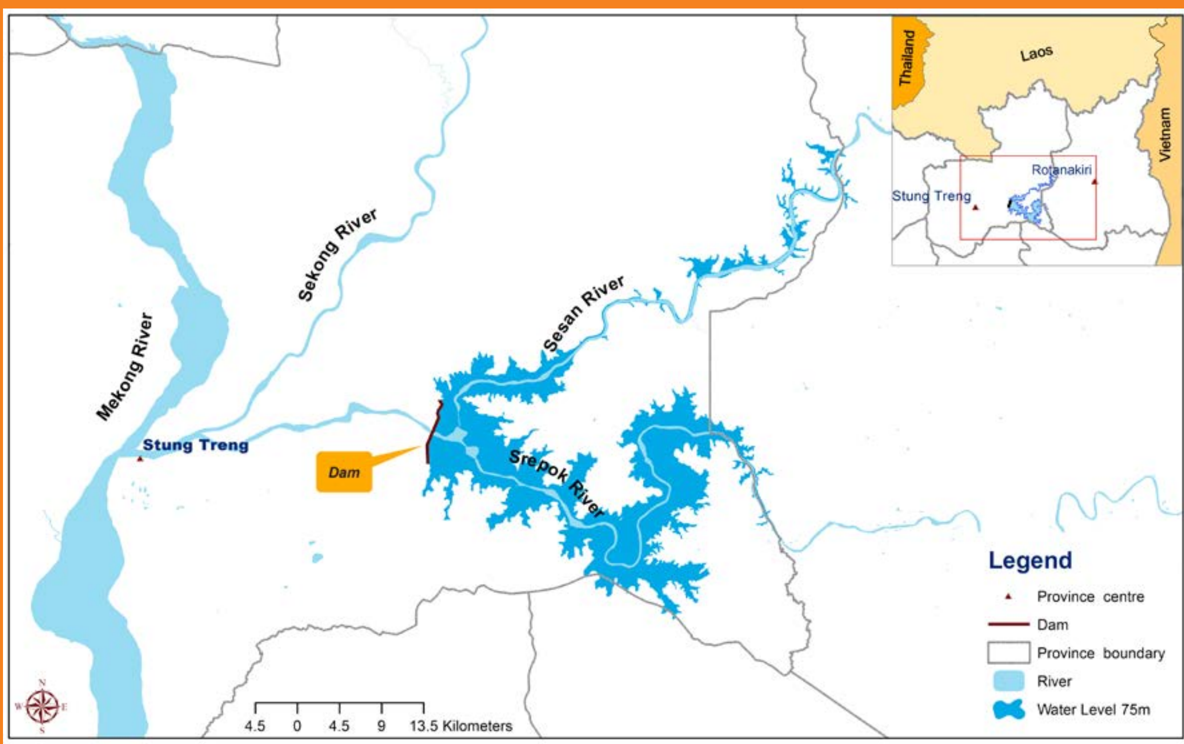
We Note A Mistake:

On Page 2 “…to produce on average **1,998MW** of power per annum.” Please be noted that the correct one is “…to produce on average **1,998GWh** per annum.”

We apologize for this unintended mistake.

វេទិកានៃអង្គការមិនមែនរដ្ឋាភិបាល ស្តីពីកម្ពុជា
The NGO Forum on Cambodia
ធ្វើការរួមគ្នាដើម្បីភាពប្រសើរឡើង
Working Together for Positive Change

Lower Sesan 2 Hydropower Dam: Current Livelihoods of Local Communities (A Baseline Study)



Phnom Penh, Cambodia
December 2012

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(A Baseline Study)

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(A Baseline Study)

Phnom Penh, Cambodia

December 2012

Table of Contents

List of Maps

List of Tables

List of Pictures

List of Figures

Table of Acronyms

Acronyms	Words In English
ADB	Asian Development Bank
ADHOC	The Cambodian Human Rights and Development Association
CEPA	Culture and Environment Preservation Association
CMDG	Cambodian Millennium Development Goals
CNRO	The Cambodia National Research Organization
DPA	Development and Partners in Action
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EVN	Electricity of Vietnam
FAO	Food and Agriculture Organization
KW	Kilowatt
MVi	My Village
MoE	Ministry of Environment
MoRD	Ministry of Rural Development
MoEYS	Ministry of Education, Youth and Sport
MW	Megawatt
NIS	National Institute of Statistic
NGO	Non Government Organization
Riel	Cambodian Currency
UNDP	United Nation Development Program
3SPN	3S (Sesan, Srepok, Sekong) Rivers Protection Network

Acknowledgment

This baseline study on the current livelihood status of the people who will be affected by the Lower Sesan 2 Hydropower Dam development project is an initiative by the Resettlement Action Network of the Housing Rights Project of NGO Forum on Cambodia. It seeks to understand the people's current livelihood status and to present their views and awareness on the Lower Sesan 2 Hydropower Dam development project, its impacts, resettlement and compensation.

The authors thank Mr. Chhith Sam Ath, Executive Director, and Mr. Kham Syngoun, Former Deputy Executive Director, NGO Forum on Cambodia for the support for this study.

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Last, but not least, sincere thanks go to the local authorities at all levels in Stung Treng and Rattanakiri provinces for the collaboration and coordination for the research team to work smoothly, safely and successfully in target areas.

Executive Summary

Cambodia has now reached a development turning point where industry and many investment programs are active in the country. The shortage of physical infrastructure has become one of the barriers contributing to interruption of investment activities in the country, including electrical energy. The Royal Government of Cambodia considers the power industry a necessary requirement for the people and for the economic development process in the country. As a result, many investment projects in hydropower dams have been approved and considered to meet these needs.

The Lower Sesan 2 Hydropower Dam Development Project has been considered by the government as a project that can generate a lot of power among other hydropower dams in Cambodia. At the same time, all the people living in the project areas who participated in this study have heard about this Lower Sesan 2 Hydropower Dam Development Project.

Information on the construction of the hydropower dam was disseminated by local authorities and from one person to another without specific official information shared by senior technical officials and officials of the company in charge of the construction of the project.

Most people think that the construction of the hydropower dam will affect the livelihoods, occupations, farmland, crops, properties, education, religion, tradition, village infrastructure, and natural resources, such as the forest, animals, rivers, fisheries, and biodiversity. Therefore, they do not wish the project to be built in their areas. While they cannot object to the development by the government, they request that the government take into account carefully and in advance the impacts of the project because the project will have great impacts on villagers' livelihoods.

Although there have been consultations with a small number of people on the construction, impacts, compensation, and resettlement due to the proposed Lower Sesan 2 Hydropower Dam Development Project, most villagers are not aware of these problems, so specific information or clear notice on the proposed construction, impacts, compensation, and resettlement has not been widely disseminated.

Most people will agree to leave their native villages to new settlements because of the construction of the proposed hydropower dam if required by the government although they are not satisfied with this decision. Preconditions for this decision are that the people need prior, fair, just and acceptable compensation before they can leave to new settlements and build new livelihoods.

Most people have predicted negative changes to their livelihoods after resettlement because at the new place there are no houses, crops, occupations for income generation, no possibilities for fishing, and insufficient water for

use/distant water sources, thus affecting their daily livelihoods. Moreover, people in the study areas have not been prepared for leaving where they live for the resettlement areas because they have not received official information or notice. The indispensable needs for moving to other areas due to the development of the Lower Sesan 2 Hydropower Dam constitute three main points: farm land and plantation (Chamkar) land; housing, and basic infrastructure, e.g., roads, schools, pagodas, health centers; and other important needs, such as water sources, fruit trees, cows/buffaloes; and tools as they have in their old areas. In particular, prior notice and allowing appropriate time for preparation to leave is a very important need for the affected people.

In addition to the study of the people's views and awareness on construction of the proposed hydropower dam, this study covers the general, daily living conditions of each household focusing on 5 main points of the resources for daily livelihoods, i.e., human resources, physical infrastructure, financial resources, social capital, and natural resources. These resources consist of many other components that are the catalysts for each resource to function.

1- Human Capital: The findings of this study show that general education is still limited. Although the primary education enrolment rate is high, the children's school quitting rate among children under 18 is at a level that requires attention. There is almost non-existence of children who can complete primary education in each target village. Most youth aged 18 and above quit schooling before completion of primary school. Factors preventing children's education attainment include parents not encouraging their children to study, difficult family livelihoods, the needs for child labor to generate income, insufficient schools and teachers for children, and some children going to farms/plantations that are far from schools with their parents during farming/planting seasons, and in particular absence of lower or upper secondary schools in the areas.

Lack of health services is a serious problem because health centers are located far from the villages, making it difficult for the people to seek treatment services. Although the distance to a health center is a barrier for receiving health treatment services, health centers remain most popular for the people compared with private treatment services because they are believed to be effective in their treatment of illnesses.

Some security problems raised by some people taking part in the study include fighting between teenagers, theft of cows/buffaloes, and domestic violence that occur in some villages. Some problems, such as domestic violence and fighting are sometimes settled by village authorities and other times, by police. It is noteworthy that in some villages people organize their own village security groups. However, they are not official groups with commissions. They are established only by people, village chiefs, and deputy village chiefs. Moreover, in some villages, people have requested policemen to help ensure security when there are important social events with dancing in the villages to prevent violent acts by young people.

2- Physical Capital: There is no documentation of official land registration that certifies land occupation in the study areas yet, in particular, the areas within the proposed dam development because they are areas not yet adjudicated. For instance, only about 12% of the people have application for land occupation/land use (receipt of certification of land occupation) at village/commune or sale/purchase contract. Land occupation in the area was transferred from one generation to another without any official papers because people in the area think their families are the real owners of the land that their families have. For housing, all the people who participated in this study live in their own houses or the houses owned by their parents for large households with numerous members

Although there are some small hydropower dams in Stung Treng and Rattanakiri provinces, the power supply is still limited because these dams cannot supply sufficient power in the entire provinces. Among the villages selected for the study, there are no power grids yet. Only around 4% of the population has access to electricity powered by generators or Koyun (power tiller). Most people in villages use kerosene lamps as the main lighting source at night.

With respect to travel means, in general, each household has a motor bicycle, a bicycle, and a boat for daily travel, but almost no cars. Other important infrastructure in the villages includes schools, Sala Chortean (local rest areas), pagodas, health posts, wells, roads, and small bridges, but there is no health center.

3- Financial Capital: Most people work in agriculture, and their livelihoods rely completely on this sector. Further, they have other secondary occupations, such as fishing, collecting non-timber forestry products (NTFPs), selling minor things, paid labor, and household animal husbandry, which can generate additional income to support household livelihoods. Main income generators are usually heads of households. On average, one household makes US $2367.5 per annum.

The average income per person per household under this study is only 51% of the 100% of per capita income according to the 2010 Cambodian standard of the National Institute of Statistics. Besides, regarding the poverty rate among all the households under the study, only about 3.2% are in poverty while the majority of households are not; it can be said that they have average livelihoods. However, the study does not confirm that the majority of these people are in an average condition or at what levels. It can only confirm that they can cope with their daily living conditions without being miserable.

4- Social Capital: Close relations and meetings exist in all communities. People always meet, communicate, and help each other, indicating relations and a lifestyle of living in groups or communities, which is difficult to rebuild if they move to separate places. Customs, traditions, religion and various faiths exist and

are celebrated in groups for each village as needed in daily livelihoods. Most people are Buddhists and organize religious ceremonies together and believe in forest and village offering rituals. However, some people believe only in spirits and souls or conduct offering rituals too because the areas where they live are forested and they live among indigenous people. The custom of mutual assistance or labor exchange during farming/planting seasons still exists in some villages.

5- Natural Capital: The northeast of Cambodia, especially, in the area of the Proposed Lower Sesan 2 Hydropower Dam of Stung Treng province, is an area with forest, wildlife and rivers. Most people live along rivers and in forest areas where the natural resources support a significant part of their livelihoods. People can draw benefits and collect NTFPs for their daily livelihood, such as wood for building houses, furniture, firewood, fruit, traditional medicine, etc. Some villagers continue to hunt wildlife for food, and only under a small number of cases are the villagers able to hunt more wild animals than their consumption needs and for sales, but this is not always the case. Because currently villagers are prohibited from hunting some wildlife for conservation purpose, people can hunt only a small number of wild animals for consumption. Rivers are the main sources of water for livelihoods along the rivers. Thanks to the rivers, villagers have sufficient water for daily livelihoods, agriculture, and fishing for consumption and selling.

People and village chiefs/deputy village chiefs request the government and the developer of the hydropower dam not to build the Lower Sesan 2 Hydropower Dam because it will have great impacts on the people and the environment. However, if the government still considers that building this dam is a development that provides great benefits to respond to the needs of the whole country, the people request that the government pay attention to paying compensation or giving substitute value for the losses suffered by affected people in a fair, just and acceptable manner to ensure that their livelihoods will not face more difficulties than their lives in their native villages before the construction of the proposed hydropower dam.

CHAPTER 1 - INTRODUCTION

1. Background

Cambodia is a developing country with a population of about 14.521.275[1] of which about 80% live in rural areas[2] and more than 70% work in agriculture.[3] Due to years of chronic wars, in particular, the civil war between 1970-1979, infrastructure in Cambodia, including the electricity sector, was seriously destroyed. During that period, Cambodia had only one power transmission line from the Kirirom I Hydropower Dam with only 115 KW of power while electric grids in the country at that time were almost completely destroyed.[4]

In 2011 the Kingdom of Cambodia had four power plants, namely the Kirirom and Kamchay Hydropower Plants, the O'Chum Hydropower Plant, Hydropower plant in Mondulkiri town, and the SL Garment Factory (Cambodia). Power generated by diesel power plants accounts for 93%, hydropower plants 3%, coal-fired steam power plants 3%, and other firewood and biomass-fired power plant 1%.[5] About 26.4% of Cambodians have access to electricity, of whom only 13% of people in rural areas have access to power while 87% of people in urban areas have access to electricity.[6] Because of such limited power supply, Cambodia has been importing power from neighboring countries like Vietnam, Laos, and Thailand for approximately 42% of total electricity consumption in the country to meet local people's needs, especially, those living in border and urban areas.[7]

According to the Power Capacity Strategy of Cambodia (1999-2016) of the Ministry of Industry, Mines, and Energy, Cambodia's annual need for electricity will increase from 522MW in 1998 to 2,634MW in 2016.[8] Due to the

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[1] National Institute of Statistics, Ministry of Planning "Census of Enterprises in the Kingdom of Cambodia 2011"
[2] (UNICEF, 2010).
[3] 2011 Human Development Report
[4] www.energypedia.info/index.php/Cambodia_Country_Situation#Energy_Situation (Searched website on March 28, 2011)
[5] "Report on the Electricity Sector of the Kingdom of Cambodia 2011", published in 2012 by the Electricity Authority of Cambodia.
[6] "Report on Demographic Census of Cambodia 2008", published in 2009 by the National Institute of Statistics, Ministry of Planning.
[7] http://www.sihanoukville-cambodiajournal.com/2011/12/08/new-hydro-dam-in-kampot/ (Searched website on May 11, 2012)
[8] http://www.business-in-asia.com/cambodia/cambodiainsight.html (Searched website on March 28, 2011)

ever increasing annual need for electricity, the government has increased the power supply capacity from 472MW in 2009 to 538MW in 2010.[9]

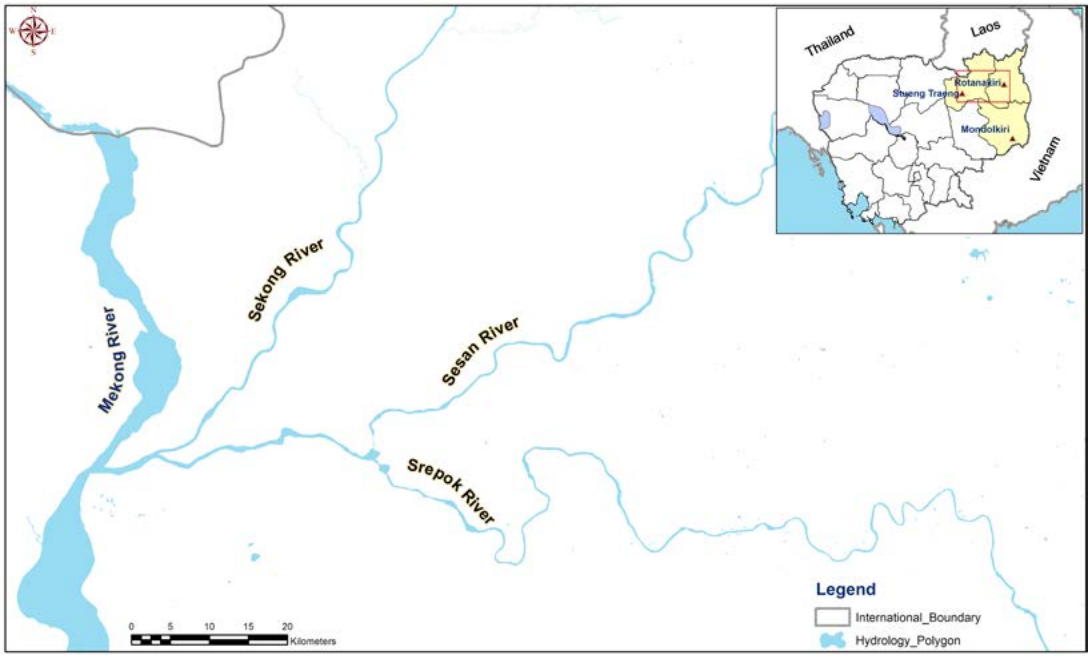
Power generation and development of hydropower dams are key strategies for national development. The Royal Government of Cambodia aims at increasing local power generation through construction of over 20 hydropower dams across the country.[10] The Lower Sesan 2 Hydropower Dam is one of many other dams that the government considers to have potential for power generation of about 400MW[11] and to be able to produce on average 1,998MW of power per annum.[12]

For instance, the Royal Government of Cambodia has granted the investment in the construction of the Lower Sesan 2 Hydropower Dam to the Electricity of Vietnam (EVN) and the Royal Group. This large-scale project has 51% share of EVN and 49% of the Royal Group[13] for development with proposed funds of US$816 million.[14] The project will build an 8 km dam on the Sesan river between the Pluk village and the confluence of the Sesan and the Srepok rivers.[15] A signing ceremony was held on 24 April in the presence of the Prime Ministers of both countries, Cambodia and Vietnam.[16]

The Environmental Impact Assessment (EIA) reviewed by a group of experts (PECC-1)[17] found that with the 80m water level in the reservoir, an area of 813.2km^2 of the Srekor, Talat and Kbal Romeas communes in Sesan district, Stung Treng province, will be inundated completely by the reservoir while the Pluk commune in Sesan district, Stung Treng province, and Sre Angkrong commune in Koun Mom district, Rattanakiri province, will be partly inundated. However, if a 75m-water level in the reservoir is an option for the construction, then the water will not inundate the commune in Rattanakiri province.[18] A great deal of concern has been raised around the issue of the Lower Sesan 2 Hydropower Dam development project in Stung Treng province by environmental organizations. Specifically, about 5,000 people will be resettled

[9] Cambodia Outlook Brief 2011, N^{o}3 (CDRI) or http://www.cdri.org.kh/webdata/policybrief/ob11/ob3e.pdf (Searched website on Sep 14, 2012)
[10] The New York Times: http://www.nytimes.com/2012/01/17/business/global/17iht-rbog-cam17.html?_r=2 (Searched website on May 11, 2012)
[11]The Cambodia Daily, Volume 47, Issue 73, Tuesday, January 25, 2011
[12]http://en.wikipedia.org/wiki/Lower_Se_San_2_Dam#History (Searched website on May 03, 2011)
[13] http://www.banktrack.org/show/dodgydeals/lower_sesan_2_hydropower_project (Searched website on November 20, 2011)
[14] http://english.thesaigontimes.vn/Home/business/environment/18592/ (Searched website on December 10, 2011)
[15] Complete Environmental Impact Assessment Report, December 2009, Final Report "Lower Sesan 2 Hydropower Project"
[16]http://thesoutheastasiaweekly.com/?p=962 (Searched website on November 28, 2011)
[17] (PECC-1) Power Engineering Consulting Company 1
[18]Complete Environmental Impact Assessment Report, December 2009, Final Report "Lower Sesan 2 Hydropower Project"

after the project starts operation.[19] In particular, this hydropower project will affect the livelihoods of the people living in and around the project area, specifically through losses of land, forest, NTFPs, and fish, problems of the quality and quantity of water, and infrastructure.[20] In addition to the impacts of losses of people's residential and farmland, the reservoir of the project will destroy up to 30,000ha of forest areas, including 10,000ha of private forest concession. It should be noted that the EIA does not talk much about the impacts on fishing and does not assess the value and prepare a costing item of compensation for the impacts on the communities living downstream who will be affected indirectly by the project over the reduction in fish catch.[21] People who will be affected directly and indirectly include many indigenous people who are vulnerable because at least people in 87 villages who live along the Sesan and the Srepok rivers and in the reservoir area will lose a lot of benefits from fishing resources.[22]



[19] http://www.internationalrivers.org/en/node/2970 (Searched website on April 05, 2011)
[20] Complete Environmental Impact Assessment Report, December 2009, Final Report "Lower Sesan 2 Hydropower Project"
[21]April 2012, Mark Grimsditch "Understanding New Threats and Challenges from Hydropower Development to Biodiversity and Community Rights in the 3S Rivers Basin".
[22] http://en.wikipedia.org/wiki/Lower_Se_San_2_Dam (Searched website on August 27, 2012)

The northeastern part of Cambodia has three main tributaries flowing into the Mekong river, namely the Sekong, Sesan and Srepok rivers, of which only two rivers, i.e., the Sesan and Srepok rivers are located in the Proposed Lower Sesan 2 Hydropower Dam in Sesan district, Stung Treng province. The Sesan and Srepok rivers shave their sources from Vietnam[23], and the Srepok river in Cambodia flows through the provinces of Rattanakiri, Mondulkiri, and Stung Treng where it flows into the Sesan river. The Sesan river flows into the Sekong river at the point where the Sekong river flows into the Mekong river.[24] The Sesan river is 462km long with a rain catchment area of 18,888km^2 and flows 252km long across Cambodia. The Srepok river is 520km long and has a rain catchment area of 30,942km^2 and flows through Cambodia for 245km. The two rivers are the main sources of water supply for people's livelihoods along the rivers.

3. Description of the Proposed Lower Sesan 2 Hydropower Dam

The proposed Lower Sesan 2 Hydropower Dam will be built in the Sesan district, Stung Treng province, on the Sesan river between the Pluk village and the confluence of the Sesan and Srepok rivers, situated 25km upstream of Stung Treng province. The main dam will be filled with compacted earth of 8km long, 83m high above sea level or about 40m high from the river bottom, and 8m wide. The power plant on the left bank will be equipped with 5 turbines, each of which has the power generation capacity of 80MW. The reservoir can stock 1.79 billion m^3 of water. The reservoir area is 335km^2 with a water level of 75m above sea level. This dam has a power generation capacity of 400MW with an average annual power supply of 1,953.9 million KW hours with a cost of US$816 million.[25]

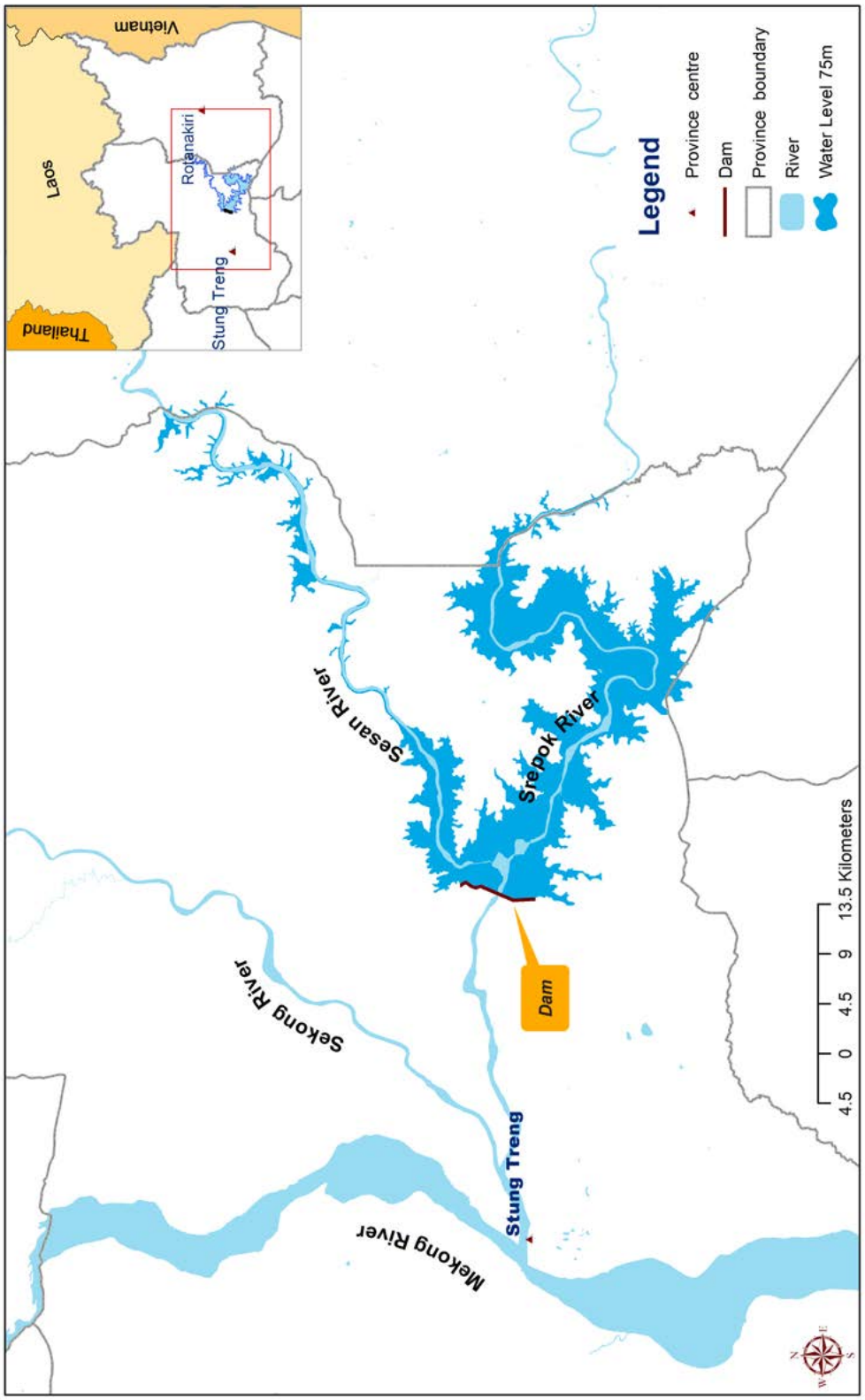
The Proposed Lower Sesan 2 Hydropower Dam is an investment joint venture between the Electricity of Vietnam accounting for 51% and the Royal Group in Cambodia - 49%[26], which was publicly announced in April 2011, with a company called the Cambodia-Vietnam Electricity Company starting operation in 2017.[27] It should be noted that the power generated will be whole sold at US$0.062 per KWH to the Electricité du Cambodge.[28] Fifty percent of the electricity generated will supply the local needs, while the other 50% will be

[23] http://www.worldfishcenter.org/resource_centre/WF_3136.pdf (Searched website on June 19, 2012)
[24] Peter Swift, March 2006 "Livelihoods in the Srepok River Basin in Cambodia: A Baseline Survey"
[25] Complete Environmental Impact Assessment Report, December 2009, Final Report "Lower Sesan 2 Hydropower Project"
[26] http://www.banktrack.org/show/dodgydeals/lower_sesan_2_hydropower_project (Searched website on November 20, 2011)
[27] http://khmernz.blogspot.com/2011/04/sesan-dam-to-proceed-this-year.html (Searched website on September 19, 2012)
[28] Complete Environmental Impact Assessment Report, December 2009, Final Report "Lower Sesan 2 Hydropower Project"

exported to Vietnam.[29] This proposed large-scale hydropower dam is a build-operate-transfer (BOT) project with an operation period of 30 years, employing about 3,000 workers. The dam is expected to have an operational life span of 100 years.

A complete EIA was prepared from January 2008 to July 2009 by Key Consultants Cambodia (KCC) under a contract from the Power Engineering Consulting Company 1 (PECC-1), which is a Vietnamese company. A memorandum of understanding (MOU) between the Electricity of Vietnam (EVN) and the Ministry of Industry, Mine, and Energy of Cambodia was signed in June 2007 authorizing the company (EVN) to conduct a feasibility study.[30]

[29] April 2012, Mark Grimsditch "Understanding New Threats and Challenges from Hydropower Development to Biodiversity and Community Rights in the 3SRivers Basin".
[30]Complete Environmental Impact Assessment Report, December 2009, Final Report "Lower Sesan 2 Hydropower Project"



Map 2 - Site of the Proposed Lower Sesan 2 Hydropower Dam

CHAPTER 2 - RESEARCH METHODOLOGY

Goal

The main purpose of this study is to seek to understand the current livelihood status of the people who will affected by the proposed Lower Sesan 2 Hydropower Dam and to present people's views and awareness on project, impacts, compensation and resettlement.

1. Research Phases

This research is divided into two phases, i.e., the baseline research and the final research. The report on baseline research shows only information during the stage when people have not resettled. The collection of information for the final research will be made 2-3 years after people moved to new places due to the construction of the proposed dam to make a comparison of livelihoods before and after resettlement.

2. Field visits before and during research

The research team conducted field visits to observe people's conditions, geographic situations, and to collect data on people in each target village, including informal inquiries with people, commune chiefs, and local organizations in the area from 21-24 March 2011 to get more ideas and comments to ensure that the research and questionnaire could collect comprehensive information. Further, during the data collection period from 29 April to 05 May 2011 with target groups in each village, the researchers also observed the general conditions in the villages and sought information on the conditions of people's livelihoods through informal/non-serious talks with some people who were not included in the study to serve as additional information for writing the report.

3. Pre-test the questionnaire

The questionnaires were trialed twice to assess its quality in collecting information. First, it was piloted by the researchers with staff in the same organization, and the second trial was done by data collectors with people who have similar situations like the target groups. Then, some questions were revised and improved to ensure people's easy understanding for information collection.

4. Selection of locations

Stung Treng and Rattanakiri provinces have joint borders and are situated in the northeast of Cambodia. Because the proposed Sesan 2 Hydropower Dam will be built in Sesan district, Stung Treng province, five communes, namely Pluk, Srekor, Talat, and Kbal Romeas in Sesan district, Stung Treng province, and Sre Angkrong commune in Koun Mom district, Rattanakiri province will be affected directly and indirectly by the dam. Therefore, the researchers selected 14 villages in those communes for the research (See Table and Map below).

Map 3 - Locations of villages/communes selected for the study

Table 1 - Villages/communes selected for the study

Province	**Stung Treng**				**Rattanakiri**
District	**Sesan**				**Koun Mom**
Commune	**Talat**	**Srekor**	**Pluk**	**Kbal Romeas**	**Sre Angkrong**
Village	1. Talat	1. Srekor Moi	1. Pluk	1. Krabei Chrum	1. Phum 1
	2. Rumpoat	2. Srekor Pie	-	2. Kbal Romeas	2. Phum 2
	3. Svay Rieng	-	-	3. Sre Sronok	3. Phum 3
	4. Khsach Thmey	-	-	4. Chrop	-

5. Selection of samples

The 2008 census report shows that Stung Treng and Rattanakiri provinces are provinces with many indigenous peoples living in there. As a result, the study incorporated indigenous peoples and general people who may be affected by the proposed Lower Sesan 2 Hydropower Dam development. To ensure that the number of selected respondents for the study was scientific and accurate, and can represent all people in the villages, the study made a calculation based on the formula in the following box.

Formula:[31]

$$n=N/1+Ne^2$$

$$\Rightarrow n=2110/1+2110 \times (0.05)^2 = \mathbf{336 \approx 340}$$

n = Sample size
N = Population size*
e = Margin of error

*N: in this study is represent of the total number of households in Table 2 below (Selected one member per household to interview).

According to the formula above, the number of people selected for interviews in each village is determined as follows:

[31] Yamane Formula 1967 or http://edis.ifas.ufl.edu/pd006 (Searched website on March 20, 2011)

Table 2 - Number of people selected in each village

N⁰	Commune Village	Total number of households		Number of households selected for the study		
		Number	%	Number	%	Number of village chiefs
Stung Treng Province						
1	**Talat commune**	**714**	**34**	**115**	**5.4**	**4**
1.1	Talat village	72	3	12	0.6	1
1.2	Rumpoat village	56	3	9	0.4	1
1.3	Svay Rieng village	276	13	44	2	1
1.4	Khsach Thmey village	310	15	50	2.4	1
2	**Srekor commune**	**341**	**16**	**55**	**2.6**	**2**
2.1	Srekor Moi village	176	8	28	1.3	1
2.2	Srekor Pie village	165	8	27	1.3	1
3	**Pluk commune**	**188**	**9**	**30**	**1.4**	**1**
3.1	Pluk village	188	9	30	1.4	1
4	**Kbal Romeas commune**	**506**	**24**	**82**	**3.9**	**4**
4.1	Krabei Chrum village	195	9	31	1.5	1
4.2	Kbal Romeas village	128	6	21	1	1
4.3	Sre Sronok village	123	6	20	0.9	1
4.4	Chrop village	60	3	10	0.5	1
Rattanakiri Province						
5	**Sre Angkrong commune**	**361**	**17**	**58**	**2.7**	**3**
5.1	Phum 1	105	5	17	0.8	1
5.2	Phum 2	131	6	21	1	1
5.3	Phum 3	125	6	20	0.9	1
Total		**2110**	**100%**	**340**	**16%**	**14**

(Source: Data is obtained from direct field data collection in each commune and village in 2011)

Table 3 - Target groups participating in the study

Target Groups	Number
1. Household semi-structured interviews	315
2. Key informant interviews (village chiefs/deputy village chiefs)	13
3. Focus Group discussions	5 groups x 5 (25)
Total	**353**

6. Data analysis

The study uses both qualitative and quantitative methodology to obtain information in figures and in-depth information on the topic. Qualitative information obtained from focus group discussions, key informant interviews, and household interviews was computerized.

Then the information was analytically ranked and written up as a report in a detailed, descriptive manner, in particular to express the respondents' views, feelings, and awareness. The quantitative data was codified, entered into the SPSS Data Entry Builder, and quantitatively analyzed using SPSS with Figures, tables, and data diagrams being prepared using Microsoft Office Excel. Both quantitative and qualitative information has been described in this report with extracts of key sentences or wording presented.

7. Scope and limitation of the study

Because the Lower Sesan 2 Hydropower Dam development project affects both Stung Treng and Rattanakiri provinces, the study focuses mainly on people who will be affected by the project, and thus will have to resettle. In particular, the study focuses mainly on the people's current livelihoods and awareness of information on the project impacts, compensation, and resettlement.

Information of the study will represent the voices and concerns of people in the 14 villages who will likely be affected by the proposed Lower Sesan 2 Hydropower Dam development, as indicated above, but the study does not intend to represent cases of other dam construction or research across the country. The information presented in this report is basic information for reflection and consideration by the general public to find solutions as well as seeking effective approaches to ensure that the development stray away from large-scale negative impacts on the people in general.

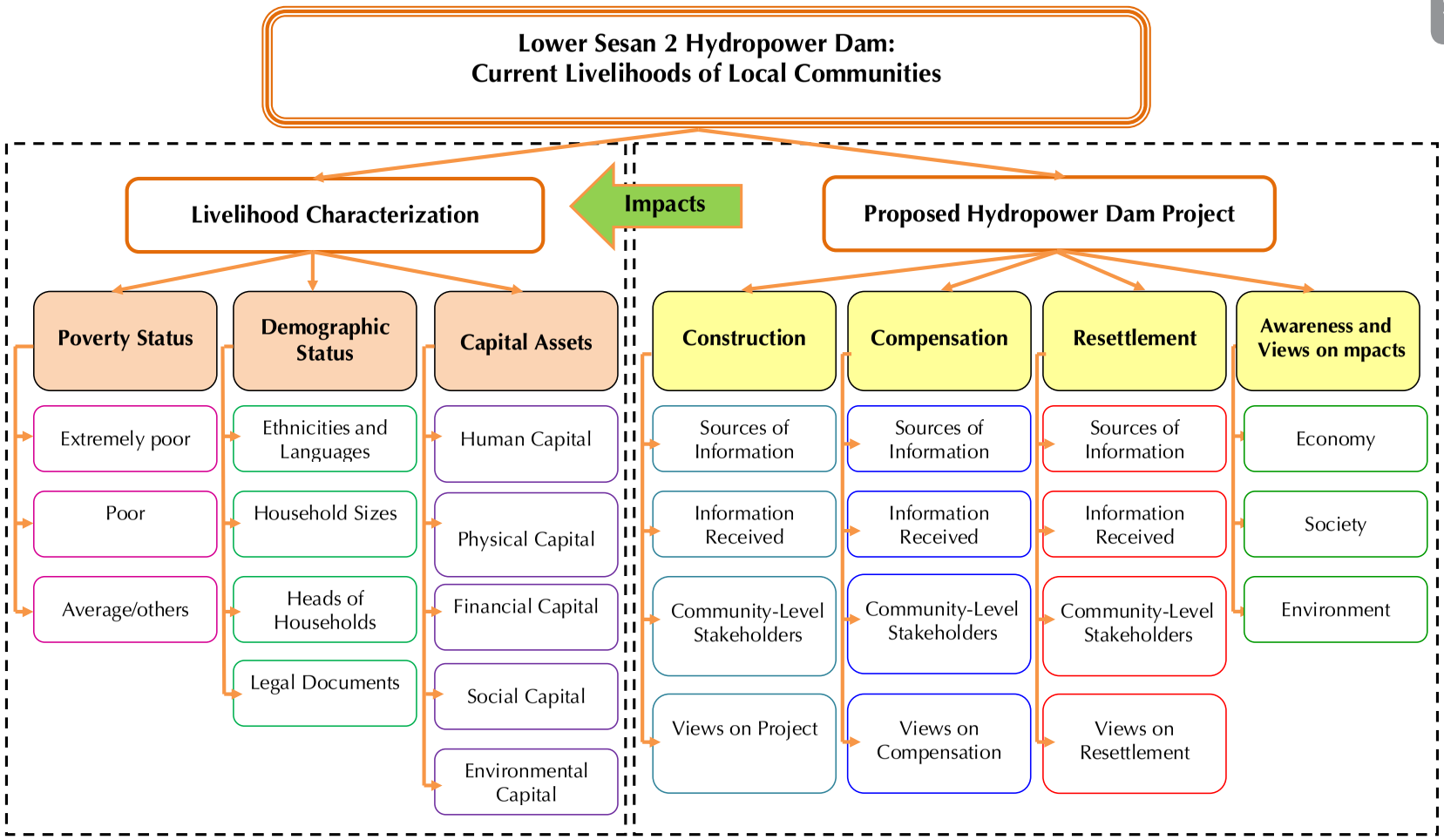
The study does not present a position against the government or any political parties. It is an independent study aimed at presenting actual information and suggestions that people have shared so that civil society organizations (CSOs), the government, and donors will have information or will hear their concerns, and thus will contribute to poverty reduction, strengthening sustainable development for Cambodia to progress further in a peaceful situation.

8. Literature Review

A lot of research documents and other important documents related to the topic were reviewed for this research. Those documents have their sources from local and international organizations and government agencies. Moreover,

some information and data, which are secondary data related to the topic in the form of research articles and informative documents used as reference in the study for data verification and confirmation, were gathered from various web pages.

9. Conceptual Framework



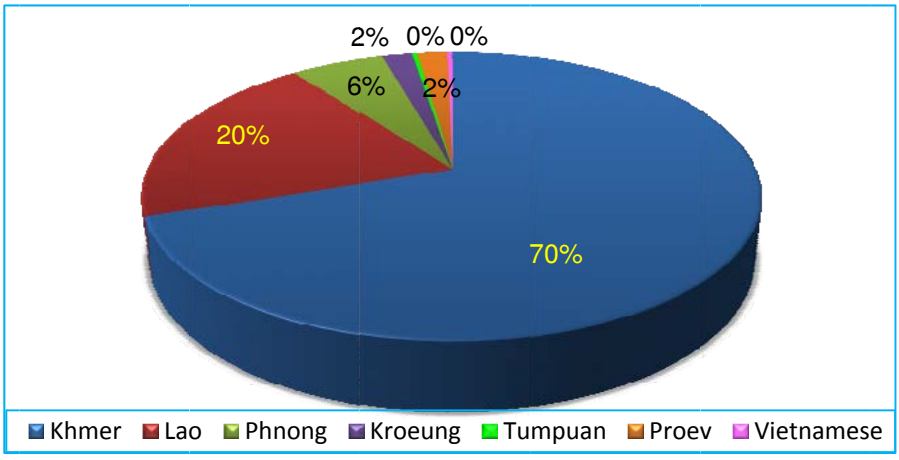
Demography

1. Ethnicities

The interviews of target households showed that among all the heads of households, 70% are Khmers, 20% Laotians, 6% Pnong, 2% Kroeng, and 2% Proev. For Vietnamese and Tumpuan is less than 1%, i.e., 0.6% for the two ethnicities. One main reason why there is a large proportion of the two main ethnic groups, Laotians and Khmer, living side by side is that most of the study area is situated near the Lao bolder. (See Figure 1)

The interviews with village chiefs and deputy village chiefs reveal that in Talat, Svay Rieng, and Khsach Thmey villages in Talat commune, Sesan district, Stung Treng province, and Phum 1, Phum 2 and Phum 3 in Sre Angkrong commune, Koun Mom district, Rattanakiri province, most people are Khmers. On the other hand, in Srekor Moi and Srekor Pie villages in Srekor commune, Pluk village in Pluk commune, and Krabei Chrum village in Kbal Romeas commune in Sesan district, Stung Treng province, most people are Laotians. In Kbal Romeas village in Kbal Romeas commune, most people are Pnong while in Rumpoat village in Talat commune, most people are Kroeng, and in Chrop village in Kbal Romeas commune, most people are Proev.

Figure 1 - Ethnicities



2. Language

Due to the ethnic diversity, languages of communication between communities are also diversified. Khmer, Lao, and indigenous languages are used for communication in the study areas. Lao is popular in daily use although the majority of the population in the study areas are Khmers. According to direct observation in target areas, older people in many villages in Sesan district, Stung Treng province can understand some Khmer, but not much, and they cannot speak Khmer. On the other hand, teenagers or children can understand Khmer well, but they use Lao or an indigenous language for daily communication in their respective villages.

3. Heads of households

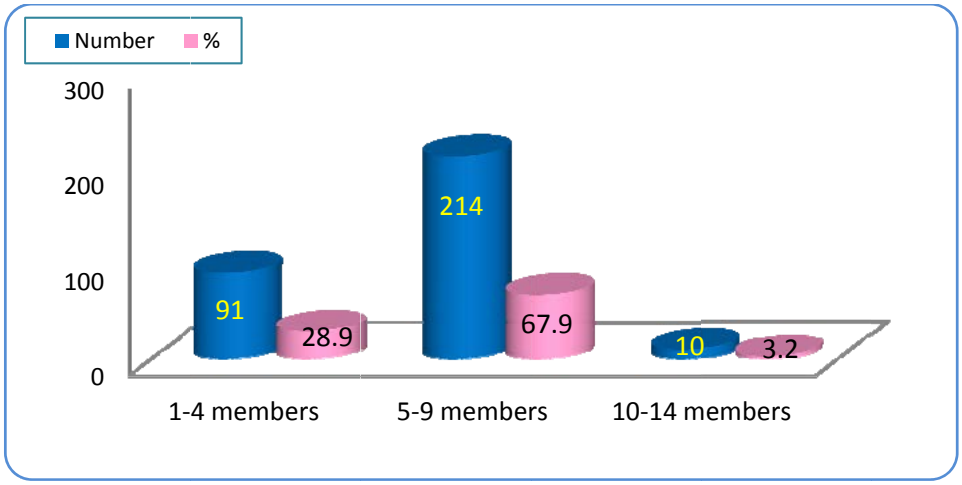
The 2009 Socio-Economic Survey shows that most heads of households are men, and there are very minimal female heads of households in rural areas.[32] Likewise, among the 315 target households participating in the study, there are more male heads of households than female ones; 87% of heads of households are men while only 13% heads of households are women. What is noteworthy is that of the 13% female heads of households 8% are widows.

4. Household size

The people in the study areas live in large extended families with many members living together, such as grand parents, children, children-in-law, and grand children forming large households. For some families, even uncles, aunts and nephews and nieces also live together. An average household has 5.58 members (about 6 members), and the majority of households, about 67.9%, have 5-9 members. (See Figure 2)

[32] National Institute of Statistics, Ministry of Planning "2009 Socio-Economic Study"

Figure 2 - Number of household members



5. Household legal documents (or supporting documents)

Understanding of the importance of personal documents to identify households among interviewees is mixed because some households do not have sufficient identity documents. Most identity documents held include Khmer identity cards, family books in larger numbers in comparison with residence books and applications for land occupation or sale/purchase contracts that were shown during interviews.

Lack of reference documents is not good for people, especially those who have settled down in the study areas. The study found that about one quarter of interviewees did not have Khmer identity cards and more than one quarter does not have family books. However, a small number of households failed to prepare legal documents for their identity because they were busy with farming/plantation. Some others lost or did not remember where they had kept the documents during interviews. This finding was confirmed to be correct by the village chiefs or deputy village chiefs who were tasked to coordinate the people in their villages to obtain identification. A lot of risks can occur in terms of losses of ownership on residential land because understanding of the importance of a legal application for land occupation is not clear. (See Table 4)

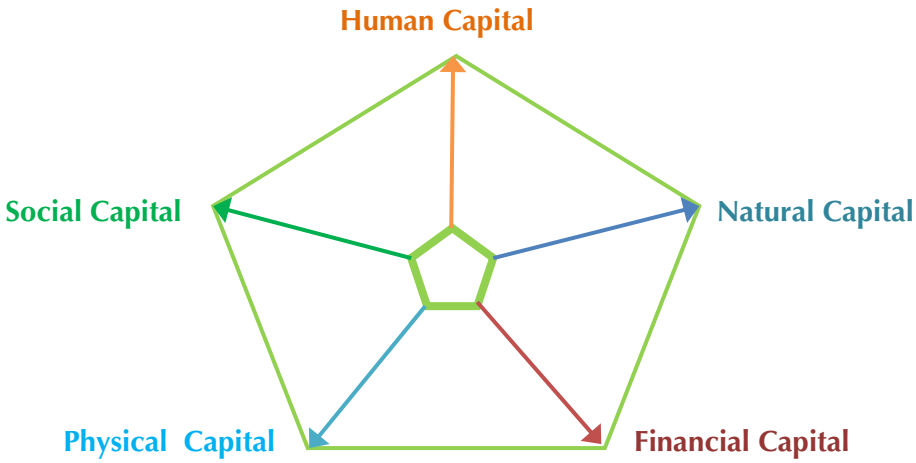
Table 4 - Types of household legal documents

Types of Legal Documents	Yes		No	
	Number	%	Number	%
Khmer identity cards	240	**76**	75	24
Family books	200	**63**	115	37
Residence books	98	**31**	217	69
Applications for land occupation	38	**12**	277	88

Livelihood Characterization

Key components of capital assets

Capital assets are divided into 5 main components, i.e., human capital, physical capital, financial capital, natural capital, and social capital.[33] These capitals are not only inter-related, but they are also basic needs for each person's daily livelihoods.



1. Human Capital

1.1. Education

1.1.1. Education of heads of households

Heads of target households participating in the study, on average, had completed only grade 3 (primary education). Heads of households who had primary education accounted for the highest percentage 50.40%, lower secondary education 10.10%, upper secondary education 4.40%, and those never attending schools accounted for 33.60%. This shows that knowledge and decisions in households could be a concern for some households.

According to the study, of the 13% women who are heads of households among the interviewees, only 6.30% have studied in primary schools while the other 6.30% have never been to schools. In contrast, of the 87% men being heads of households, 44.10% have studied in primary schools, 31% have enrolled in lower secondary schools, 13% have studied in upper secondary

[33] Oliver Serrat, Southeast Asia Department, Asian Development Bank "The Livelihoods Framework". Asset Pantegone, Scoones, 1998.

schools, other 4% have studied at pagodas, and interestingly 27% have never gone to schools. (See Table 5)

Table 5 - Education of heads of households

Education	Primary	Lower Secondary	Upper Secondary	Learning at pagodas	Never attended schools	Total
Female	20	1	1	0	20	**42**
	6.30%	0.30%	0.30%	0.00%	6.30%	**13.30%**
Male	139	31	13	4	86	**273**
	44.10%	9.80%	4.10%	1.30%	27.30%	**86.70%**
Total	159	32	14	4	106	**315**
	50.40%	**10.10%**	**4.40%**	**1.30%**	**33.60%**	**100%**

A comparison of education of male heads of households with that of female heads of households shows that female heads of households received lower education than men because approximately 47.6% of all female heads of households did not receive any education or never went to school while only 31.5% of male heads of households did not receive any education or never went to school. The comparison shows a 16% gap of education attainment between male and female heads of households. This data seems to be consistent with FAO documents which indicate that on average women receive less education than men by about 20%.[34] However, this gap may affect knowledge in female household heads' decision- making in their daily livelihoods.

1.1.2. Education of children

Distance from home to primary schools

In general, primary schools and pagodas are close to each other and there are primary schools in almost all villages in target areas under the study in 2011. According to the 2007 report of the Stung Treng provincial education department, there are 12 primary schools in the 5 communes selected for the study. Thanks to the numerous primary schools in each commune and in almost all the villages, the average distance between a primary school and a target household home is 1,119.8m or just over 1km. This distance is very favorable for children's learning.

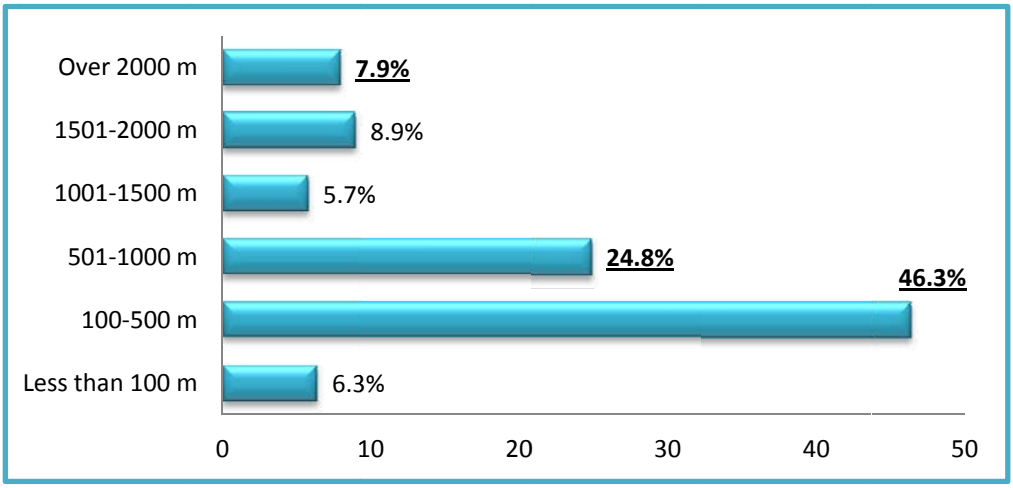
The figure below shows that 46.3% of households live within a distance of only 100-500m from home to school, and 24.8% live within 501-1,000m from home to school, which makes it easy for children to go to school. Besides, only

[34] www.fao.org/sd/WPdirect/WPre0106.htm (Searched website on May 9, 2012)

7.9% of households live far from school within a distance over 2,000m or over 2km, which makes it difficult for small children who have just reached the school age to go to school. (See Figure 3)

All interviewees, including people, village chiefs and focus group discussion believe that the distance to school is not a barrier for children in the area, i.e., it is convenient to have schools in the village or near the village. However, the distance can be an obstacle for children who follow their parents to distant farms/plantations during farming season, which requires they be far from schools. This barrier may make them fail to study or makes it impossible for them to go to schools.

Figure 3 - Distance from home to primary schools



School enrolment of children aged between 6-11

As primary schools are favorable for children's enrolment, approximately 70% of households among the 85% households who have children aged 6-11 (or 83% of 100% of all households with children aged 6-11) enrolled their young children who have reached school age in schools. Only 15% of the households did not enroll their school-aged children in schools. This statistic was confirmed to be correct through discussion with people in focus group discussions. (See Table 6)

The data across the country presented by UNDP in 2010 indicates that the rate of children's enrolment in primary schools is 94.8%.[35] Therefore, this study like data across the country shows that most people are aware about enroling their children who have reached school age in primary school.

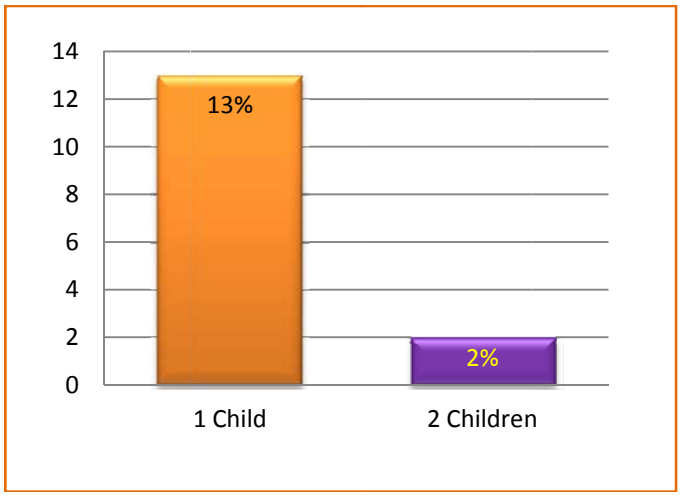
[35]UNDP, September 2010 «Current Status of Cambodian Millennium Development Goals (CMDG)» or http://www.un.org.kh/undp/media/files/pages/CMDG_current_status_19092010.pdf (Searched website on May 10, 2012)

Table 6 - School enrolment rate of children aged 6-11

Households with children aged 6-11	Number	%
Enrolled	222	70
Did not enroll	47	15
Did not have children within this age range	46	15
Total	**315**	**100**

The assessment made by village chiefs or deputy village chiefs suggests that the average rate of children's school enrolment was 66%. In this regard, 7 villages seemed to have the most robust children's school enrolment rate at 80%-90%. These villages were Chrop, Srekor Moi, Srekor Pie, Krabei Chrum, Khsach Thmey, Pluk in Sesan district, Stung Treng province and two villages in Koun Mom district, Rattanakiri province. School enrolment rate of other four villages, namely Svay Rieng, Rumpoat, Talat in Sesan district, Stung Treng province and three villages in Koun Mom district, Rattanakiri province is about 50%. The lowest children's school enrolment rate of about 30% was found in two villages – one in Koun Mom district, Rattanakiri province and Kbal Romeas village in Sesan district, Stung Treng province. At the same time, 13% of all the households with 1 school-aged child did not enrol, and another 2% had two school-aged children who did not enrol. (See Figure 4)

Figure 4 - Number of Children not enrolled



Barriers to school enrolment of children aged 6-11

Many factors, including road distance to schools (for children who follow their parents to farms/plantations far from home), lack of transport means to school, household's poverty, and households' demand for labor all influence children's school enrolment. The fifteen percent of households with school-aged children did not enrol their children based on one of the following reasons. (See Table 7)

This finding has also been agreed upon by the focus group discussion and in the interviews with village chiefs or deputy village chiefs who also took part in this study.

Table 7 - Barriers to school enrollment of children aged 6-11

Barriers to school enrolment	Number	%
Parents thought that their children were too young	17	33.3
Children did not want to go to schools themselves	13	25.5
School is far/no transport	6	11.8
Households cannot afford to support their children's study	6	11.8
Children help with housework or help look after younger siblings at home	5	9.8
Teachers were absent frequently	2	3.9
Children worked for others for wage or food	2	3.9
Total	**51**	**100**

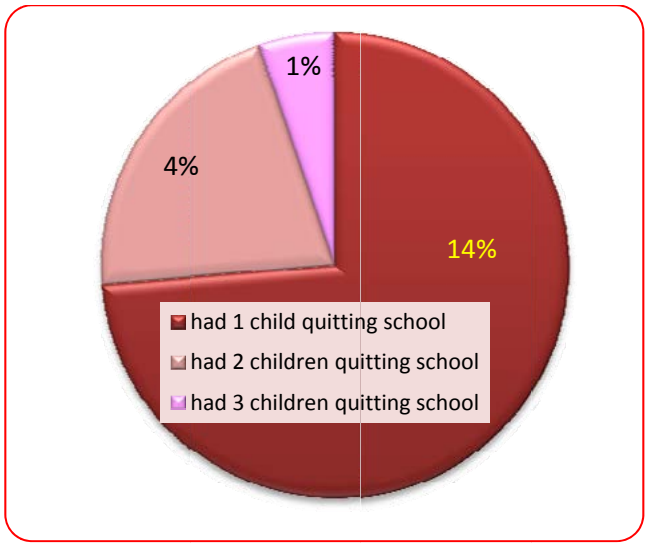
*Total number of respondents is 315

Number of children under aged 18 who quit schooling

Although there are numerous primary schools in the 5 communes in the study areas, the number of students who continued their study in lower secondary school and at a higher level is small. Generally, children abandoned their study when they completed grade 1-5 or primary school.[36] Of all the households, 75% had school-aged children under 18. It is noteworthy that children of 19% of the 75% households with school-aged children under 18 dropped out after they had started school. (See Figure 5)

[36]Complete Environmental Impact Assessment Report, December 2009, Final Report "Lower Sesan 2 Hydropower Project"

Figure 5 - Number of households that have children under aged 18 who quit schooling



Data obtained from discussions with village chiefs or deputy village chiefs showed that the highest rate of children under 18 who have started schooling but then dropped out is 50% of all children in two villages: 1) Sre Angkrong village, Koun Mom commune district, Rattanakiri province and Kbal Romeas village, Kbal Romeas commune, Sesan district, Stung Treng province. Then the rate of children who quit schooling is approximately 30% of all children in Talat and Khsach Thmey villages, Talat commune, Sesan district, Stung Treng province. Besides, the rate of drop-out children is around 10% in five villages, namely, Chrop village in Kbal Romeas commune, Svay Rieng village in Talat commune, Srekor Pie village in Srekor commune in Sesan district, Stung Treng province together with Phum 3 and Phum 2 in Sre Angkrong commune, Koun Mom district, Rattanakiri province. Another three villages, namely Rumpoat village in Talat commune, Pluk village in Pluk commune and Krabei Chrum village in Kbal Romeas commune in Sesan district, Stung Treng province, have only a few children who quit schooling at a rate of about 5%. Besides the villages described above, only Srekor Moi village did not affirm the percentage of children who quit schooling. There was only a statement that a lot of children had quit schooling.

Factors contributing to children under aged 18 quitting schooling

A review of students' school drop-out status was also included in this study. Factors discussed include transport to school, money to support schooling, income generation to help support daily livelihoods, time to help housework including looking after younger siblings so that parents can work in the

farms/plantations, or health status. These causes were also found by the complete Environmental Impact Assessment Report of the proposed Lower Sesan 2 Hydropower Dam. (See Table 8)

However, the focus group discussion seemed to explain some differences with respondents above. The focus group discussion indicated that teachers did not come to school regularly, but they also agreed with the problems of poor livelihoods that force children to help with housework and farms/plantations to address household livelihoods. They also recognized that some children were too lazy to go to school themselves *"Poor livelihoods; children help generate income by going into the forest and fishing, but their parents didn't encourage them to go to school. I think if the children have some knowledge, in the future they can support themselves."*

The village chiefs or deputy village chiefs of the target villages said that children had to quit schooling because parents did not pay attention to encouraging them to go to school. Some households need child labor to help with household livelihoods. Some children were too lazy to go to school and could not study themselves, and in particular, the teachers did not teach regularly *"About 30% of children who had already started school quit schooling because they did not understand the importance of study. They like to play around and their parents did not encourage them to go to school; and the teachers were absent frequently, so some children became too lazy to come to school."*

Table 8 - Reasons for quitting schooling by children under aged 18

Reasons for quitting schools	Number	%
Parents could not afford to support the schooling	16	**20.8**
Children help with housework or help look after younger siblings	16	**20.8**
Children did not want to go to school themselves	12	**15.6**
School is far/no transport (for children who followed their parents to farms/plantations far from home)	11	14.3
Children worked for wage or food	11	14.3
Teachers were absent frequently	9	11.7
Children got married early	1	1.3
Children were seriously sick	1	1.3
Total	**77**	**100**

*Total number of respondents 315

Encouragement and dissemination of education in villages

The information provided by the village chiefs and deputy village chiefs in the target villages suggests that education dissemination or encouragement of children to enroll in schools is carried out by village/commune authorities through inviting people to meetings to encourage parents to send their children to schools *"In this village, a lot of encouragement and awareness raising for children to go to school has been made by various organizations, and the village authority also carries out awareness raising in monthly meetings and in socials events in the village. The village authority also has a home awareness raising group too."*

1.2. Health

Health Centers

According to group discussions with people in the target villages, it is found that all the villages did not have a health center except for only two health posts[37] in the 14 villages. Discussions in the 5 villages suggests that Krabei Chrum and Khsach Thmey villages are about 30km from the health center, Srekor Moi village is 20km from a health center, Pluk village is 8km from a health center, and Phum 2 is only half a kilometer from a health post. Home interviews of target households show that it was difficult for people to access services at a health center because a health center is generally far from the village with an average distance of 21,684m or about 21km. This distance is about the same as that confirmed by the village chiefs or deputy village chiefs who said that a health center on average is 17km from the villages.

Generally, health centers in rural areas do not provide treatment services for serious illnesses, they provide more preventive or vaccination services. At a health center, there are treatment services for illnesses, such as malaria, tuberculosis, fever, injuries, birth control, birth delivery, pregnancy examination, diarrhea, vomiting, blood examination, vaccination, and referral to provincial hospitals.

Other health services besides health centers in the areas

Group discussions show that the services provided to the people in the areas include village physicians who provide treatment services for simple illnesses and sell medicine, but they are not physicians recognized by the Ministry of Health or the provincial department of health. Services in the areas

[37] A health post is a place providing health services in the village on a smaller scale than that of a health center. Health posts provide primary health services (e.g. giving vaccination, some tablets, and provide counseling, etc.) to villagers who live far from a health center; in general, a health post has one person to provide health services.

consist of treatment of malaria, typhoid, diarrhea, headache, stomach- ache, home-based treatment (physicians providing injections at home). In addition, there are vaccinations, birth control services, pregnancy examinations, and some other general treatment services.

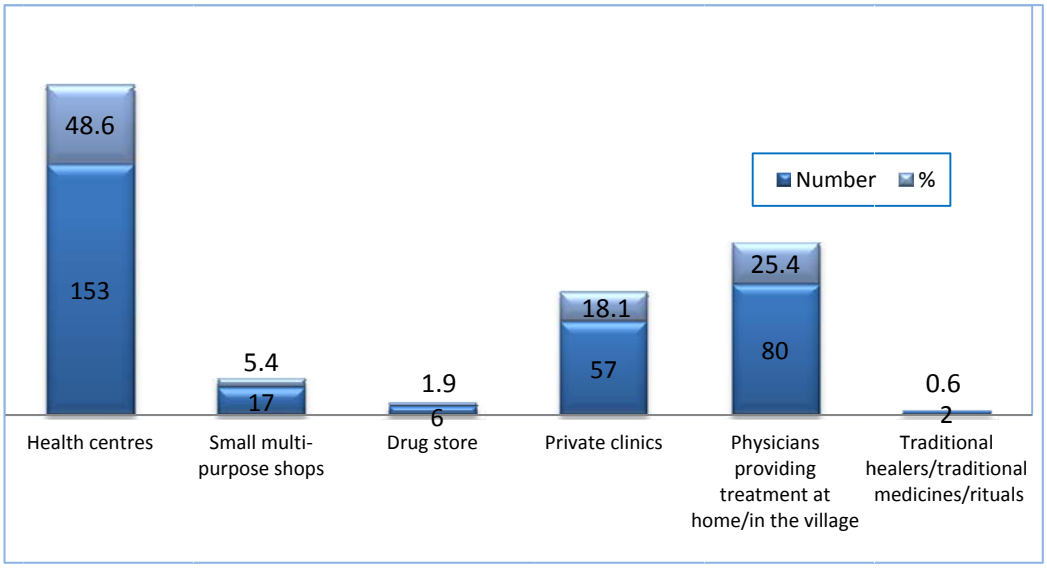
Health treatment services that people frequently use

Most people or 48.6% sought treatment services at a health center frequently, 25.4% sought village physicians' or home-based physicians' treatment services, 18.1% sought treatment services at private clinics, 5.4% bought medicine at small multi-purpose shops in the villages, and 1.9% bought medicine from drug stores for treatment. (See Figure 6)

According to information from village chiefs or deputy village chiefs, 61% of people in the areas sought health services at health centers, 8% sought services at private clinics, 8% bought medicine at small multi-purpose shops, 8% sought services from traditional healers/traditional medicine/offering rituals, and another 15% sought home-based treatment services from village physicians.

In general, villagers have treatment by buying medicine at drug stores; and if they do not get better, then they would ask village physicians to give home-based treatment; and if such treatment is still ineffective, they would be sent to the provincial hospital. Besides, two participants in the study said that a small number of people sought treatment through offering rituals; and when the illness remained, then they would go to see private physicians to buy medicine; and the medicine bought did not help them recover, then they would seek treatment services a health center.

Figure 6 - Treatment services that people used frequently



It should be noted that in Krabei Chrum village, Kbal Romeas commune, Sesan district, Stung Treng province, people sought treatment services at the health center "O'Plung" in Sre Angkrong commune, Koun Mom district, Rattanakiri province, because it is closer than going to Stung Treng province. Use of health services in each village is shown in the Table below. (See Table 9)

People think that treatment at a public health service is not as fast as that of a private clinic, but the treatment at a private clinic costs more *"The hospital does not provide 24-hour services. For example, I had fever, and went to the health post at 7 am. It was closed, so I came back home, and then went there again at 10 am, the post was still closed (it was not open). Then in the afternoon, I went there again and again it was closed (it was not open). Illnesses don't wait .... I went to the health post, and the physician was not there, so I sold my chicken/ducks to go to a private clinic ...."*

Table 9 - Use of health services in each village

Village Name	Health Center	Multi-purpose shops	Drug Stores	Private Clinic	Physicians providing treatment at home/in village	Traditional medicine/traditional healers/ offering rituals	Total
Talat	2	2	-	5	3	-	12
Rumpoat	-	-	-	4	3	2	9
Svay Rieng	13	11	-	9	12	-	45
Khsach Thmey	17	2	-	11	15	-	45
Srekor Moi	15	-	2	-	5	-	22
Srekor Pie	6	-	-	10	11	-	27
Pluk	19	1	-	3	2	-	25
Krabei Chrum	10	-	1	4	10	-	25
Kbal Romeas	8	1	1	-	12	-	22
Sre Sronok	12	-	1	5	2	-	20
Chrop	8	-	-	1	1	-	10
Phum 1	15	-	-	1	1	-	17
Phum 2	10	-	-	4	2	-	16
Phum 3	18	-	1	-	1	-	20
Total	153	17	6	57	80	2	315

Reasons for choosing one type of health service more frequently

The Table below shows that people chose treatment services from health center more because 26% of them considered that the service of a health center is effective, 24.4% thought that the health center was closer to home that other services, 17.5% thought that the treatment service was inexpensive or charged less money, 15.6% think that the service was good (friendly service providers, fast service) and there are some other reasons as shown in the Table below.

The second most frequent treatment service that people used was the service provided by village or home-based physicians. Twenty-one percent said it was because the physicians were readily available in the village or were close to the village, which made it easy to access, 12.1% said because the illness was not serious (e.g., headache, stomach ache, cold, diarrhea) and there were other reasons as shown in the table below.

Of the people most frequently choosing the treatment service at private clinics, 12.7% thought that the service was good (friendly service providers, fast service), 11.4% thought that treatment service was effective, and there were other reasons as shown in the Table below.

Next, 3.8% chose to seek treatment services by buying medicine from small multi-purpose shops in the village because the illness was not serious (e.g., headache, stomach ache, cold, diarrhea), 3.8% because the medicine shop was close to home, 2.2% because it cost less, and there were other reasons as shown in the Table below.

Among the people who chose treatment by buying medicine at drug stores, 1.6% said it was effective for treatment, 1.3% said the service was good (friendly service providers, fast service)and there were other reasons as shown in the Table below. It is noteworthy that those people who believed in traditional treatment or treatment by offering rituals said that such treatment was effective and it was their ancestral practice. (See Table 10)

In Krabei Chrum village, Kbal Romeas commune, Sesan district, Stung Treng province, the services by village medicine shops, health centers, and village physicians were all effective for treatment, but village physicians and health centers treated only minor illnesses. When there were serious illnesses, treatment was sought at the provincial hospital. In Pluk village in Pluk commune, Sesan district, Stung Treng province and Phum 2 in Sre Angkrong commune, Koun Mom district, Rattanakiri province, people believed that all the treatment services provided had reduced people's illnesses in the areas. Health center physicians collaborated with Pluk and Sre Angkrong commune physicians to raise health awareness for people in the villages, so people learned about hygiene and how to protect themselves from diseases, such as malaria *"When physicians from the upper level came to teach people about health, we see that there is a reduction in people's illnesses and they grow vegetable around their homes without using chemicals."*

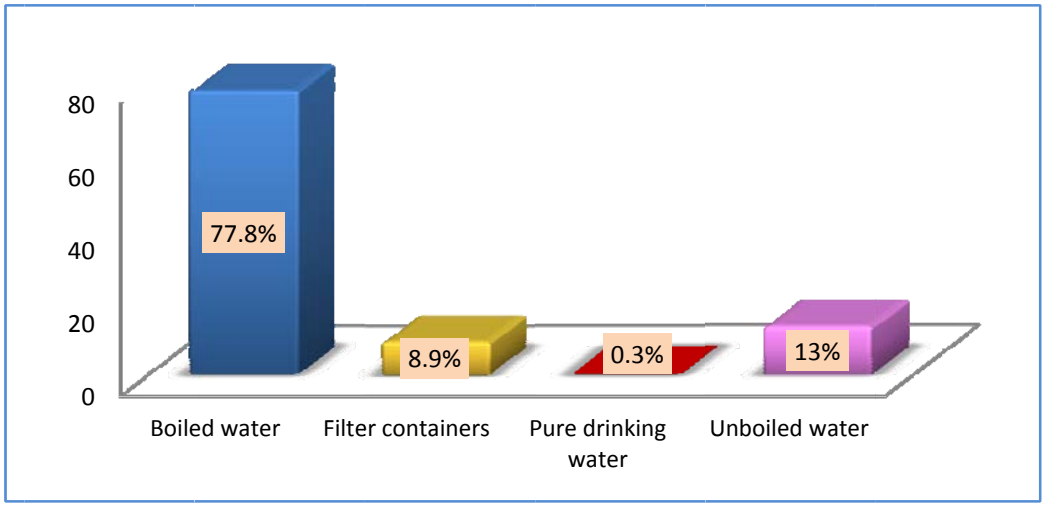
Table 10 - Reasons for frequently choosing one types of treatment services

Reasons	Health Center	Multi-Purpose Shops	Drug Stores	Private Clinics	Village/Home-based Physicians	Traditional treatment/ Traditional Healers/ offering rituals
Effective (recovery)	82	0	5	36	17	1
	26 %	0 %	1.6 %	11.4 %	5.4 %	0.3 %
Treatment service was inexpensive / spent less	55	7	1	2	18	0
	17.5 %	2.2 %	0.3 %	0.6 %	5.7 %	0 %
Did not know other treatment places	6	2	0	3	5	0
	1.9 %	0.6 %	0 %	1 %	1.6 %	0 %
Good service	49	0	4	40	17	1
	15.6 %	0 %	1.3 %	12.7 %	5.4 %	0.3 %
Treatment service was close to home	77	12	0	14	66	0
	24.4 %	3.8 %	0 %	4.4 %	21 %	0 %
Illness was not serious	28	12	0	7	38	1
	8.9 %	3.8 %	0 %	2.2 %	12.1 %	0.3 %
There was no health center in the village	2	1	0	0	0	0
	0.6 %	0.6 %	0 %	0 %	0 %	0 %
There was awareness raising	2	0	0	0	0	0
	0.6 %	0 %	0 %	0 %	0 %	0 %
Easy access roads	3	0	0	0	0	0
	1 %	0 %	0 %	0 %	0 %	0 %
Ancestral beliefs	0	0	0	0	0	1
	0 %	0 %	0 %	0 %	0 %	0.3 %
Serious illnesses	1	0	0	0	0	0
	0.3 %	0 %	0 %	0 %	0 %	0 %
Total/315	**153**	**17**	**6**	**57**	**80**	**2**

Clean drinking water

The study suggests that most people or 78% boiled water for drinking in their households, 8.9% used filter containers for drinking water, only 0.3% or one household bought drinking water produced in the area for daily consumption. This shows that most people or 87% understood water hygiene for household consumption, which can prevent some illnesses. In particular, knowledge on household hygiene was also educated by commune physicians in some villages. On the other hand, about 13% of the people did not boil or filter the water for household daily consumption, i.e., they drank unboiled water as a habit. (See Figure7)

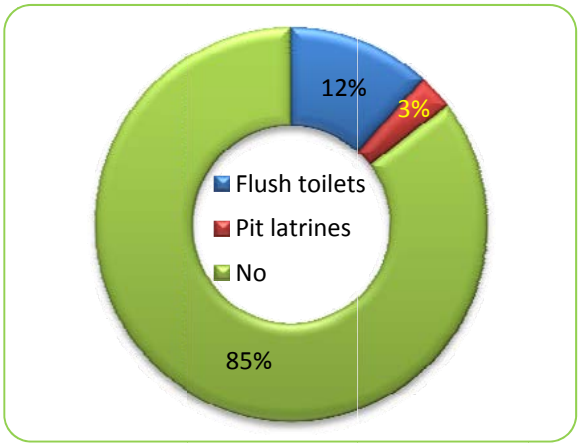
Figure 7 - Water hygiene for household consumption



Toilets

Generally, most people in rural areas do not have toilets because they are used to not using toilets; they relieve themselves in the forest near their homes, or in the water, or by digging/burying. They do not understand toilet use. The research conducted with the people in the target villages shows that only 15% of people had toilets, including 12% flush toilets, and 3% pit latrines. On the other hand, up to 85% of the people did not have toilets for use in their households. It is noteworthy that in the study, of the 14 villages, two villages - Talat and Rumpoat villages in Talat commune, Sesan district, Stung Treng province, not a single target household who responded to interviews had any toilet. Whereas in another four villages, namely Kbal Romeas, Sre Sronok, and Chrop villages in Kbal Romeas commune, Sesan district, Stung Treng province and Phum 3 in Sre Angkrong commune, Koun Mom district, Rattanakiri province, only one respondent from each of the villages said their households had toilets. (See Figure 8)

Figure 8 - Types of toilets



According to the assessment by the village chiefs or deputy village chiefs, people in Phum 1 in Sre Angkrong commune, Koun Mom district, Rattanakiri province could afford to build toilets more than others. Statistics shows that 250 households had toilets. Next are people in Srekor Moi village in Srekor commune, Sesan district, Stung Treng province, where 90 toilets were used. The reason for rural people not to use toilets is because they like to live according to their customs passed down from one generation to another, and because some households cannot afford to build toilets. For those households with toilets, the construction costs are different based on the types of toilets. However, the construction cost does not seem to be too high because some organizations (e.g., the Red Cross, remembered by one respondent) have provided some assistance for building household toilets. Some other households spend only on materials for household members build the toilets themselves. (See Table 11)

Table 11 – Cost of toilet building

Cost	Pit Latrines	%	Water Flush Toilets	%	Total
Less than 10,000 Riels	2	0.7	7	2.3	**9**
10,000-69,900 Riels	6	2	8	2.6	**14**
70,000-129,900 Riels	-	-	2	0.7	**2**
130,000-189,900 Riels	-	-	1	0.3	**1**
190,000-249,900 Riels	-	-	2	0.7	**2**
400,000 Riels-over	1	0.3	17	5.4	**18**
Total	**9**	**3**	**37**	**12**	**46**

*Total number of respondents is 315

1.3. Security in the village

Security is one of the problems noticed in this study. 53% of the people said that there are security problems in their villages while other 47% said there

were no security problems in the villages. According to the people and village authorities, security problems were identified on some activities, including gang fights when there were social functions, theft, robbery, rapes, and domestic violence. The households said most of security problems occurred in Khsach Thmey village in Talat commune and Krabei Chrum village in Kbal Romeas commune in Sesan district, Stung Treng province. The villages with least security problems were Chrop village in Kbal Romeas commune, Sesan district, Stung Treng province and Phum 2 in Sre Angkrong commune, Koun Mom district, Rattanakiri province.

The village chiefs and deputy village chiefs who took part in the study shared their comments related to security problems in their villages. Of these village chiefs and deputy village chiefs, 5 were from Srekor Moi and Srekor Pie villages in Srekor commune, Krabei Chrum and Kbal Romeas villages in Kbal Romeas commune, Sesan district, Stung Treng province and Phum 2 in Sre Angkrong commune, Koun Mom district, Rattanakiri province. They said there were no security problems in their villages that disrupted people's livelihoods because some villages had their own security groups and there were policemen for social functions.

On the other hand, other eight village chiefs and deputy village chiefs from Rumpoat, Svay Rieng, Talat, and Khsach Thmey in Talat commune, Pluk village in Pluk commune, Chrop village in Kbal Romeas commune in Sesan district, Stung Treng province and Phum 1, Phum 3 in Sre Angkrong commune, Koun Mom district, Rattanakiri province indicated that their villages faced security problems, such as drunk gangsters fighting when there were social functions, drinking, domestic violence, people from outside their villages stealing to cut down community trees, to shoot cows/buffaloes and stealing villagers' cows/buffaloes, conflicts between villagers and economic land concessionaires because the companies encroached on villagers' land and fishing offences. *"When there are dancing functions, young people drink and then fight .... There is a few domestic violence because of drinking and unemployment ... People in this village have lost their cows/buffaloes because of thievery for the people let their cows/buffaloes roam freely (raising animals by letting them roam freely"*.

Enquiries of people in target households show that 41% said that in their villages they had organized groups with participation from people in the villages and village chiefs and deputy village chiefs to ensure security in the villages (these groups were formed by the people in the villages and village chiefs/deputy village chiefs to ensure security when there were social functions with dancing and to preserve safety in the villages against thieves, youngsters, and violence, but no commissions were established). People in 2 villages, i.e., Pluk village in Pluk commune and Krabei Chrum village in Kbal Romeas commune, Sesan district, Stung Treng province said that their villages had large security groups. Whereas another 59% said that there was no organization of groups to preserve

security in their villages. Seven villages had organized groups to preserve security in the villages, namely Pluk village in Pluk commune, Svay Rieng and Talat villages in Talat commune, Krabei Chrum, Kbal Romeas and Chrop villages in Kbal Romeas commune, Sesan district, Stung Treng province and Phum 1 in Sre Angkrong commune, Koun Mom district, Rattanakiri province. It is noteworthy that among the seven villages, some villages were assisted by police to deal with problems while in some other villages the village chiefs/deputy village chiefs helped deal with security problems when they arose. As the experience for one village among all the villages, one deputy village chief said: *"In the village there is a gender commission, village commission and elders in the village to deal with households that use violence; the households are asked to put a thumb print to promise not to use any more violence. Such solution is always effective"*.

2. Physical Capital

2.1. Land Ownership

2.1.1. Laws related to land ownership

The Cambodian 2001 Land Law stipulates a number of rights to people's legal land ownership. Chapter 4, Article 38 stipulates that in order to transform into ownership of immovable assets, the possession shall be unambiguous, non-violent, notorious to the public, continuous and in good faith. Whereas Chapter 1, Article 6, stipulates that only legal possession can lead to ownership, and Article 5 states that no person may be deprived of his/her ownership, unless it is in the public interest. An ownership deprivation shall be carried out in accordance with the forms and procedures provided by law and regulations and after the payment of fair and just compensation in advance.

Further, because this study had the participation of indigenous people, there were discussions concerning their ownership of immoveable assets as stated under Article 23 of the Land Law, which states that an indigenous community is a group of people that resides in the territory of the Kingdom of Cambodia whose members manifest ethnic, social, cultural and economic unity and who practice a traditional lifestyle, and who cultivate the lands in their possession and according to customary rules of collective use. While waiting for the legal determination of the community statue, besides the Land Law, the right to ownership is protected by the 2008 Constitution of the Kingdom of Cambodia, in which Article 44 states that all persons, individually or collectively, shall have the right to own assets. Only natural persons or legal entities of Khmer nationality shall have the right to own land.

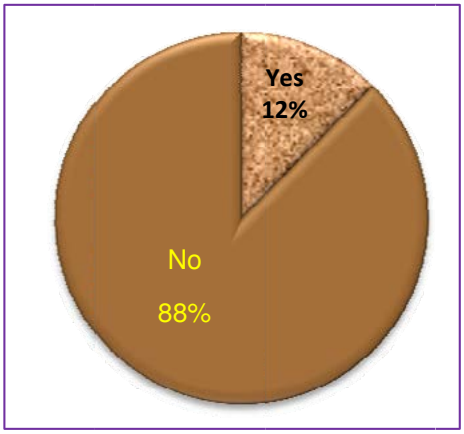
According to a number of Articles of the Land Law and the Constitution of the Kingdom of Cambodia as shown above, people who are living in target

areas of the study have the right to be legal owners of the land they are living on because all of them have been living there for a long time and continuously on their ancestral land, which is not State public land without conflicts, and especially before 2001.

2.1.2. Residential land ownership

In Stung Treng and Rattanakiri province, the target areas of this study, systematic land registration has not been started yet.[38] As a result, only 12% of households had applications for land occupation (receipts recognizing the right to land occupation) at village/commune level or sale-purchase contracts. For the other 88%, land occupation has no papers to certify ownership of their land. Further, people think that currently they live on the land owned from their ancestors for a long time, so they have legal ownership over the land although they do not have papers or documents. (See Figure 9)

Figure 9 - Number of households that have receipts or contracts certifying the right to land



2.1.3. Land ownership and sizes of land ownership besides residential land

The data obtained from households in the 14 target villages shows that 92.1% of the population had farmland, 57.8% had plantation land, 25.4% had forest land, 8.3% had vacant, unused, uncultivated land, and 3.5% had no other land other than residential land.[39] Likewise, the Table below shows that besides residential land, most households equal to 38% had farmland and plantation

[38] Newsletter of the Land Administration Sub-Sector Program, Issue No. 2 "Land Is Life", November 2011.

[39] The percentage of each land types that the people had compared with 100 percent (e.g., the percentage of the people who have farmland is 92.1%; the percentage of people who had plantation land is 57.8%.

land, 25% had only farmland, 11% had farmland, plantation and forest land, 10% had both farmland and forest land. In particular, about 67% of people participating in the study had more than one type of land other than residential land. (See Table 12)

Most people had farmland/plantation land to grow crops because their livelihoods relied almost completely on agriculture with rice being the main crop. For those people who did not have farmland/plantation land, their occupations included working as paid laborers, micro-business, fishing, collecting NTFPs, which differ from farm/plantation work.

Table 12 - Types of land ownership besides residential land

Types of land ownership besides residential land	**Number**	%
1. Had only farmland	79	**25**
2. Had only plantation land	8	3
3. Had only forest land	3	1
4. Had no land other than residential land	11	4
5. Had farmland and plantation land	119	**38**
6. Had farmland and forest land	30	**10**
7. Had plantation land and forest land	3	1
8. Had farmland and vacant, unused land	5	1
9. Had farmland, plantation land and forest land	35	**11**
10. Had farmland, plantation land and vacant, unused land	13	4
11. Had farmland, forest land and vacant, unused land	4	1
12. Had farmland, plantation land, forest land and vacant, unused land	4	1
Total	**315**	**100**

For land ownership other than residential land, 42.6% of the population had 1.50 ha or less, 43.8% had 2-3.50 ha, 9.9% had 4-5.50 ha, 2.2% had 6-7, 50 ha, and 1.6% had 8 ha or above among 100% population. Besides, 11 households or 3.5% had no land other than residential land. According to the Table below, of the 92.1% of the people who had farmland, 41.6% had 2-3.5 ha of land, and 38.4% had 1.5 ha of farmland or less. Among the 57.8% of the people who had plantation land, 27% had 1.5 ha of plantation land or less, 23.1% had 2-3.5 ha of plantation land. (See Table 13)

Table 13 - Size of land ownership other than residential land

Land Size	Farmland		Plantation Land		Forest Land		Vacant, Unused Land		No Land	
(ha)	%	Number	%	Number	%	Number	%	Number	%	Number
0 ha or no	-	-	-	-	-	-	-	-	3.5	11
1.5ha or less	38.4	121	27	85	10.1	32	2.5	8	-	-
2-3.5 ha	41.6	131	23.1	73	11.1	35	4.4	14	-	-
4-5.5 ha	8.3	26	6	19	2.9	9	1	3	-	-
6-7.5 ha	2.2	7	1.3	4	0.6	2	-	-	-	-
8 ha or over	1.6	5	0.3	1	0.6	2	0.3	1	-	-
Total	**92.1**	**290**	**57.8**	**182**	**25.4**	**80**	**8.3**	**26**	**3.5**	**11**

*Total number of respondents is 315.

2.2. Houses

2.2.1. House ownership

The respondents living in the target villages in the study said that they all lived in their own houses, or some households lived in the houses of their own parents because they lived as large extended families with many family members living together; no families lived in rented or other people's houses.

2.2.2. Types of houses

Generally, people in rural areas of Cambodia build houses from wood with zinc sheet rooves or leaves depending on their livelihoods. The most popular and most common houses in the target areas of the study are wooden houses with zinc sheet roofs, wooden, wooden sheet, or zinc sheet walls, and wooden floor; such houses accounted for 65.4%. The reason for such houses to be more popular is because the study areas are forested, so wood is not as expensive as in urban or non-forested areas. The zinc sheets for rooves are also cheaper than tiles or fiber cement, so wooden houses with zinc sheet rooves are the type of houses affordable for people's livelihoods in the study areas. Other types of houses were in about the same percentage ranges in small numbers. Those were house with roofs made from straw, leaves, rubber sheets, plastic sheets, black rubber sheets, or other light materials, which are not strong, with walls made from small trees, bamboo, straw, leaves, or other light materials, and with floors made from bamboo; there were 9.5% of such houses. There were houses with rooves made from zinc sheets, walls made from small trees, bamboo, straw, leaves, or other light materials, and with floors made from bamboo; there were 8.6% of such houses. (See Table 14)

Table 14 - Types of houses

Rooves	Walls	Floors	Talat	Rumpoat	Svay Rieng	Khsach Thmey	Srekor Moi	Srekor Pie	Pluk	Krabei Chrum	Kbal Romeas	Sre Sronok	Chrop	Phum 1	Phum 2	Phum 3	Total	
																	#	%
Tile, concrete, fiber cement	wood, plank, wooden sheet, or Zinc sheet	Wooden floor	-	-	2	-	1	-	-	1	-	-	-	-	-	1	**5**	**1.6**
Zinc sheet	wood, plank, wooden sheet, or Zinc sheet	Ground as floor (no floor)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	**1**	**0.3**
Zinc sheet	wood, plank, wooden sheet, or Zinc sheet	Wooden floor	10	7	24	37	18	24	15	16	10	7	7	8	10	13	**206**	**65.4**
Zinc sheet	wood, plank, wooden sheet, or Zinc sheet	Bamboo floor	-	-	4	2	-	-	1	-	1	-	-	2	2	-	**12**	**3.8**
Zinc sheet	wood, plank, wooden sheet, or zinc sheet	concrete/tile	-	-	-	-	-	-	1	2	-	-	-	-	-	-	**3**	**1.0**
Zinc sheet	small trees, bamboo, straw, leaves or other light materials	Wooden floor	-	-	-	1	2	1	4	1	1	6	-	4	1	1	**22**	**7.0**
Zinc sheet	small trees, bamboo, straw, leaves or other light materials	Bamboo floor	-	-	6	4	2	2	2	1	4	-	-	2	2	2	**27**	**8.6**
straw, leaves, Rubber sheet, plastic sheet, black rubber sheet or other light materials	wood, plank, wooden sheet, or Zinc sheet	Ground as floor (no floor)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	**1**	**0.3**
straw, leaves, Rubber sheet, plastic sheet, black rubber sheet or other light materials	wood, plan, wooden sheet, or zinc sheet	Wooden floor	1	-	-	-	-	-	-	-	-	1	2	-	-	-	**4**	**1.3**
straw, leaves, Rubber sheet, plastic sheet, black rubber sheet or other light materials-	Wood, plank, wooden sheet, or zinc sheet	Bamboo floor	-	-	-	-	-	-	-	-	1	-	-	-	-	-	**1**	**0.3**
straw, leaves, rubber sheet, plastic sheet, black rubber sheet or other light materials	Small trees, bamboo, straw, leaves or other light materials	Ground as floor (no floor)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	**1**	**0.3**
Straw, leaves Rubber sheet, plastic sheet, black rubber sheet or other light materials	Small trees, bamboo, straw, leaves or other light materials	Wooden floor	-	-	-	-	-	-	-	2	-	-	-	-	-	-	**2**	**0.6**
Straw, leaves, rubber sheet, plastic sheet, black rubber sheet or other light materials	Small trees, bamboo, straw, leaves or other light materials	Bamboo floor	1	2	8	1	-	-	1	3	4	6	-	1	-	3	**30**	**9.5**
Total			12	9	44	45	23	27	25	26	21	20	10	17	16	20	**315**	**100**

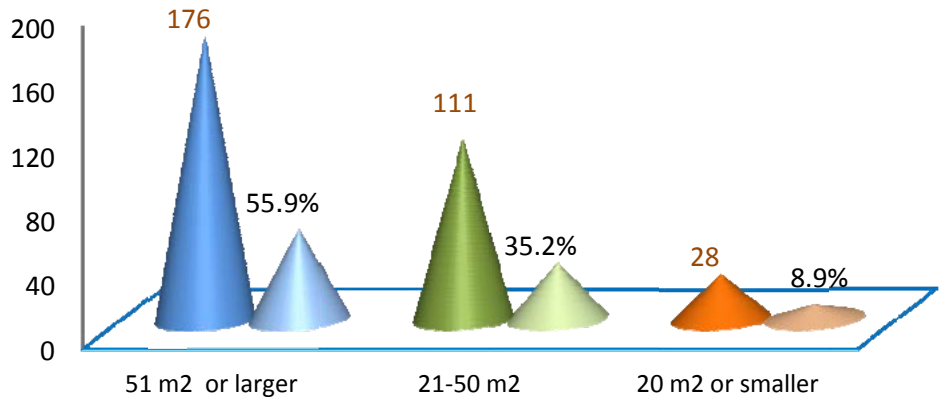
Picture 1 - Wooden house with zinc sheets roof which is popular in the study areas

2.2.3. House sizes

People's houses in rural areas, especially in the study target areas have appropriate sizes compared with the number of household members. 55.9% of the people had houses of 51m^2 in size or larger, 35.2% had houses of 21-50m^2 in size, and 8.9% had houses of 20m^2 or smaller in size. (See Figure 10)

According to the 2009 Socio-Economic Survey, an average person needs 8.5m^2 of shelter in rural areas. In comparison of this data with that of the study of target areas where an average household size had 5.58 members (or about 6 members), 55.9% of the households had their members living in fairly large houses of 9m^2 in size, 35.2% had their members living in houses of 6m^2 in size, which are a little smaller than their needs, 8.9% had their members living in houses of 4m^2 in size, which is more than half smaller than their needs. This data shows that more than half of the people lived in fairly sizeable houses compared with the number of household members.

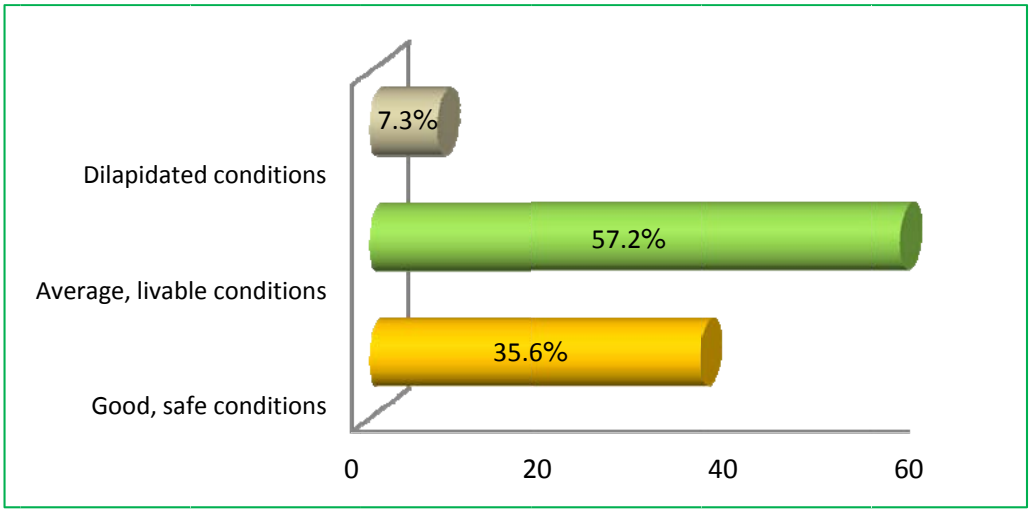
Figure 10 - House sizes



2.2.4. General conditions of houses

According to field observation of each house in the target villages, 57.1% of the people were living in average house, liveable houses (houses that looked neither very strong nor dilapidated), 35.6% were living in houses with safe, good conditions (houses that looked strong), and only 7.3% were living in dilapidated houses (houses that did not look strong in the walls, stairs, and columns, which could cause danger). These show that most people lived in houses with safe, good conditions while only a small number of people lived in dilapidated houses, which requires attention to safety of a decent, livable house. (See Figure11)

Figure 11 - Housing condition



2.3. Lighting sources at night

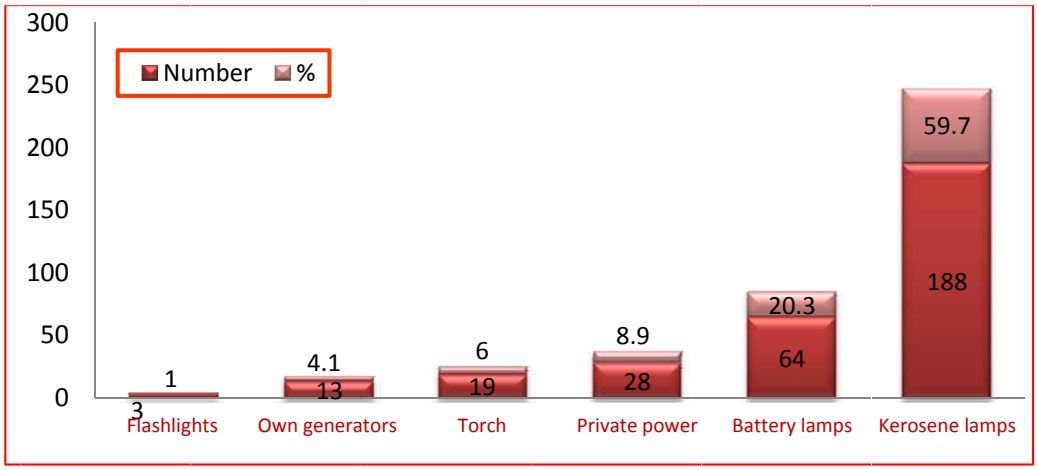
Electricity usage in rural areas is not as active as in urban areas because there are no electricity grids. However, some rural areas situated close to the border areas with Thailand, Laos, and Vietnam have access to electricity thanks to the power connection from those countries. In Stung Treng province, there are two small-scale electricity companies that are operated by the private sector and the public sector (EDC) using generators. The supply covers 70% of the provincial towns only. In addition, there are two small hydropower plants at O'Pongmoan and Siembok, operated by the private sector.

In target area studies, 59.7% of the people were using kerosene lamps, 20.3% were using battery lamps, only 8.9% were using private power (electricity produced by collective village generators, and people pooled in money to buy gasoline or petrol to run the generators, and the electricity for which people paid by connecting from their neighbors who ran generators; but no households were

connected to electricity grids of private companies). Besides these sources, torches, power generated by own Koyun or generators, and flashlights were used for lighting.

Lighting sources at night did not include State electricity in the target areas. Only in the Kbal Romeas village, Kbal Romeas commune, Sesan district, Stung Treng province did the people have one generator for collective use; people pooled in their money to buy fuel for running the generator, but in general most people (in 10 villages) used kerosene or diesel lamps for lighting at night while one village used battery lamps, and another village used torches for lighting. (See Figure 12)

Figure 12 - Lighting sources at night



2.4. Transport means

29.8% of the people had motor bicycles as transport means, 16.8% had powered boats as transport means, 15.7% had bicycles as transport means, and there are other transport means, such as rowing boats, and Koyun as shown in the Table below. According to the study, only a small number of people equal to 4.7% did not have any transport means. It should be noted that about 66% of the people had more than one kind of transport means, and the common transport means for the people in the target areas are bicycles, motor bicycles, and boats. (See Table 15)

Table 15 - Transport means

Transport means	Number	%
Motor bicycles	215	**29.8**
Powered boats	121	**16.8**
Bicycles	113	**15.7**
Small boat with no engine	80	11.1
Ox / horse carts	78	10.8
Koyun	73	10.1
No transport means	34	4.7
Small cars/tourist cars/big cars	5	0.7
Remorque	2	0.3
Total	**721**	**100**

*Total number of respondents is 315

2.5. Infrastructure

Schools

Each village had a primary school which allowed pupils to study in their village or in a nearby village. Although there were primary schools where people could send their children to learn, they are not sufficient because some schools were dilapidated and some other schools had too many pupils. There were neither lower secondary schools nor upper secondary schools in the study areas, which shows that it would be difficult for those pupils who have completed primary school to continue their study in lower secondary or upper secondary schools because generally lower secondary schools and upper secondary schools are situated in urban areas, such as a district or provincial town. Further, in Sre Angkrong commune, the distance from the village to the Trapaeng Krohom lower secondary school is about 22km.[40] In the whole Sesan district, there are only two lower secondary schools in Kamphun Commune and Samkhuoy commune, which are far from the other 5 communes in the study.[41]

[40]Complete Environmental Impact Assessment Report, December 2009, Final Report "Lower Sesan 2 Hydropower Project"
[41] "Sesan District Data Book 2009"Stung Treng province.

Picture 2 - Primary school in Srekor Moi village,
Srekor commune, Sesan district, Stung Treng province

Health centers

The study shows that there were no health centers in each of the target villages, and there were only two health posts in the Kbal Romeas village in Kbal Romeas commune, Sesan district, Stung Treng province and Phum 1 in Sre Angkrong commune, Koun Mom district, Rattanakiri province. These health posts were not very active, i.e., they only gave immunization for children and fever medicine; there were no physicians on standby. The distance from a commune to a health center is shown in the Table below (See Table 16)

Table 16 - Average distance from a commune to the closest health center

Commune	Distance
Talat	128km
Pluk	8.5km
Kbal Romeas	40km
Srekor	90km
Sre Angkrong	No data

(Source: The complete Environmental Impact Assessment Report on the Lower Sesan 2 Hydropower Dam)

Wells and ponds

The study target areas are situated along the Sesan and Srepok rivers, so only a few people have dug wells or pond for water use because they could use river water near their homes, which supplied sufficient water for their daily livelihoods.

Roads and bridges

According to observation of villages in the study, there were roads linked to the villages and for entry and exit of the villages, but most of the roads made it difficult for people to travel during rainy seasons because the road might be flooded and become damaged almost completely. Some villages, such as Sre Sronok, Svay Rieng, Talat and Rumpoat villages, faced difficulties in both dry and rainy seasons because the roads into the villages were damaged. Some bridges were also dilapidated, making it difficult to travel.

Picture 3 – Roads and bridges in the study areas

Pagodas

Like in other areas of Cambodia, the practice of Buddhism is stronger than other religions. Because of this simple reason, many pagodas have been built in almost every village across Cambodia. Statistics provided by the Ministry of Cult and Religious Affairs in April 2010 show that there are 4,392 pagodas in Cambodia.[42]

In general, each village in the study had a pagoda near the village or in the village. For those villages that did not have a pagoda, a Sala Chann representing a pagoda was built in the villages. Therefore, it was easy for people in each village to hold religious ceremonies or any other functions in their villages.

Picture 4 - Pagodas in target villages where people practice religion

[42] http://news.xinhuanet.com/english2010/culture/2010-11/02/c_13587875.htm (Searched website on September 4, 2012)

3. Financial Capital

3.1. Occupations and incomes

3.1.1. Main occupations of heads of households

Agriculture plays a very important role in Cambodian society because this sector has helped ensure food security at both community and national levels as well as providing job opportunities and incomes for about 80% of the population across the country.[43] In general, most rural Cambodians' livelihoods rely on farming. Likewise, this study shows that 87% of all heads of households worked in agriculture and 13% had other employment. In terms of employment besides agriculture, 6.30% worked in skilled areas, such as tailors, motor bicycle repairers, etc., whereas 2.90% were small vendors in the villages; 1.60% worked as laborers; and 2.20% stayed home or were unemployed. (See Table 17)

Table 17 - Occupations of heads of households

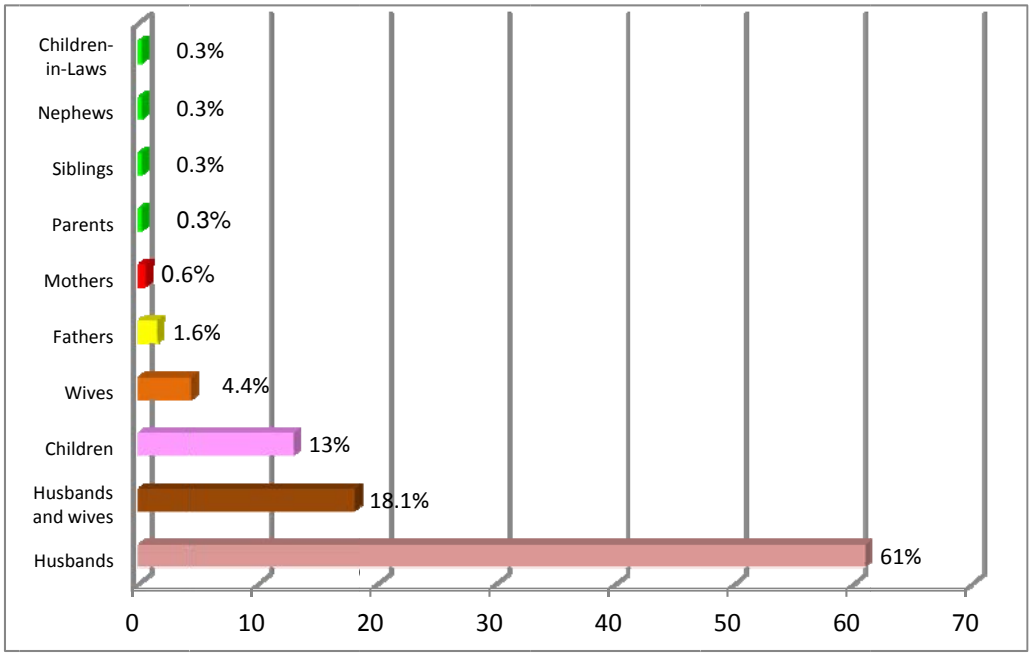
Householde head	Farmers	Workers	Unemployed/ Stay home	Vendors	Skilled Employment (tailors, motor bicycle repairers ...)	Total
Women	33	2	3	3	1	42
	10.50%	0.60%	1%	1%	0.30%	13.30%
Men	241	3	4	6	19	273
	76.50%	1%	1.30%	1.90%	6%	86.70%
Total	274	5	7	9	20	**315**
	87%	1.60%	2.20%	2.90%	6.30%	**100%**

3.1.2. Main income earners in households

Like households in other areas, the responsibility for household income generation mainly falls on the heads of households. 61% of main income earners were husbands, 18% were both husbands and wives, and 13% of income earners were children. It should be noted that heads of households and the main income earners in households could be different people in some households because these households traditionally considered men as important persons in their households by giving the position of head of household or main decision for men to make. Although men in some households were not the highest earners to support their families or men were not employed, they were still considered heads of households. (See Figure 13)

[43] Jan-Peter Mund, 2010, The Agricultural Sector in Cambodia: "Trends, Processes and Disparities". (Search website on June 4, 2012) or see this link: www.pacific-news.de/pn35/PN35_JPM.pdf (Searched website on May 3, 2012)

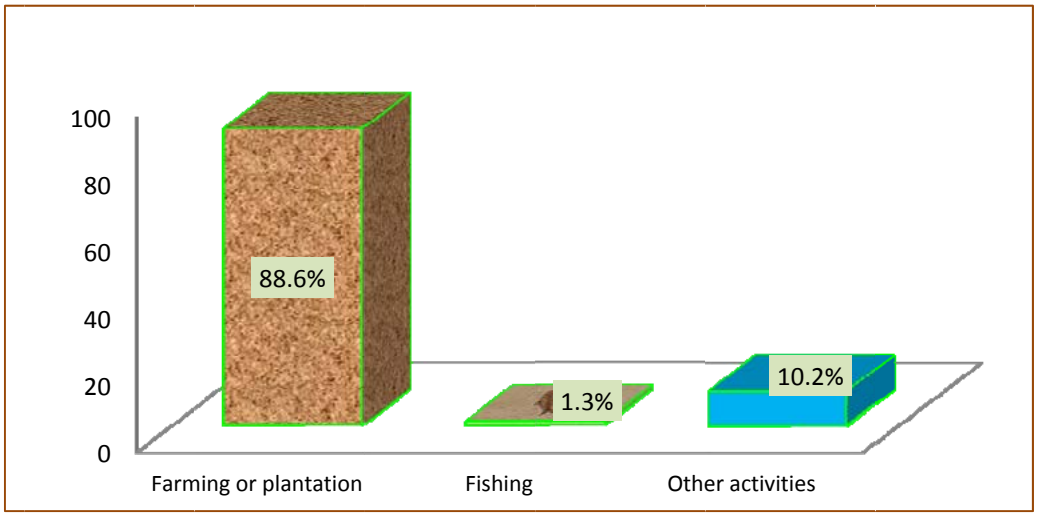
Figure 13 - Main income earners in households



Interviews of people in target households show that agriculture, including rice farming and growing various crops, accounted for the highest percentage, i.e., 88.6%, of the main source of income for their households. The second main source of income was employment in areas other than farming, accounting for 10.2%, of which 7.9% were micro-business persons/skilled workers/ government officials, 1.6% worked as laborers, and only 0.6% were involved in large-scale businesses. Fishing accounted for the least occupations equal to 1.3% or 4 households as the main source of household income. Traditional fishing tools, such as fishing rods, fishing lines, and fishing nets were the main equipment that the fishers used. Only a small number of fishing occupation were the main occupation because most people fished as their secondary occupation.

Likewise, information provided by village chiefs and deputy village chiefs as well as focus group discussion indicated that people's main occupation or main source of incomes in the target villages was agriculture, including rice, plantations, and family husbandry. (See Figure 14)

Figure 14 - Main sources of household incomes



3.1.3. Agricultural crop land sizes

88.6% of households relying on agriculture as their main source of income grew crops on an average land area of 313 a (or3.13ha) per year. Of the households working in agriculture as their main occupation, the majority had 86.3% cultivated on a land area larger than 50a, and only 2.2% cultivated on a land area between 20-50a.

Although Cambodia is seen as a country relying on agriculture, only 16% or 2.87million hectares of the country land area is agricultural land. If agricultural land were divided equally among all households in Cambodia households would have about one hectare of agricultural land (0.92ha per household or 1.09ha per household in rural areas).[44] The comparison of the agricultural land size of 1.09ha per household in rural areas with the average agricultural land size of 3.13ha per household in the study, shows that the people in the study target areas, on average, had more agricultural land, which is favorable for their household farming.

3.1.4. Secondary household income source

People in rural Cambodia rely on various sources of incomes for their livelihoods depending on living conditions of each area. In addition to the main occupation, which is the main household income source, there were many other occupations as a secondary income source of each target household, such as fishing, NTFPs, hunting, working as workers and government officials. It should be noted that only about 13.7% of households did not have any other occupations besides the main occupation while 86.3% had at least one

[44] Ngo Sothat and Chan Sophal (September, 2010). "Agriculture Sector Financing and Services for Smallholder Farmers"

secondary occupation in addition to the main occupation to support their household livelihoods. For those households who had secondary occupations, the first occupation was fishing accounting for 44.1%, and collecting NTFPs accounted for 19.7%. For second secondary occupations, collecting NTFPs accounted for 14%, and fishing accounted for 12.1%. (See Table 18 and 19)

The group discussions and the interviews of village chiefs and deputy village chiefs provided similar information. They confirmed that people's secondary occupations in the villages included collecting NTFPs, hunting, fishing, working as paid workers, animal husbandry, selling something at home.

Table 18 - First secondary income source

First secondary income	Number	%
Farming	17	5.4
Workers	9	2.9
Fishing	139	44.1
Micro-business	28	8.9
Collecting NFTPs	62	19.7
No other employment	43	13.7
Hunting	6	1.9
Government officials	11	3.5
Total	**315**	**100**

Table 19 - Second secondary income source

Second secondary income	Number	%
Farming	1	03
Workers	8	2.5
Fishing	38	12.1
Micro-business	13	4.1
Collecting NFTPs	44	14
No other employment	191	60.6
Hunting	15	4.8
Government officials	5	1.6
Total	**315**	**100**

3.1.5. Annual income[45]

With respect to annual income, on average one household earned about 9,706,714Riels or US$2,367.5 (US$1=4,100Riels in May 2011). According to each household's income, only about 4% earned an annual income of less than 1 million Riels, 75% could earn an annual income between 1 million to 9 million Riels, and 21% could earn an annual income between 10 million Riels or over.

The Table below shows that up to 85% of the people could earn between 2,000,000Riels (US$487.8) or over per annum. However, the comparison of the number of household members and income according to the Table below shows that 60% of households with 5-9 members earned an income between 2,000,000Riels (US$487.8) or over per annum, and 22.2% of households with 1-4 members earned an income between 2,000,000Riels (US$487.8) or over per annum. (See Table 20)

The comparison of 2010 Cambodian gross domestic product per capita of the National Institute of Statistics (US$830) with the per capita annual income in this study (US$424.3) shows that the people in the study target areas could earn only 51% of the Cambodian standard 100% income. This shows that the conditions of the livelihoods of the people in the study areas were just livable, but were not good yet.

Table 20 - Number of household members compared with annual incomes

Number of Members	**1 – 4 Members**		**5 – 9 Members**		**10 – 14 Members**		**Total**	
Annual income (Riels)	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
100,000-399,000	3	0.9	1	0.3	0	0	4	1.2
400,000-799,000	3	0.9	4	1.2	0	0	7	2.2
800,000-1,199,000	3	0.9	4	1.2	0	0	7	2.2
1,200,000-1,599,000	9	2.8	6	1.9	1	0.3	16	5
1,600,000-1,999,999	3	0.9	10	3.1	0	0	13	4.1
2,000,000-over	**70**	**22.2**	**189**	**60**	**9**	**2.8**	**268**	**85**
Total	91	28.8	214	67.9	10	3.1	**315**	**100**

[45] For the study of annual income in this study, the researchers added up incomes from all sources from which all household members could earn average incomes per year. However, the researchers did not study in detail the situation of each income source from which household members could earn incomes (*e.g., fishing: the researchers only wanted to know on average how much income was generated from fishing per year, but did not study in detail the months in which more income was generated, prices of fish per kilogram during fish abundant and non-abundant periods, types of fish caught, etc.)* because this study had a clear timeframe and scope.

3.1.6. Comparison of incomes by main occupations

People have different occupations depending on the conditions of each areas, so income generation for each household are also different. Table 21 below on average annual income according to types of occupation shows that the households with farming as their main source of income and those households with fishing as their main source of income could earn about similar average annual income. On the other hand, households with main sources of income other than farming and fishing seemed to have made higher annual income thanks to other occupations, including micro and large-scale businesses. (See Table 21)

Table 21 - Annual income by main occupation

Main source of income	Average Income (Riels)/Year	Average Income (US$)/Year
Farming	7, 598, 120	1853.2
Fishing	7, 952, 360	1939.6
Other occupation	28, 308, 040	6904.4

3.1.7. Number of household members who could not earn any income

There are manyneeds in a household, and this requires that all members be responsible to meet these needs in their livelihoods. However, the efforts may not be possible completely for some households because among household members there may be those who cannot earn an income, e.g., children, elderly, and people with disability.

At the same time, on average, 2.5 people in a household could not earn an income. About 45.1% of people with the number of members equal to or less than half, but more than one quarter of all household members could not earn an income; about 33.3% had more than half members who could not earn an income, and 21.1% had one quarter or less of members who could not earn an income. If the number of members who cannot earn an income is over half the number of all members, then this can become a heavy burden for heads of households or income earners in households in trying to generate income to support household livelihoods as well as members who cannot earn an income. (See Table 22)

Table 22 - Number of household members who could not earn any income

Number of household members who could not earn any income	Number	%
Equal to or less than one quarters of all household members	68	21.6
Equal to or less than half, but higher than one quarters of all household members	142	45.1
More than half of all household members	105	33.3
Total	**315**	**100**

3.1.8. Animal husbandry

Generally, people in rural Cambodia raised domestic animals, such as chicken, ducks, swine, cattle at a family level. Moreover, animal husbandry for households not only provides revenue in addition to farming, but it is also an important source of food for households and can benefit agriculture.

For instance, all people in the study areas raised animals at household level. 41.6% of the people raised 4-9 pigs, 3-9 cows or buffaloes, or horses, and 30.2% raised 1-3 pigs, 1-2 cows or buffaloes, or horses. At the same time, 15.2% of the people did not raise any cows, buffaloes, horses, pigs, or goats. It should be noted that about 13% of the people raised more than 10 pigs or more than 10 cows, buffaloes, or horses. Households raised pigs, cows or buffaloes not for household consumption, but for draught in agriculture and for sale. Further, households raised chicken and ducks for both sale and consumption.

3.2. Status of livelihoods and poverty rate

3.2.1. Rice loans

The status of people's livelihoods is mixed. Inquiries of target households shows that during the last 12 months 22% or one quarter of the people borrowed rice or owed rice to other people for household consumption while 78% did not borrow rice for consumption.

The rice borrowing also included households that had borrowed money to buy rice for household consumption. This shows that less than half of the people borrowed rice for household consumption because of rice shortage at the end of the planting season. Rice borrowing is also a custom of the people in the villages. However, the majority of households could afford food without borrowing rice. Time of rice shortage differed among the 22.2% of the people who reported their shortages. (See Table 23)

Table 23 - Short period of rice borrowing

Short period of rice borrowing	%
0-2 months	6.7
3-7 months	14.9
8-12 months	0.6
Total	**22.2**

3.2.2. Types of assets

According to registration of people's assets, the research of target households found that 30.4% of the people had mobile phones, 17.3% had a small radio, and 8.9% had a rice mill. The study also found that only 5.3% or 39 households among all interviewees did not have any personal assets at all as reported and shown in the Table below on types of assets. (See Table 24)

Table 24 - Types of assets

Types of assets	Number	%
Mobile phone	**224**	**30.4**
Small radio	**128**	**17.3**
Rice mill	**66**	**8.9**
Video player	59	8
Generator	49	6.6
Big radio	48	6.5
Color TV	43	5.8
No materials nor assets in the house	39	5.3
Pump	30	4.1
Black & White TV	24	3.3
Speaker or Loud Speaker	16	2.2
Rice thrashing machine	9	1.2
Battery charger	3	0.4
Total	**738**	**100**

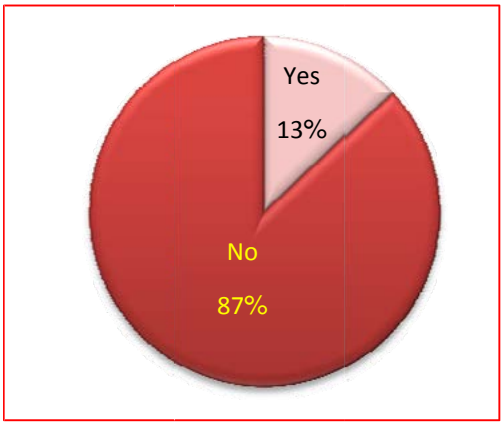
*Total number of respondents is 315

3.2.3. Equity cards

According to the display of equity cards in each household obtained in the last four years, the interviews shows that 13% of the people received the equity card (ID Poor) issued by the commune authority. (See Figure 15)

The equity cards issued to each household aimed at providing services and direct development assistance to poor households to help lift them out of poverty and to protect them from shocks (such as serious sickness, crop failure) which could plunge them deeper into poverty. The data obtained from identification of poor household can be used to calculate comparative levels of poverty of each village. Service providers can use this data to identify poor communes, villages and households in the areas.[46]

Figure 15 - Equity cards



Picture 5-Types of equity card

3.2.4. Poverty rate

Poverty is divided into two levels, i.e., poor level 1 and poor level 2. Poor level 1 is extreme poverty and poor level 2 is poverty after level 1 based on the assessment with scoring of circumstances of houses, occupations, assets, and other conditions (e.g., poor level 1 has a score from 59-68, poor level 2 has a score from 45-58).[47]

The Sesan District data book 2009 shows that the poverty rate in Talat commune was 37.40%, in Srekor commune was 36.50%, in Pluk commune was 42.20%, in Kbal Romeas commune was 40.50%, and in Sre Angkrong commune was 41.50%.[48]

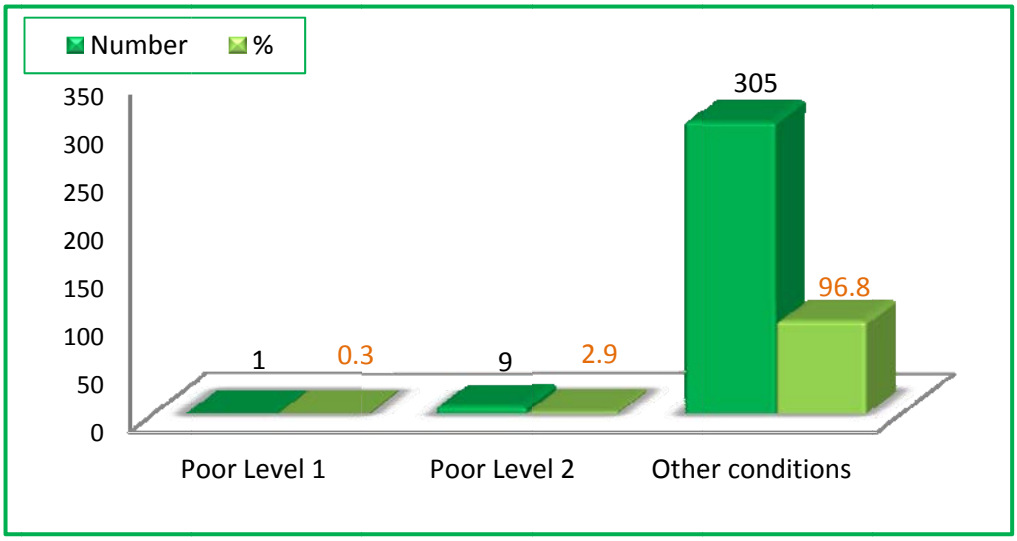
According to the scores using the questionnaire similar to that of the poverty assessment of the ID Poor Project[49] of the Ministry of Planning to identify poor households, including assessment of circumstances of houses, occupations, assets, and household members who could not generate any income etc, it was found that most people equal to 96.8% were not under the two poor levels (poor

[46]http://www.mop.gov.kh/Projects/IDPoor/tabid/154/Default.aspx (Searched website on August 7, 2012)
[47]Ministry of Planning "Questionnaire to identify poor household"
[48]Sesan district Data Book, 2009, Stung Treng province.
[49] According to the Sesan district Data Book, 2009, the ID Poor Project did not cover Sesan district, Stung Treng province.

level 1 and poor level 2); in other words, they had average, livable livelihoods, but there has not been any detailed confirmation whether these people were at what level of rich or average circumstances. At the same time, 2.9% people were in poor level 2, and only 0.3% were in poor level 1. (See Figure 16)

The comparison of the 13% households with equity cards above with the households in the poor level 1 and poor level 2 below shows that only 3.2 % households were in the two poor levels, so there were differences; because the equity cards they had received in the past four years as of the date of interviews, their livelihoods might have changed during these last four years.

Figure 16 - Poverty rate



4. Social Capital

4.1. Tradition, religion and communication

Cambodia is a Buddhist country where Buddhism is the State's religion because about 90% of the population are Buddhists.[50] The study shows that most people equal to 98% were Buddhists, 1% believed in spirit, and another 1% believed in souls or offering rituals. Although most of the population are Buddhist, they also believed in offering rituals in the forest and in their villages.

Most people in the villages gather together at pagodas or the Sala Chortean in the villages during social functions, especially when there are traditional and religious ceremonies, such as the Khmer New Year, Pchum Ben, Kathen, Bon Phka Samaki, Meak Bochea, Pisak Bochea, Jenh Vossa, Joul Vossa, Bon Dalean or Rice ceremony, Buos Neak, Bon Sen Neakta, and Water Festival.

[50]www.culturalprofiles.net/cambodia/directories/cambodia_cultural_profile/-35.html (Searched website on May 10, 2012)

Gatherings during religious or traditional ceremonies are a way to build relationship and mutual support between the people in each village. For the gathering, they worked together; some people makes contributions in money, rice, and other things to organize ceremonies and joyous gatherings.*"Villagers are active in organizing ceremonies. For example, during Pchum Ben time, people organize Kan Ben groups to take turns to offer food (Kan Ben) from Ben 1 till Ben 15, called the big Ben. People also take turns to organize Bon Phka, large or small. Important ceremonies include the New Year, Pchum Ben, Meak Bochea, Bon Phka, and Bon Kathen"*.

Only 37% of the people said that in their villages people helped each other or exchanged labor in farming during both transplantation and harvest seasons. On the other hand, most people, as many as 63%, said that in their villages there was no longer exchange of labor for farming at present although there used to be before, but it disappeared after people started occupations of working as farming laborers.

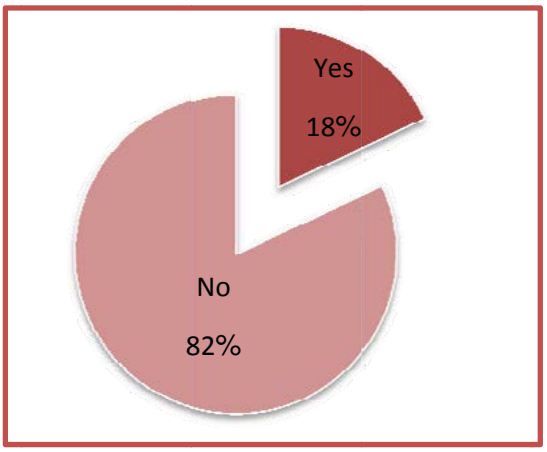
The villages where people did not exchange labor included Svay Rieng, Khsach Thmey, and Talat villages in Talat commune, Sesan district, Stung Treng province and Phum 3 in Sre Angkrong commune, Koun Mom district, Rattanakiri province. According to the focus group discussion, there was mutual assistance or exchange of labor for farming/plantation, such as harvesting rice or transplanting rice seedlings in Krabei Chrum village in Kbal Romeas commune, Khsach Thmey village in Talat commune and Pluk village in Pluk commune, Sesan district, Stung Treng province and Phum 2 in Sre Angkrong commune, Koun Mom district, Rattanakiri province *"We have been doing since before until now. Activities of mutual assistance include harvesting rice and transplanting rice seedlings withy those completed first assisting those have not yet completed; and we eat together when we help each other"*. The village chiefs and deputy village chiefs said that people from 6 villages, namely Phum 1 in Sre Angkrong commune, Koun Mom district, Rattanakiri province, Chrop and Kbal Romeas villages in Kbal Romeas commune, Srekor Pie village in Srekor commune, Pluk village in Pluk commune and Rumpoat village in Talat commune, Sesan district, Stung Treng province always helped each other or exchanged labor during farming and harvesting seasons. This represents solidarity between villagers, which is necessary for social relationships.

4.2. Village-based saving and rice banks

Among the 315 people, only 18% said that there was village-based saving to help each other in a low interest rate, 82% said that there was no saving nor rice banks in the villages to help each other. No saving nor rice banks were found in Talat, Rumpoat, Srekor Pie, Sre Sronok, and Chrop villages in Sesan district, Stung Treng province. Village-based saving aims at help each other with the fund when there is a shortage. Likewise, Srekor Moi village had no

saving, but had a rice bank or community rice so that people in saving groups could borrow rice with low interest because borrowing from outsiders required high interest. (See Figure 17)

Figure 17 - Village-based saving or rice banks



5. Natural Capital

5.1. Forest and its benefits

Numerous types of forest in the study areas were still abundant based on field observation in the 14 villages in the 5 communes. In general, people in the areas have been benefitting from and making use of NTFPs, such as felling trees for building houses/making furniture, and cutting down dead wood or collecting wood for firewood. Furniture sold in a number of markets also had sources from these areas. In addition, local people made a lot of use from NTFPs, such as resin, honey, vines, leaves, tree roots, and wild fruit to meet their daily livelihoods. There were a small number of cases in which people used the rich forest for their animal husbandry. (See Table 25)

Table 25 - Benefits of forest for people's livelihoods

Benefits	Number	%
Timber for building houses/furniture for use	**257**	**36.1**
Cutting dead wood or collecting dead wood for firewood	**242**	**34**
Timber for building houses/furniture for sale	78	11
Resin or honey	68	9.6
Vines, leaves, tree roots, fruit	65	9.1
Place for animal husbandry	1	0.1
Total	711	100

*Total number of respondents is 315

These benefits show that forestry resources were indeed important for many target households in villages near forests, especially the target areas that will be affected. The forest benefits livelihoods or partly alleviates households' livelihood problems. Moreover, forest is a source of resources that cannot be separated from people's livelihoods, in particular, for some indigenous people, such as Pnong, Kroeng, Tumpuan, and Proev, who live in Kbal Romeas and Sre Sronok villages in Kbal Romeas commune, Rumpoat and Khsach Thmey villages in Talat commune, Sesan district, Stung Treng province, who mainly rely on forestry resources.

The Forestry Law is related to indigenous people who benefit from forestry resources. The "2002 Forestry Law" was adopted to manage forests in Cambodia and this Law provides minimum protection for indigenous people through granting legal right to "customary user rights" in forest areas.[51] Further, Article 40 of the Forestry Law describes the bases of the establishment of customary user rights to forestry products by stipulating a number of activities that were allowed for indigenous people in permanent reserved forests without requirements of authorization.[52]

Picture 6 - Forest along the road to Sre Sronok village

5.2. Wildlife and its benefits

Wildlife species are parts of natural resources available in forested areas. Wildlife provides important benefits for people's livelihoods that rely on resources from forests. Consumption of wildlife and minor sale in target areas of the study continued to happen.

78% of the people in all the villages in the study believed that their surrounding areas were rich with wildlife species, but only about 59% said that

[51]Law on Forestry (2002) Article 15.
[52]Law on Forestry (2002) Article 40.

they had benefited from wildlife. Benefits from wildlife that the people obtained included hunting wildlife for daily food, hunting wildlife for sale and hunting wildlife for medicine for treating illnesses. It should be noted that villagers would sell or share with their neighbors only when they got wildlife in a large quantity. According to villagers' accounts, wildlife was caught by trapping or taking dogs into the forest. The wildlife species that the research team saw the villagers caught consisted of wild boars, Trokuat (kind of a large lizard), deers, wild sparrows, ring doves, etc. All village chiefs and deputy village chiefs said thatalthough wildlife and forests were not abundant in some areas, people still benefited from wildlife. (See Table 26)

However, although more than half of the people obtained some benefits from wildlife, they were not happy because at present they could not benefit as much as before. This means outputs and income from wildlife had declined significantly because strict protection of wildlife species by authorities and some people in the villages had increased, resulting in the need for sharing benefits from wildlife. Because of banning of wild animal hunting for business, villagers knew that it was illegal, but some wildlife, such as wild boars, was allowed for household consumption because there were numerous wild boars and they caused damages to villagers' crops.

The 2002 Forestry Law states that all kinds of wildlife species in the Kingdom of Cambodia are State property and the components of forestry resources, including all species of mammals, birds, reptiles, amphibians, insects, other invertebrates, and their eggs and offspring. All wildlife species are divided into three categories: endangered, rare, and common.[53]

The following activities committed against common wildlife species, except by a permit issued by the Forestry Administration are prohibited:

1- Stock or maintain as a zoo or in a family house.
2- Transport and trade an amount exceeding that necessary for customary use.[54]

Therefore, in accordance with the Forestry Law above, people in the study areas have the right to consume some wildlife species in the common category not exceeding the quantity for customary use permitted by the Forestry Administration except for trade that requires a permit issued by the Forestry Administration with approval by the Ministry of Agriculture, Forestry and Fisheries.

[53]Law on Forestry, 2002, Chapter 10, Article 48.
[54]Law on Forestry, 2002, Chapter 10, Article 50.

Table 26 - Benefits of wildlife species for people's livelihoods

Benefits	Number	%
Hunting wildlife species for food	**175**	**59.9**
Hunting wildlife species for sale	**113**	**38.7**
Hunting wildlife species for medicine	4	1.4
Total	292	100

*Total number of respondents is 315.


Picture 7 - Some types of wildlife species that people can hunt

5.3. Water sources and benefits

Main water sources that people use every day

The people in all the villages in the study live on the Sesan and Srepok rivers and use the river water as main sources for daily livelihoods, except the Chrop village in Kbal Romeas commune, Sesan district, Stung Treng province where people use the water of the nearby creek because the river is far from the village.


Picture 8 - Sources of river water that people use every day

Benefits of the rivers for people's livelihoods

All the people living along the banks of the Sesan and Srepok rivers benefit from the two rivers for their daily livelihoods. This study shows that 40.7% of the people benefited by having sufficient water for household use (e.g., drinking, cooking, cleaning, washing, bathing, etc.), 35% fished, and 15.9% had sufficient water for agricultural cultivation and animal husbandry. (See Table 27)

Table 27 - Benefits of rivers for people

Benefits of rivers	Number	%
Having sufficient water for household use	310	**40.7**
Fishing	266	**35**
Having sufficient water for agriculture/animal husbandry	121	**15.9**
Can grow crops on river banks	63	8.3
No benefits (no river near the village)	1	0.1
Total	**761**	**100**

*Total number of respondents is 315

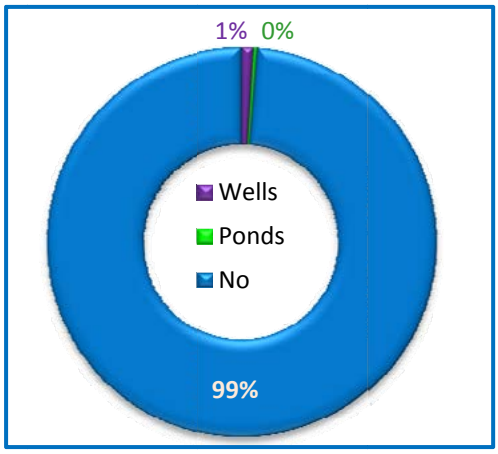
Picture 9 - Home garden irrigated by river water

Personal water sources that people have

Because almost all the people or 99% used river water as their main water source, only a very small number about 1% or 4 people had their own water sources, such as wells and ponds, and these water sources could be used all year round. Of the 4 households with personal water sources for home use, one household spent less than 100,000 Riels. Another household spent 1,20 0,000-1,599,000 Riels, and 2 other households spent 2,000,000 Riels or over for digging a pond or wells. This shows that people there had river water as their main water source, which supplied sufficient water for daily livelihoods without digging wells or ponds for water use. (See Figure 18)

It should be noted that only 9% of the people who did not have their own water sources, such as wells or ponds used water sources, such as a collective well or a neighbor's well in the village in addition to river water, but there was no mentioning of use of rain water in the study areas.

Figure 18 - People's own water sources

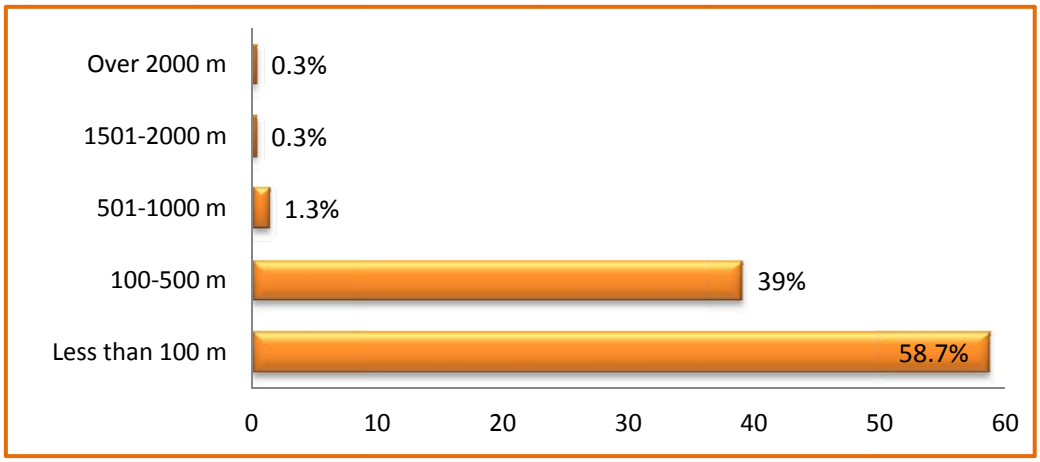


Distance of main water sources for daily use during dry season

The water sources that the people used every day are, on average, only 96.34m from their houses. There are 58.7% of people lived less than 100m from a water source, 39% lived 100-500m from a water source, and only 1.3% lived 501-1000m from a water source. (See Figure 19)

Because the distance from home to the river or creek (the people in Chrop village used the creek water) during the dry season is not more than 100 m, this shows that in general a water source did not seem to be far from the area where people lived, and they could had sufficient water for use.

Figure 19 - Distance from home to water sources for daily use during dry season



Tourist areas in the communities

Actual observation and interviews of target households suggest that only 17% of the people or 55 households in Pluk village, Phum 1, Phum 2, and Phum 3 said that their living locations had tourist areas.[55] Moreover, among the 17% who said that their locations had tourist areas, 16% said they did not benefit in terms of income from the tourist areas because those places were small, natural tourist areas on the river without many tourists visiting. Only 1% said they had benefited from these tourist areas, such as selling souvenirs and food, which contributed to household income. However, this data suggests that almost all people did not benefit from these small tourist areas.

Picture 10 - Natural tourist area in Pluk village, Pluk commune, Sesan district, Stung Treng province

[55]The tourist areas mentioned by the people here are small tourist areas on the river with strong currents. During big ceremonies, people from nearby villages go there to bathe, but they are not tourist areas registered by the Ministry of Provincial Department of Tourism.

People's Awareness and View on The Proposed Lower Sesan 2 Hydropower Dam Project

1. Dam Construction

1.1. Source of information on the project

Almost all the people (92.3%) who are now living in the areas to be affected as well as the village chiefs and deputy village chiefs in each village have heard that there would be construction of the Lower Sesan 2 Hydropower Dam. Information that people received on the project was channeled through local authorities (village chiefs, commune chiefs, district/provincial governors), rumors (heard from each other), representatives of the Vietnamese company, NGOs, and media, such as radio and TV. (See Table 28)

With respect to sources of information, the village chiefs and deputy village chiefs received information from different sources on the construction of the proposed hydropower dam, in which 30% received information from district authorities (commune, district or provincial authorities), 38% heard the information from various organizations (e.g., CEPA, the 3SPN, ADHOC and Oxfam), 27% heard from the Vietnamese company, and 3% got the news through rumors. For the source of information from the district authority, village chiefs heard from HE Suy Sem during the inauguration of the construction of the dam in Stung Treng province and heard through the publicity by the government at the provincial and commune levels.

Table 28 - Source of information on the Lower Sesan 2 Hydropower Dam development project

Source of information	Number	%
Local authorities (village chiefs, commune chiefs, district/provincial governors)	156	34.1
Rumors (heard from each other)	142	31
Representatives of Vietnamese company	77	16.8
NGOs	74	16.2
Media (TV, radio ...)	9	2
Total	**458**	**100**

*Total number of respondents is 315

1.2. Information received on the project

The information that the people in target areas to be affected by the Lower Sesan 2 Hydropower Dam development project received was about the same because they met and talked about this issue. About 75% of the people knew that there would be construction of the hydropower dam, but did not know about the real timeframe for construction. Besides, about 56% heard that there would be flooding of houses and crops after the construction of the dam, and that there would be displacement of people to live in other places. Some 13% of the people heard that there would be compensation for resettlement to new places, but it was not clear yet, and 8% heard that there would be electricity for people's use after the construction. What was noteworthy was that 2.8% of the people reported that the Vietnamese company had measured their land and took note of fruit trees in the villages, but there was no evaluation of the measurement yet. In general, almost all people received information that there would be the Lower Sesan 2 Hydropower Dam development project, but they had not received detailed, specific, official information *"It's not clear, we just heard that they would build a dam on the Lower Sesan River; we heard from one another"*.

1.3. Local authorities' perception on the project

Because of perception that the Lower Sesan 2 Hydropower Dam development project would have great impacts on livelihoods, farmland, people's assets, and forest, all the village chiefs and deputy village chiefs were not happy and did not want the proposed construction to happen. In this regard, 2 village chiefs and deputy village chiefs stressed that they did not like the project, but it was not absolute because some parts of the project could be beneficial to the people, and that they would not object the government's development, but requested that the government consider the impacts because it would greatly affect people's livelihood *"I don't want the dam to be built, but cannot ban them (because a piece of cake cannot be bigger than the scale), and it would be difficult to live because this village already has crops and utensils for use; if we move to a new place, it will be difficult."*

1.4. Meeting to discuss/consult the project

1.4.1. Analysis of the Environmental Impact Assessment

An Environmental and Social Impact Assessment is required for development projects whether by private, or semi-State owned companies, or the government. The Sub-Decree on the process of Environmental Impact Assessment (EIA) clearly states that in the EIA process, public participation must be encouraged and comments received are considered in the process of project

approval.[56] In this regard, the EIA process must be participated in by the people to be affected by the development project. By this means they will be consulted onthe process of implementation of the project in each phase, and can decide to approve or disapprove the implementation of the project.

Although the Sub-Decree gives opportunity for public consultations, there remain some gaps because Articles 15 and 17 of the Sub-Decree give only 30 days for the Ministry of Environment to review an EIA report.[57] These factors are an important reason that the line ministry and relevant institutions that have received an EIA report do not have sufficient time to review as well as to consult or coordinate comments from the communities that are going to be affected directly by development project.

The feasibility study of the proposed hydropower project is divided into two phases: the project pre-feasibility study (2007 and 2008) and the project feasibility study (2009 and 2010).[58] The complete EIA report on the Proposed Lower Sesan 2 Hydropower Dam shows that two public consultations were held.[59] The first consultation was organized through commune and village leaders in 5 communes, but there was no indication of how many people to be affected from each village in the communes were allowed to participate in the first consultation. For the second consultation, there were 45 participants, of whom 26 were government officials, 10 were commune chiefs, village chiefs and deputy village chiefs from the supposed, affected communities, 5 were from NGOs, and 4 were from the private sector. However, there was no specification of the presence of villagers in this second consultation.

Based on the information, it can be concluded that the EIA process did give opportunities for some people to take part in discussions and consultations, but people's participation remained limited because not all people to be affected from each village took part in the two consultations. The second consultation especially was not attended by the people. Therefore, such public consultations were not sufficient because there was confirmation in the study that people had not taken part in the discussions/consultations.

1.4.2. Consultations on the project between village chiefs/deputy village chiefs with the company

In this regard, the government requires close attention to the environmental impacts of the project in terms of physical environment, biological environment, and social environment. This requires an assessment and thorough and appropriate solution in planning, consultations with stakeholders, and agreement from all relevant technical agencies before approving a

[56]1999 Sub-Decree on Environmental Impact Assessment, Article 1and 2.
[57] 1999 Sub-Decree on Environmental Impact Assessment, Article 15 and 17.
[58] Royal Government of Cambodia, No. 31, 2011
[59] Complete Environmental Impact Assessment Report, Lower Sesan 2 Hydropower Project Stung Treng province December 2009, (PECC-1)

development project. However, in reality, in study target areas, 8 of 13 village chiefs/deputy village chiefs said that they had participated in discussions/consultations with the company representatives or relevant agencies on the Lower Sesan 2 Hydropower Dam development project. The consultation on the proposed construction stated that *"There will be the Lower Sesan 2 Hydropower Dam development project, and there will be fair compensation if there are impacts; but it is not clear what the compensation will be like"*.

Although more than half of the village chiefs/deputy village chiefs participated in the discussions/consultations, these could not be considered public discussions/consultations because only village chiefs/deputy village chiefs participated, whereas the affected people did not take part in the discussions. Moreover, the consultations did not provide specific, reliable information or give opportunities for the village chiefs/deputy village chiefs to decide to approve or disapprove the project; they were informed of the project only.

1.4.3. Consultations on the project between village chiefs/deputy village chiefs and people in the villages

In addition to the discussions/consultations between the village chiefs/deputy village chiefs and consultants, such as company representatives or authorities concerned, there were discussions between village chiefs and people in the villages. There are 77% of village chiefs/deputy village chiefs held discussions with the people in their villages on the Lower Sesan 2 Hydropower Dam development project, and these discussions were the time when the villagers received the news about the proposed construction, and discussed impacts, expressed concerns, sought and proposed solutions, and discussed compensation for the impact. But the other 23% of village chiefs did not hold the discussions. What seemed unusual was that one village chief among all the village chiefs revealed that there was one case occurrence: *"The discussions asked the people if they approved the construction of the dam or not (village chiefs discussed with people in the villages after the meeting and notification from the company). People had put their thumb prints not to allow the construction of the dam (village chiefs collected people's thumb prints and sent them to the company to confirm disapproval), but instead they (the company) said the people put their thumb prints to approve the construction of the dam"*.

2. Impacts of the project

2.1. People's awareness of the project's impacts

Usually an infrastructure development project cannot avoid impacts on people in the area and the natural environment, either a little or a lot depending on the nature and size of the project, but it also provides a lot of benefits, in

general, to the people, national society and economy for the whole country.[60] At the same time, all the people as well as local authorities know that the construction of the proposed hydropower dam will affect people in the villages and areas where they are living. People think that the construction of the proposed Lower Sesan 2 Hydropower Dam will affect occupations, farmland, plantation land, crops, livestock, fishing, houses, native villages where they used to work to support their daily livelihoods, and the environment because there will be flooding *"It affects, such as flooding houses, farmland, plantation land, the environment, forest, and wildlife, which is dead. There is no water downstream the dam, so fish cannot come up; as a result fish will be scarce and fish habitat will be lost."*

2.2. Impacts on village infrastructure

The Notice No. 31 by the government in 2011 which presented the measures to mitigate environmental and social impacts states that there would be flooding affecting three telecommunication antenna, one irrigation structure, 38 hand-pumping wells, and public infrastructure, such as 74 km of tertiary roads, 9.4 km of national roads, and 246 m of bridges. In addition, according to the people in the target areas, the were concerned that the construction of the hydropower dam will affect important infrastructure in the villages, such as schools, pagodas, roads, health centers, bridges, spirit/Neakta/ offering ritual forests, wells, community rice barns, and commune offices. (See Table 29)

Table 29 - Impacts on village infrastructure

Infrastructure	Number	%
School	287	33.7
Pagodas	283	33.2
Roads	171	20.1
Health centers	72	8.5
Bridges	15	1.8
Wells	10	1.2
Commune offices	7	0.8
Spirit/Areak/Neakta/offering ritual forests	5	0.6
Community rice barns	1	0.1
No impacts	1	0.1
Total	852	100

*Total number of respondents is 315

[60]Royal Government of Cambodia, No. 31, 2011.

2.3. Impacts on occupations and income generation

Almost 100% of the people who participated in the study said that the building of the Lower Sesan 2 Hydropower Dam will affect their occupations and income. With respect to impacts on occupations and income generation, 72% of the people thought that it would cause flooding of farmland, losses of cultivation areas, and flooding of crops; 45% thought that it would lead to losses of income because there would be no places for occupation or decrease in livelihoods; 42% believed it would cause a decrease in fish catch or inability to fish; 20% thought that it would inundate the forest, thus make it impossible to collect NTFPs; 9% thought that it would make it difficult or impossible to raise animals (swine, cows, buffaloes ...) because there would be flooding; and only a small number of 1.2% said that the project would not affect their occupations. It should be noted that farming, crop cultivation, animal husbandry, NTFPs, especially, fishing not only played an important role in supporting households economically, but was also an important source of people's daily food *"I am very concerned that my farmland/plantation land, residential land, and crops will be flooded. If it happens my family will have nothing to rely on."*

The Environmental Impact Assessment showed that in addition to losses of forest and farmland, the project would create a barrier that will reduce fish catch in the two rivers. Therefore, people's concerns about losses of occupations, income and benefits from forestry and river resources for daily livelihoods were also raised in the complete EIA report.

2.4. Impacts on children's education

Education remains a leading sector for human resource development and necessary for every person, especially children in rural Cambodia. About 99% of the people and village authorities in the target areas were very concerned about the impacts on children's education because the Lower Sesan 2 Hydropower Dam would affect children's access to education in the community because the water would inundate schools and villages, which would make it impossible for children to go to school, and it would take a long time to wait for construction of new schools in the resettlement areas. As a result, children will lose their study time; they will become older than the enrolment age, and will quit schooling *"It will affect children. They won't be able to go to school if schools are unindicted, and they won't have any knowledge in the future.""The water will flood schools, and thus the children won't be able to go to school, and there won't be any teachers either, so the children will have to quit schooling. Until schools have been built at the new place, the children will become too old and pass the enrolment age, so they will have to quit schooling."*

2.5. Impacts on religion and tradition

The religion and traditions that the people in the target areas practice will become difficult and will be missed because they are the habit in daily livelihoods as well as group habit of the community. In this regard, 80% of the people believed that moving to a new place would affect religious ceremonies that they had always celebrated but the other 20% did not think so. The reason for the people to think that their religion would be affected was because the religious sacred places in their old places would be lost, and moving to a new place would require building everything anew, including pagodas. Building a new pagoda would require a long time if it is to be built. However, if new pagodas are not built, then people will face difficulties because other pagodas are far from their villages, making it difficult to travel, and thus, they would not be able to meet as a community to organize ceremonies.

At the same time, the practice of the tradition of rice offering rituals for Areak/Neakta (spirits), people's belief in paying respect to the spirit altar and Areak forest will also be lost because people do not know if the new place will have sacred places like their old places or not. It should be noted that indigenous people are a group of people who have close relationship with their religion and culture, in particular, their sacrifice or offering rituals at specific forests. Therefore, they will face challenges and lose some beliefs if resettlement takes place *"Because at this place we have a pagoda and Areak forest, but when we move to a new place, there won't be any pagoda and the Areak forest won't be available, so we are concerned that Neakta will make us suffer stomach ache." "It will affect Neakta; it will flood the Neakta/spirit altars, burial grounds; bodies already buried cannot be moved."*

In contrast, some people believed that there wouldn't be any impacts on their religion and traditions because they could practice their religion and traditions anywhere they would move to without any problems.

2.6. Impacts on forest and wildlife species

Forest and wildlife species are a source of parts of income or food for people's livelihoods in the target areas of the study because their livelihoods remains dependent on products from forest and wildlife species, especially for indigenous people. The construction of the hydropower dam will affect wildlife species and forests because water will flood the forest causing it to become rotten, and thus there won't be any more wood for use. Further, the loss of forest would mean the loss of wildlife species because wildlife species cannot live without forest. Therefore, it will cause the wildlife species to lose their habitats and have to moveto other places, which are high grounds, and some animals that cannot escape will die *"Forest will be lost because it will cleared for building the*

dam; the forest will be unindicted; animals will lose their habitats, and some may die."

The impacts on forest and wildlife habitats will be significant because of losses of thousands of hectares of forest and of wildlife habitats due to the project. The loss of forest calculated in financial terms is US$2.8 million per annum, which is a fixed, sustainable natural value of forest and US$0.49 million per annum as value from NTFPs. These figures do not include the forest areas that will be inundated in the forestry concessions and land concessions of licensed companies.[61]

2.7. Impacts on rivers, fisheries, fishing and fishing tools

The Proposed Lower Sesan 2 Hydropower Dam is a hydropower project with a dam at the confluence between the Sesan and Srepok rivers in Sesan district, Stung Treng province. The hydropower dam project will use the water from the two rivers to generate power and will affect the rivers and biodiversity in the rivers too. Impacts include significant rise in water levels in the reservoir area, flooding of forests, and waste from the dam construction causing the water to be polluted and muddy with chemicals and toxins. As a result, people will not be able to use the river *"The river water will change, becoming muddy and full of germs causing illnesses; people won't be able to use the water; fish will decline."*

Further, water levels will rise significantly, making it difficult for people in identify fishing locations; and fish will not be able to migrate or swim upstream from below the dam. As a result, fish will no longer be abundant or have spawning grounds"...*Losses of spawning grounds for fish; some fish won't be able to come up to lay eggs, resulting in the decline in their numbers."*Snails, mussels, riverine plants and biodiversity will be lost. When fish are not abundant, fish catches will decline, and fishing tools, such as nets will be damaged because they will flows away with the water current. Some fishing tools will be abandoned because they can no longer catch fish *"Fishing tools, such as nets will be damaged and cannot be used because they will torn by the strong current; there won't be specific fishing grounds." "Fishing won't be good because of fish scarcity for fish won't be able to climb over the dam. Fishing tools will be all damaged, i.e., fishing nets will be torn apart because of strong current."*

The Lower Sesan 2 Hydropower Dam will cause flooding of forests resulting in loss of non-renewable carbonic resources and changes in water affecting fishing.[62] Some migratory fish species, such as, Jrakeng, Pase-Ee, Pava, Pava Mukpee, and Phkar Kor fish, will not be able to move upstream to the

[61] Complete Environmental Impact Assessment Report, Lower Sesan 2 Hydropower Project Stung Treng province December 2009, (PECC-1).
[62] http://www.internationalrivers.org/resources/stop-plans-to-construct-the-lower-sesan-2-hydropower-project-3681 (Searched website on Aug 14, 2012)

upper part of the rivers during May-June, and go downstream towards the Mekong river from October to December. Moreover, there will be significant losses of biodiversity.[63] Negative impacts on fisheries will be limited not only to the project area, but also fisheries across Cambodia and neighboring countries. Moreover, the EIA report does not mention a lot the impacts on fish downstream and does not assess the impacts on communities downstream with a costing item for compensation for those communities that will be affected by reduction in fish catch.[64]

2.8. Impacts on land and crops

The complete EIA report recognized by the Ministry of Environment shows that the 75 m-high reservoir will inundate a total 30,525 ha of land areas, including 28,969 ha of forest land, 1, 290 ha of farmland, and 266 ha of sparse forests and grass land in Sesan district, Stung Treng province. Moreover, the project will negatively affect agricultural development, especially rice production, and some other crops, such as corn, bean, cashew, many fruit trees.[65]

According to actual study, almost all rural people rely on farming and growing fruit trees in the villages, but the construction of the hydropower dam will flood the villages, causing losses of houses, farmland, rice fields, plantations, vegetable, and all kind of crops, especially fruit trees, such as mango, coconut, orange trees, etc., which will no longer give any crops; and they are the kinds of trees that take a long time to grow and to care for. *"...Crops will die out because of flood, and my land will also be lost if they really build the dam; I will lose coconut trees, rice fields, especially all fruit trees."*

3. Resettlement

3.1. Source of information on resettlement

According to this study, provision of information on resettlement did not seem very clear yet because only 59% of the people had heard there would be resettlement for affected villages. None of the people in Sre Angkrong commune in Koun Mom district, Rattanakiri province had heard about resettlement. (See Table 30)

[63] Best practice in Providing Compensation and Resettlement for Large-Scale Dams: Case Study of the Lower Sesan 2 Proposed Hydropower Dam Project (Ian G. Baird, Ph.D, 2009)
[64] Understanding New Threats and Challenges from Hydro Power Development to Biodiversity and Community Rights in 3S River Basin. (Mark Grimsditch, April 2012)
[65] Complete Environmental Impact Assessment Report, Lower Sesan 2 Hydropower Project Stung Treng province December 2009, (PECC-1)

There are 69% of the village chiefs or deputy village chiefs had heard about resettlement, but 31% had not heard. There are 41% heard from district authorities, commune chiefs, district/provincial governors, 29% heard from NGOs, 24% heard from representatives of the Vietnamese construction company, and 6% heard from rumors.

Table 30 **-** Sources of information on resettlement

Source of information	Number	%
Local authorities (village chiefs, commune chiefs, district/provincial governors)	117	45.2
Rumors (heard from each other)	65	25.1
Representatives of the Vietnamese company	46	17.8
NGOs	31	12
Total	**259**	**100**

*Total number of respondents is 315

3.2. Information on resettlement received

People knew that there would be resettlement to a new place through rumors without specific, certain information confirming official resettlement.

One person from the Pluk village said that he knew about resettlement after attending a workshop at the Sekong Star hotel, Stung Treng province (time not remembered). He was told that 16 households would be displaced to the Srekor commune situated 30km from the village where they lived or to the Kbal Romeas village (40km from the village) when the dam is built. Another resident from the Koun Mom district, Rattanakiri province said that *"For the Koun Mom district with three communes, there is no plan for moving out; if there is flooding and damages by the dam, they will not compensate. Only Srekor, Kbal Romeas, Talat and Sre Tamee communes (Stung Treng province) are asked to move out."*

People in Khsach Thmey village in focus group discussions said that the proposed resettlement location was Tuol Runteah, which is 7km from the old village. They received this information from the village chiefs, commune chiefs, and CEPA.

3.3. Discussions/consultations on resettlement

Village authorities of all villages said that no company representatives or any institutions had come to discuss/consult with the people in their villages about resettlement. However, among the 69% of those village chiefs or deputy

village chiefs who had known about resettlement, 35% had met with the people in their villages to discuss resettlement, but did not know any real locations *"I only heard about resettlement that in 2011 people will be moved out of the Srepok village, in 2012 from the Sre Sronok and Kbal Romeas villages, and in 2013 from the Krabei Chrum village, but we don't know where exactly to move to yet"*. Information on consultations on resettlement was confirmed by focus group discussions that people had not been consulted with about resettlement, except for the Khsach Thmey village, where there were discussions/consultations between the village authorities and people in the villages. In the discussions, it was said that the dam construction would affect people's houses, so people were asked to move to Tuol Runteah. However, this was only planned, not yet certain.

According to the information obtained from the target households, among more than half (59%) of the people who knew or heard about resettlement, only 35% said that there were discussions/consultations on resettlement, while the other 24% said there had not been discussions/consultations yet with the people in the villages.

Among the people who knew about the resettlement location, 27% said that the distance of the resettlement location was 13,270m or about 13km, in which the nearest distance was less than 1km and the longest distance was over 30km. They added that they were not happy with the new place because they were happy living in their old locations because they had their houses and crops; whereas at the new place they would not have water; water was scarce and sources were far away.There were no fruit trees nor existing farms, and land was infertile, so crops would not grow well, and they did not know what occupation to follow: *"Because I am happy living in the old location because we already have our homes, crops and farmland."* The village chiefs and deputy village chiefs also agreed with the responses by the people that they were not happy with the proposed resettlement location.

3.4. Perceptions on resettlement

According to the focus group discussions in 5 villages among all the villages as well as the householde interviewed, people did not want to resettle because they thought that they would face difficulties when they moved to the new place. They were not used to live in the new land, and it would take a long time to grow fruit trees and construct houses, farmland, and plantation land. In contrast, in their old place, they already had their own houses, farmland, fruit trees, and other assets, so it was easy to live. Moreover, some people in focuss group discussions said that they did not object to the development, but they must be compensated the same amount as that they would lose. Also, infrastructure in the new villages must be built before they would agree to leave.

About 28% of the people said that they would leave or resettle because the water would flood them; they would not be able to stay even if they wanted

to; they had no other choice "...*It's not that we want to object, but we do not want to resettle, but the Law on Appropriation states that for anyone who does not agree to give the land to the State, the State can confiscate and imprison the owner, so we cannot stop it; we had to abide by the development of our government leadership."* (See Table 31)

All the village chiefs/deputy village chiefs, like the people, said that most people did not like the resettlement on the grounds that the new place did not have the requirements for building livelihoods while their old placealready met those needs.

Table 31 - Perception on proposed resettlement location

Perception on proposed resettlement location	Number	%
Did not want to move to the new location because they were used to live in the old place where it was easy; they had houses, crops, and occupations	216	69
Did not want to move to the new place, but they had no choice; if they did not move the water would flood them to death, so they had to move out	89	28
If they build the dam and require us to leave, they must compensate	3	1
Did not know what to do yet	7	2
Total	**315**	**100**

3.5. People's decision if the government requires resettlement

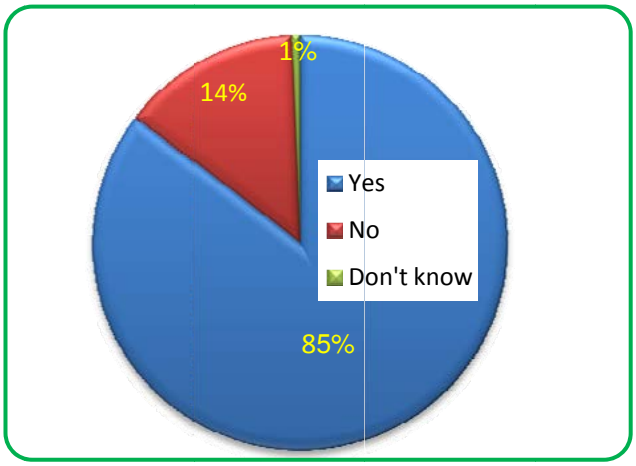
If the government required people to leave their native villages for the new settlement, most people or 85.4% would agree to abide by the demand; only a small number or 14% would not agree with the requirement while 0.6% had not decided. In fact, although most people decided to agree with the government's requirement, they would not be happy to do so; it would only be to fulfill their civic duty because they believed that they were unimportant people and thus had to listen to the guidance of higher-level leadership, i.e., they could not object against the development project. Further, they had no other choice if all villagers agreed to leave, as they would have to leave too. If they did not leave, there would be flooding, and they would not be able to continue to live there.

Along with agreement to resettle, people wanted prior, fair compensation before leaving *"Will decide to go if they ask us to; we had to go then, but with reluctance. I don't want to go at all, but if I stay then I'll be flooded; how can I stay."*

In contrast, some people said they would not leave their native villages even if the government required because their native villages were comfortable. They did not want to leave their native villages where houses, crops and occupations that were already established, to move to a new place where there was nothing: it would not make life easy. *"Because I don't want to leave my house; I lament my house, assets, land, and fruit trees. The new place would be very difficult." "I won't leave my house even if it means death."* (See Figure 20)

The information confirmed by the village chiefs and deputy village chiefs shows that 61.5% of them believed that people would agree to resettle if the government required because they could not stand against the development; if they did not leave, there would be flooding anyway, and they would not be able to live there either. On the other hand, 38.5% of village chiefs said that people would not resettle even if the government required them to because the new place did not have anything, and they did not know if the compensation would be fair or not for the people.

Figure 20 - People's decisions if the government requires resettlement

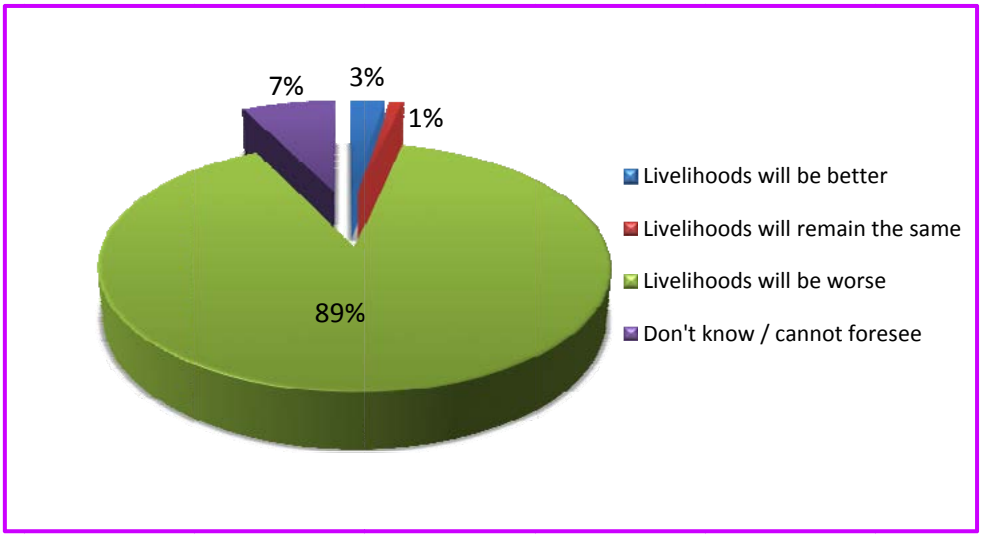


3.6. Expectation of livelihoods after resettlement

Most people, up to 89%, assessed that their livelihoods would be worse than before if they moved to the new place because the new location was a place without houses and crops. It would take a long time to develop the new location like the old place. Further, at the new place, there were no occupations to generate income, they could not fish, there was not sufficient water, water sources were far, which would affect livelihoods *"Livelihoods would decline because of losses of occupations of the old place. At the old place, most people farmed and fished to support livelihoods. If we moved to a new place, we would not know what to do; we would not know where to farm, where to fish like in*

the old place. In particular, it would take a long time to develop the new place." In addition, a small number of people thought that they were old and thus did not have energy to work or to prepare plantation land at the new place. A small number of respondents said that moving to the new place would cause illnesses. Also, 7% of the people responded that they would not know or could not assess the livelihoods when moving to the new place because they had not seen the place yet; therefore, they could not say what it would be like. In contrast to the response above, 3% of the people thought that livelihoods would be better than before because at the new place they would still be able to grow crops and there would not be flooding. Only 1% said that their livelihoods would remain the same because they would still be able to work like before. (See Figure 21)

Figure 21 - Expectation of livelihoods after resettlement



3.7. Basic needs for resettlement

About 5,000 people or over 1,000 households will be affected directly by the flood of the reservoir with 75 m of water level. In addition, most of the people in the project area are of different ethnicities, including Pnong, Kavet, Jarai, Proev, Khmer, Lao. Therefore, resettlement of these people needs to be taken into account in the preparation and design of the project.[66] People indicated a lot of needs for moving out of their old place to the new settlement in another location.

Discussions showed three key basic needs for moving to another place: farmland and plantation land, housing, and infrastructure. Other important basic

[66]Complete Environmental Impact Assessment Report, Lower Sesan 2 Hydropower Project Stung Treng province December 2009, (PECC-1)

needs include water sources, fruit trees, cows/buffaloes and other materials as shown in Table 32 below.

The village chiefs and deputy village chiefs did not have different ideas from the people in the villages *"There should be a team to help with transport and moving the houses. Compensation must be the same as what the people had. For example, 2ha of land must be compensated with 2ha of land; an 8m of house must be compensated with an 8m house. There must be schools, Sala Chortean. Spirit altars and burial forest must be prepared for us in the new location."*

Table 32 - Basic needs for resettlement

Basic needs	Number	%
Farmland and plantation land	263	**27.6**
Housing	260	**27.3**
Infrastructures	105	**11**
Water sources	98	10.3
Fruit trees	66	6.9
Cows / buffaloes	36	3.8
Funds	33	3.5
Food	31	3.2
Place to make a living	21	2.2
Electricity	12	1.3
Fishing grounds	10	1
Toilets	10	1
Place to raise animals	9	0.9
Total	**954**	**100**

*Total number of respondents is 315

3.8. Appropriate timeframe for preparation for resettlement

Preparation time for moving out to another location was discussed. Most People or 39.7% in the target areas to be affected requested appropriate time for moving out after official notification as less than one year while another 28.6% needed one year. (See Table 33)

People including some village chiefs and deputy village chiefs did not show much concern over the time allowed for preparation for moving out of their current homes because they could move out fast if there were agreements

on compensation as well as preparation of the new settlement for them. On the other hand, if the agreement and compensation for the people was not decided, then they would need more time to prepare upon official notification *"Need one year to think together about crops, farmland, residential land and other assets for living at the new settlement."*

Table 33 **-** Appropriate timeframe for moving out of the villages for resettlement

No	Timeframe	Number	%
1	Less than 1 year	125	**39.7**
2	1 years	90	**28.6**
3	2 years	39	**12.4**
4	3 years	20	6.3
5	4 years	5	1.6
6	5 years	6	1.9
7	Leave when being notified / leave when villagers leave	10	3.2
8	Will not move the house, would rather die at in the old village	5	**1.6**
9	Need 10 years	3	0.9
10	Not able to foresee	12	3.8
Total		**315**	**100**

4. Compensation

4.1. Source of information on compensation

Only about 50% of the people had known or heard about compensation and the information was not certain. Most of the information they received was from the village chiefs, commune chiefs, representatives of the Vietnamese company and rumors. (See Table 34)

According to the people in focus group discussions in the villages, people had known or heard about compensation through meetings with human rights organizations, Oxfam, CEPA, Organization Unlimited, the 3SPN, and village chiefs or commune chiefs. Moreover, 69% of village chiefs/deputy village chiefs had known or heard the news about compensation, but the other 31% did not know or hear about the compensation due to the dam construction. For the village chiefs/deputy village chiefs who had known or heard about the compensation, 29% of them received information from the district authority, 7% from NGOs, 50% from the Vietnamese construction company, and 14% from rumors.

Table 34 **-** Source of information on compensation

Source of information	Number	%
Local authorities (village chiefs, commune chiefs, district/provincial governors)	85	**38.6**
Representatives of the Vietnamese company	57	**25.9**
Rumors (heard from one another)	55	**25**
NGOs	21	9.5
Media (radio, TV...)	2	0.9
Total	**220**	**100**

*Total number of respondents is 315

4.2. Information on compensation received

People and village chiefs and deputy village chiefs who had known or heard about compensation only heard that there would be compensation for people's damages during construction of the Lower Sesan 2 Hydropower Dam, but they did not have detailed, specific official information. There are 38% heard that there would be compensation of houses and residential land, 28% heard that there would be compensation of farmland/plantation land, 14% heard that they would be compensated for their crops, and 8% heard that there would be financial compensation for damages, but did not know the real value of compensation.

Meanwhile, only a small number of people heard that the compensation would include infrastructure and electricity. The village chiefs added that at Krabei Chrum village in Kbal Romeas commune and Pluk village at Pluk commune, Sesan district, Stung Treng province, there were Vietnamese who were company representatives coming to measure the land and houses of people already, but they had not given information to the people about specific compensation. *"Heard that they will compensate farmland, houses, and crops; they came to take note to compensate the people according to the damages"*.

4.3. Discussions/consultations on compensation

Only 22% of the people and 23% of village chiefs/deputy village chiefs said there had been meetings and consultations on compensation for the impacts on or damages caused by the construction of the proposed hydropower dam with participation by people and the compensators, who were the representatives of the Vietnamese company. Based on this data, the results show that only a few households had taken part in discussions/consultations on compensation because in the 14 villages, only about 22% of the people were aware of the discussions while the majority of 78%were not aware of them. In addition, people in three

villages, i.e., Talat and Svay Rieng villages in Talat commune, Sesan district, Stung Treng province and Phum 3 in Sre Angkrong commune, Koun Mom district, Rattanakiri province who participated in focus group discussions in the study said that there had not been any discussions/consultations yet between the people and the compensators for their villages.

All the 20% of people who took part in the discussions and consultations on compensation said that the dam construction company agreed to compensate for houses, farmland and crops during the meeting. *"The company said they would compensate for the farmland and plantation land we had, and for crops, they would give financial compensation (value not yet specified); for the residential land, they would give one plot (size not yet specified); they would clear farmland for us"*.

Although those who participated in discussions/consultations heard about compensation, they said that there was not any certainty and clarity yet *"They told us about compensation, but the compensation was not certain yet; they only said there would be compensation*." It is noteworthy that in each village most people did not know about the discussions on compensation, but they had heard rumors that there would be financial compensation for fruit trees and there was measurement of people's houses for compensation. In this regard, although the complete EIA report of the Proposed Lower Sesan 2 Hydropower Dam states that there were consultations in 2008, the report did not mention organization of discussions/consultations on compensation with the people to be affected.

Because most people did not know or participate in discussions/consultations on compensation and because the EIA report did not confirm if there were discussions/consultations on compensation for the impacts, the issue of compensation remains a concern for those people to be affected by the project because they did not have opportunities to say what kind of compensation they could accept, and because they did not receive any formal information about the type of compensation the company would give them.

4.4. Appropriate and acceptable compensation

4.4.1. Analysis of compensation principles

According to ADB's resettlement policy to restore the economic and social base of people who lose their livelihood, three things are required: 1) compensation for loss of assets and income; 2) transfer and relocation assistance; 3) rehabilitation and restoration of lives.[67] This Bank's policy requires that

[67] According to ADB's resettlement policy to restore the economic and social base of people who lose their livelihood, three things are required: 1) compensation for loss of assets and income; 2) transfer and relocation assistance; 3) rehabilitation and restoration of lives. (ADB resettlement summary: a guide to good practice)

compensation must equal the status before the existence of a project, meaning that a loss replacement rate must apply.

Affected people should at least have as good conditions as before, after they resettle. The replacement rate must equal the market rate, plus transaction cost when the market reflects a reliable price information; and there are options of compensation for lost assets.[68] This Lower Sesan 2 Hydropower Dam Development Project is also related to the Law on Expropriation. Under the Law on Expropriation, Chapter 1, Article 5, public physical infrastructure includes construction or expansion of power stations, structure, equipment and lines for transmission and distribution of electrical energy.[69] This Law states that financial compensation given to the property owner and/or rightful owner shall be based on a market price or replacement price on the date of issuance of the Prakas on the expropriation, and the market price or the replacement price shall be determined by an independent commission or an agent selected by the Expropriation Committee.[70] Further, the owner and/or the rightful owner has the right to compensation for actual damages commencing from the last date of declaration of expropriation for which they are entitled to fair and just compensation.[71]

However, the legal framework in Cambodia has not yet provided for the principle of compensation or detailed procedures for fair and just compensation. The complete EIA at end 2009, recognized by the Ministry of Environment does not suggest any policies or detailed plans of compensation for the Proposed Lower Sesan 2 Hydropower Dam either. Therefore, these may lead to difficulties in receiving fair and just compensation for the communities to be affected by this dam project.

4.4.2. Compensation that people consider to be fair and acceptable

Concerning their comments on compensation for the damages caused by the construction of the proposed hydropower dam, people found it difficult to answer what would be fair for them and the compensators. In this regard, 75% of the people considered that a fair and acceptable compensation must give them back their houses, residential land, fertile farmland/plantation land (with similar size as those at the old place), crops, including fruit trees and business places the same as when they lived in the old village because these were basic needs for livelihoods. Besides, 20% of the people said that the compensation for all peoples' damaged assets had to be made based on an actual, fair market price.

[68] 1998, Asian Development Bank "Summary of the Guidelines on Resettlement" http://www.adb.org/sites/default/files/Resettlement_Handbook_Summary_KH.pdf (Searched website on Aug 16, 2012)
[69] Law on Expropriation, 2009 (Chapter 1, Article 5)
[70] Law on Expropriation, 2009 (Chapter 4, Article 22)
[71] Law on Expropriation, 2009 (Chapter 4 Article 23)

The other 12% believed that a fair and acceptable compensation had to be in cash valued on average at US$12,724.14 per household to support comprehensive livelihoods when they moved to the new place.

Although the needs for housing, residential land, farmland and plantation land are essential for livelihoods, without infrastructure, people's livelihood would not prosper. For this reason, 10% of the people said that the compensation for moving to the new place had to include infrastructure, such as schools, hospitals, pagodas, water sources, roads, etc. so that people could live in the new place. With respect to the compensation, only some 3% of the people wanted fair financial compensation for the fruit trees they had spent a long time to grow. Besides, there were various suggestions by a small number of people about fair compensation, such as prior discussions, electricity supply, etc.

Chapter 4 - Conclusion, Requests, and Recommendations

1. Conclusion

The research on the "Lower Sesan 2 Hydropower Dam: Current Livelihoods of Local Communities" shows the people's current living conditions before the construction of the dam for use as a baseline for comparing people's livelihoods after they move to new settlements. This study found peoples' awareness and views on the construction of the proposed hydropower dam, such as impacts, compensation and resettlement. These information is to show about peoples' feeling on the construction of the proposed Lower Sesan 2 Hydropower Dam.

At present, people's living conditions in the study areas are normal in terms of their daily livelihoods and activities without interruptions except for construction works, such as building of new houses or expansion of houses, which has been suspended pending official, certain notification on the project. Based on this study, it can be concluded that generally people's living conditions are on average, livable because most people or 96.8% are not living in poverty, assessed by the study. Although, there are 3.2% of people under poverty, they can enjoy existing NTFPs and river resources in their areas without facing difficulties of food shortage because the areas where they live are naturally favorable for their livelihoods. Concerning multiple-ethnic livelihood and stringent religious, traditional, and customary practice, people are likely to find it difficult to adapt to the livelihoods in the new locations if the resettlement does take place, in particular, for indigenous people because their livelihoods depend almost entirely on natural resources, such as forest, wildlife, and rivers.

Although most people in the study areas have lower levels of education compared with people in urban or city areas, they are aware of development and civil duties. In this regard, almost all people show their love for their native villages, do not want to leave, and do not want the Lower Sesan 2 Hydropower Dam Development Project to occur because it will cause great impacts on natural resources and the environment, especially, the impacts on a lot of households' livelihoods. At the same time, they know that development is important, and as Cambodians, they have to participate in the process. Based on their willingness to participate in development, although most people would be willing to align with government's requirements if resettlement is needed, they would like the government or the project investment company to provide them with decent support, such as compensation or replacement cost, taking into account thoroughly the impacts and responsibilities for their livelihoods so that they can take part in the development. In this regard, their first choice is that they do not want the proposed development of the Lower Sesan 2 Hydropower Dam.

However, if the option is not possible, then they would not object to the project either; they would only demand fair, just, and acceptable compensation or replacement cost.

Comprehensive discussions/consultations on this large-scale dam development project were not carried out with all affected people in each village. Provision of various information on the proposed dam construction project was not widely disseminated either because most people heard only uncertain information, and they have not received specific, official information yet. Refering to the complete EIA report 2009, it does not clearly specify that consultations carried out during the environmental and social impact assessment have been participated fully by all households in all villages to be affected. Further, the timeframe of only 30 days from the Ministry of Environment to review and comment on an EIA report is not sufficient for the review to be comprehensive. These problems lead to a conclusion that public consultations, information dissemination and seeking of people's approval for the implementation of the project seems to be limited.

In summary, a lot of documents, including the EIA report, the notice by the Royal Government of Cambodia, best practices in compensation and resettlement for large dams and field research in the areas to be affected by the Proposed Lower Sesan 2 Hydropower Dam showed that this proposed construction project will definitely have great impacts on the livelihoods of thousands of people, natural resources, and the environment. In addition, if there is no thorough, comprehensive consideration of impacts giving priority to people's needs, no planning for fair and clear compensation, no advanced planning of resettlement, the impacts can negatively affect people's livelihoods and food security, the poverty reduction goal, and the Cambodian Millennium Development Goals.

2. Requests

Due to concerns over future livelihoods, safety, and not wanting to move out of their current native villages, which are closely related to their traditions and religions as well as the love for their native villages, most people request that the government and the hydropower dam developer not construct the proposed Lower Sesan 2 Hydropower Dam. If the government cannot stop the construction project because it deems that the project will significantly benefit national economic development, then the people earnestly request that the government and the hydropower company consider pay close attention to prior, fair and just compensation. This compensation should be for houses, farmland, plantation land, crops, in particular, fruit trees, livestock, and for damages of other assets and business locations for people. It should also assist in resettlement transport, finance, and food for supporting the beginning of livelihoods in the new settlements.

Moreover, resettlement can proceed only after the government and the hydropower dam developer has closely considered construction of physical infrastructure, such as schools, roads, hospitals, pagodas, water sources, etc. when people move to the new place so that livelihoods as well as social movement in communities can function. In addition to these requests, the people request that the government and the company provide electricity to the people free of charge or at a low rate because they are those who are affected by the project. The last request is that the government must ensure that the new locations have land security, free from any encroachment.

3. Recommendations

❖ **For the Royal Government:**

1. Should recommend the project developer to conduct a more detailed and specific study on the environmental and social impact assessment in a good quality, honest manner with comprehensive participation in discussions and consultations with the directly affected people. It should conduct extensive awareness raising among stakeholders before starting the implementation of the project. This includes provision of sufficient opportunities for civil society to contribute to commenting on the EIA report.
2. As dissemination of information on the development project, compensation and resettlement does not seem to have clear activities, ensure that all information is made publicly available and people who will be affected can receive sufficient and certain information. In particular, give opportunities to people to share comments, make decisions, and show their satisfaction for the development project, compensation, and the proposed new settlements.
3. Strengthen the monitoring and evaluation team to monitor the project implementation activities before, during and after the construction to ensure that the company abides by the government's guidelines and principles to avoid breach of trust and contract, which can have negative impacts on the people.
4. Establish a compensation assessment commission and provide compensation with clear planning, and manage the implementation of compensation to ensure accountability, transparency, justice, and safety for the people in communities that are to receive compensation. Compensation for the impacts covers not only lost assets, but also lost time and efforts that the people have invested in their old places, and includes compensation for long-term impacts and support for people's livelihoods until they can strengthen their own living conditions. Moreover, in the future, a law on compensation should be enacted to

provide compensation for impacts by development to ensure that people will not lose benefits or suffer due to development, especially, in accordance with the government's poverty reduction policy.

5. Resettlement of affected people, especially specific locations and timeframes, must be planned in detail and in advance. Moreover, most people who live in the Proposed Lower Sesan 2 Hydropower Dam areas rely on agriculture, including farming, plantation, fisheries and NTFPs. Therefore, resettlement must take into accounts resources that people need and benefit from on an ongoing basis at the resettlement areas to ensure occupation security and food security for livelihoods.
6. Encroachment and land tenure in the new settlements may lead to land conflicts among people and other parties, so the government must ensure land tenure security and right to land tenure for the people by establishing a task force responsible for expediting land ownership or land registration.
7. Indigenous people are the target of closest attention for development because they are vulnerable. Indigenous people live in forested, mountainous areas and rely on the natural environment, such as forest, wildlife, rivers, creeks, etc. because they cannot adapt to a living style without these resources. Therefore, their rights and the kind of development that should be implemented to ensure that they are not victimized by development should be closely examined. Any development needs to preserve their traditions and religions.
8. Negative impacts and mitigation measures indicated by the EIA and the Environmental and Social Impact Assessment as suggested by experts should include preventive measures to avoid effects on people's safety and security later.
9. A Law on Environmental Impact Assessment (EIA) should be enacted to ensure perfection, quality and effectiveness of environmental impact assessment, and compliance with existing laws.

❖ **For the Hydropower Dam Development Company:**

10. Implement principles and guidelines as stipulated by laws and Sub-Decrees of the Kingdom of Cambodia, such as environmental and social impact assessments with full participation from people in each community, have clear compensation and resettlement plans, and be responsible for damages caused by the dam construction.
11. Most people did not receive clear, official information on the development project, compensation and resettlement, so ensure that such information is made publicly available and people to be affected have access to sufficient and clear information. In particular, allow people to

share their comments, to take part in decision making, to express their satisfaction of the development project, compensation and proposed new settlements.

12. Prepare compensation for immediate impacts or for basic needs before notifying people to resettle to prevent shortage of shelters, food, other basic needs. Compensation for indirect and long-term impacts and impacts on time and labor must also be well-prepared, fair, acceptable, and timely.
13. Ensure coordination of compensation or replacement cost to make similarity with the assets and resources in the people's old villages, such as houses, residential land, farmland, plantation land, locations close to forest, water sources, and fertile soil for livelihoods.
14. After relocation, people's livelihoods may not be the same as before because it will take a long time to develop the new place and to create jobs, so the company must plan people's livelihood restoration so that they can have stable livelihoods.
15. Communities directly and indirectly affected in the project area should have access to electricity at an affordable rate, which is lower than the rate for sale to outside the area because they are also taking part in developing the hydropower project.
16. There should be thorough discussions with the government, and study of sustainable development approaches for both natural environmental resources and society. In particular, attention needs to be paid to development that affects indigenous people to ensure that they can conserve their customs and traditions without affecting their livelihoods.

❖ **For Relevant NGOs:**

17. Work closely with communities to monitor all the company's activities or implementation progress, identifying those that are of irregular or negative nature for the people so that implementation will be under constructive critiques aimed at progress.
18. There should be partner working groups with the government to ensure that the company complies with the government's principles and to improve people's livelihoods after resettlement.
19. Provide training for, and share advocacy methodology with, those communities to be affected so that they will be aware of their rights and roles in development.
20. Provide additional training on hygiene, health, and vocational training so that people will gain more knowledge and skills and thus will be able to take up new occupations after resettlement.

❖ **For Communities:**

21. Organize as community groups with leaders and the people's commission in each village to share information and monitor the development project. Compile important documents related to the project, and seek assistance or report immediately if irregularities occur from the beginning of the project to secure common interest in the community.
22. Must know their rights and roles in participating in national development, and must take part in discussions/consultations on the proposed development in order to be aware of plans. They also have to bring issues to discuss and exchange ideas among people and village authorities before seeking additional support as necessary.

❖ **For Other Researchers:**

23. Study in details the impacts of the project on the environment natural resources and climate change.
24. Study income restoration program, which is a people's need in order to seek assistance from organizations for support and restoration of people's income.
25. Study about floods management for large-scale hydropower dam or study experiences of floods management from hydropower dams by other countries that have been successful and give recommendations for implementation of this hydropower project and other hydropower projects in Cambodia.
26. Study the advantages and disadvantages of constructions of large-scale hydropower dams, including a comparion of impact and benefit analysis of dam construction.
27. Study the living conditions and impacts of the Lower Sesan 2 Hydropower Dam Development on the people affected indirectly by the project.

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