THE SOCIAL AND ECONOMIC IMPACTS OF A LOGGING ACCESS ROAD: A CASE STUDY OF MARUDI TOWN, SARAWAK, MALAYSIA

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ABSTRACT

The biggest problem of Marudi Town, the major town of the districts in Sarawak, Malaysia, is the lack of an access road to connect it to the outside world, especially to the nearest city, Miri City. The Sarawak state government argued that the main reason for not providing an access road between Marudi and Miri was to reduce rural-urban migration. Since July 2005, a logging access road built by a logging company has made the Marudi Town community accessible to Miri City by land transportation. This thesis examines the social and economic impacts of the logging access road on the Marudi Town community since July 2005. A case study approach has been applied and two models of access road have been examined. The first model argues that rural access roads stimulate outward migration, while the second model suggests that access roads facilitate rural economic development. Data has been collected through questionnaire surveys, face-to-face in depth interviews, field observation and secondary data analysis. The results show that outward migration occurred before the existence of the logging access road, and the justification given by the state government for not providing an access road between Marudi Town and Miri City is questioned by the local people. Various positive impacts have been created since July 2005; namely an increase in weekend residents and visitors, improvement in the mobility of local people, land accessibility which resulting on saving human lives, more job opportunities, increased local business activities and the expanding ownership of private vehicles. However, due to the weight restrictions of vehicles and the bad condition of the logging access road, the potential positive impacts are limited.
DECLARATION

NAME:……………………………………. PROGRAM:………………………………………………

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CHAPTER 1

INTRODUCTION

In recent years, there have been many studies which have focused on the issue of rural development, but few have been concerned with the role of rural access roads in rural development. A case study has been undertaken to investigate the social and economic impacts of a logging access road on Marudi Town communities, including changes in monthly income, employment opportunities, local economic activities, impact on inward and outward migration and perceptions and perspectives of the local communities regarding the access road.

This chapter is structured as follows. The research questions and objectives are discussed in section 1.1 that is followed by an introduction to the study area in section 1.2. The research methodology is presented in section 1.3 and the significance of the study is explained in section 1.4. Finally, the thesis structure is outlined in section 1.5.

1.1 Research Questions and Objectives

Rural development should remain a priority in the development policy of developing countries because the majority of poor people live in rural areas (Windle & Cramb 1997; Maxwell 2005). As suggested by Windle and Cramb (1997), one of the strategies which is able to encourage rural people to develop in situ, is to provide accessibility, particularly access roads, so that local people will stay and work in the rural areas. There are two models emerging in today’s literature regarding the impact of access roads on rural development. The first model believes that access roads stimulate outward migration from rural areas while the second model believes that access roads facilitate rural economic development.

Researchers who subscribe to the first model believe that there is a direct link between access roads and rural-urban migration. Rhoda (1983) claims that one of the factors that stimulate outward migration from rural areas is the availability of accessibility to the city. Possessing the same perception as Rhoda, the Sarawak Government had no active plan to build any access roads from Marudi Town to the nearest city, Miri, so it would halt rural-urban migration from
Marudi Town (Sin Chew Daily News 2007). According to The Star Online (2007), instead of building an access road between Marudi Town and Miri City, the State Government had a plan to build an access road from Marudi Town to its sub-district, Long Lama. The main intention of this decision was to halt the process of outward migration, attracting more inland people into Marudi Town and to turn Long Lama into a secondary town of the district.

In addition, Wilson (2004, p. 527) also believed that an access road would undermine the existing social structure and stimulate outward migration. However, according to the Yearbook of Statistics Malaysia (2005, p. 26), from year 1991 to 2000, outward migration occurred before there was any access road connecting Marudi Town to the outside world. During that period, the total population in Marudi District had decreased from 71,958 in 1991 to 71,713 in 2000. Furthermore, Marudi District was the only district which experienced a drop in population during that particular period. According to Khoo (1995), the major three
destinations for migration from Marudi were Miri, followed by Bintulu and Kuching, ranked according to the distance from Marudi (Figure 1.1).

In contrast to the first model, the second model believes that access roads facilitate rural economic development. There are some researchers who perceive access roads as one of the critical components in creating a quality and modern lifestyle, as these roads will enable people to travel from one place to another for the purposes of working, schooling and social activities (Demir 2007). Others perceive access roads as an important element for rural people in achieving equality in national welfare distribution (Cheers 2002). Furthermore, widespread poverty and illness across Africa are always related to the lack of physical accessibility in rural areas (Porter 2002a). Although Demir (2007), Cheers (2002) and Porter (2002a) possess different views on access roads, all of them agree that access roads will create positive impacts and facilitate rural economic development. However, researchers who support this model such as Walle (2002) claim that not all of the access roads will automatically facilitate rural development as it depends on other constraints such as affordable transport services.

This thesis focuses on the logging access road which connects Marudi Town to Miri City. The reason why Marudi Town was chosen as a case study is because of its unique situation. Since Marudi was first established, there has been no access road to the outside world.

The study aims to identify the socio-economic impacts of the logging access road on the Marudi Town community by addressing two research questions:

1. Do rural access roads stimulate outward migration from rural areas?
2. What impact does the provision of an access road have on rural economic development?

The primary objective of this study is to test the validity of each of the arguments described above by examining the social impacts of the logging access road on the Marudi Town community and to identify and describe the perceptions and perspectives of the local community regarding the logging access road.
1.2 The Study Area

Malaysia has been an independent country since 1957 and comprises 11 states. Sabah and Sarawak were added to Malaysia in 1963 and are located in east Malaysia on the island of Borneo. In 2005, the total population of Malaysia was 26.4 million people with a population density of 71 people for every km² (State Planning Unit 2006). Figure 1.2 shows that the states of Malaysia are presented by different colours.
Sarawak is the biggest state in Malaysia with an area of 124,449.50 km\(^2\) and a total population of 2.3 million in 2005 (State Planning Unit 2006). Within Sarawak there are 11 divisions and this study is located in Miri Division. As shown in Figure 1.3, the 11 divisions are represented by different colours. There are two districts under Miri Division, namely Miri District and Marudi District. Even though Marudi District is the largest (22,070 km\(^2\)) out of 29 districts in Sarawak, it has the second lowest population density; only 3.2 people for every km\(^2\) as of 2000 (State Planning Unit 2006). Furthermore, Marudi District is the only district that had a zero average annual growth rate in the period of 1990 to 2000, and a total population of 71,713 in 2000, including Marudi Town which has approximately 7,282 people (Department of Statistics Malaysia 2005, p. 26).

On the other hand, Miri City is the capital of the Miri Division, as well as the main city of Miri District. Although the total area of Miri District is only 4707.10 km\(^2\), the total population is almost three times higher than Marudi District, it had 221,055 in year 2000 (Yearbook of
Statistics Malaysia 2005, p. 26). Due to its development boom, Miri was awarded the status of Resort City, from the status of town, on the 20th May 2005, by Miri City Council, Sarawak (Sarawak State Secretary’s Office 2005).

Although the measured distance between Miri City and Marudi Town is only 44 km, there were only two ways for people to travel between these two places before 2005. The first option was by plane and the travel time was approximately 15 minutes. The second option was by express boat and the travel time was approximately 2 hours and 30 minutes. Since July 2005, a logging access road built and maintained by a logging company for the purpose of timber transportation, has connected Marudi Town to the nearest city, Miri. The travelling duration between Marudi Town and Miri City using land transportation is approximately 1 hour and 30 minutes. Thus, it is worth examining the impact of the logging access road on the local community, which for the first time, had an access road which connected them to the outside world.

1.3 Research Methodology
A case study approach is employed here (Miles & Huberman 1994). The main purpose of a case study is to understand the case in depth, its natural setting, and to recognize its complexity, and the individuals (Punch 1998; Creswell 2002). It may also be considered as an intensive study of a single case where the main purpose is to shed light on a larger class of cases namely the population (Gerring 2007).

According to Hakim (2000), there are five types of case study which can be carried out in social research.

1. Individual case histories,
2. Community studies,
3. Studies of social groups,
4. Studies of organization and institutions,
5. Case studies of events, roles and relationships.

The community studies approach is adopted here. The main attribute of community studies is that it is able to examine a single community or town area and analyse the pattern and
relationship between the community and other variables such as the impact of a logging access road on the specific community or town. Hakim (2000) suggests that this type of study is suitable to use in social research on both non-industrialized and industrialized societies.

A single case study applies to understand the complexity and the entirety of the case, Marudi Town, Sarawak, Malaysia. As discussed by Merriam (1988), case study is not a method. It is a choice of what is to be studied (Stake 2005). Having decided to use a single case study, various data collection methods are adopted to ensure that relevant data can be obtained in answering the research questions and objectives.

1.3.1 Data Collection Methods
The thesis employs quantitative as well as qualitative methods to address the research questions and objectives.

One of the main characteristics of a case study is the application of multiple data collection methods (Punch 1998). Due to the pros and cons of every method, multiple data collection methods are needed for the purpose of data triangulation. The following are the methods which have been adopted here:

1) Questionnaire survey
Social impacts are difficult to measure and quantify when compared to other impacts such as economic impact (Walle 2002). To ensure that all of the anticipated and unanticipated social impacts of the logging access road are able to be identified and examined, social impact variables from the social impact assessment (SIA) have served as a guideline in constructing the questionnaire (see Chapter 4). The referred social impact variables are those suggested by Burdge (1994), the Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1994, 2003) and Vanclay (2002).

The questionnaire consisted of closed and opened-ended questions and was distributed based on the systematic random sampling method. A total of 362 questionnaires were collected in this study.
2) Face-to-face in depth interviews
This study also employed face-to-face in depth interviews (Fotana & Frey 1994). The author used one of the non-random sampling methods, namely purposive sampling, for this data collection method. Eleven interviewees were selected based on certain attributes and criteria deemed important for the study; namely representatives of local associations, local political parties and shop owners.

The rationale of conducting face-to-face interviews was to identify the responses and perceptions of the local community towards the logging access road. That way, the study could produce a more comprehensive analysis of the socio-economic impact of the logging access road.

3) Personal observations
Observations were made by the author in the town areas, residential areas, ferry terminal and shop lots regarding the reaction of the local people after the logging access road connected them to Miri City, as well as the different types of people in the town areas during the weekdays and weekends.

4) Census and other data
Census data, namely demographic data, was obtained from government statistical reports. Other data was obtained from newspapers, media, literature and state statistical reports.

1.3.2 Data Analysis
Collected quantitative data has been analysed by using Statistical Package for the Social Sciences (SPSS) and qualitative data has been analysed in a descriptive form. Thus, the findings of the study have been presented in graphs, charts, tables and in a descriptive form (Chapter 6 and Chapter 7).

1.4 Significance of the Study
Rural development is a popular study for many researchers in social science disciplines, particularly in the field of development studies. One of the reasons is because it comprises many components and each of them is inter-related with the other. Among the components of
rural development that are often discussed by the researchers are issues such as rural poverty, rural urban migration and road access. Moreover, other components such as issues of gender in rural development, road investment decisions in rural areas and the impact of rural roads are also receiving attention in recent studies. In addition, there are many studies which extend their interests and combine more than one component in a single study, i.e. the combination of gender and migration, gender and rural roads, poverty and migration, and urbanization and migration. However, the majority of studies still concentrate on issues such as rural poverty, rural-urban migration, gender in rural development and the issue of accessibility but not many focus on the social and economic impact of rural access roads.

Inequality in economic growth and particularly inequality of wealth distribution have contributed to the incidence of poverty (Hill 1985) and the majority of these conditions occur in rural areas (Wee 1999). Thus, a suitable method or combination of methods need to be used or applied by the particular country in order to alleviate poverty, particularly rural poverty. There are many studies which discuss methods for alleviating poverty, either in theory or practice. Different types of government expenditures and infrastructures have different types of effect in reducing rural poverty (Fan, Hazell & Thorat 2000; The World Bank 1994). Some have claimed that work participation in non-farm activities are able to reduce rural poverty (Stokke, Yapa & Dias 1991) while others claim that investment in rural roads and agriculture has the same effect as well. According to Fan et al. (2000), investment in rural roads and agriculture has not only generated the largest impact in reducing rural poverty, but has generated higher productivity growth as well. Furthermore, in India, investment in Research and Development (R and D) had the second largest impact while investment in education had the third in reducing rural poverty (Fan et al. 2000). However, all of these investments still have to depend on country capabilities. For example, it is impossible for a country to invest in R and D while most of their people are unable to fulfil their basic needs, such as food and shelter.

There is another interesting method implemented in China to alleviate rural poverty, called ‘Geographically Targeting Poverty Policy’ (Gustafsson & Zhong 2000). First, the government will identify poverty areas in terms of geographical location without taking into consideration the different status or income among households within that particular area. Next, the
government will send resources directly to these poverty areas. This means that some households which are not poor will also enjoy the resources sent by the government. Thus, there are two obvious flaws in this policy. The first flaw is those who are not poor but live in the areas which are identified by the government as poverty areas will enjoy the same resources as poor families do. The second flaw is those who are poor but live in the areas which are not identified by the government as poverty areas will not benefit from this national policy. Thus, although from 1988 to 1995 the policy has showed positive results in reducing rural poverty in China, it still cannot be a convincing policy unless the government is able to overcome the two weaknesses.

A popular component which is frequently discussed by researchers is migration. There are many factors which influence people to migrate, particularly rural-urban migration. The ordinary factors are rural poverty, lack of employment opportunity in rural areas and better infrastructure in urban areas (Dao 2004 & Perker 2004). As suggested by Dao (2004), there is a direct link between rural poverty and rural-urban migration. The study shows that once rural poverty is reduced, the process of rural-urban migration will consequently decelerate due to the availability of employment opportunities in rural areas. With similar findings, Perker (2004) claimed that rural-urban migration was not only influenced by unemployment but the absence of basic infrastructure in rural areas. If the population decreased in rural areas, less government investment in terms of infrastructure would be provided. On the other hand, provision of infrastructure would be increased in urban areas due to an increase of the population and it would act as an incentive for rural people to migrate to urban areas.

There was a study by Rhoda (1983) which tested the possibility of stopping rural-urban migration with the intervention of rural development. As a result of his study, he was unable to support the initial hypothesis but claimed that rural-urban migration would be stimulated by the intervention of rural development. If this is the case, does he mean that we should stop developing the rural areas in order to halt rural-urban migration? Furthermore, he also argues that there is a direct link between an increase in family income and an increase in rural-urban migration. However, Deaton et al. (1982) do not agree that monetary factors determine the decision to migrate. They argue that satisfaction with new social and physical surroundings in urban areas is more important for migrants than satisfaction with work in urban areas. If this is
an influential factor, is there any difference between men and women in terms of reasons for migration?

Furthering that argument, Hew (2001) and Chattopadhyay (1998) have studied the relation between gender and migration. Hew (2001) finds that factors which determine migration are different across genders in the ethnic group of Bidayuh in Kuching, Sarawak. In the study, the main reason for men to migrate is to get a better paid job while for women particularly, the modern life style is the main factor and rural poverty comes second. Although reasons are different across genders, the decision to migrate is still made by men, the heads of families. This shows that women have less influence in decision making unless they are the head of the family. This situation is very much related to local culture in which women do not have many chances to make decisions. In fact, some women do not have the intention to migrate at all but were asked to do so by their families in order to repay debt or support their families in rural areas (Hew 2001, p. 155). In addition, Chattopadhyay (1998) studied the matter from a different angle and divided migration into two groups, namely family migration and solo migration. She noted that men benefit more from family migration than women because unemployed men have a higher chance of securing a job in urban areas. By contrast, unemployed women who partake in family migration not only have less chance of securing a job, but a higher chance of continuing as unemployed. However, Chattopadhyay (1998) argues that these differences only occur in the family migration group, not the solo group. Thus, both studies show that migration favours men. A significant question which still remains is, is there any relation between migration and access roads?

It is believed that road access is an important element for rural development (Cheers 2002). However, there are few studies which pay attention to “under which circumstances do roads become a priority for rural people?” A simple answer given by Wilson (2004, pp. 525-526) is “to gain better access to livelihood and reduce poverty”. However, contrary to this answer, Wilson also argues that from the point of view of the rural population, road access will lead to “an undermining of fragile livelihood and dispossession of resources” as well as to an increase in rural urban migration (Rhoda 1983). However, the point of view that Wilson presents does not represent the voices of the rural population because there are still many rural communities
demanding access roads. Unlike Wilson’s and Rhoda’s arguments, most studies come to the conclusion that there is a positive relationship between road access and rural development.

Roads are one of the critical components in creating a modern and quality lifestyle (Demir 2007). Moreover, isolation may have a negative impact in rural areas and cause poverty in the region (Mustafa 2002). Mashiri and Mahapa (2002) assert that the provision of minimum infrastructure is a pre-condition in implementing poverty reduction programs, particularly in rural areas. In addition, infrastructure such as roads will help in reducing the level of rural-urban migration (Amadi 1988), in enabling people access to goods and services (Dawson & Barwell 1993 in Fernando & Porter 2002a) and reversing outward migration (Amadi 1988; Mustafa 2002).

There are various impacts that rural road development may have, such as social and economic. Windle and Cramb (1999) studied the social impacts of three selected rural roads in Sarawak and found that these social impacts vary according to distances between the location of houses and roads. For example, those who live near roads are enjoying a greater extent of mobility than those who live further from the roads. Therefore, the social impact of rural roads can be different across places, and sometimes different within the same region.

To sum up, there are not many studies which focus on the impact of rural roads and the relationship between access roads and rural development, particularly in the context of Sarawak, Malaysia. Therefore, studies on the issue of rural access roads and rural development are needed in order to enhance the understanding of the issue and contribute new ideas and knowledge into the field of rural development studies.

1.5 Structure of the Thesis
The thesis is divided into nine chapters and the following parts of the thesis are arranged as follows:

Chapter 2 reviews the literature of various topics which relate to rural development, namely rural infrastructure, rural-urban migration, rural poverty and rural access roads. This chapter also discusses the model of the migration hump which was suggested by Martin (2006)
regarding the flow and trend of migration in the next 40 years. Moreover, this chapter is intended to identify the gap among the literature so that this study is able to fill the gap in the field of rural development study and contribute to the discipline.

Chapter 3 discusses the characteristics of the case study area, Marudi Town. It includes the geographical location of the study area, demographic and social characteristics of the population, a brief history of the district and town, economic characteristics of the population and the logging access road which connected Marudi Town to Miri City.

Chapter 4 outlines the social impact variables in Social Impact Assessment (SIA) which have been referred to as a guideline in designing the questionnaire of the study. The chapter also explains how SIA is conceptualized and its role in the whole study.

Chapter 5 justifies the data collection methods, structure of the questionnaire, sampling methods of the questionnaire surveys and in depth interviews and reliability and validity of the data.

Chapter 6 analyses data obtained from the questionnaire surveys and in depth interviews, namely the background of the respondents, the overall view of the research participants regarding the road issue and their future migration plans. The chapter then discusses the impact of the logging access road on transportation, accessibility to other public facilities and rural-urban migration.

Chapter 7 examines six social impacts including the changes in the numbers of weekend residents and travellers, health care and the impact on saving human lives, access to media, local security in Marudi Town, impact on daily lives and lastly, the cultural change.

Chapter 8 describes four economic impacts including the changes of personal monthly income, employment opportunities, local economic activities in Marudi Town and the ownership of private vehicles.
Chapter 9 presents the overall findings of the study. Then the limitations and implications of the findings are discussed along with recommendations and suggestions for further research.
CHAPTER 2

RURAL DEVELOPMENT, RURAL-URBAN MIGRATION AND RURAL ACCESS ROADS

2.1 Introduction
Rural development is defined as actions taken by national or international agencies which are explicitly designed to increase production or improve the quality of life in rural areas (Rhoda 1983). Hodge (1986) describes rural development as a policy aimed at improving the potential of rural areas both to provide residents with satisfactory incomes and access to a broad range of services, and to use rural resources in a manner consistent with the demands of urban residents. World Bank (1975 p. 3) suggests rural development as a strategy to improve the economic and social life of a specific group and extending the benefits of development to the poorest group who are seeking livelihood in the rural areas.

In order to improve the situation in rural areas, the Ninth Malaysia Plan 2006 – 2010 has shifted the attention towards development in less developed regions and states with the aim of diffusing the benefits of economic growth while closing the economic disparity among regions (The Economic Planning Unit 2006). This development plan was widely agreed to and accepted because it not only stimulated rural development but also reduced urban poverty. As elucidated by Azidin (2006), delivering more development to the states or regions which are less developed will also reduce pressure on big cities and urban areas because this will indirectly provide job opportunities in rural areas and reduce a large number of economic migrants from less developed areas. In addition, rural areas will also become more attractive to investors, either local or international, once better infrastructure is available.

This chapter discusses three main elements of rural development, namely rural infrastructure, rural-urban migration and rural access roads.

2.2 The Role of Infrastructure in Rural Development
Issah et al. (2005, p.70) define infrastructure as “the stock of government public investment in electricity, water and sewerage, health facilities and education facilities”. Nevertheless, the
World Bank (1994) categorizes access roads as one of the public goods and includes them in the public investment.

Most of the time, road densities, particularly rural access roads, are correlated with economic growth, national wealth and ecological disturbance and natural resource degradation. As agreed by King and Parnwell (1999), environmental degradation is one of the factors which stimulated the phenomenon of outward migration in Sarawak, Malaysia. Moreover, Friends of the Earth Malaysia, a non-government organization involved in environmental and development issues in Malaysia, claims that a proposed 150 km trunk road which connected two towns in the northern part of Sarawak, Marudi Town and Long Lama, will permanently damage the whole district ecosystem (Bato 2007). However, the claim was denied and disagreed to by various leaders of local associations which represent the indigenous people of Sarawak. They argued that infrastructure development such as access roads are vital for the rural folks to enhance their socio-economic status and enjoy the benefits of development (Bato 2007). In addition, unofficial roads such as logging access roads are relatively crucial in regional development even though they have a negative impact on the environment and act as a threat to natural resource-based livelihoods (i.e. indigenous people who live in the forest) (Perz 2007).

There is one example in Sarawak, Malaysia, which showed that infrastructure, especially access roads, had a significant impact on tourism and rural economic development. Marudi Town organizes the Baram Regatta (traditional boat races) once every three years - the latest one was held from 15 to 17 August 2008. For the first time in this event, the word ‘International’ was added and a minister of the state commented that Marudi Town was not ready to host an international event and the word ‘International’ should not be used due to the lack of facilities and infrastructure to accommodate the international tourists, which included the absence of a good rural access road (Joseph 2008). The remark indicated that roads play a significant role for a host town in attracting both international and local visitors and tourists to such an event which would eventually stimulate rural economic development.
In line with the role of access roads in rural development, especially in closing the economic gap between rural and urban areas and East and West Malaysia, the Prime Minister of Malaysia promised that more funds would be allocated to Sarawak in the Tenth National Development Plan (2011 – 2015) for infrastructure development including electricity and roads (Borneo Post Online 2009). This decision has shown the importance of infrastructure in rural development, particularly with regards to rural economic growth.

Other infrastructure, namely telecommunication services also play a significant role in rural development. Telecommunications services and the availability of village pay phones have resulted in substantial socio-cultural benefits and reduced poverty in the rural areas. As explained by Bayes (2001), poor households who owned phones were likely to raise their social status. In addition, women who owned a mobile phone in his study had become more mobile both inside and outside their villages. However, Bayes (2001) might need to take into consideration other constraints such as jobs and income levels of the rural areas instead of concentrating on the availability of telecommunication services as phones only transmit information.

Recent studies have analysed the effects of infrastructure disparity on rural-urban migration in developing countries (Issah et al. 2005). In their findings, they argue that people are more likely to migrate from rural to urban areas when there are disparities in terms of infrastructure between these two places. Furthermore, they also pointed out that the unemployment rate in rural areas will decrease after improvements in rural infrastructure because it tends to open up employment opportunities in that area. At the same time, they did not deny that the possibility to decrease employment opportunities if the infrastructure improvement means labour can be replaced by machines. These arguments make sense but depend on at which stage the rural development is taking place, as basic infrastructures need to be fulfilled before the improvement of technologies.

2.3 An Overview of Rural-Urban Migration

According to Marquette (2007, p.5), most of the policy makers in developing countries do not support rural-urban migration and perceive it to be a survival strategy for the rural people to migrate to urban areas. That is why all kinds of policies and development programs have been
suggested to stop outward migration and keep people in rural areas. According to Wong (2008), some policy makers even purposely do not provide any rural access roads between rural and urban areas in order to halt outward migration. For example, when the Sarawak state government was asked the question of when it would provide an access road from Marudi Town to Miri City, one of the answers given was there is no active plan to build a good access road between these two places in order to halt rural-urban migration (Sin Chew Daily News 2007).

On the other hand, there are also programs which are truly focusing on facilitating rural development. One that stands out is an in-situ rural development program which was endorsed by the Malaysian government in 1996. It encouraged initiative, proactive and public involvement of rural people in the process of transforming the rural areas into more developed, attractive and profitable (in terms of agricultural production) (Koharuddin 2005). There were a few criteria which a rural area needed to have in order to achieve the objectives of the program, namely appropriate education levels, skills in leadership and management, agricultural based economy, off-farm employment, security, infrastructure and information technology development. The outcomes of the in-situ development program have delivered some successful cases and improvement in terms of income, off-farm employment opportunities, commercialization of agricultural products and use of information technologies such as computers and the internet (Koharuddin 2005). In other words, related authorities need to commit to making rural areas more developed, in order for them to become a better place to live and invest.

2.3.1 Causes of Rural-Urban Migration
The factors which stimulate rural-urban migration can be categorized into pull and push factors. These factors are often interchangeable when examined from either sending or receiving areas. For example, Pham (2001) and Faggian (2009) point out that one of the factors which cause rural-urban migration in developing countries is the difference in utilities and amenities between rural and urban areas. This factor can be considered as a pull factor and it can also be considered a push factor, depending on which side the issue is examined. However, Weeks (1994) explains the push and pull factors in a different way. He argues that the push factor is involuntary while the pull factor is voluntary. For example, people were
forced to migrate to urban areas by an insecure living environment, compared to those who choose to migrate because they are attracted by a modern lifestyle and better job opportunities in urban areas.

Issah et al. (2005) present contradictory views between income and outward migration. At first, they strongly disagreed that an income disparity alone has caused rural-urban migration. They then admitted that the minimum wage set in the urban areas would stimulate rural-urban migration. From a more concrete perspective, Fratesi and Riggi (2007) find that migration flows are highly affected by inter-regional wage differences, especially for skilled migrants. As explained by Fratesi and Riggi (2007), high-skilled workers generally receive a higher income than low-skill workers and they are able to overcome the mobility costs to travel to other regions for better job opportunities. In addition, migrants tend to have higher education levels than those who stay behind (Rhoda 1983). This argument is reinforced by Faggian (2009) who points out that the level of real earnings in the urban areas is one of the determinants of the decision of migration. Moreover, she also argues that high real earnings are a form of compensation for insufficient utilities and infrastructure. For example, the real earning will be higher when people are working in either a very congested place or a very isolated place where most utilities and infrastructure are not able to be enjoyed.

There are different factors in terms of gender in stimulating rural-urban migration. Hew (2001) focused her study on Bidayuh’s women, a group of minority indigenous people in Sarawak, East Malaysia. She claimed the main reasons to stimulate rural-urban migration for men and women were different. For example, the majority of men said they migrated due to monetary reasons such as earning a living to support their families, while 54 percent of women noted that becoming modern (i.e. buying beautiful clothes and gold jewellery) was their main reason to migrate. From the 50 women interviewed, only 20 percent said they migrated because of financial constraints.

2.3.2 The Consequence of Rural-Urban Migration
One of the consequences of rural-urban migration could be urban poverty (Musalmah 2006). When low income groups from rural areas migrate to urban areas, it will directly increase the unemployment rates if the existing employment is unable to provide extra job opportunities to
cope with these newcomers. Besides, rural-urban migration will also add pressure to urban services, utilities, infrastructure and environment. Thus, the phenomenon of poverty which has been dominated by rural areas will slowly shift toward urban areas, and create urban poverty (Musalmah 2006). Although this might be the case, if rural migrants possess an adequate educational background or are considered skilled workers and the urban areas are able to cope in terms of infrastructure and employment opportunities, then it will be able to facilitate the economic growth and reduce rural poverty. Weeks (1994) argues that migration into urban areas is both stimulated by, and contributes to, economic growth. On the other hand, outward migration from rural areas is causing the rural economy to further decline due to the departure of educated and talented people, particularly young people. Perker (2004) also possesses a similar view with Weeks (1994) - the process of rural-urban migration in rural areas will decrease the government investment in public infrastructure and affect the economic growth in rural areas.

Some studies show that the migration process can bring benefits to rural areas. Oberai and Singh (1982) investigated the relationship between migration, technological change and agricultural production. They argue that migration plays a positive role in agricultural development which includes the improvement in several productive forces such as human skills, tools and technologies. The phenomenon of outward migration from rural areas did not affect the use of the latest technologies in the agricultural sector, but increased agricultural productivity due to new skills, knowledge and capital such as money brought back by returning migrants. However, Connell et al. (1976) held a different view on return migrants and argued that they are considered as the non-productive group. It was agreed by Windle and Cramb (1999) that the majority of returned migrants in their study areas were retired persons. Thus, this group of people had less impact on contribution but more impact on consumption. Although it might be the case, not every returned migrant was retired, as some in Windle and Cramb’s studies were young people who moved back to the rural area but commuted to work in the urban areas daily due to easy road access.

### 2.3.3 Measures to Stop Rural-Urban Migration

The literature of rural-urban migration comes to a common view that rural development is able to reduce rural-urban migration and urban poverty. This is because rural development has the
potential to increase job opportunities and income in rural areas. For example, Martin (2004) introduced a model called the Migration Hump which described the migration flow of Mexicans into the United States of America. As shown in Figure 2.1, in the first 10 years the number of migrants increased due to insufficient job creation. Then the number of migrants started to fall from year 10 onwards when the economy of Mexico become more developed and was able to provide sufficient jobs for their people. Thus, this model shows that development is necessary in the poor regions in order to reduce and finally stop migration. Although the migration hump model is in an international context, the same theory applies in the local context.

![Migration hump](source: Martin (2006, p. 20))

However, Rhoda (1983) doubted that the process of rural development was able to reduce rural-urban migration. He tested a hypothesis on the relationship between rural development and rural-urban migration and found that there was two different impacts on rural-urban migration from the intervention of rural development. First, if the development involved the activities of increasing cultivatable land, equalizing land and equalizing income distribution, it would reduce rural-urban migration. On the other hand, if the development involved
increasing access to cities, commercializing agriculture, strengthening rural-urban integration, raising education levels, increasing skill levels and rural inequalities, then it would stimulate rural-urban migration (Rhoda 1983, p. 54). However, there are some contrasts with the findings as most of the mentioned developments are inter-related. For example, increasing cultivatable land will result in a surplus of production. Then farmers will commercialize their agricultural products to increase their income. Consequently, it will generate job opportunities in rural areas. He also mentioned increasing job opportunities in the rural areas was more effective than rural development interventions in stopping rural-urban migration. The question is how to clearly distinguish them. Is it possible to increase job opportunities in rural areas without the intervention of rural development?

2.4 The Role of Rural Access Roads in Rural Development

In the issue of rural access roads, the decision on whether to build one always comes first in the discussion. Wilson (2004) explains that the main purpose for authorities to build rural access roads, under economic and political circumstances, is to govern. He perceives the provision of rural access roads as an asset in earning political support from the local people. However, Escobal (2005) has an opposite view on the matter and argues that ruling governments perceive rural road investments or rehabilitation as less efficient in attracting votes in the national election. In brief, rural access roads have a significant role in certain political agendas when the road itself has an impact in gaining support from the local people. Otherwise it is just an ordinary government investment in terms of rural infrastructure.

Other than the political perspectives, sealing a road or a decision not to build a rural access road could have critical impacts in rural areas. The negative impacts include the slow pace of rural economic growth, low income levels and the stimulation of outward migration (Cheers 2002). This is true when there is no investment from investors in that area due to insufficient infrastructure. Consequently, it will increase unemployment and decrease the income level of rural people and eventually force them to find jobs in urban areas which cause outward migration.

There is one interesting study which focuses on the social and economic impact of rural access roads on local communities, particularly in Sarawak (Windle & Cramb 1997; 1999). In their
case study, the provisions of access roads were divided into three levels of accessibility
namely road access, bad access and very bad access. The first category, road access, refers to a
road which has direct access by the communities. The second category, bad access, refers to a
road which is one to three hours’ journey from the communities. The last category, very bad
access, refers to a road which is five or more hours away from communities. They
acknowledge that most of the local communities preferred to have an access road because they
felt disadvantaged without one. In the findings, they argued that rural access roads have
increased the mobility of local residents, the range of leisure activities, amount of social
contacts, the quality of government services, chances to be educated in school, and chances of
saving life especially in remote areas. However, the benefits were not well distributed
especially between men and women, and among regions that have different accessibilities.
Moreover, roads which access urban areas have more benefit to local communities in terms of
better choices of goods and services, compared to roads which access small towns. In terms of
economic impact, rural access roads have increased employment opportunities, and roads
which lead to urban areas have increased the chances of rural households to earn extra income
from non-farm employment. On the other hand, roads which lead to small towns did not have
such a positive impact.

2.4.1 Rural Access Roads and Rural Poverty

The incidence of rural poverty is higher than urban poverty in most countries. In Malaysia,
despite the incidence of rural poverty decreasing from 14.8 percent in 1999 to 11.9 percent in
2004, poverty is still dominant in rural areas as only 2.5 percent of urban people were living in
poverty in 2004 (Musalmah 2006). Furthermore, with the decline in the number of Malaysian
poor households from 409,300 in 1999 to 311,300 in 2004 and particularly the decrease of
rural poor households from 323,200 in 1999 to 219,700 in 2004, poverty is still mainly rural as
70.6 percent of the poor lived in rural areas (The Economic Planning Unit 2006). Few studies
have been carried out by researchers in examining the impact of road improvement in reducing
rural poverty. As pointed out by Warr (2008), the poorest people often live far from urban
market centres and this group of people are disadvantaged by high transport costs due to no
access roads or the poor condition of access roads. Warr (2008) divided access roads into three
categories: no vehicle access, dry season only access and all weather access. Then, he argued
that in order to reduce transport costs, converting dry season access roads to all weather access
roads, and providing dry season access roads to areas with no vehicle access roads at all, can reduce the incidence of rural poverty in a moderate but not dramatic way. Although both types of road improvement contribute to reducing rural poverty, one needs to make sure that the roads lead to market centres for positive effects to be maximized. Warr (2008 p. 279) and Cervero (1990, p. 135) agreed that roads leading nowhere benefit no one.

As argued by the World Bank (1994, p. 8), the provision of rural access roads is not a magic bullet for poverty alleviation. However, Jacoby (2000) poses a different view in his findings and claims that in providing extensive access roads to markets, it is possible to produce substantial benefits which go to the poor households. Jacoby (2000) carried out a study in Nepal to examine the distributional consequences of rural access roads and estimate the benefits to households from road projects between value of farmland and its distance to agricultural markets. In order to estimate the benefit of the road projects, he developed a method which used and compared information on the value of farmland and distance to agricultural markets. From his study, he claimed that roads play a significant role in rural development because they are able to provide cheap access to modern inputs and markets for agricultural outputs. In order to apply Jacoby’s method in estimating the benefit of road projects, the value of farmlands in the study area must be obtained by the researchers or it will affect the findings of the study as the value of farmland is the key element in that study.

Other studies have shown that investment in low quality access roads is more efficient than investment in high quality access roads to alleviate poverty. Fan and Kang (2005) compared the benefit of low quality access roads (rural) with high quality access roads (urban) by looking at the benefit-cost ratio on national GDP and poverty reduction in China. They claim that the benefit-cost ratio of low quality access roads was four times larger than the high quality access roads. Furthermore, the investment in low quality access roads not only facilitated poverty alleviation, it also had a positive impact on rural economic growth. However, the implication of these findings is only applicable to the case of China or any other regions which have a similar condition where many expressways and inter-city highways are available in the city. When too many investments are concentrated on the high quality road projects, the margin of return of the projects will decline. Therefore, they suggested that the
The Chinese government should invest more in low quality access roads in rural areas so that it will be able to reduce rural poverty and create larger marginal returns from investment.

Moreover, some studies showed that road projects provide greater benefits for men than women in rural areas when examining the impact of improved rural access roads on gender relations. Bravo (2002) has examined the question by looking at the impact between genders in terms of education, health services and accessibility to markets. In the findings, although the access roads have made it easier for women to reach school and reduced the gap between men and women in the enrolment in secondary education, it does not have any significant positive impact on women in terms of technical and undergraduate education as males are given priority in education when economic resources are scarce. Nonetheless, accessibility to markets and health services for women has not substantially improved since the provision of roads. This might be the case when traditional norms and culture in rural areas believed that women and men do not have an equal right in terms of education, accessibility, health services and the control of economic resources.

2.4.2 The Impact of Rural Road Rehabilitation

Other than the impact of rural access roads on gender, there are some other studies which examined the impact of rural road rehabilitation on income per capita and consumption per capita. One of the studies compared households in Peru who benefited from rural road rehabilitation projects with those who did not benefit (Escobar 2005). According to Escobar (2005), short term positive impacts of rural road improvement projects have occurred, such as the generation of extra income from non-farm activities but at the same time, it does not increase consumption per capita. Furthermore, those households who lived near the motorized rural roads tended to benefit more than those who lived near the non-motorized rural roads in terms of better access to public infrastructure and amenities, possessing a higher education level and having more farmlands. However, long term positive impact has become unsustainable due mainly to the inconsistency of road maintenance. With continued poor maintenance work, rural roads become unpassable and eventually close down. Thus, in order to sustain the positive impact of road improvement projects and to ensure rural households are able to make long term planning and investment, road maintenance works need to be guaranteed and scheduled properly. With the similar research direction, Tucker and Thompson...
(1981) have estimated the impact of rural road development on grain assembly costs and product values. The findings indicate that the improvement of road systems has reduced the cost of grain transportation from rural areas to urban markets.

Yunusa et al. (2002) found that the bad condition of the rural roads has contributed to high transport costs and become a barrier for rural people to send their children to school and access medical facilities. To overcome this, road improvement projects have been implemented and it has increased the accessibility to schools and medical facilities outside the village. Furthering that argument, Obare, Omamo and Williams (2003) estimate the impact of poor rural roads on the production of smallholder farmers in Kenya. From the study, they found that inadequate road infrastructure imposes significant burdens to smallholder farmers with the issue of cost saving because farmers need to face the high access cost from farms to markets. Therefore, they urged Kenya’s government to shift their concentration to the investment of rural access roads due to the fact that agricultural sectors in Kenya were dominated by smallholder farmers.

Besides the positive impacts of a rural access road, some claimed that the provision of access roads in remote areas is not cost efficient if it is not complemented with good and affordable transport services. According to a case study in Tshitwe, South Africa done by Mashiri and Mahapa (2002), the road upgrading project which cost USD 300,000 to upgrade a 15 kilometer gravel road into a bitumen surface road has not improved the overall level of agricultural activities, land productivity and off-farm employment due to the missing supply of efficient transport services. Moreover, cultural norms also played a significant role in the ownership and usage of transports. For example, the local government of Tanzania encouraged rural people, especially women, to own and use the intermediate means of transport such as bicycles and motorcycles to perform their daily tasks. Eventually, the percentage of transport ownership and usage did not increase due to low level income and cultural norms which believed that women should be prohibited from owning their own transportation (Mwankusye 2002).
2.4.3 Rural Access Roads and Transportation

Physical isolation of rural areas and poor access has contributed to the high incidence of poverty and undermined rural economic development (Chambers 1997, Cervero 1990 & Mustafa 2002). Transport, particularly in rural areas, provides access to market centres and facilities, encourages social interaction and links people with jobs. Thus, infrastructure development remains a priority in rural development in the United States because the transportation infrastructure plays a significant role in integrating and improving the economic development of rural and remote areas by providing them access to the nearest markets (Blandford, Boisvert and Davidova 2008).

By investigating that direction, rural access roads alone are not enough in assisting and improving the condition of rural mobility and development in rural areas without the provision of public transport services. Johnston (2007) argues that public transport services have become a very important element after the provision of access roads, especially as the ownership of private vehicles is low in rural areas. When reasonable and cheap public transport services are not available in the rural areas and people are unable to own a private vehicle, a high quality access road can only be walked on but not accessed by vehicles. Therefore, he urged the local government in his study area to revise the rural transport policies and programs by recognising that the provision of roads or improving roads as sufficient to facilitate rural mobility and rural development.

In terms of the equality of benefits or positive impacts, those who belong to the wealthier groups (i.e. landowners) always benefit from the infrastructure or road projects. On the other hand, infrastructure or road projects have the least positive impact on the poor due to transport constraints (Schroeder 1997, Jacoby 2000 and Bryceson, Bradbury & Bradbury 2008). Jacoby (2000) pointed out that although extensive access roads were provided in his study area, it did not sufficiently reduce the income inequality of the population. Wong (2008) also had the same view that the positive economic impacts of an access road in his study area (particularly a logging access road) linking a rural area to an urban area, were not fairly distributed among the local community. For instance, farmers who were unable to own a specific vehicle such as a four-wheel drive were unable to bring their agricultural products to the nearest city during the wet season because the poor road conditions can only be accessed by four-wheel drive.
However, in general, the poor groups still get something from the road projects because when the wealthy groups such as landowners benefit from it, job opportunities will be created for the poor groups.

2.5 Conclusion
As discussed in the previous sections, elements of rural development - namely the issue of infrastructure, rural-urban migration and rural access roads - have been widely discussed. Furthermore, some researchers examined the issue of rural development by looking at multiple combinations of components, namely rural infrastructure and rural economic development, rural infrastructure and rural-urban migration, gender and rural-urban migration, rural-urban migration and poverty, rural access roads and rural economic development, and rural access road and transportation. However, little attention in the literature has been paid to the social and economic impacts of rural access roads particularly in the context of Malaysia. As one of the largest states of Malaysia, Sarawak, located in East Malaysia, is still lacking a good road system in remote areas as well as road systems between remote and urban areas. Although there are flights and express boat services available in some rural areas, limited daily frequency and long travel times has become an obstacle in the mobility of rural people and rural development.

Therefore, this study is intended to examine and contribute ideas and knowledge regarding the impact of rural access roads on rural area communities particularly in the context of Malaysia. Nonetheless, the findings of this study would provide the policymakers an additional reference when the issue of provision of rural access roads arises.
Chapter 3

THE CHARACTERISTICS OF THE STUDY AREA

3.1 Overview of the Case Study Area

Sarawak is located in the North West region of Borneo Island. It became part of Malaysia in 1965 and is the largest state of Malaysia with an area of 124,450 km\(^2\) and a total population of 2.4 million in 2006 (Chee & Chua 1997; State Planning Unit, 2007). Within Sarawak, there are 11 administrative divisions and 31 districts. This study is focused on Miri Division, Marudi District (Table 3.1).

Table 3.1: The administrative divisions and districts of Sarawak

<table>
<thead>
<tr>
<th>Administrative Division</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miri Division</td>
<td>Marudi District</td>
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</table>

NOTE:
This table is included on page 29 of the print copy of the thesis held in the University of Adelaide Library.

Source: State Planning Unit (2007, p. 11)
* The study area
A case study was undertaken in Marudi Town and an aerial view is shown in Figure 3.1. The following parts of this chapter present the demographic and social characteristics of the Marudi Town population which include the composition of the ethnic groups and age structure. Then, a brief history of Marudi Town is discussed followed by the economic characteristics of Marudi Town and Sarawak. Finally, the logging access road between Marudi Town and Miri City is explained.

Figure 3.1: An aerial view of Marudi Town as of 14 April 2008

3.2 Demographic and Social Characteristics of the Study Area Population

Table 3.2 presents the distribution of population by ethnic groups in Marudi Town, Marudi District and Sarawak. It shows that the major population in Marudi Town is Chinese, followed by Malay and other indigenous ethnic groups. The category of other natives represents other native groups which are not specified in the figure. The category of others represents other ethnic groups which are not considered as a native group.

As shown in Table 3.2, Marudi Town has a population of 7,282 which represents 10 percent of the total population of Marudi District. The biggest ethnic group within Sarawak is Iban,
followed by Chinese and Malay. Chinese are scattered all over Sarawak and only 1.2 percent are living in Marudi District. Of this 1.2 percent (which is 5,903 Chinese) half of them (52 percent) are living in Marudi Town and dominate the Marudi Town population by a total of 42 percent. In contrast, the Malay ethnic group has a total population of 456,393 in Sarawak and about 78 percent of them are living in the Division of Kuching, where the capital city of Sarawak is located.

Table 3.2: Total population by ethnic group in Marudi Town, Marudi District and Sarawak in Year 2000

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Marudi Town</th>
<th>Marudi District</th>
<th>Sarawak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>2,951</td>
<td>2,951</td>
<td>5,903</td>
</tr>
<tr>
<td>Malay</td>
<td>2,347</td>
<td>2,347</td>
<td>456,393</td>
</tr>
</tbody>
</table>

NOTE: This table is included on page 31 of the print copy of the thesis held in the University of Adelaide Library.

Sources: Shaari (2001, p. 125-129)

The current pattern of the population distribution in Marudi Town is related to the history administration style of the Brooke Colonial Administration under British rule because the major role for the three main ethnic groups was determined by the government according to their cultural attributes. For example, Malays were assigned to play a major role in politics and administration, Iban were assigned to be involved in defence or military and Chinese were assigned to be involved in business and economic activities (Kaur 1995). Since the capital city of Sarawak and the state administrative headquarters are located in the Division of Kuching, the majority of Malays are living there according to their assigned responsibilities. In addition, about 74 percent of the total Chinese population is living in the Division of Kuching due to their assigned attributes.

On the other hand, Marudi Town is the largest town of Marudi District and the district administrative headquarters are located there. The majority of Chinese living in the district of Marudi chose to live in Marudi Town for business purposes. Although other natives are the biggest ethnic group in the whole Marudi District, only 1,123 (3.4 percent) are living in
Marudi Town. This is mainly due to the lifestyle where the native ethnic groups depend on the forest and river resources in their daily lives.

In addition, there are total of 27 ethnic groups living in Sarawak speaking at least 45 different dialects including the country official language, Malay. The 27 ethnic groups are Iban, Malay, Chinese, Bidayuh, Melanau, Kayan, Kenyah, Lun Bawang, Penan, Kelabit, Kedayan, Bisaya, Lahanan, Sekapan, Kejaman, Punan Bah, Punan Biau, Punan Busang, Baketan, Ukit, Sihan, Tagal, Tabun, Saban, Lisum and Longkiput (Sarawak Electronic Government 2008).

As shown in Figure 3.2, the biggest population in Marudi Town and Marudi District who are less than 19 years old is from the age group of 0 to 4, which are 1,009 and 10,418 people respectively. Similarly, between the ages of 20 to 54, the highest number of working population in Marudi Town and Marudi District is from the age group of 25 to 29, which is 588 and 6,093 people respectively. On the other hand, the highest number of population in Marudi Town and Marudi District for 55 years old and above is from the age group of 55 to 59, which are 222 and 2,309 people respectively.

NOTE:
This figure is included on page 32 of the print copy of the thesis held in the University of Adelaide Library.

Figure 3.2: Distribution of population in Marudi Town by age in 2000
Source: Shaari (2001)
As shown in Figure 3.3, there are two obvious differences when comparing the percentage of population in terms of age group and sex ratio between Sarawak (state) and Malaysia (country). First of all, the percentage of male and female population in the 0 – 4 age group in the state is higher than the percentage of the country. Secondly, the percentage of males in the 75 and above age group in the state is higher than the percentage in the country while the percentage of females is about the same. Other than the two differences, the highest percentage of population in the state is the 0 – 4 age group while the highest percentage of population in the country is the 5 – 9 age group.

![Sarawak (shaded) and Malaysia Population in Year 2000](image)

Figure 3.3: Population and sex ratio of Sarawak and Malaysia

In terms of education, Marudi Town has five primary schools and two secondary schools but does not have any colleges or universities. Thus, in order for the local teenagers to pursue their higher education, they must leave Marudi Town and go to other cities, particularly Miri City, which has pre university courses, colleges and universities.
3.3 A Brief History and the Most Memorable Event of Marudi Town

James Brooke arrived in Sarawak in 1839. In return for helping the Brunei Sultan’s uncle, Pengiran Muda Hassan, to suppress the uprising of the rebels in Sarawak, he officially became the first White Rajah on 24th November 1841 (Runciman 1960; Kaur 1995). James Brooke died in 1868 and then his nephew, Charles Brooke, took over his place and became the second White Rajah until 1917. Then, the third White Rajah Vyner Brooke, son of Charles continued his father’s work until Sarawak fell under Japanese occupation in 1941 (Pringle 1970, Sarawak Electronic Government 2008).

In 1873, the state of Sarawak was divided into three divisions. Before 1885, Baram (now called Miri Division) was under the jurisdiction of Brunei. After Charles Brooke acquired Baram from Brunei, Baram was added as the fourth division in the state of Sarawak and a fifth division was added in 1912 (Figure 3.4). In addition, the main administration office is located in the town area of Baram (Reinhardt 1970). The town in Baram Division was called Claude Town (now called Marudi Town), named after the first Baram British Resident, Claude Champion de Crespigny. In addition, during Brooke’s administration, Baram was considered a division with no district.

The most memorable and special event in Baram, particularly for Marudi Town is the Regatta because this event symbolizes peace and unity among the local people. During the Brooke administration, many different indigenous groups were living in the inner areas of Baram. Fights, particularly tribal wars and practices of headhunting, occurred in the more remote areas of the division and it affected the lives of other communities. With an endeavour to stop this uncivilised practise, the Rajah Brooke had declared head hunting a capital crime and whoever was found guilty would be put to death (Chee & Chua 1997). Therefore, the second Baram British Resident, Charles Hose, organised a peaceful meeting in Marudi Town which was attended by around 5,000 indigenous people from the inner areas of Baram (Chee & Chua 1997) (Figure 3.5). Eventually, the leaders of every indigenous group decided and promised no more fights and headhunting among the ethnic groups and the only way to determine the strongest was from the result of the long boat race, Regatta. The first regatta was held in Marudi Town on the 8th April 1899 and it has become a very important event until today. The Regatta is still organized and hosted by the Sarawak state.
Figure 3.4: Five divisions of Sarawak in the early 20th century

NOTE:
This figure is included on page 35 of the print copy of the thesis held in the University of Adelaide Library.
government in Marudi Town once every three years and the last Regatta was held from 15th – 17th August 2008.

NOTE:
This figure is included on page 36 of the print copy of the thesis held in the University of Adelaide Library.

Figure 3.5: Meeting of tribal leaders in Marudi Town in 1899
Sources: Chee and Chua (1997: p. 279)

3.3.1 The First Oil Well in Miri City
In 1910, the first oil well was discovered by Dr Charles Hose, the second Baram resident, on top of a hill 150 meters above sea level in Miri District (Ministry of Urban Development and Tourism, Sarawak 2005; Sebastian 2006). The hill was then called Canada Hill, to honour the contribution of a Canadian, McAlphine, who was assigned to erect the well (Sebastian 2006). The oil well which was also known as the Grand Old Lady, had produced a total of 658,650 barrels of oil from 1910 to 1972 before the well was shut down in 1972 (Sebastian 2006).

Before oil was officially discovered, Miri was a fishing village with no accommodation available for the first batch of oil well workers whereas Marudi Town was already well developed as the headquarters of the region’s administrative office (Cochrane 1924). Although the first Grand Old Lady is very well known in Sarawak, it is not the only oil well discovered by Brooke’s government. Cochrane (1924) illustrated that there were at least eight oil wells discovered in Miri and oil well number eight was the first oil well that produced 100 tons of
oil per day. Since the oil production industry occurred in Miri City, this facilitated its economic development, in particular it increased the number of workers and basic infrastructure. For example, schools and roads were built, shop houses set up in the town and private land transport (such as motorcycles and cars) started to appear on the road (Miri Resort City 2009).

Due to the significant economic impact of the oil well, Brooke’s government shifted their major concentration of development to Miri City. Furthermore, the administrative centre of Baram Region and the resident office were also shifted from Marudi Town to Miri City. Since then, Miri became an urban city while Marudi Town was left behind as a rural town.

3.4 The Economic Characteristics of Sarawak and the Study Area

For the purpose of identifying and targeting the poorer groups in order to reduce the incidence of poverty in Malaysia, monthly poverty line income (PLI) per household has been formulated and employed by the government since 1977 (The Economic Planning Unit 2006). As shown in Table 3.3, the recent PLI of Malaysia can be divided into six categories namely urban Peninsular Malaysia, rural Peninsular Malaysia, urban Sabah, rural Sabah, urban Sarawak and rural Sarawak.

Table 3.3: The poverty line income of Malaysia in 2004

<table>
<thead>
<tr>
<th>Category</th>
<th>PLI (RM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Peninsular Malaysia</td>
<td></td>
</tr>
<tr>
<td>Rural Peninsular Malaysia</td>
<td></td>
</tr>
<tr>
<td>Urban Sabah</td>
<td></td>
</tr>
<tr>
<td>Rural Sabah</td>
<td></td>
</tr>
<tr>
<td>Urban Sarawak</td>
<td></td>
</tr>
<tr>
<td>Rural Sarawak</td>
<td></td>
</tr>
</tbody>
</table>

Note: RM 3.00 = AUD 1.00

As shown in Table 3.3, the PLI for Malaysia in rural areas is slightly higher than urban areas. However, there are two exceptions which are under the category of urban Peninsular Malaysia and urban Sarawak. It shows that households in urban peninsular Malaysia and urban Sarawak need more income for living compared to the rural areas.
Today, Sarawak is well known for its natural resources namely forest and agriculture productions. In 2005, the top four forest productions in Sarawak were saw logs (12,036,000 m³), poles (3,470,000 m³), plywood (3,171,000 m³) and sawn timber (1,197,000 m³). Furthermore, the major agriculture productions are crude palm oil (1,116,500 tonnes), rubber (36,900 tonnes), pepper (20,000 tonnes) and dry cocoa beans (2,300 tonnes) (State Planning Unit 2007, p. 26, 29). Moreover, pepper production in Malaysia was ranked sixth in the world in 2007 and 98 percent of its pepper production was grown in Sarawak (Wong 2008).

NOTE:
This figure is included on page 38 of the print copy of the thesis held in the University of Adelaide Library.

Figure 3.6: The niche of economic activities in Sarawak
Source: State Planning Unit (2007, p.6)

Figure 3.6 shows the different niches of economic activities among the 11 divisions within Sarawak. It highlights that the main economic activities in Miri Division are tourism, plantation, manufacturing and commerce. Since the division has two districts namely Miri District and Marudi District, the mentioned economic activities are not fully illustrated in the overall picture of both districts. The majority of these sectors are related with Miri District and only two of them are suitable to illustrate the main economic activities (plantations and tourism) in Marudi District.
3.5 The Logging Access Road between Marudi Town and Miri City

Public infrastructure is one of the important elements in rural development because better infrastructure will provide better chances to attract investors and improve the quality of life of rural dwellers (Azidin 2006). One of the infrastructures that the local people were waiting for was a good access road between Marudi Town and Miri City.

NOTE:
This figure is included on page 39 of the print copy of the thesis held in the University of Adelaide Library.

Figure 3.7: The access road from Marudi Town to Miri City
Source: Google map

In 2002, the Sarawak state government received funding from the federal government for rural development projects in Sarawak. With the available funding, a 14 km unpaved rural connecting road (Part A in Figure 3.7), which cost RM 1 million (equivalent to USD 284,091 on 3.52 exchange rate) was constructed from Marudi Town to connect with the logging access road (Part B in Figure 3.7) between 2002 and 2005. In the application for the funding, the stated purpose of the connecting road was to connect a few small villages along the road and there was no mention of the logging access road and Miri City. According to the party responsible for applying the funding and monitoring the connecting road project, funding would not be approved if the purpose of building the road was to connect to a logging access road accessible to Miri City.
The connecting road is cut by two rivers. Thus, road users need to cross the rivers by ferry. The logging access road is connected to a main road of Miri City (Part C in Figure 3.7) which allows road users to reach Miri City. The overall distance from Marudi Town to Miri City using land transportation is about 55 km (from Part A, Part B and Part C to Miri City).

Figure 3.8: The connecting road from Marudi Town to the logging access road
Note: The photo was taken by the author on 22 April 2008

The main purpose of constructing an unpaved connecting road (Part A in Figure 3.7 & Figure 3.8) to connect with the logging access road is to create an alternative way for the local people to travel between Marudi Town and Miri City. In fact, there were two other options for the local people to travel between these two places before 2005, which was either by plane or express boats. One of the disadvantages of these two modes of transportation is the limited operating hours. The last flight departing from Marudi Town to Miri City is 2.55 pm and the last return flight from Miri City is at 2.20 pm. Similarly, the last departure time for the express boat either from Marudi Town to Miri City or return is 3 pm.
The logging access road (Part B in Figure 3.7 & Figure 3.9) was originally built by a logging company for the purpose of logging activities. At the end of 2005, logging activities stopped and the logging access road was used by a plantation company. Since then, the logging access road is maintained by the plantation company and the 14 km rural connecting road (Part A in Figure 3.7) is maintained by the ferry provider. Since the rural connecting road was opened and connected with the logging access road in 2005, it has enabled people to travel between Marudi Town and Miri City by land transportation in approximately 1 hour and 30 minutes. Although it is just a logging access road which is not accessible in all weather, it has created positive social and economic impacts to the local community of Marudi Town particularly with regards to emergency access (as discussed in Chapter 7).

3.6 Conclusion
Marudi Town has a rich history since it was added into the fourth division of Sarawak in 1885. The most memorable event, the Regatta, started in 1899, symbolises peace among the ethnic groups and became an attraction in the tourism events. The Regatta is hosted by Marudi Town
once every three years and plays a significant role in local economic development. In terms of the rich cultural values, there are 27 ethnic groups living in Sarawak and Marudi Town is dominated by various ethnic groups, namely Chinese, Malay, Iban, Bidayuh, Melanau and other indigenous groups.

Since July 2005, the Marudi Town community can travel through a logging access road to reach Miri City by land transportation. Basically, the access road which connected these two places has three different sections with two rivers to cross as shown in Figure 3.7. The total travel distance is about 55km and the travelling time is approximately one and a half hours. Although it is not a direct connected road, various social and economic impacts have been created since it was accessible by the Marudi community and this will be discussed in Chapters 6, 7 and 8.
Chapter 4

SOCIAL IMPACT ASSESSMENT

4.1 Introduction
Every development project delivers either positive or negative impacts, some even both. As emphasised by Vanclay (2003a, p.1), “the costs of development generally are not adequately taken into account by decision makers, regulatory authorities and developers, partly because they are not easily identifiable, quantifiable and measurable”. Therefore, appropriate methods have to be used to identify and categorize relevant impacts.

Social Impact Assessment (SIA) is widely used to categorize and analyse the impacts of development policies, programs and projects. This chapter discusses the diverse definitions of SIA and the development of SIA. Then, the SIA principles of 1994 and 2003 (United States version) with the criticisms discussed followed by the social impact variables written by the Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1994; 2003), Burdge (1994) and Vanclay (2002). Lastly, the role of SIA in the research design of this study is described.

4.2 Definitions of Social Impact Assessment
Generally, Social Impact Assessment (SIA) is a social science component of Environmental Impact Assessment (EIA) and some commentators refer to it as an Environmental Impact Statement (Burdge 1994). There are generally 12 types of impacts which SIA addresses: population change, employment change, displacement and relocation, neighbourhood disruption, noise impact, aesthetic impact, accessibility change, leisure and recreation impact, health and safety, citizens’ reactions, community impact and land use changes (Finsterbusch 1980).

In contemporary literature, there are many definitions of SIA. For instance, Vanclay (2002, pp. 190-191) has defined it as “an umbrella or overarching framework that encompasses all human impacts including aesthetic (landscape analysis), archaeological and heritage, community, cultural, demographic, development, economic and fiscal, gender, health,
indigenous rights, infrastructure, institutional, political, poverty-related, psychological, resource issues, the impacts of tourism and other impacts on societies”. Others have affirmed SIA as “the process of identifying the future consequences of current or proposed actions which are related to individuals, organizations and social macro-systems” (Becker 2001, p. 312). Some researchers do not define and relate SIA to only social impact but as “assessing a broad range of impacts that are experienced by social groups as a result of some course of action” (Freudenburg 1986, p. 452).

There are two versions of the Guidelines and Principles (G & P) relating to SIA, the United States version and the International version; both have similar perspectives. In the latest US version, the Interorganizational Committee on Principles and Guidelines for Social Impact Assessment (2003, pp. 231-232) has defined SIA as:

“efforts to assess, appraise or estimate, in advance, the social consequences that are likely to follow from proposed actions. These include: specific government or private projects, such as construction of buildings, siting power generation facilities, large transportation projects, managing natural resources, fish and wildlife; and preserving or leasing large tracts of land and the adoption of new policies and resulting plans and programs”.

Similarly, the latest international version has defined that SIA “includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions” (Vanclay 2003b, p. 6). Among all the definitions from the literature, the author proposes that the most suitable way of defining SIA is what has been published in the international version.

‘Social consequences’ is one of the key elements in SIA definitions. Therefore, it is important to define what social is. The word ‘social’ is one of the hardest words to define in the context of development because it has a wide range of meanings (Pisani & Sandham 2006, p. 707). Social impact refers to “the impact actually experienced by humans in either a corporeal (physical) or cognitive (perceptual) sense” (Vanclay 2002, p. 191). Although the word ‘social’
can refer to either positive or negative impact, it is generally perceived as a negative impact while the economic impact is perceived as a positive one (Leistritz & Murdock 1980, p156).

4.3 The Development of Social Impact Assessment

Environmental Impact Assessment (EIA) was established in 1970 under the National Environmental Policy Act (NEPA) in the United States (Freudenburg 1986, p. 453; Burdge 1994, p. 99; Vanclay 2006, p. 4). Under NEPA, an EIA must be done before any federal agency is allowed to implement anything “significantly affecting the quality of the human environment” (Freudenberg 1986, p. 453). After EIA became one of the key elements in environmental planning in the United States, agency planners and decision makers increased their concerns about the social consequences of development projects and felt that a better understanding of these consequences was needed (Burdge 1994; Western & Lynch 2000). Thus, a group of social scientists outlined a set of guidelines and principles for SIA after the establishment of a committee called The Interorganizational Committee on Guidelines and Principles for SIA (or the US version) (Burdge 1994).

Table 4.1: List of contents of the Guidelines and Principles for Social Impact Assessment 1994 and 2003 (United States version)

<table>
<thead>
<tr>
<th>The main content of 1994 version</th>
<th>The main content of 2003 version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1: Introduction</td>
<td>Section 1: Introduction</td>
</tr>
<tr>
<td>Section 2: Legal mandate and administrative procedures for social impact assessment</td>
<td>Section 2: Principles for social impact assessment</td>
</tr>
<tr>
<td>Section 3: A basic model for social impact assessment</td>
<td>Section 3: A basic model for social impact assessment</td>
</tr>
<tr>
<td>Section 4: Steps in the social impact assessment process</td>
<td>Section 4: Steps in the social impact assessment process</td>
</tr>
<tr>
<td>Section 5: Principles for social impact assessment</td>
<td>Section 5: Conclusions</td>
</tr>
<tr>
<td>Section 6: Conclusions</td>
<td>Section 6: Accessible social impact assessment bibliography</td>
</tr>
<tr>
<td>Section 7: Accessible social impact assessment literature</td>
<td></td>
</tr>
</tbody>
</table>


The Interorganizational Committee was formally formed in 1989, 19 years after EIA was established, and the first report of the guidelines and principles of SIA (US version) was
completed on 14 December 1993 and the public version made available in 1994 (Vanclay 2006, p. 5). As shown in Table 4.1, there were in total 7 sections in the content of the report in 1994 version. The first section was the introduction which described the development of SIA and the definitions of social impact. Section 2 was the legal mandate and administrative procedures for social impact assessment. Section 3 was the basic model for social impact assessment, followed by section 4, the steps in the social impact assessment process. Section 5 was the principles for social impact assessment followed by section 6, the conclusion and the last section was a list of the social impact assessment literature. In the 2003 version, all contents remained the same and the only difference was the original section 2 namely legal mandates and administrative procedures for SIA was removed and the sequence for the original sections 3, 4 and 5 was rearranged.

4.4 Principles of SIA 1994 US Version and the Criticisms
Since the guidelines and principles (G & P) of SIA have been published by the Interorganizational Committee (1994 US version), various commentators have raised their concerns about the US version of the G & P of SIA. For example, Vanclay (2006) who compares the principles of SIA between the International version and the US version argues that the G & P provided by the Interorganizational Committee in 1994 was based on the US regulatory context, whereas the new G & P which was provided by the International Principles in 2003 was based on the international context. The main reason can be found by looking at where the 13 committee members were from. The 13 committee members of 1994 US version were from the United States and as mentioned in the introduction of the report (the Interorganizational Committee on Principles and Guidelines for Social Impact Assessment 1994), EIA has became a key component of environmental planning in the United States and concerns had shifted to social consequences of a development project. That is why the 13 committee members produced the US version of G & P of SIA which is tailored to the context of the US but does not suit many developing countries.

Vanclay (2006, pp. 6-7) also argued that the principles of the US version were focused on the negative impacts on affected parties but not concerned with maximizing the social utility, enhancement of wellbeing and sustainable livelihoods of the whole community. In other words, it does not focus on how to maximize and enhance the positive impacts. Furthermore,
he claims that the US version “failed to identify its target audience” (Vanclay 2006, p. 7) and was too committed to developed countries (Vanclay 2003a, p. 2). The target audience can be policy makers, developers, SIA practitioners, the community who are affected by the development project and academics who are interested in SIA.

Table 4.2: The 1994 US version of the principles of Social Impact Assessment


Seebohm (1997, pp. 237-238) provided a critique of the principles which he does not agree with, namely principle 5, 6 and 9 in G & P of the 1994 US version (Table 4.2). In principle 5, Seebohm does not agree with the word ‘informal feedback’ in the detail description because
he noted that a mandatory feedback on social impact should be emphasized so that anticipated negative impact can be minimized and mitigated. In principle 6, although it mentions the use of social science expertise or practitioners in SIA, Seebohm is more concerned with what extent SIA practitioners are actively involved in the project. For example, in the first involvement the social science expert is only involved in certain stages compared to the second type of involvement, where experts are involved from the very beginning until the end of SIA stages. Lastly, in principle 9, he mentions that this principle places too much emphasis on time and resource constraints and has reduced the significance of primary data. It suggests that SIA can be produced by using secondary data. Furthermore, this principle also suggests that, if a certain level of data is available, the involvement of social scientists in SIA is not always necessary. Thus, this principle has clashed with the principle 6 where it suggests the involvement of social science expertise in SIA.

4.5 The Principles of SIA 2003 (US version)

In 2003, The Interorganizational Committee produced an updated version of G & P of SIA, which tried to switch from US-based to international-based guidelines due to the many critics of the original version. Few major changes had been made other than re-phrasing and re-arranging the contents. The first major change is the reduction of the number of principles of SIA from nine (Table 4.2) to only six as follows (The Interorganizational Committee on Guidelines and Principles for Social Impact Assessment 2003, p. 233):

1. Achieve extensive understanding of local and regional settings to be affected by the action or policy.
2. Focus on key elements of the human environment.
3. Identify research methods, assumptions and significance.
4. Provide quality information for use in decision making.
5. Ensure that any environmental justice issues are fully described and analysed.
6. Undertake evaluation/monitoring and mitigation.

The second major change was the expansion of the stages in policy or project development in SIA from four to five stages as follows (The Interorganizational Committee on Guidelines and Principles for Social Impact Assessment 2003, p. 240):

Stage 1: General planning/policy development and preliminary impact assessment.
Stage 2: Detailed planning, funding and impact assessment.
Stage 3: Construction/implementation.
Stage 4: Operation/maintenance.
Stage 5: Decommissioning/abandonment.

The third major change is the omission of Section 2 namely Legal Mandates and Administrative Procedures for Social Impact Assessment.

Although the changes were made in the 2003 US version of G & P of SIA, its weaknesses were still pointed out by commentators. One who has a strong view is Vanclay who criticized the 2003 US version “has been generalized, rather than being made more specific” (Vanclay 2006, p.7). The main reason for the generalization may be the intention of the Interorganizational Committee to make it in an international context. Vanclay (2006) also did not agree with one of the statements in the 2003 US version that “we have benefited from almost ten years of comments” (The Interorganizational Committee on Guidelines and Principles for Social Impact Assessment 2003, p. 232). As argued by Vanclay (2006), the Interorganizational Committee did not fully respond to all the feedback and concern raised over the last 10 years because the 2003 version is almost the same as the original except for some minor changes such as re-formatting and re-ordering the contents.

In contemporary literature, the majority of criticism is toward the US version of the G & P of SIA, either the 1994 or 2003 versions. The criticism was overwhelmingly led by Frank Vanclay, the author of the International version of G & P of SIA. On the contrary, criticism on the International version of SIA rarely exists in the literature compared to the US version.

4.6 Social Impact Variables

As shown in Table 4.3, there are only few differences between the Interorganizational Committee’s (left column) and Burdge’s (right column) variables. The total social impact variables written by the Interorganizational Committee are 30 whereas Burdge has 26 in total. Although both of the lists have five main categories, the third category in the left column is named Political and Social Resources whereas the right column is named Conflict between Local Residents and Newcomers.
<table>
<thead>
<tr>
<th>Interorganizational Committee’s Variables</th>
<th>Rabel J. Burdge’s Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population Characteristics</strong></td>
<td><strong>Population Characteristics</strong></td>
</tr>
<tr>
<td>2. Ethnic and racial distribution</td>
<td>2. Dissimilarity in age, gender, racial or ethnic composition</td>
</tr>
<tr>
<td>3. Relocated populations</td>
<td>3. Relocated populations</td>
</tr>
<tr>
<td>4. Influx or outflows of temporary workers</td>
<td>4. Influx or outflow of temporary workers</td>
</tr>
<tr>
<td>5. Seasonal residents</td>
<td>5. Seasonal (leisure) residents</td>
</tr>
<tr>
<td><strong>Community and Institutional Structures</strong></td>
<td><strong>Community and Institutional Structures</strong> (Public Involvement)</td>
</tr>
<tr>
<td>6. Voluntary associations</td>
<td>6. Formations of attitudes towards the project (voluntary associations)</td>
</tr>
<tr>
<td>7. Interest group activity</td>
<td>7. Interest group activity</td>
</tr>
<tr>
<td>8. Size and structure of local government</td>
<td>8. Alteration in size and structure of local government</td>
</tr>
<tr>
<td>10. Employment/income characteristics</td>
<td>10. Industrial/commercial diversity</td>
</tr>
<tr>
<td>11. Employment equity of minority groups</td>
<td>11. Enhanced economic inequities</td>
</tr>
<tr>
<td>12. Local/regional/national linkages</td>
<td>12. Employment equity of minority groups</td>
</tr>
<tr>
<td>14. Presence of planning and zoning activity</td>
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<tr>
<td><strong>Political and Social Resources</strong></td>
<td><strong>Conflicts Between Local Residents and Newcomers</strong></td>
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<td>15. Distribution of power and authority</td>
<td>14. Presence of an outside agency</td>
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<td>16. Identifications of stakeholders</td>
<td>15. Introduction of new social classes</td>
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<td>17. Interested and affected public</td>
<td>16. Change in the commercial/industrial focus of the community</td>
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<td>18. Leadership capability and characteristics</td>
<td>17. Presence of weekend residents (recreational)</td>
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<td><strong>Individual and Family Changes</strong></td>
<td><strong>Individual and Family Changes</strong> (Cultural Effects)</td>
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<tr>
<td>19. Perceptions of risk, health, and safety</td>
<td>18. Disruption in daily living and movement patterns</td>
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<td>21. Trust in political and social institutions</td>
<td>20. Alteration in family structure</td>
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<td>23. Density of acquaintanceship</td>
<td>22. Perceptions about public health and safety</td>
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<td>24. Attitudes toward policy/project</td>
<td>23. Change in leisure opportunities</td>
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<td>25. Family and friendship networks</td>
<td><strong>Community Resources</strong> (Infrastructure Needs)</td>
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<td>26. Concerns about social well-being</td>
<td>24. Change in community infrastructure</td>
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<td><strong>Community Resources</strong></td>
<td>25. Land acquisition and disposal</td>
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<td>27. Change in community infrastructure</td>
<td>26. Effects on known cultural, historical and archaeological resources</td>
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<td>28. Native American tribes</td>
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<td>29. Land use patterns</td>
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<td>30. Effects on cultural, historical, and archaeological resources</td>
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In the first category of the lists, Population Characteristics, Burdge (1994) has considered age and gender whereas the Interorganizational Committee (1994; 2003) only takes into
consideration ethnic and racial distribution. In the second category, Community and Institutional Structures, every variable is almost identical between the lists except the 12th variable by the Interorganizational Committee and 11th variable by Burdge. As mentioned earlier, the social impact variables under the third category of both lists are totally different with each other. In the third category, the Interorganizational Committee is concerned about the political and social resources while Burdge is concerned about the conflict between local residents and newcomers. Category 4 is related to individual and family changes and the differences between the lists are variables 20 - 23 from the Interorganizational Committee and variables 18, 19 and 23 from Burdge. Finally the fifth category has only one extra variable from the Interorganizational Committee which is variable number 28, Native American Tribes and it is not on Burdge’s list.

Although there are lists of social impact variables from the literature (Table 4.3) written by the Interorganizational Committee (1994, 2003) and Burge (1994), some did not recognize it as social impact but as a process which will lead to an impact. Vanclay (2002) argues that the five sub-categories under the population characteristics in the left column of Table 4.3, namely population change, ethnic and racial distribution, relocated populations, influx or outflows of temporary workers and seasonal residents are just the process of change but not impacts. For example, population change is just a process. Population change will become an impact if the movement of the population is affecting either the sending or receiving areas.

Therefore, Vanclay (2002) has produced a new list of social impact variables in seven main categories, namely health and social well-being impacts, quality of the living environment (liveability) impacts, economic impacts and material well-being impacts, cultural impacts, family and community impacts, institutional, legal, political and equity impacts, and gender relations impacts. The following are the social impact variables from the selected six categories which were referred to by the author in constructing the questions of the questionnaire surveys and in depth interviews:

1. Health and social well-being impacts.
   - Positive or negative feelings of the local community in relation to the planned intervention.
Annoyance – a feeling or experience such as due to disruption to life but which is not necessarily directed at the intervention itself.

Dissatisfaction with the planned intervention or promised benefits.

2. Quality of the living environment (livability) impacts

- Perceived quality of the living environment in terms of safety, crowding and the presence of strangers in work, home or neighbourhood environment.
- Actual quality of living environment.
- Disruption to daily living practices which may or may not cause annoyance.
- Adequacy of physical infrastructure such as water supply, sewage, land and roads.
- Adequacy of social infrastructure such as education, police, doctors in the hospital, and libraries.
- Perception of personal safety and fear of crime.
- Actual crime and violence.

3. Economic impacts and material well-being impacts

- Standard of living.
- Access to public goods and services.
- Income.
- Property value.
- Occupational status and type of employment.

4. Cultural impacts

- Change in cultural values such as moral rules, beliefs, ritual systems, language and dress.

5. Family and community impacts

- Alteration in family structure.
- Disruption of social network. For example, impact on the social interaction of household members with other people in the community.
- Change of demographic structure of the community.
Community identification and connection such as sense of belonging.

6. Institutional, legal, political and equity impacts
   - Impact equity such as notions about fairness in the distribution of impacts across the community.

Generally, the adoption of the social impact variables in social studies can vary according to the study areas because different projects or different locations of a project will have different anticipated and unanticipated impacts. For that reason, researchers must seek balance between flexibility and standardization of the variables included in SIA (Pisani and Sandham 2006). Flexibility is needed in SIA because there are many unexpected and unanticipated impacts of a project which need to be adjusted for by the researcher. If standardization has been prioritised in SIA, uniformity and formal requirements will overtake the main purpose of SIA. If that is the case, the main purpose of carrying out SIA is just to fulfil the formal requirements but not concern about the impact on the affected groups or people.

Concerns about the issue of flexibility and standardization in the development of a SIA checklist have been voiced. Many disagree with the development of the checklist due to the argument that anyone without proper training can act like an expert in predicting social impacts with the help of the checklist and they can use their ‘expert judgment’ without doing fieldwork (Burge and Vanclay 1995; Slootweg et al. 2001; Vanclay 2002). However, a standard and comprehensive SIA checklist for social impacts will increase the awareness of decision makers in the planning process. Furthermore, it will enable researchers to produce a comprehensive report in concentrating on other unanticipated or unexpected impacts. Lastly, it will also encourage new researchers to use SIA when dealing with the social impacts of a project.

4.7 The Role of Social Impact Variables in the Research Design
The social impact variables of SIA have played a significant role in this study. These variables (Interorganizational Committee 1994, 2003, Burge 1994 and Vanclay 2002) have provided a clear direction not only in the early stages of research design and questionnaire design but throughout the whole study.
In the stage of research design, the social impact variables have provided the author a glance into what is needed when answering the research questions. In constructing the questions for the questionnaire surveys and in depth interviews, the social impact variables have ensured that all possible social and economic impacts are able to be identified through the survey methods. Furthermore, it has also provided a foundation for the author when doing field observation in the study area.

4.8 Conclusion

To conclude, the social impact variables in SIA have played a significant role in social research as well as this study. It has provided a fundamental list of social impacts for the author to take into consideration in the process of designing the study. With a list of social impact variables, anticipated and unanticipated social impacts of a project can be easily pre-identified before doing the fieldwork. By continually updating the list of social impact variables, unanticipated social impacts of the previous study will become an anticipated impact in the following study. Therefore, a list of social impact variables of SIA should always be updated and made easily accessible by social researchers in order to increase its popularity in the application of social research.
5.1 Introduction

A case study approach has been adopted in this study and both qualitative and quantitative techniques have been used to collect information. Questionnaire-based surveys, face-to-face in depth interviews, observation and secondary data analysis were used in the study. This chapter discusses the mentioned data collection methods including a pilot study. Then, sampling methods for the pilot study, surveys and in depth interviews are presented. Finally, the reliability and validity of the study is justified and the technique of data analysis is described. This is necessary for the accurate interpolation of the results presented in later chapters.

5.2 Survey Methods

The primary approach of this study is data triangulation. Triangulation in this context means applying a range of data collection methods in order to approach the research questions. This improves the chances of gaining a complete picture of the studied issues. In other words, triangulation is also called mixed method studies.

There are two types of mixed method studies available namely intra-method and inter-method. As explained by Johnson and Turner (2003 p. 298), intra-method is defined as “the sequential use of a single method that includes both qualitative and quantitative components”. For example, in the context of this study, a questionnaire has been used as a method of data collection. The questionnaire includes open- and closed-ended questions which intend to collect quantitative and qualitative data. Intra-method is not applied in the study if the questionnaire only contains close-ended questions which are only able to collect quantitative data. On the other hand, inter-method is defined as “the sequential use of two or more data collection methods within one study” (Johnson and Turner 2003, p. 298). For example, inter-method has been applied in this study by employing four data collection methods, namely questionnaire surveys, face-to-face in depth interviews, observation and secondary data analysis.
In this section, the main elements of data triangulation or mixed method is discussed, namely questionnaire surveys, face-to-face in depth interviews, observation and secondary data analysis.

5.2.1 Questionnaire Survey
As the study is using a case study approach, the main target respondents in the survey were the residents of Marudi Town. In order to locate respondents able to represent the population, the 53 streets in Marudi Town have served as the sampling frame so that every household in Marudi Town is covered.

A set of self-administered questionnaires has been constructed by referring to the list of social impact variables written by the Interorganizational Committee (1994, 2003), Burdge (1994) and Vanclay (2002) (as discussed in Chapter 4) which incorporated open- and close-ended questions. Although this is a self-administered questionnaire, assistance was provided when the interviewee needed someone to fill in the questionnaire for them due to literacy constraints. The main purpose of using questionnaire surveys in the study was to collect empirical data from respondents so it could be analysed and contribute to the findings of the study.

The final version of the questionnaires was delivered to the respondents’ houses by hand and a short interview with the respondents was carried out with their permission.

5.2.1.1 Structure of the Questionnaire
The questionnaire starts with questions about the respondent’s background and demographic data. These questions not only assist the author to become familiar with the respondents, it serves as a base for the author to find out more in Section 2, which concentrates on personal experience and decisions made by the respondents. The questionnaire is divided into eight sections as outlined below (see Appendix 10.1 for the questionnaire):

- Section A - Background of the respondents
- Section B - Social impacts
- Section C - Respondent’s perceptions and perspectives
- Section D - Economic impacts
Section A of the questionnaire consisted of 11 related questions requiring respondents to answer questions about their personal background. The questions asked about gender, age, nationality, ethnicity, marital status, educational level, occupation, monthly income and duration of stay in the study area, Marudi Town. As mentioned earlier, the first section of the questionnaire was a warm-up section. Thus, these 11 questions required respondents to answer questions about themselves without any decision making.

Section B consisted of nine questions which required respondents to answer questions based on their personal experience of the social impacts they have experienced since the logging access road opened. The questions included issues of inward migration into Marudi Town, weekend residents in Marudi Town, personal safety awareness of the local people, security of the town and housing areas, crime rates of Marudi Town, impact of the logging access road on respondent’s daily life, other positive or negative social impacts and finally, opinion on cultural change caused by the logging access road. Thus, a list of social impact variables (see Chapter 4) written by the Interorganizational Committee (1994; 2003), Burdge (1994) and Vanclay (2002) have been associated in constructing the questions from Section B to Section H. The social impact variables which have been referred to by the author for Section B are as follows:

I. ‘Presence of Weekend Residents’ under the category of Conflicts between Local Residents and Newcomers (Burdge 1994).

II. ‘Actual crime and violence’ under the category of Indicative Quality of the Living Environment Impacts (Vanclay 2002).

III. ‘Perceived Quality of the Living Environment in terms of Safety, Crowding and Presence of Strangers in Work, Home or Neighbourhood Environment’ under the category of the Indicative Quality of the Living Environment Impacts (Vanclay 2002).

IV. ‘Disruption to daily living practices which may or may not cause annoyance’ under the category of the Indicative Quality of the Living Environment Impacts (Vanclay 2002).
V. ‘Change in Cultural Value’ under the category of the Indicative Cultural Impacts (Vanclay 2002).

Section C comprised of six related questions which required respondents to answer according to their perceptions and perspectives pertaining to the issues on outward migration from Marudi Town, upgrading the logging access road to a tar sealed road and the role of a good rural access road in rural economic development and outward migration. The social impact variables which have been referred to and associated by the author in constructing the questions for Section C are as follows:

I. ‘Change in community infrastructure’ under the category of Community Resources (Interorganizational Committee 1994:2003 & Burdge 1994).

II. ‘Disruption in daily living and movement patterns’ under the category of Individual and Family Changes (Burdge 1994).

Economic impacts resulting from the logging access road were explored in Section D of the questionnaire. This section consisted of four questions which required respondents to answer according to their experiences and perceptions regarding changes in their monthly income before and after the logging access road opened, changes of employment opportunity in Marudi Town and types of jobs which were affected by the logging access road. The social impact variables which have been referred to and associated by the author in constructing the questions for Section D are as follows:

I. ‘Income’ under the category of Indicative economic impacts and material well-being impacts (Vanclay 2002).

II. ‘Changing of occupational opportunities’ under the category of Community and Institutional Structures (Burdge 1994).

Section E of the questionnaire was a comparative measure to study the “before and after” effects of transportation resulting from the logging access road. This section consisted of five questions and two questions required respondents to rank their favourite modes of transport before and after the logging road was opened to the public. Other questions regarded the feeling of respondents after the logging access road opened and the number of cars and
motorcycles that respondents owned before and after the logging road opened. The social impact variables which have been referred to by the author for Section E are as follows:

I. ‘Annoyance’ under the category of Indicative Health and Social Well-being Impacts (Vanclay 2002).

II. ‘Attitudes toward project’ under the category of Individual and Family Changes (Interorganizational Committee 1994; 2003).

Section F of the questionnaire aimed to further explore the impact of the logging access road on public facilities in Marudi Town and Miri City. There were five questions which focused on schools and local public hospitals. The questions included the frequency that respondents visited the Marudi Town Public Hospital and Miri City Public Hospital, the location of schools and the frequency of children returning home if their schools were not located in Marudi Town. The social impact variable which has been referred to by the author for Section F is as follows:

I. ‘Change in community infrastructures’ under the category of Community Resources (Burdge 1994).

Section G required respondents to fill in the household data such as number of children, current school or work place of their children and the reasons why their children chose not to stay in Marudi Town. The social impact variables which have been referred to by the author for Section G are as follows:

I. ‘Change of demographic structure of the community’ under the category of Indicative Family and Community Impacts (Vanclay 2002).

II. ‘Alteration in family structure’ under the category of Individual and Family Changes (Burdge 1994).

Lastly, Section H allowed respondents to add any comments and feedback regarding the study.

5.2.1.2 Pilot Study

A pilot study with 10 sets of questionnaires was administered to ensure that every question is understandable by the people of Marudi Town. The questionnaire was constructed by using three major languages namely English, Malay and Mandarin considering the main ethnic
groups in the study area. All respondents in the pilot study agreed to participate in the survey after the author explained clearly the purposes of this study. Most of the respondents were worried about the issue of privacy and were afraid participation would reveal their identity when answering the questionnaires. Eventually, all of them agreed to participate after the author assured their privacy and the confidentiality of their personal particulars and feedback towards the research. The sampling method of the pilot study is explained in section 5.3.1.

5.2.2 In Depth Interviews

In depth interviewing is a way to access people’s perceptions, meanings and the definitions of situations on a discussed topic (Punch 1998). Particularly, interviews help in obtaining in depth feedbacks and responses from the interviewees on particular questions and topics. It is significant when the qualitative in depth data is unable to be obtained from the respondents by using questionnaire surveys only. In addition, it also enabled the interviewer to get immediate clarification on the feedback given by the interviewees, as well as follow up questions when necessary. Furthermore, in depth interviews also enabled the interviewer to observe the nonverbal behaviour and reaction of the interviewees in the interviewing sessions (Sproull 1995; Dooley 1995).

Other than the short interviews with the respondents who participated in the questionnaire survey, in depth interviews were carried out on selected interviewees based on certain attributes they had, namely representatives of local associations, political parties and shop owners. The sampling method in choosing suitable interviewees has been explained in Section 5.5.3.

5.2.2.1 List of Questions in the In Depth Interviews

The interviews were not only limited to the following questions but served as a guideline to ensure the discussed issues were in line with the research questions:

I. How long have you been staying in Marudi Town?
II. What is your position in the association or party?
III. As a leader of your association or party, what do you think in regards of a good access road from Marudi Town to the outside world such as Miri City?
IV. Did you anticipate that the logging road was fully accessible in 2005 between Marudi Town and Miri City?

V. What are the social and economic impacts of the logging access road to the local community since it was opened?

VI. What do you think of the following statements:
‘Rural access roads encourage outward migration’ and ‘rural access roads facilitate rural economic development’.

VII. What do you think if the authority upgrades the logging access road into a tar sealed road?

VIII. What should be done in Marudi Town in order to improve the social and economic status of the local community?

5.2.3 Observations
As suggested by Delamont (2004, p. 218), observation could mean spending long periods watching people and may involve talking to them to know what they are thinking, doing and saying. Similarly, an observer becomes an instrument that absorbs all sources of information through what they have seen, heard, smelt, tasted and touched (Neuman 2006, p. 396).

As an observer, the author avoided interfering in or affecting any event in the study area. This was to ensure that the event would have happened with or without the attendance of the observer.

Due to the limitations of time, cost and the ability of the observer, it was impossible to observe everything that happened in the study area. In order to observe the right events at the right place and time, the author selected a few locations and events which had direct relationship to the research questions and objectives. These included observing the differences of the business activities of shops and food stores in Marudi Town during the weekdays and weekends, the number of outsiders in Marudi Town during weekdays and weekends and the security awareness of the residents in housing and town areas. Each observed event or happening which was relevant to the study was noted and watched carefully by the observer. Then all the observed events served as complementary data in the section on findings and discussions.
5.2.4 Census Data
Census data from the statistical reports have been referred to in order to describe and compare the characteristics of the population between Marudi Town with the district, state and country. The statistical reports used included the basic demographic data, social characteristics and economic characteristics of the population of Marudi Town, the administrative district, state and country. In the section of basic demographic data, age groups, gender, ethnic groups and marital status were referred to. In the section on social characteristics, details of the highest education levels attained were referred to. Lastly, in the section on economic characteristics, the employment of the population by industry was referred to.

5.3 Sample Selection
Generally, several constraints such as the interest in the topic, researcher’s desire and availability of resources play a significant role in deciding which population to study (Chadwick, Bahr and Albrecht 1984). It is inefficient to cover every person of the population in a study, unless it is a census study. Therefore, a sample selection from the particular population is required to ensure that the findings of the study are able to represent the whole population.

Sample size usually depends on the nature of the population, the purpose of the study and the resources available (Chadwick, Bahr & Albrecht 1984). The mentioned resources are time and funds available to the researchers doing fieldwork. Although some suggest that 30 to 200 is the range of the sample size (Bailey 1982, Chadwick, Bahr & Albrecht 1984), there is no absolute rule in dictating the sample size. The rule of thumb is the samples must be representative of the population.

5.3.1 Sample Selection for Pilot Study
The main objective of a pilot study is to test that the questions in the questionnaires can be understood. Thus, a convenience sampling method was applied to obtain quick feedback from suitable respondents who had different types of attributes. The pilot study was carried out by the author in the town area of Marudi Town particularly in the food stores. It was chosen as a source to find suitable respondents because people with different attributes can be easily found in the food stores, namely persons of different ethnic groups, age and gender.
Since the pilot study was to test that the questions of the questionnaire could be understood, the author avoided choosing respondents with the same attributes. Thus, ethnic group, age and gender were taken into consideration when selecting potential respondents. Once the suitable respondents were identified through observation, they were approached by the author personally to explain the purpose of the survey and to obtain their permission to participate in the survey. In terms of ethnic groups, the respondents who participated in the pilot study consisted of Iban, Chinese and Malay within the age range of 21 to 62 years old. Furthermore, the highest education levels attained included no formal education, primary school education and secondary school education. Overall, the questions used in the pilot study were understood by the respondents.

5.3.2 Sample Selection for Questionnaire Survey

Systematic sampling is a non-random sampling method in which every nth on the list were selected as a sample from the sampling frame (Sproull 1995). The sampling frame of the study is the 1,456 houses in Marudi Town. These houses were identified and distinguished by the streets in Marudi Town (Appendix 10.2). In order to overcome potential bias in the sampling method as noted by Bryman (2004), a random start in selecting the sample on every new street was applied. Then every 4th house on that street was selected as a sample.

The funding and timeframe available permitted the author to obtain about 400 respondents which constitutes around 28 percent of the sampling frame. From the 411 distributed questionnaires, 362 were collected with an 88 percent of response rate.

5.3.3 Sample Selection for In Depth Interviews

The process of finding suitable interviewees and setting up interviews played a significant role in the outcome of the research (Rapley 2004). To ensure that every interviewee in this study could represent certain attributes of the population, purposive sampling method was employed in selecting interviewees. The main reason was to identify a group of potential interviewees with particular attributes, namely the presidents of local associations, representatives of political parties and shop owners.
Firstly, a list of potential interviewees who were heads of local associations and representatives of political parties was obtained from a local key informant. The local associations on the list must have certain attributes namely they must represent certain groups of the population in Marudi Town. For example, there are associations on the list which represent the majority and minority of the ethnic groups in Marudi Town, associations which represent the businessmen in Marudi Town and political parties which speak for the population in Marudi Town. In addition, shop owners from the bazaar area of Marudi Town were selected by the author as this area contained all kinds of shops doing different business.

In order to get permission from the potential interviewees, the author contacted them by phone. After they agreed to participate in the in depth interview, a time and venue was determined by them. Different approach methods were used in order to interview the shop owners; the author visited the shop and asked for permission to interview the owner or person in charge.

Due to the limited timeframe which was less than 12 weeks, the number of potential interviewees first targeted was 15. Eventually, the number of interviewees who had participated in the in depth interviews was 11 with the response rate of 73 percent.

5.4 Reliability and Validity of the Study

Reliability means dependability or consistency (Neuman 2006, p.188). It denotes that if the same thing is repeated, it gets the same result under a very similar condition. Similarly, Hunter and Brewer (2003, p. 581) suggests that reliability refers to the degree to which a measurement can be replicated.

Although it is very rare to have perfect reliability in every study, this study tried to achieve it by clearly conceptualizing constructs in the study and to use a pilot test before distributing the final version of the questionnaire survey. As suggested by Neuman (2006), clearly conceptualized constructs meant each measure only indicated one concept. For example, the author ensured that the word ‘logging access road’ used in the study referred only to the road which connected Marudi Town and Miri City and not other roads. Nevertheless, pilot tests in
this study consisted of a set of trial questions used to ensure they could be understood by the respondents, before a final version was distributed.

There are three reliabilities, namely stability reliability, representative reliability and equivalence reliability which were not fully attainable in this study. Since the survey was conducted as a one off questionnaire survey and one off face-to-face in depth interview, stability reliability was not tested. As explained by Neuman (2006), stability reliability is a measure which should obtain consistent results at different time points with the condition that what is being measured does not change. In the context of this study, the author should receive a consistent answer from the same participants on the same question in different time periods, e.g. three days after the participants completed the questionnaire. However, no follow up surveys and interviews were planned due to limited time and cost constraints. In addition, the feedback of the participants in the survey might change and not be consistent when other relevant constraints affected the studied issue. For example, if the logging access road between Marudi Town and Miri City was closed by the authorities, or a brand new access road was built between these two places.

Representative reliability should yield a consistent result from various social groups (Neuman 2006). However, in this study, representative reliability only applied to the basic demographic data which does not require the respondents to partake in decision making nor give opinions when answering the questions in the survey. One of the main purposes of this study was to examine the impact of the logging access road and what the local people think of it. If every question in the survey should receive the same answer from the various groups of participants, it would not meet the main purpose of a field survey. There are two circumstances when this type of reliability could and could not be achieved. For example, when male and female respondents stated their real age in the survey, representative reliability was achieved. On the other hand, if male respondents stated their real age while female respondents understated their age, then representative reliability was not achieved.

In order to increase the degree of equivalence reliability, triangulation methods were applied in collecting qualitative and quantitative data. Equivalence reliability applies when researchers use several indicators to measure the same constraint. For example, the author used four data
collection methods, namely the questionnaire survey, face-to-face in depth interviews, observation and secondary data analysis to examine the social and economic impact of the logging access road on the Marudi Town community.

Validity suggests truthfulness and how well an idea fits into a real world or reality (Neuman 2006, p.188). Similarly, Hunter and Brewer (2003, p. 581) suggest that validity addresses the question of whether it measures what is intended to be measured. For example, in terms of this study, the author intends to examine the social and economic impact of the logging access road on Marudi Town community. If what has been described and explained by the author in the findings is not what really happens in the Marudi Town community, then the findings of the study have not achieved a high degree of validity.

5.5 Data Analysis and Presentation
Two types of data have been obtained in this study, namely qualitative and quantitative data. Qualitative data was collected through face-to-face in depth interviews and observation whereas quantitative data was collected through questionnaire surveys and statistical reports.

The Statistical Package for Social Sciences (SPSS) was used to analyse the quantitative data, particularly what was obtained from questionnaire surveys. Qualitative data particularly obtained from the in depth interviews and open-ended questions from the questionnaire surveys were presented in a descriptive form to complement the limitation of quantitative data.

5.6 Conclusion
This chapter has explained the methods employed in collecting data and the sampling methods used in the sample selection. The structure of the questionnaire has been constructed by referring to the social impact variables from Social Impact Assessment (SIA) written by the Interorganizational Committee (1994; 2003), Burdge (1994) and Vanclay (2002). The main purpose was to ensure that every anticipated and unanticipated impact was identified throughout the survey.

The study also displayed the strength of face-to-face in depth interviews as a tool of social investigation compared to questionnaire surveys which have a less interactive manner. The
process of interviews allowed the author to ask and thoroughly understand the issue of theoads and the impact of the logging access road to the local community. The time constraint,
less than 12 weeks, limited the number of in depth interviews which could be conducted by
the author. In the future, when longer fieldwork duration is granted, larger groups of
interviewees for the in depth interviews will be given priority to produce a comprehensive
finding.
CHAPTER 6

THE DEMOGRAPHY OF THE RESPONDENTS AND THE IMPACT OF THE LOGGING ACCESS ROAD

6.1 Introduction
The aim of this chapter is to provide a profile of the respondents from the questionnaire surveys including their views of the impact caused by the logging access road since it was opened in July 2005. Census data obtained from the statistical reports has been compared with the survey data and presented in this chapter.

This chapter outlines the characteristics of the respondents, the overall view of the participants regarding the road issue followed by the future migration plans of the respondents. The impact of the logging access road on transportation is then described followed by the impact on accessibility to other public facilities. Finally, the impact on rural-urban migration caused by the logging access road is examined.

6.2 The Characteristics of the Respondents
In this section, the background of the respondents is presented by looking at their gender, age, marital status, number of children, ethnic groups, highest level of education attained, occupation and monthly income.

The total number of distributed questionnaires was 411, out of these, 362 were completed with a response rate of 88 percent. The total number of collected questionnaires, n=362, represents 25 percent of the total number of houses in Marudi Town.

As shown in the census data, the population in terms of gender in Marudi District in the year 2000 was 37,333 males and 34,380 females with the sex ratio of 109 males for every 100 females. Whereas in Marudi Town, there are 3,548 males and 3,734 females with the sex ratio of 95 males for every 100 females (Department of Statistics Malaysia 2005; 2008). The survey data of the author shows that the respondents of Marudi Town consisted of 62 percent (n=224) males and 38 percent (n=138) females out of 362 respondents.
The representation of males and females between survey data and census data is different mainly due to the gender of the head of household in the study area. When the questionnaire was distributed to the selected households, the majority were answered by the head of the household which tended to be a male. In some cases when the father of a family was not at home when the questionnaire was delivered by hand, the mother did not answer the questionnaire but either requested her son to fill it in or left it to her husband to do when he came back later.

In Marudi District, 36.3 percent of the population are 0 to 14 years old, followed by 58.8 percent 15 to 64 years old and 5 percent 65 years old and above (Shaari 2001). As compared to Marudi Town, the average age of the respondents is 39, in the range 17 to 77 years old. In terms of marital status, the census data of Sarawak and the respondents in Marudi Town were 63 percent married (Shaari 2002). The percentage of respondents who stated they were still single was 26 percent, 6 percent lower than the census data of Sarawak. On the other hand, 5.2 percent of the respondents stated they were divorced compared to only 0.9 percent in the Sarawak census, and 5.8 percent of respondents stated they were widowed compared to 4 percent in the Sarawak census.

As shown in Table 6.1, the number of children respondents ranged from zero to nine. The majority of respondents have two children, which is 24.1 percent (n=60), followed by three children (18.1 percent), four children (17.3 percent) and one child (16.5 percent).

<table>
<thead>
<tr>
<th>Number of children</th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>18</td>
<td>7.2</td>
</tr>
<tr>
<td>1</td>
<td>41</td>
<td>16.5</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>24.1</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>18.1</td>
</tr>
<tr>
<td>4</td>
<td>43</td>
<td>17.3</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td>249</td>
<td>100</td>
</tr>
</tbody>
</table>
Although there are 27 different ethnic groups living in Sarawak, less than half of these groups live in Marudi Town. The dominant ethnic groups in Marudi Town are Chinese, Malay and Iban (See Chapter 3). Table 6.2 compares the distribution of ethnic groups in Marudi Town in the year 2000 (Shaari 2001) between the census and respondents from the survey.

Table 6.2: The ethnic groups in Marudi Town

<table>
<thead>
<tr>
<th>Ethnic Groups</th>
<th>Percentage</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Natives</td>
<td>27%</td>
<td>70</td>
</tr>
<tr>
<td>Kenyah</td>
<td>14%</td>
<td>29</td>
</tr>
<tr>
<td>Kayan</td>
<td>14%</td>
<td>29</td>
</tr>
<tr>
<td>Kelabit</td>
<td>14%</td>
<td>37</td>
</tr>
<tr>
<td>Penan</td>
<td>5%</td>
<td>5</td>
</tr>
<tr>
<td>Malay</td>
<td>26%</td>
<td>55</td>
</tr>
<tr>
<td>Chinese</td>
<td>22%</td>
<td>39</td>
</tr>
<tr>
<td>Iban</td>
<td>21%</td>
<td>33</td>
</tr>
<tr>
<td>Melanau</td>
<td>4%</td>
<td>7</td>
</tr>
<tr>
<td>Bidayuh</td>
<td>0.3%</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Shaari (2001)

As shown in Table 6.2, the respondents of this study consisted of nine ethnic groups. The majority of respondents were from the category of other natives (27 percent) which consisted of Kenyah (n=48), Kayan (n=29), Kelabit (n=14) and Penan (n=5). The second largest group is Malay with 26 percent (n=94). The third largest ethnic group is Chinese with 22 percent (n=81), followed by Iban with 21 percent (n=76), then Melanau with 4 percent (n=14) and the smallest ethnic group is Bidayuh which has only 0.3 percent (n=1).

The distribution of the ethnic groups in the survey is different with the year 2000 census data mainly due to the willingness to participate. Firstly, quite a large number of respondents from certain ethnic groups particularly Chinese, refused to participate because they were afraid their personal data would be revealed and be traced by someone else. Other than that, non-returned questionnaires also contributed and played a significant role in the uneven distribution.
Overall, the majority of respondents possessed adequate skills to read and write as the majority of them studied to at least secondary school (Figure 6.1). The proportion of educated population in Marudi Town is higher than the census data in Sarawak with only 10.8 percent of the respondents in Marudi Town never attending school compared to 17.8 percent of the population in Sarawak (Shaari 2002). The majority of respondents had attained at least primary and secondary school qualifications, mainly due to the availability of five primary and two secondary schools in Marudi Town.

As shown in Figure 6.1, there are few differences between the respondents in Marudi Town and the census of Sarawak in terms of highest education attained. First of all, the percentage of respondents in Marudi Town is higher than the census data of Sarawak in three education levels, namely secondary school, post-secondary school and technical skills institution. Although there is no post-secondary education and technical skills institutions available in Marudi Town, the percentage is still higher than the census data of Sarawak. Indirectly, it
shows that those who studied outside Marudi Town have returned and worked in Marudi Town after completing their studies.

Table 6.3: Occupation of the respondents

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Male</th>
<th>Female</th>
<th>Subtotal</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-employed</td>
<td>37</td>
<td>14</td>
<td>51</td>
<td>14.1</td>
</tr>
<tr>
<td>Education</td>
<td>13</td>
<td>13</td>
<td>26</td>
<td>7.2</td>
</tr>
<tr>
<td>Government sector</td>
<td>49</td>
<td>16</td>
<td>65</td>
<td>18.0</td>
</tr>
<tr>
<td>Sales and marketing</td>
<td>8</td>
<td>5</td>
<td>13</td>
<td>3.6</td>
</tr>
<tr>
<td>Customer service</td>
<td>19</td>
<td>10</td>
<td>29</td>
<td>8.0</td>
</tr>
<tr>
<td>General worker</td>
<td>14</td>
<td>14</td>
<td>28</td>
<td>7.7</td>
</tr>
<tr>
<td>Student</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>2.8</td>
</tr>
<tr>
<td>Unemployed</td>
<td>7</td>
<td>5</td>
<td>12</td>
<td>3.3</td>
</tr>
<tr>
<td>Farming</td>
<td>24</td>
<td>10</td>
<td>34</td>
<td>9.4</td>
</tr>
<tr>
<td>Fishing</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>1.9</td>
</tr>
<tr>
<td>Housewife</td>
<td>0</td>
<td>32</td>
<td>32</td>
<td>8.8</td>
</tr>
<tr>
<td>Construction</td>
<td>17</td>
<td>1</td>
<td>18</td>
<td>5.0</td>
</tr>
<tr>
<td>Engineering</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Administration</td>
<td>8</td>
<td>6</td>
<td>14</td>
<td>3.9</td>
</tr>
<tr>
<td>Retired</td>
<td>13</td>
<td>4</td>
<td>17</td>
<td>4.7</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1.1</td>
</tr>
</tbody>
</table>

There are few occupations held by the respondents which differ according to their gender in Marudi Town. The figures in Table 6.3 show that majority of the males are working in the government sector while females are working as a housewife, which are 22 percent (n=49) and 23 percent (n=32) respectively.

The top three occupations of the respondents are government employees, self-employed and farmers. First, there are 65 respondents (18 percent), 49 males and 16 females, who are working in the government sector. The second highest occupation is self-employed which has 51 respondents (14.1 percent), 37 males and 14 females. The third highest occupation is farming which has 34 respondents (9.4 percent), 24 males and 10 females. On the other hand, the occupation which has the least respondents involved is engineering which has only two respondents (0.6 percent), one male and one female.
Table 6.4: The distribution of employed persons in Sarawak by industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number of Respondent</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry, livestock, fishing</td>
<td>113</td>
<td>31</td>
</tr>
<tr>
<td>Community, social, personal services, other services</td>
<td>115</td>
<td>32</td>
</tr>
<tr>
<td>Wholesale, retail trade, restaurants, hotels</td>
<td>36</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>362</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: State Planning Unit (2008, p. 16)

Table 6.5: The monthly income of respondents per capita

<table>
<thead>
<tr>
<th>Monthly income per capita (RM)</th>
<th>Number of Respondent</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 500</td>
<td>113</td>
<td>31</td>
</tr>
<tr>
<td>501 – 1000</td>
<td>115</td>
<td>32</td>
</tr>
<tr>
<td>1001 – 1500</td>
<td>36</td>
<td>10</td>
</tr>
<tr>
<td>1501 – 2000</td>
<td>57</td>
<td>16</td>
</tr>
<tr>
<td>2001 – 2500</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Above 2500</td>
<td>33</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>362</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: RM 3.00 = AUD 1.00

In terms of the respondents’ monthly income, Table 6.5 shows the distribution of income by different income groups. As shown in Table 6.5, the respondents’ monthly income per capita is concentrated into two income groups - below RM 500 (31 percent) and RM 501 to RM 1000 (32 percent). The monthly poverty line income (PLI) in rural Sarawak is RM 753 per household (The Economic Planning Unit 2006). By examining the monthly income per capita
of the respondents and assuming that only one household member is working for a living, 42.3 percent of the respondents are considered as poor because they are earning less than RM753 per month. If there is more than one household member working then the percentage of respondents who are considered poor will be lower.

6.3 Views of the Local People on the Logging Access Road, Tar Sealed Road and Outward Migration in Marudi Town

The perceptions of respondents on the issues of the logging access road as well as a proper rural access road, such as a tar sealed road, are deemed important to show what the population thinks. Thus, related issues have been analysed in order to show their views and feelings on whether the logging access road has attracted more people into Marudi Town, what they feel about the newcomers, whether the logging access road encourages outward migration, feelings of the respondents if the logging access road is upgraded into a tar sealed road, views of the respondents on whether proper access roads stimulate outward migration and lastly, the views of the respondents on proper access roads facilitating rural economic development. The feedback of respondents on these issues is significant to examine their response to the changes caused by the logging access road.

6.3.1 The Logging Access Road and the Newcomers

With respect to the role of the logging access road in attracting outsiders into Marudi Town, the majority of respondents agreed that it had attracted more people. There are 88.3 percent (n=318) of the respondents agreed that the logging access road had attracted more people into Marudi Town and only 11.7 percent (n=42) did not agree. The pattern of the feedback from the questionnaire surveys was quite similar to the feedback from the in depth interviews as 91 percent (n=10) of the interviewees agreed that the logging access road had attracted more people into Marudi Town. As explained by the interviewees and respondents, the logging access road has served as an alternate way and indeed the cheapest way to travel between Marudi Town and Miri City. Since it was accessible by the public from Marudi Town to Miri City, local people anticipated the increase of unknown faces in the town.
6.3.2 The Local People and the Newcomers

From the 318 respondents who agreed that the logging access road has attracted more people into Marudi Town, only 17.6 percent (n=56) felt afraid whereas 82.4 percent (n=262) were not afraid of these newcomers.

According to the 56 respondents from the questionnaire surveys, there were two main reasons for them to feel afraid of the newcomers. First, they did not know them and felt uncomfortable with them. Furthermore, the respondents worried that these newcomers would commit crime in Marudi Town.

On the other hand, the 262 respondents from the questionnaire surveys and 10 interviewees from in depth interviews gave a different reason as to why they were not afraid of the newcomers. Firstly, the respondents noted that the main purpose of the newcomers coming to Marudi Town was for business activities. Secondly, they possessed a perception that everyone could live together as long as there was no offensive action against the newcomers. Thirdly, most of the respondents perceived Marudi Town as a peaceful town and they knew everyone in the community. Therefore, attention would be paid by the local community on the suspicious strangers in the town.

6.3.3 Reactions of the Respondents on the Logging Access Road

The majority of respondents in the study had a positive reaction when they anticipated that the logging access road would be accessible to them. As shown in Figure 6.2, 55 percent (n=196) of the respondents were happy and 23 percent (n=83) said that they were extremely happy when the logging access road became accessible from Marudi Town to Miri City. On the other hand, only 18 percent (n=63) of the respondents remained neutral. In general, the respondents were happy with the logging access road because it was the first access road which connected Marudi Town to the outside world since Marudi Town was first established. In addition, the logging access road improved their mobility, shortened travelling time and reduced travelling costs between Marudi Town and Miri City.
6.3.4 The Logging Access Road and Outward Migration

First, when respondents were asked whether the logging access road had encouraged outward migration from Marudi Town, 75 percent (n=271) of them selected the answer of do not agree and absolutely not agree (Figure 6.3). Of the 75 percent of respondents, the majority believed that outward migration happened not because of the logging access road but due to a lack of employment opportunities in Marudi Town. Furthermore, they argued that outward migration happened before the existence of any access roads.
Similarly, 10 out of 11 interviewees (91 percent) from the in-depth interviews did not agree that the logging access road encouraged outward migration. In fact, they believed that if there was a good rural access road such as a tar sealed road between Marudi Town and Miri City, reverse migration would occur due to easy access, a safer living environment and cheaper accommodation in Marudi Town.

6.3.5 Perspectives of the Respondents on Upgrading the Logging Access Road into a Tar Sealed Road

When respondents answered the question of what they feel if the logging access road was upgraded into a tar sealed road, 55 percent (n=200) of the respondents thought it was very good and 38 percent (n=138) said that it was good (Figure 6.4). The majority of local people believed that a good access road would facilitate the local economic activities and improve mobility. From the answers, it showed that approximately 93 percent of respondents wished to have a tar sealed road which enabled them to travel between Marudi Town and Miri City without physical and time barriers. Although the logging access road has improved their mobility between districts, physical barriers such as rivers have limited its positive impact on the local people.

![Figure 6.4: The perspectives of the respondents on the issue of upgrading the logging access road into a tar sealed road](image-url)
Similarly, 10 out of 11 interviewees (91 percent) from the in depth interviews said they would fully support the plan if related authorities intended to upgrade the logging access road into a tar sealed road because it would directly improve the economic activities of Marudi Town.

Table 6.6: The perspectives of the respondents on whether a good access road encourages outward migration

| What do you feel if the logging access road is upgraded into a tar sealed road? | If there is a tar sealed road between Marudi Town and Miri City, do you think the access road will encourage outward migration? |
|---|---|---|---|
| | Yes | No | Other | Total |
| Very bad | 3 | 0 | 0 | 3 |
| Neutral | 2 | 18 | 1 | 21 |
| Good | 7 | 131 | 0 | 138 |
| Very good | 10 | 190 | 0 | 200 |
| Total | 22 | 339 | 1 | 362 |

As shown in Table 6.6, out of the 200 respondents who stated they would feel very good if the logging access road was upgraded into a tar sealed road, 95 percent (n=190) of them did not agree that the upgraded access road would encourage outward migration from Marudi Town. Similarly, within the 138 respondents who felt good if the logging access road was upgraded into a tar sealed road, 95 percent (n=131) of them also did not agree that the upgraded access road would encourage outward migration. In addition, the distribution was almost the same for those who stayed neutral on this question because the majority of respondents, 18 out of 21 (86 percent), did not agree that the upgraded road would encourage outward migration. Thus, it showed that the majority of respondents did not agree with the statement given by the state government that access roads encouraged outward migration.

6.3.6 Views on Whether Access Roads Stimulate Outward Migration

The overall feedback of the respondents from the questionnaire surveys on the statement of access roads stimulating outward migration from rural areas was different from the interviewees from the in depth interviews. As shown in Figure 6.5, most of the respondents, 44 percent (n=160), preferred to stay neutral when they were asked this question. The
The proportion of the respondents who agreed and strongly agreed with the statement of whether access roads stimulated outward migration was 31 percent (n=114), slightly higher than those who disagreed with the statement, 25 percent (n=88).

As described by the respondents, due to uncertainty, the majority of them preferred to stay neutral as there were two possible outcomes from the provision of a tar sealed road between Marudi Town and Miri City. The first possible outcome was outward migration occurring due to a lack of continuing rural development programs and no increase in employment opportunities in Marudi Town. The second possible outcome was that outward migration would reduce due to the creation of proper rural development programs which would increase employment opportunities in Marudi Town.

![Pie chart showing the perspectives of the respondents on whether access roads stimulate outward migration from rural areas]

Figure 6.5: The perspectives of the respondents on whether access roads stimulate outward migration from rural areas

From the in depth interviews, 10 out of 11 did not agree that access roads stimulated outward migration but they believed that reverse migration would occur if there was a good access road, such as a tar sealed road, between Marudi Town and Miri City. As explained, with easy accessibility and the provision of affordable land transportation services, Marudi Town would have the potential to be attractive not only to the migrants who moved out of Marudi but to other businesses from Miri City who would eventually create more jobs in the town. The reverse migrants referred to those who were originally from Marudi Town, then moved back from other places particularly Miri City.
6.3.7 Views on Whether Access Roads Facilitate Rural Economic Development

With regards to the statement of whether access roads facilitate rural economic development, the overall answer of the respondents from both the questionnaire surveys and the in depth interviews were almost the same. As shown in Figure 6.6, 66 percent (n=244) of the respondents agreed and strongly agreed with the statement and believed that a good access road facilitates rural economic development. Meanwhile, 31.8 percent (n=115) of the respondents stayed neutral regarding the statement. Similarly, 10 out of 11 interviewees agreed that a good access road would facilitate rural economic development. Mobility was the main reason given by the survey respondents and interviewees. They stated that a good access road not only improved the mobility of local people, it would also enable outsiders such as tourists and investors to come into Marudi Town for travel and business purposes. This would eventually facilitate rural economic development and increase employment opportunities in rural areas.

![Figure 6.6: The perspectives of the respondents on whether access roads facilitate rural economic development](image)

6.4 Future Migration Plans

As shown in Table 6.7, the distribution of the answers on whether the respondents were planning to leave or stay in Marudi Town are quite even except from those who had stayed in Marudi Town for less than ten years. Of the 77 respondents who had lived in Marudi Town for less than 10 years, 31 percent (n=24) of them intended to move out due to four main reasons, namely they were not born there, better employment opportunities in other places such as Miri
City, absence of a good road system to the outside world and lastly to follow the decision of their spouse or children. On the other hand, 68.8 percent (n=53) of the respondents who did not intend to move gave five main reasons, namely they had a permanent job in Marudi Town, they owned houses or properties there, a sense of belonging, affordable living costs and a safer living environment compared to Miri City. From the reasons given, it shows that employment opportunities played an important role and influenced the decision making on migration.

Table 6.7: The respondents’ migration plans

<table>
<thead>
<tr>
<th>Years living in Marudi Town</th>
<th>Are you planning to leave Marudi Town?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>1 to 10 years</td>
<td>24</td>
</tr>
<tr>
<td>11 to 20 years</td>
<td>11</td>
</tr>
<tr>
<td>21 to 30 years</td>
<td>16</td>
</tr>
<tr>
<td>31 to 40 years</td>
<td>3</td>
</tr>
<tr>
<td>41 years and above</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
</tr>
</tbody>
</table>

The highest percentage of the respondents who intended not to leave Marudi Town belongs to those who have lived there between 31 to 40 years and more than 41 years. For the 31 to 40 years group, of the 61 respondents, 95 percent (n=58) did not wish to leave Marudi Town due to similar reasons given above. Similarly, for the group of more than 41 years, of the 82 respondents, 95 percent (n=78) did not wish to move from Marudi Town.

6.5 The Impact on Transportation

The choices of transport modes to travel between Marudi Town and Miri City have changed drastically since the logging access road opened. As shown in Table 6.8, before the logging access road opened, 72 percent (n=260) of the respondents selected the express boat as their most preferred transport mode to travel between Marudi Town and Miri City. After the logging access road opened, only 16 percent (n=56) of the respondents still chose the express boat as their first choice and the majority, 73 percent (n=264) of the respondents chose cars as their most preferred transport mode for travelling. However, the number of respondents who chose the express boats as their second choice increased from 28 percent (n=102) to 64 percent (n=231). The impact on transportation within this study is similar with the findings of
Windle and Cramb (1999) as they found that new roads in their study area replaced river transport due to time and cost constraints.

Table 6.8: The preferred modes of transportation of the respondents before and after the logging access road opened

<table>
<thead>
<tr>
<th>Transportation</th>
<th>Choices of the respondents before the logging access road opened</th>
<th>Total</th>
<th>Choices of the respondents after the logging access road opened</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>1st</td>
</tr>
<tr>
<td>Car</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>264</td>
</tr>
<tr>
<td>Express boat</td>
<td>260</td>
<td>102</td>
<td>N/A</td>
<td>362</td>
</tr>
<tr>
<td>Plane</td>
<td>100</td>
<td>257</td>
<td>5</td>
<td>362</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>2</td>
<td>359</td>
<td>362</td>
</tr>
</tbody>
</table>

Table 6.9: Comparison of transport modes

<table>
<thead>
<tr>
<th>Transports</th>
<th>Cost</th>
<th>Time</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four-wheel drive</td>
<td>RM35</td>
<td>One and a half hours</td>
<td>Straight to desired destinations</td>
</tr>
<tr>
<td>Express boat</td>
<td>RM20 + RM30 (Taxi to the city) = RM50</td>
<td>Two and a half hours + 30 minutes (taxi)</td>
<td>Service stop after 3pm</td>
</tr>
<tr>
<td>Flight</td>
<td>RM57 to RM66 + RM18 (Taxi to the city) = RM75 to RM84</td>
<td>20 minutes + 10 minutes (taxi)</td>
<td>Service stop after 3.15pm</td>
</tr>
</tbody>
</table>

Note: RM3.00 = AUD 1.00

Land transportation, particularly cars, have become the most preferred transport mode of the local community based on two factors. The first factor is convenience and flexibility. Basically, there are two groups of road users. The first group drove their own vehicles (cars or motorcycles). In this situation, road users were able to decide their own travelling schedule as long as it was within the operation hours of the ferries (6.30 am to 8 pm). The second group of road users travelled using the transport services provided by the private transport providers. As shown in Table 6.9, the entire journey by land takes approximately one and a half hours to reach Miri City from Marudi Town. Compared to travel by river, the travelling time is shorter by one hour; an express boat needs about two and a half hours to reach Miri Ferry Terminal. Travellers are required to hop on a taxi for another 30 minutes to reach Miri City from the ferry terminal. In total, travellers need to spend about 3 hours to reach Miri City from Marudi.
Town by using the express boat. Due to the long journey and unsuitable operating conditions after dark (the last express boat departs Miri Ferry Terminal at 3 pm), passengers find it difficult to travel between Marudi Town and Miri City, as the expense of staying overnight at the Hotel in Miri City a burden to those who cannot afford it.

The second factor for cars becoming the most preferred transport mode was the cheaper travel fares when compared to flight services. As shown in Table 6.9, one-way flight tickets cost between RM57 and RM66. In order to reach Miri City from Miri International Airport, passengers need to spend about RM18 for a taxi. Thus, the total fare from Marudi Town to Miri City is ranges from RM75 to RM84. Whereas, the total fare using land transportation is only RM35 which will send passengers from Marudi Town to their desired destination in Miri City.

However, some respondents and interviewees raised their concerns about the safety of driving on the logging access road, particularly during the wet season. As the logging road is not paved, driving requires skills and concentration because vehicles easily drift and are hard to control on the steep parts of the road. If the logging access road is improved or upgraded into a tar sealed road, what has been suggested by Bravo (2002) might occur; which is an improved road will facilitate transport services. This will eventually increase the safety degree of the road and increase the availability of transport services with a competitive price to travel between Marudi Town and Miri City.

6.6 Accessibility to other Public Facilities

As Marudi Town is headquarters of the district administrative centre, public facilities such as schools, hospital, post office, banks, library and government offices were available in Marudi Town before the logging access road opened. Therefore, every basic administrative need was taken care of in Marudi Town (i.e. applying and renewing driving licences, identity cards, passports and registrations of marriage). Although the logging access road does not affect the accessibility to the public facilities in Marudi Town, it does provide an easy access for local people who want to lodge the aforementioned applications in Miri City. As most of the headquarters of the division administrative offices are located in Miri City, the waiting and processing time for such applications will be relatively shorter when compared to the District
Office in Marudi Town. Therefore, the division offices have become the first choice for the local people who want to get a quick approval of their applications. Moreover, the logging access road also enables this group of people to make a day trip to Miri City without spending unnecessary expenses such as overnight accommodation. The finding is consistent with what was reported by Schroeder (1997); the provision of rural access roads improves the mobility of local people in accessing social services.

6.7 Rural-Urban Migration from Marudi Town

In the case of Marudi Town, the logging access road did not play a significant role in outward migration. According to the interviewees and survey respondents, outward migration from Marudi Town occurred before any road was built. Moreover, they affirmed that outward migration was not caused by access roads but a lack of employment opportunities.

Table 6.10: The population and annual growth rate of Marudi Town and District

<table>
<thead>
<tr>
<th>Year</th>
<th>Marudi Town</th>
<th>Marudi District</th>
<th>Average Annual Growth Rate of Marudi District</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>N/A</td>
<td>51,632</td>
<td>N/A</td>
</tr>
<tr>
<td>1991</td>
<td>6,628</td>
<td>71,913</td>
<td>3.02</td>
</tr>
<tr>
<td>2000</td>
<td>7,282</td>
<td>71,713</td>
<td>-0.04</td>
</tr>
<tr>
<td>2008*</td>
<td>N/A</td>
<td>85,100</td>
<td>2.14</td>
</tr>
</tbody>
</table>

* Estimation
Source: Department of Statistics Sarawak (1993; 2008) and State Planning Unit (2008)

On the other hand, the population size in the whole Marudi District has shown a different picture regarding the link between outward migration and access roads in 1991 to 2000. In that period, some logging access roads had been constructed by the logging companies from some upriver areas of Marudi District to Miri City. During that time, the total population in Marudi District decreased from 71,958 in 1991 to 71,713 in 2000 and showed a negative -0.04 percent average annual growth rate when compared to positive 3.02 annual growth rate in 1980 to 1991 (Table 6.10). Maybe due to this figure, the state government has linked the phenomenon of outward migration with rural access roads and applies it in every rural area. That is the reason behind the state government not having an active plan to build any good rural access road between Marudi Town and Miri City (Sin Chew Daily News 2007). However, the trend
has not been sustained because a recent estimation forecasted an increase in population of Marudi District from 71,713 in 2000 to 85,100 in 2008 (State Planning Unit 2008).

The local people believe that outward migration from Marudi Town occurred for approximately 30 years; before an access road connected them to the outside world. Obviously, it was not caused by the provision of roads but a lack of employment opportunities. Many believe that this was the worst situation that the town was facing in terms of outward migration. In contrast with the findings of this study, Issah et al. (2002) argued that the availability in terms of infrastructure between rural and urban areas played a significant factor in stimulating rural-urban migration but was not influenced by the differences of jobs and income alone.

A few interviewees assumed that if there was a good rural access road between Marudi Town and Miri City, it would increase the number of reverse migrants due to easy accessibility, cheaper living expenses, cheaper house rental and a safer living environment when compared to Miri City. One similar example given by an interviewee, who said this could happen in Marudi Town, was a Malaysian who commuted to work in Singapore but lived in Johor Bharu, a state of Malaysia located next to Singapore which was connected by a 1 kilometre long bridge. The escalating living costs in Singapore encouraged Malaysians to stay in Johor Bharu and commute to work in Singapore on a daily basis. However, Windle and Cramb (1999) claimed that easy accessibility encouraged outward migration from rural areas. In the findings of their study, the number of outward migration was higher for the roadside villages compared to remote villages due to easy accessibility.

6.8 Conclusion

People of Marudi generally have a positive perception toward the logging access road that connects them from Marudi Town to Miri City. From the perception of the respondents on the issue of a good access road, 51.9 percent and 15.5 percent of them agreed and strongly agreed respectively that a good access road such as a tar sealed road would facilitate rural economic development. However, their perceptions have contrasted with the view from the interviewees that access roads stimulated outward migration. Of the survey respondents, 44 percent of them remained neutral on that statement, 30 percent agreed and 23 percent disagreed with it.
Whereas 91 percent of the interviewees disagreed that an access road would stimulate outward migration.

Although there is no official data in the numbers of outward migrants, interviewees, respondents from the surveys and the estimated population in 2008 from the statistical report have shown that outward migration occurred before there was any access road between Marudi Town and Miri City. Therefore, the state government who believed that not to build a good rural access road between these two places is the solution of halting rural-urban migration is not applicable in the case of Marudi Town.

In brief, various positive social and economic impacts have occurred since the logging access road opened and a thorough discussion of these impacts is presented in the following chapters (Chapter 7 and 8).
CHAPTER 7

THE SOCIAL IMPACT OF THE LOGGING ACCESS ROAD

7.1 Introduction
This chapter examines six types of social impacts of the logging access road between Marudi Town and Miri City. The social impacts include changes in the number of weekend residents and travellers, healthcare and the impact on saving human lives, access to media, local security in Marudi Town, impact on daily lives and cultural change. The interviewees mentioned in this chapter are those who participated in the face-to-face in depth interview sessions, while respondents refer to those who participated in the questionnaire surveys.

7.2 Weekend Residents and Travellers in Marudi Town
Weekend residents in this study refer to those who are working in other places, particularly Miri City, but stay in Marudi Town on Saturday and Sunday. Weekend residents play a significant role in the social and economic aspects of Marudi Town. With their regular return on the weekend, not only does the social network with their parents and relatives in Marudi Town increase, local economic activities will also be improved due to their spending in the town (Windle & Cramb 1999). Although there is no official data on the number of this group of people, observations have been made by the author and questions have been asked of the respondents and interviewees.

The number of people in the town areas obviously increased during the weekend but it was hard to distinguish between weekend residents and shoppers from upriver in Marudi District. From the feedback of the respondents, Figure 7.1 shows that 55.1 percent (n=199) of the respondents agreed that the number of weekend residents were almost the same as before. On the other hand, 37.4 percent (n=135) of the respondents noted that the number of weekend residents increased since the logging access road opened. According to them, their children or neighbour’s children who are working in Miri City make more home trips back to Marudi Town during the weekend but some are not on a consistent weekly basis. For example, their first trip back home was last weekend but the second trip might be next month.
According to the interviewees, 91 percent (n=10) of them agreed that the logging access road has increased the number of weekend residents in Marudi Town since it was linked with Miri City. Although the changes of weekend residents were hard to determine, from the observation and feedback of respondents, the number of weekend travellers and shoppers in Marudi Town had definitely increased on weekends. In brief, the increase of weekend residents, weekend travellers and shoppers in Marudi Town was a significant element in improving the local economic activities and eventually improved the social and economic status of the local people. As described by Windle and Cramb (1999), the weekend residents who returned to their home town every weekend would contribute to household expenses and community welfare.

7.3 Healthcare in Marudi Town and the Impact on Saving Human Lives

In general, the respondents who stayed in Marudi Town preferred to go to Marudi Public Hospital for minor illnesses such as flu and fever, instead of Miri Public Hospital because of close distance, friendly medical staff, cheap expenses and shorter waiting time when compared to Miri Hospital.

The average visiting time for Marudi Public Hospital is three times in the last 12 months whereas the average visiting time for Miri Public Hospital is only one. As shown in Table 7.1 and Table 7.2, 28 percent (n=99) of the respondents never visited the Marudi Public Hospital in the last 12 months whereas 66 percent (n=234) of the respondents never visited the Miri
Public Hospital in the last 12 months. However, most of the respondents also said that Marudi Hospital is their first choice for minor illnesses. When it came to serious illness which needed expertise and special equipment, Miri Hospital was their only option.

Table 7.1: Frequency of respondents visiting Marudi Public Hospital in the last 12 months

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Number of Respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>99</td>
<td>28</td>
</tr>
<tr>
<td>1</td>
<td>58</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>68</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>37</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
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<td>1</td>
</tr>
<tr>
<td>8</td>
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<td>3</td>
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<tr>
<td>9</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>10 and above</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>354</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 7.2: Frequency of respondents visiting Miri Public Hospital in the last 12 months

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Number of Respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>234</td>
<td>66</td>
</tr>
<tr>
<td>1</td>
<td>58</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>6 and above</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>354</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

For those who had visited Marudi Hospital in the last 12 months, the top three frequencies of visits were twice (19 percent of the respondents), once (16 percent of the respondents) and three times (10 percent of the respondents). On the other hand, the top three frequencies of visiting Miri Public Hospital in the last 12 months were once (16 percent of the respondents), twice (7 percent of the respondents) and three times (5 percent of the respondents).

The study shows that younger people are not visiting the Marudi Hospital as frequently as older people. As shown in Table 7.3, the highest percentage of respondents who are not
visiting the Marudi Hospital in the last 12 months are from the age group of 20 and below, 50 percent (n=6). When examining the frequency of visiting of the Marudi Public Hospital for older age groups, 24 percent (n=4) of them from the age 61 and above have visited the hospital for two and ten times and above respectively in the last 12 months. Moreover, 23 percent (n=7) of the respondents who are from age 51 to 60 have visited the hospital at least once in the last 12 months.

Table 7.3: Frequency of visits to Marudi Public Hospital by different age groups

<table>
<thead>
<tr>
<th>Frequency</th>
<th>20 and below</th>
<th>21 to 30</th>
<th>31 to 40</th>
<th>41 to 50</th>
<th>51 to 60</th>
<th>61 and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>26</td>
<td>32</td>
<td>31</td>
<td>3</td>
<td>1</td>
<td>99</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>15</td>
<td>22</td>
<td>14</td>
<td>7</td>
<td>0</td>
<td>58</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>20</td>
<td>21</td>
<td>14</td>
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<td>4</td>
<td>68</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>8</td>
<td>11</td>
<td>11</td>
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<td>19</td>
</tr>
<tr>
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<td>0</td>
<td>7</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>10 and above</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>93</td>
<td>112</td>
<td>90</td>
<td>30</td>
<td>17</td>
<td>354</td>
</tr>
</tbody>
</table>

Table 7.4: Frequency of visits to Miri Public Hospital by different age groups

<table>
<thead>
<tr>
<th>Frequency</th>
<th>20 and Below</th>
<th>21 to 30</th>
<th>31 to 40</th>
<th>41 to 50</th>
<th>51 to 60</th>
<th>61 and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9</td>
<td>62</td>
<td>73</td>
<td>62</td>
<td>22</td>
<td>6</td>
<td>234</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>14</td>
<td>20</td>
<td>19</td>
<td>2</td>
<td>2</td>
<td>58</td>
</tr>
<tr>
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<td>6</td>
<td>10</td>
<td>3</td>
<td>2</td>
<td>4</td>
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<td>1</td>
<td>18</td>
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<tr>
<td>4</td>
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<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>6 and above</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>93</td>
<td>112</td>
<td>90</td>
<td>30</td>
<td>17</td>
<td>354</td>
</tr>
</tbody>
</table>

In contrast, the highest frequency of the respondents visiting the Miri Hospital in the last 12 months for all age groups was zero. It shows that the majority of local people still prefer to visit Marudi Hospital rather than Miri Hospital. However, there is a similarity in terms of the frequency of visits for the older age group between Marudi and Miri Hospitals. The highest frequent visitors for Miri Hospital are from the older age group. As shown in Table 7.4, 65
percent (n=11) from the age group of 61 and above have visited the Miri Hospital at least once in the last 12 months compared to other age groups which have less than 35 percent.

Although the logging access road does not increase the popularity of Miri Public Hospital in general, it has provided an alternate accessibility for the patients especially in emergency cases where it is beyond the capability of Marudi Public Hospital in terms of equipment and expertise. For example, when a serious injury happens after 3 pm and patients need to be transferred to Miri Hospital, the logging access road will become the only access as express boats and flights are not operating.

The shortage of doctors in Marudi Town Hospital is a major concern of the local people in terms of healthcare. There is a government hospital in Marudi Town and there is only one medical doctor available in the hospital. Although there are about five assistants who are able to handle the minor cases such as fever and flu, consultation of major and serious illness still have to be conducted by the only doctor. Due to his excellent service and good reputation, he earns a lot of respect from all levels of the local community. In addition, the honoured medical practitioner is reaching retirement age and the local community is worried they may lose the one and only medical doctor in Marudi Public Hospital. So far, the logging access road does not have any impact in recruiting new medical doctors. However, the local people believe that a good access road between Marudi Town and Miri City which provides easy land access between these two places will increase the attraction when recruiting new medical doctors.

All interviewees affirmed that the logging access road plays a significant role in saving lives when emergency incidents happen. It has become the only way to send patients or injured persons to Miri Public Hospital due to insufficiency of equipment and specialists in Marudi Public Hospital. Although there are two other modes of transport (express boats and flights) the inflexible services have limited its use when it comes to emergency cases. The last express boat and flight departs from Marudi Town to Miri City at 3 pm and 2.55 pm respectively. Thus, there is no way for the injured person to be sent to Miri after the mentioned time except charter an express boat. However, this will take relatively longer travelling time than the day time to reach Miri City due to the darkness and higher costs when compared to land transport. Although the users of the logging access road have to cross two rivers by using the services of
the ferries, it can be operated if there is any request or emergency case after the normal operating hours.

7.4 Access to Media
One of the prominent positive impacts in Marudi Town since the logging access road opened is the early arrival of newspapers. Before, daily newspapers were available in the town at about 11.30 am to 12 pm due to the late departure and long travelling time of the express boats from Miri City. Due to this, local people always fell behind in getting the latest daily news, except news from television. With the logging access road, they were able to get a copy of daily newspaper at around 7.30 am as one of the local private transport providers has a deal with the newspaper companies and works as a distributor in Marudi Town. The newspapers are sent by vehicles which depart from Miri at about 6 am every morning, using the logging access road.

Although there are internet connections in the town and local people are able to access daily news by using the internet, the majority of respondents still preferred to get the latest news from newspapers. Through observations, the internet users of the two internet centres in the town were dominated by youngsters who are less than 18 years old. The majority of them were playing computer games, online games and checking emails but not reading daily news.

7.5 Security
Generally, crime rates and safety awareness are inter-related because safety awareness of the people will increase when crime rates increased. As shown in Figure 7.2, more than half of the respondents, 65.1 percent (n=235), did not change their safety awareness in public and residential areas after the logging access road opened mainly due to no significant change of the crime activities in town and residential areas. On the other hand, 31.9 percent (n=115) of the respondents said they had increased their safety awareness. Only 1.9 percent (n=7) said they had decreased their safety awareness.
Similarly, all of the interviewees (100 percent) agreed that their safety awareness in public and residential areas remained the same. As explained by the interviewees, this was due to the fact that there was only one available access road from Marudi Town to Miri City (which is the logging access road). Moreover, along the logging access road, there are two rivers road users need to cross by using ferries and the operating hours are until 8 pm in normal circumstances. If the owners discover that their vehicles are missing, they can inform the ferry providers to be aware and stop that particular vehicle when it is crossing the rivers.

As shown in Figure 7.3, 80.1 percent \((n=289)\) of the respondents agreed that there were not many changes in terms of the crime rate in Marudi Town after the logging access road opened. Under the category of decrease in crime rate, 11.1 percent \((n=40)\) of the respondents agreed that the crime rate in Marudi Town decreased after the logging access road opened. Whereas 7.5 percent \((n=27)\) of the respondents said that the crime rate in Marudi Town has increased and only 1.4 percent \((n=5)\) of them said that it has extremely increased.
Figure 7.3: Change in crime rate after the logging access road opened

The logging access road has not affected the security level in Marudi Town. Safety awareness is definitely not a major concern of the local people, either in housing or town areas because the crime rate in Marudi Town has not increased since the logging access road opened in 2005. If crimes happen regularly in residential areas, the main gates of houses will remain locked during the day and night to prevent trespassers. Moreover, a house with more locks at the gates or main doors implies that there is a higher alertness of crime activities in the residential areas. Through observation, as shown in Figure 7.4 and 7.5, about 75 percent of the main gates of the houses in housing areas were left unlocked during the day. This directly shows that the crime activity in Marudi Town is not a threat to the local people in the housing areas.
Figure 7.4: The residential area of Marudi Town

Figure 7.5: The residential area of Marudi Town
Furthermore, about 90 percent to 95 percent of bike riders do not lock their bikes and leave their helmets on the bike when parked on the streets. This also shows that it is safe in terms of street crime in the town areas. One of the interviewees told the author that his car was parked outside the building with the key still in the ignition. Most of the interviewees noted that the local community in general felt safe in Marudi Town and the logging access road was not causing any danger or crime in their daily life. Since there is only one access road to take them from Marudi Town to Miri City, stolen vehicles and the escape from crimes by vehicle have become very difficult as there are two rivers to cross using the ferries along the access road to the city.

In fact, some studies have shown that the majority of criminal offenders travel less than 3.2 kilometres to conduct crime activities (Costello & Wiles 2001; Brumwell 2007). In that case, because the travel distance by road between Marudi Town and Miri City was around 55 kilometres, this was not favoured by offenders or potential offenders from Miri City or outside Marudi Town.

**7.6 Impact on Daily Lives**

![Bar chart showing the impact of respondent’s daily lives after the logging access road opened](chart)

When respondents were asked whether the logging access road affected their daily lives, most of them chose to say unaffected and about the same. As shown in Figure 7.6, 37 percent (n=135) of the respondents said that their daily lives were not affected and 12.2 percent (n=44)
were extremely unaffected. On the other hand, 15 percent (n=54) of the respondents noted that their daily lives were affected, followed by 1.1 percent (n=4) who said their daily lives were extremely affected. In addition, 34.3 percent (n=124) of the respondents said that their daily lives were about the same as before the logging road opened.

Table 7.5: Types of impacts experienced by the respondents in their daily lives

<table>
<thead>
<tr>
<th>Has the logging road affected your daily life after it has opened?</th>
<th>If your daily lives was affected, it was positively or negatively affected?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positively affected</td>
</tr>
<tr>
<td>Affected</td>
<td>38</td>
</tr>
<tr>
<td>Extremely affected</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
</tr>
</tbody>
</table>

From the respondents who noted that their daily lives were affected, the majority of them agreed that the logging access road caused positive effects in their daily lives such as shorter travelling time between Marudi Town and Miri City. As shown in Table 7.5, of the 53 respondents who noted that the logging access road affected their daily lives, 72 percent (n=38) affirmed that it was positively affected.

From the point of view of these 38 respondents, they were grateful that the logging access road reduced their travelling time, cost and eventually improved their mobility. This finding is similar with Schroeder (1997) and Windle and Cramb (1999) who claimed that rural access roads are able to increase mobility. Schroeder (1997) and Windle and Cramb (1999) agreed that access roads improved the mobility and social networks of local people as the interaction between villages increased since the provision of access roads. In the case of this study, the first example given by the research participants is that a one-day travelling trip has become possible after the logging access road was accessible to them. A government employee who needed to perform an assigned task in Miri City was now able to make a one-day return trip even though the task finished after 3 pm. The second example was that the logging access road had become a secondary access when other transport is unavailable. For example, a traveller who wanted to fly to Miri International Airport for a transit flight to Peninsula Malaysia had been cancelled and the next available flight from Marudi Town was 3 hours later. In order to
arrive at the airport on time to avoid missing the transit flight, land transport by using the logging access road was the only option for the traveller.

### 7.7 Cultural Change

When it comes to the issue of cultural change such as beliefs, ritual system, dialects and costumes, almost all of the respondents did not agree that the logging access road had caused any cultural change since it opened. Marudi Town has a long history and a rich cultural diversity as many ethnic groups live in Sarawak and almost every ethnic group has their own culture, especially dialect and costume. According to Sarawak Electronic Government (2008), there are at least 45 different dialects which are still used by the 27 ethnic groups in Sarawak. Other than that, costumes of the indigenous people represent the identity of their ethnic group. Therefore, it is important to examine if there is any impact on these aspects caused by the logging access road.

As shown in Figure 7.7, 92 percent \((n=331)\) of the respondents did not agree that the logging access road caused any cultural change in Marudi Town. The reasons given were such as the logging access road has attracted Sarawakian and Malaysian but not many international tourists. Therefore, there was not much direct inflow in terms of foreign cultures in Marudi Town.

![Figure 7.7: The cultural change since the logging access road opened](image-url)
Similarly, according to the 11 interviewees, all believed there was no cultural change caused by the logging access road. However, most of the interviewees and respondents do not deny that minor change occurs in the community, such as sense of fashion, due to other factors such as the influence of media and urbanization.

In contrast with the findings of this study, Windle and Cramb (1999) argued that the provision of access roads between urban and rural areas created youth cultural problems (which does not occur in Marudi Town). As explained by them, due to the easy accessibility between rural and urban areas, rural youth obtain more exposure from urban peers about urban cultures and lifestyles which were different to how they were raised. Due to the exposure, they tended to live in a ‘modern’ way and refused to live in the ‘traditional’ lifestyles like their parents did. Thus, socially unacceptable behaviour occurs such as disobeying orders from parents, perceiving farming as a ‘traditional’ way of living and perceiving their parents as outdated.

7.8 Conclusion
Overall, six social impacts of the logging access road to the Marudi Town community have been identified and examined. Among them, only two do not affect the livelihood of the local community. These are security in Marudi Town and cultural change. The security in Marudi Town remains at the same safety level as before the logging access road opened and there is no cultural change (moral rules, beliefs, ritual system, languages and dress).

The other four social impacts include changes in the number of weekend residents and travellers, healthcare and saving human lives, access to media, and impact on daily lives. In terms of weekend residents and travellers, although official numbers of weekend residents and travellers were unavailable, observation and feedback from interviewees and respondents showed that numbers have increased. The second impact regards an alternative access to Miri Public Hospital from Marudi Town and saving human lives when emergency or serious illness cases occurred and must be sent to Miri Public Hospital. The third impact is that acquisition of information is faster than before. Before the logging access road opened, the daily newspaper only arrived in Marudi Town at about 12 noon but after the logging access road opened, local people could obtain a copy at 7.30 am. The last impact is the impact on daily lives which the
majority of respondents agreed that the logging access road brought positive impacts into their daily lives.

The logging access road not only caused social but economic impacts. The next chapter (Chapter 8) discusses the economic impacts of the logging access road on the Marudi Town community.
CHAPTER 8

THE ECONOMIC IMPACT OF THE LOGGING ACCESS ROAD

8.1 Introduction
This chapter identifies and presents four economic impacts of the logging access road which connected Marudi Town to Miri City. The impacts including the changes of personal monthly income, employment opportunities, local economic activities in Marudi Town and the ownership of private vehicles. These elements were selected as economic impacts based on the literature and the impact variables from SIA (see chapter 4). The interviewees in this chapter are those who participated in the face-to-face in depth interview sessions, while respondents refer to those who participated in the questionnaire surveys.

8.2 The Changes of Personal Monthly Income
Since the logging access road opened in July 2005 until the survey started, only 14 percent (n=48) of the respondents experienced an increase in their monthly income while 81 percent (n=294) did not experience any changes. On average, the monthly income of the 14 percent (n=48) increased by RM397.92 (RM3.00 = AUD1.00) since the logging access road opened. The impact of the road is similar to the findings of Jacoby (2000) as he claimed that the benefits of the access roads were not big enough to reduce the income inequality of the population, even though the provision of access roads from rural areas to markets was able to bring substantial benefits to poor households in rural areas.

By comparing the differences among the groups of income in Figure 8.1, 21 percent of the respondents who belong to the group of RM1501 to RM2000 (n=12) and above RM2500 (n=7) have experienced an increase in their monthly income respectively. The second highest is the group of RM2001-2500 which has 12.5 percent (n=1) and followed by the group of RM501-1000 which has 12 percent (n=14). The group of RM1001-1500 has 11 percent (n=4) and the lowest, the group below RM500 which has only 9 percent (n=10). Thus, the top three groups who experienced an increase in their monthly income are from the income groups of RM1501 per month and above.
The results indicated that the higher income group (RM1501 and above) have better chances of enjoying and gaining positive economic impacts from the connected logging access road. The finding is in line with Obare et al. (2003) who studied the impact of rural access roads in Kenya and claimed that inadequate road infrastructures imposed negative impacts on poor farmers in terms of accessibility from farm to market. Moreover, Howe (1984) had a similar statement in his findings as the wealthier group of the society has better benefits from the provision of access roads compared to the poor one. As explained, a good access road will result in lower cost of agricultural inputs and products. With this, the land owners or the big farm owners would benefit more than the landless farmers.

In the case of this study, a four-wheel drive is too expensive for farmers who have lower incomes. A locally made compact car only costs about RM25,000 but an imported four-wheel drive costs more than RM85,000. Therefore, some of the farmers are unable to penetrate the market in Miri City as easy as others who owned or were able to rent a four-wheel drive. Although the logging access road can be accessed by motorcycles and 2-wheel drive during normal weather, it is accessible only by four-wheel drives during and after heavy rains because of the muddy and slippery conditions. Sometimes the logging access road is totally
inaccessible when flooded due to its poor drainage system. However, the findings might be different if there was a good access road, such as a tar sealed road, between Marudi Town and Miri City. With that, everyone could easily commute to Miri City in all types of vehicles and without time or weather restrictions as the road safety is increased. With easy road access, it not only provides accessibility to local farmers but also investors, agricultural product buyers or distributors from Miri City. In that case, employment opportunities will increase. Furthermore, if affordable and well established public transport is available along the road, it will boost the local economic activities.

In terms of the role of the logging access road in changing respondent’s monthly income, the majority of them chose the answer of not relevant and stayed neutral. As shown in Table 8.1, of the 360 respondents who answered the question of how important the logging access road in the changing of their monthly income, 42.5 percent (n=153) said the effect of the logging access road was neutral and 24.2 percent (n=87) said that it was not important. Whereas 19.2 percent (n=69) of the respondents noted that the logging access road played an important role in the changing of their monthly income, and the least popular answer of the respondents was ‘very important role’ which was only 4.2 percent (n=15).

Table 8.1: The role of the logging access road in changing respondents’ income

<table>
<thead>
<tr>
<th>The role of the logging road in changing respondents’ monthly income</th>
<th>Changes in respondents’ monthly income after the logging road opened in July 2005</th>
<th>Increased</th>
<th>decreased</th>
<th>About the same</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not important at all</td>
<td></td>
<td>0</td>
<td>0</td>
<td>35</td>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>Not important</td>
<td></td>
<td>0</td>
<td>0</td>
<td>86</td>
<td>1</td>
<td>87</td>
</tr>
<tr>
<td>Neutral</td>
<td></td>
<td>12</td>
<td>5</td>
<td>131</td>
<td>5</td>
<td>153</td>
</tr>
<tr>
<td>Important</td>
<td></td>
<td>25</td>
<td>1</td>
<td>38</td>
<td>5</td>
<td>69</td>
</tr>
<tr>
<td>Very important</td>
<td></td>
<td>11</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>48</td>
<td>7</td>
<td>293</td>
<td>12</td>
<td>360</td>
</tr>
</tbody>
</table>

When the 48 respondents who experienced an increase in their monthly income were required to rate the role of the logging access road in those changes, 23 percent (n=11) noted that the logging access road played a very important role and 52 percent (n=25) noted that it played an important role. This is in line with the Mashiri and Mahapa (2002) study as they claimed that the provision of minimum infrastructure such as roads play an important role in reducing the
income gap. The rest of the respondents, 25 percent (n=12), said it had a neutral effect in the change of their monthly income. Overall, the logging access road played a different role between different groups of people. It had a positive economic impact for the respondents who received a monthly salary of RM1501 and above but less positive impact on the people who earned RM1500 and below.

The economic impacts were not fairly distributed to everyone in the study area due to the poor condition of the logging access road. As the 11 interviewees pointed out, only those who have access to four-wheel drive vehicles have virtual access to the logging access road when the condition of the road is very poor during the wet season. Due to this, those who were unable to own a four-wheel drive vehicle would not directly enjoy the positive economic impacts which the logging access road brings. The evidence is consistent with what was argued by Escobal (2005) in the case of Peru. Escobal (2005) argued that households which have better access to motorized roads have on average more than USD120 increase in annual per capita income compared to households which do not have access.

8.3 Employment Opportunities

Another indicator of the economic impact of the logging access road is the changes in job opportunities in the study area. As suggested by Azidin (2006) and Musalmah (2005), jobs and business opportunities needed to be created in rural areas so that rural economic growth was fairly distributed to all levels of the local community and the rural poor could benefit from the changes of their household incomes. As shown in Figure 8.2, when respondents answered the question regarding the changes of job opportunities in Marudi Town, 50 percent (n=182) of them agreed that job opportunities increased after the logging access road opened, while 43 percent (n=154) noted that the current job opportunities were about the same as before.
Figure 8.2: The change in local job opportunities after the logging access road opened

The most obvious newly created job in the town is the private land forwarding services. The transport provider uses a four-wheel drive to send not only people but products to and from Miri City. Since the logging access road opened, not less than 25 forwarding services which use four-wheel drives have been created. Almost all of the drivers are local people; some work as drivers and some are owner/drivers. Some owners even have an opportunity to work as distributors with newspaper companies in Miri City sending daily newspapers to Marudi Town every morning. This finding is consistent with Warr (2008) whose argument is that rural access roads have the potential to increase income earning opportunities.

Second, the logging access road has created new businesses such as car wash centres in Marudi Town. Furthermore, it has also increased the business of the only local petrol station, car servicing workshops and restaurants in the town. Generally, vehicle owners send their cars to the car wash centre after they come back from Miri City, especially during the wet season. This is because mud along the road trapped easily on the vehicle such as tyres and windscreen when they travel along it. In addition, the time between restocking of shops in Marudi Town has shortened, and the variety of products exchanged between Marudi Town and Miri City has increased. This finding is in line with Jacoby (2000) who outlined that rural access roads were able to influence the variety of consumer goods in rural areas. In addition, a few interviewees of this study changed their job after the logging access road opened. For example, one interviewee who once worked as an electrical technician has opened a food restaurant in
Marudi Town. Another interviewee and his sibling who worked in the logging industry for about 16 years have become private transport providers in Marudi Town.

8.4 Level of Local Business Activities

Since the logging access road opened, local business activity, particularly the number of customers in local restaurants, has increased slightly during weekdays and more on the weekends. Moreover, local business dramatically increases when Marudi Town hosts a special event such as Regatta. Regatta is a long boat race event held once every three years which started more than 100 years ago (see Chapter 3).

Furthermore, the owners of fruit, livestock and crops have a better than ever chance to penetrate the Miri market. Before there was an access road, the fruit or agriculture product owners had to sell their products in Miri City through a middle man. The profits were slashed due to the expenses that occurred in finding a middle man, buyers and accommodation in Miri City. The situation is similar with what was described by Mustafa (2002) as without an access road from rural areas to urban markets, farmers become the victim of under-pricing of agricultural products.

After the logging access road opened, those owners who had their own vehicles were able to sell their products directly in Miri City without a middle man. In addition, their profits were higher and unnecessary overnight stays in Miri could be avoided. Furthermore, those who owned land along the logging access road rented it to private companies who wished to develop the land as oil palm plantations. The impact of the rural access road on the owners is consistent with Escobal’s (2005) findings that claimed with the reduction in transport costs and easy accessibility from rural areas to markets, had increased the supply of agricultural products to the markets and the money paid to the farmers.

A good rural access road which links rural to urban areas is significant in stimulating local business activities and improving the personal income of the local community. According to the interviewees and respondents of the study, if the logging access road is upgraded to a tar-sealed road and the relevant authorities introduce suitable programs to promote local agricultural products, it would attract agricultural product distributors or buyers to Marudi
Town. This would reduce the transportation costs and therefore the selling prices of the local produce as agreed by Escobal (2005) and Jacoby (2000).

8.5 Ownership of Private Vehicles
The number of vehicles owned by Marudi’s households has dramatically increased since the logging access road opened. As shown in Table 8.2, 44 percent (n=161) of households did not own a car before the logging access road opened. However, after the logging access road opened, the number of households which did not own a car decreased to 26 percent (n=93). Although 44 percent (n=159) of households own one car after the logging access road opened, the biggest change in terms of percentage was the households which owned four cars (an increase of 300 percent - from one to four households). The second significant changes were the households which owned five cars (an increase of 150 percent - from two to five households), and followed by households which owned three cars (a 128 percent increase from 8 to 18 households). Lastly, the number of households which own two cars has increased by 89 percent, from 44 to 83 households.

Table 8.2: Number of cars and motorcycles owned by each household before and after the logging access road opened

<table>
<thead>
<tr>
<th>Quantity of vehicles</th>
<th>Before the logging access road opened (Household)</th>
<th>After the logging access road opened (Household)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cars</td>
<td>Motorcycles</td>
</tr>
<tr>
<td>0</td>
<td>161</td>
<td>126</td>
</tr>
<tr>
<td>1</td>
<td>146</td>
<td>197</td>
</tr>
<tr>
<td>2</td>
<td>44</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>362</td>
<td>362</td>
</tr>
</tbody>
</table>

In addition, there were only three significant changes in the number of motorcycles owned by respondents’ households. First, the number of households which did not own a motorcycle dropped from 35 percent (n=126) to 24 percent (n=85). Second, the number of households which owned two motorcycles dramatically increased by 117 percent (29 to 63 households). Although 56 percent of the households owned one motorcycle after the logging access road opened, this is the smallest percentage growth with an increase of 4 percent, from 197 to 204 households.
The differences between the change of car and motorcycle ownership before and after the logging access road opened could have been influenced by the condition of the logging access road. Although from the field observation, as well as feedback from respondents and interviewees who noted that they sometimes used motorcycles to travel on the logging access road, the unpaved surface and the terrain of the road were favourable only to four-wheel vehicles, especially during and after the rain. That is why the change in the number of car ownerships is more significant than motorcycle ownership.

Table 8.3: Number of cars owned by each household by general workers, farmers, fishermen and construction workers, before and after the logging access road opened

<table>
<thead>
<tr>
<th>Occupations</th>
<th>Number of cars owned by respondent’s household</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>General Workers (before)</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>General Workers (after)</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Farmers (before)</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>Farmers (after)</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Fishermen (before)</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Fishermen (after)</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Construction (before)</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Construction (after)</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

By examining the differences among respondents’ occupations, the majority of respondents who worked as general workers, farmers, fishermen and construction workers were unable to own any car before and after the logging access road opened. As shown in Table 8.3, the highest percentage of respondents (fishermen), 85.7 percent (n=6) were unable to own a car after the logging access road opened. The second highest percentage was 50 percent which was made up of those who work in farming (n=17) and the construction industry (n=9). The lowest percentage, 42.9 percent (n=12) of households who did not own a car were those who worked as general workers. The results implied that those with lower incomes are unable to own a vehicle in their household.
On the other hand, the majority of respondents who were self-employed, working in the education and government sectors owned at least one car after the logging access road opened (Table 8.4). Moreover, the majority of respondents working in the sales and marketing sector owned two cars. Under the sales and marketing sector, the majority of them, 61.5 percent (n=8), only owned one car before the logging access road opened. After the logging access road opened, 53.8 percent (n=7) of the respondents owned two cars. The second highest, 50 percent (n=13), was those working in the education sector. Third and fourth are those who work as government employees and were self-employed which were 47.7 percent (n=31) and 47 percent (n=24) respectively.

<table>
<thead>
<tr>
<th>Occupations</th>
<th>Number of cars owned by respondent’s household</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Self-employed (before)</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>Self-employed (after)</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>Education (before)</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Education (after)</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Government sector (before)</td>
<td>25</td>
<td>31</td>
</tr>
<tr>
<td>Government sector (after)</td>
<td>10</td>
<td>31</td>
</tr>
<tr>
<td>Sales and marketing (before)</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Sales and marketing (after)</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

To sum up, it has been found that the logging access road has benefitted the local people who are from the higher income groups such as those who are self-employed, working in the education and government sectors, and sales and marketing. On the other hand, the logging access road has less impact, in terms of owning a car, on the people who are from the lower income groups (especially those who work as a general worker, farmer, fisherman and construction worker). The finding is consistent with Cervero (1990) who agreed that in order for rural residents to purchase vehicles, wages in off-farm employment need to rise faster than the cost of capital. This seems to be the case as the majority of respondents in Marudi Town who were unable to purchase a car were working as farmers and fishermen.
8.6 Conclusion

Overall, the logging access road did not significantly change the income of respondents since it was accessible by the local community as only 14 percent (n=48) of the respondents experienced an increase in their monthly income. This is in line with Jacoby’s (2000) argument as he stated that the benefits of access roads were not big enough to close the gap of income inequality within the population, even though the provision of access roads from rural areas to market centres benefitted the poor households in rural areas. Among the 48 respondents who experienced an increase in their monthly income, 54.5 percent of them were from the income group of RM1501 and above, with the average increase being RM397.92.

In terms of other economic impacts, the logging access road increased the employment opportunities and improved the local economic activities in Marudi Town. Furthermore, the ownership of cars dramatically increased among households, but there was less impact in the change of motorcycle ownerships since the logging access road opened. However, the increase of car ownership only applied to the higher income group who were self-employed, worked in the education and government sectors, and sales and marketing. It had less impact on the lower income group who work as general workers, farmers, fishermen and construction workers.
CHAPTER 9

CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction
This study has focused upon the impacts of a logging access road in the context of Marudi Town, Sarawak, Malaysia. Thus, this chapter attempts to make an assessment to the extent to which the research questions and objectives presented in Chapter 1 have been successfully achieved by summarizing the overall findings of the study.

This chapter is divided into four sections. The first section summarizes the overall findings by answering the two models of rural development. The first model is that rural access roads stimulate outward migration while the second model is that rural access roads facilitate rural economic development. The second section of this chapter describes the policy implications of the findings and the third section explains the limitations of the study. The last section outlined the recommendations and suggestions for future studies related to rural access roads and rural development studies.

9.2 Findings of the Study
Holding back the rural people by not building a good rural access road has limited their mobility and forced them to remain isolated. As claimed by Mustafa (2002), isolation contributes to poverty in the regions. Although there are other ways to travel between Marudi Town and Miri City, such as by express boat and flight, time and cost constraints had not improved their mobility. A few years back, the state government proposed to build a tar sealed road from Marudi Town to its sub district, Long Lama (Sin Chew Daily News 2007). The proposed road was commonly supported by the local people of Marudi Town who believed it would stimulate local economic activities in both places. Although Friends of the Earth Malaysia, a NGO, claim that the proposed road will permanently damage the entire ecosystem of the district, this was denied and disagreed to by the leaders of the indigenous people of Sarawak who argued that the provision of access roads were vital for rural people to improve their mobility, enhance their socio-economic status and enjoy the benefits of development (Bato 2007). Nevertheless, some local people in Marudi Town suggested that both roads
should be built (one from Miri City to Marudi Town and the other from Marudi Town to Long Lama) so that Marudi Town could become a transit hub and eventually improve its economic development.

Indeed, Marudi Town used to be a transit hub for the indigenous people from up river of Marudi District before any access road existed to Miri City. During that time, due to the long journey and travelling time by express boat from the inner area of the district to Miri City, instead of going to Miri City, the majority of indigenous people opted for Marudi Town to fulfil most of their basic needs and official matters. Furthermore, the headquarters of the district administrative offices are located in Marudi Town, so applications for any administrative matters could be done there instead of Miri City. However, after a logging access road was built (which is a different road from the one referred to in this study), people from the inner area now can travel directly to Miri City by four-wheel drive instead of using the services of express boats and stopping at Marudi Town. Due to this, the local business activities have been affected and Marudi Town has become isolated since then. That is the reason why most of the local people possess an optimistic view regarding the role of an access road, either from the inner area of the district to Marudi Town or from Marudi Town to Miri City, in facilitating the local economic development. The result is in line with Cervero’s (1990) argument that noted rural access roads which are complemented by other capital and human service investments not only stimulated rural economic development but were able to encourage indigenous residents to stay in rural areas.

From the aspect of rural-urban migration, rural access roads are not the only factor which causes outward migration from rural areas. The Sarawak statistical reports have shown two different pictures in the changes of population in Marudi District between two different time periods; 1991 to 2000 and 2000 to 2008 (Department of Statistics Sarawak 1993; 2008; State Planning Unit 2008). First, by examining the changes of population from 1991 to 2000, the population annual average growth rate of Marudi District dropped from 3.02 in 1980-1991 to -0.04 in 1991-2000. With the existence of other logging access roads from upriver areas of the district to Miri City since the 1990s and a sharp decline of the annual average growth rate of the district, the state government linked the matters together and decided not to build a good rural access road between Marudi Town and Miri City to stop and reduce outward migration.
However, by examining the estimated population in 2008 by the state government for the entire district of Marudi, there was an increase in the number of people (from 71,713 in 2000 to 85,100 in 2008) with an annual average growth of 2.14 (State Planning Unit 2008). Therefore, there is not enough evidence to support model one which claims that rural access roads stimulate outward migration. Moreover, it is not a logical decision for authorities to claim that rural access roads stimulate outward migration and, as a solution to curbing outward migration, decide not to build a good rural access road between rural and urban areas.

Lack of employment opportunities and the absence of appropriate rural development programs further encouraged outward migration from Marudi Town. When a rural area lacks appropriate rural development plans and is unable to create employment opportunities for the local people, rural people will shift their attention to urban areas for better employment opportunities. As suggested by Fratesi (2007), wage differences between urban and rural areas have a strong influence in migration flows between these two areas.

On the other hand, the study has shown that even with a logging access road which is not accessible in all weather, it was still able to improve local business activities, create new businesses and increase employment opportunities. Therefore, it shows that model two, rural access roads facilitate rural economic development, is applicable in the context of Marudi Town and in line with Windle and Cramb’s (1997; 1999) study in Sarawak. Although there are some different factors between this and their study regarding the uneven distribution of positive economic impacts to all levels of the local community, both studies produced the same conclusion. Windle and Cramb claimed that the uneven distribution of positive economic impact was based on two factors, namely the size of the markets the road leads to and the distance of the road from the location of the villages. Roads leading to bigger urban areas created more benefit than roads leading to small towns and it has greater benefit to roadside communities than remote communities. As compared to the study in Marudi Town, the uneven distribution of positive economic impact occurred because of the condition of the logging access road which was not accessible all year round and had weight limitations.

Due to the poor condition of the road, the maximum weight of vehicles allowed on the road is three tonnes. This restriction has affected the farmers’ ability to mass deliver their agricultural
products to Miri City in a short period of time. The vegetables and fruits rot in a short time as no proper storage system exists in Marudi Town. A similar argument was made by Porter (2002b) who argued that poor and unreliable transport services affected the efficiency of transporting agricultural products to sell in urban markets. On the other hand, the weight restriction on the logging access road also limited the agricultural product distributors or potential distributors from Miri City to travel to Marudi Town for mass purchases. Although the time between restocking for local shops in Marudi Town has shortened, the quantity ordered is limited due to the weight restriction of the road. Furthermore, it has influenced the price of goods which sell in Marudi Town due to the small quantity ordered and higher transportation costs, as argued by Warr (2008).

Generally, the local people in the study area felt disadvantaged and perceived it as an obstacle in rural economic development to not have a good rural access road linking them to the outside world. The claims were based on two scenarios. First, without a good rural access road, the town itself lost its attraction to chain effect development, had less business opportunities, a decrease of social interaction with other cities in the proximity, and made it less attractive in terms of tourism. One example is the Regatta hosted by Marudi Town. In the 2008 Regatta, Sape (a traditional music instrument of the Sarawak indigenous people) was first integrated into the event. The organizer called it the Baram International Regatta and Borneo Sape Festival but was criticised by one of the state ministers regarding the use of the word international. The minister explained that due to the inadequate infrastructure such as a proper road and accommodation, Marudi Town was unable to cope with the huge number of international tourists and be able to satisfy their needs if the Regatta were published as an international event (Joseph 2008). From this comment, it showed how significant a good rural access road is when it comes to the issue of attracting people and investors into rural areas. If there was a good rural access road such as a tar sealed road which linked Marudi Town to Miri City or more generally a rural area to an urban area, it would enhance the capability of smaller towns to attract visitors and tourists, both international and local, to such a historical event and stimulate rural economic development.

Second, a good rural access road is able to increase the social networks of local people. The study shows that most of the siblings, children and relatives of local people will only return to
Marudi Town once or twice a year, usually during the annual festival, even though they are staying and working in Miri City. This is mainly due to the lack of a good rural access road from Marudi Town, and limited transport services currently available. Although the current logging access road has improved the social interaction between these two places, the positive impact of a good access road such as a tar sealed road would be larger than that of the current logging access road.

9.3 Policy Implications

Although the findings of this study have shown that access roads are able to improve the level of rural economic development and social networks in rural areas, a number of issues emerged which are relevant to the formulation of policies regarding the role of rural access roads in rural development studies. The results showed that providing an access road between rural and urban areas is not effective in terms of rural economic development without the provision of affordable public transport services. Public transport is very significant when most rural people are unable to own private vehicles such as cars and motorcycles. The findings of this study are similar with Cervero (1990), Yunusa et al. (2002), Johnston (2007) and Warr (2008) who claimed that public transport was essential in making rural access roads succeed with rural economic development and improve the mobility of rural communities. Therefore, when a decision on the provision of a rural access road is made by policy makers, other rural development projects to develop the rural areas also need to be carefully planned because the road alone is unable to do much to improve the social status of rural people without an increase in employment opportunities.

Secondly, public involvement and circulation of related information needs to be enhanced in Marudi Town. Throughout the study, the author found that although every member of the community knew about the existence of the logging access road, not all knew about the connecting road built by one of the local associations using the government’s rural development project funding. Furthermore, most of the local people did not know who was actually responsible for the maintenance work on the connecting and logging access roads. By increasing public involvement and improving the circulation of information, local people would have a better sense of what is going on around them and know which authority they should approach when it comes to the issues of road maintenance.
Thirdly, Marudi Town has the potential to do well in tourism if easy land access is available between Marudi Town and Miri City. It has a rich composition of ethnic groups and background history of more than 100 years, since the administration of Rajah Brookes. The most stand-out event is the Regatta held in Marudi Town once every three years. With easy land access and sufficient infrastructure, the event has the potential to become an annual event, attracting local and international tourists and thereby stimulating local economic development.

Lastly, the issue of inadequate medical equipment and the shortage of medical doctors in public hospital in rural areas needs to be addressed. As most of the local people are concerned about this issue, attention is needed by the related authority.

9.4 Limitations of the Study

The case study focused on the impact of the logging access road since it was opened in July 2005 on the Marudi Town community. Compared to other studies, the majority of access roads examined in those studies have a background of not less than 3 years from when the study was carried out (Windle & Cramb 1997; 1999; Jacoby 2000; Bravo 2002; Warr 2008).

In terms of this study, the fieldwork was carried out from April to June 2008. The logging access road only connected Marudi Town and Miri City for less than 3 years. Several demographic, social and economic impacts which were described in Chapter 6, 7 and 8 could be considered as temporary or short term impacts. It may take up to 10 years for other impacts to surface. Therefore, the impacts described and examined in this study are only valid from July 2005 to June 2008.

Furthermore, there is a limitation in generalizing the findings of this study to a bigger scope in terms of the impact of a rural access road because the road between Marudi Town and Miri City is just a logging access road which is not accessible in all weather. It is not appropriate to generalize the findings of this case study to a proper rural access road, such as a tar sealed road, in the context of developing countries. However, the findings will be able to fit in well to other cases which have a similar condition to the road in this case study. In addition, this study
was able to cover the whole Marudi Town area but not the inner areas of Marudi District. Therefore, the samples only represent the population of Marudi Town.

In terms of fieldwork, there were some difficulties in finding respondents and interviewees to participate in the study. For example, they were concerned by who would carry out the survey, what was the purpose of the survey, and afraid their answers and personal particulars would be published or traced by the relevant authorities and therefore were not willing to participate in the questionnaire surveys. Although an explanation of the study was given by the author, some potential respondents still refused to participate. To them, the issue of an access road was very sensitive and they were afraid that the study would influence the government’s decision regarding the provision of an access road between Marudi Town and Miri City.

9.5 Recommendations and Suggestions for Further Study

First, a series of follow-up studies could be carried out in order to identify other impacts of the logging access road. As mentioned before, the logging access road has been accessible by the Marudi Town people since July 2005 and this study was carried out from April to June 2008. Additional impacts of the road may occur after a longer period of time, such as 10 to 15 years. Therefore, a series of follow-up studies would identify other unanticipated impacts of the road on the local community of Marudi Town.

Second, the scope of the study could be extended to the inner areas of Marudi District. A comparison study regarding the impact of the logging access road could be carried out in the inner area of Marudi District, namely Long Lama which is located 50 kilometres from Marudi Town. Another logging access road between Long Lama and Miri City has connected these two places for more than 10 years. Thus, the impacts of the road on the local community of Long Lama might be different than Marudi Town in terms of the time that the road has existed and the distance from Miri City. Furthermore, comparison could be made between agricultural based and off-farm employment based residents in the study area.

Third, comparison of the changes in income levels with household consumption and savings before and after the provision of access roads could be an interesting topic to examine as there are four possible combinations of outcomes if it is assumed that the provision of a rural access
road increases the income levels of households, what is the impact on household consumption and savings? The first possible outcome could be that household consumption increases and savings decrease. The second possible outcome could be that consumption decreases and savings increase. The third and fourth outcomes could be that both consumption and savings increase or decrease.
10. APPENDICES

Appendix 10.1: The Questionnaire

THE SOCIAL AND ECONOMIC IMPACTS OF A LOGGING ACCESS ROAD: A CASE STUDY OF MARUDI TOWN, SARAWAK, MALAYSIA.

My name is Bemen Wong Win Keong from University Malaysia Sarawak and currently doing my Master Degree in University of Adelaide (Australia). I am collecting data for my thesis and I will really appreciate if you can take 25 minutes of your valuable time to fill up this questionnaire.

I would like to assure you of the confidentiality of your answers and will only use your responses for the purpose of my thesis. If you have any questions regarding this questionnaire, you may contact me via the email or mobile phone as provided below.

Thank you very much.

Bemen Wong Win Keong
Masters Candidate
Department of Geographical and Environmental Studies
School of Humanities and Social Sciences
The University of Adelaide
Adelaide, South Australia
5005 Australia
Email: bemen.wong@student.adelaide.edu.au
wwkbemen@fss.unimas.my
Mobile Phone Number: +6013-4010733 (Malaysia)
+614-31098104 (Australia)
Instruction: Please ☑️ for your answer/ Arahan: Sila ☑️ jawapan anda.

Section A: Background of Respondent/ Latar Belakang Responden/ 个人资料

Q1. Gender/ Jantina 性别  Male/ Lelaki 男  ☐ Female/ Perempuan 女 ☐

Q2. Age/ Umur 年龄 __________

Q3. Nationality/ Warganegara 国籍:
Malaysia/ 马来西亚 ☐
Non-Malaysia/ 非马来西亚 ☐

Q4. Ethnicity/ Etnik 种族:
Malay ☐  Kayan ☐
Chinese ☐  Kenyah ☐
Iban ☐  Penan ☐
Melanau ☐  Kelabit ☐
Others ☐ Please specify: __________

Q5. Marital Status/ Status perkahwinan/ 婚姻状况:
Single/ Bujang 单身 ☐  Married/ Kahwin 已婚 ☐  Divorced/ Bercerai 离婚 ☐
Separated/ Berpisah 分居 ☐  Widowed/ Balu/Duda 寡妇 ☐

Q6. What is the highest level of education you have obtained?  Apakah tahap pendidikan tertinggi anda?
No formal education/ Tidak menerima pendidikan formal ☐
Certificate/ Sijil 证书 ☐
Diploma/ Diploma 文凭 ☐
Primary school/ Sekolah rendah 小学 ☐
Bachelor degree/ Ijazah sarjana muda 学士 ☐
Secondary school/ Sekolah menengah 中学 ☐
Master/ PhD 硕士/博士 ☐
A-level/ STPM/ Matric (Matriculation) A 水准 中六/ 大专预科 ☐
Others/ Lain-lain/ 其它(Please specify/ Sila jelaskan) 请说明: __________
Q7a. What is your main occupation? Apakah pekerjaan anda?

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<thead>
<tr>
<th>Occupation</th>
<th>Indonesian</th>
<th>Malay</th>
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<tbody>
<tr>
<td>Self-employed</td>
<td>Bekerja sendiri</td>
<td>经商</td>
</tr>
<tr>
<td>Education</td>
<td>Pendidikan</td>
<td>教育</td>
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<tr>
<td>Government sector</td>
<td>Sektor kerajaan</td>
<td>政府部门</td>
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<tr>
<td>Sales and Marketing</td>
<td>Penjualan dan pemasaran</td>
<td>销售及市场</td>
</tr>
<tr>
<td>Customer service</td>
<td>Perkhidmatan Pelanggan</td>
<td>顾客服务</td>
</tr>
<tr>
<td>General worker</td>
<td>Pekerja biasa</td>
<td>普通员工</td>
</tr>
<tr>
<td>Student</td>
<td>Pelajar</td>
<td>学生</td>
</tr>
<tr>
<td>Unemployed</td>
<td>Tidak bekerja</td>
<td>失业</td>
</tr>
</tbody>
</table>

Other (please specify): Lain-lain (sila jelaskan)

Q7b. What is the status of this occupation? Apakah status pekerjaan tersebut?

- Full-time  
  填全职
- Part-time  
  填兼职
- Seasonal  
  填季节性

Other/ Lain-lain  
Please specify/ Sila jelaskan

Q8. How much is your current monthly income? Berapakah pendapatan bulanan terkini anda?

RM ____________
Q9. What is (are) the source(s) of your income?
Dari manakah punca pendapatan anda?

(You may tick more than one/ Anda boleh menjawab lebih daripada 1 jawapan/ 你可选择超过一个答案)

Paid work/ Gaji kerja 薪水 □
Pension/ Pencen kerajaan 遇标金 □
Own business/ Perniagaan sendiri 生意 □
Children/ Anak 子女 □
Property rents/ Sewaan hartanah 出租财产 □
(Rent of house, room, shop, land and etc./ Sewaan rumah, bilik, kedai dan tanah/ 房屋、房间、商店、土地等)

Other/ Lain-lain 其它 □

Saving (interests/ dividends of saving)
Simpanan (Faedah/ dividen simpanan) □

Q10. How long have you lived in Marudi?
Sudah berapa lama anda tinggal di Marudi?

__________________ years/ tahun 年

Q11a. In your opinion, do you feel that the logging road has attracted more people into Marudi?
Pada pendapat anda, adakah jalan balak tersebut telah membawa lebih ramai orang masuk ke dalam Pekan Marudi?

Yes/ Ya 是 □
If yes, go to Q11b/ Kalau Ya, sila jawab soalan 11b/ 如是，请回答问题 11b

No/ Tidak 不是 □
If no, straight to Q12/ Kalau tidak, sila melompat ke soalan 12/ 如不是，请直接到问题12

Q11b. Did you fear of these people? Adakah anda berasa takut kepada orang-orang tersebut?

Yes/ Ya 会 □
Why/ Mengapa 为什么？____________________

No/ Tidak 不会 □
Why/ Mengapa 为什么？____________________
Q12. From your observation, are there any changes in terms of weekend resident (those who only stay in Marudi on Saturday and Sunday) after the logging road opened?

Menurut kepada pemerhatian anda, adakah perubahan dari segi bilangan penduduk hujung minggu berlaku (iaitu mereka yang hanya tinggal di Pekan Marudi pada Hari Sabtu dan Ahad sahaja) setelah jalan balak tersebut dibuka?

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<tr>
<td>1. Extremely decreased</td>
<td>2. Decreased</td>
<td>3. About the same</td>
<td>4. Increased</td>
<td>5. Extremely increased</td>
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<tr>
<td>Menurun dengan dramatik</td>
<td>Telah menurun</td>
<td>Lebih kurang sama</td>
<td>Telah meningkat</td>
<td>Meningkat dengan dramatik</td>
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<tr>
<td>橫幅減少</td>
<td>降低</td>
<td>大概一样</td>
<td>增加</td>
<td>橫幅增加</td>
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Q13. Are there any changes in your personal safety awareness in public areas and living areas after the logging road opened?

Adakah perubahan dari segi kesedaran keselamatan anda di kawasan awam dan perumahan berlaku setelah jalan balak tersebut dibuka?

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<td>3. About the same</td>
<td>4. Increased</td>
<td>5. Extremely increased</td>
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<td>Lebih kurang sama</td>
<td>Telah meningkat</td>
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<td>橫幅減少</td>
<td>降低</td>
<td>大概一样</td>
<td>增加</td>
<td>橫幅增加</td>
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Q14. From your observation, are there any changes in terms of crime rate in Marudi after the logging road opened?

Menurut kepada pemerhatian anda, adakah perubahan dari segi kadar jenayah di Pekan Marudi berlaku setelah jalan balak tersebut dibuka?

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<td>3. About the same</td>
<td>4. Increased</td>
<td>5. Extremely increased</td>
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<td>橫幅減少</td>
<td>降低</td>
<td>大概一样</td>
<td>增加</td>
<td>橫幅增加</td>
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</table>
Q15a. Has the logging road affected your daily life after it opened?

Adakah jalan balak tersebut mengganggu kehidupan harian anda setelah ia dibuka?

自从这条木路开放后，是影响您的日常生活？

1. Extremely unaffected
   Tidak mengganggu langsung
   没有直接影响

2. Unaffected
   Tidak mengganggu
   没有影响

3. About the same
   Lebih kurang sama
   大概一样

4. Affected
   Mengganggu
   影响

5. Extremely affected
   Amat mengganggu
   极度影响

---

Q15b. According to your answer in Q15a, is that positively affected or negatively affected your daily life?

Menurut kepada jawapan anda di soalan Q15a, gangguan tersebut adalah gangguan positif atau negatif?

根据Q15a的答案，这些影响对您的日常生活造成了正面或负面影响？

Positively affected
Gangguan positif
正面影响

Negatively affected
Gangguan negatif
负面影响

Both
Dua-dua pun ada
两者都有

Comments/ Pandangan/ 意见:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

---

Q16. Have you experienced any other positive or negative impacts which caused by the logging road?

Pernahkan anda mengalami impak positif atau negatif yang disebabkan oleh jalan balak tersebut?

自从这条木路开放之后，您有没有经历过其它的正面或负面影响？

Yes/ Ya 有

No/ Tidak 没有

Other/ Lain-lain 其它

If 'yes' or 'other', please specify:
Sila jelaskan dengan lebih lanjut sekitarnya menjawab ‘Ya’ atau ‘Lain-lain’:

如有或其它，请详细说明：

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Q17. Have you experienced any cultural changes after the existing of the logging road?
(Such as moral rules, beliefs, ritual system, languages and dresses)
Pernahkah anda mengalami perubahan budaya setelah jalan balak tersebut dibuka?
(Contohnya, nilai moral, kepercayaan, system keagamaan, bahasa dan pemakaian)

Yes/ Ya □  No/ Tidak □  Other/ Lain-lain □

If ‘yes’ or ‘other’, please specify:
Sila jelaskan dengan lebih lanjut sekiranya menjawab ‘Ya’ atau ‘Lain-lain’:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Section C: Respondent’s Perceptions and Perspectives/ Pendapat dan Pandangan Responden

Q18. Do you agree that the logging access road has encouraged Marudi people to leave or move out from Marudi?
Adakah anda setuju bahawa jalan balak tersebut telah mendorongkan penduduk tempatan meninggalkan Marudi?

1. Absolutely not agree
Amat tidak setuju
非常不同意

2. Not agree
Tidak setuju
不同意

3. Neutral
Neutral
中立

4. Agree
Setuju
同意

5. Absolutely agree
Sangat setuju
非常同意

Comments/ Pandangan/ 意见:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Q19. How do you feel if the logging access road has been upgraded to a tar sealed road?
   Apakah pendapat anda sekiranya jalan balak tersebut dinaik taraf kepada jalan tar?

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<tr>
<td>Amat tidak bagus</td>
<td>Tidak bagus</td>
<td>Neutral</td>
<td>Bagus</td>
<td>Amat bagus</td>
</tr>
<tr>
<td>非常不好</td>
<td>不好</td>
<td>中立</td>
<td>好</td>
<td>非常好</td>
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</tbody>
</table>

Comments/ Pandangan/ 意见: _____________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Q20. If there is a tar sealed road which connects Marudi Town to Miri, do you think the access road will encourage Marudi people to leave Marudi?
   Pada pendapat anda, sekiranya terdapat sebatang jalan tar yang mengubungkan Pekan Marudi dan Bandar Miri, adakah jalan tersebut akan mendorongkan penduduk tempatan meninggalkan Pekan Marudi?

Yes/ Ya/ 会 □ No/ Tidak/ 不会 □ Other/ Lain-lain/ 其它 □

Comments/ Pendapat/ 意见: _____________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Q21. What do you think of the following statement?
“Access roads stimulate outward migration from rural areas”.
“Jalan raya mempengaruhi bilangan penduduk dan menyebabkan migrasi dari luar bandar ke bandar”.

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<td>Amat tidak setuju</td>
<td>Tidak setuju</td>
<td>中立</td>
<td>Setuju</td>
<td>Amat Setuju</td>
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<tr>
<td>非常不同意</td>
<td>不同意</td>
<td>中立</td>
<td>同意</td>
<td>非常同意</td>
</tr>
</tbody>
</table>

Comments/ Pandangan/ 意见: _____________________________________________________
______________________________________________________________________________
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______________________________________________________________________________

Q22. What do you think of the following statement?
“Access roads facilitate rural economic development”
“Jalan raya membantu dalam meningkatkan pembangunan ekonomi luar bandar”

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<td>Amat tidak setuju</td>
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<td>中立</td>
<td>Setuju</td>
<td>Amat Setuju</td>
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<tr>
<td>非常不同意</td>
<td>不同意</td>
<td>中立</td>
<td>同意</td>
<td>非常同意</td>
</tr>
</tbody>
</table>

Comments/ Pandangan/ 意见: _____________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Q23. Are you planning to leave Marudi?
Adakah anda akan meninggalkan Marudi?

Yes/ Ya/ 有 [ ] When will you leave and why? Bilakah anda ingin meninggalkan Marudi dan mengapa? 打算几时撤离及为什么?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

No/ Tidak/ 没有 [ ] particular reason? Terdapat sebab-sebab yang tertentu? 有没有任何特别原因?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Section D: Economic Impacts/ Impak Ekonomi/ 经济

Q24. Are there any changes in your monthly income after the logging road opened in July 2005?
Adakah anda mengalami perubahan dari segi pendapatan bulanan setelah jalan balak tersebut dibuka pada Bulan Julai 2005?

Increased/ Meningkat 增加 [ ] Increment of/ Peningkatan sebanyak RM _________

Decreased/ Menurun/ 减少 [ ] Decrease of/ Menurun sebanyak RM _________

About the same/ Lebih kurang samai 大致一样 [ ]

Other/ Lain-lain/ 其它 [ ]
Q25. What is the role of the logging road in changing of your monthly income in Q24?

Apakah peranan jalan balak tersebut dalam perubahan pendapatan bulanan anda dalam soalan Q24?

1. Not an important role at all  
2. Not an important role
3. Neutral
4. Important role
5. Very important role

Q26a. From your observation, are there any changes of job opportunities in Marudi after the logging road opened?

Menurut kepada pemerhatian anda, adakah perubahan dari segi peluang pekerjaan di Pekan Marudi berlaku setelah jalan balak tersebut dibuka?

1. Extremely decreased
2. Decreased
3. About the same
4. Increased
5. Extremely increased

Q26b. According to your answer in Q26a, what kind of job has been affected based on the following categories? You can fill in more than one answer.

Menurut kepada jawapan anda di soalan Q26a, apakah jenis pekerjaan yang telah mengalami perubahan? Anda boleh memilih lebih daripada 1 jawapan.

(I = Increased/ Meningkat/增加 & D = Decreased/ Menurun/减少)

Self-employed/ Bekerja sendiri
Education/ Pendidikan
Government sector/ Sektor Kerajaan
Sales and Marketing/ Penjualan dan pemasaran
Customer service/ Perkhidmatan Pelanggan
General worker/ Pekerja biasal
Student/ Pelajar

Farming/ Pertanian
Fishing/ Perikanan
Housewife/Suri rumah tangga
Construction/ Pembinaan
Engineering/ Kejuruteraan
Administration/ Pentadbiran
Retired/ Bersara
Section E: Transportation/ Pengangkutan/ 交通工具

Q27. Please rank the following transport modes when you travel to Miri after the logging road opened in July 2005. (1 = The most preferred/ Pilihan pertama, 4 = The least preferred/ Pilihan terakhir)

Car (logging road)           Why/ Mengapa
Kereta (Jalan balak)           Why/ Mengapa
Speedboat (river)           Why/ Mengapa
Kapal express (Sungai)           Why/ Mengapa
Plane (air)                Why/ Mengapa
Kapal terbang(Udara)                Why/ Mengapa
Others              Why/ Mengapa
Lain-lain               Why/ Mengapa
Q28. Please rank the following transport modes when you travel to Miri before the logging road opened in July 2005.

Sila memilih jenis kenderaan untuk pergi ke Bandar Miri mengikut keutamaan anda, sebelum pembukaan jalan balak tersebut.

(1 = The most preferred/ Pilihan pertama, 3 = The least preferred/ Pilihan terakhir)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Why</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speedboat (river)</td>
<td></td>
</tr>
<tr>
<td>Kapal express (Sungai)</td>
<td></td>
</tr>
<tr>
<td>Plane (air)</td>
<td></td>
</tr>
<tr>
<td>Kapal terbang(Udara)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>

Q29. How do you feel when you know you can go to Miri by using the logging road?

Apakah perasaan anda apabila mengetahui bahawa anda dapat pergi ke Bandar Miri dengan menggunakan jalan balak tersebut?

<table>
<thead>
<tr>
<th>Feeling</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely unhappy</td>
<td>1</td>
</tr>
<tr>
<td>Unhappy</td>
<td>2</td>
</tr>
<tr>
<td>Neutral</td>
<td>3</td>
</tr>
<tr>
<td>Happy</td>
<td>4</td>
</tr>
<tr>
<td>Extremely Happy</td>
<td>5</td>
</tr>
</tbody>
</table>

Comments/ Pendapat/ 意见
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Q30. How many cars and motorcycles do you and your household members (those who are living in Marudi) owned before the logging road opened?

Berapakah kenderaan yang dimiliki oleh seluruh ahli keluarga anda (yang tinggal di Marudi) sebelum pembukaan jalan balak tersebut?

<table>
<thead>
<tr>
<th>Type</th>
<th>Car(s)/ Kereta/ 汽车</th>
<th>Motorcycle(s)/ Motosikal/ 电单车</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q31. How many cars and motorcycles do you and your household members (those who are living in Marudi) owned after the logging road opened?

_Berapakah kenderaan yang dimiliki oleh seluruh ahli keluarga anda (yang tinggal di Marudi) setelah pembukaan jalan balak tersebut?

在那一条林道开放之后，您与您的家庭成员（居住在Marudi）拥有多少辆汽车及电单车？

**Car(s)/ Kereta**

**Motorcycle(s)/ Motosikal**

<table>
<thead>
<tr>
<th>Hospitals/医院</th>
<th>Frequency of visiting in the last 12 months/Bilangan penggunaan anda dalam masa 12 bulan yang lalu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marudi Public Hospital</td>
<td></td>
</tr>
<tr>
<td>Marui 政府医院</td>
<td></td>
</tr>
<tr>
<td>Miri Public Hospital</td>
<td></td>
</tr>
<tr>
<td>美里政府医院</td>
<td></td>
</tr>
</tbody>
</table>

Any particular reason for choosing the hospital? _Sebab-sebab tertentu dalam memilih hospital tersebut?

选择该医院的原因？

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________
**Answer Q33 if your children are still schooling (otherwise go to Q37)**
Sila menjawab soalan Q33, sekiranya anak-anak anda masih bersekolah (Kalau tidak ada, sila lompat ke soalan Q37).

**Q33. Where are the schools of your children located?**
*Dimanakah lokasi sekolah anak-anak anda?*

<table>
<thead>
<tr>
<th>Sample/Contoh/例子</th>
<th>Current level of education/Tahap pendidikan sekarang</th>
<th>Location of the current school/Lokasi sekolah sekarang</th>
<th>Location of the previous school/Lokasi sekolah sebelum ini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child 1/子女1</td>
<td>Secondary school/Sekolah menengah/中学</td>
<td>Miri/美里</td>
<td>Marudi/马律</td>
</tr>
<tr>
<td>Child 2/子女2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child 3/子女3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child 4/子女4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child 5/子女5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child 6/子女6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child 7/子女7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Answer Q34 if your children have changed their schools.**
*Sila menjawab soalan Q34, sekiranya anak-anak anda pernah menukar sekolah.***

**Q34. What is (are) the reason (s) for your children to change their schools?**
*Apakah sebab-sebab yang menyebabkan anak-anak anda menukar sekolah?*

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Answer Q35 and Q36 if your children are not studying in Marudi.
Sila jawab soalan Q35 dan Q36, sekiranya anak-anak anda bukan bersekolah di Marudi.

Q35. How often had your children come home from the school before the logging road was developed?
_Berapa kali anak-anak anda balik ke rumah sebelum jalan balak tersebut dibuka?_

____________ / 6 months/ 6 bulan/ 6个月

Q36. How often have your children come home from the school after the logging road opened?
_Berapa kali anak-anak anda balik ke rumah setelah jalan balak tersebut dibuka?_

____________ / 6 months/ 6个月

Section G: Household Data/ Data Rumah Tangga/ 家庭数据

Q37. How many children do you have?
_Anda mempunyai berapa orang anak?_

__________ (If none, go to Section H/ Kalau tidak ada, sila terus ke bahagian H)

Q38. Children information/ 详细资料:

<table>
<thead>
<tr>
<th>Gender/ Jantina (M/F)</th>
<th>Age or Year of Birth</th>
<th>Place of living/ Tempat tinggal</th>
<th>If they are not living in Marudi/ Kalau mereka tidak tinggal di Marudi</th>
<th>Years since they have left/ Sudah berapa tahun mereka pindah keluar dari Marudi</th>
<th>Highest education level/ Tahap pendidikan mereka</th>
<th>Current occupation/ Pekerjaan terkini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: Male 26 Kuching 2 years Bachelor Degree Engineer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Child</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Child</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Answer Q39 if your children are not living in Marudi.
Sila menjawab soalan Q39, sekiranya anak anda bukan tinggal di Marudi.
如您的子女没有留在Marudi，请回答问题39。

Q39. Why your children had left Marudi? (Maximum 5 main reasons)
Mengapakah anak anda meninggalkan Marudi? (Maksimum 5 sebab)

Reason 1/ Sebab pertama 原因1:

_______________________________________________________________

Reason 2/ Sebab kedua 原因2:

_______________________________________________________________

Reason 3/ Sebab ketiga 原因3:

_______________________________________________________________

Reason 4/ Sebab keempat 原因4:

_______________________________________________________________

Reason 5/ Sebab kelima 原因5:

_______________________________________________________________
Appendix 10.2: Number of Houses in the Residential Area of Marudi Town

<table>
<thead>
<tr>
<th>Streets</th>
<th>Number of houses</th>
<th>Distributed questionnaires</th>
<th>Collected questionnaires</th>
</tr>
</thead>
<tbody>
<tr>
<td>JALAN MERDEKA</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>JALAN RAJA</td>
<td>14</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>JALAN PERMAISURI</td>
<td>13</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>JALAN SUNGAI MARUDI</td>
<td>13</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>JALAN KAPITAN LIM CHING KIAT</td>
<td>49</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>LORONG 1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LORONG 5</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>JALAN PERPADUAN</td>
<td>52</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>JALAN MAWAR</td>
<td>32</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>JALAN MELOR</td>
<td>13</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>JALAN TUANKU TAH A</td>
<td>42</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>JALAN KAMPUNG CINA</td>
<td>48</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>JALAN JELUTONG</td>
<td>11</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>JALAN KEMBOJA</td>
<td>14</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>JALAN BUNGA RAYA</td>
<td>36</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>JALAN CEMPAKA</td>
<td>20</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>JALAN ANGSANA</td>
<td>18</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>JALAN BURONG TIONG</td>
<td>44</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>JALAN WAWASAN</td>
<td>78</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>JALAN MUHIBAH</td>
<td>73</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>LORONG 1, JALAN MUHIBAH</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>LORONG 2, JALAN MUHIBAH</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>LORONG 2A, JALAN MUHIBAH</td>
<td>10</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>LORONG 2B, JALAN MUHIBAH</td>
<td>53</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>LORONG 3, JALAN MUHIBAH</td>
<td>19</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>LORONG 3A, JALAN MUHIBAH</td>
<td>30</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>LORONG 3B, JALAN MUHIBAH</td>
<td>12</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>LORONG 3C, JALAN MUHIBAH</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>LORONG 5, JALAN MUHIBAH</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LORONG 5A, JALAN MUHIBAH</td>
<td>16</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>LORONG 6, JALAN MUHIBAH</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LORONG 7, JALAN MUHIBAH</td>
<td>84</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>JALAN TEMENGGONG DATO' LAWAI JAU</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>JALAN TERATAI</td>
<td>17</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>JALAN LIMBANG</td>
<td>46</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>PADANG KERBAU</td>
<td>25</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>JALAN DATO GALAU</td>
<td>28</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>JALAN KAPITAN ABA</td>
<td>49</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>JALAN HII NGUON SONG</td>
<td>27</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>JALAN SUNGAI PASIR</td>
<td>42</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>JALAN TEMENGGONG GAU JAU</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>LORONG 1, JALAN TEMENGGONG GAU JAU</td>
<td>27</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>LORONG 2, JALAN TEMENGGONG GAU JAU</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LORONG 3, JALAN TEMENGGONG GAU JAU</td>
<td>8</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Jalan/Kampung</td>
<td>No. LORONG</td>
<td>No. LORONG 2</td>
<td>No. LORONG 3</td>
</tr>
<tr>
<td>---------------</td>
<td>------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>LORONG 4, JALAN TEMENGGONG GAU JAU</td>
<td>39</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>LORONG 5, JALAN TEMENGGONG GAU JAU</td>
<td>17</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>LORONG 6, JALAN TEMENGGONG GAU JAU</td>
<td>19</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>JALAN RIDAN</td>
<td>21</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>JALAN KUBU</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>JALAN NAKHODA ABANG MATASIM</td>
<td>69</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>JALAN DATO TUANKU ABDUL RAHMAN</td>
<td>67</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>JALAN KAMPUNG NARUM</td>
<td>95</td>
<td>27</td>
<td>22</td>
</tr>
<tr>
<td>JALAN LINTANG</td>
<td>10</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1456</strong></td>
<td><strong>411</strong></td>
<td><strong>362</strong></td>
</tr>
</tbody>
</table>

*Source: Marudi District Office (2008)*
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