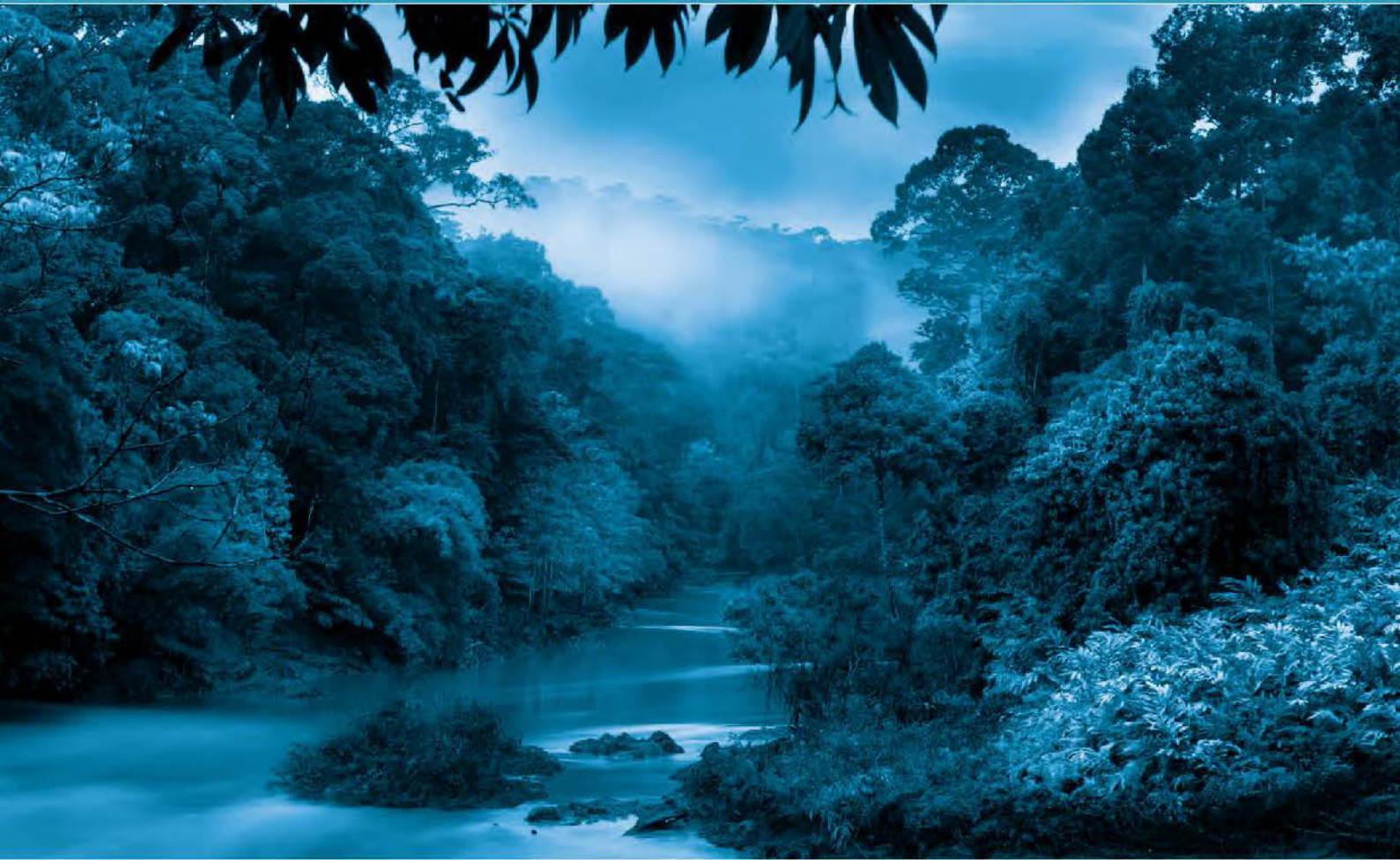


# REPORT

MARCH 2015



Economics of  
River Basin Management toward  
Sustainable Development for  
Biodiversity and  
Ecosystems Conservation  
in Sabah



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## Preface

In Sabah, around 53% of the total state land is designated as protected area or conservation site within which human activities are strictly regulated. A large scale plantation industry has been put in place and population growth has been the threats for natural resources around and near the border of protected area and conservation site. There have been increasing needs to develop new incentive mechanism for the better natural resource management.

In the meantime, regardless of rapid economic development in Malaysia, Sabah is still suffering from poverty. Most of the needy people live in the mountainous area, thus rural development for poverty eradication is essential for human well-being. Sabah needs to pursue way toward a society in harmony with nature where harmonization between conservation and development can be realized. Sabah has some outstanding management systems like land-use control and environment awareness programme (Environmental Education). In order to promote environment-friendly and sustainable development more, integrated and innovative approaches are indispensable.

Considering the above-mentioned matters, JICA-SDBEC conducted the study on “Economics of River Basin Management for Sustainable Development for Biodiversity and Ecosystems Conservation” from December 2014 to February 2015. This report presents current situation in Sabah and challenges as well. Particular attention was paid on Croker range Biosphere Reserve (UNESCO MAB) where harmonization between nature conservation and livelihood improvement for people need to be explored. Some future recommendations including possibilities of establishing new economic incentives are compiled in the report. These recommendations are offered as tentative options only to stimulate further discussions among relevant multiple stakeholders in Sabah.

I am hoping that this report can provoke next actions by Sabah State Government.

Lastly, I would like to thank all relevant stakeholders and partners for their cooperation to prepare the report. Special thanks should be given to Dr. Jiro Iguchi, PADECO Co., Ltd. for his tremendous efforts and strong supports.

Kazunobu Suzuki  
Chief Advisor, JICA-SDBEC

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## List of Abbreviations

ABS	Access and Benefit Sharing
BBEC	Bornean Biodiversity and Ecosystems Conservation Programme
BBOP	Business and Biodiversity Offsets Programme (BBOP)
CBD	Convention on Biological Diversity
CCA	Community Conserved Area
CRBR	Crocker Range Biosphere Reserve
CRP	Crocker Range Park
CUZ	Community Use Zone
DID	Department of Irrigation and Drainage
DoA	Department of Agriculture
DOE	Department of Environment (Federal)
EE	Environmental Education
EPU	Economic Planning Unit
EPD	Environmental Protection Department
FiT	Feed-in-Tariff
FSC	Forest Steward Council
GEF	Global Environment Facility
HoB	Heart of Borneo
ICCA	Indigenous and Community Conserved Area
ITBC	Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
JKKK	Village Security and Development Committee
K-CoL	Kinabatangan Corridor of Life
KiTA	Kinabatangan Corridor of Life Tourism Operator Association
KPLB	Ministry of Rural Development (Sabah)
LIGS	<i>Lembaga Industri Getah Sabah</i> /Sabah Rubber Industry Board
MSPO	Malaysian Palm Oil Council
MAB	Man and Biosphere Programme, UNESCO
MPOA	Malaysia Palm Oil Association

MOSTI	Ministry of Science, Technology and Innovation, Malaysia
NGO	Non Governmental Organisation
NRO	Natural Resources Office
PES	Payment for Ecosystem Services
RSPO	Roundtable on Sustainable Palm Oil
REDD+	Reducing Emissions from Deforestation and Forest Degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
SDBEC	Sustainable Development on Biodiversity and Ecosystems Conservation in Sabah
SDC	Sabah Develop Corridor Blueprint
SEDA	Sustainable Energy Development Authority of Malaysia
SEDIA	Sabah Economic Development and Investment Authority
SFD	Sabah Forestry Department
TEK	Traditional Ecological Knowledge
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UPM	Universiti Putera Malaysia

# Chapter 1: Introduction

## 1.1 Background of the Study

The Japan International Cooperation Agency (JICA), the State Government of Sabah and Universiti Malaysia Sabah (UMS) jointly implemented the technical cooperation project, entitled “Sustainable Development for Biodiversity and Ecosystem Conservation in Sabah” (SDBEC). The project purpose of SDBEC is as “Promotion of Sustainable Development.” In the Project Design Matrix (PDM) of SDBEC, an activity concerning Payment for Ecosystem Services (PES) is planned to achieve the Output 2 “Sabah’s experiences are shared nationally and internationally for biodiversity conservation and sustainable development” as follows: -

*Activity 2-2: To undertake study on possible sustainable financing mechanisms for biodiversity (i.e. the payment for ecological services (PES), biodiversity accounting, rationalisation of incentives and taxes for sustainable development, REDD+, CSR and strengthening of the Biodiversity Centre Fund, etc.)*

As a part of the above activity, JICA commissioned PADECO Co., Ltd. to conduct the Study on PES for SDBEC, then their consultant, Dr. Jiro Iguchi was dispatched as “an expert” in economic incentives for river basin management.

In addition, the study aims at contributing to the management of “Crocker Range Biosphere Reserve” (CRBR). Under SDBEC and its preceding Programme (Bornean Biodiversity and Ecosystems Conservation Programme/BBEC2), JICA assisted the management of Crocker Range Park (CRP), which is a catchment area for the populated west coast of Sabah. In June 2014, CRP and its surrounding areas were designated as CRBR under Man and Biosphere Programme (MAB) by UNESCO. The State Government of Sabah plans to formulate a management plan for CRBR.

The CRBR consists of three zones, such as the core area (CRP and the forest reserves), the buffer zone and the transition area. In its buffer zone and transition area, sustainable development for biodiversity conservation is critical, as some areas even nearby the core area are occupied by large scale plantations. To achieve comprehensive natural resources management in the buffer zone and transition area, introduction of economic incentives and market-based mechanism including PES would prove to be an effective measure, in addition to the conventional command and control by the government and the voluntary control which has been applied in Sabah.

Furthermore, currently UNDP-GEF is assisting a project entitled “Biodiversity Conservation in Multiple-use Forest Landscapes in Sabah, Malaysia”. One of the 12 subcontracts (SC-4) for the project is to support the development of new state-level policies and regulations for PES and pilot implementation of PES within the demonstration area. The subcontract will approximately be started in October 2015 for a duration of 4 years.

## 1.2 Objectives of the Study

In line with the above background, the objectives of the study are defined as follows: -

- To collect information and analyze policies, strategies, plans and implementation of PES and other economic incentives for biodiversity conservation and river basin management in Sabah.
- To present recommendations on designs and feasibility of PES and other economic incentives for biodiversity conservation and river basin management in CRBR. (The recommendations should also contribute to the development of state-level policies and regulations for PES assisted by UNDP-GEF.)



### 1.3 Detailed Work Plan

The study was implemented following the detailed work plan as follows.

Task1: Preparation (in late Nov. 2014)

1-1 The reference literature was reviewed to determine information to be collected in the field study.

1-2 Advanced practices of PES (both domestic and international) were identified and screened for applicability to the natural and socioeconomic conditions in CRBR.

1-3 An inception report was prepared, in Japanese and also in English and submit it to the Global Environment Department, JICA.

Task 2: Field study (in early and middle Dec. 2014)

2-1 During the field study, the expert had discussions with SDBEC Chief Advisor as often as required to agree on the implementation plan of the study and to have their comments on information collected and analysed by the study.

2-2 The expert interviewed the concerning agencies and organisations, and efficiently collected information.

The respondents of the interview survey and information collected include: -

- Natural Resources Office: comments and confirmation on the study plan, current status of CRBR management plan, on-going and planned activities on economic incentives for biodiversity conservation, arrangement of the final reporting of the study, progress of the PES policy formulation under the UNDP-GEF project, etc.
- Sabah Parks: comments and confirmation on the study plan, current status of CRBR management, on-going and planned activities on economic incentives for biodiversity conservation, etc.
- Sabah Forestry Department: progress of the PES policy formulation under the UNDP-GEF project, progress of on-going and planned activities by the Department for PES such as Malua Biobank, REDD+, studies on PES, forest certificate, etc.
- Sabah Biodiversity Centre (SaBC): a role of SaBC for introduction of PES to Sabah and management of CRBR, current status of ABS in Sabah, etc.
- Ministry of Rural and Entrepreneurial Development (Kementerian Pembangunan Luar Bandar Sabah/KPLBS): Status and monitoring system of poverty and poverty alleviation in CRBR, reconfirmation and updating of the facts on poverty alleviation in Sabah, feasibility of branding products in CRBR, etc.
- Sabah Economic Development and Investment Authority (SEDIA): Classification and strategy for development of the area overlapping with CRBR in Sabah Development Corridor Blueprint, etc.
- Rural Development Corporation (Korporasi Pembangunan Desa/KPD) including OISCA Sabah: Status of rural development in CRBR, reconfirmation and updating of the facts on rural development in Sabah, feasibility of branding of products in CRBR, etc.
- Department of Agriculture Sabah: Status of rural development in CRBR, reconfirmation and updating of the facts on rural development in Sabah, feasibility of branding of products in CRBR, etc.

- Sabah Wildlife Department: on-going and planned activities on PES, etc.
- Department of Irrigation and Drainage: Feasibility of PES through water supply service in CRBR, etc.
- Jetama Sdn. Bhd. (a concessionaire for water supply service in the west coast of Sabah): Feasibility of PES through water supply service in CRBR, etc.
- Sabah Fisheries Department (as promoting agency of “Tagal”): Feasibility of PES utilizing Tagal, etc.
- Sabah Tourism Board: Status of tourism in CRBR, feasibility of PES through tourism in CRBR, etc.
- Malaysia Palm Oil Association: status and problems as a member of RSPO, etc.
- Environmental Protection Department (as a secretary of SEEN): environmental education as a tool of river basin management and PES, etc.
- Institute of Tropical Biology and Conservation, Universiti Malaysia Sabah: environmental education as a tool of river basin management and PES, etc.
- Lands and Surveys Department: Legal restrictions for institutional design of PES, etc.
- District Offices overlapping with CRBR (Penampang, Papar, Beaufort, Keningau, Ranau, Tuaran) and Kota Kinabalu City Hall (Dewan Bandaraya Kota Kinabalu/DBKK): Status of rural development in CRBR, reconfirmation and updating of the facts in the draft buffer zone management plan of CRBR in 2011, etc.

2-3 The expert visited the site Kg. Tudan, the pilot project site for management of CRBR under SDBEC where traditional hillside farming, organic farming, beekeeping, and composting are carried out.

2-4 Based on the analysis of the gathered information, the expert prepared recommendations for introduction of economic incentives and market-based mechanism for biodiversity conservation. At first, ecosystem services in CRBR that could be targeted by PES were identified, such as water supply, erosion control, tourism value generated by rare species, etc. Institutional design (mechanism) for payment to the ecosystem services with some options were discussed, such as collaboration with the palm oil industry, electricity companies, the tourism industry, etc., creation or allocation of fund for PES, taxation, subsidies, transfer of development rights including biodiversity offset, etc.

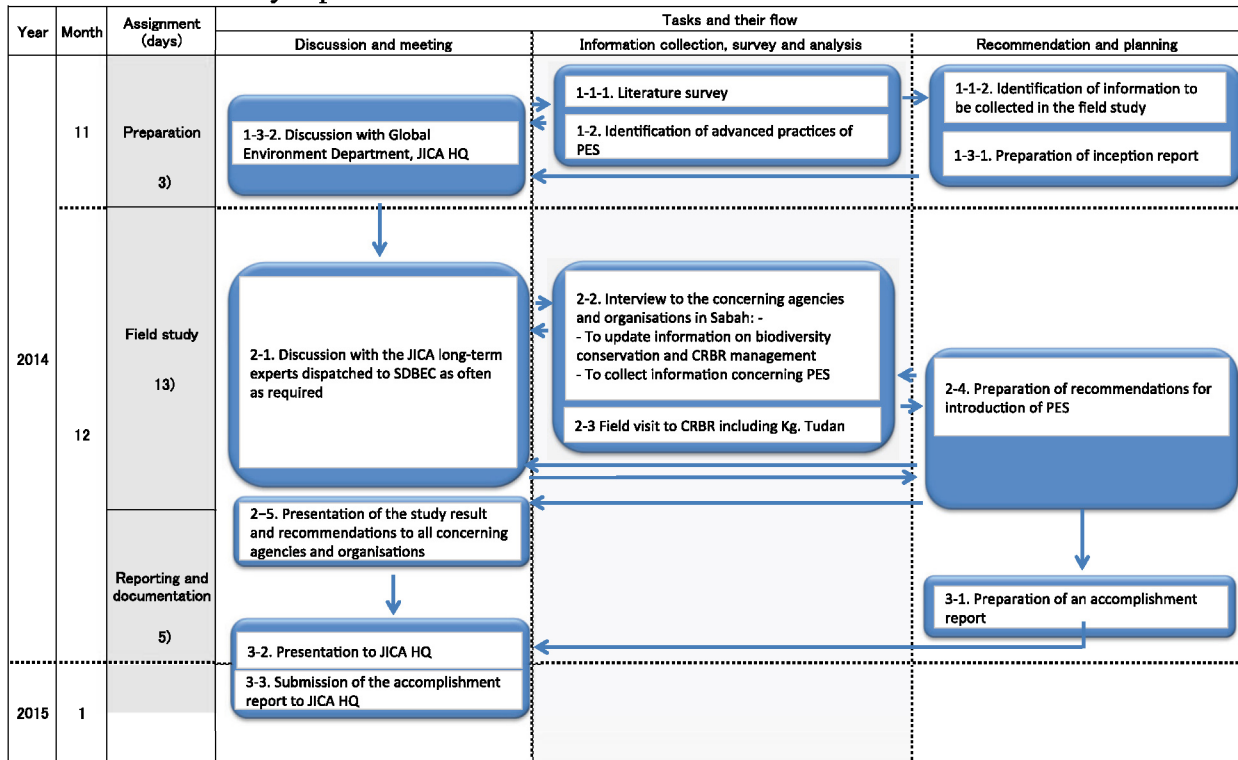
2-5 The expert presented the study result including the recommendations above at a final reporting where all the agencies and organisations concerned in the management of CRBR were presented.

Task 3: Reporting and documentation (in late Dec. 2014 and early Jan. 2015)

3-1 A final report both in English and Japanese was prepared.

### 1.4 Schedule

A schedule of the study is presented below.



### 1.5 Outputs

- Recommendations on introduction of economic incentives including PES for biodiversity conservation and river basin management in CRBR
- Contribution to the formulation of state-level policies and regulations for PES planned in the PES component of the UNDP\_GEF project (Biodiversity Conservation in Multiple-use Forest Landscapes in Sabah, Malaysia)

## Chapter 2: Rural Development and poverty in Sabah

### 2.1 Poverty in Sabah and Malaysia

It is critical to understand and analyse socio-economic status and Government intervention to improve the status in Sabah and CRBR for the purpose of preparing feasible recommendations for introducing PES and other economic incentives. In particular, the rural areas in Sabah have suffered and still suffer poverty, though the government has making efforts for these 40 years to alleviate and eradicate the poverty. The rural development in Sabah is always discussed by the government together with poverty eradication. Understanding the context of poverty and poverty alleviation in Sabah and discuss PES and other economic incentives in line with their policies and implementation on poverty alleviation is essential to make the recommendations feasible and effective.

Malaysian government's long-term poverty eradication Programmes have successfully addressed poverty since the early 1970s. The poverty incidence in Malaysia declined sharply from 52.4 % in 1970 to 6.1 % in 1997. At present, the nation's poverty incident is at a minimal of 1.7% as of 2012 in the whole nation. However, Sabah failed to realize significant decrease in the incidence in 1980s and 1990s, even though the whole nation saw it go down to 1/5th. Poverty incident in Sabah fluctuated around 20% for almost 15 years from the middle of 1990s (Table 1, Figure 1)<sup>1</sup>. Though recent figures (2009 and 2012) show reduction by half in four years, the latest figure (8.1% in 2012) is still extremely high in comparison with those in any other states (Figure 2).

**Table 1 Incidence of Poverty in Sabah and Malaysia 1976-2012**

Year	1976	1979	1982	1987	1995	1997	1999	2002	2004	2009	2012
Total in Sabah	58.3%	41.1%	29.2%	n.a.	28.71%	21.37%	24.31%	16.00%	24.22%	19.7%	8.1%
Urban	25.9%	21.3%	15.9%	n.a.	15.36%	10.24%	14.25%	9.25%	13.97%	9.8%	5.3%
Rural	65.7%	50.1%	36.1%	n.a.	35.75%	27.72%	30.22%	23.64%	35.79%	32.8%	12.9%
Total in Malaysia	37.7%	37.4%	n.a.	19.4%	8.7%	6.1%	8.5%	6.0%	5.7%	3.8%	1.7%

Source: Government of Malaysia, 1984

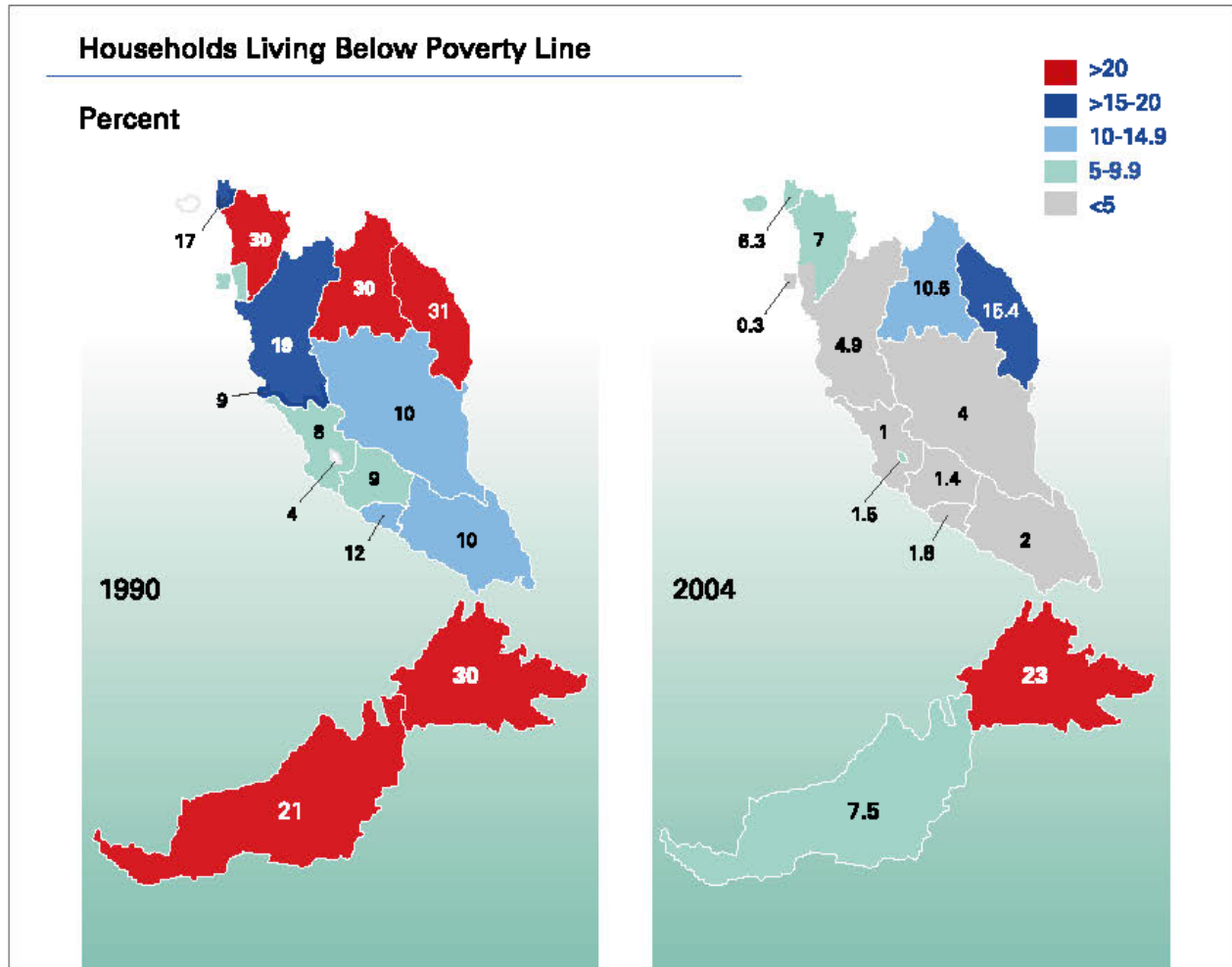
UKM, 2006

Department of Statistics Malaysia, 2014

Ministry of Tourism, Culture and Environment Sabah, 2014

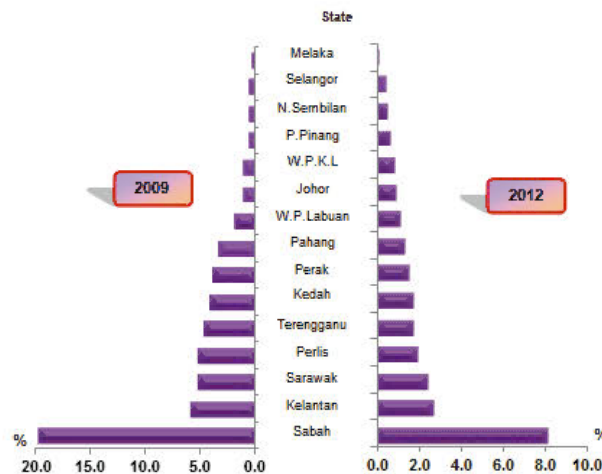
Economic Planning Unit, 2014

<sup>1</sup> The causes of the fluctuation could be explained as follows. In 1999, the incidence of poverty has slightly increased to 24.31% and again decreased and recorded the lowest of 16.00% in 2002. It again increased to 24.22% in 2004. The increase of the poverty incidence in 1999 can be explained by the lag effect of the Financial Crisis of 1997, which was in actual effect in 1999. It can be speculated that the sudden decrease in the incidence of poverty in 2002 was associated with the strong deportation policy implemented in the late 2001 and throughout 2002 which might have resulted in the expansion of employment opportunities for Malays in low-waged labour market on the one hand and the fierce operation of the Sabah state government to remove local squatters of prime real estate close to cities and major towns which might have resulted in under-registering of the local poor. As the control on the immigration became relatively weaker, the number of migrant workers increased again and the Malaysian poor seemed to have been crowded out from the low-waged market. In addition, the policy to remove local squatters was being implemented less and the registration of the Malaysian poor seemed to have been increased since 2002. The explanation about the increased poverty incidence in 2004 that government capacity to identify the poor was improved in 2004 may also be in line with the above inference (PADECO et al. 2007).



Source: IDS, 2008

Figure 1 Households Living Below the Poverty Line



Source: Department of Statistics Malaysia, 2014

Figure 2 Incidence of poverty by state, Malaysia 2009 and 2012

Sabah’s economic structure is heavily dominated by the primary sector and the export of a few commodities, mainly oil and gas. In the gross domestic products in Sabah in 2012, the service sector contributed about 50.4% to Sabah’s overall GDP, followed by agriculture at 22.9%, mining and quarrying

16.9%, manufacturing 7.9% and construction at 1.4%. In 2003, persons employed in the agriculture, forestry, fishery and hunting accounts for 31.3% of the total labour force in Sabah, while the national average for agricultural sector accounts for 13.8% of the total labour force. Sabah is located far from the economic centre of Malaysia. In comparison with the other states in Malaysia, development of manufacturing sector faces difficulties due to the disadvantage of geographical condition, insufficient basic infrastructure, serious shortage of human resources and absence of special institutional/political consideration.

## **2.2 Policy and Institution for Rural Development and Poverty Eradication in Sabah**

### **2.2.1 The 10<sup>th</sup> Malaysia Plan**

The latest 5-year national development plan in Malaysia, the 10<sup>th</sup> Malaysia Plan (EPU, 2010) states “Malaysia can effectively declare victory in its fight against poverty” because the incidence of poverty has been drastically reduced from 49.3% in 1970 to only 3.8% in 2009, with hardcore poverty nearly eradicated. Thus in the 10<sup>th</sup> plan, the Government’s focus will shift towards the low-income segment, specifically the bottom 40%, which consists of 2.4 million households. The strategy for the bottom 40% differs from the issue of poverty, in that it is not a case of dispensing assistance but ensuring that low-income households have the opportunity to enjoy a better standard of living.

On the other, the Plan also states that pockets of poverty nevertheless remain, both in terms of specific geographies and particular communities. The Government remains committed to transmitting assistance and welfare to the poor and vulnerable. Special Programmes will be undertaken to address poverty on a sustainable basis, especially in terms of providing income generating opportunities, such as through agropolitan projects.

### **2.2.2 Sabah Development Corridor (SDC) Blueprint (2008-2025)**

The Sabah Development Corridor (SDC), the blueprint for the period of 18 years from 2008 to 2025 was initiated to enhance the quality of life of the people in Sabah by accelerating the growth of the state’s economy, promoting regional balance and bridging the rural-urban divide while ensuring sustainable management of the state’s resources.

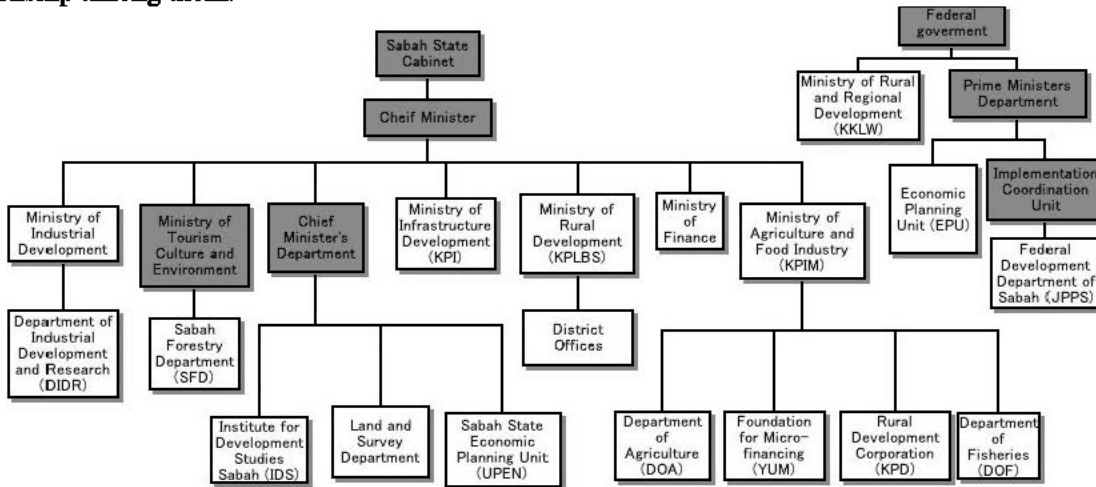
By 2025, the SDC initiative aims to triple Sabah’s Gross Domestic Product (GDP) per capita, and increase its GDP by four times through the implementation of the prioritized Programmes. In total, more than 900,000 new jobs are expected to be generated during the SDC implementation period. Hardcore poverty is targeted to be eliminated by the end of the Ninth Malaysia Plan (9MP) with overall poverty halved from 23% in 2004 to 12% in 2010.

Identifying the key challenges against poverty eradications such as remoteness of poor population, infrastructure in rural areas and accurate data to monitor poor households, most importantly basic infrastructure and utilities need to be made available within rural areas. Other initiatives to eliminate poverty under the SDC would include: -

- Expanding the size and scope of existing poverty eradication schemes
- Improving productivity in rural areas especially through agriculture
- Promoting small scale rural entrepreneurship

**2.2.3 Agencies In charge of poverty alleviation and rural development**

Figure 3 shows agencies playing important roles for poverty alleviation in Sabah and organisational relationship among them.



Source: PADECO et al. 2007

**Figure 3 Agencies for Poverty Alleviation in Sabah**

**2.3 Issues in the Rural Development and Poverty Alleviation from Perspective of Biodiversity Conservation in Sabah**

From 2006 to 2007, on consignment of Japan Bank for International Cooperation (JBIC), PADECO Co., Ltd., Tokyo University of Agriculture and Kyushu University conducted “the JBIC Pilot Study on Knowledge Assistance for Income-Generation through Sustainable Natural Resource Use in Poverty Areas in Sabah.” The purpose of the Study is as follows:

*To propose basic ideas of possible new ODA loan projects which are envisaged to contribute towards correcting economic disparity in Sabah, through sustainable utilization of the natural resources by the local communities, by way of examining and evaluating one (1) or two (2) pilot projects only for the whole duration of the study which will be implemented with no encumbrances whatsoever on the Malaysia side. The study shall focus primarily on the hard-core poor in the state of Sabah in areas to be determined by the relevant Executing and Implementing agency (ies).*

In the final report of the Study (PADECO et al. 2007), issues of the poverty and on-going poverty eradication Programme in Sabah were analyzed from the perspective of sustainable rural development as well as biodiversity conservation as follows.

Based on the literature review and the observation of ten cases of poverty alleviation Programme in Sabah, Figure 4 is a problems tree showing causes of poverty in Sabah and the cause-effect relationships among them. Based on the problem tree, major and common problems causing poverty in Sabah could be summarised as follows.

**(1) Common route causes: remoteness and low education level**

The remoteness is a common cause for inaccessibility to educational institutions and inaccessibility to the market. The low educational level is also a common cause for lack of information among poor households and difficulty in outreach by government agencies for development.

**(2) Less competitiveness of the product in the market**

The majority of the poor are dependent upon household labour in agricultural activities, fishing, hunting and gathering. Given the inaccessibility to the market and marketing skills due to the remoteness and the

low educational levels, it is assumed that most products are for self-consumption rather than income-generating sales.

### **(3) Little knowledge on sustainable resource use**

Due to small production size and inefficient farming or fishing methods, productivity of rural farmers and fishermen is relatively low. They often tend to exploit natural resource to improve short-term productivity which could degrade natural resources and productivity in the long run.

### **(4) Ineffective poverty-eradication Programmes**

Ineffective poverty-eradication Programmes are one of the causes of poverty. The JBIC Study found many instant examples of poverty eradication activities which have been abandoned after assistance by the government was completed. In the Gana Resettlement and Integrated Development (GRID) project initiated in 1997 by Sabah Forestry Department in Kota Marudu district, the original goal for forest conservation by relocating those used to live in the forest to a new village was not yet successful after 10 years. A lot of people are back and forth between the forest and the newly built village. The resettled people have also suffering from the lack of amenities and difficult market accessibility and they seemed to maintain the old life style. It can be said that the project itself is not effective yet for both environment protection and poverty alleviation.

### **(5) Limited capacity of the government officers and agencies**

One of the causes for ineffective poverty-eradication Programmes is poor monitoring and evaluation due to lack of human resources (in both terms of number and expertise).

### **(6) Few alternatives to monoculture plantation**

Establishment of monoculture plantation with government investment has been a common means to alleviating poverty. The crop of monoculture used to be mainly oil palm, but rubber is getting popular recently owing to its high price in the international market in these few years. Some of the past monoculture estate programmes in Sabah contributed to less number of poor in comparison to their counterpart in the peninsular Malaysia, while they were successful as a profitable industry. One of the causes of this is that many of the targeted poor easily sold their lot of the plantation, after the land ownership was transferred to them from the state.

### **(7) Lack of coordination between nature conservation and poverty eradication**

The matter of conflict between economic development of poor rural communities and management of the protected areas has been considered as one of the most difficult issues for years in terms of nature conservation in Sabah. The approaches the government agencies have taken to solve the conflict between protection and utilization of natural resources in the protected areas in Sabah vary according to local conditions and strategies of the agencies. Some approaches were successful, while others were not.

### **(8) Little consideration of social factors**

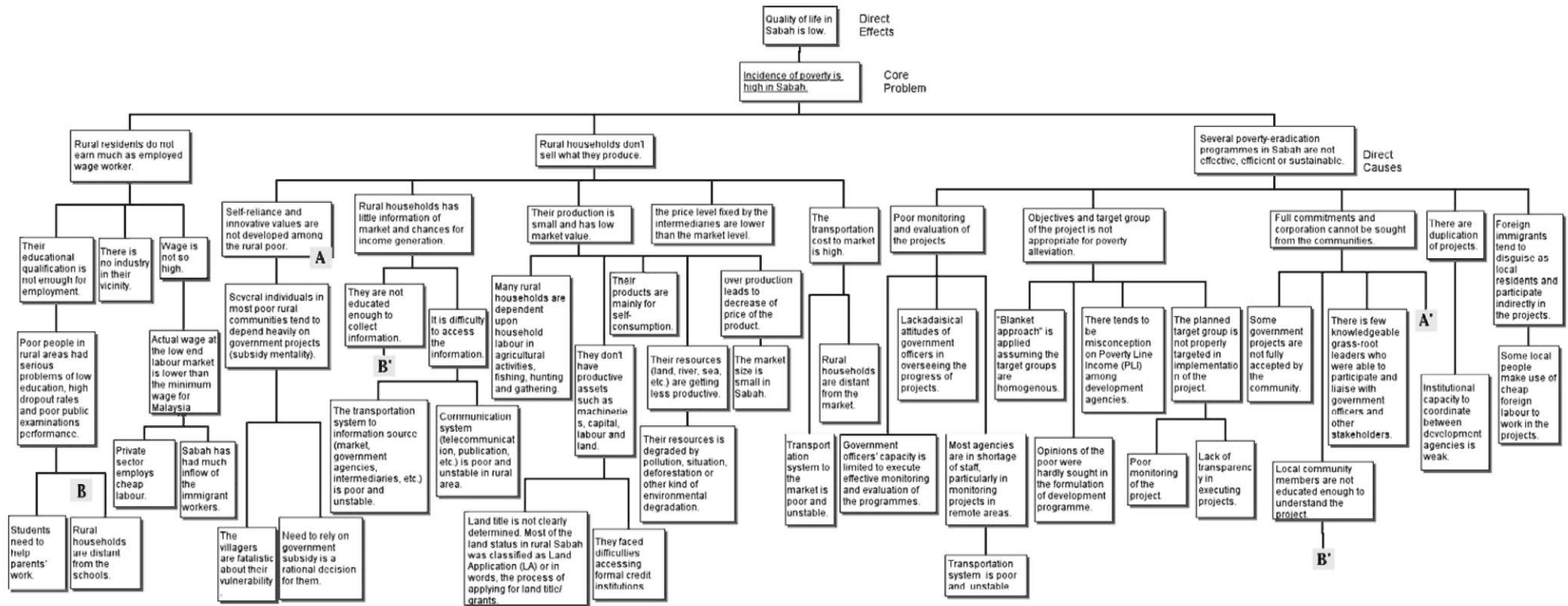
Many government officers in charge of poverty alleviation programmes claimed that the people targeted by their programmes have an "attitude problem", and that is the reason why the programmes are not effective and sustainable as expected. However, when we carefully study the target population of these particular cases, there could be certain social and/or economic reasons why they cannot sustain the poverty programme well. For example, the social study on seaweed farming in Banggi island revealed that some of the key factors determining successful application of seaweed farming in different villages are social factors, such as religious and cultural meaning of the seaweed farming in the specific ethnic groups. In planning and implementation of poverty alleviation Programmes, while technical factors were considered well, such factors were not. That would be one of the causes of ineffective poverty alleviation Programmes by the government.



**(9) Additional causes**

The small size of market in Sabah is also a factor contributing to poverty. Since market size is small, with lower population density in Sabah, over production leads to vast decrease of price of the product. Another additional factor is an effect of foreign immigrants to the minimum wage. Sabah has had much inflow of the immigrant workers accounting for about 28.9 % of the total population according to the official statistics in 2010. The presence of the migrant workers played a role in lowering the actual income by taking the jobs at the lower end of the labour market.

Chapter 2: Rural Development and poverty in Sabah



Source: PADECO et al. 2007

Figure 4 Problems Tree Concerning Poverty in Sabah

## **Chapter 3: Introduction and Plan of Economic incentives for Nature Conservation in Sabah**

### **3.1 Introduction of PES and other positive economic incentives to conservation at the national level**

#### **3.1.1 PES policy formulation**

In 2012 at several national level seminars and conferences on conservation, EPU claimed needs for development of PES mechanism, discussing that the current regulation may not have been sufficient to protect ecosystem services and alternative policy to create and develop systematic market mechanisms that would improve the way ecosystem services are used (EPU 2012a, EPU 2012b).

In 2012, as early stage of exploring these mechanisms, EPU and UPM with assistance from UNDP conducted a scoping study on PES that looked into potential ecosystem services and its users (key sectors). They found lack of understanding on PES, needs of capacity development for PES and the fact that PES is not explicitly incorporated in the laws of Malaysia, though certain elements of PES do exist in a number of laws. They also found that many valuation studies of ecological services were conducted but few had been applied to development of a PES mechanism. There is no central database for these valuations and lessons learned either. Economic valuation on marine ecosystems is less than that of terrestrial ecosystems.

A national level UNDP-GEF funded project, the “National Biodiversity Planning to Support the Implementation of the CBD 2011-2020 Strategic Plan in Malaysia (NBSAP)” aims to revise NBSAP by 2015 to meet national priorities and the Aichi targets (UNDP 2012a). In preparation of the revised NBSAP, identification of potential means of capturing the ecosystem services including through policies such as PES and other positive incentives is planned.

As a way forward for 11<sup>th</sup> Malaysia Plan, EPU is preparing key recommendations for biodiversity conservation. The 4<sup>th</sup> key recommendation discussed is “Strengthening Financial Mechanism in Management of Natural Resources and Conservation,” and one of the goals of this recommendation is “Implementation of Payment for Ecosystem Services (PES) for water utilization, biodiversity conservation, and recreational areas for ecotourism” (EPU, 2014a).

#### **3.1.2 REDD+ at national level**

At the national level, UNDP supported the Government of Malaysia through the national level project “National REDD+ Readiness in Malaysia.” The project (2011-2013) aimed to provide policy recommendations and support for developing institutional and legal frameworks, supporting capacity building and developing a sustainable financing mechanism for REDD+ (UNDP, 2012c). The project engaged with the Forestry Departments in Peninsular Malaysia, Sabah and Sarawak to ensure the inclusion of the three federal territories in the development of a cohesive REDD+ national process. As a result, Malaysia began to develop a National REDD+ Strategy. The Roadmap for REDD+ Implementation, within the strategy, outlines the scope of REDD+ activities to be considered within Malaysia, the proposed national reference emission levels, the proposed financing structure and benefits sharing mechanisms for REDD+, the methods of ensuring safeguards, and the management structure for REDD+ implementation in the country.

### **3.2 Introduction of PES and other Economic Incentives for biodiversity conservation in Sabah**

#### **3.2.1 PES Policy formulation under Biodiversity Conservation in Multiple-use Forest Landscapes in Sabah, Malaysia (the UNDP GEF Project)**

“Biodiversity conservation in multiple-use forest landscapes in Sabah, Malaysia” is a project funded by UNDP-GEF, which started in January 2012 and expected to be completed in December 2018. The objective of the project is to bring land use in connecting landscape and protected areas under a common and integrated management umbrella strategy in order to mainstream biodiversity, ecosystem functions and resilience, while enabling ongoing sustainable uses. The project will meet this objective by achieving three interconnected outcomes: (1) provisioning of an enabling environment for optimized multiple use planning, financing, management and protection of forest landscapes; (2) demonstration of multiple-use forest landscape planning and management system, and (3) demonstration of innovative sustainable financing methods for multiple-use forest landscape management.

According to the Project Document (UNDP 2012b), the State of Sabah has yet to capitalize on the various goods and services provided through payment for ecosystem services (PES) mechanisms. According to the Project Document, WWF commissioned a study to scope out possible catchment services for PES in Sabah and Sarawak in 2011. They identified seven basins as potential pilot sites to test the business model for implementing payments for catchment services, including the Labuk and Kinabatangan river basins in Sabah. The Project Document suggests Sabah conduct a scoping study which is similar to the above mentioned scoping study of PES under another UNDP-GEF project at the national level.

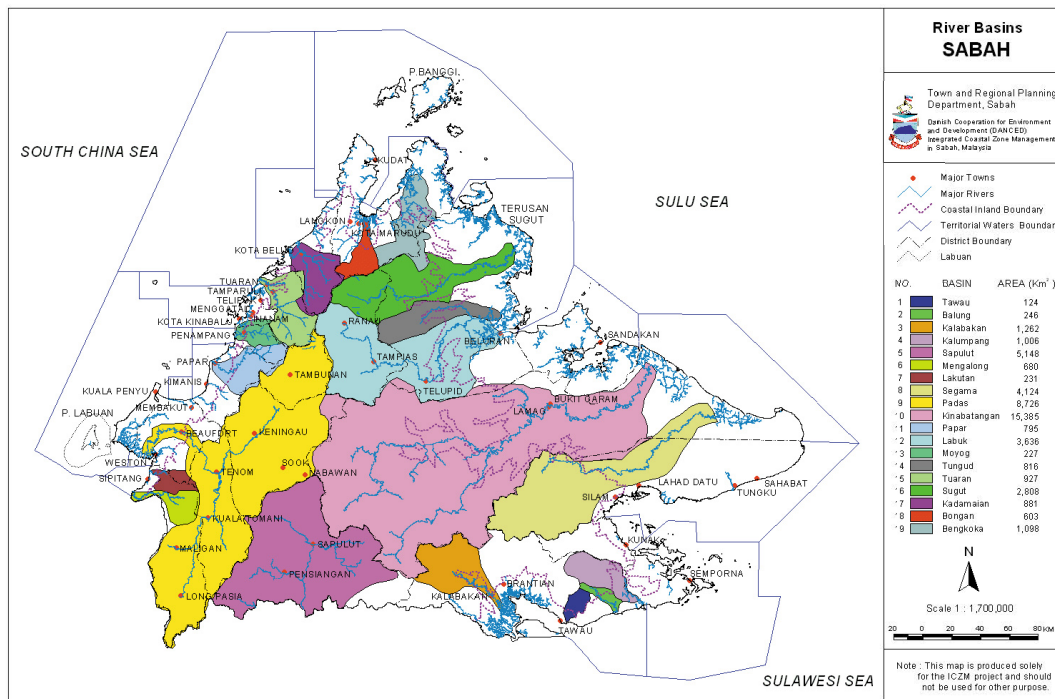
Under Outcome (1) (provisioning of an enabling environment for optimized multiple use planning, financing, management and protection of forest landscapes), UNDP will also support the creation of an enabling environment to permit the introduction and implementation of innovative sustainable funding through REDD+, bio-banking and PES mechanisms. Under Outcome (3) (Sustainable financing of protected areas and associated forest landscape areas demonstrated at the pilot site), the project will support the design and development of three alternative revenue generation schemes and disbursement using pilot modalities of REDD+, biodiversity offset, and PES.

According to the draft inception report of the project in Aug. 2014, 9 subcontracts in total are planned under the Project. The fourth one is to support the development of new state-level policies and regulations for PES, and pilot landscape level demonstration of PES (scheduled for 4 years from Oct. 2015). According to the interview with the Deputy Director (Forest Sector Planning) of SFD, they made a few changes to the subcontract. Originally, they planned three subcontracts in total for Malua Biobank, REDD+ and the PES policy formulation. These are combined, reorganized and split in two, 1) subcontract on state level policy, and 2) subcontract on investment. The revised plan of the subcontracts will be documented. Besides PES, under the project they have started study on No Net Loss policy, and Business and Biodiversity Offsets Programme (BBOP). They hired Forest Trend as a contractor for the study.

#### **3.2.2 Valuation of catchment service and “Quick scan watershed service” under Heart of Borneo Initiative**

REDD+ is a mechanism under UNFCCC whereby developing countries that are willing and able to reduce emissions from deforestation and degradation are paid by developed countries for doing so. In this sense, it can be considered as an example of PES at international level.

The forests of Sabah provide vital ecological services, such as water supply, flood control, carbon sequestration and climate regulation. There are 19 river basins in Sabah (Figure 5), most of which are located in the upland regions in the interior of Sabah. These catchments contain pristine forests that are important in regulating the hydrological cycle. The Kinabatangan river basin on the East Coast is the largest, covering an area of 15,385 km<sup>2</sup> followed by the Padas river basin on the west coast which covers an area of 8,726 km<sup>2</sup>. There are 13 main rivers in these 19 river basins. At 560 km in length, the Kinabatangan River draining much of the eastern region of Sabah is the longest in Sabah, and the second longest river in Malaysia (Town and Regional Planning Department, 1998).



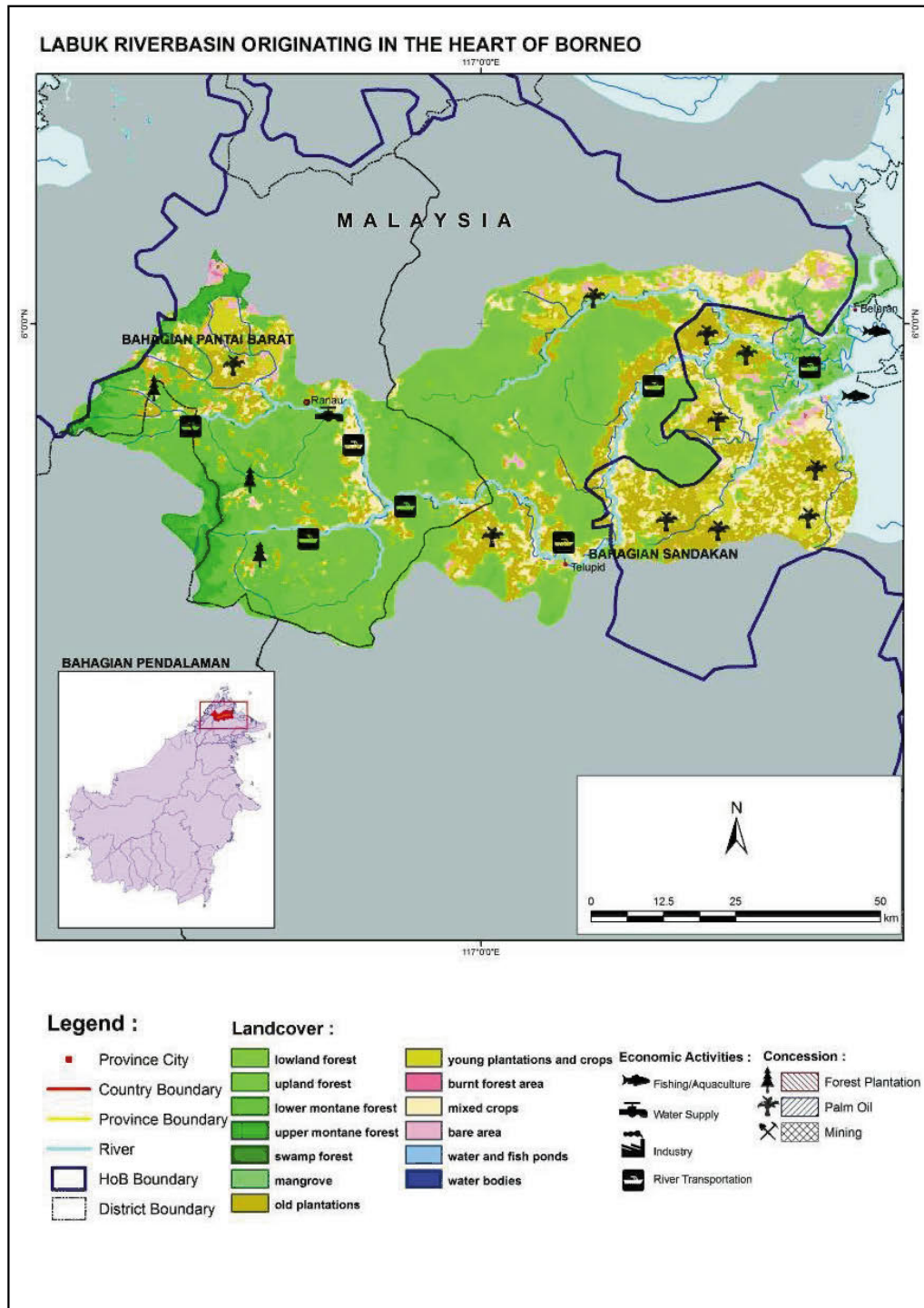
Source: Town and Regional Planning Department, 1998

**Figure 5 River Basins in Sabah**

Witteveen Bos Indonesia (2011) conducted a study named “Quick scan watershed service” under the Heart of Borneo Initiative commissioned by WWF. Considering how PES is the key to answering the question of “who is willing and also able to pay for forest conservation and who should drive this?”, the study aimed at conducting rapid assessment on the various catchment services from the Heart of Borneo and identifying the users and beneficiaries of these catchment services. The study is the first step towards building an economic case to value forests in the economy and more practically implementing a system to help finance forest conservation and management. In the study, seven river basins in the three countries have been selected as potential pilots to test the business model for implementation of payments for catchment services. In Sabah, the Labuk river basin and Kinabatangan river basins were selected.

They found that the Labuk river basin was especially interesting as a pilot site because of the demonstrated link between logging and large scale palm oil industry and sediment and nutrient discharges in Labuk Bay (Figure 6). The impact on aquaculture in Labuk Bay and the tourism

industry on Turtle Island Marine Park could provide a basis for payment for catchment services. In addition, the relatively large population, the plans for hydro-electro power and the scarcity of water are other reasons why payments for catchment services of the Labuk river basin might be economically attractive.

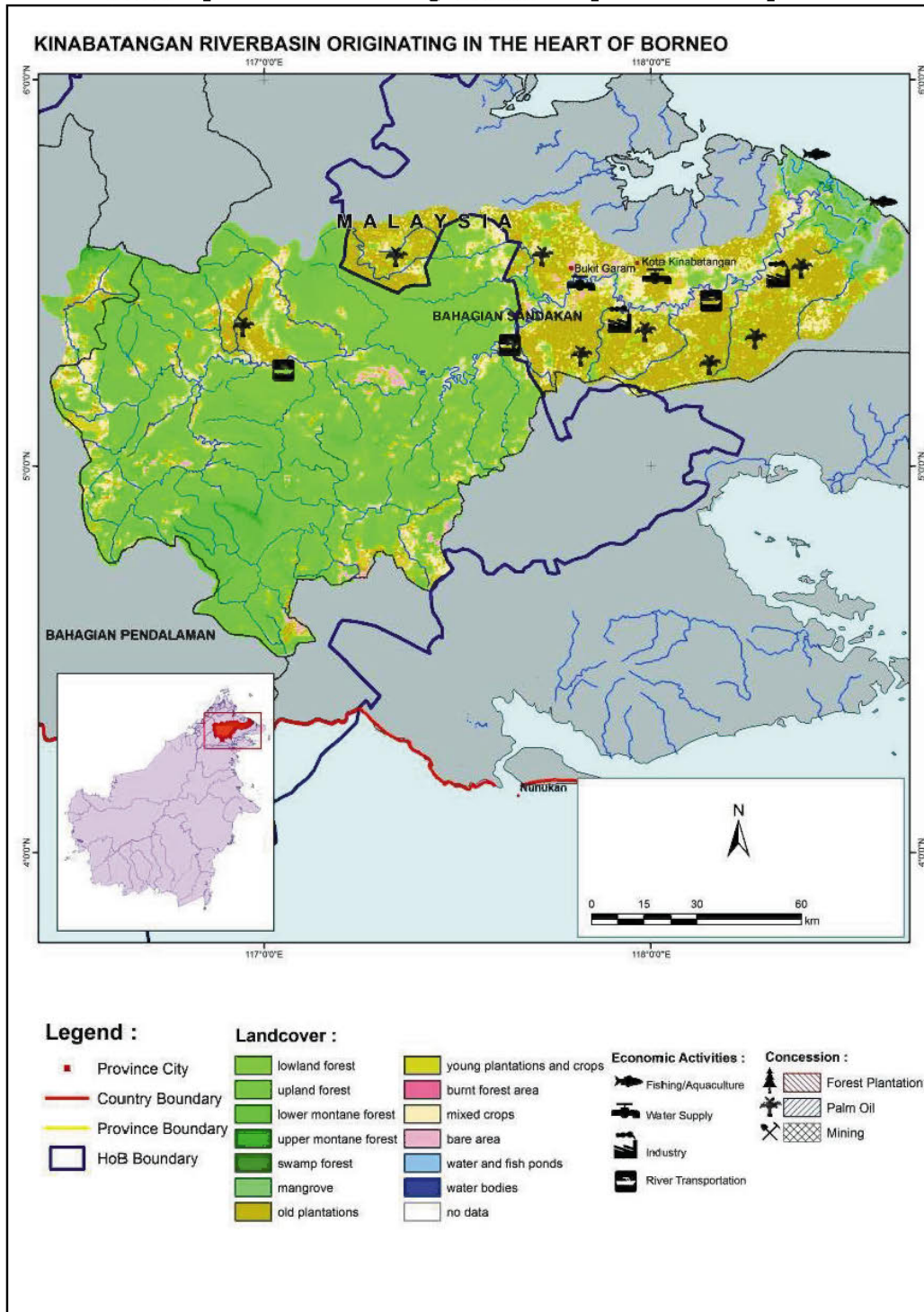


Source: Witteveen Bos Indonesia, 2011

**Figure 6 Labuk river basin originating in the Heart of Borneo and its land use**



For the other pilot site, Kinabatangan river basin, they found that it provided an interesting economic model due to its large scale palm oil plantations. Palm oil plantations pose a threat to the forest and at the same time experience the impact from deforestation due to floods. Other beneficiaries of this catchment include the tourism industry, aquaculture and the Kinabatangan population in terms of prevention of flooding, assured transportation and improved livelihoods.



Source : Witteveen Bos Indonesia, 2011

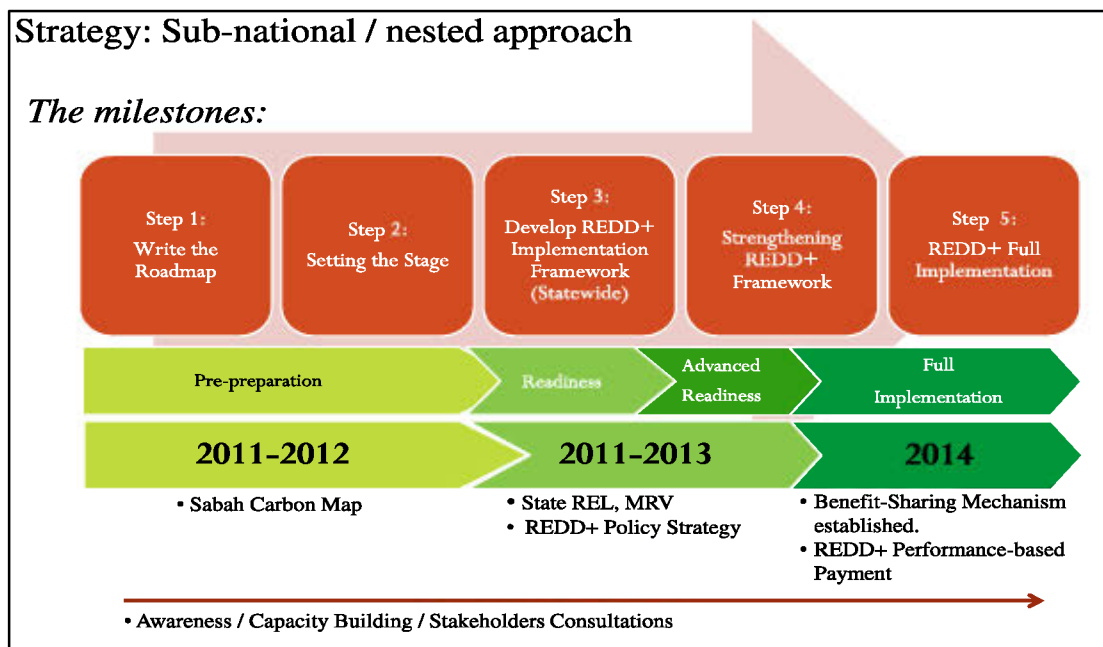
Figure 7 Kinabatangan river basin originating in the Heart of Borneo and its land use

On the west coast, the Padas river basin is being utilized by the biggest hydroelectric plant (tenom pangi) in Sabah with installed capacity of 66MW also connected to the west coast grid. Many rivers in Sabah also have high recreational value. For example, the upper Padas river and Kiulu river are popular for white water rafting.

### 3.2.3 Bio-carbon funding such as REDD+

In 1990s, SFD implemented some pioneering carbon sequestration projects, and then in 2000s carbon stock assessment along with assessment of carbon at risks were conducted. A study commissioned by the Sabah Forestry Department in 2009 estimated that carbon potential in the 3.6 million ha forest reserves is 566 million tonnes of carbon with a potential value of US\$2.8 billion (UNDP, 2012b). SFD also worked closely with the Federal Government and WWF-Malaysia and formulated the Sabah REDD+ Readiness Roadmap (Figure 8). In a paper presented in the National Inception Workshop on REDD+ in Feb. 2012, SFD concluded status of REDD+ in Sabah as follows: -

- Sabah is on the right track to capitalize on the potential REDD+ money, with 500,000 Verified Carbon Units (VCUs) up for sales.
- Real transaction of carbon money is yet to take place.
- The Sabah REDD+ Roadmap is a guidance to press forward the REDD+ Implementation in the State, in line with the National Development.
- More pilot projects to be implemented.
- Success relies heavily on the measures to address all the pre-requisites.
- Sub-national approach is the most pragmatic way forward and should be supported by all.
- The bottom line is that the State wants to be rewarded for keeping its forests and to prove to the skeptics that money does grow on trees. (Sabah Forestry Department, 2012)



Source: Sabah Forestry Department, 2012

**Figure 8 Sabah REDD+ Roadmap**



Currently the European Union (EU) is implementing the project “Tackling Climate Change through Sustainable Forest Management and Community Development,” (the EU-REDD Project). Under the EU-REDD Project, SFD is developing the necessary tools to design and implement the state REDD+ strategy, and focusing on Measurement, Reporting and Verification (MRV), safeguards, enhancing capacity and providing technical support (SPC and the REDD Desk, 2014). The EU-REDD Project has three pilot subprojects, Gana Highland Project, Kinabalu Eco-Linc Project and Kinabatangan Project. While Gana Highland Project is implemented directly by SFD, Kinabalu Eco-Linc Project and Kinabatangan Project are implemented by Sabah Parks and Sabah Wildlife Department respectively. Kinabalu Eco-Linc Project is aimed at the establishment of an ecological connectivity between Kinabalu Park and Crocker Range Park, and the target area overlaps with CRBR.

SFD is also collaborating with WWF Malaysia in the delivery of elements of the Roadmap, specifically in developing carbon accounting methodologies, appropriate legal and policy frameworks, and financing mechanisms for REDD+ development. The Heart of Borneo project, a trans-boundary conservation project spanning across Indonesia, Brunei and Malaysia, is also considered a platform where elements of the Roadmap for REDD+ Readiness can be developed and delivered. An international conference meeting was held in August 2011 in Sabah titled “Forest and Climate - Decoding and Realising REDD+ in the Heart of Borneo (HoB), with Specific Focus on Sabah” to foster collaborative engagement with relevant stakeholders on REDD+ development in the territory.

#### **3.2.4 Forest certification**

Forest certification can be considered as an example of ecolabelling scheme, another mechanism utilizing economic incentives for biodiversity conservation (OECD, 2013). It is the policy of the State Government of Sabah, to have all long term licensed areas, certified under any internationally recognized scheme by 2014, with a 5-year notice period given in 2009 (Sabah Forestry Department, 2003). As of the end of 2013, a total of 863,762 ha of the State’s forests are under some form of certification, while the total area of the commercial forest (Class II) is 2,177,732ha, and the total area of all forest classes under SFD is 3,614,730ha (Sabah Forestry Department, 2014).

As of May 2013, 386,607ha of the forest has been fully certified under the Forest Stewardship Council (FSC). The remaining certified forests are mainly certified under Verification of Legal Compliance (VLC). According to the Deputy Director (Forest Sector Planning) of SFD, the most important target is that everything from the forest is legal and has clear origins; therefore, SFD is using any scheme applicable at various levels, to certify their forest. For operators who are not able to get forest management certification, Verification of Legal Origin (VLO) can be obtained. Once they clarify legal origin of timber by VLO, they can move up to acquiring VLC.

SFD also plans to get their protected forest, such as Class I, Class VI, etc. certified. Though no timber is produced from the protected forest, they can still be certified.

#### **3.2.5 Other innovative financial mechanisms (lead by SFD)**

Malua BioBank implemented by Sabah Forestry Department is even introduced in one of the series of reports published by The Economics of Ecosystems and Biodiversity (TEEB), an international initiative to draw attention to the global economic benefits of biodiversity (TEEB, 2010). Malua BioBank is a collaborative effort of a private equity firm and Sabah Forestry Department, which has given conservation rights to the Malua BioBank for a period of 50 years. The aim is to raise US\$10 million for the rehabilitation of 34,000 hectares of formerly logged

forest adjacent to the Danum Valley Conservation Area. The Malua BioBank sells Biodiversity Conservation Certificates, which are each equivalent to 100 square meters of protected and restored rainforest. Certificates were sold at \$10 per unit (equivalent to \$1,000 per hectare). The certificates are registered in the environmental registry and can be traded or retired. Revenue generated from certificate sales is used to fund the running costs of the project and is invested in a trust fund for the conservation management of the 50-year license. Any profit beyond this will be shared between the forest management license holders (Yayasan Sabah) and the Malua BioBank investors. Purchase of Certificates from the Malua BioBank cannot be used by companies to offset their impacts on rainforests in other locations.

In the interview with SFD, it was informed that a small number of biodiversity credit issued by Malua BioBank has been sold, though they targeted anybody marketing internationally. One of the reasons for the small transaction is the global market recession. The mechanism of BioBank also competes with conventional donation and philanthropy works. BioBank is a business, while a lot of people just want to donate. SFD extended to finance the project for another year. It is too early to conclude BioBank. They would not be ready for transaction of biodiversity value. Even for the carbon transaction, people are still skeptical.

Under the UNDP-GEF project mentioned above, SFD also started a study on No Net Loss policy, and Business and Biodiversity Offsets Programme (BBOP). They hired Forest Trend as a contractor for the study. SFD is discussing biodiversity offset for oil palm plantation in the framework of RSPO.

### 3.2.6 Conservation fees through tourism

According to Sabah Tourism Board, there is an innovative practice of collection of conservation fee from tourism through tour operators in Sabah. Kinabatangan Corridor of Life Tourism Operator Association (KiTA) levy their members for conservation. KiTA was initiated by WWF with some lodge operators for nature conservation and membership is on voluntary basis. KiTA members contribute RM10 for every guest who purchased a tour package in the area. The participating lodges, comprising KiTA members, pooled the money together and channeled it into on-going or new conservation efforts in the Kinabatangan area. WWF-Malaysia was the custodian of the fund.

Another case of payment by tourists for conservation of a certain area with high conservation value is conservation of Lankayan island. Lankayan island is one of the three islands located in Sugud Islands Marine Conservation Area (46,000ha) under Sabah Wildlife Conservation Enactment. The area is managed by a private non-profit organization, REEF Guardian. They use the conservation fee collected from tourists visiting the island for research and conservation of ecosystems and turtles. Tourism attraction in the island is snorkeling and scuba diving.

It is also common in Sabah that the agencies managing protected areas, such as Sabah Parks, Sabah Forestry Department, Sabah Wildlife Department, etc. charge fees to visitors at entrances of protected areas. The fees are usually called “conservation fee” rather than entrance fee, to clearly indicate the purpose of the collection to the payers. On the other hand, according to Sabah Parks, the total collected conservation fee from tourists even in the popular Kinabalu Park and Tungku Abdul Rahman Park is nowhere near to bearing the whole cost of management of the parks. Sometimes MONRE misunderstands and expects Sabah Parks to establish sustainable financing of park management totally depending on conservation fees collected from visitors, but it is arguable. Sabah Parks consider that the recreational service for tourists is only a part of various services provided by the ecosystem in the protected area; therefore the cost of conservation of the protected area needs not to be covered only from the payment by tourists.

Some of the respondents to the interview in the Study discussed introduction of collections of conservation fee from all visitors coming to Sabah at entrance/exit points, referring to the case in Indonesia where exit fees differs at different exit points. They also discussed collection of fees at hotels and accommodations, referring to the case in Melaka where the state government imposes RM2/room per night as heritage tax to all hotels in the state as state regulation.

Sabah Tourism Board also suggested that feasibility of PES through tourism relies on a market segment targeted as service users. The Japanese tourism market is positive about payment for and contribution to conservation effort, such as tree planting, coral restoration, etc.

### **3.2.7 RSPO and palm oil certifications**

Palm oil certification by RSPO and other organizations have been introduced to the oil palm industry in Sabah. In Sabah there are 30 members of RSPO, including big companies such as Sime Darby, IOI, KRK, etc. and the members of RSPO has been increasing. Malaysia Palm Oil Association (MPOA) is a secretariat of RSPO. There is another certification body, Malaysian Palm Oil Council (MSPO) which is local to Malaysia and getting mandatory. According to MPOA, MSPO certification is more suited for all oil palm planters including small holders in Sabah, while RSPO is voluntary and is only applicable to big companies.

The big palm oil producers in Sabah and Malaysia, such as IOI, Sime Darby and Felda Global Ventures have their own productive facilities in Europe; therefore, they cannot quit RSPO and give up the European market. In the EU countries, they don't buy product without the RSPO certification. These big companies have RSPO certification for almost all their estates. On the other hand, in China, India and Pakistan, they buy palm oil even without RSPO certifications. Small oil palm plantation holders are selling their products mainly to china without RSPO certification. Bigger companies such as KRK, who have some mills, allot some of their mills for the EU market with the RSPO certification, while using other mills for the local and Chinese markets. They even have two mills side by side, one of which is for RSPO and the other is for the local market. Currently even medium-sized planters are getting more and more RSPO oriented.

MPOA sees compliance with conditions for RSPO certification has been becoming more strict and rigid. Their focus now is not only on environment, but also human rights, child labor, safety of workers, etc. Such shift of criteria of RSPO certification has made the palm oil industry in Malaysia wonder if RSPO has a biased view and might have hidden agenda to protect the vegetable oil industry in Europe which cannot compete with palm oil. Because of this, MPOA discussed quitting the secretariat of RSPO. In Indonesia, when RSPO tried to apply living conditions of workers as one of the criteria for certification, the palm oil industry in Indonesia abandoned RSPO, and establishing up their own Indonesian Sustainable Palm Oil Foundation (ISPO), mainly selling the palm oil to China and India.

MPOA understand Malaysian local MSPO certification doesn't work for the EU market. While the US market doesn't mind palm oil certifications much. They understand it is similar to what happened with the timber certifications in the past. According to preferences of different markets, the producers could apply for different palm oil certifications, in the same way as the timber industry in Malaysia has two options of timber certification, with national certifier and international certifier.

### 3.2.8 Surcharge for “Renewable Energy Fund” imposed in electricity bill in Feed-in-Tariff (FiT) Mechanism

To promote the use of renewable energy in Malaysia, the Government has implemented Feed in Tariff (FiT), a new mechanism under the Renewable Energy Act 2011. Effective from 1st January 2014, the Government will collect an additional 1.6% on consumers’ monthly electricity bills (Figure 9) to be paid to the “Kumpulan Wang Tenaga Boleh Baharu” (Renewable Energy Fund). Domestic consumers with usage 300kWh and below will be exempted.

No. Jangka	Gdn	Dahulu	Semasa	Kegunaan
99025532	1.0000	2614.00	4008.00	1394.00 KWH
99025532	1.0000	810.00	1261.00	451.00 KUARH

Caj	Unit	Kadar	Amaun
BLOK KEGUNAAN ELEK.	100.00	0.175 RM	17.50
	100.00	0.185 RM	18.50
	100.00	0.330 RM	33.00
	200.00	0.445 RM	89.00
	500.00	0.450 RM	225.00
	784.00	0.470 RM	368.08
<b>KUMPULAN WANG TENAGA BOLEH BAHARU</b>			<b>9.09</b>
PENGENAPAN			-0.02

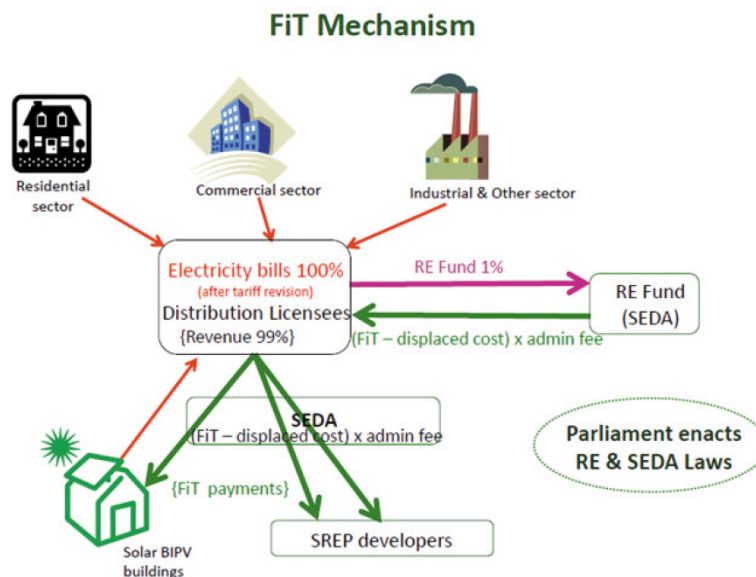
  

Amaun Elektrik RM	577.27	Bil Semasa RM	577.25
Lain-lain Caj RM	0.00	Tunggakan RM	0.05
Anggrn Pelarasan RM	0.00	Cag. Tambahan RM	0.00
Pelbagai RM	0.00	Jum. Perlu Dibyr RM	577.30

No. Telefon Aduan Kerosakan : 15454  
 No. Telefon Pertanyaan Bil : 088-282144

Figure 9 Sample: S urcharge for Renewable Energy Fund in a consumers’ monthly electricity bill

The amount collected at the Renewable Energy Fund is used for the purpose of paying for renewable energy projects such as landfill gas, biogas, biomass, solar, mini hydro etc. The Renewable Energy Fund is under the management of the Sustainable Energy Development Authority (SEDA) (Figure 10).



Source: <http://ecoideal.com.my/2011/06/feed-in-tariff-fit-set-to-drive-renewable-energy-development-in-malaysia/>

Figure 10 FiT Mechanism in Malaysia



and Benefit Sharing (ABS) and Clearing-House Mechanism (CHM) was initiated as a part of capacity development of Sabah Biodiversity Centre (SaBC). SaBC is in the process of developing CHM. The Sabah Biodiversity Rules and Regulations (Access and Benefit Sharing) was approved by the State Cabinet.

According to interview to the director of SaBC during the study, currently Sabah Biodiversity Enactment which is a fundamental enactment for ABS in Sabah is in the process of amendment and its revision will be tabled in the first seating of the state assembly in April 2015. New rules and regulations on ABS following the amended Enactment will be tabled and approved by the state cabinet accordingly. The change in the Enactment is on the function of Sabah Biodiversity Centre. The bill, rules and regulations are now examined in Attorney General's Office.

## Chapter 4 Issues and Opportunities of Crocker Range Biosphere Reserve

### 4.1 Issues in Management of the Buffer Zone and Transition Area of CRBR

#### 4.1.1 Objectives of the management of CRBR

The management plan of CRBR is in the process of formulation at present. On 10 Dec. 2014, Sabah Parks organized a workshop to identify stakeholders, main objectives and an organization for the management of CRBR, inviting the concerning agencies. In the objectives analysis part of the workshop, the participants set a core objective and direct means (intermediate objectives) as follows (though they have not been documented and officially approved by any authorities yet) :

##### Core Objective

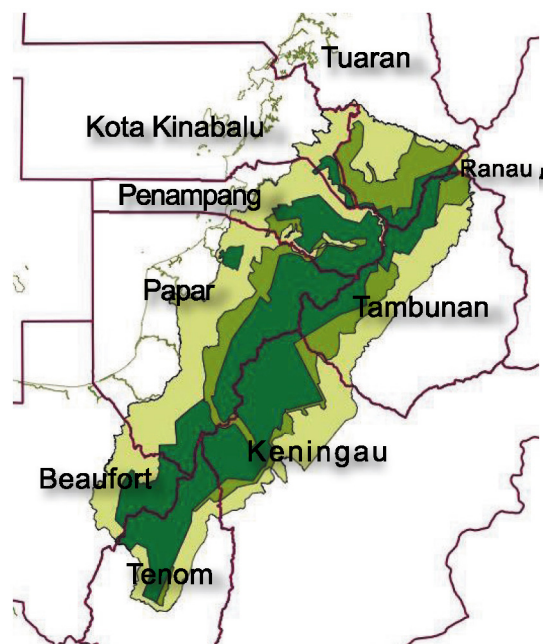
- To protect biodiversity, ecosystem and cultural diversity including genetic diversity.

##### Direct Means to achieve the Core Objective

- To improve ecosystem conservation in the Core Area
- To promote sustainable community livelihood in the Buffer Zone and Transition Area
- To promote research and education in CRBR

#### 4.1.2 Population and Communities

The CRBR overlaps with 8 districts and one city (Kota Kinabalu City) located in western Sabah, Malaysia (Figure 11). Densely populated urban areas in Kota Kinabalu city and the 8 districts are not included in the CRBR. A total of population in the 8 districts and Kota Kinabalu city is around 1,254,700 (2008) as shown in Table 2. The population in the 8 districts has been almost doubled from 1991 to 2010.



Source: GIS Data of CRBR compiled by BBEC II

**Figure 11 Eight districts and Kota Kinabalu city overlapping with CRBR**

**Table 2 Population of the 8 Districts Surrounding CRBR and Kota Kinabalu City**

Administrative areas	Area (km <sup>2</sup> )	Population		
		1991	2000	2010
Penampang	466	86,941	137,002	159,600
Papar	1,243	59,473	92,451	111,400
Beaufort	1,735	48,742	64,756	75,900
Tenom	2,409	37,954	48,353	54,400
Keningau	3,533	88,456	155,069	195,700
Tambunan	1,347	19,726	29,294	35,000
Ranau	2,978	49,358	74,456	88,800
Tuaran	1,166	63,995	84,974	97,800
Subtotal of 8 Districts	14,877	456,636	688,355	818,600
Kota Kinabalu	350	209,175	372,047	436,100
Total of the 9 administrative areas	15,227	665,811	1,060,402	1,254,700
Sabah (whole)	73,711	1,743,685	2,603,485	3,214,200

Source: Data of the National Census in 2010 provided by Beaufort District Office in 2011, Sabah Parks (2004)

Table 3 indicates the areas of CRBR occupying the eight districts and Kota Kinabalu city along with the population of CRBR in comparison with the total population of the districts and the city. The confirmed total population in CRBR is around 99,000 which is 12.1% of the total population in the eight districts.

**Table 3 Populations in CRBR**

Administrative areas	Area (km <sup>2</sup> )		Population	
	CRBR (% in the area of the district/city)	Total area of District/City	CRBR (in 2011)	Total population in the district (2010)
Penampang		466	16,162 (10.1%)	159,600
Papar		1,243	22,320 (20.0%)	111,400
Beaufort		1,735	2,053 (2.8%)	74,600
Tenom		2,409	4,645 (8.5%)	54,400
Keningau		3,533	28,404 (14.5%)	195,700
Tambunan		1,347	17,571 (51.7%)	34,000
Ranau		2,978	767 (0.9%)	88,800
Tuaran		1,166	7,179 (7.3%)	97,800
Subtotal of 8 Districts		14,877	99,101 (12.1%)	818,600
Kota Kinabalu		350	N/A	447,200
<b>Total</b>	<b>3,505.84 (23%)</b>	<b>15,227</b>	<b>N/A</b>	<b>1,254,700</b>

Source: Demographic data in CRBR collected from the district offices and questionnaire survey to the villages

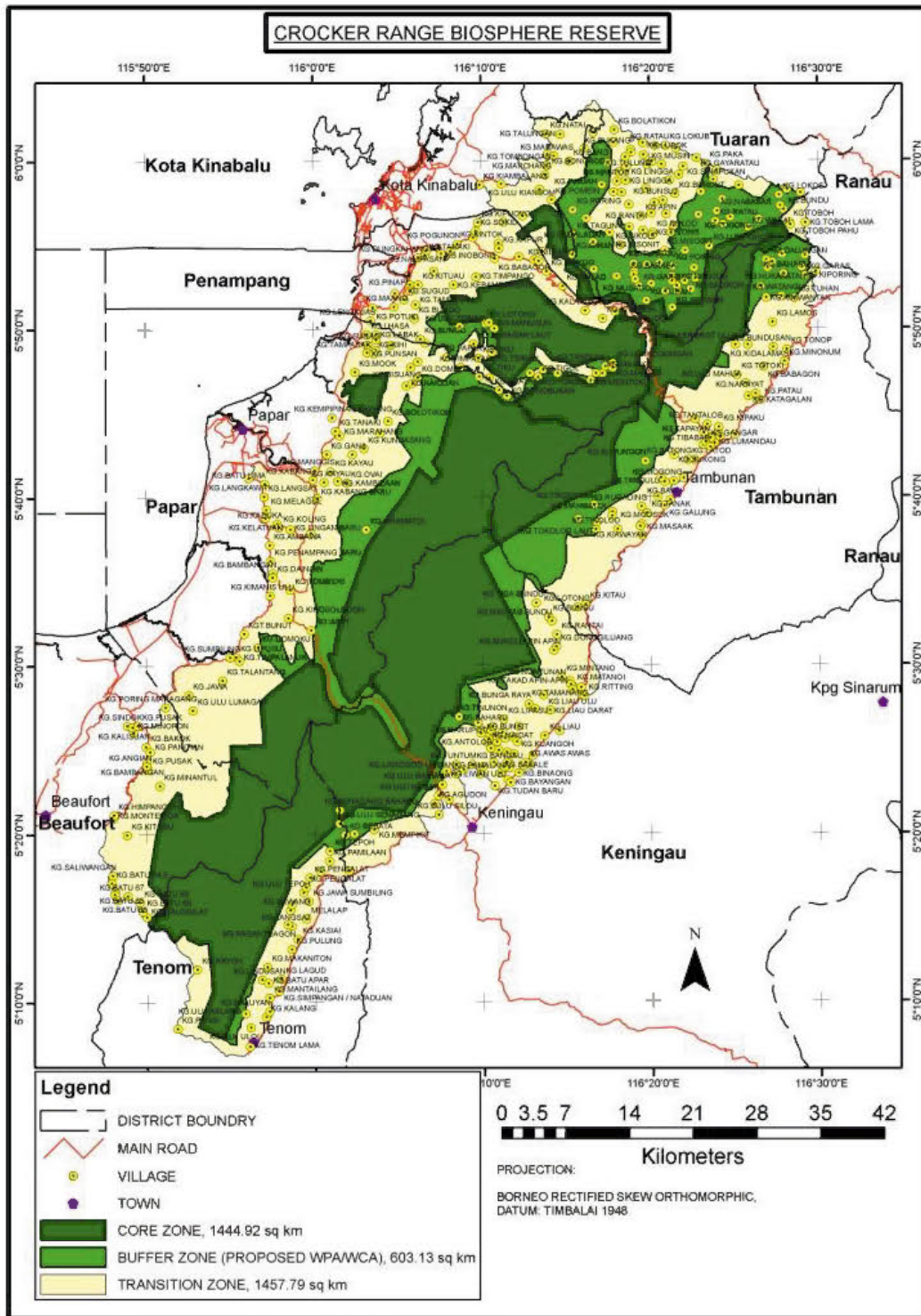
Number of villages in CRBR is 399 (Table 4), and their locations are indicated in Figure 12.

**Table 4 Number of Villages in CRBR**

DISTRICT	PEN AMP ANG	PAP AR	BEAU FORT	TE NO M	KENI NGA U	TAMB UNA N	RA NA U	TUAR AN	KOTA KINA BALU	TO TAL
<b>Number of villages</b>	<b>44</b>	<b>73</b>	<b>24</b>	<b>29</b>	<b>92</b>	<b>57</b>	<b>2</b>	<b>61</b>	<b>17</b>	<b>399</b>
Buffer zone	9	2	0	2	1	12	0	26	0	52
Transition area	32	54	16	26	50	38	2	29	17	264
Core area	0	0	0	1	1	0	0	0	0	2
Location unknown	3	17	8	0	39	6	0	7	0	80

Source: The district offices





Source: GIS Data of CRBR compiled by BBEC II

Figure 12 Locations of Villages in CRBR

#### 4.1.3 Status of Poverty and Rural Development

In CRBR in 2011, we had in total 1,895 poor households registered in the poverty database e-Kasih and targeted in the poverty eradication schemes by the government (Table 5). They make up 9.6% of the total estimated number of households (19,820) in CRBR.

**Table 5 Number of poor households in CRBR registered in e-Kasih**

DISTRICT	PENAMPANG	PAPAR	BEAUFORT	TENOM	KENINGAU	TAMBUNAN	RANAU	TUARAN	KOTA KINABALU	TOTAL
Number of e-Kasih Registered households										
hardcore poor	34	22	1	15	73	148	0	1	2	296
poor	159	162	6	82	155	365	0	46	0	975
moderately poor	90	181	9	55	52	199	0	34	4	624
Total	283	365	16	152	280	712	0	81	6	1,895
Ratio in the all households in CRBR	8.8%	8.2%	3.9%	16.4%	4.9%	20.3%	0.0%	5.6%		9.6%

Source: e-Kasih data from Sabah Development Office in 2011, Department of Statistics Malaysia, Sabah (2009)

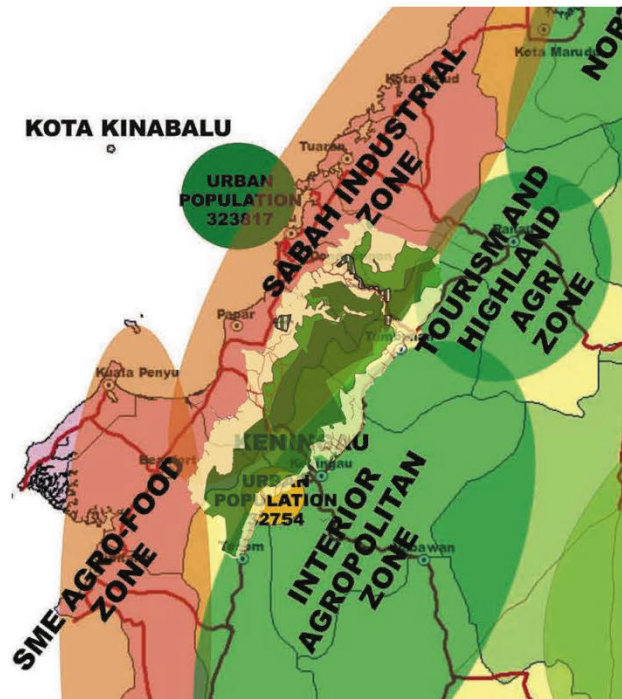
#### 4.1.4 Livelihood Support Schemes Applied to the Buffer Zone and Transition Area

As stated above, in CRBR, there are 399 villages with at least 99,000 people in total. The people living in the area are relatively poor from the national standard. Following the national five-year development plan (10<sup>th</sup> Malaysia Plan), the government is now trying to eradicate hardcore poverty and decrease number of poor household in Sabah by 2015 with various rural development schemes. Many of the schemes are in line with the objectives of CRBR; therefore, they should be promoted in the management of CRBR, however some of the schemes impose risks of having a negative impact on the ecosystem in CRBR which should be monitored by the management of CRBR.

The Ministry of Rural Development Sabah (KPLB) is primarily responsible for poverty eradication and rural development in Sabah including CRBR. For the buffer zone and the transition area overlapping with the 8 districts (Penampang, Tuaran, Ranau, Tambunan, Keningau, Tenom, Beaufort and Papar), the District Offices under the Ministry of Rural Development Sabah are in charge of implementing and monitoring programmes and projects for poverty eradication and rural development. For the part of the buffer zone and the transition area in Kota Kinabalu city, Kota Kinabalu City Hall (DBKK) is primarily responsible for rural development and poverty eradication.

#### 4.2 CRBR as Natural Capital for the State Level Development Plan

CRBR is also important for natural capital supporting development planned in Sabah Development Corridor Blueprint. CRBR overlaps with and in between the four zones, such as the SME Agro-food Zone, Interior Agropolitan Zone, Tourism and Highland Agri Zone and Sabah Industrial Zone in the Sabah Development Corridor (Figure 13).



Source: Institute for Development Studies (Sabah). 2008, GIS Data of CRBR compiled by BBEC II

**Figure 13 Zoning in Sabah Development Corridor and CRBR**

### 4.3 Ecosystem Services to be Conserved in CRBR

The following important ecosystem services of CRBR could be defined as what potential PES or other economic incentives conserve:

- Water supply (regular flow and quality)
- Flood control, disaster control
- Carbon sequestration
- Recreation (landscape, rare species, etc.)
- Genetic resources

Types of land use to secure the above ecosystem services identified up to now are as follows:

- Conservation of existing forest
- Reforestation and enrichment of existing forest
- Traditional shifting cultivation with a sufficient fallow period
- Wet paddy
- Tagal
- Alternative livelihood with the ecosystem services maintained

### 4.4 Catchment Service of CRBR

#### 4.4.1 Users and Providers of Catchment Service of CRBR

One of the most important ecosystem services of CRBR that various concerning agencies and stakeholders point out is water supply and water regulating services. CRBR provides regular and clean water for domestic use and also agriculture and other production by not only the 99,000 people who are living in CRBR but also the whole population living downstream of CRBR (which would be around 1/3 of the whole population in the state). The water flow regulation by CRBR also benefits the people by lowering risks of flooding and other disasters.

Undisturbed forest upstream, in general, controls erosion and load of sediment in rivers and even contributes to conservation of marine ecosystems, such as coral ecosystem, and maintenance of fishery resources.

Such catchment service is maintained by the forest ecosystem in CRBR. In other words, the service is maintained by means of forest conservation in the core area of CRBR (Crocker Range Park and the three forest reserves) by Sabah Parks and Sabah Forestry Department, while forest conservation and sustainable land uses in the buffer zone and the transition area of CRBR are supported by the landowners. Thus, we can consider Sabah Parks, Sabah Forestry Department and the landowners as providers of the catchment service. On the other hand, the population downstream utilizing the water for domestic use, irrigation, etc. can be considered as service users (Figure 14).

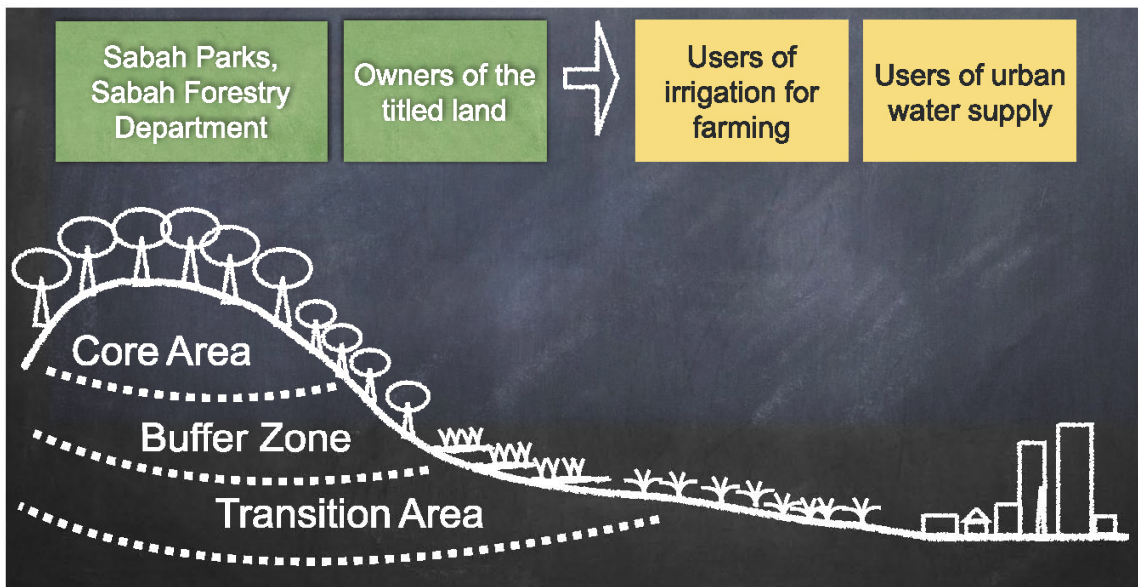
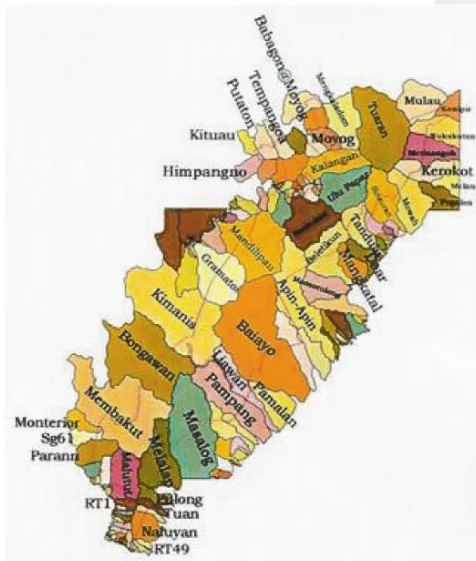


Figure 14 Providers and users of catchment service of CRBR

#### 4.4.2 Outline of the Catchment Service

CRP overlaps with 17 sub-catchment areas (Figure 15), while CRBR has more subcatchment (Figure 16). In 2009, Sabah Parks calculated total volume of water flown out 18 rivers from Crocker Range Park (Table 6). In 2013, Mr. Maipol Spait, Terrestrial Park Manager, Sabah Parks attended a workshop on PES organized in Philippine by ASEAN Centre for Biodiversity (ACB). He presented a proposal of PES for water supply service from CRP at the workshop. In the proposal, water volume of the 8 main rivers from CRP was estimated. He estimated value of the water supply as RM700/day by multiplying a certain rate of value to the total volume of water.





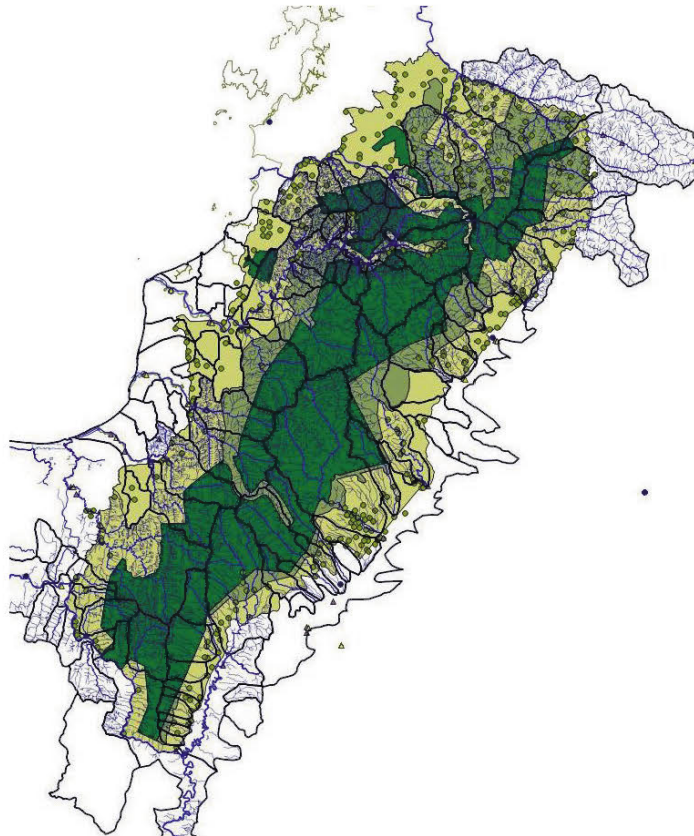
Source: Greer (1998)

Area	River	Size of catchment area (km <sup>2</sup> )	% of park area <sup>1</sup>	Sub-catchment	Size of sub-catchment area (km <sup>2</sup> )
West coast	Tuaran	37	2.6	Tuaran	31
				Mulu	6
	Moyog	59	4.2	Moyog	59
	Papar	491	35.1	Upper Papar	398
				Mandalipau	93
	Kimanis	64	4.6	Kimanis	64
Bongawan				54	
Bongawan	54	3.9	Bongawan	54	
			Membakut	93	
Membakut	93	6.6	Membakut	93	
Interior plain	Pegalan-Padas	538	38.4	Sinsulan	34
				Bolotikon	37
				Apin-Apin	41
				Bayyo	180
				Pampang	59
				Masalong	81
				Melalap	59
				Malutut	47
North east	Liwagu	12	0.9	Nukakutan	12
	<b>Total</b>	<b>1348<sup>2</sup></b>	<b>96.3 %</b>		<b>1348<sup>2</sup></b>

<sup>1</sup>Percentage of total area of the park (1399 km<sup>2</sup>); <sup>2</sup>Total catchment area excluding small catchment areas

Source: Tajima, Makoto (2010) *Final Report on CUZ/CRBR Implementation*.

Figure 15 17 Sub-catchment Areas Overlapping with CRP



Source: Department of Irrigation and Drainage, GIS Data of CRBR compiled by BBEC II

Figure 16 Sub-catchment Areas Overlapping with CRBR

**Table 6 Measurement of Water Volume of Rivers from Crocker Range Park (2009)**

No.	River	Water Vol (L) in 1 minute	Water Vol (L) in an hour	Water Vol in 1 day
<b>Penampang District*</b>				
1.	Sg. Ulu Papar	610,200	36,612,000	878,688,000
2.	Sg. Ponobukan	364,800	21,888,000	525,312,000
3.	Sg. Buayan	241,200	14,472,000	347,328,000
4.	Sg. Terian	75,000	4,500,000	108,000,000
Total				1,859,328,000 billion litter
No.	River	Total water (L) in 1 minute	Total water (L) in an hour	Total (L) in 1 day
<b>Papar/Beaufort* District</b>				
1.	Sg. Bongawan**	169,500	10,170,000	391,392,000
2.	Sg. Kimanis	229,880	13,788,000	330,912,000
3.	Sg. Membakut	201,000	12,060,000	289,440,000
Total				1,011,744,000 billion litter
No.	River	Total water (L) in 1 minute	Total water (L) in an hour	Total (L) in 1 day
<b>Keningau* District</b>				
1.	Sg. Baiayo	410,400	24,624,000	590,976,000
2.	Sg. Pampang	121,920	7,315,200	175,564,000
3.	Sg. Apin-apin	75,000	4,500,000	108,000,000
4.	Sg. Liawan	62,400	3,744,000	89,856,000
5.	Sg. Keritan	22,200	1,332,000	31,968,000
Total				996,364,000 billion litter
No.	River	Total water (L) in 1 minute	Total water (L) in an hour	Total (L) in 1 day
<b>Tambunan* District</b>				
1.	Sg. Tondulu	90,600	5,436,000	130,464,000
2.	Sg. Tikolod	43,200	2,592,000	62,208,000
3.	Sg. Bolotikon	37,800	2,268,000	54,432,000
4.	Sg. Mahua	29,400	1,764,000	42,336,000
Total				289,440,000 billion litter
No.	River	Total water (L) in 1 minute	Total water (L) in an hour	Total (L) in 1 day
<b>Tenom* District</b>				
1.	Sg. Mosolog	151,800	9,108,000	218,592,000
2.	Sg. Melalap	15,000	900,000	2,160,000
Total				220,752,000 billion litter
<b>Total water volume of Crocker Range Park</b>				<b>4,377,628,000 billion water</b>

Source: Sabah Parks

Note:

\*Measurement procedure Cross-Section

\*\*Average Water Volume at Sg. Bongawan (downstream and upstream)

#### 4.4.3 Application of Tagal system

The Tagal system has its origin in the tradition of the communities in the buffer zone and transition area of CRBR. In 2011, 76 villages (19% of all the villages) applied the Tagal system in CRBR (Table 7). As discussed above, current practice of the Tagal system already includes an aspect of PES or economic incentives for biodiversity conservation. Furthermore, though the Tagal system was originally developed to conserve fisheries resources based on Sabah Inland Fisheries and Aquaculture Enactment 2003, the village level institutions in the Tagal system have a potential to contribute to other mechanisms of PES for catchment conservation. Expansion of function of the Tagal system to provide positive incentives for conservation of ecosystem services of river systems other than fisheries resources should be discussed.

**Table 7 Number of Villages covered by Tagal Programme in CRBR (as of 2011)**

DISTRICT	PENA MPAN G	PAPA R	BEAU FORT	TENO M	KENIN GAU	TAMB UNAN	RANAU	TUAR AN	KOTA KINA BALU	TOTA L
Number of villages covered by Tagal Programme	14	20	0	2	6	17	2	12	3	76
Ratio to all villages in CRBR	31.8%	27.4%	0.0%	6.9%	6.5%	29.8%	100.0%	19.7%	17.6%	19.0%

Source: Sabah Fisheries Department, GIS Data of CRBR compiled by BBEC II

## Chapter 5 Proposal of PES and other economic incentives for management of CRBR

The following are recommendations on possible assistance to introduce PES and other economic incentives for management of CRBR, based on information collected and analysis through the interviews, literature survey and field survey, etc. It needs much efforts and time to introduce such economic incentives as they require consent of various stakeholders such as many concerning agencies, local communities, the private sector in proposed transactions, international agencies providing useful frameworks, etc. Further discussion is required on feasibility of each of the recommended interventions below among the stakeholders. The order of the recommendations follows feasibility of each recommendation within the framework of SDBEC (the project period, institution and resources available).

### 5.1 Recommendation No.1: Payment for Catchment Service of CRBR and its Pilot Project

#### 5.1.1 Laws enabling payment for catchment service

##### (1) Water Resources Enactment

Clause 52(2) of Sabah Water Resources Enactment (1998) stipulates as the following:

*52.(2) The Director may levy, in accordance with the rules, water management fees, and charges representing the cost of management activity undertaken by the Director or a person authorised by the Director, on a person—*

*(a) holding a licence issued under Part IV;*

*(b) who owns or occupies land within a declared floodplain area;*

*(c) who is benefitted by a water protection area; and*

*(d) where the Minister has authorised such charges, a person who owns or occupies land within a water conservation area.*

A person *(c) who is benefitted by a water protection area* is applicable to the users of the catchment service of CRBR, provided that catchment upstream is gazetted as water protection area under the enactment.

In reality, though water protection area and water conservation area are legally stipulated in the enactment for protection of catchment, and the government identified and proposed 78 water protection/conservation areas; none of them has been gazetted in the state.

The buffer zone of CRBR was designed following the water protection areas proposed by DID. Once the Water Catchment Area is gazetted, there will be legal restrictions on development activities there. In the Water Protection Area, no land shall thereafter be alienated, no person shall be authorized to erect a new structure, establish a new plantation or clear land. In the Water Conservation Area, the Water Resource Department may notify the owner or occupier of the land regarding the specified types of activities that are prohibited, that to be undertaken in a specified manner or at a specified location, as well as those activities that are prohibited.

##### (2) Park Enactment

Clause 45.(2)(f) of Park Enactment (1984) of Sabah stipulates as follows: -

*45.(2) The Board, subject to the special conditions stated in the declaration, shall have power to do all things expedient or reasonably necessary or incidental to the discharge of its functions and in particular but without prejudice to the generality of the foregoing to levy fees or to collect dues from persons utilizing the accommodations, amenities, facilities or services provided under this Enactment;*



Based on this clause, considering the catchment service of CRP as the “service provided,” some officers of Sabah Parks discuss that this clause provides a legal basis to levy fees for the catchment service<sup>3</sup>. However, Water Department considers the clause is not applicable to the catchment service and Water Resources Department can only charge the catchment service<sup>4</sup>.

### 5.1.2 Pilot Project for Babagon Catchment: Background

Currently NRO, as the secretary for Water Resources Council is proposing declaration of catchment of Babagon dam as Water Conservation Area and Water Protection Area under Water Resources Enactment in gazette.

Application of PES for the water service from the Babagon catchment would facilitate consent of landowners of titled lands in the catchment and other stakeholders for the gazette. Once the Babagon catchment is declared in gazette, it will be the first legal water protection/conservation areas in the state and it could be a model for the other proposed water protection/conservation areas.

Land status in the Babagon catchment and the proposed Water Protection/Conservation Areas are shown in Figure 17 and summarized as follows:

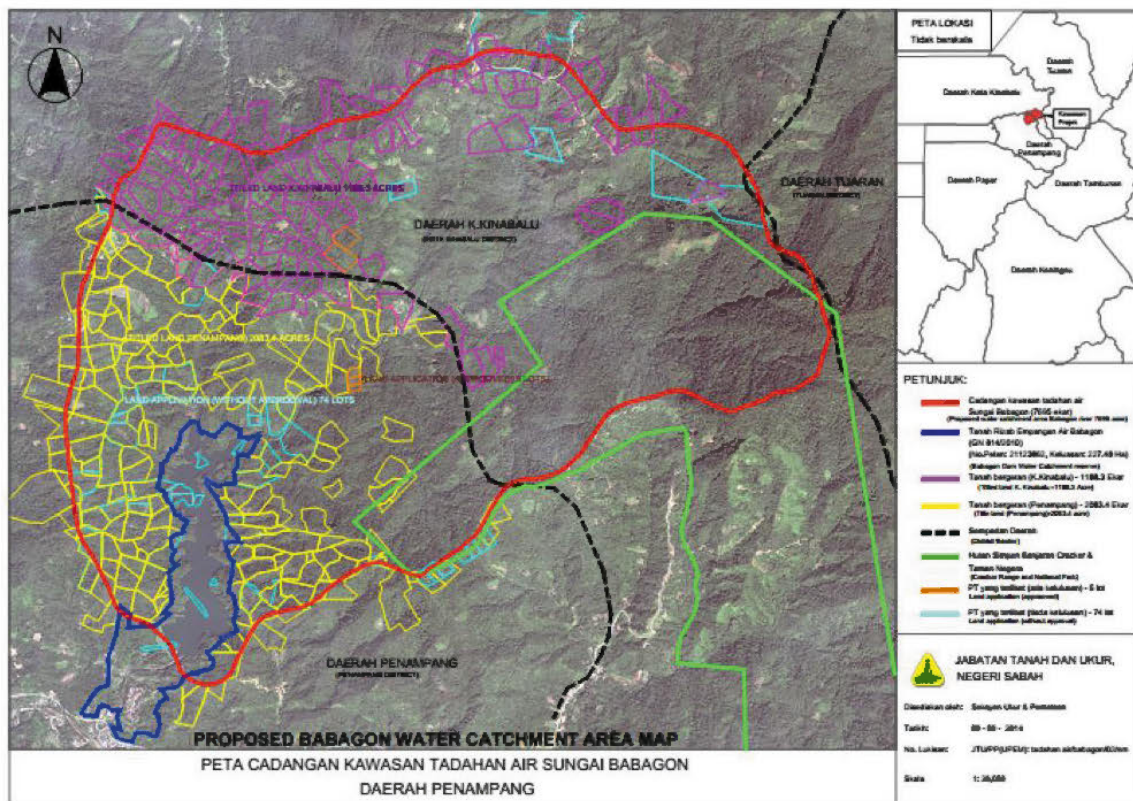
- Area of the Babagon catchment: 3,114 ha (7,695 acre)
- Number of land owner: 322
- Total area of alienated land: 1,324 ha (3,271.7 acre, 42.5% of the total catchment)
- Acreage of Dam Area: 155 ha (384 acre, 5.0% of total catchment)
- Area of the Forest Reserve (Crocker Range Forest Reserve): 705 ha (1,741 acre, 22.6% of the total catchment)
- Approximate state land: 930 ha (2,300 acre, 29.9% of the total catchment)
- Total number of land applications: 79 (5 approved) No title yet

The whole catchment of the Babagon dam is included in CRBR. The Crocker Range Forest Reserve is a part of the core area of CRBR. The rest of the catchment including the alienated lands is in the transition area of CRBR (a little could be in the buffer zone). Referring to the coordinates of the villages derived from the GIS of CRBR developed under BBEC II, the catchment may include 4 villages with JKKK such as Kg. Kapur, Kg. Kintok, Kg. Tampasak and Kg. Kalasunan<sup>5</sup>.

<sup>3</sup> In practice, Sabah Parks already levy fees for commercial entities (hotels and restaurants) setting water intakes at rivers in Kinabalu park.

<sup>4</sup> To include carbon fixation as a service provided by forest reserves in legal sense for the EU-REDD+ Project, SFD required revision of the enactment recently in 2013. Then they can prepare rules and regulations to conserve and transact the service.

<sup>5</sup> The coordinates of the villages in the CRBR GIS have not been confirmed by ground truth, so they might not be accurate.



Source: Natural Resources Office

**Figure 17 Land status and proposed water protection/conservation areas in the Babagon catchment**

Babagon dam is a main source of water supply in Kota Kinabalu. According to the Water Department, the Babagon dam covers a little less than a half (48.4%)<sup>6</sup> of the whole water supply in Kota Kinabalu city. As the population of the city is 465,000 at present, we can assume approx. 225,000 people rely on water from Babagon dam. Babagon dam is owned by the state government and managed by JETAMA Sdn Bhd, the concessionaire of the Water Department.

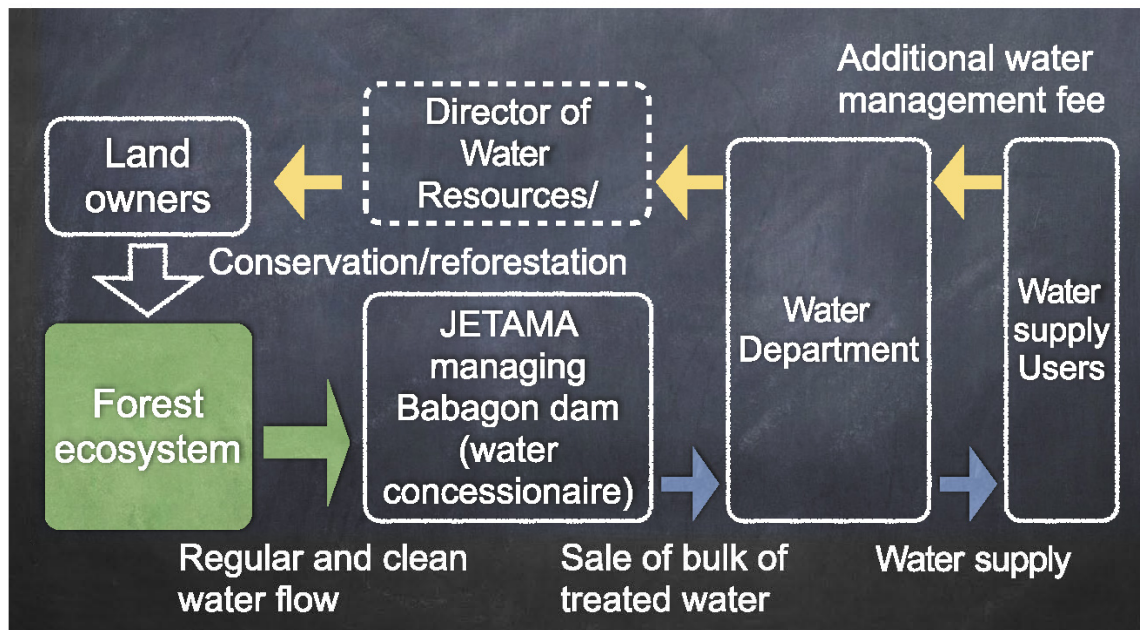
### 5.1.3 Pilot Project for Babagon Catchment: Payment Mechanism

The expected stakeholders in a mechanism of PES for Babagon catchment are as follows:

- Landowners of the catchment
- Users of water supply from Babagon dam
- Director of Water Resources (Director of Irrigation and Drainage)
- Water Resources Council
- Water Department
- JETAMA (as a manager of Babagon dam)
- Lands and Surveys Department
- Sabah Forestry Department (as a manager of Crocker Range Forest Reserve)
- Sabah Parks (as a manager of CRBR)
- NGOs assisting the indigenous communities in the catchment

<sup>6</sup> According to the information from Water Department, the average daily production of water in Kota Kinabalu in 2013 is 366,867.69m<sup>3</sup>/day from the three water sources including Babagon dam. Among them Babagon dam shares 177,784.66 m<sup>3</sup>/day (48.4%).

A proposed mechanism of PES for Babagon catchment is shown in Figure 18.



**Figure 18 A proposed mechanism of PES for Babagon catchment**

Regulatory measures (detailed conditions for land use in the alienated land in the Water Conservation Area according to the enactment) must be applied together with PES. It will take time to prepare such regulatory measures, as regulations should be determined through discussions with the landowners and documented and each different land use and crops require specific regulations. The process is like the planning and implementation of regulations in the Community Use Zone (CUZ) in Crocker Range Park under BBEC. We can refer to the agreement processes and institutions for the CUZ in CRP and Community Conserved Areas (CCAs) in Kinabalu Eco-Linc Project. Establishment of a PES mechanism requires awareness building of landowners and other stakeholders in the communities in the catchment through the River Environmental Education Programme (REEP), etc.

## 5.2 Recommendation No.2: Control Subsidies to Maintain Ecosystem Services in Rural Development in CRBR

### 5.2.1 Issues: current status of the subsidies biased to the monoculture

Currently new plantation and re-plantation of oil palm and rubber by local communities are heavily subsidized. According to the Department of Agriculture, MPOA has a scheme to provide financial assistance of RM9,000 per hectare for new plantation and re-plantation of oil palm up to 5ha, which is called TBSPK (*Skim Tanam Baru Sawit Pekebun kecil* New Planting Scheme for Palm Smallholders). LIGS may also give similar subsidy for rubber plantation as well, which covers cost of seedlings, land preparation and plantation.

The agencies or associations promoting rural development and poverty eradication generally tend to increase rubber and oil palm plantation in the “idle land,”– land alienated to communities but yet to be developed – without evaluating ecosystem services provided by the forest remaining in the “idle land.” Therefore, the “agropolitan” scheme has been the mainstream option of poverty eradication, while there have been less established schemes to subsidize alternative livelihood to maintain/improve ecosystem services. Even in CRBR, there are some MESEJ and Micro MESEJ projects (settlement of poor households with rubber/ oil palm plantation) implemented under KPLB.

## 5.2.2 Interventions

By regulating such negative financial incentive given by the government for conservation of ecosystem services, and providing positive incentives instead through PES and other means, the land owners in the buffer zone and transition area may have a third option in addition to the first two, 1) to develop monoculture or 2) not to develop monoculture, such as 3) not to develop monoculture but making profit through conservation and sustainable land use.

Economic incentives and subsidies for agropolitan and monoculture plantation in CRBR should be regulated. On the other hand, more subsidies and economic incentives should be provided for sustainable land use with ecosystem services maintained/improved, such as Tagal, beekeeping, organic farming, agroforestry, fertigation of ginger, hillside farming, fruit trees, diversification of crops, handicraft, NTFP, etc.

Such direction of rural development in CRBR should be adopted by the concerning agencies and their district branches, such as KPLB, District Offices, Fisheries Dept., KPD, Dept. of Agriculture, MPOA, LIGS, SLDB, etc. with their clear recognition of the boundary of CRBR and the villages in it.

## 5.3 Recommendation No.3: Recommendations on the pilot projects in Kg. Tudan and other villages under SDBEC

Kg. Tudan is a small village located above 1,100m AMSL in the buffer zone of CRBR. The village was selected as a pilot site under SDBEC for the management of CRBR. Rubber can still grow in this altitude but is not productive. Palm oil plantation is not applicable because of the altitude and also the steep slope. Before the project, there was minimal assistance from the government for improvement of livelihood. With technical assistance under SDBEC, the villagers practiced environmentally sustainable methods such as beekeeping, hillside farming, compost making, etc. Under the pilot project, Participatory 3D Modeling of the village and surrounding area is also implemented.

Once the pilot project proposed for the Babagon catchment mentioned successfully achieves gazettement of water protection/conservation areas applying PES of catchment services secured by the certain land uses by the landowners, the model of PES developed in the pilot project can be replicated in and around Kg. Tudan. Such land uses includes forest conservation, conservation of riparian area, plantation of more permanent type crop, introduction of soil conservation in hillside farming, longer fallow for shifting cultivation, introduction of the Tagal programme, etc. Kg. Tudan is located in catchment of Libodon river which is considered as one of the many headwaters of Tuaran river which then flows along the western flank of the Crocker Range before discharging into the sea some 80 km away. In Tuaran River downstream there are five intakes for water supply, such as Telibong, Telibong II, Kg. Bawang, Kg. Topokon and Kg. Topokon II. Among the total water produced from the five intakes in Tuaran river, 116,782.10m<sup>3</sup>/day is used in Kota Kinabalu area, and the remaining 39,780.87m<sup>3</sup>/day was used in Tuaran district in 2013. The amounts cover 31.8% of the total water supply in Kota Kinabalu city and 99.5% of water supply in Tuaran district. Simply multiply the percentages to the total populations of Kota Kinabalu city (465,000 in 2014) and Tuaran district (97,800 in 2010), in total approx. 245,000 people could be benefited by water supply from Tuaran river. In comparison with the big contribution of the land uses in Babagon catchment to secure water supply from Babagon dam, contribution of the land uses in Kg. Tudan to the water supply from the whole Tuaran river is small. However, clear connection between the land uses in Kg. Tudan and supply service downstream could justify PES similar to the proposed Babagon pilot project.



To secure sustainability of initiatives started in the pilot study, scheme to provide subsidies, technical assistance and other assistance for the alternative livelihood maintaining ecosystem services should be introduced in Tudan. Besides the subsidies and assistance to monoculture plantation, there are some schemes to promote various livelihood maintaining ecosystem services. According to the Department of Agriculture, in Sabah, consumers don't want to pay additional cost for organic products. However, if farmers can produce organic fertilizer and the cost and price of the organic products are the same as ordinary products, the consumers choose the organic products. To harvest such organic crops which have price competitiveness with ordinary crops, at least at the initial stage of introduction of organic farming, the farmers require subsidies or other assistance from the government.

Kg. Tudan was selected as a pilot site because it is in a critical area on higher elevation. Methodology and technology such as hillside farming examined in Kg. Tudan could be applicable to the other villages in CRBR on lower elevation, as they share needs to produce crops on steep slopes. On the other hand, the majority of 400 villages in CRBR are located on elevation lower than Kg. Tudan. Critical question in the lower villages is if the alternative livelihood with less negative impact to biodiversity would be economically comparable with the monoculture of oil palm and rubber. If there is a chance to conduct other pilot projects in villages on lower elevation and successfully confirm the alternative livelihood has comparable economic performance with the monoculture, that would contribute much to extension of the livelihood to the other 400 villages in CRBR<sup>7</sup>.

#### **5.4 Recommendation No.4: Introduction of conservation fees in tourism**

As discussed above, collections of conservation fees for CRBR, the Kinabalu and Crocker Range area or all the protected areas in Sabah at the exit points and accommodations can be proposed.

Promotion of collection of conservation fees at entry of specific ecotourism attractions in CRBR is also proposed, such as: -

- "One village one tourism attraction" in CRBR
- Salt trails
- Blooming rafflesia (in sustainable manner)
- Other rare species
- Agrotourism (traditional farming, organic farming)
- Ethnotourism (Kadazandusun culture, TEK)

#### **5.5 Recommendation No.5: Sale of power generated by small hydropower plants through the Feed-in-Tariff (FiT) mechanism**

Possibility of utilisation of the FiT mechanism stated above for conservation of CRBR and river basin management should be examined. According to Renewable Energy Act 2011, to a feed-in approval holder (who generates renewable energy), a distribution licensee (Sabah Electricity Sdn. Bhd. in Sabah) pay feed-in-tariff for renewable energy generated. The Act also specify the renewable resources to which feed-in-tariff is payable, such as biogas, biomass, small hydropower and solar power.

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<sup>7</sup> In the final report of the Community-Based Conservation Survey at Kg. Tudan, Sabah (ERE, 2014), there is no clear indication of the boundary of Crocker Range Forest Reserve, which is a part of the core area of CRBR and neighbors to Kg. Tudan on the south and west (in between Kg. Tudan and Crocker Range Park).

Construction of small hydropower plants within CRBR connected to the state electricity grid could be discussed for electrification of the rural villages as well as PES through the feed-in-tariff mechanism. A committee consisting of landowners and community members in the catchment of the hydropower plant can manage the plant and account the feed-in-tariff collected from Sabah Electricity Sdn. Bhd. If there is a functioning Tagal committee established to implement the Tagal Programme of the river, they can utilize such institution for management of the small hydropower plant. Then the income can be spent not only for maintenance of the plant but also for payment of forest conservation and other land uses securing the catchment service.

There are still many questions to confirm feasibility of such mechanism in CRBR, e.g. if the mechanism would be financially viable considering the initial installation and operation cost and actual income generated by the feed-in-tariff, if Sabah Electricity Sdn. Bhd. could technically connect supply lines to small hydropower plants in the rural areas in CRBR, if there would be any financial instruments (subsidies, loans, etc.) to assist initial installation of hydropower plants<sup>8</sup>. To answer these questions, further study and discussion with SEDA and other concerning agencies are required.

## 5.6 Recommendation No.6: Establishment of CRBR PES Fund

To make the proposed PES mechanisms accountable with appropriate public interventions, establishment of a trust fund is advised. So-called CRBR PES fund can pull payment from the service users and facilitate payment to the service providers (Figure 19). The Sabah ICCA Review conducted under BBEC II (Cooke and Vaz, 2011) suggests utilization of Sabah Biodiversity Centre Fund stipulated in Sabah Biodiversity Enactment for such purpose as follows: -

### *RECOMMENDATION 6*

*An ICCA Fund to be created and managed by the Sabah Biodiversity Centre*

...

*Action: A Sabah Biodiversity Centre Fund should be established specifically for ICCAs and the Sabah Biodiversity Council should convene a discussion on the sourcing of funds from a variety of national and international sources to support initiatives related to community-conserved areas. The Centre should establish the necessary processes to administer the fund in an effective, equitable and transparent way, and a framework for accessing funding through Payment for Ecosystem Services (PES), Reducing Emissions from Deforestation and Forest Degradation (REDD) and other schemes for maintaining areas under forest cover or investments in habitat restoration, or any other suitable funding source.*

*Lead agency: Sabah Biodiversity Centre, ICCA Working Group*

<sup>8</sup> In Sabah and Sarawak, Embassy of Japan in Malaysia through its Consular Office in Kota Kinabalu using its Grant Assistance for Grassroots Projects (GAGP), the Centre of Excellence for Rural Informatics (CoERI) of University Malaysia Sarawak (UNIMAS), and PACOS Trust (Sabah based NGO) have been technically and financially assisted installation of micro-hydropower plants and solar power plants in many rural villages. These power plants aim electrification of the rural villages for fulfilling basic human needs, and sometimes they also aim power supply for rural informatics such as provision of telecommunication centres with internet connection. Though there has not been a case of connection of supply line to sell surplus power to the state level power grid, utilization of such assistance for initial installation and operation of the hydropower plants in CRBR for FiT could be discussed.

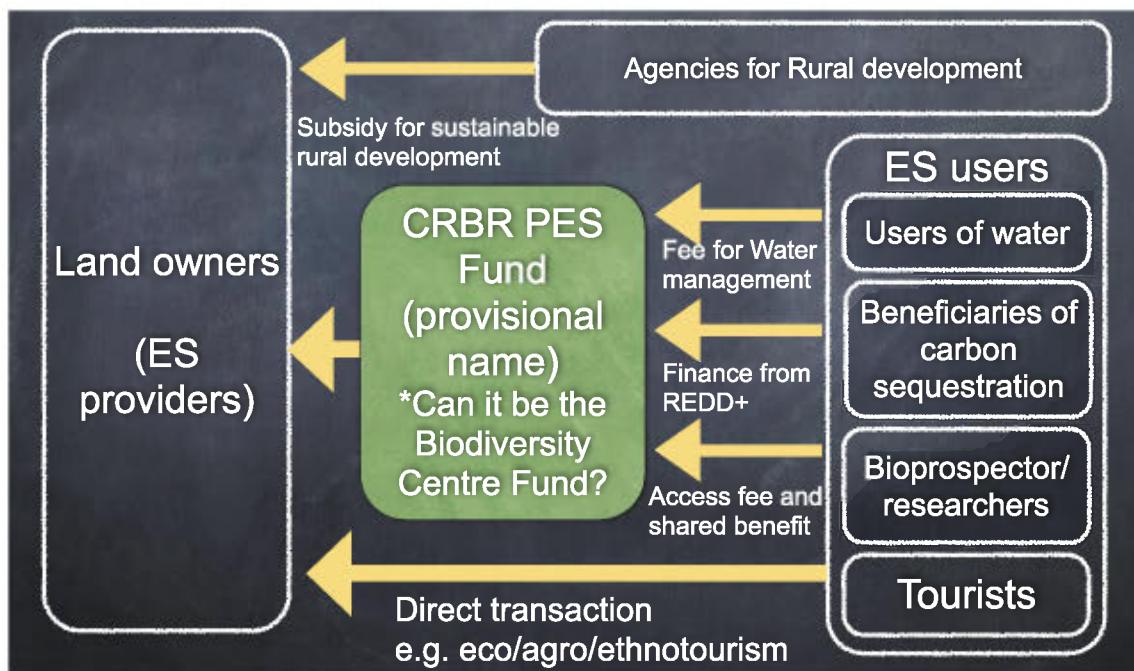


Figure 19 Flow of payment through CRBR PES Fund

### 5.7 Recommendation No.7: Collaboration with the Palm Oil Industry

The number of oil palm plantations is increasing in Beaufort and Tenom district near the CRP boundary within CRBR transition area. The impact of the oil palm plantations was one of the major threats to conservation of the core area, then intervention to the operation of the plantations and further expansion of plantations is needed for management of CRBR.

To lower the impact of the palm oil industry in CRBR, we can refer to the strategy and activities applied to the palm oil industry in Kinabatangan river basin including introduction of positive economic incentives for conservation. In the Ramsar Site Management Plan for Lower Kinabatangan-Segama Wetlands (SaBC, 2011), the directions to promote the activities for the sustainable palm oil production in the Kinabatangan and Segama river basins are as follows: -

- To promote branding the palm oil produced in Kinabatangan and Segama river basins for its sustainable production, including promotion of Certified Sustainable Palm Oil (CSPO) by RSPO and other palm oil certificates. Branding as well as certification of palm oil production will be an effective measures to achieve the conservation which benefits the palm oil industry.
- To promote pollution control of the oil palm plantations and palm oil mills including utilization of biogas and biomass as proposed in the study by DOE on water pollution of Kinabatangan river, applying advanced technology with technical cooperation from research institutes inside and outside Malaysia.
- To enhance forest connectivity including the conservation and rehabilitation of riparian forests proposed by WWF-Malaysia under Kinabatangan Corridor of Life (K-CoL), with cooperation from the palm oil industry.

In addition, payment by oil palm planters for their usage of water from the forest upstream could also be discussed. For big planters, biodiversity offset within CRBR would be applicable.

### **5.8 Recommendation No.8: Introduction of the initiatives for REDD+**

Following the REDD+ Roadmap and collaborating with the activities led by Sabah Forestry Department, economic incentives will be introduced through REDD+ framework to CRBR. However, the core area would be considered as forest without threat and there would be no value in the REDD+ framework. Assessment of carbon at risk in the buffer zone and the transition area in CRBR and measurement of carbon value by forest conservation and sustainable management are proposed.

The ongoing Kinabalu Eco-Linc Project is a pilot project of the EU REDD Project. The southern part of the target area of the Eco-Linc Project overlaps with the buffer zone and the transition area of CRBR. In the context of CRBR management, considering the Eco-Linc Project as a pilot for introducing REDD+ initiatives to CRBR, replication of the achievement in other areas in CRBR, such as the pilot project sites of CRBR under SDBEC and the Babagon catchment, can be proposed.

### **5.9 Recommendation No.9: ABS and Bioprospecting**

The forest and villages in CRBR could be pilot sites for enforcement of the revised Sabah Biodiversity Enactment and its rules and regulations on ABS (benefit sharing from genetic resources and associated traditional ecological knowledge/TEK). Although possible interventions rely on legal framework provided by revised enactment and the rules and regulations, scientific research and bioprospecting of genetic resources and TEK in CRBR as a pilot project could be proposed to examine and fine tune revised rules and regulations for ABS. For obtaining free, prior and informed consent (FPIC) from the indigenous communities owning TEK, drawing up of bio-cultural protocols (minutes of understanding) between the communities, SaBC and other concerning parties would help the communities know their legal rights about ABS.

ABS may not generate revenue for the state and private sectors in Sabah and Malaysia in a short term. The revision of the laws and expected lengthy process for obtaining FPIC from the indigenous communities may take even longer than the other recommended interventions.

### **5.10 Recommendation No.10: Quarries in CRBR**

When Sabah Parks defined the outer boundary of CRBR, existing quarries were excluded based on site observation. As the transition area of CRBR is rich in rock reserves, there will be applications of new quarries in future. In general the use of ecosystem services for quarrying includes the need for freshwater supplies for mineral processing, which can be very significant. Then payment by quarry operators for catchment service they are utilizing could be discussed.

Quarries are also in general associated with adverse impact on biodiversity. Biodiversity offset for No Net Loss within CRBR as conditions for approval of quarry operation could be discussed<sup>9</sup>.

<sup>9</sup> In 2010, Hap Seng Building Materials Sdn. Bhd., one of the major constructing companies in Sabah who also operates many quarries started a project collaborating with Sabah Forestry Department for 30 months. The project aims to (1) recruit field workers for forest rehabilitation and protection works, forest management activities and tree planting, and (2) to undertake the experimental “no net loss” voluntary endeavor of the department, by restoring at least 40 hectares of degraded lands and forests (Sabah Forestry Department, 2014).



## **Chapter 6 Recommendations for the PES policy formulation at state level**

As stated above in Section 3.2, the project “Biodiversity conservation in multiple-use forest landscapes in Sabah, Malaysia” (2012-2018) funded by UNDP-GEF includes a subcontract to support the development of new state-level policies and regulations for PES, and pilot landscape level demonstration of PES (scheduled for 4 years from Oct. 2015). Here in this Chapter, based on the analysis of status of introduction of economic incentives for nature conservation in Sabah, and discussion for application of economic incentives stated above, recommendations on formulation of state-level policies for PES are presented.

### **6.1 Policy Recommendation No.1: In trodution of PES to the Water Resources and Catchment Management in the State**

The state-level policies for PES should be formulated in synergy with the policies and plans on water resources management including catchment management. The recommendation in Section 5.1, introduction of payment for catchment service of CRBR and its pilot project in the Babagon catchment could be considered as a model for catchment management of the entire state.

Below are summarized the past and ongoing plans and efforts for catchment management in Sabah. The protection of the water catchments is under the purview of DID based on the Water Resources Master Plan for Sabah developed in 1994. The Master Plan also identified the needs for catchment management. Water Resources Enactment was enacted in 1998 which stipulates various powers and responsibilities for water resources management including the management of catchments. To manage water catchments is to manage activities in the catchments and this is done through the determination of access in catchment, monitoring approved access and enforcement for non-compliance. Catchment management plans are developed to facilitate these controls. Experience gained from the development of the pilot Integrated Catchment Management Plan for the Moyog River catchment in 1999 and DANIDA’s capacity building in integrated catchment management planning project in 2002 has helped DID to develop other catchment management plans such as for Kota Marudu and Kinabatangan. In 2005, the Director of DID was officially assigned as Director of Water Resources stipulated in the Water Resources Enactment. In Feb. 2006, based on the Enactment, a State Water Resources Council chaired by the Chief Minister of Sabah was established to ensure that water catchment areas in Sabah are well managed.

On the other hand, these experiences unveiled various challenges in catchment management in Sabah. One of them is socio-economic issues among the people residing in the catchment. The catchment management plans included measures determined by the stakeholders to address issues in the catchment. Such measures include official gazette of areas into water protection areas, or water conservation areas. These measures have financial, political and socio-economic implications. Measures such as official gazette of a water protection area require the government to acquire lands that are already alienated. Acquiring these lands would be a cost to the government. Official gazette of a water conservation area is another measure whereby activities in that land may need to be changed. Change of land activities could mean a change of lifestyle and loss of income to the landowners. The government may have to compensate this.

The introduction of PES for the water supply service from the catchment would address the above challenges concerning economic cost and benefit of catchment management for land owners, and it may promote official gazette of water protection/conservation areas. In the proposed pilot project for conservation of the Babagon catchment, it is planned to establish a payment mechanism for the owners and occupants in the catchment through water bill

collection, etc. so as to give them an economic incentives to agree on the official gazette. If the pilot project is successful, we can consider extending the approach to combine PES and official gazette of water protection/conservation areas to the other proposed water catchment areas in the state.

## **6.2 Policy Recommendation No.2: Consideration of PES in Poverty Eradication and Rural Development**

In development of the state-level PES policies, poverty eradication planned and implemented by the federal government and state government should not be considered as “external factors.” Poverty related information including the national poverty database (e-Kasih) and various poverty eradication schemes applied by the government should be utilized during planning and implementation of the PES policies. In consideration of poverty eradication and rural development scheme which may in some cases have negative impact on ecosystem services, in addition to the regulatory measures such as EIA, etc., intervention and coordination on determination of project sites and plan including application of PES should be considered.

Specifically, application of poverty eradication scheme which may have a negative impact on the ecosystem services should be avoided around protected areas and candidate sites for international recognition (Mount Kinabalu World Natural Heritage Site, CRBR, Lower Kinabatangan Segama Wetlands Ramsar Site) and protected areas under domestic laws, with high conservation values. Instead, alternative livelihood and income generation including application of PES should be discussed.

As organizational structure in order to realize such a policy, it is desirable that the agencies, such as NRO, etc. who are in charge of natural resources conservation and an introduction of PES participate in the various existing poverty eradication committees. These poverty eradication committees are inter-agency and formed at state level as well as district level, for making important decisions on poverty eradication and rural development. In turn, also in the organizational structure for implementation and policy development of PES, it is recommended to have agencies not only for nature conservation but also for poverty eradication, such as the State Economic Planning Unit (EPU), Ministry of Rural Development (KPLB), SEDIA, etc.

## **6.3 Policy Recommendation No.3: Utilization of Feed-in-Tariff (FiT) Mechanism**

Utilization of Feed-in-Tariff (FiT) mechanism for promotion of renewable energy could be considered as a state-level PES policy. In Section 5.5, construction of small hydropower plants within CRBR for selling electricity in the FiT mechanism is recommended. Though there are still many questions to confirm feasibility of such mechanism in CRBR, the approach could be applicable to the other part of the state.

In addition, the FiT mechanism creates economic incentives to reduce pollution of river from the oil palm industry. While the oil palm industry produces palm oil and palm kernel oil, they also have huge amount of by-product such as empty fruit bunches, palm kernel cake, palm oil mill effluent, palm tree trunks (through replanting palm trees), etc. The industry used to discharge them as “waste” after some processing to natural environment. In particular, palm oil mill effluent could pollute river water if it is discharged without proper processing.

As stated above, in the recently introduced FiT mechanism, renewable resources to which feed-in is payable includes biomass. Thus, electric power generation utilizing biomass in the by-product from the palm oil industry is offered an economic incentive through the FiT mechanism, in addition to incentive by in-house power generation for the plantation and oil palm mills. Such

use of the palm oil by-product reduce discharge of waste to natural environment including palm oil mill effluent and contribute to maintenance and improvement of ecosystem services.

#### **6.4 Policy Recommendation No.4: Others**

The collection of conservation fees at the exit points from Sabah and collection of fixed amount of fee from all guests in hotels and accommodations in Sabah (or in particular area) recommended in Section 5.4 for CRBR management can be also considered as an option of state-level PES policy. CRBR PES fund recommended in Section 5.6 needs not to be limited to payment for ecosystem services of CRBR, but state-level PES fund can be discussed utilizing Sabah Biodiversity Centre Fund, etc.

REDD+ is considered as a PES mechanism whereby developing countries that are willing and able to reduce emissions from deforestation and degradation are paid by developed countries for doing so. Thus, activities and projects under the REDD+ framework lead by Sabah Forestry Department (SFD) are considered as PES utilizing an international framework. The state-level PES policy could include further development, extension and institutionalization of the activities under REDD+, together with other innovative financial mechanisms implemented or planned by SFD (such as forest certification, biobank, biodiversity offset, etc.).

As stated in Section 5.9, CRBR could be a pilot site for enforcement of the revised Sabah Biodiversity Enactment and its rules and regulations on ABS, though realization of the pilot project may take even longer than the other recommended interventions. Institution building for ABS based on the revised law and regulations could be promoted by the state-level PES policy.

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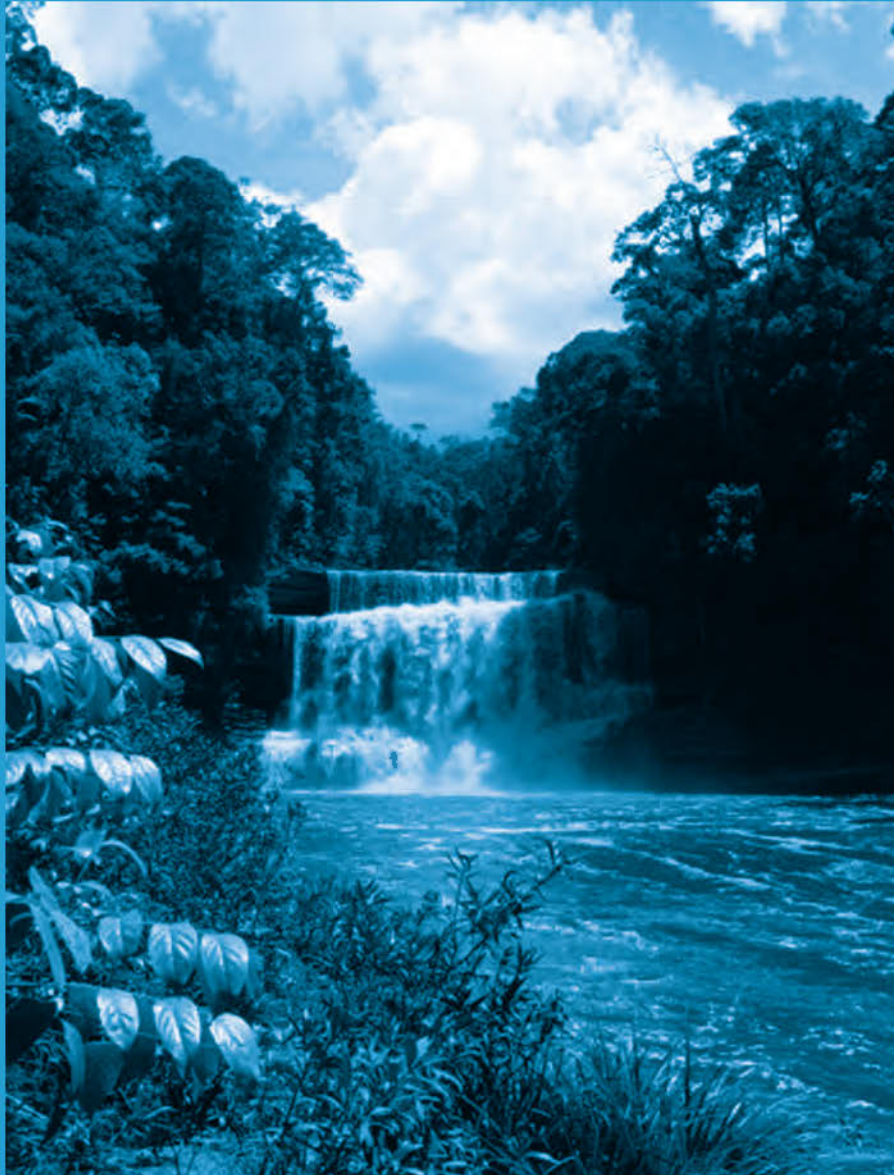
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