Impact of Reforestation Project on Livelihood and Awareness on Forest Conservation among the Local Community:
A Case Study in Kampung Tong Nibong, Serian

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A dissertation submitted in partial fulfillment of the requirements for the degree of
Master of Environmental Management (Development Planning)

Faculty of Social Sciences
UNIVERSITI MALAYSIA SARAWAK
2015
DECLARATION OF ORIGINAL WORK

This declaration is made on (date)______________

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I, Kotaro Ozawa (14030009), Faculty of Social Sciences, hereby declare that the work entitled Impact of Reforestation Project on Livelihood and Awareness on Forest Conservation among the Local Community: A Case Study in Kampung Tong Nibong, Serian is my original work. I have not copied from any other students' work or from any other sources except where due reference or acknowledgement is made explicitly in the text, nor has any part been written for me by another person.

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Abstract

This study is conducted to determine impact of reforestation project on local communities. Specifically, the objectives of this study are to identify impact of the reforestation project implemented by Japan Malaysia Association in cooperation with Forestry Department Sarawak in Apeng Forest Reserve on livelihood of and forest conservation awareness among participating community of Kampung Tong Nibong, Serian. Socioeconomic impacts of the project on the participating households are also identified.

In order to obtain data necessary to achieve research objectives, face-to-face interview, which helps to obtain respondents’ demographic and socioeconomic information as well as their perception of forest conservation, with 14 participants of the reforestation project was carried out in November 2014.

The findings of this study show that the reforestation project conducted in Apeng Forest Reserve has positive effects on socioeconomic status of participating households in Kampung Tong Nibong. These include increase in job opportunity and household’s income as well as better understanding and recognition of the important role of forest in sustaining livelihoods of the community. The findings of this study also reveals that land issues caused by the expansion of oil palm plantation and restriction on agricultural activities within the forest reserve area have resulted the non-participating villagers’
encroachment into Apeng Forest Reserve.

Therefore, it is suggested that the project should expand its scale to involve more villagers in reforestation activities so that the forests would remain undisturbed from deforestation while the community of Kampung Tong Nibong as a whole would be able to enhance their socioeconomic status and awareness on forest conservation.
Abstrak

Kajian ini dilaksanakan bagi menentukan kesan projek penghutanan semula terhadap masyarakat setempat. Secara khususnya, objektif kajian ini adalah untuk mengenalpasti kesan projek penghutanan semula yang dilaksanakan oleh Persatuan Jepun-Malaysia dengan kerjasama Jabatan Perhutanan Sarawak di Hutan Simpan Apeng terhadap kehidupan dan kesedaran mengenai kepentingan pemuliharaan hutan di kalangan masyarakat setempat yang terlibat dalam projek tersebut di Kampung Tong Nibong. Kesan projek terhadap sosioekonomi isirumah yang terlibat dalam projek tersebut juga dikenalpasti dalam kajian ini.

Untuk mendapatkan data yang diperlukan bagi mencapai objektif kajian ini, temubual bersemuka dengan 14 orang peserta yang terlibat dalam projek penghutanan semula itu telah dilakukan pada November 2014 bagi memperolehi maklumat mengenai demografi dan kesan sosioekonomi responden di samping persepsi mereka mengenai pemuliharaan hutan.

Dapatan kajian menunjukkan bahawa projek penghutanan semula yang dilaksanakan di Hutan Simpan Apeng mempunyai kesan positif terhadap status sosioekonomi isirumah peserta yang terlibat dalam projek tersebut. Kesan positif ini termasuklah peningkatan peluang pekerjaan dan pertambahan tingkat pendapatan serta kesedaran isirumah peserta mengenai peranan penting hutan bagi mengekalkan kehidupan
masyarakat setempat. Dapatan kajian juga menunjukkan bahawa isu tanah yang
disebabkan oleh pengembangan ladang kelapa sawit dan halangan terhadap aktiviti
pertanian di dalam kawasan hutan simpan telah menyebabkan penduduk yang bukan
merupakan peserta projek mencerobah kawasan Hutan Simpan Apeng.

Justeru itu, adalah dicadangkan agar projek ini diperkembangkan lagi skalanya agar ia
membolehkan lebih ramai lagi penduduk untuk terlibat dalam aktiviti penghutanan
semula ini. Dengan demikian, hutan simpan tersebut akan kekal tanpa dicerobohi
dengan aktiviti penebangan pokok hutan di samping status sosioekonomi dan kesedaran
mengenai kepentingan pemuliharaan hutan dapat dipertingkatkan di kalangan
masyarakat setempat di Kampung Tong Nibong secara keseluruhannya.
Acknowledgement

First and foremost, I wish to express my heartiest gratitude to my honorable supervisor, Dr Wong Swee Kiong, senior lecturer in Faculty of Social Sciences, for her continuous support and generous guidance without which it would never have been possible for me to complete this work. The knowledge that I have acquired through fruitful discussions with her will be helpful to me when I make important decision in the future.

In addition, I would like to thank all lecturers and resource persons who taught us in the SLUSE-M programme and my special thanks goes to Dr Mohd Effendi Wasli for his encouragement and valuable advice.

I must also acknowledge Madam Sakai Kazue of Insar Tours & Travel Sdn. Bhd. for providing me with opportunity to conduct my research in Kampong Tong Nibong. Moreover, her kind support helped me to feel comfortable to stay in Malaysia.

I am also thankful to the villagers of Kampong Tong Nibong for their cooperation which let my fieldwork be carried out smoothly.

Last but not the least, I am grateful to my parents, Sumio Ozawa and Masako Ozawa for their understanding of pursuing my postgraduate study in Malaysia and spiritual and financial support for many years during my studies.
No temptation has overtaken you except what is common to mankind. And God is faithful; he will not let you be tempted beyond what you can bear. But when you are tempted, he will also provide a way out so that you can endure it.

1 Corinthians 10:13
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<td>CO₂</td>
<td>Carbon Dioxide</td>
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<td>DFID</td>
<td>Department for International Development</td>
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<td>FDS</td>
<td>Forestry Department Sarawak</td>
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<td>F.R.</td>
<td>Forest Reserve</td>
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<td>GHG</td>
<td>Greenhouse Gasses</td>
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<td>Japan Malaysia Association</td>
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<td>LCDA</td>
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Chapter 1

Introduction

1.1 Background of the Study

Global climate change has been severe issue that must be resolved urgently. The Earth’s average surface temperature has increased 0.8 degree Celsius since the Second Industrial Revolution when the social system of mass production and mass consumption begun (NASA, 2015). The warming climate has brought massive changes to the planet such as decreased ice and snow cover, sea level rise, ocean acidification, extreme weather and ecosystem changes. It is a threat to billions of lives including human beings who are affected by the extreme weather due to global climate change. Most climate researchers agree that human activities such as driving automobiles, excessive electricity usage and uncontrolled urban development have accelerated greenhouse effects, and this has then resulted in current global warming heating up the surface of the Earth and the lower atmosphere (NASA, 2015).

Carbon dioxide (CO₂) is one of the major human-induced greenhouse gasses (GHG) that trap heat radiating from the earth towards space. In the past 8,000 years, the stable climate cycles allowed human civilization to thrive, but about 200 years ago they began digging up old carbon that had been stored in the soil. These fossil fuels such as coal, oil and natural gas were made from plant and animal remains which died long time ago.
before human evolved. Energy stored inside fossil fuel deposits is able to power factories, cars and power plants, but also emit CO₂ when they are burnt. As a result, the amount of CO₂ in the atmosphere has increased 40% as compared to that in 1750 and it shows no sign of slowing down (NASA, 2015).

Forests are known as carbon sink for their function to capture and store atmospheric carbon. When plants photosynthesize, they absorb CO₂ and produce oxygen. This process of removing carbon from the atmosphere and depositing it in a reservoir, which is called carbon sequestration, is very important to mitigate the amount of CO₂ in the earth’s atmosphere. However, a large area of forests cover on the Earth has been lost significantly since the industrialization.

Forests have been damaged or cleared for timber products, fuel woods, agricultural land-use (cash-crop and livestock farming) and expansion of residential area. About twelve to fifteen million hectares of forests are lost each year; this is equivalent of 36 football fields per minute (WWF, 2015). It is estimated that deforestation and forest degradation account for around 20% of the annual green gas emissions, which is larger than emissions from the entire global transport sector (WWF, 2015). Degraded forests release the carbon stored in trees and below ground as CO₂ when they are cut, burned and removed; consequently, it causes reduction in carbon sink. Boucher et al. (2011) said, “Since carbon dioxide is the principal gas trapping heat in Earth’s atmosphere, tropical deforestation is said to be an important contributor to global warming”. Other
than increasing GHG, deforestation and forest degradation bring impacts on environment and socio-economy such as reduced biodiversity, disruption in water cycle, increased soil erosion and disrupted livelihoods.

In response to climate change reaching a warning level, governments, enterprises and organizations began to work in cooperation with each other to engage with efforts to combat this problem. As stated by Zhou et al. (2007) “reduction in green house gases to combat global climate change has been commonly recognized as an important strategy by policy makers and scientists from around the world”. United Nations Framework Convention on Climate Change (UNFCCC) was adopted and ratified by 155 countries at United Nations Conference on Environment and Development in 1992 and entered into force in 1994, aiming at stabilizations of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

For further efforts to tackle the issue of climate change, Kyoto Protocol, which commits its parties by setting internationally binding emission reduction, was adopted at the 3rd Session of the Conference of the Parties to UNFCCC (COP3) in 1997. Developed nations of the parties are assigned a heavier burden to reduce GHG emissions, taking into consideration that more than 150 years of industrial activities by these countries resulted in the current enhanced greenhouse effect. In order to fulfill the commitments, the clean development mechanism (CDM), which is defined under the protocol, public
and private entities from industrialized countries are encouraged to implement sustainable forest management practices, afforestation and reforestation in developing countries aiming at protection and enhancement of sinks and reservoirs of GHG. UNFCCC (2013) stated in their report that “Reforestation activities contribute to climate change mitigation by capturing the atmospheric carbon and locking it into the living and dead biomass in the ecosystem”.

Massive scale deforestation on the nutrient-rich land of Sarawak is a concerned issue in terms of degraded biodiversity and ecosystem of tropical rainforests. Forestlands are the main natural resources to be utilized for economic development of the nation and the state. Planting cash crops such as oil palm, rubber and pepper has been actively practiced throughout Sarawak especially in rural areas where timber extraction used to take place. In addition to these lucrative land-use strategies, for indigenous people of Sarawak, paddy farming is a traditional form of agricultural activity mainly for their own consumption. Therefore, current land-use pattern in Sarawak does not seem to be sustainable since it requires land clearing by means of slash-and-burn and shifting cultivation. As reported in Sarawak Facts and Figures (State Planning Unit, 2012), planted area of cash crops namely oil palm, rubber and pepper has been expanding, and even the area of paddy field, which is usually subsistent farming, has also been increasing. In other words, the forest-covered land has been reducing drastically.

Having realized that Japan should take responsibility for tropical deforestation since the
country is a main importer of timber and palm oil products, Japan Malaysia Association (JMA), which is a public interest incorporated association, was searching for the opportunities for implementation of reforestation project in Sarawak. JMA’s aspiration to rehabilitate such degraded forests as a part of their social responsibilities reclines the specified vision of Forest Department Sarawak (FDS) to achieve excellence in the management and conservation of tropical forests. Thus, reforestation projects have been carried out through the partnership between JMA and FDS in the land of Sarawak since 1995 to regenerate rainforests with the help of enterprises, organizations and individual volunteers from Japan. After the completion of the former tree planting activities at Balai Ringin Protected Forest in the year of 2000, Gunung Apeng, which was gazetted as Apeng Forest Reserve\(^1\) as stipulated in Forests Ordinance, 1953, No.726, was selected by FDS for the following project site since 2005.

### 1.2 Statement of Problem

Despite the increase in GHG emissions from developing nations including Malaysia as a result of changing trend towards industrialization and expanding deforestation activities, policy makers and implementers of the countries concerned cannot dedicate all efforts to mitigate climate change. Since they are facing several issues to tackle simultaneously such as poverty reduction, food scarcity, management of natural

\(^1\) Forest Reserve is categorized under Permanent Forest Estate which is intended for sustainable forest management. In the designated area, selective harvesting, in which only mature trees are felled and sufficient young trees are left behind to form the next crop, is carried out (Forest Department Sarawak, 2015). Please refer to Appendix1 for further explanations.
resources and energy, improvements of education and healthcare, in turn achieving economic development is prioritized and environmental issues are likely to be set aside in developing countries.

It can be seen that livelihoods of the rural people of Sarawak are much dependent on natural resources from forests including fertile soil and clean river water for agriculture, timber for building, wildlife for hunting and fishing and herbs for pharmaceutical use. They have been interacting with nature and become a part of forest ecosystem. Thus, deforestation and forest degradation have direct adverse impact on their livelihoods. However, because of increasing living costs due to the rapid economic growth of the country in the last few decades and lacking knowledge of forest conservation, the rural people tend to cultivate forestlands in a manner that they apply so much fertilizer and pesticide to maximize output, which in turn pollutes soil and river water.

Reforestation projects, on the other hand, not only contribute to the climate change mitigation by enhancing carbon sinks and reservoirs but also assist developing countries in achieving sustainable development that reduce poverty and improve the living standard of participating local communities (UNFCCC, 2013). In this case, reforestation project can give solution to development issues of nation, state and community by means of spillover effects of the projects while improving the ability of forest ecosystem of capturing atmospheric carbon and locking it in.
UNFCCC (2013) explains that co-benefits of reforestation project can potentially contribute to the objectives of sustainable development. For instance, socio-economic benefits of reforestation project can be derived from increased availability of wood and non-wood products that generate revenue. Employment engaging with forest management such as tree planting, maintenance and looking after nursery can be given to local communities besides developing potential ecotourism and agroforestry. Awareness of forest conservation can also be enhanced by strengthening cultural, religious and indigenous value of forest through local community’s participation in reforestation project.

Another research also shows that benefits of reforestation project is significant to local community other than increasing in carbon sequestration that might be helpful to global issue of climate change. Reforestation can rehabilitate former degraded land by improving water quality and tree roots stabilize soil, which is vulnerable to erosion. Well-structured forest ecosystem can protect surrounding villages from flood damage by minimizing the effects, and it can also be home for millions species of fauna and flora, from which villagers obtain food (EPA, 2012).

Local participating community of Kampung Tong Nibong in the reforestation project carried out by JMA and FDS at Apeng Forest Reserve (Apeng F.R.) seems to enjoy the benefits from the reforestation project. The villagers from Kampung Tong Nibong have consistently participated in reforestation activities since the beginning of the project in
2005 while participants from the neighboring villages has quitted being involved in the project and made agreement upon oil palm plantation scheme with a private enterprise.

Although joining in an oil palm plantation scheme is more likely to have short-term economic return, people of Kampung Tong Nibong have chosen to get involved in the reforestation project. What are the driving forces behind this decision? Are people in Kampung Tong Nibong seeing greater benefits gained from the project than that from the oil palm plantation scheme? Are the participants of the project in Kampung Tong Nibong having better understanding of importance of forest conservation than other members of the community, thus motivating them to carry on with tree planting activities? To what extent has the reforestation project carried out at Apeng F.R. affected the livelihoods of the inhabitants particularly in Kampung Tong Nibong? How has the project brought socioeconomic impacts to the people in Kampung Tong Nibong? How then has the reforestation project affected the level of awareness on forest conservation among the local inhabitants in Kampung Tong Nibong?

1.3 Research Objectives

The general objective of this study is to investigate impacts of participating in the reforestation project at Apeng F.R., which might then affect the standard of living of people in Kampung Tong Nibong. From the general objective of the present study, specific objectives are derived and are as follows;
• To find out changes in the livelihoods of the participating community in Kampung Tong Nibong after the implementation of reforestation project in the area;
• To identify socioeconomic impacts of the reforestation project on the participating community in Kampung Tong Nibong;
• To determine the awareness level on forest conservation among the participating community in Kampung Tong Nibong.

1.4 Significance of the Study

Reforestation has been a trend among developed countries since the last few decades in response to increased awareness of climate change, environment degradation and pollution due to extremely industrialized economic activities. Those countries that are used to disturb forest ecosystem are actively engaged with rehabilitating such degraded forests in developing countries in order to compensate for their relentless action during the development period.

Although international scenario is shifting towards pro-environmental behavior, developing or less developed countries have a different perspective on the issue. Since they are under developed, more emphasis is put on utilizing natural resources for their economic development than on conservation. For instance, oil palm plantation is widely practiced in the state of Sarawak as a catalyst for economic growth and consequently
reducing poverty. In order to venture into oil palm plantation, forests are normally cleared and replaced with oil palm trees. This causes forest covers to be reduced and weaken the function of forest ecosystem.

The joint reforestation project carried out by JMA and FDS does not only focus on forest conservation, but also targets to reduce poverty at Kampung Tong Nibong through the economic benefits channeled to the local community from the project. This is done through the given employment opportunities to the locals as general workers and nursery caretakers at Apeng F.R.. The project is also expected to create ecotourism that can be a source of income for the community. Rehabilitated forests may accommodate animals, which previously inhabited in the forest, and they may attract tourists to visit the village.

Thus, it is imperative to carry out this study to find out the real impact of the reforestation project at Apeng F.R. on the participating community in Kampung Tong Nibong with a wide range of perspectives of economic, social and environmental so as to provide policy makers with accurate information on whether benefits of reforestation project outweigh of which oil palm plantation scheme brings to rural people. The outcome of this study is crucial to make contribution to building theoretically advanced forest management system specifically in the area of reforestation.

Since tree-planting activities at Apeng F.R. involves investment of a lot of money,
manpower and other resources, which are limited and should be effectively utilized, it is worth examining impacts of the reforestation project to the community in Kampung Tong Nibong. Furthermore, the outcome of this investigation on impacts of participating in the reforestation project would give policy makers as well as donors some clue on sustainable rural development, as improved rural livelihoods are considered significant drivers of a healthy forest ecosystem. In the case where benefits of reforestation projects can satisfy villagers’ needs, sustainable rural development based on sustainable forest management, from which villagers gain their livelihoods, would be achievable.

This study is also hoped to provide a suggestion to the land-use issues between conflicting issue of economic development through oil palm plantation and inculcating awareness of forest conservation among local community, in particular. The result of this study is also hoped to indicate to policy makers if sustainable land-use patterns particularly the reforestation project can be engine for economic development while improving the environment and social health at the same time.