

**A SOCIO-ECONOMIC STUDY OF THE COMMUNITY LIVING
WITHIN
SUNGAI MEDIHIT WATERSHED, LIMBANG**

BY

**JIRAM SIDU,
(PROJECT CONSULTANT)
COMMUNITY-BASED SUSTAINABLE FOREST MANAGEMENT OF
SUNGAI MEDIHIT WATERSHED, SARAWAK, MALAYSIA
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CONTENTS

	PAGE
TABLE OF CONTENTS	
1.0 INTRODUCTION	1
2.0 GENERAL DESCRIPTION OF THE STUDY AREA	1
3.0 FIELD WORK	5
3.1 Scope and Objectives of Study	5
3.2 Method and Area of study	6
4.0 DEMOGRAPHIC CHARACTERISTICS OF THE COMMUNITY	7
4.1 Population	7
4.2 Household Size	8
4.3 Economically Active and Dependent members	8
4.4 Sex Ratio	10
4.5 Age Structure	10
4.6 Educational Attainment	11
4.7 Main Occupations	11
5.0 LAND OWNERSHIP AND LAND USE	13
6.0 MAIN ECONOMIC ACTIVITIES OF THE COMMUNITY	17
7.0 DEPENDENCY ON FORESTRY RESOURCES	20
7.1 Dependency and Extent of utilization	20
8.0 PERCEPTIONS AND ATTITUDES TOWARDS PROJECT AND CONSERVATION OF THE CATCHMENT	22
8.1 Perception towards Project	22
8.2 Perception towards Forest and its resources	23
8.3 Measures for Conservation & Management	25
9.0 MAIN PROBLEMS AND FELT NEEDS OF THE COMMUNITY	28
9.1 Main problems of Household	28
9.2 Main problems in farming	29
9.3 Main problems of the community	30
9.4 Felt needs of the community	30
10.0 RECOMMENDATIONS AND PROJECT IDEAS	32
11. CONCLUSION	35
REFERENCES	

A SOCIO-ECONOMIC STUDY OF THE COMMUNITY WITHIN SUNGAI MEDIHIT WATERSHED (SMW), LIMBANG

1. INTRODUCTION

The Community-based Sustainable Forest Management of Sungai Medihit Watershed, Sarawak Project (CBSFM) is the only **ASIA-PACIFIC NETWORK (APFNet)** project in Sarawak, Malaysia, which focuses on **Sungai Medihit Watershed in Upper (Ulu) Limbang**. Its main objective is to promote sustainable forest management in the watershed through community capacity building, innovative operational model demonstration and establishing a new governance mechanism in community development.

For the formulation of any management plan for the area, various technical studies will definitely need to be undertaken, and these include the socio-economic study of the local community. Even though several dialogues and consultations have been held with the community, there have been little attempt to really understand their socio-economic situations as the dialogues were more on awareness of the project and the need for the community participation to ensure successful implementation of the project. Awareness on the importance of sustainable management of the surrounding forestry was also conducted as part of community empowerment to enable them to appreciate and recognize the importance of biodiversity conservation, in line with the project goals to promote sustainable forest management in Sg Medihit watershed.

In view of this, it is, thus, essential to have a proper understanding of the local communities, their problems, aspirations and needs, and attitudes towards conservation, as well as, the extent of their dependency on the available resources. This is to ensure that the conservation effort and future development plan for the project will be socially and culturally acceptable to the communities concerned. Corollary to this, a socio-economic study of the communities living within the Sg Medihit Watershed was carried out in November 2016, and the findings of the study are presented in this is report.

2. GENERAL DESCRIPTION OF THE STUDY AREA

The whole of the Sungai Medihit Watershed has been estimated to cover an area of about 35,400 hectares, and located in a remote area of upper (Ulu) Limbang in northern Sarawak, Malaysia. It flows north-northwest to its confluence with Sg Limbang at Lg Napir. Geographically, being in the interior and hilly zone of the State, most of the lands within the catchment are hilly or mountainous (See Photo 1). Lowland areas that are suitable for wet paddy cultivation and other agricultural crops are, thus, limited, if not negligible.

Photo 1 – Difficult and rugged terrain



Photo 2- Beautiful sceneries (with Batu Lawi at background on left)



Although some parts of the areas have been logged over, while those within the vicinity of the villages have been cleared for shifting cultivation, most of the areas are still covered with relatively pristine tropical rain forests and still rich in biodiversity. This can be seen from its beautiful sceneries, which provide a great potential for ecotourism (See Photo 2 above).

There are only two indigenous communities found to have settled within the area, namely, the Kelabit and the Penan. The Kelabit community is at Long Napir, which is located near the confluence of Limbang and Medihit rivers. Being a closely-knit community, they live in a longhouse, and due to space constraint, some of them live in individual units close to the existing longhouse (See Photos 3 & 4). The Kelabits were the first occupants of Sungai Medihit catchment, having migrated from Long Seridan and Sg Adang. A study made on the Kelabit past and current use of forestlands revealed that that they have been living in Sg Medihit watershed for more than 100 years as evidenced by remnants of old settlements, burial sites and farmlands found in various places (Pre-Project Technical Report: ITTO Pre-Project PPD 135/07 Rev.1(F) Community-based Forest Management of Sungai Medihit Watershed, 2010).

Photo 3 – Long Napir Village



Photo 4 - Longhouse at Long Napir



The Penan community is at Kampong (Kpg) Bahagia, and located upstream about 4 km from Long Napir. The Penans have been nomadic before and only resettled by the government to the present area in 1972. With government assistance, they have built and lived in individual houses (See Photo 5). Some of them have built better houses as in Photo 5 with the income they received from their employment in logging camp, schools and as farm labourers. Therefore, since their resettlement in the area, both Kelabit and Penan communities have been living harmoniously in the catchment for many years, lending support to one another.

Photo 5 - Penan Houses at Kampong Bahagia – Few have built new houses on their own and some with government assistance.



In terms of their socio-economic development, being in the remote areas, the areas have been rather isolated from the main stream of development. Like any other rural areas, basic infrastructure and public amenities are still poor, and generally lacking at the time of the study. Formerly, the only means of transportation to the area was by long boat, which took them about a day to travel along Limbang river, and eventually following the smaller Medihit river. However, with the construction of logging roads that traversed their areas, the transportation and accessibility have been very much improved as they no longer used river transport to travel. They are now dependent on logging road to travel to Limbang town, which took them about a much shorter time of three to four hours by 4-wheel drive. The first steel bridge, which spanned 80m across Sungai Limbang was built by the logging company, Limbang Trading (L) Sdn Bhd in 1981 (See Photo 6). The company has also constructed feeder road to Long Napir from the main logging road, which has greatly improved their accessibility, and since then, the community in that area no longer use river transport (or via Sg Limbang) to travel to Limbang town.

Photo 6 – The Wong Fujita Steel Bridge crossing Sg Limbang (first steel bridge built in 1981)



With better access to Limbang town and their ability to find employment locally, especially, with the logging camps, a number of them have purchased the motor cycles and motor cars, while the more enterprising ones even purchased 4-wheel vehicles. Based on the record at the time of the study, majority (or 80%) of the households in Long Napir have the motor cycles; 8 persons having 4-wheel drive vehicles and 2 persons having sedan cars. Even among the Penan in Kpg Bahagia, 30 of them owned the motor cycles despite the fact that road access to their village is still difficult.

Photo 7 – SK Long Napir (Government Primary School)



However, the community in the area are fortunate, especially, the Kelabit in Long Napir as they have the Primary School, which was built long time ago and provided early education to their children since the 1960s. The new primary school, a government school or Sekolah Rendah Kerajaan Long Napir was built near to their present village in 1980s (Photo 7). The school only caters for the children of the two communities up to primary level, and so upon completion of their primary education, their school children will have to continue their secondary education at Government Secondary Schools in Limbang town, either at SMK Limbang or SMK Medamit. Currently, as the Kelabit children are getting less, more of the Penan children are studying in the school. In terms of their educational attainment, being the earliest community to realize and value the importance of education, it was estimated that not less than ten of the people in Long Napir have graduated with their degrees, and some completed their Diploma and technical training. This is a great achievement for the community despite their remoteness and the hardship that the students have to cope with in the early days. On the other hand, for the Penan community, being the slow starter, only about ten of them has completed their education with the highest up to Form Five level. Currently, three of their children are attending Vocational Training, and about 50 of their children are attending the primary education at SK Long Napir

In terms of the basic infrastructures and amenities, both communities are still very much dependent on their Gravity-fed water supply from the upstream of the river systems for the water supply. For their electricity supply, they have both the community generator set provided by the government, and a number of them have their own generator sets. However, the use of these generator sets is rather limited due to high cost of diesel fuel and maintenance.

In view of these problems, the government is in the process of building the water treatment plant and solar powered generator for the communities. In addition, a new Health Clinic to cater for the two communities has been planned and proposed site is near to Long Napir (See Photo 8)

Photo 8 – Proposed Rural Health Clinic at Long Napir



Photo 9 – Maxis Transmitting Tower and Solar-powered public phone.



It is interesting to note that a transmission tower for Maxis lines has been constructed right in Long Napir, which provides valuable access to the outside world (Photo 9). Although rather limited, the communities in both villages can communicate with their families elsewhere and even for marketing their products.

3.0 FIELD WORK

3.1 SCOPE AND OBJECTIVES OF STUDY

Based on the Terms of Reference for the study, the scope of this socio-economic study is confined to the communities living within Sg Medihit Watershed, namely Long Napir and Kampong Bahagia. The study is aimed primarily to describe the existing socio-economic situation of the target communities and to find out their attitude, needs and problems in the context of the conservation and management of the watershed. Specifically, the main tasks will be as follows:-

1. To collect and analyse the socio-economic data of the communities, including the demographic characteristics of the community, such as their household size, and compositions; their land use and major socio-economic activities;
2. To assess the dependency of the communities upon the forestry resources, including utilization of its timber and non-timber products, including hunting, fishing, and collection of jungle products;

3. To determine the perception and attitude of the communities towards the management and conservation of the watershed; and
4. To recommend appropriate strategies and project initiatives to sustainably manage the watershed and to improve the socio-economic status of the local community to enhance their participation in the sustainable management of the areas.

3.2 METHOD OF STUDY

With a view to gain in-depth understanding of the community, apart from field observations, both focus group and personal interviews using structured questionnaires were carried out during the field work (Photo 10). General information on the village and opinions with respect to the problems and aspirations of the community would be obtained through group interviews, particularly, with the Village Headmen and other knowledgeable persons. For detailed interviews, the target respondents are the head of households residing in the villages.

Photo 10 – After Interview session at Kpg Bahagia
(The author is 2nd from right & Headman is 3rd from left)



Since there are only two villages within the watershed, almost all households in the respective villages were selected for detailed interview. As in Table 1, 40 respondents (or 91%) of the total households in Long Napir and 28 respondents (or 80%) of the total households in Kpg Bahagia were interviewed.

Table 1 - Total number of households selected for the survey

No.	Name of Kampong	No. of H.H.	No. of Respondents (%)
1	Long Napir	44	40 (91%)
2	Kampong Bahagia	35	28 (80%)
Total		79	68 (86%)

4.0 DEMOGRAPHIC CHARACTERISTICS OF THE LOCAL COMMUNITIES

4.1 Population

Overall, the total population of the two villages is small and less than 300 people as shown in Table 2. Long Napir has 44 households, but the number of people living in the village is relatively smaller, with 120 people, as compared to those in Kpg Bahagia. This is not surprising as based on field observation, a number of the houses in Long Napir were practically empty with only the elderly parents staying behind looking after their houses and farms

Table 2 – TOTAL POPULATION

No.	Name of Kampong	Name of Headman	No. H.H.	Tot. pop
1	Long Napir	T.K. Jangin Tai Bilong	44	120
2	Kampong Bahagia	T.K. Leju Rigung	35	178
		Total	79	298

The most significant observation is that there has been a positive movement of the Kelabit to urban areas, especially, with their educational attainment. In fact, the population of Long Napir has been said to have declined in recent years, and many locals agreed or at least accepted the view that more and more young people have migrated to urban centers. A considerable proportion of the young and economically active people from the village have migrated or found their employments in Miri, Kuching and other major towns in the country. Beside as the housewives and students, majority of them are employed in the public services as teachers, nurses, administrators, police and others. Students, who attended schools in town, will also eventually take up employment in towns rather than do farming in their remote village. Therefore, most of the young people, especially those who possessed good educational attainment, tend to migrate to towns in order to obtain remunerative jobs. However, they do come back to their village occasionally, especially to visit their aging parents and during festive seasons like Christmas.

The older generations are too steadfast to leave, but somehow leave, in consequence, joining their working children. Hence, those remaining behind are mostly the elderly, the youngsters and some government employees and their families. From general observations, it is quite reasonable to assume that the decline in population due to out-migration would continue, if the existing situations prevail.

However, it would be wrong to assume that the village would eventually become deserted. There are many people who would still prefer to remain in the area because of sentimental and traditional attachment to the area. In the final analysis, it can be concluded that the areas are under populated and from the size of the population alone it is difficult to justify bringing costly development to the areas. However, development considerations have to take account of other factors as well.

4.4 Sex Ratio

In terms of the gender composition, the ratio of males to females in both communities seemed to be higher as 56% of the survey populations in Long Napir are males and 44% are females. The ratio is even higher among the Penan as 61% of the population are males and 39% females. In other words, there is less number of females than males in both communities (See Table 6).

Table 6 – Composition of Survey Households by gender

VILLAGE	Total HH	Male	Female	Total Pop.
LONG NAPIR	40	53 (56%)	42 (44%)	95
KPG BAHAGIA	28	59 (61%)	38 (39%)	97
TOTAL	68			192

4.5 Age structure of the Household Heads

Detailed distribution of the Household heads by age groups can be seen in Table below.

Table 7 – Age group of the surveyed Household Heads

Age group (Years)	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
20-30	4	10	5	18
30-40	2	5	6	21
40-50	9	22.5	9	32
50-60	9	22.5	4	14
60-70	5	12.5	3	11
70-80	9	22.5	1	4
Above 80	2	5	0	0
Total	40	100	28	100
Average	55		43	
Range	22-89		26-75	

n=40

n=28

In terms of the age structure of the household heads, those in Long Napir appeared to be aging as more than half or 57% of the household heads are within the range of 50 – 80 years old. On average, their age is 55 years old and ranging from 22 to 89 years old. Two of the household heads with the age of over 80 years old happened to be lone rangers and prefer to stay back home looking after their house rather than following their children working elsewhere.

On the other hand, the Penan households seemed to be of younger generation as 53% of the household heads are within the age group of 30 – 40 years old. On average, their age is much lower at 43 years old and ranging from 26 to 75 years old (See Table 7 above).

4.6 Educational Attainment of the Household Heads

Looking at the educational attainment of the household heads, there seemed to be some relation with the age structure among the Kelabit households. Being in older generation, when the present school was not yet established, about 22.5% of them had no formal education. Nevertheless, over half or 57.5% had completed their secondary education and two households are degree holders.

For the Penan households, the percentage of household heads having no formal education is also about the same at 21%, and great majority or 68% of their household heads just completed their primary education. Incidentally, two of the household heads completed their lower secondary and another one completed his education up to Form Five level (See Table 8).

Table 8 – Educational level of the surveyed Household Heads

Educational level	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
Nil	9	22.5	6	21
Primary	10	25	19	68
Lower Secondary	13	32.5	2	7
Upper Secondary	6	15	1	4
Diploma	0		0	0
Degree	2	5	0	0
Total	40	100	28	100

n=40

n=28

4.7 Main Occupations of the Household Heads

The head of households or respondents were asked regarding their main occupation at the village. From the survey results, apart from those without any occupation due to old age and ill-health, greatest number of them considered farming as their main occupation with about 38% of those in Long Napir and 50% of those in Kpg Bahagia is involved in farming.

However, being better off and more enterprising than the Penan, the Kelabit households are involved in a multitude of activities to earn their living, while the Penan are largely involved in farming and worked as labourers. As indicated in Table 9, some of the Kelabit households are working with the logging company as truck and excavator drivers, few of them operate a Village shop to cater for basic necessities of the villagers, and as transporters to provide transportation services to Limbang town (See Photo 11).

Photo 11 – Village Shop and transport operator



Quite a number of the Kelabit and Penan household heads are being employed by the Primary School in Long Napir as Security Guards, school gardeners, school cook and cleaners. A number of them also worked as farm labourers and in constructing and repairing of houses in the village (See Table 9). Especially in farm work, the Kelabit depended very much upon Penan, while the Penan needs the work to earn their cash income.

Table 9 – Main Occupation of the Household Heads

Main Occupation	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
Nil	6	15	4	14
Full-time Farming	15	38	14	50
School Security Guard	4	10	1	4
Teacher	1	2.5	0	0
School gardener & cleaner	3	7.5	0	0
Government Retiree	1	2.5	0	0
Pastor	1	2.5	0	0
Village shop operator	2	5	0	0
Transporter	3	7.5	0	0
Excavator Operator	1	2.5	0	0
Truck Driver	1	2.5	0	0
Labourer	2#	5	9*	32
Total	40	100	28	100

n=40

n=28

5.0 LAND OWNERSHIP AND LAND USE

The land area occupied by the Kelabit and Penan communities in the area is classified, invariably, as Native Customary Rights (NCR) Land. Established mainly through rights acquired in the first instance by felling primary forest under their shifting cultivation practices or inherited from their ancestors, individual households (or members) hold or own certain land within their kampongs territory. Since lands are valuable assets to the farming communities in the rural areas, it is, therefore, important to determine the landholdings and the extent of their utilization among the community in the areas.

In this connection, the survey households were asked to estimate the size of land holdings, in terms of parcels and acreage they have without any further verification. The land holdings include those that are being planted with crops and those that are currently not utilized for any crops, but may be reserved for future rotation of hill paddy planting. Based on the survey results, the distribution of survey households by the number of parcels and acreage of land being utilised and non-utilised have been summarized in Table 10 to Table 15 below.

Table 10 and Table 11 indicated the number of parcels and acreage of land that are being utilized for various crops by both villagers. From the survey results, it is obvious that the Kelabit households owned bigger acreage of utilized land than the Penan as 27.5% and 25% of the Kelabit owned 3 and 5 parcels of landholdings respectively, while over half (or 57%) of the Penan households owned 1-2 parcel of landholdings. Therefore, in terms of acreage about 48% of the Kelabit households owned 10-20 acres of land being utilised for various crops, with an average of 14 acres per household. Among the Penan households, majority (or 46%) of them owned less than 10 acres, with an average of 8.2 acres (See Table 11).

Table 10 – Total parcel of utilised land among Survey Households

Total parcels (Lots)	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
Nil	6	15	6	21
1	4	10	9	32
2	8	20	7	25
3	11	27.5	2	7
4	0	0	1	4
5	10	25	2	7
Over 5	1	2.5	1	4
Total	40	100	28	100
Average	3.1		2	
Range	1-6		1-6	

n = 40

n = 28

Table 11 – Total acreage of utilised land among Survey Households

Total acreage	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
Nil	6	15	2	7
Below 10	4	10	13	46
10-20	19	47.5	10	36
20-30	10	25	3	11
30-40	1	2.5	0	
Over 40	0	0	0	
Total	40	100	28	100
Average	14.0		8.2	
Range	5-30		2-25	

Typical of the rural landscape, much of the lands belonging to both communities are still very much under-utilised as greatest number or 38% of those in Long Napir have 10-15 parcels of land unutilised, with an average of 9 parcels per household. In terms of acreage, greatest number or 35% of the households owned 50-60 acres of land with an average of 48 acres per household. Even among the Penan, 43% of the households owned 1-10 parcels with an average size of 28 acres per household (See Table 12 & 13 below).

Table 12– Total parcel of Non-utilised land among Survey Households

Total parcels (Lots)	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
Nil	10	25	12	43
1-10	9	23	12	43
10-15	15	38	2	7
15-20	3	8	1	3.5
Over 20	3	8	1	3.5
Total	40	100	28	100
Average	9		6	
Range	0-20		1-20	

Table 13 – Total acreage of Non-utilised land among Survey Households

Total Acreage	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
Nil	6	15	5	18
10-20	3	8	5	18
20-30	5	13	8	29
30-40	2	5	4	14
40-50	1	3	0	0
50-60	14	35	2	7
60-70	1	3	2	7
Over 70	3	8	2	7
Total	40	100	28	100
Average	48		28	
Range	0-200		6-100	

It is not surprising to note that they still have a relatively big areas of land not utilised for any crops since the areas have difficult and rugged terrain, most of which are not really suitable for agriculture, and only such tree crops like rubber and fruit trees can be planted (See Photo 10). Hill paddy planting based on shifting cultivation has been their traditional practice, but now such practice has been greatly reduced due to lack of manpower. Apparently, they do not have much or limited flat land within the immediate vicinity of the kampongs for wet paddy cultivation, which resulted in their difficulties in getting enough paddy for their own consumption. Another limiting factor for agriculture production in the areas was the transportation and marketing difficulties, and as such, agriculture development in the area is still very much under developed.

Overall, the Kelabit and Penan communities living in Sg Medamit watershed owned a relatively vast track of land scattered all over in several parcels of lands within their village territory. None of the Kelabit households are landless as even among the newly set-up households, they have inherited the lands from their parents or ancestors. However, four of the Penan households were found to be landless as they are newly established households.

On average the total parcels of land owned by the Kelabit in Long Napir is 11 parcels per household, and varying from 3 to 25. This totalled up to an average of 60 acres per household, and ranging from 15 to 225 acres. On the other hand, on average the total parcels of land owned by the Penan in Kpg Bahagia are 7 parcels (ranging from 0 to 20 parcels). These totalled up to an average of 42 acres per households and ranging from 6 to 100 acres (See Tables 14 & 15).

From the survey results, it can be deduced that there are great disparity among the survey households in terms of their agricultural land resources as some households owned vast areas that exceed their immediate needs, while others had only small acreages. The situation is more predominant among the Kelabit in Long Napir than the Penan in Kpg Bahagia. About 20% of the individual Kelabit households owned over 100 acres and 25% of them owned 60-70 acres of land, whereas 46% of the Penan households owned 20-40 acres of land (See Table 15). Like any other rural communities, inequality in land resources is a common phenomenon as it depends very much of land inherited from their forefathers and their early pioneering spirit in opening up of new areas for cultivation.

Table 14 – Total parcel of land among Survey Households

Total parcel	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
Nil	5*	12.5	4#	14
1-10	10	25	18	64
10-15	11	27.5	3	11
15-20	6	15	2	7
20-25	5	12.5	1	4
Over 25	3	7.5	0	0
Total	40	100	28	100
Average	11		7.0	
Range	3-25		0-20	

Note:

* - 5 Kelabit Households without complete data

- 4 Penan Households landless

Table 15 – Total number of land among Survey Households by Acreage

Total Acreage	Long Napir		Kpg Bahagia	
	Freq	Percentage	Freq	Percentage
Nil	5*	13	4#	14
1-10	0	0	1	4
10-20	1	2.5	1	4
20-30	3	7.5	6	21
30-40	5	13	7	25
40-50	2	5	2	7
50-60	1	2.5	2	7
60-70	10	25	1	3.5
70-80	5	12.5	3	11
80-90	0	0	0	0
90-100	0	0	1	3.5
Over 100	8	20	0	0
Total	40	100	28	100
Average	60		42	
Range	15-225		6-100	

Note:

* - 5 Kelabit Households without complete data

- 4 Penan Households landless

6.0 MAIN ECONOMIC ACTIVITIES OF THE COMMUNITY

As shown in Table 16 below, the community in the area is involved in a number of activities for their livelihood and to enable them to earn supplementary cash income for basic necessities. However, the main economic activity of the Kelabit and Penan communities within the catchment is farming, particularly, annual planting of paddy based on the traditional practice of shifting cultivation. Overall, a great majority (or 63%) of the households in Long Napir and 71% of the households in Kpg Bahagia reported to have planted paddy in the last season. However, most of them planted hill paddy as only 22.5% of those in Long Napir and none of the Penan household planted wet paddy. This is largely due to the fact that the available land suitable for wet paddy cultivation in the area is limited even among the Kelabit community, and none at all among the Penan in Kpg Bahagia.

Although their main objective in planting paddy was to produce enough rice for their own needs for the year, none of them managed to produce enough for their families. The productivity has been reported to be rather low due to a number of factors, including poor soils, lack of agricultural inputs, poor maintenance and pest and disease attacks. Therefore, most of them can be considered to be subsistence farmers and still practice shifting agriculture for living. With the exception of few Penan families, who take sago as substitute to rice, majority, if not all, of the households in both villages purchased their rice from Limbang town to supplement their rice requirement for the year. In fact, a number of the households, especially, among the Kelabit would prefer to buy rice from Limbang rather than planting paddy as paddy planting is one of the hardest jobs and yet uneconomical and very low productivity. This is obvious as based on the survey; almost all of the households in the two villages purchased their rice from Limbang town for their family requirement. In terms of values, on average those in Long Napir spent around RM1,600.00 per household (and varying from RM480.00 to RM3,360.00 for last year, whereas among the Penan, each household spent an average of around RM1,380.00 a year, and ranging from RM600.00 to RM3600.00.

Both communities are also still very much dependent on forestry resources, including indigenous freshwater fishes, wild life and jungle produces for their food supply as well as to supplement their cash income. However, because of logging activities, which resulted in the depletion of forest resources and river pollution, as well as, the relatively low paddy yields, both communities, are still living in a relative poverty barely at subsistence level.

The two communities seemed to have limited choice of crops to plant as land suitability is the limiting factor. Other major limiting factors are their remoteness and the transportation problems as apart from the logging roads traversing their villages, they have limited or no road access to their farms. The next most popular crops that both communities have planted are rubber and some indigenous fruit trees like durian, rambutan, jackfruits and dabai. Rubber planting is commonly planted as it is considered to be hardy crop even with low maintenance and can be grown even in difficult terrain. Moreover, matured rubber trees are considered as "Saving bank" to some of them as they just tap the rubber trees and process the rubber latex into rubber sheets for sale. Beside, rubber sheets are not perishable like any other agricultural products and can be accumulated for sale.

The other major crops planted by the communities in the area are pepper and sago. It is interesting to note that only 10% of the survey households in Long Napir ventured into pepper planting in view of the good price of pepper at the moment, and all of them planted pepper on their own without any assistance from the government. For sago, being one of its staple foods, 39% of the Penan households planted sago for their own consumption (See Photo 12).

Apart from planting paddy and the crops, the other major agricultural activities of the communities living in the areas within the waters are livestock rearing and fish culture. In particular, livestock, such as chickens and pigs are reared by both communities, not only for own consumption, but also for sale. Particularly, in respect of pig rearing, 13 households or 32.5% of the households in Long Napir reared at least 2 pigs and a maximum of 10 pigs. Pigs are commonly reared by the communities as they can feed them with local foodstuff such as tapioca, yam and left-over food from the school, and they can easily sell the meat among themselves or to the loggers at an average price of RM10.00 per kg.

Photo 12 – Sago planted near their house compound



Photo 13 – Chicken Rearing Project



Although keeping few chickens for their own needs are quite common, a number of those, who have been assisted by the project, reared a maximum of 50 chickens (for the Penan) and 100 chickens for the Kelabit households (See Photo 13). Like pigs, they can also easily sell their chickens locally to the school teachers and loggers in the area.

In view of the fact that freshwater fishes are still available in their rivers, aquaculture is still not quite popular among the communities in the watershed. Only 12.5% of the survey household in Long Napir reported to be rearing fish in their fishpond, and none of the Penan was involved.

In addition, other activities such as fruits and vegetable planting are also being done. Although, fruits and vegetables have good potentials as cash crops, there is little incentive for growing these crops in the area due to limited access to the market centres. Therefore, these crops are presently grown on a small-scale basis and mainly for home consumption.

Incidentally, only one household, who happens to be the Ketua Kampong (Village Headman) of Long Napir reared buffaloes, and altogether, he has 8 buffaloes. In fact, buffaloes rearing has the potential and considered important to the Kelabit community as it is an integral part of their traditions, such as for marriage, and in Bario highland, buffaloes are being used for their wet paddy farming and for transportation.

7.0 DEPENDENCY ON FORESTRY AND FISHERY RESOURCES

7.1 Dependency and Extent of utilisation

From the conservation point of view, it is important to have a proper understanding on the extent of community's dependency and utilization of the existing forestry resources. Although no detail study has been done, there are indications that the forest-related activities are commonly undertaken by the two communities living in the watershed. Like any other communities, whose lives are closely associated with forest, the communities in the watershed are, definitely and on varying scale, dependent on the forest for their sustenance and livelihood. Practically, most of the materials that they need for their daily use, such as, timber for building their houses, have been obtained from the nearby forests. Although some of the activities are often considered as pastimes to some people, they are of importance to the local communities as some of them depended very much on hunting and fishing for the supply of their meat and fish protein, as well as, to supplement their cash income. The extent of these activities being done by the communities in the area can be seen from Table 17 below.

Table 17 – Dependency of the community on the forestry resources

Forestry Resources	Long Napir			Kpg Bahagia		
	No. HH involved	Percent	Highest Frequency	No. HH involved	Percent	Highest Frequency
Collection of wild veg.	21	53	1/week (95%)	15	54	1/week (60%)
Hunting	16	40	1/week (63%)	13	46	1/week (54%)
River fishing	23	58	1/week (61%)	15	54	1/week (60%)
Frog catching	3	8	1/month (All)	12	43	3/week (67%)
Rattan collection	0	0	0	12	43	3/week (58%)
	n=40			n=28		

With respect to hunting, among the most frequently hunted and sought after are the wild boar (*Sus barbatus*), rusa (*Cervus Unicolor*), kijang (*muntiacus spp.*), and other smaller animals. Of all the animals that they caught, the most common one is the wild boar as it is their main motive of hunting is to hunt for the animal. The hunting of the other animals like "rusa", "kijang" and other smaller animals are often incidental and considered as secondary though they are also equally sought after. This is partly due to the fact that compared to other animals, wild boar are more prolific, and therefore, still found to be relatively plentiful in the neighbouring areas. Actually, most of the villagers in the neighbouring areas found that "rusa" and "kijang" are generally getting scarce and harder to find compared to the wild boar. Normally, beside for own consumption, larger portion of the wild meat would be sold locally or even brought to Limbang town for better price.

Based on the survey, about 40% of the households in Long Napir reported to have involved in hunting at least once a week, and if they are lucky, they can derive about RM175 to RM240 worth of wild boar meat per hunting trip. Hunting is even more rampant among the Penan as it is one of their means to earn cash income. Almost half or 46% of their households were

involved in hunting at least once a week. It has been estimated that they can derive about RM100 to RM300 worth of wild boar meat per hunting trip.

Like hunting, fishing is also an important activity of the local community in the neighbouring areas. More than half of the survey households of both communities are involved in fishing for at least once a week. Various types of fish are caught from the rivers in the neighbouring areas but the major ones that are of importance and much sought after are ikan semah (*Tor duronensis*), tenggadak (*Puntius schwanenfeldi*), baong (*Mystus spp.*) and others. Their fishing activities are confined mainly to rivers nearby their respective villages, and as such, being close to the rivers, it is not uncommon for them to go fishing almost daily just to get the supply of fish for their immediate consumption. Being aware of the needs to ensure continuous supply of fish in their rivers, most of the villagers used the traditional methods of fishing, such as using fishing line, caste nets and drift net.

As a mean to earn their cash income, they also sell much of their catches, especially, high value fish like ikan semah and tenggadak. It has been estimated that those in Long Napir can derive an income of RM70 to RM400 per fishing trip if they can get more Ikan Semah, as compared to only RM20 to RM200 per fishing trip among the Penan.

Besides fishing, frog catching is also quite popular among the Penan as 43% of the survey households reported to have done it at least thrice a week. However, only 8% of the households in Long Napir did it on a much less frequency of just once a month. This is largely due to the fact that frogs are getting much harder to find.

Another important activity, by which most of the households supplemented their food supply and cash income is through collection of wild vegetables and non-timber forest products like rattan and medicinal plants. With their intimate knowledge of the forests, most of the "wild products" in the jungles like the ferns, bamboo shoots, and fungi that are edible and medicinally useful are practically known to them, and therefore, collected for own consumption. However, rattan is either for sale or being used by themselves for making mats, baskets and handicrafts. Unfortunately, the resources are dwindling and rattan is getting harder to find, and they have to go deeper into the forest to find the stock..

8.0 PERCEPTIONS AND ATTITUDES TOWARDS THE PROJECT AND MANAGEMENT OF THE CATCHMENT

8.0 With a view to properly manage the Sg Medihit Water Catchment and to enhance community participation in its management for sustainable use, it is essential to gauge the perceptions and views of the local communities towards the project and the catchment area itself. The assessment and analysis of the current situations of the communities, their perceptions and attitudes towards the existing project will provide some insights and inputs for the formulation of strategies and action plan for the management of the watershed.

8.1 Perceptions towards the Project

With a number of dialogues and on-going visits by the project team to the two villages, it is not surprising to note that a great majority of the survey households had prior knowledge of the project and its effort to assist the community in the area (See Table 18). Naturally, through their active involvement in the project, a great majority (or 80%) of those in Long Napir knew about the project through project team coordinator and community dialogues (See Photo 15). On the other hand, since the Penans are less active, only half (50%) of them knew about the project through project team and dialogues, while another half (50%) knew about the project through their neighbours and friends (See Table 19)

Table 18 - Percentage of households having prior knowledge of the Project

Having Prior Knowledge	LONG NAPIR		KPG BAHAGIA		Overall	
	Freq	%	Freq	%	Freq	%
Yes	38	95	27	96	65	96
No	2	5	1	4	3	4
Total	40	100	28	100	68	100

n=40 n=28

Photo 15 – Community Engagement with Penan Community (Project Coordinator at left)



Table 19 – Source of information about project

Source of Information about project	LONG NAPIR		KPG BAHAGIA		Overall	
	Freq	%	Freq	%	Freq	%
1	25	62.5	10	36	35	52
2	7	17.5	4	14	11	16
3	8	20	14	50	22	32
Total	40	100	28	100	68	100

n=40

n=28

Code:

1 - Project Coordinator & Consultants

2 – Community dialogues

3 – Friends & neighbours

As they appreciate the values of forest and its resources and the potential of project initiatives towards sustainably managing the forest in the vicinity, overwhelming majority of the survey households (or 95% of the survey households in Long Napir and all of the Penan households) were also very supportive of the government effort in conserving the neighbouring forests. They welcomed the effort and project initiatives towards conserving the catchment as there was a fear among them that the existing logging activities may extend further into the remaining forests, which may cause further damage to the environment and deplete the available resources. For this matter, they even suggested that, logging activities within and around the vicinity should be reduced, if not completely stopped to maintain the existing quality of the environment.

Based on their views, the project could also benefit the local communities in terms of the possible improvement to their existing infrastructure and other basic amenities. At the same time, it is hoped that the implementation of the socio-economic and income-generating projects can also help to improve the socio-economic situations of the communities in the area. Already they have seen the success of some of their members being assisted by the project in doing some of the income-generating projects such as chicken rearing, vegetable gardening and home-stay, and the challenge is how to sustain the activities. As such, the communities welcomed the project and proposed for some more communal projects to be implemented in their villages to benefit the whole community. The case in point is the road project from Long Napir to Kpg Bahagia, which will provide the necessary and proper access to the two villages.

8.2 Perceptions towards Forest and its Resources

Being an integral part of their immediate environment, forests and its resources are of great value to the two communities living in the catchment. For many years, the communities have been dependent on the forests for the supply of food and other basic needs. They will continue to be dependent on the forest for their food and supplementary income even though forest products, fisheries and wild life have dwindled over the years. They realized the importance and the needs to conserve the forest and its pristine environment to ensure a continuous supply of food and other valuable products for the local communities.

In view of its importance, it is crucial for the project to determine the perceptions of the local communities towards the existing resources and surrounding environment, which include forestry, fisheries, wild life and their rivers, and how do the communities rate them in terms of their current status and their quality.

Based on the ratings of the survey households, it can be concluded that the current status of the available forestry resources and the environment are moderately poor to poor in terms of their availability and quality. As can be seen in Table 21 and Table 22, a great majority of the households in both villages considered their river quality, fishery and wild life resources to be in poor state. These are based on their observations and personal experiences as in terms of their catch, the resources are dwindling. Most of the villagers feel that there is much less fish now compared to ten years ago. Rapid decline of fish in most rivers has been largely due to increasing pollution of most rivers resulting from logging and earthworks in the catchment, as well as, due to over fishing. The situation is worsened as with improved accessibility to the areas, increasing number of the “outsiders”, who have no sense of belongings to the areas, have come all the way from Limbang to hunt for wild life, fishing and collecting jungle produces within the catchment areas.

With regard to the forestry resources, which include medicinal plants, rattan, sago and indigenous fruits, the Kelabit and the Penan have different views as greatest number or more half of the Kelabit households rated them to be moderately poor (See Table 20), while majority of the Penan households rated them to in poor state (Table 21). Their rating could be influenced by the extent of their dependency and utilization of the resources as Penan used more of these resources that the Kelabit.

Table 20 – Perceptions of the Long Napir community towards forestry resources

RESOURCES	RATINGS [1:Poor; 2:Moderate; 3:Good]					
	1		2		3	
	Freq	(%)	Freq	(%)	Freq	(%)
Forestry resources						
Medicinal plants	18	45	22	55	0	0
Rattan	18	45	22	55	0	0
Sago	16	40	23	58	1	2.5
Indig. fruits	17	43	23	58	0	0
Others	14	35	23	58	3	7.5
River Quality	26	65	14	35	0	0
Fishery Resources	26	65	14	35	0	0
Wild Life Resources	26	65	14	35	0	0

n=40

Table 21 – Perceptions of the Kpg Bahagia community towards forestry resources

RESOURCES	RATINGS [1:Poor; 2:Moderate; 3:Good]					
	1		2		3	
	Freq	(%)	Freq	(%)	Freq	(%)
Forestry resources						
Medicinal plants	17	61	10	38	1	4
Rattan	19	68	9	35	0	0
Sago	17	61	11	42	0	0
Indig. fruits	17	61	11	42	0	0
Others	15	54	12	46	0	0
River Quality	26	93	1	4	0	0
Fishery Resources	24	86	3	12	0	0
Wild Life Resources	25	89	2	8	0	0

n=28

8.3 Measures for Management and Conservation of the Watershed

With the various issues and constraints that hinder their socio-economic development and their predicament in earning their living, including the problem of dwindling resources within the catchment, the survey households were asked to express their views and opinions regarding the possible measures that should be taken by the authorities concerned in order to sustainably manage and conserve the catchment. These include the concerted effort by project management and local community as they all have the roles to play in the management of the catchment. In this regard, the survey households have expressed their viewpoints and proposed several measures for the conservation and sustainable management of the catchment, and these have been summarized in Table 22 below.

Table 22 - Suggestions on how the Community and government can conserve the Catchment Area

MEASURES	LONG NAPIR		KPG BAHAGIA		OVERALL	
	Freq	Percent	Freq	Percent	Freq	Percent
P1	26	65	15	58	41	62
P2	4	10	4	15	8	12
P3	8	20	4	15	12	18
P4	2	5	3	12	5	8
TOTAL	40	100	26#	100	66	100

n=40

n=28

n=68

Note: # - 2 no response

KEY TO MEASURES FOR CONSERVATION AND MANAGEMENT OF CATCHMENT

P1	Reduce or Stop logging & plantation activities in the areas to prevent river pollution & further destruction of forests – Authority to monitor illegal activities with the cooperation of the villagers.	P2	Authority to strictly enforce and control outsiders from hunting, fishing, and doing any illegal activities in the catchment.
P3	Forest Department to undertake the Rehabilitation & Conservation work with community participation and allocate certain areas for community use.	P4	More frequent dialogues & consultations between stakeholders and local community in planning future projects and undertake a proper forest management & conservation projects for the benefit of all community
<p>Other additional suggestions: Implement more socio-economic projects for the community, including income-generating projects (like chicken rearing and vegetable gardening), leveling of old village area for Village extension; riverbank protection to prevent erosion affecting their houses; gravel road and drainage system for their village; construction of multi-purpose hall, play ground and other recreational facilities; establish “tagang” system for conservation of their indigenous and high value fishes; promote ecotourism; and continue to assist them in maintaining the existing logging road to their kampongs for their transportation and marketing of their products.</p>			

With their strong attachment to their land and nearby forests, the local communities are very concerned about the available resources within Sg Medihit Catchment areas. Under such situation and their pressing needs to conserve the resources, their top proposition is for the government to reduce or stop logging and plantation activities in the areas. The authority such as Forest Department should continuously monitor any illegal activities within the areas with the cooperation of the villagers. This is crucial with a view to prevent river pollution and avoid further destruction of the neighbouring forests. Overall, as clearly indicated in Table 22, a great majority or 62% of the survey households proposed the idea, particularly the Kelabit, 65% of them expressed the idea. However, if the existing logging are to continue, the activities should be properly regulated and under strict control by the authorities concerned. This is to prevent any encroachment by the loggers as they may indiscriminately destroy the environment and deplete the available resources.

Closely related to the first proposition, their next most important proposal is for the Forest Department to really undertake the Rehabilitation and Conservation work with community participation, and simultaneously, the government should allocate certain areas not only as buffer zone to the forest reserve but for community use to cater for their basic needs, such as timber for their building materials and other jungle products.

With better accessibility to the areas, the local community observed that there has been increasing number of “outsiders”, all the way from Limbang, coming into their neighbouring areas to do hunting, fishing and collecting jungle produces. As they feel the threat of intrusion from the outsiders, who may deprive them of the forestry resources, the survey households had also expressed the needs for stringent enforcement measures by the government to prevent indiscriminate exploitation of the available resources. Priority should be given to the local inhabitants of the catchment areas to enable them to meet their basic needs.

Alongside with the above regulatory and enforcement measures, the survey households had also expressed their dire needs for socio-economic and income-generating projects to the community in improving their livelihood and socio-economic conditions. These include

implementing more income-generating projects, such as livestock rearing and vegetable gardening, and promotion of handicrafts and ecotourism, especially, among the Penan. These are important in order to provide them an alternative source of cash income, which reduce their dependency on the forestry resources. Of equal importance are the socio-economic projects, which are meant to improve their living conditions, and these include leveling of old village area for Village extension; riverbank protection to prevent erosion affecting their houses; gravel road and drainage system for their village; construction of multi-purpose hall, play ground and other recreational facilities for their children.

Another interesting proposal, which the project may consider to propose to the Department of Agriculture is on the establishment of “tagang” system for the conservation of their indigenous and high value fishes as they still have the existing fish stocks and they may still have suitable stretch of rivers for such project. Lastly, since the existing logging is their life line, they would like the government and the logging company to continue to assist them in maintaining their road to their kampongs not only to ease their transportation, but for marketing of their products.

9.0 MAIN PROBLEMS AND FELT NEEDS OF THE COMMUNITY

Although the problems faced by the Kelabits and Penans in the catchment are generally similar to those faced by any other groups in the remote interior of Sarawak, they may have different perceptions to their real problems. It is, therefore, appropriate to find out the major problems facing the community, which would provide some indications on the types of projects and priorities that need to be considered for future development of the catchment. In this connection, the survey households were asked to state their major problems affecting both their families, including their farming difficulties and those affecting their community, and the results have been summarised in the following Tables.

9.1 Main problems of the Household

Major problems of the households and the severity of the respective problems (as reflected by the frequency of the problems mentioned) are shown in Table 23 below.

Table 23 - Major problems of the surveyed households

MAJOR PROBLEMS (FAMILY)	LONG NAPIR		KPG BAHAGIA	
	Freq.	%	Freq.	%
1	35	87	20	71
2	37	92	26	93
3	37	92	24	86
4	0	0	1	4
5	2	5	2	8

n=40

n=28

n=68

Major Family Problems:

- 1. Lack of manpower to do farming and other activities**
- 2. Lack of capital to start any enterprise**
- 3. Lack of opportunities to earn cash income**
- 4. Land Suitable for farming limited**
- 5. Family members always get sick**

Based on the survey results, both of the Kelabit and Penan households in the area are beset with three major problems, including lack of capital to start any enterprises, lack of manpower and lack of opportunities to earn cash income. These are not surprising as they are actually reflective of their prevailing socio-economic situations and their isolation from the mainstream of development. The problem of inadequate or lack of manpower is greatly felt among the Kelabit families in Long Napir due to their aging population coupled with the outmigration of their capable bodies, who left their village to work in major towns in Sarawak. The other problem like family members always get sick among the Kelabit family and limited land suitable for farming among the Penan are relatively considered less important among the survey households.

9.2 Main problems in farming

Looking at their farming problems, the two communities appeared to have different views (See Table 26 below). The Kelabits, who have been doing the shifting cultivation ever since they moved and settled in the present area, considered pest and disease attack as their most critical problem. About 70% of the Kelabit households as compared to only 29% of the Penan households reported such incidence. Apart from the normal attacks from insects, rodents and fungus, these include the destruction by wild animals. Being surrounded by forest, destruction of crops by wild animals such as monkeys and wild boars is reported to be still rampant and can be devastating if not controlled. This happened, particularly, if their farms are isolated and located deep in the jungle.

The other major critical problems facing both the Kelabit and Penan in farming are the lack of capital and limited land suitable for farming. The same proportion or 68% of the Kelabit households reported such problems. This is not surprising as looking at the topography of the area much of their land had a difficult and steep terrain with poor skeletal soils. The problem of lack of capital to undertake any activities is a universal problem in both urban and rural areas, but the problem is particularly critical among the local community as being in the remote areas, the financial institutions are not available while the opportunities to earn cash income are limited. Lack of manpower to do farming is also another problem for both communities, and to address the problem, the Kelabit families normally engaged the Penans as their farm hands. However, with increasing wages, more than half or 53% of the Kelabit households mentioned that hired labour are getting more expensive now.

On the other hand, being less involved in farming and having settled much later than the Kelabit, the Penan looked at their farming problems differently. As can be seen in Table below, their three major problems in farming in order of importance are the lack of capital, limited land suitable for farming and not enough manpower. About 88% of them reported lack of capital, 79% mentioned limited land for farming and 61% of the households cited not enough manpower as their problem (See Table 24).

Table 24 - Major farming problems of the surveyed households

MAJOR PROBLEMS (FARMING)	LONG NAPIR		KPG BAHAGIA	
	Freq.	%	Freq.	%
1	27	68	23	88
2	19	48	17	61
3	27	68	22	79
4	28	70	8	29
5	21	53	0	0

n=40

n=28

Major Farming Problems:

- 1 Lack of capital to start any enterprise**
- 2 Not enough manpower**
- 3 Suitable land limited for farming**
- 4 Pest & disease attacks**
- 5 Hired labour expensive**

9.3 Main problems of the Community

At the community level, the major problems affecting their community as a whole are numerous, and though vary in terms of magnitude between the two communities; the first three major problems seemed to be their common problems as indicated in Table 25 below.

Table 25 - Major problems of the Local Community

MAJOR PROBLEMS (HOUSEHOLD)	LONG NAPIR		KPG BAHAGIA	
	Freq.	%	Freq.	%
1	38	95	23	82
2	36	90	25	89
3	38	95	23	82
4	7	18	9	32
5	0	0	2	7
6	1	2	1	4
7	4	10	5	18
8	1	2	1	4

n=40

n=28

Main Community Problems:

1. Too far from town
2. Rivers getting polluted
3. Wild animals and fishes getting scarce
4. No electricity
5. No water supply
6. No road link
7. No clinic nearby
8. Not enough land for farming

Based on the survey results, the three major problems facing both communities in the catchment are the distance to the nearest town in Limbang, rivers getting polluted and increasing scarcity of wild animals and fishes. From the survey, overwhelming majority or 95% of the Kelabit households mentioned the problem of too far from town and wild animals and fishes getting scarce as the main problems facing their community. A majority or 90% of them also mentioned their rivers getting polluted. The last two problems are, in fact, closely related, and largely the result of logging within surrounding catchment. Likewise, the Penan community is also having similar problems as 82% to 89% of their households cited the respective problems (See Table 25).

9.4 Felt Needs of the Community

Under the existing socio-economic conditions and based on their problems, the felt needs of the communities in the catchment can be summarized as follows:-

- (1) Better road and transportation system;
- (2) Basic facilities and social amenities;
- (3) Creation of employment opportunities and implementation of more income generating projects; and
- (4) Forest conservation projects.

Having experienced the hardships of being isolated in a remote catchment of Ulu Limbang, the communities in the area really need the basic infrastructure, particularly, all weather road to connect them to their nearest town in Limbang.

At present, the communities are totally dependent on the existing logging roads passing their areas, and through their social obligations the logging companies in the areas have given the necessary support to the community in the construction and maintenance of feeder roads. In particular, the Penan in Kpg Bahagia really need access road to connect their village to Long Napir as the government had just constructed a small concrete path to their village long time ago. The construction of better roads to their villages would definitely reduce their transportation problems, and in the long run, would improve their socio-economic status as apart from being more exposed to the market economy, they would have greater access to more modern facilities in the town center.

Basic facilities and social amenities and services, such as health clinic, electricity and treated water supply, telecommunication and internet services, as well as, recreational facilities for the growing children are generally lacking, and therefore, need to be provided in order to improve their standards of living. Surprisingly, none of the households mentioned their needs for more and better schools and clinic. The construction of more and better equipped school and clinic in their areas would be useful to the local community.

It is expected that with increasing pollution of most of their rivers, their need for a more proper water supply would become more critical in the near future. The same applies to their power needs as with their rising expectations for better living, their need for power supply are expected to be on the rise with some households having their own television sets and other electrical appliances.

Apart from their needs for basic infrastructures, there is a need to create the opportunities for their employment, including income-generating projects, such agricultural and forestry projects and promotion of handicrafts and ecotourism in view of the high incidence of poverty among the local community.

Based on their experience for the past 10 years, wild animals and fishes are getting harder to catch in their neighbouring areas as a result of increasing intensity of hunting and fishing, while their rivers are increasingly polluted. The trend is expected to continue as they have been depending on the wild animals and river fishes for food supply and to supplement their cash income. Any development programs, which help to minimise their dependency on the neighbouring forests for the supply of food and supplementary income, would be beneficial to the community. Alternative approaches, such as the development of integrated agroforestry projects could be worked out for the community in order to diversify their economy, as well as, to increase their income.

All these problems and felt needs of the survey households reflected the prevailing socio-economic situations of the areas, which should, therefore, be considered in the management plan for both immediate and long-term development of the catchment area.

10.0 RECOMMENDATIONS AND PROJECT IDEAS

10.1 In tandem with the strategic objectives of the project towards sustainable management of forests with greater community participation, as well as, based on the prevailing socio-economic situations, the following recommendations and project initiatives are proposed as part of the management and conservation measures for Sg Medihit Water Catchment.

First and foremost, in order to reduce the pressure on existing environment and their dependency on the forestry resources, priority should be given to the socio-economic development of the community for long-term and sustainable development of the watershed. At same time, certain measures to develop and encourage greater participation of the local community in the management and conservation of the area will need to be seriously considered in the management plan for the project.

With a view to enhance community participation, the establishment of committee, such as the Community-based Sustainable Forest Management Committee at community level is crucial and need to be explored further. It is important as it does not only provide the venue for the full participation of the local communities, but most important to establish a good rapport and long-lasting relationships with the locals for its sustainable development. The implementing agencies should get the cooperation and active participation of the local communities in the management of the areas through continuous dialogue and consultations with the community.

In order to encourage greater participation and commitment of the local communities in the conservation effort, there is a need to create and increase the level of awareness on the importance of forests and environment. Such awareness programmes can also empower them to identify and address the related environmental issues locally. Alongside with this initiative, the related agencies should provide some alternative options and opportunities for the local communities to earn their living in order to sustain their cooperation and effort in the conservation of the forests. Their training needs in related fields should be seriously looked into as a mean to empower them, and apart from forest and environmental management, the necessary training may include enterprise and skills development, such as, agricultural training, establishment of home-stay, handicrafts and tourist guide.

10.2 Socio-economic Development Initiatives

As part of the conservation strategies, it is crucial to address their needs for socio-economic development in order to improving the socio-economic status, and the followings are the specific project initiatives proposed for consideration of project.

(a) Niche Medicinal and herbal plants production

With its vast areas under forest and its richness in biodiversity, one of the potential projects for the community could be the development and production of a niche agricultural and forestry products, including some high value medicinal and herbal plants. The plants could easily be sourced locally as the resources are available within the nearby forests, and there is a wealth of indigenous knowledge on these plants, especially, among the elders of the Kelabit and Penan communities. The project could assist in the collection and documentation of these resources, with a view not only to generate interests in the conservation of the resources, but most important to preserve the ethnobotanical knowledge for the younger and future generations. Starting small and initially for own consumption and for local market, the

production of these niche products could be commercialized with the assistance of relevant government agencies.

(b) **Integrated planting of tree Plants and indigenous fruits**

Another potential project that could be considered is the integrated planting of tree plants and indigenous fruits considering the existing resources. Given the necessary assistance, in term of financial and technical advice, the planting of appropriate tree plants to cater for their needs can be an alternative option to reduce the pressure on the nearby forest. The initiative can be further enhanced and integrated with the indigenous fruits as some of these indigenous fruits can be developed as an exotic fruits for their own consumption and local markets. A development of **integrated agroforestry projects**, which include the rehabilitation and reforestation of degraded secondary forest with suitable plants and indigenous fruits, will be beneficial to the community. The approach of implementing this initiative could be done individually or on communal basis depending on availability of communal land.

(c) **Development of freshwater fisheries**

Freshwater fish is one of the major sources of protein and supplementary cash income for the local community in the area. Through observation and discussion with the villagers, river fish are increasingly on a decline, and thus, harder to find. Particularly, indigenous and high value fish species, like ikan semah and ikan tenggadak are getting harder to catch although still available in certain rivers of the area. Therefore, there is a need to provide necessary assistance for the villagers to develop freshwater fisheries. Such development, especially, for high value indigenous fish like Ikan Semah and Ikan Tenggadak, would definitely provide good income and constant supply of protein food for the community. This kind of projects can be done both by individual households and on community basis depending on their interest and capability.

Since the idea of communal ownership and working together are still prevailing among the local communities, fisheries project under the **“Tagang” system** could be implemented in the area. After all, a number of the households have proposed the idea, and the project can be implemented with the assistance of Department of Agriculture. The nearest example of this particular project, which has been successfully implemented by the Inland Fisheries Branch of the Department of Agriculture, Limbang, is at Long Tuyo, Lawas. Basically, under the **“tagang” system**, certain parts of the rivers are adopted as conservation areas for their fishery resources, where fishing are prohibited and only allowed at certain times of the year. The rivers will be properly managed by the community themselves on a cooperative and trust basis. If it is successful, the project could be further enhanced and develop as an attraction to tourists coming to the area.

(d) **Development of Ecotourism and Handicraft industry**

Apart from the forestry and natural resources, the communities have a full of histories and culture that offer a great opportunities for ecotourism activities, which could, in turn, generate some form of employment and other income-generating activities for the community.

Based on the observation, the ladies of both the Kelabit and Penan communities are talented and skillful in making various handicrafts for souvenir items, including working with beads, weaving mats and baskets using rattan and plastics (See Photo 16 - 17).

Photo 16 – Kelabit Ladies with their traditional costumes and beads



Photo 17 – Penan lady and their handicrafts



Especially now, even with limited access to telecommunications, they are able to market their handicrafts to Limbang town and other places. The most common handicrafts that they produced currently are the plastic mats and baskets. As such, the Penan ladies are now able to earn their cash income through sale of handicrafts to either tourists or visitors coming to their village and through the help of some caring individuals to help them in marketing their products. However, there is a need to properly organize and train them in order to ensure that their products are of high quality and acceptable to the current market. Financial assistance as a start-up capital to enable them to buy plastic materials from Limbang town may be considered as some of them have limited or no cash at all to buy the plastics.

The Kelabits are also talented in their cultural dances and lovely sape music, which can be an attraction to foreign tourists. Given the necessary assistance, all these activities can be packaged with home-stay and eco-tourism product for the benefits of the community. With the increase in the tourist arrivals, and given the necessary support from the government, all these related activities will provide them employment, especially, to the elder members of the family, therefore, another important source of cash income to the local community.

(e) **Community-based Watershed Management**

Since the watershed is located in the interior parts of Sarawak, particularly, in the remote interior of Ulu Limbang, there is a need to establish a mechanism to manage and conserve the watershed and its neighbouring forests. This may necessitate the establishment of a special committee at the community level with the support of relevant agency like Forest Department to carry out the monitoring and enforcement.

In view of its certain constraints, it is essential for the agency concerned to encourage greater participation from the local communities in the conservation and management of the watershed and nearby forests. After all, the local communities are the closest to the natural forest and their environment, and being closely related and interdependent, the local community can be made to play a more active role as stewards of the forests. Towards this end, there is a need to establish the Watershed Management Committee at the community level in order to undertake the task of community development and consultation, which should be continuously carried out. The committee will also able to coordinate and implement various development programs and initiatives for the local communities, which include educational and conservation programs. Through regular consultation and community dialogues, the project management will also be able to get important feedback on any issues and problems relating to implementation of any development program. Most importantly, the idea is to bring together the major stakeholders in the process of collective decision-making and innovative problem-solving, and at the same time, help to establish a good rapport with the locals for sustainable management of the forests.

11.0 CONCLUSION

Overall, it can be concluded that the two communities living within Sg Medihit Watershed are supportive of the project and government effort in helping them to conserve and manage the area sustainably. Being interdependent on the lands and nearby forests for their livelihood for centuries, generally they appreciate the values of the forests, and realize the great potentials for the benefits of the community, particularly, in terms of its rich in biodiversity and natural resources. With their strong attachment to the forests, and long tradition of conservation strategies, they are generally receptive to the conservation of the whole watershed. However, being dependence on these resources, priority should be given to cater for the basic socio-economic needs and aspirations of the local communities. Being able to fulfill the basic needs of the community will help to reduce their dependence on the forest and its resources.

One of the management strategies should be to encourage greater participation of the local communities in the actual management of the watershed. This is crucial as in reality sustainable development and management of the forest conservation areas depend very much on the cooperation and active participation of the nearby communities.

Lastly, in order to ensure this rich heritage of natural ecosystems is conserved and managed wisely, the project should aim to provide the local communities with the opportunities and skills not only to manage their lands and forests sustainably, but most importantly in improving their livelihood. These efforts will ensure that the watershed will remain a haven for rich plant and animal life and continue to provide valuable ecological functions for present and future generations.

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