WWF REPORT MALAYSIA 2018

Social Impact Assessment of Implementing Green Economy Concepts at Logging and Oil Palm Operations within the Song-Katibas Area WWF-Malaysia Project Report (Project Code: BM010201-907-INTL)

December/2018

Acknowledgements

We wish to record our sincere appreciation for the kind cooperation and assistance provided by the Ta Ann Group and District Office of Song during the study trip to Song-Katibas, Song District, Kapit Division, Sarawak.

In particular, we wish to thank:

- Dr. Michael V. Galante, Mr. George Wong and Mr Nicholas Ting of Ta Ann Group, for the excellent coordination to ensure assistance from the camp manager, and for sharing information relevant for this Study.

- Mr. Wong Teck Ing, Manager of Hariwood Sdn Bhd, for the accommodation, food, good hospitality and for providing us the transport, information and extending us the necessary helps and supports during our study trip.

- Puan Jackline bt August, District Officer of Song District Office, for helping us to set-up meetings in communicating with the community and longhouse leaders in the Song-Katibas region.

TABLE OF CONTENTS

TABLE OF CONTENTS

	Page
Table of Contents	i
List of Figures	v
List of Tables	vi
List of Abbreviations	vii
EXECUTIVE SUMMARY	ES1
CHAPTER 1 INTRODUCTION	
1.1 STUDY BACKGROUND	C1-1
1.2 GREEN ECONOMY CONCEPT	C1-2
1.3 STUDY OBJECTIVES	C1-3
CHAPTER 2 STUDY AREA AND METHODOLOGY	
2.1 STUDY AREA DESCRIPTIONS	C2-1
2.1.1 Study Area	C2-1
2.1.2 Accessibility	C2-1
2.1.3 Stakeholders	C2-3
2.1.4 Local Communities	C2-5
2.2 CONSTRAINTS AND LIMITATIONS OF THE STUDY	C2-7
2.3 STUDY METHODOLOGY	C2-7
2.3.1 Methodology of Socio-Economic Survey	C2-7
2.3.1.1 Meetings	C2-8
2.3.1.2 Interviews	C2-8
2.3.1.3 Field Observations	C2-9
2.3.1.4 Directly and Indirectly Affected Communities	C2-9
2.3.1.5 Rounds of Field Survey and Sample Size	C2-10
CHAPTER 3 EXISTING ENVIRONMENT	
3.1 PHYSICAL-CHEMICAL ENVIRONMENT	C3-1
3.1.1 Geology, Topography and Soils	C3-1
3.1.1.1 Geology	C3-1
3.1.1.2 Topography	C3-1
3.1.1.3 Soils	C3-1
3.1.1.4 Potential Agricultural Areas	C3-2
3.1.2 Water Resources and Rainfall	C3-5
3.1.2.1 River System	C3-5
3.1.2.2 Rainfall	C3-8
3.1.2.3 River Level and Flood	C3-11
3.1.2.4 Water Quality	C3-15
3.2 BIOLOGICAL ENVIRONMENT	C3-17
3.2.1 Vegetation	C3-17
3.2.1.1 Secondary Forest	C3-17
3.2.1.2 Mixed Dipterocarp Forest	C3-17
3.2.1.3 Protected Flora Species	C3-18
3.2.2 Wildlife	C3-20

3.3 HUMAN ENVIRONMENT C3-23
3.3.1 Land Uses C3-23
3.3.1.1 Historical Land Uses C3-23
3.3.1.2 Current Land Uses C3-24
3.3.2 Land Classification and Land Tenure C3-29
3.3.3 Tourism Spots C3-30

CHAPTER 4 SOCIO-ECONOMIC PROFILE FOR 92 LONGHHOUSES (ROUND 1)
4.1 Socio-Economic Characteristic C4-1
4.1.1 Longhouses within Study Area C4-1
4.2 DEMOGRAPHY FEATURES C4-2
4.2.1 Ethnicity C4-2
4.2.2 Religion C4-2
4.3 ACCESSIBILITY C4-3
4.4 SOCIAL FACILITIES, INFRASTRUCTURES AND SERVICES C4-7
4.4.1 Schools and Educations C4-7
4.4.2 Medical Services C4-8
4.4.3 Electricity Supply C4-8
4.4.4 Water Supply C4-9
4.4.5 Telecommunication C4-11
4.5 ECONOMIC ACTIVITIES C4-12
4.5.1 Farming Activities C4-12
4.5.2 Fishing Activities C4-12
4.5.3 Collecting Forest Produce C4-13
4.5.4 Small Business C4-16

CHAPTER 5 SOCIO-ECONOMIC PROFILE FOR 18 LONGHOUSES (ROUND 2)
5.1 LONGHOUSES COVERED OR SURVEYED C5-1
5.1.1 Ethnicity C5-2
5.1.2 Current Migration C5-2
5.2 COMMUNITY DEMOGRAPHY C5-3
5.3 MODE OF TRANSPORTATION C5-8
5.4 SOCIAL INFRASTRUCTURE, ULTILTIES AND MUNICIPAL SERVICES C5-10
5.4.1 Social Infrastructure C5-10
5.4.2 Utilities C5-10
5.4.2.1 Electricity Supply C5-10
5.4.2.2 Water Supply C5-10
5.4.2.3 Telecommunication C5-11
5.4.2.4 Other Services C5-12
5.5 EDUCATION C5-13
5.5.1 Schools C5-13
5.5.2 Education Levels C5-14
5.5.2.1 No Formal Education C5-14
5.5.2.2 Pre-School Education C5-15
5.5.2.3 Primary Education C5-15
5.5.2.4 Secondary Education C5-15
5.5.2.5 Pre-University or Tertiary Education C5-16
5.5.2.6 Dropouts C5-16

5.6 HEALTH SERVICES C5-17
5.7 SANITATION FACILITIES C5-19
5.8 ECONOMIC ACTIVITIES C5-19
5.8.1 Agriculture C5-19
5.8.1.1 Paddy C5-20
5.8.1.2 Rubber C5-20
5.8.1.3 Pepper C5-21
5.8.1.4 Fruit Trees C5-22
5.8.2 Forest-Based Resources C5-22
5.8.3 Fishery Activities and Aquaculture C5-23
5.8.4 Apiculture C5-24
5.8.5 Handicraft C5-24
5.8.6 Wage-Earning Employment C5-25
5.9 HOUSEHOLD MONTHLY INCOME C5-26
5.10 HOUSELD MONTHLY EXPENDITURE C5-28
5.11 LAND OWNERSHIP AND ULTILIZATION C5-30
5.12 LOCAL INSTITUTIONS C5-30
5.13 SOCIAL-CULTURAL ORGANIZATION C5-31
5.13.1 Social Organization and Cultural Relationship C5-31
5.13.2 Gender Roles in Household Economy C5-33
5.13.3 Community Leadership C5-34
5.13.4 Organization of Labour in Farming and Rituals C5-36

CHAPTER 6 DISCLOSED PERCEPTIONS AND NEEDS
6.1 VIEWS AND PERCEPTIONS OF LOCAL COMMUNITIES C6-1
6.1.1 Logging and Oil Palm Plantation Operations C6-1
6.1.1.1 Perceived Positive Impacts of Logging and Oil Palm Operations C6-2
6.1.1.2 Perceived Negative Impacts of Logging and Oil Palm Operations C6-4
6.1.2 Perceived Causes of Declined in Fish Stock C6-6
6.1.3 Perceived Causes of Declined in Wildlife Population C6-9
6.1.4 Perceived Causes of Declined in Forest Produce C6-11
6.2 PERCEIVED NEEDS/WANTS FOR FUTURE COMMUNITY DEVELOPMENT C6-14
6.2.1 Leaders C6-14
6.2.2 Vulnerable Groups C6-17
6.3 POTENTIAL OPPORTUNITIES AND GAPS FOR CHANGES C6-20

CHAPTER 7 POTENTIAL IMPACTS OF GREEN ECONOMY CONCEPTS
7.1 POTENTIAL POSITIVE IMPACTS OF GREEN ECONOMY CONCEPTS C7-1
7.1.1 Reduction in Greenhouse-Gas Emission C7-1
7.1.2 Biodiversity Conservation C7-1
7.1.3 Sustainable Economic Growth C7-2
7.2 POTENTIAL NEGATIVE IMPACTS AND CONSTRAINTS OF GREEN ECONOMY CONCEPTS C7-3
7.3 MANAGEMENT PLAN FOR POTENTIAL NEGATIVE IMPACTS AND CONSTRAINTS C7-4

CHAPTER 8 PROPOSED PILOT COMMUNITY PROJECTS
8.1 INTRODUCTION C8-1
8.2 IDENTIFICATION OF PILOT COMMUNITY PROJECTS C8-2

8.3 PROPOSED PILOT COMMUNITY PROJECTS C8-6
8.3.1 Pepper Planting C8-7
8.3.2 Rubber Planting C8-8
8.3.3 Tagang System C8-9
8.3.4 Longboat Making C8-10
8.3.5 Other Minor Projects C8-10
8.4 FACTORS TO BE CONSIDERED IN DEVELOPMENT OF PILOT COMMUNITY PROJECTS C8-11
8.4.1 Interested Participants C8-11
8.4.2 Training for Participants C8-12
8.4.3 Institutional Supports C8-13
8.4.4 Site Suitability and Agronomy Requirements C8-15
8.4.5 Infrastructure Development Projects C8-15
8.5 IMPLEMENTATION PLAN OF PILOT COMMUNITY PROJECTS C8-16

CHAPTER 9 MONITORING PROGRAMME
9.1 MONITORING OBJECTIVE C9-1
9.2 PROPOSED MONITORING PROGRAMME C9-1
9.2.1 Monitoring Requirement C9-1
9.2.2 Responsibility C9-2
9.2.3 Results and Reporting C9-2

CHAPTER 10 CONCLUSIONS
10.1 HUMAN AND NON-HUMAN SETTINGS IN THE STUDY AREA C10-1
10.2 VIEWS AND PERCEPTIONS OF LOCAL COMMUNITIES TOWARDS EXISTING LOGGING AND OIL PALM OPERATIONS C10-2
10.3 LOCAL NEEDS AND WANTS C10-3
10.4 POTENTIAL OPPORTUNITIES AND GAPS FOR CHANGE C10-3
10.5 POTENTIAL IMPACTS AND CONSTRAINTS OF GREEN ECONOMY CONCEPTS C10-5
10.6 PROPOSED PILOT COMMUNITY PROJECTS C10-6
10.7 PROPOSED MONITORING PROGRAMME C10-6

REFERENCES Ref-1

APPENDICES
Appendix I Terms of Reference
Appendix II Questionnaire & Observation Schedule for Round 1
Appendix III Questionnaire for Round 2
Appendix IV List of Round 1 Longhouses (92 longhouses)

LIST OF FIGURES

		Page
Figure 2.1	Location of the Study Area	C2-2
Figure 2.2	Local Communities of Longhouses	C2-6
Figure 2.3	Longhouse Selection and Longhouse Surveyed in Song-Katibas	C2-14
Figure 3.1	Potential Agricultural Areas	C3-3
Figure 3.2	River Catchments, Water Sampling Points, Rainfall Stations and Water Level Stations in the Song-Katibas Study Area	C3-9
Figure 3.3	Mean Monthly Rainfall within the Study Area	C3-10
Figure 3.4(a)	High-Low of Average Monthly Water Level at Song Station (2007 – 2016)	C3-12
Figure 3.4(b)	Daily Mean Water Levels at Song Station	C3-12
Figure 3.5	High-Low of the Average Monthly Water Level at Nanga Mukeh Station (Year 2007 – 2016)	C3-13
Figure 3.6	Mean Daily Rainfall (Ng Bangkit), Mean Daily Water Level and Mean Daily Discharge at Nanga Mukeh	C3-14
Figure 3.7	Shifting Cultivation Area within the Song-Katibas Study Area (Year 1975-1977)	C3-19
Figure 3.8	Present Land Uses in the Song-Katibas Study Area	C3-25
Figure 3.9	Existing and Past Timber Licences and LPFs	C3-27
Figure 4.1	Ethnic Compositions of the Longhouses	C4-2
Figure 4.2	Religion Compositions of the Longhouses	C4-3
Figure 4.3	Mode of Access to the Longhouses	C4-4
Figure 4.4	Sources of Electricity Supply	C4-9
Figure 4.5	Purpose of Participation in Fishing Activities	C4-13
Figure 4.6	Participation in Collecting Forest Produces	C4-14
Figure 4.7	Forest Produces Commonly Collected	C4-15
Figure 5.1(a)	Total Village Population and the Actual Population Present during Survey	C5-4
Figure 5.1(b)	Overall Percentage of the Total Village Population and Actual Population Present	C5-4
Figure 5.2	Overall Percentage of People in Each Category	C5-8
Figure 5.3	Education Level	C5-14
Figure 5.4	Distributions of Household Monthly Income	C5-27
Figure 5.5	Distributions of Household Monthly Expenses	C5-28
Figure 6.1	Outcomes of the 18 Group Discussion with Tuai Rumah and JKKK on the Current Logging and Oil Palm Operations inside the Study Area	C6-2
Figure 6.2	Main Benefits Received by the Villagers based on the Feedbacks from the 18 Group Discussion	C6-3
Figure 6.3	Perceived Negative Impacts Caused by Logging and Oil Palm Operations	C6-5
Figure 6.4	Influences of Low Water Levels of Sg Katibas	C6-6
Figure 6.5	Perceive Causes of Decline in Fish Stock	C6-8
Figure 6.6	Perceive Causes of Decline in Wildlife Stock	C6-9
Figure 6.7	Perceive Causes of Decline in Forest Produce	C6-13
Figure 6.8	Needs and Wants from Leaders	C6-14
Figure 6.9	Types of Cash-earning Project Preferred by Leaders	C6-17
Figure 6.10	Needs and Wants by Vulnerable Groups	C6-18
Figure 6.11	Types of Cash-earning Project Preferred by Women Group	C6-19
Figure 8.1	Tentative Implementation Plan for Pilot Community Projects	C8-16

LIST OF TABLES

		Page
Table 2.1	Meeting with Kapit and Song District offices	C2-8
Table 2.2	Longhouse Selection Criteria and Marking Weightage	C2-12
Table 3.1	Rivers and Tributaries of the Katibas River System	C3-5
Table 3.2	Sub-Catchment Areas of Sg Katibas	C3-7
Table 3.3	Mean Monthly Rainfall (mm) at the DID Stations for 2007 – 2016	C3-10
Table 3.4	Maximum and Minimum Daily Mean Water Level at the Study Area	C3-11
Table 3.5	Mean, Minimum and Maximum Daily River Discharge at Nanga Mukeh Station, Sg Katibas (Year 1991 – 1994)	C3-13
Table 3.6	Water Quality Results	C3-15
Table 3.7	Protected Flora Species that may be found within the Study Area	C3-18
Table 3.8	Species of Mammals and Birds Reported from the Study Area and their Protection Status	C3-21
Table 3.9	Present Land Uses in the Study Area	C3-26
Table 4.1	Accessibility of the Longhouses	C4-4
Table 4.2	Tributaries and sub-tributaries that act as water source for gravity water feed supply	C4-10
Table 4.3	Longhouses that spotted the presence of wildlife	C4-15
Table 5.1	Longhouses Surveyed in Round 2 Survey	C5-1
Table 5.2	Migration Rate of the Surveyed Communities (Round 2)	C5-3
Table 5.3	Demographic Features of the Villages in the Study Area	C5-5
Table 5.4	Number of Individuals Based on Grouping	C5-7
Table 5.5	Utilities	C5-11
Table 5.6	Education Facilities Serving the Surveyed Longhouses	C5-13
Table 5.7	Health Facilities and Services	C5-18
Table 5.8	Proportion of Wage-earning Employment	C5-25
Table 5.9	Economic Activities	C5-26
Table 5.10	Households' Average Monthly Expenses by Items	C5-29
Table 5.11	Rituals Associated with the Rice Planting Cycle in the Longhouse	C5-37
Table 6.1	Details of Responses on Causes of Decline in Fish Stock	C6-8
Table 6.2	Details of Responses on Causes of Decline in Wildlife Stock	C6-10
Table 6.3	Details of Responses on Causes of Decline in Forest Produce	C6-13
Table 7.1	Proposed Management Plan for Potential Constraints of Green Economy Concepts	C7-4
Table 8.1	Summary of Observational and Potential Pilot Projects at the 18 Longhouses	C8-3
Table 8.2	Selected Longhouses and Proposed Pilot Community Projects	C8-6
Table 8.3	Protocols for Implementation of Tagang System	C8-9

LIST OF ABBREVIATIONS

AL	Assumed Level
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
DoA	Department of Agriculture
DID	Department of Irrigation and Drainage
EIA	Environmental Impact Assessment
HoB	Heart of Borneo
FELCRA	Federal Land Consolidation and Rehabilitation Authority
FMU	Forest Management Unit
IAL	Interior Area Land
IKI	International Climate Institute
JBALB	Jabatan Bekalan Air Luar Bandar
JKKK	Jawatankuasa Kemajuan dan Keselamatan Kampong
KEMAS	Federal Department of Community Development
LEWS	Lanjak Entimau Wildlife Santuary
LPF	Licence for Planted Forest
MARDI	Malaysia Agricultural Research and Development Institute
MPB	Malaysian Pepper Board
MSL	Mean Sea Level
MZL	Mixed Zone Land
ND	Not Detected
NTFP	Non-timber forest products
NWQS	National Water Quality Standards
OPE	Oil Palm Estate
PFE	Permanent Forest Estate
RISDA	Rubber Industry Smallholders Development Authority
SIA	Social Impact Assessment
SPM	Sijil Pelajaran Malaysia
STPM	Sikil Tinggi Persekolahan Malaysia
TC	Technical Committee
TCC	Total Coliform Count
TDS	Total Dissolved Solids
TFC	Total Faecal Coliform
TOR	Terms of Reference
TSS	Total Suspended Solids
UNEP	United Nations Environment Programme
VHT	Village Health Team
WWF	World Wide Fund for Nature
Btg	*Batang*
km	kilometer
m	meter
mg/l	milligram per litre
Ng	Nanga
Rh	*Rumah*
Sdn Bhd	*Sendirian Berhad*
Sg	*Sungai*
ft	feet
%	percentage
ha	hectare
4WD	4 wheel drive

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This document presents the outcomes of the study on "**Social Impact Assessment (SIA) of Implementing Green Economy Concepts at Logging and Oil Palm Operations within the Song-Katibas Area**" in the Heart of Borneo (HoB) Project area in Sarawak, Malaysia.

STUDY OBJECTIVES

The objectives of the Study are:

i. To provide a detailed background description of human and non-human settings of the Study Area, which include socio-economic (e.g. demographic pattern, economic activities, income level, social cultural capital), political and biophysical (e.g. resources and infrastructure) aspects;

ii. To provide a clear picture of local perception towards the existing projects/supports (e.g. government and companies) and local needs/wants for future developments, and potential opportunities and gaps for changes;

iii. To predict the trend of social changes (social impact) for the area before (business as usual) and after (green economy concepts is implemented for the logging and oil palm operations) the implementation of the proposed applying green economy approach at the pilot Study site(s) in Song-Katibas area in Sarawak, Malaysia;

iv. To use the SIA findings to shape favourable social changes for the directly affected local communities, especially the Iban people, identifying target Iban villages for pilot community projects, and suggesting suitable pilot community projects for the area;

v. To develop guidelines for monitoring the performance of the proposed interventions or activities under the pilot community projects, which reflect the efforts of promoting the concept of "Green Economy" to assist multi-stakeholders, including the target Iban villagers, and their adaptation to the changes that have been created or promoted in line with the IKI project; and

vi. To provide monitoring result of the proposed pilot community projects.

GREEN ECONOMY CONCEPTS

"Green economy" is defined by United Nations Environment Programme (UNEP) as "***one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities"***. Simply put, a green economy can be thought of one which is **low carbon**, **resource efficient** and **socially inclusive**.

In a green economy, growth in income and employment should be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. In addition, it prioritizes increasing well-being and equitable distribution of the benefits of economic development or growth, and would sharply reduce or even reverse environmental damage, while mitigating climate change and aiding adaptation to it.

STUDY AREA AND STAKEHOLDERS

The Study Area covers an area of approximately 2,449 km^2, defined by the catchment of Sg Katibas located within Song District, Kapit Division, Sarawak, Malaysia. Sg Katibas is one of the major tributaries of the Btg Rajang, and the catchment is bordered by:

- Btg Ai catchment, Sg Julau catchment, and Sg Ngemah catchment, in the west;
- Sarawak-Kalimantan border in the south; and
- Sg Sut – Sg Gaat catchment in the east.

This SIA Study focuses on selected Iban longhouse communities within the Sg Katibas river basin. Of particular interest are the people who are staying or whose village are located in the vicinity of logging operations and oil palm plantations.

In total, there are 92 longhouses and these longhouse communities can be grouped into the following clusters within the Study Area:

i. Song area (Btg Rajang & lower Sg Katibas);
ii. Sg Musah/ Sg Matalau;
iii. Sg Tekalit;
iv. Sg Bangkit;
v. Sg Katibas Hilir (Lower Katibas); and
vi. Sg Katibas Ulu (Upper Katibas).

In addition to the Iban longhouse communities, the other stakeholders operating within the Study Area include five logging operators, two forest plantation operators and two oil palm plantation operators, Government departments and agencies which have influence within the Study Area, amongst others, include Song District Office, Forest Department Sarawak, Sarawak Forestry Corporation, Land and Survey Department Sarawak, Natural Resources and Environment Board Sarawak and Department of Agriculture Sarawak.

CONSTRAINTS AND LIMITATIONS

The constraints and limitations that have been identified for the social impact assessment study and proposed implementation of green economy concept at the Study Area are:

i. The reported results for focus group interviews and household surveys done in **Round 2** may not be representative for the entire population. Based on the sampling criteria this study required 118 samples (i.e. 392 X 30% = 118 doors) which equivalent to 30% of the total doors of all selected longhouses in Round 2. However, this study only obtained 90 samples. This is because households who supposedly live in the longhouses were not available at the time of study as they are residing outside the Study Area and only return to the longhouses on special occasion and public holidays.

ii. Due to high mobility among the youth, the continuous presence and supply of able-bodied workforce at the longhouse may fluctuate.

iii. There was some degree of reticence or reluctance to give basic information at some longhouses.

iv. Accessibility within the Study Area and to the longhouses is largely limited to river transportation.

EXISTING ENVIRONMENT

The geology of the Study Area is made up of rocks formed from sediments deposited in a deep synclinal basin and subsequently intensely folded and subjected to low-grade dynamic metamorphism. The topography of the Study Area consists almost entirely of steep hilly land, being characterized by steep slopes and narrow valleys and drained by fast-flowing streams. Steep slopes of 30 degrees or more rise almost immediately from the river banks and the bulk of the hilly land has altitude of 150-300 m. The soils over the bulk of the Study Area are classified as shallow or skeletal soils due to the absence of deep, well developed soil profiles.

The Study Area has a tropical equatorial climate which is typically hot, wet and humid throughout the year. The mean annual rainfall recorded was 3,790 mm; with the months of November to February being reasonably wet with an overall mean monthly rainfall of more than 350 mm.

Based on the 10-year water level records at Nanga Mukeh River Water Level Station (located within the Sg Katibas basin) from year 2007 to 2016, the daily mean water levels mainly ranged from 2.252 m to 3.471 m, with the minimum and maximum recorded level of 0.809 m (extreme drought level) and 14.585 m (extreme flood level).

Records indicated that the water quality of the rivers in the Study Area is moderately good with results mostly comparable to Class I and Class IIB of the National Water Quality Standards (NWQS) for Malaysia.

The Study Area is covered with two major forest types, i.e. secondary forest and mixed dipterocarp forest. The secondary forests are largely found along the main rivers and logging roads near to local settlements. These are essentially forest regrowth from ex-shifting agricultural lands and heavily logged/disturbed areas. The mixed dipterocarp forests are largely found in the interior upriver areas. Most of this forest type had been subjected to at least one cycle of timber harvesting. Effects of past logging operation were evident as the once dense emergent canopy layer had been reduced to an open and uneven structure, more obvious in areas with gentle and moderate slopes.

Biological resources within the Study Area are considered rich and diverse. Environmental impact assessments conducted within the logging areas in 2014 recorded a total of 14 flora species that are protected under the Wild Life Protection Ordinance 1998; five totally protected and ten protected species of mammal and bird. Twelve species of fish, including Empurau, Semah, Tengadak, Adong; and six genera of amphibians; could be found along the river network.

Current land uses include logging, forest plantation and oil palm plantation. Forest timber licences were issued in the 1970s in the region and covered most part of the Song-Katibas area. In the 1990s, Licence for Planted Forest were issued for establishment of tree plantation. Shifting cultivation is practiced by the local people mainly along the major rivers and areas surrounding their settlements.

SOCIO-ECONOMIC PROFILES OF LONGHOUSE COMMUNTIES

As part of the SIA Study, two rounds of survey were conducted to study the socio-economy of the local communities. There are 92 longhouses that were surveyed during Round 1 and 18 longhouses were re-visited and surveyed in Round 2. The local communities consist mainly of Iban ethnic group.

It was observed that the migration rate of the local people was quite high. A lack of job opportunities relevant or equal to their education background contributes partly to the high migration in the Study Area. 81.5% of the population of the 18 longhouses surveyed have migrated out of the longhouse communities on a long-term basis. In the 18 longhouses surveyed, 57% of the people who were present during the surveys were in the working age group, followed by 33% of elders whose age were 60 years old and above, and 14% of children whose age were 17 years old and below.

In the Study Area, the main modes of transport are river, tar-sealed road and logging road. There is a regular express boat service plying the Btg Rajang along the Sibu-Kanowit-Song-Kapit and Putai routes. For communities along the mid and upper stretches of the Sg Katibas, Sg Musah, Sg Tekalit and Sg Bangkit, water transport is still the main transportation mode for the local communities to travel. As all the longhouses were situated along the rivers, the Ibans still rely heavily on water transportation and the longhouses were constructed in a single row parallel to the rivers.

Based on the surveys, there were no social infrastructure facilities such as community hall, public library, worship place, playground, football field, badminton court, etc. at these longhouses. This might be because of the complex geographical landscape, rapid river flows, and poor accessibility which posed financial and logistical constraint to transport building materials to the longhouses in the Study Area.

Six longhouses surveyed were supplied with solar panels from Sarawak Energy Berhad and/or government representative for electricity while the other 12 longhouses still relied on individual and communal generators for power supply. All 18 longhouses surveyed received water supply from gravity-feed dams on streams nearby the longhouse. All modes of telecommunications, including fixed-line and cell phones were still lacking in the surveyed area.

In general, the cleanliness of the longhouse compound was good or fair. All 18 surveyed longhouses have access to news through radio and television. They also have access to kindergartens, primary and secondary schools which are found in each of the river clusters.

There are five government medical clinics serving the Song-Katibas area, namely Song Clinic (Song town area), Tekalit Clinic (Sg Tekalit), Ng Bangkit Clinic (Sg Bangkit), Ng Engkuah Clinic (Ng Engkuah) and Chemanong Clinic (upstream of Sg Katibas). The five health clinics cater for out-patient treatment, maternity, childcare, and dental.

All 18 surveyed longhouses in Round 2 are equipped with pour-flush toilet with septic tank system and most of the sanitary facilities are in moderate condition. As for waste collection, most of the surveyed longhouses have rubbish pits near their longhouses for disposal of solid waste while some of the longhouses do not have rubbish pits and would throw waste into the river or nearby bushes, followed by burning of rubbish.

The local economic activities are characterized by a mix of farming and wage-earning employment either full-time or part-time. Their main occupation is farmers. The major sources of household incomes are from agriculture, forest-based resource, fishery activities and aquaculture, remittance from relatives, subsistence from their children and wage-earning employments.

Based on the data collected from the surveys, among those who had stated their monthly household income, 72% of them earn RM 1,200 or below a month, while the remaining 28% earn RM 1,201 or above a month. The major expenditures for each door include food, education, medical, transport and utilities (generator) at which on average the estimated expenditures for each door were RM 1,200/month.

Based on Round 2 survey, all the 90 respondents owned certain areas of land with NCR status. The sizes (ha) claimed to be owned by the doors varied from 0.4 to 4.1 ha per doors. These lands are utilized for cultivation of hill paddy, rubber, pepper, fruit trees, etc. The most popular cash crop is pepper and rubber (although the rubber trees are only tapped if the market value of rubber increases).

The Tuai Rumah (longhouse headman) and the Village Security and Development Committee or JKKK is in charge of the planning and development of the longhouse. The role of the Tuai Rumah is to safeguard and administer the customary laws, to conduct longhouse meetings and activities, as well as to act as host and spokesman to visiting officials. Although he or she may be a person of considerable influence and status, the Tuai Rumah has no authority to command others in the community.

DISCLOSED IMPACTS OF LOGGING AND OIL PALM OPERATIONS

The interviews with the 18 longhouse leaders or the villages' representatives in the Study Area revealed both positive and negative comments on the current logging and oil palm operations inside the Study Area.

The beneficial impacts include improved communication and accessibility in their area; employment opportunities created and in kind assistances provided by the logging and oil palm companies. Negative impacts include river pollution, decrease in water level, decline in river resources, no more virgin forest and decline in forest resources. The major concern from the respondents was on the shallowing of the rivers in their area.

COMMUNITIES' NEEDS/WANTS

The majority of the family heads prefer to have good accessibility not only to their own villages, but also connectivity to other places. Many are interested in agriculture and they hope that agricultural welfare services can be extended to them in order to develop their economy. Some mentioned their needs in utility provision such as clean water supply, electricity supply and telecommunication networks in their area. Other economic-related needs or wants are pepper planting, rubber planting, oil palm planting, tagang system, and bee keeping.

With respect to types of cash-earning projects that they wish to undertake, the majority showed their interest in agriculture such as in pepper plantation, followed by rubber plantation and oil palm plantation. Other cash-earning projects of interest include selling vegetables and handicraft, followed by aquaculture such as cage culture and fish breeding and tagang system.

The women group preferred to be involved in agricultural activities such as pepper planting, oil palm planting and rubber planting. Some showed their interest in selling vegetation and handicraft, and to be involved in fish breeding.

The old people/handicapped in general requested for welfare services to improve their economic activity and lifestyle. Some of the respondents in particular mentioned that they would like the assistance to be given to them in handicraft activity and pepper planting. Some would like to be involved in livestock rearing, aquaculture activity, poultry rearing and vegetable planting. Other non-cash-earning requests are provision of utilities from government and better accessibility between the longhouse and other places.

POTENTIAL IMPACTS OF GREEN ECONOMY CONCEPTS

When a Green Economy concept is implemented well, it can lead to several positive outcomes and the positive impacts of green economy concepts can be assessed against its three related priorities which are:

i. Reduction in greenhouse-gas emissions – There will be notable reduction in fossil fuel consumption, higher efficient in energy generation and utilization, and increase in carbon sequestration capacity. Consequently, this leads to reduce effects of global warming, less haze problems and regional air quality will be improved. These will bring about improved health, reduction in cost of living and better quality of life.

ii. Biodiversity conservation – There will be increased sources of foods for local people; sustainable production of timber and non-timber forest produce; increased touristic value; securing genetic resources for research, scientific interest and medical advancement; and improved ecological functions of the forest to attenuate flood and keeping river flowing during dry season.

iii. Sustainable economic growth – There will be increased in household incomes and access to natural resources for daily livelihood needs; opportunity for education and medical attention; reduced local people's dependence or reliance on aid from government and logging and oil palm operators; reduced costs of repairs due to ecological abnormalities (e.g. flood, landslide, forest fire); and improved regional and national economy.

The potential negative impacts and constraints of green economy concepts include:

i. It is envisaged that the success of implementing green economy concepts would be slow and challenging, and thus will likely reduce immediate rate of economic production of affected sectors, increase their cost of production and reduced income in the short- and medium-term;

ii. Impeded growth of the affected economic sectors due to lack of manpower and knowledge in implementing green economy concepts;

iii. The increase in wildlife populations especially species such as wild boar, squirrel, porcupine and macaque may give rise to more pest problem in the agricultural sector as well as human-wildlife conflicts;

iv. Reduced usage of agrochemicals in agricultural sector may result in reduced crop production, thereby affecting the investment return and deter future expansion and potential investments;

v. With increased ecotourism and economic activities, if not properly regulated and managed, may lead to increase in solid wastes and sewage generation and pollution, spread of diseases, cultural shock to the local people, and even pressure on natural habitats and wildlife.

The management plan for potential constraints of green economy concepts are outlined and included:

i. Introduce tax deduction, financial incentive or appropriate form of compensatory payments;

ii. Knowledge and technology transfer to improve productivity and crop yield;

iii. Increase effort in capacity building, improve information sharing, provide awareness and training programmes;

iv. Improve mechanism in wildlife population control (i.e. wildlife surveillance and relocation/culling);

v. Provide awareness and training on proper usage of agrochemicals;

vi. Tax and charges on polluters, proper wastes handling procedures, facilities and management system; and

vii. Monitoring procedures and enforcement on disease control and vice activities.

PROPOSED PILOT COMMUNITY PROJECTS

The proposed pilot community projects will involve five longhouses (Rh Sebastian Tambi, Rh Dagom, Rh Dominic Runggom, Rh Peter and Rh Sa) located within four clusters or sub-catchments of Sg Katibas; and the identified activities are:

i. Planting of pepper and/or rubber;

ii. Management of the river and fishery resources under Tagang system and;

iii. Making of longboats

Detailed project document should be developed for each project. This is because site conditions and the project scope and activities would vary from site to site. The following factors should be considered in the development the proposed projects: interested participants; site suitability and agronomy requirements; input resources; and institutional supports.

MONITORING PROGRAMMES

A monitoring programme is proposed which is geared towards determining and documenting the progress and notable social impacts of implementing the proposed pilot community projects. Monitoring frequency is six-monthly and the proposed monitoring parameters cover: size of farm developed; amount of material inputs and expenditures; quantity of harvests and cash receivable; as well as problems encountered during the implementation.

CHAPTER 1

Introduction

CHAPTER 1
INTRODUCTION

1.1 STUDY BACKGROUND

Plate 1: Heart of Borneo

WWF-Malaysia has engaged Envisar Sdn Bhd to undertake the **Social Impact Assessment (SIA) of Implementing Green Economy Concepts at Logging and Oil Palm Operations within the Song-Katibas Area**, the Heart of Borneo (HoB) Project area in Sarawak, Malaysia. This is part of a bigger project called "Green Economy in the Heart of Borneo Project (Project Code: BM010201-907-INTL)."

The HoB is the largest remaining expanse of transboundary tropical forest in Southeast Asia, comprising more than 22 million hectares of rainforest across Indonesia, Malaysia and Brunei. It is a zone of unique natural capital with its forests acting as a carbon reserve, generating livelihoods for the local indigenous communities and habitats of diverse flora and fauna species. For its protection, in 2007 the Governments of Indonesia, Malaysia and Brunei created a trilateral conservation program called "the HoB Corridor Initiative" (Van Paddenburg, *et al*, 2012).

In the HoB, unsustainable resource use, such as logging, mining and oil palm planting, fragmentize the landscape and depletes livelihoods of the local communities. A local, regional and transboundary management concept is required to bring together conservation and development needs, and hence a vision for green economy for the HoB was laid down in the trilateral HoB Declaration 2007 (FDS, 2018).

The HoB initiative in Sarawak pilots a comprehensive land-use plan and a green economy plan for a region of two million hectares within the HoB Corridor, covering contiguous areas in West Kalimantan, Indonesia, and Sarawak, Malaysia. The green economy management concept revolves around collaboration of government institutions, the private sector and the local communities; and is driven by three inter-related priorities i.e. reducing greenhouse-gas emissions, biodiversity conservation, and sustainable economic growth.

1.2 GREEN ECONOMY CONCEPT

"Green economy" is defined by UNEP as "***one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities***" (UNEP, 2011). In its simplest expression, green economy comprises three interdependent and mutually reinforcing pillars namely **environmental sustainability, economic development and social inclusivity**.

Since the Industrial Revolution the practicing of a Business as Usual trajectory has immensely disrupted the Earths' carbon, water and nitrogen cycles which caused a series of climate-related catastrophes such as extreme storms, heat wave, high intensity hurricanes and storm-related flood surges that the world is currently experiencing (SEG, 2007). The presence of green economy concepts is perceived as a holistic contemporary remedy to understand and solve the problems shadowing our 'environmental services' without compromising the commitment to socio-economic development.

The aim of green economy can be more readily grasped by understanding the central tenets of the above mentioned three pillars. Environmental sustainability means promoting integrated and sustainable management of natural resources and ecosystem that support the needs of economic, social and human development while facilitating ecosystem conservation, regeneration, restoration and resilience to face new and emerging challenges. Economic development focuses on improving the basic standards of living of every single individual through implementation of sustained, inclusive and equitable economic development policies. Social inclusivity asks for reduction of inequalities through creating greater opportunities for all.

Although not mentioned in UNEP's green economy concepts definition there is a fourth pillar namely good governance which underscores the successful implementation of green economy. Good governance demands government and businesses to operate in accordance to the rule of law with accountability, transparency and responsiveness to the needs of stakeholders as well as actively engage with public audiences on critical issues.

In short, green economy requests and encourages growth in income and employment through momentum driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. In addition, the developing notion of a green economy is one which also prioritizes increasing well-being and equitable distribution of the benefits of economic development or growth. Such an economy would sharply reduce or even reverse environmental damage, while mitigating climate change and aiding adaptation to it.

The green economic concepts have been adopted as the main enabling approach in the management, conservation and sustainable development within the Heart of Borneo (HoB) Corridor that spans a 22-million hectare landscape of natural capital. This green economy approach (Van Paddenburg, *et al*, 2012) will:

- Decrease future cost to business, households and government;
- Increase future revenue from biodiversity-based and green industries;
- Raised crop yields and lower domestic energy consumption; and
- Support a transformation to a more just and equitable economy.

1.3 STUDY OBJECTIVES

This Study is to conduct a Social Impact Assessment (SIA) on the proposed applying Green Economy Concept for the logging and oil palm operations located within the Song-Katibas area of the HoB of Sarawak, Malaysia. The objectives of this Study are:

i. To provide a detailed background description of human and non-human settings of the Consultancy site, which include socio-economic (e.g. demographic pattern, economic activities, income level, social cultural capital), political and biophysical (e.g. resources and infrastructure) aspects;

ii. To provide a clear picture of local perception towards the existing projects/supports (e.g. government and companies) and local needs/wants for future developments, and potential opportunities and gaps for changes;

iii. To predict the trend of social changes (social impact) for the area before (business as usual) and after (green economy concepts is implemented for the logging and oil palm operations) the implementation of the proposed applying green economy approach at the pilot Study site(s) in Song-Katibas area in Sarawak, Malaysia;

iv. To use the SIA findings to shape favourable social changes for the directly affected local communities, especially the Iban people, identifying target Iban villages for pilot community projects, and suggesting suitable pilot community projects for the area;

v. To develop guidelines for monitoring the performance of the proposed interventions or activities under the pilot community projects, which reflect the efforts of promoting the concept of "Green Economy" to assist multi-stakeholders, including the target Iban villagers, and their adaptation to the changes that have been created or promoted in line with the IKI project; and

vi. To provide monitoring result of the proposed pilot community projects.

CHAPTER 2

Study Area and Methodology

CHAPTER 2
STUDY AREA AND METHODOLOGY

2.1 STUDY AREA DESCRIPTIONS

2.1.1 Study Area

The Study Area is part of the IKI[1] project area which stretches from Batang Ai in Sri Aman Division to Kapit in Kapit Division, and also a part of the much larger Heart of Borneo (HoB) area which covers the Sarawak-Kalimantan border area from Sri Aman to Lawas/Brunei (**Figure 2.1**). Kapit Division now comprises four administrative districts i.e. Bukit Mabong, Belaga, Kapit and Song, from upstream to downstream, following the Batang Rajang.

The Study Area was located within Song District, defined by the Katibas river catchment. It covers an area of approximately 2,449 km^2. The district headquarters and bazaar were found at Song Township, located at the west bank of Sg Katibas river estuary on the Batang Rajang.

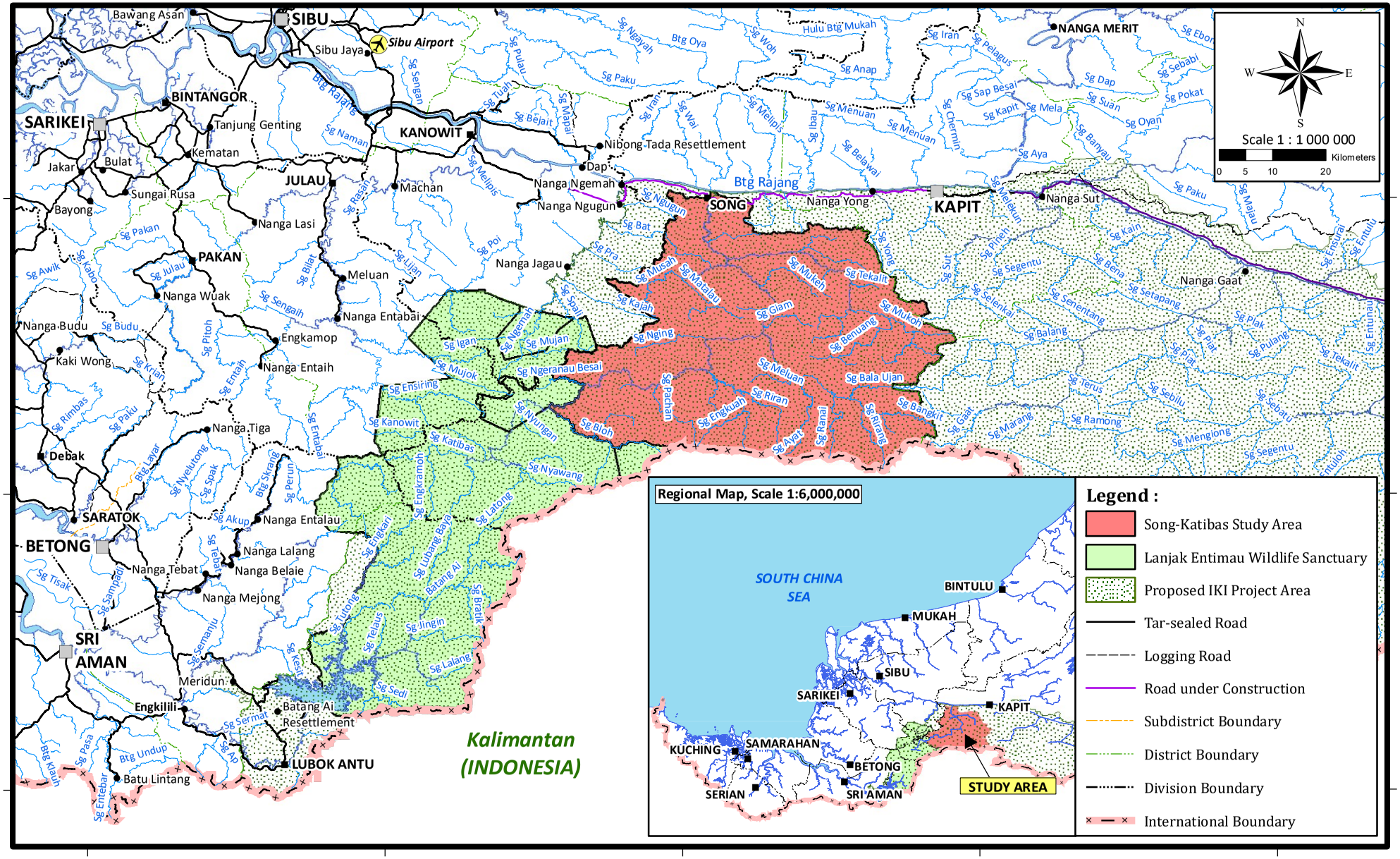
The Katibas river basin was drained by Sg Katibas and its tributaries. Notable tributaries are Sg Tekalit (an eastern branch with its mouth found 20 km upstream of the Katibas estuary), Sg Bangkit (the south-eastern branch), Sg Musah (river mouth found slightly 1.4 km upstream of Sg Tekalit). The upper area of the Katibas basin past Sg Bloh was where the Lanjak Entimau Wildlife Sanctuary (LEWS) was found. The LEWS was reputed for its orangutan landscape and is one of the few natural habitats for orangutan in Sarawak.

2.1.2 Accessibility

The closest major town to the Study Area is Sibu Town which has an urban population of about 170,000. The nearest airport is Sibu Airport which is about 80 km downstream of Song Township. Currently there are direct flights from Sibu Airport to Kuala Lumpur, Johor Bahru, Kuching, Bintulu and Miri. Sibu is a river port town located at the confluence of the Batang Rajang and the Batang Igan. Historically, river transport is used to reach upstream townships along the Batang Rajang such as Kanowit, Song, Kapit and Belaga. Regular express boat services ply between Sibu Town and Song Township, a river journey of about 2 hours.

[1] *IKI – International Climate Initiative of the Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety, Federal Republic of Germany.*

Figure 2.1 Location of Song-Katibas Study Area



Source : Basemap derived from Land & Survey Department, Sarawak 2007, Series 9, Edition 8, Scale 1:500,000

Map Projection : Geographic (Latitude/Longitude)
Datum : WGS 84

From Sibu, going upriver, a tar-sealed road reaches Kanowit Township, a distance of 58 km. Kanowit is a riverine town located on the south bank of the Batang Rajang. By land, Song Township can now be only accessed by four-wheel drive from Kanowit, as part of the existing route is through oil palm plantation roads and dirt tracks. Road construction between Kanowit and Song, a distance of about 53 km, is on-going as part of the endeavour to link Sibu with Song and Kapit, with the major bridges at Sg Kanowit and Sg Katibas being already completed, while an old one-way bridge currently serves the Sg Ngemah crossing. Once the on-going road construction work is completed, the Song Township-Sibu Town distance will be 155 km.

Construction of the Song-Kapit Road (about 44 km) is also on-going. Looking at present road construction progress, the Song-Kapit stretch of the road is likely to be completed before the Kanowit-Song stretch. Kapit is the divisional headquarter of the Kapit Division. Again, for now, four-wheel drive is needed to access Kapit from Song by land. The proposed Kanowit-Song-Kapit Road is mostly aligned along the south bank of the Batang Rajang and hence will not serve the interior Katibas region.

From Song Township, the Study Area can be accessed only through logging tracks and rivers, and hence four-wheel drives and longboats are the only modes of transportation. A tar-sealed road, gravelled in some sections, follows the west bank of Sg Katibas, going about 24 km upstream passing Nanga Musah. A network of logging tracks starting from Song routed up to 85 km inland into the upper Katibas region.

2.1.3 Stakeholders

Proposed implementation of the green economy concepts in Song-Katibas area will involve and/or affect the following stakeholders:

Stakeholder	Role/Influence
Longhouse communities residing within the Study Area	– Local communities affected by operations of economic sectors
Logging operators • T/3135 (Pasin Sdn Bhd) • T/3346 (Woodley Sdn Bhd • T/3409 (Bigwood Sdn Bhd) • T/3400 (Tanjong Manis Holdings Sdn Bhd) • T/3430 (Sejahtera Ultima Sdn Bhd)	– Undertaking timber harvesting activities within the Study Area
Forest plantation operators • LPF/0010 (Ta Ann Plywood Sdn Bhd) • LPF/0032 (Immense Fleet Sdn Bhd)	– Developing planted forests within the Study Area

Stakeholder	Role/Influence
Oil palm plantation operators	
• Katibas Oil Palm Plantation (Ta Ann Plywood Sdn Bhd) • Proposed Sejahtera Katibas Oil Palm Estate (Sejahtera Ultima Sdn Bhd)	– Developing and operating oil palm plantations within the Study Area
Study/project sponsors	
• WWF Malaysia • IKI (International Climate Initiative)	– Proponent/sponsor of this Study and pilot community projects
Government departments and agencies	
• Song District Office	– Administration of Song District
• Forest Department Sarawak • Sarawak Forestry Corporation	– Forest management and conservation regulate timber harvesting and forest plantation activities
• Natural Resources and Environment Board Sarawak	– Environmental management and conservation, enforcement of environmental legislations
• Land and Survey Department Sarawak	– Administration of land
• Sarawak Health Department	– Provision of public health services
• Department of Agriculture Sarawak	– Provision of technical advices, agri-business development, training and agronomic extension services to farmers
• Sarawak Farmers' Organisation	– Provision of agro-business, supply and delivery of agricultural subsidy, and undertaking agricultural development projects
• Malaysian Pepper Board	– Development of pepper industry in areas of production, marketing and research
• Rubber Industry Smallholders Development Authority (RISDA)	– Administration of the Rubber Industry (Replanting) Fund, plan and implement reforms, research and development in the rubber smallholder sector
• Sarawak Public Works Department	– Provision of public works services
• Jabatan Bekalan Air Luar Bandar	– Provision of water supply to rural areas

2.1.4 Local Communities

This SIA Study focuses on selected local communities within the Sg Katibas river basin in Song District, Kapit Division of the State of Sarawak, Malaysia. Of particular interest are the people who are staying or whose village are located in the vicinity of logging operations and oil palm plantations.

In total, there are 92 longhouses within the Study Area and location of these longhouses is shown in **Figure 2.2**. These longhouse communities can be grouped into the following clusters within the Study Area:

i. Song area (Batang Rajang & lower Sg Katibas);

ii. Sg Musah/ Sg Matalau;

iii. Sg Tekalit;

iv. Sg Bangkit;

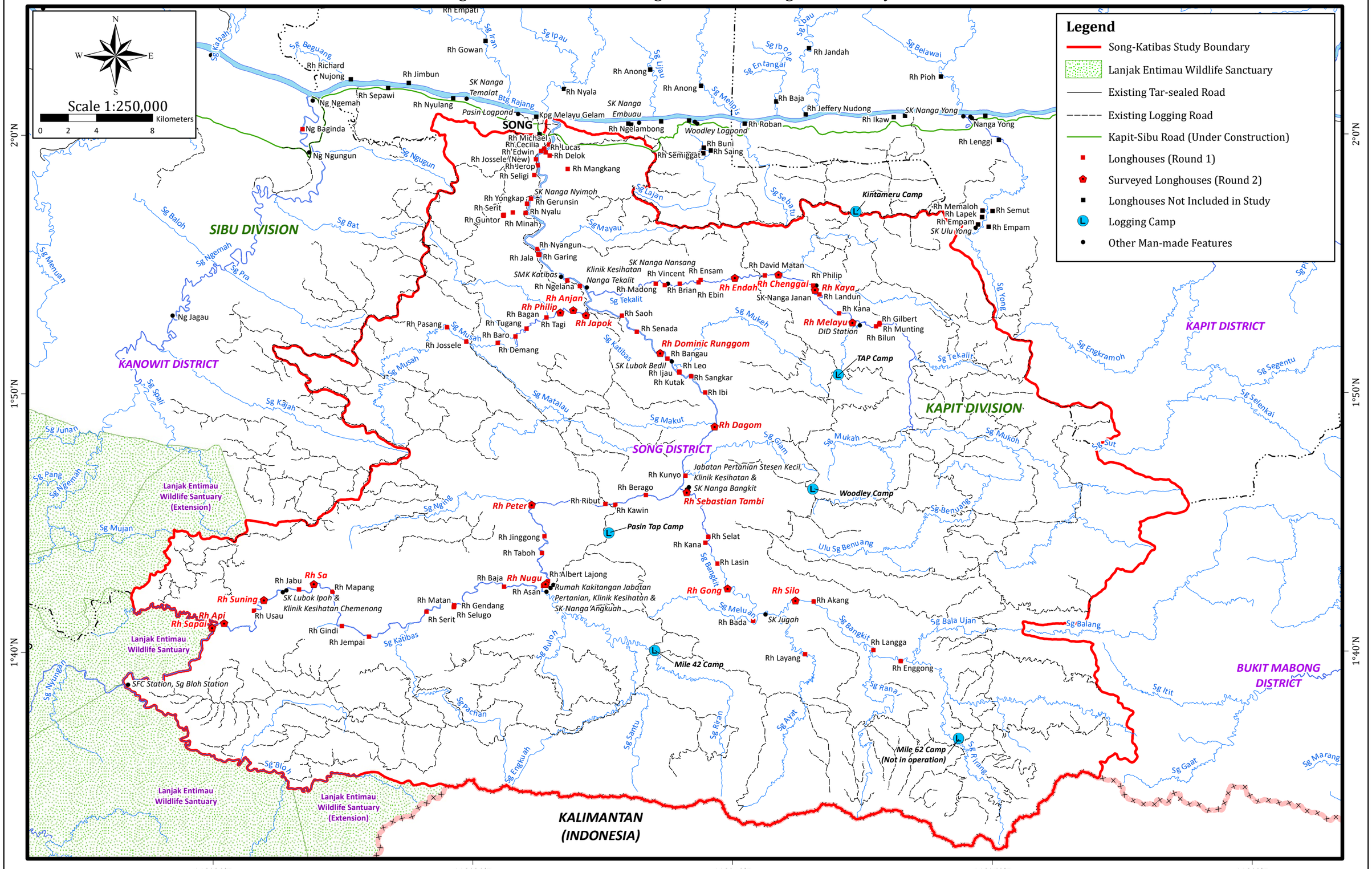
v. Sg Katibas Hilir (Lower Katibas); and

vi. Sg Katibas Ulu (Upper Katibas).

Most of the local communities originated from the Iban ethnic group. Inter-marriages with other racial groups of Sarawak would have brought other minority races into these communities.

According to the Statistics Yearbook Sarawak 2015 (Vers 2.0), Song District has a projected population of 21,300 (4,300 in the Song Council/Town area, and 17,000 beyond the council area), with an Iban population of 18,800; other races are confined mainly to Song Township. The population figures as quoted above can be misleading as the actual number of people living in the longhouses is lower than the official figures due to members of the communities working and staying outside the Study Area, seeking employment in other places e.g. Sibu, Kuching, Miri, Bintulu, West Malaysia and overseas, who usually return to the village of origin during Gawai Dayak and other occasions. They are also those who kept their village unit/door but owned house in other towns or cities, and who spend short time in the longhouses, coming back to visit only during festivities or occasions, or tending to their hobby farms.

Figure 2.2 Location of the Longhouses within Song-Katibas Study Area



Basemap derived from Land & Survey Department, Sarawak 2007, Series 8, Edition 9, Scale 1:500,000

Map Projection : Geographic (Latitude/Longitude)
Datum : WGS84

2.2 CONSTRAINTS AND LIMITATIONS OF THE STUDY

The constraints and limitations that have been identified for the Social Impact Assessment Study and proposed implementation of green economy concept at the Study Area are:

i. The reported results for focus group interviews and household surveys done in **Round 2** may not be representative for the entire study population, which consist of 392 doors. Based on the sampling criteria this study required 118 samples (i.e. 392 X 30% = 118 doors) which equivalent to 30% of the total doors of all selected longhouses in Round 2. However, this study only obtained 90 samples. This is because households who supposedly live in the longhouses were not available at the time of study as they are residing outside the Study Area for reason like seeking living in town or city and only return to longhouses on special occasion like festive season and public holidays.

ii. Due to high mobility among the youth, the continuous presence and supply of able-bodied workforce at the longhouse may fluctuate.

iii. There was some degree of reticence or reluctance to give basic information at some longhouses.

iv. Accessibility within the Study Area and to the longhouses is largely limited to river transportation.

2.3 STUDY METHODOLOGY

The overall study methodology is defined in the agreed Terms of Reference (TOR) for the Study as appended in **Appendix I, Section 5**. However, the survey methodology for the human environment as provided in **Section 5.3** of the TOR has been subsequently refined and improved and is documented as follows.

2.3.1 Methodology of Socio-Economic Survey

Both qualitative survey and quantitative survey were applied in data collection. The qualitative survey was done based on field observation on the ground condition in order to gain some general understanding of the local people daily lifestyle, culture and standard of living. In addition, formal and informal interview session was conducted with the key people in the areas and relevant information was also obtained from the local authorities such as Song District Office, Song Health Department and health clinics (at Ng Tekalit, Ng Bangkit, Ng Engkuah, and Ng Chemenong), Song District Council, Department of Agriculture, Forest Department, and Kapit Land and Survey Department.

2.3.1.1 Meetings

Five meetings were held with Song and Kapit District Offices and community leaders to inform the local authorities and communities of the SIA Study prior to embarking on the field research. These meeting are recorded in **Table 2.1** below.

Plate 2: Meeting with Community Leaders

Table 2.1 Meetings with Kapit and Song District Offices and Community Leaders

Date	Venue
13th June 2017	Kapit District Office
20th October 2017	Song District Office
26th October 2017	Song District Office
2nd August 2018	Hotel Meligai, Kapit

2.3.1.2 Interviews

The main instrument used to guide the interview was questionnaire. Four different sets of questionnaires were formulated (**Appendix II**); one for village-level with longhouse community used in Round 1 survey, and the other three respectively used in Round 2 survey for group discussion with *Tuai Rumah* and his committee (JKKK) and group interview with the representative of *'bilek'* (door) and vulnerable groups i.e. women, youths, senior citizens and disabled.

Plate 3: Interview the household members

For interview with representative of door, they were selected based on convenience sampling method. Ideally, interview with representative of door, vulnerable group and

sub-groups within vulnerable group should be conducted independently. However, the ground situation does not allow enumerators to isolate representative of door away from the vulnerable group and sub-groups within vulnerable group into their respective clusters. This is because, some individuals within the vulnerable group were nervous and not confident to accept interview from enumerators without the presence of familiar families' members. Interview for representative of door and vulnerable group was conducted simultaneously but not every response given by each individual who participated in the interview session was recorded. Response given by each individual who spoke, when one question was asked generally to all individual was recorded based on its relevancy to the questions set in the questionnaire for the targeted individual and/or group.

2.3.1.3 Field Observation

Direct systematic observation is the observation strategy used in this Study. The term 'direct' imply that the observers do not have any influences or try to exert any influences over the situation being observed, thus all recorded observation would be in its usual occurrence. The term 'systematic' denote that the observations were done in accordance to a set of explicitly formulated rules. This set of explicitly formulate rules are represented by a schedule of elements grouped into different categories to be observed. The document that contains the explicitly formulated rules is known as observation schedule. The observation schedule for this Study covers tangible and intangible elements such as local living condition, culture, social interaction, standard of living, economic activities and land use pattern. The usage of observation schedule ensures the quality of the results because observations of all longhouses were conducted based on unified rules. Unclear issues arising from interview session were clarified through observation as well.

2.3.1.4 Directly and Indirectly Affected Communities

The SIA Study covers both directly and indirectly affected communities in the Song-Katibas Area. The directly affected communities refer to the communities where the longhouses are located near or within the boundaries of the Forest Management Unit (FMU) and Licence for Planted Forest (LPF) licence areas and the immediate catchment downstream of these areas where the communities' livelihood, welfare, water supply, food resources, hunting grounds and shifting cultivation areas are likely to be impacted by the logging and oil palm operations.

The indirectly affected communities refer to those communities where their longhouses are located outside the aforesaid licence areas but within a reasonable sphere of influence of the logging and oil palm operations, and whose livelihood, welfare, water supply, food resources, hunting grounds and shifting cultivation areas are not to be

directly impacted by the logging and oil palm operations. From appraisal of the communities in and around the Study Area based on geographical location, the indirectly affected communities are those on the south bank of the Batang Rajang only and those longhouses connected to Song Township by tar-sealed road.

2.3.1.5 Rounds of Field Survey and Sample Size

Two rounds of field surveys were conducted:

- Round 1 survey was to obtain basic information of all longhouse communities found within and in the vicinity of the Study Area.
- Round 2 survey was conducted on 18 selected longhouses to compile a more detailed socio-economic profile of these communities; as well as their perceptions of existing projects and identify local needs and wants for future developments and potential gaps for changes.

Prior to the field surveys, a recce was conducted. This was a trip to gather general ground information of the Study Area through interviews with government departments and leaders of communities at Song.

(i) Round 1

All in all, 92 longhouses were surveyed in this round. The longhouses were clustered into six areas by river system or location i.e.:

- Cluster 1: Song area (Batang Rajang & lower Sg Katibas) – 18 longhouses;
- Cluster 2: Sg Musah/ Sg Matalau – 10 longhouses;
- Cluster 3: Sg Tekalit – 19 longhouses;
- Cluster 4: Sg Bangkit – 11 longhouses;
- Cluster 5: Sg Katibas Hilir (Lower Katibas) – 11 longhouses; and
- Cluster 6: Sg Katibas Ulu (Upper Katibas) – 23 longhouses.

Finding from the Round 1 survey indicates a total of 1,857 doors in these 92 longhouses. The basic information obtained included:

- Longhouse name and locality, Tuai Rumah's name;
- Location and accessibility;
- Population, number of doors and actual occupancy of doors;
- Agricultural activities and land resources;

- Economic activities e.g. tourism and potential sites, handicrafts making, apiculture (bee keeping), fishery and aquaculture (e.g. tagang), etc.;
- Community involvement in surrounding economic activities, logging and oil palm operations in particular;
- Longhouse condition and infrastructure;
- River condition in terms of water quality; and
- Common problems and complaints.

Round 1 also included visits to District Office in Song, Song Hospital and medical clinics serving the Katibas region. Mapping of the longhouses was undertaken by using GIS and field data, as well as cross-referencing with available satellite images and reports including EIAs conducted in the area.

(ii) Round 2

10% out of the 92 longhouses visited in Round 1 survey had been selected for Round 2 survey for a more detailed study. The suitability of a longhouse to qualify for Round 2 survey was evaluated based on a set of criteria as shown in **Table 2.2**. All together there were eight criteria, mainly human resource, tourism, agriculture, fishery, handicraft, impact, accessibility and relative wealth.

Each criterion carries a 1.0 weightage except for human resource. Human resource carries a 2.0 weightage. As compare to other criterion, human resource receives greater emphasize because the availability of workforce significantly decides the success of the socio-economic development initiatives, as sufficient size of workforce is needed to kick-start and continuously maintain the initiatives. Each criterion is further divided into sub-criterion; the sub-criterion then divides the assigned weightage equally.

The sub-criterion was rated based on a marking scheme in accordance to the longhouse's condition. The marking scheme consists of three ascending numbers, 1, 2 and 3. Each number represents the potentials of a longhouse to support socio-economic development initiatives or the urgency of a longhouse in needs of socio-economic development initiatives. For a longhouse to score high mark in each sub-criterion, they either need to have great potentials in supporting a socio-economic development initiative or exhibit significant urgency in need of socio-economic development initiatives. The standard used to mark each sub-criterion was stated in the brackets next to the headers of each criterion. With the intention of stratified sampling the longhouses from different river systems or locations, the ranking of longhouses was carried out with respect to each cluster and shown in **Figure 2.3**.

Table 2.2 Longhouse Selection Criteria and Weightage

No.	*Criteria*	*Weightage*
1	**Human resource** (Priority given to longhouse with more human resource)	
	• No. of doors	1.0
	• Occupancy	1.0
2	**Tourism** (Priority given to longhouse with more tourism sites)	
	• Known tourism site(s)	1.0
3	**Agriculture** (Priority given to longhouse with more arable land and lack existing projects)	
	• Land availability	0.5
	• No. of existing projects/ activities	0.5
4	**Fishery** (Priority given to longhouse lacking existing projects but with good fishery/aquaculture potential)	
	• No. of existing projects	0.33
	• Good water quality of nearby river	0.33
	• Suitability of river system for fishery/aquaculture project(s)	0.33
5	**Handicraft** (Priority given to longhouse with existing handicraft activities)	
	• No. of existing handicraft activities	1.0
6	**Impact** (Priority given to longhouse having more impacts from logging and oil palm plantation)	
	• Adverse impacts from logging/oil palm plantations	0.33
	• Wild animals – pest attack	0.33
	• Outsider intrusion – hunting, illegal logging	0.33
7	**Accessibility** (Priority given to those with better accessibility)	
	• Distance	0.25
	• Transportation mode	0.25
	• Navigability of river/ road condition	0.25
	• Seasonal travel restriction	0.25
8	**Relative wealth** (Priority given to poor communities)	
	• Well off	0.0
	• Poor	1.0

The Study focuses on longhouse communities in the interior of the Song-Katibas area disadvantaged by poor infrastructure and utilities due to their remoteness and are generally more socio-economically backward compared to the communities living closer to urban Song. As such, the 16 longhouses closer to Song Township (Cluster 1) connected by good road network were excluded from the evaluation. These longhouses are connected to Song Township by all-weather road, have SESCO electricity, are served

by mobile telecommunication services, and represent an urban population having access to better utilities and social services.

In consequent, the Study rendered its attention on the remaining five clusters, namely:

i. Cluster 2: Sg Musah/Matalau

ii. Cluster 3: Sg Tekalit

iii. Cluster 4: Sg Bangkit

iv. Cluster 5: Sg Katibas (Hilir)

v. Cluster 6: Sg Katibas (Ulu)

Initially, 12 longhouses from these five clusters were selected based on the selection criteria. Some longhouses were bypassed in the selection and were not short-listed due to low occupancy (less than 10 doors). The potential longhouses on the Round 2 study list was refined with the assistance and inputs of the Song District Officer (Puan Jackline August), taking into consideration her observation of communities' responsiveness, pro-activeness and willingness to participate in community projects and dependency on surrounding land for their livelihoods. This led to another 10 longhouses being added to the shortlisting of longhouses to be considered in the second round of the field trip.

In the actual ground study, group interviews and household surveys were carried out with 18 longhouses out of the 22 short-listed potential longhouses. This study exceeded the original targeted sample size which only demand for 9 longhouses (i.e. 90 X 10% = 9 longhouses). Nevertheless, this study only manages to interview and survey 90 doors despite the sampling criteria demand for 118 doors due to absence of representative of door at the point of study.

Figure 2.3 Longhouse Selection and Longhouse Surveyed in Song-Katibas

Legend

O.D	Occupied Doors
T.D	Total Doors
*	By-pass due to low occupancy
**	Longhouse not selected based on criteria but recommended by District Office Song

92 longhouses in Round 1 Survey

Cluster 1: Song Area (Excluded from selection process)

Longhouse	O.D/T.D	Mark
1. Rh Minah	17/17	16
2. Rh Gerunsin	31/36	15.9
3. Rh Yongkap	18/18	15.5
4. Rh Guntor	13/15	15.3
5. Rh Michael	7/7	15
6. Rh Jerop	43/43	15
7. Rh Edwin	19/19	15
8. Rh Cecelia	31/31	15
9. Rh Delok	40/40	14.8
10. Rh Nyalu	25/27	14.5
11. Rh Nyangun	8/13	14.2
12. Rh Garing	4/26	14.2
13. Rh Garai	14/14	14.2
14. Rh Lucas	25/25	13.8
15. Rh Serit	36/36	7
16. Rh Seligi	22/22	7
17. Rh Jala	28/28	6
18. Rh Mangkang	2/12	4.8

Cluster 2: Sg Musah/Matalau

Longhouse	O.D/T.D	Mark
1. Rh Philip	10/14	17.8
2. Rh Japok	19/21	16.7
3. Rh Bagan	2/22	16.2
4. Rh Anjan	5/8	16.0
5. Rh Demang	4/37	15.9
6. Rh Jossele	2/21	15.2
7. Rh Tagi	2/5	15.2
8. Rh Pasang	5/23	6.0
9. Rh Baro	0/13	4.8
10. Rh Tugang	0/7	3.8

Cluster 3: Sg Tekalit

Longhouse	O.D/T.D	Mark
1. Rh Melayu	14/18	18.5
2. Rh Kaya	11/24	18.5
3. Rh Kana*	6/12	18.3
4. Rh Landun*	6/15	17.5
5. Rh Ngelana	31/31	17.4
6. Rh Chenggai	18/32	16.7
7. Rh Brian	12/31	16.7
8. Rh Endah	18/22	16.7
9. Rh David Matan	14/19	16.3
10. Rh Philip	20/30	15.8
11. Rh Munting	6/18	15.4
12. Rh Bilun	3/7	15.4
13. Rh Madong	3/13	15.0
14. Rh Gilbert	4/10	14.9
15. Rh Ebin	3/10	14.3
16. Rh Ensam	3/14	13.3
17. Rh Vincent	0/30	6.0
18. Rh Anchu	0/15	2.3
19. Rh Sibat	0/10	2.3

Cluster 4: Sg Bangkit

Longhouse	O.D/T.D	Mark
1. Rh Sebastian Tambi	42/42	19.1
2. Rh Layang	13/23	16.9
3. Rh Enggong	9/27	16.8
4. Rh Gong	10/17	16.5
5. Rh Silo	8/9	16.4
6. Rh Lasin	7/17	16.0
7. Rh Selat	7/23	15.8
8. Rh Akang	10/36	15.4
9. Rh Kana	3/11	14.8
10. Rh Langga	5/12	13.4
11. Rh Bada	0/14	4.8

Cluster 5: Sg Katibas (Hilir)

Longhouse	O.D/T.D	Mark
1. Rh Dagom	20/32	19.3
2. Rh Dominic Runggom	24/32	17.6
3. Rh Ijau	13/19	17.4
4. Rh Kunyo	6/6	17.3
5. Rh Ibi	11/23	17.3
6. Rh Saoh	13/1	16.7
7. Rh Kutak	6/19	16.3
8. Rh Bangau	11/22	16.3
9. Rh Senada	9/9	16.3
10. Rh Sangkar	9/12	15.3
11. Rh Leo	3/15	15.3

Cluster 6: Sg Katibas (Ulu)

Longhouse	O.D/T.D	Mark
1. Rh Api	19/21	19.1
2. Rh Peter	15/32	18.5
3. Rh Sapai*	7/17	18.1
4. Rh Nugu	14/21	18.0
5. Rh Albert Lajong	14/28	18.0
6. Rh Jabu	21/26	17.6
7. Rh Assan	16/39	17.0
8. Rh Taboh	9/14	16.0
9. Rh Suning	9/14	15.9
10. Rh Sa	13/16	15.8
11. Rh Gindi	10/32	15.8
12. Rh Jinggong	6/13	15.8
13. Rh Berago	3/32	15.5
14. Rh Ribut	13/23	15.3
15. Rh Kawin	3/20	15.3
16. Rh Gendang	13/24	14.9
17. Rh Baja	12/14	14.5
18. Rh Serit	7/14	14.4
19. Rh Mapang	6/13	13.8
20. Rh Jempai	4/11	13.8
21. Rh Selugo	3/14	12.9
22. Rh Matan	3/10	12.9
23. Rh Usau	0/14	3.0

12 longhouses based on criteria mark

Cluster 2: Sg Musah

Longhouse	O.D/T.D
1. Rh Philip	10/14
2. Rh Japok	19/21

Cluster 3: Sg Tekalit

Longhouse	O.D/T.D
1. Rh Melayu	14/18
2. Rh Kaya	11/24
3. Rh Ngelana	31/31

Cluster 4: Sg Bangkit

Longhouse	O.D/T.D
1. Rh Sebastian Tambi	42/42
2. Rh Layang	13/23

Cluster 5: Sg Katibas (Hilir)

Longhouse	O.D/T.D
1. Rh Dagom	20/32
2. Rh Dominic Runggom	24/32

Cluster 6: Sg Katibas (Ulu)

Longhouse	O.D/T.D
1. Rh Api	19/21
2. Rh Peter	15/32
3. Rh Nugu	14/21

DO Recommendation

Cluster 2: Sg Musah

Longhouse	O.D/T.D
1. Rh Philip	10/14
2. Rh Anjan**	5/8

Cluster 3: Sg Tekalit

Longhouse	O.D/T.D
1. Rh Melayu	14/18
2. Rh Kaya	11/24
3. Rh Chenggai**	18/32
4. Rh Endah**	18/22

Cluster 4: Sg Bangkit

Longhouse	O.D/T.D
1. Rh Sebastian Tambi	42/42
2. Rh Layang	13/23
3. Rh Gong**	10/17
4. Rh Silo**	8/9

Cluster 5: Sg Katibas (Hilir)

Longhouse	O.D/T.D
1. Rh Dagom	20/32
2. Rh Dominic Runggom	24/32
3. Rh Ijau**	13/19
4. Rh Bangau**	11/22

Cluster 6: Sg Katibas (Ulu)

Longhouse	O.D/T.D
1. Rh Api	19/21
2. Rh Peter	15/32
3. Rh Sapai**	7/17
4. Rh Suning**	9/14
5. Rh Sa**	13/16

Actual Survey List

Cluster 2: Sg Musah

Longhouse	O.D/T.D
1. Rh Philip	10/14
2. Rh Japok	21/21
3. Rh Anjan	5/8

Cluster 3: Sg Tekalit

Longhouse	O.D/T.D
1. Rh Melayu	12/18
2. Rh Kaya	10/24
3. Rh Chenggai	18/32
4. Rh Endah	18/22

Cluster 4: Sg Bangkit

Longhouse	O.D/T.D
1. Rh Sebastian Tambi	37/42
2. Rh Gong	10/17
3.Rh Silo	9/9

Cluster 5: Sg Katibas (Hilir)

Longhouse	O.D/T.D
1. Rh Dagom	20/32
2. Rh Dominic Runggom	20/32

Cluster 6: Sg Katibas (Ulu)

Longhouse	O.D/T.D
1. Rh Api	9/21
2. Rh Peter	15/32
3. Rh Sapai	7/17
4. Rh Nugu	7/21
5. Rh Suning	8/14
6. Rh Sa	13/16

Summary of Selection Process:

- 92 longhouses were surveyed from six river systems or area during Round 1
- Out of 92 longhouses surveyed, 18 longhouses from Song area was excluded from selection process due to close distance to Song Township
- 92 longhouses were short-listed to 12 longhouses from selection process based on criteria with additional 10 longhouses recommended by DO to be survey for round 2
- 18 longhouses from five river systems were finally selected, surveyed and assessed for potential pilot project

CHAPTER 3

Existing Environment

CHAPTER 3
EXISTING ENVIRONMENT

3.1 PHYSICAL-CHEMICAL ENVIRONMENT

3.1.1 Geology, Topography and Soils

3.1.1.1 Geology

The geology of the Study Area was covered by the work of Wolfenden in the geological mapping of the Lower Rajang (Wolfenden, 1960). The rocks of the area were formed from sediments deposited in a deep synclinal basin and subsequently intensely folded and subjected to low-grade dynamic metamorphism. The rocks were mapped as the Kapit member of the Belaga Formation and consist dominantly of argillite and slate, some phllite, greywacke and greywacke conglomerate. The rocks have a common characteristic of steeply dipping over 60 degrees. Hard, massive and medium to coarse-grained sandstone beds forming the lower part of the Kapit Member also occur in the Katibas valley.

Younger arenaceous rocks of Nyalau Formation occur as outliers resting uncomformably on the intensely folded Belaga Formation rocks. The rocks consist of massive quartzose sandstone and minor claystone. The Nyalau sandstone, being resistant to erosion, form some of the most rugged hilly terrain in the upper Katibas valley, with hill summits of over 700 m (2,200 ft.); these hills are often characterized by steep scarp slopes and small areas of gentle dip slopes and hill summits.

3.1.1.2 Topography

The topography of the Study Area consists almost entirely of steep hilly land, being characterized by steep slopes and narrow valleys and drained by fast-flowing streams. Steep slopes of 30 degrees or more rise almost immediately from the river banks and the bulk of the hilly land has altitude of 150-300m. Some of the high mountain peaks in the area include Bukit Dungan (2,500 ft.) and Bukit Mesau (2,427 ft.) in the northwest and Bukit Buloh (2,430 ft.) in the south. Alluvial areas occur only as narrow levees along parts of the main streams such as Sg Tekalit and Sg Katibas.

3.1.1.3 Soils

The soils of the Study Area are covered by a broad reconnaissance survey and the data is available in unpublished 1:50,000 scale maps. A large part of the area was covered by

a more recent study under the Rural Growth Centres by the Ministry of Rural Development in 2005 and this study also included a more detailed evaluation of the soil resources. The present study has thus made a review of the data from the existing sources and coupled with brief field verification over the area.

The soil types and their distribution in the area are strongly influenced by the parent materials and the topography. The soils are developed on sedimentary rocks of argillite, slate and phyllite and the soils thus developed are characterized by their clay textures. The development of soil profiles is strongly influenced by the nature of the topography. The steep and dissected hilly terrain thus precludes the formation of deep stable soils due to the active process of erosion and mass-wasting. For this reason, the soils over the bulk of the Study Area are classified as shallow or skeletal soils due to the absence of deep, well developed soil profiles.

The shallow soils are commonly underlain by a thick deeply weathered zone of soft rocks or regolith. The oil palm in the Pasin Area was observed to be planted on terraces cut into the deep weathered zone; the oil palm and the cover crops appear to be growing successfully. The development of this area clearly shows that the thick weathering zone or regolith under the shallow surface soil could be used successfully if the land is well managed.

3.1.1.4 Potential Agricultural Areas

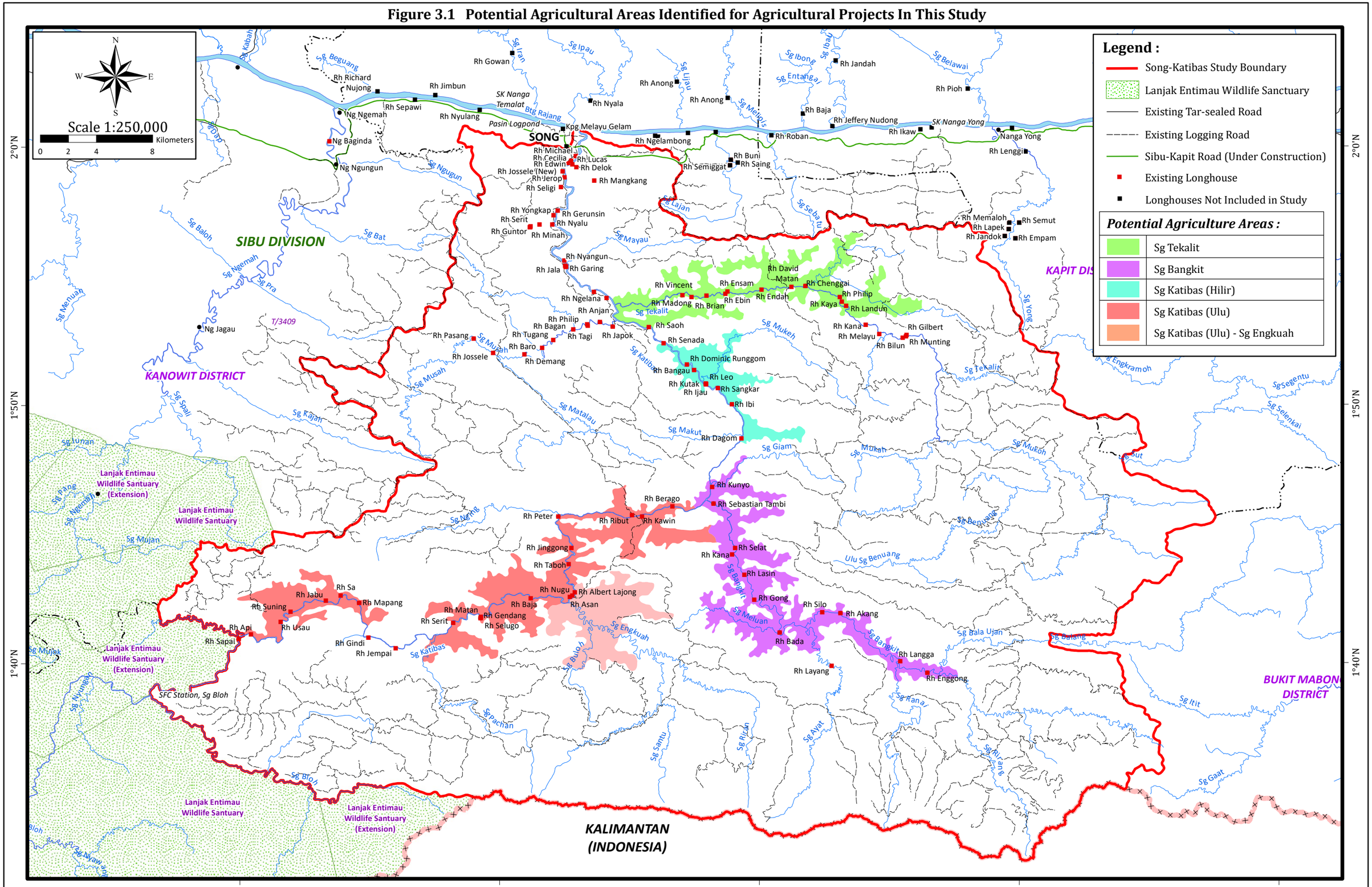
From the review of the soil data coupled with field investigation, the potential areas in the Study Area are identified. The important parameters used to delineate these areas include the nature of the topography such as slopes and elevation. Most of the areas are delineated roughly by the 500 feet contour where the land is less than 100 m or 300 feet above the local base level; this consideration is for the ease of access and workability of the land for sustained agricultural development. The soils in all these potential areas consist dominantly of Sekeletal soils of Lalis series, with minor Red-yellow Podzolic soils of Merit and Recent Alluvial soils of Bemang and Seduau series. The Potential Agricultural Areas in shown in **Figure 3.1**.

These Potential Agricultural Areas are as follows:

Sg Tekalit

This area follows the whole length of Sg Tekalit valley and the area includes the flanking hills of about 500 m from the river and small patches of recent alluvium. The areas include several long valleys spreading north and south from the main river and these valleys are presently served by timber roads. There is moderately good potential to develop permanent agriculture including crops such as pepper and fruit trees in these areas.

Figure 3.1 Potential Agricultural Areas Identified for Agricultural Projects In This Study



Basemap derived from Land & Survey Department, Sarawak 2007, Series 8, Edition 9, Scale 1:500,000

Map Projection : Geographic (Latitude/Longitude)
Datum : WGS84

Sg Bangkit

Sg Bangkit is one of the longest tributaries of Sg Katibas, flowing southeast and the river valley is farmed up to over 20 km from its confluence with Sg Katibas. The potential agricultural area lies in the lower-mid river section, from Rh Selat to Rh Layang and the more extensive areas are located in the valleys of Sg Meluan at Rh Bada and Sg Lunut at Rh Selat. Rh Sebastian Tambi is reported to have planted rubber under Risda rubber planting scheme. This is the first rubber planting scheme and the experience and success could be useful for others to follow.

Sg Katibas (Hilir)

The Sg Katibas (Hilir) cluster is made of small areas lying between Sg Tekalit and Sg Bangkit. Of these areas, Rh Dagom is of significance because the people of Rh Dagom have planted 8,000 vines of pepper with assistance provided by the government (Federal) pepper development scheme. Rh Dagom has set itself as the pioneer or model for large scale pepper planting in the steep hilly land in the Katibas valley; its experience or success could serve as a model for other longhouses in the Study Area.

Sg Katibas (Ulu)

The Sg Katibas (Ulu) cluster is located from the middle valley to the furthest end of Sg Katibas and probably represents the most extensive contiguous block along Sg Katibas. The area at Rh Berago to Rh Serit, with over 1,000 ha on the northern bank which is presently designated as logged over forest, and over 500 ha on the southern bank and presents considerable potential for extensive planting of tree crops including rubber, pepper, fruit trees and oil palm. The area from Rh Mapang to Rh Sapai is steep and there is only limited potential for planting of crops like pepper and rubber. The area from Ng Engkuah is formed by the lower valley of Sg Engkuah, extending approximately about 5 km from the confluence with Sg Katibas, and includes the two main tributaries, Sg Sebatang and Sg Ensurai. This area probably represents one of the largest continuous blocks, with moderately suitable hilly land covering about 2,000 ha which can be developed for tree crops such as oil palm rubber, pepper and fruit trees.

As a conclusion, a large part of the Study Area is constrained by severe limitations such as steep terrain and shallow soils. Out of the eight areas identified as having potential for development, probably those that occur in larger contiguous blocks and presently unencumbered with any permanent land use could be further investigated so that these areas could be offered for agricultural development. The findings show that terrain at each longhouse area is steep with limited space of flat land. However, the land at each longhouse area is adequate for appropriate agriculture such as pepper, rubber and other tree crops. Agriculture is required to promote self-sufficiency in food to drive the economy and to earn income for improving the livelihood of the local communities.

3.1.2 Water Resources and Rainfall

3.1.2.1 River System

The Study Area is drained by Sg Katibas, one of the major tributaries of the Btg Rajang joining the Rajang River at Song Township. Sg Katibas catchment is bordered by:

- Btg Ai catchment, Sg Julau catchment, and Sg Ngemah catchment, in the west;
- Sarawak - Kalimantan border in the south; and
- Sg Sut – Sg Gaat catchment in the east.

Its longest flow path is about 150 km from the Btg Ai side and 90 km from the Sg Sut side. Based on the topographical maps (*Sheets No. 6012-6013, 6112-6114, 6212-6214, Series T738, Scale 1:50,000*), Sg Katibas is a fifth order river. There are more than 100 tributaries of Sg Katibas within the Study Area, out of which 61 of the tributaries are named (**Table 3.1**).

Notable tributaries of the Sg Katibas within the Study Area are Sg Tekalit (an eastern branch with its mouth found 20 km upstream of the Katibas estuary), Sg Bangkit (the southeastern branch, about 25 km upstream of the river mouth of Sg Tekalit) and Sg Musah (western branch with its river mouth found slightly 1.4 km upstream of Sg Tekalit).

Table 3.1 Rivers and Tributaries of the Katibas River System

Tributaries of Sg Katibas	*Sub-tributary 1*	*Sub-tributary 2*
Sg Engkabau	-	-
Sg Engkabaw	-	-
Sg Kebiaw	-	-
Sg Takan	-	-
Sg Mayau	-	-
Sg Tekalit	Sg Nansang	-
	Sg Bungkang	-
	Sg Chunpin	-
	Sg Sepayang	-
	Sg Lanang	-
	Sg Kenangoh	-
	Sg Barok	-
	Sg Latong	-
Sg Tekalit	Sg Mukoh	Sg Mukah
		Sg Benuang
Sg Musah	Sg Seairuk	-
	Sg Engkaraju	-
	Sg Semalung	-
	Sg Pesi	-
	Sg Sibau	-

Tributaries of Sg Katibas	*Sub-tributary 1*	*Sub-tributary 2*
	Sg Silu	-
	Sg Serau	-
	Sg Nansang	-
	Sg Matalau	Sg Selanau
		Sg Setapang
Sg Bantor	-	-
Sg Entuat	-	-
Sg Mukeh	-	-
Sg Banin	-	-
Sg Pasek	-	-
Sg Kakup	-	-
Sg Makut	-	-
Sg Giam	-	-
Sg Bangkit	Sg Perak	-
	Sg Bunut	-
	Sg Lalayuan	-
	Sg Wong	-
	Sg Nonsang	-
	Sg Meluan	Sg Nevan
	Sg Bundar	-
	Sg Kawi	-
	Sg Ayat	-
	Sg Semumban	-
	Sg Mino	-
Sg Angkuah	Sg Ensurai	-
	Sg Temawai	-
	Sg Sebatang	-
	Sg Buloh	Sg Sepungoa
		Sg Nansang
		Sg Seluba
	Sg Singka Bang	-
	Sg Riran	Sg Saping
	Sg Papua	-
	Sg Bambang	-
	Sg Nansang	-
Sg Angkuah	Sg Santu	-
	Sg Kallang	-
Sg Darap	-	-
Sg Temakop	-	-
Sg Jala	-	-
Sg Banan	-	-
Sg Kuap	-	-
Sg Pachan	-	-
Sg Barok	-	-
Sg Kuap	-	-
Sg Engkramong	-	-
Sg Ibau	-	-

Tributaries of Sg Katibas	*Sub-tributary 1*	*Sub-tributary 2*
Sg Malai	-	-
Sg Masau	-	-
Sg Chamanong	-	-
Sg Kuam	-	-
Sg Spayon	-	-
Sg Tawan	-	-
Sg Nayai	-	-
Sg Jaom	-	-
Sg Nareh	-	-
Sg Buloh	-	-
Sg Ajup	-	-
Sg Temangat	-	-
Sg Duyan	-	-
Sg Spandam	-	-
Sg Ngeranau Kechil	-	-
Sg Ngeranau Besar	-	-
Sg Pantu	-	-
Sg Dajau	-	-
Sg Mengiong	-	-
Sg Lawas	-	-
Sg Likau	-	-
Sg Datai	-	-
Sg Bloh	Sg Joh	Sg Joh Gorogok
		Sg Joh Ganda

The Sg Katibas catchment within the Study Area is approximately 2,449 km^2 (**Table 3.2**). The Sg Tekalit catchment covers predominantly the north-eastern part of the Study Area, encompassing an area of approximately 551 km^2, while the Sg Bangkit catchment (530 km^2) and Sg Musah catchment (235 km^2) covers the southern-eastern part and north-western part of the Study Area respectively. The south-western part of the Study Area is mainly drained by numerous headwaters of the mid-Sg Katibas. The upper area of the Katibas basin, past Sg Bloh (beyond the Study Area), is where the Lanjak Entimau Wildlife Sanctuary is found. **Figure 3.2** shows the major rivers and the three major river catchments within the Study Area.

Table 3.2 Sub-Catchment Areas of Sg Katibas

Sub-Catchment	*Area (km^2)*	*% of Study Area*
Sg Musah	235.26	9.6
Sg Tekalit	551.38	22.5
Sg Bangkit	530.15	21.7
Sg Katibas (remaining area)	1,131.79	46.2
Total	2,448.58	100.0

3.1.2.2 Rainfall

The Study Area has a tropical equatorial climate which typically is hot, wet and humid throughout the year. The regional climate is affected by the seasonal movements of the Inter-Tropical Convergence Zone and the associated movements of the warm air with the monsoons.

The climatic information in the Study Area was extracted from the rainfall data collected at Song (DID Station No. 2025012), Rh Gaul (DID Station No. 1827001), Nanga Bangkit (DID Station No. 1726041), Sungai Nawang (DID Station No. 1622001), Rh Andau (DID Station No. 1624001), and Upper Sg Ayat (DID Station No. 1628001) (**Figure 3.2**). As these six stations are all located within the Study Area, the data will be representative of the climate conditions at the Study Area.

The mean monthly rainfall recorded at the six stations for the years 2007-2016 is shown in **Table 3.3** and illustrated in **Figure 3.3**. The mean annual rainfall recorded was 3,790 mm for the six stations. The mean annual rainfall of the six stations ranged from 3,551 mm to 4,267 mm. It is noted that generally the months of November to February were reasonably wet with an overall mean monthly rainfall of more than 350 mm. The wettest month was December with an overall mean rainfall of about 399 mm. The driest month was June with overall mean monthly rainfall of 208 mm. May to September had comparatively low rainfall with means ranged between 208 mm to 272 mm.

As such, there is enough rain on a yearly basis, however, there are occasion of dry season. The implications of dry season:

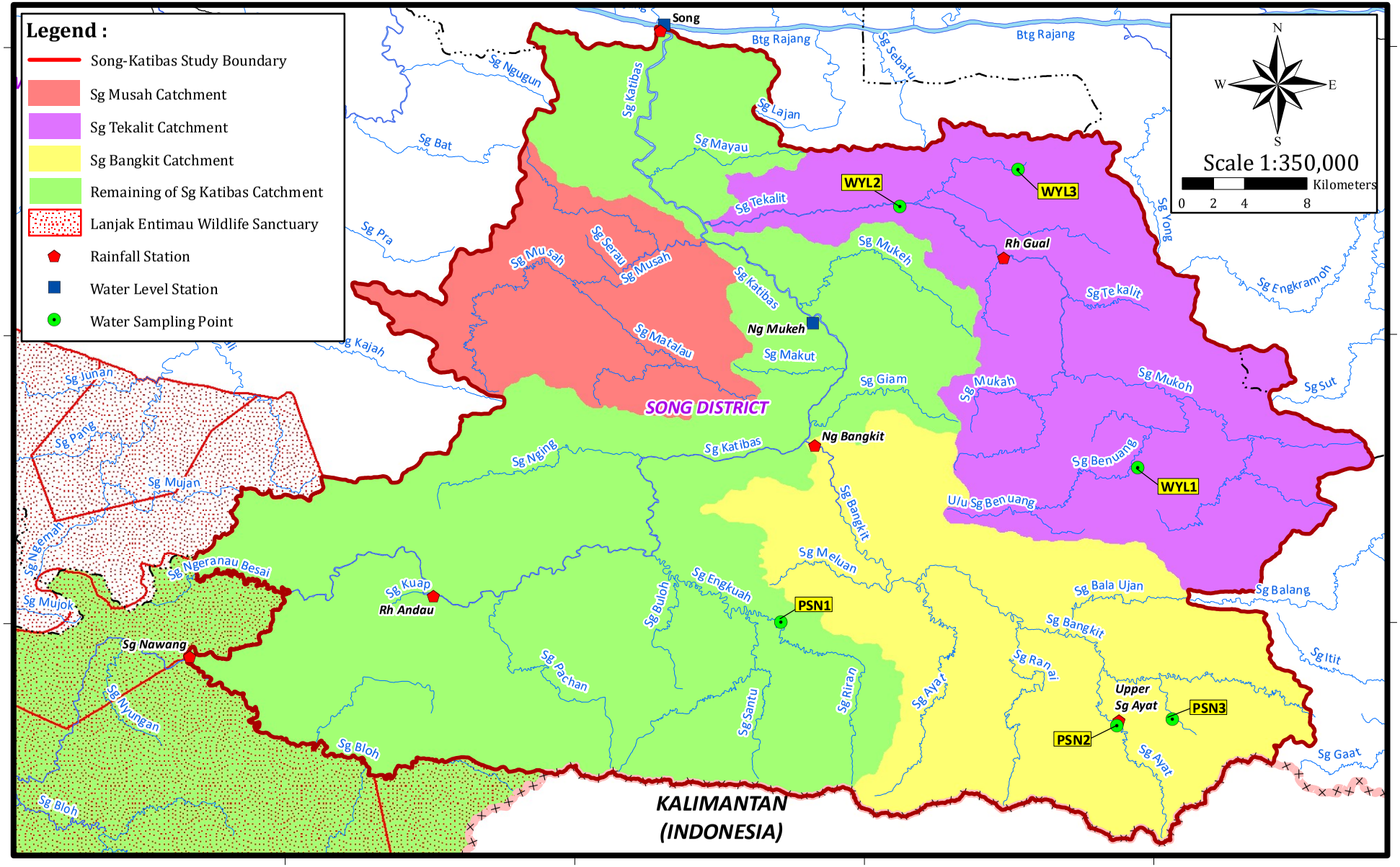
i. Decrease of water supply from gravity-feed and will need rainwater tank to store water as emergency supply. Alternative water supply would be from the river near or far from the longhouse.

ii. Shallow river due to longer dry season period may impede boat movement and therefore transport of products would be decreasingly possible to evacuate.

iii. Restrict crop growth due to lack of water during dry season

iv. Water for aquaculture may be inadequate due to the dry season

Figure 3.2 River Catchments, Water Sampling Points, Rainfall Stations and Water Level Stations in the Song-Katibas Study Area



Source : Basemap derived from Land & Survey Department, Sarawak 2007, Series 8, Edition 9, Scale 1:500,000

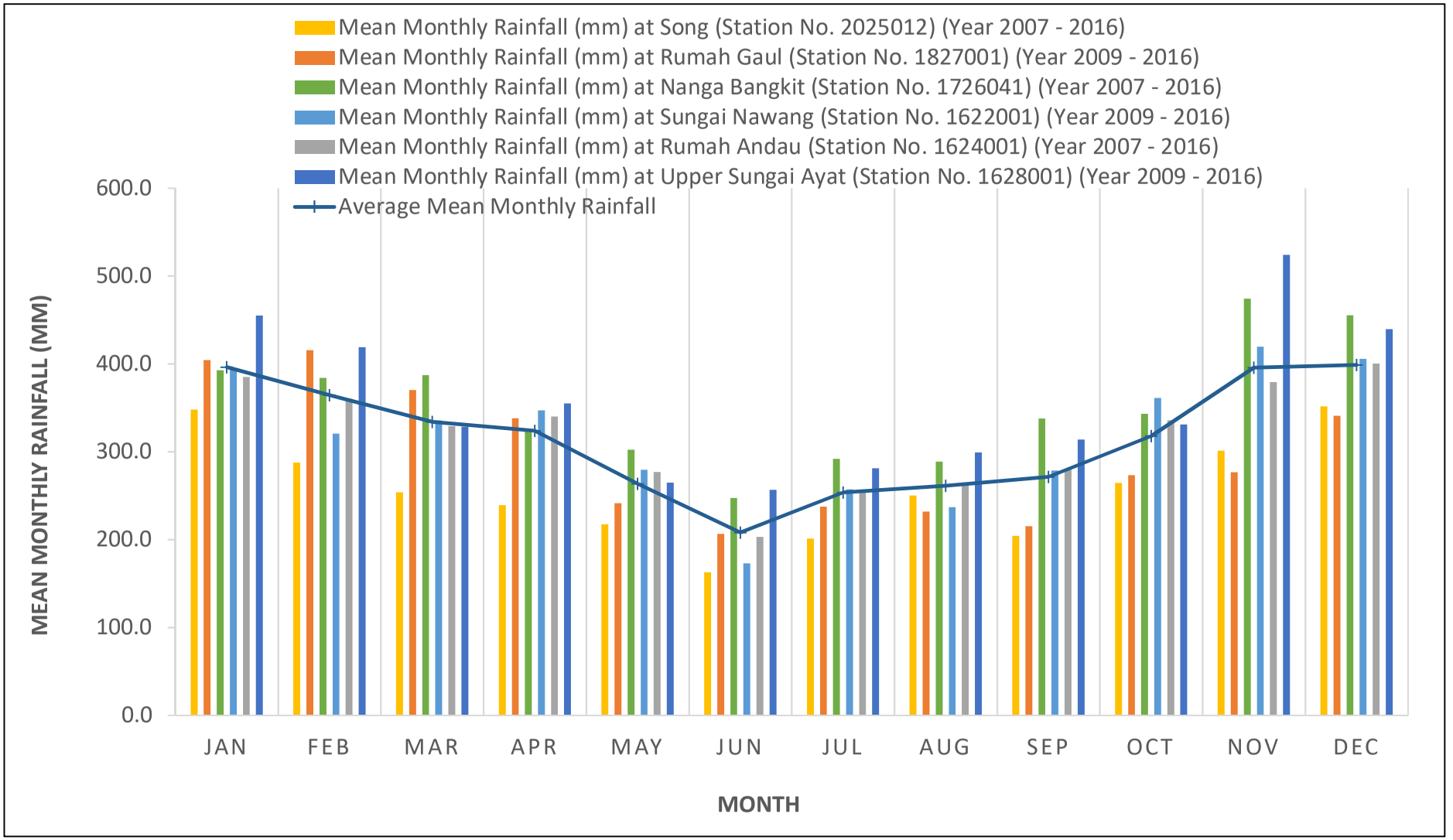
Map Projection : Geographic (Latitude/Longitude)
Datum : WGS84

Table 3.3 Mean Monthly Rainfall (mm) at the DID Stations for 2007 – 2016

Station (River System) / Month	Mean Month Rainfall (mm)						
	Song (Lower Btg Rajang)	Rh Gaul (Sg Tekalit)	Ng Bangkit (Sg Bangkit)	Sg Nawang (Ulu Sg Katibas)	Rh Andau (Ulu Sg Katibas)	Upper Sg Ayat (Sg Ayat)	Average Mean Monthly Rainfall
Jan	393.8	404.2	385.1	347.9	455.0	392.9	**396.5**
Feb	320.5	415.6	360.3	287.5	418.8	384.0	**364.4**
Mar	335.6	370.3	329.0	253.9	328.5	387.2	**334.1**
Apr	347.2	338.1	339.9	239.2	354.9	324.9	**324.0**
May	279.5	241.4	276.8	217.5	264.9	302.2	**263.7**
June	172.9	206.3	203.0	162.8	256.7	247.4	**208.2**
July	257.1	237.5	253.6	201.2	281.0	291.9	**253.7**
Aug	236.9	231.7	261.5	250.1	299.3	288.6	**261.3**
Sep	278.6	215.3	280.1	204.3	313.9	337.8	**271.6**
Oct	361.3	273.1	335.7	264.6	330.9	343.3	**318.1**
Nov	419.4	276.5	379.3	301.3	523.9	474.2	**395.8**
Dec	405.7	340.8	400.4	351.7	439.6	455.3	**398.9**
Total	**3,808.5**	**3,550.7**	**3,804.4**	**3,081.7**	**4,267.2**	**4,229.4**	**3,790.3**

Source: Department of Irrigation and Drainage Sarawak, 2017

Figure 3.3 Mean Monthly Rainfall within the Study Area



3.1.2.3 River Level and Flood

There are two DID water level stations in the vicinity of the Study Area, namely Song Station (DID Station No. 2025401) and Nanga Mukeh Station (DID Station No. 1826401) (**Figure 3.2**). The maximum and minimum daily mean water level, and the daily mean water level for both stations for 2007-2016 are shown in **Table 3.4**. River discharge at Nanga Mukeh Station for 1991-1994 is given in **Table 3.5** below.

Table 3.4 Maximum and Minimum Daily Mean Water Level at the Study Area

Year	Song Station (Rajang River Catchment)				Ng Mukeh Station (Katibas River Catchment)			
	*Max (m)	*Min (m)	*Mean (m)	Variance (m)	**Max (m)	**Min (m)	**Mean (m)	Variance (m)
2007	11.527	2.553	6.001	8.974	14.585	1.428	3.049	13.157
2008	10.219	2.187	6.175	8.032	9.741	1.309	3.123	8.432
2009	10.359	2.335	5.545	8.024	8.642	0.809	2.616	7.833
2010	11.297	3.245	6.339	8.052	9.924	1.579	3.314	8.345
2011	9.329	2.208	5.249	7.121	9.136	1.242	2.928	7.894
2012	10.144	2.381	5.518	7.763	9.627	1.143	2.822	8.484
2013	9.932	4.195	5.949	5.737	10.512	0.977	2.753	9.535
2014	11.002	4.167	5.708	6.835	8.258	1.192	2.459	7.066
2015	9.500	3.151	5.662	6.349	7.315	1.042	2.288	6.273
2016	9.118	3.358	5.882	5.760	8.145	1.242	2.549	6.903
Normal Level (m)	*5.59				NA			
Alert Level (m)	*10.59				NA			
Warning Level (m)	*11.59				NA			
Danger Level (m)	*12.59				NA			

*Note: * Based on Mean Sea Level (MSL); ** Based on Assumed Level (AL);*
NA denotes data not available.

Song Station (Lower Rajang River Catchment)

Based on the 10-year water level records at Song Station from year 2007 to 2016, the daily mean water levels mainly ranged from 5.249 m+MSL to 6.339 m+MSL, with the minimum and maximum recorded level of 2.187 m+MSL (extreme drought level) and 11.527 m+MSL (extreme flood level). The annual maximum variation of water levels is

between 5.737 m and 8.974 m. **Figure 3.4(a)** shows the high-low plot of average monthly water levels; while the daily mean water levels, together with its normal, alert, warning and danger levels at Song Station is illustrated in **Figure 3.4(b)**.

Figure 3.4(a) High-Low of Average Monthly Water Level at Song Station (2007 – 2016)

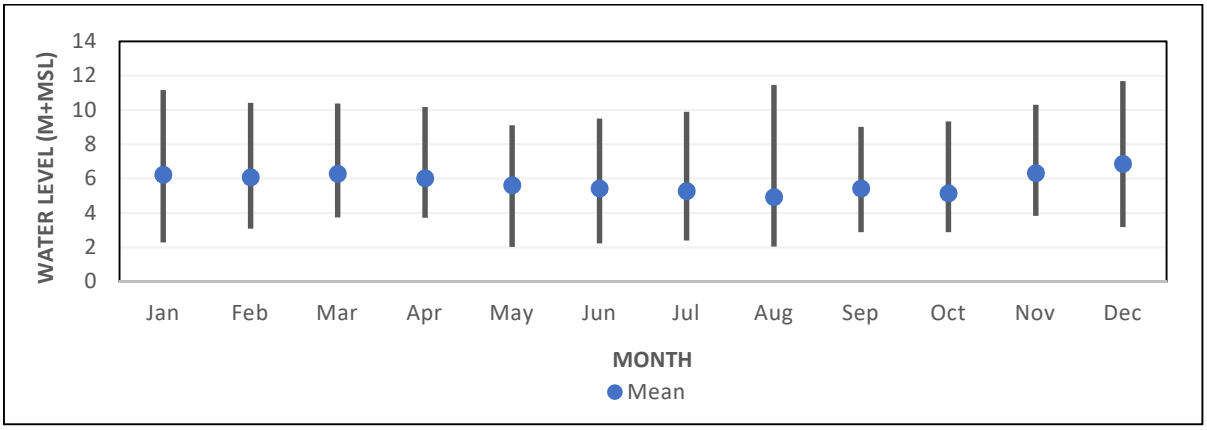
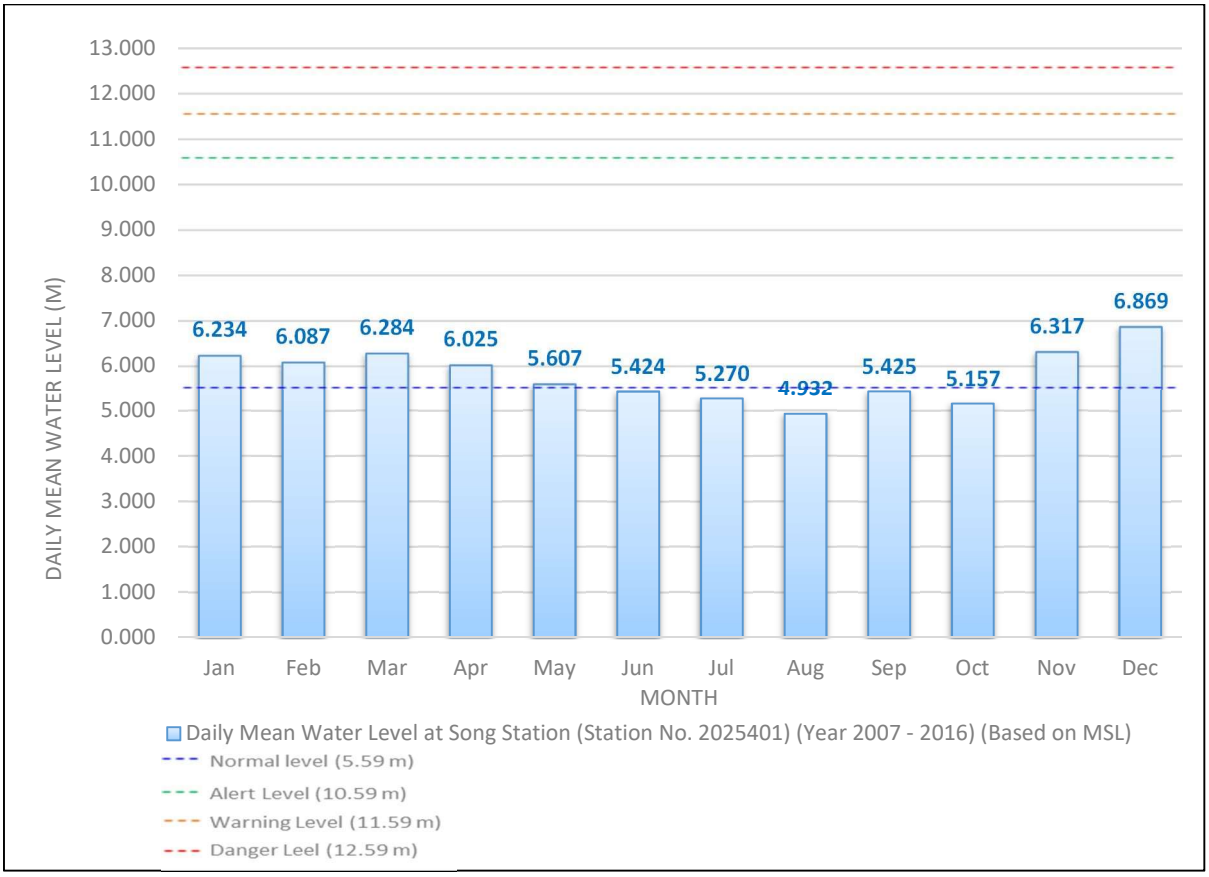


Figure 3.4(b) Daily Mean Water Levels at Song Station



Nanga Mukeh Station (Katibas River Catchment)

The Nanga Mukeh Station is located about 30 km upstream of the Song Station and the Nanga Mukeh catchment area is 2,272.7 km^2.

Based on the 10-year water level records at Nanga Mukeh Station from year 2007 to 2016, the daily mean water levels mainly ranged from 2.252 m (AL) to 3.471 m (AL), with the minimum and maximum recorded level of 0.809 m (AL) (extreme drought level) and 14.585 m (AL) (extreme flood level). **Figure 3.5** shows the high-low plot of average monthly water levels at Nanga Mukeh Station. The annual maximum variation of water levels is between 6.273 m and 13.157 m.

The mean, minimum and maximum daily water discharge at Nanga Mukeh for 1991-1994 is shown in **Table 3.5**.

Figure 3.5 High-Low of the Average Monthly Water Level at Nanga Mukeh Station (Year 2007 – 2016)

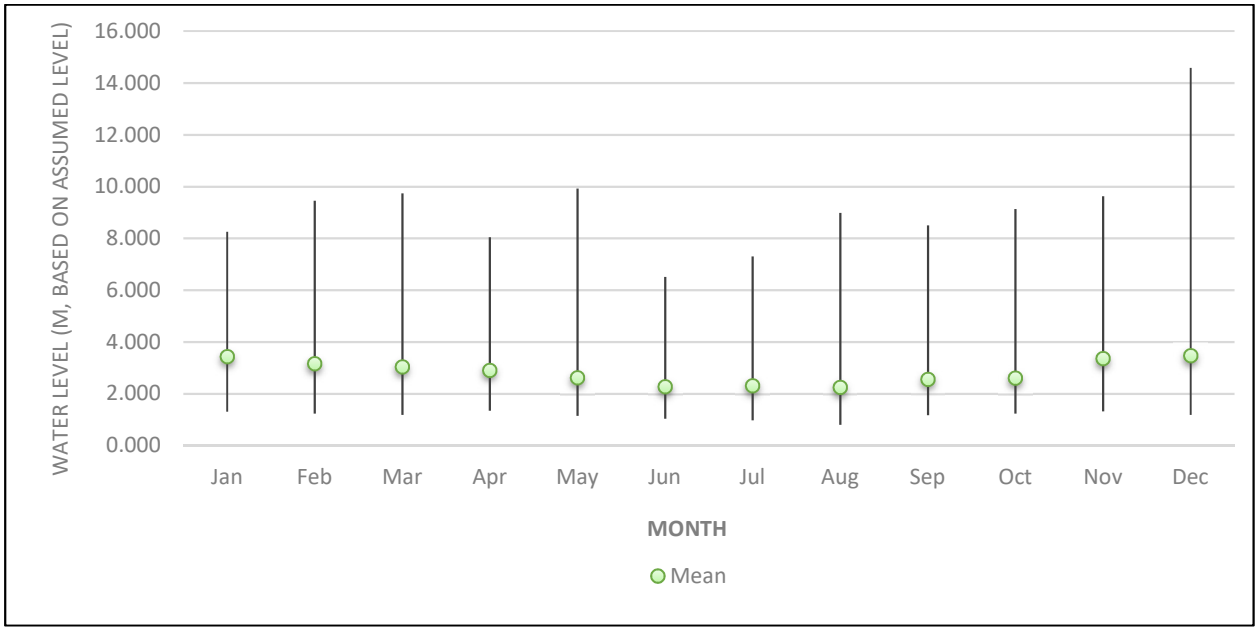
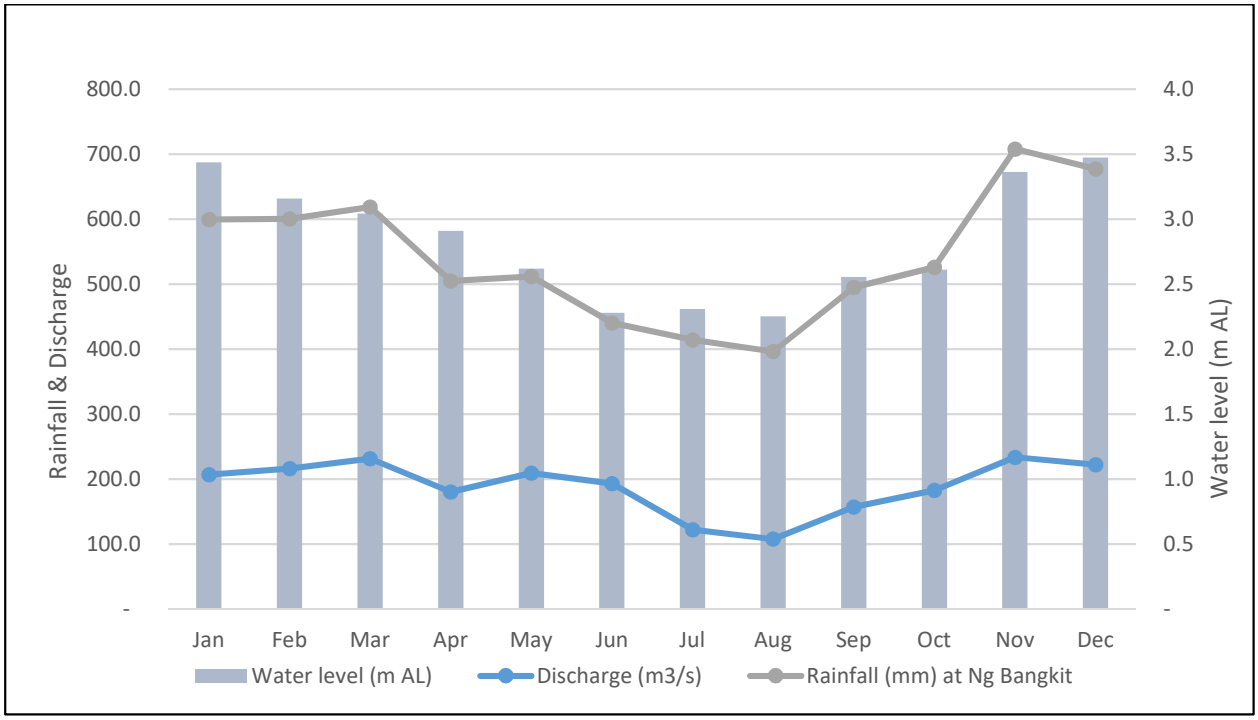


Table 3.5 Mean, Minimum and Maximum Daily River Discharge at Nanga Mukeh Station, Sg Katibas (Year 1991 – 1994)

Year	Mean (m^3/s)	Minimum (m^3/s)	Maximum (m^3/s)
1991	133.89	4.63	533.40
1992	219.27	29.27	1,802.45
1993	167.67	19.88	1,207.30
1994	234.97	25.02	2,138.80

Figure 3.6 shows the relation between rainfall (Nanga Bangkit), water level and discharge for Nanga Mukeh Station. As there is no rainfall station at Nanga Mukeh, Nanga Bangkit rainfall station is the nearest station within the same river system, i.e. Sungai Katibas.

Figure 3.6 Mean Daily Rainfalls (Ng Bangkit), Mean Daily Water Level and Mean Daily Discharge at Nanga Mukeh



It is observed that there are similar trends between the rainfall the discharge and the water level. When the amount of rainfall increases over the years, the discharge rate and water level also increase, and vice versa.

From the findings above, there is high variability in river level in the Study Area. The implication of flash flood:

i. Seedlings, young crops or trees are vulnerable to floods;

ii. Longhouses are usually built high up at the valley due to flash flood occurrences in the area and the longhouses communities would have to walk far to the jetty;

iii. A fix jetty may not be possible as the water level would rise up during flash flood

iv. Evacuation of heavy product may need energy and hard labour;

v. Planting of crops or trees would have to be high up to avoid being damaged by flood.

3.1.2.4 Water Quality

The water quality data for the Study Area was extracted from two Environmental Impact Assessment (EIA) Reports carried out for the Pasin FMU and Woodley FMU, i.e.

i. EIA Report for the Proposed Re-Entry Timber Harvesting within Coupes 07AR to 11AR under Forest Timber Licence No. T/3135 in the Upper Bangkit-Sg Tekalit-Sg Gaat Area, Kapit Division, Sarawak (Pasin Sdn Bhd, 2014), and

ii. EIA Report for the Re-Entry Logging within Coupes 05A to 08A under the Forest Timber Licence No. T/3346 in the Sg Katibas-Sg Tekalit-Sg Bangkit Area, Kapit Division, Sarawak (Woodley Sdn Bhd, 2014).

The location of the water sampling points is shown in **Figure 3.2** and the water quality results are tabulated in **Table 3.6**.

Table 3.6 Water Quality Results

Water Quality Parameters		Pasin FMU Report			Woodley FMU Report		
		PSN1	PSN2	PSN3	WLY1	WLY2	WLY3
In situ Analyses							
pH	mg/l	6.9	7.0	6.7	6.9	7.0	6.7
DO	mg/l	6.5	6.6	6.6	5.5	5.1	5.3
Laboratory Analyses							
BOD	mg/l	3	3	3	3	3	3
COD	mg/l	15	15	20	14	15	18
TSS	mg/l	4	5	5	29	7	3
TDS	mg/l	12	15	14	10	12	27
AN	mg/l	0.06	0.06	0.05	0.04	0.02	0.06
NO_3-N	mg/l	0.1	0.2	ND (<0.1)	0.1	0.1	0.1
P	mg/l	0.03	0.08	0.07	0.03	0.02	0.07
TCC	MPN/100ml	23	240	23	1600	1600	7
TFC	MPN/100ml	13	130	5	24	17	<2
O&G	mg/l	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)

In general, the water quality within the Study Area exhibited weak acidic to neutral pH levels (pH6.7 – pH7.0), and to contain moderately high dissolved oxygen (5.1 mg/l – 6.6 mg/l), based on *in situ* testing. Laboratory analyses carried out for the water samples showed moderately low biochemical oxygen demand (BOD) (3 mg/l) and chemical

oxygen demand (COD) (14 mg/l – 20 mg/l), indicating moderately low loading of both biodegradable and refractory organic compounds in the rivers.

Low to moderately low total suspended solids (TSS) (3 mg/l – 29 mg/l) reported indicated relatively low content of inorganic or organic particles in the waters. Low total dissolved solids (TDS) (10 mg/l – 27 mg/l) in all the water samples suggested low amount of nutrients, salts or impurities in the waters.

The reported low levels of ammoniacal nitrogen (0.02 mg/l – 0.06 mg/l) indicated that there was no significant or alarming sewage or animal waste or fertilizer contamination. Ammoniacal nitrogen is oxidized to form nitrates under aerobic condition. Nitrate poisoning in infant animals, including humans, can cause serious problems and even death. A limit of 10 mg/l (as nitrogen) has been imposed on drinking water to prevent nitrate poisoning in infants. The low nitrate level detected (<0.1 mg/l – 0.2 mg/l) and the low phosphorus (0.02 mg/l – 0.08 mg/l) suggested that the waters within the Study Area was not polluted by detergents or washing liquids, sewage discharge or fertilizers.

Microbiological analyses carried out for total coliform count (TCC) and total faecal coliform (TFC) showed low to moderately low coliforms in the waters. This further suggested that human or animal wastes pollution in the rivers was minimal. Oil and grease were not detected in all the water samples.

As a conclusion, the water quality of the rivers in the Study Area was reported to be moderately good with results most comparable to Class I and Class IIB of the National Water Quality Standards (NWQS) for Malaysia.

3.2 BIOLOGICAL ENVIRONMENT

The biological environment of the Study Area is assessed based on the secondary information obtained from the EIA Reports prepared for the re-entry timber harvesting of Forest Timber Licence nos. T/3035 and T/3346; as well as observation made during the field surveys to the longhouses.

3.2.1 Vegetation

The Study Area is covered with two major forest types i.e. secondary forest and mixed dipterocarp forest (**Figure 3.7**).

3.2.1.1 Secondary Forest

The secondary forests are largely found along the main rivers and logging roads near to local settlements. These are essentially forest regrowth from ex-shifting agricultural lands and heavily logged/disturbed areas.

The dominant trees species within the secondary forests are mainly light demanding pioneer species from the Families Cluciaceae (e.g. *Callophyllum* and *Garcinia*), Euphorbiaceae (e.g. *Croton*, *Glochidion*, *Macaranga* and *Mallotus*), Fabaceae (e.g. *Acacia* and *Cassia*), Melastomataceae (e.g. *Melastoma* and *Memecylon*), Moraceae (e.g. *Artocarpus* and *Ficus*), Myrtaceae (e.g. *Syzygium*), Rubiaceae (e.g. *Ixora*, *Neolamarckia* and *Neonauclea*), Sonneratiaceae (e.g. *Duabanga*) and Verbenaceae (e.g. *Clerodendrum* and *Vitex*).

The local people had also planted various fruit trees within the shifting agriculture lands and these include durian (*Durio zibethinus*), nangka (Artocarpus heterophyllus), cempedak (*Artocarpus integer*), assam (*Mangifera* spp.), rambutan (*Nephelium lappaceum*) and terap (*Artocarpus elasticus*).

3.2.1.2 Mixed Dipterocarp Forest

The mixed dipterocarp forests are largely found in the interior upriver areas. Most of this forest type had been subjected to at least one cycle of timber harvesting. Effects of past logging operation were evident as the once dense emergent canopy layer had been reduced to an open and uneven structure, more obvious in areas with gentle and moderate slopes.

Members of the family Dipterocarpaceae remained the dominant tree group, these include *Dipterocarpus oblongifolius* (Ensurai), *Dipterocarpus pachyphyllus* (keruing sol padi), *Dipterocarpus verrucosus* (keruing), *Hopea* sp. (luis), *Parashorea* spp. (urat mata),

Shorea beccariana (meranti langgai), *Shorea flaviflora* (selangan merah), *Shorea laxa* (lun), *Shorea macrobalanos* (melapi), *Shorea macrophylla* (engkabang jantong), Shorea myrionerva (meranti sepit undang), *Shorea parvifolia* (meranti sarang punai), *Shorea pauciflora* (nemesu), *Shorea seminis* (tegelam) and *Vatica umbonata* (resak).

Non-dipterocarps were equally common, and included species of *Aglaia* spp. (segera), *Cratoxylum* spp. (geronggang), *Duabanga moluccana* (sawih), *Dysoxylum* sp. (segera), *Elateriospermum tapos* (perah), *Garcinia* spp. (kandis), *Koompassia excels* (tapang), *Koompassia malacensis* (menggris), *Knema* spp. (kumpang), *Lasianthus* spp. (sabra bubu), *Lophopetalum* spp. (perupok), *Madhuca* sp. (nyatoh), *Melanochyla* spp. (rengas), *Millettia* spp. (kedang belum), *Myristica* spp. (kumpang), *Neolamarckia cadamba* (kelampayan), *Palaquium* spp. (nyatoh), *Pometia pinnata* (kasai), *Santiria* sp. (seladah), *Saraca hullettii* (babai), *Swintonia* spp. (pitoh), *Syzygium* sp. (ubah) and *Xanthophyllum* spp. (nyalin).

3.2.1.3 Protected Flora Species

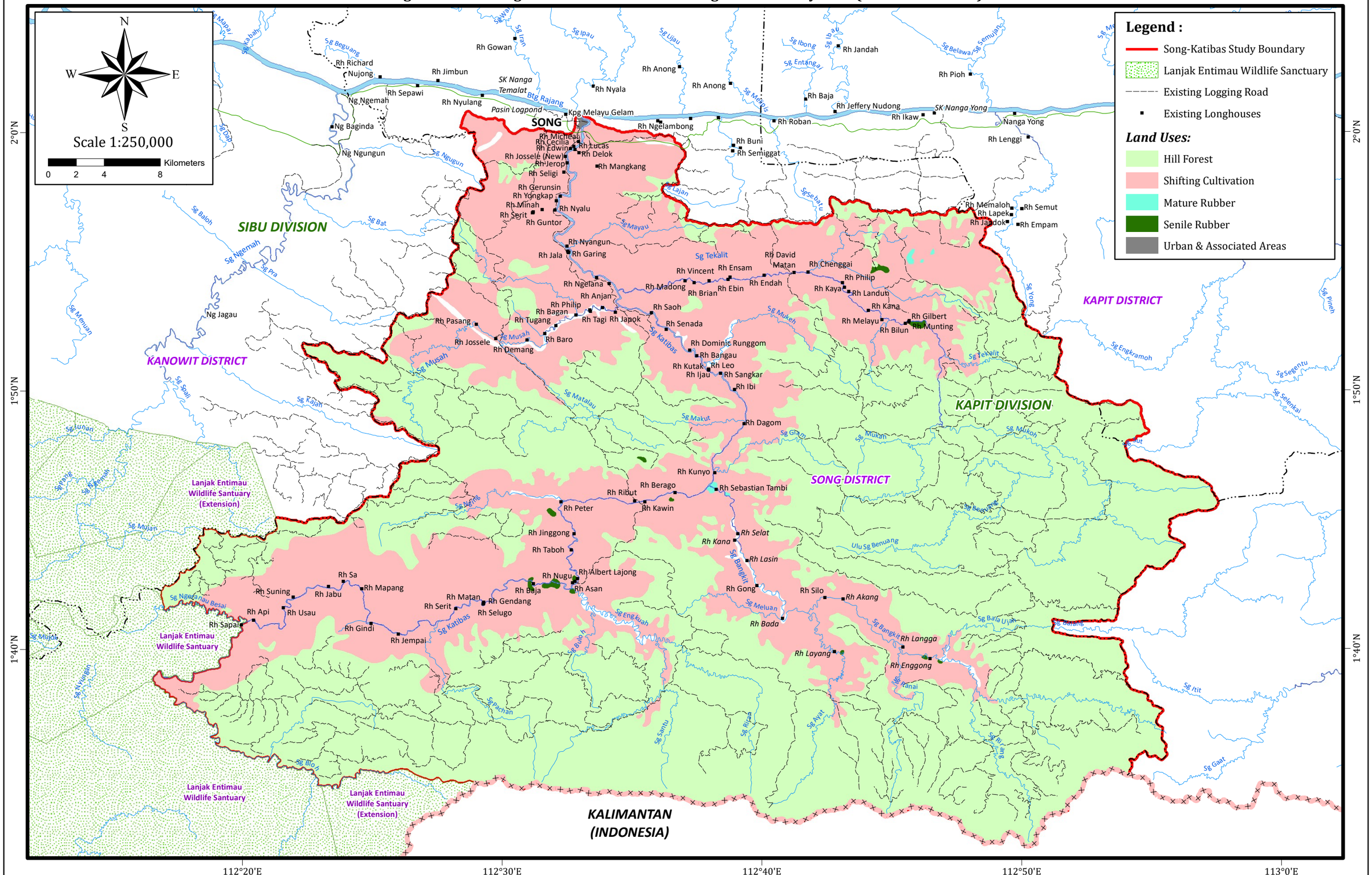
The list of flora species that may be found within the Study Area and are protected under the Sarawak Wild Life Protection Ordinance 1998 is shown in **Table 3.7** below.

Table 3.7 Protected Flora Species that may be found within the Study Area

No.	Family	Species*	Common Name	Protection Status**
1	Annonaceae	*Goniothalamus velutinus*	Kayu hujan panas	P
2	Begoniaceae	*Begonia spp.*	Riang	P
3	Dipterocarpaceae	*Dipterocarpus oblongifolius*	Ensurai	TP
4	Dipterocarpaceae	*Shorea macrophylla*	Engkabang jantong	P
5	Fabaceae	*Koompassia excels*	Tapang	P
6	Fabaceae	*Koompassia malaccensis*	Menggris	P
7	Gesneriaceae	*Cyrtandra spp.*	Melabab	P
8	Moraceae	*Ficus bruneiensis*	Tempan rusa	P
9	Moraceae	*Ficus fistulosa*	Engkaruroh	P
10	Moraceae	*Ficus geocharis*	Entimau	P
11	Moraceae	*Ficus grossularioides*	Lengkan	P
12	Moraceae	*Ficus megaleia*	Entimau	P
13	Moraceae	*Ficus uncinata*	Entimau	P
14	Orchidaceae	*Grammatophyllum speciosum*	Wild orchid	P

** Sources:- Woodley Sdn Bhd, 2014; Pasin Sdn Bhd, 2014.*
*** Status accorded under Wild Life Protection Ordinance 1998: P = Protected; TP = Totally Protected.*

Figure 3.7 Shifting Cultivation Area within Song-Katibas Study Area (Year 1975 - 1977)



Source: Land & Survey Department, Sarawak 1975-1977, Series No.22, Edition 2, Sheet NA49-11 and NA49-12, Scale 1:250,000

Map Projection : Geographic (Latitude/Longitude)
Datum : WGS84

Distribution of the existing vegetation reflected that part of the Study Area's natural ecosystem has been altered by human activities. Both small scale (shifting cultivation) and large scale (timber harvesting & plantation operation) land clearing activities have contributed to the alteration of the natural ecosystem, however effect from the latter will be greater than the former. Currently, it is believed that the hilly and rugged areas of the mixed dipterocarp forest remain intact. Due to complex and dangerous geographical landscape, the hilly and rugged areas are difficult to access and clear and thus making it unattractive for any form of land clearing activities. Nevertheless, with the improvement of technology the circumstance may change.

The alteration of natural ecosystem has affected the lifestyle of the communities and land use pattern in the Study Area. The intact mixed dipterocarp forest is supposed to be the forest produce collecting site and hunting ground of the longhouse communities. Absence of man-made disturbance has secured the biodiversity of the environment to act as the longhouse communities' resource centre. Therefore, the longhouse communities are forced into steeper marginal lands for foods and resource harvesting. On the other hand, the presence of fruit trees in secondary forest has shown that the longhouse communities is adapting to the scarcity of lands within the Study Area. Instead of clearing new land for agricultural purpose, the longhouse communities have chosen to cultivate crops on secondary forest lands. With the detection of a numbers of protected and totally protected flora species, it is important that any planned activities in the Study Area cherish the high conservation value of the Study Area.

Interventions to be introduced and implemented within the Study Area should prioritize the conservation of the endangered flora species. It is also important that the transformation of forest areas within the Study Area will not discriminate the traditional land use pattern of the longhouse communities and reduce the success rate of longhouse communities to harvest food and resources from the forest areas.

3.2.2 Wildlife

It was reported that the secondary forest harbours less wildlife than the mixed dipterocarp forest. The species of mammals and birds that have been reported from within the Study Area and their protection status under the Sarawak Wild Life Protection Ordinance 1998 are shown in **Table 3.8** below. Other wildlife reported from the Study Area includes reptile and amphibians. The reported snakes include pythons, Wagler's vipers, pit vipers, whip-snake, striped bronze-backed tree snake, elapids (*Elaphe taeniura*), krait (*Bungarus fasciatus*) and the paradise tree snakes. The reptiles reported by the locals included the spiny hill terrapins, flat-shelled turtles (*Notochelys* sp.), the brown tortoise (*Manouria* sp.), soft shell turtles or labi-labi, geckos, flying

lizards, tree monitor lizards and tree skinks (Pasin Sdn Bhd, 2014; Woodley Sdn Bhd, 2014).

Table 3.8 Species of Mammals and Birds Reported from the Study Area and their Protection Status

No.	Family	Species*	Common Name	Protection Status**
A	***Mammal***			
1	Hylobatidae	*Hylobates muelleri*	Bornean gibbon	TP
2	Ceropithecidae	*Macaca nemestrina*	Pig-tailed macaque	P
3	Ceropithecidae	*Macaca fascicularis*	Long-tailed macaque	P
4	Felidae	*Neofelis nebulosa*	Clouded leopard	P
5	Manidae	*Manis javanica*	Pangolin	P
6	Suidae	*Sus barbatus*	Wild boar	P
7	Cerninae	*Rusa unicolor*	Sambar deer	P
8	Cervidae	*Muntiacus muntjac*	Barking deer	-
9	Tragulidae	*Tragulus javanicus*	Mouse deer	-
B	***Bird***			
1	Phasianidae	*Argusianus argus*	Argus pheasant	TP
2	Bucerotidae	*Buceros vigil*	Helmeted hornbill	TP
3	Bucerotidae	*Buceros rhinoceros*	Rhinoceros hornbill	TP
4	Pycnonotidae	*Pycnonotus zeylanicus*	Straw-headed bulbul	TP
5	Acciptridae	*Nisaetus limnaeetus*	Changeable hawk-eagle	P
6	Monarchidae	*Terpsiphone paradisi*	Asian paradise flycatcher	P
7	Picidae	(Unidentified)	Woodpecker	P
8	Muscicapidae	*Copsychus malabaricus*	White-rumped shama	P
9	Muscicapidae	*Copsychus sualaris*	Oriental magpie robin	-
10	Cisticolodae	*Orthotomus sericeus*	rufous-tailed tailorbird	-
11	Chloropseidae	*Chloropsis cochinchinensis*	Blue-winged leafbird	-
12	Nectariniidae	*Arachnothera spp.*	Spiderhunter	-

** Sources:*

- *Woodley Sdn Bhd, (2014). EIA for the Re-Entry Logging within Coupes 05A to 08A under the Forest Timber Licence No. T/3346 in the Sg Katibas – Sg Tekalit – Sg Bangkit area, Kapit Division, Sarawak.*
- *Pasin Sdn Bhd, (2014). EIA for the Proposed Re-Entry Timber Harvesting within Coupes 07AR to 11AR under Forest Timber Licence No. T/3135 in the Upper Sg Bangkit – Sg Tekalit – Sg Gaat Area, Kapit Division, Sarawak.*

*** Status accorded under Sarawak Wild Life Protection Ordinance 1998: P = Protected; TP = Totally Protected.*

Amphibians reported were represented by species of *Rana*, *Bufo*, *Amolops, Ansonia*, *Microphyla*, *Pedostibes*, and *Rhacophorus*. The most common frogs were *R. blythii* and *R. chalconota*. Species of aquatic wildlife reported include Adong *(Hampala macrolepidota*), Bantak (*Puntius* sp.), Baung (*Mystus baramensis*), Empurau (*Tor*

tambroides), Labang (*Panagsius nieuwenhussii*), Lajong (*Kryptopterus cryptopterus*), Patin (*Pangasius hypophthalmus*), Palau (*Osteochilus vattatus*), Semah (*Tor douronensis*), Seluang (*Rasbora tornieri*), Tapah (*Wallago attu*), Tengadak (*Puntius schwanenfeldii*), and the freshwater crabs (*Parathelphusa maculata*) and *Caridina* shrimps.

Presence of undisturbed mixed dipterocarp forest in the Study Area and partially belong to LEWS has made part of the Study Area a suitable habitat for numerous wildlife. Some of the wildlife is culturally significant or crucial for the survival of the Iban community. In term of cultural aspects, wildlife such as hornbill and orangutan are seen to possess divine power or relate to the origin of the Iban community. Furthermore, for a community that does not practice poultry farming extensively, hunting wildlife became an important source of protein for the Iban community. Usually large mammals such as wild boar and deer as well as different varieties of freshwater fishes are the foremost preference of the hunters and fishers. However, at times when the presence of large mammals and freshwater fishes respectively decreased due to ending of fruiting season and fluctuation of river hydrology, the attention of the communities will turn to birds, amphibians and small mammals. Hence, the decline of wildlife in the Study Area will negatively impact the self-identity and health of the communities.

The existence of abundant rare wildlife species in the Study Area which some of them can only be found in Borneo Island will cause the Study Area to become poachers' illegal hunting ground. The poachers may be Malaysian or Indonesian who came from Kalimantan that trespassed Malaysia-Indonesia international border into the Study Area. Poachers will illegally hunt rare wildlife species in exchange for money from irresponsible buyers who believe in the medicinal value of wildlife or immoral collectors who love to collect wildlife trophies. There will also be poachers who see hunting wildlife as a form of sport.

To effectively conserve wildlife in the Study Area, it is important that the longhouse communities are informed and guided with sustainable measures when they are conducting hunting activities. This is to ensure the wildlife is protected while at the same time maintaining the longhouse communities' protein supply and preserving the hunting culture of Iban communities. In addition, longhouse communities should be included in any programme or task force that was implemented to curb poaching in the Study Area. With the continuous presence of the longhouse communities around the Study Area and contribution of traditional knowledge it is believed that the effectiveness to ward off and track down poachers can be significantly enhanced.

3.3 HUMAN ENVIRONMENT

3.3.1 Land uses

3.3.1.1 Historical Land Uses

Shifting Cultivation and Native Farming

Examination of Land and Survey Department 1:50,000 scale map series T735 Sheets 1/112/2-1/112/8 with reliability of year 1962-1964 shows the Study Area to be predominantly jungled with some areas of hill paddy cultivation and secondary jungle (likely to be area cleared for hill paddy cultivation and was in the fallow period) spreading up to 3-5 km along the major rivers. Later Land and Survey Department 1:250,000 map Sarawak Series No. 22 Sheet NA49-11 and NA49-12 with 1975-1977 reliability documented existence of hill forest with tracts of shifting cultivation along the major rivers, and minor pockets of cropping of rubber, mixed horticulture, etc. near the rivers (**Figure 3.7**).

Plate 4: Vegetables garden

Timber Harvesting

Forest timber licences were issued in the 1970s in the region and covered most part of the Song-Katibas area. In the post 2000 period, they included T/3135 (Pasin Sdn Bhd), T/3249 and T/3346 (Woodley Sdn Bhd), T/3400 or T/3491 (Tanjong Manis Holdings Sdn Bhd), T/0040 (Ta Ann Plywood Sdn Bhd), and T/3409 (Bigwood Sdn Bhd). The Lanjak Entimau Wildlife Sanctuary at the upstream end of Sg Katibas, past Sg Bloh, was spared from logging.

Forest Plantations

In 1998, Licence for Planted Forest (under LPF/0010) was issued to Ta Ann Plywood Sdn Bhd for 60 years i.e. 8/12/1998 – 7/12/2058), and it covered 35% of the Study Area. The planted forest project was developed in three Divisions, namely Rejang Division (22,164 ha, west of Sg Katibas), Woodley Division (18,423 ha, east of Lower Katibas), and Pasin Division (54,393 ha, between Sg Bangkit and Upper Katibas).

3.3.1.2 Current Land Uses

Present commercial land uses within the Study Area are shown in **Figure 3.8** and listed in **Table 3.9**. Timber harvesting and forest plantation are now the major industries with some oil palm plantings, the key player being the Ta Ann Group of Companies.

Shifting Cultivation and Native Farming

Shifting cultivation and native farming still existing in pockets concentrating around the longhouse settlements in the zone fringing the major rivers is shown in **Figure 3.7**. Within these zones, the areas are spared from logging and are being utilised by the local people for siting longhouses and burial grounds, small-scale agriculture, water catchments and gathering forest resources. Common crops planted included hill padi, pepper, rubber, corn, miscellaneous fruit trees and mix of vegetables. The riparian buffers allocated by the forest and oil palm operations are also contained herein.

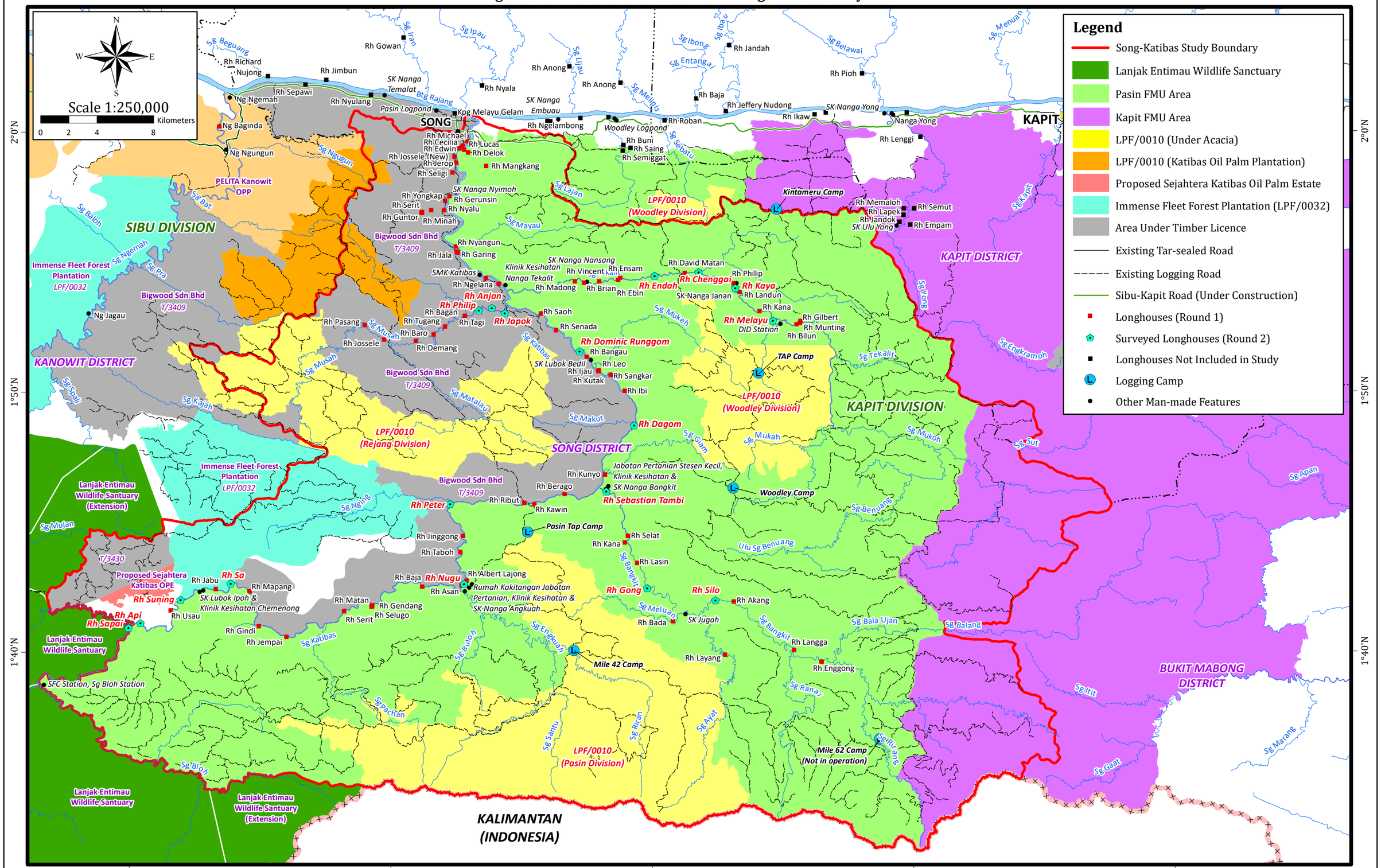
Forest Plantations

Currently, the Woodley Division and Pasin Division, east of Sg Katibas, are being amalgamated as the Pasin Forest Management Unit (FMU), and acacia planting had been carried out in two blocks, one in Woodley Division (8,653 ha) and the other in Pasin Division (27,141 ha). Another block of acacia planting is found west of Sg Katibas, in Rejang Division, totalling 12,534 ha within the Study Area. Harvesting of the first round of acacia planting had begun and the trees are about 15 years old. Re-planting of acacia for second rotation is also taking place.

Plate 5: Acacia tree

The south-eastern part of the Study Area, bordering Kapit District and Bukit Mabong District is under the Kapit Forest Management Unit, which is being managed by Tanjong Manis Holdings Sdn Bhd. This FMU extends much further eastwards. Tanjong Manis Holdings Sdn Bhd also belongs to the Ta Ann Group of Companies. Ta Ann is hence the major player in the Song Katibas area having a hold over 198,084 ha (or 80%) of the Study Area. There is another LPF at the southwestern edge of the Study Area near the LEWS, namely Immense Fleet Sdn Bhd LPF/0032 (8,525 ha of which is inside the Study Area). Immense Fleet Sdn Bhd belongs to the WTK Group of Companies.

Figure 3.8 Present Land Uses in the Song-Katibas Study Area



Basemap derived from Land & Survey Department, Sarawak 2007, Series 8, Edition 9, Scale 1:500,000

Map Projection : Geographic (Latitude/Longitude)
Datum : WGS84

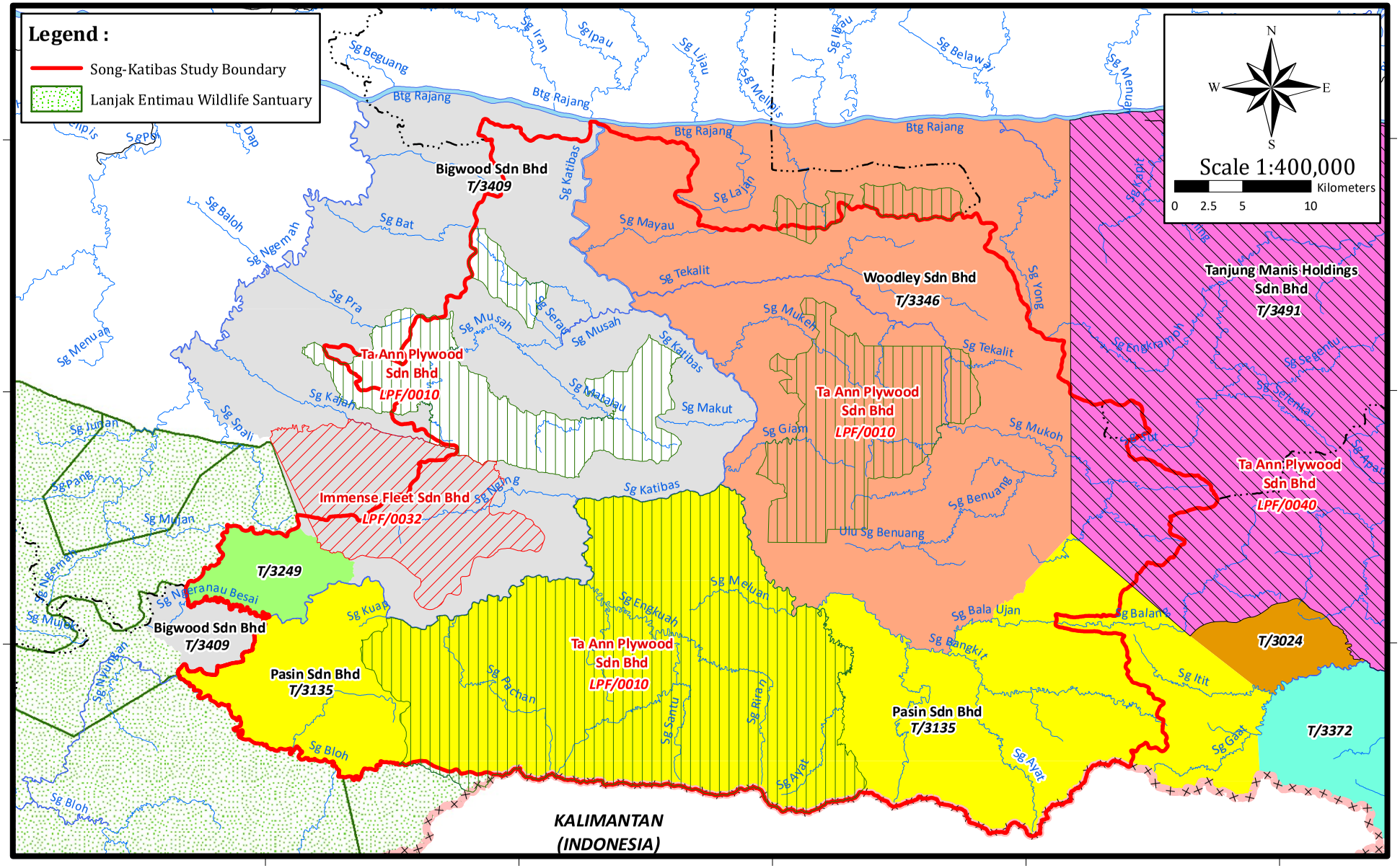
Table 3.9 Present Land Uses in the Study Area

Land Use	Description	Owner (Operator)	Area (ha) in Study Area
Oil palm plantation	Katibas Oil Palm Plantation (Licence for Planted Forest, LPF/0010 (Rejang Division), currently with 7,500 ha under oil palm extending into Ngemah area, western edge of the Study Area, but only 2,000 ha out of this is inside the Study Area	Ta Ann Plywood Sdn Bhd (Ta Ann Group)	2,000 ha
	Proposed Sejahtera Katibas Oil Palm Estate (yet to be developed)	Sejahtera Ultima Sdn Bhd	650 ha
Forest plantation	Acacia plantations under Woodley Division, Pasin Division & Rejang Division (Licence for Planted Forest, LPF/0010)	Ta Ann Plywood Sdn Bhd (Ta Ann Group)	48,328 ha (Woodley Division 8,653 ha + Pasin Division 27,141 ha + Rejang Division 12,534 ha)
	Licence for Planted Forest, LPF/0032, southwestern edge of Study Area	Immense Fleet Sdn Bhd (WTK Group)	8,525 ha
Timber harvesting	Pasin Forest Management Unit (amalgamation of Timber Licence Nos. T/3135 (Pasin Sdn Bhd) and T/3346 (Woodley Sdn Bhd))	Pasin Sdn Bhd (Ta Ann Group)	126,003 ha
	Kapit Forest Management Unit (T/3400 (T/3491 & T/0040)	Tanjong Manis Holdings Sdn Bhd (Ta Ann Group)	21,753 ha
	Forest Timber Licence area T/3409	Bigwood Sdn Bhd	31,555 ha
	Forest Timber Licence area T/3430	Sejahtera Ultima Sdn Bhd	2,700 ha

Timber Harvesting

The forest area on the western bank of Sg Katibas is largely licenced to Bigwood Sdn Bhd for timber harvesting under forest timber licence T/3409. Another timber licence T/3430 was issued to Sejahtera Ultima Sdn Bhd at Ulu Katibas, between Sg Nanyai and Sg Ngeranau, next to the LEWS (**Figure 3.9**).

Figure 3.9 Existing and Past Timber Licences and LPFs within the Song-Katibas Study Area



Basemap derived from Land & Survey Department, Sarawak 2007, Series 8, Edition 9, Scale 1:500,000

Map Projection : Geographic (Latitude/Longitude)
Datum : WGS84

Oil Palm Plantations

Currently, the Rejang Division of LPF/0010 had been planted with approximately 7,500 ha of oil palm (2,000 ha is located within the Study Area), and the palms are now 5 to 6 years old and are starting to fruit. An area of 650 ha has been alienated to Sejahtera Ultima Sdn Bhd to develop the Sejahtera Katibas Oil Palm Estate (Lot 6, Block 5, Plandok L.D., Kapit Division) near the LEWS but oil palm planting has not taken place yet.

Plate 6: Oil Palm

Generally, land use pattern in the Study Area, be it before or after the millennium are driven by the need for self-subsistence or pursuit for commercial interest. Self-subsistence involved small-scale clearing and cultivation of land by longhouse communities for shifting cultivation and native farming. The objective of the land use pattern is to produce sufficient food for the households and community instead of generating profit. Commercial interests are dominated by large-scale clearing and cultivation of land for profit-making activities like timber harvesting, forest plantation and oil palm plantation.

From the information obtained, it is suggested that the land use pattern in the Study Area is dominated by commercial interest. In other words, the area of land owned and cultivated by the longhouse communities are significantly small as compare to the land occupied by commercial interest. Under this circumstance, introducing new commercial interest in the Study Area may further reduce the availability of land for community usage. Therefore, introduction of new commercial interest in the Study Area should take note and respect the traditional land use pattern of the longhouse communities as the alteration of traditional land use pattern will have negative impact on the livelihood and disintegrate the social relationship of the longhouse communities.

3.3.2 Land Classification and Land Tenure

The Study Area is largely classified under Interior Area Land (IAL) and Reserved Land (RL) classification. A small belt of Mixed Zone Land (MZL) exists along the southern bank of the Btg Rajang spreading eastwards and westwards from Song Township. Land under Permanent Forest Estate (PFE) classification can be found at the headwaters of Ulu Sg Katibas and its tributaries as well as Ulu Sg Bangkit fringing Kapit District. They include the Katibas Bangkit PF (East) and the Baleh PF. The PFEs are classified as Reserved Land (RL). It is to be noted that the western portion of the Lanjak Entimau Wildlife Sanctuary is located within the upstream catchment of Ulu Sg Katibas i.e. bordering the southwestern boundary of the Study Area.

In terms of land tenure, State Land predominates in the Study Area. Most of the State Land had been licensed for timber harvesting or forest plantation development. Long-term forest timber licences are usually of twenty-five years tenure duration while Licence for Planted Forest (LPF) is 60 years.

Cadastral map from the Land and Survey Department Sarawak shows that Alienated Land or Titled Land is predominantly found around Song Township, forming a belt of mostly less than 2 km from the Rajang riverbank. However, immediately south of Song Township, it extends along the west bank of Sg Katibas, up to 5 km inland to Ng Nyimoh. Further upstream, only a few minor plots had been surveyed and alienated. Of the alienated area, the largest is the provisional lease issued to Sejahtera Ultima Sdn Bhd for development of the Sejahtera Katibas Oil Palm Estate, an area of 650 ha at Ulu Sg Katibas, close to Ngemah catchment.

According to the Sarawak Land Code (Chap. 81, Part II, Section 5), Native Customary Rights (NCR) can be exerted over land cleared for settlement and cultivation prior to year 1958. The extent of such settlement or cultivation is indicated in the old series of 1:50,000 T735 Land and Survey Department map having 1962-1964 reliability. Comparing these areas with later settlement and cultivation as shown in the 1:250,000 Land and Survey Department, SS. 22 map (**Figure 3.7**), it can be seen that by 1975-1977, the area had extended farther from the river bank. Even though the later settled or cultivated area may not qualify as NCR Land in legal terms, they will be subject to NCR claims. It is estimated that by 1977, the settled or subject to shifting cultivation or native farming had reached 937 km^2 (93,700 ha, 38% of the Study Area). Some of these NCR areas had been surveyed and issued with title.

3.3.3 Tourism Spots

Plate 7: River condition at Sg Tekalit

Tourism spot is a place of interest, attraction or destination whereby tourist visited for its natural or man-made wonders or attraction and cultural as well as historical values, which offers leisure, adventure and amusement.

The Study Area was granted with numerous magnificent natural assets such as waterfalls and clear rivers at Tekalit, Bangkit and upper Katibas catchments which have the potential to be developed into eco-tourism spots to attract domestic and foreign nature lovers. Moreover, to enhance the marketability of these tourism spots, they can be further advance into sites for more extreme sports such as kayak, rafting, caving, jungle trekking, trail running and others. Furthermore, at the upper Katibas catchment, there are presences of some picturesque landscapes of forests, hills and rivers which are suitable to be developed into cultural and historical tourism attractions.

Before Rh Peter was burnt down in 2010, Rh Peter was a very famous homestay attraction to foreign tourists. Rh Peter had successfully turned itself into an eco-cultural tourism spot by incorporating the magnificent natural landscape with traditional longhouse structure and Iban culture. However, most of the cultural significant possessions such as traditional costumes, musical instruments and classical longhouse were burnt down in the big fire. The loss of cultural significant possession and relocation to new site that have less natural attractions has significantly reduced the attractiveness of Rh Peter among the foreign tourist who wish to enjoy the nature and experience Iban culture.

The development of eco-tourism activities in the Study Area should be aware of the accidental or prevent intentional encroachment into LEWS. This is because Sarawak Forestry has prohibited the entry of unauthorized parties into the area to protect the highly sensitive wildlife area. The development of tourism sector in the Study Area and promotion of tourism package related to the Study Area must abide to the existing law enforce by the relevant authorities and exhibit high sensitivity to the surrounding environment of the Study Area.

CHAPTER 4

Social-Economic Profile for 92 longhouses
(Round 1)

CHAPTER 4
SOCIO-ECONOMIC PROFILE FOR 92 LONGHOUSES (ROUND 1)

4.1 SOCIO-ECONOMIC CHARACTERISTICS

4.1.1 Longhouses within Study Area

Based on the survey results, there are 92 longhouses located within and in the vicinity of the Study Area (**Figure 2.2**) and these longhouses were clustered into six groups based on the river system they were found:

- Sg Bangkit (11 longhouses)
- Sg Tekalit (19 longhouses)
- Sg Ulu Katibas (23 longhouses)
- Sg Hilir Katibas (11 longhouses)
- Sg Musah/Matalau (10 longhouses)
- Song (18 longhouses)

As part of the Social Impact Assessment (SIA) Study, a field survey was conducted to assess the socio-economic of the local communities. This Study had visited 92 longhouses found directly in the Study Area or at close proximity to the Study Area. The list of the 92 longhouses in six clusters is appended in **Appendix III**.

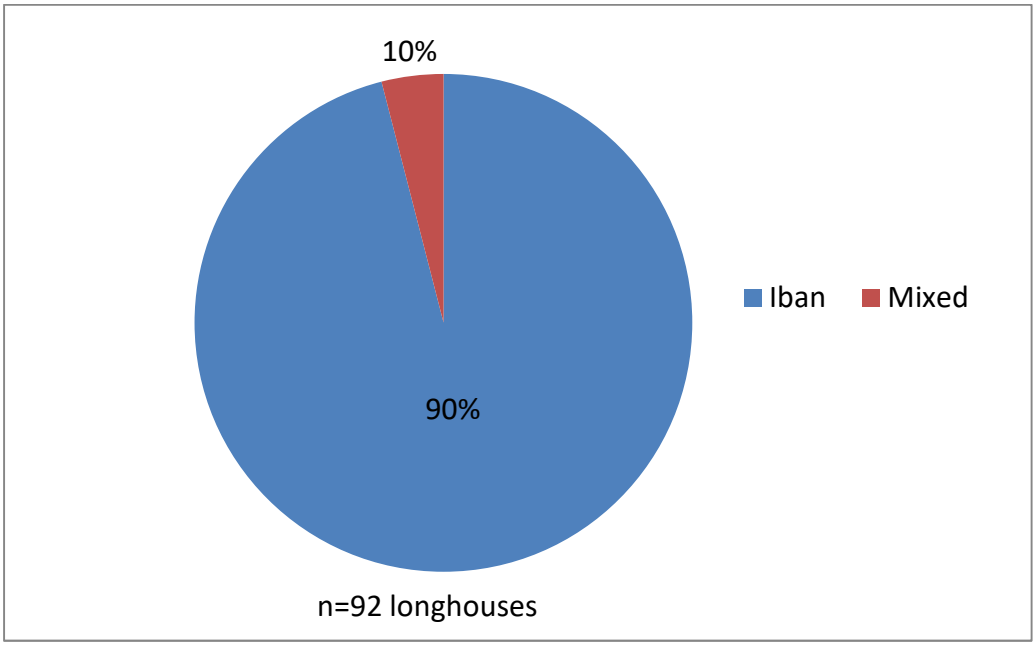
The 92 longhouses had a population size of 14,865 which equivalent to 1,857 doors. However, the actual population who reside long-term or permanently at these longhouses might be lower than the reported figure because considerable numbers of the longhouse members were staying and working outside of the Study Area. From the information obtained, the percentage of residents who reside long-term or permanently in the Study Area was 46.15% (6,754 people). The other 53.85% (7,881 people) of the residents who supposedly live in the longhouses would only return to the longhouses on special occasion.

4.2 DEMOGRAPHY FEATURES

4.2.1 Ethnicity

According to the Statistic Yearbook Sarawak 2015 (Vers 2.0), Song District was predominantly occupied by the Iban community and the survey result of this Study complies with this fact. 90% (83) of the longhouses comprised completely people of the Iban race. The other 10% (9) of the longhouses had a mixed composition of Iban as the predominant community with the presence of other ethnics such as Malay, Chinese and other indigenous groups due to mixed marriage (**Figure 4.1**).

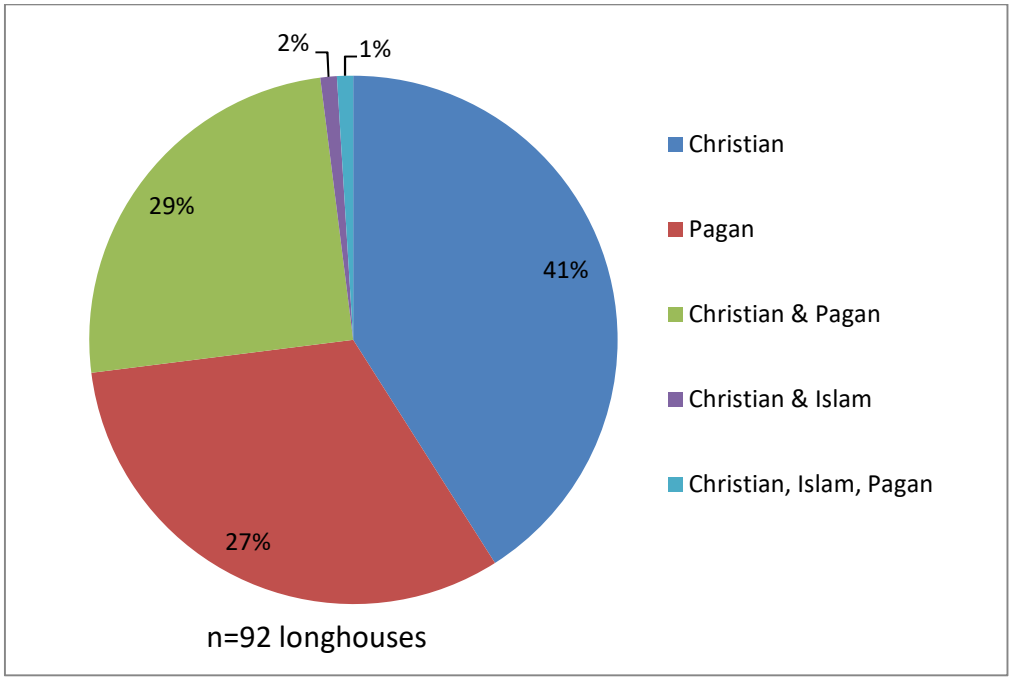
Figure 4.1 Ethnic Compositions of the Longhouses



4.2.2 Religion

Within this Study Area, 41% (38) of the longhouses embrace Christianity. Although almost half of the populations in this Study Area are Christian, traditional belief still remains important for certain numbers of longhouses. Based on the survey results, 27% (24) of the longhouses are Pagan followers. Apart from that, there are 29% (27) of longhouses that constitute both Christianity and Pagan followers. However, the breakdown of Christianity and Pagan followers in these 29% (27) longhouses are not equal, some of the longhouses had more Christian as compared to Pagan and vice versa. The remaining 3% (3) sees longhouses which had a coexistence of Christianity and Islam or Christianity, Islam and Pagan (**Figure 4.2**). In short, in descending orders Christianity, Pagan and Islam are the major religion.

Figure 4.2 Religion Compositions of the Longhouses



4.3 ACCESSIBILITY

Currently, for outsiders and Songs' communities, the river in general and the Btg Rajang in specific is still the main and commonly use entry point to and exit point from Song Division. Regular express boat service to Song Division can be obtained easily at Sibu, Kanowit and Kapit.

The main means of access to all of the 92 longhouses scattered around the Study Area are tar-sealed road, logging road or river. Nevertheless, not all of the longhouses are equally provisioned with road system. Only 17% (16) of the surveyed longhouses located at a relatively close proximity to Song Township can be accessed via tar-sealed road. 8% (7) of the longhouses within this Study Area can be reached via logging road (see **Table 4.1**). These are longhouses that previously were or currently are within close vicinity to logging, oil palm or planted forest operations. However, for logging roads which are close to abandoned logging operation areas, the road condition had degraded heavily over the years due to lack of maintenance. The majority or 75% (69) of the longhouses still rely heavily on rivers to commute between different longhouses or destinations. This is especially true for longhouse communities who reside along the lower and upper stretches of Sg Katibas, Sg Musah, Sg Tekalit and Sg Bangkit which previously were and currently are not exposed to any large scale modern economic activities. Navigation along the rivers is not an easy task because the mobility and safety of the longboats are affected by factors like shallow water level, rapids water flow, rocky beds and other natural features.

The main modes of transports to travel to the 92 longhouses are cars, 4WD vehicles or outbound engine longboat. The usage of cars only limited to longhouses near to Song Township. For longhouses communities who live near to plantation and planted forest operations they would carpool with 4WD vehicles belonging to plantation or planted forest operations with a charge of roughly RM 7 per trip. Based on the surveyed results, the majority of the doors owned a longboat but only a minority of them equipped their longboats with outbound engine. Hence, for doors that do not have outbound engine longboats, they have to rely on those who have them especially when they needed to travel to distance longhouses or Song Township. The charge of each trip would be based on the discretion and kindness of the longboats owner by taking into consideration of various tangible and intangible factors like fuel price, distance, number of passengers, fondness of relationship, urgency and others (**Figure 4.3**).

Figure 4.3 Mode of Access to the Longhouses

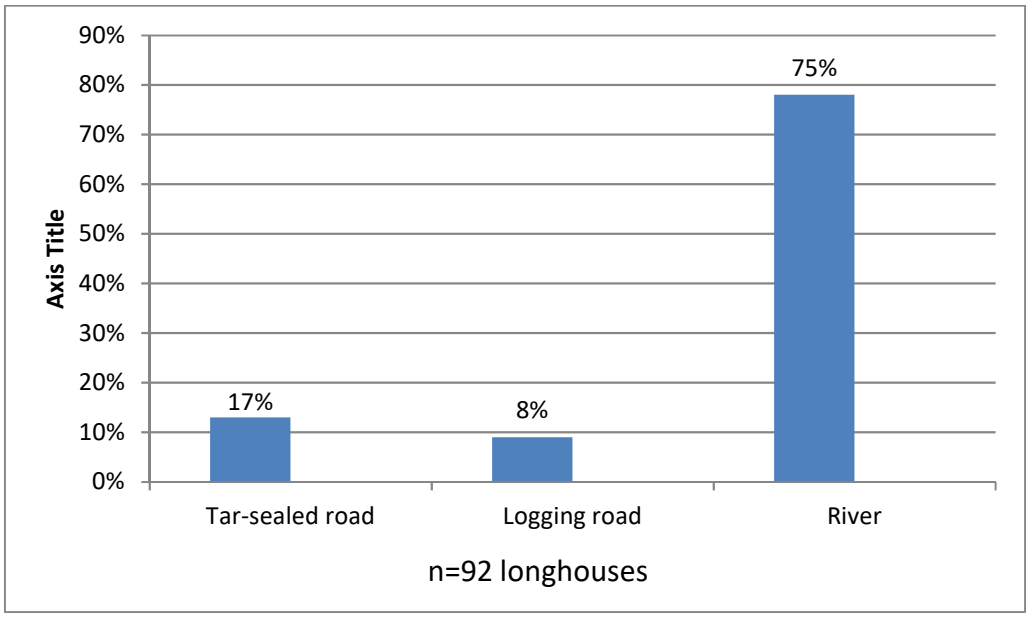


Table 4.1 Accessibility of the Longhouses

No.	Area	Name of Longhouses	Accessibility
Cluster 1: Song Area			
1	Nanga Miaw	Rh Garing	Tar-Sealed Road
2	Nanga Miaw	Rh Jala	Tar-Sealed Road
3	Hilir Katibas	Rh Nyangun	River
4	Takan	Rh Guntor	Tar-Sealed Road
5	Takan	Rh Serit	Tar-Sealed Road
6	Temkus, Sg Takan	Rh Minah	Tar-Sealed Road
7	Nanga Takan	Rh Nyalu	Tar-Sealed Road
8	Nanga Entawai	Rh Yongkap	Tar-Sealed Road

No.	Area	Name of Longhouses	Accessibility
9	Nanga Nyimoh	Rh Seligi	Tar-Sealed Road
10	Nanga Nyimoh	Rh Gerunsin	River
11	Ulu Engkabau	Rh Mangkang	River
12	Engkabau	Rh Delok	River
13	Nanga Engkabau	Rh Lucas	River
14	Kebiau, Song	Rh Cecelia	River & Tar-Sealed Road
15	Nanga Sepadi	Rh Jarop	River & Tar-Sealed Road
16	Nanga Kebiau	Rh Michael Lasu	River & Tar-Sealed Road
17	Nanga Kebiau	Rh Mohamad Edwin	River & Tar-Sealed Road
18	Nanga Rarong	Rh Garai	River & Tar-Sealed Road
Cluster 2: Sg Musah/Matalau			
1	Ulu Matalau/Nanga Setapang	Rh Pasang	Logging Road
2	Nanga Matalau	Rh Jossele	River
3	Ulu Musah	Rh Demang	River
4	Batu Ensulit	Rh Baro	River
5	Emperan Kasai	Rh Tugang	River
6	Nanga Tengangai	Rh Bagan	River
7	Rantau Pitak	Rh Tagi	River
8	Nanga Semulong	Rh Philip	River
9	Nanga Musah	Rh Anjan	River
10	Nanga Senyaro	Rh Japok	River & Tar-Sealed Road
Cluster 3: Sg Tekalit			
1	Nanga Sepunggok	Rh Gilbert	River
2	Rantau Assam, Ulu Tekalit	Rh Munting	River & Logging Road
3	Rantau Assam	Rh Bilun	River
4	Nanta Latong	Rh Melayu	River & Logging Road
5	Nanga Barok	Rh Kana	River
6	Lubok Lampah	Rh Landun	River
7	Ulu Sg Janan	Rh Kaya	River
8	Nanga Janan	Rh Philip	River
9	Ulu Janan	Rh Anchu	River
10	Rantau Ensurai	Rh Sibat	River
11	Nanga Tergangai	Rh Chenggai	River
12	Nanga Lanang	Rh David Matan	River
13	Nanga Sepayang	Rh Endah	River
14	Nanga Chupin	Rh Ensam	River
15	Nanga Chupin	Rh Ebin	River
16	Nanga Sebungkang	Rh Brian	River

No.	Area	Name of Longhouses	Accessibility
17	Nanga Nansang	Rh Vincent	River
18	Nanga Nansang	Rh Madong	River
19	Nanga Tekalit	Rh Ngelana	River & Tar-Sealed Road
Cluster 4: Sg Bangkit			
1	Ulu Bangkit	Rh Enggong	River
2	Karangan Panjang	Rh Langa	River
3	Batu Pikul	Rh Akang	River
4	Nanga Semumban	Rh Silo	River
5	Nanga Meluan	Rh Bada	River
6	Sg Ayat	Rh Layang	River & Logging Road
7	Wong Betong	Rh Gong	River
8	Nanga Nansang	Rh Lasin	River
9	Nanga Lelayang	Rh Kana	River
10	Rantau Abau	Rh Selat	River
11	Nanga Bangkit	Rh Sebastian Tambi	River
Cluster 5: Sg Katibas (Hilir)			
1	Nanga Sesibau/Pala Giam	Rh Kunyo	River
2	Nanga Makut	Rh Dagom	River
3	Batu Lobang	Rh Ibi	River
4	Nanga Benin	Rh Sangkar	River
5	Nanga Mukeh	Rh Kutak	River
6	Nanga Mukeh	Rh Leo	River
7	Nange Mukeh	Rh Ijau	River
8	Nanga Entuat	Rh Bangau	River
9	Nanga Entuat	Rh Dominin Runggom	River
10	Nanga Ujat/Nanga Entuat	Rh Senada	River
11	Nanga Banjor	Rh Saoh	River & Tar-Sealed Road
Cluster 6: Sg Katibas (Ulu)			
1	Ulu Katibas	Rh Sapai	River
2	Nanga Terusa	Rh Api	River
3	Nanga Bulo	Rh Usau	River
4	Nanga Nangai @ Nayai	Rh Suning	River
5	Nanga Chemenong	Rh Jabu	River
6	Nanga Mesau	Rh Sa	River
7	Nanga Malai	Rh Mapang	River
8	Nanga Masak	Rh Gindi	River
9	Nanga Lintang	Rh Jempai	River
10	Rantau Entimau	Rh Serit	River
11	Karangan Rangkang	Rh Selugo	River

No.	Area	Name of Longhouses	Accessibility
12	Karangan Rangkang	Rh Matan	River
13	Karangan Rangkang	Rh Gendang	River
14	Tapang Nawie, Nanga Engkuah	Rh Baja	River
15	Nanga Engkuah	Rh Assan	River
16	Nanga Sesibau, Nanga Engkuah	Rh Nugu	River & Logging Road
17	Nanga Engkuah	Rh Albert Lajong	River
18	Nanga Anchau	Rh Jinggong	River
19	Nanga Lian, Nanga Engging	Rh Peter	River
20	Nanga Kejakar	Rh Taboh	River
21	Nanga Serau	Rh Ribut	River & Logging Road
22	Nanga Pengaran	Rh Kawin	River & Logging Road
23	Nanga Tengadak/Nanga Engkaroh	Rh Berago	River

4.4 SOCIAL FACILITIES, INFRASTRUCTURES AND SERVICES

4.4.1 Schools and Educations

In the Study Area, Pre-school education was overseen by Federal Department of Community Development (KEMAS) while primary to secondary education falls under the auspice of Department of Education.

There are seven primary schools namely, SK Ng Musah, SK Ng Janam, SK Ng Bangkit, SK Tun Jugah, SK Lubok Bedil, SK Ng Engkuah and SK Luboh Ipoh found in the Study Area. On the other hand, SMK Katibas located in Ng Katibas and SMK Song located in Song Township are the only two secondary schools. The primary and secondary schools mentioned above were also boarding schools that provide accommodation facilities for their students. In the Study Area, it is very common for children and teenagers of age 7 to 18 to live in schools and only return to their homes during weekends or special occasions. This is because the location of the primary and secondary schools is usually far from majority of the longhouses for youngsters to travel daily thus it would be time and cost saving if the youngsters live in the boarding facilities instead of travelling back and forth every schooling day.

Unfortunately, pre-schools services are not available for all of the longhouses. Only children from longhouses near to the pre-school will be sent for pre-school education by their parents. This is because pre-school services shared the same buildings with some

of the primary schools which mean pre-school services are far from the majority of the longhouses. Hence, it is not conducive for parents to send their children every schooling day and it is not safe for young children to live in the boarding facilities. Primary schools with pre-schools attached to them are SK Ng Musah, SK Ng Janam and SK Ng Lubok Ipoh. In other words, only longhouses' children who live in close proximity to the three primary schools have the advantage to attend pre-school.

4.4.2 Medical Services

Two types of medical services namely Clinic and Village Health Team (VHT) are provided by Department of Health. This Study discovered that the Government was the sole provider of health services as private clinic or hospital was not found in the Study Area.

The Study Area is served by five clinics namely Song Clinic (Song Township), Tekalit Clinic (Sg Tekalit), Ng Bangkit Clinic (Sg Bangkit), Ng Engkuah Clinic (Ng Engkuah) and Chemanong Clinic (upstream of Sg Katibas). These clinics provide out-patient, maternity, childcare and dental services except Chemanong Clinic which only provide maternity, childcare and dental services. The time estimated to travel from longhouses to the clinic range from 10 minutes to 3 hours based on the distance between longhouses and clinic, means of access and mode of transport.

The longhouse communities who live at the upper Katibas region would be visited by VHT at averagely two to three times a year. The creation and implementation of VHT to provide medical check-up for distance longhouses communities who have problem travelling to clinics are to ensure their health are well taken off as well as to equip them with the latest and correct health information. In special circumstance such as disease out-breaks, the frequency of VHT visit will be increased. For cases which needed more advance medical attention, patients will be referred to Kapit or Sibu Hospital for treatment.

4.4.3 Electricity Supply

Longhouses in the Study Area acquire their electricity supply from any of these three sources namely generator, solar panel or public electricity grid. 63% (58) of the longhouses rely on generators for electricity supply. In some longhouses, certain doors have their own individual generators, but some longhouses have all of the doors sharing on communal generator. Regardless of individual or communal generator, they will only operate their generator for certain period of time which usually start from dusk and end in the midnight to save cost. Averagely, they spend about RM 22 per day to operate their generator. If generator experiencing serious faulty or broke down, the longhouses will

have no electricity supply for months because it is costly and difficult to send the generator for maintenance or repair at Song Township.

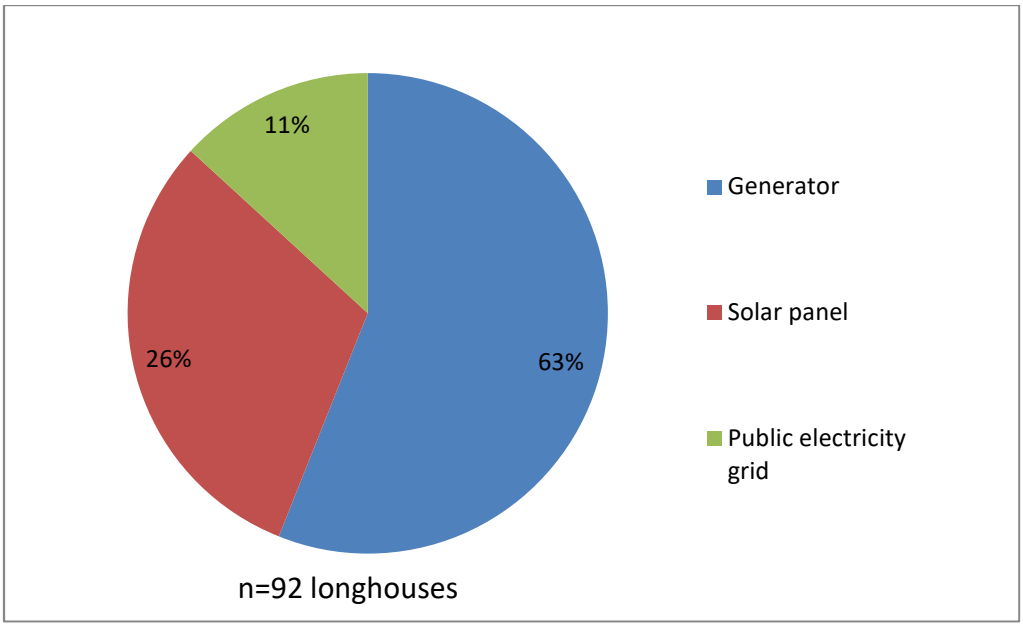
26% (24) of the longhouses in the Study Area uses solar panel, provided to them through various community development programmes. These longhouses claim that with solar panel now they are having more stable electricity supply as compared to generator and the longhouses environment is less noisy due to absence of generator operations.

Nevertheless, longhouses who use generator or solar panels as electricity source both asserted that they would experience electricity shortage during festive season or when the longhouses are having special occasions. This is because the demands for electricity increase significantly when residents who before this work or live outside of the Study Area return to their longhouses to participate in important community events. 11% (10) of the longhouses in the Study Area received electricity supply from public electricity grid. These are longhouses which can be found at close proximity to Song Township. The percentage of sources of electricity is shown in **Figure 4.4**.

4.4.4 Water Supply

Gravity feed water system, harvesting rainwater and collecting river water are the three main methods, longhouses within the Study Area used to obtain their water supply. By using these sources as their main water supply, longhouses in the Study Area obtained their water supply directly from natural resources like river and rain which usually is not treated with scientific process apart from boiling before the water is consume.

Figure 4.4 Sources of Electricity Supply



More than half of the longhouses in the Study Area obtained their water supply via gravity feed water system. This group of longhouses represents 72% (66) of the total surveyed longhouses. Longhouses located in different river systems will source their water supply from different tributaries or sub-tributaries. The survey result reveals that 70 tributaries or sub-tributaries from the six main river systems within the Study Area are the water source for each relevant longhouse. **Table 4.2** shows the tributaries and sub-tributaries within each river system.

Table 4.2 Tributaries and sub-tributaries that act as water source for gravity water feed supply

River System	Tributaries/Sub-Tributaries	
Song/Sg Lajan	• Sg Sepanyong • Nanga Katibas/Sg Nyirun • Sg Suong	• Sg Muang • Sg Sarawak • Sg Nyineoh
Song/Sg Lajan	• Sg Senpawang • Sg Setapang	• Sg Kupa
Sg Musah/Matalau	• Sg Lungu • Sg Sumong • Sg Sengkala • Sg Tapang	• Sg Sumong • Sg Satap • Sg Kara
Sg Tekalit	• Sg Pesuk • Sg Ankung • Latong Enjop • Sg Baruk • Sg Isu • Sg Landak • Sg Santung • Sg Sengkabans	• Sg Prangai • Sg Bilat • Sg Sepayang Sejau • Sg Guci • Sg Kepayang • Sg Bala • Sg Santun • Sg Nansang
Sg Bangkit	• Sg Mamcam • Sg Unau • Sg Serian • Sg Semumban • Sg Serambai • Sg Nyelang • Sg Rumah	• Sg Kerupok • Sg Ridan • Sg Nyirau • Sg Ara • Sg Sejugan • Sg Bilat
Sg Hilir Katibas	• Sg Sibau • Sg Baya • Sg Serugok • Sg Batu Lobang • Sg Sebira	• Sg Mukeh • Sg Sarau • Sg Bukau • Sg Prak • Sg Bengkai

River System	Tributaries/Sub-Tributaries	
Sg Ulu Katibas	• Sg Yuk • Sg Terusak • Sg Semanong • Sg Wong, Song • Sg Malai • Sg Tinein • Sg Kecil • Sg Nangka	• Sg Talak • Sg Senyarok • Sg Sengain • Sg Rabau • Sg Au • Sg Besigap • Sg Mayau

28% (26) of the surveyed longhouses obtained their water supply from harvesting rainwater and collecting river water. Water harvested from rain or collected from river would then be stored in water tanks provided by government or purchased by the longhouses communities. Longhouses that used these two methods will spend more time and effort in securing their water supply. Nevertheless, all of the longhouses claim that their water supply would be unstable when the river water level is low. Water shortage is also common to them during dry season (May - September) as the water supply depend on natural phenomenon like progression of river cycle and change of weather.

4.4.5 Telecommunication

79% (73) of the surveyed longhouses did not receive any telecommunication coverage. The complex physical terrain and geographical landscape in the Study Area posed logistical and financial constraint to install cellular cell tower or cable for fixed line telephone service in the interior part of the Study Area is the main factor that led to zero telecommunication coverage for these longhouses.

21% (19) of the surveyed longhouses have access to telecommunication service but it is only limited to cellular signal. Generally, longhouses that have access to cellular signal are at close proximity to Song Township. These longhouses are not provided with cellular cell tower by any telecommunication service provider, but they are able to receive cellular signal due to close proximity to Song Township that make them falls within the coverage radius of cellular cell tower in Song Township.

4.5 ECONOMIC ACTIVITIES

4.5.1 Farming Activities

Farming refers to any activities that involve growing crops and raising livestock for self-consumption and/or commercial purposes. Based on the survey results, the major crops and poultry production in the Study Area are paddy, pepper, rubber and chicken. Based on Land & Survey Department 1:250,000 land use map (SS22, Sht NA49-11 and NA49-12), with a reliability of year 1975 to 1977, the lands used for farming activities are located within the shifting cultivation areas as shown in **Figure 3.7**. In the context of purpose for participating in farming activities, 11% (10) of the longhouses responded for commercial purpose; 89% (82) of the longhouses participated in it for the need of self-consumption. The longhouses that conduct farming activities for commercial purpose were Rh Layang, Rh Lasin, Rh Kana, Rh Philip (Sg Tekalit), Rh Munting, Rh Suning, Rh Dagom, Rh Kutak, Rh Philip (Sg Musah) and Rh Tugi.

Based on the reported results, it is clearly shown that the majority of the longhouses do not sell their harvested crops. From their responses, it is known that the crop productivity was only sufficient to cater the daily need of the longhouse. In other words, the longhouses were unable to produce large amount of crops to meet internal demand and business activity concurrently though every longhouse have the interest to sell their crops to earn cash incomes.

4.5.2 Fishing Activities

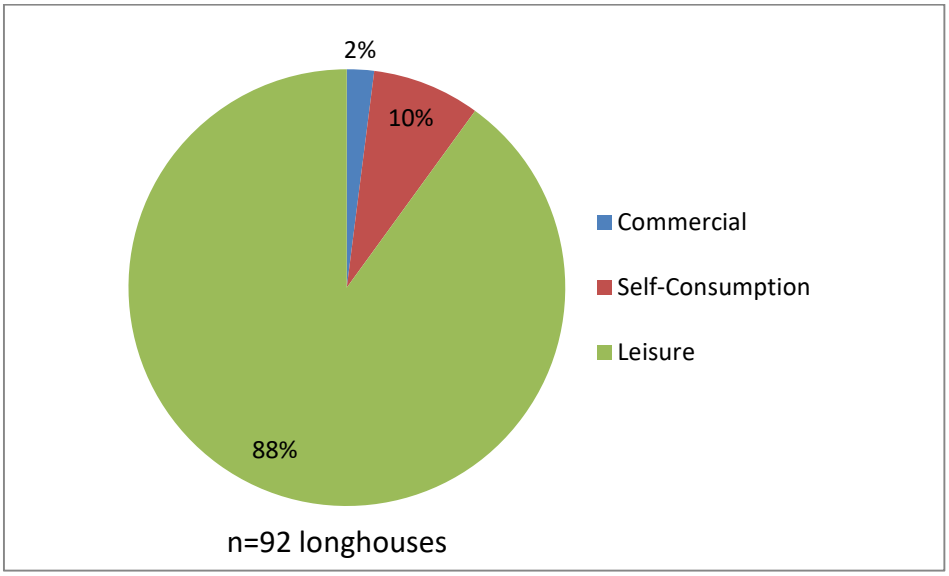
Fishing refers to any activities that involve catching fishes either for food, cash and sport. Fish species that are commonly found and caught within the Study Area are Yellow Cat Fish (*Mystus planiceps*) and Semah (*Tor dourenensis*) while at certain stretch of the main river system, there are Kulong (*Diplocheilichthys jentinkii*) and Tengadak (*Puntius schwanenfeldii*). Due to increasing difficulty to catch prawn, prawn has become a less common catch in the Study Area.

The purpose of the surveyed longhouses taking part in fishing activities can be attributed to three main factors namely commercial, self-consumption and leisure, while the percentage of longhouses that falls into each category are 2% (2), 10% (9) and 88% (81) (**Figure 4.5)**.

Longhouses in the Study Area do not see fishing as an important cash-income generating sector. Their attention is now turned to more lucrative cash-earning economic activities; these include cash crops and wage-earning employment from which part of the cash earned can be used to buy fish and meat. This is because the surveyed longhouses claimed that fishing activities is not a lucrative sector due to small

amount of fish catch. Over the time, fish stock in the Study Area are declining due to environmental degradation and over-fishing.

Figure 4.5 Purpose of Participation in Fishing Activities



Five longhouses within the Study Area are implementing 'Tagang' system – fish conservation system establish by village committee whereby indigenous fish species will be reared along protected rivers with specific set of harvest rules to optimize fish production. These five longhouses are Rh Ijau, Rh Leo, Rh Kutak, Rh Ngelena and Rh Nugu. Rh Ijau, Rh Leo and Rh Kutak jointly operate one 'Tagang' system recognize by Inland Fisheries Division. Although Rh Ngelena and Rh Nugu respectively claimed they owned a 'Tagang' system, their 'Tagang' system did not possess official recognition from Inland Fisheries Division. Furthermore, Rh Melayu, Rh Kaya, Rh Chenggai, Rh Sebastian Tambi, Rh Peter, Rh Sapai, Rh Sa and Rh Suning has aquaculture operation.

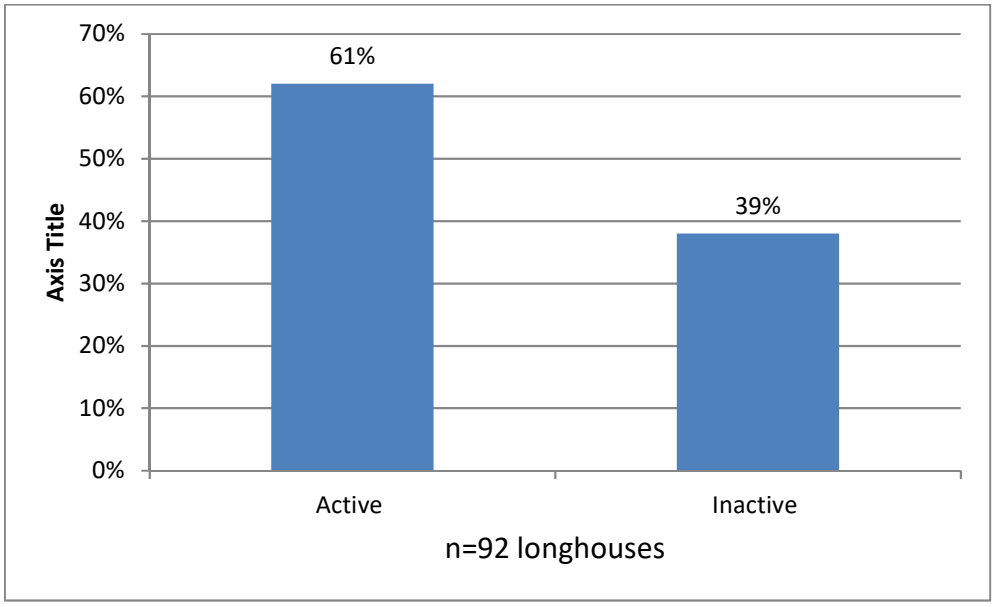
4.5.3 Collecting Forest Produce

For this Study, collecting forest produce include two activities namely harvesting plant and hunting wildlife. Based on the survey result, collecting forest product is another most widely practiced economic activities in the Study Area. Forest resources are considered as valuable community assets for the longhouse communities to sustain their livelihoods. Collection of forest plant produces are more confined to the zone nearer to the longhouse whereas the hunting area is usually further from the longhouse.

More than half or 61% (56) of the surveyed longhouses stated that they are active forest produces collector. The other 39% (36) surveyed longhouses are relatively inactive in collecting forest produce due to reason like the communal forest which surround their old settlement are far from their current settlement and less interest to collect as the stock of forest produces are declining. Nevertheless, these 39% (36) will carry out

forest produce collection during certain period such as fruiting season and mating season (**Figure 4.6**).

Figure 4.6 Participation in Collecting Forest Produce



In the context of type of forest produces collected, 64% (56) of the surveyed longhouses had a higher interest toward hunting wildlife (**Figure 4.7**). The widely hunted wild games are monkey, wild boar and deer. They revealed that the hunted animals were essentially for own consumption. However, some of them also claimed that excesses will be distributed to neighbors who are in need of meats in return for some cash. Of all the species of wildlife, wild boar has the highest contribution to the household economy.

On the other hand, 36% (36) of the longhouses state that they harvest plant produces. Rattans, firewood, timber and wild vegetable are usually collected. Rattans are mostly used to produce handicraft to be sold at different towns and furniture use in the longhouses. To save fuel, usually longhouses would rely on firewood for cooking purpose because it is difficult for them to obtain supply of liquefied natural gas cylinders. Timber will only be collected when it is needed for the repair, maintenance and building of longhouses or longboats. On the dining table of longhouse communities, wild vegetable is a common food to supply them the needed nutrition.

Based on the question posed to the surveyed longhouses they responded that hornbill, orangutan and sun bear are the rare and precious wildlife they come across when they conduct activities in the forest. The longhouses that claimed they had spotted the presence of these wildlife are shown in **Table 4.3**.

Figure 4.7 Forest Produces Commonly Collected

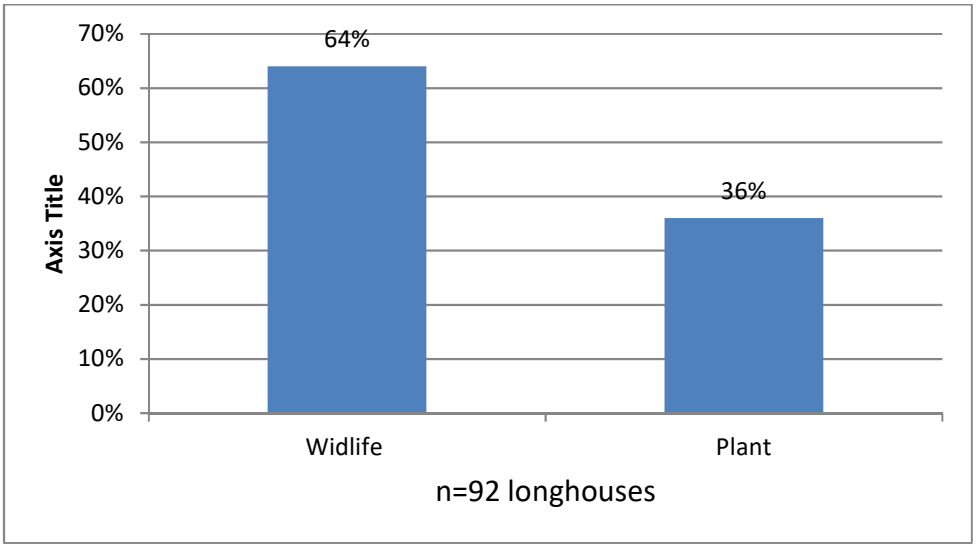


Table 4.3 Longhouses that spotted the presence of wildlife

Area	Longhouse
Sg Ulu Katibas	Rh Jabu Rh Api Rh Nugu Rh Sa Rh Mapang Rh Albert Lajong Rh Taboh Rh Assan Rh Gendang Rh Jinggong Rh Peter Rh Suning Rh Gindi Rh Jempai Rh Baja Rh Sapai Rh Serit Rh Berago
Sg Tekalit	Rh Endah Rh Chenggai Rh Brian Rh Kana Rh Kaya Rh Gilbert Rh Munting Rh Landun Rh Ensam
Sg Musah	Rh Philip Rh Anjan Rh Tagi Rh Bagan Rh Demang
Song/Lajan	Rh Delok Rh Lucas Rh Gerusin Rh Guntor Rh Nyangun
Sg Bangkit	Rh Sebastian Tambi Rh Silo Rh Gong Rh Lasin Rh Enggong Rh Langga Rh Akang
Sg Hilir Katibas	Rh Kunyo Rh Senada Rh Ijau Rh Dominic Rh Bangau Rh Sangkar Rh Ibi Rh Leo Rh Kutak

4.5.4 Small Business

Similar to fishing activities, small business is not a popular income generating sector within the Study Area. Small business in this context refers to grocery store operate and own by members of the longhouse. Out of the total surveyed longhouses, only 10% (9) of them responded that they have longhouse members operating small business in the village.

Longhouse communities in the rural area being a form of traditional society usually practice self-sufficient lifestyle. Daily needs of the longhouses especially in term of food supply can be easily obtained and fulfilled through harvesting natural resources surrounding the longhouses by farming, fishing, hunting and collecting forest produces. Hence, their demands for modern goods which are usually used by urban folks are very limited except for some necessities like salt, sugar, rice, canned food, clothes as well as demerit good like cigarette and others. Longhouses communities that do not have small business in their longhouses would travel to nearby longhouses with small business to purchase their needs. In this context, a few small businesses within the Study Area are able to meet with the demand of all of the longhouses toward modern goods.

Longhouse communities' low demands toward modern goods also explain why there is absence of outsider doing business within the Study Area. Businessperson reside outside of the Study Area perceive the Study Area as a non-profitable market with high opportunities cost. The Study Area is a small market with low demand for modern goods but businessperson entering this market need to bear high logistics and transportation cost. Furthermore, wholesale is not a favorable business strategy because small businesses from the longhouses will visit Song Township periodically to replenish their supply.

CHAPTER 5

Social-Economic Profile for 18 longhouses
(Round 2)

CHAPTER 5
SOCIO-ECONOMIC PROFILE FOR 18 LONGHOUSES (ROUND 2)

5.1 LONGHOUSES COVERED OR SURVEYED

As part of the Social Impact Assessment (SIA) Study, field surveys were conducted to assess the socio-economy of the local communities in the Song-Katibas area of Song District, Kapit Division, Sarawak, Malaysia. There are 92 longhouses that were covered during Round 1 survey, and 18 longhouses were re-visited and surveyed in Round 2 survey.

The names and locations of the 18 longhouses surveyed in Round 2 are shown in **Table 5.1** (Refer to **Figure 2.2**).

Table 5.1 Longhouses Surveyed in Round 2 Survey

No.	River cluster	Name of longhouse	Locality	GPS readings
1.	Cluster 2: Sg Musah	Rh Philip ak Geliga	Ng Semulong, Sg Musah	N 1° 53.095' E 112° 33.593'
2.		Rh Anjan ak Gaid	Ng Musah, Sg Musah	N 1° 53.191' E 112° 34.074'
3.		Rh Japok ak Ribai	Ng Senyaro, Sg Musah	N 1° 53.123' E 112° 34.507'
4.	Cluster 3: Sg Tekalit	Rh Melayu ak Angkup	Ng Latong, Sg Tekalit	N 1° 52.691' E 112° 44.823'
5.		Rh Chenggai ak Baring	Ng Tengangai, Sg Tekalit	N 1° 54.543' E 112° 41.964'
6.		Rh Kaya ak Nyelang	Rantau Pitak, Sg Tekalit	N 1° 53.960' E 112° 43.379'
7.		Rh Endah ak Kap	Ng Sepayang, Sg Tekalit	N 1° 54.426' E 112° 40.309'
8.	Cluster 4: Sg Bangkit	Rh Gong ak Kerabor	Wong Betong, Sg Bangkit	N 1° 42.409' E 112° 40.019'
9.		Rh Silo ak Bungkong	Ng Semumban, Sg Bangkit	N 1° 41.962' E 112° 42.614'
10.		Rh Sebastian Tambi ak Jugah	Ng Bangkit, Sg Bangkit	N 1° 6.145' E 112° 38.406'

No.	River cluster	Name of longhouse	Locality	GPS readings
11.	Cluster 5: Sg Katibas (Hilir)	Rh Dagom ak Sanggai	Ng Makut, Sg Katibas	N 1° 48.685' E 112° 39.510'
12.		Rh Dominic Runggom ak Jugah	Ng Entuat, Sg Katibas	N 1° 51.521' E 112° 37.434'
13.	Cluster 6: Sg Katibas (Ulu)	Rh Peter ak Jabat	Ng Nging, Sg Katibas	N 1° 45.657' E 112° 32.482'
14.		Rh Nugu ak Irang	Ng Sesibau, Sg Katibas	N 1° 42.575' E 112° 32.976'
15.		Rh Sa ak Andas	Ng Mesau, Sg Katibas	N 1° 42.598' E 112° 24.093'
16.		Rh Suning @ Sidi ak Jengging	Ng Nanyai, Sg Katibas	N 1° 41.962' E 112° 22.174'
17.		Rh Api ak Sanun	Ng Terusa, Sg Katibas	N 1° 41.085' E 112° 20.636'
18.		Rh Sapai ak Ajom	Ng Ngeranau, Sg Katibas	N 1° 40.954' E 112° 20.170'

5.1.1 Ethnicity

The communities covered in this Study are predominantly and originally Ibans living in longhouses along Sg Katibas and its tributaries in Song-Katibas area. Nonetheless, there are members of the Iban communities who married other races e.g. Malay, Chinese, Indian.

5.1.2 Current Migration

Currently, most of the able-bodied people have moved out of their longhouses and migrated elsewhere due to work or children schooling in major towns and cities. Those still staying in the longhouses are mostly school children, old folks and disabled people and most of them are not able to do hard labour and only manage to do simple farming to earn a living.

During the Round 2 survey, it was observed that the migration rate of the local people was quite high. Migration is commonly experienced in the rural communities. The able-bodied people, mostly the younger and more educated, have left the longhouses to work and search for a better living elsewhere. A lack of job opportunities relevant or equal to their education background or level contributes partly to the high migration in the Study Area. Based on Round 2 survey, 81.5% of the population of the 18 longhouses

surveyed has migrated out of the longhouse communities on a long-term basis. A total of 2,849 members who migrated out from these 18 longhouses as shown in **Table 5.2**.

Table 5.2 Migration Rate of the Surveyed Communities (Round 2)

Total population in the 18 longhouses surveyed	Actual population in the 18 longhouses	Total number migrated	Migration rate (%)
3,494	645	2,849	81.5

The main reasons for these migrations are the availability of employments outside the Study Area, and members following spouses who are working, and/or children who are schooling elsewhere. Larger towns attract the younger and educated members of the doors surveyed. Most of the migrated members from the doors surveyed were working in Song, Kapit, Kanowit, Sibu and other major towns in Sarawak such as Kuching, Bintulu, Sarikei, Sri Aman and Miri and also outside of Sarawak like Sabah, West Malaysia and even in other countries such as Papua New Guinea, etc.

5.2 COMMUNITY DEMOGRAPHY

The demographic information of the 18 surveyed longhouses in Round 2 is summarized in **Table 5.3**. The 18 surveyed communities consist mainly of Iban ethnic group. The Iban communities are either Christians or Pagan.

The number of doors and total population are indicated in **Table 5.3**. There were altogether 392 doors, and a total population of 3,494 for the 18 longhouses covered in Round 2 survey. However, based on the actual doors occupied and population present during the survey, there were only 249 doors (63.5%) occupied and 645 (18.5%) people present. It should be pointed out that the population is quite mobile due to considerable out-migration. **Figure 5.1(a)** shows the total village population recorded and the actual population present during the survey for the 18 longhouses, while the overall percentage of the total population recorded, and actual population present is shown in **Figure 5.1(b)**.

Figure 5.1(a) Total Village Population and the Actual Population Present during Survey

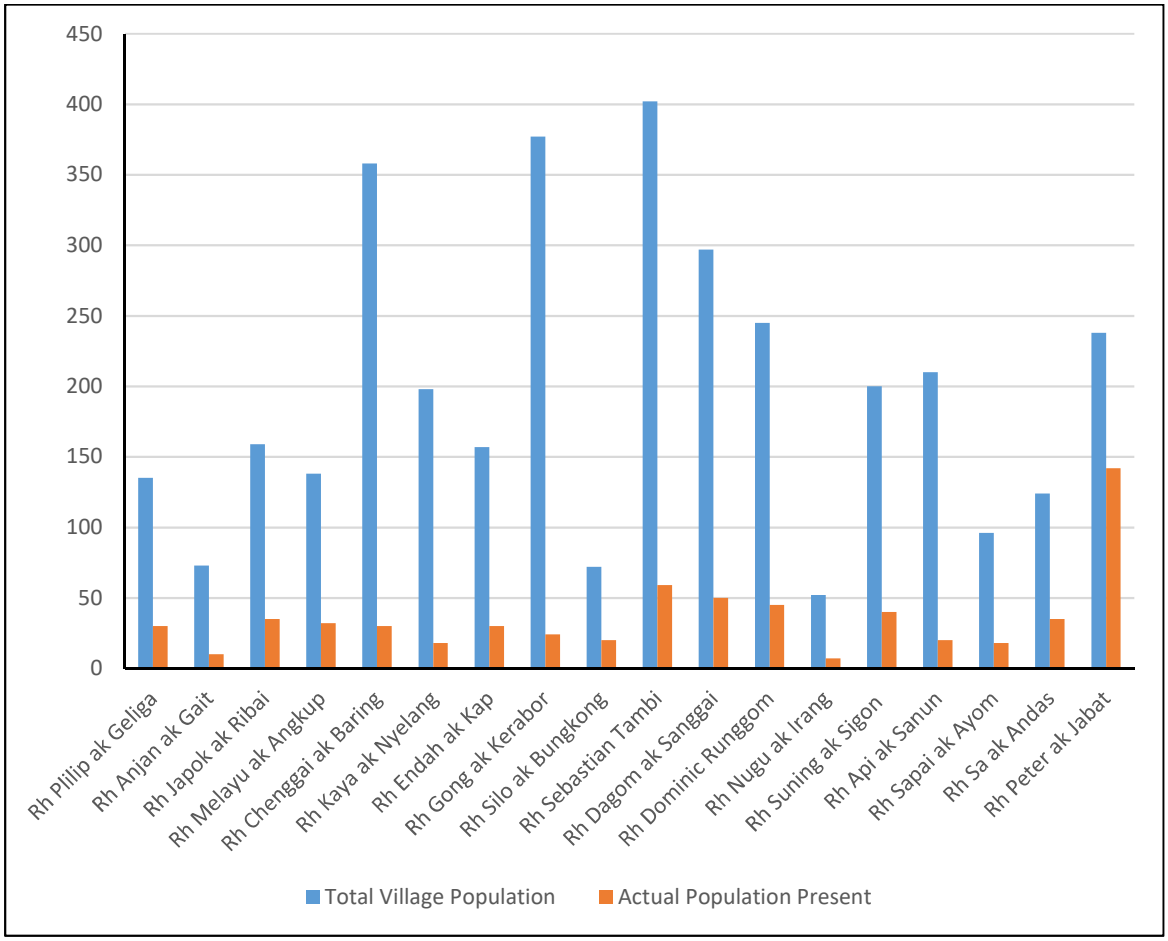


Figure 5.1(b) Overall Percentage of the Total Village Population and Actual Population Present

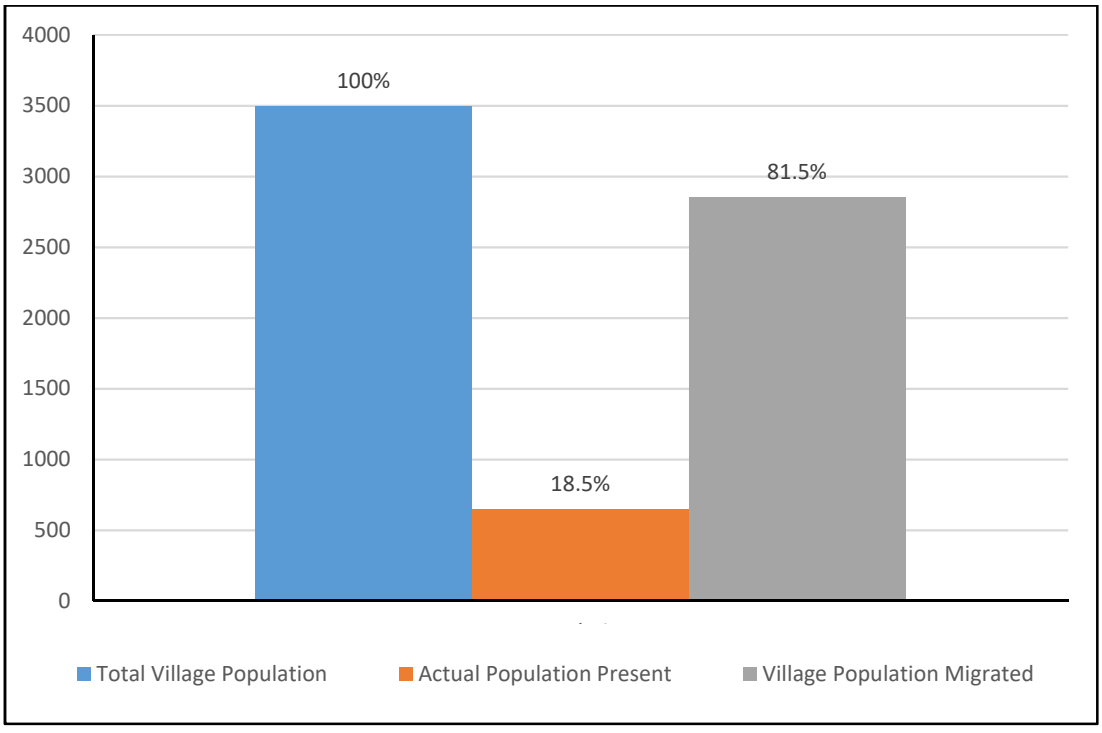


Table 5.3 Demographic Features of the Villages in the Study Area

No.	*Name of Village*	*River System*	*Locality*	*Total Village Population*	*Total No. of Doors*	*Occupied Doors*	*Number of Male Present*	*Number of Female Present*	*Actual Population Present*	*Main Ethnicity (Race)*	*Main Religion*
1.	Rh Plilip ak Geliga	Sg Musah	Rantau Pitak	124	14	10	12	18	30	Iban	50% Christian; 50% Pagan
2.	Rh Anjan ak Gait	Sg Musah	Katibas Song	73	8	5	5	5	10	Iban	Christian
3.	Rh Japok ak Ribai	Sg Musah	Ng Senyaro	159	21	21	16	19	35	Iban	Christian
4.	Rh Melayu ak Angkup	Sg Tekalit	Ng Lating Tekalit	138	18	12	16	16	32	Iban	Christian
5.	Rh Chenggai ak Baring	Sg Tekalit	Ng Tenanggai	300	32	18	15	15	30	Iban	Christian
6.	Rh Kaya ak Nyelang	Sg Tekalit	Rantau Pitak	198	24	10	8	10	18	Iban	Christian
7.	Rh Endah ak Kap	Sg Tekalit	Ng Sepayang	271	22	18	10	20	30	Iban	Pagan
8.	Rh Gong ak Kerabor	Sg Bangkit	Wong Betong Ulu Bangkit	377	17	10	10	14	24	Iban	Pagan
9.	Rh Silo ak Bungkong	Sg Bangkit	Ng Semumban	48	9	9	8	12	20	Iban	Pagan

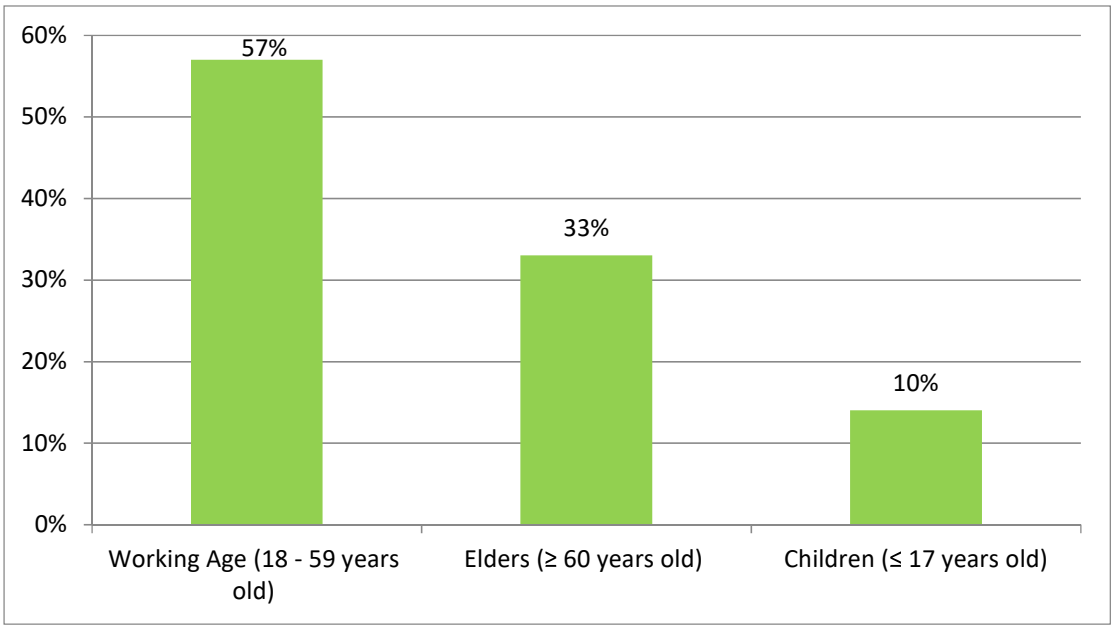
No.	*Name of Village*	*River System*	*Locality*	*Total Village Population*	*Total No. of Doors*	*Occupied Doors*	*Number of Male Present*	*Number of Female Present*	*Actual Population Present*	*Main Ethnicity (Race)*	*Main Religion*
10.	Rh Sebastian Tambi	Sg Bangkit	Ng Bangkit Ketibas Song	402	42	37	25	34	59	Iban	Christian
11.	Rh Dagom ak Sanggai	Sg Katibas	Ng Makut	297	32	20	24	26	50	Iban	Christian
12.	Rh Dominic Runggom	Sg Katibas	Ng Entuat	245	32	20	23	22	45	Iban	Pagan
13.	Rh Nugu ak Irang	Ulu Katibas	Ng Sesibau	52	21	7	1	6	7	Iban	Pagan
14.	Rh Suning ak Sigon	Ulu Katibas	Ng Nanyai	192	14	8	19	21	40	Iban	Pagan
15.	Rh Api ak Sanun	Ulu Katibas	Ng Terusa	210	21	9	11	9	20	Iban	Christian
16.	Rh Sapai ak Ayom	Ulu Katibas	Ng Ngeranau	96	17	7	10	8	18	Iban	Christian
17.	Rh Sa ak Andas	Ulu Katibas	Ng Mesau	124	16	13	14	21	35	Iban	Christian
18.	Rh Peter ak Jabat	Ulu Katibas	Sg Nigging	188	32	15	84	58	142	Iban	Pagan
	Total:			***3494***	***392***	***249***	***311***	***334***	***645***		

It can be seen that there were only 18.5% (645) of the actual population who stayed back in the longhouses. In terms of gender grouping, out of this group of people who were present during the survey, 48% (311) were male, while the remaining 52% (334) were female. These groups of people were furthered classified into three categories, namely the working age, the elder (≥ 60 years old), and the children (≤ 17 years old). **Table 5.4** shows number of people in each category for each longhouse. The overall percentage of people in each category is presented in **Figure 5.2**.

Table 5.4 Number of Individuals Based on Grouping

Name of the Longhouses	No. of Individuals			
	Able Adult (18-59 years old)	Elder (≥ 60 years old)	Children (≤ 17 years old)	Total
Rh Philip ak Geliga	14	8	8	**30**
Rh Anjan ak Gait	4	3	3	**10**
Rh Japok ak Ribai	17	8	10	**35**
Rh Melayu ak Angkup	22	4	6	**32**
Rh Chenggai ak Baring	10	20	0	**30**
Rh Kaya ak Nyelang	9	7	2	**18**
Rh Endah ak Kap	15	10	5	**30**
Rh Gong ak Kerabor	8	13	3	**24**
Rh Silo ak Bungkong	7	11	2	**20**
Rh Sebastian Tambi	22	31	6	**59**
Rh Dagom ak Sanggai	28	17	5	**50**
Rh Dominic Runggom	24	18	3	**45**
Rh Nugu ak Irang	3	3	1	**7**
Rh Suning ak Sigon	29	11	0	**40**
Rh Api ak Sanun	9	10	1	**20**
Rh Sapai ak Ayom	11	7	0	**18**
Rh Sa ak Andas	16	11	8	**35**
Rh Peter ak Jabat	122	19	1	**142**
Total	**370**	**211**	**64**	**645**

Figure 5.2 Overall Percentage of People in Each Category



It can be concluded that among the 18 longhouses surveyed, 57% (370) of the people who were present during the surveys were in working age, followed by 33% (211) of elders whose age were 60 years old and above, and 10% (64) of children whose age were 17 years old and below.

5.3 MODE OF TRANSPORTATION

Plate 8: Daily express boat

The main modes of transport are river, tar-sealed road and logging road. There is a regular express boat service plying along the Btg Rajang, on the Sibu-Kanowit-Song-Kapit and Putai routes. For communities along the lower and upper stretches of Sg Katibas, Sg Musah, Sg Tekalit and Sg Bangkit, water transport is still the main transportation mode. As all the longhouses were situated along the rivers, the communities still rely heavily on water transportation. The longhouses were constructed in a single row in-line parallel to the rivers. Based on the surveys, 78% (87) of the doors surveyed owned longboats but only 22% (13) owned outboard engines. Travelling along the river with longboats powered

by outboard engines is costly due to the high fuel consumption and the high cost of petrol. Therefore, the local people settling at Ulu Katibas seldom go to Song. A return trip between the furthest surveyed longhouse, Rh Sapai and Song Township consumed roughly 40 gallons of petrol which cost approximately RM 560. In addition, due to weekly fluctuation of petrol price, the cost of petrol for a return trip may be higher or lower than the reported RM 560.

Plate 9: Rapid water at Sg Bangkit

The rivers and streams are quite shallow at the upper part of each river. Navigation along the rivers and streams can be dangerous due to the presence of rapids and rocky bed. These rapids can be found along the stretches of Sg Tekalit, Sg Bangkit and Sg Katibas (Ulu). Navigation thus requires skill, experience and intimate knowledge of the local streams. The problem is exaggerated during the dry season, thus making the trip more costly and dangerous.

Plate 10: Logging road connecting to Rh Melayu (Sg Tekalit)

Based on Round 2 survey, 3 out of 18 longhouses surveyed have access to logging road and out of these 3 longhouses, only Rh Melayu has a 4-wheel drive vehicle while the other 2 longhouses, Rh Nugu and Rh Dominic Runggom have to carpool with 4WD vehicles belonging to plantation operators (RM7 per trip) to travel to Song town and other destination. 4% (4) of them travel for business purposes while 12% (11) visit other relatives or family, 48% (43) travel to consult a doctor or government staff and 36% (32) for personal reasons. 11% (10) of them travel once a week while 66% (59) travel once a month and 23% (21) travel once in 2 to 6 months.

5.4 SOCIAL INFRASTRUCTURE, UTILITIES AND MUNICIPAL SERVICES

5.4.1 Social Infrastructure

Social infrastructure may consist of community hall, public library, worship place, playground, football field, badminton court and others. Based on the surveys, the surveyed longhouses are lacking social infrastructure. This might be because of the complex geographical landscape, rapid river flows, and poor accessibility which posed financial and logistical constraint to transport building materials to the longhouses in the Study Area.

5.4.2 Utilities

The utilities (electricity supply, water supply and telecommunication) provided for the 18 longhouses are shown in **Table 5.5**.

5.4.2.1 Electricity Supply

During Round 2 survey, 6 longhouses surveyed were supplied with solar panels from Sarawak Energy Berhad and/or government representative for electricity; 11 longhouses still relied on individual and communal generators for power supply; and 1 longhouse received electricity from public electricity grid. Longhouse which received solar panel from government representatives quite some time ago claimed that currently the electricity supply from solar panels were insufficient due to lack of maintenance on the solar panels. Electricity supply from generators was only available for a limited period, usually from dusk to midnight to save cost. The spent roughly RM400-RM 700 a month to purchase fuels for their electric generator.

Plate 11: Solar panels (SEB) at Rh Silo

5.4.2.2 Water Supply

All 18 longhouses surveyed received water supply from gravity-feed dams on streams either nearby the longhouse or at the other side of the river. During dry season, which usually start on May and end on September, the water supply by gravity-feed system was insufficient due to low water level in the streams as claimed by the respondents

surveyed. All 18 longhouses surveyed experience water shortage during the long dry weather period.

5.4.2.3 Telecommunication

Out of 18 longhouses surveyed, only 6 longhouses have mobile telecommunication coverage while the other 12 longhouses still lacking in modern telecommunication system as they are too isolated to be connected with local cellphone network.

Table 5.5 Utilities

No.	River cluster	Name of longhouse	Electricity supply	Water supply	Telecommunication
1	Cluster 2: Sg Musah	Rh Philip ak Geliga	Individual and communal generator	Gravity-feed	Cellular
2		Rh Anjan ak Gaid	Individual generator	Gravity-feed	Cellular
3		Rh Japok ak Ribai	SESCO	Gravity-feed	Cellular
4	Cluster 3: Sg Tekalit	Rh Melayu ak Angkup	Solar panel; individual and communal generator	Gravity-feed	Not available
5		Rh Chenggai ak Baring	Solar panel	Gravity-feed	Cellular
6		Rh Kaya ak Nyelang	Solar panel	Gravity-feed	Cellular
7		Rh Endah ak Kap	Individual and communal generator	Gravity-feed	Cellular
8	Cluster 4: Sg Bangkit	Rh Gong ak Kerabor	Individual generator	Gravity-feed	Not available
9		Rh Silo ak Bungkong	Solar panel	Gravity-feed	Not available
10		Rh Sebastian Tambi ak Jugah	Individual generator	Gravity-feed	Not available
11	Cluster 5: Sg Katibas (Hilir)	Rh Dagom ak Sanggai	Solar panel and individual generator	Gravity-feed	Not available
12		Rh Dominic Runggom	Individual and communal generator	Gravity-feed	Not available

No.	River cluster	Name of longhouse	Electricity supply	Water supply	Telecommunication
13	Cluster 6: Sg Katibas (Ulu)	Rh Peter ak Jabat	Solar panel and individual generator	Gravity-feed	Not available
14		Rh Nugu ak Irang	Individual generator	Gravity-feed	Not available
15		Rh Sa ak Andas	Individual generator	Gravity-feed	Not available
16		Rh Suning ak Sigon	Individual generator	Gravity-feed	Not available
17		Rh Api ak Sanun	Communal generator	Gravity-feed	Not available
18		Rh Sapai ak Ayom	Individual generator	Gravity-feed	Not available

5.4.2.4 Other Services

During Round 2 survey, it was observed that the cleanliness of the longhouse compounds was generally range from fair to good. All 18 surveyed longhouses have access to news through radio and television. However, the transmission of radio and television was weak, and the reception was poor. Newspapers are only available at Song town. For postal services, all surveyed 18 longhouses have post office boxes at Song Post Office in Song Township, where they would have to go to collect their mails.

Plate 12: Song Postal Mailbox Shed

5.5 EDUCATION

Generally, from Round 2 social survey it is shown that all 18 surveyed longhouses have access to kindergartens, primary and secondary schools which are found in each of the river clusters. Schools and education level is elaborated in **Section 5.5.1** and **5.5.2**.

5.5.1 Schools

There are seven primary schools namely SK Ng Musah, SK Ng Janam, SK Ng Bangkit, SK Tun Jugah, SK Lubok Bedil, SK Ng Engkuah and SK Lubok Ipoh serving the surveyed longhouses. On the other hand, SK Ng Musah, SK Ng Janam and SK Lubok Ipoh are the three primary schools which also provide pre-school education to children residing in the Study Area. For secondary education, the students from the Study Area will have to go to SMK Katibas (Ng Katibas) which cater up to Sijil Pelajaran Malaysia (SPM) education or SMK Song (Song Township) which allow education up to Sijil Tinggi Persekolahan Malaysia (STPM). Most of the primary and secondary students who live far away from the schools would have to stay in boarding schools.

The details of the educational facilities for the kindergartens, primary schools and secondary schools for the surveyed longhouses are shown in **Table 5.6**.

Table 5.6 Education Facilities Serving the Surveyed Longhouses

No.	Longhouse	Kindergarten	Primary School	Secondary School
1.	Rh Philip ak Geliga	-	SK Ng Musah	SMK Katibas
2.	Rh Anjan ak Gaid	-	SK Ng Musah	SMK Katibas, SMK Song
3.	Rh Japok ak Ribai	Pre-school SK Ng Musah	SK Ng Musah	SMK Katibas
4.	Rh Melayu ak Angkup	Pre-school SK Ng Janam	SK Ng Janam	SMK Katibas
5.	Rh Chenggai ak Baring	-	-	SMK Katibas, SMK Song
6.	Rh Kaya ak Nyelang	-	SK Ng Janam	SMK Katibas
7.	Rh Endah ak Kap	-	-	SMK Katibas
8.	Rh Gong ak Kerabor	-	SK Ng Bangkit, SK Tun Jugah	SMK Katibas, SMK Song
9.	Rh Silo ak Bungkong	-	SK Tun Jugah	SMK Katibas
10.	Rh Sebastian Tambi ak Jugah	-	SK Ng Bangkit	-
11.	Rh Dagom ak Sanggai	-	SK Lubok Bedil	SMK Katibas, SMK Song

No.	Longhouse	Kindergarten	Primary School	Secondary School
12.	Rh Dominic Runggom	-	SK Lubok Bedil	SMK Katibas, SMK Song
13.	Rh Peter ak Jabat	-	SK Ng Engkuah	SMK Katibas
14.	Rh Nugu ak Irang	-	SK Ng Engkuah	SMK Katibas
15.	Rh Sa ak Andas	-	SK Lubok Ipoh	SMK Song
16.	Rh Suning ak Sigon	Pre-school SK Lubok Ipoh	SK Lubok Ipoh	SMK Katibas, SMK Song
17.	Rh Api ak Sanun	-	SK Lubok Ipoh	SMK Katibas
18.	Rh Sapai ak Ayom	-	-	SMK Song

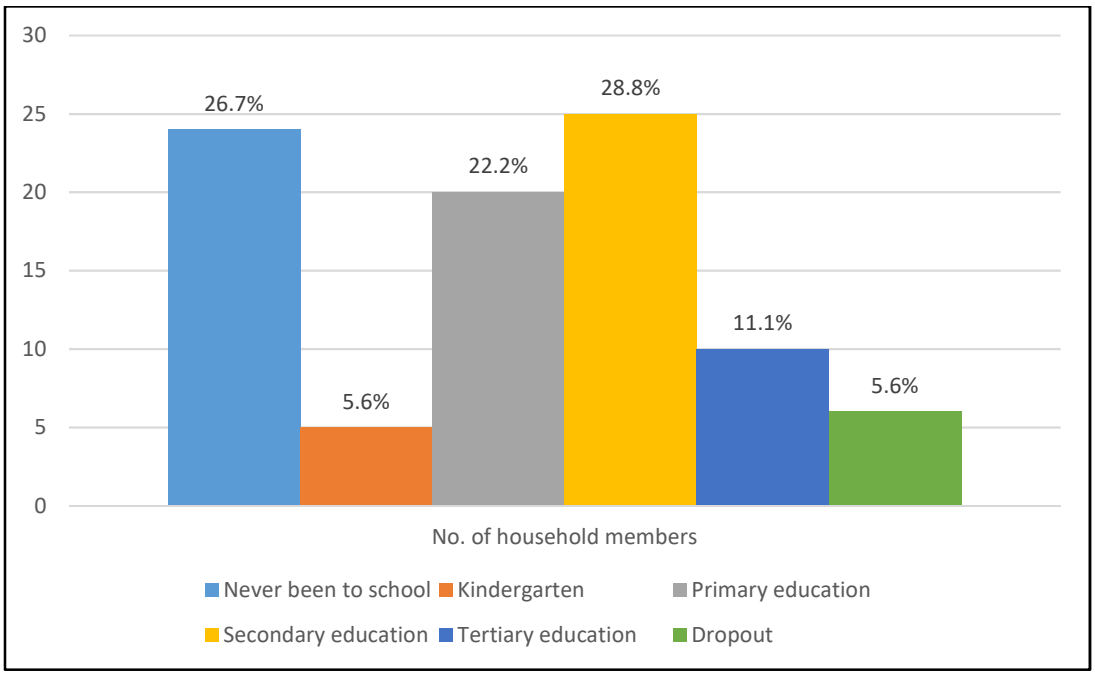
5.5.2 Education Level

The education level of the 90 doors surveyed, ranged from no formal education, kindergartens, primary education, secondary education and tertiary education. The surveyed education level is shown in **Figure 5.3** and it is elaborated in **Section 5.5.2.1**, **5.5.2.2**, **5.5.2.3**, **5.5.2.4**, **5.5.2.5** and **5.5.2.6** respectively.

5.5.2.1 No formal education

26.7% (24) out of the 90 doors surveyed stated that they have members who do not have the chance to receive formal education. Their parents choose not to send their children to school because they needed extra hands to help with household chores and farm works.

Figure 5.3 Education Level



5.5.2.2 Pre-School Education

5.6% (5) out of the 90 doors surveyed have members who had received pre-school education. The number of individuals who attended pre-school education is small because the numbers of education facilities that provide pre-school education service is limited and they are usually far from the longhouses which make it inconvenient for parent to send them every schooling day.

5.5.2.3 Primary Education

22.2% (20) out of the 90 doors surveyed have members who completed primary education. It is noted that the number of individuals who were sent to receive primary education is greater than kindergarten. The number rose up because parents believe that it is important for their children to be educated and there are already capable to take care of themselves if they are required to live in boarding facility.

Plate 13: SK Lubok Ipoh

5.5.2.4 Secondary Education

28.8% (25) out of the 90 doors surveyed have members who attained secondary education. The enrolment percentage for primary education and secondary education is almost similar which could possibly indicate that the majority of individuals who completed their primary education had chosen to continue with secondary education.

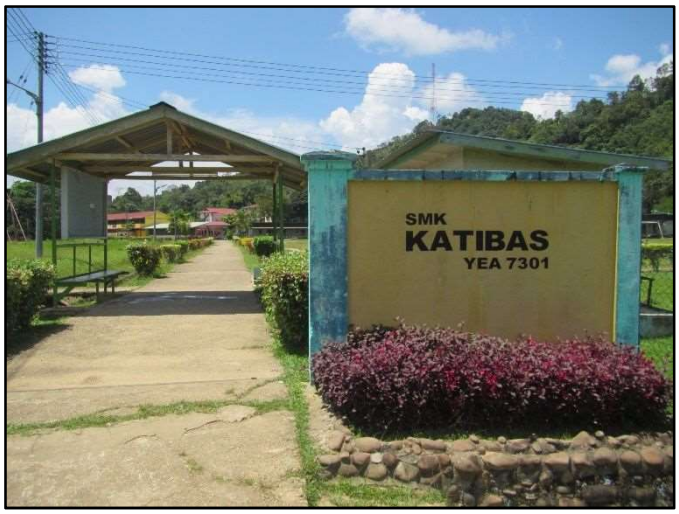


Plate 14: SMK Katibas Secondary School

5.5.2.5 Pre University or Tertiary Education

11.1% (10) out of the 90 doors surveyed had members who obtained qualification in pre-university or tertiary education. Pre-university and tertiary education in this context refers to doors that have members possessing qualification in STPM, Diploma or Degree. The percentage of enrolment for tertiary education drop because the cost to pursue further studies is high and thus most of them who completed secondary education choose to work so they can have income to support themselves and their younger siblings.

5.5.2.6 Dropouts

5.6% (6) out of the 90 doors surveyed had members who were dropout from school. It is noted that the percentage of dropouts was due to lack of interest in education and only interested in working to earn a living. Other than that, it was due to money-constraint that the members were unable to afford to continue schooling and thus, unable to complete their studies.

Results elaborated above, and the presence of different level of education facilities and services reflects that education opportunities are readily available for longhouse communities within the Study Area. About one-third of the surveyed doors have members who do not have any qualification in formal education which may be attributed to the weak financial situation of the households. Moreover, due to poor transportation network considerable numbers of the parent were discouraged to send their children to attend pre-school education. Nevertheless, in the context of rural area, the literacy level among those who reside in the village is considerably high as about one-third of the surveyed doors have members who successfully completed secondary education and a small number of doors have members who finished pre-university or tertiary education. Only a few of the doors have members who dropout from school due to personal constraints such as lack of interest in education and money-constraint.

Hence, it is important that the socio-economic development programme to be introduced should be initiative that meant to improve the existing economic activities perform by the longhouse communities, instead of introducing brand new economic activities that may require the longhouse communities to undergo formal learning process which can be a burden for longhouse members who do not have any qualification in formal education. On top of that, training and workshop to be participated by the longhouse communities should not be focused heavily in disseminating theoretical knowledge and paper examination, it should involve intensive practical application and hands-on training to enable efficient learning process that match to the learning habit and education background of the longhouse communities.

5.6 HEALTH SERVICES

There are 5 government medical clinics serving the Song-Katibas area, namely Song Clinic (Song Township), Tekalit Clinic (Sg Tekalit), Ng Bangkit Clinic (Sg Bangkit), Ng Engkuah Clinic (Ng Engkuah) and Chemanong Clinic (upstream of Sg Katibas). These health clinics cater for out-patient treatment for maternity, childcare, and dental services.

For those closer to Song Township area, Song Clinic would be the nearest health clinic to seek medical treatments. In the upper Katibas region, the longhouses are visited by the Village Health Team (VHT) from the Health Department. These visits are carried out to provide medical check-up for the local people. If there are cases of any disease out-break, VHT will make frequent visits to the longhouses in the area.

Plate 15: Ng Bangkit Clinic at Sg Bangkit

The surveyed longhouses are visited by the VHT two or three times per year on average. For more serious cases, the patients in the area will be referred to the Kapit or Sibu Hospital for treatment. No private clinic is found in the Song-Katibas area.

The name, service provided and estimation of time of travel from the longhouses concerned are shown in **Table 5.7** below.

Table 5.7 Health Facilities and Services

No.	Longhouse	Name of clinic	Service provided	Estimated travel time from longhouse to clinic
1.	Rh Philip ak Geliga	Tekalit Clinic	Out-patient, maternity, childcare and dental	15 minutes from longhouse
2.	Rh Anjan ak Gaid	Tekalit Clinic	Out-patient, maternity, childcare and dental	15 minutes from longhouse
3.	Rh Japok ak Ribai	Song Clinic	Out-patient, maternity, childcare and dental	10 to 15 minutes by road from longhouse
4.	Rh Melayu ak Angkup	Song Clinic and Tekalit Clinic	Out-patient, maternity, childcare and dental	1 ½ hours to Tekalit Clinic and 2 hours to Song Clinic
5.	Rh Chenggai ak Baring	Tekalit Clinic	Out-patient, maternity, childcare and dental	1 hour from longhouse
6.	Rh Kaya ak Nyelang	Tekalit Clinic	Out-patient, maternity, childcare and dental	30 minutes or 1 hour from longhouse
7.	Rh Endah ak Kap	Tekalit Clinic	Out-patient, maternity, childcare and dental	15 minutes from longhouse
8.	Rh Gong ak Kerabor	Ng Bangkit Clinic	Out-patient, maternity, childcare and dental	30 minutes or 1 hour from longhouse
9.	Rh Silo ak Bungkong	Ng Bangkit Clinic	Out-patient, maternity, childcare and dental	1 ½ hour to 2 hours from longhouse
10.	Rh Sebastian Tambi ak Jugah	Ng Bangkit Clinic	Out-patient, maternity, childcare and dental	10 minutes' walk from longhouse
11.	Rh Dagom ak Sanggai	Ng Bangkit Clinic	Out-patient, maternity, childcare and dental	½ hour from longhouse
12.	Rh Dominic Runggom	Ng Bangkit Clinic	Out-patient, maternity, childcare and dental	½ hour from longhouse
13.	Rh Peter ak Jabat	Ng Engkuah Clinic	Out-patient, maternity, childcare and dental	½ hour from longhouse
14.	Rh Nugu ak Irang	Ng Engkuah Clinic	Out-patient, maternity, childcare and dental	1 hour from longhouse
15.	Rh Sa ak Andas	Song Clinic and Chemanong Clinic	Out-patient, maternity, childcare and dental	30 minutes to Chemanong Clinic and 3 hours to Song Clinic
16.	Rh Suning ak Sigon	Chemanong Clinic	Maternity, childcare and dental	2 hours from longhouse
17.	Rh Api ak Sanun	Chemanong Clinic	Maternity, childcare and dental	½ hour from longhouse
18.	Rh Sapai ak Ayom	Chemanong Clinic	Maternity, childcare and dental	30 minutes or 1 hour from longhouse

5.7 SANITATION FACILITIES

All 18 surveyed longhouses are equipped with pour-flush toilet system with septic tank and most of the sanitary facilities are in moderate condition. As for waste collection, most of the surveyed longhouses have rubbish pits near their longhouses for disposal of solid waste while some of the longhouses do not have rubbish pits and would throw waste into the river or nearby bushes, followed by burning of rubbish.

Out of the 18 longhouses surveyed, only one longhouse practices both disposing solid waste into the rubbish pit and burning of rubbish. Only 14 longhouses have rubbish pits for disposal of solid waste. Based on Round 2 survey, the main problems with the current sanitary facilities were the lack of water for toilets and rubbish bins for disposal of rubbish.

5.8 ECONOMIC ACTIVITIES

The economic activities are characterized by a mix of farming and wage-earning employment either full-time or part-time. From Round 2 survey, it was observed that 90 doors were engaged in full-time occupation in farming and in wage-earning employments. The household cash incomes were contributed by all working members, working their farms and outside the longhouses. These incomes depended on the types of employment and the number of working members. Three factors attributed to the households being cash poor; they are (i) high cost of transportation fuel, (ii) farming on a subsistence basis and selling only surplus (which is rare) to longhouses or plantation camps nearby does not give good income, and (iii) having less number of working household members, who are able-bodied and more educated, working outside of the Study Area.

5.8.1 Agriculture

The majority of the surveyed doors from Round 2 survey participate actively in agricultural activities. The minority who do not participate in agricultural activities are senior citizens (≥ 60 years old) who are not physically robust to involve in energy consuming land cultivation activities. They cultivate both food crops and cash crops. The major food crops are paddy and fruits while the major cash

Plate 16: A local villager tends to her pepper harvest

crops are rubber and pepper. All of them stated that their farmlands are experiencing pest attacks, and this has reduced their agricultural outputs which in turn affected their food supply and availability of crops to be sold. The popularly encounter pest are wild boars, monkeys, squirrels and insects. They also claimed that monkeys are growing rampant. Monkeys will attack, destroy and eat crops cultivated at close proximity to the longhouse's compounds.

5.8.1.1 Paddy

Based on the survey results, hill paddy is the only paddy species cultivated by the doors surveyed. Out of the 90 doors surveyed, 54% (49) of them engaged in hill paddy cultivation and out of this 54%, 55% (27) of them received assistance from the Department of Agriculture. Non-organic farming has been practiced by the paddy farmers. Almost all of the surveyed farmers stated that they applied fertilizers, weedicides and pesticides to ensure the proper and fast growth of their paddy.

Plate 17: Paddy harvest

Although hill paddy is the main subsistence crops, some of them claimed that their paddy outputs are not sufficient to meet the needs of their family. The short of rice supply usually will be supplemented with rice purchased from Song Township and Sibu.

5.8.1.2 Rubber

Plate 18: A local villager carrying rubber sheet

Each of the 18 longhouses surveyed owned rubber garden. The size of the rubber garden ranged between three to ten acres and 57% (51) of doors from these 18 longhouses were rubber smallholders. However, 16 out of the 18 longhouses owned rubber garden that consists mainly of old rubber trees that were planted years ago mostly under the Rubber Scheme implemented by the Department of Agriculture (DOA). These 16 longhouses have taken the initiative to apply for new rubber scheme from the relevant agencies to replace their

unproductive old rubber trees, but none have replied them when the survey was conducted. Rh Sebastian Tambi and Rh Dominic Runggom were the two longhouses respectively that owned land which will be planted and planted with new and young rubber trees. They were the only longhouses that successfully received new rubber plantation scheme from Rubber Industry Smallholders Development Authority (RISDA). Although the longhouses still remain interested to rehabilitate and continue to cultivate their rubber gardens, currently rubber tapping was not their main and important source of cash income. This is because the longhouses had temporarily stopped or scale down rubber tapping due to low market price.

5.8.1.3 Pepper

Pepper is also a commonly cultivated cash crop in all of the 18 longhouses surveyed. Rh Dagom is the largest pepper planter in the Study Area. The longhouse community of Rh Dagom has planted 8000 pepper trees. Based on the survey results, 56% (50) out of the 90 doors engaged in pepper planting. The numbers of pepper trees planted by each door which was identified as pepper planter, ranged from 25 to 300 trees based on their experience in pepper planting. The longer the time they involved in pepper planting and continuously maintain their pepper farm, the greater the numbers of pepper trees they owned.

Pepper trees will normally be planted on the terraced slopes near to the longhouses. All of the pepper planters in the Study Area practiced non-organic farming. They rely heavily on the application of fertilizers, weedicides and pesticides to guarantee high and steady pepper outputs. Based on the responses given, the practice of non-organic farming has respectively led to high operating cost and high capital requirements to expand the current and start a new pepper farm.

Plate 19: Pepper farm on the hill side

As compare to rubber, pepper has a greater significant in contributing to the cash income of the longhouse communities. This is because the price and market for pepper is relatively stable as compare to rubber. The collection points for pepper harvested by the longhouses will be Sibu Town and Song Town. Licensed pepper marketing dealer appointed by Malaysian Pepper Board (MPB) offered higher buying price as compare to middlemen, while the buying price at Sibu Town is higher than Song Town. At Sibu

Division, licensed pepper marketing dealer is buying a kilogram of pepper at RM 20 but at Song District it only worth RM 15. On the other hand, middlemen at Sibu Division are paying RM 14 to RM 16 for a kilogram of pepper but middlemen at Song District are buying a kilogram of pepper at RM 9. Due to better market and higher price as compare to rubber, considerable number of longhouses and doors wish to expand their current pepper farm or venture into pepper planting, if financial assistance is given to them to offset the burden caused by high operating cost or high capital requirement.

5.8.1.4 Fruit Trees

59% (53) of the doors surveyed, owned a fruit garden near to their longhouses. The majority of them have a fruit garden ranged between one to two acres, while only a few doors owned fruit garden measured seven acres and above. Varieties of seasonal fruits such as durians, engkabang fruit, dabai, and langsat are planted by the farmers. Most of the time, fruits produced are mainly for their own consumption. This is because the harvested fruits usually perished before they reach the local market due to the poor accessibility between longhouses and local market. Currently, only fruits that can fetch a good price and having longer shelf life like durians and dabai will be sold to Song Township, either directly or through middlemen. Some of them also stated that if the accessibility between longhouses and Song Township is improved it will significantly contribute to the commercialization of the produced fruits.

Furthermore, out of the 18 longhouses, Rh Melayu is the first longhouse that venture into avocado cultivation. Currently, out of the three avocado trees planted, only one tree survived healthily and is able to produce fruits. Based on the response from Rh Melayu, one kilogram of Avocado can fetch RM 8 at Song Township. With limited technical information and uncertainty to commercialize avocado fruits, it is suggested that not to include avocado farming in the initiatives planned for the longhouse communities.

5.8.2 Forest-based Resources

Forest-based resources gathering still remained fairly common among the 17 out of the 18 longhouses surveyed. Rh Endah is the only longhouse that has abandoned this activity. Forest-based resources gathering include hunting wildlife, collecting non-timber forest products (NTFPs) and harvesting timber products. The common grounds which the longhouse communities gathered forest-based resources are former shifting cultivation land, brushy areas near the longhouses and communal forests.

According to the survey result, 22% (20) out of the 90 doors surveyed engaged in hunting wildlife. Nevertheless, participation rate may be higher than reported. For the Sarawak's natives, it is legal to hunt wildlife for self-consumption, but it will be illegal if the hunters do not comply with the relevant rules and regulations. Hence, they may

choose to conceal their answer to prevent any appraisal from the relevant agencies that may cause them legal consequences. Responses reveal that fruiting season will be the best period to hunt, because fruits will attract wildlife to move to brushy areas and forests nearer to the longhouse. Shotgun and hunting dog are used to hunt wildlife like wild boar, deer, mouse deer, porcupine, monkey and civet.

Plate 20: Timber planks for boat building

15 out of the 17 longhouses have 100% of the doors engaged in collecting NTFPs. Gathering is mostly carried out by womenfolk on a part-time basis, either individually or in group. Some of the common NTFPs collected by womenfolk are wild vegetables, edible ferns and fruits which are the main vitamins, minerals and additional food source for the households. There is also collection of rattan to produce traditional handicrafts like mats, hats and baskets as well as furniture. The frequency of collecting NTFPs is affected by the demand toward additional food and market's demand on handicraft.

The harvesting of timber products is mostly conducted by men. It usually involved the collection of hard wood such as *belian* and *meranti* for the repair and maintenance of longhouses. Furthermore, timber extracted is also used in building longboats. Within the Study Area, Rh Philip, Rh Chenggai, Rh Sebastian, Rh Peter and Rh Endah are the longhouses that have boat builders, while Rh Sa is the major boat builder in the Study Area. Building longboats is a lucrative market because schools, government agencies and other longhouses have a high demand for longboats, because longboats is the most efficient means to commute around the Study Area. A big longboat cost RM 3000 – RM 4000 while a small longboat cost RM 1500. Nevertheless, boat builders from Rh Sa claimed that they were facing shortage of hardwood to build longboat, because previously the majority of their hardwood supply come from the nearby forest which now had been gazette as LEWS and thus, the relevant agencies responsible to look after LEWS restrict them to cut down trees within LEWS.

5.8.3 Fishery Activities and Aquaculture

51% (46) of the doors surveyed engaged in fishing for leisure purpose. They catch fish to supplement and enhance the variety of their protein supply. The longhouse communities used fishing gears such as line-and-hook and cast net to catch *kulong, tengadak, semah, bantak, seluang* and catfish, the commonly found fish species in the Study Area. Based on the response given by the longhouse communities, the best

window to catch fish is determined by the river tide of the day. 24% (27) of the doors surveyed participated in aquaculture. They concentrated in Rh Melayu, Rh Kaya, Rh Chenggai, Rh Sebastian Tambi, Rh Peter, Rh Sapai, Rh Sa and Rh Suning, Rh Dagom.

Plate 21: Fish in ponds

Out of these nine longhouses, Rh Sebastian Tambi and Rh Sa have the most sophisticated aquaculture operation. Rh Sebastian Tambi owned seven concrete ponds. Five out of the seven concrete ponds were used to rear common freshwater fish species, while the other two concrete ponds were specially used to breed high value freshwater fish species like *semah, tengadak and empurau* that will be sold to urban folks to earn cash income. In Rh Sa, 13 out of the 20 doors were actively involved in aquaculture. They breed common freshwater fishes like *kaloi* and *tilapia* as well as high economic value freshwater fishes like *semah, tengadak* and *empurau*. Rh Sa will sell the grown freshwater fishes to nearby school. In addition, the remaining seven longhouses mentioned above, operated smaller scale and less commercialize aquaculture operation as compared to Rh Sebastian Tambi and Rh Sa.

5.8.4 Apiculture

Apart from avocado cultivation mentioned in **Section 5.8.1.4,** apiculture or commonly known as bee keeping, is another niche market which the longhouses within the Study Area is establishing. Rh Melayu (two doors), Rh Silo (two doors), Rh Api (one door) and Rh Peter (one door) are the longhouse who has ventured into apiculture. Furthermore, the apiculture established by Rh Gong failed.

Rh Silo is the most experienced bee keepers among the longhouses who ventured into apiculture. Rh Silo has been in this field for two years and Rh Silo has started producing and selling honey. Based on the information given by Rh Silo, they can produce ten boxes of honey for each round of honey harvesting. Each box contained 32 bottles of honey. The selling price for one bottle of honey at Song Township is RM 20 – RM 30.

5.8.5 Handicraft

The results of Round 2 survey reveal that four longhouses within the Study Area are relatively active in making handicraft as compare to the other longhouses. The four longhouses are Rh Kaya, Rh Endah, Rh Silo and Rh Sapai. The four longhouses

respectively have 10, 11, 2 and 4 doors participated in making handicraft. However, each of the longhouses focused on a slightly different handicraft. Rh Kaya, Rh Endah and Rh Silo are the major *pua kumbu* producers and Rh Sapai is the major rattan furniture maker.

Among the major *pua kumbu* producers, Rh Kaya is the only longhouse that has a registered *pua kumbu* weaver. *Pua Kumbu* is a hand woven multicoloured ceremonial cotton cloth that contain the intricate motifs of Iban community's lifestyles and beliefs. On top of that, Rh Peter, a longhouse that previously active in operating homestay and promoting Iban's culture to foreign tourists before their late longhouse was burnt down, currently is working to revive their traditional costume making industry as a first step to bring the rebuild longhouse back on track.

The produced handicraft is for both individual usage and commercial purposes. The handicraft will be marketed to major towns and cities in Sarawak, Sabah and Peninsular Malaysia, either directly or through middlepersons. Quality and unique handicraft can fetch a high price from urban folks and tourist who show interest in and appreciate indigenous knowledge. Nevertheless, majority of the surveyed handicraft makers claim that they needed more assistance especially in term of financial and marketing solutions to establish a new or expand the existing handicraft making sector, as well as to promote and conserve the indigenous culture.

5.8.6 Wage-earning Employment

According to Round 2 survey, every door had more than one member engaged in wage-earning jobs either full-time or part-time. They belonged mostly to the younger and able-bodied generation. 63 out of 90 doors engaged in wage-earning employments were found to be in full-time employment and 27 out of 90 doors surveyed had members engaged in part-time jobs (**Table 5.8**).

Table 5.8 Proportion of Wage-earning Employment

Category of Employment	Total surveyed doors (%)
1. Full-time	69.9
2. Part-time	30.1
Total	**100.0**

The type of wage-earning employment are characterized by carpentry, shop keeper, labourer work, logging, transportation, shop assistant, civil servant, company staff and others (**Table 5.9**).

Table 5.9 Economic Activities

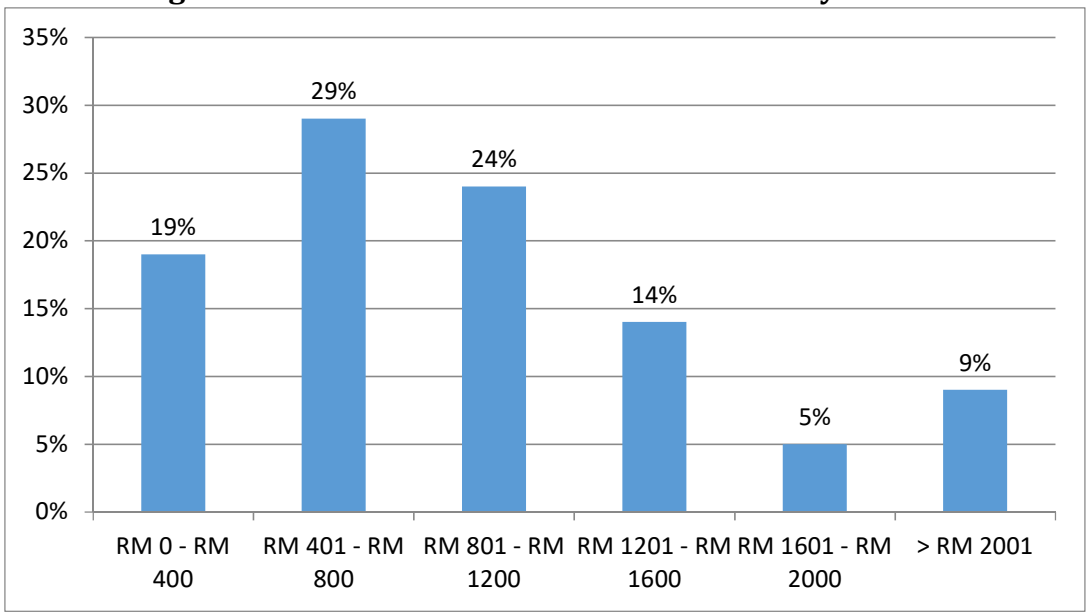
Economic Activity	Percentage of Active Workforce (%)
Carpentry	42
Shop keeping	0
Labourer work	19
Logging	3
Transportation	0
Shop assistant	3
Civil Servant	7
Company staff	7
Others	19
Total	**100**

5.9 HOUSEHOLD MONTHLY INCOME

Out of the 90 doors surveyed, only 21 doors responded to this question. The majority of them had avoided this question for two reasons. Firstly, they do not want outsiders to use their monetary income as the yardstick to determine their social status. Secondly, considerable numbers of them at present do not have active income; they support themselves and families through savings.

Based on the responses given by the 21 doors, their major source of income is revenue from selling farming products; salary from wage-earning employment; remittance from relatives and children working in towns; or welfare assistance given by government agencies. The least and greatest recorded cash income are respectively RM 150 and RM 3,100. 29% (6) out of the 21 doors earn about RM 401- RM 800 a month. 24% (5) out of the 21 doors that responded make around RM 801 – RM 1,200 a month. 19% (4) out of the 21 doors have their monthly income falls into the range RM 0 – RM 400. 14% (3) out of the 21 doors are able to generate RM 1,201 – RM 1,600 a month. 9% (2) of them can make more than RM 2,001 a month. Only 5% (1) door falls into the category RM 1,601 – RM 2,000. **Figure 5.4** summarizes the distributions of household monthly income.

Figure 5.4 Distributions of Household Monthly Income



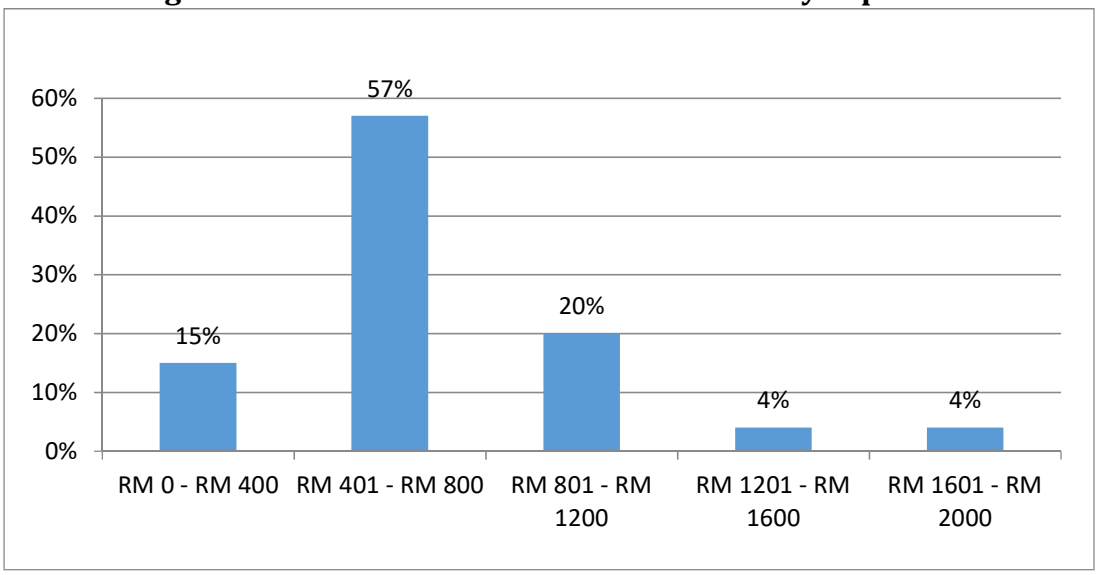
The survey result shows that 19% (4) out of the 21 doors that responded are living in extreme poverty which based on authority definition; they are categorized as not having sufficient cash resources to fulfill their basic survival needs (Jala, 2015). However, considering the actual situation, they were not experiencing immediate life threatening situation because they have access to surrounding lands and forest to cultivate and harvest foods, water and building materials. Moreover, roughly 48% (10) of the doors are classified as poor who based on the authority definition; they are earning better cash income than those in extreme poverty (Jala, 2015). Although based on the authority definition they should be categorized into different groups, both of them are confront by the same issue, which is lack of accessibility to social services and infrastructures such as healthcare, education and in the case of the Study Area physical connectivity to different places. Social assistance render to both groups should concentrate on enhancing their accessibility to social services and infrastructure with the effort to improve income level as supplementary while to the greatest extent retain their indigenous way of life.

The 33% (7) of doors which were better off may be used as a learning model for the underserved doors to improve themselves in term of participation in entrepreneurship, continuous improvement in agricultural and aquaculture knowledge and techniques, promotion of education for children and interaction with urban world.

5.10 HOUSEHOLD MONTHLY EXPENDITURE

The survey reveals that RM 150 is the least amount while RM 2,000 is the greatest value that a family will allocate for their monthly household's expenses. 57% (51) out of the 90 doors surveyed spent between RM 401 – RM 800 a month. 4% (4) out of the 90 doors surveyed respectively have their monthly household's expenses fall into RM 1,201 – RM 1,600 and RM 1,601 –RM 2,000. 20% (18) of them put in RM 801 – RM 1,200 to cover up their monthly household's expenses. 15% (13) of them will spend between RM 0 and RM 400 a month. **Figure 5.5** summarizes the distributions of household monthly expenses.

Figure 5.5 Distributions of Household Monthly Expenses



Almost all or 92% (82) of the doors surveyed spend less than RM 1,201 a month on their household expenses. It reflects that the longhouse community is practicing a mix of subsistence and cash economy with subsistence economy playing a greater role. Most of the daily supplies are obtained from the surrounding natural resources through farming, fishing and collecting forest produces. The doors surveyed only spent their cash on goods and services which could not be derived from or insufficiently supplied through harvesting of natural resources. For examples, purchase of extra food supplies, and payment for education services, medical services, transportation and utilities. In general, their spending pattern shows that they do not acquire all of their daily supplies through cash economy.

According to the household survey, the major items the doors surveyed spent on are food, education, medical, transport and utilities. The estimated average household expenditures are shown in **Table 5.10**.

Table 5.10 Households' Average Monthly Expenses by Items

Expenditure Items	Range of expenditures (RM/month)	Average expenditures (RM/month)	% (N=100)
1. Food	0 – 800	336	28.0
2. Education	0 – 1,000	72	6.0
3. Medical	0 – 250	59	4.9
4. Transport	0 – 600	183	15.3
5. Utilities (Generator)	0 – 700	550	45.8
Total	**0 – 3,350**	**1,200**	**100**

From the table above, it is observed that utilities (generator) have the highest household expenditure (45.8%) with an average expenditure at RM 550 per month. This is followed by food, the second highest (28.0%) with an average expenditure at RM 336 per month and the third highest (15.3%) falls on transport with an average expenditure at RM 183 per month. The fourth highest average expenditure falls on education, with an average of RM 72 per month or 8.8% and the lowest household average expenditure is on medical with an average of RM 59 per month or 4.9%.

Utilities have incurred the highest cost because fuel needed to operate generator is expensive and generator will be operated every day. Foods positioned as the second highest average expenditure because budget allocated for foods are for all members. Furthermore, the price of goods selling at Song Township are higher as compare to other major towns in Sarawak which also heightened the households' monthly expenses. Although transport also needed fuel, cost incurred by transport is much lower than utilities because longhouse communities do not travel to distance places on a daily basis. Nevertheless, it also caused considerable stress on the households' monthly expenses as the boat fares to travel from longhouse to Song Township is expensive, while extra fares will be charged if the passengers need to deliver bulk of goods. Expenses on education and medical are much lower than the other items because not all members needed these two services. In addition, education and medical are social services provided and subsidized by the Government and thus they do not have to pay a lot for it.

5.11 LAND OWNERSHIP AND UTILIZATION

Based on Round 2 survey, all the 90 doors in 18 longhouses owned certain areas of land with NCR status. The sizes (ha) claimed to be owned by the doors varied from 0.4 to 4.1 ha per doors.

For the 90 doors, the lands have been utilized for hill paddy, rubber, pepper, fruit trees, etc. The most popular cash crop is pepper and rubber (although the rubber trees are only tapped if the market value of rubber increases).

Pepper gardens vary from 0.2 to 2.2 ha per doors. The doors surveyed have already planted 100 to 8,000 pepper trees and have started to harvest peppers from the vines.

Rubber gardens vary from 0.2 to 4.0 ha per doors. The sizes are determined by resources possessed by each doors in terms of land, labour and capital. The doors surveyed claimed that some of the rubber gardens were not in good conditions and unable to be tapped due to the long distance from the longhouses and the lack of manpower.

For hill paddy, the land sizes vary between 0.2 and 4.0 ha per doors. The sizes of the paddy farms are determined by availability of land and family labour.

Only 60% (54) of the doors surveyed have fruit tree orchard larger than 0.2 ha. The sizes of the larger orchards vary between 0.2 and 4.0 ha per door. The orchards predominantly consist of local fruits such as durian, rambutan and others.

5.12 LOCAL INSTITUTIONS

The Tuai Rumah (longhouse headman) and the Village Security and Development Committee or JKKK is in charge of the planning and development of the longhouse. The role of the Tuai Rumah is to safeguard and administer the customary laws to conduct longhouse meetings and activities as well as to act as host and spokesman to visiting officials. Although he or she may be a person of considerable influence and status, the Tuai Rumah has no authority to command others in the community.

The Tuai Rumah is the most important person that an agency needs to contact first to seek his or her concurrence in the introduction of new development project or innovation to the longhouse community in view of his or her considerable influence and status, and to gain his or her support in implementation projects or communicating any policy or information on the projects to the members of the longhouse. Most of the

surveyed longhouses have strong and effective leadership based on the way meetings were conducted and how government projects had been implemented.

In the longhouse, the significant social organisation is the Village Security and Development Committee or locally called Jawatankuasa Keselamatan dan Kemajuan Kampung (JKKK). There is a JKKK in each of the longhouses surveyed and it is headed by the Tuai Rumah and sub-committee members of the longhouse. The JKKK is responsible for planning and implementation of development projects in the longhouse and looking after the welfare and security of the longhouse such as crime prevention and fire prevention and control. Under the JKKK, there are sub-committees or officially called bureaus to cater specific aspect of development or security of the longhouse such as economic politic, health and sports, agriculture, longhouse security, culture and etc. The establishment of the JKKK in longhouse development is facilitated and encouraged by the Government in an effort to enhance greater participation by the local communities.

The 18 longhouses surveyed have some contacts with the government agencies. The agencies that provide services include Department of Health, Education Department, KEMAS, District Office, Department of Agriculture, Information Service Department, etc. For infrastructure development (footpath, jetty, bridges, etc.), the 18 longhouses surveyed have been occasionally assisted under the Minor Rural Projects organised by the Ministry of Rural Development through the District Office. Department of Agriculture is also assisting the longhouses surveyed in terms of subsidize of fertilizer.

5.13 SOCIAL-CULTURAL ORGANIZATION

5.13.1 Social Organization and Cultural Relationship

The features of the social organization and cultural relations of the Iban longhouses communities can be summarized as follows:

i. The longhouse structure is still the principal dwelling of the Iban in the Song-Katibas catchments as in most of the Iban communities in the Rajang basin.

ii. The longhouse provides a physical representation of the social organization of the people.

iii. It is simply a voluntary association of autonomous households. It is not a stable social unit as it frequently changes composition and can easily break up and disperse.

iv. The household is the basic social and economic unit which is domestic unit in that its members live together in the same room or apartment (bilek) in a longhouse and usually share a common meal. It is a legal entity, possessing land and other

property in its own right. Economically it is an independent unit, with members participating in its own paddy planting and relying on its own resources to provide its various needs. It is also a ritual unit, with its own charms and taboos, and its sacred strain of paddy (padi pun). Nearly 50% of the households consist of nuclear families and about 25% are extended families up to one generation to include one or both parents of either husband or the wife.

v. Although Iban marriages are rarely prearranged, it is quite a common practice of marriage between cousins; provided the cousins belong to the same generation level and do not come from the same household. Because of this preference, majority of marriages are between persons of the same longhouse.

vi. On marriage, it is equally common for a man to join his wife household as for a woman to join her husband's. Once children are born to the marriage, it is usual for the couple to break away and form a new household. However, the last sibling to marry is expected to remain with the parents and ensure continuity of the original household.

vii. Household properties, apart from personal items, belong to the household. They include ritual property (e.g. padi pun, household charms); prestige property (e.g. brass gongs, valuable jars, gold, jewellery); productive property (e.g. land, crops, livestock). All siblings are equal co-heirs to the household property. If a sibling marries into another household, he or she forfeits all property rights in the parental household and gain full rights in the spouse's household.

viii. This unit is considered ideal because each member had a distinct and significant role to perform at home in the longhouse and/or in the farm. Today, the situation is somewhat different as the husband is often absent working away from the longhouse with only the wife, the grandparents and the young children in the bilek. School-age children are often absent while they attend school, only returning to the longhouse during school holidays.

ix. A departure from the ideal bilek situation is the case in many longhouse communities where a number of households share the same bilek. As the sons marry, they are often unable to establish a new bilek because of lack of available space or due to financial constraints, and they (and their family) continue to reside with their parents. This can also be due to the fact that many of the young men travel away from the longhouse to seek work leaving their wife and young children in the longhouse.

x. The longhouse exists within a territorial domain (menoa rumah) where individual door-families clear their annual farms and grow paddy and other food crops. The members of the longhouse observe a common body of rules (called adat) and ritual (penti-pemali), which are enforced by the longhouse and reinforce its status as the jural and ritual centre for the people. Responsibility for safeguarding the normative order in the longhouse rests chiefly with the longhouse headman (tuai rumah) and

other community elders including the tuai bilik or family heads. Thus, in matters of adat, longhouse and door elders are said to have authority over other longhouse or apartment residents. This also reinforces the important role the longhouse plays in defining the culture and community.

xi. The basic layout of the longhouse has remained unchanged even though there have been changes in the construction materials from wood to concrete. The basic structure still consists of a series of apartments connected by a common roof with a common covered public gallery or veranda. This veranda or ruai is the focus of the public life of the longhouse and the location of all community activities. This is where the majority of the social interaction occurs and where all the public meetings and discourse are carried out.

5.13.2 Gender Roles in Household Economy

As the bilek is the basic economic as well as social unit of Iban society, labour has been traditionally divided among its members. While there is no rigid division of labour, men and women, young and old are expected to prefer certain occupations. In the past, collecting firewood was a man's job while drawing water was women's work. In general, tasks requiring great physical strength and energy fall to the men, while the women are responsible for the more onerous and time-consuming work that is within their physical capacities.

Nowadays, while roles such as water and firewood gathering have been more or less rendered obsolete by piped water and cylindered gas in many longhouses, the women's role in guiding the agriculture activities of the longhouse is still significant. With many of the young and able-bodied men working away from the longhouse, the agriculture activities are left to those remaining in the longhouse, essentially the women and the older men. Field observations have indicated that only small proportions of the young and able male workforce regard farming as their main employment. Wage-earning activities have taken over the employment in the present economy. The women who are resident in the longhouse are very much responsible for the bulk of the farming activities.

Often the absentee men will return to the longhouse during periods when additional labour is required. This is generally concentrated over the period (June to September) corresponding to the heaviest work requirements for clearing the jungle to establish the new crop or during the harvest period when the new paddy crop needs to be harvested and carried to the longhouse.

While the position of women in the traditional longhouse setting is unquestionably equal, moves to urban settings can upset this status by placing the women in

disadvantaged situation. It has been observed that the relative autonomy, social control and respect that Iban women enjoy in their rural communities is often undermined through the declining viability of rural (especially economic) institutions. In migrating to urban areas, Iban women have found that the traditional prescriptions and opportunities for achievement have given way to economic and political systems with uneven advantages for males.

In the urban areas, the men can find a variety of work ranging from physical low-skilled labour to semi-skilled work. Unlike the men, the value of the women's skill set diminishes in the urban areas placing her in a dependency role to the earnings of the husband. Women who have not received education are particularly vulnerable in this situation. However, with equal educational opportunities for girls, women have access to wage-earning employment in the private and public sectors.

5.13.3 Community Leadership

Iban community leadership is characterized as egalitarian, flexible and formless and without ascribed stratification or hereditary chiefs. Presently, the community still retains this overall sense of equality, and leaders continue to require the approval of the members. However, the means by which the various levels of headmen are appointed has changed. The headman is now a government-appointed position, and the Iban headmen are expected to deal with their communities in a manner similar to all other communities in Sarawak.

The legal provision for the appointment of headmen in Sarawak is stipulated in Community Chiefs and Headmen Ordinance (Cap 60) 2004 as well as Part X of Article 140 of the Local Authorities Ordinance 1996, which also spells out the general responsibilities of the various community chiefs.

Article 140 states that the "Yang Dipertua Negeri may appoint for any local authority area any number of headmen holding the rank of Tuai Rumah, Tua Kampong, Capitan Cina, Penghulu, Pemancha or Temenggong for such period and upon such terms and conditions as he may deem fit". Accordingly, in Article 140 of the Local Authorities Ordinance, the headmen are entrusted to "assist a local authority in the exercise of its powers and the performance of its duties, including the provision of services and amenities to or for the benefit of the inhabitants of the local authority".

The headmen service is structured according to the local level of administration with the Temenggong representing community chiefs at the divisional level, the Pemancha representing the district level and the Penghulu overseeing the sub-district level.

i) Ketua kaum (village headman)

The title of village headman or ketua kaum differs according to ethnic group and covers the designation of Ketua Kampong for the Malays, Bidayuh, Melanau and Bisaya; Tuai Uma for Orang Ulu; and Kapitan Cina for the Chinese. In the case of the Iban, this refers to the Tuai Rumah.

The responsibilities for the ketua kaum are outlined in a government circular dated 2 October 1980, entitled "Terms and Conditions of Service of Ketua Kaum". According to the Terms and Conditions, the village head is responsible for:

i. assisting the Penghulu as and when required in the administration of the area,
ii. encouraging and leading his community to participate in government activities or projects,
iii. settling family squabbles or minor disputes based on his community's adat (or customary law) and where applicable the Native Courts Ordinance,
iv. promoting closer links between his community and the government, and
v. carrying out government instructions from time to time.

The appointment of ketua kaum is based on the recommendation of the Penghulu and the District Officer who will then submit their recommendation to the State Secretary through the Resident's Office.

ii) Penghulu

The Penghulu is responsible for the welfare of various ethnic groups at the sub-district level and is arguably the most powerful leader at the grassroots level. His functions and responsibilities include the registration of new marriages, resolution of domestic problems, ensuring the safety and security of the village, assisting probate, assisting in child adoption cases, addressing social problems within his area, attending government functions and planning the development of villages within his jurisdiction. Some Penghulu have also been appointed as judges in the Native Chief Court. In appointing a Penghulu, the District Officer generally consults the Pemancha or the Temenggong in order to find a suitable candidate. The area's elected representatives also offer their recommendations for candidates to the District Office for consideration.

iii) Pemancha

The second highest authority within the headmen service is the Pemancha who is responsible for representing his respective ethnic group at the district level and is also entrusted to administer the administration of justice in the Native Court. While in theory above the Penghulu, in practice there is little interaction as the Penghulu report

directly to the Deputy State Secretary. As the Pengulu are not obliged to inform the Pemancha about the affairs of the kampongs under the Penghulu's jurisdiction, the supervisory roles of Pemancha exist in theory only. The District Office chooses Pemancha from among the longest serving and most respected Penghulu.

iv) Temenggong

As the highest authority within the headmen service, the Temenggong is entrusted to represent the major ethnic groups in every division in Sarawak. In a division comprised of several small ethnic groups, a Temenggong shall be appointed to represent all of them or they shall come under the jurisdiction of a Temenggong who is representing one of the major ethnic groups in the division. In theory, the Temenggong has a supervisory function over the Pemancha and the Penghulu. However, in practice, the Pemanchas and the Penghulus are not required to report to the Temenggong on the affairs of the community under their jurisdiction. The Pemanchas and the Penghulus report to the District Officer and the Assistant District Officer in charge of the headmen service. The Temenggong therefore holds symbolic power similar to that of the Datu system during the Brooke rule. The appointment of Temenggong is done by the District Office through the Resident's Office, with the Temenggong generally selected from among the Pemanchas or former senior government officers.

5.13.4 Organization of Labour in Farming and Rituals

The bilek (door or apartment) is the basic economic as well as social unit of Iban society and labour supporting this unit is divided among its members. While there is no rigid division of labour, men and women, young and old are expected to participate in contributing their efforts according to their physical abilities. The social structure of the Iban society is such that all are expected to toil in the rice fields to meet the consumptive needs of their families.

The Iban men have always been in touch with the world beyond the longhouse through trading and work outside the longhouse. The women, on the other hand, tended to remain in the longhouse and played the primary role in maintaining the farms and carrying out all associated tasks (with the exception of felling primary jungle). Thus, it was incumbent upon the women to guide the timing and much of the effort for paddy cultivation, in particular, the responsibility of selecting, processing and storing seed; deciding upon the planning order of the farm; and remaining in touch with the rituals associated with paddy planting and harvesting. This state of affairs was largely due to the men's custom of bejalai and seeking work outside the longhouse.

This connection with what was arguably the central ritual of the community – the paddy planting cycle – placed women extremely high in Iban society (**Table 5.11**). In the

traditional value system, their equal status was expressed in other ways as well through the female equivalent of headhunting. This was the weaving of blankets (pua kumbu) according to a laborious resist-dying (ikat) technique, which the Iban developed into a superlative artistic skill. Highly respected women were those who had woven a first-class blanket.

Table 5.11 Rituals Associated with the Paddy Planting Cycle in the Longhouse

Ritual Name	Purpose
Gawai	Paddy harvest festival
Gawai batu	Blessing of the new whetstones for sharpening the farm implements
Manggol rites	Inauguration of the farm clearing
Basoh Arang	Rites to terminates planting prohibitions
Paung padi	Rites to foster growth of the paddy
Matah padi	Rites in preparation for the harvest
Berangkat	Carrying of the rice back to the longhouse
Bersimpan	Rites in preparation of storage of paddy

In the longhouse setting, men and women enjoy identical rights and equal claim to the family estate. Women are not excluded from ritual or public affairs, and there is very little formal segregation of any sort. If anything, the women are central to the maintenance of ritual in the longhouse.

CHAPTER 6

Disclosed Perceptions and Needs

CHAPTER 6
DISCLOSED PERCEPTIONS AND NEEDS

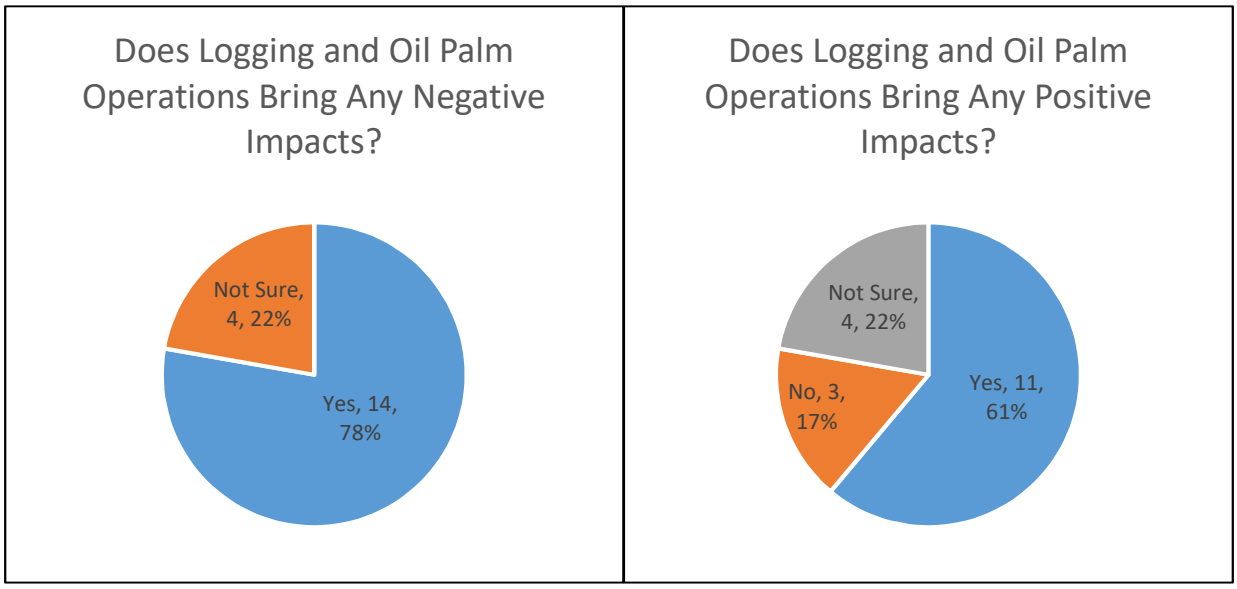
6.1 VIEWS AND PERCEPTIONS OF LOCAL COMMUNITIES

6.1.1 Logging and oil palm plantation operations

18 group discussions with the *Tuai Rumah* and *Jawantankuasa Kemajuan dan Keselamatan Kampung* (JKKK) of 18 longhouses revealed that the past and existing logging and oil palm operations within the Study Area had impacted the longhouse communities positively and negatively. **Figure 6.1** shows their general perception toward the logging and oil palm operations within the Study Area.

14 out of 18 groups reflected that the presence of logging and oil palm operations within the Study Area had adversely affected their quality of life. The remaining four groups did not give significant response on this topic **(Section 2.2)**. On the other hand, 11 out of 18 groups had commented that despite having negative impacts, logging and oil palm operations within the Study Area do have certain positive contributions to the longhouse communities. Furthermore, three groups totally disagreed that the past and existing logging and oil palm operations within the Study Area had brought or will bring them any benefits. The remaining four groups were non-committal on this topic **(Section 2.2)**. Based on the responses, it is shown that the majority were inclined toward the proposition that the negative impacts arise from logging and oil palm operation is greater than the positive impacts it can generate. Hence, it is suggested that mitigation measures or relief plans should be introduced and implemented to minimize or eliminate the unpleasant effect of logging and oil palm operations as well as resolved dissatisfaction of the longhouse communities. The design of mitigation measures or relief plans should also take into consideration of the affected communities' cultures, needs and wants.

Figure 6.1 Outcomes of the 18 group discussion with *Tuai Rumah* and *JKKK* on the Current Logging and Oil Palm Operations inside the Study Area



6.1.1.1 Perceived Positive Impacts of Logging and Oil Palm Operations

Feedbacks from the 18 groups shows that the benefits the longhouse communities enjoyed due to presence of logging and oil palm operations within the Study Area as show in **Figure 6.2** are improved communication and accessibility, increased employment opportunities and different form of assistance in kind from the logging and oil palm companies.

Ten groups has commented the presence of logging and oil palm operations have help to improve the Study Area's telecommunication connectivity and road accessibility. The ten groups were Rh Philip and Rh Japok from Sg Musah Catchment; Rh Melayu, Rh Chenggai and Rh Endah from Sg Tekalit Catchment; and Rh Dagom, Rh Nugu, Rh Suning, Rh Api and Rh Sapai from Ulu Sg Katibas Catchment. As mentioned and describe in previous chapters, longhouses in the Study Area were poorly connected with each other and the nearest township. Improvement in telecommunication connectivity and road accessibility meant a lot to the longhouse communities and can be a push factor to uplift the socioeconomic condition of the Iban community in the Study Area.

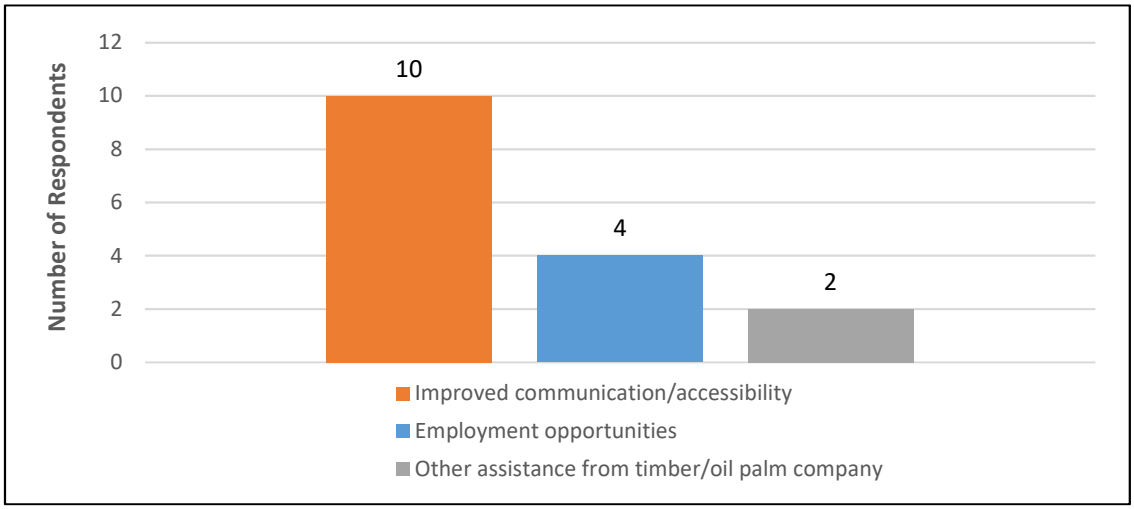
The four groups which commented on the increased of employment opportunities are Rh Philip form Sg Musah Catchment; Rh Melayu and Rh Endah from Sg Tekalit Catchment; and Rh Peter from Ulu Sg Katibas Catchment. To ensure sufficient workforce for the smooth operation of logging and oil palm operation, interested, able and qualified locals will usually be hired by logging and oil palm companies to fill up available and vacant operative, clerical or managerial positions. For an area which has limited economic activities, logging and oil palm operation may be the only platform that the locals can gain a chance to be a wage-earner.

Rh Japok from Sg Musah Catchment and Rh Melayu from Sg Tekalit Catchment stated that they received assistance in kind from the logging and oil palm companies operated in the Study Area. The assistance provided to them is fuel and groceries during festive season. Furthermore, Rh Anjan from Sg Musah Catchment also commented that back in year 1980, the logging companies did help the villagers to clear part of the forest for their longhouse construction. However, since then they have not benefited from the logging and oil palm companies operated in the Study Area. Although only Rh Japok and Rh Melayu stated they received assistance in kind from the logging and oil palm companies, it does not signified that other longhouses did not receive assistance in kind from the companies.

It is noted that none of the group from Sg Bangkit Catchment had responded to this question. For every interview, there was a disclosure session to inform the interviewees that the purpose of the interview is to gather data to assess their suitability for community development initiative, without implying that the responsibility to select the suitable longhouse communities falls on the field assistants. Hence, group which had not responded to the question may be attributed to their concern that by revealing the amount and/or form of assistance they received is going to scale down their chance to be selected for the initiative.

From the groups' responses, it is observed that the positive impacts received by the longhouse communities are restricted to economical, physical and material aspects. The positive impacts have very limited effects in improving the capability and the overall social outlook of the longhouse communities. Therefore, it will be beneficial to the affected communities that the suggested economic and social assistance programmes can include objectives from the social aspect such as enhance the social status of women, children and minorities; advancement of capacity building; promote social equity; and alleviation of all forms of dependency.

Figure 6.2 Main Benefits Received by the Villagers based on the Feedbacks from the 18 Group Discussions



6.1.1.2 Perceived Negative Impacts of Logging and Oil Palm Operations

The 18 groups asserted that the negative impacts caused by logging and oil palm operation are manifested in the adverse changes these activities did to the rivers, forests and lands in the Study Area. **Figure 6.3** summarized the negative impacts perceive by the 18 groups caused by logging and oil palm companies.

The majority of the recorded responses had reflected the groups' concern over the deterioration of rivers' quality. Deterioration of river's quality in the Study Area from their perspective was manifested in different ways such as reduced river water level (10 responses), increased river water turbidity (6 responses), contaminated river water and declined river resources (2 responses). Beside deforestation arise from logging and oil palm operations, the groups also mentioned that seasonal rainfall variation is also one of the major cause contributed to the reduced river water level. The impacts arose from declined river resources will be discussed more detailed in **Section 6.2.1**. Negative impact toward forest has received seven responses. Six out of the seven groups stated that logging and oil palm operations had led to the loss of virgin forests. The remaining one group commented on the decline of forest resources. The impacts arose from declined forest resources will be discussed more detailed in **Section 6.2.3**. Furthermore, Rh Endah (Sg Tekalit Catchment) stated that logging and oil palm operations have caused their area more susceptible to landslide.

Although the groups perceived the adverse changes confronting rivers, forests and lands in the Study Area were due to logging and oil palm operations, it does not signified that they are the sole contributor to all of the negative impacts. Nevertheless, it is believed that being large scale economic activities, logging and oil palm operations may have significant adverse impact toward the Study Area surrounding environment.

As elaborated in previous chapters, longhouse communities in the Study Area relied extensively on the natural environment for survival and to maintain their standard of living. Hence, even mild changes to the surrounding environment may affect the life of the communities significantly. From the group discussions, it can be concluded that the major concern of the groups was the dropping of river water level. **Figure 6.4** summarized the influences of low water levels of Sg Katibas.

Based on feedbacks from the groups, the influences of low river water levels of Sg Katibas are reducing longboat's mobility along the river, obstructing the shipment of items, extending travelling time, delaying arrival of passengers and items, and laying out extra expenses for boat fuel. The numbers of responses received by the respective influences are 12, 3, 3, 1 and 1. These influences will posed certain challenges and discouragements to the longhouse communities.

Low river water level limits the propulsion of longboats to transport passengers and delivery of goods. This can be a life threatening situation for longhouse members who needed immediate and advance medical attention from the medical facilities located at Song Township or the nearest towns. Apart from that, the supply of necessities from and delivery of cash crops to Song Township and/or Sibu will be affected. Long travelling time and poor punctuality may also reduce parents' eagerness to send their children to and children's interest to attend school. It may also reduce the keenness of the younger generation who work outside the Study Area to visit seniors who reside at the longhouses. As longboat is going to consume more fuels, boat fare will be increased. Hence, passengers will need to pay more money for the same service which may increase the households' financial burden. The mentioned and elaborated challenges and discouragement are not all of them. It is just some examples given to illustrate that the change of river hydrology or the surrounding environment will considerably alter the lifestyle and scale down the living standard of longhouse communities.

Figure 6.3 Perceived Negative Impacts Caused by Logging and Oil Palm Operations

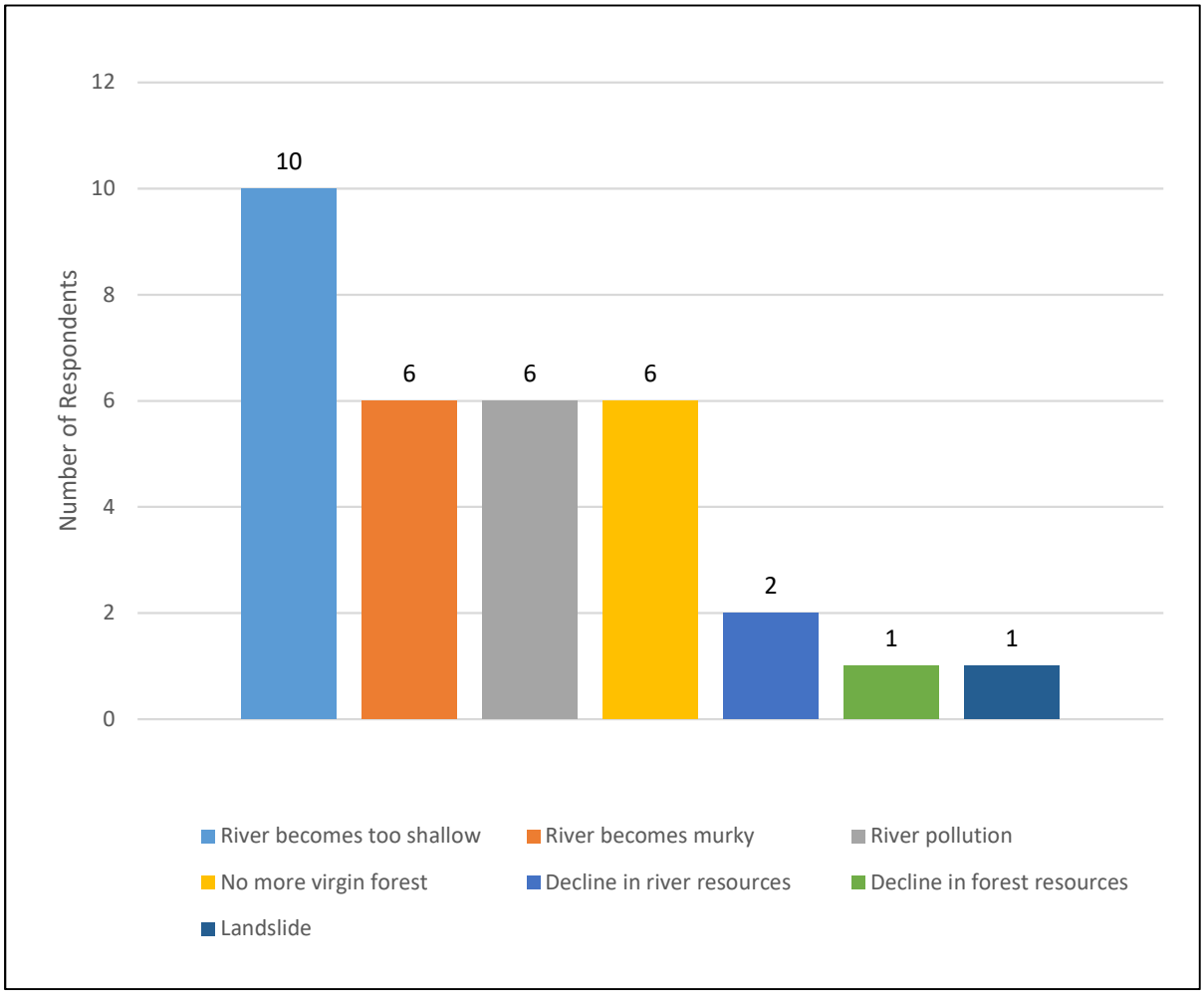
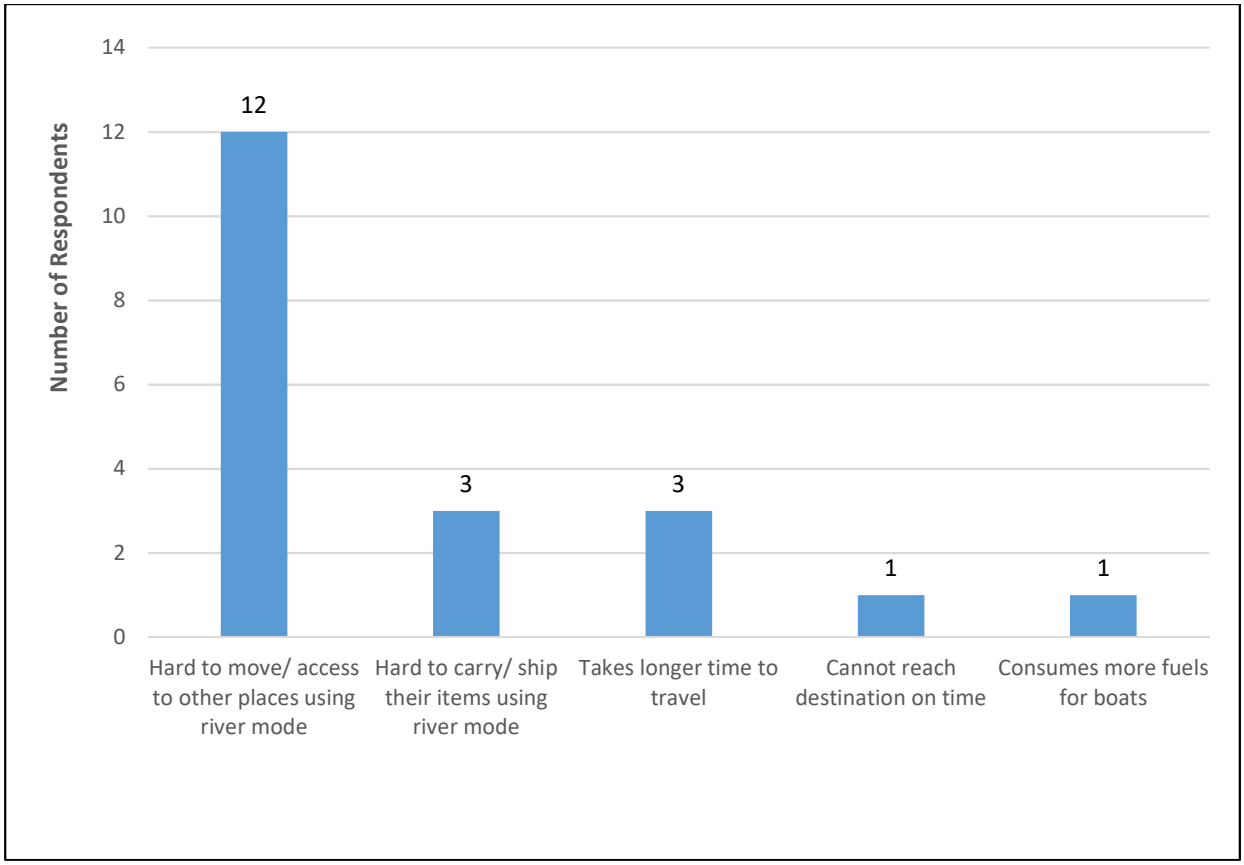


Figure 6.4 Influences of Low Water Levels of Sg Katibas



6.1.2 Perceived Causes of Declined in Fish Stock

Based on the responses from individuals in group discussion with *Tuai Rumah* and JKKK as well as vulnerable groups, they perceived the causes of decline in fish stock to be degradation of river water quality, competition from non-residents fishermen, overfishing and drop of river water level. **Figure 6.5** summarises the perceived causes of decline in fish stock and the details of responses on causes of decline in fish stock is shown in **Table 6.1**.

Degradation of river quality had received response from 25 individuals. 18 out of the 25 individuals were confident that the prime factor that leads to degradation of river water quality is logging activities. Competition from non-residents fishermen has recorded response from 18 individuals. Five out of the 18 individuals specifically stress that the use of illegal fishing methods by non-residents fishermen leads to the decline of fish stock. Six individuals attributed the decline of fish stock to overfishing. Nevertheless, they failed to clarify who is the party responsible for overfishing. Three individuals stated that drop of river water level is the cause of decline in fish stock, but they did not further explain the drop of river water level is due to seasonal variation or impact arise from timber harvesting and plantation operation. 13 individuals did not respond to the question, they were either not attentive to the transformation of the surroundings

environment or discouraged to answer the questions due to sense of incapability to make a positive change toward the degrading surroundings environment.

The decline of fish stocks may alter the lifestyle of longhouse communities; contribute to the decline of wildlife population; and reduce the viability of local economy. Firstly, fish protein remain one of the most important parts of the rural diet, but nowadays fishing activity is not widely perform, in view of poor and irregular catches. The attention of longhouse communities, now turned to more remunerative economic activities related to cash-earning income; these includes cash crops (particularly pepper and rubber) and wage-earning employment in private or government sector from which part of the cash earned can be used to buy fish and meat. The associated impact of neglecting fishing activity is the loss of local fishing knowledge. As the adults no longer performing fishing, the dissemination of local fishing knowledge such as fish behaviour, fish location, fishing methods and techniques, and best time to fish to the younger generation may cease.

Secondly, using animal protein as replacement for fish protein will contribute to the decline of wildlife population. Protein is an essential nutrient that makes up a balanced diet. To ensure the sufficient supply of protein for daily dietary intake, the contraction of fish protein supply pressured the longhouse communities to hunt and consume wildlife as a replacement for fish protein. This scenario may cause hunting activity which usually actively conducted within fruiting season to be expanded into an activity that will be conducted throughout the year. The continuous hunting of wildlife will lead to constant decline of wildlife population which will be a setback for the conservation of wildlife and biodiversity of the Study Area.

Thirdly, the decline of fish stock will reduce the viability of the local economy. Due to limited fish catch, the commercialization of fresh fish is not possible. Therefore, longhouse communities are not interested to spend time and invest money in fishing sector because they cannot make profit from it. As a result, longhouse communities may gave up fishing and focus on better return economic activities such as farming cash crops, selling forest produces or goods derived from forest produces and wage-earning employment. Over relying on the current economic activities and lack of will to rejuvenate fishing sector will lead to the lack of alternative economic activity. This will increase the susceptibility of local economy toward economic disruption when any of the current economic sectors experiencing downturn.

Figure 6.5 Perceived Causes of Decline in Fish Stock

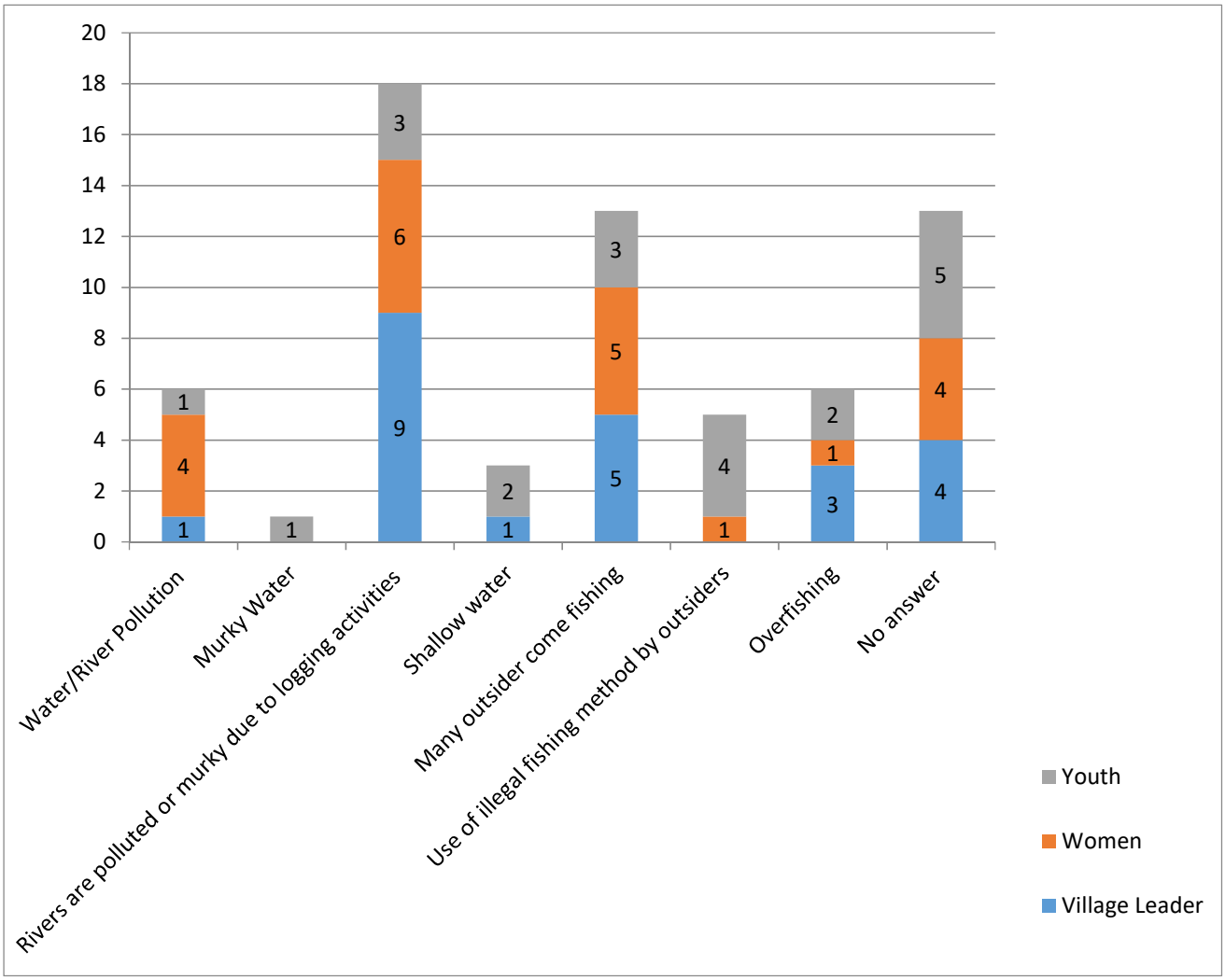


Table 6.1 Details of Responses on Causes of Decline in Fish Stock

Causes of Decline in Fish Stock	*Number of Respondents*			
	Village Leader	*Women*	*Youth*	*Total*
Water/river pollution	1	4	1	*6*
Murky water	0	0	1	*1*
River becomes polluted/ murky because of logging activities	9	6	3	*18*
Shallow river	1	0	2	*3*
Many outsiders come fishing	5	5	3	*13*
Use of illegal fishing method by outsiders	0	1	4	*5*
Over fishing	3	1	2	*6*
No answer	4	4	5	*13*

6.1.3 Perceived Causes of Declined in Wildlife Population

Based on the responses from individuals in group discussion with *Tuai Rumah* and JKKK as well as vulnerable groups, they perceived the main causes of decline in wildlife population to be variations of biophysical environment (i.e. fruiting season, migration of wildlife and environmental pollution), deforestation, unchecked hunting activity and remoteness of hunting grounds. **Figure 6.6** summarises the perceived causes of decline in wildlife population and the details of responses on causes of decline in wildlife population is shown in **Table 6.2**. Variations of biophysical environment recorded response from 17 individuals. 13 out of the 17 individuals indicated that the wildlife population size fluctuate in accordance to the fruiting season. The presence of wildlife will significantly decreased when it is none fruiting season. Other biophysical variations are migration of wildlife and environmentall pollution but they did not provide extra information on the cause of wildlife migration and source of pollutants. 16 individuals recognized that deforestation is the cause of decline in wildlife population. Forests are cleared for development, commercial logging, planted forest and further worsen by illegal forest clearing. 15 individuals have noted that unregulated hunting activity is the cause of decline in wildlife population. 12 out of the 15 individuals specifically stress that it is due to illegal hunting. They claim that there are a lot of outsiders gain entry into the forest via logging camp or plantation estate entrance to hunt wildlife for food, cash and sport.

Figure 6.6 Perceived Causes of Decline in Wildlife Population

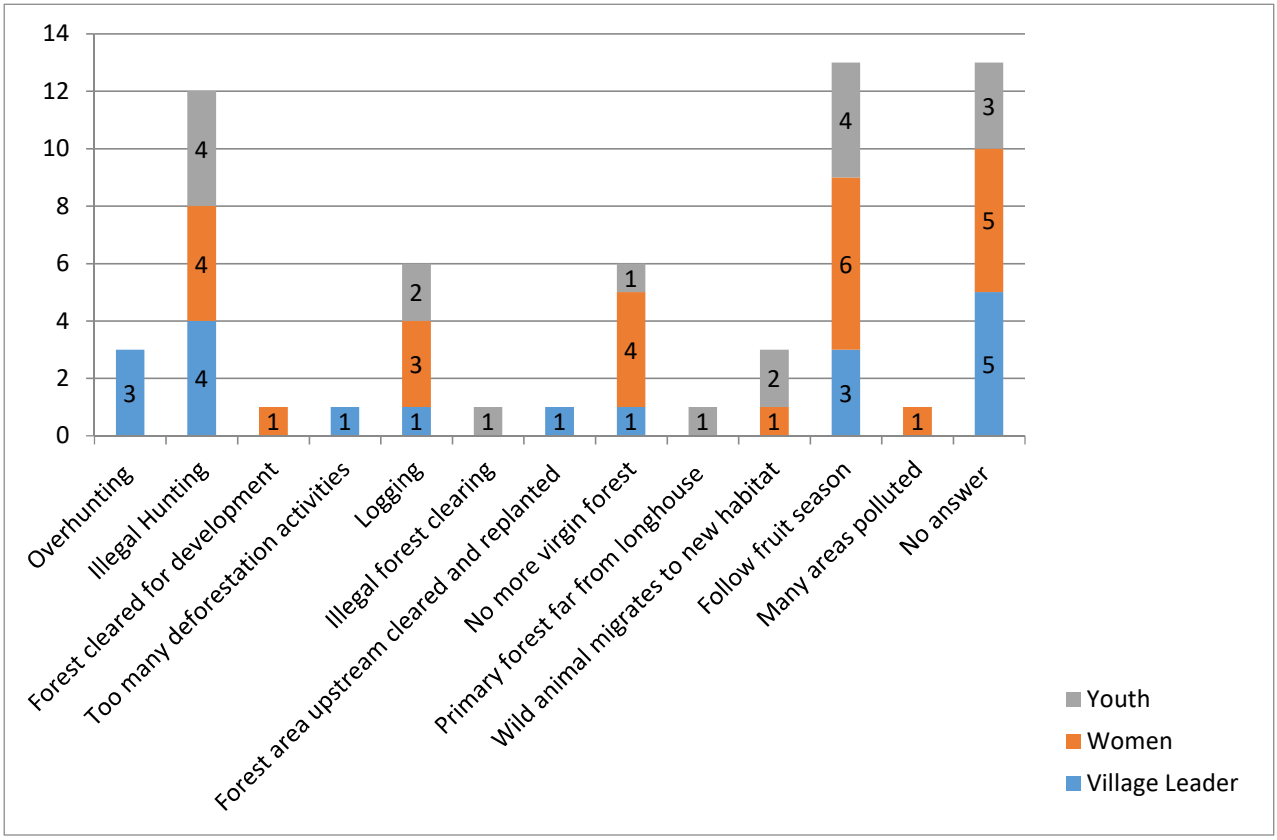


Table 6.2 Details of Responses on Causes of Decline in Wildlife Population

Causes of Decline in Wildlife Population	*Number of Respondents*			
	Village Leaders	*Women*	*Youth*	*Total*
Over hunting	3	0	0	*3*
Illegal hunting	4	4	4	*12*
Forest cleared for development	0	1	0	*1*
Too many deforestation activities	1	0	0	*1*
Logging	1	3	2	*6*
Illegal forest clearing	0	0	1	*1*
Forest area upstream cleared and replanted	1	0	0	*1*
No more virgin forest	1	4	1	*6*
Primary forest far from longhouse	0	0	1	*1*
Wild animal migrates to new habitat	0	1	2	*3*
Follow fruit seasons	3	6	4	*13*
Many areas polluted	0	1	0	*1*
No answer	5	5	3	*13*

Long distance between longhouse and hunting grounds has only recorded a response from one individual. 13 individuals did not respond to the question, they were discouraged to answer the questions due to sense of incapability to make a positive change toward the degrading surroundings environment. The potential impacts arise from the decline of wildlife population are raising the stress on protein supply and stimulating the loss of indigenous culture.

Firstly, pressure place on protein supply as a result of decline in fish stock is intensifies by the shrinking of wildlife population. The short of protein supply is worsens by undeveloped poultry farming within the Study Area. Protein deficiency in the daily diet of youngsters may have adverse impacts toward their health, growth and development. It is important that alternative source of protein supply such as poultry farming and 'Tagang' system is introduce and implement to ensure and promote youngsters' health, growth and development.

Secondly, the decline of wildlife population also signified the loss of indigenous culture. The decline of wildlife population within the Study Area signified the population size of endangered species is also adversely impacted. Some of the endangered wildlife species such as hornbill and orangutan which the longhouse communities occasionally spotted within the Study Area are also culturally significant to them. The Iban community believed that hornbill is the intermediary between human and *Singalang Burong* a powerful deity. On the other hand, Iban community regarded human as the descendant

of orangutan or orangutan is the reincarnation of dead soul. Myth and legend constructed around hornbill and orang-utan gave Iban community the sense of attachments toward their surrounding nature. The absence of the mentioned endangered species from the Study Area may alienate Iban community from the surrounding nature which will corrode their traditional practices such as totem, tattoo, music, dance and handicraft that are created based on inspiration from and admiration of the endangered wildlife species.

6.1.4 Perceived Causes of Declined in Forest Produce

Deforestation and loss of virgin forest are the two main factors perceived by the participants of group discussion to be the cause of decline in forest produce. **Figure 6.7** summarises perceived causes of decline in forest produce and the details of responses on causes of decline in forest produce is shown in **Table 6.3**. 15 individuals claimed that deforestation to be the main cause. Forests were cleared legally or illegally for farming, plantation, commercial logging and other forms of developments. 12 individuals claimed that the loss of virgin forest is the main factor that leads to the decline of forest produce. Remoteness of forest produce harvesting ground only recorded response from three individuals. 23 individuals did not respond to the question, they were discouraged to answer the questions due to sense of incapability to make a positive change toward the degrading surroundings environment. The decline in forest produce may impact the longhouse communities in different ways such as weaken women's capability to earn cash income, disrupt balanced diet and induce loss of traditional knowledge.

Firstly, the decline of forest produce may weaken women's effectiveness to generate cash income for the households. The tasks commonly perform by women who reside at the longhouse are cooking, taking care of children, collecting edible plants, farming and handicraft making. Among the few mentioned tasks, the role to earn cash income usually fall on farming and handicraft making through trading harvested cash crops and crafted artworks. However, the decline of forest produce will impede the making of handicraft, because most of the materials needed to make handicrafts were derived from forest produce like bamboo, rattan and *daun biruk*. As a result, without forest produce that can be made into handicraft, farming becomes the only activity which women can participate actively in contributing to the generation of cash income for the households.

Secondly, without edible plants from the forest, the balanced diet of the longhouse communities will be adversely affected. Vegetable farming is not widely practice by the communities. They rely heavily on ferns and wild vegetables such as *midin, paku, umbut*, bamboo shoot and other edible plants as well as fruits from the forest to be their daily supply of vitamins and minerals. The declines of forest produce will constraint the

vitamins and minerals intake of the longhouse communities and thus result in unbalanced diet, and causing them to be more susceptible to illness.

Thirdly, the traditional knowledge of the Iban community was passed down from generation to generation through the regular harvesting and utilization of natural resources. At present there are still considerable numbers of longhouses and households within the Study Area practicing traditional knowledge in healthcare and handicraft making. Due to poor transportation system to access the major healthcare centres, medicinal herbs still played a significant role in the daily life of the communities to treat minor ailments and this keep the knowledge of plants' medicinal values found in the forest continuously circulating within the community and disseminating into the younger generation. Hence, if the forest produce continue to diminish, the informal spreading of traditional medical knowledge may cease due to absence of medicinal herbs for daily practical application.

Forest produce such as bamboo, rattan, and *daun biruk* collected from the forest are very important raw materials used by the Iban women to produce traditional handicraft like mats, hats, basket, *Pua Kumbu* (woven textile) and cloth. However, over the years due to the decline of forest produce, Iban women has switched some of raw material collected from forest with synthetic material for the making of handicraft. For example, the Iban women replaced *daun biruk* with nylon string to weave *Pua Kumbu*. However, for handicrafts that use bamboo and rattan as raw materials it is difficult to get their alternative from synthetic sources. Without the right materials, the making of handicraft will be halted and following that is the loss of a series of traditional knowledge such as raw materials preparation, weaving techniques, dye preparation, and traditional totem as well as pattern imprinted on the produced handicrafts. In addition, traditional totem and pattern imprinted on the handicrafts carries myth and legend that connect the community with their past. These unique totem and pattern that contain Iban cultural elements also act as recognition of the Iban community. The loss of these traditional totem and pattern will alienate the affected community from their past and disintegrate their cultural identity.

Figure 6.7 Perceived Causes of Decline in Forest Produce

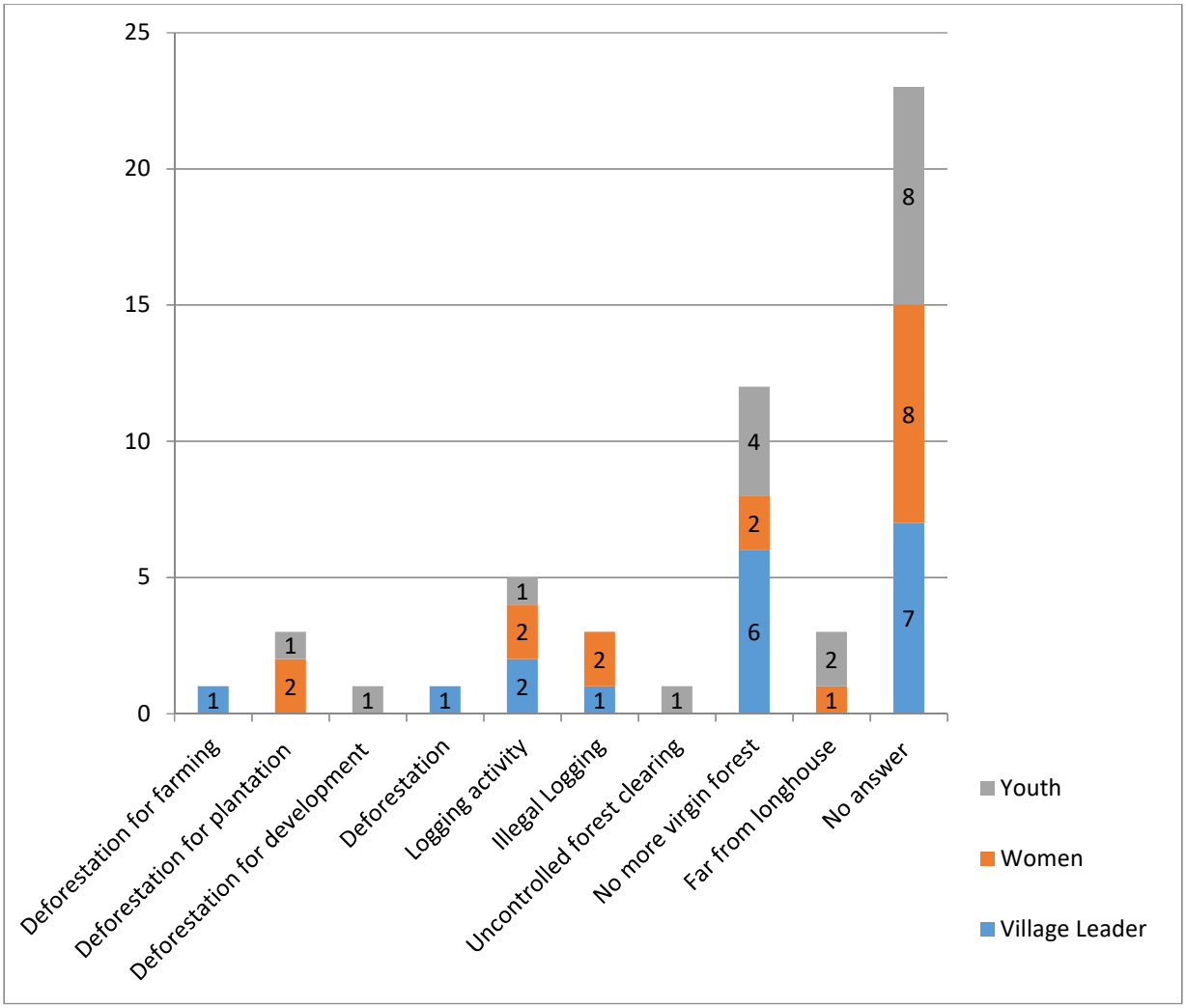


Table 6.3 Details of Responses on Causes of Decline in Forest Produce

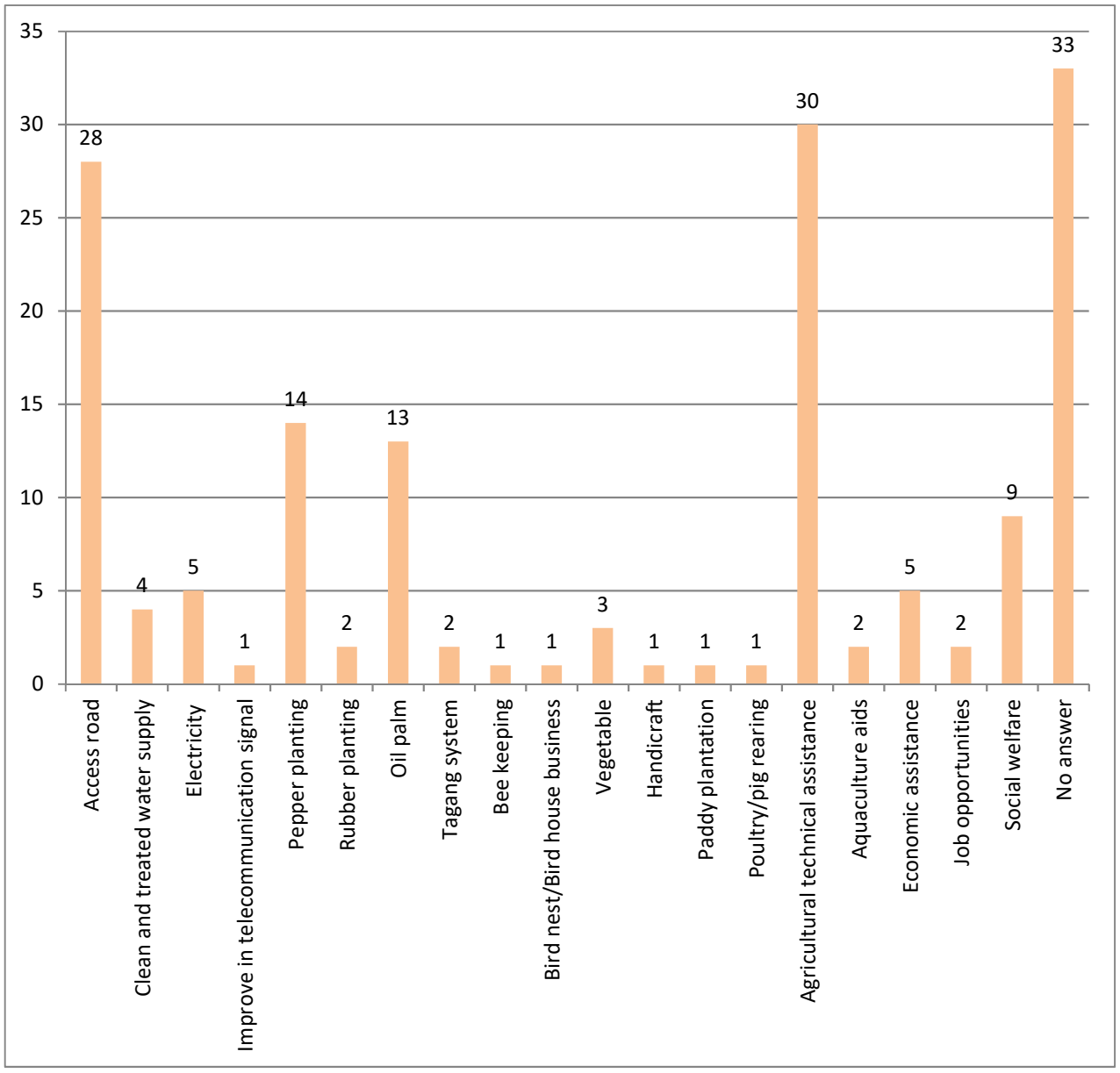
Causes of Decline in Forest Produce	*Number of Respondents*			
	Village Leaders	*Women*	*Youth*	*Total*
Deforestation for farming	1	0	0	*1*
Deforestation for plantation	0	2	1	*3*
Deforestation for development	0	0	1	*1*
Deforestation	1	0	0	*1*
Logging activity	2	2	1	*5*
Illegal logging	1	2	0	*3*
Uncontrolled forest clearing	0	0	1	*1*
No more virgin forest	6	2	4	*12*
Far from longhouse	0	1	2	*3*
No answer	7	8	8	*23*

6.2 PERCEIVED NEEDS/WANTS FOR FUTURE COMMUNITY DEVELOPMENT

6.2.1 Leaders

Perceived needs and wants for future community development is one of the topics discussed during the group discussions with the *Tuai Rumah* and JKKK of 18 longhouses. It is important to gauge the perceived needs and wants of the leaders to ensure that the resources will be directed into economic or social assistance programmes that the longhouse interested and needed. As shown in **Figure 6.8** the needs and wants that received the greatest number of responses are access road, pepper planting, oil palm and agricultural technical assistance.

Figure 6.8 Needs and Wants from *Tuai Rumah* and JKKK



Access road had received response from 28 individuals who participated in the group discussion. From the perspective of longhouse communities the development of decent road links is essential to uplift the socioeconomic condition of their longhouse. As elaborated repeatedly in the previous chapters a lot of places within the Study Area can only be accessed via river but river is less reliable as compare to roads. This is because the mobility of longboat along the river will be affected by fluctuation or river water level which fluctuates daily and seasonally but road condition is less likely to be affected by weather condition. Due to unreliability of river, longhouse communities are confronted by a series of problems such as difficulties to access social services, logistic constraint to market agricultural products, inaccessibility of government resources to implement socioeconomic programmes, limited economic opportunities and high cost of transportation. Hence, the presence of decent road links will significantly alleviate the problems faced by the longhouse communities.

Pepper planting had recorded response from 14 individuals who participated in the group discussion. The longhouse communities within the Study Area have a strong sense of attachment toward pepper planting, because for generations Iban community has been cultivating pepper. Moreover, the success of Rh Dagom in pepper planting became a strong motivator for other longhouse communities to venture into or expand current pepper planting. As compare to other existing cash crops in the Study Area, pepper has relatively stable and higher market prices which enhance its attractiveness as a profitable cash crop.

On the other hand, oil palm had recorded response from 13 individuals who participated in the group discussion. Currently, in Malaysia oil palm occupied the largest grown areas. The upstream and downstream of oil palm sector were diversified and well-developed with massive and continuously expanding internal and export market. Due to its significant contribution to national economy, oil palm sector received great attention and support from the Government, and thus various incentives, assistance and policies were introduced to assist oil palm planters especially smallholders. As illustrated above, stable domestic market, growing foreign market and government's backing made the longhouse communities to view oil palm to be a prospective sector.

30 individuals who participated in the group discussion recognized agricultural technical assistance to be the needs and wants they required. Based on the feedback from the longhouse communities, they claimed that as compare to other government agencies, healthcare department had visited them the most. Hence, they hoped that government agencies especially those related to agricultural sector can visit to their longhouses more frequently to help improve their agricultural productivity. Currently, considerable numbers of the households are still practicing traditional or outdate modern farming techniques. They hope through the frequent visit of agricultural agencies, they can constantly update to the latest farming techniques. Inputs from the

expert to correct their farming mistakes are also important to them. Moreover, with frequent visit from the agricultural agencies it is believed that the longhouse communities are more accessible to information related to the prevention of pests and diseases, market or business opportunities, government's latest policies, incentives and assistance, proper usage of agrochemical and sustainable farming.

33 individuals who participated in the group discussion were reluctant to give any active response on the perceived needs and wants required by the longhouse communities to foster development. This group of people may be the passive members of the longhouse communities who do not want to participate actively in the community development and just wanted to go along with the opinion of the majority to make their life easy and prevent conflict with the dominant party.

In the context of cash-earning projects, the majority showed their interest in agriculture activities such as pepper plantation (17), rubber plantation (15), oil palm plantation (11) and selling vegetables (9). On the other hand, selling handicraft (9), aquaculture (8), Tagang system (6) and pig rearing (4) received considerable attention. Only small subsets of them were interested in poultry farming (2), homestay (1) and bird house (1). **Figure 6.9** shows the type of cash earning projects the *Tuai Rumah* and JKKK wish to undertake.

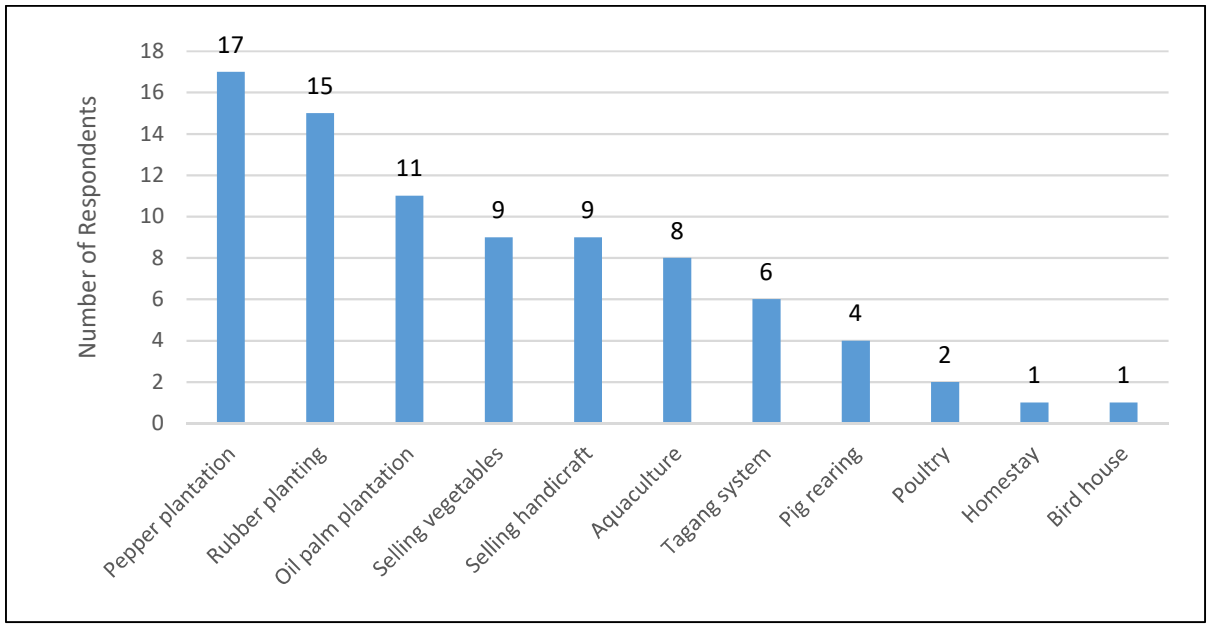
Agricultural projects received the utmost attention because as compare to other cash-earning projects, the return of agricultural projects for individual door is the greatest. Each door within the longhouse usually will be given a specific area of land which the particular door totally owned and worked, with its yields completely belonged and consumed by them. In other words, the door enjoys all of their fruit of labour and they have the privilege to decide do they wish to share the excesses with other members of the longhouse. However, in other cash-earning projects, they may be obliged to share the outcome with other members due to sharing of resources and thus reduced the attractiveness of non-agricultural projects.

Comparing **Figure 6.8** and **Figure 6.9** shows that oil palm which is the second highest needs and wants was subdue by rubber planting when it comes to preferred cash-earning projects. Currently, not many longhouses and households within the Study Area had started planting oil palm. The main purpose to have these cash-earning projects is to empower local communities in co-management of natural resources in a sustainable manner and according to the green economy concept. In the meantime, it is to provide an alternative source of cash income for the communities to alleviate the impacts of logging and plantation operation. It is safer for them to continue on rubber plantation which they already have certain level of understating through expansion of existing or renewal of old rubber plantation rather than start planting an unfamiliar cash crop from

scratch although in term of profitability oil palm is higher and firmer. In addition, oil palm cultivation is likely to create more significant negative impact on the environment.

Selling handicraft only recorded moderate responses because not all longhouses have members who are good handicraft makers. Hence only longhouses who are good in producing handicraft gave their support to this cash-earning project. Moreover, as compare to pig and poultry farming, aquaculture and 'Tagang' system received greater support from the leaders. This is because aquaculture and 'Tagang' system usually rear freshwater fish species such as *Semah, Empurau, Tengadak, Kaloi* and *Tilapia* that fetch high price in the market as compare to pigs and poultries. Due to undeveloped tourism sector within the Study Area, homestay did not draw wide attention. Most of them were also not interested to venture into high risk bird house business that require huge capital and specialised knowledge.

Figure 6.9 Types of Cash-earning Projects Preferred by *Tuai Rumah* and JKKK



6.2.2 Vulnerable Groups

During the group interview that contains a mix of representative of door, women, youths and old people/handicapped, individuals who belong to the vulnerable group had also stated their perceived needs and wants. The perceived needs and wants of the vulnerable group were gauge to ensure that their necessities and demands will be well represented in the proposed socio-economic development initiatives.

Based on **Figure 6.10**, agricultural/farming aids and better land accessibility were the two needs and wants that received the greatest attention and it coincide with the utmost concerns of the leaders as shown in **Figure 6.8**. In other words, agricultural/farming aids and accessibility are the needs and wants agreed by both

dominant and minorities section of the communities as the foremost issues to be addressed and resolved. Hence, the proposed economic and social assistance programmes must be able to contribute directly to alleviate or induce indirect positive reinforcement toward foremost concerns of the communities.

Furthermore, it is observed that some respondents had shown their interest toward job opportunity and housing development. This shows that they are concern about the longhouse future economic and welfare prospects. On the other hand, it also reflects that they are anxious toward the economic development in the Study Area and their chances and capabilities to own a house or any form of assistance that can be provided by the Government to assist the communities to rebuild or renovate their longhouses.

In term of welfare for handicraft activity, old people/handicapped and women had shown their interest in it. This is because handicraft making was the role traditionally performed by women and it may be the only economic activity that is suitable for old people/handicapped that inclined toward sedentary lifestyle. It also reflects that the younger generation of the communities may not be interested in handicraft making. This is an alarm to the Iban community that there may be a fault in the transmission of the Iban community's cultural heritage and handicraft making knowledge. The fading of cultural heritage and traditional knowledge may cause the society to practice a more materialistic lifestyle and less concern in the preservation of the Iban community's intangible wealth.

Figure 6.10 Needs and Wants by Vulnerable Groups

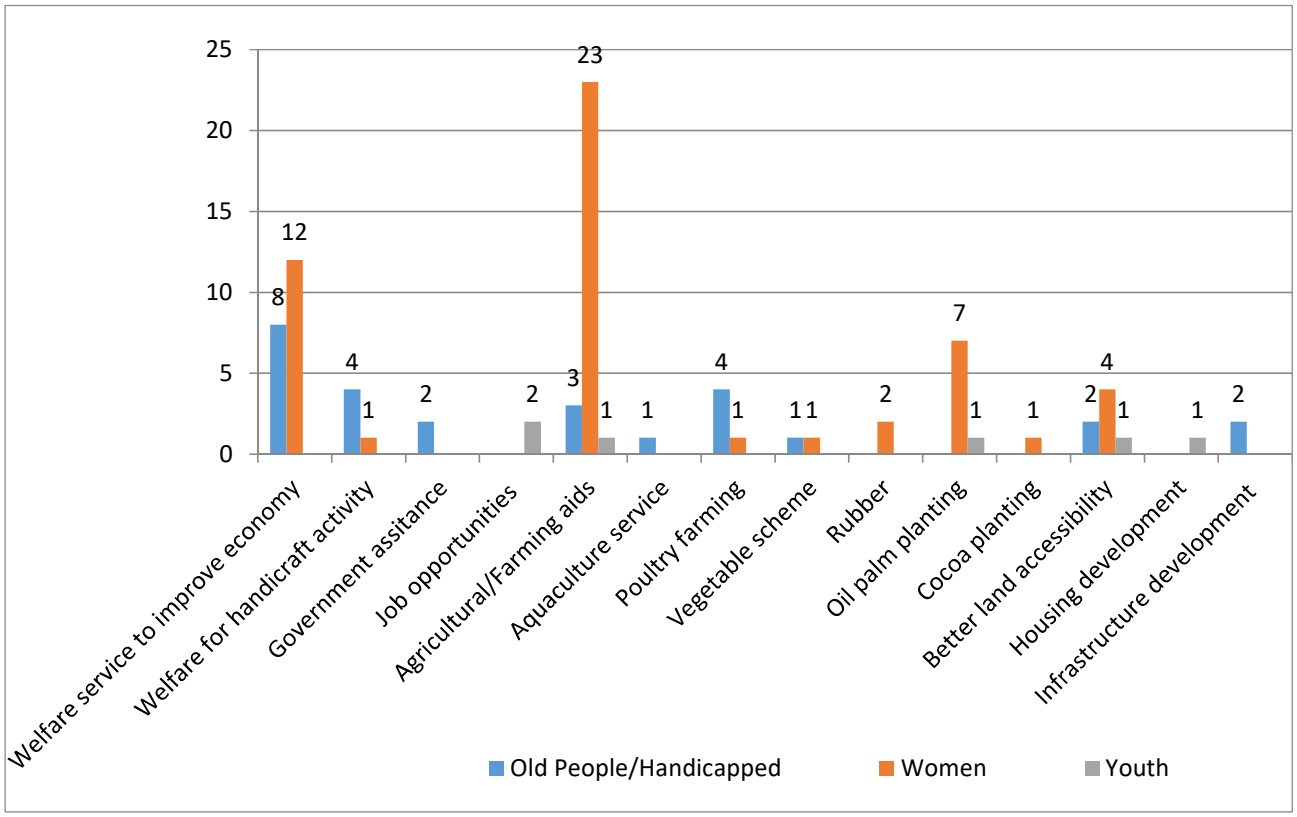
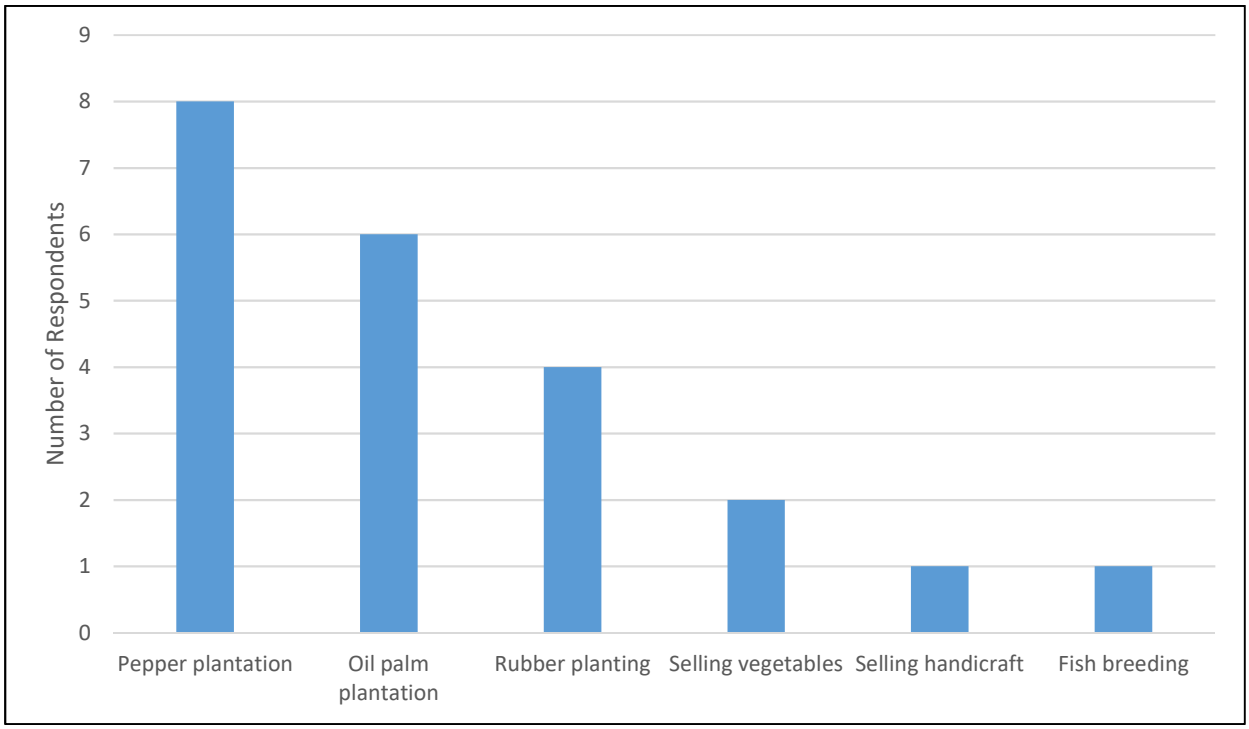


Figure 6.11 summarized the type of cash-earning projects preferred by women who participated in the interview. The majority preferred to venture into agricultural activities such as pepper planting, oil palm planting and rubber planting. Some showed their interest in selling vegetables and handicrafts, and to be involved in fish breeding.

It is noted that, as compare to leaders, women are more interested in oil palm. Women's high interest in oil palm may be attributed to the influence of their relatives whose standard of living had improved after venturing into oil palm cultivation. The success of the well-off relatives is giving them the message that oil palm is a promising cash crop. Nevertheless, women who stated their interest for oil palm during the interview fail to realise that oil palm plantation need huge capital to kick-off and maintain. They also fail to take into consideration of the logistical difficulties posed by the complex terrain to transport fresh fruit bunches from their longhouse to the nearest mill.

Figure 6.11 Types of Cash-earning Project Preferred by Women



6.3 POTENTIAL OPPORTUNITIES AND GAPS FOR CHANGES

There are considerable numbers of longhouse communities which have the desire, resources and capacity to participate in Green Economy programme/projects. The opportunities include the following:

i. Longhouse communities are eager to enhance the productivity of cash crops especially pepper and rubber in suitable farm land to raise household income.
ii. Presence of suitable rivers for introduction of Tagang System for conservation of fisheries resources through controlled harvesting to ensure sustainable fish stock.
iii. Vegetable farming is not common in the Study Area and thus there is prospect to introduce home garden (vegetables and annuals) on sustainable basis to improve household nutrition.
iv. Introduction of apiculture (stingless bees) especially in the vicinity of the planted Acacia forest to generate supplementary household income.
v. Women are interested to participate in local handicraft making using local materials to sustain the local culture and to earn extra income for the household.
vi. Women's participation in programmes/projects can increase the workforce participation rate of the community and enhance the social status of women.
vii. Introduction and implementation of economic or social programme can be a pull factor to attract migrate back and reside at the longhouse which create an opportunity to improve the viability of the longhouse due to present of energetic and educated able-workforce.
viii. The success of principal economic or social programme can build a solid foundation for the introduction and implementation of supplementary programme that can further contribute to the improvement of longhouse communities' welfare.
ix. The presence of economic or social programme coordinated by environmental organization creates window to cultivate the idea of sustainable development within longhouse communities.

The gaps include the following:

i. Lack of telecommunication system that allow the longhouse communities to obtain and share with each other on pepper's latest market information.
ii. Poor accessibility has posed logistic constraint to collect goods from the longhouse communities and deliver goods to the local markets or consumers.
iii. Insufficient number of entrepreneur minded longhouse member to kick-start the introduced and lead the implemented economic or social assistance programme.
iv. The longhouse communities do not have adequate knowledge, tools and mediums to design and perform marketing campaign to promote and sell their products.

v. Constant and periodic visit from relevant government agencies such as Malaysia Pepper Board (MPB), Rubber Industry Smallholder Development Agency (RISDA), Malaysia Agricultural Research and Development Institute (MARDI), Sarawak Craft Council, SME Corporation and other agencies to organize technical workshop and knowledge sharing session to improve the capacity of the longhouse communities to produce quality goods and market their goods.

vi. Due to high mobility among the youth, the continuous presence and supply of able-bodied workforce at the longhouse may fluctuate.

vii. The number of participants allocated for each economic or social programme may not be able to include every household or individuals reside in the longhouse.

Initiatives to fulfil these opportunities need to start from scratch for most longhouses; except for a small number of longhouses where planting of pepper and rubber have been undertaken. As such, the gaps for changes will require considerable efforts and proper planning fill. These entail the following actions and considerations:

i. Project cycle:
   - Situation Analysis – Surveys and dialogue sessions with interested villages; identification of target groups/households and their needs; resources (land, labour, capital, knowledge etc.) availability;
   - Project Planning – Scope of individual projects: objectives and justifications; target groups/participants; design of project/production model; physical and financial schedule; cost and return; management and organization; output delivery system; and implementation plan;
   - Project Appraisal – Social and economic benefits; cost-benefit analysis; availability of funds; Technical Committee (TC) to appraise;
   - Project Implementation and Monitoring – Monitoring & Evaluation; Monitoring Implementation Plan; Physical & financial progress; milestones; Problems, resolutions to address problems; TC meetings; Communication (horizontal & vertical); decision-making; training; financial management;
   - Project Evaluation – Whether objectives and goals achieved? Social & Economic impacts; continue or expand or discontinue? Identify management strengths & weaknesses; and
   - Back to Situation Analysis.

ii. Training of participants - this activity should cover the participating households and project leaders.

iii. Budget preparation and manpower planning – to ascertain adequate fund, logistics and manpower for implementation.

CHAPTER 7

Potential Impacts of Green Economy Concepts

CHAPTER 7
POTENTIAL IMPACTS OF GREEN ECONOMY CONCEPTS

7.1 POTENTIAL POSITIVE IMPACTS OF GREEN ECONOMY CONCEPTS

The positive impacts of green economy concepts can be assessed against its three inter-related priorities i.e. reducing greenhouse-gas emissions, biodiversity conservation, and sustainable economic growth.

7.1.1 Reduction in Greenhouse-Gas Emission

The move towards a green (i.e. lower carbon) economy means that there will be notable reduction in fossil fuel consumption, higher efficient in energy generation and utilization, and increase in carbon sequestration capacity. Consequently, there will be less carbon being emitted into the atmosphere, lesser effect of global warming, no haze problem and regional air quality will be improved. These will bring about improved health, reduction in cost of living and better quality of life.

7.1.2 Biodiversity Conservation

Green economy concept requires the industrial operators to devote efforts in the protection, conservation and rehabilitation of the biological diversity of the ecosystems they operated in. As such, the positive impacts of green economy concept in the context of biodiversity conservation include:

i. Increased sources of foods for local people – this will be realised from the increase in the population and diversity of wildlife and non-timber forest produces (e.g. wild fruits and edible plants) present within the ecosystem;

ii. Adopting green economy concepts required that forest areas are properly managed and timber harvesting operations are conducted in a sustainable and more environmental friendly manner. These assured the sustainable production of timber and non-timber forest produce in the long-term;

iii. There will be an increase in touristic values of the area due to a better and intact forest cover, good river water quality, more terrestrial wildlife and aquatic resources. These pristine environmental settings would provide the necessary natural capitals to attract nature-loving tourists, thus supporting the development of eco-tourism sector, with the assumption that carrying capacity and limits of acceptable changes are observed;

iv. Adopting green economy concepts will ensure conservation of the biodiversity resources that will provide and secure genetic resources for research and scientific interests, medical advancement, and the development of biotechnology industry; and

v. The efforts to conserve biodiversity will require the forested ecosystem being well-managed and maintained in intact conditions. Consequentially, this improves the ecological functions of the forest to attenuate flood and keeps rivers flowing during dry season.

7.1.3 Sustainable Economic Growth

Positive impacts of green economy concepts in the context of sustainable economic growth are:

i. The local people will have increased access to natural resources for daily livelihood needs and improved cash crop production thereby enable the household to increase their income;

ii. With the increase in household income, they will be able to provide their family members with better nutrition, education and medical attention and these will generally improve the quality of life and standard of living;

iii. With improved quality of life and standard of living, this will reduce local people's dependence or reliance on aid from government and industry operators;

iv. Adopting green economy concepts assure ecological resilience that will reduce occurrence of ecological abnormalities (e.g. flood, landslide, forest fire) which are usually costly to the government and the society for reliefs and repairs. Therefore, efforts to improve ecological resilience will thus reduce or avoid the costs of disaster relief, recovery, rehabilitation and reconstruction; and

v. The improved household income, quality of life and standard of living, coupled with reduced aid and costs of reliefs and repairs as well as the benefits of biodiversity conservation, will collectively and synergistically provide for better opportunity and prospect of vibrant local, regional and national economy.

7.2 POTENTIAL NEGATIVE IMPACTS AND CONSTRAINTS OF GREEN ECONOMY CONCEPTS

The potential negative impacts and constraints of green economy concepts include:

i. It is envisaged that the success of implementing any initiative of green economy concepts would be slow and challenging, and thus will likely reduce immediate rate of economic production of affected sectors, increase their cost of production and reduced revenue in the short- and medium-term;

ii. Lack of knowledge on green economy concepts may weaken the willingness of the longhouse communities and industry operators to adapt, practice and defend sustainable development. In addition, potential investors may be reluctant to invest in view of the current lack of industry information and possibility of more stringent requirements on regulatory compliance;

iii. With the adoption of green economy concept and good wildlife management in place, wildlife habitats are protected and hunting pressures on wildlife will be reduced thereby giving more opportunity for growth of the wildlife population. This potential increase in wildlife populations especially species such as wild boar, squirrel, porcupine and macaque may give rise to more pest problem in the agricultural sector (e.g. crops damaged by herbivores and frugivores) as well as human-wildlife conflicts (e.g. nuisance or attacks by monkeys, bears, snakes);

iv. Reduced usage of agrochemicals in agricultural sector may result in increase of pest population and more regular disease outbreaks. These will reduced crop production, thereby affecting the investment return and deter future expansion and potential investments; and

v. With increased ecotourism and economic activities, if not properly regulated and managed, the influx of tourists and business activities may lead to increase in solid wastes and sewage generation and pollution, spread of diseases and cultural shock to the local people.

7.3 MANAGEMENT PLAN FOR POTENTIAL NEGATIVE IMPACTS AND CONSTRAINS

The proposed management plan for potential negative impacts and constraints of green economy concepts is outlined in **Table 7.1** below.

Table 7.1 Proposed Management Plan for Potential Negative Impacts and Constraints of Green Economy Concepts

No.	Potential Negative Impact and Constraints	Proposed Management Plan
1	Slowdown in operation productivity and reduced income	• Government to introduce tax deduction, financial incentive or appropriate forms compensatory payments • Technology transfer to improve productivity
2	Lack of knowledge in green economy concepts	• Increase effort in capacity building, improve information sharing, provide awareness and training programmes
3	Reduced crop yields, affecting investment return and deter future expansion and potential investments in agricultural sector	• Government to introduce tax deduction, financial incentive or appropriate forms compensatory payments • Provide awareness and training on proper usage of agrochemicals • Provide alternatives to agrochemicals • Knowledge and technology transfer to improve crop yield
4	Pest problems and human-wildlife conflicts	• Improve mechanism in wildlife population control (i.e. wildlife surveillance, relocation / culling)
5	Increased tourism and industrial wastes, sewage and potential of pollution and social risks	• Government to introduce “Green Tax” and charges on polluters • Proper wastes handling procedures, facilities and management system • Monitoring procedures and enforcement on disease control and vice activities • Conduct awareness programmes on good practices in waste management

CHAPTER 8

Proposed Pilot Community Projects

CHAPTER 8
PROPOSED PILOT COMMUNITY PROJECTS

8.1 INTRODUCTION

The identification and selection of pilot community projects and longhouses for project implementation takes into consideration the following criteria:

i. Availability of workforce

Availability of able workforce is a major factor to determine the success of projects. Currently, most of the younger, more able, more mobile and more educated members of the communities have moved out of the longhouses to work elsewhere. In project matching and recommendation, priority is thus given to those longhouses with a viable workforce i.e. the young and able-bodied especially where more labour intensive projects are to be implemented e.g. pepper and rubber projects.

ii. Expanding existing projects/ activities

Communities with existing project activities are prioritized as there is already a level or sign of success in the existing projects. The idea is to capitalize on these existing resources, capability and capacity, and to bridge any existing gaps in order to expand, improve or invigorate the existing projects.

iii. Human factors

Human factors such as leadership quality, pro-activeness, and mutual cooperativeness between members of a community are also observed and noted during the Study. Communities that have good leadership, industrious, and can work together will enhance the chance of success.

iv. Site suitability

Availability of suitable site is important especially for agricultural projects. For examples, rubber planting projects will need ample land, and aquaculture will require adequate and consistent good quality water supply.

v. Marketability and economic potential

Projects to be identified should yield products that are saleable or in demand in the local or wider market for economic viability. Ideally, the prices of products would have to be resilient to counter price fluctuation.

vi. Institutional support

As the communities are residing in remote area which is difficult and expensive to access, agriculture support and extension is a challenge. Institutional support should as far as possible come from existing institutions already established and operating in the area e.g. Department of Agriculture, RISDA, and Malaysian Pepper Board.

vii. Distance, storage, transport and handling of products

Again, due to isolation and challenging access to these communities, project identification would have to take into account the distance, storage, mode of transport, perishability of products.

viii. Environmental protection

Proposed projects should be in tandem with the concept of green economy. Emphasis is thus given to sustainable projects. Projects that require clearing of natural forest or have significant negative impacts on the environment will not be considered.

8.2 IDENTIFICATION OF PILOT COMMUNITY PROJECTS

Based on the selection criteria above mentioned, the 18 longhouse communities involved in the second round of survey in this Study were evaluated and the types of potential pilot community projects that may be implemented are:

i. Pepper planting;
ii. Rubber planting;
iii. Paddy planting;
iv. Vegetable farming;
v. Planting of Gaharu;
vi. Management of riverine fishery under Tagang System;
vii. Bee-keeping;
viii. Making of longboat;
ix. Making of traditional handicrafts i.e. baskets, mats, chairs bead ornaments and *pua kumbu*; and
x. Ecotourism and homestay.

Table 8.1 below summarises the outcomes of the longhouses and potential project evaluations. Due to low population and lack of able workforce, interests or leadership; there is no pilot project being identified for these five longhouses, Rh Philip (Sg Musah), Rh Japok, Rh Anjan, Rh Nugu and Rh Suning.

Table 8.1 Summary of Observations and Potential Pilot Projects at the 18 Longhouses (compiled from Round 2 survey)

River Catchment	Longhouse	Total doors	Occupied doors	Population	Grouping (People)				Gender		Observations	Potential Pilot Projects
					Able Adult	Elder >60 y/o	Disabled	Children <17 y/o	Male	Female		
Sg Musah/ Matalau	Rh Philip	14 doors	10 doors	30 people	14	8	0	8	12	18	• not active in agriculture • most able-workforce are working in Song and other major towns	None
	Rh Japok	21 doors	21 doors	35 people	17	8	0	10	16	19	• able adults working elsewhere • younger generation not interested in farming or staying in longhouse • easy access to Song (30 mins) via tar-sealed road	None
	Rh Anjan	8 doors	5 doors	10 people	4	3	0	3	5	5	• low number of able-workforce • low occupancy (less than 10 doors)	None
Sg Tekalit	Rh Melayu	18 doors	12 doors	32 people	22	4	0	6	16	16	• easy access by river and logging road • a family has three matured avocado trees, regularly producing good quality fruit which fetches RM8 per kilo at Song • all the other families have just started to plant avocado • 2 doors doing bee-keeping on-trail • potential tagang system area at Sg Latong and Sg Latong Antu	• Bee-keeping • Tagang System
	Rh Kaya	24 doors	10 doors	18 people	9	7	0	2	8	10	• active handicraft activities such as making beads ornaments and *pua kumbu*	• Handicraft making (Bead ornaments and *pua kumbu*)
	Rh Chenggai	32 doors	18 doors	30 people	4	20	6	0	15	15	• low able workforce • unable to do hard labour (too old) • only able to do simple farming • 10 doors doing pepper and vegetable farming on small scale • 6 people are doing *pua kumbu*	• Vegetable farming • *Pua kumbu* making
	Rh Endah	22 doors	18 doors	30 people	15	10	0	5	10	20	• 11 people are doing *pua kumbu* • 3 people are doing boat building	• *Pua kumbu* making • Boat building

River Catchment	Longhouse	Total doors	Occupied doors	Population	Grouping (People)				Gender		Observations	Potential Pilot Projects
					Able Adult	Elder >60 y/o	Disabled	Children <17 y/o	Male	Female		
Sg Bangkit	Rh Sebastian Tambi	42 doors	37 doors	59 people	10	31	6	12	25	34	• potential tagang system area such as Sg Pra, Sg Sebandau and Sg Nirau Besar • 26 doors received assistance from RISDA in rubber farming • 1 door have planted 200 gaharu trees	• Tagang system • Rubber planting • Gaharu planting
	Rh Gong	17 doors	10 doors	24 people	6	13	3	2	10	14	• mostly old folks, disabled people and children living in the longhouse • 4 doors are doing pepper farming on small scale • 6 doors are planting paddy on small scale • headman was ill, staying in Song	• Pepper planting • Paddy planting
	Rh Silo	9 doors	9 doors	20 people	7	11	0	2	8	12	• 2 people are extracting honey from own made beehive boxes (bee-keeping) • 2 people are doing handicraft such as *pua kumbu*	• Bee-keeping • *Pua kumbu* making
Sg Katibas (Hilir)	Rh Dagom	32 doors	20 doors	50 people	28	17	0	5	24	26	• Active pepper farmers • Largest pepper farming community with > 8,000 pepper vines	• Pepper planting (develop as model farm)
	Rh Dominic Runggom	32 doors	20 doors	45 people	19	18	3	5	23	22	• having land dispute and conflict with Rh Bangau and Rh Senada • headman working at Majlis Daerah Kapit • 25 doors get rubber scheme assistance from RISDA since 2014 • 3 doors are doing pepper farming • 6 doors are doing paddy farming	• Rubber planting • Pepper planting • Paddy planting

River Catchment	Longhouse	Total doors	Occupied doors	Population	Grouping (People)				Gender		Observations	Potential Pilot Projects
					Able Adult	Elder >60 y/o	Disabled	Children <17 y/o	Male	Female		
Sg Katibas (Ulu)	Rh Api	21 doors	9 doors	20 people	7	10	1	2	11	9	• 6 doors are doing pepper farming • 3 doors are doing paddy farming • 1 door is extracting honey from own made beehive box • 1 family is doing handicraft (rattan basket, chairs)	• Pepper planting • Paddy planting • Bee-keeping • Local handicraft (Rattan baskets and chairs)
	Rh Peter	32 doors	15 doors	142 people	102	19	1	20	84	58	• High able workforce • Potential Tagang system at Sg Nging • 9 doors are doing pepper farming • 5 doors just started planting pepper • 1 person just started bee-keeping • 1 family is doing *pua kumbu* • The whole longhouse used to be a tour operator that run homestay and eco-tourism activities	• Tagang system • Pepper planting • Bee-keeping • Pua kumbu making • Eco-tourism and homestay
	Rh Sapai	17 doors	7 doors	18 people	10	7	1	0	10	8	• Local people skillful in handicraft activities such as making baskets, mats, and chairs out of rattan	• Rattan handicraft (baskets, mats and chairs)
	Rh Nugu	21 doors	7 doors	7 people	2	3	1	1	1	6	• Low able workforce • Low population	None
	Rh Suning	14 doors	8 doors	40 people	29	11	0	0	19	21	• Undefined community leadership had become a constraint in the allocation of resources to implement community development initiative.	• Pepper planting
	Rh Sa	16 doors	13 doors	35 people	16	11	0	8	14	21	• 3 people are doing boat building • 10 doors are doing pepper farming (200 vines planted) but not well maintained • 7 doors are doing paddy farming	• Boat building • Paddy planting

8.3 PROPOSED PILOT COMMUNITY PROJECTS

Five (5) longhouse communities are selected for implementation of the proposed pilot community projects (**Table 8.2**) that include one or more of the followings:

i. Planting of pepper and/or rubber;

ii. Management of the river and fishery resources under Tagang system; and

iii. Making of longboat.

Table 8.2 Selected Longhouses and Proposed Pilot Community Projects

Selected Longhouse (occupied door, population)	Proposed Pilot Community Project	Remarks
Sg Bangkit Cluster		
Rh Sebastian Tambi (37 doors, 59 persons)	- Rubber planting - Tagang system	- RISDA has assisted a few families to plant rubber but progress is not satisfactory - Nearby streams (Sg Pra, Sg Sebanday & Sg Nirau Besar) have potential for Tagang system (clean river water, good fish stock, easy access)
Sg Katibas Hilir Cluster		
Rh Dagom (20 doors, 50 persons)	- Pepper planting (as model farm)	- The most active pepper farming community - Currently there are 8,000 vines tended by the community - Potential to develop as model farm for the area
Rh Dominic Runggom (20 doors, 45 persons)	- Pepper planting - Rubber planting	- RISDA has assisted 25 families to plant rubber in 2014 but progress is not satisfactory - 3 families have pepper farms - Active farmers
Sg Katibas Ulu Cluster		
Rh Peter (15 doors, 142 persons)	- Pepper planting - Tagang system	- 9 families have matured pepper farms - 6 families have just started planting pepper - Available able adult to do farming works - Nearby stream (Sg Nging) have potential for Tagang system (clean river water, good fish stock, easy access)
Rh Sa (13 doors, 35 persons)	- Boat building	- 3 persons are making longboat for sales - Constant demand for longboat in the area

Conceptual framework of the proposed pilot community projects are briefly described below:

8.3.1 Pepper Planting

Among the income-generating agricultural projects, pepper is the most popular one based on the feedback of needs/wants among leaders and women (See **Figure 5.8** and **Figure 5.11** in **Section 5.3**). This activity is proposed for implementation at three (3) longhouses i.e. Rh Dagom, Rh Dominic Runggom and Rh Peter. These longhouses have pepper planting experience and adequate able adults to undertake the laborious works associated with pepper farming.

It is to be noted that Rh Dagom has the most extensive pepper farms, some 8,000 vines have been planted by this community. Under the proposed pilot project, these pepper farms and the associated agricultural extension services and agronomics may be further improved and strengthened to become a model pepper farming community that may be promoted and replicated at other longhouse communities. Another potential project activity at Rh Dagom is to establish a nursery to produce quality pepper seedlings for distribution to other longhouse communities.

Several families at Rh Dominic Runggom and Rh Peter have planted pepper. The proposed pilot project shall explore the opportunity to promote pepper farming to more families and to provide assistances to start up new farms and to expand existing farms.

In addition, the proposed pilot project shall seek and collaborate with the Department of Agriculture Sarawak and the Malaysian Pepper Board to improve and strengthening the agricultural extension services for the pepper farmers. The extension services include, among others, access to Government's fertilizer subsidies, market information, farming techniques and technology, and training opportunity. Furthermore, there may be some households who are not in an economic position to have financial capital to establish or expand pepper planting. In this particular case, there may be a need to seek financial assistance from certain financial institution.

In view of the fact that this project is both labour intensive and capital demanding in terms of agrochemical inputs, pepper posts and other inputs, it is envisaged that the initial scale of operation is small. It is a considered view that the initial scale should be 200 vines, i.e. ¼ of an acre. Below are the critical technical details of implementation that should be considered, especially for those that have little experience in pepper cultivation:

- Small-scale operation starting with 200 vines per doors with the view to expand the scale.

- Planting material should be obtained from disease-free source i.e. free from leaf bright and root-rot diseases.
- Normally the land for pepper cultivation should be located on hill slope of less than 25 degrees. Land preparation would include terracing.
- Planting distances recommended are either 2.4 m x 2.4 m or 2.4 m x 1.8 m (or 8 ft by 8 ft or 8 ft by 6 ft).
- Fertiliser application should follow the formulation recommended by the Department of Agriculture for various stages of growth; and dolomite application is essential.
- Pest and disease control is crucial for the healthy growth of the plants as well as productivity.
- Clean weeding of the garden, maintenance of drainage and terraces and mounding are important aspects of crop maintenance.
- Farm productivity performance should be aimed at minimum 3 kilograms of black pepper per vine per year. Higher productivity could off-set lower price situation.
- With proper maintenance, the high productivity of at least 3 kilograms per vine could be attained and sustain for longer period.

In each door, attempt should be made to encourage the vulnerable groups and elderly to participate in pepper production. These vulnerable groups and elderly could handle the less heavy chores such as weeding, pruning, harvesting, etc.

8.3.2 Rubber Planting

Rubber project is chosen over oil palm for the following reasons:

- Many longhouses have already established certain area of rubber garden.
- Less labour required to maintain rubber crop.
- Rubber can be planted on steeper slopes of more than 25 degrees (although the limit should be not more than 30 degrees).
- Oil palm should be restricted to slopes of less than 25 degrees and have to depend on processing mill to process the fresh fruits.

Rubber planting is recommended to be undertaken and intensified at Rh Dominic Runggom and Rh Sebastian Tambi. RISDA has provided assistances in establishment of smallholder rubber orchards at these longhouses. However, the progress of planting and growth of the planted seedlings have not been optimised.

It should be pointed out that unlike pepper, farmers usually do not establish rubber on their own; they depend on the government to help them to do so. The reason is presumably rubber has long gestation period, and the government has access to good planting materials and technical information especially for the latest high-yielding clones. Rubber would, therefore, need an agency to assist in all aspects of establishment – planting materials, fertilisers, technical advice on land preparations, as well as maintenance and disease control. Collaboration with RISDA in this respect is thus required.

8.3.3 Tagang System

The local people at Rh Sebastian Tambi and Rh Peter have expressed their interests to manage the rivers adjacent to their longhouses under Tagang system. Initial reconnaissance indicated that these rivers are in considerably good conditions (i.e. smooth flowing clear water with intact riparian vegetation).

It should be noted herein that during the determination of the extent and coverage of the Tagang system, existing land uses within the upstream catchment of the river should be taken into consideration and engagement with the relevant stakeholder(s) should be conducted. On the other hand, the river water quality, potential pollution sources, and existing fish stock in the rivers proposed for Tagang system, as well as the community's preparedness to participate, will need to be assessed to determine how to implement the proposed fisheries project.

The pilot project shall seek and collaborate with Inland Fisheries Division of the Department of Agriculture Sarawak in formulating and implementing a comprehensive development plan for the Tagang system at the selected longhouses. In this Tagang system, the main purpose is to conserve and control of the fisheries by means of controlled harvesting as well as preserving the environment of the rivers to ensure the fish population can breed and grow satisfactorily. There are five protocols for the implementation of the Tagang Project as summarised in **Table 8.3** below.

Table 8.3 Protocols for Implementation of Tagang System

Steps	Activity
Protocol 1 (preparation)	• Fish inventory survey for the proposed areas.
Protocol 2 (preparation)	• Design site plan and layout plan; indicating the site for red area (no fishing), green area (seasonal fishing) and yellow area (non-restrictive fishing).
Protocol 3 (confirmation)	• Talk to the communities having a stake in the two areas on Tagang concept, their roles and responsibilities and benefits etc.; • Confirm communities' interest and commitment in the Tagang project. • Formation of ***Village Tagang Committee (VTC).*** • Study tour to be organized for VTC and staff involved to visit a successful Tagang Project in Rajang Basin at any time convenient.
Protocol 4 (confirmation)	• Working out Tagang Rules. Implementing agency together with VTC to participate.
Protocol 5 (implementation)	• Launching • Enforcement • Monitoring (stock survey, management of VTC etc.) and feedback from participants • Programme of harvesting • Organization of work and responsibilities • Others

8.3.4 Longboat Making

This pilot project aims to support and strengthen the boat making activity at Rh Sa. The project will assist the boat makers to secure supply of timber from adjacent FMU operator(s). The pilot project will (a) prevent unregulated taking of timber from the forest; (b) ease the difficulty currently faced by the boat makers in sourcing of quality timber in nearby forest; and (c) provide an avenue for FMU operator to undertake corporate social responsibility activity.

8.3.5 Other Minor Projects

These include vegetable gardening, and handicraft making for improved nutrition and income. Although the scale is small, they can contribute significantly to the well-being of the households, especially for the vulnerable groups including children, expecting mothers and elderly.

8.4 FACTORS TO BE CONSIDERED IN DEVELOPMENT OF PILOT COMMUNITY PROJECTS

The proposed pilot community projects will involve five longhouses located within three clusters or sub-catchments of Sg Katibas; and involving the following activities:

i. Planting of pepper and/or rubber;

ii. Fishery management in sections of river under Tagang system; and

iii. Making of longboat.

A detailed project document should be developed for each pilot project at each longhouse. This is because site conditions and the project scope and activities will differ from site to site and from project to project. The following factors should be considered in developing the proposed projects.

8.4.1 Interested Participants

This study has only identified the potential longhouse communities for the proposed pilot community projects. Actual numbers of interested doors and participants have not been ascertained. As such, further investigations and engagements should be undertaken to determine the numbers of participant, their preparedness to participate, and their knowledge and capabilities in undertaking the proposed pilot projects.

The following are crucial factors that need to be considered:

i. The number of interested and capable participants; there is a need to ascertain this number through dialogue as well as surveys on their needs and wants, socio-economic capacity in terms of land, capital and household labour availability.

ii. It should be borne in mind that in the design of a project, be it pepper or rubber, the developer is writing on 'a blank sheet of paper'; there are already a number of longhouse folks who already have had pepper or rubber plots (See Section 4.8). A close examination would reveal their needs and wants lie in low productivity – notably attributable to lack of technical skills, and capital, and difficult access to sources of these skills and capital as well as marketing information.

iii. There is also a need to identify together with the longhouse leaders and household heads the vulnerable groups (i.e. the elderly, the mothers, the poorest segment of the society whose poverty is usually unperceived) their physical capacity, their needs and wants so as to design a more inclusive strategy and approach in the planning of project. That means a project design that fits for the whole longhouse community is needed. This concept is based on the belief that the vulnerable groups can significantly contribute to the household economy of the longhouse community; albeit on lesser capacity. As such, their potentials should not be ignored.

iv. There is also a need to ascertain the potential participants of their level of knowledge and skills to participate in the proposed projects; that includes the vulnerable groups.

v. The need to prepare the intended participants what are expected of them to ensure successful implementation; this encompasses the initiatives related to assessment of their level of knowledge and skills in the implementation of the proposed projects; their awareness of their commitments in labour inputs, financial inputs for capital and operational costs, contribution of outside agency's assistance in material and financial assistance, organisation and management for project implementation; training needs; the expected cost and return for the proposed projects; how the benefits should be shared as well as how much to be used for project expansion.

vi. There is also the need to work out with the participants the project implementation plan and as well as training programme for the participants.

8.4.2 Training for Participants

To effectively implement the various projects planned for the GE Development Programme, emphasis should be placed on the development of human resources to ensure that effective and capable people participate in the implementation. The strategy is to achieve the goal of enhancing the capability and capacity of the local participants in the implementation of the projects. The following factors should be considered:

i. Subject Matters in Training Courses

The subjects to be focussed on will depend on the type of project concerned. The following are subject matters to be considered:

- Leadership training – effective communication; conduct of meeting; planning and management; record keeping, etc. (for all projects).
- Specific practical subjects related to agronomy of pepper and rubber;, aquaculture and fisheries – cage culture, Tagang system; etc. (for those involved in aquaculture only).

ii. Length of course

- Short practical courses lasting 2 days to one week.

iii. Venues

- Any facilities available in Song; most of the training will be conducted in the field.

iv. Trainers

- The trainers will be drawn from Department of Agriculture (DoA) extension staff, fisheries staff and staff from Malaysian Pepper Board (MPB) and RISDA.

8.4.3 Institutional Supports

There are several institutions that are essential to ensure successful implementation of the proposed pilot projects. They are as follows:

a. WWF-Malaysia

This is considered as the lead agency in initiating, planning and implementation of the pilot projects. WWF-Malaysia is also responsible to provide funds and man-power in the management of GEP. However, they need expertise and funds to initiate other related aspects of development, especially on pepper, rubber, fisheries, infrastructure development and other projects to ensure a comprehensive and holistic development of the communities.

b. Department of Agriculture (DOA)

The DOA is mandated to develop the smallholders in the State. It is a multifunctional institution. Its core business is to promote and facilitate the development of agriculture, and fisheries for the smallholders through its extension and R&D services. As such, DOA should be called in to participate in the development of GEP. The Inland Fisheries Division is responsible for fisheries resources management and freshwater aquaculture. In this respect, it mandated to implement the Tagang System of fish conservation. It is therefore, plays the role of implementing the five protocols as mentioned in the Tagang Project development, and it should be called upon to participate in project development.

c. State Farmers' Organisation and Area Farmers' Organisation

State Farmers' Organisation and Area Farmers' Organisation (or in abbreviated forms SFO and AFO), is a Government-linked institution established under the Farmers Organisation Act, and it is considered as the business arm of the DOA in dealing with the agribusiness aspect of agriculture development. It is mandated to deal with supply of farm inputs, and marketing of farmers' produce by securing a fair deal and leveraging on bulk purchase to obtain cheaper prices of farm inputs. This institution at the State and area levels can help in organising the participants in dealing with supply and marketing of their produce.

d. Malaysian Pepper Board (MPB)

This is a newly established institution initially mandated to deal with marketing of quality pepper by appointing local dealers at district level and liaising with overseas buyers. This agency is providing market information for dealers as well as pepper farmers. It is now mandated to provide material and technical assistance to pepper farmers with the assistance of DOA to provide extension services. MPB also has the mandate to encourage farmers to produce high quality pepper (e.g. creamy white pepper) for niche markets in Europe and USA.

e. Rubber Industry Smallholders Development Authority (RISDA)

This is the institution that is most appropriate for developing smallholders' rubber estates in the Rajang Basin. In fact, RISDA has implemented smallholders' rubber estate in Rh Sebastian Tambi in Sg. Bangkit as well as Rh Dominic Runggom in Sg. Katibas Hilir. The institution provides all the necessary technical and financial inputs to develop smallholders' rubber estate for the community. For the smallholders' rubber estate development under the GEP, it would be useful for WWF to invite RISDA to take the role of rubber estate development.

f. Other Governmental Agencies

For infrastructure development, the assistance of different government agencies should be sought to ease and fasten the establishment of basic infrastructure. For examples, Jabatan Bekalan Air Luar Bandar (JBALB) for gravity feed water supply; Resident and District for minor access road, community hall and recreational facilities; and local council for health and sanitation facilities (toilets, rubbish pits, etc.).

g. Financial Institution (including Bank Pertanian, and others)

Apart from Bank Pertanian, there are financial institutions that might be sought to assist in the cottage industry, handicraft making, and other small enterprises such as:

- Small Medium Enterprise Development Bank Malaysia Berhad - for financing involving the manufacturing, service and tourism industry of the village; and
- Bank Kerjasama Rakyat Malaysia Berhad (Bank Rakyat) - for financing involving the manufacturing, services, agriculture and rural tourism industries.
- SME Bank

h. GE Coordinating Committee

There is a need to establish an interagency platform to implement the various projects to ensure better coordination and integration in the development of projects. The interagency platform in the form of GE Coordinating Committee would ensure more effective collaboration among all agencies involved.

However, it should be pointed out that the establishment of a coordinating committee takes time. People have got to get used to working in a collaborative manner and this takes time and leadership.

i. Other Agencies

Assistance could be sought from Rural Enterprise Development Program, Ministry of Rural and Regional Development (KKLW) to help in the implementation of small enterprises. The agency has following programme objectives:

- Increase the number of rural Bumiputera entrepreneurs in all viable and law-abiding economies;

- Enhancing the enterprises involved in rural Bumiputera entrepreneurs to be more viable, competitive, resilient and highly committed;
- Provide loan facilities to rural Bumiputera entrepreneurs to help start and improve rural economic development;
- Provide unsecured loan schemes with low repayment rates; and
- Increase the involvement of rural Bumiputera entrepreneurs in more potentially viable rural economies to create Bumiputera Commercial and Industrial Communities (MPPBs) from rural populations.

8.4.4 Site Suitability and Agronomy Requirements

Each of the proposed crops (i.e. pepper and rubber) has different agronomic requirements and organisational requirements with respect to soil, terrain, drainage, fertilization regimes and the likes. As such, site assessment is necessary to determine crop suitability and the required agronomic inputs. It should be noted herein that new farming grounds should be established on abandoned shifting cultivation lands and clearing of natural forest for the proposed farming activities should be avoided.

8.4.5 Infrastructure Development Projects

These include access roads (main roads networks and access roads to longhouses); water supply; telecommunication; and electricity supply; jetties; community hall, recreational facilities; health and sanitation facilities; and others. These are the development initiatives that should be included to enhance the quality of life for the longhouse communities **(Section 5.3)**. As part of the Green Economy strategy, the implementer of the Green Economy Programme needs to regularly pay attention to these needs to offset the socio-economic impacts of logging and oil palm plantation that entail deforestation around the environment of the longhouse communities. The development of these infrastructure facilities will take time and requires substantial amount of money from the government. The only option is to develop them in stages starting with the most urgent cases first. It is recommended that the implementer of the Green Economy Programme shall work out the priority with the relevant Governmental agencies (especially the District Officer).

8.5 IMPLEMENTATION PLAN OF PILOT COMMUNITY PROJECTS

The tentative implementation plan for the proposed pilot community projects is shown in **Figure 8.1** below. This should be refined upon finalization of the proposed projects by the sponsor.

Figure 8.1 Tentative Implementation Plan for Pilot Community Projects

No.	Activity	Year 1				Year 2			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.0	**Design & Development**								
1.1	Situational assessment (participants, site suitability, available resources & etc.)								
1.2	Project planning & design								
1.3	Appraisal & Approval for Implementation								
2.0	**Implementation**								
2.1	Training of Participants								
2.2	Sourcing & preparation of materials								
2.3	Delivery of materials & launching of Projects								
2.4	Projects implementation								
3.0	**Monitoring & Review**								
3.1	Finalizing Monitoring Programme								
3.2	Monitoring exercise								

CHAPTER 9

Monitoring Programmes

CHAPTER 9
MONITORING PROGRAMME

9.1 MONITORING OBJECTIVE

The monitoring programme proposed hereunder is geared towards determining and documenting the progress and notable social impacts of implementing the proposed pilot community projects mentioned in **Chapter 8**.

9.2 PROPOSED MONITORING PROGRAMME

With diligent management inputs and care, success of the Tagang system may materialize in one to two years' time. However, the proposed pepper and rubber planting projects will take more than 3 to 4 years to yield any notable harvests. The economic impacts of these projects could only be determined thereafter.

9.2.1 Monitoring Requirement

Monitoring frequency is six-monthly (as shown in **Figure 8.1**). The proposed monitoring parameters cover:

i. Cropping Projects

- Size of farm developed (area allocated, developed to-date)
- Quantity of crops planted (number of seedlings planted)
- Number of agrochemicals used (type and quantity used)
- Amount of fund disbursed (from sponsor, own fund)
- Quantity of crops harvested (kg of fruits, litre of latex)
- Cash received from sales of crops harvested
- Problem encountered

ii. Tagang System

- Area demarcated for project (length of river, zonation, marking installed)
- Fish fly released (species, quantity, source)
- Amount of feed utilized (kg per month)
- Amount of fund disbursed (from sponsor, own fund)
- Quantity of fish harvested (kg, head)
- Cash received from sales of fish harvested
- Problem encountered

9.2.2 Responsibility

During the implementation of the pilot community projects, WWF is responsible to ensure that the projects are taking place at the identified locations and that all relevant resources and assistance from various stakeholders are extended to the communities concerned.

WWF has appointed the SIA Consultant to carry out the first round of monitoring at all the identified community pilot project sites. The first monitoring shall be carried out about six months after the submission of the final SIA Report to WWF. To this end, it is the responsibility of WWF to decide on which pilot community projects proposed by the Consultant are to be implemented, to inform the local communities chosen and to incorporate strategies for participation and contributions from relevant stakeholders.

9.2.3 Results and Reporting

A report to the WWF would be required after each monitoring. It should take place on a half-yearly basis, and the progress and status of the proposed pilot community projects will be compiled and reported to WWF in the format as required by the WWF. All the monitoring parameters proposed in **Section 9.2.1** should be taken into consideration during the monitoring visits. This is to ensure the sustainability of the pilot community projects.

CHAPTER 10

Conclusion

CHAPTER 10
CONCLUSIONS

10.1 HUMAN AND NON-HUMAN SETTINGS OF THE STUDY AREA

This SIA Study of the Iban longhouse communities within the Sg Katibas river basin has been conducted via two rounds of field survey. There are 92 longhouses that were surveyed during Round 1 and 18 longhouses were re-visited and surveyed in Round 2.

These longhouse communities can be grouped into the following clusters within the Study Area:

i. Song area (Btg Rajang & lower Sg Katibas);
ii. Sg Musah/ Sg Matalau;
iii. Sg Tekalit;
iv. Sg Bangkit;
v. Sg Katibas Hilir (Lower Katibas); and
vi. Sg Katibas Ulu (Upper Katibas).

The 92 longhouses are predominantly made up of Iban ethnic group and had a total population size of 14,865 which is equivalent to 1,857 doors. However, the actual population who reside long-term or permanently at these longhouses might be lower because considerable numbers of the longhouse members were staying and working outside of the Study Area and only return to the longhouses on special occasion.

In addition to the longhouse communities, the other stakeholders include five logging operators, two forest plantation operators and two oil palm plantation operators, Government departments and agencies which have influence within the Study Area, amongst others, include Song District Office, Forest Department Sarawak, Sarawak Forestry Corporation, Land and Survey Department Sarawak, Natural Resources and Environment Board Sarawak and Department of Agriculture Sarawak.

In the Study Area, the findings of Round 2 survey indicated that the main modes of transport for the 18 longhouses are river, tar-sealed road and logging road. Based on the surveys, there were no social amenities such as community hall, public library, worship place, playground, football field, badminton court, etc. within the longhouses surveyed due to complex terrain, rapid river flows and poor accessibility which caused financial constraints and slow down logistic arrangement to transport building

materials. 6 longhouses surveyed were supplied with solar panels from SEB and government agencies for electricity while 12 longhouses still relied on individual and communal generators for power supply. All 18 longhouses surveyed received water supply from gravity-feed dams on streams either nearby the longhouse or at the other side of the river. All modes of telecommunications, including fixed-line and cell phones were still lacking at these longhouses. In general, the cleanliness of the longhouse compound was good or fair. All 18 surveyed longhouses have access to kindergartens, primary and secondary schools which are in each of the river clusters.

There are five government medical clinics serving the Song-Katibas area. These health clinics cater for out-patient treatment and maternity, childcare, and dental services. All 18 surveyed longhouses are equipped with pour-flush toilet system with septic tank and most of the sanitary facilities are in moderate condition. As for waste collection, most of the surveyed longhouses have rubbish pits near their longhouses for disposal of solid waste while some of the longhouses do not have rubbish pits and would throw waste into the river or nearby bushes, followed by burning of rubbish.

The economic activities of each unit of door are characterized by a mix of farming and wage-earning employments are either full-time or part-time. The main occupation of every doors from the 18 longhouses surveyed is farmers. The major sources of their incomes are from agriculture, forest-based resource, fishery activities and aquaculture, remittance from relatives, subsistence from their children and wage-earning employments.

Based on the data collected from the surveys, among those who had stated their monthly household income, 72% of them earn RM 1,200 or below a month, while the remaining 28% earn RM 1,201 or above a month. The major expenditures for each door include food, education, medical, transport and utilities (generator) at which on average the estimated expenditures for each door were RM 1,200/month.

10.2 VIEWS AND PERCEPTIONS OF LOCAL COMMUNITIES TOWARDS EXISTING LOGGING AND OIL PALM OPERATIONS

The interviews with the 18 longhouse leaders or the villages' representatives in the Study Area revealed both positive and negative comments on the current logging and oil palm operations inside the Study Area. The beneficial impacts include improved communication and accessibility in their area; employment opportunities created, and assistances provided by the logging and oil palm Companies. Negative impacts include river pollution, decrease in water level, decline in river resources, no more virgin forest

and decline in forest resources. The major concern from the respondents was on the shallowing of the rivers in their area.

10.3 LOCAL NEEDS AND WANTS

The majority of the respondents prefer to have good accessibility not only to their own villages, but also the connectivity to other places. Many are also interested in agriculture and they hope that agricultural welfare services can be extended to them in order to develop their economy.

10.4 POTENTIAL OPPORTUNITIES AND GAPS FOR CHANGE

There are considerable numbers of longhouse communities which have the desire, resources and capacity to participate in Green Economy programme/projects. The opportunities include the following:

i. Longhouse communities are eager to enhance the productivity of cash crops especially pepper and rubber in suitable farm land to raise household income.

ii. Presence of suitable rivers for introduction of Tagang System for conservation of fisheries resources through controlled harvesting to ensure sustainable fish stock.

iii. Vegetable farming is not common in the Study Area and thus there is prospect to introduce home garden (vegetables and annuals) on sustainable basis to improve household nutrition.

iv. Introduction of apiculture (stingless bees) especially in the vicinity of the planted Acacia forest to generate supplementary household income.

v. Women are interested to participate in local handicraft making using local materials to sustain the local culture and to earn extra income for the household.

vi. Women's participation in programmes/projects can increase the workforce participation rate of the community and enhance the social status of women.

vii. Introduction and implementation of economic or social programme can be a pull factor to attract migrate back and reside at the longhouse which create an opportunity to improve the viability of the longhouse due to present of energetic and educated able-workforce.

viii. The success of principal economic or social programme can build a solid foundation for the introduction and implementation of supplementary programme that can further contribute to the improvement of longhouse communities' welfare.

ix. The presence of economic or social programme coordinated by environmental organization creates window to cultivate the idea of sustainable development within longhouse communities.

The gaps include the following:

i. Lack of telecommunication system that allow the longhouse communities to obtain and share with each other the cash crops' latest market information such as price of commodities like rubber and pepper. Market information for pepper is especially important because pepper price fluctuate frequently based on world market as well as supply and demand factor.

ii. Poor accessibility has posed logistic constraint to collect goods from the longhouse communities and deliver goods to the local markets or consumers.

iii. Insufficient number of entrepreneurs minded longhouse member to kick-start the introduced and lead the implemented economic or social assistance programme.

iv. The longhouse communities do not have adequate knowledge, tools and mediums to design and perform marketing campaign to promote and sell their products.

v. Constant and periodic visit from relevant government agencies such as Malaysia Pepper Board (MPB), Rubber Industry Smallholder Development Agency (RISDA), Malaysia Agricultural Research and Development Institute (MARDI), Sarawak Craft Council, SME Corporation and other agencies to organize technical workshop and knowledge sharing session to improve the capacity of the longhouse communities to produce quality goods and market their goods.

vi. The number of youths reside in the longhouses are scarce and thus posed constraint on the availability of strong workforce to do heavy and dangerous work.

vii. The number of participants allocated for each economic or social programme may not be able to include every household or individuals reside in the longhouse.

Initiatives to fulfil these opportunities need to start from scratch for most longhouses; except for a small number of longhouses where planting of pepper and rubber have been undertaken. As such, the gaps for changes will require considerable efforts and proper planning fill. These entail the following actions and considerations:

i. Project cycle:

- Situation Analysis – Surveys and dialogue sessions with interested villages; identification of target groups/households and their needs; resources (land, labour, capital, knowledge etc.) availability;

- Project Planning – Scope of individual projects: objectives and justifications; target groups/participants; design of project/production model; physical and financial schedule; cost and return; management and organization; output delivery system; and implementation plan;
- Project Appraisal – Social and economic benefits; cost-benefit analysis; availability of funds; Technical Committee (TC) to appraise;
- Project Implementation and Monitoring – Monitoring & Evaluation; Monitoring Implementation Plan; Physical & financial progress; milestones; Problems, resolutions to address problems; TC meetings; Communication (horizontal & vertical); decision-making; training; financial management.
- Project Evaluation – Whether objectives and goals achieved? Social & Economic impacts; continue or expand or discontinue? Identify management strengths & weaknesses.
- Back to Situation Analysis.

ii. Training of participants - this activity should cover the participating households and project leaders.

iii. Budget preparation and manpower planning – to ascertain adequate fund, logistics and manpower for implementation.

10.5 POTENTIAL IMPACTS AND CONSTRAINTS OF GREEN ECONOMY CONCEPTS

The potential impacts of green economy concepts have been assessed and the positive impacts are reduction in greenhouse-gas emissions; improved quality of life; increased sources of foods for local people; sustainable production of timber and non-timber forest produce; increased touristic value; securing genetic resources for research, scientific interest and medical advancement; and improved ecological functions of the forest; and sustainable economic growth.

The potential negative impacts and constraints of green economy concepts include the reduction in immediate rate of economic production of affected sectors, increase their cost of production and reduced revenue in the short- and medium-term; lack of knowledge on green economy concepts may weaken the willingness of the longhouse communities to adapt, practice and defend sustainable development; increase in pest problem in the agricultural sector and human-wildlife conflicts; reduced crop production thereby affecting investment return and deter future investments; and with increased economic activities and human population density if not properly regulated

and managed, may lead to increase in wastes generation and pollution which intensify the pressure place on the ecosystem.

The management plan for negative impacts of green economy concepts are outlined and included:

i. Government to introduce tax deduction, financial incentive or appropriate forms compensatory payments;

ii. Knowledge and technology transfer to improve productivity and crop yield;

iii. Increase effort in capacity building, improve information sharing, provide awareness and training programmes;

iv. Improve mechanism in wildlife population control;

v. Provide awareness and training on proper usage of agrochemicals;

vi. Government to introduce 'green' tax and charges on polluters, proper wastes handling procedures, facilities and management system, and conduct awareness programmes on good practices in waste management.

10.6 PROPOSED PILOT COMMUNITY PROJECTS

The Study also appraised the needs and wants of the family heads, women group and old people /handicapped and accordingly has identified and proposed pilot community projects for five longhouses (i.e. Rh Sebastian Tambi, Rh Dagom, Rh Dominic Runggom, Rh Peter and Rh Sa); and the project activities encompass:

i. Planting of pepper and/or rubber;

ii. Fishery management in sections of river under Tagang system; and

iii. Making of longboat.

Detailed project document should be developed for each project. This is because site conditions and the project scope and activities would vary from site to site. The following factors should be considered in the development the proposed projects: interested participants; training of participants; site suitability and agronomic requirements; input resources; and institutional supports.

10.7 PROPOSED MONITORING PROGRAMME

A monitoring programme is proposed which is geared towards determining and documenting the progress and notable social impacts of implementing the proposed pilot community projects. Monitoring frequency is six-monthly and the proposed monitoring parameters cover: size of farm developed; amount of material inputs and expenditures; quantity of harvests and cash receivable; as well as problems encountered during the implementation.

REFERENCES

REFERENCES

1. Anon, (undated). *A Partnership Approach to Economic Sustainability: Building a Green Economy in Borneo through Conservation and Sustainable Development in the Heart of Borneo*. 19pp.

2. DID, (2017). *Sarawak Hydrological Yearbook*. Sarawak: Department of Irrigation and Drainage.

3. FDS, (2018). *Heart of Borneo Initiative*. Official Website of the Forest Department Sarawak, https://forestry.sarawak.gov.my/page-0-146-993-Heart-of-Borneo-Initiative-HoB.html, retrieved 2 July 2018.

4. Jala, I. (2015). *The measure of poverty*. Retrieved from http://etp. pemandu.gov.my/Transformation_Unplugged-@-The_measure_of_ poverty.aspx.

5. Pasin Sdn Bhd, (2014). EIA for the Proposed Re-Entry Timber Harvesting within Coupes 07AR to 11AR under Forest Timber Licence No. T/3135 in the Upper Sg Bangkit – Sg Tekalit – Sg Gaat Area, Kapit Division, Sarawak. Ecosol Consultancy Sdn Bhd, Kuching.

6. Percetakan Nasional Malaysia Berhad, (1998). *Laws of Sarawak, Wild Life Protection Ordinance 1998 (chapter 26).*

7. SEG (Scientific Expert Group on Climate Change), (2007): *Confronting Climate Change: Avoiding the Unmanageable and Managing the Unavoidable*. [Rosina M. Bierbaum, John P. Holdren, Michael C. MacCracken, Richard H. Moss, and Peter H. Raven (eds.)]. Report prepared for the United Nations Commission on Sustainable Development. Sigma Xi, Research Triangle Park, NC, and the United Nations Foundation, Washington, DC, 144 pp.

8. UNEP, (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. United Nations Environment Programme, 630pp.

9. Van Paddenburg, A., Bassi, A., Buter, E., Cosslett C. & Dean, A., (2012). *Heart of Borneo: Investing in Nature for a Green Economy*. WWF Heart of Borneo Global Initiative, Jakarta.

10. Wolfenden, E.B., (1960). *The geology and mineral resources of the lower Rajang Valley and adjoining areas, Sarawak*. Geological Survey Department, British Territories. 167pp.

11. Woodley Sdn Bhd, (2014). *EIA for the Re-Entry Logging within Coupes 05A to 08A under the Forest Timber Licence No. T/3346 in the Sg Katibas – Sg Tekalit – Sg Bangkit area, Kapit Division, Sarawak.* Ecosol Consultancy Sdn Bhd, Kuching.

APPENDICES

Appendix I

Terms of Reference

TERMS OF REFERENCE

Social Impact Assessment of Implementing Green Economy Concepts at Logging and Oil Palm Operations within the Song-Katibas Area

(Project Code: BM010201-907-INTL)

1. INTRODUCTION

This Terms of Reference is to develop and establish the work plan for the **Social Impact Assessment (SIA) of Implementing Green Economy Concepts at Logging and Oil Palm Operations within the Song-Katibas Area** following the commissioning of Envisar Sdn Bhd as the SIA Consultant.

The Green Economy Concepts are aimed at integrating the efforts to reduce greenhouse-gas emissions, promote biodiversity conservation and balanced economic development, and to elevate the well-being of local communities, especially of the indigenous groups.

2. THE STUDY AREA

The SIA Study shall focus on selected native communities from the Katibas region of Song District, Kapit Division of State of Sarawak, Malaysia, particularly the people who are staying or whose home village are located in the vicinity of logging operations and oil palm plantations. The Study Area is a part of the IKI project area which stretches from Batang Ai in Sri Aman Division to Kapit in Kapit Division, and also a part of the much larger Heart of Borneo (HoB) area which covers the Sarawak-Kalimantan border area from Sri Aman to Lawas/Brunei. Kapit Division now comprises four Districts; Bukit Mabong (a new district declared in February 2016), Belaga, Kapit and Song, from upstream to downstream, following the Btg Rajang. The Study Area is located within Song District, defined roughly by the Katibas river catchment where the longhouses are found; the area within Song District found on the northern side of the Btg Rajang (opposite Song) and the upper Katibas within the Lanjak Entimau Wildlife Sanctuary are not to be included. It covers an area of approximately 2,490 km^2. The district headquarter and bazaar is found at Song, located at the west bank of the mouth of Sg Katibas, where the river enters the Btg Rajang, the longest river in Sarawak. **Figure 1** shows the Study Area.

The Katibas river basin is drained by Sg Katibas and its tributaries. Notable tributaries are Sg Tekalit (an eastern branch with its mouth found 20 km upstream of the Katibas estuary), Sg Bangkit (the southeastern branch), Sg Musah (river mouth found slightly 1.4 km upstream of Sg Tekalit). The upper area of the Katibas basin, past Sg Bloh, is where the Lanjak Entimau Wildlife Sanctuary is found (LEWS). The LEWS is reputed for its orang-utan landscape and is one of the few natural habitats for orang utan in Sarawak.

The Study Area can be accessed only through logging tracks and rivers, and hence four-wheel drives and longboats are the only modes of transportation. The nearest major town is Sibu, and nearest airport is the Sibu Airport, located 95 km and 80 km downstream of Song respectively. The Sarawak trunk

system currently reaches as far upstream of the Btg Rajang as Kanowit, a riverine town 46 km downstream of Song. Road construction between Kanowit and Song is on-going with the bridges across Sg Kanowit and Sg Katibas also under construction. An old one-way bridge currently serves the Sg Ngemah crossing. An endeavour is being made to complete the Sibu-Kapit link, through the construction of the Song-Kapit Road. Kapit is located about 43 upstream of Song. From Song, a tar-sealed road, gravelled in some sections, follows the west bank of Sg Katibas, going 24 km upstream passing Nanga Musah. A system of logging tracks starting from Song are routed up to 85 km inland into the upper Katibas region. The proposed Kanowit-Song-Kapit Road is mostly aligned along the southern bank of the Btg Rajang and hence will not serve the interior Katibas region.

The communities of interest in the Study originated from the Iban ethnic group. Inter-marriages with other racial groups of Sarawak would have brought minority of other races into these communities. The longhouse communities can be grouped into the following areas within the Study Area (number of longhouses based on Land and Survey Department 1:125,000):

- Btg Rajang (including those near Song) – 10 longhouses
- Sg Katibas – 45 longhouses
- Sg Tekalit – 17 longhouses
- Sg Bangkit – 14 longhouses
- Sg Musah/ Sg Matalau – 10 longhouses
- Others – 2 longhouses

Preliminary data from year 1990 showed 98 longhouses in the Study Area but this figure may have changed by today. The location of the longhouses to be studied is shown in **Figure 2**. According to the Statistics Yearbook Sarawak 2015 (Vers2.0), Song District has a projected population of 21,300 (4,300 in the Song Council/Town area, and 17,000 beyond the council area), with an Iban population of 18,800; other races are confined mainly to Song Town. The population figures as quoted above can be misleading as the actual number of people living in the longhouses is usually lower than the official figures due to members of the communities working and staying outside the Study Area, seeking employment in Sibu, Kuching, Miri, Bintulu, West Malaysia and overseas, who usually return to the village of origin during Gawai Dayak and other notable occasions. They are also those who kept their village unit/door but owned house in other towns or cities, and who spend short time in the longhouses, coming back to visit only during festivities or occasions, or tending to their hobby farms.

Due to its hilly terrain and remoteness from good roads, the Katibas region has been deprived of infrastructural development. New road linkage will benefit those found near the southern bank of the Btg Rajang where the Sibu-Kapit Road is aligned. For water supply, most communities in the Study Area still depends on gravity-feed hill sources, rainwater or the river water.

Logging and forest replanting are the major industries with some oil palm plantings in the Study Area, the key player being the Ta Ann Group of Companies. Active landuses noted in the Katibas are:

- Licence for Planted Forest, LPF/0010 (Ta Ann Plywood Sdn Bhd), with 2,000 ha under oil palm fringing Ngemah area, western edge of the Study Area i.e. Katibas Oil Palm Plantation
- Pasin Forest Management Unit (Pasin Sdn Bhd), an amalgamation of Timber Licence Nos. T/3135 (Pasin Sdn Bhd) and T/3346 (Woodley Sdn Bhd) (both under Ta Ann Group)
- Kapit Forest Management Unit (Tanjong Manis Holdings Sdn Bhd, also under Ta Ann Group)
- Proposed Sejahtera Katibas Oil Palm Estate (yet to be developed)

3. OBJECTIVES OF THE STUDY

The objectives of the SIA Study are:

a) To provide a detailed background description of human and non-human settings of the Consultancy site, which include socio-economic (e.g., demographic pattern, economic activities, income level, social cultural capital), political and biophysical (e.g., resources and infrastructure) aspects;

b) To provide a clear picture of local perception towards the existing projects/supports (e.g., government and companies) and local needs/wants for future developments, and potential opportunities and gaps for changes;

c) To predict the trend of social changes (social impact) for the area before (business as usual) and after (green economy concepts is implemented, for the logging and oil palm operations) – the implementation of the proposed applying green economy approach at the pilot study site in Song-Katibas area in Sarawak, Malaysia;

d) To use the SIA findings to shape favourable social changes for the directly affected local communities, especially the Iban people, identifying target Iban villages for pilot community projects, and suggesting suitable pilot community projects for the area;

e) To develop guidelines for monitoring the performance of the proposed interventions or activities under the pilot community projects, which reflect the efforts of promoting the concept of "Green Economy" to assist multi-stakeholders, including the target Iban villagers, and their adaptation to the changes that have been created or promoted in line with the IKI project; and

f) To provide monitoring result of the proposed pilot community projects.

4. SCOPE OF STUDY

The scope of the SIA will cover the followings:

i) Description of the proposed project

The context of Green Economy Concepts applicable to the Study Area will be analysed and described. The proposed actions, their alternatives including 'no action' option are to be identified and documented, and their suitability examined on the basis of the information on the project(s), environmental and social issues and with the wider stakeholders. Project development and operation activities shall be examined or reviewed. The project plan and schedule shall be also outlined.

ii) Description of the existing environments

Profiling of baseline condition shall be conducted and documented. In the SIA, emphasis is to be placed on human environment (including socio-cultural, institutional, historical and political context). Other components of the environment of relevance shall be explored with varying degrees. Information/data on the existing environments in the Study Area will be collected, reviewed and compiled. Secondary sources such as previous reports and papers will be relied upon. The Study Area will be visited to verify the accuracy of the existing information and to collect primary data.

iii) Identification and analysis of impacts and key social issues

Scoping of impacts shall involve identification and prioritization of likely social impacts through discussions or interviews with stakeholders, and discussion among the various consultants in the Study Team. Field visits are to be made to the Study Area and stakeholders to learn about their points of view, concerns, ideas and priorities.

Identification and analysis of potential social impacts shall compare the business-as-usual scenario against application of Green Economy Concepts scenario. Prediction of impacts can be made using the comparative method or trend projection method. The comparative method will examine how affected community has responded to similar change in the past i.e. comparing with past known experiences. The trend projection method will take an existing trend and simply project the same rate of change into the future.

Prediction and evaluation of responses to impacts will be made to determine the significance of the social impacts on those who will be affected. After the assessment of direct impacts, the next stage will be to gauge how the affected people would react or respond, in attitude and action.

Social impacts will be studied in the following not-mutually exclusive categories:

- Lifestyle impacts
- Cultural impacts
- Community impact
- Quality of life impacts
- Health impacts

iv) Develop strategy for social development outcomes

Potential social development outcomes of the Green Economy Concepts shall be identified and appropriate social development strategy, proposed. This will include recommendations for strengthening institutional arrangement and also improve capacity building.

v) Analysis of alternatives and impact mitigation

The proposed approaches for Green Economy Concepts will be reviewed and compared in terms of relative impacts and social outcomes. If the analysis and consultation indicate that a different approach likely yield better outcomes, the options shall be described and considered with respect to budgetary, institutional, legal or other requirements.

Mitigation measures will be proposed to alleviate adverse social impacts. These could involve modifying project design, schedule or policy, or compensate for the impacts by providing substitute facilities, resources and opportunities.

vi) Management Plans

Management plans will be developed to manage any potential adverse impacts from the Green Economy Concepts. Relevant management plans will be suggested for Green Economy Concepts likely to be adopted by private and public agencies (assuming that the private and public agencies have no incorporated any Green Economy Concepts into their management or operation).

vii) Recommendation of action plans

Action plans will be recommended to provide guidance to project management and other stakeholders on how to integrate social development issues into project design and implementation. The action plans can be developed as integrated or separate action plans.

viii) Development of monitoring plan

A framework for monitoring and evaluation shall be developed and this as far as possible shall be done in consultation with key stakeholders. The framework shall identify expected social development indicators, set benchmarks, and propose party to be responsible for monitoring as well as specify evaluation procedures.

ix) Monitoring

Monitoring will be carried out in order to gauge or measure the changes and the monitoring result will be reported. The core objectives of monitoring are to gauge the effectiveness of any action plans or mitigation measures.

5. COMPONENTAL OBJECTIVES & METHODOLOGY FOR DATA COLLECTION

The environment within and in the vicinity of the Study Area will be studied under three major components. These are the physico-chemical, the biological and the human environment. While in the Studies, the emphasis shall be the human environment, the physico-chemical environment and the biological environment are also to be studied in order to understand and define the natural resources available to the people or communities of interest.

5.1 PHYSICO-CHEMICAL ENVIRONMENT

5.1.1 Geology, Topography & Soils

Objectives

- To establish predominant soil types in the Study Area
- To determine terrain and slope condition in the Study Area
- To find out the general agricultural capability and suitability of the Study Area for determining possible Green Economic Concepts projects (cropping, agro-tourism, etc)
- To study the potential for soil disturbance, erosion, soil loss and sedimentation so as to avoid environmental degradation

Methodology

- Secondary data collection
  - Maps, reports, records, papers and publications
  - Mineral & Geoscience Department, Agriculture Department, Land & Survey Department, National Mapping Department, Natural Resources and Environment Board, FMU licence holder
- Primary data collection
  - Site observation and random check with aid of a hand-auger

- Digital elevation modelling using available data

5.1.2 Water Resource & Rainfall

Objectives

- To discover sources of water or water catchments in the Study Area
- To determine the availability of water for cropping, aquaculture and fishery in the Study Area

Methodology

- Secondary data collection
  - Reports, records, papers and publications
  - Department of Irrigation and Drainage, Land & Survey Department, National Mapping Department, Health Department (hospital & clinics), Rural Water Supply Department, Public Works Department, Natural Resources and Environment Board, FMU licence holder
- Primary data collection
  - Site observation
  - Interviews with local people

5.2 BIOLOGICAL ENVIRONMENT

5.2.1 Flora & Forestry

Objectives

- To give a general profile of timber operation and harvesting activities (FMU, LPF and other timber licences), biodiversity, timber and forest resources in the Study Area
- To determine need for conservation of sensitive ecosystems and flora habitats in the Study Area
- To evaluate the potential for eco-tourism in the Study Area
- To document forestry prescription and practices in the Study Area

Methodology

- Secondary data collection
  - Maps, reports, papers and publications
  - WWF, Forest Department, Sarawak Forestry Corporation Sdn Bhd, Land & Survey Department, National Mapping Department, Natural Resources and Environment Board, FMU licence holder
- Primary data collection
  - Site reconnaissance and rapid ecological assessment

5.2.2 Fauna

Objectives

- To establish a general profile for fauna biodiversity and wildlife resource including aquatic resource in the Study Area
- To determine habitat disturbance and integrity of ecological system in the Study Area
- To evaluate the potential for eco-tourism in the Study Area
- To assess fishery and aquaculture as a food source and as an economic activity

Methodology

- Secondary data collection
  - Maps, reports, papers and publications

  - WWF, WCS, Dept of Agriculture, Forest Department, Sarawak Forestry Corporation Sdn Bhd, Natural Resources and Environment Board, FMU licence holder
- Primary data collection
  - Random site observation
  - Interviews with local people

5.3 HUMAN ENVIRONMENT

5.3.1 Socio-Economy

Objectives

- To provide a detailed socio-economic profile of the native people living in selected communities in the Study Area affected or to be affected by logging and oil palm operations
- To survey awareness and perception of the people with regard to Green Economy Concepts and the impacts of the possible action plans
- To gauge local perception of existing projects and identify local needs and wants for future developments, and potential gaps for changes.
- To engage stakeholders in particular the FMU licence holder, timber licensee and oil palm operators in the participation of implementing Green Economic strategies.
- To establish grievance mechanism for collecting and evaluating social grievances, and for making decisions on the solutions and on which agencies are to be responsible for taking action.

Methodology

- Secondary data collection
  - Maps, records, reports, papers and publications
  - Health Department, District Office, local council, Statistics Department, Labour Department, Immigration Department, Natural Resources and Environment Board, FMU licence holder
- Primary data collection
  - Interview and social survey

Data collection in the social survey is further explained below.

Both qualitative survey and quantitative survey shall be applied in data collection. The qualitative survey will be done based on field observation on the ground condition in order to gain some general understanding of the local people daily lifestyle, culture and standard of living. In addition, formal and informal interview session will be conducted with the key people in the areas and relevant information will also be obtained from the local authorities such as district office, local health clinics, local council, JKKK, JKR, Department of Agriculture, Forest Department and so on.

The main instrumentation to be used is questionnaires (one for focus group discussion, one for individual household interviews, and one for the monitoring round interviews). Among the issues consider in the questionnaire form are listed as below:

- Demography background (age, sex, ethnic group, religion, educational level, family size, etc)
- Migration Pattern – population actually staying in the Study Area versus those who are living elsewhere but regard the longhouses as ancestral home, and those working outside
- Natural biodiversity/ forest resource utilization and functions
- Cultural significance of the surrounding area to the local people
- Local employment/unemployment situation

- Economic activities, including agriculture, shifting cultivation, fishing, etc
- Existing community development projects
- Social economic condition and functions which including the income and poverty level, ownership of household properties
- Income level and trends
- Local pattern of land ownership
- Social organization or Institutional framework
- Belief system
- Impact of present forest plantation and oil palm operation
- Local awareness and perception of Green Economy Concepts
- Housing characteristics including types of housing occupancy levels, and age and condition of housing
- Health and social services in study area, including water supply, solid waste collection and disposal and utilities
- Educational resources
- Transportation systems
- Public amenities and facilities

Field Observation

Field observation is a systematic data collection approach. It is based on the Consultants' senses to examine people in the existing natural settings. For this Study, field observation will be carried out to gain a brief understanding of the local living conditions, culture, social interaction, standards of living, economic activities and also land use pattern. In addition, unclear issues arising from interview session will be clarified through observation as well.

Focus Group Interviews

Focus group interviews will be carried out with the headmen or their representative(s), and vulnerable groups e.g. women, seniors, youths, disabled people as the sampling units. Formal and also informal interview session with the representative of each settlement will be conducted. In this regard, questionnaires are designed to guide the interview session in order to derive supporting findings as a result of the Study (**Appendix A1 – Leaders, Appendix A2 – Vulnerable Groups**).

Household Interviews

A household survey will be used to collect primary data from the field with the household as the sampling units. A household is defined as a person or group of persons that are generally bound by ties of kinship who live together under a single family unit.

The household chosen for the Study will be based on a randomly simple system. A representative from each household will be interviewed face-to-face by the researcher. In order to obtain reliable and more holistic information and data, the study sample will target household's representatives who are able to give the most accurate information in response to the questions asked by the Consultants. For this purpose, a set of structured-interviewed questionnaire form has been designed for further quantitative analysis in order to come out with supporting findings for the Study (**Appendix A3 – Households**).

Directly and Indirectly Affected Communities

The SIA Study will cover both directly and indirectly affected communities in the Song-Katibas Area. The **directly affected communities** refer to the communities where the longhouses are located near or within the boundaries of the Pasin FMU and LPF licence areas and the immediate catchment downstream of these areas where the communities' livelihood, welfare, water supply, food resources, hunting grounds and shifting cultivation areas are likely to be impacted by the logging and oil palm operations. The **indirectly affected communities** refer to those communities where their longhouses are located outside the aforesaid licence areas, and whose livelihood, welfare, water supply, food resources, hunting grounds and shifting cultivation areas are not to be directly impacted by the logging and oil palm operations.

From initial appraisal of the communities in and around the Study Area based on geographical location, the indirectly affected communities are those on the southern bank of the Btg Rajang only.

Round of Sampling & Sample Size

At least three rounds of field trips are anticipated.

i) Round 1

The first round will be to obtain basic information (location, accessibility, longhouse name and locality, Tuai Rumah's name, population, number of doors, and community involvement in surrounding economic activities, logging and oil palm operations in particular, and water supply source(s) of all longhouse communities found within the Study Area, both directly affected and indirectly affected longhouses. This will include visits to District Office in Song, Song Hospital and medical clinics serving the Katibas region. Mapping of longhouses will also take place using secondary data including available satellite images and available reports including EIAs conducted in the area, and this data will be cross-matched with available ground data. This will be a trip to gather more ground information of the Study Area through interviews with government departments, and leaders of communities at Song. The Study Area will also be briefly visited to gain more data on the longhouses and their locations within the Study Area.

ii) Round 2

The second round visit will target 10% of the directly affected longhouses. These will be selected based on criteria such as:

- Location & accessibility
- Population & number of people actually staying at the longhouse
- Existing economic activities
- Available resources including land, people, forest produces, tourists attraction (waterfall, rapid, rock, cave, etc.)

In the later part of the second round, we will further refine the selected longhouses taking into account responsiveness, pro-activeness and willingness to participate in community projects.

Focus group interviews and household survey will be carried out at the selected longhouses. Household survey will target 30% of the households. At this stage, it is foreseen that stratified sampling can be applied following the rivers in the Study Area:

1. Sg Katibas (lower) – 2 longhouses
2. Sg Katibas (upper) – 2 longhouses
3. Sg Tekalit – 2 longhouses
4. Sg Bangkit – 2 longhouses
5. Sg Musah/ Matalau – 2 longhouses

Present data indicates 98 longhouses and a projected population of 20,000 in the Katibas region. Detailed survey will cover 10% of the longhouses and this means a sample size of 10 longhouses. Survey at the household level will target 30% of the households in the selected longhouses. Working backward from population of 20,000, a mean household size of 7, it is estimated that there are about 2,857 households in the Study Area. Hence, the household survey sample size is approximately 86. This survey sample size may be adjusted upward during the actual survey work depending on ground situation.

ii) Round 3

The third round visit will be the monitoring visit and this will target only the selected longhouses where pilot projects have been recommended and put into effect. Indicators for monitoring shall include:

- Status of projects
- Communities' perception and response to the pilot projects at time of monitoring
- Income generation
- Family members coming back
- Improvement in infrastructure and utilities
- Condition of house
- Nutritional status
- Material possession (eg. Television, washing machine, handphone, internet facilities, boat with outbound engine, etc.)
- Education status
- Health status
- Lifestyle
- Saving
- Welfare

Engagement of Stakeholders

Meetings and discussions will be held with the stakeholders such as the FMU licence holder, timber licensee, oil palm operators, other relevant government agencies and relevant NGOs (eg. DOA, DO, Forest Department Sarawak, Farmers' Organisation, etc.) and local community leaders and other vulnerable groups.

Grievance Mechanism

The setting up of a grievance mechanism shall be looked into addressing and managing adverse social issues identified in the Study and raised by the communities during the survey.

5.3.2 Land Use

Objectives

- To establish land-use type and pattern in the Study Area

- To know and understand potential pollution from land-uses activities in the Study Area
- To know remaining forest resources in the Study Area
- To understand any land-use conflict and potential native claim land in the Study Area

Methodology

- Secondary data collection
  - Maps, records, reports, papers and publications
  - Land & Survey Department, National Mapping Department, Natural Resources & Environment Board, Forest Department Sarawak, Sarawak Forestry Corporation, FMU licence holder
- Primary data collection
  - Site survey
  - Interviews with local people

5.3.3 Land Tenure

Objectives

- To establish land tenure situation in the Study Area
- To identify area where potential land tenure problem may arise in the Study Area
- To understand local land ownership characteristics

Methodology

- Secondary data collection
  - Maps, records, reports, papers and publications
  - Land & Survey Department, National Mapping Department, District Office, Village heads, Natural Resources and Environment Board, FMU licence holder
- Primary data collection
  - Interviews with key informants
  - Site observation
  - Results of land-use study

5.4 GIS & REMOTE SENSING

The SIA Study will be approached with the application of GIS and remote sensing. Such approach would increase the accuracy and reliability of the Studies. Due to the inaccessibility of the Study Area, remote sensing can greatly assist data collection. The major applications anticipated are in the mapping and analysis of:

- Land cover
- Landuse and vegetation
- Settlements
- Land tenure - native cropping and shifting cultivation area
- Terrain and catchments

Remote sensing data will be sourced from WWF Malaysia if available. Additional remote sensing data will be also obtained from the FMU licence holder, Pasin Sdn Bhd, as discussed in the meeting with Dr Michael V. Galante on 17 March 2017.

6. STUDY TEAM

The Study Team members are listed below (**Table 1**).

Table 1 List of Study Team Personnel

	Name	*Qualification(s)*	*Designation*	*Job Scope*
1.	**Vincent Ting Mui Soon**	*B. Eng. (Agri.), M. Env. Sc. (Landuse & Water Res. Mgmt.)*	Project Manager, Environmental Specialist	Project management, landuse
2.	**William Chang Wei Say**	*B. Rural Sc. (Agri.), M. Sc. (Agri. Ext.)*	Socio-economist	Socio-economy
3.	**Phang Tze Jan**	*B. Sc. (Forestry)*	Forester	Flora, fauna, forestry
4.	**Lim Chin Pang**	*B. Sc. (Geology), M. Sc. (Geology)*	Soil Scientist, Agriculturalist	Soils, agriculture
5.	**Didi Amarildo**	*B. Sc. (Remote Sensing)*	GIS Specialist	GIS, mapping

7. SCHEDULE OF WORK

The SIA Study commenced on 27 February 2017, and is to be completed by 3 August 2018. The schedule of work as per stipulated in the Contract between WWF-Malaysia and Envisar Sdn Bhd is as follows:

(i) Scoping Exercise:
- a. To submit draft TOR for scoping — 24 March 2017
- b. To conduct scoping exercise — 18 April 2017
- c. To submit final TOR for the Study — 28 April 2017

(ii) Progress Report
- a. Progress SIA Report No. 1 — 23 June 2017
- b. Progress SIA Report No. 2 — 14 March 2018

(iii) Final Report for SIA Study
- a. To submit draft SIA Study Report — 17 July 2017
- b. To present the SIA findings — 31 July 2017
- c. To submit final SIA Study Report — 14 August 2017

(iv) Monitoring Report for Post-SIA Study
- a. To submit draft monitoring report — 15 June 2018
- b. To present the monitoring for Post-SIA findings — 29 June 2018
- c. To submit the final post-SIA monitoring report — 15 July 2018

(v) To present the SIA and Post-SIA findings to WWF Malaysia and relevant stakeholders — 3 August 2018

8. DELIVERABLES

The deliverables/ outputs from these studies are stated below.

a) TOR for scoping exercise
b) Progress reports for SIA and Post-SIA
c) A presentation and briefing of the SIA and Post-SIA results to WWF-Malaysia
d) A presentation and briefing of the results to relevant stakeholders (e.g., representatives of government agencies, timber operators and NGOs) in a meeting arranged by WWF-Malaysia in Sarawak
e) Final report of SIA Study
f) Monitoring report of Post-SIA Study

The general report format for the final report of the SIA Study is attached in **Appendix B**.

Appendix II

Questionnaire for Round 1 and Round 2

Questionnaire for Village Level

(Round 1)

SIA STUDY: SONG-KATIBAS SOCIO-ECONOMIC SURVEY QUESTIONNAIRE

Area	Name of river system	GPS location

SECTION A: GENERAL INFORMATION

No	Question	Answer
1	Name of longhouse	
	a. Any old longhouse's name?	
	b. Any other longhouse's name?	
2	Name of Tuai Rumah	
	a. Previous Tuai Rumah's name?	
3	Number of doors/houses	
	a. Number of empty doors	
	b. Number of separate houses	
4	Number of population	
	a. Number of residents currently staying at the longhouse (inbound)	
	b. Number of residents staying outside of the longhouse (outbound)	
5	Race	
6	Religion	

7	**How long has the longhouse been here in Song-Katibas area?**	
8	**History of the longhouse**	
	a. Origins of the people	
	b. Reasons to settled here	
9	**Migration Pattern**	
	a. How many left the longhouse?	
	b. Where they mostly go to?	

SECTION B: ECONOMIC ACTIVITIES

No.	Question	Answer
1	**Local Market**	
	a. Where are the common market visited?	
	b. Purpose of visiting the market **- to buy or sell goods**	
2	**Source of income** **(e.g. wages remittance, business)**	
3	**Farming Activity**	
	a. Are the people involved in farming activity **- commercial/own consumption**	

	b. What are the main types of commercial/ subsistence crops planted (e.g. paddy, fruit trees, pepper, oil palm and vegetable)	
	c. Anyone involved in livestock farming (e.g. raise chicken, goat and cow)	
	d. Anyone involved in aquaculture farming – e.g. has fish pond	
4	**Fishing Activity**	
	a. Do people go for fishing? - commercial/self-consumption/leisure	
	b. Where are the common fishing grounds?	
	c. What are the predominant fish species caught?	
5	**Small business**	
	a. Anyone operate small business such as stall and grocery shop?	
	c. Any outsiders do business in their longhouse? (e.g. sell things to them)	

SECTION C: SOCIAL CULTURAL CAPITAL

No	Question	Answer
1	**Any social organization in the longhouse? (e.g. JKKK)**	
2	**Any government agencies visited their area? (Please specify)**	

SECTION D: BIOPHYSICAL ASPECTS

No	Question	Answer
1	**Forest product (if any)**	
	a. What are the common types of forest products collected (e.g. wildlife, wild vegetable, firewood, timber and raw materials)	
	b. Where do they go to collect the forest products?	

	c. What are the common animals found in the forest?	
	d. Any rare animals (e.g. hornbill, orang utan) spotted in the forest?	
2	**Water**	
	a. Where do people get their water sources (e.g. rainwater, river water, gravity feed water or water tanks) Identify source – name of the mountain or hill, pond water, river or water from a well)	
	b. How is the quantity of the water? Give reason (e.g. sufficient or not sufficient)	
	c. Are there any subsidies for the water tank – by whom?	
4	**Transportation network**	
	a. Accessibility to the longhouse (by road or river)	
5	**Electricity source**	
	a. Where do the people get power supply? (individual generator, communal generator or solar system)	
	b. For those who rely on generator sets (if any) **- where do people buy fuel?** **- are there any problems with the current power supply?**	
6	**Telecommunication network**	
	a. Type of telecommunication services in the area	

	b. Type of mobile network coverage in the area	
	c. Signal level of the mobile network coverage in the area	

Questionnaire for Leaders

(Round 2)

Song-Katibas SIA Study

Socio-Economic Survey

VILLAGE PROFILE

- Leaders -

Group Discussion involving Tuai rumah, JKKK and its bureau, any family heads

1. Basic Socio-economic Information

1.1. Name of village:_____

1.2. Location: (GPS reading if available); in which river system:_____**; name of locality:**_____

1.3. Demography:

Total village population	**No of *Farm families***	**No. of doors**	**Male**	**Female**	**Ethnicity(Race)**

1.4. Transport: (Please tick (**√**) in box)

Mode	a. river	b. road		
Road Type	a. gravel/mud road	b. tar-sealed road	c. Plantation road	d. Logging road
Services	a. express boat	b. own boat	c. hired van/4-wheel drive	d. own vehicle

Main problems/ other remarks: (Short and brief; in Iban, Malay and or English)

_____

_____

1.5. Utilities: (Please tick (**√**) in one or more appropriate boxes)

Electricity	a. SESCo/SEB	b. generator	c. pressure lamps	d. solar	e. kerosene lamp
Water	a. JBALB supply	b. gravity feed system	c. river	d. water tanks (rain)	e. others
Telephone	a. fixed line	b. wireless telephone	c. cellular	d. none available	

Main problems/ other remarks: (e.g. water supply)

_____

_____

1.6. Social Communities, Amenities & Services

1.6.1 Kindergarten (fill in blank):

(a) Name of kindergarten: _____

(b) No. of children:_____

(c) Run by which agency: _____

(d) Location: _____

1.6.2 Primary school(fill in blank):

a) Name of school: _____

(b) No. of pupils:_____

(c) Location: _____

(d) Is boarding provided? Yes/no:_____

1.6.3 Secondary school(fill in blank):

(a) Name of school the students normally go to:_____

(b) Is boarding provided? yes/no _____

(c) Is it a junior secondary school (up to form 3) or a senior secondary school (up to Form 5 or SPM)?_____

(d) If it is a junior secondary school, which school do their children go for upper secondary school education?_____

Comments about education services:

_____

_____

1.6.4 Health services:

(a) Which clinic(s) do the villagers normally go for treatment?_____

(b) What services does the clinic provide?(Please tick (**√**) in one or more appropriate boxes)

- Out-patient□
- Maternity □
- Childcare□
- Dental□
- Others □; Specify _____

(c) How far is the clinic to your longhouse? _____
Comments about medical and health services:

_____

_____

1.6.5 Recreational/community facilities in the village(Please tick (**√**) **boxes in**(a) to (g)**:**

(a) Community hall; yes□/no □
(b) Public library;yes □/no □
(c) Worship place ; yes □/no □
(d) Playground; yes □/no □
(e) Football field ; yes □/no □
(f) Badminton court ; yes □/no □
(g) Others, specify

Comments:

_____

_____

1.6.6 Sanitation facilities:

(a) Type of toilet system (Please tick (**√**) in one or more appropriate boxes)

(i) pour-flush system □; (ii) pit latrine □; (iii) hanging toilet (by the river bank) □; (iv) others (specify)_____

(b) Any rubbish pit? yes □/no □

Comments on facilities:

_____

_____

1.6.7 Any other facilities (e.g. church, chapel, community hall, etc.)? _____

1.7 Main occupations of villagers:_____

A. Agriculture/Forestry/Fisheries:

Type of activities	**No. of families having the activities**	**Average Scale/size**	**Ha/no. of plants**	**Remarks**
(a) Own farm:				
1. Hill paddy (shifting cultivation)				
2. Dry-land paddy (in paya, rain-fed))				
2. Wet paddy				
3. Rubber tapping				
4. Pepper				
5. Fishpond				
6. Pig rearing				
7. Cattle rearing				
8. Goat rearing				
9.Poultry rearing				
10.Others 1 ( )				
11.Others 2 ( )				

1.7.A.1 Which types of agricultural activities benefit from nearby natural forests (e.g. because insects from the forests help controlling pests)?

_____

_____

1.7.A.2 If there is no natural forest near to these types of agricultural activities, what will happen to the agricultural activity?

_____

_____

(b) Working outside own farm	**No. of families having members engaged in**	**Names of plantations & where?**	**Nature of work (e.g. daily paid, monthly paid, farm worker, clerk, supervisor assistant manager**	**Average wages/salary RM per day or per month**
Oil Plantations				
Forest plantations				
Other commercial farms (please specify)				

(c) Fishing:	**No. of families involved**	**Av. catch per month (kg)**	**Main species of fish caught**	**Fishing methods**	**Best months for activities**	**Worst months for activities**
Fishing activities						

Any for sale?(Please tick (**√**)**only one** in box)**:**

All for own consumption □; Small proportion (less than ¼) for sale □; More than ¼, but less than ½ for sale □; More than ½ for sale □; All for sale □

(d) Hunting:	**No. of families involved**	**Av. no. of animals per month**	**Main species of wild life hunted**	**Methods of hunting**	**Best months for activities**	**Worst months for activities**
Hunting activities						

Food provisioning	**Where does the hunting take place, and in what kind of forest is this?** _____ _____ _____

Any for sale?(Please tick (**√) only one** in box)**:**

All for own consumption □; Small proportion (less than ¼) for sale □; More than ¼, but less than ½ for sale □; More than ½ for sale □; All for sale □

(e) Collection of jungle produces:	**No. of families involved**	**Av. collection (Kg) per month**	**Main types collected: specify for food (f) or for non-food (nf)**	
			Food (f)	**Non-food (nf)**
Food provisioning	**Where does the collection of jungle produce take place, and in what kind of forest is this?** _____ _____ _____			

For jungle produce collection, do you go in groups or individually (Please tick (**√) only one** in box)?

In group □; Individually □; Sometimes in groups and sometimes individually □

B. Other economic activities; (wages-earning and own employment)

Types (*e.g. carpentry, shop-keeping, labourer work, logging, transportation, shop assistant, government, company staff etc.*)	**No. of families having members engaged in**	**Average no. of days in a month engaged in?**

Provisioning of other raw materials	**Where does the collection of raw materials used for this activity take place, and what kind of forest is this?** _____ _____ _____	
Opportunities for recreation and tourism	**If tourism is mentioned under 1.7.B as an economic activity, please indicate:** **a) How many tourist visit this longhouse per year**?_____ **b) How much is earned per tourist (RM)?**_____	

C. Types of Cottage Industries

Types (eg. handicraft, bakery, salted fish, salai fish and animal products)	**No. of families engaged in & who in the family are involved. (grandmother, mother, sisters)**	**Remarks: e.g. indicate whether the raw materials are scarce now or difficult to obtain.**
Provision of other raw materials	**How much of each type is produced per month?** _____ _____	
	Which raw materials are taken from the forest (or river) per month? _____ _____	
	How much of these raw materials are taken from the forest (or river) per month? _____ _____	

	Where does the collection of raw materials used for this type take place, and in what kind of forest is this? _____ _____
Do the local Iban people produce nature inspired art objects? If so, what are the most relevant objects? E.g. kitchen utensils, decorative objects etc. _____ _____	

Spiritual Experience

1.7.C.1 Which species (trees, plants or animals) have spiritual or religious value for this village?

1.7.C.2 In which forests or plantations can these species be found within the proximity of the longhouse?

1.8. Any other observations about the Village?

1.8.1 Religious belief (Religion and % of population):

1.8.2 General cleanliness: (Include compound and longhouse)

1.8.3 Leadership (headman, JKKK)(Please tick (**√**) **only one** in box)**: Strong** □ **; mild** □; weak □

1.8.4 Local institutions (JKKK, sub-committee, Farmers Organisation (FO), Youth organization etc.)

1.8.5 No. of families who are members of FO:

1.9. Government Services

Names of agencies	Type of services provided	Frequency of services or visits	Remarks

1.10. Sources of Information (Please tick (**√**) in one or more appropriate boxes)

(i) Radio □(ii) TV □(iii) News Papers □(iv) Government agency □(v) Others (specify) _____.

1.11. Postal Services

1.11.1 How are mails sent and to which post office/ agent?_____

1.11.2 Where do you collect your mails?_____

1.12. Migration

1.12.1 Any families or members not staying in longhouses? Yes/no

If yes, number of entire families not staying in longhouses _____

If yes, number of families having at least a member not staying in longhouse _____

1.12.2 Where do they stay (locality)?_____

1.12.3 Reasons:

2. Views, Attitudes and Opinions (VAO) (focusing on resources, livelihoods and quality of life and aspirations)

2.1 VAO from Village Elders (Leaders, Members of JKKK)

2.1.1 Fisheries Resources

(i) What is your view about the availability of fish in the rivers? Is it getting more and more difficult to fish (Please tick (**√**)**only one** in box)?

Easy to catch fish□; Difficult to catch fish□; Very difficult to catch fish□

(ii) Name the species most commonly caught:

(iii) Name the species rarely caught:

(iv) What are your views about the causes of decline in fish stocks?

(v) Do you have any suggestion about improving the situation? Discuss.

2.1.2 Wildlife Resources

(i) What is your view about the availability of wildlife in the forest (Please tick (**√)<u>only one</u>** in box)? Is it getting more and more difficult to hunt? Easy to hunt □; Difficult to hunt □; Very difficult to hunt □

(ii) Name the species most commonly hunted:

(iii) Name the species rarely hunted:

(iv) What are your views about the causes of decline in wildlife?

(v) Do you have any suggestion about improving the situation? Discussion

2.1.3 Forest Products

(i) What is your view about the availability of jungle produces in the forest? Is it getting more and more difficult to collect? Easy to collect □; Difficult to collect □; Very difficult to collect □

(ii) Name the types most collected:

(iii) Name the types rarely collected:

(iv) Name the types you need:

(v) For own consumption?

(vi) For handicrafts?

(vii) For other household uses?

(viii) What are your views about the causes of decline in forest products?

(ix) Do you have any suggestion about improving the situation?

2.1.4 Impact of logging/plantation activities/flood or river level

(i) What is your view about the Company logging/oil palm plantation activity near your longhouse area?

(ii) Any Negative impacts (Please tick (√) only one in box):Yes □; No □; Not sure □

(iii) If yes, what types of impacts?

_____

(iv) Any Positive impacts?(Please tick (√) only one in box):

- **If positive, what are the benefits?**
- **Provide employment;** Yes □; No □; Not sure □
- **Improve communication/accessibility?** Yes □; No □; Not sure □
- **Can get assistance from Timber/Plantation Company for assistance for repair of longhouse, road, community facilities/amenities** (e.g. community hall, sport/recreational facilities, gravity pipe water)**.** Yes □; No □; Not sure □
- **What types of benefits/assistance has the Timber/Plantation Company provided for the longhouse?**

  _____

  _____

- **List names of projects and costs**

  _____

  _____

(v) Other benefits

_____

_____

(vi) Do longhouses and their (food) gardens suffer from floods or droughts?

_____

_____

(vii) What is the influence of low water levels of the Katibas rivers on local shipping: is shipping sometimes impossible and has this the results that ships cannot reach their final destination?

_____

_____

(viii) What do local people consider to be the cause of low water levels: deforestation, or seasonal variation in rainfall or upstream water intake for power plants etc?

_____

_____

(ix) Are there any social problems in the area, such as quarrels between parties, exclusion of groups of people, alcohol abuse, a general low life expectancy that are related to the changing natural surroundings i.e. forests turned into plantations?

_____

_____

2.1.5 List the types of development you would like to have for your village.

Include views expressed by elders (leaders, members of JKKK etc.); by women group; and by youths. (Group discussion, facilitated by enumerator/field officer). Just write down main points in Iban, Malay and/or English.

Leaders/ JKKK members:

_____

_____

2.1.6 What types of cash-earning projects you prefer to undertake?
(Please tick (**√**) in appropriate boxes)**:**

- Rubber□
- Pepper□
- Smallholder Oil Palm□
- Other□_____
- Livestock: cattle; □ ; poultry □; pig □; wild pig □; deer farming; others (specify) □_____
- Aquaculture: Tagang system□ (which river); fishpond; cage culture □; tank culture □_____
- Handicrafts; □ name the types:_____
- Tourism (homestay, tour guiding) □
- Others (specify) □_____

2.1.7 Land Issue

(i) Do any of the households (doors/bilik) have any land claim in the logging area or forest land outside logging area? Yes □; No □

(ii) If yes, how many household (bilik) are making claim in logging area?

(iii) How many doors/bilik are making claim in forest land outside logging area?

2.1.8 What is the longhouse's relation with the Timber Company (Please tick (√) only one of the appropriate boxes): Excellent □; Good □; Fair □; Bad □

(i) Do you have any disputes or grievances with the Timber Company? Yes □; No □

(ii) If yes, what nature? land □; water source □; road damage □; land-slide/erosion □; theft by workers □; Others (specify) □

-- End --

Questionnaire for Households

(Round 2)

Song-Katibas SIA Study

Socio-Economic Survey

HOUSEHOLDS

1. Major Sources of Household Income

Sources: agriculture, forestry, fishing, non-agric., remittance from relatives, etc.	Estimate Average Quantity*: kilo per year for agric., fishing, livestock	Income** estimated; state per year or per month basis	Remarks: Whether enough for consumption? Any excess for sale?
Hill paddy			
Wet paddy			
Poultry Rearing			
Tapping rubber			
Pepper			
Hunting			
Fishing			
Collection of jungle produce			
Fruits			

*** one fertiliser sack of paddy = 25 kg of rice; ** Income computed on opportunity cost (i.e. how much would it be if they were purchased in market.)**

2. Major monthly expenses

Items	RM /month	Remarks
1. Food		
2. education		
3. Medical		
4. Transport		
5. Utilities		

3. Land Ownership and Utilization

Lot	1	2	3	4	5	remarks
Status*						
Size(Ha)						
Land use** (ha)						

***Land Status: a – NCR, b – title land, c – TOL, d - State land**

****Land use: A – Wet Paddy, B – hill paddy, C – vegetables, D – annuals, E – rubber, F – pepper, , G – livestock, H– fishpond, I – other (to specify)**

4. Crop/Livestock/ Aquaculture Production of household

Crop	Ha/number	Yield kg/ha	Use of fertilizer (tick)	Use of weedicides (tick)	Use of pesticides (tick)	Any Assistance from DOA? Y/N
1.Hill paddy						
2.Wet paddy						
3. Pepper						
4.Fruit trees						
5. Rubber						
6.Vegetables						
7. Annuals						
8. Others						
Livestock						
9.Pig						
10. Poultry						
11. Others						
Fishpond						
Other (eg. cage culture, tank culture						

5. Employment

5.1 Full-time Employment

Type	Where	Members of family (father, son, daughter etc.)	Salary/wage per month	Remarks

5.2 Part-time Employment

Type	Where	Members of family (father, daughter, son etc.)	Salary/wage per month	Remarks: Which months?

6. Educational Level

Educational level completed	No. of members	No. employed	Age group
1. Kindergarten			
2. Primary School			
3. Lower secondary up to Form III			
4. SRP			
5. SPM			

6. STPM			
7. Diploma			
8. Degree			
9. Never been to school			

7. <u>Age Structure</u>

Age group (years)	No. in family	Gender: M/F	Schooling (S) or working (W) (S or W)	Remarks: married (M);unmarried (UM); with child/children (WC)
1. 0-3				
2. 4-6				
3. 7-12				
4. 13-15				
5. 16-17				
6. 18-19				
7. 20-23				
8.24-30				
9. 31-39				
10. 40-55				
11. 55-64				
12. 65 & above				

8. <u>Migration</u>

No. members of family not staying in their longhouse	Where are they? (name the places)	Reasons for migration

9. Transport

9.1 Which service centre (town) do your family members normally go to? _____

9.2 How do they get there; by what mode of transport? (Please tick (**√**) in **one or more** appropriate boxes)**:**

4-wheel drive□; Longboat □; Speed Boat □; Motorcycle □; Walking □

9.3 How long is the journey? (Please tick (**√**) in **ONLY ONE** appropriate box)

a. <1 hour □ b.1-2 hours□ c. 2-3 hours□ d. >3 hours□

9.4 For what purposes? (Please tick (**√**) in **one or more** appropriate boxes)**:**

a. Business □ b. Visit other relatives/family □

c. Consulting a doctor/governmental staff □ d. Personal reason □

9.5 Frequency of travelling (Please tick (**√**) in **ONLY ONE** appropriate box)

a. Once a week □ b. Once a month □ c. Once in 6 month □

9.6 Do you own(Please tick (**√**) in **one or more** appropriate boxes; may have more than one):

long boats□; outboard engines□ own vehicle□

9.7 If vehicle, what type of vehicle? _____

10. List the types of development you would like to have for your family? Views of family head, wife, and youth members.

Family head:

_____

Wife:

Youth members:

_____

Elders and Handicapped:

_____

11. What sort of skill development training you would like to undergo?(Please tick (**v**) in appropriate boxes; MAY HAVE MORE THAN ONE)

- **Auto-mechanic** □
- **Electrical technician** □
- **Carpentry** □
- **Welding** □
- **Accounting** □
- **Aquaculture** □
- **Agriculture** □
- **Others (specify)** □

12. If there was economic development in Katibas, would you prefer to stay or allow your children to stay in your own community? Views of family head, wife, and youth members of family.(Please tick (**v**) in appropriate boxes)

Family head**:** yes □/no □ to stay

Wife: yes □/no □ to stay

Son(s): yes □/no □ to stay

Daughter(s):yes □/no □ to stay

Any comment?

_____

_____

_____

-- End --

Questionnaire for Vulnerable Groups

(Round 2)

Song-Katibas SIA Study

Socio-Economic Survey

- Vulnerable Groups -

2.2 VAO by Women Group

2.2.1 Fisheries Resources

(i) Is fish important to the diet of your family? Yes □ No □

(ii) Is fish important to your children? Important □; Very Important □; Not so important □

(iii) How often do you have fish in a week? Once □; Twice □; Thrice □; More than 3 times/week □

(iv) What is your view about the availability of fish in your river?

□ It is easy to catch

□ Difficult to catch

□ Very difficult to catch

(v) What are the causes of decline in the fish stock?

_____

_____

(vi) Do you have any opinion about how to improve the situation?

_____

_____

2.2.2 Wildlife Resources

(i) Is wildlife important as a source of protein to your family? □ Yes; □ No

(ii) Is wildlife important to your children? Important □; Very Important □; Not so important □

(iii) How often do you have meat in a week? Once □; Twice □; Thrice □; More than 3 times/week □

(iv) What is your view about the availability of wildlife in the forest?

□ It is easy to hunt

□ Difficult to hunt

□ Very difficult to hunt

(v) What are the causes of decline in the wildlife?

_____

_____

(vi) Do you have any opinion about how to improve the situation?

_____

_____

2.2.3 Cash-earning Projects

(i) What type of cash-earning projects you prefer to undertake?

_____

_____

2.2.4 Non-Timber Forest Products (NTFP)

(i) What is your view about the availability of NTFP in the forest?

□ It is easy to collect

□ Difficult to collect

□ Very difficult to collect

(ii) What are your views about the causes of decline in NTFP?

_____

_____

(iii) What types of NTFP are important to you? Please specify.

_____

_____

(iv) Do you have any opinion about how to improve the availability?

_____

_____

2.3 VAO by Youth

2.3.1 Fisheries Resources

(i) How often do you go fishing in the river? Often □; Very often □; Not often □; not often □; very seldom □

(ii) What is your view about the availability of fish in the river?

□ It is easy to catch

□ Difficult to catch

□ Very difficult to catch

(iii) What are the causes of decline in the fish stock?

_____

_____

(iv) Is fishing important to your life? Important □; Very Important □; Not so important □

(v) Do you have any opinion about how to improve the situation?

_____

_____

2.3.2 Wildlife Resources

(i) Do you go hunting for wildlife? Often □; Very often □; seldom □; never □

(ii) What is your view about the availability of wildlife in the forest?

□ It is easy to hunt

□ Difficult to hunt

□ Very difficult to hunt

(v) What are the causes of decline in the wildlife?

_____

_____

(vi) Do you have any opinion about how to improve the situation?

_____

_____

2.3.3 Non-Timber Forest Products (NTFP)

(i) What is your view about the availability of NTFP in the forest?

□ It is easy to collect

□ Difficult to collect

□ Very difficult to collect

(ii) What are your views about the causes of decline in NTFP?

_____

_____

(iii) What types of NTFP are important to you? Please specify.

_____

_____

(iv) Do you have any opinion about how to improve the availability?

_____

_____

2.4 VAO by Old People and Handicapped

What are the things you would like to have to make your life comfortable?

_____

_____

_____

_____

-- End --

Appendix III

List of Round 1 Longhouses
(92 longhouses)

Cluster 1:

Song Area

SIA - Cluster 1: Song Area

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
1	Nanga Rarong	Rh Garai	TR Gari ak Seliong	14	14	0	146	_	_	_	_	Tar-sealed road/ Absent of longhouse representative*
2	Nanga Miaw	Rh Garing	TR Garing ak Pangit	26	4	22	226	15%	85%	50%	50%	Tar-sealed road
3	Nanga Miaw	Rh Jala	TR Jala ak Ugol	28	28	0	314	_	_	_	_	Tar-sealed road/ Absent of longhouse representative*
4	Hilir Katibas	Rh Nyangun	TR Nyangun ak Bundak	13	8	5	138	46%	54%	60%	40%	River
5	Takan	Rh Guntor	TR Guntor ak Thomas	15	13	2	104	52%	48%	50%	50%	Tar-sealed road
6	Takan	Rh Serit	TR Serit ak Uching	36	36	0	254	_	_	_	_	Tar-sealed road/ Absent of longhouse representative*

*During field survey on 17th to 29th April 2017

SIA - Cluster 1: Song Area

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
7	Temukus, Sg Takan	Rh Minah	TR Minah ak Serit	17	17	0	85	100%	0%	50%	50%	Tar-sealed road
8	Nanga Takan	Rh Nyalu	TR Zachius Nyalu @ Jaluk ak Ambap	27	25	2	155	54%	46%	50%	50%	Tar-sealed road
9	Nanga Entawai	Rh Yongkap	TR Yongkap ak Poh	18	18	0	70	100%	0%	50%	50%	Tar-sealed road
10	Nanga Nyimoh	Rh Gerunsin	TR Gerunsin ak Pagang	36	31	5	238	53%	47%	40%	60%	River
11	Nanga Nyimoh	Rh Seligi	TR Seligi ak Selutan	22	22	0	157	100%	0%	50%	50%	Tar-sealed road
12	Ulu Engkabau	Rh Mangkang	TR Mangkang ak Jaee	12	2	10	74	–	–	–	–	River/ Absent of longhouse representative*

*During field survey on 17th to 29th April 2017

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present In longhouse*	Out of longhouse*	Male*	Female*	
13	Nang Sepadi	Rh Jerop	TR Jerop ak Bungkong	43	43	0	274	_	_	_	_	Tar-sealed road/ Absent of longhouse representative*
14	Engkabau	Rh Delok	TR Delok ak Riti	40	40	0	276	100%	0%	50%	50%	River
15	Nanga Kebiau	Rh Edwin	TR Mohamad Edwin bin Abdullah	19	19	0	118	_	_	_	_	Tar-sealed road/ Absent of longhouse representative*
16	Nanga Engkabau	Rh Lucas	TR Lucas ak Baru	25	25	0	149	100%	0%	50%	50%	River
17	Kebiau, Song	Rh Cecelia	TR Cecelia Bunsu ak Sebat	31	31	0	188	100%	0%	50%	50%	River and tar-sealed road
18	Nanga Kebiau	Rh Michael	TR Michael Lasu ak Nyantau	7	7	0	42	_	_	_	_	Tar-sealed road/ Absent of longhouse representative*

*During field survey on 17th to 29th April 2017

Cluster 2:

Sg Musah/Matalau

SIA - Cluster 2: Sg Musah/Matalau

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total Population	Present in longhouse*	Out of longhouse*	Male*	Female*	
1	Ulu Matalau/ Nanga Setapang	Rh Pasang	TR Sanda ak Tading	23	5	18	243	–	–	–	–	Logging road/ Absent of longhouse representative*
2	Nanga Matalau	Rh Jossele	TR Jossele ak Unchat	21	2	19	157	10%	90%	50%	50%	River
3	Ulu Musah	Rh Demang	TR Demang ak Rebai	37	4	33	167	11%	89%	50%	50%	River
4	Batu Ensulit	Rh Baro	TR Baro ak Mawa	13	–	–	137	–	–	–	–	River/ Absent of longhouse representative*
5	Emperan Kasai	Rh Tugang	TR Tugang ak Bati	7	–	–	70	–	–	–	–	River/ Absent of longhouse representative*
6	Nanga Tengangai, Sg Musah	Rh Bagan	TR Bagan ak Jugam	22	5	17	184	23%	77%	60%	40%	River

*During field survey on 17th to 29th April 2017

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total Population	Present in longhouse*	Out of longhouse*	Male*	Female*	
7	Rantau Pitak, Sg Musah	Rh Tagi	TR Tagi ak Ungkar	5	2	3	45	40%	60%	60%	40%	River
8	Nanga Semulong, Sg Musah	Rh Philip	TR Philip ak Geliga	14	10	4	124	71%	29%	50%	50%	River
9	Nanga Musah	Rh Anjan	TR Anjan ak Gaid	8	5	3	73	63%	37%	60%	40%	River
10	Nanga Senyaro	Rh Japok	TR Japok ak Ribai	21	19	2	159	90%	10%	50%	50%	River and tar-sealed road

*During field survey on 17th to 29th April 2017

Cluster 3:
Sg Tekalit

SIA - Cluster 3: Sg Tekalit

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
1	Nanga Sepunggok	Rh Gilbert	TR Gilbert Nyandang ak Tinggi	10	4	6	80	40%	60%	40%	60%	River
2	Rantau Assam, Ulu Tekalit	Rh Munting	TR Munting ak Nabau	18	6	12	210	33%	67%	50%	50%	River and logging road
3	Rantau Asam	Rh Bilun	TR Bilun ak Taboh	7	3	4	33	43%	57%	50%	50%	River
4	Nanga Latong	Rh Melayu	TR Melayu ak Angkup	18	14	4	138	78%	22%	5%	5%	River and logging road
5	Nanga Barok	Rh Kana	TR Kana ak Langgai	12	6	6	110	50%	50%	50%	50%	River
6	Lubok Lampah	Rh Landun	TR Landun ak Manja	15	6	9	111	40%	60%	40%	60%	River

*During field survey on 17th to 29th April 2017

SIA - Cluster 3: Sg Tekalit

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
7	Ulu Sg Janan	Rh Kaya	TR Kaya ak Nyelang	24	11	13	198	46%	54%	60%	40%	River
8	Nanga Janan	Rh Philip	TR Philip ak Bagol	30	20	10	217	67%	33%	50%	50%	River
9	Ulu Janan	Rh Anchu	TR Anchu @ Achau ak Sigaw	12	–	–	100	–	–	–	–	Absent of longhouse representative*
10	Rantau Ensurai	Rh Sibat	TR Sibat ak Laeh	10	–	–	89	–	–	–	–	Absent of longhouse representative*
11	Nanga Tengangai	Rh Chenggai	TR Chenggai ak Baring	32	18	14	300	56%	44%	50%	50%	River
12	Nanga Lanang	Rh David Matan	TR David Matan ak Sibat	19	14	5	248	74%	26%	50%	50%	River

*During field survey on 17th to 29th April 2017

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
13	Nanga Sepayang	Rh Endah	TR Endah ak Kap	22	18	4	271	82%	18%	50%	50%	River
14	Nanga Chupin	Rh Ensam	TR Ensam ak Ibang	14	3	11	98	21%	79%	50%	50%	River
15	Nanga Chupin	Rh Ebin	TR Ebin ak Lagak	10	3	7	102	30%	70%	50%	50%	River
16	Nanga Sebungkang	Rh Brian	TR Brian @ Barain ak Padang	31	12	19	216	39%	61%	50%	50%	River
17	Nanga Nansang	Rh Vincent	TR Vincent ak Jugah	30	–	–	361	–	–	–	–	River/ Absent of longhouse representative*
18	Nanga Nansang	Rh Madong	TR Dunggo ak Madong	13	3	10	118	23%	77%	50%	50%	River

*During field survey on 17th to 29th April 2017

SIA - Cluster 3: Sg Tekalit

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
19	Nanga Tekalit	Rh Ngelana	Rh Ngelana @ Galana ak Endong	31	31	0	230	100%	0%	50%	50%	River and tar-sealed road

*During field survey on 17th to 29th April 2017

Cluster 4:
Sg Bangkit

SIA - Cluster 4: Sg Bangkit

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
1	Ulu Bangkit	Rh Enggong	TR Enggong ak Imba	27	9	18	170	34%	66%	60%	40%	River/ cut-off from logging road
2	Karangan Panjang	Rh Langga	TR Langga ak Bajol	12	5	7	101	42%	58%	40%	60%	River/ cut-off from logging road
3	Batu Pikul	Rh Akang	TR Akang ak Jebeng	36	10	26	238	28%	72%	60%	40%	River
4	Nanga Semumban	Rh Silo	TR Silo ak Bungkong	9	8	1	48	89%	11%	60%	40%	River
5	Nanga Meluan, Sg Bangkit	Rh Bada	TR Bada ak Ijang	14	–	–	181	–	–	–	–	River/ Absent of longhouse representative*
6	Sg Ayat	Rh Layang	TR Layang ak Sumbang	23	13	10	180	57%	43%	50%	50%	Logging road/ difficult to access through river (shallow)

*During field survey on 17th to 29th April 2017

SIA - Cluster 4: Sg Bangkit

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
7	Wong Betong	Rh Gong	TR Gong ak Kerabor	17	10	7	377	59%	41%	40%	60%	River
8	Nanga Nansang	Rh Lasin	TR Lasin ak Buda	17	7	10	154	41%	59%	40%	60%	River
9	Nanga Lelayang	Rh Kana	TR Jabu ak Angih	11	3	8	80	27%	73%	50%	50%	River
10	Rantau Abau, Ulu Bangkit	Rh Selat	Rh Selat ak Mancha	23	7	16	303	30%	70%	60%	40%	River
11	Nanga Bangkit	Rh Sebastian Tambi	TR Sebastian Tambi ak Jugah	42	42	0	402	100%	0%	50%	50%	River

*During field survey on 17th to 29th April 2017

Cluster 5:

Sg Katibas (Hilir)

SIA - Cluster 5: Sg Katibas (Hilir)

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
1	Nanga Sesibau/ Pala Giam	Rh Kunyo	TR Jenang ak Juwing	6	6	0	34	100%	0%	60%	40%	River
2	Nanga Makut	Rh Dagom	TR Dagom ak Sanggai	32	20	12	297	63%	37%	40%	60%	River
3	Batu Lobang	Rh Ibi	TR Ibi ak Saoh	23	11	12	141	48%	52%	40%	60%	River
4	Nanga Benin	Rh Sangkar	TR Sangkar ak Undi	12	9	3	131	75%	25%	40%	60%	River
5	Nanga Mukeh	Rh Kutak	TR Kutak ak Mugang	19	6	13	120	32%	68%	30%	70%	River
6	Nanga Mukeh	Rh Leo	TR Leo ak Sana	15	3	12	102	20%	80%	60%	40%	River

*During field survey on 17th to 29th April 2017

SIA - Cluster 5: Sg Katibas (Hilir)

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
7	Nanga Mukeh	Rh Ijau	TR Ijau ak Sibat	19	13	6	146	68%	32%	50%	50%	River
8	Nanga Entuat	Rh Bangau	TR Bangau ak Muran	22	11	11	111	50%	50%	50%	50%	River
9	Nanga Entuat	Rh Dominic Runggom	TR Dominic Runggom ak Jugah	32	24	8	245	75%	25%	60%	40%	River
10	Nanga Ujat/ Nanga Entuat	Rh Senada	TR Senada ak Tandang	9	9	0	59	100%	0%	60%	40%	River
11	Nanga Banjor	Rh Saoh	TR Saoh ak Jenggut	17	13	4	104	76%	24%	50%	50%	River and tar-sealed road

*During field survey on 17th to 29th April 2017

Cluster 6:
Sg Katibas (Ulu)

SIA - Cluster 6: Sg Katibas (Ulu)

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
1	Ulu Katibas	Rh Sapai	TR Sapai ak Ajom	17	7	10	96	41%	59%	50%	50%	River
2	Nanga Terusa	Rh Api	TR Api ak Sanun	21	19	2	210	90%	10%	50%	50%	River
3	Nanga Bulo	Rh Usau	TR Cyril Usau ak Unjong	14	–	–	120	–	–	–	–	River/ Absent of longhouse representative*
4	Nanga Nangai@ Nayai	Rh Suning	TR Sidi ak Jengging	14	9	5	192	64%	36%	60%	40%	River
5	Nanga Chemenong	Rh Jabu	TR Jabu ak Braoh	26	21	5	103	81%	19%	50%	50%	River
6	Nanga Mesau	Rh Sa	TR Sa ak Andas	16	13	3	124	81%	19%	40%	60%	River

*During field survey on 17th to 29th April 2017

SIA - Cluster 6: Sg Katibas (Ulu)

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
7	Nanga Malai	Rh Mapang	TR Kawin ak Pau	13	6	7	87	46%	54%	50%	50%	River
8	Nanga Masak	Rh Gindi	TR Gindi ak Jimbun	32	10	22	438	31%	69%	50%	50%	River
9	Nanga Lintang	Rh Jempai	TR Jempai ak Lau	11	4	7	127	36%	64%	60%	40%	River
10	Rantau Entimau	Rh Serit	TR Serit ak Ngadit	14	7	7	140	50%	50%	50%	50%	River
11	Karangan Rangkang	Rh Selugo	TR Selugo ak Sambang	14	3	11	149	21%	79%	50%	50%	River
12	Karangan Rangkang	Rh Matan	TR Matan ak Manja	10	3	7	58	24%	76%	50%	50%	River

*During field survey on 17th to 29th April 2017

SIA - Cluster 6: Sg Katibas (Ulu)

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
13	Karangan Rangkang	Rh Gendang	TR Gendang ak Saweng	24	13	11	203	54%	46%	50%	50%	River
14	Tapang Nawie, Nanga Engkuah	Rh Baja	TR Baja ak Jabang	14	12	2	170	86%	14%	50%	50%	River
15	Nanga Engkuah	Rh Assan	TR Assan ak Munan	39	16	23	77	41%	59%	40%	60%	River
16	Nanga Sesibau, Nanga Engkuah	Rh Nugu	TR Nugu ak Irang	21	14	7	52	67%	33%	50%	50%	River and logging road
17	Nanga Engkuah	Rh Albert Lajong	TR Albert Lajong ak Maja	28	14	14	201	50%	50%	40%	60%	River
18	Nanga Anchau	Rh Jinggong	TR Jinggong ak Agan	13	6	7	79	46%	54%	50%	50%	River

*During field survey on 17th to 29th April 2017

No.	Area	Name of longhouse	Name of Tuai Rumah	No of doors	Occupied doors*	Vacant doors*	Percentage (%)					Accessibility/ Remark
							Total population	Present in longhouse*	Out of longhouse*	Male*	Female*	
19	Nanga Lian, Nanga Engging	Rh Peter	TR Peter ak Jabat	32	15	17	188	47%	53%	50%	50%	River
20	Nanga Kejakar	Rh Taboh	TR Taboh ak Saweng	14	9	5	151	64%	36%	60%	40%	River
21	Nanga Serau	Rh Ribut	TR Ribut ak Layang	23	13	10	194	55%	45%	50%	50%	River and logging road
22	Nanga Pengaran	Rh Kawin	TR Kawin ak Laja	20	3	17	180	15%	85%	50%	50%	River and logging road
23	Nanga Tengadak/ Nanga Engkaroh	Rh Berago	TR Berago ak Empawi	32	3	29	205	9%	91%	50%	50%	River

*During field survey on 17th to 29th April 2017

About WWF-Malaysia
WWF-Malaysia (World Wide Fund for Nature-Malaysia) was established in Malaysia in 1972. It currently runs more than 90 projects, covering a diverse range of environmental conservation and protection work, from saving endangered species such as tigers and turtles, to protecting our highland forests, rivers and seas. The national conservation organisation also undertakes environmental education and advocacy work to achieve its conservation goals. Its mission is to stop the degradation of the earth's natural environment and to build a future in which humans live in harmony with nature, by conserving the nation's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

WWF-Malaysia
1 Jalan PJS 5/28A
Petaling Jaya Commercial Centre (PJCC)
46150 Petaling Jaya
Selangor, Malaysia

Telephone No: +603 7450 3773
Fascimile No: +603 7450 3777
Email: contactus@wwf.org.my
wwf.org.my