

# **MEGA-INFRASTRUCTURE DEVELOPMENT— INDUCED DISPLACEMENT IN EAST MALAYSIA: A STUDY OF SOCIAL SUSTAINABILITY**

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## ***Abstract***

Mega-development projects—such as urban renewal and infrastructure projects (multiplex housing, dams and highways)—require land, and often large quantities of that limited resource. One of the most significant consequences of such mega-projects, therefore, is upheaval and displacement of the local residents and communities.

Displacement due to mega-development projects encompasses the loss of land, income and employment, social structure, traditional living patterns and culture, and control over natural resources such as forests and rivers. Resettling such displaced communities becomes a formidable challenge for social sustainability.

Bakun hydroelectric dam—under the Sarawak Corridor of Renewable Energy (SCORE) in Sarawak, located in the island of Borneo, East Malaysia—represents an example of development-induced displacement by a mega-infrastructure project. The Bakun hydroelectric dam project has displaced almost 10,000 people from 17,000 ha of land where they had been living for generations. Resettling those displaced communities has become a major challenge for social sustainability in terms of social justice, economy, and the environment. This research aims to understand the social challenges faced by resettled communities who are displaced by the Bakun project. To assess those challenges at different stages of the resettlement process, the Impoverishment Risks and Reconstruction (IRR) model is used for advocating better alternatives to ensure social sustainability.

## ***Introduction***

Any mega-development, such as large-scale urban renewal or infrastructure projects (multiplex housing, dams and highways), requires

land, and often a large quantity. One of the most significant consequences of mega-projects is upheaval and displacement of the local residents and communities. Displacement due to physical development encompasses more than the loss of land: displaced communities also lose their social structure, control over their lives, traditional living patterns and economic activities, and control over natural resources [1].

Development-induced displacement and resettlement (DIDR) remains one of the most contentious topics in innovative urban and economic evolution, particularly for Asian nations. The Asian economy is undergoing a transition from subsistence farming to a highly industrialized economy. For many mega-development projects, cost-benefit analysis has proven to be more important than the study of social implications of displacement. Of course, development-induced displacement is hardly a new issue, especially for the urban development process; but the number of affected people has grown dramatically, mostly in developing nations like Malaysia, India, and China, where rapid physical infrastructure development is considered integral to economic growth and sustainability [2].

Malaysia is one of the most dramatic examples in Southeast Asia of a nation that is investing millions in collaboration with foreign investors to meet growing housing and economic demands. Under the 1Malaysia plan, the new development goal of Malaysia is for the country to become a high-income and sustainably developed nation by 2020 [3].

Coping with energy demands, especially for electrical energy, is the greatest challenge facing Malaysia as it attempts to sustain and expand its development momentum. The growth of per capita energy consumption has come to be associated with the construction of mega-dams, which are considered mega-infrastructure developments [4]. The state government and the state-owned energy company Sarawak Energy Berhad (SEB) are building a series of up to twelve large-scale dams to generate hydroelectric power. The aim of such large-scale projects is to expand the industrial economy in the Sarawak region, under the industrial development initiative called the Sarawak Corridor of Renewable Energy (SCORE). Among these hydroelectric dams is Bakun Dam: the largest dam in Southeast Asia, and one of the largest in the world. The dam is 205 m high, with an installed capacity of 2400 megawatts (MW) and a lifespan of 50 years. The impoundment of the dam will inundate 69,640 ha of forest ecosystem—an area larger than Singapore. The project is estimated to cost RM9 billion, and displace more than 10,000 indigenous people from their land [5].

This article presents a qualitative research approach to understanding the current impoverishment of the soon-to-be-displaced communities, and the steps that might be taken to ensure higher standards of living for them in the future. Toward that end, it uses the Impoverishment Risks and Reconstruction (IRR) model introduced by

Michael M. Cernea in the 1990s.

During the field research, a comparison was made to understand whether the various displaced communities faced the same challenges during their resettlement process, and if so, to what extent. Such a comparison will promote understanding of the best alternative approaches to the resettlement process, in order to minimize risks and ensure sustainability.

#### *The Impoverishment Risks and Reconstruction model*

The Impoverishment Risks and Reconstruction (IRR) model was first designed by Cernea in 1990, and has been changed considerably to accommodate new development issues. Consistently at the core of the IRR model, however, are three basic concepts: **risk, impoverishment, and reconstruction**. The model aims to: “(a) explain what happens during massive displacement due to development, and (b) create a theoretical and safeguarding tool capable of guiding policy, planning and actual development programs to counteract these adverse effects” [6]. This article addresses the development-induced displacement challenges in modernizing countries like Malaysia, where forced resettlement carries numerous risks of impoverishing the uprooted people, many of whom were very poor even before displacement. According to Cernea [7], the IRR model not only addresses impoverishment from an “income–poverty” perspective, but also considers other social challenges, such as the loss of employment opportunities, housing, health care, educational opportunities, community power, and social status. According to the IRR model, the most general risks that are linked to developmental displacement are: **landlessness; homelessness; increased morbidity and mortality; loss of access to common property; joblessness; marginalization; food insecurity; and social (community) disarticulation**.

#### *Bakun Dam, displacement and resettlement of indigenous people*

According to the International Commission on Large Dams (ICOLD), a dam is considered “large” when the minimum height is 15m or it carries at least 3 million m<sup>3</sup> of water [8]. Bakun meets all the criteria of a large dam. Located at the Balui River about 200 km from the town of Bintulu in Sarawak, the dam is designed to generate 2400 MW of electricity. Initially it was planned that almost 70 percent of the generated electricity would be delivered to Peninsular Malaysia and the remainder would be used for East Malaysia. Later, it was decided that Bakun’s power will remain in Sarawak to develop this region into a new economic hub under the SCORE project by 2020 [9]. Table 1 presents a summary of Bakun Dam [10].

Aside from all the economic benefits generated by large dams, they also create significant geological and social impacts, which are clearly addressed in, for example, *Silenced Rivers* [11]. As this book makes clear, large dams always cause displacement, and in most cases, indigenous people (also known as “sons of the land”) are the victims. It is estimated that in China alone, between 30 million and 60 million people have been displaced by river dam projects. The Bakun Dam is no exception to this rule, and almost 10,000 indigenous people already have been displaced by this mega-project. Such displacement and resettlement often causes hardship for the indigenous people, many of whom fail to secure a job in their new location, and are unable to continue their agricultural or hunting activities that sustained them prior to their resettlement [12].

| Issue            | Facts/Impacts  |
|------------------|--|
| Project cost     | RM15 billion   |
| Shelf-life       | 50 years   |
| Type of dam      | Concrete Face Rockfill Dam (highest in the world)                        |
| Land inundated   | 69,640 ha  |
| Catchment area   | 1.5 million ha   |
| Capacity         | Generator of 2400 MW electricity   |
| Site             | Balui River 37 km upstream from Belaga Power                             |
| Transmission     | 1,500 km overland wires, 650 submarine cables                            |
| Turnkey contract | Ekran Berhad   |
| Social impact    | Human dislocation 10,000 persons from 1,700 families from 15 long-houses |

Table 1. Summary of Bakun Dam

*Indigenous People (Orang Asli)*

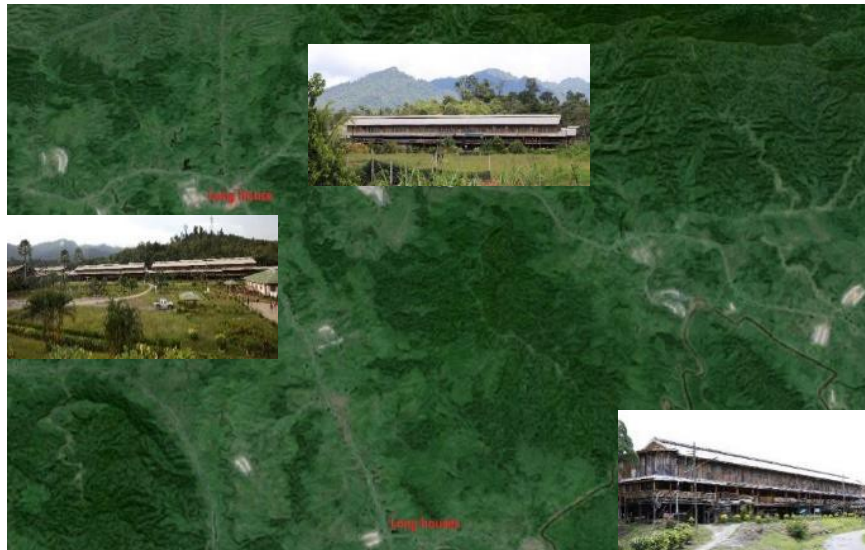
Orang Asli (**Orang** means “people” and **Asli** means “original”), or indigenous people, have their own unique language, culture, beliefs and knowledge of living with the environment for the sustainable management of natural resources. They are deeply connected to the land, and their inherited land has significant value for their physical and cultural survival as people [13].

Orang Asli in Malaysia are classified into 95 subgroups, each with their own distinct language and acculturation. In Malaysia, they are all marginalized socioeconomically and culturally; however, the natives of Sabah and Sarawak are in a relatively vulnerable position due to heavy construction projects like dams [14]. About five different communities in East Malaysia—including Kenya, Kayan, Kajang, Ukit and Penan, incorporating almost 10,000 people—have been relocated due to the dam. Most of them were subsistence farmers and obtained their protein from fishing and hunting. For this project, about 170,000 acres of jungle was cleared, which was home to more than 100 species of fauna, including the great leaf monkey, the Bornean gibbon, and the Malayan sun bear [9].

The different communities of Orang Asli living in Bakun are classified by their location, or “Home of Stay.” For example, one group is known as **Orang Ulu** (people of the upstream), as they used to live along the upstream river, and another group is known as **Orang Penan** (people of the forest), as they lived in the forest areas. Both the Orang Ulu and Orang Penan have been displaced due to the Bakun Dam development, and are now resettled in the Belaga district, Sarawak. In their new settlement they are also known by their long-houses as **Rumah Panjang**. Such an identity clearly indicates their character and connection with the land where they live and to which they belong.

#### *Rumah Panjang (long-houses)*

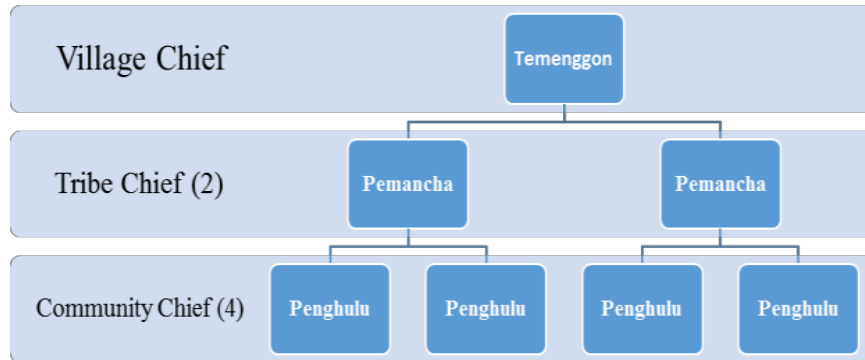
The Orang Ulu and Orang Penan have been resettled in 15 Rumah Panjangs (long-houses) in one village: Sungai Asap, in the Belaga district. This study was conducted with the people in Sungai Asap living in these long-houses. According to the field survey, 10,000 residents are currently living in the 15 long- houses. Each one of the long-houses is known by a name, and the residents are also identified based on which long-house they reside in. Figure 1 shows a Google satellite image of the long-houses in the village named Sungai Asap.



**Figure 1.** Location of Rumah Panjang/long-houses in the village of Sungai Asap

The 15 long-houses are named Lebu Kulit, Uma Belor, Uma Daro, Uma Nyaving, Uma Kelap, Uma Lahanar, Uma Bawang, Uma Balui Lito, Uma Balui Ukap, Uma Bakah, Uma Badong, Uma Penan Talun, Uma Juman, Uma Le song, and Uma Ukit. In keeping with their cultural norms, these long-houses are managed by local leaders, selected from among the residents and appointed by the local government to protect their culture, ethics, social structure, and values. Figure 2 illustrates the administrative hierarchy of Sungai Asap, and this local administrative

authority maintains the long-houses as a part of their (Orang Asli) cultural heritage:



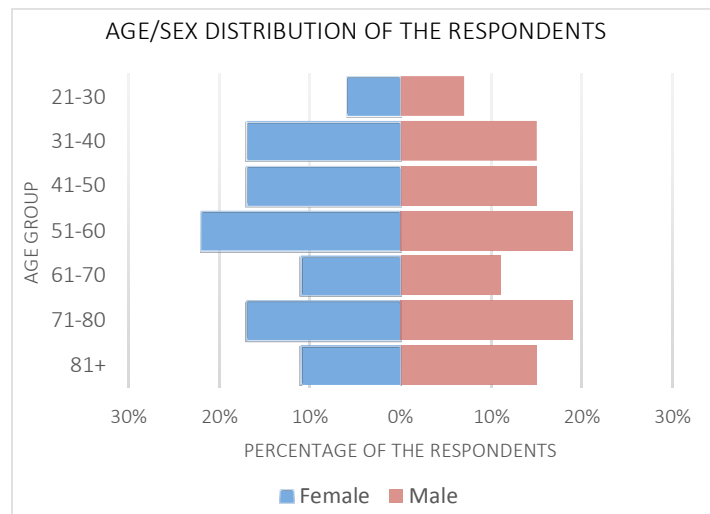
**Figure 2.** Administrative hierarchy of Sungai Asap

The government convinced the indigenous communities that were relocated from the Bakun areas to continue using their own administrative system. Today, in addition to accepting the laws of Malaysia, the authority of the local police and district council, these indigenous communities still practice their own administrative system based on their ethnicity and culture.

### ***Research design***

This study used focus group discussions as the research method, which is a qualitative research approach used to obtain perceptions, opinions, and attitudes towards social issues or challenges. Using this method, a group of people is questioned in an interactive group setting where they are free to talk.

A total of 45 participants (both male and female) were chosen randomly from 15 long-houses. Participants were then divided into three groups, and three focus group discussions were arranged. Each group was asked for their responses to the challenges they are facing since they were displaced. They were also asked about the challenges they have overcome over time, and the challenges they are still facing to achieve sustainability in terms of income, social wellbeing, and local environment. Figure 3 shows the age and gender distributions of the respondents who attended the focus group discussions.



**Figure 3.** Age and gender distribution of focus group participants

According to Figure 3, among the 45 respondents, 18 (40 percent) were female and 27 (60 percent) were male. Among the male respondents, 22 percent (4 out of 18) were in the 51–60 years age group. Among the male respondents, 19 percent (5 out of 27) were in the 51–60 years age group, and another 19 percent were in the 71–80 years age group. This last age group, in particular, has lived through all the difficulties of the displacement and resettlement process.

This study also used the case study method, as a means of obtaining and presenting individuals’ opinions about the challenges they face during the relocation process.

### ***Bakun Dam—induced displacement and relocation challenges***

During the focus group discussions, one of the Penghulus, Mr. Ebao, and one of the Pemanachas Mr. Umengeno, stated that in the first phase of the relocation process, Bakun residents were informed by the government authority that they would be relocated from the Bakun areas due to the new hydroelectric power development projects. However, they were not informed about the relocation plan, the level of compensation, or the facilities they would have access to in the wake of such a forced displacement. To protect their land and their social and cultural rights, they formed the Bakun Relocation Committee (BRC) to negotiate with the government authority; Mr. Ebao and Mr. Umengeno were on that committee. In the course of those negotiations, the committee proposed a “compassion plan” to the government for each family, so they could achieve a better life in their new location.

According to the Penghulu, Mr. Ebao, and the Pemanacha, Mr. Umengeno, “most of the elderly members of the community were not at all

happy to be relocated to a new place, as they were not sure how much land they will have in the new location and what would be their way of living and earning.” Furthermore, the Orang Asli are very much connected with the forests and rivers for their food and living. Bakun was a perfect place for them to obtain their food and living because of the Balui River and adjacent forests. Through the relocation, they were displaced from the river and forest, which had been their livelihood and their cultural heritage.

According to the relocation plan, each house in Bakun was allocated 3.1 ha of land (7 acres), even though some of them previously owned more than 100 ha and had complete freedom to cultivate wherever they wanted. Compared to their old property, 3.1 ha of land was not enough to support a family of 3; thus, they were forced to find an alternative income source. Furthermore, the land parcel they have now is surrounded by a palm plantation area, and its use is also restricted by the government agriculture and land department. Therefore, there is no more common access to land as they had before and they are limited as to how much land they can cultivate.

**Landlessness** in the IRR model is defined as a key challenge for displaced and relocated communities. As noted, these indigenous communities are not completely landless, but the land they have is insufficient to support their families; therefore, most of the residents are now involved in other economic activities to augment their incomes. Another key challenge that has forced them to become involved in different economic activities is their family expenditure. Based on an interview with another Penghulu, Mr. Lebu Kulit, and a community member, Li-Wong, people have to pay for everything, including water supply, electricity and infrastructure. They are not used to paying a tariff, as they didn't have those facilities before. They do agree that these facilities have improved their quality of life, but again, the available acreage can't provide enough income to cover all those expenditures.

**Marginalization:** Since displacement took place, the elderly people—who used to rowing boats on the river, fishing, farming, and socializing—can't cope with modern technologies such as mobile phones and cars. As a result, they are effectively marginalized in society. A good example is Deng Ngo.



**Case study 1:** Deng Ngo is an 85-year-old Orang Ulu widow who spent 70 years of her life in the Bakun area, where she was completely free to go anywhere and to any other villages with her boat to meet friends and family. She used to farm and fish. For the last 16 years, however, she has been living with her son, and for the most part just remains at home. She can't farm or fish. She is not used to driving a car like her son, or riding a motorbike like her



grandson. She depends on others for almost everything. In this new location she has lost her individuality, which is the character of an Orang Ulu woman. She misses her old life and her tribe and wants to get that life back. She still has the marks of her tribe on her hands and ears, but not the freedom that those marks used to signify.

The new village of Sungai Asap has a clinic for health services, and modern hospital facilities are in Bintulu city, just 153 km away. Morbidity and mortality are no longer a challenge for these communities, as they had been previously in the Bakun area. In Bakun, according to Penghulu and Pemanacha interviewees, it used to take three days to get to the hospital. Similarly, they now have two primary schools and a secondary school—for the first time, ensuring an education for the younger generation to prepare them for modern Malaysia.

Nevertheless, their challenges are far from over. As noted, they still have food insecurity and limited access to common properties. Such scarcity of food compels them to go back to the Bakun Dam area, where they have access to common property for fishing and hunting. A 50-year-old lady, Aijun Ng, who also has a room in Rumah Panjang in Sungai Asap, moved back to her old place along the Bakun Dam where she has easy access to food.



**Case study 2:** Aijun Ng, a 50-year-old Orang Ulu woman, has a house in Rumah Panjang like all the others. However, she and her husband returned to their old place along the forest near the Bakun Dam in search of food. The area is right next to the forest and the river where they can hunt and catch fish. Every Saturday and Wednesday, they bring their products to the local weekly market to sell and make money to meet other domestic needs. She is a present-day example of traditional Orang Ulu, who used to live near the river and forest and obtain their sustenance from nature.

According to the IRR model, compared to other communities that have been displaced by development projects, this indigenous community is relatively well off. In part because the relocation process was much more democratic than most, they received modern facilities like schools, clinics, water supply and electricity in their new settlement area. Certainly, there are challenges and risks involved with the relocation process as addressed above; however, the local community has been working hard to overcome these challenges since they moved from their original place 17 years ago.

The younger generation now has opportunities to go to school and there are higher education facilities. Within the last 16 years, almost 170 people from their community have earned their university diploma and are

now working all over Malaysia; they have chosen a modern lifestyle, rather than following the path of their ancestors. Inevitably, this move toward an urban lifestyle introduces social disarticulation, and the community is at risk of losing its heritage and culture. Community leaders are taking steps to reduce such social risks. For example: each room in every long-house is named after that family, and—to underscore their traditions—the family is known by that long-house. Furthermore, young people are encouraged to return to their village every Christmas, to maintain family ties and a social bond with their tribe.

### ***Resettlement, social challenges, and sustainability***

During the focus group discussions, the respondents were asked to address five key issues that they considered as major challenges for this relocation process—challenges that they are still struggling to cope with to become a sustainable community. Most respondents named the following five key issues as challenges that they are still struggling with:

1. Enough land for farming
2. Alternative income opportunities
3. Food security
4. Cultural identity
5. Social structure

Their responses are plotted in a spider diagram (Figure 4) using a five-degree scale and the following equation:

$$V = \left\{ \left( \frac{R_o}{R_t} \right) \times D_i \right\},$$

where **V** = value under the five degree scale; **R<sub>o</sub>** = number of respondents that have that opinion on that issue; **R<sub>t</sub>** = total number of respondents (45); and **D<sub>i</sub>** = 5, the constant value of the five degree scale.

Figure 4 presents the respondents' opinions on these major challenges they are still struggling with since being displaced from their place of origin.

RESPONDENTS' ANSWERS TO MAJOR CHALLENGES OF DISPLACEMENT

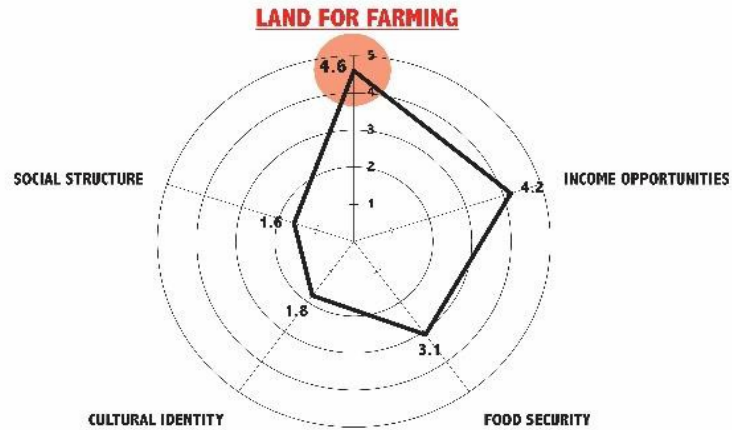
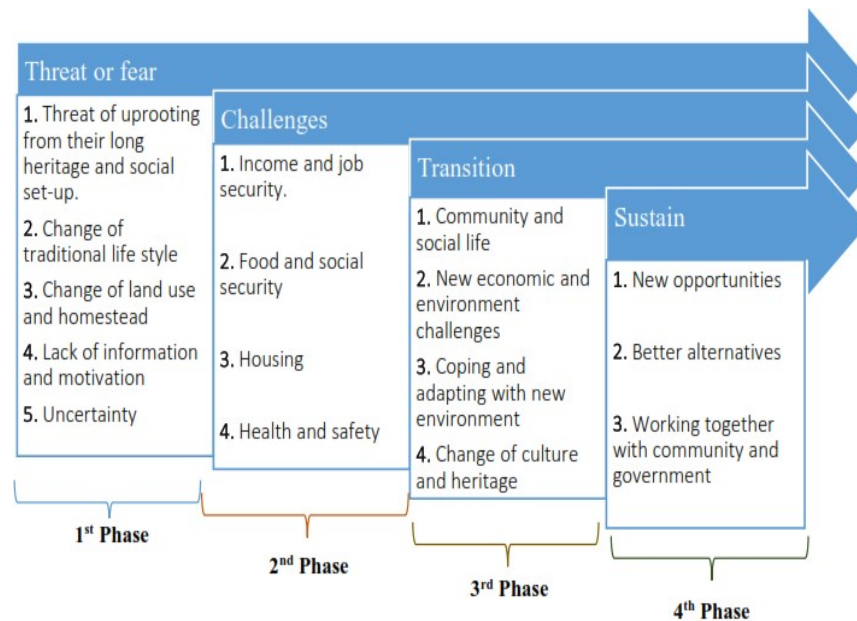


Figure 4. Key issues identified and ranked by the respondents as major challenges of displacement and relocation

According to Figure 4, the maximum number of respondents indicated that the land they were allocated after the resettlement process is not enough to maintain their livelihoods, and they also stated that they are still looking for alternative income opportunities to survive. Food security is considered as the third key issue, which is linked to land availability. On the other hand, cultural identity and social structure were given less priority as a challenge to be overcome in their new location.

Most resettlement programs focus predominantly on the cognitive operation of physical relocation, rather than the economic, societal, and emotional development of the displaced masses. Displaced or relocated communities usually face different challenges at various stages of the relocation process. That is a challenge of social sustainability of settlers [15]. The Orang Ulu and Orang Penan people have been displaced for 16 years, and yet, they are still struggling to carve out a sustainable life in their new settlement. Figure 5 presents the challenges faced by those communities, based on focus group discussion results.



**Figure 5.** Social sustainability challenges in the resettlement process

The indigenous communities in Bakun have gone through all of these challenges of the resettlement process, and are working to sustain and ensure a quality life in their new location. According to the field survey, they were confused and afraid during the first stage of the relocation process. They received very limited information, and had no choice but to move. After being relocated, they had to struggle to make their new place a home. They had to work hard to build their community, face new economic and environmental challenges, and adapt. That struggle continues, as the next generation looks for new opportunities—such as local tourism—that may enable them to stay in Rumah Panjang, and to sustain their culture and heritage.

Compared to many other displacement and resettlement cases, the resettlement process in Bakun is a qualified success story. Based on the results of the discussion groups, it is clear that the residents' standard of living is much higher now than it was before displacement. They have better health, education, water supply, and sanitation facilities. They also have community halls and stadiums for social gatherings—all new and welcome resources.

But it has taken almost 16 years to get to this stage. Still more time will be needed to find alternatives and opportunities that are economically and socially sustainable.

## **Acknowledgements**

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