



Convention on
Biological Diversity

Technical Report



ITTO Project PD 617/11 Rev. 4 (F)

*Promoting Biodiversity Conservation in Betung Kerihun National Park (BKNP)
as the Trans-boundary Ecosystem Between Indonesia and Sarawak State of Malaysia (Phase III)*

Jakarta, July 2018

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Prepared for the ITTO
By Dr Hiras Sidabutar
The Project Coordinator

Jakarta, July 2018



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*Promoting Biodiversity Conservation in Betung Kerihun
National Park (BKNP) as the Trans-boundary Ecosystem
Between Indonesia and Sarawak State of Malaysia (Phase III)*

TECHNICAL REPORT

Executing Agency : Betung Kerihun National Park (BKNP),
Directorate General of Conservation of
Natural Resources and Ecosystems (KSDAE),
Ministry of Environment and Forestry

Starting date : 1 November 2013

Duration : 56 months

Disbursable Project budget (USD)	:	<u>Source</u>	<u>Original</u>	<u>Revised</u>
		ITTO	795,678	764,110
		Gol	272,920	285,105
		Total	1,068,598	1,049,215

Jakarta, July 2018

List of Abbreviations and Acronyms

BANP	Batang Ai National Park
BKDSNP	Betung Kerihun and Danau Sentarum National Parks
BKNP	Betung Kerihun National Park
BKNR	Betung Kerihun Nature Reserve
BMU	Biogas Management Unit
BNP	Bako National Park
CAP	Community Action Program
CFET	Centre for Forestry Education and Training
DG	Directorate General
ESE	Ecological, Social and Economic
FDS	Forest Department Sarawak
FGD	Focussed Group Discussion
FRI	Forest Research Institute
GGNP	Gunung Gading National Park
IBBE	ITTO Borneo Biodiversity Expedition
ITTO	International Tropical Timber Organization
JTTF	Joint Technical Task Force
KSDAE	Konservasi Sumber Daya Alam dan Ekosistem (Conservation of Natural Resource and Ecosystem)
LEWS	Lanjak Entimau Wildlife Sanctuary
LFM	Logical Framework Matrix
LoI	Letter of Intent
MoEF	Ministry of Environment and Forestry
MTAP	Mid-term Action Plan
NGO	Non-Governmental Organization
NTFP	Non-timber Forest Product
RIPPARNAS	Strategic Plan for National Tourism Development
SIPAT	Serakop Iban Perbatasan
SNR	Semenggoh Nature Reserve
TBCA	Trans-Boundary Conservation Area
WWF	World Wildlife Fund
YPO	Yearly Plan of Operation

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References



1. Introduction

1.1. Previous ITTO projects implemented at Betung Kerihun National Park (BKNP)

Brief information on the ITTO Projects that had been previously implemented at BKNP is presented below:

i. PD 26/43 Rev. 1 (F) Phase I

- Title : Development of Bentuang Karimun Nature Reserve (BKNR) as a National Park
- Duration : 48 months, including a 12-month Interim Program
- Starting date : November 1995
- Executing Agency : BKNR and WWF Indonesia
- Objectives of the project
 - Development objective:
To develop BKNR as a national park for biodiversity conservation and trans-boundary cooperation with Lanjak Entimau Wildlife Sanctuary (LEWS) in Sarawak, Malaysia
 - Specific objectives:
 - ✓ To collect baseline data on flora and fauna of the BKNR, on the communities residing in the buffer zone and on other parameters needed for formulating a comprehensive management plan for the national park.
 - ✓ To conduct IBBE (ITTO-Borneo Biodiversity Expedition) for updating biodiversity data on the national park
 - ✓ To formulate management plans for the National Park comprising long-term and mid-term plans.

- An interim program was developed and implemented as a means for socializing and communicating with stakeholders implementation of developed management plans as these processes were insufficiently done during the development stage of the plans.
- Achievements:
 - Baseline data on biophysical and socio-economic aspects were collected and compiled.
 - Management plans for BKNP developed.
 - The management plans were adequately communicated with stakeholders prior to implementing.

ii. PD 44/00 Rev. 3 (F) Phase II

- Title : Development of a community-based management plan for Betung Kerihun National Park (BKNP)
- Duration : 40 months, including a 4-month extension
- Starting date : November 2001
- Executing Agency : BKNP and WWF Indonesia
- Objectives of the project
 - Development objective:
To develop a community-based integrated conservation and development program that transcends jurisdictional boundaries between Sarawak (Malaysia) and West Kalimantan (Indonesia)
 - Specific objectives:
 - ✓ To develop a respected, well-managed and well-functioning BKNP where local stakeholders actively participating and receiving fair benefits of the park.
 - ✓ To develop a cooperative working system where stakeholders of BKNP and LEWS could work together effectively in managing the eco-regions that transcend boundaries between two protected areas.
- Achievements:

The specific objectives had been achieved in the following manner:

 - Through intensive dialogues, local communities agreed on the park boundaries constructed in 2003 and supported implementation of different conservation programs under BKNP management plan.
 - BKNP headquarters established in Putussibau in 2003 and number of recruited staff increased from 73 in 2001 to over 100 in 2003.
 - Different local government agencies involved in the project implementation and well-informed of the management status of the BKNP.
 - A series of public awareness raising campaign launched.
 - BKNP database/information system developed and operational.
 - Exchange of visits by Officers and Staff of BKNP and LEWS took place for sharing knowledge and experience in the management of protected areas which resulted in the recommendations for developing future joint programs and activities.

1.2. ITTO project PD 617/11 Rev. 4 (F) Phase III

a. Project identities

- Title : Promoting biodiversity conservation in Betung Kerihun National Park (BKNP) as the trans-boundary ecosystem between Indonesia and Sarawak State of Malaysia
- Duration : 56 months, including a 8-month extension
- Starting date : November 2013
- Executing agency : Betung Kerihun National Park (BKNP) Agency DG of Conservation of Natural Resources and Ecosystems (KSDAE) Ministry of Environment and Forestry (MoEF)
- Original Total Budget : USD 1,068,598
USD 795,678 ITTO contribution
USD 272,920 GOI contribution

b. Highlight of the project design

- Objectives
 - Development objective
To contribute to conservation of ecosystems through implementation of activities on biodiversity conservation and local socio-economic development
 - Specific objective
To strengthen sustainable conservation management of BKNP as the trans-boundary conservation area (TBCA)
- Outputs
 - i. Strengthened cooperation in the conservation of the trans-boundary ecosystems of BKNP in Indonesia and Batang Ai National Park (BANP) and LEWS in Sarawak State of Malaysia
 - ii. Management plan for biodiversity conservation in BKNP enhanced.
 - iii. Sustainable livelihood of local communities residing in BKNP buffer zones improved.
 - iv. Community-based forest conservation monitoring system developed.
- Activities

In total, 16 major activities were planned for implementation under different outputs, they were:

Output 1

Activity 1.1:
To form a joint task force representing stakeholders of Indonesia and Sarawak, Malaysia, to implement TBCA programs.

Activity 1.2:
To identify partnership/cooperation in biodiversity conservation management of protected areas.

Activity 1.3: To conduct surveys, studies, and exchange of information in order to improve management effectiveness of the protected areas.

Activity 1.4: To conduct training and on-the-job training on biodiversity conservation.

Activity 1.5: To organize a workshop on TBCA in Asia and the Pacific region.

Output 2

Activity 2.1: To update data and information on biodiversity conservation in trans-boundary ecosystem.

Activity 2.2: To assess on biodiversity conservation in bordering area focusing on endangered species and development of monitoring system.

Activity 2.3: To conduct a series of discussion between BKNP Agency, indigenous people and local governments for solving issues on forest conservation.

Output 3

Activity 3.1: To develop sustainable use of park resources through development of eco-farming and utilization of NTFPs in selected areas.

Activity 3.2: To develop community-based ecotourism programmes in transboundary ecosystem.

Activity 3.3: To conduct awareness campaign on conservation amongst local peoples in border areas.

Output 4

Activity 4.1: To carry out a feasibility study on community-based carbon and biodiversity conservation to support formulation of a REDD+ project.

Activity 4.2: To support regular forest patrol operation in BKNP.

Activity 4.3: To mobilize a well-equipped forest patrol squad.

Activity 4.4: To conduct training on forest patrolling for forest patrol squad personnel.

Activity 4.5: To conduct training on community-based monitoring system for local communities.

c. Project site

The project was implemented in BKNP area of approximately 800,000 hectares, which is located in Kapuas Hulu district (*kabupaten*) that was established just in 1997 with Putussibau town as the capital. The district was declared by the district government as a conservation district on 1 October 2003, being the first one in Indonesia. BKNP is one of the most important national parks in Indonesia, not only because of its extent, but also due to its rich and unique biodiversity and ecosystems.

d. Extension of BKNP area

In 2016, the MoEF decided to merge Betung Kerihun and Danau Sentarum National Parks to become one park management unit called Betung Kerihun and Danau Sentarum National Parks (BKDSNP) for management efficiency reason because the two parks are located at a near distance from each other.

The former Danau Sentarum National Park, around 132,000 hectares in extent, have the following salient features:

- Strategic values
 - As a RAMSAR site and home to different protected wildlife species
 - As a National Strategic Area of Heart of Borneo and reservoir for Kapuas Hulu river.
 - Is a target of RIPPARNAS (Strategic Plan for National Tourism Development) and border area development.
 - Is included in 15 Priority Lakes for development.
- Ecosystem and biodiversity
 - The Park consists of 8 forest ecosystems.
 - Rich in biodiversity, i.e. 675 species of flora (13 rare species and endemic to Borneo) and 754 fauna species comprising 147 mammals, 31 reptiles, 310 aves, and 266 fresh water fish have been recorded.

The extent of the merged parks now has become 932,000 hectares in total, app. 800,000 hectares of Betung Kerihun and 132,000 hectares of Danau Sentarum. In the sections that follow, the terms BKNP and BKDSNP are used interchangeably.



2. Enhancing Cooperation between BKNP and Forest Department Sarawak (FDS)

2.1. Introduction

This chapter concerns with the efforts devoted to enhancing cooperation in the conservation of the trans-boundary ecosystems of BKNP in Indonesia and Batang Ai National Park (BANP) and LEWS in Sarawak State of Malaysia”; enhanced cooperation would be delivered through implementation of 5 major activities, namely:

Activity 1.1:

To form a joint task force representing stakeholders of Indonesia and Sarawak, Malaysia, to implement TBCA programs.

Activity 1.2:

To identify partnership/cooperation in biodiversity conservation management of protected areas.

Activity 1.3:

To conduct surveys, studies, and exchange of information in order to improve management effectiveness of the protected areas.

Activity 1.4:

To conduct training and on-the-job training on biodiversity conservation.

Activity 1.5:

To organize a workshop on TBCA in Asia and the Pacific region.

Recall that completed ITTO Project PD 44/00 Rev. 3 (F) Phase II recommended to continue cooperation between Indonesia and Malaysia in TBCA management as such cooperation was proved useful for both sides. In fact, Activity 1.1. “to form a joint technical task force (JTTF) representing stakeholders

of Indonesia and Sarawak, Malaysia, to implement TBCA programs” under ITTO Project PD 617/11 Rev. 4 (F) was intended as a follow up action to that recommendation.

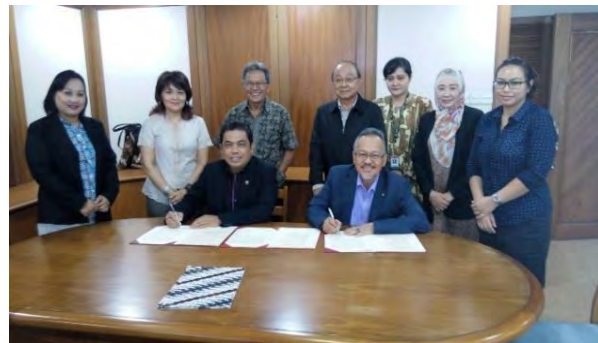


Directors of BKDSNP and FDS signed LoI to cooperate in biodiversity conservation

However, forming such a Joint Technical Task Force (JTTF) between the two nations as initially planned was proved not an easy task due mainly to the rigid and strict policies of each nation and the complicated, established diplomatic protocols. For instance, the Terms of Reference of the JTTF to be formed must first be approved by each country involving the Ministry of Foreign Affairs of Indonesia and Attorney General of Malaysian Government. Even after waiting for nearly 3 years, formation of the JTTF had not

materialized yet. In the interest of biodiversity conservation and in-time completion of the Project, Directors of BKDSNP and FDS had decided to sign a Letter of Intent (LoI) on 5 November 2016 in Kuching, Sarawak. The LoI, as shown in Annex 1, governed technical cooperation between BKDSNP and FDS, on behalf of BANP and LEWS. The signing of the LoI therefore, signified formation of a JTTF.

Under the signed LoI, both BKDSNP and FDS Authorities had identified 8 joint activities for implementation which signified completion of Activity 1.2 that was originally designed to identify partnership/cooperation in biodiversity conservation management of protected areas in West Kalimantan of Indonesia and Sarawak State of Malaysia. Identified joint activities appears in Annex 2.



Official signing of LoI at HQ of FDS in Kuching

It should be clear at this junction that, the original Activities 1 and 2 under Output 1 had been somewhat modified in order not to compromise in-time completion of the project; formation of a JTTF under Activity 1.1 had been completed with the signing of LoI while identification of cooperation in biodiversity conservation had been accomplished by defining 8 activities for joint implementation by BKDSNP and FDS.

2.2. Joint activities implemented and results

a. Joint activities identified

To deliver Output 1 “strengthened cooperation in the conservation of the trans-boundary ecosystems of BKNP in Indonesia and Batang Ai National Park (BANP) and LEWS in Sarawak State of Malaysia”, five activities as listed in Section 2.1 were planned for execution. As has been described in the previous section, a LoI had been signed by authorized Officers as the cooperation framework. Under this LoI, 8 activities were identified for joint implementation (Activity 1.2) and then listed as sub-activities under Activities 1.3 and 1.4, respectively as follows:

- Activity 1.3:
To conduct surveys, studies, and exchange of information in order to improve management effectiveness of the protected areas.
 - ✓ Sub-act 1.3.1:
To conduct a collaborative research and joint publication on Orangutan.
 - ✓ Sub-act 1.3.2:
To promote ecotourism in West Kalimantan and Sarawak.
 - ✓ Sub-act 1.3.3:
To exchange experience in implementing community empowerment programs.

- Activity 1.4:
To conduct training and on-the-job training on biodiversity conservation.
 - ✓ Sub-act 1.4.1:
To carry out on-the-job training on park management skills.
 - ✓ Sub-act 1.4.2:
To carry out training on ecotourism guiding.
 - ✓ Sub-act 1.4.3:
To carry out training on semah fish raising in Kapuas Hulu and Sarawak.
 - ✓ Sub-act 1.4.4:
To assist local communities in producing quality gaharu commodity.
 - ✓ Sub-act 1.4.5:
To produce a common map of parks to facilitate joint forest patrolling in bordering areas.

Out of the 8 joint activities identified, Sub-activities 1.4.2. and 1.4.5. were cancelled due mainly to the financial crisis then experienced by ITTO, leaving only 6 sub activities that were implemented as highlighted in the section below.

b. Joint activities implemented

i. Collaborative research and joint publication on Orangutan

- Objective of the research
 - To assess the extent of damage by Orangutan on local community livelihood and its potential consequences.
 - To propose appropriate mitigating measures to help affected farmers.

- Research methodology
 - The research was conducted in Batang Ai National Park (BANP) where damage incidences by Orangutan had been occurring and in Betung Kerihun National Park (BKNP) where no such incidences had been reported.
 - Two Orangutan experts were hired to conduct the research at the two sites: a Sarawakian expert at BANP and an Indonesian expert at BKNP.
 - Each research lasted for around 3 weeks and information gathering was accomplished through direct visits and stakeholder dialogues, notably local communities.

– Results of the research at BANP

- All respondents from Nanga Sumpa research site reported problems with Orangutans, while none reported in the other two sites.
- Most of the respondents claimed that Orangutan was not the most problematic crop pests compared to other wildlife species such as macaques.
- *Pantu palm*, *Durio spp.* and *Artocarpus spp.* were the most reportedly raided by Orangutans almost every year during fruiting season.
- Orangutans mainly raid fruits but would also consume durian flowers and young leaves of *kesindu* and *luwak*.
- Crop raiding in Nanga Sumpa has been going on for generations but getting worse since five years ago.
- Most of the respondents feared Orangutan and it is a taboo killing one as they regard them as their descendants.
- To counter the invasions of Orangutan, villagers would normally make noise by knocking on the raided trees or bringing dogs but claimed that this method did not work.
- One of the main reasons why the other research sites, Menyang Taih and Menyang Sedi had no problems with Orangutan raiding crops was that their shifting cultivation sites were located in between the old secondary forests, where Orangutans were mostly encountered, and their farmlands. In contrast, shifting cultivations in Nanga Sumpa are in scattered patches interlaying with old secondary forests, their farmlands and “pulau”.
- The main tourist attractions in BANP were Orangutan, culture (longhouse and Iban lifestyle) and nature (forests, rivers, waterfalls) thus Orangutans were an important asset in generating income:
 - ✓ The main communities that supported the proposal on Menyang Orangutan Conservation Area were from Nanga Sumpa and Menyang Taih as Orangutan was the main attraction for tourists and generates income.
 - ✓ Majority of communities from Menyang Sedi disagreed with the proposal on Menyang Orangutan Conservation Area as they claim that the land and forest belong to them and Orangutan did not benefit them.
- BANP area zoning may be the best sustainable option to mitigate the problem on Orangutan conservation but various factors need to be strengthened such as boundary patrol around BANP, international border, ecotourism, education and awareness and, most importantly, co-management with the local communities.



Nest of Orangutan at Nanga Sumpa, BANP

– Results of the research in BKNP

- Consultation on crop raiding by orang utan had been carried out with local communities at 8 hamlets, namely Nanga Potan, Tanjung Lasa, Sungai Utik, Mungguk, Sungai Uluk Palin, Sadap, Kelawit and Sumpang Layak; these hamlets are all located in the middle and western buffer area of BKNP

- The communities consulted with at all villages indicated that orang utans had never entered and damaged the crops grown nearby or around the villages; in fact, Iban communities have positioned orang utans in their customary laws as the wildlife that must be protected.
- The communities also indicated that orang utans have been moving freely between BKNP, BANP and LEWS without making damages to crops and settlements.



Back-to-nature Orangutan at Semenggoh Wildlife Centre in Sarawak

– Overall conclusions

- The crop raiding by Orangutans in BANP has been going on for a long time but got worsening during the recent years. Most likely causes of the crop raiding include decreasing area of Orangutan habitat, increasing disturbance of habitat by local people, reduced availability of foods and proximity of habitat with settlement.
- Crop raiding and settlement intrusion by Orangutans in BKNP had not been experienced by the communities consulted with at eight villages; this phenomenon was speculated as closely related to ample and undisturbed habitat, secured availability of foods, large intervening space between habitat and the settlements.
- Technical Report on the Orangutan research are now available; interested parties/persons may visit the BKDSNP website or contact the EA to obtain the report.

ii. Promotion of ecotourism in West Kalimantan and Sarawak

- This activity has been completed through execution of a Focused Group Discussion (FGD) in Putussibau on 2 October 2018.
- A separate report on the FGD and MTAP document are available with the Executing Agency.
- The FGD was attended by some 65 people representing ecotourism stakeholders of West Kalimantan and Sarawak with the main message that enhanced cooperation in ecotourism development of West Kalimantan and Sarawak stakeholders is needed in view of tapping the great potential of the two regions in ecotourism.
- Following up the recommendation of the FGD, a mid-term Action Program (MTAP) on enhancing cooperation between West Kalimantan and Sarawak in ecotourism development has been prepared during the project extension period and the MTAP document is now available with the EA.



FGD on promoting ecotourism in West Kalimantan and Sarawak

iii. Exchanging of experience in implementing community empowerment programs.

- Under this activity; 4 staff of FDS visited several community empowerment programs in Kapuas Hulu from 28 November to 3 December 2017; results/findings of the visit are summarized below:

- The honey-bee keeping project using artificial branches at Semangit in Danau Sentarum National Park has brought significant changes in increasing income and uplifting the livelihood of the community within the area.



Honeybee raising on trees at Semangit.

- The Iban community of Mensiau village has actively performed weaving activity using threads that are soaked in natural dyes or coloring which has been practiced since a long time ago. Currently, there are 34 tree species that have been identified to produce natural dyes and used by the community, with different parts of the tree produce different colors.



Weaving technique using natural colouring at Mensiau

- The biogas development project at Banua Sadap village, constructed and operated in a *gotong royong* (collective, voluntary action) basis, was introduced to overcome electricity shortage and reduce the usage of firewood and petrol in daily use. The biogas energy generated has been used for cooking, providing electricity for the long house and the making of products such as palm brown sugar (*gula aren*), chips of bamboo shoots and different fruit cakes.

- The traditional tattooing art practiced by Iban community at Sungai Utik village is not much different compared to that practiced by Sarawak Ibans but is unique in the sense that the former Iban community uses traditional tools and natural dyes in their tattooing work.

- The visiting FDS staff reported that the information captured during the visit would be useful for their future work

iv. Conducting on-the-job training on park management skills

- Under the activity, 5 senior staff and managers of BKDSNP visited several parks in Sarawak on 13-19 November 2017 and had the opportunities to learn on different practical park management skills. Results/findings of the visit are outlined below:

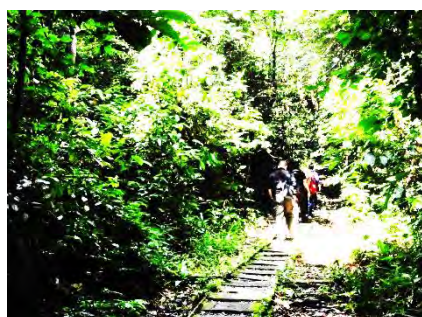
- The on-the-job training was carried out at Semanggoh Nature Reserve (SNR), Bako National Park (BNP), and Gunung Gading National Park (GGNP).
- The SNR, 653 ha in extent, was established in 1975; its management focus is on Orangutan wilderness release combined with controlled ecotourism, i.e. limited number of visitor, equipped with sufficient track network that free of garbages.
- The BNP, 2,727 ha in extent, established in 1957, is managed for adventure experience involving local community members in adventure guiding and logistic supporting. The park is well equipped with boarding facilities, clear map of routes and detailed technical information on the park and adventuring inputs.
- GGNP (4,196 ha), was gazetted in 1983 and opened for public in 1994. It is managed for adventure tourism, focusing on wildlife expedition. The park is well equipped with



Orangutan feeding site at Semenggoh Wildlife Nature Reserve, Sarawak



Bako National Park (BNP), Sarawak



Gunung Gading National Park (GGNP), Sarawak

detailed map, detailed technical information on adventuring and facilities for boarding.

- The participants admitted that the skills learned from the visits could enhance management operations of BKNP if they could properly be practiced

v. Training on semah fish raising in Sarawak and Kapuas Hulu

- Two training sessions on semah fish raising had been carried out in Lawas (Sarawak) and Bungan Jaya (Kapuas Hulu), respectively:
 - The training in Sarawak was conducted at Long Lidong tagang system on 5-9 November 2015, participated by 4 community leaders of Kapuas Hulu and 2 technical staff of BKDSNP.
 - The Indonesian participants were impressed by the tagang system practiced



Successful semah fish raising with tagang system at Long Lidong, Sarawak

by Long Lidong community due to its strong natural features, i.e. negligible physical construction, insignificant capital investment, significant income stream generated by the system, the critical role of collective decision and action plays in the management of tagang system and replicability of the system to Kapuas Hulu.

- In Kapuas Hulu, community of Bungan Jaya was trained on tagang system development by Mr. Haji Abdul Gani of FDS and Mr. Tom Anak Samoek of Agriculture Department Sarawak. Results of the training are outlined below:
 - The community understood well what tagang system is all about: its objectives, prerequisite for successful development and essential elements.
 - The community welcomed tagang system and were convinced of its potential economic benefits as well as practicality.
 - The community acknowledged prerequisites to developing a tagang system which include strong leadership, transparent and honest collective decision and action, compliance to customary and government laws governing fishery resource development and strong commitment to tagang system management principles.
 - Field survey of the river as well as zoning classification could not be practiced because of the unexpected too strong river current during the training dates.

PROJEK TAGANG LONG LIDUNG
KINI DIBUKA UNTUK EKO-PELANCONGAN
(LONG LIDUNG TAGANG PROJEK
IS NOW OPEN FOR ECO-TOURISM)

WAKTU NIAGA (BUSINESS HOUR)
ISNIN - SABTU (MON-SAT)
8.30am - 4.00pm
(Waktu Rehat (Rest hours)
12.00pm - 1.00pm)
AHAD (SUNDAY)
12.00pm - 4.00pm

KADAR BAYARAN (CHARGES RATE)

UNTUK	WARGA M'SIA		PELAWAT ASING	
	DEWASA	KANAK2 *	DEWASA	KANAK2 *
1. TURAN MASUK (ENTRANCE FEE)	RM 2.00	RM 1.00	RM 4.00	RM 2.00
2. MANDI BERSAMA IKAN	RM 5.00	Tidak dibenarkan	RM 10.00	Tidak dibenarkan
3. RENDAM KAKI SAJA (DIPPING LEGS ONLY)	RM 2.00	Tidak dibenarkan	RM 4.00	Tidak dibenarkan

Nota: KESELAMATAN PENGINJUNG ADALAH TANGUNGJAWAB SENDIRI.
(SAFETY IS YOUR OWN CONCERN)
* Kanak-kanak : umur 12 tahun ke bawah.

AJK TAGANG
LONG LIDUNG

Board showing entrance fee rates to tagang system

vi. Technical assistance for local communities in producing quality gaharu commodity.

Allured by the attractive market price of gaharu, people in West Kalimantan and Sarawak have been planting gaharu trees for decades now. While reliable figure on area size is not available, the extent of gaharu tree plantation in the two regions may have reached thousands of hectares in total.

Natural gaharu or agarwood is a brownish black resin produced on a gaharu tree through physiological process with the assistance of endophytic fungi occupying living cellular tissues of a tree. The common gaharu trees are *Aquilaria spp.* and *Gyrinops spp.* When burned, gaharu resin produces sweet-scented fragrance which makes it as one of the highly valued elite non-timber forest products.

While price of natural gaharu is very attractive, its production quantity is very limited which makes local communities opt to produce gaharu from planted trees. However, there are problems facing gaharu growers: uncertainty of volume and timing of production and the relatively cheap price of artificial compared to natural gaharu. Planted gaharu will certainly produce gaharu resin but it is not clear at what volume and what age. The recent inoculation technology introduced by the Forest Research Institute (FRI) in Bogor is to help reducing this uncertainty of volume and timing of gaharu resin production.



*Training on gaharu inoculation of gaharu-producing trees (*Aquilaria beccariana*) at Tanjung Lokang, Kapuas Hulu*



Training location at Tanjung Lokang (Betung Kerihun National Park) and Ulu Mujok (Sarawak, Malaysia)

Training of local communities on gaharu development was conducted in two batches; the first one at Tanjung Lokang village in Kapuas Hulu with 35 participants and the second one at Ulu Mujok village in Sarawak with 40 participants. Topics of the trainings covered under both batches were the same, which included: experience in natural gaharu collection, introduction of gaharu producing trees, cultivation technology, inoculation technology, processing and marketing, and gaharu ecotourism. Results of the trainings are outlined below:

- Hunting of natural gaharu requires considerable efforts in terms of time, up to 3 months in the forest, and working capital, mostly for logistic, yet probability of success is only 5 percent meaning that most hunters have failed to recover the costs incurred.
- Four gaharu tree species that commonly produce natural gaharu, namely: *Aquilaria malaccensis*, *A. microcarpa*, *A. beccariana*, *A. hirta*, are familiar to the participants in both sites.
- Planting of gaharu trees is best to be done under agro-forestry system in order to secure income of the growers before gaharu harvest.
- Growers of gaharu trees are now able to practice inoculation technology but there is a need to secure the right inoculant at affordable price from Bogor FRI for which communication and coordination between farmer groups and the Institute need to be developed through local government institutions. It was noted during the training that in the past, many farmers had used fake inoculant bought at local markets which failed to produce gaharu resin in perceptible volume even after years of waiting.

- Most gaharu farmers did not have market information nor had the skill to identify buyers that selling was mostly done through local collectors that controlled price. There is a need to train gaharu growers on developing marketing strategy based on available market information.
- Gaharu can be managed for ecotourism by establishing an arboretum of gaharu tree species and exhibition booths for primary and derivative gaharu products like the one at Bukit Gopeng in Perak State of Malaysia which has contributed to genetic conservation of gaharu tree species and community livelihood.



Exhibition of gaharu trees and gaharu products to promote conservation and local livelihood at Bukit Gopeng, Malaysia

The important lessons learned from the implementation of training on gaharu commodity development by local communities are:

- Interest of local communities in hunting natural gaharu is diminishing due to the financial loss risk involved; their interest has recently shifted to producing artificial gaharu using inoculation technology.
- Processing of artificial gaharu to derivative products is a feasible means to increase price and farmers are eager to learn simple processing technology.
- The inoculant produced by Bogor FRI helps the process of gaharu resin formation by trees and is very much expected by farmers to be widely available at affordable price.

vii. Organization of Asia-Pacific regional workshop on TBCA management

- This workshop was executed on 6-8 March 2018 in the City of Pontianak which was officially opened by Director General of Conservation of Natural Resources and Ecosystems (DG KSDAE) and attended by some 65 participants representing



A plenary session of the Asia-Pacific Regional Workshop on TBCA Management

different groups of stakeholder including Central, Provincial, and District government institutions, Universities, International and National NGOs, ITTO and Forest Department Sarawak and also representatives of Malaysia, Thailand, Cambodia, Laos

PDR, Myanmar and India.

- A separate technical report of the workshop is now available with the Executing Agency.

2.3. Achievement assessed

The full implementation of Activities 1 through 5 including 3 sub-activities under Activity 1.3 and 3 sub-activities under Activity 1.4 has obviously contributed to enhancing cooperation between BKDSNP and Forest Department Sarawak (FDS) in TBCA management in general, in biodiversity conservation as well as local livelihood development in particular. Enhanced cooperation means that such cooperation was already in place and now has been improved through joint implementation of particular activities. In other word, cooperation between BKDSNP and FDS that had been initiated in the past is now operational, has been enhanced and it is sustainable.

The improvement made in the cooperation can be assessed at least, qualitatively, using the indicators defined in the LFM presented in the project document. However, those indicators are not all measurable or operational. For purpose of assessing current state of cooperation, below are modified indicators applied:

- i. Signed Lol

Letter of Intent (Lol) to cooperate in TBCA management between BKDSNP and FDS on behalf of BANP and LEWS, has been duly signed by respective authorized officials.
- ii. Joint activities identified

Eight joint activities have been identified by BKDSNP and FDS in a collaborative manner: 3 activities dealt with study and exchange of experience and information and 5 activities concerned with capacity building.
- iii. Six joint activities and one regional workshop on TBCA implemented
 - One study on Orangutan collaboratively implemented by BKDSNP and FDS experts.
 - One FGD on ecotourism development organized by BKDSNP in close consultation with FDS.
 - 4 FDS staff visited livelihood programs in Kapuas Hulu.
 - 5 BKDSNP staff gained practical skills on protected area management in Sarawak through field visit and discussion.
 - 4 community leaders, 2 BKDSNP staff and community of Bungan Jaya village trained by Sarawakian experts on fish raising under tagang system.
 - 75 community members in Ulu Mujok of Sarawak and Tanjung Lokang of Kapuas Hulu trained by Indonesian expert on gaharu commodity development.
 - Asia-Pacific workshop on TBCA organized by BKDSNP Agency in collaboration with ITTO, FDS, and other partners.

Close examination of above achievements and indicators clearly indicates that cooperation between BKDSNP and FDS in TBCA management has been enhanced indeed and such cooperation needs to be sustained in the interest of future biodiversity conservation on TBCA.

2.4. Lessons learned

Among the important lessons learned from the implementation of joint activities by BKDSNP and FDS are:

- Forming an official cooperation between two nations may experience considerable delay due to established protocols and procedures in each country.

- Identification of any programs and activities for joint implementation is best accomplished through organized official meetings.
- Operational planning for any joint programs or activities need to be done well in advance to allow for proper arrangements of time schedule and needed inputs by the countries involved
- Sudden change to developed operational plan by any party may cause difficulties or inconvenience to partner country or considerable delay in completion of planned activities.
- Visit to project site and on-site discussion between visitors and hosting project staff proved able to enrich practical knowledge of the persons involved in an efficient manner.
- Development of a Work Programme for important big event is best to be accomplished through brainstorming sessions in order to avoid missing any essential element(s).
- After-visit discussions between the visitors and hosting staff were proved useful for better planning of future cooperation programs.



3. Enhancing Management Planning and Operations of BKNP

3.1. Introduction

This part of report concerns with the efforts dedicated to enhancing management planning and implementation of BKNP management plan; below are the underlying notions of defining the efforts:

- A management plan for biodiversity conservation on BKDSNP defines management objectives in light of actual park conditions and national policy on biodiversity conservation; to be applicable, such a management plan should be developed using updated information on biodiversity. The current BKDSNP management plan was developed using the old biodiversity data collected by the ITTO Borneo Biodiversity Expedition (IBBE) conducted in 1997 or more than two decades ago. There is an urgent need to enhance the current management plan using updated biodiversity data for which a field survey has to be undertaken. This is the very reason for updating data and information on biodiversity in transboundary ecosystem of BKNP.
- Aside from updating biodiversity data, there is also an urgent need to assess scarcity status of wildlife species in order to facilitate proper planning of programs on conservation of species and ecosystems. This was the very reason for assessing biodiversity conservation status focusing on endangered species.
- A management plan, to be effective in achieving its defined objectives, should be implemented with the active participation of primary local stakeholders, i.e. local governments and local communities. To properly participate, there is a need to conduct intensive dialogue with these stakeholders. This was the very reason for conducting a series of dialogue between BKNP, local communities, and local governments.

3.2. The activities implemented and results

i. Updating data and information on biodiversity of BKNP ecosystems



Endangered Pongo pygmaeus pygmaeus located at BKNP

- A field survey on biodiversity of BKNP was conducted with the assistance of a team of professionals. Dictated by availability of funds, the survey covered only the Embaloh Sub-watershed area, about 200,000 hectares in extent at survey intensity of 0.1 percent. The survey, therefore, covered only about 25 percent of BKNP area. A separate technical report in English and Bahasa Indonesia is now available with the EA.

- Results of that survey are summarized below:
 - a. Flora
 - 227 flora species of 46 families compared to 1,217 species identified at the previous survey on the entire park area.
 - 3 species had never been identified → no scientific names
 - Dipterocarp species dominated the flora
 - b. Mammals and primates
 - 17 species (13 families) identified
 - c. Aves
 - 301 species under 36 families, 24 species endemic
 - d. Herpetofauna
 - 33 species under 10 families (21 amphibians and 12 reptiles)
 - 1 VU (vulnerable) species (*Notochelys platynota*)
 - Near threatened (NT) species
 - 4 new species identified
 - e. Fish
 - 22 species, 5 families
 - f. Insect
 - 82 species, 5 families



Endangered Catopuma badia at BKNP

ii. Assessing scarcity status of biodiversity

- This activity was implemented with the assistance of a Team of Expert; the Team identified that, using the IUCN criteria (5) and indicators (21), six species were at endangered status, namely:
 - *Catopuma badia* (Mammals)
 - *Manis javanica* (Mammals)
 - *Pongo pygmaeus* (Mammals)
 - *Hylobates muelleri* (Mammals)
 - *Dyrobalanops beccarii* (Dipterocarpaceae)
 - *Dyrobalanops lanceolate*

- A separate technical report, in English and Bahasa versions, of the activity is available with the EA

iii. Conducting dialogues between BKNP, local governments and local communities on BKNP biodiversity conservation issues

The activity was implemented in collaboration with BKNP Agency; the implementation processes are highlighted below:

- Under YPO 2, a series of dialogue between BKNP, local community leaders and local government authorities on issues relating to Kapuas Hulu district development in general, to conservation of BKNP biodiversity and ecosystems in particular, had been conducted. The dialogue concluded that Dayak Community Leaders (Temenggungs) had to design their Community Action Programs (CAP) on local livelihood development consistent with existing BKNP conservation programs. After six months of time elapse, none of the community leaders completed the task due primarily to lack of technical capacity.



Dialog with local community leaders on livelihood and park management

- Under YPO 3, BKNP Agency organized two small workshops in Putussibau and Pontianak wherein its partners that comprised local NGOs as representatives of the Temenggungs and Kapuas Hulu government took part in. The main objective of the workshops was to assess programs and activities on local livelihood development that had been prepared by the Partners. The workshop concluded that the Partners had to improve their respective programs in conformity to the interests of the local communities and the governments they are representing and to management objectives of BKDSNP.
- Under YPO 4, the CAPs had been fully developed signified by the signing of Partnership Agreements on 13 July 2017 in Jakarta by BKDSNP Director and 16 Partners representing Kapuas Hulu government and the Temenggungs residing in the buffer zone of BKDSNP.

3.3. Achievement assessed

- The remaining question to answer at this stage is “have management planning and implementation of BKNP management plan for biodiversity conservation been actually enhanced?”. To answer this question, outcomes of the activities implemented need to be assessed using the indicators defined in the LFM of the project document.
- The indicators defined in the LFM were:
 - i. Biodiversity data updated and mapped through conduct of field survey combined with interpretation of satellite imagery and verified through ground truthing exercises.
This indicator has been satisfied, noting that the area covered by the survey and satellite imagery was only about 25% of BKNP total area. That is to say that, biodiversity data updating had been completed only partially.

ii. Assessment of scarcity status of biodiversity completed

Indeed, this indicator had been met but only on 25 percent of BKNP area. Again, the indicator was partially met.

iii. Two series of dialogue between BKNP, local communities and local governments conducted.

Information on the dialogue processes and outcomes outlined in the previous section clearly indicates that the indicator had been fully satisfied.

- In light of above assessment, it is reasonable to conclude that: biodiversity data updating and assessment of biodiversity conservation status have been partially completed while implementation of BKNP management plan has not been actually enhanced for the following reasons:

- ✓ As shown above, the biodiversity data collected and assessed only covered 25 percent of BKNP area. The management plan, however, has not been revised using updated biodiversity data. The existing management plan should have been revised using the updated biodiversity data yet this work has not been done by BKNP Agency. In other words, the management plan under implementation is still based on old data.
- ✓ The Community Action Programs (CAPs) developed by 16 Partners and endorsed by BKNP Agency for implementation has, in fact, been only attached to the individual Partnership Agreements signed by authorized Partners but have not been operational at all.

- Above assessment on achievement clearly shows that the project intervention has not enhanced implementation of BKNP management plan; indeed, the intervention has provided needed information for improving the plan for the western part of BKNP area but updated data have not been incorporated into the management plan.



Dialog with local community and local government on livelihood and park conservation

3.4. Lessons learned

Among the important lessons learned from the implementation of the activities on enhancing of BKNP management planning and operations are:

- Importance of using updated and accurate data in management planning apparently has not been fully appreciated by park officials that data updating activity has not received the priority it deserves.
- Employment of experienced professionals in the designing of field survey on biodiversity is crucial to ensure soundness of the methodology applied, reliability of data produced and cost effectiveness of survey operation.
- Accuracy of the data collected is highly dependent on the skill of species markers. Employment of more than one local species markers having strong familiarity with the ecosystems in the area under consideration is strongly advisable in order to allow for on-site exchange of knowledge and experience.
- The main purpose of biodiversity data updating is to facilitate improvement of a management plan that it becomes highly consistent with the real situation. There is a need to periodically

update current management plan in terms of its objectives, work programmes, and priorities using updated data.

- e. Relying on local community leaders to develop their livelihood action programs was proved not realistic. Building partnership between local communities and local NGOs is perhaps the best strategy for moving forward on local livelihood development. Technical skills of community leaders on livelihood management planning is generally very poor and enhancing the capacity in this area could be more costly compared to building partnership between local communities and competent NGOs.
- f. The work programmes developed by Partners would be operational only if external funding could be secured due to limited state funds allocated for BKNP management operations.



4. Developing Sustainable Livelihood of Local Communities

4.1. Introduction

Three major activities were devoted to developing sustainable local livelihood as highlighted in the sections that follow. The propositions made were:

- Efficient utilization of NTFPs and environmental services of BKDSNP can significantly improve local livelihood
- Improved livelihood should strengthen support of local communities on SFM
- Livelihood endeavour is sustainable only if the products made are marketable at profit
- Products are marketable at profit if produced in a competitive manner with respect to price and quality as well as sufficiency and continuity of supply
- Ability of local communities to market products at profit signifies the right exit strategy for external assistance.

4.2. The activities implemented and results

4.2.1. Promoting sustainable use of BKNP resources through development of eco-farming and utilization of NTFPs (Activity 3.1)

This activity comprised two sub-activities, namely: 3.1.1) identification of potential NTFPs for development and 3.1.2) establishment of demonstration plots of selected NTFPs for purpose of technology transfer.

3.1.1. Identification of potential NTFPs for development by local communities

- This activity was implemented with the assistance of competent national consultants, i.e. Mr Agus Irianto and Dr. Retno Suratri.

- The NTFPs identified as having great potential for development to support local livelihood include:
 - Tengkawang seed for tengkawang oil
 - Sungkai trees for construction and handicraft materials
 - *Arenga pinnata* (aren) for brown organic sugar
 - Gaharu trees for incense products
 - *Donax canniformis* (bemban) for “anyaman” products
 - Bamboo for construction, handicraft and food products
 - *Piper albi* (lada) for cooking recipe and pharmaceutical industry
 - Fish
 - Different vegetable species
 - Paddy
 - Livestock (pigs, cows, fighting cocks, etc.)
 - Ecotourism (adventure, religious, culture, etc.)



Samples of community produced bamboo product

3.1.2. Establishment of demo plots for selected NTFPs for purpose of technology transfer

This activity was meant as a follow up to findings of preceding activity (3.1.1) and consisted of several programs including: utilization of biogas energy to support local livelihood, trainings on semah fish raising and on bamboo planting and bamboo shoot products diversification.

i. Installment of biogas production system

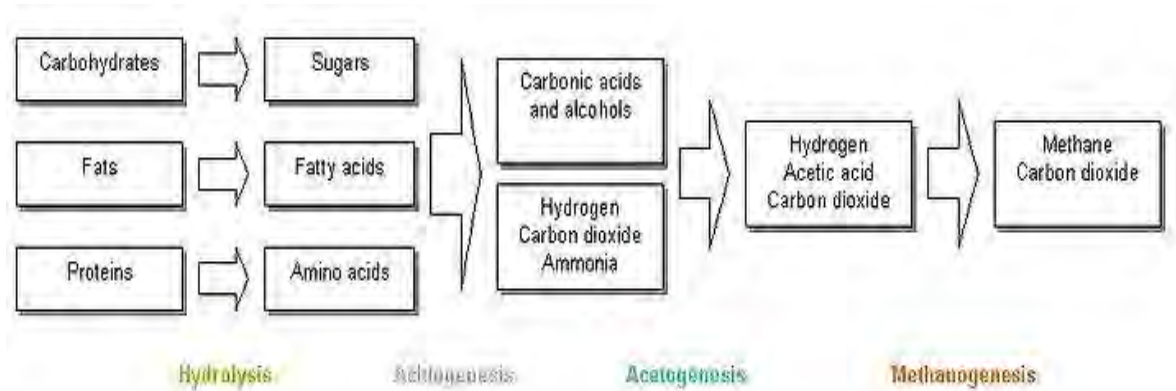
- Under this component, 2 programmes had been piloted: installment of biogas energy production system and utilization of produced biogas energy in the makings of NTFP products.
- The biogas energy production system was installed in June 2015 at Sadap village situated in the buffer zone of BKNP. Biogas production is essentially a phenomenon of decomposition of carbohydrate into methane gas compounds (CH₄) and carbon dioxide (CO₂) under an anaerobic environment which takes place in 4 stages of reaction:



Installation of biogas production system at Sadap village

- Hydrolysis: carbohydrate, in the form of polymers, is transformed by hydrolytic bacteria into compounds with shorter chain of monomer, known as glucose and amino or fatty acids.
- Acidogenesis: the glucose and acids are converted into alcohols, ketones, and other organic acid compounds by fermentative acetogenic bacteria.
- Acetogenesis: the alcohols, ketones, and other organic compounds are converted to acetate, CO₂ and H₂
- Methanogenesis: conversion of acetate, CO₂ and H₂ to methane gas (CH₄)

Above processes take place in an oxygen free state known as an anaerobic reaction which is illustrated in the diagram below:



- The biogas production technology is basically to create an environment without oxygen (*anaerobic*) where temperature, pH, nutrition, etc. are maintained that decomposing bacteria can grow well and convert protein, carbohydrate and oil compounds into methane gas called biogas energy. In addition to this, the technology also performs other functions such as to:
 - Reduce the amount of solid waste
 - Reduce the typical odor of original waste
 - Produce a cleaner processed fluid waste
 - Increase useful solid nutrients, and
 - Reduce pathogens of the original waste



Installation of biogas production system at Sadap village



Installation of biogas production system at Sadap village

- The biogas production system installed at Sadap village consisted of:
 - A digester of 17 m³ capacity, commissioned by PT Swen Inovasi Transfer, a competent firm from Bogor, West Java.
 - A pig stall with a capacity to house up to 40 pigs that would produce dungs or manures as the raw material of biogas energy.
- During the immediate months of the installation of the production system, while still in small volume, production of biogas energy was successful, which was used by some households for cooking and lighting. After months, however, the biogas production system had ceased to function due mainly to:
 - Weak commitment and ownership of the villagers
 - Insufficient volume of manure by both pigs and long-house residents.

- Damaged biogas installation including broken pipes and leaking waste containers for poor maintenance by villagers
- Weak capacity of the village institution tasked to manage the biogas production system
- The troubleshooting actions taken by the Project and BKNP authority were:

- To enhance commitment and ownership of villagers to the biogas program for which a door to door dialogues was conducted.
- To increase volume of pig manure by increasing the number of pigs for which the pig stall had to be renovated in accordance with the cage design preferred by the villagers. It is to be noted that the pigs expected to produce manure were owned by villagers and many pigs died, the villagers argued, because the cage was wrongly designed.
- To raise 3-4 cows to ensure stability and sufficiency of manure production.



Raising pigs to produce manure for biogas production

- To repair or replace damaged biogas pipes and manure containers to ensure a steady flow of manure from the pig/cow cages to the containers and digester.
- To strengthen capacity of the Biogas Management Unit (BMU) by involving the Head of village and Long house leader (Tuay) as personnel of BMU, improving communication and coordination between BMU and villagers and local park officials and introducing a feasible incentive mechanism for BMU members through benefit sharing of cow raising.



Raising cows to produce manure for biogas production

- The troubleshooting process took a long time to complete resulting in idle status of the production system for nearly two years. Among the important lessons learned from above mentioned problem include:
 - Strong commitment of local community to any development program has to be first sought for and obtained prior to making any investment in physical construction; in this manner, strong ownership of the villagers on the initiative will be secured and operational management eased.
 - A strong commitment could be secured only if the community truly understood the purpose of introduced program and its long-term contribution to livelihood.
 - Appointment of BMU personnel should be made taking competence and representativeness into account.
 - Coordination between the Community, BMU and Park officials must be kept strong over time through continued communication and coordination.

- The underlying cause of the problem was incomplete, premature pre-conditioning process, i.e. insecure commitment and ownership of villagers, which proved costly to repair thus should be avoided from happening.
- Today, the production of biogas energy is already at a steady state; biogas is produced continuously in sufficient volume. Utilization of the energy for livelihood of Sadap community, the sincere intention of introducing the biogas energy program, has been initiated. As the first move, 3 NTFPs have been selected for utilization: Aren (*Arenga pinnata*), bamboo shoot and locally available fruits, durian and papaya. Interested community members, mostly women and girls were trained on the makings of organic brown sugar from aren, chips from bamboo shoot and cakes from durian and papaya fruits.



Brown palm sugar making through cooking of palm liquid using biogas at Sadap

ii. Training on the utilization of biogas in the processing of NTFPs

• Production of organic brown palm sugar

- Traditionally, aren fluid has been processed to yield tuak, a traditional liquor for local consumption and for sale at local market; in this way, value added is obviously low, with price of fluid at around IDR 3,000 per litre.



Community produced organic brown palm sugar

- If converted to organic brown sugar, the value added is much higher as one kilogram of sugar, can be made of 5 litres of aren fluid at around IDR 15,000, but sold for IDR 30,000 – 40,000 at bordering market in Sarawak.
- Conversion of aren fluid to sugar is basically accomplished through cooking using the biogas produced under the biogas program, practically at no cost.
- Some 30 community members had been trained on the aren fluid cooking techniques and able to produce quality brown sugar.
- To legally market the sugar, however, the community has to obtain home industry permit from local authority. Such a permit (PIRT) certifies that the product made and sold has met the standards of quality set by



Conversion process of palm liquid into brown sugar

the government thus is save for consumption. This licensing process was completed towards end of the project.

- A separate technical document on the training of villagers on palm sugar and processing technology is available with the EA.

• **Production of bamboo shoot chips**

- Bamboo shoot, locally known as “rebung” is young bamboo that appears on the surface of a clump base; it is widely classified as edible vegetable. Rebung is cone-shaped and its outer rim is usually covered by lugut (bamboo hair) that causes itchy when exposed to skin.



Harvested bamboo shoot for chip making



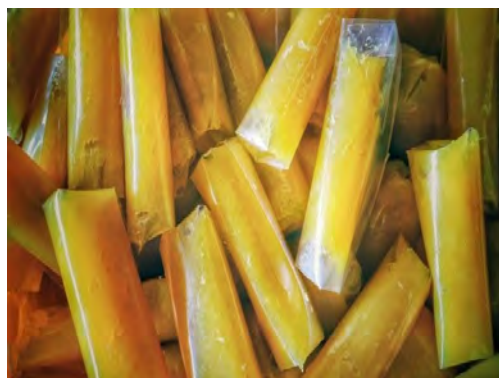
Identifying bamboo shoot for harvest

- Bamboo shoots can be harvested all year round but big harvest occurs during rainy season as bamboo shoots grow easily and sprung almost in every clump. While many bamboo species grow widely around Sadap village, not all species are edible because of the bitter taste.

- Nowadays, bamboo shoots are generally sold in whole or in thin slices at varying prices yet with low value added. Processing shoot using simple technology is intended to increase value added accruable to villagers. Needed processing equipment and ingredients are usually available around home.
- Some 31 villagers of Sadap and Kelayam, a neighboring village, have been trained on skills needed for production of dry sliced bamboo shoot and the making of chips.
- A separate technical document on the processing of bamboo shoots and training on processing skills is available with the EA.

• **Production of fruit cakes or dodol**

- Two kinds of cake were chosen for development based on local availability of fruits and marketability, namely durian cake and papaya cake. Durian fruits are available seasonally but papaya fruits are available year round around the settlements. In this manner, cakes can be produced continuously using the technologies that are basically the same for processing durian and papaya fruits.



Durian fruit cake

- Nowadays, durian fruit is fermented to yield tempoyak, used as the ingredients of traditional pastries such as gelamai or jenang, used in the making of candies, ice cream or mixing ingredient of different types of fresh drink or consumed the pulp directly. In fact, dodol durian or durian cake is another food that can be stored for a relatively long period without compromising the quality and taste.
- As regards papaya, the fruit is widely consumed directly as a dessert. The fruits are commonly only available in local markets at relatively low price. Converting papaya into dodol is an attempt to diversify its use and increase value added.
- Some 31 villagers have been trained on the technologies for making dodol papaya, mostly women.



Processing fruit cake of papaya

Notes: A separate technical report detailing process on above trainings and technical manuals for processing are now available with the project.

iii. Semah fish raising under tagang system

Conduct of training on development of tagang system for raising semah fish was presented in the preceding part of this report. This activity was implemented in Sarawak and West Kalimantan jointly by FDS and BKDSNP (see Section 2-2b (v)).

iv. Diversification of bamboo shoot products



Bamboo shoot stripping/debarking

distribution, species and volume. This activity was intended to convince the communities that raw material for making bamboo shoot chips is available around the corners of their villages.

Training on the making of chips of bamboo shoot has been conducted involving two villages and its implementation process was outlined in previous Section. In addition to chip making a survey on bamboo growing stock in the two villages was also conducted in a collaborative manner. The main purpose of this survey is to gather general information on availability of bamboo shoots in terms of



Bamboo shoot chips

Another activity carried out was a short training on harvesting techniques for bamboo shoots including identification of edible bamboo shoots, basic harvesting techniques and pre-treatment of the shoots harvested. The main purpose of this activity was to minimize unnecessary waste due to harvesting of wrong species and practicing of inappropriate techniques.

Yet another activity implemented was a quick demonstration on bamboo planting covering aspects of planting materials, i.e. criteria and source of material, techniques for site preparation and planting of propagules. The main purpose of carrying out this activity was to educate villagers on the essence of sustainability; that harvested shoots must be replenished through planting in order to ensure sustainability of shoot availability in the long-run.

4.2.2. Developing community-based ecotourism programmes in transboundary ecosystem (Activity 3.2)

This activity consisted of 5 sub-activities, namely:

a. To conduct a study on village-based ecotourism

The study had been completed and a full report is available with the Executing Agency in both English and Bahasa Indonesia versions. The study, which dealt with feasibility of developing village tourism at Tekelan area of BKNP, made the following recommendations:

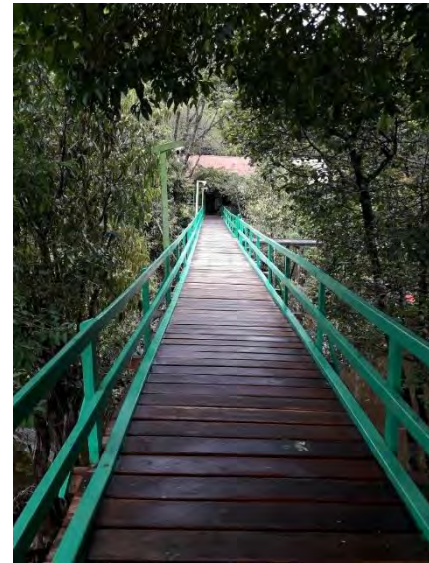
- There is a need to identify and coordinate major stakeholders of village ecotourism at Tekelan area which include: community groups and government as well as private sectors.
- Ecotourism training modules have to be tailored to conform with characteristics of the stakeholders identified and local ecological as well as institutional settings of Tekelan area, and such modules have to be applied continuously.
- It is crucial to identify ecotourism activities and job opportunities that directly or indirectly promote ecotourism development and provide local communities with access to eco-tourism resources.
- There is a need to formulate rules of the game concerning business opportunity and incentive for local communities involved in ecotourism development.
- Continuous mentoring of local communities is required for empowering them in tapping business opportunities for better livelihood.
- Promotion of ecotourism business models should be accomplished in accordance with local needs and capacity of local communities enhanced in ecotourism business development.
- BKNP and local government authorities should not pay attention to only positive impacts of Tekelan village ecotourism development but also to potential negative impacts brought about by the development.
- There is a need to develop code of conduct for local communities to adhere to the operational management of village ecotourism in Tekelan area.

An engineering design of Tekelan village ecotourism had been developed by BKDSNP with the assistance of a competent national consultant. Commencement of operational stage is now subject to availability of funds.

- b. To develop partnership for ecotourism development
- c. To promote ecotourism

Above two activities (b and c) had been implemented in an overlapping manner at 3 different villages.

- At Tekenang, the rotten wooden bridge connecting the guest house with boat harboring points, about 80 meters in length, was repaired with the assistance of Tekenang Fisherman Association that it is now safe for visitors and other pedestrians to walk on.
- At Kedungkang, a mid-term Action Plan (MTAP) for Community-based Ecotourism Development had been formulated with the assistance of a local NGO, KOMPAKH, specializing in ecotourism development. Implementation of the Action Plan is now subject to availability of funds.
- At Sadap, the project assisted in revitalizing the longhouse on a collective, voluntary (gotong royong) basis covering improvement of walking paths inside and outer border of village complex, removal of obsolete buildings and organization of dialogues on needed skills and facilities for tourist servicing.



Renovated wooden bridge at Tekenang

- d. To strengthen involvement of women in ecotourism development

- To strengthen involvement of women in ecotourism development, a training workshop on operational management of homestays and lodges has been organized collaboratively by BKDSNP and District Government of Kapuas Hulu on 30-31 January 2018 and attended by some 34 trainees, mostly women, representing 19 villages in 3 sub-districts of Kapuas Hulu.



Training of women and girls on homestay and lodge operational management

- e. To organize 2 FGDs on the promotion of ecotourism.

This particular activity was implemented in the form of discussion sessions under the activity on MTAP development by KOMPAKH.

4.2.3 Conducting awareness campaign on conservation amongst local people in border areas (Activity 3.3)

This task was accomplished with the assistance of a local NGO, SIPAT, specializing in transboundary community development. The NGO was intensively guided by WWF Kalimantan. Several works carried out by SIPAT include:

- i. To collect information on ecological, social and economic aspects of forest landscape at border areas.

On ecological aspect, data on forest landscape in general covering flora and fauna, forest types and ecosystems were obtained from existing secondary sources. On social aspect, profiles of social groups residing in the border areas were identified, which consisted of Punan Bukat, Iban, Kantu, Tamambaloh and Kayan dayak group. On the utilization of forest resources it was found that cultivation of lands with crops, timber production, fish catching, traditional gold mining, natural gaharu hunting and collection of walet bird nests were among the preferred activities by border communities.



Learning on using a forest survey navigating device

- ii. To develop dialogue material using ESE data and information collected.
 - Material for dialogue identified include: local issues and challenges, how to analyze issues and challenges, how to identify solutions and rank them based on availability of resources.

- iii. To identify appropriate communication strategy
 - Community participation is essential for forest resource conservation which can only be obtained through dialogue or communication. Level of participation obtained is very much dependent on the communication strategy adopted.



Discussing a local conservation issue

- The strategy piloted were direct interview, group discussion and general or plenary discussion. It was found that combining personal interview and discussion at group level was the most appropriate strategy to use as some community members lack of confidence to speak up at group level.

- iv. To assess level of awareness on biodiversity conservation
 - SIPAT did not attempt to develop scientific method or technique for measuring level of awareness but using conventional method, i.e. questionnaires. To be fruitful, questionnaires must be structured in two groups of question: the first group was meant to measure general level of awareness on primary issues while the second group is to measure level of knowledge on specific issues.
 - Using questionnaire technique it was found that level of awareness of Iban people in border areas on biodiversity conservation was low as evidenced by the fact that some of 24 respondents still questioned on the benefits of conservation for local communities.
 - Results of questionnaires depend on the quality of the questionnaires used. Developing appropriate questionnaires is not an easy task; it involves several stages, including: a) defining objective of the questionnaire, what information is expected to, b) types of question to ask (open, dichotomic, multiple choice, etc.), c) clarity of question, d) number of question, target respondents, and confidentiality of respondents.

v. To assess traditional sources of income

Iban community leaders and members from Batang Lupar sub-district were involved in this exercise; 17 local wisdom-based land use types were identified as sustainable sources of income.

vi. To obtain formal commitment of indigenous people to biodiversity conservation

The commitment was reflected in sustainable income-generating activities that are not harmful to biodiversity and environment.

4.3. Achievement assessed

- Outcomes of individual activities implemented, including sub-activities under major activities, determine level of achievement in the development of livelihood of local communities. Level of achievement is to be assessed by matching outcomes of the activities implemented with the indicators defined in the LFM presented in the project document.
- Defined indicators of Output 3 “improved livelihood of local communities” were:
 - i. Development of eco-farming and NTFPs implemented in 2 villages.
Under the project, generation of biogas and its utilization in the processing of NTFPs were demonstrated. The Sadap and Kelayam communities had been trained on the making of brown palm sugar, fruit cakes and bamboo shoot chips noting that Kelayam community was not involved in the training on fruit cake making. The indicator therefore has been met.
 - ii. One programme on community-based ecotourism developed
A Mid-term Action Plan for development of community-based ecotourism at Kedungkang village is now ready for implementation. Hence, this indicator has been satisfied.
 - iii. One feasibility study on ecotourism conducted
Completion of the study at Tekelan site met this indicator.
 - iv. Coordination meeting between local government, community and private sector carried out 3 times on village ecotourism development. Such meetings have indeed been organized several times but without the presence of private sector. Therefore, the indicator was met only partially.
 - v. One set of document/video on village ecotourism produced.
Indeed, several documents and videos have been produced by the project. The indicator therefore was satisfied.
 - vi. At least 2 groups of village involved in ecotourism development.
A number of villages including Tekenang, Kedungkang, Sadap and several others were involved in the initiative. The indicator therefore was satisfied.
 - vii. One national workshop on the promotion of ecotourism conducted.
Such a workshop was not organized. Instead, a regional FGD and 2 local FGDs had been organized with the consent of ITTO. In this light, the indicator could be considered as fulfilled.
 - viii. 5 times of campaign, 2 exhibitions and 3 meetings on awareness raising on conservation among local people in border areas conducted.
Indeed, community meetings were conducted, an exhibition booth established in Pontianak during the occasion of the regional TBCA workshop and several community dialogues on conservation issues organized. In this light, the indicator was essentially met.

- Considering how the eight defined indicators were met, it is reasonable to conclude that, overall, Output 3 “livelihood of local communities improved” has not been achieved. This is a bold conclusion indeed. In fact, livelihood of local communities has not been improved. It is more appropriate to say that the process on improving local livelihood has been initiated under the project. Improving livelihood is an on-going and long process. The project just initiated the process and it has to be continued consistently, for which required inputs must be made available. One of the critical inputs is professional technical assistance; without this input, local communities can not be expected to continue practicing the knowledge and skills they have acquired from the project. Technical assistance is best to be provided not only for months but for years. Only then, that the “change” mentality promoted would become aculturized and the expected results delivered, i.e. improved livelihood.
- Indeed, local communities do not only need continued technical assistance but also material and financial inputs, at least seed capital under specific agreed-upon terms and condition.

4.4. Lessons learned

- Commitment of indigenous people residing in border areas to practicing local wisdoms in daily lives has contributed to conservation of biodiversity. Commitment to conservation can be developed through dialogues for which communication strategy pursued plays critical role.
- Among the key challenges in communicating with indigenous communities were: lack of knowledge on procedures and rules for natural resource utilization, sustainable forest management practices are not fully transferred between generations, cultural and traditional wisdoms start fading away, absence of documented village rules for natural resource utilization and disharmony of policies at different levels of government.
- Convincing local communities on potential benefits of conservation initiatives to livelihood was a resource consuming task; the convincing process can be regarded as complete when the communities have expressed commitment to supporting the initiative, preferably on written form.
- Investment in any local livelihood initiative should be made only after a written expressed commitment of target communities is obtained. The investment in biogas energy production system at Sadap village was made prior to obtaining such a commitment to the biogas initiative; the system proved inactive for almost two years for lack of commitment to use and maintain the system.



5. Developing Community-based Monitoring System for Forest Conservation

5.1. Introduction

Today, extent of the area under BKDSNP management is slightly over 900,000 hectares; monitoring of this resource is a big challenge in light of limited resource available in terms of human resource and funding. The total number of park rangers for instance by end of 2017 was only 34 persons. With such a limited human resource, future forest monitoring can not rely only on own park rangers; engaging local communities in this formidable task appears inevitable. To this end, there is an urgent need to technically empower local communities through training on forest monitoring system focusing on operational aspect.

The first attempt on conducting such training is obviously to select and recruit local community members. This process requires explanation on what benefits can be expected by recruited local people for taking part in forest monitoring task. Unless some form of incentive can be provided, local people may not be interested in the training thus not be empowered to take part in the system. For sure, a trained local villager taking part in a forest monitoring operation, is entitled for a lumpsum daily income in accordance with existing government rules and regulation. Another important incentive is the recognition as a forest stakeholder granted by the park authority; this recognition is morally important for local people. These and other forms of incentive should be made clear since the recruitment phase.

5.2. The activities implemented and results

A series of activity have been implemented to help BKNP increase its capacity in forest monitoring. Under one activity, the project allocated a limited lumpsum fund for forest monitoring operations as the state provided only a tiny amount of funds to carry out this important task. The financial support

of the project made only for the second year of project implementation. In addition, the project also made contribution to increasing capacity in forest monitoring operations through procurement of operational equipment and facilities including two units of speedboat, life vests, raincoats, boats and camping kits.

Technical training sessions were conducted at two sites involving 74 people comprising 15 BKNP employees and 59 community members. The overall objective of the trainings was to enhance capacity of local people and park rangers in performing operations of forest monitoring in BKNP and buffer zone areas. The expected outcomes of the training at completion of each training session were:



Training on community-based forest patrolling

- Deep understanding of participants on forest laws on forest conservation and protection, especially Acts no. 5 of 1990, 41 of 1999, and 18 of 2013.
- Participants gained deep understanding on the principles and elements of community-based forest monitoring system as well as its tasks and function.
- Participants acquired necessary skills for navigating forest monitoring, notably in map reading and use of compas and GPS devices.
- Participants learned on needed knowledge and skills for carrying out monitoring operations and collecting data and information.
- Participants also gained skills for reporting of unlawful activities, collected data and information and conduct of forest patrolling.

The training sessions had successfully delivered above expected outcomes. In addition, the trainings had also improved relation between BKNP employees and communities of the two villages as evidenced by the formal formation of Community Forest Patrols at Bungan Jaya and Tanjung Lokang villages that had been declared by BKNP as its partners in forest conservation monitoring.

5.3. Achievement assessed

The Indicators of achievement of development of community-based monitoring system defined in the LFM of the project were:

- i. Study on development of a community-based REDD+ project conducted
This indicator is not applicable as the planned study had been cancelled due to the financial problem then experienced by ITTO.
- ii. 10 times forest patrolling operations supported
This was accomplished through cost sharing by the Project and the Park.
- iii. Forest patrol squad well equipped to carry out operations
This was met through procurement of operational equipment and facilities by the project.
- iv. Training for personnel of forest monitoring implemented (3 sessions)
- v. Training for local communities on forest monitoring implemented (5 sessions)

Upon consultation with the Centre for Forestry Education and Training (CFET) of MOEF, training on forest monitoring for both Park Rangers and community members had been combined as both

trainings had the same objectives. The trainings had been fully implemented at two sites involving 15 Park Rangers and 59 community members. Therefore, indicators iv) and v) can be regarded as satisfied.

Overall, it is reasonable to conclude that 4 defined indicators had been satisfied; in other words, community-based forest monitoring system has been developed. It is to be noted that the Park Ranger trainees had been in the past somewhat exposed to forest monitoring and involved in monitoring operations. Through this training, however, their capacity has been enhanced. As for community members, the trainees, the training was new to them. It was found that they participated in the training sessions enthusiastically and had acquired the necessary knowledge and skills that enable them get involved in forest monitoring operations.



Evaluating conduct of training on community-based forest monitoring

5.4. Lessons learned

- i. Proper forest monitoring operations
To properly undertake forest monitoring operations, sufficient resources have to be made available in the forms of well designed operational plan, able personnel, functioning equipment and facilities as well as operational funds. Lack of either one of these resources will compromise forest monitoring operations causing irregularities that might occur in the field left undetected. Relying on external financial support to perform forest monitoring operations should be forsaken to the extent possible as the task is not escapable.
- ii. Community-based forest monitoring is strongly advisable
Conduct of forest monitoring operations by park rangers alone is a formidable task due to limited number of rangers relative to the extent of park area involved. It was found during the training process that the trainees recruited from the local communities were enthusiastic to follow the training programme. Their recruitment was perceived as an appreciation for their role as stakeholder of the park. The training, therefore, strengthened sense of ownership among the community trainees.
- iii. Training as a vehicle to enhance local partnership
It was found that the training on community-based forest monitoring has served as a vehicle to improve relation between park management and local communities. Before the training, this relation was somewhat tense and acid; after the training, partnership in forest monitoring was enhanced resulting in formation of Community Forest Patrol institution at village level wherein park rangers and trained community members will be working together in a team of forest monitoring operations.
- iv. Improved training design
The trainings on community-based forest monitoring, implemented in two sessions at two sites have successfully achieved its planned objectives. There still room to further improve design of

the training in order to be more attractive for the trainees in general, community trainees in particular. It was found that many trainees needed longer time to digest particular subjects such as forest laws and reporting. For future training, presentation of these subjects needs redesigning, to be more attractive and also to ease comprehension.



6. Discussions

6.1. Overall achievement of the project intervention

The extent to which defined project outputs have been achieved varied from one output to another and is summarized below:

- Matching the outcome of the interventions made with defined indicators of achievement indicated that cooperation between BKDSNP with FDS in TBCA management has been enhanced. As the indicators were not adequately defined, the actual level of enhancement can not be measured in precision. Implementation of the pertinent activities and the results realized, however, pointed to the fact that cooperation between BKDSNP and FDS institutions has been enhanced.
- Assessment of achievement in enhancing management planning and operations of BKDSNP was accomplished by matching results of the interventions made with defined indicators. It was found that management planning was only partially achieved while implementation of BKNP management plan has not been significantly enhanced by the project
- On livelihood development, it was found that livelihood of local communities has not been improved by the project. However, the project has initiated the process of improving livelihood through the various project activities implemented. To reach the state of “improved livelihood” this process ought to be continued by providing the necessary process inputs in terms of material, financial and technical assistance.
- As regards community-based forest monitoring system, it was found that all defined indicators had been met by the outcomes of the interventions made. Therefore, it is reasonable to conclude that the system has been fully developed.

As highlighted in the first part of this report, four outputs had been defined as the means for achieving the specific objective, i.e. strengthened sustainable management of TBCA between BKNP in Indonesia and BANP and LEWS in Sarawak State of Malaysia. Above assessment indicated that, out of four outputs, two outputs have been fully delivered while the other two outputs have been delivered only partially. It is, therefore reasonable to conclude that the specific objective was not fully achieved at completion of the project. This partial achievement was due mainly to several forces beyond control

of the project and the executing agency which included limited coverage of biodiversity survey, use of un-updated management plan, non-operational partnership agreements signed and incomplete process of local livelihood development.

6.2. Local livelihood development vs forest resource conservation

Policy makers and forest managers alike have learned, admitted and concluded through experience, observation and research, that efforts on conservation of forest resource will be successful only with the support of primary stakeholders, notably local communities. This strong proposition is attributable to several reasons as described below:

- For generations, local communities have lived around and inside forest land area that they, frequently or persistently, claim themselves as owner of the forest resource; ousting the communities from the forest lands is against the principles of fairness and humanity.
- For centuries, most local communities have relied heavily on forest resource as sustainable source of their livelihood; stopping the communities to depend their lives on forest resource is against the law of human rights.
- For the sake of sustainable forest management (SFM), several laws on conservation have been enacted and enforced by many governments including Indonesia which limit access of local communities to using forest resource as their source of income; the conservation laws have, in fact, sacrificed local livelihood.



Climbing a palm tree to harvest liquid for making palm brown sugar

Above reasons obviously do not justify the proposition made by policy makers and forest managers, i.e. conservation of forest resource can only be successful if supported by local communities; above observations clearly indicated that conservation of forest resources is basically not in the interest of local communities as conservation laws and efforts limit their old privileges and access to using the resource. In short, conservation of forest resource is making them worse-off thus it is against their traditional way of living. If so, how then the policy makers and managers could gain support of local communities on conservation? The logical option is to ensure that conservation efforts do not deprive local people; that conservation initiatives do not make local people worse-off by taking care of their livelihood while, at the same time, implementing conservation initiatives. That is to say that conservation shall make livelihood as an incentive for local communities to support conservation policy; that conservation can provide them with needed sources of income to secure their lives. This is the point where development enters conservation regime.

To ensure that local livelihood is not compromised by conservation initiatives, livelihood development initiative should be placed as an essential element of any conservation program and collaboratively

designed in order to build up strong local ownership and ease its effective implementation. Effectively implemented livelihood initiatives can significantly improve local livelihood which in turn will serve as a strong incentive for local communities to support SFM in general, conservation of forest ecosystems in particular.

6.3. Sustainable livelihood

Poor local people normally enter nearby forest for making living by collecting any forest products that can be consumed or sold. It is argued in this report, based on informal talks with local peoples at some localities and on common sense, that most poor local people will not enter the forests if they can make living outside the forests since it is indeed more comfortable for them. And by reducing forest entry, probability of doing irregular harvests or forest clearing by local people is minimized thus supporting forest conservation. Developing source of income outside forest is therefore the major task for proponents of forest conservation to accomplish and to preserve appreciation on forest resource, such sources of income developed outside forests must be sustainable.



Fish catching and processing as source of income outside the forest

To be sustainable, any livelihood initiative shall produce goods or services that are marketable at profit. To be marketable at profit, any good or service sold must have competitive advantages as similar products or substitutes are usually already sold in the same market, unless the new products sold are unique, newly invented that no substitute yet exists around.

To be competitive, a good or service must be produced in a cost efficient and quality manner and supplied in a continuous fashion. Efficiency, quality and continuity of supply are therefore the heart of market competitiveness that must be understood and practiced by any local livelihood endeavour in order to be sustainable for simple reason. To sustain the initiative, re-investment is required overtime for payment of necessary inputs, e.g. raw materials and wages, and overhead costs; and source of this re-investment is the product marketed, i.e. proceeds of product selling. It must be clear at this junction that any livelihood endeavour is sustainable only if the products made are marketable at profit.

Making a “marketable at profit” good or service of NTFP is new experience to most, if not all, local peoples as they were familiar only with collecting and harvesting for generations. Therefore, local people have to be trained on the conversion of NTFPs, into marketable products. Such a training, however, should not only teach on mastery of needed skills but also has to introduce and practice the aforementioned heart of market competitiveness since the onset of livelihood development process. Indeed, it is a big challenge for managers of livelihood programs to overcome because it is paid off only in the mid-term.

By the time a community is able to market the products they made at profit, that is exactly the right time for any external sponsor to leave the community on their own feet. In other words, the right exit strategy for any livelihood development assistance is ability of assisted community to market at profit the products they have been trained on making.

6.4. Development of livelihood under the project

Several activities implemented under the project meant to improve local livelihood were production of brown palm sugar, fruit cake and bamboo shoot chips: all three products at Sadap village and the third product also at Kelayam village. The activities involved training on needed production and marketing skills. Have these activities resulted in improved, sustainable livelihood of the communities involved? The answer is obviously “no”; the communities have not been able to market the



Cake made of durian fruit

products they made at profit. In fact, the products have been placed in the local markets on a trial basis; as such it is too early to conclude if the products are marketable, not to mention about profit, for at least four reasons, taking the livelihood development at Sadap village as a point in case.

Firstly, the project intervention had focussed only on technical aspect of the product. The production costs of each product were not exactly known for different levels of production volume that selling price for making profit remains unclear. Secondly, to market a product of home industry requires a special permit by local government called PIRT (Perijinan Industri Rumah Tangga) which specifies hygienic and quality attributes that have to be met by the product. Obtaining PIRT involves bureaucratic and technical processes that the communities are unlikely able to complete without external assistance. Thirdly, marketing a product involves packaging and marketing efforts that also require financial and technical inputs the communities may fail to complete without an external assistance. Lastly, an institution at community level in charge of home industry management has not been established. A community-based home industry, to be sustainable, involves buying of inputs and selling of products, distribution of income, etc. When the endeavour is making a profit, any community member will take the position as a profit share holder although she or he might have not contributed anything to the profit making process; in contrast, if the endeavour is at loss, no community members will act as a loss taker. Therefore, it is crucial to establish and operate a community institution to be tasked responsible for managing the community undertaking in accordance with the rules of the game developed and agreed upon by community members.

On above analysis it should be reasonable to conclude at this juncture that ITTO Project PD 617/11 Rev. 4 (F) was not able to develop a sustainable community-based livelihood endeavour at its

completion; the project had ended before the target communities have built up the capacity to market the products they make at profit. Can then one conclude that the project failed to achieve its planned output, i.e. improved livelihood of local communities? Using “ability of the communities to market product(s) at profit” as the only criterion, the answer is “yes”; the project indeed failed to deliver the intended output. But the answer is “not failing” if the impacts of the project interventions on local livelihood development are also taken into account as highlighted below:

- Through the time-consuming dialogue, the villagers had been convinced on alternative sources of livelihood to collecting and harvesting of forest products; that income can be generated outside the forest, in fact right at the village area through processing of NTFPs. Indeed, this change in mentality is an invaluable social asset for transfer of technologies.
- The villagers had acquired needed skills for processing of NTFPs and making products for sale and generating income. Indeed, the skills are invaluable social-economic asset in the long run as a tool for generating income subject to availability of other factors of production, i.e. raw material and capital.
- The project has installed needed equipment and facilities for producing sufficient and steady biogas energy with the support of Sadap community. Indeed, availability of energy is an essential economic and ecological asset that can be used to process NTFPs at practically zero cost in the long run.
- The project had, in a collaborative manner, developed a mid-term action plan for ecotourism development at Kedungkang village which is a strong basis for moving forward in developing village-based ecotourism industry in Danau Sentarum area, as an alternative source of sustainable income.

Above information indicated that the project had, in fact, paved the way for development of local livelihood by initiating several relevant livelihood-related activities. These livelihood activities may have not generated income nor improved lives of the communities today but will be if they are continued in a consistent manner. The endeavour at Sadap, Kelayam and Kedungkang villages should be viewed as the initial step of local livelihood development that will bear fruits in the mid to long term if, and only if, the next steps are properly undertaken. It must be now clear that the project has indeed not improved local livelihood yet but had laid down a foundation for moving forward on livelihood development.

6.5. Lessons Learned

The lessons learned from the project implementation processes are highlighted at the end of parts 1 through 5 of this report. Most important ones are summarized below:

- i. Operational planning for any activities to be jointly executed by two or more countries is best accomplished through organized official meetings well in advance in order to avoid misunderstanding and minimize possibility for revision.
- ii. Visit to project site and on-site discussions proved able to enrich practical knowledge of the persons involved in an efficient manner.
- iii. Accuracy and validity of biodiversity data collected are highly dependent on field survey design and quality of the surveyors involved, notably the species marker.

- iv. Local community leaders have no capacity to develop their own livelihood development program that forming partnership of local NGOs with them perhaps is the best strategy for development of sound local livelihood programs.
- v. Patient and professionalism are needed in the process of convincing local communities on a new initiative which otherwise will result in weak commitment and ownership.
- vi. Investment in a local livelihood initiative should be made only after obtaining strong commitment of the local communities to support the initiative in order to avoid wasting of socio-economic asset and downgrading of mentality of the people involved.
- vii. Community-based forest monitoring system is perhaps the best strategy to pursue for accomplishing monitoring task in a least costly yet productive manner.
- viii. Prior to involving local people in forest monitoring operations, technical training are required which also can serve as a vehicle for enhancing relationship between trainees and furtherly between the park and the community as well.



Selected project activities on local livelihood development



7. Conclusions and Practical Implications

- i. Overall, the project has contributed to enhancing conservation management of BKDSNP through strengthened cooperation between BKDSNP Agency and FDS, updated biodiversity data on BKNP as well as enhanced management operations, laid down foundation for improving local livelihood at selected villages and developed system for community-based forest monitoring. While the contributions may not be significant relative to expectation of the park agency and stakeholders, similar future project is surely needed by BKDSNP. Consequently, there is a need to develop a project proposal on further enhancement of sustainable management of BKDSNP. Such a project should build on findings of Project PD 617/11 Rev. 4 (F).
- ii. The project has contributed to enhancing cooperation between BKDSNP Agency and FDS in conservation management of protected areas through joint implementation of the relevant activities jointly defined by both parties. Significant elements of enhanced cooperation include better mutual understanding on national policies and priorities on protected area management, appreciation of constraints to technical cooperation, mutual benefits of sharing experience and information and recognition on requirements for planning of joint operations. To sustain and further enhance the cooperation, future TBCA initiatives should not overlook but ought to emphasize on identification of relevant activities for joint implementation.
- iii. Contribution of the project to enhancing management planning and operations of BKNP had been limited due mainly to the confined area covered in the survey of biodiversity and funding constraint. BKDSNP Agency should make its utmost effort to update data on biodiversity of the parks using both state and externally sourced funds. Survey on biodiversity should cover the entire area of BKDSNP. Considering the distinct and unique nature of Danau Sentarum ecosystems, development of a separate management plan for this park is strongly advisable.

- iv. The project had initiated several activities on community livelihood development including training of villagers on the making of brown palm sugar, fruit cakes and bamboo shoot chips; formulation of mid-term action plan for community-based ecotourism development at Kedungkang village, sufficient and steady supply of biogas energy at Sadap village, training on homestay and lodge operational management, etc. While these activities had not improved local livelihood, they had laid down foundation for moving forward. Consistent implementation of follow-up actions should result in improved livelihood in the mid-term. This is a big challenge for BKDSNP Agency and requires sufficient and timely available resources.
- v. Contribution of the project to developing community-based forest monitoring system was significant. In total, 15 park rangers and 59 community members had been trained on forest monitoring skills. It was found that the communities of Tanjung Lokang and Bungan Jaya sincerely appreciated recruitment of villagers as trainees whom could work with their park ranger counterparts in one forest patrolling team. It is important for BKDSNP Agency to function the established Community Forest Patrol institution in order not to lose the gained support of local communities on forest conservation program.

Annex 1. Letter of Intent

Letter of Intent

We, the undersigned, intend to shortly commence with the implementation of particular activities under ITTO Project PD 617/11 Rev.4 (F): Promoting Biodiversity Conservation in Betung Kerihun National Park (BKNP) as The Trans-boundary Ecosystem between Indonesia and State of Sarawak Malaysia (Phase III). The activities annexed herewith have been jointly defined by representatives from Betung Kerihun National Park (BKNP), Lanjak Entimau Wildlife Sanctuary (LEWS) and Batang Ai National Park (BANP) during the meeting held on 22 April 2015 at Forest Department Sarawak (FDS) headquarters in Kuching.

Needed funds for implementing the said activities are to be sourced mainly from the ITTO Project 617/11; as required, FDS may provide partial contribution to selected activities.

To expedite implementation process, Project Coordinator of ITTO PD 617/11 Rev. 4. (F) should directly liaise with the FDS assigned staff in the planning and execution of activities, noting that BKNP and FDS Offices should be kept informed of any progress made.

Signed in : Kuching
Date : 5 November 2015




Arief Mahmud
Director of BKNP

Signed in : Kuching
Date : 5 November 2015




Haji Sapuan Ahmad
Director of Forests Sarawak

Annex 2. Joint TBCA activities identified by BKNP and FDS for implementation

1. To carry out on-the-job training on park management skills
Contact person(s) : Mr. Francis Gombek of SFC
2. To carry out training on eco-tourism tour guiding
Contact person(s): Mr. Francis Gombek of SFC and Ms. Latifah Teh of FDS
3. To exchange experience in implementation of community empowerment activities
Contact person(s) : Ms. Zarina Shebli and Dr. Paul Chai
4. To conduct a collaborative research and joint publication on Orangutan
Contact person(s) : Mr. Francis Gombek of SFC
5. To promote eco-tourism in West Kalimantan and Sarawak
Contact person(s): Ms. Latifah Teh of FDS
6. To carry out training on Tagang Fishery
Contact person(s): Ms. Zarina Shebli
7. To assist local communities in producing quality *gaharu* wood
Contact person(s) : Ms. Zarina Shebli
8. To produce a common map of BKNP, LEWS and BANP to facilitate planning of joint forest patrol operations in bordering areas
Contact person(s) : Ms. Zarina Shebli and Dr. Paul Chai

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