2015). It is therefore important to understand the full extent of the existence and success of non-farm activities in rural areas and their impact on income for poverty reduction.

2.4.6 Rural Livelihood Diversification

Livelihood diversification entails complex collaboration with poverty, wage support, agricultural efficiency, ecological protection, and gender relations (Ellis, 1999). Hussein and Nelson (2016) recognised that exogenous patterns and shocks play a significant function in pushing rural individuals towards an expanded livelihood technique. It also refers to the expansion of cultivation as a transcendent method for rural survival (Ellis, 2000; Pur, 2018). Diversification is also characterised as the process by which rural families develop an undeniably different arrangement of activities and resources to sustain and improve their way of life. Studies on rural households have distinguished off-farm work as the most distinctive type of livelihood diversification (Asfaw et al., 2019; Saker et al., 2020).

On the other hand, Asfaw et al. (2019) noted that diversification can be divided into farm and non-farm diversification. Farm diversification involves the integration of crop varieties and livestock breeds into farm communities. In contrast, non-farm diversification refers to the pursuit of business or employment opportunities outside of traditional agriculture, such as services, retail stores, and manufacturing. Both farm and non-farm livelihood diversification is a way to manage risk (Kassie et al., 2017). In addition, Hernández et al. (2011) states that diversification includes integrated agriculture such as agrotourism. The important aspects of agrotourism includes accommodation, food, holidays, and participation in farm work. Agrotourism functions as a sustainable activity to complement a declining agricultural sector and ensure the survival of the household.

There are also several reasons for livelihood diversification, namely seasonality, labour market and risk management (Bell et al., 2021; Kerua, 2019). Agricultural production is highly seasonal. There is uncertainty about how much crop will be ready for harvest and how the harvestable crop will be valued in the market (Rao & Raju, 2020). Moreover, in the labour market, the family may choose to expand off-farm activities when both human capital factors and accessibility to job opportunities may affect returns in the labour market (Arouri & Nguyen, 2018; Watanabe, 2018).

In addition, Nkonya et al. (2018) and Wang et al. (2018) report that risk in farming is associated with uncertain harvests. It is characterised by variables beyond the control of producers, including soil, pest, and weather risks. Even when farmers have access to hired labour and a market for the harvested crop, it directly affects how they respond to seasonality, uncertainty, and risk in agricultural production. Therefore, diversification is the

decision to maximise returns by investing in different areas, each of which would respond differently to the same event (Amanto et al., 2019).

More studies need to be done in this area as it is important to understand the full extent of livelihood diversification, especially in the rural Iban community, in order to create a more secure and stable livelihood.

2.5 Agriculture and Livelihood Strategies

Land is a significant aspect of indigenous economy and identity. For the Iban community, owning a piece of land means that they have an association and a sense of belonging to their territory. Local rights to land include the right to develop the land, rights to the products of the wild, hunting and fishing rights, as well as rights to use the land for internal and formal purposes (Andersone et al., 2008). The Iban inhabit the landlocked regions of Sarawak, their topographical features and dependence on the land obviously determine their land use (Cramb, 2007). Developed land and any land where a natural forest product has been planted is heritable. Communities can demarcate certain areas of vital wilderness as *Pulau Galau* (reserve forest land) for common use, within which rights over various assets can be established. However, these rights are forfeit when the individual leaves his village or moves permanently. Olaniy et al. (2013) reported that as agricultural land use and productivity increases, indigenous people should utilise science and technology related to resource utilisation, disease and pest control, new crop varieties, and competitiveness. In addition, indigenous knowledge systems should be incorporated as an integral part for sustainable and cost-effective survival strategies (Urrieta, 2015). Therefore, indigenous peoples should be aware of various aspects such as technology, knowledge, and

finance for the development of their land. This includes the concepts of multifunctional agriculture.

Multifunctional agriculture is described as numerous bases of activities assigned to agriculture. The objective of multifunctional agriculture is to coordinate cropping patterns, expand food production and avoid migration of farmers to urban areas and secure better financial returns (Jonathan, 2000). It is also a process of incorporating new activities, maintaining existing ones or abandoning others, thus sustaining diverse and changing livelihoods (Saha & Bahal, 2014).

In addition, Far and Rezaei (2019) notes that multifunctional agriculture can have several other functions, such as managing renewable natural resources, conserving biodiversity, and contributing to the socioeconomic viability of rural areas.

2.5.1 Iban Agricultural Systems

Pringle (2010) reports that Iban agriculture was not generally limited to the development of hillside rice. In downstream regions, the Iban also developed swamp rice (*padi paya*). The cultivation of swamp rice usually occurs along the bank of the waterway. The rice is first planted in the seedbeds and then moved to the field as it develops. The swamp paddy field is typically cultivated for more than a couple of years in a row and the fallow period is much shorter than that for hill or slope rice (*padi bukit*). Regardless of the usual swamp rice cultivation, hill rice is becoming increasingly prevalent (Echoh et al., 2017). However, Cramb et al. (2009) reports that the Iban no longer see themselves as rice farmers even in rural communities where they pursue more diverse livelihood strategies such as cash crop cultivation and natural resource utilisation.

Moreover, each Iban family takes care of its own cultivation process (Hata & Wahab, 2018). Padoch et al. (1998), Maharani et al. (2018) and Ichikawa (2019) conducted studies on the phases of cultivation in rice farming by the Iban. The first phase of cultivation is the removal of undergrowth. The second phase involves the felling (*nebang*) of large trees. When the felling is done, the cultivation area is left to dry for a month. During this time, the farmer usually goes out to fish and hunt. This would give them enough food for the following stages of cultivation. In the meantime, the elder in the longhouse would observe the situation of certain stars and the various lunar periods to decide when to start planting (*nugal*). At the point when the elder conceded the suitable time for planting, the farmers would choose the ideal occasion for burning (*nunu*). After the burning, the farmers appeased the gods to protect their rice farm from being attacked by birds or insects. When the soil (*tegalan*) is prepared for planting, the farmers would plant the grains. When planting is ready, the women would weed (*mantun*) the fields while the men would go fishing and foraging for food. When the opportunity to harvest (*ngetau*) has come, the farmers would bring offerings to the gods at the sacred place where the first paddy grain was planted. When all the ceremonies are completed, the farmers harvest the grains and carry them to the longhouse, where they are sifted and soaked.

As proposed by Freeman (1970) these divisions of labour between the male and female are shown in Table 2.1. During any or all stages of development, Iban families may practice labour exchange. This extremely unique type of labour exchange in the Iban community is called *Beduruk*. They would work together on each of their farms beginning with one farm and then moving on to the next, which is done on a rotational basis (Maharani et al., 2019; Markus, 2020; Mertz & Christensen, 1997).

In another study, Ugeh et al. (2015) reported that there is a clear division of tasks between the male and female farmers. Their division of tasks is divided into different types, namely that the woman works in the paddy fields and the man looks for an additional salary or that both man and woman work together in the paddy fields. Nevertheless, nowadays, the Iban community is more proactive and creative in farming and usually receives help from government agencies in the form of subsidies, technology, and financial support (Hassan et al., 2019).

Table 2.1: Division of Labour for Paddy Cultivation

Activities	**Males**	**Females**
Nebas or slashing of undergrowth	/	/
Nebang or felling of the jungle	/	
Ngeredak or cutting away branches of fallen trees	/	
Nunu umai or firing of the farm	/	
Nugal or dibbling	/	
Ngebak or clearing away of branches, debris, etc. in the event of bad burn	/	/
Building of *langkau*, or farm hut	/	
Menih or sowing		/
Mantun or weeding		/
Erection of fences or *pagar*	/	
Making of traps (*peti, bubong*, etc.)	/	
Making of Aeolian alarms, etc.	/	
Guarding of the farm, especially at night	/	
Guarding of the farm, especially during the day		/
Berangkut or the carrying of the *padi*	/	
*Ngetau*or reaping		/
*Muntih*or selecting of seed, and its subsequent care		/
Nungko or threshing	/	
Ngeruman or separating of grains from straws		/
Besimpan or storing of *padi* in bins *(tibang)*	/	
Besimpan or placing of *padi* in baskets *(baka)* ready for storing		/
Berayar, and *muput* or initial winnowing by fanning		/
Muput or winnowing by hand trays *(chapan)*		/
Guarding of *padi* while it is being sunned	/	
Beburong or the taking of bad omens	/	
General supervision of ritual, especially during *manggol*	/	
Organisation of major *padi* rituals, such as *gawai*	/	

Table 2.1 continued

Preparation of offerings *(piring)* for all *padi* rituals		/
Care of the sacred rice – *sangking* and *padi pun*		/
Care of *padi* charms *(pengaroh padi)*		/
Participation in all *padi* rituals, with special responsibility for those accompanying the harvest		/
Blacksmithing - making of adzes *(bilong)*, bush knives*(duku)*, weeding implements *(ilok)*, and harvesting knives *(ketap)*	/	
Making of bark-cloth *(tekalong)*, and bark carrying straps	/	
Making of *lanji* (*padi* carrying baskets)	/	
Making of *bidai* (large mats for temporary storage)	/	
Making of *kajan* (palm frond) covers	/	
Making of *tibang* (large bins for permanent storage of *padi*)	/	
Making of *keban* (sowing baskets)		/
Making of *sintong* (reaping baskets)		/
Making of *baka* (large baskets for handling *padi*)		/
Making of mats (*tikai*)		/

Source: Freeman (1970)

However, doubts remain as to how far the current agricultural practices of the Iban affect their livelihood. Therefore, this study is necessary to examine the current agricultural practises of the Iban and the division of labour in the family, especially between the sexes.

2.6 Migration as Livelihood Strategies

There are two main types of migration, internal and external. Internal migration refers to individuals within a nation moving to another area within its locality, while external migration, also called worldwide or international movement, refers to movement across borders. Internal movement can be categorised into four aspects, namely rural to city, city to city, rural to rural, and city to rural (Tebboth et al., 2019; Zhang, 2017). However, city to city movement is not discussed here as this study focuses on the movement of the individual in the rural areas. Much of the migrants were men, but a growing number of women participated in the migration. The predominantly male migration from rural areas may also bring about changes in the agrarian gender division of labour, as the process of moving

permanently increases the burden of women on the farm. This leads to a shortage of agricultural labour in the farm (Nguyen, 2019; Ofuoku, 2017). Cheaper transportation costs and better road systems allow people to move to cities for work. However, various measures have been introduced by the government to create and improve the economy, namely the opening of land schemes by agencies such as Sarawak Land Consolidation and Rehabilitation Authority (SALCRA), Rubber Industry Smallholders Development Authority (RISDA) and other support schemes in rural areas (Ishida & Azizan, 1998). Despite this, there are still problems with out-migration in rural areas due to the lack of the next generation to develop this sector further because they would rather work in the cities than stay in the village. Thus, the settlements in rural communities are inhabited mostly by women, children, the elderly and the uneducated who face the challenge of making a living for their families (Fredericks, 2017; Ichikawa, 2019).

In terms of migration, Amster (2005) and Umping (2014) expressed that international migration occurs between people in Sarawak and Kalimantan. In fact, a large number of communities on both sides of the border share basic ethnic, semantic, and social characteristics. These normal characteristics have been used by communities on both sides of the border to frequently seek approaches to improve living conditions in Sarawak regions. The community near the border of Sarawak-Kalimantan highlights the cross-border developments, although generally without essential passes and utilising only illegal routes. It is a preferred choice for individuals who need to look for work, trade, access facilities or essentially visit their family members on both sides of the border.

People migrate for various reasons, such as economic and cultural reasons. The economic and cultural reasons are important features in migration. People migrate from rural

to urban areas in search of better economic opportunities. It is often reported that there is a need for income diversification through employment and increased access to cash income. Next, cultural reasons explain that rural to urban migration in most developing countries is based on the cultural belief that the man is the breadwinner of the family (Kontuly & Smith, 1995; Mihi & Kumpikaite, 2014). On the other hand, another study by Jia et al. (2017) informed that migration is related to dual economy caused by push and pull factors. The unfavourable conditions in one place, such as inadequate employment opportunities and infrastructure, push people out of their communities, while favourable conditions in an external place pull them to the new destination. Moreover, migration is not done by individuals but by families. This shows that there are decision-making structures, including between women and men and young and old within the household, which links structuralism to household analysis (Hare, 1999; Hoffmann et al., 2019).

Thus, this study recognises that migration is a gendered social process that engages with notions of femininity and masculinity as decision making about migration is related to power relations between men and women. This study also analyses migration for reasons of dual economy.

2.6.1 Iban Bejalai

The versatility of Iban *bejalai* has been examined from a variety of angles. There are a number of terms that have similar meanings and are used differently depending on localisation in Sarawak. For this study, different terms are used to characterise *bejalai,* namely *pengawa, berkuli, kerja, pegi, belelang, kampar* and *pindah.* In Iban culture, *bejalai* occupies a major function in masculinity (Kedit, 1993; Umping, 2014).

Pengawa has a much more extensive meaning and regularly includes a monetary reward. The word is additionally utilised for everyday tasks and resource activities. *Bejalai* in earlier times referred to male exploratory expeditions or journeys to explore new wilderness. An Iban man was considered an adult after completing such excursions. In this sense, *bejalai* was a particularly important social framework among the Iban (Kedit, 1993). When Iban men go on *bejalai*, they usually secure a position as a coolie or *bekuli*. On the other hand, *kerja* basically means an ordinary job, such as an administrative clerk. Nonetheless, *kerja* presently implies a job that is done in the method of *bejalai* and another job (*bekuli*) that is constant. Furthermore, *pegi* implies the individual's excursion or development, far from his village. The activities when individuals are in search of employment in another place are called *belelang*. *Kampar*, on the other hand, refers to an outsider who stays for a short time as a part of a family space. *Kampar* is an aftereffect of *bejalai* since an individual stays here and there with his adopted family during the trip (Helbing, 2021; Kato et al., 2020).

Freeman (1970) states that *bejalai* implies a movement action that begins with a point and then proceeds to the next, or a trip. Moreover, Kedit (1993) and Soda (2001) characterise *bejalai* as where men, especially single men, leave their towns to go on excursions that bring them better pay and social prominence. Comparatively, in the past, only the women with a bad reputation go for *bejalai*. In the traditional practise of the Iban, good women should take care of themselves by not leaving their homes because they should take care of their families and the rice fields for their own food. However, Sim (2011) found that it is very common nowadays for single Iban women to go *bejalai* for various reasons such as work and study. Moreover, more and more women are leaving the longhouse to follow their husbands who work in urban areas.

Furthermore, Sebli (2009) reports that *bejalai* is important for Iban self-esteem and for monetary reasons. Nowadays, most Iban move away from their longhouse to look for opportunities for work or further studies. In studying the *bejalai* of the Iban in Batang Ai and Bintulu, Padoch (1982) found that the Iban who migrate join the military and police force (Peninsula Malaysia) and some work as labourers in the oil fields of Miri, Brunei, or as loggers in timber camps in Sabah. Their study also found that the remuneration earned on the *bejalai* is far better than that of rubber tapping or farm work.

Sather (2006) claims that Sarawak has been doing well financially in the past. There are more opportunities in urban areas which leads to an increase in rural to urban migration. In another study, Siti et al. (2011) found that rural to urban migration affects livelihood activities in rural areas. A large number of youths move away from their village and bring their family with them. This is because of limited job opportunities in rural areas and some of them are reluctant to engage in rural agriculture. *Bejalai* contributes to life experience and provide opportunities for self-development and improvement of the family's standard of living (Soda & Seman, 2011).

Moreover, the notion of *bejalai* has been transformed by rapid socio-economic modernisation in rural areas, such as the development of tourism and some light industries. As a result, rural-urban migration has slowed down, and urban communities have come back to work in their rural areas. This is also due to the development of various facilities such as rural roads that increase accessibility and job opportunities (Langub, 2011; Soda, 2001; Windle & Cramb, 1997).

Since the idea of *bejalai* is an important aspect of Iban livelihood, the researcher has adopted this concept in developing research in the Iban community. Although the importance

of *bejalai* is abundantly mentioned in the literature, a consideration of the impact of *bejalai* on rural livelihood is lacking. On the other hand, the scope of *bejalai* should not be limited to any particular aspect. In this study, the scope of *bejalai* is more diverse as it can be practiced by all genders whether they are single or married with the main objective of improving livelihood. Moreover, it is important to address the types of *bejalai*, namely internal or external.

2.7 Uses of Natural Resources as Livelihood

In rural areas, natural resources such as land, water and forest are essential assets for supporting human life and securing prosperity. The indigenous peoples of Peninsular Malaysia, Sabah and Sarawak are highly dependent on the environment surrounding them for their daily life. The Iban community in Sarawak particularly, rely on their various natural resources and the land as basic components of their livelihood activities especially in hunting, fishing, and gathering forest products. Land is essential to them as a prerequisite for their income and social identity. It assumes a crucial function in their daily life as a cultural and social heritage. In any case, the destruction of natural resources by enormous development projects, such as logging, construction of hydroelectric dams, and oil palm plantations, has impacts on both the Iban and other indigenous communities in Sarawak (Cramb, 1993; Dale, 1997).

For the Iban, natural resources are part of their reserve forest or jungle (*pulau galau*) and land as territorial domain (*pemakai menoa*), which is crucial for their livelihood. For them, *pulau galau* is the place where they collect their forest products and the natural boundary that separates one longhouse from another (Ngidang, 2000). Umping (2014) and Padoch (1982) also clarified that according to Iban custom, *pemakai menoa* is a region of

land held by a particular longhouse that includes the farmer, gardens, forests with natural products, cemetery reserve, water catchment, and backwoods within a certain boundary.

Apart from this, Munan (2015) expressed that most of the indigenous food in Sarawak comes from natural resources, especially farms, forest, and rivers. Rice farmers regularly offered surplus rice for barter. Apart from this, hunting and gathering forest products clearly preceded rice or sago cultivation as survival methods and remained significant as an optional food source. Rural people regularly collect forest products or from the fields, namely snails, clams, mushrooms, and larvae (sago worm). Besides growing vegetables, rural women also collect wild vegetables and sell them to generate additional income for the family.

Moreover, hunting is an exclusive activity of the men. The men usually gather in small groups and go on hunting trips that can last a few hours or a few days. Hunting hogs and deer requires a pack of dogs. Before the days of shotguns, the trackers of Sarawak used blowguns to hunt small animals such as winged animals, squirrels, mouse deer and so on (Harrison, 2011; Yi & Mohd, 2020). Moreover, fishing is an essential aspect for all Sarawak communities. It was also found that the Iban in Sarawak used wild or domesticated pigs as a source of fat. They also used various nut butters and oil palms as a significant source of oil (Munan, 2015; Sather, 2006).

However, there is an ongoing debate about the distribution of natural resources. Most natural resources are exhaustible, meaning that they are present in insufficient quantities and can be depleted if not properly managed (Stiglitz, 2017). Furthermore, Mal et al. (2011) suggests that effective participation in biodiversity conservation programs will help conserve natural resources.

In addition, Naming (2015) and Ozawa (2015) argues that sustainable forest use is important because forests provide food, medicine, and livelihood for the rural community. They are economically, collectively, and spiritually associated to the forests. When the forest is destroyed, the cultures of the local people also vanish. As for the Iban community, they not only preserve their environmental system but also benefit from the resources they find in it through their traditional knowledge. Indigenous peoples are the bearers of traditional knowledge, and this knowledge can have a significant impact on sustainable development (Lydon et al., 2020).

2.8 Land Right in Iban Livelihood

Land is important for present and future generations and is part of the identity within the rural community. Land has inherent value and is also a natural asset through which other livelihood goals can be achieved. The Sarawak Land Code (1958) is the primary law that oversees land in Sarawak. The Sarawak Land Code reflects the historical contextualisation of indigenous communities and protects the privileges of landowners in Sarawak. This code was passed in 1957 and came into force in 1958. Since then, there have been several revisions. For example, in 1998, the instruments of valuation and part payment were introduced in preparation for compulsory acquisition of land. The most extensive changes were set out in the Land Code (Amendment) Ordinance 2000. This incorporated a meaning of local rights that was not present in the previous enactment (Adam, 2019; Bulan, 2006).

The Sarawak State Government has always focused on land development and guarantees the security of land tenure. Native land title in Sarawak is derived from the customary traditions and laws of local communities. These traditions are perceived as part of the Law of Malaysia in the Federal Constitution (Cooke, 2006; Cramb & Will, 1990). In

addition, Bulan (1999) asserts that traditions are the way to characterise the genuine property of the natives. Beginning with the Adat Iban Ordinance of 1993 and followed by the Adat Bidayuh Ordinance of 1994, various codes of law have been drafted based on the structure set forth in the Adat Iban (Lang, 2019; Subramaniam, 2018). Moreover, the general clarification of Adat Iban Ordinance in 1993 states that the standard of Iban laws throughout Sarawak are based on the current *Tusun Tunggu* Iban (Sea Dayak) Third Division 1952 and Dayak Adat Law Second Division 1963 (Hamid & Buang, 2011; Hooker, 2002). Furthermore, Khantun and Roy (2012) have demonstrated that the uncodified and systematised customs are subsequently an equally legitimate source of law, as the uncodified nature of the constitution are central principles that frequently appear as customs, habits, reference point and a selection of resolutions and legal instruments.

In the past, when the Iban cleared virgin forest land for cultivation, an offering to the spirits would be made (*miring*). Only once the *miring* ritual has been carried out can the primary clearing of the virgin forest for cultivation begin in the territory of their *pemakai menoa*. *Pemakai menoa* encompasses a territory of land bounded by a particular longhouse (Perera, 2009; Tang, 2013).

In addition, for *umai* land, it includes all areas developed as farms, gardens, *temuda* and forests for organic products. The Iban also made offering to the gods (*Petara*) each time before planting rice in the *umai*. The families within the communities that originally cleared the forest secures individual rights over explicit portions of the farmland. These rights are hereditary and are preferably handed down from generation to generation in the family. The boundary of the *umai* land is marked by certain indications. Farmland can be either a private or a customary property, depending on whether the privileges of access to such property lie

with the people or the communities. A group may claim free access only to certain types of common property, such as wild vegetables and shoots. At the same time, it retains the authority necessary to restrict access to produce that have monetary qualities such as rattan, timber, and trees with organic produce. However, the privileges of responsibility can be transferred to someone else (Kedit, 1993; Ugeh, 2015).

Temuda refers to the original plot of cultivated farmland. When the wealth of this farmland decays, the Iban farmers would leave the farmland for it to regain its fertility. The farmers would move on to cultivate a different plot of land and only return to the *temuda* many years later, either with the originally planted or different crops. On the other hand, *tembawai* refers to the old longhouse site, within the area of the *pemakai menoa*. *Tembawai* land can be either a natural or independently claimed land. An old longhouse site is distinguished by the various trees planted by its previous settlers. The old longhouse site serves as evidence not only of the privileges of a particular community over it, but also of particular people over particular trees within the *Tembawai* region (Freeman, 1992; Kedit, 1993).

Next, *pulau galau* includes areas of forest land that has been deliberately reserved by an individual or community which is not cleared or left untouched as a natural resource for the needs of the community. *Pulau galau* may be owned by one longhouse or several longhouses. It may be owned separately or jointly by several families. When *pulau galau* is owned by the community, the longhouse community has direct rights over the land. However, individuals from outside the longhouse are not allowed to fell trees or collect natural products. Various individuals from the longhouse are allowed to collect wild vegetables or cut bamboo, wood and other resources on the land. The area is declared to be

pulau galau when it is rich in wood, such as ironwood, to supply the people from the longhouse with material for their own use, especially for the construction of the longhouse (Azima et al., 2015).

However, there are issues concerning the customary right of indigenous people to land, and it becomes a dispute between the Iban and some development agencies. Conflict usually arises from the landowners' resistance to political pressure from above when private investors selected by the government are to form a joint venture (JV) with the community to develop their native customary land for plantations (Ngindang, 2005). This issue arises from the fact that the Iban want to protect their land rights. This study considers land as part of the natural assets of the Iban community. Land is a source of livelihood, areas for foraging, hunting, and gathering forest products.

2.9 Factors Influencing Rural Livelihood Strategies

An extensive literature review revealed that the choice of livelihood strategies of a rural household is influenced by various factors. It was found that the ability to seek a different livelihood strategy depends on the essentiality of material and non-material factors that individuals currently possess (Hossain, 2005; Mertz et al., 2005b; Rokodi, 2014). Material factors include stocks of food and cash savings, land, water, and forest. Non-material resources, on the other hand, include entitlement and access factors. Entitlement factors can be asserted in times of need against persons or organisations that have the right, duty, and power, such as the government. In addition, access factors refer to opportunities to access resources and services such as education and transportation.

Furthermore, Matthews and Nwaogwugwu (2014) found that cultural factors influence livelihood strategies of rural households. The three types of cultural factors were

found to influence rural households' livelihood strategies: high dependence on the household head, culture-based inequalities, and traditional gender-based property rights. Subsequently, Ellis (2000) pointed out some factors that influence livelihood, particularly irregularity, danger, labour markets, credit markets, resources, and adjustment techniques. In another study, Khatun and Roy (2012) clarified different factors that influence livelihood strategies namely age, education, family size, resource value, infrastructure, membership in social organisation and others government support (Weinlein, 2017).

However, various studies show that livelihood factors should be considered from two different perspectives, namely push and pull factors (Asfaw et al., 2019; Devereux, 2000; Hanh & Boonstra, 2018). Push techniques are designed to help families build a minimal level of ownership that increases their ability to interact more productively and proactively with other public and personal market actors. One example of this is building family or network ownership through shared ownership models and improving social relations with formal authorities.

On the other hand, pull techniques enable the improvement of market structures in ways that expand the scope and quality of opportunities to participate in the effective economic system. For example, the small and medium business can benefit from financial support for business development. Push and pull factors are an interactive strategy for achieving sustainable and scaled poverty reduction (Baffour et al., 2018; Shin & Kim, 2018).

Although there are widespread factors discussed in the literature by various scholars, it cannot be considered conclusive. The approach should focus on looking closely at the diversity of assets that contribute to building sustainable livelihoods and how they are interconnected. Through asset building, the rural community can develop its capacity to deal

with challenges and meet its needs in a sustainable manner. Hence, the Sustainable Livelihood Framework was adopted as it identifies five livelihood assets, namely capital, social, natural, financial, and physical. This framework was developed DFID and most commonly used livelihoods frameworks in development study (Knutsson, 2006; Udoh et al., 2017).

2.9.1 Livelihood Assets and its Influence on Livelihood Strategies

Rural communities need a range of assets to achieve positive livelihood outcomes. All five asset categories (human, social, natural, physical, and financial resources) are interrelated. No single category alone is sufficient to achieve all the many and varied livelihood outcomes that people need. DFID (1999) explains that the pentagon livelihood framework helps to measure changes in the various factors that contribute to livelihood strategies, as shown in Figure 2.4.

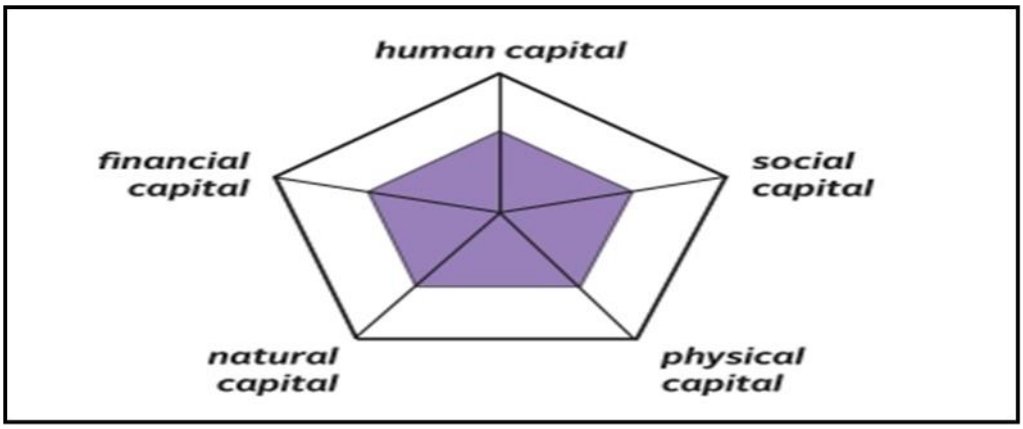


Figure 2.4: Livelihood Pentagon (DFID, 1999)

Xu et al. (2019) show that human capital is the most important asset, assuming that individuals need a range of different resources to achieve positive livelihood outcomes. Human resources include skills, information, ability to work and household size (Pandey et al., 2017). Moreover, Moser (2009) and Gai et al. (2020) find that family size has a

remarkable impact on farmers' livelihood decision. With more family members, they can distribute the workload in the family and improve the standard of living by expanding economic activities. Apart from this, Anderson et al. (2008) states that human capital is the prerequisite for rural communities. In their study, it was found that families with high human capital led by men prefer hunting in the wilderness over concentrating on agricultural activities.

Next, social capital are the social assets that individuals rely on, for example, to get connections either with more influential individuals (vertical relationship) or with others like themselves such as participation in gatherings or associations (horizontal relationship). Broadly, these are connections of trust, correspondence, and trade that the poor can draw on in times of need and that lower the cost of beneficial cooperation (Naithani & Saha, 2020). Furthermore, Mendez (2017) found that social capital, like human resources, has inherent value; good social connections are not just a method, they are an end in themselves.

Missemer (2018) showed that a higher stock of proximal natural resources is associated with higher financial, human, and social capital. Natural capital is the stock of various resources from the environmental system such as land, air, water and all the organisms that live in it. It has also been noted that deforestation poses a significant threat to the diversity of available resources. It is directly related to rural livelihood strategies associated with fuelwood collection, timber exploitation and cropland expansion. In addition, traditional slash-and-burn techniques have also contributed to the problem (Bateman & Mace, 2020; Carrasco et al., 2017).

Physical capital is an essential foundation that individuals need to make ends meet, and also known as tangible assets that are either intrinsically valuable or produce value for

the owner. Examples of such physical assets include machinery, land, buildings, vehicles, or any other form of tangible economic resource. Evidence from extensive studies also shows that when machinery is used in agricultural activities, the efficiency and capacity of production increases and contributes to the increase in standard of living (Ebenezer & Abbyssinia, 2018; Oluwatayo & Babalola, 2020).

Finally, financial capital includes the available stock and the inflow of money. Available stock refers to savings, which may be held in various forms, such as cash and bank deposits. It can also be obtained through lending institutions (Huang et al., 2018; Kuang et al., 2020). On the other hand, examples of regular inflows of money are income from pensions and remittances. To contribute positively to financial capital, these inflows must be reliable. Financial capital is an important component of rural community development and a key aspect of community resilience (Lu & Luo, 2021; Lukasiewicz et al., 2019; Quandt, 2018). A review of key studies found that farmers who have access to funds contribute to reduced poverty, as households with sufficient income do not need to rely on others for help (Liu et al., 2021; Shobe, 2018). Moreover, ensuring their financial inclusion can solve the significant economic opportunities of rural areas and bring benefits to the community by increasing household income and employment opportunities (Jiao et al., 2017; Lawealai, 2021).

As society progresses, farmers' physical resources, money-related resources, and social resources increase, allowing them to choose non-agricultural livelihoods and thus achieve differentiated livelihoods or change occupations; the higher the aggregate livelihoods, the more likely farmers are to choose livelihoods with higher pay (Moser, 2009). As evidenced by Cheruiyot (2020), the analysis of five livelihood assets in the rural

livelihood study involving mixed research was an effective method in evaluating the choice of agricultural and non-agricultural livelihood activities of less privileged communities in comparatively remote areas. These findings are also supported by the work of Uddin et al., (2020) who stated that the complementary effect of all five forms of livelihood activities can capture the complexity of livelihood such as opportunities and constraints. The researcher agreed with such ideas and believed that the most effective way to analyse the livelihood capital of a particular community is through the five livelihood assets as reflected in the Sustainable Livelihood Framework. The rural community has mostly adopted a diversified livelihood strategy. Therefore, there has been an increased awareness of the need for a holistic and comprehensive framework for assessing the factors affecting the livelihood strategies of the Iban. This study is an application of this framework by focusing on the five factors namely natural, social, human, physical and financial. Empirical evidence shows that livelihood assets are effective in identifying multiple livelihood choices in rural areas (Abbassi, 2020; Mahama & Maharjan, 2019; Scoones, 2009; Shivakoti & Shrestha, 2005). Hence, assets are an important component of any sustainable livelihood.

2.10 Gender and Pattern of Livelihood Activities

The rural way of life is a key area for understanding gender patterns and their roles in the family unit. In rural families, there is a gendered division of labour and in terms of livelihood sectors, men and women have different access. Their access to and interest in labour markets depends on the role within the family, the influence of culture and gender segregation of occupations. Women's livelihoods also vary within and between families, dictated by agriculture and other income. Women were found to be crucial contributors to family income. Moreover, rural women's work patterns are characterised by change and adaptability. Change and adaptability are evident in women taking up new roles in

agricultural and non-agricultural activities. Most rural families who own limited amounts of land or have no land often look for ways to increase family income and ensure food security through non-farm activities (Alston et al., 2017; Owens, 2018).

Most societies have historically identified gender as a means of dividing family work, which means that there are usually exclusive tasks that are expected to be done by women and men. Akthar et al. (2018) in their study in rural Southern Punjab found that women play an important role in the agricultural sector with nearly twenty million women involved in the production of crops, vegetables, and livestock. Cotton, which accounts for half of the national export earnings, depends heavily on female labour. Women bear sole responsibility for the cotton harvest, exposing themselves to health risks through exposure to pesticides.

Moreover, Race et al. (2019) and Mariyono (2019) found that women are the pillars of rural households, providing both family and farm labour. In addition, Alozie and Isiwu (2020) reaffirmed the importance of women in marketing agricultural products and most fruit and vegetable stalls were owned by women. Besides that, in the indigenous community, men are mainly engaged in farming, hunting, keeping domesticated farm animals and fishing. Women on the other hand, focus on domestic work and help the family with farm chores (Mertz et al., 2005b). In addition, Mehar et al. (2016) found that male farmers rely on the labour of the family, especially women, for certain agricultural activities.

Additionally, the difference between the gender also displays how they make decisions pertaining to their livelihood. For example, men make higher levels of reward seeking decisions compared to women. In terms of risky decisions, men are generally more risk averse than women. Furthermore, men are more efficient than women and show a more goal-oriented behaviour pattern (Genre, 2021). A review of major studies found that, when

both men and women are involved in family decision making, it broadens perspectives, diversifies the pool of talent, and reduces conflict. In addition, the female leadership style contributes to the benefits of diversity, as women are better able to handle difficult personal relationships because they pay more attention to people's needs (Carnegie, 2020; Weler et al., 2018).

Eneyew and Mengistu (2004) reported that the study of gender orientation examines perceived contrasts in people's lives, encounters, needs and issues. On the other hand, Frankenberger et al. (2002) drew attention to the fact that understanding gender relations and elements is fundamental to understanding job security for people within family units. They suggested that the study should consider the gender division of labour, access to goods and enterprises, authority over assets, power relations and rights. The study should distinguish techniques and activities that contribute to improved value and also explore the potential for separate effects (both positive and negative) for a range of proposed mediation options. The study should consider contrasts in identity and age while reflecting on women's livelihoods and obligations.

Existing studies show that the changes within the gender and livelihood structure are mainly due to growing tensions between the needs of employment and gender roles in family decision-making. The changing position of women includes more equal access to decision-making and resources, elimination of discrimination in employment and ownership of land. There is an urgent need to improve the situation of women at various levels and give them more opportunities to engage in income-generating activities (Aayog, 2017; Dzanku, 2019; Xie et al., 2020). Thus, this study further explores the role of gender in the livelihood decision-making process. Gender analysis is a subfield of socio-economic study. It is used

to show the association between gender relations, the livelihood choice and problems to be solved.

2.10.1 Gender Theories

Gender theory is the study of the masculine and feminine and their behaviour in a particular context such as household and community. It also refers to the interdisciplinary academic field dedicated to the analysis of gender character and representation (Jule, 2014).

The most common gender theories are Moser's (1993) triple role, Harvard, and social relations (Abdul, 2012). Moser's triple roles, developed by Caroline Moser (1993), this theory follows the gender orientation and promotion approach, which emphasises the importance of gender orientation in livelihood, gender needs, control over wealth, and dynamics within the family. Specifically, Moser's theory refers to the threefold livelihood structure of production, reproduction, and community activities. Productive tasks contribute to the household economy, such as the production of crops and livestock, reproductive tasks provide the household with food preparation and childcare, and communal tasks support the community and social events. The role of women in productive labour is unusual and unappreciated in comparison to men. Reproductive work is often done by women, and it is not usually associated with income, as it is one of the traditional tasks of women. In the community, women are most often engaged in manual activities, such as visiting the sick and fundraising, compared to men who are actively involved in political and representative activities (Delaney, 2018; McLaren et al., 2020). This theory supports strategies for integrating gender into all types of interventions and comparing power relations in various levels such as household and community (Balgah et al., 2019). However, the limitation of

this theory is that it considers the workload as a separate activity rather than the interrelated activities of women and men (Bui et al., 2018; Neumann, 2013).

In addition, Harvard gender theory is characterised by the motivating forces and demands that influence both men and women in their livelihood strategies. It identifies the type and amount of work that men and women do in a household, business, or community. As such, it can help planners design more efficient projects to improve overall productivity (Percy, 1999; Skutsch, 2005). However, Harvard theory has been criticised for focusing on material resources rather than strategic gender needs. It also overgeneralises and standardises inequalities such as class and ethnicity (Warren, 2007).

Next, the social relations theory views the functions of gender as a set of intensity relations from social plans and social directives (Kabeer, 2000). The system of social relations views gender as reasoning as well as a natural advantage and considers the inconsistent access to assets for different individuals from the family. The social relations structure accentuates the heterogeneity of women and the social relations that exist within a community. In addressing gender inequality, the focus of this theory is not on integrating women into development, but on changing the social structures, processes and relationships that underpin women's disadvantaged position. Ending women's subordination thus goes beyond the redistribution of economic resources and involves a redistribution of power (Agarwal, 1997; Kabeer, 2006; Lucy, 2018).

All the gender theories discussed are important because they provide a ready-made methodology that can be used to explain the gender division of labour and different work patterns. Gender roles should not be seen as mutually exclusive; they can also overlap. The choice of an appropriate framework depends on the task at hand, the context, and the

resources available. Each theory is designed to address different aspects of gender equality and is therefore useful for different objectives. Gender analysis helps to interpret inequalities and differences and better understand their causes. As such, in this study, only the triple role theory is employed as it shows more practicality in explaining the dynamic idea of gender division of labour, women's profitable and regenerative livelihoods, accessibility to assets and power relations within the family unit. The researcher examined how women cope with their different roles in making decisions about livelihood. This is related to the possibility of women performing a triple role of productive labour, reproduction, and community welfare, as well as the different livelihood activities that women perform at the same time.

2.11 Application of Indigenous Knowledge in Rural Livelihood

Indigenous knowledge (IK) consists of principles, rites, perceptions, learning methods and practices of the local community. Indigenous knowledge has many areas that include linguistics, treatment of ailments, weather, agriculture, animal farming and crafts. IK is an important portion of subsistence practices of rural communities as it informs the decision making with regards to food, security, and management of useful plant resources.

IK is naturally transmitted across all ages through oral communication. Indeed, a considerable number of the traits, standards, and practices continues conventionally. Indigenous ways remain dynamic and inventive components of contemporary communities (Pottier et al., 2003). It is necessary to avoid the IK generalisations and negative self-judgments to increase the acceptance of IK in development (Alcock et al., 2011; Omar, 2005). In this process, the development solutions that are culturally acceptable should be implemented as this is an important contribution to sustainable development plans (Eda, 2010).

A recent study reported that IK comes from a sense of ownership that could then be passed directly and there is more than one reason why understanding indigenous knowledge is important. First, they help discover the maximum best preference for local development. Second, it could help professionals to recognise the indigenous community better. Third, the presence of indigenous information has effectively controlled the environment (Keane et al., 2017; Magni, 2017; Makondo & Thomas, 2018).

Available evidence show that IK reflects the interests of a community. Some groups rely on their conventional information to survive, and for them the land is the provision of food and a gift from the Creator. Although customs, culture, and impacts on the land vary widely among indigenous peoples, all regard the environment as part of life and respect it accordingly (Gadil et al., 2021; Son et al., 2019).

The natural environment is also the centre of the universe, culture, and local identity of the indigenous community. It connects them to their past, to what exists, and to destiny, because they are a legacy for their children and grandchildren. In this way, indigeneity offers a sense of belonging to a place. At the heart of indigeneity there are deep connexions to the environment as rivers, animals, plants, insects, rocks, and people are inextricably linked (Eckert et al., 2020; Munsaka & Dube, 2018).

The close ties of indigenous knowledge to nature have enabled local cultures to survive for generations amidst the pressures of change. Indigenous initiatives to respond to contemporary environmental conditions constitute the dynamic characteristics of local cultures. This study focuses on a particular category or type of IK and how it affects the livelihood of the Iban. It also ensures a better understanding of how IK is embedded in a

dynamic system where spirituality, kinship and other factors are interconnected and influence each other.

2.11.1 Indigenous Knowledge as a Conceptual Approach in Rural Livelihood

Indigenous knowledge refers to the knowledge, skills, and ways of thinking created by social orders. For rural people, indigenous knowledge (IK) is a dynamic guide to crucial parts of daily life. The essentiality of IK to rural livelihoods is a widely debated topic, and there is a developing enthusiasm to understand the different parts of IK and their influence on people's livelihoods (Aikenhead & Ogawa, 2007; Battiste & Youngblood, 2000; Mundy & Compton, 1991). IK is created and communicated by communities after some time to adapt to their own agricultural and other livelihoods. IK is created through an orderly process of observing nearby conditions, trying different things, and adapting to ecological responses (Edda et al., 2010). Moreover, it was found that indigenous knowledge can be in form of tacit and implicit knowledge. Tacit knowledge is the knowledge gathered from personal experience, while explicit knowledge can be easily expressed, documented, and communicated (Nonaka & Von, 2009; Pereira et al., 2019).

Chikaire et al. (2012) are among the few researchers who have fundamentally examined the ways in which indigenous knowledge has been brought into the dominant discussion. In their study, IK helps create development solutions that are culturally compatible for the community being assisted. Previously, such knowledge was ignored, and development solutions that were created were neither economically feasible nor culturally appropriate for a particular community. Subsequently, Campbell (2009) noted that the IK approach is the basis for agriculture, environmental protection, education, customary law, and many other activities. For example, Hodgson (2017) reported that in disputes between

indigenous peoples over land, customary rights are usually used to resolve potential conflicts arising from competing claims to land. Other studies also report that activities that incorporate indigenous perspectives and conventional strategies are most likely to address needs and promote change (Aluma, 2004; Brush, 1993). In addition, development aspects that do not understand the indigenous concept can end up in a risky state (Fang, 2013). All studies consistently reported the inclusion of IK in rural lifestyle. It is believed that such recognition empowers people, boosts their self-esteem, and consequently allows them to participate in decision-making processes. IK cannot simply be removed from the community. The integration of an indigenous knowledge perspective implies a serious engagement with people's knowledge at the local level, and an understanding of the interrelation between the practical, social, and cultural context (Risiro et al., 2013).

Explicit and tacit IK are also important approaches in the livelihood of the Iban. Traditionally, Ibans hold on to their traditional animistic beliefs which are inherited from one generation to the next. IK of the Iban have been derived from various sources as the Iban world includes both humans, gods, and spirits. Life in the natural world is associated with omens. Traditionally, the Iban also believe that their lives are closely connected to the world of the gods. The interaction between the human and the spirits constantly takes place in divinations, sacrificial acts, and dreams. In the Iban way of life, the knowledge of IK encompasses different areas of their lives such as crafts, agriculture, fishing, and hunting, including culture and traditions such as traditional performances and festivals (Jawol et al., 2018; Lydon et al., 2020).

The Iban use plants as conventional medicine, as they still find it in the forest, and some grown in the farm. The Iban also believe that natural remedies do not cause side effects.

For example, turmeric can help lower coronary heart disease, delay ageing problems, and increase brain function (Supiandi & Leliavia, 2020). However, IK among the Iban is in danger of dying out, as such information continues to be passed on orally generally undocumented (Budiman et al., 2018; Jarvie & Perumal, 1994).

Although some studies have been conducted on the Iban IK, deeper analysis is still needed, particularly on how IK influences the choice of livelihood strategies in response to changes in their environment.

2.12 Agriculture and Rural Development Transformation

Agriculture is an integral part of the Malaysian economic system. Agricultural growth is necessary to alleviate poverty and reduce rural-urban inequality. Agriculture also refers to subsistence and cash crops. In rural Malaysia, subsistence agriculture is the cultivation of crops such as rice, fruits, and vegetables to meet the needs of individuals and their families. In addition, Malaysian agriculture has been and continues to be inundated by modern crops, particularly oil palm, rubber, cocoa, coffee, and pepper. It was found that the palm oil industry is one of the major financial drivers of agriculture (Echoh et al., 2017; Izzah & Wan, 2019; Razali et al., 2018).

In addition, the development of oil palm in Sarawak has boosted the livelihood of smallholders. It creates direct employment and also provides a long-term and stable source of income (Soda & Kayo, 2019). In addition, McCarthy and Cramb (2009) showed that the palm oil sector also provides an opportunity to lift many communities out of poverty. Moreover, the Sarawak Land Consolidation and Rehabilitation Authority (SALCRA) promotes employment for locals and transformation of rural communities through a cohesive land development plan (Ngindang, 2002). However, the manageability of such land

acquisitions of enormous scale is controversial as the conversion of land into oil palm plantations of enormous scale can have irreversible impacts on nature (Obidzinsk et al., 2011; Posen et al., 2014).

The findings of recent studies also show that livelihoods and land use in rural Malaysia are undergoing a series of changes. This is because the rapid increase in cash crop development has been accompanied by high rates of deforestation and biodiversity degradation, which consequently raises concerns about the long-term manageability of this land use change (Razali et al., 2018; Varkkey et al., 2018).

Nowadays, most locals prefer to grow cash crops such as rubber, pepper, and oil palm instead of their traditional crops. Empirical studies show that cash crop cultivation contributes to the positive impact on family income. In addition, livestock is a major industry such as poultry, pigs, and goats. The rural economy consists mainly of the smallholders of pepper, rubber, palm oil, coconut, and paddy farms. The government has implemented various rural development adjustment projects such as rural industrialisation and integrated development projects (Kato & Soda, 2019; Loh, 2004; Tang, 2020).

High production at farm level is important to increase the income of farmers. Therefore, agricultural development is of great importance and yet controversial, especially in relation to the role of subsistence and cash crop agriculture for indigenous rural people such as the Iban community. Consequently, this research is important to fill the gap and furthermore to analyse the current circumstances.

2.12.1 Agricultural Practices and Land Development Schemes

The government in Malaysia has implemented various rural development strategies and programmes. These strategies include rural industrialisation, non-farm employment, community development and rural urbanisation which form the non-agricultural components of the rural development policy. Together with the provision of infrastructure, basic needs, and welfare programmes to improve the quality of life, agrarian reform was a key strategy responsible for the transformation of the rural sector in Malaysia. It was seen as a means to bring about structural and institutional changes in the agricultural sector and promote greater equity in agricultural and rural development. The reform determines the size distribution of farms and changes the institutional structure that governs people's relationship with the land (Hansen, 2005).

Apart from this, there is also in-situ development which involves replanting, rehabilitating, and consolidating activities on existing agricultural land that are facing low productivity. Various government agencies are involved in the replanting programme such as the Rubber Industry Smallholders Development Authority (RISDA). Integrated Rural Development (IRD) is also being implemented in Malaysia. To ensure an effective outcome, a more integrated approach to rural development was needed. The idea was that the various complementary rural development activities needed to have single administrative framework, rather than being implemented by various separate agencies. There are two key components of IRD, namely inter-sectoral planning and local level coordination (Cramb & Will, 1990; Hassan et al., 2018; Mustaffa et al., 2019). In-situ development strategies help to improve income, modernise agriculture, and raise living standards; however, it has been noted that it mostly benefits those who own land, limited employment opportunities and out-migration among the youth (Hoe et al., 2018; Rashid et al., 2019; Zainoddin et al., 2017).

In addition, rural industrialisation in Malaysia began to receive considerable attention. Rural industrialisation includes the processing of agricultural commodities for export, such as rubber, palm oil and cocoa. Traditional activities also included handicrafts with products such as batik, basketry and pottery produced as small-scale enterprises. Rural industrialisation also included small-scale production of consumer goods for the local market, such as bread and cakes, fish crackers, clothing, furniture, bricks, and cement blocks. There were also motor and electrical repairs, often with only one working proprietor in informal premises (Fong et al., 2017; Kader et al., 2009; Thomson, 2004).

The Malaysian Government has also established Rural Growth Centres (RGCs), which are the amalgamation of traditional villages comprising the main village or a group of villages to function as one economic unit. The RGCs have been provided with necessary facilities and infrastructure. The idea is to diversify the rural economy based on the development of agro-based small-scale industries and non-farm activities and services (Lydon, 2015; Ngindang, 1997).

Various land development programmes have been introduced to support the active participation of indigenous smallholder farmers in commercial land development. Cramb (2013) pointed out that the concept of joint venture is based on the assumption that Native Customary Land becomes an economic asset through the creation of a native customary land. After the merger, it is assumed that large-scale plantation development and optimal returns can be realised. It is also assumed that large areas of native customary land will be attractive and profitable for private investment. However, there are still some challenges of land development in rural areas such as out-migration and increasing dependence on foreign labour, global warming, and climate change (Hassan et al., 2018; Hatta & Ali, 2013).

In addition, the Land Custody and Development Authority (LCDA) have been appointed as managing agents. Each landowner must sign a trust deed to assign all their respective rights, interests, shares, and assets in the land to the government agency. The government agency then enters a joint venture with a private company. If an area is designated for commercial development, the Minister may declare that area as a development area. A title is issued to the joint venture companies (JVC) for a period of 60 years for an agreed value. The said land may only be used for agricultural purposes and the JVC may not trade in the land or encumber it as security for loans to implement the project without prior approval from the government. At the expiration of the term of the title, the customary landowners shall decide either to renew the title in favour of the JVC or to apply for the disposal of the land to it or to another entity. Strategic partnerships with commercial operators have been widely promoted as a means of maintaining productivity and facilitating access to high-value markets for communities (Azima et al., 2015; Cramb & Ferraro, 2017).

However, the joint venture concept has too often failed to achieve satisfactory results because of the often-conflicting interests of landowners and private investors. Although development planners are responsible for solving the problems, government development interests often end up supporting the interests of private capital (Ngindang, 2008). As such a current study is needed to determine how the various agriculture policies and land development influence the livelihood of the rural community in Sarawak.

2.13 Structure Change Development Theory

Development involves multiple disciplines, namely economic, social, political, cultural, religious, and environmental. Development theories serve as a guide on how best to achieve desirable changes in society. The structural change development theory became

dominant by the monumental work of Arthur Lewis, Harris Todaro, Simon Kuznets, and Hollis Chenery.

Lewis's structural change theory was used in this study. The development of structural change theory by Arthur Lewis became dominant in 1954 and is an early traditional theory that seeks to explain how the movement of labour from one sector to another leads to economic development in a rural area, especially in developing countries. It is also known as the dual economic theory. This theory attempts to explain the transition of labour from a traditional to a modern industrial sector (Boianovsky, 2018).

According to Sen et al. (2020), capital accumulation is envisaged through the transfer of labour from the traditional to the modern sector and he believed that the economy of the community can be sustained through this process. In Lewis' theory, the traditional sector is characterised by low wages, an abundance of labour, and low productivity due to an intensive production process. Even though there are many workers, they do not contribute to production because their marginal productivity is zero. For example, most traditional agriculture does not produce high yield, and some is merely subsistence. Traditional agriculture involves the exhaustive use of local knowledge, traditional implements, natural resources, and organic compost. Moreover, agricultural production in subsistence agriculture is mainly for survival with little surplus. On the other hand, the modern industrial sector is defined by higher wages, higher marginal productivity, and initially a higher demand for labour (Buchenrieder, 2007; Herrendorf, 2014).

However, there are several limitations to this theory, as there should be an equilibrium of the development economy. When an economy grows, all sectors must support each other. The interconnectedness of the various sectors implied that growth was required

throughout the economy at a constant rate. This view recommends that governments should take the responsibility of supporting those sectors that cannot develop naturally or due to lack of investment. In this study, therefore, all traditional and modern sectors are considered important to the livelihood of the rural community.

This theory was chosen because it touches on all parts of the structural change system, namely structural change in agriculture and rural livelihood. The structure of the agricultural sector is the result of ongoing changes in various sub-sectors such as the economic, social, cultural, and technological. The focus is on the modernisation of agriculture. In the process of capital accumulation, agriculture is becoming increasingly capital intensive, which means that subsistence agriculture is shifting to a more commercialised agriculture. In subsistence agriculture, small-scale crops are grown primarily for consumption by the family. If there is a surplus of food, it is sometimes sold, but this is not common. In commercial farming, the primary objective for better income (Hapke & Ayyankeril, 2004; Key, 2004). Moreover, Bishop et al. (2018) reported that in commercial agriculture, farmers cooperate with the broader economy and institutions. Norman and Malton (2002) reported that the bottom line of modern agriculture is focused on achieving sustainability. Agricultural sustainability is based on the principle of meeting the needs of the present without compromising the prospects of upcoming generations.

Structural changes in rural livelihood are related to two sectors namely farm and non-farm. Non-farm or non-agricultural livelihoods are a necessary aspect of rural livelihoods. Non-agricultural livelihoods can also draw skilled labour away from the agricultural sector and accordingly promote out-migration and fundamental change (Herrendorf, 2014). For this

study, structural change theory is applied to agricultural adaptation and rural livelihoods in the Iban community.

Overall, the structural change theory is the most appropriate theory for this study as it relates to the dual economic sector, i.e., agricultural, and non-agricultural sectors, and represents the dynamic nature of the rural economic system which is more applicable to the current livelihood strategies of the Iban as influenced by modernisation and recent development.

2.14 Conclusions

Livelihood studies have emerged as an important mechanism for studying indigenous livelihood strategies and their local adaptations for survival. There is a growing consensus that any policy for rural development must take into account multidimensional aspects of rural livelihoods in order to alleviate poverty and achieve the sustainable development goals (Carney, 1998). This chapter is important as it gives a firm premise to the various parts. The literature highlights the idea of livelihood, livelihood strategies, livelihood factors, gender patterns and theories, and the importance of indigenous knowledge. The variables related to livelihood procedures, gender and indigenous knowledge were discussed in this chapter. The relevance to agricultural employment structure change and rural livelihood theory is due to the development of farming systems and rural livelihood transformation of the indigenous community, particularly the Iban community. The development transformation can be seen in the agricultural policy and land development system.

In addition, it is also related to livelihood diversification in the Iban community. Likewise, the current analysis of agricultural systems and livelihoods has adopted the sustainable livelihoods framework to provide a comprehensive tool for understanding the

livelihoods of the indigenous community. Structural change theory and Sustainable Livelihood Framework (SLF) are considered appropriate for the study.

The study additionally connects the SLF to the idea of the triple role of gender and indigenous knowledge. The relevance of Sustainable Livelihood Framework (SLF) in this study also provides knowledge about the various livelihood activities. The development theory of structural change was also considered in this study to examine the various components of livelihood diversification and the climate that affects the livelihood strategies of family units. An examination of livelihood strategies is imperative as it involves the skills, resources, income, and activities of individuals that are required as a method of survival. In conclusion, this research aims to fill the knowledge gaps in the literature regarding livelihood of the Iban community.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter describes the methods used in this study to answer the research objectives, research questions, and assumptions. Both quantitative and qualitative methods were used in this study to collect data and information about the livelihood strategies of an Iban community in Pantu Sub-District. In addition, in-depth interviews, structured interviews, focus group interviews and observation were discussed to collect data and information from the key informants namely the community chiefs (*penghulu*), the headmen (*tuai rumah*) and other longhouse residents which include the household heads (*tuai bilik*). An overview of the research design, research instruments, population, sample size, sampling technique and procedure, data collection procedure and data analysis, is presented.

3.2 Research Design

In this research, a mixed method is used as it mitigates some shortcomings of single method research such as pure quantitative or qualitative research. Therefore, this research uses both quantitative and qualitative methods. Specifically, data collection methods used to gather information from the Iban community in this study includes in-depth interviews, structured interviews, focus group interviews, and observation.

Since this study is exploratory in nature, it begins with the qualitative method. The suitability of this method lies in the way it identifies the contextual issues that are assessed from various sources of evidence. In this research, both descriptive and explanatory case study approaches are used sequentially. In the descriptive process, key characteristics of the

Iban community are acknowledged, followed by an explanatory quantitative analysis that can identify cause-effect relationships in the selection of livelihood strategies of the Iban community. A qualitative research strategy is used to explore people's perceptions and gain deeper insights into specific issues, as well as examine the institutional context of livelihoods at the household and community level. This line of thought is supported by Bilgin (2017) who argues that qualitative methods are participatory in nature and seek to understand the reality of the situation from the perspective of the actors.

The complementarity of qualitative and quantitative research is critical to livelihood research. Quantitative research findings are based on numerical responses and therefore generally offer little insight into thoughts and behaviours. Through qualitative research on the other hand, the researcher specifically selects people and places that can provide the necessary information. In terms of numbers, the qualitative researcher does not select many people or places, but a small number that can provide in-depth information about a particular person or place. However, due to its in-depth nature, qualitative research is more time-consuming, therefore it is more difficult to generalise and relies on experienced researchers to conduct interviews or lead focus groups.

3.2.1 Research Strategies

Data collection was focused on the livelihood strategies of a Iban Community in Pantu Sub-District. Key informants have been identified and consists of the community chiefs (*penghulu*), headmen (*tuai rumah*) and other members of the longhouse which include household heads (*tuai bilik*) who are also respondents of this study. Before heading into the field, preparations were made to ensure that the fieldwork would be successful. Several months were spent designing the interview schedule and guides for the in-depth interviews

and focus group discussions. In addition, a work plan and timetable were prepared before fieldwork began. Once all the logistical arrangements for the fieldwork have been made, the researcher proceeded to the field with the research instruments and other interview materials.

Based on the results of this research, both qualitative and quantitative analyses will then be applied to the data generated which are expected to shed light on the study of Iban livelihood and future research. In order to narrow down the livelihood strategies, this study applies structure change theory to analyse Iban livelihood along with the Sustainable Livelihood Framework (SLF) to assess the factors affecting the livelihood strategies of rural Iban households. In addition, the triple role theory is used to assess the gender role in this study. The concept of indigenous knowledge is also used to evaluate the livelihood strategies of the Iban in Pantu Sub-District. Finally, to show the relevance of all theories, the data were be analysed based on the frameworks and theories mentioned above.

3.2.2 Selecting the Research Sites

The fieldwork was carried out in two stages. The first stage involved a recce visit to the research sites in December 2016. The aim was to become familiar with the area and the villages. Prior to this, a letter of introduction was obtained from Universiti Malaysia Sarawak and brought to a meeting with the Pantu Sub-District officer and other government agencies. Various villages and communities were recommended by the district officers who had years of experience with the locals. It was found that these places had similar characteristics and met the research objectives. A week was then spent with locals to cultivate the community network and develop local contact lists, including the list of *penghulu* and *tuai rumah*, which was obtained from the Pantu Sub-District office. Popular local meeting places in Pantu and

Lachau town were identified and issues of accessibility to the various longhouses in Pantu Sub-District were addressed in advance.

The second phase was the actual fieldwork, during which observations and interviews with informants were conducted. The actual fieldwork took three months, from January 2017 to March 2017. The fieldwork involved interviewing *penghulus, tuai rumahs* and heads of households, a group of men and women and observation. The location of Pantu Sub-District is shown in Figure 3.1 and Figure 3.2. The distance from Sri Aman town to Pantu Sub-District is 57.8 km. The name Pantu was derived from a local prickly palm tree which grows abundantly in the forests of the area. It is a traditional food among Sarawakians, especially the Iban community.

Pantu Sub-District consists of two administrative areas, namely Munggu Ubah and Kara Pantu. These areas are administered by three community chiefs known as *penghulu*. Pantu is also covered by two State Legislative Assembly seats, namely N.30 Balai Ringin and N.31 Bukit Begunan. There are 137 Iban longhouses and six Chinese villages in Pantu. Each village has a headman whose appointment is by consensus of the community and then formally appointed by the State Government.

The headmen are called *tuai rumah* in the Iban Community, while in the Chinese community they are called Kapitan. There are two famous towns found in this area, namely Pantu and Lachau. Interestingly, most of the older Chinese here can speak Iban while the younger Iban generations can speak Mandarin because they attended Chinese-medium schools.

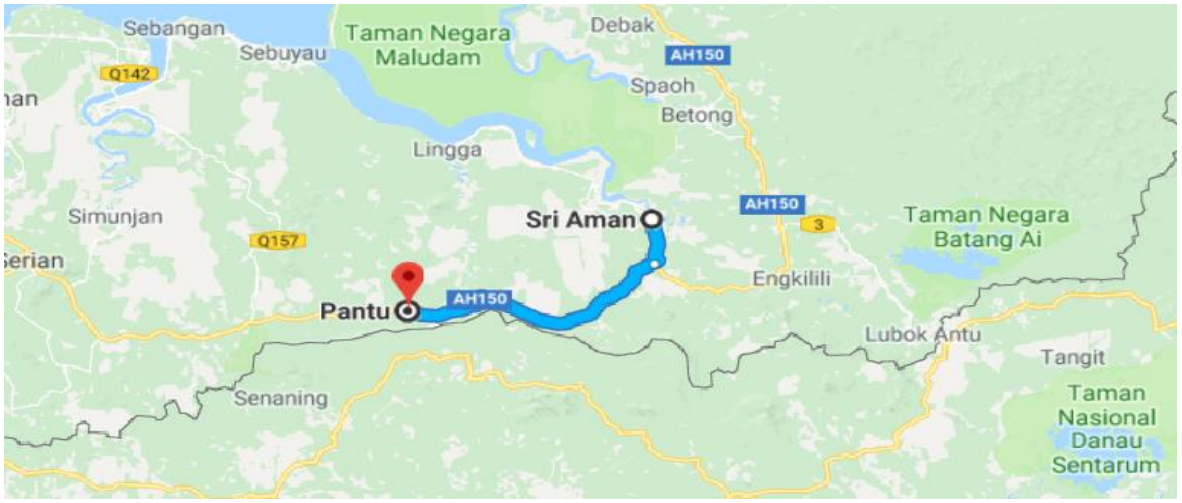


Figure 3.1: Location of Pantu Sub-District (Google, 2017)



Figure 3.2: Map of Pantu Sub-District (Google, 2017)

3.2.3 Rationale of Selecting the Research Sites

As mentioned earlier, the research sites were suggested by the local officials who knew the background of the local communities. These sites had some common characteristics in terms of ethnicity, location, and livelihood strategies that are consistent with the objectives of this study. First, most of the communities in Pantu Sub District are Iban. The Iban are one of the largest indigenous groups in Sarawak. Secondly, Pantu Sub-District is unique as it is located near the border between Kalimantan, Indonesia, and Malaysia. It was found that the Iban originally came from Kalimantan and lived around the Kapuas River. From there, they

migrated to the Sri Aman River area. Pantu Sub-District is one of the earliest Iban settlements in Sarawak. As such, it provides a wealth of knowledge about Iban traditions and livelihood strategies.

Third, there is a high concentration of longhouses in Pantu Sub-District. There are 137 longhouses in this district and of these, 12 longhouses have been identified as research sites, namely six from Munggu Ubah and six from Kara Pantu. Fourthly, the guiding principle for the selection of the Iban community in these longhouses is that they are involved in various agricultural activities and utilise natural resources in their daily life. Finally, these villages still preserve their indigenous knowledge and there are still villagers who are familiar with this knowledge.

3.3 Research Instrumentation

A research instrument is a tool used to obtain, measure, and analyse data from subjects around the research topic. Qualitative research is primarily an exploratory study. The sources for formulating the questions for in-depth interview, focus group interview and structural interview were adopted from different studies namely Riman (2009), Mambu (2013) and Regina (2016). However, the source is not adopted in its entirety as it needs to be adapted to the research area and research objectives with the questions. In a qualitative study, the interviewer deliberately selects individuals and targets that can provide the essential data. In terms of numbers, the qualitative analyst does not select an enormous number of people or places, but a modest number that would provide internal and external data about each subject or place. The quality of qualitative exploration is its capacity to give complex literary accounts of how individuals experience a particular topic of study. Qualitative techniques are additionally powerful in identifying elusive elements, for example, accepted practices,

financial status, gendered circumstances, identity, and religion, whose function in the study in question may not be immediately obvious. Qualitative information sorting strategies change through the use of unstructured or semi-organised methods. Gerring (2009) reports that qualitative techniques are participatory in nature and seek to capture truth from the perspective of the entertained.

One of the most natural methods for qualitative data collection is direct observation. It can be distinguished from participant observation in several ways. In this study, the researcher conducting the observation seeks to learn and observe the strategies of Iban livelihood in Pantu. In the community setting, the researcher takes careful, purposeful notes of what they see and records their perceptions as field notes in a field note pad. In addition, casual conversations, and communications with individuals at the research sites are important components of the technique and are recorded in the field notes.

Subsequently, the interviews can be classified into three categories, namely unstructured, semi-structured and structured interviews. The unstructured can be termed as in-depth interview. The unstructured interview involves a direct connexion between the researcher and an interviewee. It differs from standard structured interviews in several key ways. First, there is no formal, organised instrument, although the researcher may have some underlying guiding inquiries or central ideas about which to ask questions. Second, the interviewer can steer the discussion in any direction of intrigue that might emerge. Lastly, the unstructured conversation is especially helpful in exploring a topic comprehensively. Nonetheless, this method also has its limitations. Since each interview is usually exceptional and there is no predetermined arrangement of questions asked, it is normally more difficult to examine information from unstructured interviews, particularly when integrating multiple

interviewees. Therefore, the in-depth interview is used to compensate for this weakness. The in-depth interview is a qualitative research method in which intensive one-on-one interviews are conducted with a small number of respondents to explore their perspectives on a particular thought or circumstance. The process for conducting an in-depth interview follows a similar general process as other research, namely planning, creating instruments, gathering information, reviewing information, and distributing discoveries.

The in-depth interview for this research were conducted at a location suggested by the respondents. In this study, the in-depth interview is conducted in two phases, the first phase with the *penghulu* and the second phase with the *tuai rumah*. Two *penghulus* and 12 *tuai rumahs* were involved in the in-depth interviews. The *penghulu* and *tuai rumah* were purposely selected because of their knowledge and experience in livelihood strategies of the Iban in Pantu, especially in their respective areas of responsibility. Furthermore, the semi-structured interviews are conducted as in-depth interviews. It is a sequence of open-ended questions depending on the topics the researcher wants to cover. The open-ended nature of the interview characterises the topic under study and gives both the questioner and the interviewee the opportunity to talk about certain points in more detail. This technique gives the researcher the opportunity to test the interviewee to expand or pursue a different line of inquiry presented by what the interviewee states. Finally, in structured interviewing, the researcher asks the interviewee follow-up questions in a similar manner.

Furthermore, the focus group is conducted to obtain data from a group as opposed to an individual. Focus group is a type of in-depth interview that is conducted in a group, where the group has features that are characteristic of the statement, size, structure, and session strategies. The focus or the object of study is the association with the group. The members

influence each other through their reactions to the thoughts and commitments during the conversation. The general attributes of focus group are association of individuals, progression of groups, homogeneity of members in terms of research interests, age of qualitative information, and point directed conversation driven by the reason for the study (Freitas et al., 1998). This study uses the focus group interview to identify the differences in roles in livelihood activities in relation to the decision-making process and how their roles have changed.

3.4 Pilot Study

Pilot study refers to small forms to pre-test a particular study instrument. It can give advance indications of where the essential adventure of evaluation might fail, where research findings cannot be followed, or whether proposed instruments are appropriate or inappropriately jumbled. A pilot study is an approach used to evaluate interview questions with a smaller sample compared to the intended sample size. In this phase, each set of structured interview guide was administered in a more informal manner, which is 22 respondents selected using the convenience sampling method. In this method, respondents were selected because they are a convenient source, easy to contact and reach. The pilot study was conducted in December 2016 in a longhouse in Kampung Selanjan Sebemban.

The inputs from the pilot study were used to update the research schedule. This was done by making the questions more specific. Some questions were slightly modified to make them clearer, for example the question on land ownership, instead of "yes" or "no", the study should indicate the types of land ownership, namely inherited, purchased, borrowed, or rented.

In addition, the pilot test revealed that the estimated time to conduct the interview with each *tuai bilik* was 20 to 30 minutes. It was found that each question must be communicated to the respondents in appropriate language before they give the answers to the questions asked. Through this pilot study, the researcher can improve the research quality by being more specific in the questions asked.

3.5 Sample Size, Sampling Technique and Procedure

Purposive sampling was used in the selection of research sites. Purposive sampling is a criteria-based selection in which settings, people, or events and areas are deliberately selected to provide important information for the researcher. Based on the 2016 statistics from Pantu Sub-District, the total population in Pantu is 16,100 and the major ethnic groups are as follows: Iban (12,800), Chinese (2,600) and others (800) as shown in Table 3.1.

Table 3.1: Pantu Sub-District Total Population

Races	**Number of persons**	**Percentage**
Bumiputra (Iban)	12,800	80%
Chinese	2,600	15%
Others	800	5%
	16, 100	**100%**

The complete list of villages was obtained from Pantu Sub-District office. Overall, there are two Iban *penghulu* and one Chinese *penghulu* in Pantu Sub-District, as shown in Table 3.2.

Here, the *penghulu* are assigned to a particular area to manage a larger area with some villages, and they also become the facilitator and mediator between the locals and the government. Under the *penghulu* are *tuai rumah* and Kapitan for the Chinese community.

Penghulu Entika Anak Senan is responsible for managing the Iban community in Kara Pantu while Penghulu Johnny A/L Lumi is responsible for managing the Iban in Munggu Ubah in Pantu.

Table 3.2: *Penghulu* and Administrative Areas

Penghulu	**Administrative Area**	**Number of Longhouse**
Entika Anak Senan	Iban Villages in Kara Pantu	64
Johnny A/L Lumi	Iban Villages in Munggu Ubah	73
Lee Thong Sen	All Chinese Villages in Munggu Ubah and Kara Pantu	6
	Total	**143**

In this study, no sampling frame is prepared for the selection of *penghulu.* Due to the nature of information needed for Iban livelihood, an in-depth interview was conducted with all two Iban *penghulu.* Both were selected for the in-depth interview to gather systematic information on livelihood history, cultural interpretation, and modes of adaptation in the past and today. The two Iban *penghulus* represent Kara and Munggu Ubah area in Pantu Sub-District.

In quantitative methods, Sekaran (2003) argues that a sample size of more than 30 and less than 500 is appropriate for most studies. To determine the sample size for the structural interview, Yamane's (1967) formula was employed in this study. In this study, structural interview through interview schedule was used to interview the 220 *tuai bilik* to understand the demographic and economic information, household livelihood strategies and choice, impact of livelihood diversification activities and indigenous knowledge of the Iban. The reason for using a sample rather than collecting data from the entire population is obvious. In a research study involving several hundred or even thousands of items, it would

be practically impossible to collect, test, or examine data from every item. Even if it were possible, it would be prohibitively expensive in terms of time, cost, and other human resources.

Next, cluster sampling technique was used to select the villages or longhouses in both Kara and Munggu Ubah areas to represent the main economies activities in Pantu. The cluster sampling is a method where the researcher divides the entire population into sections or clusters that represent a population. Table 3.3 shows the name list of the 12 *tuai rumah*, their longhouse and administrative areas that were selected for the in-depth interview.

Table 3.3: *Tuai Rumah* and their Longhouses

Tuai Rumah	**Longhouses**	**Areas**
Mejat Anak Muping	Kampung Semawa Ili	Munggu Ubah
Jelema Anak Jimang	Kampung Limau	Munggu Ubah
Donald Anak Matin	Kampung Abok Pulau Mawang	Munggu Ubah
Usek Anak Beredai	Kampung Sungai Merah Atas	Munggu Ubah
Lanyau Anak Mangas	Kampung Pantu	Munggu Ubah
Bar Anak Adie	Kampung Selantik Ulu	Munggu Ubah
Sepitson Anak Apa	Kampung Rapak Tepus	Kara Pantu
Merinding Anak Mangku	Kampung Rapak Baru	Kara Pantu
Gani Anak Tindin	Kampung Lachau Engkabang	Kara Pantu
Suring Anak Bangih	Kampung Lachau Jinggau	Kara Pantu
Marphy Anak Jeritan	Kampung Selanjan Sebemban	Kara Pantu
Iben Anak Gawan	Kampung Selanjan Asal	Kara Pantu

Twelve longhouses were selected based on demographics consideration. First, in order to answer all the research objectives, it is important that both areas in Pantu Sub-District, namely Munggu Ubah and Kara, were represented in the study. Secondly, they are the most actively engaged in agricultural activities. Thirdly, the communities in these villages

still depend on natural resources for their sustenance. Fourth, these villages were also suggested by the *penghulu* during the in-depth interview. At this stage, all 12 *tuai rumah*, representing Munggu Ubah and Pantu Kara were personally interviewed by the researcher. Stratified random sampling was then used to randomly select household heads in the 12 selected longhouses for interviews. In this case, purposive disproportionate sampling was used because some families are not in the longhouse due to *bejalai.* Then, 220 of the respondents were identified using the Yamane formula shown in Equation 3.1.

$$n = N\,(1 + N\,e^2) \qquad \text{Equation 3.1}$$

According to the Yamane formula, *n* is the corrected sample size, *N* is the population, and *e* is the precision level. In addition, the confidence level depends on the requirements of the study, for example, in the range of 95% to 97%. In this study, the total population (*N*) in the selected 12 longhouses is 277, thus the sample size is equivalent to 220 respondents with a confidence level of 97%. Yamane formula offers a simplified formula to compute the sample size as the sample size can differ widely from one study to another. The sample size for structure interview with the head of household shown in Table 3.4.

In this study, the respondents selected in this stratum refers to the *tuai bilik* in the 12 longhouses. This unit of analysis is the *bilik* family, an Iban household containing an independent domestic family unit. There is a total of 220 heads of the *bilik* members selected in structure interview via the interview schedule. The respondents selected for face-to-face interview are the heads of the household or their representatives who are 18 years old and above. The reason of setting these criteria is that the heads of household would know best the livelihood strategies of their individual families. Family members who are too young i.e.

below 18 years old might not be able to answer the questions on the livelihood strategies of their families.

Table 3.4: Sample Size for Structured Interview via Interview Schedule

No.	Villages	Number of Household *(Bilik /Pintu)*	Number of Interviews (Head of Household / *Tuai Bilik*)	Total
	Munggu Ubah			
1.	Kampung Semawa Ili	23	23	
2.	Kampung Limau	38	36	
3.	Kampung Abok Pulau Mawang	13	13	
4.	Kampung Sungai Merah Atas	16	10	
5.	Kampung Pantu	22	14	
6.	Kampung Selantik Ulu	19	14	**110**
	Kara Pantu			
7.	Kampung Rapak Tepus	32	25	
8.	Kampung Rapak Baru	22	15	
9.	Kampung Lachau Engkabang	21	21	
10.	Kampung Lachau Jinggau	14	14	
11.	Kampung Selanjan Sebemban	51	29	
12.	Kampung Selanjan Asal	6	6	**110**
Total				**220**

Finally, purposive sampling is used in focus group discussion for men and women. They are purposely selected to identify their role in economies activities. A focus group is a group that comprised of individuals with certain characteristics who focus discussions on a given issue or topic. In the focus group, these selected members were brought together to explore attitudes and perceptions, feelings, and ideas about a topic. A focus group interview

provides a setting for the relatively homogeneous group to reflect on the questions asked by the interviewer. There are 15 men and 15 women in the focus group discussion.

3.6 Method of Data Collection

The underlying need for data collection is to capture quality evidence that seeks to answer all the research questions and objectives of this study. The source of data is based on primary and secondary data (Creswell, 2014; Sekaran, 2003).

3.6.1 Primary Data

The primary data consists of a collection of original data from the survey carried out. The primary data collected can enhance the quality and assurance of this study. An advantage of primary data is that it is specifically tailored to research needs (Sekaran & Bougie, 2009). Primary data for this study were collected through in-depth interview, focus group interview, structured interviews, and direct observation.

Interviews and focus group were conducted with *penghulu*, *tuai rumah* and heads of each *bilik* in the longhouse. Interactions with the participants were conducted in the Iban language as the participants were not well-versed in other languages. Besides the interview, observation method was also used in this study. The researcher used all their senses to examine Iban livelihood strategies in natural settings or naturally occurring situations.

3.6.2 Secondary Data

Secondary data was collected from both published and unpublished sources, including journals, articles, books, pamphlets, brochures, publications and reports from Pantu Sub-District office, Agriculture Department, and Farmers Associations. This

secondary data was used to gain initial insight into the research problem. It saves time, efforts and money and adds to the value of the research study.

3.7 Procedure of Data Collection

The data collection procedure involves the general plan to be followed in the collection and analysis of data. It details how the research objectives were achieved and how the problems encountered during the research were addressed. Therefore, the data collection procedures are summarised in Table 3.5. It is the overall flow pattern of the study that determines the information to be collected, the sources and the procedure.

Table 3.5: Procedures of Data Collection

No.	Procedure
1.	**Permission to conduct study** • The researcher passed the formal letter and met the officers in Pantu Sub-District to obtain their permission in order to conduct study at Pantu Sub-District
2.	**Identification of data collection method** • Interview (In dept interview, structure interview and focus group interview) • Observation
3.	**Designing the data collection method** • Interview schedule and pilot test
4.	**Implementation on the method of data collection** • In depth interview with *Penghulu* and *Tuai Rumah* • Structure interview via interview schedule for head of household (*Tuai Bilik*) • Focus group interview (Men and Women*)*
5.	**Preparation for data analysis** • The structured interview – interview schedule was analysed using SPSS. • Coding qualitative response (The in-depth interview, focus group data and observation data was analysed by transcriber and coding process was carried out.

This data collection plan is a crucial key to developing a sound study on Iban livelihood strategies in Pantu Sub-District. Data collection plan indicates how the researcher accesses and gathers information from different respondents.

3.8 In-depth Interviews with *Penghulus*

The in-depth interviews were conducted using an interview guide that listed the main topics and subtopics to explore. At the first stage, the in-depth interview was conducted with the two *penghulus*. The first interview was conducted on 3rd January 2017 with Penghulu Johnny A/L Lumi. The interview was conducted at Pantu Sub-District office as shown in Figure 3.3. He is responsible for the 73 Iban longhouses in the Munggu Ubah areas.



Figure 3.3: In-depth interview with Penghulu Johnny A/L Lumi

The second interview was conducted with Penghulu Entika Anak Senan on the 5th of January 2017 at a coffee shop in Lachau as shown in Figure 3.4. He is responsible for the 64 Iban longhouses in the Kara Pantu area. The interview with the Penghulu took about 40 minutes. The Penghulu was interested in the topic of discussion, and he spoke affectionately about it.

The interview questions were divided into several sections namely the respondent profile, livelihood strategies, factors influencing the livelihood strategies, the role of gender, and indigenous knowledge. The content of the interview guide can be found in Appendix I. Section A consists of the *penghulu* profile. Information that can be gathered from this section are their full name, administrative area, age, gender, level of education, duration in position, *penghulu* roles and responsibilities and longhouses. Section B sought the information about the overall livelihood strategies of Iban community in both Munggu Ubah and Kara.



Figure 3.4: In-depth interview with Penghulu Entika Anak Senan

It includes the information related to the main sources of income, farm and non-farm activities such as importance of agriculture, livestock, Iban *bejalai*, the use of natural resources. Next Section C focuses on the role of gender and indigenous knowledge in Iban likelihood and finally Section D is related to overall satisfaction of *penghulu* in their respective areas namely Munggu Ubah and Kara Pantu.

3.9 In-depth Interviews with *Tuai Rumah*

In Iban society, a longhouse chief is called a *tuai rumah*. The second stage of the in-depth interview was conducted with the *tuai rumah*. A *tuai rumah* is an Iban village headman whose position in his/her community is to act as their leader. In this study, when several *tuai rumah* were not available for the interview, the deputy head was interviewed to represent him. The interviews with most of the *tuai rumah* took place at the longhouses and some were conducted at the paddy field or farm.



Figure 3.5: In-depth Interview with Tuai Rumah

The *tuai rumah* are selected to fulfil the objectives of this study and to represent the Iban community in Munggu Ubah and Kara. The *tuai rumah* usually holds great information on the livelihood strategies of their villages. The interview questions for the *tuai rumah* were also divided into five sections namely Section A (the respondent's profile), Section B (livelihood strategies and livelihood factors), Section C (role of gender in Iban livelihood

and indigenous knowledge) and Section D (overall satisfaction). The interview guide for the *tuai rumah* can be found in Appendix II.

Section A consists of the profile of the *tuai rumah* including name, age, gender, level of education, duration in position, roles and responsibilities, number of *bilik* in the longhouse and the longhouse committee. Section B consists of the information on the livelihood of the longhouse namely the sources of income, farming activity, financial aids, and information on *bejalai*. Furthermore, Section B also discuss the factors that influence the livelihood choice which focus into five livelihood capitals (human, financial, social, physical, and natural capital). Next, Section C investigates the role of men and women in Iban livelihood and to investigate the importance of indigenous knowledge. Finally, Section D is related to overall satisfaction of *tuai rumah* towards the development in their respective longhouses in Pantu Sub-District area.

3.10 Interview with the Head of Household (*Tuai Bilik*)

A structured interview was used to interview the selected head of household or *tuai bilik*. The structured interview complemented the in-depth interview and deepened the research results. The goals of the study were clearly formulated, and specific questions were identified. The respondents for structured interviews were from 12 selected longhouses. The duration of the interview was around 30 minutes per respondent. The structured interview was carried out by the researcher and two translators who were well versed in the Iban language. The interviews were audio recorded, with notes and photographs taken. The structured interview was conducted in an appropriate manner that was both culturally acceptable and respectful. For example, it was important to greet people every time we met them, and it was particularly important to greet and ask of the health of household members

before starting the interview. The interviews were conducted within the respondent's home where it was possible to view living and housing conditions. For some respondents, it was necessary to interview them in their work sites, such as farms. It was also important to realise that some rural households have no male head of household so the female heads of households should certainly be interviewed. Besides, cases where the head of household was unavailable, the spouse or other family members who were at least 18 years old were interviewed in their stead.

The structured interviews were conducted during the period of January to March 2017. The interview questions comprised of structured response option which was written in English and translated into Iban language. Section A consists of questions on demographic and socioeconomic information. Section B of the schedule identifies the livelihood aims to investigate livelihood strategies, that includes livelihood activities, factors (livelihood asset or capitals), gender role in household and the importance of indigenous knowledge. Next, Section C is related to the overall satisfaction on the services and facilities provided in their longhouses. After taking the pilot survey, the researcher was able to improve the interview questions which were more reliable for information aggregation. The heads of household were interviewed to create a profile of the whole household. It is a custom that each *bilik* is headed by a senior member of the family, regardless of gender. The *bilik* family typically consists of three generations which includes the grandparents, a son or daughter, his or her spouse and their children, with relationship status acquired by birth, marriage, incorporation, or adoption.

3.11 Focus Group Discussion

The focus group is a research interview procedure specifically designed to gain insights from a small group of subjects. It was conducted once and divided into two sessions, namely the male focus group and the female focus group. The focus group discussion was personally led by the researcher. Notes, audio, and visual recordings were made to capture information during the focus group. Since the focus group was conducted on a weekend, both male and female respondents turned up in large numbers.

3.11.1 Male Focus Group Discussion

The focus group discussion for the men was conducted in March 2017, with 15 participants from the 12 longhouses chosen for the study. The focus group interview was conducted at Kampung Lachau Engkabang. The interview took 45 minutes to complete. The questions were divided into three different sections to ease the researcher and respondents during the interview process. The focus group interview schedule used is as per attached on Appendix III. The question categories were related to the basic information of the respondents, role of gender in decision making process in order to determine the livelihood strategies and personal views. This encouraged the group to speak more freely about the subject without fear of being judged by others. More importantly, they showed respect for each other. For instance, participants were quiet and listened when someone was speaking. They nodded their heads when in agreement and waited for their turn to speak when they disagreed with someone's opinion. The most amazing observation was that they focused on the issues being discussed and not on the individuals. As a result, nobody took other's opinion personally, and there were no misunderstandings or disagreements.

3.11.2 Female Focus Group Discussion

The women's focus group discussion was also conducted in March 2017, with participants from 12 longhouses within the scope of this study. The focus group interview was conducted at Kampung Lachau Jinggau. This was to obtain specific information on the gendered aspects of the decision-making process in household livelihood strategies. Specifically, the questions were related to the work that the women do, their access to resources, their sources of income and any problems they face. The detailed transcript of the focus group discussion for women was as per attached in Appendix IV. Kampung Lachau Jinggau is very near to Pantu Town, and it is convenient for the female respondents to attend, as some of them need to buy household goods in town. Besides, some of the respondents stated that, it was strategic place because they were selling jungle produce such as ferns, fungi and vegetable shoots in Lachau Town.

3.12 Observation

A primary consideration in this study was to conduct the research in an ethical manner. In this study the researcher lets the respondents know the purpose for observation was to document their livelihood activities. Besides, before entering the field for observation, there were several activities involved namely choosing a site, gaining permission, selecting key informants, and familiarising oneself with the setting or culture. In this study the types of data collected were in the forms of written narrative field notes along with audio and visual recordings. Besides, the process of conducting observations focuses on three types of processes. The first was descriptive observation, in which one observes anything and everything. The second type, focused observation, emphasises observation supported by interviews. The third type of observation is selective observation, in which the researcher focuses on different types of activities to help delineate the differences in those activities.

The researcher had engaged in these types of observations. These observations involved short visits to the site namely the paddy field, pepper farm and locations of other economic activities. Researcher also participated in women's handicraft making. The summary of the observed activities is shown in Table 3.6.

Table 3.6: Types of Activities Observed

No.	Activities
1	Pepper farming
2	Paddy farming
3	Rubber plantation
4	Palm oil plantation
5	Fruit cultivation
6	Aquaculture project
7	Vegetable farm
8	Women handicraft making
9	Livestock
10	Collecting jungle and indigenous vegetables
11	Fishing Activities
12	Selling jungle produce

Understanding the life strategies of the rural Iban is only possible by experiencing them first-hand and participating in the lives of the people on a daily basis. The application of this method required the researcher to stay with the people under study and experience the same living conditions. The researcher conducted the study by both observing and anticipating the daily activities of the community. Informal maintenance and interaction with the community are important components and these were recorded in field notes. The experience of life temporarily observed in the villages was not the same as that of those who live there permanently. Over time, the researcher acquired a status somewhere between that of an insider and an outsider. As an Iban from Sarawak with the same culture and context of

social change, it was easy for the researcher to become an insider, build friendships, and understand the intricacies of people's lives. However, as a city dweller, the researcher felt like an outsider among the villagers. Overall, living in the village was useful for understanding the village context, the processes of resource allocation, and the social relationships between people within the community as well as within households. It gave the opportunity to observe and experience the reality of rural Iban life. It also allowed the researcher to match the information obtained from the interviews and focus group with what was observable. The researcher observed what the villagers did and listened to what they said rather than directly asking people about their views and feelings. This provided a degree of validity as it focused on what people were actually doing as opposed to what they said they were doing. From the observation it was clear that the division of labour within the households was evident, there were also recorded conversations that related to the research topic and other relevant discussions that shed more light on the lives of the villagers. Direct observation of household activities provided the researcher with information that complemented earlier information. Through this approach, a more comprehensive understanding of the Iban way of life was developed. Documentation of observations was done by taking field notes. Then these notes were interpreted according to relevant criteria. Finally, the notes were organised to answer the research question of this study.

3.13 Qualitative Data Analysis Methods

Data analysis is a process of collecting, modelling, and transforming data with the goal of highlighting useful information, drawing conclusions, and supporting decision making. To analyse the qualitative data, this study used NVivo software for thematic analysis. A thematic analysis is a categorising strategy for qualitative data. First, the data from the observations, focus group, and in-depth interviews were analysed to generate

coding. Coding within qualitative data analysis treated the data as potential indicators of concepts and indicators were constantly compared. An overview of the data analysis can be seen in Figure 3.6. Several steps were involved in analysing the qualitative data (Creswell, 2014).

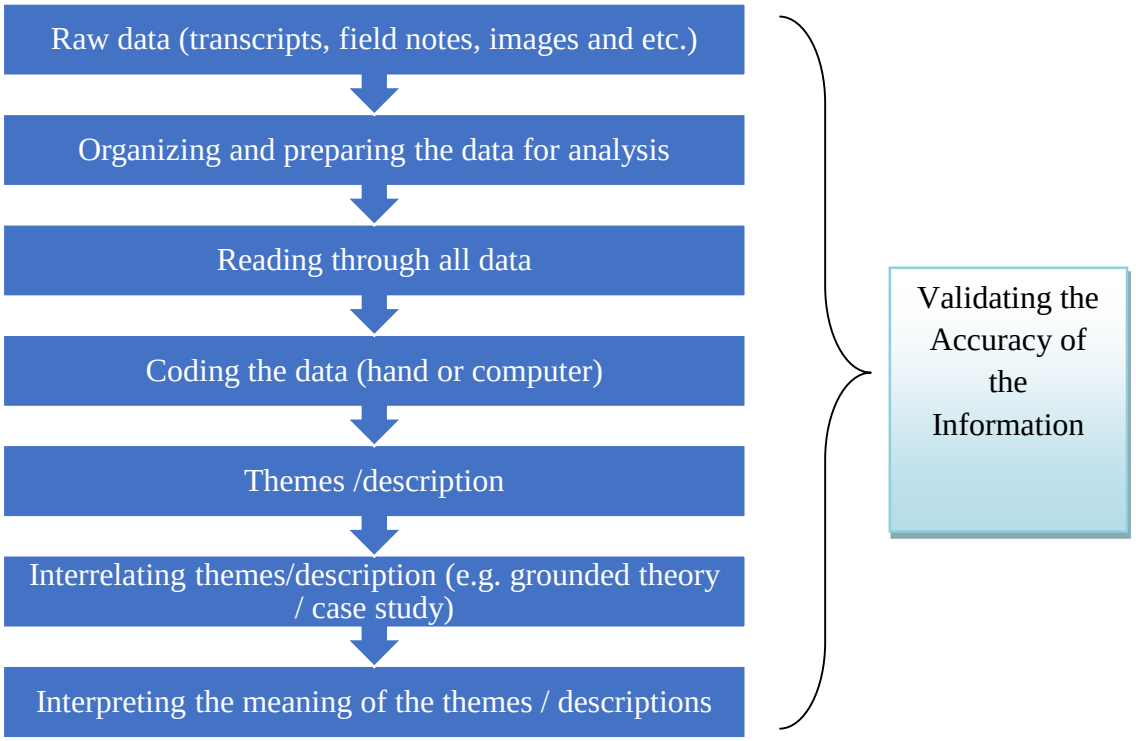


Figure 3.6: Data Analysis in Qualitative Research

The first step was to gather and compile all the raw data from the in-depth interviews, focus group interviews and observation. The raw data were scanned, the field notes typed up and all the visual material was catalogued, sorted, and arranged into different categories depending on the nature and source of information. Step two was organising and preparing data for analysis. This step involved analysing whether the information provided by the respondents had sufficiently answered the research objectives.

Step three involved reading through all the data repetitively to consider if the data was adequate for further analysis. Next, step four involved coding all the data. Coding

involved the process of organising the data by tracing chunks (text or image segment) and noting key words presenting the category. It involved taking text data or pictures gathered during data collection, segmenting sentences or images into categories and labelling these categories with terms.

Step five involved applying the coding outcomes to generate a description of setting or people as well as categories or themes for analysis. Descriptions involved detailed rendering of information about the people, place, or event in the setting. In this stage the answers provided by the respondents were interpreted and investigated based on major themes against the research objectives. Besides that, step six involved interrelating the themes or descriptions with the livelihood strategies choices to determine the knowledge or theories related to the answers provided by the respondents. This was the advance descriptions and themes that used the narrative passage to convey the findings of the analysis.

The seventh step involves the interpretation of the findings or results. Interpretation in qualitative data took many forms and was adapted for different types of designs. The goal was to interpret the data in a flexible, research-based, and actionable way. The final step was to validate the accuracy of the information. Validation can be used to assess the quality, reliability, and consistency of the analysis results. The researcher called the respondents involved to confirm the facts and figures given. The secondary data was also used to verify the data obtained from the respondents.

3.14 Statistical Analyses Methods

Data obtained through the structured interviews via the interview schedule was analysed using IBM Statistical Package for Social Sciences (SPSS) version 23 for Microsoft Windows and SEM SmartPLS3.0, also known as Partial Least Squares (PLS) software.

Descriptive analyses were used to analyse the demographic data. The descriptive analysis is the elementary transformation of data in a way that describe the basic characteristics of data. The descriptive statistics primarily included the generation of frequencies, means, standard deviation, ranges, percentage, and quartiles. For inferential data, structural equation modelling analysis namely SEM Smart PLS software were used to verify the significant relationships among the factors influencing the livelihood strategies choices of the villagers.

Firstly, SPSS was used to analyse the respondents' demographic profile, the descriptive analysis for the variables such as frequencies, cross-tabulations, means and standard deviation. Secondly, the partial least squares (PLS) with structural equation modelling through bootstrapping were used to analyse the relationship among the constructs of the study. Hair et al. (2019) purposed that SEM-PLS provide sound solutions when the subject consists of many constructs and there are large number of items.

3.14.1 T-Value Analysis

T-value refers to the identification of the variables where valid measures of their respective constructs is based on the parameter estimates and statistical significance, as such T-value must equal or exceed 1.645 (Chow & Chan, 2008). T-value was used to identify the relationship between Iban choices of livelihood strategies and the human, nature, financial, social, and physical assets. This demonstrates the significant level of the measurement items explaining the respective constructs.

3.14.2 Spearman's Correlation Coefficient

According to Sekaran and Bougie (2016), correlation coefficients refer to the measurement of the degree of relationship between two sets of scores. The value can vary between 21.00 and 11.00. The higher value of the correlation coefficients the higher the

existence of relationship between the variables. In this study, the relationship between the variables such as income level, education level and so forth were analysed based on correlation analysis. In this study, the Spearman's rank of coefficient (Spearman's rho) used as the data is ordinal as well as categorical, thus it is not expected to have normal distribution.

3.14.3 Confidence Level

The confidence level in a research is the measure of how likely the scores would fall within a stated confidence interval. In this study the confidence level was set at 95% meaning the p-value for the research is 0.05 under the two-tailed significance. The significant relationship in the t-value of the correlation coefficient analysis was based on $p<0.05$ in this research.

3.14.4 Chi Square Test

There are two outcomes of the chi-square tests. If the small chi-square test statistics were found on the data, and it is smaller than the critical value based on the degree of freedom (df) then the observed data fits the expected data exceptionally well. This implies there is a relationship between the variables. When very large chi-square test statistics were observed, it indicates that there is no relationship between the variables because the chi-square value is far greater than the critical value based on the degree of freedom. Therefore, in this study, the relationship between these variables was analysed based on this approach.

3.14.5 Cross-Tabulation

According to Hair et al. (2003), cross-tabulation involves comparing two or more variables in the study simultaneously and categorising the number of respondents who answered two or more questions consecutively. In this study, the data that required cross-tabulation included items such as gross income level and expenditure, education level and

gender and so on. In cross-tabulating, the researcher must select the variable to be used in studying the relationship and it should be based on the research objectives. It should be considered on the basis of whether such tabulation would answer the research questions.

3.14.6 Friedman Chi Square Test

According to Adams and Lawrence (2019), the Friedman chi-square test is a nonparametric test designed for the analysis of ordinal or ranked data from a study with one variable with three or more dependent groups. In this study, the Friedman chi-square test compares the relationships among the livelihood activities of the Iban community which includes hunting wildlife, gathering forest products, farming, and so on. However, the Friedman test is also used for comparing ranks of data rather than frequencies of data. The test compares the observed and expected sums of ranks between groups and the critical value for chi-square is used to decide whether the calculated Friedman chi-square value is significant. From here, the level of importance of livelihood activities of the Iban community can be compared.

3.15 Reliability and Validity

Due to the qualitative nature of the study, the researcher had to verify all information for accuracy, reduce bias through triangulation, and ensure credibility, reliability, and dependability of the information. Triangulation involved comparing different types of data (quantitative and qualitative) and different methods (observation and interviews) to see if they corroborated each other. This multi-method approach is of great value as the research design of this study includes quantitative and qualitative methods.

3.15.1 The Rationale for Data Triangulation

Figure 3.7 provides a schematic description of triangulation and how it combines key informants, observation, and secondary research to validate research data. Therefore, in line with Flick (2006), triangulation was used as a combination of several methodological procedures that added rigor, breadth, complexity, richness, and depth to the research. The goal is to overcome the weakness and problems that come from a single method, contributing to more accurate results. Triangulation gives a more detailed and balanced picture of Iban livelihood strategies in Pantu Sub-District.

In this study, the qualitative data collected complemented and clarified the quantitative findings by helping to identify common themes. It is an attempt to gain more than one perspective on what is being studied. Thus, such methods were able to establish the reliability and validity of the data collected.

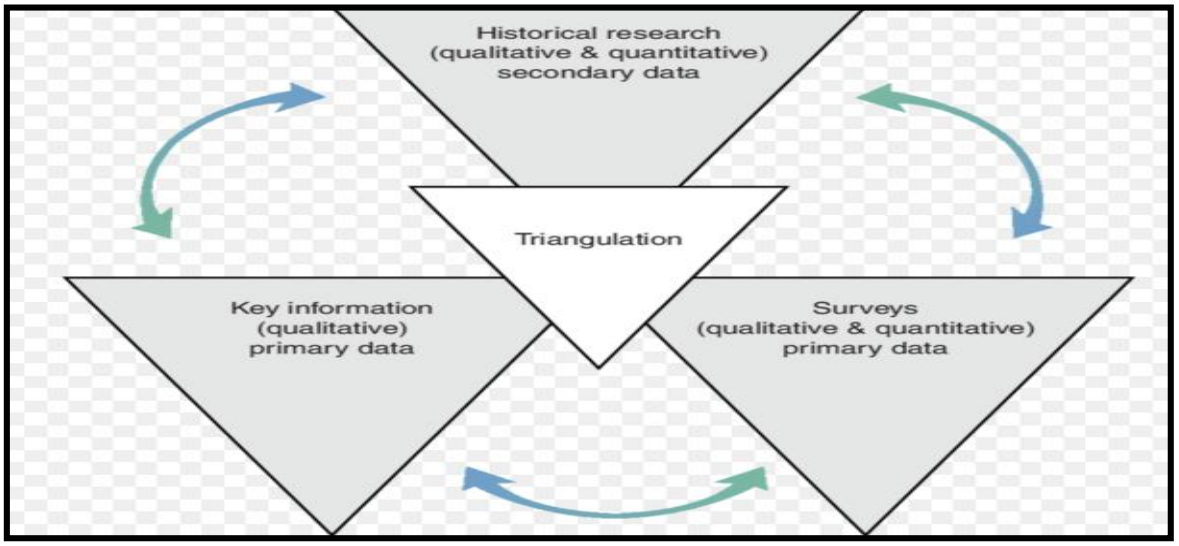


Figure 3.7: Triangulation Method for Cross Checking Data (Cresswell, 2014)

Furthermore, in terms of differences in results between qualitative and quantitative data, the researcher has used the middle of the mixed methods continuum, which is an equivalent decision. Here, the researcher makes decisions based on observations and

experiences gained during the study. As such, the data were re-analysed to sort out the differences and reach the point of integration.

3.16 Ethical Considerations

Ethical issues and considerations permeate the entire research process. Research ethics is primarily concerned with the treatment of human participants in research. Ethics for research involving human subjects is about respect for the person, concern for welfare, and justice. The highest ethical standards must be adhered to when collecting data, and the research plan must describe the measures that were taken to protect the participants involved. The researcher spent approximately three months collecting data and resided in various longhouses in the Pantu Sub-District during the data collection trips. The culture of respect is deeply rooted in the Iban community, especially towards the "*Tuai*". The permission of the "*Tuai*" is very important. In this case, we are talking about the *penghulu* and *tuai rumah*. Before a request for an interview can be made, a meeting and permission from the *Tuai* is required. In negotiating permission to conduct interviews in the longhouses, the selected *tuai rumah* were also needed and informed of the research intention.

Ethical considerations during the research included obtaining informed consent, asking for voluntary participation, avoiding harm to respondents, and maintaining confidentiality. Informed consent involved fully informing the respondents participating in the survey of the purpose of the study that was being conducted. The main purpose of informed consent was that the participant was then able to make an informed decision about whether they would participate in the research. In this study, verbal informed consent was used instead of written consent. The reason for this was the low level of education of the respondents.

In addition, the purpose of the research was clearly explained, and participants were given time to ask questions. Since participation in the study was voluntary, participants were free from coercion. Participants were free to withdraw their participation at any time, so there was no pressure on those who chose not to continue. This was done at the first meeting before the face-to-face interview began with them. The interview was also conducted keeping in mind the place and time that was convenient for the respondents. It was imperative that the interview process was free from harm. The harm could be physical or psychological and could therefore be in the form of stress, pain, anxiety, an impairment of self-esteem or an invasion of privacy. Confidentiality was also considered during the study. All identifiable information was not provided or made available to anyone except the researcher. There were some of them who were not able to disclose certain amounts of their income and the researcher ensured that such identifiable information was excluded from any reports or published documents.

3.17 Conclusion

This chapter begins with an introduction and then describes the research design used in this study. It includes information about the method used in conducting this research and a rationale for using this method. The researcher collects all the necessary primary data and information through structured interviews, focus group interviews, in-depth interviews, and observation.

This chapter also describes the different stages of the research which includes the selection of participants, the process of data collection and the process of data analysis. Several ethical considerations were taken into account to ensure that the study was conducted in an appropriate manner. In order to adhere to ethical considerations when conducting

research, all participants gave verbal consent to be interviewed and participate in the study. The results of the study are described in the next chapter.

CHAPTER 4

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents all the analyses of data collected throughout this study pertaining to the livelihood strategies adopted by the Iban community in Pantu Sub-District. All the data and information gathered are analysed statistically and thematically in order to identify the central issues affecting the livelihood strategies of the Iban community in Pantu, the determining factors in the diversification of the livelihood strategies, the role of gender in the decision-making process in order to determine the livelihood strategies of the Iban community besides evaluating the changing role of gender in affecting activities participated by both men and women, as well as indigenous knowledge in determining the livelihood diversification strategies among the rural Iban in Pantu.

The data is analysed based on the respondents' responses during the interviews which included the in-depth interview, focus group discussions and observation activities. Both the qualitative and quantitative data were synthesised to provide an explanation for the various issues related to livelihood strategies of Iban communities in Pantu. The generated quantitative data were analysed using IBM SPSS statistical analysis and Partial Least Square (PLS) software to demonstrate the significance of the data. On the other hand, thematic analysis was conducted for the verbatim qualitative data obtained in this study.

In order to specifically address the research objectives and research questions in this study, the discussion is divided into specific sections. The first section of this chapter describes the social structure of the Iban community. The social structure was described and

explained in detail to provide the contexts in which primary decision-making functions within the Iban community was carried out. Thereafter, the second part of this chapter focuses mainly on the five livelihood assets. The five livelihood assets were thoroughly explained by dividing them into five different subsections, namely human capital, financial capital, physical capital, social capital, and natural capital. All these sub-sections have been comprehensively discussed with data analysis in relation to the livelihood strategies of the Iban in their village. Subsequently, the following section discusses the livelihood strategies and how the five assets act as underlying determinants for the choice of livelihood strategies of the Iban community in their villages. The data was presented with econometric analysis as statistical evidence to justify the assumptions made in this study.

The next section deals with household livelihood diversification strategies which were divided into five main subsections, namely, selection of livelihood strategies based on income level, relationship between agricultural diversification and income level, on-farm livelihood strategies (agriculture), use of natural resources as livelihood strategies, remittances and other off-farm income, and frontier livelihood strategies.

The last two sections address the impact of gender on livelihood strategies and how rural Iban households in Pantu Sub-District reduce their vulnerability to environmental change by applying indigenous knowledge in their livelihood activities. All analyses of the data were presented with appropriate statistical analysis and supported with empirical evidence from other findings.

4.2 Decision Making and Social Structure in the Iban Community

The social structure of the Iban community influences the decision-making on how particular livelihood strategies are chosen in Pantu Sub-District. In the Iban community, the

community chiefs (*penghulu*), head of longhouses (*tuai rumah*) and head of households (*tuai bilik*) play eminent roles as transformation leaders where they obtain knowledge and experiences to bring positive changes in the community lifestyle following the current development. For example, from the in-depth interviews with all *penghulu* and *tuai rumah,* it was noted that they attended a seminar conducted by the district office detailing their job scope and duties as a local community leader. Aside from that, they also have briefings on Adat Iban (1993), Wildlife Protection Ordinance (1998), and crime prevention by officials from relevant authorities. The findings from this study are in line with Yukl (2006) and Freddie et al. (2013) highlighting on the significance of the transformational leader in community development.

The community chiefs also serve as a bridge between the government or any other external institutions and the local community. There are two Iban chiefs in Munggu Ubah and Pantu Kara respectively, namely Penghulu Entika Anak Senan and Penghulu Johnny A/L Lumi. Both are male and their highest education qualification is primary school level. Penghulu Entika Anak Senan was elected in 1998, and is currently the longest serving *penghulu* in Pantu Sub-District. *Penghulu* Entika Anak Senan is responsible for administering 64 longhouses in Kara Pantu while *Penghulu* Johnny A/L Lumi is responsible for administering 73 longhouses in Munggu Ubah in Pantu Sub-District. This study found that the District Officer would formally appoint a community chief and headman with the agreement of the community. Each term of office lasts up to four years, after which they are eligible for reappointment. Their duties and responsibilities comprise of presiding over any native court, representing their community in official functions, assisting the government in looking after the welfare of their community and generally assisting all officers of the government in the execution of their public duties. However, a person cannot be appointed

as *penghulu* or *tuai rumah* in the event that they hold any position in a political party or is appointed as a councillor.

The head of longhouses (*tuai rumah*) is responsible in assisting the *penghulu* in various areas of administration such as cultural issues, infrastructure development, and religious issues. Based on the in-depth interviews conducted with both *penghulu*, the traditional hereditary leadership is passed through the patriarchal line whilst the contemporary practice the democracy system. Traditionally, the *tuai rumah* is appointed by directly inherited position, that is from father to son (Pang, 2018).

However, in the current democratic system the headman is elected by their own community before they are formally appointed by the local governing authority and receives a monthly allowance. In this democratic system both men and women have an equally opportunity to become the *tuai rumah*. The findings also found that the *tuai rumah* were selected by their own group of people based on certain criteria such as the leadership qualities and their success in life. This result from this study ties well with Anggo and Laja (2018) on the contemporary selection of *penghulu* and *tuai rumah* in the Iban social rank. Deriving from this background, this study focused on 12 *tuai rumah* in Munggu Ubah and Kara Pantu area. The number of *bilik* within the study area ranges from six *bilik* being the shortest, to the longest at 51 *bilik* as indicated in Figure 4.1.

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However, in the current democratic system the headman is elected by their own community before they are formally appointed by the local governing authority and receives a monthly allowance. In this democratic system both men and women have an equally opportunity to become the *tuai rumah*. The findings also found that the *tuai rumah* were selected by their own group of people based on certain criteria such as the leadership qualities and their success in life. This result from this study ties well with Anggo and Laja (2018) on the contemporary selection of *penghulu* and *tuai rumah* in the Iban social rank. Deriving from this background, this study focused on 12 *tuai rumah* in Munggu Ubah and Kara Pantu area. The number of *bilik* within the study area ranges from six *bilik* being the shortest, to the longest at 51 *bilik* as indicated in Figure 4.1.

The headman is supposed to guide the community members to make decisions based on the best interests of the community with inputs from the members of the community. Usually, the *tuai rumah*'s decision in all matters pertaining to his community will be finalised after consultation with the Village Development and Security Committee (JKKK). A good *tuai rumah* is commendable in all his activities and acts as an excellent role model for his community.



Figure 4.1: The shortest longhouse (Left, Kampung Selanjan Sebemban) and Longest Longhouse (Right, Kampung Selanjan Asal)

The *tuai rumah* should also possess problem-solving skills and protect the culture and norm of the Iban society. The *tuai rumah* conducts close rapport and dialogues known as *aum* at the longhouses. At the meetings (*aum),* discussions include consideration of proposals of government-sponsored community development projects, such as agriculture schemes for cash crops cultivation. In this respect, the *tuai rumah* is assisted by the JKKK. This committee is responsible for planning and implementing development or transformation projects by involving the local community of their respective village. Additionally, the JKKK is also in charge of executing comprehensive human capital transformation to produce a united and progressive community as well as to support government policies. Regarding this socio-cultural structure of the Iban, a highly hierarchical system in Pantu Sub-District was observed where the *tuai rumah* is a key figure in decision-making; as the *tuai rumah* is the only one who can apply for any infrastructure-related subsidies and projects concerning electricity, water and road access. The finding from this study corresponded to the study by Freeman (1992) and Islam et al. (2020) on the important role of *tuai rumah* in Iban society.

Findings from the in-depth interview also revealed that the Iban *bilik* family constitutes a significant financial and political unit. The head of the household (*tuai bilik*)

plays a vital role in leading their family members and bringing them to a consensus. Consensus here refers to a situation in which all the household members mutually agree to a decision made by the head of the household by listening to his opinions and concerns. Based on the interviews, while certain outcomes might not please everyone, they recognised it as the best decision for the household.

Typically, the oldest member of the family would assume the role of *tuai bilik*; however, according to the findings, there was also a strong connection between headship and the highest income-earner in the family. These findings correlated with findings from previous studies highlighting the role of heads in influencing the decision-making in each household in rural parts of Sarawak (Bischoff et al., 2018; Denham et al., 2015). Each *bilik* contains at least two generations living and practising as an extended family unit. Newly wedded couples were encouraged to stay in the family's *bilik* until they are able to build their own *bilik* within the longhouse. The division of work in the household is dependent on gender, age and physical capacity of an individual and this is an acknowledged practice among Iban community in Pantu. From these results, it is clear that the social structure in the Iban community affects decision making which then influences the way the households choose their livelihood strategies.

4.3 Structure Change Development Theory and Pantu Sub-District Livelihood Strategies

This section and its sub-sections discuss the findings on the livelihood strategies of an Iban community in Pantu Sub-District, Sri Aman. It also answers the research questions on the categories of livelihood strategies and how the livelihood strategies are selected. The findings are drawn from questionnaires with 220 respondents, in-depth interviews with *tuai rumah* and *penghulu*, focus group discussions and observations. Informal conversations with

the local community members also provided additional information. This study applies the structural change theory of development. Structural change theory highlights the progress from a traditional agricultural sector to a modern industrial sector (Buchenrieder, 2007; Norman & Matlon, 2000). As such, issues related to the impact of structural change on rural livelihoods that contribute to farm and non-farm livelihood strategies are discussed.

Structural change in livelihood strategies provided more opportunities for the Iban community in Pantu Sub-District to diversify their livelihoods through farm (agriculture) and non-farm activities. A rigorous analysis revealed that in Pantu Sub-District, farm livelihood is associated with traditional agriculture, which refers to subsistence farming, while the more modern sector is commercial agriculture and non-farm labour, which has led to diversification of Iban livelihood in various activities. Farm and non-farm livelihood strategies are discussed in different sub-sections. In addition, the arrangement of results and discussion on farm livelihood strategies are divided into subsistence, cash crops and livestock. Moreover, the relationship between agricultural diversification and income level is discussed in detail. On the other hand, non-farm livelihood strategies, including discussion of natural resource use, remittances, and other non-farm income, are covered in another section. Furthermore, the location of Pantu Sub-District bordering West Kalimantan has an impact on the community's livelihood strategies. As such, discussion of cross-border livelihood strategies is put in its own section. The final part of this section discusses how the choice of livelihood strategies affects income levels.

Before discussing the farm and non-farm types of livelihood strategies in detail, this section explains the structural change development theory and how it relates to the farm and non-farm livelihood strategies of the Iban community in Pantu Sub-District. Traditional

livelihoods include growing crops for subsistence and other activities such as fishing and gathering jungle produce for households, which usually contribute to low productivity. The results of the interviews showed that the community in Pantu Sub-District participate in subsistence farming because it provides better food security. Some of the respondents indicated that they continue to grow rice for self-consumption as this is the traditional livelihood of the Iban. They believe this should be maintained as they have land to cultivate, and land is the most important natural resource for the Iban. From the results, agriculture (farm) is the main activity for the Iban in Pantu Sub-District. The traditional agricultural sector of the Iban in Pantu is generally a low-wage sector and mainly for subsistence. A similar pattern was found in the study of Iban livelihood in Lubok Antu (Kendawang, 2005) and Betong (Riman, 2015), with most Iban in rural areas focusing on farming.

On the other hand, the most intriguing finding is that the reason for farming in Pantu Sub-District changes from merely covering food independence to generating cash income. The findings in this study show that commercialisation leads to diversification into other areas and activities either on or off the farm. It was found in this study that modern industrial sector is associated with higher productivity as more farmers depend on commercialisation of agriculture to generate income such as pepper, rubber, and oil palm. Moreover, continuous agricultural extension leads to improved livelihoods of farmers and their families. The study found that there was transformation of agricultural sectors into higher value agriculture sectors in Pantu, namely swiftlet farming, modern aquaculture, and commercial rice farming in Abok, Pantu. Other changes observed in agriculture were related to agricultural programmes such as Rubber Planting Scheme and the development of the fruit growing area in Rapak, Pantu, which was introduced by the Ministry of Agriculture.

In Pantu Sub-District there was diversification of livelihood and non-agricultural activities such as wage labour and dependence on remittances. In Pantu, wage labour was the main source of income for non-agricultural activities. At Pantu Sub-District, two basic examples of self-employment can be found, namely full-time work that contributes substantially to family income, or temporary diversification, where rural people engage in a small self-employed activity with exceptionally low returns. The transition from subsistence agriculture to commercial, modern agriculture such as oil palm cultivation, means that more and more farmers, rely on a fixed income and have sufficient income to meet their daily needs. In addition, remittances also contributed to the income of rural families in Pantu Sub-District, especially the low-income families whose families' members often participated in migration or *bejalai* with the aim of improving their livelihood and supporting their family. These activities were chosen because they believed that the diversified livelihood strategies in Pantu Sub-District were more sustainable as they were less vulnerable to certain risks and seasonality compared to the non-diversified ones. The results of this study correlated with the findings of previous studies by Badariah and Rosli (2014); Barrett et al. (2001); Bezu et al. (2012); Carney (1998); Hoang et al. (2014) and Sheela and Puttaraj (2017).

It was found that the household's decision whether to engage in farm or non-farm activities is directly or indirectly influenced by the social structure and gender roles in Iban communities. *Penghulu, tuai rumah,* JKKK, *tuai bilik* (head of household) and gender roles influence decision-making in choosing livelihood strategies. Moreover, the results also show that the choice of livelihood strategies in Pantu Sub-District is influenced by various factors. For example, changes in utilisation of natural resources in Pantu Sub-District are mainly associated with the shrinkage of cultivated land and other natural resources such as virgin forest, so that some villagers choose non-agricultural activities, i.e., wage labour and small

businesses. In addition, there are changes in human capital in Pantu relating to the decline of the labour force, resulting in a high dependence on external labour. This is due to the fact that some household members undertake *bejalai*, especially the young adults. In order to meet the family's labour needs, the Iban practice wage labour where they pay local and foreign workers, mainly from Kalimantan, to work on their oil palm and bee farms. In addition, the Iban practise *beduruk* culture in rice cultivation to overcome the labour shortage. The findings of the study also show that there are changes in the financial assets of rural Pantu as their household income comes from various agricultural and non-agricultural works to improve their livelihood. The changes in physical assets in Pantu Sub-District can be seen in various infrastructures like schools, Pantu health clinic, water supply, electricity supply and road accesibility. This affects the accessibility and choice determination of livelihood strategies among the local Iban in Pantu Sub-District. The farmers in Pantu Sub-District also have the opportunity to work closely in collaboration and innovation with various agencies such as the Farmers Association, Department of Agriculture (DOA) and Pantu Sub-District Office.

Overall, the structure change development theory explains that the transformation of livelihood strategy affects the livelihood of the Iban community in Pantu Sub-District. They depend on the opportunities that are available in the rural situation. These opportunities are related to livelihood diversification because agriculture is not the only source of livelihood in rural Pantu. This means that they have the opportunity to engage in farm and non-farm activities to generate income and secure employment.

4.3.1 Farm (Agriculture) Livelihood Strategies

This section discusses the main findings on agricultural livelihood strategies. Agricultural livelihood includes the subsistence farming and commercial farming. The discussion of the main findings in this section is divided into four sub-sections. Subsistence and food crops (paddy, fruits, and miscellaneous crops) is covered in the first sub-section while the second sub-section focuses on three main cash crops namely oil palm, rubber, and pepper. The third sub-section focuses on livestock and the fourth sub-section explains the relationship between agricultural diversification and income levels.

There are various combinations of subsistence crops and cash crops that clearly define the livelihood strategies of households in Pantu. Almost all households in Pantu typically produce multiple crops, with an averaging of three different types per family household. As shown in Figure 4.2, rice cultivation (paddy) had the highest percentage (26.12%) of household's involvement, followed by fruits (18.84%) and miscellaneous crops (17.54%). These three groups of crops provide income and food for self-consumption for the villagers in Pantu Sub-District. By selling their excess farm production, these households generate income that expands their access to other food varieties.

In addition, there are three major cash crops cultivated in the area, with oil palm (11.57%) at the highest percentage, followed by rubber (11.75%) and pepper (11.57%). Cash crops contribute directly to household income. Overall, it was found that farm livelihood strategies are an integral part of rural livelihoods in Pantu Sub-District to improve food security.

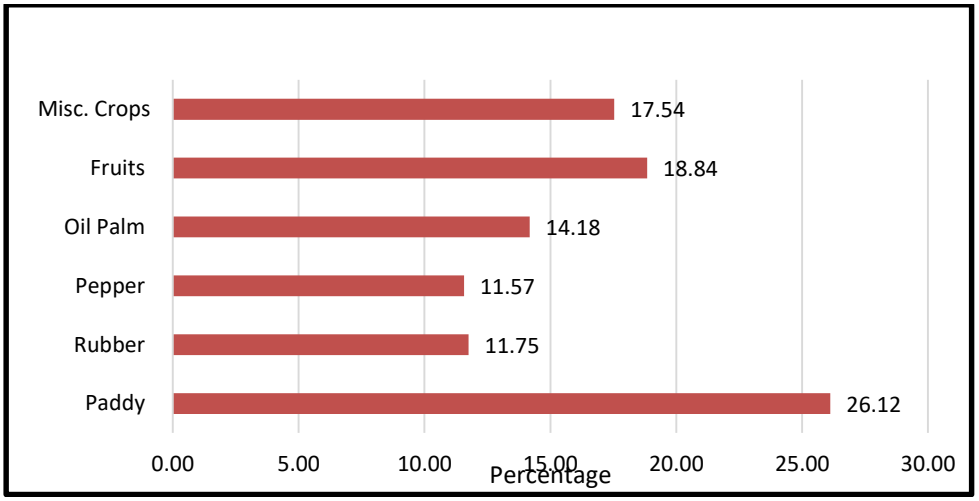


Figure 4.2: The Percentage of Households' Involvement by Types of Crops Planted

4.3.1.1 Subsistence and Cash Crops Farming

Rice has been the staple food of the Iban community in Pantu for several generations. Indeed, the Iban community identifies itself primarily as rice farmers (Freeman, 1992; Garcia et al., 2019). The rice fields in Pantu are small and the majority of the respondents had a plot of two acres or less. The paddy fields are prone to flooding, dry seasons, and other land constraints. Due to these prevailing problems, farmers in Pantu plant only one variety of rice per season. There are two types of rice cultivation in Pantu Sub-District, namely highland rice cultivation and lowland rice cultivation. Highland rice varieties are planted on the slopes as part of the shifting cultivation system. Based on interview findings, a plot has to be replanted every three to five years nowadays due to land scarcity. However, this usually results in low paddy yield. For lowland rice cultivation, farmers use the land every year. They apply herbicides to eradicate weeds and other vegetation before planting with the rice seedlings. Lowland rice is planted in swampy land. Of the total percentage of paddy cultivation, 90% of the respondent's plant lowland rice compared to only ten percent who plant upland rice.

As for the cultivation calendar, it was found that the Iban community in Pantu Sub-District begins its cultivation cycle for highland rice around August to September. Lowland rice cultivation then begins between September and October. Comparing this result with previous studies, the cultivation calendar for Iban in Pantu Sub-District is later than that of Lubok Antu, which begins in mid-June (Kendawang, 2005). The *tuai rumah* conducts a meeting (*aum*) before rice cultivation activities begin. The meeting is to ensure that all families coordinate their activities and that the rice can mature at about the same time. Ripening at the same time is critical to reduce a family's losses to insects, birds, and wild animals. It also allows families to coordinate their harvesting rituals.

Many varieties of rice are grown in Pantu Sub-District and the plant characteristics vary widely. Respondents indicated that they like to plant rice that is adapted to the local climate, is resistant to pests and diseases, is tall, tolerates drought, has an interesting colour and good taste. The community in Pantu Sub-District still practices traditional paddy cultivation, which involves several steps: land preparation, dry raising, transplanting, rainwater, weeding, harvesting, and drying. In paddy cultivation, the use of fertilizer is important to ensure good plant establishment (Fahmi, 2013). Chemical fertilizers, herbicides and insecticides are used by Iban farmers. The Ministry of Agriculture supports rice farmers in Pantu Sub-District with fertilizers and pesticides. In Pantu, interviewees stated that farmers growing lowland rice are provided with herbicides such as Rumputox, Rumpas and Padan. There are four types of fertilizers namely urea, compound and organic. The respondents also stated that for cultivation of paddy in the hills they are provided with Tepat herbicide and two types of fertilizers namely compound fertilizer and Coron fertilizer. The respondents also stated that the paddy is harvested when 85 percent of the grains are shaded with straw. This is to reduce mishaps due to shortening and attacks by winged animals, insects, and rats.

The results of this study show that there is a shortage of labour for rice cultivation, as well as a shortage of land in Pantu Sub-District for rice cultivation. Since male household members often participate in off-farm work for pay, doing really important tasks such as cutting trees or carrying rice from the paddy field to the longhouse can be a major problem for the family. Households in Pantu also find that the land available for rice cultivation has become smaller as there is competing land use after the introduction of various cash crops such as pepper, rubber, and oil palm. Paddy cultivation requires a lot of labour. This work is usually done by the farmers' families or hired labourers. According to the interview with the local farmers, they would usually have to pay RM25 to RM30 per day for the labourers to help at the rice farm.

Most of the rice production was for self-consumption, with a small percentage of farmers selling the rice. Respondents also reported that the yield from traditional rice cultivation averaged 20 to 30 bags of paddy per farmer per year, depending on the size of their fields and the quality of the paddy harvested. When asked how much rice they had sold in the past year, the households interviewed replied that they had managed to sell at least 10 bags. The rice farmers in Pantu usually sell to middlemen and some of them sell directly to the State Famers' Organisation in Pantu. The remaining rice is kept for family own consumption and is also given away as gifts to relatives. In Iban culture, rice farmers would give newly harvested rice (*berau baru*) to their non-farming relatives, especially those from urban areas, to test the *berau baru*. Popular rice varieties grown by farmers in Pantu Sub-District include Bubuk, Mamut, Bajong, Kurau, Telasih, Chelum, Bali and Pulut.

Bajong rice is a highly commercial rice. The respondent indicated that the Bajong type is suitable for transplanting. Transplanting involves developing the rice seedlings in

seedbeds before planting them in the field. A seed rate of 25 kg is suggested. Transplanting is done when the seedlings are about 30 days old. Three to four seedlings per planting site are recommended. The seedlings should be planted 1.5 to 3.0 cm deep. If they are planted too deep, germination will be inhibited. The recommended planting distance is 30 cm x 30 cm to ensure good vegetative development, with the aim that the plants form as many useful shoots as possible.

Another respondent adds that Mamut rice is a conventional, tall-growing variety that is indispensable when it comes to tapping soil amendments for development. The plant of this variety measures about 140 to 143 cm and is an upright plant type. It grows well in upland and rain-fed conditions. The stems are solid and thick and do not twist easily except in strong winds before harvest. Farmers transplant 30- to 35-day old seedlings by hand, and Mamut rice matures 125 days after transplanting. The grains of this variety have a purple pericarp that flakes off to a light purple. In Pantu Sub-District, Mamut rice is a common rice variety that is usually grown with low chemical inputs because of its adaptability to soils and natural conditions.

In addition, for the paddy scheme in Pantu, there is a paddy production project in Abok Pantu, which covers 30 hectares of land and involves 44 participants. Based on the observation and interviews with the respondents, the project includes drainage improvement and farm development. In addition, the commercial production of rice was addressed through the consolidation and development of small farmers' plots. In addition, the project aims at providing better quality paddy seeds to the farmers to improve the yield of paddy production. However, during the study, the project was still in its inception and early stages. Therefore, the impact on paddy production for the participants is difficult to measure. Nevertheless, the

respondents hope that the project from the commercialisation of rice cultivation will be successful and provide income to the community. The study revealed that Pantu Sub-District has lower productivity in terms of rice yield as most of the rice is grown for family consumption.

Besides paddy, other miscellaneous crops were also preferentially cultivated by the Iban in Pantu. Based on the interviews, it was found that all households who did not cultivate paddy were engaged in at least one subsistence activity by cultivating various vegetables or fruits instead of paddy. They indicated that the various crops such as local maize and imported maize (sweet corn) are intercropped with hill rice in their *kebun* and *umai*. Vegetable farming is also becoming popular among the Pantu Sub-District community. Vegetables commonly cultivated include *kucai* (chives), *ensabi* (mustard greens), tapioca, chilli, pumpkin, cucumber, squash, yam, lady's finger, *dayak* brinjal, and long bean.

The results of the interviews found that the Iban community in Pantu grow vegetables for their own consumption, to feed their livestock and partly for sale. According to one of the respondents, they planted maize to feed the chickens. Other respondents said that they use some of the tapioca to feed the pigs. This allows them to save costs in livestock feed. Some villagers in Pantu also sell the vegetables in Pantu town and Lachau to supplement their income.

There are also fruit varieties that are planted in Pantu Sub-District for subsistence and cash. As previously shown in Figure 4.2, 18.8% of the respondents plant fruits, mostly for subsistence and sell the surplus in the farmers' market in Pantu. The most popular types of fruit grown, and their prices per kilogram are shown in Table 4.1.

Table 4.1: Types of Fruits and Price in Pantu Sub-District

Types of Fruits	Price Per Kg (RM)
Langsat	6.00
Papaya	1.00
Banana	2.00
Jackfruit	2.00
Rambutan *Anak Sekolah*	2.50
Pineapple	4.00
Durian	10.00 (3 pieces)

The results of the survey revealed that the community in Rapak Pantu grows rambutan and jackfruit on 17 hectares of land. The Rambutan Anak Sekolah (RAS) or the R191 variety planted in Rapak Pantu had begun to bear fruit at the time of this study and was in demand in the export and domestic markets. To help farmers in Pantu, there is Touch Point Program (TPP) to prepare RAS for export. Under this program, villagers enter into contracts with the Federal Agricultural Marketing Authority (FAMA) so that rambutan fruits can be purchased by FAMA at higher prices. According to the respondents, they previously faced the problem of rambutan fruits being sold at dumping prices below RM 2.50 per kilogram. The results of this study show that the yield of rambutans contributes to a good cash since farmers have access to FAMA.

4.3.1.2 Oil Palm, Pepper and Rubber Farming

About 37.5% of the households in the study were engaged in three main cash crops, namely oil palm (14.18%), rubber (11.75%) and pepper (11.57%), the latter two of which have been the main agricultural income in Sarawak for several generations. Oil palm cultivation is one of the major cash crops that influenced the livelihood strategies of most farmers in Pantu. There are two categories of oil palm cultivation in Pantu, namely

supporting smallholders and independent smallholders. Of the 12 villagers involved in oil palm cultivation, 40% are independent smallholders and 60% belong to the supporting smallholders.

The supporting smallholder farmers are those who participate in the oil palm programme administered by Malaysian Palm Oil Board (MPOB) and Sarawak Land Consolidation and Rehabilitation Authority (SALCRA). According to the respondents interviewed, the oil palm programme in Pantu Sub-District started in 2007 and the Malaysian Palm Oil Board (MPOB) plays an important role in supporting the community in Pantu Sub-District. The respondents from the assisted smallholder categories indicated that the MPOB helps them by sharing information on oil palm development, providing technical support, advising them, and helping them with seeds, fertilisers, and pesticides. The findings of this study are similar to Lydon's (2015) study which explained the importance of MPOB in assisting the rural Bidayuh community in Serian, Sarawak. In addition, the respondents stated that they are able to hire a truck from MPOB to transport the fruits for sale at RM50 per tonne while some use their own transportation. In addition, respondents indicated that MPOB helps them to get information, advice, and support which they desperately need since oil palm cultivation is still new to them and requires a relatively larger capital. Another study (McCarty, 2010) also mentioned the role of MPOB in assisting farmers. Another effective initiative of the MPOB in Pantu Sub-District was the establishment of smallholder buying groups (*Kelompok Baja Terkumpul, KBT)* to improve access of smallholder farmers to fertiliser and credit. When asked about the details of this approach, respondents indicated that the agent provides credit to participating farmers who agree to deliver their fruits to a predefined institution, which then agrees to deduct the cost of fertiliser and reimburse the provider. However, none of the 12 villagers interviewed is involved in the joint venture with

SALCRA. Moreover, based on the in-depth interview with the *penghulu*, the community's participation in SALCRA is declining and is mainly concentrated in Jaong area. When asked for details, the *penghulu* mentioned that landowners receive monthly pay-outs based on oil palm yields and the size of their land. Even though all 12 villagers interviewed were not involved in SALCRA, they are indirectly provided employment opportunities for Pantu residents, meaning that plantations have provided jobs for the households.

The second category of oil palm smallholders in Pantu Sub-District refers to the independent smallholders. The independent smallholders refer to farmers who grow oil palm on their own land and use their own labour and capital, without support from government agencies. Smallholder development is self-financed andinvolves family labour. The smallholders decided to engage in oil palm cultivation because they see it as a lucrative source of income. According to the respondents, most villagers buy oil palm seedlings from Tetangga Akrab in Pantu Sub-District at the price of RM13 each. When asked about the cultivation of oil palm, the respondents state that oil palm can grow up to 20 m high and its fronds can reach up to 5 metres long. According to the respondents, oil palm cultivation starts with clearing the land, raising seedlings, planting seedlings that are 12 months old, and applying fertilisers and weedicides at least once a month. Oil palm begins to bear fruit after about 30 months and the productivity cycle lasts about 20 to 30 years.

Thereafter, rubber is the second most grown cash crop with 11.75% households having planted this crop. Most farmers from Pantu tap their own rubber. The rubber is sold in Pantu market at RM250 for 100 kg. However, the price of rubber fluctuates over time. Rubber can be tapped daily, and this is usually done in the early morning when it is cooler as the latex is more fluid and therefore flows better. The interviewees stated that they will

head to the farm as early as four o'clock in the morning to tap the rubber. The interviewees also stated that it is difficult to survive on rubber alone as they only earn RM2.50 per kg from the rubber sale. Moreover, the respondents stated that it is not tapped during the rainy season as the latex is water soluble.

When asked about the cultivation and life of the rubber, the respondents informed that the rubber trees are planted with a spacing of eight feet between each tree and six feet between rows, which amounts to 908 trees per acre. The villagers also stated that it usually takes five years for the rubber to mature enough to be tapped for latex. The life span of rubber trees can reach up to 100 years, but they only produce large amounts of rubber for a period of 20 to 25 years after reaching maturity. The findings of the study also revealed that the Iban community in Pantu receives the support from Rubber Industry Smallholders Development Authority (RISDA) and there is a rubber development programme in Pantu. The requirements of the programme are that the applicant should own at least a quarter hectare but not more than 100 hectares of rubber cultivation; have valid land ownership documents; and the land earmarked for replanting should have trees that have already been tapped. Apart from this, the *penghulu* stated that the rubber development program at Pantu Sub-District covers an area of 845.5 ha. The five locations within the area are shown in Table 4.2.

Table 4.2: Rubber Development Programme in Pantu Sub-District

Location	**Size (Ha)**
RME Muding	194
RBP Sg. Tenggang Phase 1	131
RBP Sg. Tenggang Phase 2	52.5
RBP Sapak	368
RBP Limau	100
Total	**845.5**

In addition, the results of this study show that in order to support the villagers in Pantu, Group Processing Centres (GPC) have been established in RME Muding. The main purpose is to help a group of active smallholder rubber farmers to build an adequate centralised processing facility to encourage them to produce higher quality rubber. All the rubber farmers interviewed indicated that poor rubber prices are the most significant problem faced by the respondents. Other constraints are due to aging of trees. The findings of this study are similar to that of previous studies which indicated problems related to rubber smallholdings include unstable latex prices, individuals planting less than two hectares of land, hence no economies of scale and adverse weather conditions (Drable, 1991; Saufe & Man, 2017; Yusof et al., 2019).

Finally, pepper is also a predominant cash crop that provided a livelihood for rural people in Pantu Sub-District. More than 11.57% of households own a pepper farm where they grow pepper on small plots averaging 0.2 acres. According to the villagers of Pantu Sub-District, they started small-scale pepper cultivation in the late 1990s. Pepper is an important cash crop of the rural community in Pantu Sub-District. The respondents reported that their pepper cultivation is near their longhouses i.e., within 1 km to 5 km. Most of the farmers are small scale farmers thus the scale of pepper production is small. Moreover, the respondents said that they often sell black pepper because the process of producing black pepper is faster and easier than that of white pepper, despite the fact that they can earn more if they produce the higher priced white pepper. Villagers with more than 200 pepper vines receive subsidised pesticides and fertilizers from the Malaysian Pepper Board.

When asked about the techniques of pepper cultivation in Pantu Sub-District, respondents indicated that pepper is usually planted on fertile hill slopes. According to the

respondents, pepper cultivation involves planting in the field, propping, pruning, fertilizing, harvesting, and processing. The respondents also informed that field planting of rooted cuttings is done from October to December. They practice a planting distance of 2.5 meters and planting density of 2000 pepper plants per hectare. Newly planted cuttings need to be shaded until they are well established. Young plants are trained to climb up a support post. Majority (95%) of pepper growers in Pantu Sub-District use posts made of *belian* (ironwood) to support the pepper. According to the respondents, they prefer ironwood because it is durable and lasts for more than 20 years. However, they claim that the ironwood stakes are expensive and difficult to find. Five percent of the respondents who plant pepper use other hardwood such as *Selangan Batu* (*Shorea* spp.). In addition, pepper farmers informed that the vines need to be pruned to encourage the formation of a desired canopy. The final pruning is done when the terminal shoots have reached the top of the post. Next, the application of chemical fertilizer is important to obtain high yield. Respondents also indicated that the pepper vine takes about one to three years to reach a height of about 10 feet. The last step of the pepper growing cycle usually coincides with the first berry production. Pepper vines are usually brought in for the first harvest at the beginning of the rainy season in the second year of field planting. Harvesting takes place from March to August. The interview with the respondents also shows that the life span of pepper depends on the care it receives. Respondents informed that under optimal conditions it can last about 15 to 20 years, but under poor care it can only last about 6 to 10 years.

Next, respondents were asked about the differences between black and white pepper. Respondents indicated that black pepper is produced by direct sun-drying of fresh berries harvested from spikes which show early signs of maturity. White pepper is processed by soaking the berries in clean running water to remove their pericarp and then sun drying them.

Spikes of more ripened berries are harvested for this purpose. Pepper is prone to attacks by a variety of pests and diseases. The most common diseases of pepper are caused by fungi that thrive in our warm and humid conditions. Protecting the pepper vines against the various pests and diseases, largely with chemicals, incurs significant production costs for pepper.

The farmers in Pantu sell their pepper to village traders in Pantu and Lachau as well as city traders in Sri Aman. The Malaysian Pepper Board (MPB) also supports and subsidises the farmers at Pantu Sub-District. MPB introduced a special fertilizer which could reduce the production cost and increase the yield of their pepper vines. The fertilizer has a chemical and biological ratio of 80:20. The biological portion contains live microorganisms that can help neutralize the acidity in the soil. MPB also helps train farmers. However, to participate in this program, farmers must be registered with MPB. The average prices of white and black pepper on Pantu Sub-District during the study are RM45,058.33 and RM28,622 per tonne, respectively.

However, according to the respondents, the market price of pepper is fluctuating. Environmental factors such as stable temperatures and fewer droughts have also contributed to higher production. Villagers in Pantu Sub-District harvest pepper and store it in their houses first. Majority would like to sell the black pepper at a minimum price of RM20 per kg. To support the villagers, the Malaysian Pepper Board offers a Pepper Ownership and Storage Programme (SPPL) with Tuai Rumah Iben, Kampung Sebemban Selanjan.

Overall, the cultivation of oil palm, rubber and peppers brings significant wage and employment opportunities to the rural population in Pantu Sub-District. However, the findings of the study show that cash crop cultivation is subject to various hazards such as land degradation and price instability.

4.3.1.3 Livestock Farming

As part of agricultural diversification, rural communities in Pantu are also actively involved in livestock production. The sale of livestock provided another source of income for rural households in Pantu. Livestock also serves as a subsistence source for most households as it was the main source of animal protein that contributed to the household's nutritional base.

As shown in Figure 4.3, households in Pantu kept a range of animals, with poultry as the main livestock constituting 49%, mainly domestic chickens; followed by pigs (44%); and fish (2%). Other livestock (5%) included ducks and goats. The prices of livestock in Pantu are shown in Table 4.3.

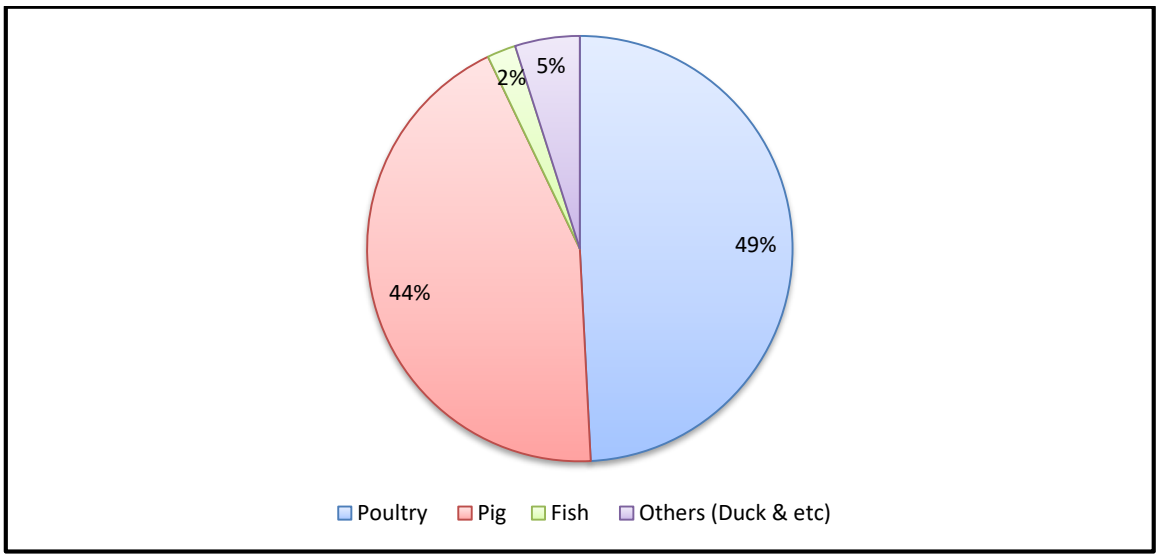


Figure 4.3: The Percentage of Household's Involvement by Types of Livestock

Table 4.3: Livestock Price in Pantu Sub-District

Livestock	Price Per Kilogram (RM)
Chicken	12
Duck	18
Pig	14

There are also livestock rearing projects in Pantu, such as the Livestock Commercial Unit (LCU) for pigs and chicks involving villagers in Pantu Sub-District. Another project is AZAM which targets the rural poor to involve them in farming activities like pig farming, chicken farming, duck farming and aquaculture. For example, one of the respondents involved in pig farming received support in the form of infrastructure development such as improved road access to the farm, and utility infrastructure including electricity and water supply.

Pig rearing is very common in the Pantu households. Pig rearing involves raising domestic pigs as livestock, with land provided to investors for raising pigs. However, farmers did not make much profit from commercial farming because of the high cost of maintenance.

Apart from this, a minority of households (2%) were involved in the fishing project, especially from Kampung Limau and Kampung Rapak Tepus. Two households (bilik) have constructed fishponds to raise fish, while other households in Selanjan Sebemban, Sungai Merah and Abok raise fish in fibreglass tanks and cement tanks.



Figure 4.4: Tilapia and Catfish Pond (Kampung Limau)

According to the interviewees, good market communities, production inputs, access and transport facilities influenced the demand and supply of aquaculture products. Good quality fish were important to be promoted and meet specific market demands. As a result, these farmers obtained better income, which could help them to expand their production inputs and diversify their products. Apparently, most of the farmers were engaged in small-scale aquaculture whereby their production did not meet the high demand in the market, thus preventing them from earning a higher income. Based on the observation, most fish farmers preferred tilapia and catfish farming which has taken an important role in commercial fish farming in Pantu.



Figure 4.5: Swiftlets Farming in Kampung Rapak Tepus

Finally, another form of agriculture is swiftlet farming, as shown in Figure 4.5. In Rapak Tepus there is a *bilik* family that raises swiftlets. According to the respondent, the price of bird nests was also influenced by the size and shape of the bird nest. Most of the harvested bird nests were exported to China while some were sold in the domestic market.

The community keeps livestock at different income levels and livestock rearing in Pantu Sub-District helps to improve the livelihood of *bilik* families. In Pantu Sub-District, livestock contributes to household livelihoods by providing cash income and consumption of meat and eggs. In addition, livestock keeping is a form of savings and insurance, as

respondents indicated that selling animals provides them with immediate cash in case of emergencies or unexpected expenses, such as medical care and school fees.

4.3.1.4 Relationship of Agricultural Diversification and Income Level

In this study, the Iban community in Pantu was found to grow several crops or mixed crops instead of growing only one crop for subsistence or commercial purposes. Even though farming is not the main occupation for some households, the majority of households are involved in farming as a secondary activity. Considering the fact that agriculture is a main occupation for majority of the households, an in-depth study was carried out on agricultural diversification and its impact on farmers' income. As shown in Table 4.4, households with different income levels diversified their agriculture for various purposes.

Overall, 47.5% of households engaged in both subsistence and cash crop farming, 37.5% are engaged in cash crop farming, 5.9% are engaged in subsistence farming and the remaining 9.1% did not engage in farming at all. Majority of the farmers are low-income earners (RM2,000 and below) which is 154 respondents or 70% of the respondents. This shows that the low-income population in Pantu are more involved in diversification of agricultural activities to sustain their livelihood. They participate in agricultural diversification by growing crop varieties on their farms, mainly for subsistence and cash crops.

Table 4.4: The Crosstabulation of Agriculture (Crops) Strategies at Different Income Level

Purpose of Crops Farming					
Gross Monthly Income	**Subsistence Farming**	**Cash Crops Farming**	**Subsistence and Cash Crops Farming**	**Not Relevant**	**Total**
RM1.00-RM1,000	3a	2a	45a	6a	56
	5.4%	3.6%	80.4%	10.7%	100.0%
RM1,001-RM2,000	6a	4a	78a	10a	98
	6.1%	4.1%	79.6%	10.2%	100.0%
RM2,001-RM3,000	4a	10a	34a	3a	51
	7.8%	19.6%	66.7%	5.9%	100.0%
RM3,001-RM4,000	0a	1a	10a	1a	11
	0.0%	0.0%	90.9%	9.1%	100.0%
RM4,001-RM5,000	0a	0a	1a	0a	1
	0.0%	0.0%	100.0%	0.0%	100.0%
RM5,001 & above	0a	0a	3a	0a	3
	0.0%	0.0%	100.0%	0.0%	100.0%
Total	**13**	**17**	**170**	**20**	**220**
	5.9%	**37.5%**	**47.5%**	**9.1%**	**100.0%**

The summary of cross tabulation results for livestock diversification is presented in Table 4.5. The table shows that 50.5% practice subsistence farming and commercial farming, 8.6% practice subsistence farming, 3.6% practice commercial farming and the remaining 37.3% do not practice livestock farming. It shows that most farmers raise livestock for their families' needs on small farms and sell surpluses for some cash, as most of them still belong to the low-income household group (154 out of 220 respondents).

Table 4.5: The Crosstabulation of Agriculture (Livestock) Strategies at Different Income Level

Purpose of Livestock Farming					
Gross Monthly Income	**Subsistence Livestock Farming**	**Commercial Livestock Farming**	**Subsistence and Commercial Livestock Farming**	**Not Relevant**	**Total**
RM1.00-RM1,000	7 a	3 a	30 a	16 a	56 a
	12.5%	5.4%	53.6%	28.6%	100.0%
RM1,001-RM2,000	8 a	3 a	43 a	44 a	98 a
	8.2%	3.1%	43.9%	44.9%	100.0%
RM2,001-RM3,000	4 a	2 a	29 a	16 a	51 a
	7.8%	3.9%	56.9%	31.4%	100.0%
RM3,001-RM4,000	0 a	0 a	8 a	3 a	11 a
	0.0%	0.0%	72.7%	27.3%	100.0%
RM4,001-RM5,000	0 a	0 a	0 a	1 a	1 a
	0.0%	0.0%	0.0%	100.0%	100.0%
RM5,001 & above	0 a	0 a	1 a	2 a	3 a
	0.0%	0.0%	33.3%	66.7%	100.0%
Total	19 a	8 a	111 a	82 a	220 a
	8.6%	3.6%	50.5%	37.3%	100.0%

Furthermore, based on Table 4.6, it was found that no significant correlations were observed between agricultural diversification strategies and household income levels. The correlation between income level and crop farming was negative at 0.01 and the correlation between income level and livestock farming was very weak at only 0.104. Both activities also recorded low significant values with income level, crops farming at 0.990 and livestock farming at 0.124 which were higher than 0.05. Interestingly, 55.9% of the households still belong to the low-income group even if they practised subsistence and cash crop farming, and 33.18% of the households practising subsistence and commercial livestock farming

belonged to the low-income group. Only 24% of respondents practicing agriculture and 16.82% owning livestock earned a middle-income despite practicing agricultural diversification strategies.

Table 4.6: Correlations between Agricultural Activities and Income Level

Correlations Between Agricultural Activities and Income Level		**Gross Monthly Income**	**Purpose of Crops Farming**	**Purpose of Livestock Farming**
Gross Monthly Income	Pearson Correlation	1	-.001	.104
	Sig. (2-tailed)		.990	.124
Purpose of Crops Farming	Pearson Correlation	-.001	1	.341**
	Sig. (2-tailed)	.990		.000
Purpose of Livestock Farming	Pearson Correlation	.104	.341**	1
	Sig. (2-tailed)	.124	.000	

** Correlation is significant at the 0.01 level (2-tailed).

This could be explained by the fact that most households are self-sufficient in food (subsistence) and sell only the surplus in the local markets, resulting in lower income (crop or commercial livestock). It shows that, diversification of agricultural production has become a necessity for the community in Pantu Sub-District. Another reason is that the farmers studied are small-scale farmers. They still lack skills, technologies, and financial services to produce a marketable surplus. Persistently low-income levels are one of the main reasons why farmers remain smallholders and why young people are leaving rural areas.

In addition, it was found that the monthly income earned by most of the affected households from the different cropping strategies was not consistent. They indicated that their income from their farming activities was not fixed or consistent as it depended on yields and other factors such as seasonality and market price of crops. Some of the respondents said that they would earn less than RM100 and sometimes a maximum of only RM500 per month.

The lower monthly income from the sale of crops and livestock results in a comparatively low income for most households.

In comparison, a relatively low income within RM2,000 for most households in the Pantu area was considered high enough to improve their well-being and it has alleviated the previously unstable living situation of farmers. This is because the average minimum income in Sarawak was only RM920 during the study (2017). It was found that farmers can also reduce food expenditure by diversifying agriculture as they have a stock of rice and various vegetables and fruits. Overall, rural livelihood, especially farming, is inherently a less profitable activity that is usually used to sustain household livelihood.

4.3.2 Rural Non-Farm Income and Remittances

Rural transformation has moved the labour force from farm to non-farm activities as there are employment opportunities in non-farm sectors in Pantu Sub-District. The non-farm sector is important as it provides diverse employment opportunities to the rural population in Pantu Sub-District. In this study, it was found that the livelihood activities of the rural communities in Pantu Sub-District are not purely agricultural as 30% of the respondents derive their income from wage income, self-employment, and unearned income. Of these respondents, about 12.7% earn wage income working in private enterprises such as oil palm companies, on contract basis in Pan Borneo projects and a few as unskilled workers in coffee and grocery shops in the area. Meanwhile, 6.4% of respondents who received wage income work in government sectors as police officers, military officers, nurses, medical officers, and teachers. This group received better education with the minimum of SPM holders to earn a living in government sectors. The 5% of household heads who were unemployed with unearned income are mostly elderly people who depended on pensions, government social

assistance and remittances. Furthermore, in the category of other occupations, 3.2% work as fishermen and collectors of jungle products.

In addition, 1.8% are the self-employed who own businesses such as a grocery stores, selling handicrafts and forest products, and a vehicle rental business (van). The remaining 1.4% are homemakers who depend primarily on unearned income, i.e., remittances from their spouse or family members. Based on observation, it can be seen that diversification of activities through growth of service sector and infrastructure in Pantu, such as school, clinic, private oil palm company and Pan Borneo Road construction, have created job opportunities.

In Pantu, remittances were identified as a secondary source of income sent by young adults working and living in urban areas to their families back home. It was found that 26% (58 households) of the households received remittances. Mostly, remittances serve as a supplement to the main income. Only some respondents such as the elderly and housewives depend mainly on remittances for their livelihood. In addition, respondents indicated that remittances are sent by their families, i.e., their spouse (husband) or children, especially the permanent *bilik* member. The permanent *bilik* member refers to the family members who still occupy the same dwelling and form a household, they have responsibilities towards their own family under the same roof or *bilik*. Compared to those who have formed an independent *bilik*, they rarely send remittances as they have their own permanent residence in another place. Nevertheless, they occasionally remit money to their family in the village, for example during visits, with varying amounts.

Besides that, in terms of income level it was found that low-income households were the majority (86%) who received remittances compared to middle and high-income groups. This meant that more migrants were from low-income groups who work in urban areas or

other places to generate more income to support their families in the villages. This was consistent with the assumption generated in the study that the *bejalai* culture still existed and improved their socio-economic status. Iban in Pantu participate in *bejalai* for the purpose of *pengawa, berkuli, kerja, belelang* and *pindah*. The younger generation in particular was likely to migrate from this village as most of them had completed their tertiary education and moved to urban areas to seek better employment and improve their standard of living instead of sticking to farming. It was observed that more and more young women joined the migrating labour force. In some cases, the mothers may migrate for work, leaving their children in the village under the care of their grandparents. It was also found that migration activities in Pantu Sub-District were represented by a push and pull measure. The respondents in the study indicated that non-farm employment opportunities in the cities were the major significant pull factors. Most of the industries in the cities provide the opportunity for better wages and tertiary educational institutions are also located in the cities. In addition, poor living conditions and lack of non-farm jobs in rural areas are push factors. Thus, they move away from rural areas due to limited economic opportunities and other pressures on rural livelihoods.

In fact, most of the Iban in Pantu have moved from the villages to the city for work, for example in Kuching, Miri, Johor Bahru and so on. The migrants have permanent jobs in the government and private sectors. In the government sector, they work in various fields such as education, defence, health, and tourism. In the private sector, some of them worked in the oil and gas industry, usually with the help of relatives who had just relocated, and some were employed in various industrial and construction sectors.

From the discussion, it appears that remittances helped to strengthen the manageability of family units in Pantu Sub-District. There is only a small proportion of families in Pantu who depend on remittances as such non-farm livelihood strategies related to remittances does not influence their livelihood strategies. From the study, the younger adults tend to move to urban areas for better employment opportunities. In order to improve the quality of life in rural Pantu, it can be concluded that non-farm income can be considered as a potential sector that can be developed to provide employment for young people.

4.3.2.1 Use of Natural Resources as Livelihood Strategies

The Iban community also depends on natural resources to make a living and as a source of their livelihood. For the villages within the study scope, the four main natural resources still used by the community were land, forest, wildlife, and river. Activities such as foraging, wildlife hunting and fishing were their livelihood strategies to improve their household income. The aim of this study was to analyse whether these activities affect the livelihood strategies of Iban people in Pantu area.

Based on Table 4.7, the impact of foraging activities seemed to be more substantial ($p = 0.016$) compared to hunting ($p = 0.549$) or fishing ($p = 0.118$), as more individuals are engaged in this activity. The two natural resource-based activities, fishing, and wildlife hunting did not have a significant impact (fishing, $p = 0.118$, $p > 0.05$; wildlife hunting, $p = 0.549$, $p > 0.05$) on monthly household income, as only about 30% of households were involved in these activities. Moreover, the average income for the three activities was less than RM1,000. It was found that most of them consumed the natural products for their own use and the rest were sold in the local markets where they could not earn much money.

Table 4.7: Association between the Use of Natural Resources and Houshold Monthly Income

Spearman's Rho		**Gross Monthly Income**	**Collection of Forest Produce**
Income and Collection of Forest Produce	Correlation Coefficient	1.000	.162
	Sig. (2-tailed)	.	.016
	N	220	220
Income and Fishery Activities	Correlation Coefficient	1.000	.106
	Sig. (2-tailed)	.	.118
	N	220	220
Income and Wildlife Hunting	Correlation Coefficient	1.000	.041
	Sig. (2-tailed)	.	.549
	N	220	220

Figure 4.6 shows that more households preferred to consume the yield rather than sell it, especially those engaged in foraging (85 households). In addition, some residents collected vegetables for their own consumption and sold the surplus. The community in Pantu Sub-District still benefits from the jungle produce as they spend less money buying food from the markets. In Kampung Semawa Ili, the majority of the households engage in fishing activites. As the market price for fish is relatively high, fishermen also tended to sell their catch. According to the respondents, their income is not fixed as it depends on the type of catch and the price of fish. In addition, the community in Pantu Sub-District still hunts wild animals for their own consumption (10 households), but this was not a common activity. They would only go hunting if they had the time. In addition, forest degradation and lack of flora and fauna reduced the frequency of hunting activities by households, as revealed in the interviews. Similarly, most of the respondents showed less interest in hunting as they prefer non-farm work as the pay is more promising.

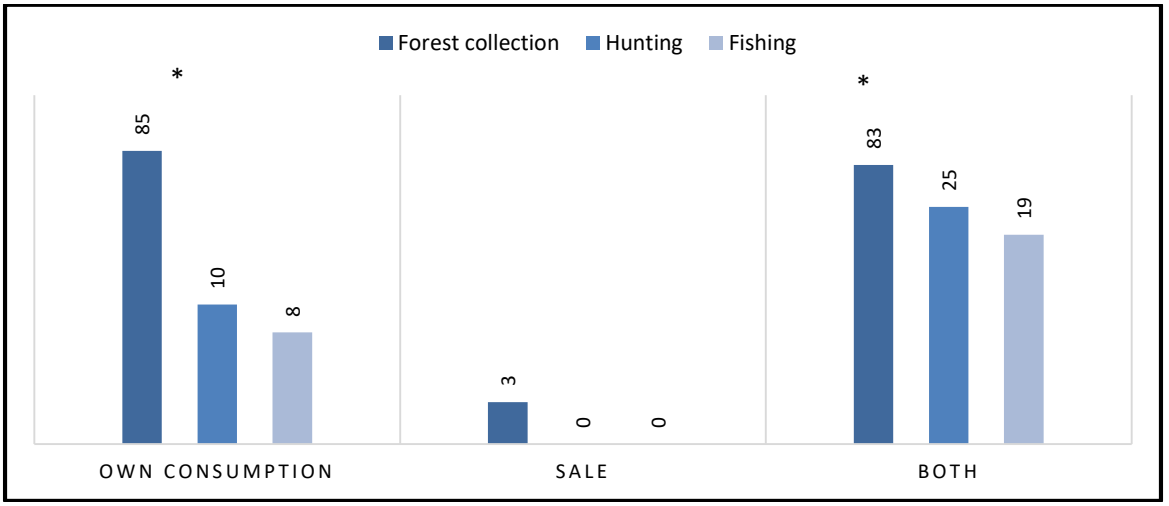


Figure 4.6: The use of Natural Resources by the Number of Households

Moreover, for the community in Pantu Sub-District the relationship with the land remains essential to their identity and livelihood. The reliance of this local community on natural resources was still very high, as they were all able to derive benefits from these resources. The Iban community in Pantu Sub-District is dependent on land for forest products, hunting, agriculture, and livestock. The available land provides essential food such as fish and edible crops. Moreover, the land contributes significantly to the income of this community, as the profits they make from the sale of agricultural products contribute to their monthly income.

Table 4.8: Relationship between Land Size and Income

Spearman's Rho		**Size of Land (Acres)**	**Gross Monthly Income**
Size of Land (Acres)	Correlation Coefficient	1.000	.207**
	Sig. (2-tailed)	.	.002
	N	220	220
Gross Monthly Income	Correlation Coefficient	.207**	1.000
	Sig. (2-tailed)	.002	.
	N	220	220

As shown in Table 4.8 based on the bivariate analysis, the different land sizes have a significant effect (P=0.02) on the average monthly income of most Iban households in Pantu. The average monthly income increases with land size as households practised agricultural diversification on their land to earn a better living, as shown in Figure 4.7. Those who owned larger areas of land carried out greater diversification strategies in their agricultural activities such as growing subsistence and cash crops; with commercial and subsistence livestock resulting in greater monthly income compared to those who owned smaller pieces of land.

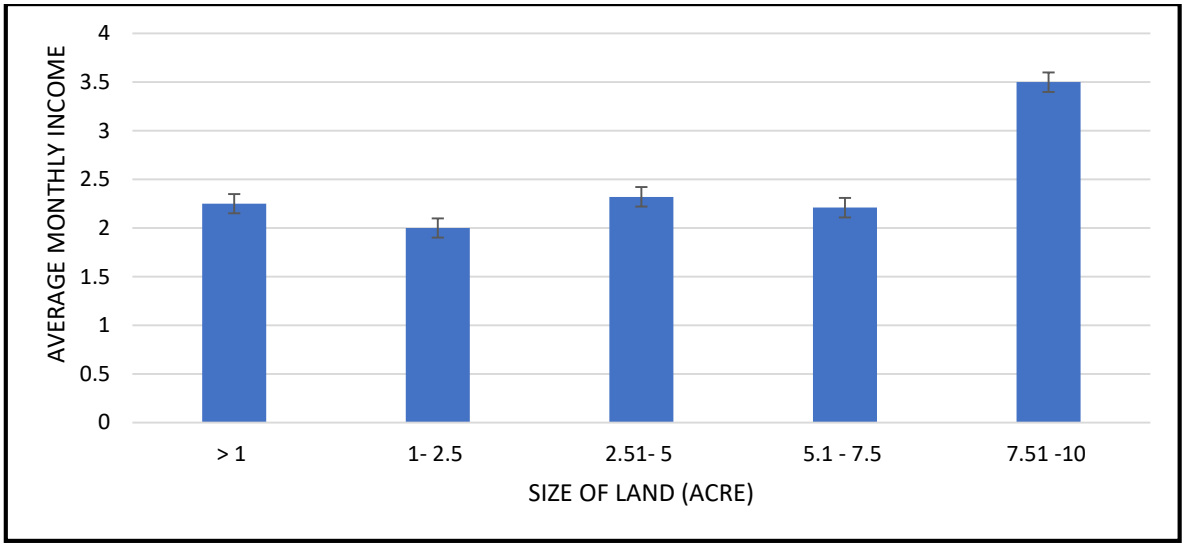


Figure 4.7: Distribution of Average Monthly Income with the Size of Land

Furthermore, the results of the Friedman Test shown in Table 4.9 also revealed that monthly yield in farming and livestock had the highest performance (M = 2.36, M = 3.50). Although most of the community in Pantu Sub-District are landowners, some of them borrow and rent the land for farming purpose with farming being the main occupation (70%) of the rural community in Pantu Sub-District. Likewise, there was a significant relationship between monthly yield in farming, livestock, forest produce and hunting (x2 = 231.540, p = .000) as shown in Table 4.10. These validations can answer the assumption that the Iban have diversified their livelihood strategies and still rely on natural resources to earn a living.

Table 4.9: Friedman Test of Monthly Yield in Farming, Livestock, Forest Produce, and Hunting

Ranks	Mean Rank
Monthly Yield in Hunting	1.86
Monthly Yield in Forest Produce	2.28
Monthly Yield in Livestock	2.36
Monthly Yield in Farming	3.50

Table 4.10: Chi Square Test on Monthly Yield in Farming, Livestock, Forest Produce and Hunting

Chi Square Test	Test Statistics
N	220
Chi-Square	231.540
Df (degrees of freedom)	3
Asymptotic Significance	.000

In fact, this study is in line with the research of Munke et al. (2011), Riman (2015), Sanggin et al. (2015), Jawol et al. (2018) and Owens et al. (2018) who highlight that the Iban people in different parts of rural Sarawak still depend on natural resources for their livelihood. In this modern era, the Iban community in Pantu Sub-District still practice its traditional livelihood as land, water and forests help to sustain the community's livelihood.

4.3.3 Borderline Livelihood Strategies in Pantu Sub-District

Pantu Sub-District is unique in that it is located near the border of West Kalimantan. There are four Indonesian regencies that directly border with Malaysia, namely Sambas, Sanggau, Sintang and Kapuas Hulu, which stretch along the Kelingkang Range of Kapuas Hulu. Moreover, transportation between West Kalimantan and Sarawak is mainly by land through the official border checkpoints. There are three border checkpoints on the Malaysian

side, namely Tebedu, Lubok Antu and Lundu, while there are three more on the Indonesian side, namely Entikong, Badau and Aruk. Bukit Kelingkang is a mountain range which acts as a natural border between Malaysia and Indonesia as shown in Figure 4.8.

According to the respondents, economic transactions between villages on both sides of the border began a long time ago. This is supported by extensive studies which show that the Iban have a long history of migration and a close-knit organisation of exchange, correspondence and family relations dating back to pre-colonial times. After independence, the old borderlands in Borneo remained divided and the Iban living on either side became Indonesian and Malaysian residents respectively (Padoch, 1982; Sandin, 1968; Yapp & Morah, 2013).



Figure 4.8: A View of Bukit Kelingkang from a Villager's Pepper Farm

The findings of the study revealed that the people in West Kalimantan, especially those from Sintang Regency, namely Sungai Ketungau, Nanga Bayan and Belubu, have illegally crossed the Malaysian-Indonesian border to conduct cross-border activities with the community in Pantu Sub-District. From the interviews with the villagers, people from West Kalimantan enter Pantu Sub-District through Kampung Gua, with Lachau Town as their

main destination. When asked about the mode of transportation, the interviewees stated that the illegal routes (*jalan tikus*) can be traversed by walking or on motorbikes. Belubu is the furthest, and usually it takes about 4 hours and 30 minutes to walk from Belubu to Nanga Bayan. Next, from Nanga Bayan they travel towards Sungai Ketungau and from Sungai Ketungau they will travel on to Kampung Gua in Lachau at Pantu Sub-District.

The respondents from the interview indicated that there are small scale informal trading activities between those in Pantu and West Kalimantan. The findings of the study also revealed that Sarawak is a popular place for people from West Kalimantan as the Malaysian Ringgit currency is higher compared to Indonesian Rupiah. The types of traded goods from those in West Kalimantan include pepper, fruits, *lukai* and handicrafts. They sell them to local villagers and shop at Pantu Sub-District. *Lukai* is the bark of a tree that repels insects when burned. The tree is called *selukai* or *lukai* (*Goniothalamus Andersonii*). During the fruit season, people from Kalimantan regularly travel to the town of Lachau and surrounding villages to sell their fruits. They also sell the fruits by the roadside and in the town of Pantu. The results of this study show a similar pattern of the study by Eilenberg and Wadley (2009) who reported that Iban are involved in cross-border activities in Sarawak and Kalimantan.

In addition, those from West Kalimantan will purchase household goods from Lachau Town, as shown in Figure 4.9. The results of the survey revealed that there is also a barter trade system where people in Kalimantan exchange their crops such as pepper and fruits for sugar, cooking oil and other prepared foods from the community in Pantu Sub-District.



Figure 4.9: A group of People from West Kalimantan

There is also a flow of labour. Many Indonesians seek job opportunities in Pantu Sub-District, where there is a shortage of labour, and receive cash payment in ringgit in return. Unlike bilateral trade in goods, the direction of labour is one-way, that is, only from Indonesia to Malaysia. Indonesia is a major supplier of labour to Malaysia, especially labourers. This finding is in line with Fariastuti's (2014) study which reports that inadequate job opportunities in Indonesia push those who can be found at West Kalimantan to work in Sarawak.

Similarly, the findings of the study also revealed that the employment of Indonesian workers in Pantu Sub-District is regulated on an individual basis. Indonesians are usually employed to harvest oil palm, pepper and rice, as well as other jobs on the farm. There is a severe labour shortage among some palm oil farms. These casual jobs are seasonal and offered only occasionally. These results correlate with the findings that emphasise the labour shortage in oil palm plantations in Malaysia, especially among local workers (Zainol, 2015).

This scenario also applies to Pantu Sub-District as most of the local youths are not interested to work in the plantation sector. In Pantu Sub-District, Indonesians were surprisingly paid the same wage as locals for the same work.

Apart from this, according to the respondents, there are also intermarriages or cross-border marriages. A relatively small number of villagers in Pantu marry people from Kalimantan and live in Pantu. Other studies on intermarriage show similar patterns, for example Amster (2005) and Bulan (2011) found that cross-border marriages exist in the Kelabit highlands of Borneo. Besides that, according to the *tuai rumah,* cross-border marriages that were not officially registered led to problems when their children reach the schooling age as some did not have birth certificates. When asked about the reason for cross-border marriage, respondents said it was a desire to support the family's livelihood, especially in agriculture, and to help care for ageing parents. Such marriage also helps to supplement the labour force in the family, and they can get a spouse who is familiar with rural livelihood. Interviews with villagers, headmen and *penghulu* show that cross-border trade has improved the socio-economic conditions of local communities. This interaction has been crucial for the economic survival of the residents of Pantu Sub-District.

4.3.4 Choice of Livelihood Strategies and Income Level

In this study, the farm and non-farm activities undertaken by households for their livelihood were defined as livelihood strategies. Households were grouped according to the proportion of income earned in these sectors. To distinguish between farm and non-farm accounts, they were classified according to their main occupation.

The analysis of the income portfolio in Table 4.11 shows that most of the income is derived from farm (69.54%) followed by 30.46% from non-farm activities. It was also

observed that 70% of the respondents (154 households) belonged to the low-income group earning less than RM2,000 per month and most of them were involved in agricultural activities. Besides that, 28.18% fall in the middle-income group while only 1.82% belong to the high-income group. This indicates that majority of the Pantu population were low-income earners despite their diversified livelihood activities.

Table 4.11: Relationship of Livelihood Strategies and Income Level

Main Occupation / Livelihood Strategies	**Income Group**			
	Low (f/%)	**Medium (f/%)**	**High (f/%)**	**Total (f/%)**
Farm	130/59.09	23/10.45	0	153/69.54
Non-farm	24/10.91	39/17.73	4/1.82	67/30.46
Total (f/%)	154/70.00	62/28.18	4/1.82	220/100

In 2017, when the study was conducted, the poverty line income level in Sarawak was RM920. However, when the national poverty line income (PLI) was revised in July 2020 from RM908 to RM2,208 (DOSM, 2020), majority of the Iban community in Pantu are now considered living below poverty line. Despite the fact that majority of the Iban households in Pantu earn less than RM2,000 per month, they still have enough resources to meet the basic needs. This is probably due to the availability of the natural capital around them to sustain their livelihood. As Hwa et al. (2013) emphasised in their study, the poverty line refers to the minimum income necessary to provide a person at the subsistence level with food, shelter, clothing, and other needs. This study also found that while there were no high-income earners among the farmers, there were four high-income earners among those involved in the non-farm sector earning more than RM4,000 in Pantu.

In the situation of Pantu, livelihood diversification was seen as both endless and new activities. They have diversified their income through both traditional and modern activities which are differentiated into agricultural and non-agricultural activities such as farming, remittances, rural business, renting, hunting, fishing, and forest gathering. Interestingly, the respondents in the interviews indicated that they do not only focus on their main livelihood strategies but also diversify their livelihood strategies. In this study, livelihood diversification refers to household attempts to find new ways to increase income or diminish environmental hazard, which differ significantly in the degree of choice. In Pantu Sub-District livelihood diversification includes both agricultural and non-agricultural activities undertaken to generate additional income to that from the household's main occupation. For example, based on the *tuai rumah* interviews, government employees participated in commercial farming as an additional activity because they own land. A similar scenario was found in the study conducted by Ellis and Allison (2004) in Tanzania, which revealed that diversification of income sources across classes seems to be very pronounced between the better off and the poor households. The better off tend to diversify in the form of off-farm activities, while the poor tend to diversify in the form of low-wage work, such as on other farms (Eshetu, 2016).

4.4 Five Types of Livelihood Assets That Influence Iban Livelihood Strategies

This section discusses the findings related to the determining factors in the diversification of the livelihood strategies of the Iban community. There are five types of livelihood factors, namely human, physical, financial, natural, and social assets, as shown in Sustainable Livelihood Framework (SLF). Since a family's decision to choose a particular livelihood strategy is influenced by asset ownership, this study examines how these assets influence the diversification of livelihood strategies among the Iban community in Pantu Sub-District. Different livelihood activities have different requirements, but those who are

asset rich are more likely to make positive livelihood choices. Therefore, the household in Pantu Sub-District depends on these assets in farm and non-farm livelihood activities to achieve positive livelihood outcomes. Livelihood outcomes are determined by income, food security and environmental sustainability, which may vary by strategy and household. In this study, income was considered as an indicator of livelihood. The study was conducted by interviewing the household heads in the longhouses. In addition, the findings from the in-depth interviews with *tuai rumah* and *penghulu* were provided to elucidate the information on livelihood factors. The information from observation also helps to enrich the findings of this study.

4.4.1 Human Capital

For both Mungguh Ubah and Kara Pantu, the pillars of human capital index were analysed to track the state of human capital development in the village. Human capital for these longhouses was represented by gender, age, education and *bilik* members (household size). The respondents were the heads of each household (*bilik*) in 12 longhouses studied. Each longhouse has a different name that starts with the term "*kampung*" and refers to the village or the longhouse. Figure 4.10 shows the size of a household (*bilik*) in each longhouse.

The presence of *bilik* members is crucial because they contribute their energy, knowledge, and skills as active labour. The average family size of a *bilik* is between three and five people, which includes father, mother, children, and grandchildren. In fact, an Iban household contains a distinct domestic family unit whose members may consist of up to four generations. This number was slightly smaller than the average household size in the study of Ayob et al. (1990), which was 6.6 persons.

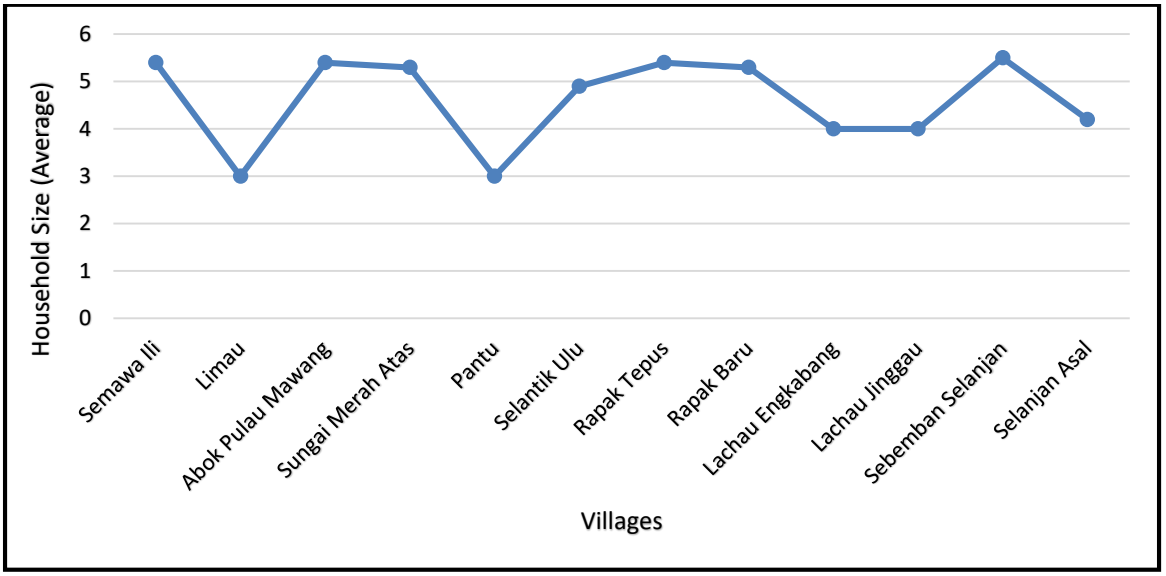


Figure 4.10: Average Size of Household of the 12 Longhouses Examined

On the other hand, the household size in this study was almost comparable to the average household size in the state of Sarawak of 4.6 persons per household (Sarawak Census, 2010). This trend indicates the structural change of rural *bilik* families which have decreased over the years, most likely due to migration. In addition, the results of the interviews showed that the *bilik* family members are the most important human capital for the *bilik* family. This is because the Iban *bilik* family plays the main role in decision making regarding their household. Different households or different individuals within a household have different livelihood strategies. As a result, each *bilik* family may develop differently compared to the other families living in the same community or longhouse.

Based on the findings of the in-depth interview, the size of human capital in their village was declining due to family livelihood diversification activities in Pantu Sub-District, especially through migration or *bejalai* where men and women leave their villages for a considerably long period of time, from a few months to years. Based on the in-depth interview with *penghulu* and *tuai rumah*, the young adults move to the urban areas to find better living conditions for the purpose of *pengawa*, *berkuli*, *kerja*, *belelang* and *pindah*. One

of the most important findings is that the spirit of "*Agi Idup Agi Ngelaban*" still applies to young adults in Pantu.

According to Table 4.12, both middle-aged men and women contribute the highest percentage of human capital (67.7%) and the least would be young adults (9.1%). There are senior citizens (23.2%) who are over 65 years old and still play the role as the head of the family. This result indicates that young adults are absent as heads of households in the longhouses. The results of the study revealed that the young adults in Pantu Sub-District had higher levels of education and more energy to travel to cities for livelihood employment or higher educational opportunities compared to the other age groups.

Table 4.12: Age and Education Level of Heads of Households

Level of Education	**Frequency/ Percentage**	**Young Adult (20 -40 Years Old)**	**Middle Age (41-64 Years Old)**	**Senior Citizen (>65 Years Old)**	**Total**
No Education	Frequency	1	13	15	29
	Percentage	0.5%	5.9%	6.8%	13.2%
Primary School	Frequency	7	45	11	63
	Percentage	3.2%	20.5%	5.0%	28.6%
Secondary School	Frequency	12	83	24	119
	Percentage	5.5%	37.7%	10.9%	54.1%
Tertiary Education	Frequency	0	8	1	9
	Percentage	0.0%	3.6%	0.5%	4.1%
Total	**Frequency**	**20**	**149**	**51**	**220**
	Percentage	**9.1%**	**67.7%**	**23.2%**	**100.0%**

A similar pattern of results was obtained in Riman's (2015) study in Betong, Sarawak. In addition, some *bilik* members were not at home during the study as they reportedly move to the urban areas, which proves that they *kerja* or *berkuli* in the urban areas. The results of the in-depth interview supported the notion that migration was more of an option for the younger adults than the middle-aged groups who had heavier family burdens and more problems that prevented them from moving further away from their families. Due to such constraints, they preferred to stay in the longhouse. Some elders may have had no choice but to lead the family since the younger generation of the family had migrated. Moreover, the findings indicated that some families accede the responsibility to their seniors out of respect or trust considering their experience and knowledge. Nevertheless, the results also showed that 23.2% of them were still in the active working population group. Therefore, the choice of livelihood strategies could be strongly influenced by these characteristics.

Thereafter, education was another prominent element in human development and acted as a catalyst for the development of skills that eventually contributed to the well-being of livelihoods. Table 4.12 illustrates the level of education of household heads (*tuai bilik*) based on their respective ages. Table 4.12 shows that 13.2% of the household heads had no formal education. According to the researcher's observations, this group was mainly senior citizens and middle-aged villagers who did not have access to education due to the lack of educational awareness and poor family circumstances in earlier times. Moreover, there were not enough schools in the Pantu area. However, later, as the district developed, more schools were built, and the majority of the Iban population was able to attend school.

Thus, 28.6% had completed their primary education, while the majority of household heads had secondary education, about 54.1%. These findings were contrary to Ayob et al.,

(1990) who found that 60% of household heads in Balingian had never attended formal education while Mambu (2013) reported that only 40% of household heads in Pantu had secondary education. In view of this, the study found that there was an improvement in educational attainment among household heads in Pantu Sub-District. This trend showed the structural change in terms of educational development in Pantu which was applicable to the theory of structural change for rural livelihood adopted in this study. Meanwhile, only 4.1% of household heads completed tertiary education, which may include different levels such as certificates, diplomas, or degrees. These groups of respondents mostly worked in the private and government sectors; some of them were pensioners.

The different levels of education affected the occupations of the respondents while also influencing their livelihood strategies. The results of the survey showed that the household heads with formal education were able to make positive choices of livelihood activities for their household. This was because formal education increased their knowledge in selecting activities with more income and helped them to keep abreast with all the modern technologies for effective entrepreneurship, thus contributing to the welfare of the family. The educational profile of the household heads showed that education was one of the most important factors that influenced the adoption of their livelihood diversification strategies. The skills, work abilities and good health attributes demonstrated by the Iban communities allowed them to engage in various strategies and meet their own livelihood goals. These attributes led to a more sustainable livelihood.

4.4.2 Financial Capital

In this study financial assets were assessed according to the source of income, income level and villagers' access to any form of financial support structure. In this regard, Table

4.13 showed that most of the households (70%) derived their income from farming inclusive of planting various cash crops, subsistence farming and rearing livestock.

Table 4.13: Main Occupation of the *Bilik* Head

Occupation	**Frequency**	**Percentage**
Farmers	153	69.5
Employed in Private Sector	28	12.7
Employed in Government Sector	14	6.4
Homemakers	3	1.4
Unemployed	11	5.0
Own Business	4	1.8
Others	7	3.2
Total	**220**	**100.0**

About 30% of the respondents indicated that they derived their income from non-agricultural sources such as being employees in the private sector, employees in the government sector, homemakers, owning their own business, unemployed (pensioners and those dependent on government support) and other occupations such as fishermen.

Out of the 30% of respondents who receive non-farm income, about 12.7% work in private companies such as palm oil companies, on contract at Pan Borneo and as shop assistants in coffee and grocery shops in Pantu and Lachau town. Meanwhile, 6.4% of heads worked in the government sector as police officers, military officers, nurses, medical workers, and teachers. This group is among the higher educated, thus are able to make a living working for the government. There are 5% of household heads among the categories of unemployed, they were mostly senior citizens who depended on pensions, state welfare or remittances. Besides these, there are 3.2% who are engaged in other occupations, referring to fishermen and those who gather forest produce. In addition, 1.8% have their own business

such as grocery store, small business selling handicrafts and forest products, and vehicle rental (van). The remaining 1.4% are homemakers who depend entirely on their children or spouse's remittances.

The findings of this study show that the Iban community in Pantu Sub-District rely on both agricultural and non-agricultural resources to generate income for their household. Furthermore, although farming is their main occupation, the respondents who work as farmers indicated that they also engage in additional non-agricultural activities (wage labour) and use natural resources such as through hunting and foraging for trade to generate more income to sustain the livelihood of their household. These findings are consistent with those of Munke et al. (2011) who highlighted the diversification strategies of some farmers in the Sejijak Mawang region by incorporating the interaction between subsistence and cash crops and local opportunities.

Table 4.14 shows that households were divided into three groups based on their monthly income: a low-income group earning up to RM2,000; a middle-income group earning between RM2,001 and RM4,000; and a high-income group earning more than RM4,000. Seventy percent of the households in these longhouses had a gross monthly income of less than RM2,000. This income could be related to the higher number of residents engaged in agriculture.

This was followed by 28.2% with middle-income (RM2,001 to RM4,000); and only 1.9% earned a high income (RM4,001 and above). The lowest income could be due to the head of household being unemployed or relying solely on only one income source which provides a lower wage. In the case of RM2,001 to RM4,000, these families engaged in both farm and non-farm activities to earn a higher income. Those with the highest income were

among those working permanently in the government or private sector where their wage was considerably stable and some of them own their own business. The findings of this study are in contradiction with the study of Riman (2015) where majority of the households in Betong were middle-income.

Table 4.14: Overall Gross Monthly Income

Gross Monthly Income	**Frequency**	**Percentage**
RM2,000 and below	154	70.0
RM2,001 to RM4,000	62	28.2
RM4,001 and above	4	1.9
Total	**220**	**100.0**

Residents of Pantu Sub-District also had access to various financial support structures or secondary sources. Based on the interview findings, the secondary sources of income were pensions from their elderly family members; remittances; rental money through property rentals; and financial assistance from the government such as 1Malaysia People's Aid (BR1M) and E-Kasih. Most residents (76.3%) received BR1M, and 8.6% of them received both types of financial assistance (E-Kasih and BR1M).

The 1Malaysia People's Aid was a cash disbursement programme targeted towards low-income Malaysians. BR1M was disbursed three times, in February, June and August of the year. In addition, 15% did not receive any financial assistance. E-Kasih contributed to the households' gross monthly income and provided a stable flow of funds to meet their needs. The data on financial assistance received is presented in Table 4.15.

Table 4.15: Financial Assistances Received

Financial Assistances	Frequency	Percentage
E-Kasih & BR1M	19	8.6
BR1M	168	76.3
Nil	33	15.0
Total	**220**	**100.0**

The outcome from in-depth interviews with *tuai rumah* showed that the longhouse community in Pantu Sub-District still solely relied on their primary income to run their household requirements. The reason was that their primary income was sufficient for their living and they did not have reliable sources to generate secondary income. Several residents received monthly remittances given by their family members who have migrated from Pantu Sub-District and this added on their financial capital. However, not all the migrated *bilik* members contributed the remittances to their families at the longhouses.

As shown in Figure 4.11, only 26.4% of those who had migrated contributed remittances to their family, while the 73.6% did not. Apart from this, the data on the remittances amount received was inconsistent, making it difficult to ascertain the exact amount. Some respondents indicated that they received remittances based on the number of times their children visited, particularly during holidays or feast days when the children returned home. Few indicated that they received the same amount every month.

From the data collected, most household members (14.5%) remitted between RM201 and RM400, 6.4% remitted between RM401 and RM600, and 4.5% remitted less than RM200 per month. Meanwhile, only 1% of the respondents received remittances of more than RM601 each month. Respondents indicated that the high remittances were due to the

fact that they have more family members working in urban areas. Some respondents indicated that the high remittances were due to the high income that their family members receive from their permanent employment in the cities.

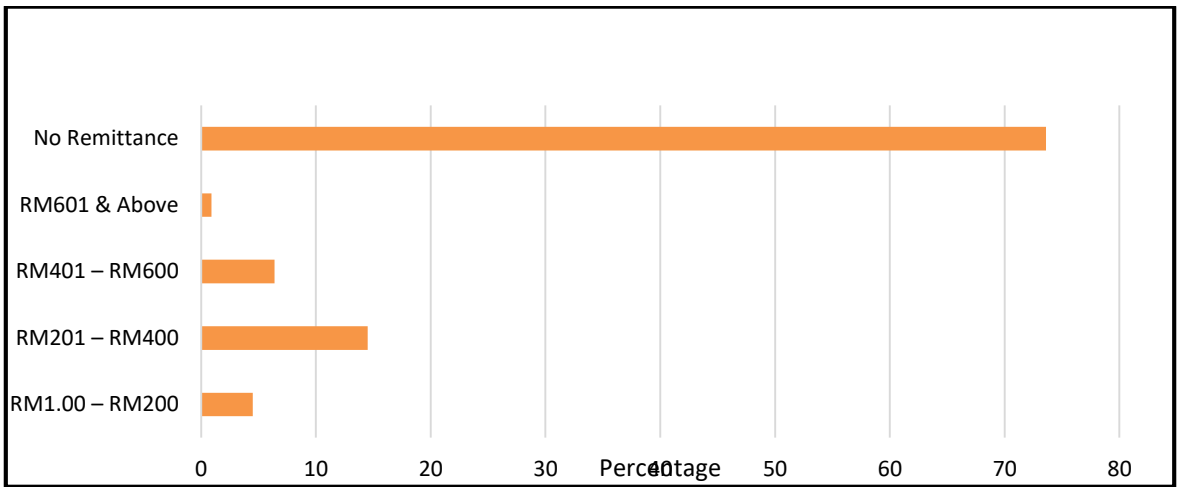


Figure 4.11: Average Remittance Received Monthly

However, the low remittances were related to the high standard of living in urban areas and there are some family members who are still financially unable to provide high remittances for their families. Some may still be struggling to find employment or study. Nonetheless, respondents indicated that as a parent, they understand their children's circumstances and ask them not to send remittances as they are able to support their lives with their income from local activities.

Consequently, the financial capital of household heads in Pantu Sub-District longhouses influenced their monthly expenditure and lifestyle. Their monthly expenditure was analysed as it influenced income diversification strategy. Diverse income generating activities may have different impacts on household wealth depending on the needs of each bilik. The expenditures covered the basic needs such as food, clothing, health, education, agricultural inputs, telecommunication costs, transportation costs and entertainment costs (Astro).

As shown in Table 4.16, 6.8% of households spent more than RM300 on food, indicating that households allocate a large budget for food expenditure. However, the range of expenditure on food was also related to the number of people within a bilik and their income. It is worth noting that 93.2% of households spent less than RM300 per month on food. Expenditure increased with the number of people in the household.

The respondents indicated that they had to spend more than other *bilik* to buy food as they were not engaged in farming activities, which led to the differences in food expenditure. Meanwhile, it was noted by the respondents that *bilik* who were actively involved in growing subsistence crops, rearing livestock, and gathering jungle produce tended to spend less on food.

Table 4.16: Monthly Expenditure on Food

Expenditure on Food	**Frequency**	**Percentage**
RM100 and below	95	43.2
RM101 to RM200	61	27.7
RM201 to RM300	49	22.3
RM301 and above	15	6.8
Total	**220**	**100.0**

In terms of spending on clothes, as shown in Table 4.17, most *bilik* members, 70%, do not spend on clothes every month. According to several respondents, they preferred to save the money rather than spend unnecessarily on clothes apart from special occasions or during the festive season. In contrast, the situation was different for households with infants or toddlers as they had to spend more on clothing, especially diapers or napkins for the infants. For this, about 28.6% of *Bilik* members spent less than RM100 and only 1.4% spent up to RM200.

Table 4.17: Monthly Expenditure on Clothing

Expenditure on Clothing	Frequency	Percentage
No Spending	154	70.0
RM100 and below	63	28.6
RM101 to RM200	3	1.4
Total	**220**	**100.0**

Table 4.18 shows that most households (82.7%) spent less than RM100 on health care. Meanwhile, 17.3% of the household did not spend at all on healthcare. Justifiably, the elderly are exempted from paying for outpatient treatment in government hospitals and clinics. This benefit allowed patients to receive medical examinations, consultations, and medications free of charge; however, villagers still paid a small fee for specialist care and treatment or hospitalisation. Public service pensioners also enjoyed free medical services at all government medical facilities under the pension scheme. In contrast, *bilik* with young children had to pay for medical bills and medicines when they visited private clinics. Despite the need for regular medical check-ups and medicines to maintain health in order to work and support the family, adult villagers still spent less than RM100 on health care because government health facilities were available, and the fees are reasonable compared to private clinics or hospitals.

Table 4.18: Monthly Expenditure on Healthcare

Expenditure on Healthcare	Frequency	Percentage
No Spending	38	17.3
RM100 and below	18 2	82.7
Total	**220**	**100.0**

As for education, the monthly expenditure is shown in Figure 4.12. There are 131 *Bilik* or 59.5% who do not spend on education as all their children were no longer studying and had started working. Nevertheless, a total of 89 *bilik* from these longhouses spends on education every month as their children were still in school. Besides, 21.1% of the respondents spent less than RM100 and 18% of the respondents spent RM101 to RM200.

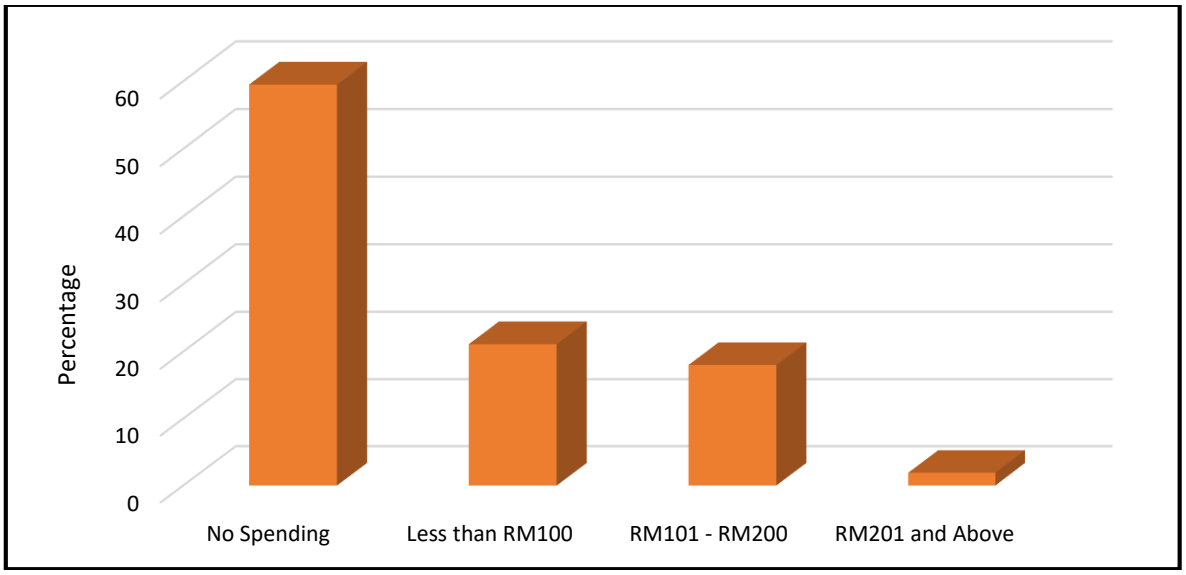


Figure 4.12: Monthly Expenditure on Education

Their educational expenses did not exceed RM200 as the children attended primary and secondary schools. All schools were located close to the village and therefore incurred lower expenditure. The remaining 1.4% spent more than RM200 per month as their children attended secondary school. Parents gave them allowances or pocket money for food and other expenses. Government loans or scholarships were provided for hostel and tuition fees at the tertiary education level.

Subsequently, expenditure on agricultural inputs was also assessed since most households are engaged in agricultural activities. Here, inputs include all costs of buying seedlings, fertilisers, pesticides, fodder for livestock, initial costs of preparing the land, and monthly maintenance. Only 18% of households spent nothing on farm inputs. Apart from the

subsidies they received, some households (82%) invested in agricultural inputs depending on the type of crops and livestock, the size of the land and the number of livestock. This has been depicted in Figure 4.13.

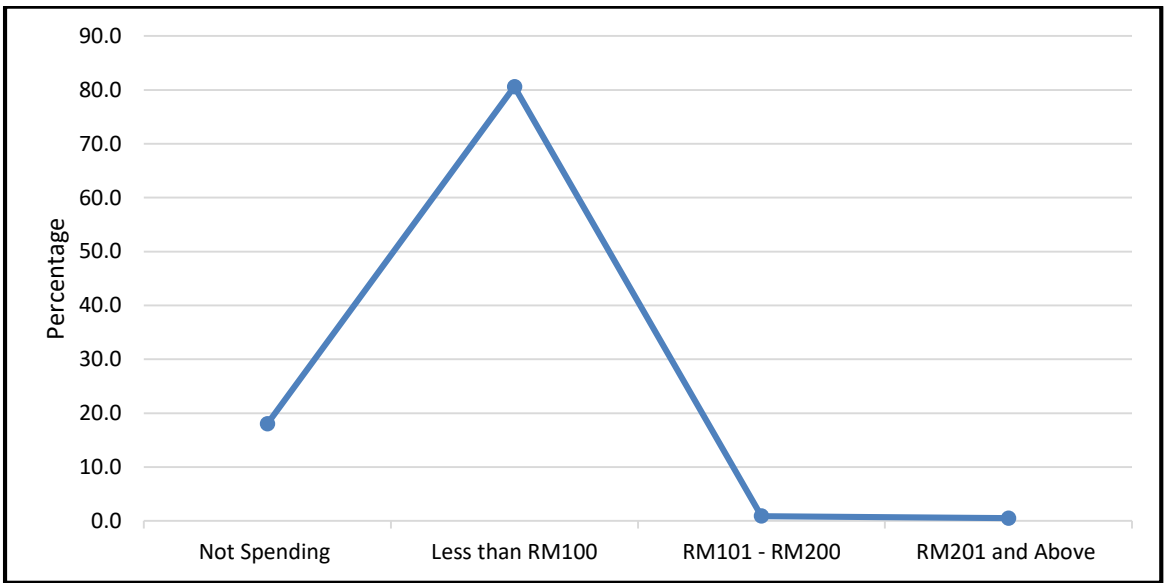


Figure 4.13: Monthly Expenditure on Agriculture Input

Furthermore, electricity bills were the most necessary expenditure of this community. This was shown in Table 4.19. The data showed that 74.1% of the *bilik* in this village spent less than RM100 on their electricity bills. This was because they did not own any high energy consuming electrical appliances such as air conditioners or water filters. Based on the observation, the electrical appliances they owned were refrigerator, television, radio, washing machines and ceiling fan. Some households (25.9%) owned other electrical appliances such as kettle and oven and they paid extra for electricity bill. Overall, electricity consumption differed with the electrical appliances that each household owned.

Following that, about 84.5% of the *bilik* spent within RM100 on their telecommunication bills. Most of them owned mobile phones and they paid for prepaid or

postpaid bills. Although majority of the residents owned mobile phones, they rarely used them. This was shown in Table 4.20.

Table 4.19: Monthly Expenditure on Electricity Bill

Expenditure on Electricity Bill	Frequency	Percentage
RM100 and below	163	74.1
RM101 and above	57	25.9
Total	**220**	**100.0**

Table 4.20: Monthly Expenditure on Telecommunication Bill

Expenditure on Telecommunication Bill	Frequency	Percentage
No Spending	34	15.5
RM100 and below	186	84.5
Total	**220**	**100.0**

A similar scenario emerged for transportation costs in each household where 84.5% spent on transportation and another 15.5% did not spend on transportation. This was shown in Figure 4.14.

Some groups walked to their farm or work areas near their homes where they had no need for transportation expenses. The results of the study also showed that those who owned a vehicle had to pay for vehicle loans, road tax and insurance and thus spent more on transportation expenses. Overall, transportation expenses for each *bilik* were related to the mode of transportation and types of vehicles they used. In addition, the frequency of trips also contributed to differences in transportation costs.

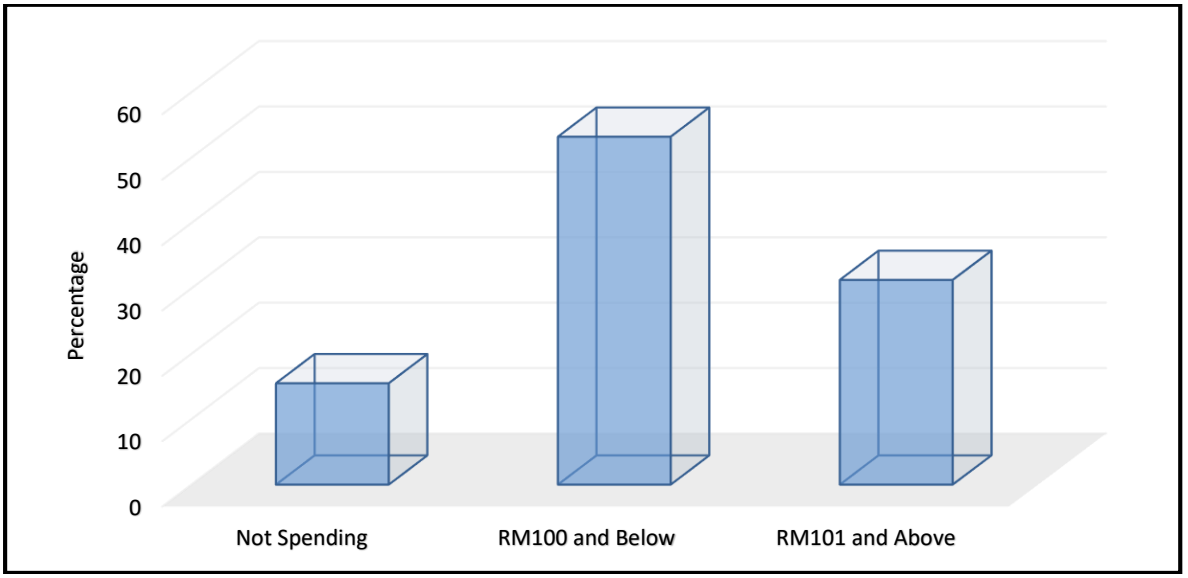


Figure 4.14: Monthly Expenditure on Transportation Cost

In terms of entertainment, only 25% of households had an Astro subscription, the rest did not. Most *bilik* with children and youth had Astro subscription, indicating that the younger generation watches more television than the adults and seniors. This was shown in Figure 4.15.

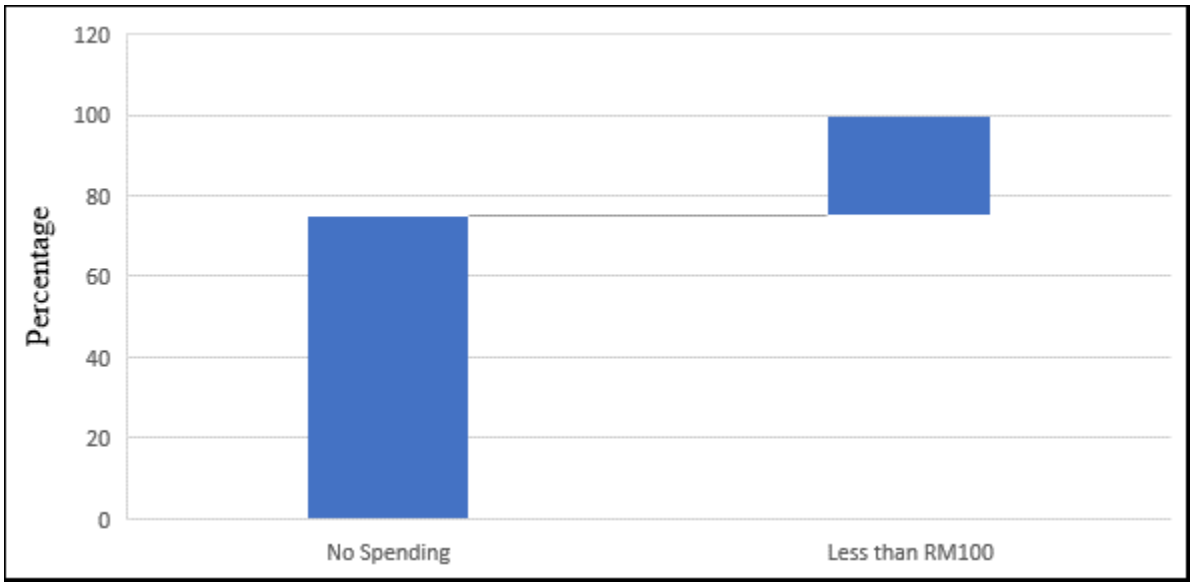


Figure 4.15: Monthly Expenditure on Astro Bill

Those who subscribed to Astro spent less than RM100 on their monthly bills. Those who did not subscribe to Astro spent their free time gathering at their *ruai* and chatting while

having evening tea with their families and friends. The results of this study showed that the majority of the community in Pantu Sub-District falls into the low-income group. Livelihood diversification, either farming or non-farming had a positive impact on household expenditure.

The community in Pantu Sub-District had sufficient food as they grew subsistence crops, fished, and collected jungle produce. Livelihood diversification also served to supplement the income of the Iban community to achieve their livelihood goals.

4.4.3 Physical Capital

The findings from this study revealed that in Pantu Sub-District, the physical capital owned by the Iban community in their respective longhouses is represented by various infrastructures, land holdings and vehicles that they need to sustain their livelihood. Physical capital is also essential for the development of the Iban community in Pantu. *Penghulu* and *tuai rumah* mentioned that key facilities and services in Pantu Sub-District include electricity and water supply, road access, market access, educational institutions, medical and health facilities, sports and recreational facilities and communication facilities. Iban households use the various available physical resources to make a living through agricultural and non-agricultural activities. In addition, clean and affordable electricity, access to roads and transportation, house, schools and hospitals, and access to information were necessary to increase their livelihood productivity and income.

Following this, Table 4.21 summarised the results in terms of the prominent physical assets of the residents. There are 11 villages under study which are properly supplied with electricity by Sarawak Electrical Supply Corporation (SESCO), currently known as Sarawak

Energy Berhad (SEB). The remaining village, namely Kampung Semawa Ili, was still dependent on a Genset (generator) as a source of electricity.

Table 4.21: Types of Electricity and Water Supply

Villages	Types of Electricity Supply	Types of Water Supply
Kampung Semawa Ili	Genset	Gravity Feed System
Kampung Limau	SESCO	JBALB
Kampung Abok Pulau Mawang	SESCO	JBALB
Kampung Sungai Merah Atas	SESCO	JBALB
Kampung Pantu	SESCO	JBALB
Kampung Selantik Ulu	SESCO	JBALB
Kampung Rapak Tepus	SESCO	JBALB
Kampung Rapak Baru	SESCO	JBALB
Kampung Lachau Engkabang	SESCO	Gravity Feed System
Kampung Lachau Jinggau	SESCO	Gravity Feed System
Kampung Selanjan Sebemban	SESCO	Gravity Feed System
Kampung Selanjan Asal	SESCO	Gravity Feed System

Moreover, the in-depth interview with two *penghulu* revealed that out of the 137 Iban villages in Pantu Sub-District, the majority (107 villages) were supplied with electricity by SESCO, 24 villages used Genset, and the remaining 6 villages used the Engine Set. These results show that electricity supply has improved in Pantu area where most households are connected to SESCO's 24-hour power supply grid, which is contrary to the findings of Mambu (2013) where all households in Kranggas, Pantu area relied entirely on generators for their electricity supply in 2013.

Overall, respondents indicated that the reliable electricity system has improved their economic prospects, which ultimately affects their livelihoods as continuous electricity supply is critical to their livelihood activities. For example, access to electricity was found

to create new job opportunities, especially in non-agricultural sectors. The community has also reaped the domestic benefits of light and television. In addition, children living in electrified households benefit from higher levels of education as they can use computers and laptops for learning.

In addition to electricity, water was another important element in their daily lives. Table 4.21 shows that seven of the sampled villages consumed clean and treated water supplied directly from Sarawak Rural Water Supply Department (JBALB) and they expressed satisfaction with the quality of the treated water during the interviews, while the remaining five villages were supplied with water through a gravity feed system. However according to the in-depth interview with the two *penghulu*, the gravity feed system is still an important source of water supply in Pantu area, they indicated that majority of Iban villages in Pantu Sub-District, namely 92 villages, still depend on gravity fed water supply and only 45 villages are supplied water by JBALB.

This scenario shows the improvement compared to the situation in Kranggas, Pantu area where there was no treated water supply and all the inhabitants depended on gravity system (Mambu, 2013). In addition, Ayob et al. (1990) found that 65% of the respondents were not satisfied with gravity water supply due to the deplorable water quality. In short, this suggests that the water supply in Pantu Sub-District has improved over the years. In Pantu Sub-District water supply was an important factor for most household activities and livelihood, such as growing vegetables and fruits and raising livestock. In addition, water is used in agriculture for irrigation, and the use of pesticides and fertilizers.

In addition, residents were satisfied with other facilities, namely schools, markets, health centres, recreational facilities, and access to roads. Better physical facilities increase

a rural community's access to diversified livelihood opportunities. In addition, there were 11 schools in the area and one health clinic (*Klinik Kesihatan Pantu*) that provided health services to residents of the area. For example, Figure 4.16 shows one of the Chinese schools, namely SJK (C) Chung Hua, which can be found at Pantu Sub-District.



Figure 4.16: SJK (C) Chung Hua Pantu at Pantu Sub-District

In addition, the overall list of the school, which can be found at Pantu Sub-District, has been included below:

1. SK Kerrangas Pantu
2. SK Saint Leo Gayau Pantu
3. SK Jaong Pantu
4. SK Abok Pantu
5. SK Aping Pantu
6. SK Pantu
7. SJK Chung Hua Pantu

8. SK ST. Martin Lachau Pantu
9. SJK Chung Hua Bangkong Pantu
10. SK Munggu Beringin Pantu
11. SK Selanjan Pantu

All the villages under study are accessible by a tarred road and the longhouses are located at a distance of 1 to 30 km from the main town, namely Pantu and Lachau. The respondents informed that road connectivity has been improved and all the longhouses in Pantu Sub-District are accessible by road. Some of the longhouses were quite far (30 km) from Pantu and this distance affected the accessibility of local markets for villagers. Likewise, the development of roads between the villages and the town improved the accessibility of markets in the town and encouraged greater household participation in trading activities. Respondents indicated that they are able to sell a wider variety of goods such as fruits, vegetables, fish, and meat at the nearby local markets in Lachau, Pantu, Sungai Tenggang and Sri Aman. In addition, the construction of highways linking Pantu to major cities and towns in Borneo has provided significant economic and tourism growth and development for Pantu communities. Subsequently, this highway provided an opportunity for Pantu Sub-District residents to travel to the ports and associated industrial areas in search of markets and employment opportunities.

The villagers interviewed emphasised that their relatives who live in cities such as Kuching can visit them more often because of the improved road system. In addition, respondents indicated that the improved road connection provided them with more opportunities in terms of education and health care for their children. Commuting was convenient as most residents had their own means of transportation (84.5%) as shown in

Table 4.22. The results of the study show that transportation between farms and villages was very important to farmers.

Table 4.22: Owned Vehicles

Owned Vehicles	Frequency	Percentage
Yes	186	84.5
No	34	15.5
Total	**220**	**100.0**

Respondents indicated that walking to their farms was time-consuming and tiring for them and could delay their agricultural and domestic chores. As shown in Figure 4.17, motorcycles were the preferred mode of transport owned by 54% of the households while 22.7% owned a car. In addition, 6.4% owned a van and 1.4% owned a lorry.

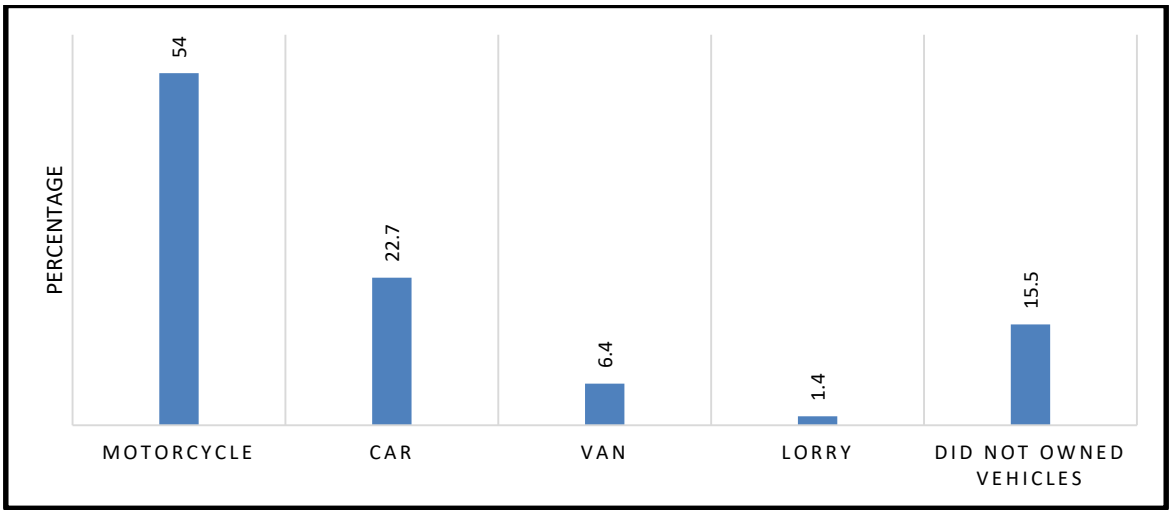


Figure 4.17: Types of Vehicles Owned

Those who own a van operated a van rental business which became the main mode of transportation for other villagers to the nearest town. Those who own a truck have more advantages as they can use the lorry to transport their agricultural products such as oil palm, rice, and pepper to the market. The results also showed that the remaining 15.5% who did not own a vehicle used rental vehicles and public transport to travel to the nearest towns. The

cost of transportation was affordable as it depended on the distance and the respondents reported that they spent less than RM20 for one round trip to the town of Lachau.

Another personal physical asset that villagers in Pantu owned was agricultural land, which is shown in Table 4.23. Almost 95% were landowners and they either inherited the land or bought it from a secondary source. The inherited land is categorised under Native Customary Rights (NCR) and was not held under title, so they had limited rights to sell. On the other hand, 3.7% were tenants who either leased or borrowed the land for cultivation. Land was the main source of income as most of the residents were farmers.

Table 4.23: Types of Land Owned

Household Land Type	Frequency	Percentage
Inherited	110	50.0
Bought	99	45.0
Rented	7	3.2
Borrowed	1	.5
Not Relevant	3	1.4
Total	**220**	**100.0**

They used the land to grow crops either for their own use and/or for sale. Physical capital is important to the community in Pantu Sub-District and influences their livelihood activities to promote better social and economic opportunities.

4.4.4 Social Capital

Social capital in Pantu Sub-District refers to the institutions and group in which the Iban community interacts with each other to facilitate their livelihood strategies and resolve difficulties for the mutual good in their community. In this study, interaction can be explained in two forms, namely vertical network, and horizontal network. In vertical network, the

interaction is with institutions that have more authority and influence on the community. However, the horizontal network is the interaction of related entities at the same level of respect and expertise.

Evidence of a vertical network in Pantu Sub-District can be seen in the fact that there are several government departments and agencies that have introduced schemes, subsidies, training and relevant development projects to improve the living standards, knowledge and skills of the community. Based on Table 4.24, it was found that 85% of the households have participated in various agricultural programmes and subsidies introduced by different agencies such as the Department of Agriculture (DOA), Malaysian Palm Oil Board (MPOB), Malaysian Pepper Board (MPB), Rubber Industry Smallholders Development Authority (RISDA), State Farmers' Organisation (*Pertubuhan Peladang*), Village Security and Development Committees (JKKK) and several local political representatives. Some respondents indicated that they participated in more than one type of scheme and subsidy because they have a variety of crops and diversified livelihood activities.

Table 4.24: Involvement in Agricultural Schemes or Subsidies

Agricultural Schemes/Subsidies	**Frequency**	**Percentage**
Not Involved	33	15.0
Involved	187	85.0
Total	**220**	**100.0**

In fact, most residents agreed that DOA played a significant role in achieving rapid agricultural growth through optimal use of land and other resources in Pantu. There are 137 respondents from 12 villages under study informed that DOA supported them in the form of seeds, cash subsidies, pesticides, and fertilisers. This led to agricultural diversification where farmers were able to grow multiple crops and livestock. For example, paddy seeds such as

the MR269 variety were provided to the farmers to encourage smallholder farmers to grow modern paddy seedlings and ensure food security towards paddy self-sufficiency. Assistance in the form of herbicides such as Rumputox, Rumpas, Padan and Tepat was also provided to the rice farmers. Similarly, fertilisers namely NPK, urea, compound, organic and Coron fertilisers have been supported.

In addition, DOA also introduces the livestock project in Pantu, namely Livestock Commercial Unit (LCU), which provides support to farmers to facilitate growth towards conversion into more viable and efficient units. Under LCU, pigs and chickens are given to rural farmers in Pantu. Another project is the Azam Tani initiative to promote agricultural enterprises such as poultry farming and aquaculture. Rambutan R191 variety scheme was also introduced to the community in Pantu Sub-District. Rambutan fruit collection centres were established in Rapak to provide a convenient place for farmers to deliver their fruits for collection by buyers. It is also used for cleaning, sorting, grading, wrapping, and packing of the fruits.

Subsequently, MPOB provided subsidies in the form of planting materials (seedlings), fertilisers, pesticides and weed killers. It was found that 60% of the households involved in oil palm plantation were supported by MPOB. MPOB has supported the establishment of purchasing groups for smallholder farmers to improve access to fertiliser and credit for the community Pantu Sub-District.

In addition, MPB offers various types of schemes and subsidies that benefit 11.57% of the sampled households, such as the new pepper scheme, the mature paper scheme, the financing scheme, and marketing development. In addition, MPB supports villagers in

providing pesticides and fertilisers to pepper farmers. Also, for the benefit of the Pantu Sub-District community, a pepper store was established by MPB at Kampung Selanjan Asal.

RISDA have offer 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. The respondents revealed that they were also given assistance in the form of land clearing, seedlings, fertilisers, and other necessary materials.

In addition, there are also political representatives in the Pantu Sub-District. The peculiarity of Pantu Sub-District is that it is divided into two constituencies, namely N.31 Bukit Begunan under YB Datuk Mong Dagang and N.30 Balai Ringin under Datuk Snowdan Lawan. The elected representatives have great importance to the constituencies they represent. They have contributed to the development of the people of Pantu and help to improve their standard of living by implementing projects that the community needs under the Rural Transformation Programme (RTP). Accordingly, various development activities have been initiated such as access to a good gravel road and utility infrastructure such as water, electricity, and internet for the community at Pantu Sub-District. They also strive to ensure that good roads are properly constructed and maintained. The respondents also shared that the state representatives always work hard and spend adequate funds to improve access to quality education for the community in Pantu by improving facilities in schools. Similarly, various projects have been implemented in Pantu Sub-District to transform the agricultural sector such as aquaculture, swiftlet nest farming, fruit cultivation and processing and strengthening rice cultivation in irrigated areas.

In addition, all 12 villages studied were involved in the State Farmers' Organisation (*Pertubuhan Peladang*), which focuses more on facilitating farmers than on generating revenue. For example, the Famers' Organisation supplies agricultural products with quality and value guaranteed such as fertilisers, livestock and aquaculture fodder, agricultural tools such as grass cutters, seeds for vegetables, fruits, and rice to farmers in Pantu Sub-District. In addition, the Village Security and Development Committees (JKKK) was established by the committee members of the respective longhouses to manage the facilities and provide services to the longhouses. For example, the JKKK can propose the contractor for repair works at Rural Transformation Programme (RTP). In addition, Penghulu and Tuai Rumah contributed to the social capital by acting as the spokesperson of the entire longhouse community and voicing their concerns to the official representatives.

The community in Pantu benefits from vertical social network that enable them to work together and facilitate collaboration in their livelihoods as 98.6% of households in Pantu owned land that they had either inherited, purchased, leased, or borrowed to participate in the development program based on their agricultural and livelihood activities. However, to be eligible for assistance, each agency has its specific requirements. For example, those who grow pepper may benefit from assistance through MPB, and those who wish to apply for a new pepper planting program must have suitable soil for pepper plants and grow new pepper plants that are less than three years old, either on owned or leased land.

As shown in Table 4.25, only 22.7% of the communities in Pantu have participated in agricultural and non-agricultural training programmes. The respondents indicated that most of the training programmes are conducted at various Agriculture Training Centre (ATC) such as the ATC at Temuduk Sri Aman. The examples of training attended by the

respondents are training for farmers in aquaculture, training for agricultural entrepreneurs and marketing for products of entrepreneurs. In addition, the women interviewed indicated that they received training from KEMAS to improve their knowledge and skills through cooking, sewing and handicraft courses to increase family income.

Table 4.25: Participation in Agricultural and Non-Agricultural Trainings

Participation in Agriculture/Non-Agriculture Training	Frequency	Percentage
Yes	50	22.7
No	170	77.3
Total	**220**	**100.0**

Although the majority of households participate in various scheme and subsidies, the number of villagers participating in agricultural training programmes is very low. It was found that some household in Pantu Sub-District remain excluded as they are not aware of the training programs available and do not know how to participate. This shows that villagers in the study areas have either strong or weak attachment to the networks. Some villagers have weak relationship as they are not well informed about certain skills or trainings. This group of respondents shared that the skills and trainings are only known to certain people or villages. This affects their productivity, and they also have limited opportunities to learn modern agricultural practices. The lack of skills and training is a major constraint to successful agricultural production and affects their ability to diversify their livelihoods. In this study, it is clear that the majority of farmers still belong to the low-income categories, as they are small scale farmers and with low production.

The horizontal network of the Iban community can be seen in the joint-cooperation or *beduruk* practice. Nowadays, joint-cooperation in agricultural work has slowly

disappeared as the community no longer volunteers to help their neighbours in agricultural work. Joint-cooperation in agricultural work is limited to family members, such as married children who live in another *bilik* helping their parents during rice harvesting. Some families pay wage labourers, either local or Indonesian, to do the agricultural work. Another horizontal integration found in the study is mutual support in collecting money for certain occasions such as weddings, funerals, and hospitalisation of longhouse community members to reduce their burden. However, household resources invested in raising money mainly take place within the boundaries of each village or longhouse. Horizontal social capital is one of the most important socially organised groups that enables the Iban in Pantu Sub-District to solve their livelihood difficulties more easily.

Overall, both vertical and horizontal social capital are important in Pantu Sub-District facilitating cooperation and improving efficiency within the community. Similarly, social capital is perceived to positively contribute to the quality of life of those who are in the network. This is consistent with an empirical study in Keranggas, Pantu area, which highlighted the positive socio-economic impact on villagers in the area following the establishment of the joint venture project under the State Government (Mambu, 2013). Social capital provides facilities and resources to support engagement and collaboration and helps bridge and connect different households in Pantu Sub-District.

4.4.5 Natural Capital

Natural assets refer to the stock of natural resources from which further resources and services can be developed and which are useful for livelihood. In this study, the natural resources possessed by the Iban community in Pantu were access to land, river, wildlife, and forest. The Iban in Pantu had deep spiritual, cultural, social, and economic connections to

their land, territories, and resources that were fundamental to their identity and existence. In this case, the land was a place of identity, culture, and the main economic source for most communities in the Pantu area. Most residents owned land, but the size of landholdings varied. According to the interviews with the *tuai rumah,* each longhouse in Pantu had its own *pemakai menoa* and it comprises the land area controlled by a particular longhouse. The results of the quantitative findings in Figure 4.18 show that almost 45.9% of the households owned land which sized from 1 to 2.5 acres and 20.5% owned less than 1 acre.

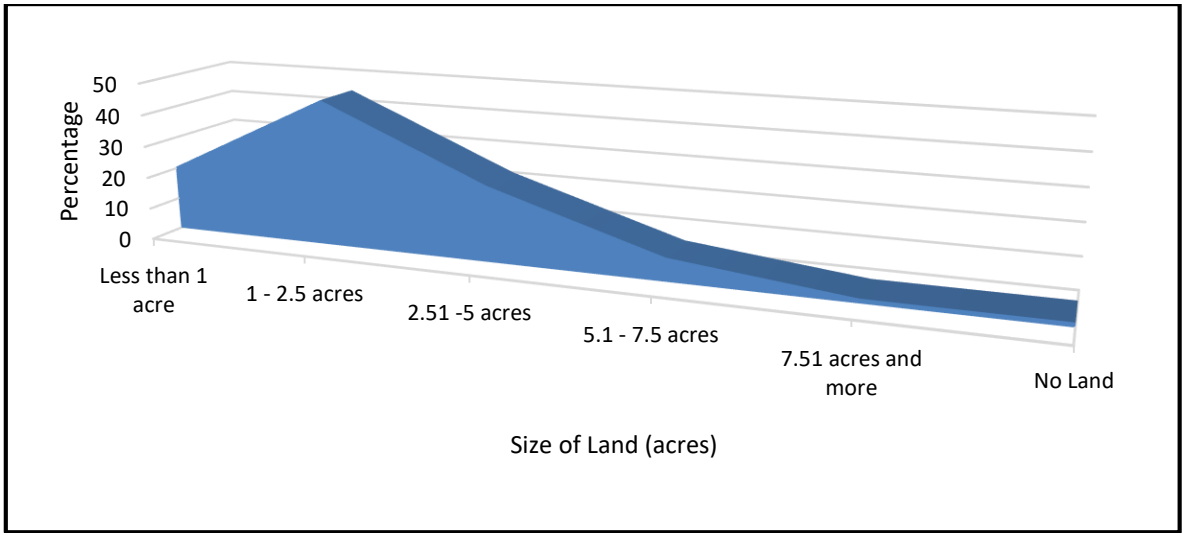


Figure 4.18: Land Size Owned by Respondents

Moreover, 23.6% of them owned 2.51 to 5 acres of land and 7.3% of them owned 5.1 to 7.5 acres of land, while only a small percentage of households owned more than 7.51 acres of land. The size of land holding of the respondents in this study shows that most of them were small scale farmers.

Apart from this, the majority of the Iban in Pantu (77.7%), depend on the forest for their daily livelihood. This is shown in Table 4.26.

Table 4.26: Collection of Forest Produce

Collection of Forest Produce	Frequency	Percentage
Yes	171	77.7
No	49	22.3
Total	**220**	**100.0**

According to the respondents, they collected various jungle products such as wild vegetables and fruits for their own consumption. The results of the observation showed that a group of women in the village also collected the main forest products such as ferns, bamboo shoots and mushrooms. Some of the jungle products available in the *pulau galau* were intentionally reserved by households or the village community for the domestic needs of the community.

However, most of them go foraging in the jungle only once or twice. The results of the study indicate that the respondents sold the jungle products in the local markets when there was surplus after daily use. However, in the same cases, they collect the jungle products intentionally to supplement their income. From the in-depth interviews with the tuai rumah and penghulu, it was found that the natural forest had been exploited through commercial logging, deforestation, agriculture, and other land uses, which affected the flora and fauna of the forest. Therefore, the natural resources of the forest have deteriorated over the years. However, some households continued to benefit from the resources in the form of food and income. Either consciously or subconsciously, they manage these resources using indigenous knowledge.

In addition to forest gathering, as shown in Table 4.27, 15.9% of the villagers are occasionally engaged in hunting wildlife.

Table 4.27: Involvement in Wildlife Hunting

Involvement in Wildlife Hunting	Frequency	Percentage
Yes	35	15.9
No	185	84.1
Total	**220**	**100.0**

From the interviews, it appears that hunting is a source of food for them but is rarely used for income generation. The respondents also indicated that hunting is no longer a popular activity as most of them are no longer interested in hunting and the supply of wildlife species is also deteriorating.

Further, the villagers shared that hunting was not easy as it required special skills and knowledge. They preferred to hunt bearded pigs (*Sus barbatus*) and when they did, the meat was usually shared among their families and neighbours. From the interviews, it appears that the hunters were all male and practised the conventional way of hunting with traps and nets. Only those who had a licence could use shotguns for hunting. Hunting was another form of livelihood strategy as it was considered a secondary source of food.

Similarly, the river was another active natural resource element for this community. 12.3% of the inhabitants are involved in fishing especially the Iban of Kampung Semawa Ili. However, of this percentage, only a few of the respondents said that fishing is their main occupation while others said that fishing is only a secondary occupation as they focus on farming and other livelihood activities. It was found that 87.7% of the residents were not involved in fishing activities.

When asked the reason for non-participation, they indicated that fish populations were declining, and some claimed that they had acquired diversified livelihood activities

such as land-based agricultural activities. This was illustrated in Figure 4.19. The villagers indicated that fishing was demonstrably important to them for food, income, employment, and nutrition. Those who focused on fishing as their main activity indicated that fishing was done daily throughout the year.

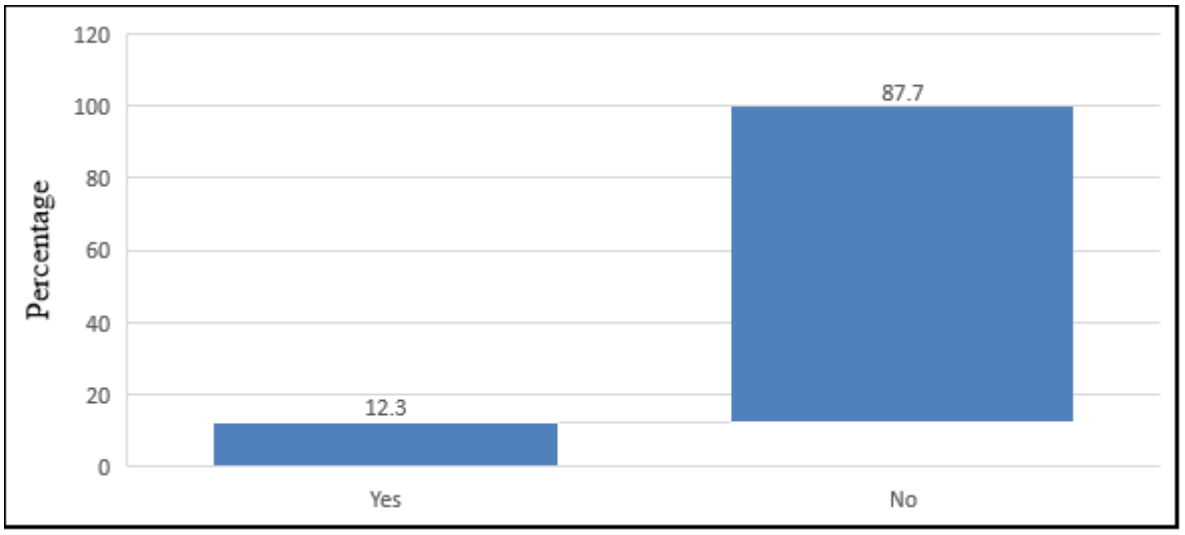


Figure 4.19: Involvement in Fishing Activities

From the study, the nature of inland fishery of Pantu Sub-District is mainly from the rivers. According to the detailed interview with respondents, the main rivers in Pantu are Sungai Semawa, Sungai Kubau and Sungai Keranggas. When interviewed in more detail about the fishing activities, the respondents shared that travelled by boat for one to two hours in the morning and returned to the jetty in the afternoon when they were done fishing.

The fishermen in Pantu used outboard motors with simple fishing gears such as small drift nets and hand lines. The fisherman informed that most of them worked alone because of this technical simplicity, although there were exceptions. For example, some fishermen needed extra help in handling their boats and nets because of their age, and this help was usually provided by a son or grandson. These helpers were not paid, as they were not considered employees, nor did the old fisherman himself play the role of an employer. When

working alone, the traditional fisherman took care of every step of his production activities. Kampung Semawa Ili, a fishing village shown in Figure 4.20, is a settlement near the major rivers where fishing is still vital to them.



Figure 4.20: Kampung Semawa Ili (Fishing Village)

It was also clear from the interview that organic poisons or naturally produced pesticides and explosives may also be used in this case. These fishing activities were generally subsistence-oriented and complemented a broader rural land-based livelihood strategy that included agriculture. In addition, the in-depth interview with *penghulu* and *tuai rumah*, revealed that fishermen were subsidised by the Fisheries Department in the form of engine, boat, and a monthly allowance of RM200 to ease their financial burden.

Their catches were either for subsistence or commercial purposes, depending on the size of the catch and the fish population. The catches varied throughout the year. They usually sold them at the local markets in Pantu and the town of Lachau. The most common fish species and average price are shown in Table 4.28.

Most respondents indicated that current fishing practices were unsustainable as fish stocks were declining and affected by the weather, especially with persistent rains and rough

river conditions, making it impossible for fishermen to travel to the rivers and affecting fishermen's income. In this sense, fishing was not a sustainable livelihood for most Pantu residents.

Table 4.28: Average Fisheries Price in Pantu Sub-District

Types/Species of Fish	Average Price (RM/Kg)
Jelawat	RM12
Boeng	RM20
Keli	RM12
Lampan Jawa	RM12
Lajong	RM30
Tapah	RM35
Labi-Labi	RM30
Tangadak	RM25
Udang	RM25
Patin	RM12
Tilapia	RM12
Tilapia Merah	RM12

Therefore, it was noted that majority of the Iban still rely on natural products from the forests where they rely on their pemakai *menoa* and *pulau galau* to extract natural resources including flora and fauna. Similarly, fishing is still an essential part of some Iban communities in Pantu Sub-District.

4.5 Structural Equation Model for Evaluating the Factors of Determinants of Livelihood Strategies

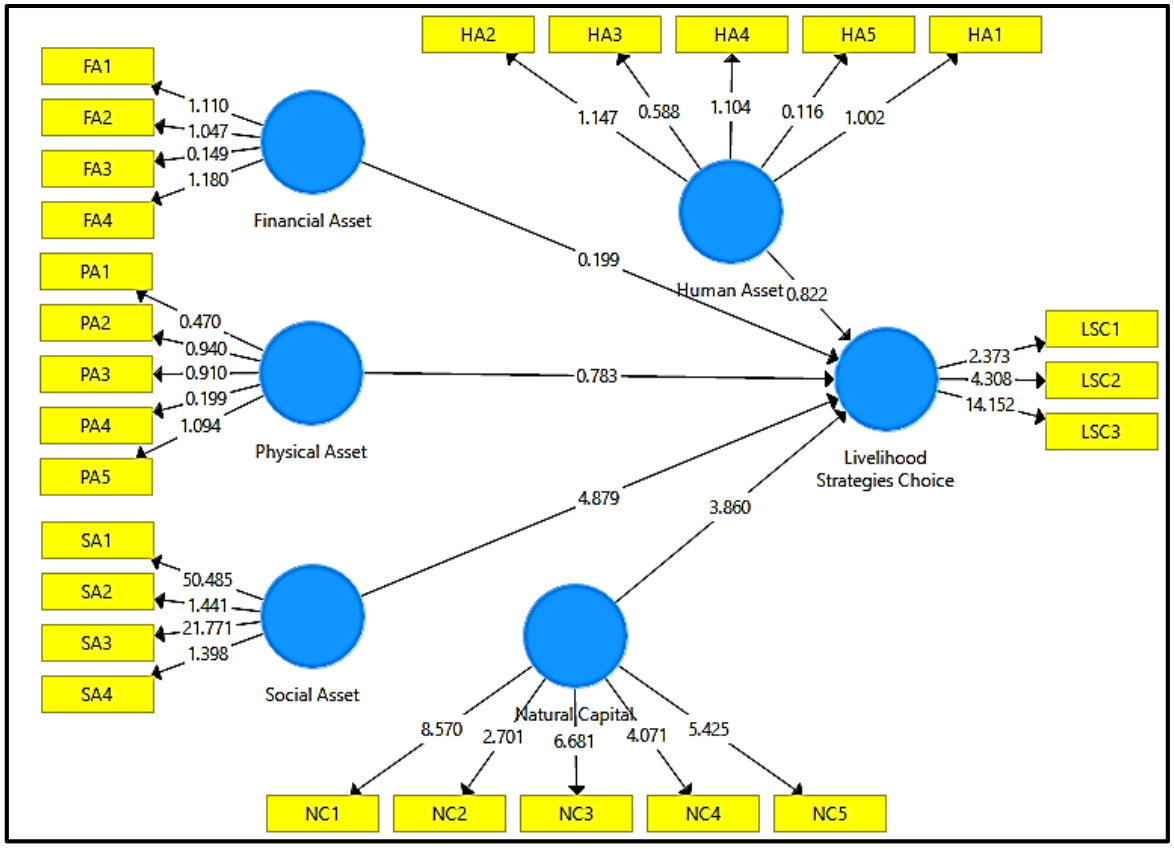
The results of this study show that the Sustainable Livelihood Framework (SLF) organises assets (human, financial, physical, social, and natural) that increase livelihood pressures or enhance opportunities. In Pantu Sub-District, livelihood assets are unequally distributed among households, and they need to find ways to combine what assets they have

to ensure survival and influence livelihood diversification. To achieve the objective of this study, the Structural Equation Model (SEM) approach was used to build a model of the critical factors in the diversification of livelihood strategies of the Iban community in Pantu Sub-District. The determinants of livelihood strategy choice by rural households were presented in Figure 4.21. This study is unique in that it applies the SEM to build a model that explains all five assets, namely human, natural, social, physical, and financial assets as discussed in the Sustainable Livelihood Framework. All these assets held by the Iban community in Pantu were discussed in detail in the previous sections.

In this study, t-values were obtained as shown in each row in Figure 4.21 and Table 4.29. It was calculated to assess the estimated level of significance, that is, when the t-value exceeds 1.645, indicating significance at 0.5 level ($P < 0.05$). Subsequently, Table 4.30 showing the PLS Bootstrapping Outer Loadings further explains the significance of the outside coefficients on the nonparametric bootstrap in the context of partial least squares.

As shown in Figure 4.21, livelihood strategies are distinguished between non-farm livelihood strategies (LSC1) and farm livelihood strategies (LSC2-Livestock) and LSC3 (Subsistence and Commercial Agriculture). Both farm and non-farm livelihood strategies are important for people's livelihoods at Pantu Sub-District. However, farm livelihood strategies (LSC2 = 4.308 and LSC = 14.152) have the highest performance compared to non-farm livelihood strategies (LSC1 = 2.373). Basically, mixed commercial and subsistence farming is the mainstay of Iban livelihood. In addition, farmers with fewer crops and fewer livestock preferred to diversify their livelihoods through non-farm activities. The Pantu community was able to earn money by growing crops to strengthen their financial capacity, which could

then become capital for income-generating activities outside agriculture. These findings are consistent with those of Asfaw et al. (2015).



Note: Livelihood Strategies Choice (LSC1-Non-Farm, LSC2-Farm-Livestock, LSC3-Farm-Subsistence/Commercial), Human Asset (HA1-Household Size, HA2-Age, HA3-Gender, HA4-Education Level, HA5-Occupation), Financial Asset (FA1-Gross Monthly Income, FA2-Remmitence, FA3-E-Kasih & BRIM, FA4-BRIM), Physical Asset (PA1-Electricity Supply, PA2-Water Supply, PA3-Land Status, P4-Land Size, P5-Transportation), Social Asset (SA1- Involvement in Farming Schemes/Subsidies, SA2-Agriculture Training, SA3- Involvement in Livestock Scheme/Subsidies, SA4-Non-Farming Training), Natural Capital (NC1-Land for Crops, NC2-Land for Livestock, NC3-Collection of Jungle Produce, NC4-Wildlife Hunting, NA5-Fishing Activities)

Figure 4.21: Structural Equation Modelling for Determinants of Rural Livelihood against Livelihood Strategies Choices

Figure 4.21 also shows that two categories of assets namely social assets (t-value = 4.879) and natural capital (t-value = 3.860) have a significant impact on households' choice and adoption of particular livelihood diversification strategies. However, the remaining three assets namely human assets (t-value = 0.822), physical assets (t-value = 0.783) and financial

assets (t-value = 0.199) are not significant. The results of the study show that accessibility to social and natural assets has a positive influence on Iban's choice to diversify their livelihood.

Table 4.29: PLS Bootstrapping Outer Loadings

Outer Loadings	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
FA1	-0.563	0.508	1.110	0.267
FA2	-0.485	0.463	1.047	0.296
FA3	-0.048	0.324	0.149	0.882
FA4	-0.74	0.627	1.180	0.238
HA1	0.527	0.526	1.002	0.317
HA2	0.584	0.510	1.147	0.252
HA3	-0.242	0.412	0.588	0.557
HA4	-0.597	0.540	1.104	0.270
HA5	-0.042	0.367	0.116	0.908
NC1	0.705	0.082	8.570	0.000
NC2	0.396	0.146	2.701	0.007
NC3	0.646	0.097	6.681	0.000
NC4	0.599	0.147	4.071	0.000
NC5	0.689	0.127	5.425	0.000
PA1	0.125	0.266	0.470	0.638
PA2	-0.422	0.449	0.940	0.348
PA3	-0.362	0.398	0.910	0.363
PA4	-0.044	0.218	0.199	0.842
PA5	0.871	0.796	1.094	0.274
SA1	0.929	0.018	50.485	0.000
SA2	-0.264	0.183	1.441	0.150
SA3	0.806	0.037	21.771	0.000
SA4	-0.185	0.132	1.398	0.163
LSC1	0.441	0.186	2.373	0.018
LSC2	0.678	0.157	4.308	0.000
LSC3	0.905	0.064	14.152	0.000

In order of importance, social assets, natural assets, human assets, physical assets, and financial assets can be ranked as most important to least important. The most important asset in Pantu was social capital, as the structural equation model explains. Overall, social capital had an impact on household livelihood choices (t-value = 4.879, t-value > 1.645). This result is consistent with most studies showing a positive correlation between social capital and livelihood diversification strategies (Asfaw et al., 2017; Getcho et al., 2014; Khatun & Roy, 2012).

Referring to Table 4.29 under the aspect of social capital, the number of households involved in schemes or subsidies and training related to agriculture and non-agriculture was analysed. Apparently, household participation in farming schemes or subsidies (SA1) is associated with livelihood diversification strategies and highly influential on the construct of social capital (t = 50.485, p = 0.000) compared to other social variables. The plausible reason was that households were relatively receptive to the government schemes or subsidies to engage in crop diversification.

This result suggests that the support in the form of cash, seeds, pesticides, and fertilisers provided by these schemes was important in the choice of livelihood strategies of the households. These schemes led to agricultural diversification where farmers were able to grow new and multiple crops on their land with the support and collaboration of various vertical networks such as DOA, MPOB and MPB. In addition, participation in livestock scheme or subsidies (SA3, t = 21.771, p = 0.000) was also significant for social capital. This shows that a community in Pantu can diversify their livelihood by participating in livestock scheme and subsidies where DOA supports them in poultry, pigs and aquaculture for

subsistence and commercialisation from which most farmers benefit and develop their livestock diversely and effectively.

However, for SA2, i.e., agriculture training, the t-value was 1.441, indicating a weak relationship, and it is also not significant with the relationship of social asset (p = 0.150). Similarly, non-farming training (SA,4 t = 1.398, p = 0.163) is not important for social assets and not significant towards the livelihood diversification strategies. This is due to the limited training given to the community in Pantu Sub-District. This is because although they participate in various subsidies and programmes, they are not as exposed to specific trainings and skills in their community. Participation in training is low among households in Pantu because they are very much influenced by local political representatives and the JKKK to help them diversify their household income. This was indeed the case when scholars argued that accountable government representatives would make a positive contribution that would encourage households to participate in diversifying economic activities (Davis, 2003). In addition, several household heads had participated in local governance bodies such as the State Famers' Organisation, which helped them gain more access to information and credit, expand their social communities, and gain access to more inputs and farm equipment.

Natural asset is the second most important asset in Pantu Sub-District and has a strong influence on livelihood diversification strategies (t = 3.860). Natural assets include NC1-Land (Crops), NC2-Land (Livestock), NC3-Collection of Jungle Produce, NC4-Wildlife Hunting, NA5- Fishing Activities. As predicted, access to land as part of natural asset for cropping NC1 owned by Pantu households has a strong relationship with livelihood diversification (t = 8.570, p = 0.000) and a significant impact on natural asset value as majority of the households are engaged in farming as their main livelihood strategy. t = 2.701,

p = 0.007). The utilisation of land for livestock, NC2 (t = 2.701, p = 0.007), is associated with livelihood diversification but not significantly associated with natural asset. Most households indicated that they do not need a large space to keep livestock because livestock can be kept near their longhouse and backyard. They also indicate that they keep their livestock on the same yards where they grow their crops.

Three natural resource activities namely jungle produce gathering NC3 (t = 6.681, p = 0.000), wildlife hunting NC4 (t = 4.071, p = 0.000) and fishing NC5 (t = 4.071, t = 0.000) have a strong influence on livelihood diversification and significant relationship with livelihood natural capital. This shows that rural people in Pantu still depend on forest, wildlife, and rivers for their livelihood. Even though some of them are engaged in agriculture or other non-agricultural activities, they still depend on these resources to supplement their livelihoods. Natural resource extraction also serves as a safety net, as respondents indicated that they extract forest products in the event of crop failure. In the same case, respondents indicated that this is related to their surviving strategies in times of emergency, namely that they substitute goods by hunting wildlife and fishing to supplement the livelihood of their household.

Moreover, human asset does not seem to affect livelihood diversification (t = 0.822). This is because each household has different types of human capital including household size (HA1), age (HA2), gender (HA3), education level (HA4) and occupation (HA5). It was found that small household size (HA1) was also weakly related (t = 1.002) because there is a small number of active workers and some of them might be unhealthy, elderly or physically disabled. The household, which is highly dependent on the productive family, contributed

significantly to the share of total household income by participating in various farm and non-farm diversification strategies.

Among the human assets, the age factor (HA2) had a weak correlation but the largest influence (t = 1.147) on the other human assets. It was noted that several young adults entering non-farm activities but perhaps returning to farming later in life could be one of the reasons for the increase in the age of those engaged in farming. This trend was reported by Munke et al. (2011) in Sejijak Mawang, Sarawak. In addition, HA3 was statically found to have a weak association with livelihood diversification in relation to gender (t = 1.104, p = 0.270) despite there being gender inequalities in education, capability, or skills. In fact, most household decisions are made jointly by husband and wife.

Educational level (HA4) was also weakly related (t =1.104, p = 0.270) to livelihood diversification into agricultural or non-agricultural household activities. As described in the previous section, most household heads had completed primary and secondary education, while only a few had completed tertiary education. This education trend was natural in most rural villages in Sarawak where tertiary education levels were low, e.g., Sejijak Mawang, Munggu Sawa, Serubah Ulu and Kranggas, Pantu (Munke et al., 2011; Owens et al., 2018) and where the highest education level was secondary school. In fact, they have lower chances of being employed in non-agricultural activities such as government sectors compared to the higher educated as some of the permanent job requires a higher qualification. However, since most of the farmers had secondary education, they were equipped with knowledge and skills that helped them to diversify their farming strategies to earn a better livelihood compared to the poorly educated households. Conversely, they may also adopt better livelihood strategies such as business/enterprise and commercial farming strategies, as demonstrated in several

studies (Gautam & Andersen, 2015; Gebru et al., 2018; Rigg & Nattapoolwat, 2001; Soltani et al., 2012).

Moreover, the association with financial asset was not significant (t = 0.199). Similarly, gross monthly income (FA1) was found to have a weak association (t = 1.110, p = 0.267) with livelihood diversification strategies categories. Farmers' involvement in non-farm activities and diversification of their farming strategies did little to improve their income. This study is contrary to the situation in Keranggas, Pantu where most farmers' income improved after engaging in oil palm plantation (Mambu, 2013). Farmers in Serubah Ulu also practised crop diversification to stabilise their household income (Denham et al., 2015).

Regarding remittances (FA2), the result showed that they did not affect household participation in livelihood diversification with a t-value of 1.047. The relationship between remittances and financial assets was not significant (p = 0.296). This could be due to the low percentage of households (26.4%) receiving remittances. The findings of this study are contradictory to other studies which found that most rural households in Sarawak rely on remittances as part of their income sources (Bischoff et al., 2018; Denham et al., 2015; Munke et al., 2011; Owens et al., 2018). Both E-Kasih and BRIM (FA3) and only BRIM (FA4) also turn out to be non-significant (FA3, t = 0.149, p = 0.882; FA4, t = 1.180, p = 0.238), since only 8.6% of them receive the government support (E-Kasih) and in the case of BRIM it is not paid every month and only three times a year.

The last asset observed in Pantu is the physical asset, which includes electricity supply (PA1), water supply (PA2), land status (PA3), land size (PA4), and transportation (PA5). Electricity and water supply are not significant (PA1, t = 0.470, p = 0.638; PA2,

t = 0.940, p = 0.348) because the majority of Pantu Sub-District have already had access to this infrastructure, which does not affect their choice of livelihood diversification strategies, whether agricultural or non-agricultural. Likewise, land status (PA3) was not significant (t = 0.910, p = 0.363) for physical asset value. This could be due to the fact that most of the lands were inherited by multiple generations, which encouraged households to work on the farm. However, land size (PA4) had a weaker effect on physical assets (t = 0.199, p = 0.842). This showed that households with larger land size tend to engage in farming and crop diversification. This meant that the larger the land they owned, the better the income they could earn from the farm. However, few households owned larger land up to ten acres and the majority owned only up to five acres. This could explain the weaker effect on livelihood strategy choice. However, farmers with large farm size were less likely to diversify their livelihood strategies into off-farm income sources. This suggests that farmers who own larger land area are more likely to depend on crop production rather than resorting to off-farm sources of income to meet their basic needs. The findings of the study are consistent with those of Fabusoro et al. (2010) who found that when farming activities provide sufficient income for the household, the tendency to diversify into off-farm sources of income is reduced. In contrast, smaller land size could not help farmers to produce sufficient crops to meet their food needs and marketable surpluses; it encouraged farmers to diversify into non-farm economic activities to supplement their income from such activities. Irrespective of the size of farm, most households in the study diversified their livelihood into non-farm activities mainly to survive and build better assets. This result coincides with the study of Eshetu and Mekonnen (2016) and Gebru et al. (2018).

As predicted, transportation (PA5) showed a weak relationship (t = 1.094) with the likelihood of household diversification into non-farm income-generating activities.

However, this relationship was not significant against physical asset (p = 0.274). As discussed in the previous sections, 84.5% of households in Pantu owned their own means of transport, namely a motorcycle (54%), a car (22.7%), a van (6.4%) and a truck (1.4%). This scenario was different from other villages in Sarawak where the Iban still relied on the river for transportation (Sanggin et al., 2016). They also had a good road system and reliable community transport to get to their desired destination. These transportation facilities allowed residents to conveniently get to their workplaces and the market in a shorter time. Those who had their own means of transportation were even able to pursue non-farm activities in the city because they could get there more easily and with flexibility. In addition, having their own means of transport enabled them to travel more frequently to markets to sell their crops, livestock, or collections from the forest, compared to those who had no means of transport and could only travel to markets within a limited period and frequency. Some villagers had to limit their income-generating opportunities due to transportation constraints. In this sense, owning a means of transport provided more benefits to households in diversifying their livelihood activities into non-agricultural activities and they benefited the most.

Overall, this study was able to justify the assumption that all five assets influence Iban households' decisions regarding their livelihood strategies differently to some extent. As evidenced in this study, social capital and natural capital have a great influence on Iban livelihood choices in Pantu Sub-District.

4.6 Effect of Gender on Livelihood Strategies

Livelihood strategy issues related to gender arose from the need to understand and shape research outcomes that benefit women and men of a community equally and advance

the development prospects of a nation (Manjur et al., 2014). Notwithstanding, gender disaggregated data was still sparse and poorly developed (Eneyew, 2013). In this context, the typical rural livelihood strategy in Sarawak was that both men and women of the household combined their crop and livestock production (Devereux, 2000). There were risks associated with gender in diversification because it excluded women from decision-making roles in rural development. Many experts noted that the participation of men and women in livelihood choices differed (Denton, 2002; Manjur et al., 2014). This study therefore sought to identify the role of gender in the decision-making process in order to determine the livelihood strategies of the Iban community and furthermore to assess the changing role of gender in influencing activities in which both men and women participate.

The female sample population from the interview scheduled for this study were smaller at only 10.9% (24 heads of households) compared to the male 89.1% (196 heads of households), as only the majority male heads of households were interviewed in this study. Moreover, this study was supplemented with focus group discussions with a group of males and females to analyse their roles. In terms of education, the majority of the women completed primary school while a majority of the men had completed secondary school. The results of this study show that there are fewer female heads of households in Pantu because they have migrated through marriage, work, and education. This was the case when half of Sarawak's population lived in urban areas and 45% of migrants were female (Cheng, 2007). Traditionally, migration within the Iban community was dominated by men, which is known as the bejalai concept (Jensen, 1974; Sather, 2006; Soda, 2001), but in the 1980s there were increased opportunities for female employment in the service sector due to the economic boom (Cheng, 2007).

This study found that most women and families followed their husbands to the cities, resulting in permanent migration. In addition, young women began to be educated and moved to the cities to pursue higher education or better career opportunities. In addition, there were many women who left home only to get married, which is known as the traditional nguai rule. The results of this study are similar to the situation in Munggu Sawa as reported by Owens et al. (2018) where most of the women migrated for relationship and in search of jobs. Based on the interviews, the respondents agreed that household migration was influential among women.

Next as shown in Figure 4.22, majority (71%) of women in Pantu were farmers, 13% were housewives, 8% had their own business and 8% were involved in other activities.

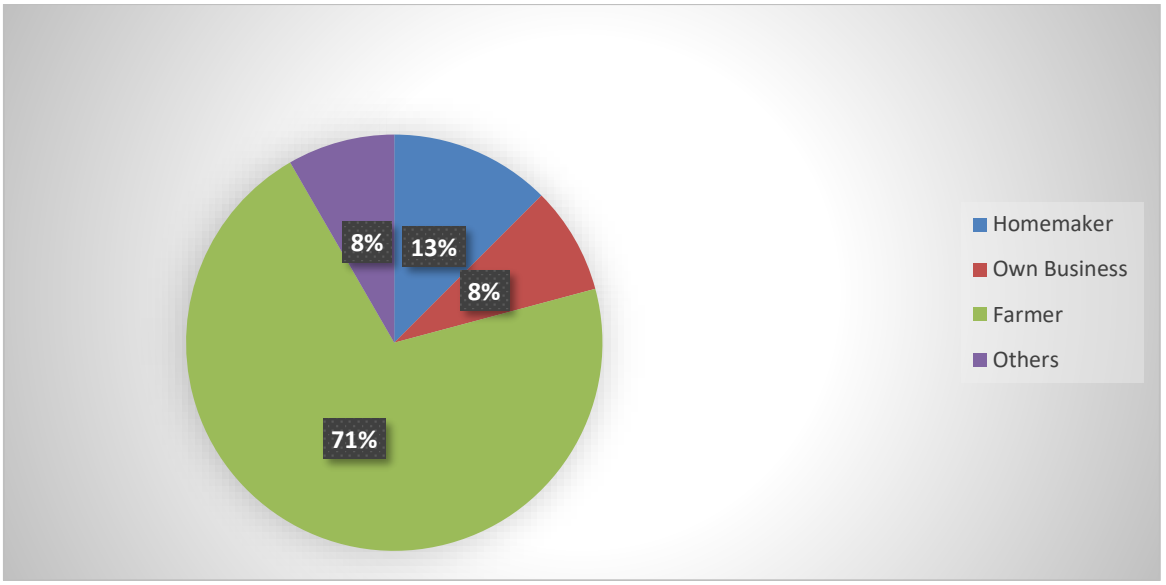


Figure 4.22: The Types of Occupation of Females in Pantu Sub-District

Figure 4.22 shows that only a few women worked in the private sector and the rest were housewives. Their participation in non-agricultural activities was lower as most of them had completed their education at primary school level. The local private or government sector

required at least secondary education for employment, which most of the women in Pantu lacked. Therefore, 71% of them ended up in agriculture following family traditions.

Apart from this, the women of Pantu were also skilled in making a variety of baskets for different functions. There were special baskets for planting, harvesting, storing and milling the paddy. Baskets, of course, were also used by most of the inhabitants in daily activities such as gathering in the forest, fishing, or personal use. Similarly, Pantu women specialised in making hats for the farmers to protect them from the hot sun and rain. Women also made mats, not only for sleeping, but also for drying rice and other rituals.

Similarly, 8% of the women who had their own business were actively engaged in the craft business. As shown in Figure 4.23, one of the respondents Delina Anak Tana from Kampung Sungai Merah Atas started her handicraft business in 2009 with support from the Department of Agriculture in the form of training, provision of sewing machines and other resources for handicraft making.



Figure 4.23: Delina Anak Tana (left) the Handicraft Businesswoman

The Iban community has great respect for women who can weave and braid, and handicrafts are an important part of Iban livelihood. In addition, the women were also

supported by Community Development Department (KEMAS) who conducted handicraft classes at the KEMAS premises to improve the skills of the rural women.

In addition, the Women Economic Development (WEDA) program provided entrepreneurship training to the rural women in Pantu. All handicrafts produced were usually sold by the women in the town of Lachau near their villages. Respondents reported that the main indigenous raw material for handicraft production was rattan, bamboo, *donax canniformis* (*bemban*), palm leaves and plastic wrapping strips. Due to the lack of natural material, most Iban women made the handicrafts from colourful plastic wrapping strips as shown in Figure 4.24.



Figure 4.24: A Group of Women with Their Handicraft at Kampung Lachau Jinggau

There were also women and housewives who gathered and sold jungle produce such as fruits and vegetables to provide additional income for their families. They usually sell their forest collections at the "*Pasar Tamu*" or Famers' Market in Lachau and Pantu Town, as shown in Figure 4.25. According to the respondents, Lachau has more visitors compared to Pantu because it is close to the highway and is a popular place for visitors, especially on weekends.



Figure 4.25: Farmers' Market in Lachau

It was found that women also contributed to household monthly income by adopting various livelihood strategies other than farming. This was evident in the quantitative results in Table 4.30, where a similar trend was observed in the income shares of males and females, with the majority belonging to the low-income level.

Next, as shown in Table 4.31, there was a significant relationship ($p = 0.045$, p 0.05) between gender and income shares as both genders contributed to the income shares although the contribution of women was less compared to men. This finding correlates with that of Manjur et al. (2014), stating that income in the watershed was shared by both sexes in the Northern Ethiopia region.

Apart from this, there was still a division of labour between men and women in agricultural and domestic activities. In particular, in the Iban community, there was still a gender division of labour in cultivation where almost 95% of the respondents agreed when asked if there was a division of labour in their household. In terms of household roles, most households were headed by men (89%), while female-headed households were in the minority at 11%. In male-headed households, agricultural activities such as land clearing, ploughing, sowing, threshing and tree pruning were dominated by men, while household activities were carried out by women. The changes between Iban men and women, which are

most frightening due to technological changes such as the use of chainsaws and outboard motors, have opened up opportunities for men that are beyond the physical strength of women. Women who were not involved in selling forest produce helped their husbands on the farms. In contrast, in female-headed households, women were also actively involved in all agricultural activities except for tasks requiring greater strength, such as ploughing or clearing the land. Therefore, a division of tasks between the two parties was necessary to have an efficient farming system. Alternatively, some women practised agricultural diversification on their farmland as independent farmers where they practised a combination of subsistence, cash crop and commercial farming. They also raised livestock on their farm and sold them at the nearby market.

Table 4.30: Income Shares of Both Male and Female in Pantu Sub-District

Gross Monthly Income	**RM1,000 and below**	**RM1,001 - RM2,000**	**RM2,001 - RM3,000**	**RM3,001 - RM4,000**	**RM4,001 - RM5,000**	**RM5,001 and above**	**Total**
Male	44	91	47	11	1	2	196
Female	12	7	4	0	0	1	24
Total	56	98	51	11	1	3	220

Table 4.31: Chi-Square Tests on Income Shares of Both Male and Female in Pantu Sub-District

Chi-Square Tests	**Value**	**Df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	11.321[a]	5	.045
Likelihood Ratio	11.140	5	.049
Linear-by-Linear Association	2.826	1	.093
N of Valid Cases	220		

The focus group discussion with the women revealed that the women wanted to earn some income to help their husbands who worked as contract laborers or in urban areas by contributing to household expenses and paying fees for their children's education. A similar scenario could be observed in Munggu Sawa and Kuala Tatau where female-headed households bore the greater burden of playing both the mother and father roles in the absence of their male counterparts in the family (Owens, 2018; Ugeh et al., 2015). In most cases, the role of men in the family in generating income for the whole family was predominant, although women appeared to have the same number of responsibilities as men. Although gender appeared to be a fundamental determinant of household livelihood strategies, it was found to have no significant influence on livelihood choices of Iban households in Pantu, as the sample size of women was smaller compared to men. This result is consistent with a report by Gebru et al. (2018). In addition, only a small number of women were involved in business and trading activities because their financial constraints prevented them from financing start-up costs for a business. This limited their ability to generate surpluses which they could then invest in farming or other non-agricultural activities. This justifies the assumption that men and women adopt different livelihood strategies to contribute to the household to some extent.

Apart from this, in the focus group discussion with a group of men and women, it was found that there are gender equality and inequality in livelihood decision making in Pantu. These reflect that gender plays a role in the decision-making process in choosing their livelihood strategies in Pantu Sub-District. In gender equality, both the husband and wife made joint decisions on certain aspects such as choosing their livelihood activities and important decisions related to finances, renting, or selling land and selling farm produce. During the focus group discussion, joint decision making was the most common response

from both men and women. They informed that everything they do must be agreed upon between them and their spouse. For example, female respondents informed that they need to ask their husband for advice when deciding on things like their children education. Male respondents shared that decisions on how to grow crops and hire workers are also made jointly. Greater mutual decision-making in livelihood decisions was recognised as a means of transformation and contributing to women's empowerment (Leigh et al., 2017). However, due to gender inequality, it was mainly women who ran the household and took care of the children. For example, women make the decision on daily expenditure on food and clothing. Male respondents also perceived that the women usually have sole decision-making power over tasks that women are normally responsible for, namely cooking. The findings of this study are consistent with Hutchings' (2000) study on gender inequality in relation to traditional roles.

The findings of this study can justify that both men and women play a role in the decision-making process. All these also affect their choice of work and livelihood activities. The focus group discussion also shows that women have experienced a change in gender roles, with women taking on some tasks that were previously reserved for men, and this was further illustrated by the triple role of women.

4.6.1 Gender Triple Roles Model

Gender differences in decision making were innate. Decisions in rural families were made against a backdrop of social and financial change and were typically based on the wealth and financial status of the family. Decisions were additionally dependent on family characteristics, such as age and gender, wealth status, farming experience, information and talents, and connections among individuals. Decisions in the household could alter the gender

division of labour within the family unit. The trend in livelihood had created new types of gender divergence. Women in Pantu were more vulnerable to economies and hardships. For example, the focus group interview revealed that women had more responsibilities during the illness of a family member and in agriculture when their husbands went for *bejalai*, especially for long-term work in urban areas. Based on the focus group interview, respondents indicated that both genders were involved in the livelihood decision-making process in rural areas. Men had more knowledge in agriculture, therefore most of the decisions in this area were made by men.

Due to changing role of gender, the women in Pantu became more skilled in multitasking. This study employed the triples roles theory to highlight the various roles and labour division between men and women. In Pantu Sub-District, it was found that women undertook all three the roles namely reproductive, productive, and community roles.

The reproductive role of women in Pantu involved the consideration and support of the actual labour force of the family. Based on the study, it is found that there are two types of reproductive roles, household duties and caring for the family members in the house. The women respondents indicated that their household duties include washing clothes, cooking, cleaning, and buying food for the family. They are also responsible for caring for the family member in the home, including raising children, caring for the elderly, and caring for sick family members. The women interviewed indicated that a heavy domestic workload limits their chances of pursuing various activities such as agricultural or non-agricultural employment. This study found that the division of reproductive work between husband and wife, their children and other family members is common. For example, the husband was found to assist his wife in reproductive tasks such as disposing of household waste and

sending their children to school. The children, especially the daughter, also participated in sweeping and taking care of the animals. Nonetheless, family members make different contributions to ensure the smooth running of the household, with women spending more time on reproductive unpaid care work than others.

Then the productive role is related to the wage earner of the family. In the past, the wage earner referred mainly to the husband when the wife stayed at home and focused only on the reproductive role. Today, there are changes where the wage earner can be women or men, or both. For example, there is evidence that women in Pantu do related work to earn money. It was found that women often perform these tasks alongside their reproductive role while men are more involved in productive activities as they are the main breadwinner of the family. Women in Pantu Sub-District are engaged in agricultural and non-agricultural activities.

Women who play a productive role in agriculture work full time in agriculture along with their husband. Here their work is twofold, for example, women are not only responsible for the agricultural activities in the rice fields, but also for the processing of the rice at home, such as drying the rice and storing it properly. In addition, in some situations, women have participated in agriculture as self-managed producers by growing their own crops or raising their own livestock, this is true for women who are the head of the family in the absence of their husband or as single parents. However, this study found that their productivity was rather minimal compared to full-time male farmers. Most of the time they use their own labour and knowledge of farming practices, but in some cases for heavy tasks they usually hire labour. In some cases, there are women who work for other villagers on other farms to earn wage income especially during cultivation and harvesting of crops like paddy and

pepper. This is due to the shortage of agricultural labour where women's participation in agricultural work is necessary. In the area of non-farm activities, women are engaged in making handicrafts, running small businesses, and collecting forest resources to generate and supplement family income. The respondents indicated that these activities do not necessarily have to be full time as they can also do them part time from home such as making handicrafts. This study found that women's access to safe and productive tasks not only improves their family's food security but can also provide opportunities for change when women are more independent.

The community role involved unpaid work for the good of the community. In the focus group discussion, it was noted that some women served as members of the Village Development and Safety Committee (JKKK). This committee was the main machinery for the community's participation in the State Government's development programme aimed at promoting the rural sector. It emerged from the focus group discussion that one-third of the respondents had assumed that the highest designation was in the village development and security members. There were both tangible and intangible gains from respondents' involvement in community tasks. Respondents recognised that committee involvement increased awareness of public issues, well-being, health, and education. They also had the opportunity to participate in various governmental and non-governmental programmes targeted at female candidates. For example, respondents informed that KEMAS conducted *sekula tuai* (adult classes) which was held two to three times a week. The aim of the programme was to increase the level of literacy and numeracy in order to improve the quality of life in the community.

Other communal tasks found at Pantu Sub-District include attending funerals, performing religious activities, and attending weddings, which is a common communal task for both men and women. However, the women interviewed indicated that their advancement in community roles is limited by their housework or reproductive roles. Some of them spend less time on community tasks. Men in Pantu tend to participate more in community political activities and chair the local farmers' association. Men were found to have more opportunities to travel outside the village for meetings and training related to their role in the community than women, who have primary reproductive responsibilities.

From this study, gender roles in Iban society are also influenced by the culture and gender stereotypes in the community. The gender division of labour gave men and women different skills. In agriculture, for example, men were predominantly involved in clearing the land and cutting trees, while women were in charge of transplanting rice and harvesting. Culturally, Iban women were also known for making handicrafts such as *pua kumbu* and making traditional rice cakes (*penganan jala*), pressed cookies (*kuih sepit*), molded cakes (*cuwan*) and making rice wine (*tuak*) for consumption and sale in the farmers' market. According to the respondents during the interview, the demand for such foods increased during festivals, such as Gawai. The income generated from these activities contributed to the family income.

The focus group interviews with the women's group also revealed that the women whose husbands went on *bejalai* mainly because of work had the added burden of working on and off the farm. In summary, with the change in role, the Iban women could no longer cover all the regular household tasks. Some respondents shared that the workload in the household did not decrease in line with their increased role. In addition, some respondents

reported even greater responsibilities within the household, mainly due to their spouses. In addition, others indicated that they were less burdened with the help of family members in completing their household activities. This result could be justified by a gendered study conducted by Valdiva (2001) and Denton (2002), which states that the division of tasks between husband and wife in any household is critical to the sustainability of the family. In this study it was found that there was an increase in the willingness of men to help women with housework.

It then emerged from the discussion that women's productive and reproductive roles are often described as conflicting, as women's growing labour force participation has not necessarily led to a central change in their childcare and household responsibilities. Gendered categorisations related to women's roles at work and at home depress their work opportunities. Because the labour force is still primarily organised along gender lines, it is predictable that women involved in productive roles will continue to assume the bulk of reproductive role responsibilities. Women's productive roles contribute to women working longer hours than men when both paid and unpaid work are considered. Previous studies (Jansen et al., 2020; Molla, 2019) on the triple role have focused on women while paying little attention to both genders, so this study is interesting in this model as the researchers discuss both men's and women's roles in the triple role.

4.7 Indigenous knowledge Application on The Livelihood Strategies

Indigenous knowledge (IK) is unique to a particular culture and society (Anderson 2008; Antweiler, 2016). IK including values, self-governance, social association, environmental stewardship, adherence to network and land-related agreements have been inserted into expressions, melodies, verses, stately rituals, and ceremonies to be passed down

from subsequent ages (Ulluwishewa, 2008). In Iban communities, IK refers to their experiential, traditional and informal knowledge that is important for both farm and non-farm livelihood. This knowledge is considered heritable as it is passed on from one generation to the next to find solutions to existing livelihood problems. The Iban community is the guardian of the IK system and uses the natural resources surrounding it, such as forests, land, and rivers, for practices related to IK. Specifically, IK in the Iban community is associated with their various farm and non-farm roles such as farmers, labourers, fishermen, gatherers, and hunters. Most of the income of rural households in Pantu Sub-District comes from agricultural activities such as wet rice cultivation, small-scale poultry farming and aquaculture.

There are two main categories of IK knowledge in Iban society namely explicit and tacit knowledge. Explicit IK refers to traditional knowledge that has been written down and recorded because it is easy to disseminate and communicate. In contrast, tacit knowledge refers to the practical or IK acquired through personal experience, perception, and intuition. With the erosion of IK, the need to transfer, store and preserve tacit into explicit IK is greater than ever in the Iban community today. Moreover, as can be seen in Figure 4.26, 96.3% of households agreed that they still apply the IK to their livelihood strategies when responding to changes in their environment or vulnerability to their livelihood.

Villagers indicate that despite the decline in the natural resources such as their forests or *pulau galau*, animals and fish, Iban communities are more creative where they look for alternatives to earn and sustain their livelihoods. This means that they look for a substitute by using their IK to diversify their livelihood. For example, they began cultivating traditionally wild vegetables such as ferns and bamboo shoots.

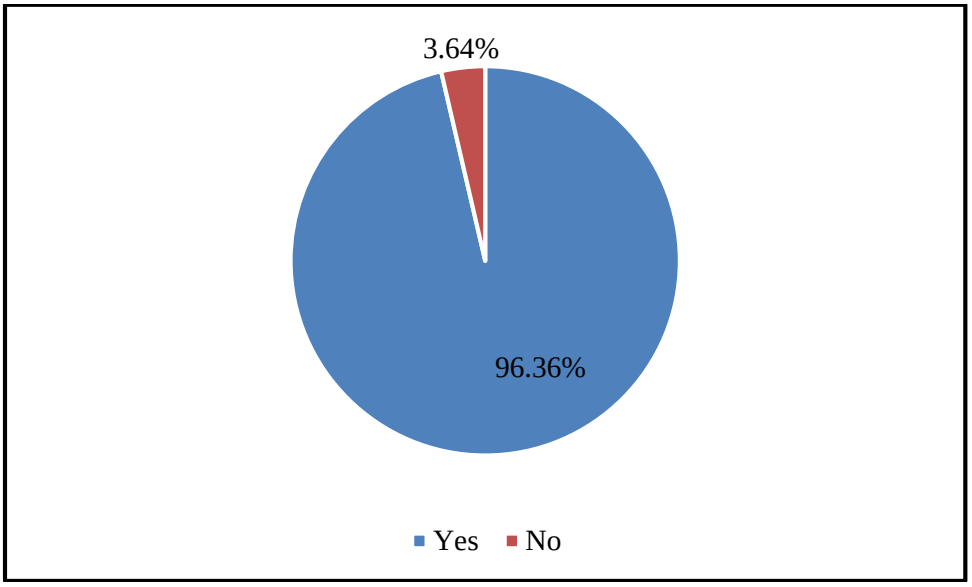


Figure 4.26: The Importance of Indigenous Knowledge on Livelihood Strategies

Since some of them do not go to the river to catch fish, the Iban raise fish for their own consumption in fibreglass or cement tanks in Pantu Sub-District. The respondents said that even their children and relatives who have migrated or *bejalai* retain their IK such as buying the fish or meat from the market and making their own smoked fish (*ikan salai*), salting fish, and preserving meat or fish (*kasam*) either for their own consumption or to sell to friends in the cities.

The women engaged in handicraft making also reported that with a limited number of *bemban* (*donax canniformis*) and palm leaves, they can still make their mats and baskets using colourful plastic strips. Some of the respondents grow their own *bemban* and palm on their farm. Other women involved in the production of *pua kumbu* (woven textiles) replace the natural dyes with pre-made modern dyes that are more vibrant and durable. This is because the natural dye made from *engkudu* (*Morinda Citrifolia*) and the leaves of *tarum* (*Indigofera Tinctoria*) are no longer available in the forest due to the decline of the species. Moreover, most of the fishermen in Pantu make their own boat from fibreglass material, compared to the past when they needed ironwood for boat making. Since ironwood is very

expensive and difficult to get from the forest, fibreglass is the best alternative. According to the interviewees, boat building skills have been passed down in the family from one generation to another but now they have to use the fibreglass.

Besides that, as shown in Table 4.32. There were only 8 households involved in farming that considered IK as less important compared to 192 households who treated IK as important in farming. Only 20 households considered IK as important in non-farm livelihood.

Table 4.32: Crosstabulations on the Indigenous Knowledge in Farming and Non-Farming

Livelihood Activities	**Important**	**Not Important**	**Total**
Farm	192	8	200
Non-Farm	20	0	20
Total	**212**	**8**	**220**

This indicated that IK played a substantial role for the community to perform their daily livelihood activities and influence the choice of livelihood strategies from farm to non-farm. Results from the in-depth interview with penghulu and tuai rumah also found that there were few types of IK that existed among the Iban communities in Pantu which were still in practice in their livelihood strategies by the rural households.

For example, IK was commonly used to make handicrafts such as necklaces (tangu), sashes (selampai), woven textiles (pua kumbu), headdresses for women (sugu tinggi), short-sleeved vests (kelambi), loincloths (sirat) and headdresses for men (labong). This handicraft is mainly for the traditional dress of Iban men and women, worn on special occasions, ceremonies, dances, and rituals. Knowledge about making handicrafts is tacit knowledge, but it has been noted that tacit knowledge can be transformed into explicit knowledge when

knowledge is passed on through personal conversations and made into available references in printed materials.

In Pantu Sub-District, knowledge about making handicrafts was practically passed on in formal and informal ways. In a formal way, some of the women take part in the handicraft courses run by KEMAS, where they can learn the steps of making a particular handicraft. However, most of the time it is learnt through informal ways, such as by observing and watching elders. It was usually the women who practised this activity. Some Iban artisans rely heavily on natural materials such as rattan, bamboo, leaves and bemban to make handicrafts such as plant baskets, mats, or hats. In making the handicrafts, they had to observe some prohibitions and be aware of the taboos surrounding their craft. This finding agrees with Jawol et al. (2018) who stated that weavers must start with a basic patterns before attempting to weave complex patterns such as the leopard. If they skip any of the steps, it is considered dangerous as the women might get sick or die. Therefore, IK knowledge was found to be important in guiding women to follow the right steps in making handicrafts so that bad circumstances do not occur, even though this belief is waning due to modernisation.

Similarly, IK is crucial to the Iban, especially in fishing and hunting, as they believe strongly in superstitions or taboos and certain restrictions. For example, they must be careful and attentive to the behaviour of birds and animals, as their actions are seen as warning signs, signposts, or indications of future events. As Jawol et al. (2018) noted in their study, there are several species of birds such as Beragai, Ketupong, Embuas, Bejampong, Kelabu Papau and Nendak that are believed to be a sign of how future events will occur. However, this study has shown that this knowledge remains tacit and has faded over the years as the current generation (younger adults) have not been able to recognise these birds. Some older members

and those of middle age still used this IK during their fishing and hunting activities which had become a rare activity among them.

Moreover, the respondents who participate in hunting shared the IK knowledge about hunting. According to them, hunting can be done with traps, dogs, and shotguns or simply just a shotgun. For example, when they hunt with the shotgun (nimbak), they start by following the tracks of the wild boar. Hunting for the wild boar starts as early as 6:00 am and lasts until 6:00 pm, depending on the catch. Usually, they follow the wild boar tracks until 11:00 am. The hunters are informed that the wild boar family sleeps in the den of the felled or dead Empenit tree (lubang kayu empenit) from 11:00 am until 2:00 pm. The dead or felled trees provide shelter for the wild boars, where it is the nest for the wild boar family. If the hunters manage to find a wild boar in the nest and are lucky, they will get the wild boar family, which usually consists of six to seven wild boars. However, on the way to hunt the wild boar, they must not catch a small animal such as a turtle or a monkey as they fear that it will bring bad luck and they will not get a wild boar. Also, the hunters informed that the wild boar wakes up after 2.00 pm and go out to forage until 6.00 pm. If they cannot catch the wild boar in the den, they will follow the boar's tracks until 6:00 pm. Usually they do not hunt alone, but in groups of two to three. It was found that hunting is part of tacit knowledge and those who have hunting skills are usually more involved in these activities. It was also found that hunters gained their hunting skills from their experience and intuition.

The second most important activity in Pantu, in which IK was employed, was farming. The Iban paid great respect to the land, as it was the site of their main economic activity. Some farmers still used the manual way of harvesting paddy by using ketap (finger knife). Ketap was a traditional tool made from a combination of wood, bamboo, and a small

blade. In addition, the Iban community in Pantu also practises bedurok or labour exchange in their farm. Moreover, during the rice harvest, the Iban put their rice in the takin (basket) before putting it in the sacks. Besides, the Iban also practiced farming rituals such as "miau umai" to bless and protect their crops. This knowledge is in the form of tacit knowledge, where the experienced ritual practitioners must use specific metaphorical language to convey the message to Petara during the ritual. On the other hand, the traditional performance of Ngajat (dance) is still practiced by the community in Pantu Sub-District as part of their IK. The Iban community conducts Ngajat training which serves to pass on the knowledge to the new generation.

IK is also widely used in traditional medicine among the Iban community in Pantu Sub-District. According to the villagers, they still use some traditional medicine for health treatment, such as the use of kemunting (Rhodomyrtus Tomentosa) and the guava plant to treat diarrhea or stomach pain, and mabung (Blumea Balsamifera) to treat fever. This study found that this knowledge is part of the explicit knowledge and the Iban community uses traditional medicine complementary to modern medicine. The respondents also stated that for some diseases which are difficult to cure by modern medical methods, they perform bebelian which is done by the manang (Shamans) who are responsible for treating the sick by bringing back the semengat (soul). Traditionally, they believe that sickness is caused by the soul of a patient being absent from the body. This is a tacit IK and is rarely practiced, as most manang are among the elders and are hard to find, as some of them are too old and can no longer perform the bebelian. Another reason why this practice is not popular is that many Iban in Pantu Sub-District are Christians.

Moreover, explicit IK aspects are also written in the Adat Iban 1993. The essential function of adat in the Iban community was to maintain harmonious relations among individual members of the Iban community and to ensure the physical and profound prosperity of the general communities. It was a successful apparatus of social control to determine debates productively and appropriately. For instance, adat Iban connection with marriage, divorce, inheritance, and division of property. Moreover, in Iban society, there are ritual prohibitions (penti pemali) that must be followed by the society. For example, when a resident of the longhouse dies outside the village, the genselan is performed, that is, a pig is sacrificed before the deceseased's body is brought into the longhouse for the rites and preparation for burial. These ritual rules are still commonly practiced by the Iban community in Pantu Sub-District.

As discussed, most households believed that they could reduce their livelihood vulnerability by applying IK. Since agriculture was the main economic activity of households in Pantu, they were exposed to various hazards that could pose a threat to their productivity and livelihood strategies based on agriculture. However, the local Iban were aware of the threats and were able to manage these resources sustainably based on their indigenous knowledge. In particular, rapid rural development had led to the depletion of available natural resources, limiting household dependence on natural resources compared to earlier times. However, the community in Pantu found an alternative solution to replace some of the natural resources and preserve their IK knowledge. Similar findings on the use of indigenous knowledge in the daily life of the Iban community were reported by Kendawang et al. (2005), Bolhassan et al. (2014), Riman (2015), Sanggin et al. (2016) and Jawol et al. (2018).

It has also been noted that tacit IK can be transformed into explicit knowledge, but there is also expertise and experience in IK, which remain tacit and only preserved by some individuals, such as elders. In summary, indigenous knowledge was useful for farm and non-farm livelihood strategies. In light of this, it defended the assumption that indigenous knowledge influences the choice of livelihood strategies in response to changes in the vulnerability of their livelihoods to environmental change.

4.8 Conclusion

This study focused on the livelihood of the Iban community in Pantu Sub-District, Sarawak. Specifically, it examined the role of assets in livelihood security, gender differences in livelihood strategies, and the use of indigenous knowledge to reduce livelihood vulnerability. Interestingly, many households diversified into both farm and non-farm activities, such as small enterprises, which led to an improvement in their livelihood. The results show that almost all households engaged in farming practised agricultural diversification strategies by shifting from subsistence farming to cash crop farming, which helps farmers to increase and stabilise their household income. A few households relied on remittances from family members who had migrated to urban areas as part of their diversification strategies. Meanwhile, some of them diversified their livelihoods based on natural resources such as fishing, hunting, and gathering in the forest.

The results also suggest that all households relying on human, natural, social, physical, and financial capital for their livelihoods were able to justify the sustainable livelihood theory. However, only social capital and natural capital have a significant impact on the choice of livelihood diversification strategies among rural households. The livelihood strategy aspects in relation to gender were examined. Since the proportion of women among

household heads was low, men seem to dominate in contributing to monthly household income, except among female-headed households. The reproductive and productive roles of the sexes, based on the triple role model, were evaluated. It was found that the division of labour in each household between men and women was evident, with men undertaking tasks that required more strength, while women focused more on household chores and simple agricultural work. Women also diversified into non-agricultural activities associated with making handicrafts and owning craft businesses. Therefore, men and women in Pantu had adapted differently to livelihood strategies.

Finally, the use of indigenous knowledge was still widespread in households. They believed that their IK could reduce their livelihood vulnerability, especially in agricultural activities that were their main source of income. Iban communities in the Pantu Sub-District spent a considerable amount of their time farming and gathering resources. The available natural resources at Pantu Sub-District supported people's livelihoods through agriculture, hunting, fishing, and handicrafts.

CHAPTER 5

CONCLUSION

5.1 Introduction

This chapter provides an overview of the research objectives, research questions and presents the essence of the findings of this study as well as the rationale behind the findings. Similarly, the derived implications and contributions of this study and the conclusion have been explained. The limitations of the study and recommendations for future studies are also presented.

5.2 Essence of the Findings

This study was conducted in Pantu Sub-District, specifically in their two administrative areas namely Munggu Ubah and Kara Pantu. Basically, this study employs the structure change development theory as a foundation and conceptualises the sustainable livelihood framework (SLF) with the integration of gender and indigenous knowledge factors to gain an understanding of rural livelihood strategies in Pantu Sub-District. Four research questions and four research objectives were addressed, while four assumptions were developed around specific indicators guided this study.

The main objectives of the study were: (i) to examine the livelihood strategies of an Iban community in Pantu Sub-District, Sri Aman, Sarawak; (ii) to identify the crucial factors in diversifying the livelihood strategies of the Iban community in Pantu; (iii) to analyse the role of gender in the decision-making process to determine the livelihood strategies of the Iban community, alongside assessing the changing role of gender in influencing activities in which both men and women participate in Pantu Sub-District, Sri Aman; and (iv) to explore

how the indigenous knowledge of the Iban community in Pantu Sub-District influences the choice of livelihood strategies in response to changes in the vulnerability of their livelihoods to environmental change.

This research employed mixed methods, incorporating the qualitative interviews and the quantitative survey. Overall, this research was a comprehensive study as it covers different dimensions of the community, village, as well as the household levels. Two hundred and twenty Iban households from 12 different longhouses were selected as samples for the study.

The first part of the research focused on the in-depth and structured interviews with the *penghulu, tuai rumah* (headmen) and *tuai bilik* (household heads) of Kara Pantu and Munggu Ubah. Two Iban *penghulu* serves at the Iban community where they act as community leaders for the villages and are responsible for representing the community in all official activities. At the village level, the *tuai rumah* have a higher responsibility as headmen who look after the affairs of the longhouses. *Tuai rumah* play a role as the eyes and ears of the administration and other duties such as advisors and leaders of the JKKK. In addition, the *tuai rumah* also decide on the settlement of disputes between his followers. The appointment of both *penghulu* and *tuai rumah* must be confirmed by the State Government in order for them to receive an allowance. They act as important transformative leaders to bring about positive changes in the Iban way of life. Next, each Iban *bilik* is headed by a head of household (*tuai bilik*). The *tuai bilik* play a role in the leadership of their family and influence the household's decision making in agriculture and non-agricultural activities. The study indicates that the interplay between role of gender and indigenous knowledge within

the social structure of the Iban communities at different levels affects their decision making on choices of their livelihood strategies.

5.2.1 Livelihood Strategies in Pantu Sub-District

This section summarises and discusses the results of the study. It relates to the main objective of the study which is to examine the livelihood strategies of an Iban community in Pantu Sub-District. It also answers the research question on the local livelihood strategies of the Iban in Pantu Sub-District and how the livelihood strategies are chosen. The study confirms the assumption that the Iban community has diversified its livelihood strategies. It proves that the Iban in Pantu Sub-District adopt livelihood diversification strategies by engaging in more than one type of farm (agricultural) activities in addition to engaging in non-farm activities. Moreover, it correlates with the theory of structural change in livelihood and agriculture, as there are labour changes or transition of labour from the traditional sector to a more modern economic sector. The findings of the study indicate that the Iban in Pantu still practise subsistence agriculture, but commercial and non-agricultural activities have increasingly gained popularity. This implies that similar to many local communities elsewhere, the Iban households in Pantu have generally diversified strategies to reduce livelihood instability and the threat of focusing entirely on a single source of income generating activity. The structure change development theory also shows that there are changes in the rural way of life. There is a decline in the supply of labour force in the villages as some household members have undertaken *bejalai*, especially the young adults. The findings of the study also show that there is generally an improvement of financial assets among rural Iban communities in Pantu when they adopt livelihood diversification strategies to earn income from different sources. The changes in physical assets in Pantu Sub-District can be seen in the various infrastructures that affect the accessibility of capital assets which

then affect their livelihood choices. Next, it was found that social capital either vertical or horizontal integration plays an important role in their livelihoods. In addition, there are changes in natural resources which then also affect livelihood choice among the Iban in Pantu. These are basically related to the shrinking of cultivated land and other natural resources such as virgin forest. Moreover, the changes in gender roles can also be seen in different levels of decision making process in determining livelihood strategies adopted by both men and women in the Iban households in Pantu.

Majority of the households in Pantu are low income earners (income below RM2,000) whose income level is below the currently revised (July 2020) Malaysian poverty line income (RM2,208) (DOSM, 2020). Although the majority of the households are low-income earners, their income is sufficient to meet the needs of the household. It was noted that the predominant livelihood strategies among the Iban community in Pantu are farm activities with 70% of the community working as farmers. The findings from this study showed that farmers in Pantu largely practice agricultural diversification. Agricultural diversification refers to the various agricultural activities or farming practices of the community in Pantu Sub-District. The majority practice both subsistence and commercial farming. Moreover, almost all farmers in Pantu practice crop diversification by growing more than one type of crop on their farmland. These include rice, various fruits and vegetables, rubber, oil palm, and pepper. Although there is no significant relationship between agricultural diversification and income level, the community is still able to make a living. This situation is due to the fact that most of the farmers are small scale farmers. However, the Friedman test shows that monthly income from agriculture has the highest performance compared to forest products and hunting.

There are 30% of the Iban community in Pantu Sub-District involved in non-farm activities such as those who work in the public and private sector, run small businesses and fishermen. The results also show that their involvement in non-farm activities helps to sustain their livelihoods. Moreover, they still rely on natural resources for their livelihood. Activities such as forest gathering, wildlife hunting and fishing are part of their livelihood strategies to improve their household income. However, all three activities do not contribute much to the monthly household income because they are mainly subsistence activities and not all households are involved in these activities. According to the in-depth interview, most of the households use the natural products for their own consumption and only the surplus is sold in Pantu and Lachau town at low prices.

Similarly, households in Pantu Sub-District still rely on remittances as additional income sent by their permanent family members who have migrated to urban areas and is permanently employed in the government or private sectors. However, remittances are not significant with their income level as only 26% of the community depends on remittances. Low-income households are the majority of remittance recipients compared to middle- and high-income groups. These results support the structural change theory about the existence of a rural dual economy where migration is represented by a push-pull measure, such as inadequate job opportunities for the younger people in Pantu, leading them to seek better income in the city and send remittances to their family.

In terms of income distribution, the majority of Iban in Pantu Sub-District fall into the low-income category (monthly income below RM2,000). Most households are smallholders and are self-sufficient in food (subsistence), resulting in lower income. Overall,

Iban households have adopted both farm and non-farm activities such as farming, petty trading, renting, hunting, fishing and forest gathering to improve their livelihoods.

5.2.1.1 Borderline Livelihood Strategies in Pantu Sub-District

Interestingly, this study shows that the community Pantu Sub-District has socio-economic relations with the Indonesian border community in the form of trade, labour, and cross-border marriages that contribute to their livelihood. However, most of the benefits accrue to the trading communities in Pantu. Moreover, the community in Pantu also receives benefits in the form of labour, directly or indirectly.

Cross-border informal trading activities influence Iban livelihood strategies in Pantu Sub-District, as it is located near the border of West Kalimantan. In this study, it was found that people in West Kalimantan, especially those from Sintang regency, specifically from Sungai Ketungau, Nanga Bayan and Belubu, cross the border between Malaysia and Indonesia informally. They enter Pantu Sub-District from Kampung Gua.

There is also an exchange of goods between the two communities such as pepper, fruits, *lukai* and handicrafts. Trade is conducted using Malaysian currency. In some cases, a barter trade system was also found where people in Kalimantan usually exchange their crops such as pepper and fruits to get sugar, cooking oil and other prepared foods from the community in Pantu Sub-District. On the other hand, they also buy daily necessities in Pantu, especially from Lachau Town. There is also the free movement of labour, with Indonesians usually working on farms in the Pantu Sub-District Iban community, where they are paid the same wage as the locals. In addition, there are cross-border marriages in which some villagers in Pantu are married to those in West Kalimantan in order to secure the family's livelihood, to help with domestic and agricultural work.

5.2.2 Factors Influencing Adoption of Livelihood Strategies

This part specifically focuses on the determining factors in the diversification of livelihood strategies of the Iban community in Pantu, where the five types of assets have been analysed and described in detail. The research assumption has justified that all capital assets have an impact on people's decision to diversify their livelihood. However, this study rejects this assumption as only social capital and natural capital have a significant impact on households' livelihood diversification decisions. In this study, human capital includes age, gender, educational attainment, and household size; financial capital includes monthly income, remittances, and financial assistance; social capital includes household involvement in various subsidies or scheme and their participation in training; physical capital includes infrastructure, transportation, and land ownership; and natural capital includes natural resource-based activities.

As for human capital, the average *bilik* family of each household ranges from three to five persons and influences the household's involvement in agricultural and non-agricultural activities. The findings of the study indicate that family members play an important role in supporting the household and participate in non-farm activities to finance their farming activities and family needs. Those who *bejalai* for the purpose of *pengawa, bekuli* and *kerja* sent remittance to their family. In terms of age, it was found that majority of the household heads are middle aged. The study found that most young adults have higher education and energy to travel, work and pursue higher educational opportunities for livelihood compared to other age groups. The difference in education levels affected the occupations of the respondents and influenced their livelihood strategies.

Secondly, in terms of financial asset, monthly income showed that most of the households (70%) were low-income earners with only 28.2% earning middle-income and 1.9% earning higher income. The community derives its income from agriculture, personal businesses, pensions, government support, remittances, employees in palm oil companies, contracted work, temporary workers in shops, military, and teachers. Next, only a minority (26.4%) of those who had migrated sent remittances to their family, while 73.6% contributed nothing at all. Respondents indicated that the amount of remittance received was inconsistent and some stated that they received the same amount each month. Apart from this, the Pantu community also received government support from E-Kasih and BRIM.

Third, physical capital includes infrastructure, transportation, and land ownership. The *penghulu* and *tuai rumah* interviewed shared that the main facilities and services available are electricity and water supply, road access, market access, education, medical and health facilities, sports and recreational facilities, and communication facilities. Most villagers in Pantu are satisfied with the level of infrastructure provided. The Iban are supplied with electricity by SESCO and some use Genset or engine set. As for water supply, gravity water supply and water supply through Sarawak Rural Water Supply Department have contributed to better livelihood of the Iban community. Besides, respondents shared that road access has been improved and all longhouses in Pantu Sub-District are accessible by road. This improves their livelihood and provides more opportunities for their children's education. Moreover, commuting was convenient as most residents had their own means of transportation. Another physical asset is agricultural land where 95% were landowners, either inherited or purchased. The rest were tenants who either rented or borrowed the land for farming.

In terms of social capital, communities in Pantu have vertical and horizontal integration with different authorities and communities. Vertical integration is evident in the fact that there are several government departments and agencies that aim to introduce programmes, subsidies, training, and relevant development projects to improve the living standards, knowledge, and skills of the community, such as DOA, MPB, MPOB, RISDA, Famers' Organisation, JKKK, and several local political representatives. Participation of residents (85%) was observed in various agricultural schemes and subsidies such as paddy scheme, pepper scheme, fruit, and rubber scheme. They also received support in the form of seeds, cash, pesticides, and fertilisers through these programmes to encourage smallholder farmers. However, only a small percentage (22.7%) of the villagers participated in training related to both agricultural and non-agricultural programmes. This indicates the lack of awareness among Pantu villagers to develop their skill. In addition, the JKKK, *penghulu* and *tuai rumah* contributed to social capital by representing the whole longhouse community in expressing their opinions or concerns to the official representatives. In addition, horizontal integration can be seen where the community in Pantu works together in other villages in the form of joint cooperation or *beduruk* in agriculture. However, with time, this practice is diminishing, and they prefer to use hired labourers to help them in agricultural work. Similarly, there is also mutual support in collecting money for activities related to weddings and funerals of their longhouse dwellers.

Finally, the natural assets possessed by the Iban community in Pantu are access to land, river, wildlife, and forest. The size of the land holdings of the respondents in this study indicates that most of them were small farmers. The majority of Iban in Pantu, about 77.7%, depends on the forest for their daily livelihood. In Pantu Sub-District, some of the jungle products available in the *pulau galau* were intentionally reserved by households or village

communities for the domestic needs of the community. Most of the respondents stated that they collect jungle products such as wild vegetables for their own use, only some sold the jungle products in the farmers' market in Pantu and Lachau Town. In addition, villagers occasionally go hunting for wild animals. Based on the interviews, the respondents also indicated that hunting is no longer a popular activity. Similarly, the river was another active natural resource element for this community. Some of the villages, especially the Iban of Kampung Semawa Ili, engage in fishing, however their income from fishing is unpredictable as it depends on the catch and weather.

Finally, the structural equation model was used to determine how the underlying determinants (factors) affect a household's choice of livelihood diversification strategies. As the results suggest, social asset and natural asset were found to have a significant impact on a household's decision whether to diversify their livelihood or not. The various vertical and horizontal integrations have supported livelihood diversification such as available schemes, subsidies, and training. Apart from this, natural capital is still important to the community in Pantu even though it is facing the decline of natural resources as a result of development in Pantu.

5.2.3 Gender Perspective on Livelihood Strategies

This part explains the role of gender in the decision-making process in determining household livelihood strategies and assesses the changing role of gender in activities involving both men and women in Pantu Sub-District, Sri Aman. It also relates to the research question on the extent to which gender differences play a role in livelihood activities in relation to the decision-making process and how their role has changed. The findings are

consistent with the research assumption about the existence of gender role in the livelihood decision-making process. The triple gender role model was used in this analysis.

Focus group discussions with both women and men explained the importance of gender roles in their decision-making process. In terms of livelihood decision making, there is gender equality and gender inequality in Pantu Sub-District. In gender equality, both man and woman make decisions together. Respondents agree that joint decision making is best in terms of livelihoods, such as what type of subsistence and commercial farming they want to focus on. However, with gender inequality, the decision can only be made by either man or woman. For example, in a male-dominated family, men make farming decisions, such as the type of fertilizer used and livestock to be reared.

Next, gender roles in Pantu Sub-District can be seen based on the triple role model which consists of reproductive, productive and community roles which also relate to their social roles. Reproductive roles include childbearing and household chores that contribute to the family's well-being, such as cooking, cleaning, washing, and caring for elderly family members. These tasks are considered real work, essentially done by women with the help of their children, especially daughters. There is even a trend of shared reproductive work, where the husband also plays a role in household chores and helps his wife, such as sending and picking up the children from school. Compared to other places in the world where women choose not to marry or remain single, this study found that women in Pantu still play an important role in child rearing. This also referred to the significant influence of culture and tradition on the role of Iban women. The findings of this study show that although many Iban women are employed, they are still expected to be responsible for the family and uphold the

traditional notion of a woman in domestic work. Additionally, Iban women who are more focused on family matters are now caught in a dilemma between work and traditions.

Moreover, in the productive role, these tasks are identified with livelihood or income activities such as growing crops for sale or consumption in the household. Both men and women are engaged in these tasks. Nevertheless, women regularly perform these activities alongside their reproductive roles, making their involvement less obvious than men's paid work. As expected, the results of the study revealed that most women are involved in agricultural and non-agricultural work, thus contributing to household income.

Finally, community roles, these roles involve work in the community matters such as holding social events, activities to improve or maintain community resources, and participation in groups such as JKKK chairmanship or farmers' association. These roles empower both men and women and open more opportunities for them.

5.2.4 Importance of Indigenous Knowledge on Livelihood Strategies

This part discusses how the indigenous knowledge of the Iban community in Pantu Sub-District influences the choice of livelihood strategies in response to changes in the vulnerability of their livelihoods to environmental change, which is related to the last objective of the study. It also answers the research question of how indigenous knowledge of the Iban community in Pantu Sub-District influences the choice of livelihood strategies and how it relates to the research assumptions. The findings were aligned with the research assumption on the presence of the influence of IK on the choice of livelihood strategies of the Iban community.

Regarding the importance of indigenous knowledge (IK) among rural households, Iban households in Pantu reduced their livelihood vulnerability by applying IK in their livelihood activities. As expected, almost 96% of Iban households admitted to the importance of IK in their livelihood strategies such as farming, handicrafts, forest gathering, hunting, and fishing. There was also a relationship between IK in farm and non-farm livelihood strategies studied. This indicates that IK still plays an important role for the community to make their daily livelihood as IK is a solution to their livelihood problem. The developed knowledge and practises of IK help the community to adapt to natural conditions to survive in a sustainable way. Most households in Pantu could reduce livelihood vulnerability by applying IK. For example, considering that agriculture is the main economic activity in Pantu, there are many hazards that farmers face such as poor soil fertility, threats to crops and livestock in the form of diseases, climate variability that can affect their productivity and eventually their livelihood strategies.

However, Iban households are well prepared for these risks and can effectively manage them based on their IK and with some help from government agencies. In this light, IK plays an important role in conserving the environment and helping people to earn a living. Even though the number of *Pulau Galau*, animals and fish are decreasing, people are smart enough to look for alternatives to earn and sustain their livelihood by applying IK to diversify their livelihood strategies. For example, they grow their own wild vegetables such as ferns and bamboo shoots. The women involved in handicraft making also stated that with a restricted number of bemban and palm leaves, they can still make their mats and baskets by using a colourful plastic strip. In addition, fishermen in Pantu make their own fishing boat from fibreglass material compared to the past when they needed iron wood to build boats. It was found that IK in Iban is in the form of tacit and implicit knowledge. Some IK is explicitly

available among the Iban via stored or written information, such as Adat Iban 1993, but some IK knowledge is tacitly retained, such as specific skills about hunting and farming rituals. However, this knowledge can be transformed into explicit knowledge by codifying and formally expressing this knowledge.

5.3 Contribution of the Research on Implications for Policy Making

The findings of this study provide several policy implications for promoting livelihood diversification, sustainable, and effective rural household development in the Pantu Sub-District area and other regions in Sarawak with similar situations. Since this study has up-to-date information on Iban livelihoods in Pantu Sub-District, it could provide meaningful and current insights for policy makers to develop appropriate policies and strategies. There are agricultural and crop diversification strategies practiced by farmers on their farmlands, including cash crops and commercial farming, however they still fall into the low-income category. Even, fewer are in the high-income category. Therefore, to enable low-income households to access high income, interventions and engagement of relevant stakeholders and various ministries are needed.

The Ministry of Modernisation of Agriculture, Native Land and Regional Development (MANRED) should actively intervene and improve and revise the pricing policy of agricultural products to improve the income of farmers in Pantu Sub-District. Similarly, various socio-economic measures could be introduced such as investment in agricultural infrastructure, research and development of environmentally sustainable farming models, promotion of agriculture-specific education, livestock insurance program, fisheries training and extension program, and funding to expand commercial agriculture to increase agricultural production and farmers' income.

As found that farmers are involved in farm as well as non-farm activities, more wage labour can be introduced. The Ministry of Human Resources could open more non-farm employment opportunities and encourage private enterprises to invest in production, agribusiness, and services in rural areas. For example, factories for manufacturing rubber products or other agricultural products. Similarly, the Ministry of Education should consider opening a technical or vocational school in rural Pantu to enhance the skills of the community. This could be a way to improve their diversification strategies by creating more livelihood opportunities.

The fact that a significant proportion of households, especially from the low-income group, depend on secondary income (remittances) indicates a higher level of dependence on migrant workers. However, the trend of rural-urban migration may have a negative impact on the development of the Pantu Sub-District, as the region loses labour force, leading to population decline. In order to control the rate of migration and retain the locals, appropriate policy reforms could be implemented by various ministries such as MANRED, to enable better distribution of wages, modernise agriculture, and advance technology to stimulate migrants' interest in either coming back or staying.

In addition to active agricultural activities, non-agricultural industries have great potential to be developed by expanding the agricultural industrial chain. The Ministry of Tourism, Arts and Culture should consider integrating industries to promote Iban identity and local characteristics, such as fish processing and livestock meat processing. Sewing and embroidery can also be integrated into the craft skills of women in Pantu.

Although there are no formal cross-border routes between Pantu Sub-District and West Kalimantan, this has an economic and social impact on cultural assimilation and fusion.

The labour force is important in addressing the labour shortage in the Pantu Sub-District community. Informal trade also creates a greater variety of goods sold in the Lachau. Lachau town has the potential to become a cross border trade centre that benefits the surrounding society and attracts more tourists. As the Indonesian government has made the decision to relocate its capital to Kalimantan, the bilateral cooperation agreements between Malaysia and Indonesia should be considered in this matter. As this study explains, cross-border cooperation plays an important role in rural development, especially in Pantu Sub-District and West Kalimantan. The Sarawak State Government and Pantu Sub-District offices could cooperate in the planning and development of Pantu by introducing more formal cross-border entrepreneurial activities that would benefit both sides.

This study also highlighted women's participation in various livelihood activities in Pantu and their contribution to household income. In fact, attention should be paid to women in Pantu by providing them with all basic needs to encourage them to participate in rural enterprises and self-employment. The Ministry of Women, Family and Community Development (KPWKM), Community Development Department (KEMAS), Sarawak Women for Women Society (SWWS), TEKUN Nasional, Amanah Ikhtiar Malaysia (AIM) and other agencies should empower rural women in Pantu by providing business grants for more women to participate in small and medium enterprises. Similarly, more effective awareness campaigns should be conducted to educate women on the importance of basic education so that they can achieve better employment status and become economically independent. Moreover, women’s skills and strengths should not be neglected; rather they should become an asset in economic growth on par with men.

Next, this study highlights the importance of indigenous knowledge in household livelihood strategies in Pantu. Indigenous knowledge appears to have a significant impact on livelihood strategies by reducing household vulnerability, especially in agriculture. Even though modern scientific knowledge dominates, indigenous knowledge is still necessary to shape the livelihoods of people in rural areas like Pantu. Therefore, tacit IK should not be neglected, but should be made explicit in order to be preserved for future generations. Therefore, the Sarawak government should promote and take intensive measures to institutionalise indigenous knowledge, document it and include it in the higher education curriculum through Ministry of Education and Sarawak Biodiversity Center. Similarly, Iban NGO such as Sarawak Dayak Iban Association (SADIA) can promote awareness among people to preserve and protect the almost extinct indigenous knowledge.

In conclusion, this study is important in highlighting the issues of livelihood as it will sensitise the various stakeholders such as the government, NGOs, Social Workers, development workers and the community to understand the problems and challenges of Iban households in Pantu Sub-District and possibly work towards a solution.

5.4 Contribution of Research on Implications to the Body of Knowledge

It has been a long journey to explore the livelihood strategies of Iban households in Pantu Sub-District. The contribution of this study stems from the conceptual and theoretical part of the findings to close the research gap.

This study seeks to contribute to dearth knowledge on the literature dealing with Iban livelihood strategies, determinants of livelihood, gender roles and indigenous knowledge. Similarly, this study seeks to create new theoretical framework and policy implications by combining Lewis' theory of structural change, sustainable livelihood framework, gender

triple roles model and the concept of indigenous knowledge. All of these demonstrate the linked interactions and in this sense this study is unique in analysing current livelihoods by incorporating the factors that influence livelihood strategies, including gender roles and indigenous knowledge simultaneously. No study so far directly combines the mentioned framework in the study of Iban livelihood strategies.

Moreover, this study can provide more accurate data on the current livelihood practises of the Iban community in Pantu. This study can fill potential gaps in livelihood systems such as information on livelihood strategies, livelihood assets, gender roles in decision making, and indigenous knowledge. This study has additionally sought to add information by relating poverty status to livelihood improvement in the Pantu Sub-District, Sri Aman, Sarawak.

The results of this study have made it clear that the perception of rurality is no longer true. The assumption that rural livelihoods are mainly associated with agricultural strategies has been shown not to be entirely true, as this study of rural Iban households in Pantu Sub-District shows. Although the majority of households are engaged in agriculture, a significant number of them diversify into non-farm or off-farm activities to improve their household income. In this sense, these results could fundamentally change the preconception of rural life. In the past, the Iban were subsistence farmers, but the modern Iban are diversifying their livelihood strategies to generate a more sustainable livelihood. Thus, this study has proved that there is a structural change in agriculture and livelihood of the Iban.

This study was able to show that livelihood diversification is important to sustain rural livelihood. Although majority of the Iban are engaged in agriculture. Iban households also diversify into the combination of agricultural and non-agricultural activities. These

activities enable them to increase their income compared to those who are engaged in agriculture and non-farm activities, respectively. The Iban community in Pantu Sub-District has the opportunity to engage in other activities besides agriculture to achieve a better standard of living. Surprisingly, even those who are engaged in agriculture practice diversification of farming and cultivation could sustain their income for survival but not many from Pantu carried out their livelihood mainly for wealth creation as the majority still fall under the low income category. However, their income levels have improved compared to the poverty line income set in Malaysia during the data collection time. The better-off who own larger land practise more diversification strategies. In addition, the Iban community in Pantu Sub-District also receive remittances from the migrated members and engage in nature-based activities such as forest gathering, hunting, and fishing. This helps the society to alleviate poverty among rural households, promote rural economic development, and minimise the gap between rural and urban communities.

In addition, this study found that local community benefit from cross-border trade with West Kalimantan, especially with the regencies of Sintang, Sungai Ketungau, Nanga Bayan and Belubu. This informal trade and interaction were found to be vital to the socio-economic survival of the community in Pantu Sub-District. It was also found that there are cultural implications on the assimilation and amalgamation of the Iban society in these two places. This finding shows the realities of cross-border communities. This adds to the literature on this cross-border aspect.

Structural equation model (SEM) analysis distinguishes this study from other studies on Iban livelihood strategies conducted in different rural areas in Sarawak and explains the relationship between assets and livelihood diversification choices. In this case, the findings

can point a way for the development of targeted programmes that focus on two important assets that influence livelihood diversification choices, namely social and natural capital.

In this study, the triple roles model was discussed from both men's and women's perspectives, which makes this study unique as previous studies only focus on the role of women when discussing the triple roles. This study also shows that the triple roles of women and men exist among rural households in Pantu Sub-District. However, women carry more burden in reproductive role as compared to men and men focus more on productive role. It also shows that women play an important role in supporting the family as they contribute to the family income by participating in both agricultural and non-agricultural activities.

As 96% of the households agree on the importance of indigenous knowledge (IK), this study adds and expands the understanding of how indigenous knowledge is transmitted in practise to achieve various goals such as vulnerability reduction, resource management and conservation, human survival, and well-being in rural Pantu. Similarly, the livelihood strategies of the indigenous communities have changed due to transformation in various aspects of modern lifestyle, education, and socio-economic situation. Thus, the current analysis of indigenous livelihood helps to understand their way of life which is increasingly threatened by the forces of modernisation. However, it was found that rural Iban still practise the IK in agricultural and non-agricultural activities by making some adaptations or seeking substitutes. Active efforts should be done to transform Iban IK from tacit to explicit knowledge. From this study, it was found that much of the IK is in the minds of the elders, and if it is not grasped and stored, it is more likely to be lost. Therefore, it is important to identify and capture the expertise of the Iban IK to avoid collective loss of the Iban IK in relation to sustaining of livelihoods among the Iban communities.

The selection of Pantu Sub-District as a research area also contributes to the body of knowledge. The original homeland of the Iban is in the Ketungau tributary near Kapuas Basin in West Kalimantan before they migrated to Sarawak. Pantu Sub-District is unique because it is located near the border between Kalimantan, Indonesia, and Malaysia. Moreover, Pantu Sub-District was found to be one of the earliest Iban settlements in Sarawak where Iban customs and traditions are still practised. In Pantu Sub-District, there is a high concentration of longhouses and the Iban community in these longhouses have different livelihood strategies. It was also found that the administration of Pantu is divided into two areas, namely Munggu Ubah and Kara Pantu. Therefore, livelihood strategies could be influenced based on local conditions.

In conclusion, this study has shed light on rural development, provided practical implications, and expanded the knowledge of the literature for future research. Indeed, various stakeholders may also benefit from these findings as they may be able to implement more effective policies and intervention programmes to enhance well-being to support rural communities.

5.5 Limitations of the Study

This study also has some limitations. The results should be read by taking into these underlying limitations.

The most important limitation relates to the generalisation of the results. The findings of this study should not be generalized to the Iban community as a whole as it mainly focused on 12 Iban villages in Pantu Sub-District. Most importantly, the findings should not be generalised to the entire indigenous population in Sarawak. Therefore, it is suggested that future study should widen the scope of the study by investigating the livelihood strategies of

Iban people in other places or beyond in order to have a more holistic view of livelihood strategies among Iban community or even to a wider scope of indigenous communities in Sarawak. Despite this limitation, this study is very meaningful as it used a mixed method approach combining in-depth interview, focus group, observation, and interview schedule to capture the livelihood strategies among the Iban community in a more indepth contextualized manner by taking into consideration role of gender and indigenous knowledge simultaneously into analysis.

Another limitation is that some households find it difficult to ascertain their income directly because they are engaged in farming and their income is not fixed. However, in this case, the researcher advised them to report the average income per month. Despite the results showing that social and natural aspects are associated with the decision to diversify livelihood. The analysis of this study depends on the criteria chosen such as agriculture training, involvement in schemes or subsidies, wildlife hunting and fishing activities. Other criteria related to these factors like common rules, norms, and the degree of neighbourhood communication should be expanded and studied.

Similarly, to the researcher's knowledge, the sample size in the quantitative part of this study is limited to only 220 respondents in 12 villages. The sample of respondents can only represent the area covered in this study and cannot apply to the whole of Sarawak. However, this study also uses the qualitative method, so the sampling frame or number does not matter, but a deep consideration of thoughts is a concern in qualitative studies. Moreover, for the diversity and richness of the data, the researcher considered different categories of Iban farmers to be interviewed. However, majority participated in the interviews own small farms only.

5.6 Future Research

For future research on a similar topic, it is recommended to increase the sample size and expand the research sites by selecting more potential rural areas in Sarawak. In addition, future researchers should expand the scope of the study on livelihood and natural resource management strategies for other ethnic groups such as Kedayan, Murut, Bisayah and Berawan who live in the interior of Sarawak. Other variables related to the external factors affecting livelihood strategies such as geographical location and labor quality can be included and studied to provide detailed information for policy interventions.

In this study, in-depth interviews, focus groups, interview schedules and observations were used as research techniques for data collection. Although this technique provided rich data and in-depth study, the use of other techniques such as PRA, ethnography or action research can also unearth rich data. For example, ethnography involves a lived experience with participants that can provide more insight into their livelihood strategies among the local communities.

Moreover, a broader study on gender analysis of men and women in rural areas of Sarawak covering other dimensions can also be conducted in future studies together with other research methods to incorporate role of indigenous knowledge into the analysis to derive a more comprehensive analysis of livelihood strategies among local communities to achieve inclusive economic growth, poverty alleviation and improvement of women's economic conditions.

5.7 Concluding Remarks

The findings suggest that livelihood diversification in farm and non-farm activities have significant impact in shaping the livelihood strategies among the Iban communities in

Pantu Sub-District. Gender and indigenous knowledge play an important role in determining choice of livelihood strategies adopted by the local Iban communities in Pantu particularly in response to the changes of their livelihood susceptibility to environmental alteration which subsequently bring changes in their capital assets availability and accessibility. Interestingly, almost all the farming households practiced diversification of agricultural and crop activities on their farmland to sustain their income or livelihoods. The results show that most farmers move from subsistence farming to cash cropping and commercial farming to stabilise their income and meet their daily needs. Cash crop cultivation makes villagers susceptible to the fluctuations of the world cash crop market. On the other hand, from the continuing observed trend of villagers diversifying their income generating activities, they are found to be less vulnerable to these external forces.

The results also suggest that social and natural factors are the main determinants of their adoption of different livelihood strategies, suggesting avenues for more targeted asset strengthening programs to encourage more households to diversify into more profitable non-farm activities. Most of the Iban households have awareness and interest in engaging in a variety of livelihood activities for their families in the future such rural enterprises, livestock rearing, aquaculture and ecotourism. This can be achieved by optimising the use of the five capitals in their livelihood strategies. Reliance on natural resources such as forest gathering, hunting, and fishing are still important, but the trend is declining as the majority have shifted to agricultural and higher yielding livelihood strategies. Some still engage in it mainly for subsistence and only the surplus is sold in local markets. However, the use of land as a natural resource is still crucial and in high demand as agriculture is the main economic activity in Pantu.

Moreover, by incorporating indigenous knowledge, farmers are aware of how to deal with the vulnerabilities they face especially in agriculture and the knowledge is also disseminated by government agencies. The importance of indigenous knowledge for daily livelihood was confirmed by all households in Pantu. Therefore, the tacit knowledge must be preserved by converting it to explicit knowledge for the future reference before it becomes extinct.

On the other hand, the role of women in diversifying livelihood strategies was highlighted. Their active participation in various livelihood activities such as farming, handicrafts and forest gathering needs to be addressed and encouraged. They contribute a part to household income even though men are in majority, and they predominate. Overall, these results succeeded in meeting the objectives and answering the research questions posed in this study.

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APPENDICES

Appendix I

INDEPTH INTERVIEW GUIDE - *PENGHULU*

Date of interview:_____ Location: _____

SECTION 1: REPONDENT PROFILE

1. Full Name: .....
2. Administrative Area: .....
3. Age: .....
4. Gender: .....
5. Level of Education: .....
6. How long have you held this position?
7. What are your duties and responsibilities as a *Penghulu*?
8. How many longhouses you are a responsible for?

SECTION B: LIVELIHOOD STRATEGIES AND LIVELIHOOD FACTORS

1. What are the main changes you have noticed in Pantu Sub-District and Iban livelihood strategies?
2. What is the main source of income for most people in your community? Can you explain in detail the farming and non-farming activities?
3. Describe the main agricultural activities in Pantu Sub-District.
4. Can you explain the term "*Bejalai*" and the role of remittance in Pantu Sub-District?
5. Are there any households in the villages currently receiving financial assistance from the government?
6. How do natural resources affect the livelihood of the Iban community?
7. What are the main types of natural resources available in Pantu Sub-District?
8. What is currently the main means of transportation from the various villages to the nearest town?
9. Explain the factors that influence the choice of livelihood strategies in the Iban community (human capital, natural capital, physical capital, social capital, and financial capital).
10. What are the seasonal patterns of the various activities that household members engage in?
11. In which organizations, institutions, and associations (clubs, cooperatives, political parties, etc.) are household members active and what role do they play there?
12. Does the location of Pantu Sub-District near the border with Malaysia and West Kalimantan have an impact on the livelihood of the Iban community?

SECTION C: ROLE OF GENDER AND INDIGENOUS KNOWLEDGE

1. Who do you consider the head of your household in Iban Community? Who makes major decisions at the household level? Who makes important decisions at the village and community level?
2. Do you have village meetings? What is the role of men and women in such meetings?
3. Do women and men participate equally in decision making regarding livelihood strategies?
4. What roles do women, men and children play in the Iban livelihood strategies?
5. In your opinion, do more men or women migrate? What do you think are the reasons why people migrate from the village?
6. What is the indigenous knowledge in Iban community, give examples?
7. Explain the importance of indigenous knowledge to the Iban community? How does it influence the Iban's choice of livelihood strategies in response to changes in the vulnerability of their livelihoods or environmental changes?

SECTION D: OVERALL SATISFACTION

1. Are you satisfied with the level of physical development in your administrative area?
2. In your opinion, what areas of physical development are still inadequate?
3. In general, are you satisfied with the educational and health facilities available in your community?
4. What about human capital development in your area, do you generally feel that your community has made progress in terms of human development?
5. Do you have any other comments on Iban livelihood strategies, the role of gender and the use of indigenous knowledge of the Iban community?

End of Interview

Thank you for your co-operation

Appendix II

INDEPTH INTERVIEW GUIDE - *TUAI RUMAH*

Date of interview:_____ Settlement: _____

SECTION 1: GENERAL INFORMATION

1. Full name: .....
3. Age: .....
4. Gender: .....
5. Level of education: .....
6. How long have you held this position? How did you obtain this position?
7. What are your duties and responsibilities as *Tuai Rumah*?
8. How many *Bilik* currently make up this longhouse?
9. Do you have any abandoned Bilik in these longhouses at present?
10. Do you have any JKKK committee in your village?

SECTION B LIVELIHOOD STRATEGIES AND LIVELIHOOD FACTORS

1. What are the main changes you can see in Iban livelihood strategies and their agricultural practices in your village?
2. In general, what is the main source of income for the majority of the community in your longhouse (farm and non-farm)?
3. If the majority is involved in farming as a source of income, describe the main farming activity.
4. Are there any households in this longhouse currently receiving financial assistance from the government?
5. Can you explain the role of remittances and migration (*Bejalai*) in your longhouse community?
6. How do natural resources affect the livelihood of your longhouse?
7. What are the main natural resources in your longhouse?
8. Does the river still play a role in the daily routine of your community?
9. Explain the specific factors that influence the choice of livelihood strategies in your longhouse (human, natural, social, financial, and physical factors).
10. What are the seasonal patterns of the various activities in which household members are engaged?
11. If any, in what organizations, institutions, and associations do household members participate?
12. Does the location of Pantu Sub-District near the border with Malaysia and West Kalimantan have an impact on the livelihood of the Iban community?

SECTION C: ROLE OF GENDER AND INDIGENOUS KNOWLEDGE

1. Who do you consider to be the head of your household in the Iban community?
2. Who makes major decisions at the household level? Who makes important decisions at the village and community level?
3. Do women and men participate equally in livelihood decision-making for the household?
4. What roles do women, men and children play in their household and longhouse? Are there any changes in their roles?
5. In your opinion, do more men or women migrate (*Bejalai*)? What do you think are the reasons for people migrating from the village?
6. What is the indigenous knowledge in Iban community, give examples?
7. Explain the importance of indigenous knowledge to the Iban community? How does it influence the Iban's choice of livelihood strategies in response to changes in the vulnerability of their livelihoods or environmental changes?

SECTION D: OVERALL SATISFACTION

1. Are you generally satisfied with the state of development of this longhouse?
2. What physical aspects of development do you think are still lacking?
3. Are you generally satisfied with the educational and health facilities available to your community?
4. What about human capital development in your longhouse, do you generally feel that your community has made progress in terms of human development?
5. Do you have any further comments on Iban livelihood strategies, the role of gender and the use of indigenous knowledge of the Iban community?

End of Interview

Thank you for your co-operation

Appendix III

INTERVIEW SCHEDULE - HEAD OF THE HOUSEHOLD

SECTION A DEMOGRAPHIC AND SOCIO-ECONOMIC INFORMATION

(*The information obtained from the respondents is based on the situations in January 2017*)

1. Name :_____
2. Longhouse :_____

3. State Legislative Assembly:
   1. N.30 BalaiRingin ( )
   2. N.31 Bukit Begunan ( )

4. Administration Area:
   1. Munggu Ubah ( )
   2. Kara Pantu ( )

5. Number of family members:
   1. 1 ( )
   2. 2 ( )
   3. 3 ( )
   4. 4 ( )
   5. More than 5

6. Other's information on family members:
   1.) Gender (Male /Female) ( )
   2.) Relationship ( )
   3.) Age ( )

7. Age:
   1. Young Adult (20-40 Years Old) ( )
   2. Middle Age (41-64 Years Old) ( )
   3. Senior Citizen (>65) ( )

8. Gender:
   1. Male ( )
   2. Female ( )

9. Marital Status:
   1. Single ( )
   2. Married ( )
   3. Widowed ( )
   4. Divorced ( )

10. Highest Level of Education
   1. No Formal Education ( )
   2. Primary School ( )
   3. Secondary School ( )
   4. Other ( )

11. Occupation *(Note: This Refer to The Main Occupation)*
   1. Famers ( )
   2. Employed in Private Sector ( )
   3. Employed in Government Sector ( )
   4. Homemaker ( )
   5. Unemployed ( )
   6. Own Business ( )
   7. Other ( )

12. Other Source of Income Besides Main Occupation:
    1. Yes ( )
    2. No ( )

13. Gross Monthly Income:
    1. RM1000 and Below ( )
    2. RM1,001 - RM2000 ( )
    3. RM2,001 - RM3000 ( )
    4. RM3,001 - RM4000 ( )
    5. RM4,001 - RM5000 ( )
    6. RM5,001 and Above ( )

14. Has an adult family member migrated from your household? *Yes ( ) or No ( ).* If YES does your family member send remittances?
    1. Yes ( )
    2. No ( )

15. If YES, indicate the amount of the remittance in the last year (average monthly amount in the last 12 months)
    1. RM200 and Below ( )
    2. RM201 – RM400 ( )
    3. RM401 – RM600 ( )
    4. RM601 and Above ( )

SECTION B: LIVELIHOOD STRATEGIES AND OTHER LIVELIHOOD FACTORS

1. What is your monthly expenditure on the following items? Specify in RM if any.

Foods	**Clothes**	**Healthcare**	**Education**	**Agriculture Input**	**Electricity Bill**	**Mobile Phone**	**Transportation Cost**	**Astro**

2. Do you receive any welfare assistance from the government

NO.	**TYPES OF WELFARE ASSISTANCE**	**YES**	**NO**	**AMOUNT (RM)**
1.	*BR1M*			
2.	e-Kasih			
3.	Other, please specify			

3. Does your household own Land? **YES** *( )* **NO** *( ) If Yes, please provide details below.*

Inherited	**Bought**	**Rented**	**Borrow**	**Size of Land (acres)**

4. Do you plant crops on your land? **YES** *( )* **NO** *( ) If Yes, the following information is required.*

No.	**Types of Crops**	**Size of Land (acres)**	**Types of Farming**		**No. of People Engaged**		**Involvement in Scheme / Subsidies**	**Average Monthly Yield (RM)**
			Subsistence Farming	**Cash Crops**				
1.	Paddy							
2.	Rubber							
3.	Pepper							
4.	Oil Palm							
6.	Fruits							
7.	Miscellaneous Crops							

5. Do you keep livestock on your land? **YES** *(1)* **NO** *(2) If Yes, the following information is required.*

No.	**Types of Livestock**	**Types of Farming** *(Tick one of the boxes)*		**No of People Engaged**	**Involvement in Scheme / Subsidies**	**Monthly Yield (RM)**
		Subsistence Farming	**Commercial Farming**			
1.	Poultry					
2.	Pig					
3.	Fish, please specify					
4.	Others					

6. Do you still go to the forest to collect jungle produce? (**YES** ( ) **NO** ( ) If Yes, please provide the following information.

No.	**Types of Forest Produces**	**No. of Bilik Members Engaged**	**Purpose of Collection**		**Monthly Yield (RM)**
			Own Consumption	**For Sale**	
1.					
2.					

7. Do you still hunt for wildlife *(ngasu)?* **YES** *( )***NO** *( ) If Yes, below are the details required.*

No.	**Types of Wildlife**	**Reason**		**Frequency of Hunting Wildlife**	**Monthly Sale**
		Own Consumption	**For sale**		
1.					
2.					

8. Do you still fish in the river? YES *( )*NO *( ) If Yes, below are the details required.*

No.	**Types of catch**	**Reason**		**Frequency Fishing**	**Yield Per Sale**
		Own Consumption	**For sale**		
1.					
2.					

9. Have you or a family member participated in any agriculture or non-agriculture training?
YES *( )* **NO** *( )* If Yes, please specify._____

10. Do you have any additional income from other livelihood activities in addition to your main employment?
YES *( )* **NO** *( )* If yes, what was the reason for engaging in this economic activity?

11. Do you own any of these transportations?
YES *( )* **NO** *( ) If Yes, please provide the following information.*

Motorcycle	Car	Van	Lorry	Other, please specify

12. Is there a division of labor in your household? YES ( ) NO ( ) if yes, are there corresponding gender roles in decision making?

13. Does migration affect women's responsibilities in the household? YES ( ), NO

14. In your opinion, is Indigenous Knowledge important in Iban Livelihoods? YES ( ), NO ( ) If yes, how does indigenous knowledge influence your choice of livelihood strategies?

15. What economic activities would you like to engage in the future? FARM ( ), NON -FARM ( )

SECTION C: OVERALL SATISFACTION

1. What are your perceptions of the services and facilities available?

No.	Types of Services and Facilities	Likert Scale (Tick one of the boxes below for each category)				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Education					
2.	Health Facilities					
3.	Resource Centre					
4.	Road Communities					
5.	Market Access					
6.	Electricity Supply					
7.	Treated Water Supply					
8.	Recreational Facilities					
9.	Internet Connection					
10.	Communities Telecommunication					

2. Overall how important are these capitals to your livelihood choice?

No	Livelihood Capital	Likert Scale *(Tick one of the boxes below for each category)*				
		1 (not at all important)	**2 Slightly important**	**3 Important**	**4 Fairly Important**	**5 Very Important**
1.	Natural Capital					
2.	Physical Capital					
3.	Social Capital					
4.	Human Capital					
5.	Financial Capital					

3. Which of the following agencies do you think could positively develop the community?

No	Agency	Yes	No	Reason
1.	RISDA			
2.	JKKK			
3.	Agricultural Department			
4.	Pantu Sub District			
5.	Others			

End of Interview

Thank you for your co-operation

Appendix IV

FOCUS GROUP INTERVIEW SCHEDULE (MEN)

SECTION A: BASIC DEMOGRAPHIC INFORMATION

No.	Names of Participants	Age	Longhouse

SECTION B: ROLE OF GENDER IN DECISION MAKING AND LIVELIHOOD STRATEGIES

1. What are the main livelihood activities in which men are involved in the Iban community?
2. What is the role of men in the decision making process to determine livelihood strategies?
3. Who decides the choice of livelihood strategies such as children's education and your family's future plans?
4. Is there a shift in roles between men and women and how does this affect your livelihood strategies?
5. Do men and women play different roles in farming and non-farming activities?
6. How are household chores divided among adult men and women within the *Bilik*?
7. How are agricultural activities divided among adult males and females within the *Bilik*?
8. Do you think farming is important compared to other activities?
9. Can you explain the factors (human capital, social capital, natural capital, physical capital, and financial capital) that influence the choice of livelihood strategies?
10. Do you follow any of your family members in hunting wildlife?
11. Do you follow any of your family members in gathering jungle produce?
12. Fishing is still going on in the river. Who is involved in these activities?
13. Do your wife and children help in agricultural activities?
14. Whether indigenous knowledge is important for the livelihood of the Iban?

SECTION C: PERSONAL VIEW

1. What do you hope for the village, your family, and the community in the future?
2. Do you feel that existing programs, services, and facilities in the village have supported the men's livelihood role?
3. What programs could help strengthen the role of men in the future?
4. Do you have any other comments on the role of gender in decision making and livelihood strategies?

Appendix V

FOCUS GROUP INTERVIEW SCHEDULE (WOMEN)

SECTION A BASIC DEMOGRAPHIC INFORMATION

No.	Names of Participants	Age	Longhouse

SECTION B: ROLE OF GENDER IN DECISION MAKING AND LIVELIHOOD STRATEGIES

1. What are the main activities by which women in the Iban community make a living?
2. What is the role of women in the decision-making process to determine livelihood strategies?
3. Who decides on the choice of livelihood strategies such as children's education, future planning, and other matters in your family?
4. Are there role shifts between men and women and how does this affect your livelihood strategies?
5. Do men and women play different roles in agricultural and non-agricultural activities?
6. Do women have a triple role in Pantu?
7. How is domestic work divided among adult men and women within Bilik?
8. How are agricultural activities divided among adult males and females within the Bilik?
9. Do you think farming is important compared to other activities?
10. Can you explain the factors (human capital, social capital, natural capital, physical capital, and financial capital) that influence the choice of livelihood strategies?
11. Do you follow any of your family members in hunting wildlife?
12. Do you follow any of your family members in collecting jungle produce?
13. Fishing is still going on in the river. Who is involved in these activities?
14. Do you help your husband in agricultural activities?
15. Whether indigenous knowledge is important for the livelihood of the Iban?

SECTION C: PERSONAL VIEW

1. What do you hope for the village, your family and the women's community in the future?
2. Do you feel that the existing programs, services, and facilities in the village have supported the role of women in livelihoods?
3. What programs could help strengthen the role of women in the future?
4. Do you have any other comments on the role of gender in decision making and livelihood strategies?