



Best Practices in Compensation and Resettlement for Large Dams:

The Case of the Planned Lower Sesan 2 Hydropower Project in Northeastern Cambodia

Ian G. Baird, Ph.D

សម្ព័ន្ធនៃកម្ពុជា

The Rivers Coalition in Cambodia

May 2009

© Published by the Rivers Coalition in Cambodia, May 2009.

This publication may be quoted or copied for non-commercial purposes provided that full acknowledgement of the source is given.

Suggested Citation

Baird, Ian G. 2009. *Best Practices in Compensation and Resettlement for Large Dams: The Case of the Planned Lower Sesan 2 Hydropower Project in Northeastern Cambodia.* Rivers Coalition in Cambodia, Phnom Penh.

About the Rivers Coalition in Cambodia

The Rivers Coalition in Cambodia is an advocacy and information-sharing alliance of national and international civil society organizations dealing with the impacts of hydropower dam projects on the environment and local communities. For more information, please contact: ngoforum@ngoforum.org.kh .

Disclaimer

This report has been prepared for the Rivers Coalition in Cambodia. The views and opinions expressed herein are solely those of the author and may not necessarily reflect those of the Rivers Coalition in Cambodia and its member organisations.

សម្ព័ន្ធនៃកម្ពុជា

សម្ព័ន្ធរវាងអង្គការសង្គមស៊ីវិលនានាដែលធ្វើការដើម្បីការពារ និងស្តារ ឡើងវិញនូវប្រព័ន្ធអេកូឡូស៊ីទន្លេ និងជីវភាពដែលពឹងផ្អែកទៅលើទន្លេ នៅក្នុងប្រទេសកម្ពុជា

Rivers Coalition in Cambodia

An Alliance of Civil Society Organizations Working to Protect and Restore River Ecosystems and River-based Livelihoods in Cambodia



អភិរក្ស និង អភិវឌ្ឍន៍



FACT
Sustainable Livelihoods



បណ្តាញការពារទន្លេសេសាន ទំព្រួងពន្លាត សេសាន
3 S River Protection Network



ស្ម័គ្រចិត្តដើម្បីសង្គម



វេទិកានៃអង្គការមិនមែនរដ្ឋាភិបាល ស្តីពីកម្ពុជា
THE NGO FORUM ON CAMBODIA



Association of Cambodian and Environmental Preparation Association
AEGEP
CEPA

Acknowledgements

This study of the Lower Sesan 2 dam was initiated by the Rivers Coalition in Cambodia (RCC), a network of civil society organisations committed to protecting Cambodia's valuable river resources, and was coordinated at the Phnom Penh-level by The NGO Forum on Cambodia (NGOF). Tonn Kunthel, Bun Chantrea and Ame Trandem provided excellent assistance. Thanks also to Ngy San and Chhith Sam Ath for their overall support. Funding was provided by Oxfam America.

It would be impossible to individually thank all of the hundreds of people who participated in this study, and assisted in various ways. However, it is particularly important to thank Peak Saven from the Culture and Environment Preservation Association (CEPA), who assisted in conducting the fieldwork in Stung Treng Province. Thanks also to Tek Vannara and Tep Bunnarith from CEPA for their assistance with valuable documentation and other support. In Ratanakiri Province, the 3S (Sesan, Srepok and Sekong) Rivers Protection Network (3SPN) coordinated fieldwork. Thanks to Kim Sangha and Meach Mean for their efforts, and to members of the 3S community network, including Ngong Bunchan and Pheut Pheua from Ta Veang District, for their assistance during fieldwork conducted in that Ta Veang District. Thong Lien and Nou Phit coordinated activities in Veun Sai District. Nang Noy, Sin Thonglao, and Thon Bunhan from 3SPN, and the 3S community network, assisted in organising fieldwork in Lumphat District. Many other villagers made exceptional contributions during the two field data verification meetings held in Ban Lung, Ratanakiri and Stung Treng town. Thanks to Hok Menghoin of the Land Information Center at NGOF for preparing the maps. The wildlife photos were provided by Andy Maxwell of WWF.

Other support was provided by Megan MacInnes of NGOF, Yorth Bunny from the Cambodian Legal Education Centre (CLEC), Andy Maxwell of WWF, Hugo Rainey and Tom Evans from Wildlife Conservation Society (WCS), Paul Humphrey from 3SPN, and other NGO workers concerned with relocation and resettlement issues in Phnom Penh and other parts of Cambodia. They generously shared ideas and information with me, as did Grainne Ryder from Probe International, David Hall from Sechaba Consultants, and Jonathan Padwe. Thanks also to Pao Narit from the NGO Development Partners in Action (DPA) in Stung Treng for assistance in providing important documentation related to the Lower Sesan 2 dam.

Abbreviations

3SPN – 3S (Sesan, Srepok, Sekong) Rivers Protection Network
ADB – Asian Development Bank
CEPA – Culture and Environment Preservation Association
CITES – Convention on the International Trade in Endangered Species
CLEC – Cambodian Legal Education Centre
DPA – Development Partners in Action
EIA – Environmental Impact Assessment
EMP – Environmental Management Plan
ERAV - Electricity regulatory Authority of Vietnam
EVN – Electricité du Viet Nam or Electricity of Vietnam
GAA – German Agro-Action
Ha – Hectare
Hp – Horsepower
JICA – Japanese International Cooperation Agency
KCC – Key Consultants Cambodia
Kg – Kilogram
Km - Kilometre
MoE – Ministry of Environment (Cambodia)
MDGs – (United Nations) Millennium Development Goals
MEF – Ministry of Economics and Finance (Cambodia)
MIME – Ministry of Industry, Mines, and Energy (Cambodia)
MOWRAM - Ministry of Water Resources and Meteorology (Cambodia)
MRC – Mekong River Commission
MW – Mega Watt
NGO – Non-government Organisation
NGOF – The NGO Forum on Cambodia
NTFP – Non-timber forest product
PECC1 – Power Engineering Consulting Joint-Stock Company 1
PFD – Partnerships for Development (US NGO)
PRA – Participatory Rural Appraisal
RCAF – Royal Cambodian Armed Forces
RCC – Rivers Coalition in Cambodia
SIA – Social Impact Assessment
TIA – Transboundary Impact Assessment
WCD – World Commission on Dams
WCS – Wildlife Conservation Society
WFP – World Food Programme
WHO – World Health Organisation
WWF – World Wide Fund for Nature

Table of Contents

Acknowledgements.....	03
Abbreviations.....	04
Executive Summary.....	13
1) Introduction.....	16
2) Methodology	21
3) Review of Specific Expected Impacts of the Lower Sesan 2 Dam	25
3.1) Relocation Due to Inundation.....	25
3.1.1) Problems Related to Relocation.....	25
3.1.2) Compensation and Relocation.....	29
3.1.2.1) Villages in the Reservoir Area	29
3.1.2.1.1) House Replacement and Compensation.....	30
3.1.2.1.2) Fruit Tree Compensation.....	31
3.1.2.1.3) Agriculture Land Replacement and Compensation.....	31
3.1.2.1.4) Forestry Resources and Grazing Land Compensation.....	33
3.1.2.1.5) Fisheries Compensation.....	34
3.1.2.1.6) Domestic Ground Water Compensation.....	36
3.1.2.1.7) Other Compensation Issues.....	36
3.1.2.2) Villages Upstream from the Proposed Reservoir Area.....	37
3.1.2.3) Villages Downstream from the Proposed Dam Site	37
3.2) Fisheries.....	38
3.2.1) Fisheries Impacts Upstream from the Dam Reservoir in the Sesan and Srepok Rivers in Ratanakiri Province.....	39
3.2.1.1) Streams in the Srepok River Basin in Cambodia.....	47
3.2.1.2) Streams in the Sesan River Basin in Cambodia.....	51
3.2.2) Fisheries Impacts in the Reservoir area in Stung Treng Province.....	53
3.2.3) Fisheries Impacts Downstream from the Sesan 2 Dam in Stung Treng Province.....	54
3.2.4) Widespread Downstream Fisheries Impacts in the Mekong River, Tonle Sap and Mekong Delta.....	58
3.3) Forestry and Wildlife.....	62
3.3.1) Forestry.....	62
3.3.2) Wildlife.....	63
3.3.3) National Protected Area Management.....	65
3.4) Re-routing National Road #78.....	65
3.5) Tap Water Supply in Stung Treng.....	66
3.6) Fish Loss and Nutritional Problems.....	67
3.7) Cumulative Impacts.....	68
3.8) Livelihood Losses.....	69
4) Field Research Results.....	71
4.1) Individual Villages.....	71
4.1.1) Ta Bouk Village, Ta Veang District, Ratanakiri Province.....	72
4.1.1.1) Ta Bouk Stream Dams.....	75
4.1.1.2) Mysterious Mining Surveys in Ta Bouk area.....	76
4.1.2) Sieng Say Village, Ta Veang District, Ratanakiri Province.....	76

4.1.3) Veun Hay Village, Veun Sai District, Ratanakiri Province.....	77
4.1.4) Phum Thmei (Ban Mai) Village, Lumphat District, Ratanakiri Province.....	79
4.1.4.1) Concerns about Upstream Dams in the Srepok River Basin in Viet Nam	80
4.1.4.2) Concerns about Plans to Build the Lower Srepok 3 Dam.....	81
4.1.5) Kbal Romeas Village, Sesan District, Stung Treng Province.....	81
4.1.5.1) Problems with Resettlement Sites.....	82
4.1.5.2) Compensation Problems.....	85
4.1.5.3) Problems with Data Collection.....	89
4.1.6) Srae Kor 1 and 2 (Na Kor) Villages, Sesan District, Stung Treng Province.....	90
4.1.6.1) Resettlement Issues.....	90
4.1.6.2) Economic Land Concession Problems.....	91
4.1.6.3) Compensation Issues.....	93
4.1.6.4) Other Impact Issues.....	95
4.1.6.5) Problems with Data Collection.....	96
4.1.7) Rumpoat Village, Sesan District, Stung Treng Province.....	97
4.1.8) Phluk Village, Sesan District, Stung Treng Province.....	101
4.1.8.1) Downstream Impacts.....	103
4.1.8.2) Compensation Issues.....	104
4.1.8.3) Other Impact Issues.....	107
4.1.8.4) Dam Worker Issues.....	108
4.1.8.5) Problems with Data Collection.....	108
4.1.9) Ban Bung Village, Sesan District, Stung Treng Province.....	108
4.1.10) Hang Khou Suon Village, Stung Treng District, Stung Treng Province.....	112
4.2) Stung Treng Town.....	114
5) Best Practices.....	115
5.1) Participation of Affected People.....	115
5.2) Transparency.....	116
5.3) Full-Cost Accounting and Unconditional Compensation.....	117
5.4) Focus on Vulnerable Groups.....	117
5.5) Transboundary Impact Assessment.....	118
5.6) Environmental Flows.....	118
5.7) Cumulative Impacts.....	119
5.8) Considering Other Options.....	119
5.9) Guiding Principle-based Compensation.....	119
5.10) Results-Based Compensation.....	120
5.11) Compensation + 1	120
5.12) Long-Term Perspective.....	121
5.13) Payments for Ecological Services.....	121
5.14) Livelihoods Restoration.....	122
5.15) Making Dam Affected People into Full Project Shareholders.....	122
5.16) Secure Land Rights.....	123
5.17) Formalisation of Plans and Appropriate Implementation.....	123

5.18) Timely Compensation Payments.....	124
5.19) Grievance Redress Procedures.....	125
5.20) Viet Nam’s ‘Benefit Sharing’ Scheme—Is it a Step Forward?.....	126
6) Some Conclusions regarding the Lower Sesan 2 Dam.....	128
7) Recommendations.....	130
References Cited.....	133

Tables and Figures

Figure 1. Location of Lower Sesan 2 dam in the Mekong River Basin.....	17
Figure 2. Map of Surveyed Villages Enlargement.....	21
Table 1. Schedule of study fieldwork visits.....	23
Figure 3. Map of Surveyed Villages by Environment Team.....	24
Table 2. Resettlement housing floor space according to number of people per family.....	30
Table 3. Villages directly adjacent to the Srepok River that would be impacted by losses of migratory fish from the Sesan, Sekong and Mekong Rivers.....	41
Table 4. Statistics for villages in the Srepok River Basin in Cambodia that would be directly impacted by the Sesan 2 dam blocking migratory fish from the Sesan, Sekong and Mekong Rivers.....	42
Table 5. Villages upstream from the Sesan 2 dam on the Sesan River in Cambodia that would be impacted by a lack of fish migrations from the Sesan, Srepok, Sekong and Mekong Rivers.....	43
Table 6. Statistics for villages in the Sesan River Basin in Cambodia that would be directly impacted by the Sesan 2 dam blocking migratory fish from the Sesan, Srepok, Sekong and Mekong Rivers.....	46
Table 7. Villages not adjacent to the Srepok River but which are in the Srepok River Basin and in range of migratory fish from the Sesan, Sekong and Mekong Rivers.....	49
Table 8. Villages in the Sesan River Basin in Cambodia, not adjacent to the Sesan River, but in range of migratory fish from the Lower Sesan, Sekong and Mekong Rivers.....	52
Table 9. Villages downstream from the Sesan 2 dam on the Sesan and Sekong River in Stung Treng Province.....	56
Table 10. Statistics for villages located downstream of the dam site of the Sesan 2 dam along the Sesan and Sekong Rivers in Cambodia.....	57
Table 11. Fish species that migrate up the Mekong River from the Tonle Sap River each dry season. They migrate up the Sesan and Srepok Rivers from the Mekong River as well (adapted from Baird <i>et al.</i> 2003).....	60
Table 12. Household and population statistics for villages visited.....	71

Table 13. Village meeting participation statistics and the percentage of villagers
in those meetings who indicated that they are opposed to the construction of the Sesan
2 dam.....72

Photos

Front cover – Teenagers paddle a boat in the Sesan River from Phluk Village to an adjacent island in the river. Boats full of people would be vulnerable to tipping over due to downstream water releases if the Lower Sesan 2 dam is built.

Back cover – Statue of *Mekongina erythrospila* (*trey pa sa-i*) in Stung Treng town. This species of fish, which Stung Treng is famous for, is seriously threatened by the Lower Sesan 2 dam.

Photo 1 – Data validation workshop organised in Ban Lung Town, Ratanakiri Province.....	24
Photo 2 - Data validation workshop organised in Stung Treng Town, Stung Treng Province.....	24
Photo 3 – Data validation workshop organised in Stung Treng Town, Stung Treng Province.....	24
Photo 4 – Dhole and pups in the wild in project area.....	64
Photo 5 – Douc Langur in the wild in project area.....	64
Photo 6 – Eld’s Deer in the wild in project area.....	64
Photo 7 – Village headman stands and speaks during village meeting about the Lower Sesan 2 dam in Ta Bouk Village, Ta Veang Leu Commune, Ta Veang District, Ratanakiri Province.....	73
Photo 8 – Villagers in Ta Bouk Village raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....	73
Photo 9 – Villagers from Sieng Say Village, Ta Veang Kraom Commune, Ta Veang District, Ratanakiri Province examine a map showing the expected reservoir area of the Lower Sesan 2 dam during a village meeting.....	76
Photo 10 – Village meeting in Veun Hay Village, Hat Pak Commune, Veun Sai District, Ratanakiri Province regarding the Lower Sesan 2 dam.....	78
Photo 11 - Villagers in Veun Hay Village, Hat Pak Commune, Veun Sai District, Ratanakiri Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....	78
Photo 12 - Villagers in Phum Thmei Village, Chey Otdam Commune, Lumphat District, Ratanakiri Province raise their hands to indicate their opposition to the	

construction of the Lower Sesan 2 dam.....	79
Photo 13 - Villagers in Kbal Romeas Village, Kbal Romeas Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....	82
Photo 14 – Land taken from villagers from Kbal Romeas Village in order for a company to develop a commercial rubber plantation.....	87
Photo 15 - Villagers in Srae Kor 1 Village, Srae Kor Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....	90
Photo 16 - Villagers in Srae Kor 2 Village, Srae Kor Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....	90
Photo 17 – A rubber seedling nursery near Srae Kor Village. The rubber seedlings are being plantation on what was previously land used by villagers.....	92
Photo 18 - Villagers in Rumpoat Village, Ta Lat Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....	98
Photo 19 – Flood-level cement marker located in streambed adjacent to Rumpoat Village, and concerned villager.....	99
Photo 20 - Flood-level cement marker located in streambed adjacent to Rumpoat Village.....	99
Photo 21 –Ritual objects used by the Kreung people in Rumpoat Village to bless their rice crops.....	100
Photo 22 - Lowland rice paddy fields behind Rumpoat Village that are endangered of being flooded due to the Lower Sesan 2 dam.....	100
Photo 23 - Men in Phluk Village, Phluk Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....	102
Photo 24 – Women in Phluk Village, Phluk Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....	102
Photo 25 - Villagers in Phluk Village, Phluk Commune, Sesan District, Stung	

Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....102

Photo 26 - Villagers in Ban Bung Village, Phluk Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.....111

Executive Summary

This report is about plans to build the 480 MW and 75 metre high Lower Sesan 2 dam on the Sesan River in Sesan District, Stung Treng Province, northeastern Cambodia, the tens of thousands of people who are expected to be negatively impacted by the project, and options for dam developers and the government of Cambodia to uphold the rights of local people. The dam would be built just downstream from the confluence of the Srepok River, thus blocking two of the largest rivers in the Mekong River Basin, and causing serious negative environmental impacts.

This study included a review of all available documentation related to the Sesan 2 dam. Relevant policy and legal framework in Cambodia were also considered. Eleven villages (ten locations) were visited to consult with local people regarding the Sesan 2 dam. Data collected in villages and elsewhere were validated in workshops organised in Ratanakiri and Stung Treng Provinces. A review was done of ‘best practices’ literature related to compensation and resettlement issues associated with large dam construction and operation.

The most important conclusion of the study is that 100% of the people who participated in village meetings organised in all the communities visited clearly indicated that they are opposed to the Sesan 2 dam. Many did not want to discuss compensation issues, instead insisting that no level of compensation would be sufficient to make up for the expected severe impacts of the dam. It also appears, based on villager reports, that the vast majority of people in other parts of Stung Treng Province are opposed to the project.

The Sesan 2 dam, if built, can be expected to cause the following impacts:

- 1) Thousands of people would have to be relocated as a direct result of being inundated by the dam’s reservoir, although the exact number remains unclear. Local people would also lose access to fisheries, as well as forest and wildlife resources.
- 2) At least 38,675 people, including a large number of indigenous peoples, included in at least 86 villages located along the Sesan and Srepok Rivers and in the reservoir area would lose access to the vast majority of their fisheries resources due to the dam blocking fish migrations from the Mekong and Sekong Rivers up the Sesan and Srepok Rivers. In addition, at least 87 villages in Cambodia located along tributaries of these two rivers would also lose access to migratory fish. In total, at least 78,000 people living above the Sesan 2 dam site are expected to lose access to migratory fish.
- 3) Tens of thousands of people living downstream from the proposed dam site along the Sesan, Sekong and Mekong Rivers in Stung Treng Province would be negatively impacted as a result of dramatic changes in hydrology and water quality, causing a whole range of serious impacts ranging from fisheries losses to impacts on domestic water sources. This includes at least 22,277 people living in 19 villages adjacent to the Sesan and Sekong Rivers downstream from the dam site in Stung Treng Province.

- 4) Hundreds of thousands of people living as far away as the Tonle Sap Lake in Central Cambodia, the Mekong Delta in Viet Nam, and the middle Mekong River in Laos and Thailand would be negatively impacted by the Sesan 2 dam as a result of severe impacts to important fish stocks that conduct regional migrations.

In the reservoir area, local people are unhappy with the plan for fisheries compensation, but are especially dissatisfied with the provisions for resettlement, including the compensation proposed for lost houses, fruit trees and forest land.

Upstream of the dam, people are not satisfied with the one-time lump-sum payments proposed as compensation for a single year of fish losses, even though the dam would potentially result in generations of lost migratory fish resources.

Downstream from the dam in Stung Treng Province people are unhappy with the lack of measures to mitigate water quality and hydrology impacts, as well as the apparent lack of proposed compensation for a variety of downstream losses.

Although the Environmental Management Plan acknowledges that fish stocks as far away as Viet Nam, Laos and Thailand would be negatively impacted by the Sesan 2 dam, no efforts have been made to quantify these impacts or put together a compensation package for those who would be impacted. A transboundary impact assessment for this project should be conducted, due to the severe impacts that the dam would cause to migratory fish. Wide impacts within Cambodia should also be studied in more detail.

Local people are not satisfied with the environmental and social impact assessment (EIA and SIA) data collection work done regarding the Sesan 2 dam, especially as it relates to resettlement and compensation issues, as they feel that the data collection process was not participatory, and that there are problems with the accuracy of the data collected, as well as with various recommended mitigation measures, resettlement plans, and compensation rates. Local people demand that the study be redone. This sentiment has also been expressed by government officials in Stung Treng Province.

Available information indicates that the dam developers have only collected household level data and consulted with local people living in the reservoir area and directly adjacent to the dam site. There have also not been any significant consultations or data collection efforts related to plans to build the Sesan 2 dam within the large number of villages located upstream from the expected reservoir area of the Sesan 2 dam, or downstream from the dam site. This is a major deficiency of the EIA and SIA work done so far.

If approved, the Sesan 2 dam as currently planned would result in increased poverty and malnutrition over a wide area in Cambodia, thus going against the Cambodian government's development plans for the nation, including efforts to achieve UN Millennium Development Goals (MDGs).

This report makes recommendations regarding different approaches to resettlement and compensation issues that would be acceptable to the communities affected by the Sesan 2 dam. These recommendations are relevant for other large dam development projects in Cambodia and the region.

It is particularly important to incorporate good public participation into environmental and social impact assessments for projects that are expected to have as heavy impacts, such as the Sesan 2 dam. Informed participation is the hallmark of good quality environmental and social impact assessments worldwide.

Other crucial best practices relate to focussing on vulnerable groups, including indigenous peoples, ensuring transparent processes, assessing transboundary impact, applying full-cost accounting and unconditional compensation provisions, considering cumulative impacts, implementing guiding principle-based compensation, conducting results-based compensation, introducing the concept of 'compensation +1', taking a long-term perspective to impact and compensation issues, making dam affected people into full project shareholders, ensuring that local people have secure land rights after being relocated, formalising plans and appropriately implementing them, mandating timely compensation payments, and establishing grievance redress procedures to ensure that dam affected people have a way of addressing problems with compensation measures.

Based on the findings of this study, and especially considering the strong opinions of large numbers of local people who are against the Sesan 2 dam, the Cambodian government should carefully consider whether the project should be built, or if the costs to local people, biodiversity and the country more generally are so high as to make the dam economically, environmentally and socially unattractive.

1 Introduction

This report is about plans to build the Lower Sesan 2 dam (hereafter referred to as the Sesan 2 dam) on the Sesan River in Sesan District, Stung Treng Province, northeastern Cambodia. It is also about the hundreds of thousands of people who are expected to be negatively impacted by the project, and options for dam developers and the Cambodia government to uphold the rights of Cambodians and others in the region. The Sesan, Srepok, Sekong and Mekong Rivers in northeastern Cambodia are crucial for the livelihoods of a large number of people, thus making this project regionally significant.

The Sesan 2 dam is now expected to have an installed capacity of 480 MW, and a firm capacity of 120.5 MW (PECC1 2008a).¹ It would be the largest hydroelectric project in Cambodia to date. It is presently expected to be a 75 metres high² concrete dam (KCC 2008a; PECC1 2008a), with a length of over one kilometre. The Sesan 2 dam would completely block the Sesan River at a location not far upriver from Phluk Village, Sesan District, known to locals as the Khanh Ampo rapids, which is just 1.5 km downstream from the confluence of the Srepok River with the Sesan River.³ The funding arrangements for the project remain unclear. A new company controlled by EVN—named EVN-Cambodia Joint Stock Company—has been set up to manage this dam.⁴

Halcrow and Partners (1999), funded by the Asian Development Bank (ADB), conducted the first pre-feasibility study on the Lower Sesan 2 dam, including generally assessing the project's environmental and social impacts, as part of a sectoral study of a number of large hydroelectric dams in the Sesan, Sekong and Nam Theun River Basins. Halcrow and Partners (1999) found that the dam was unattractive for investment due to its marginal financial viability. They were particularly concerned about the extremely heavy environmental and social impacts of the dam.

After the ADB study little was heard of the Lower Sesan 2 dam until June 15, 2007, when the Cambodian government, represented by the Ministry of Industry, Mines, and Energy (MIME),⁵ granted permission for Electricité du Viet Nam (EVN) to conduct a detailed feasibility study on the dam, which is expected to be located about 1.5 km from the confluent point where the Srepok River discharges into the Sesan River, in Sesan District, Stung Treng Province (KCC 2008a &

¹ However, KCC (2008b) reported that the dam is expected to have a capacity of 400 MW, not 480 MW, and Lor & Quinn (2007) reported that the size was expected to be 420 MW, with each MW costing US\$1,000,000. VNA (2007) also reported that the size was expected to be 420 MW.

² When the feasibility study began the project developers considered project designs with 75 m and 80 m tall dams. However, according to various reports, they eventually decided to support the 75 m option, which is about 40 m above the riverbed (KCC 2008b).

³ A second option at Khanh Kasach rapids just north of Phluk Village, and 7.5 km downstream from the confluence of the Srepok River with the Sesan River, has been ruled out in favour of the upstream site (KCC 2008b).

⁴ Rutherford *et al.* (2008) report that Chinese companies have been awarded permission to conduct pre-feasibility studies on the Lower Sesan 2 dam, as well as the Lower Srepok 2, 3 and 4 dams. However, there does not appear to be any evidence of the Sesan 2 dam having been studied by the Chinese. However, as explained below, the Lower Srepok 3 dam has been under study by a Chinese company.

⁵ The Ministry of Water Resources and Meteorology (MOWRAM) also has a role to play in the management of multipurpose hydropower dams, based on the Water Resources Law, which was passed by the National Assembly in May 2007. MOWRAM is responsible for managing Cambodia's surface and ground-water resources, and MOWRAM has issued water-use permits for dams in the past (Meach 2008).

b). Vietnam News Agency (VNA) (2007) reported that EVN's Deputy General Director Lam Du Son and Cambodian State Secretary in charge of MIME, H.E. Khlaut Randy, had inked the agreement, which also covered plans to conduct a feasibility study on another dam on the Sesan River with the capacity of 90 MW.⁶



Figure 1 Location of Lower Sesan 2 dam in the Mekong River Basin

EVN is the same Viet Nam government-owned company that owns the 720 Mega Watt (MW) Yali Falls dam in the Central Highlands of Viet Nam, a project which has caused many serious downstream impacts along the Sesan and Sekong Rivers in Cambodia. So far, The extensive negatives impacts of the dam have been well documented (Wyatt & Baird 2007; Berge 2007; NGO Forum on Cambodia 2005; Hirsch & Wyatt 2004; Learner 2003; Baird *et al.* 2002; Ojendal *et al.* 2002; Fisheries Office & NTFP 2000). The people from the affected communities report that they have not yet received compensation for any of their material or livelihoods losses since first reporting impacts in 1996. This is despite the fact that a study done for EVN on the downstream impacts in Cambodia of Sesan dams in Viet Nam has largely verified the serious

⁶ According to Heng Soy (2007), the total amount of electricity that can be produced along the Sesan River in Cambodia would be 818 MW. That would require that five dams be built. The first would be constructed on the Sesan River near the Cambodia-Vietnam border, and would have a capacity of 90 MW, the second would be built in Stung Treng Province with a capacity of 420 MW (Sesan 2 dam), the third would be located on the Ta Bouk Stream (Prek Liang) and have a capacity of 64 MW, the fourth would also be on the Ta Bouk Stream and have a capacity of 64 MW, and the fifth dam would be on the Sesan River in Ratanakiri Province, and have a capacity of 180 MW. The cost of constructing all five dams has been estimated at US\$1.388 billion. All would reportedly be built with Vietnamese assistance.

nature of downstream impacts (SWECO 2006a).⁷ EVN has also failed to provide compensation to those in Cambodia who have been impacted by subsequent dams built, and being built, on the Sesan and Srepok Rivers in Viet Nam, including the Sesan 3, 3A, 4, 4a⁸ and Plei Krong dams in the Sesan Basin; and the Buon Kuop, Dray Hlinh (new and old), Duc Xuyen, Srepok 3, Srepok 4, Srepok 4a and Buon Tou Srah dams in the Srepok Basin.

EVN appointed Viet Nam's Power Engineering Consulting Company 1 (PECCI) to conduct the feasibility study for the Sesan 2 dam (PECC1 2008a & b). Then, on January 2, 2008 MIME notified the Stung Treng and Ratanakiri Provincial Departments of Water Resources that a feasibility study would be implemented for the Sesan 2 dam from September 2007 to March 2009. PECC1 of EVN would go to the Sesan 2 dam site to do topology, drill soil, and collect other data. PECC2 Company of EVN would go to the Lower Sesan 1 dam site to do topology, drill soil and data collection in Ratanakiri Province. PECC3 would study the transmission line for the two projects during the dry season.⁹ The Cambodian company Key Consultants Cambodia (KCC) was contracted by PECC1 to conduct the EIA part of the feasibility study (KCC 2008b). A draft Environmental Management Plan (EMP) has been prepared by KCC (KCC 2008a), presumably with the input of PECC1. The EMP was expected to be finalised in November 2008, but as of March 2009 Ministry of Environment (MoE) officials reported that they had not yet received a copy of the EMP for review (NGOF, *pers. comm.*), but that it was expected to arrive in March 2009. According to Article 6 of Cambodia's Law on Environment Protection and Natural Resource Management (1996), the MoE is required to examine and evaluate EIAs before submitting them to the Royal Government of Cambodia for approval (MoE 1996). However, according to article 15 in the Sub-decree on Environment Impact Assessment Process, the MoE has to complete reviews of EIA submitted to them within just 30 days (MoE 1999), which leaves little opportunity for the MoE to check the accuracy of information provided by, and paid for, by project proponents. The Inter-ministerial Resettlement Committee (IRC) of the Ministry of Economics and Finance (MEF), line ministries and local authorities are responsible for approving resettlement action plans and compensation rates for projects requiring resettlement (Meach 2008).

On February 26, 2008, a new MoU was signed between MIME and EVN Cambodia to build a 100 KV transmission line to supply power to Stung Treng Province, a 220 KV sub-station in Ban Lung town to supply power for Ratanakiri province, and a 220 KV transmission line to export electricity from the Lower Sesan 2 dam to Ban Lung, and then to Viet Nam.¹⁰

In 2008 the Japan International Cooperation Agency (JICA) also made the Sesan 2 dam one of its proposed ten priority hydropower dams in Cambodia, as a part of a hydropower development

⁷ SWECO (2006b) also conducted a similar study on the impact of Vietnamese dams in the Srepok River Basin on downstream areas in Cambodia. Both reports were publically released.

⁸ The Sesan 4a dam was supposed to be a regulating dam to reduce downstream impacts on Cambodia of upstream dams in Viet Nam. However, it remains unclear whether this dam has been converted into a hydropower dam or will be a re-regulating dam.

⁹ MIME 2008. Fax notification received by the Department of Water Resources, 2 January 2008, dated 7 December 2007.

¹⁰ Meach (2008) Public Consultation Meeting for the EIA Study. PECC1 & KCC, Power Point Presentation, Stung Treng Town, May 2008.

master plan (JICA and Nippon Koei 2008; Nippon Koei 2008). Later it became one of JICA's seven priority projects.¹¹ The large amount of electricity that would be produced from the project is the main argument for it.

The draft EMP estimates that the project would lead to the resettlement of thousands of people¹², and would indirectly impact hundreds of thousands of others located both upstream from the dam along the Sesan and Srepok Rivers, and downstream from the project site along the Sesan, Sekong and Mekong Rivers (KCC 2008a). Based on what is presently known about the Sesan 2 dam, project's reservoir would inundate approximately 33,560 ha of land and riverbeds (KCC 2008b). While complete details of EVN's project implementation plan have not been disclosed, and the EMP may well change before being finalised, available information indicates that only very basic asset compensation and little to no compensation for communities indirectly impacted is planned. A review of the Sesan 2 dam is thus warranted, and is a key objective of this research. This is, indeed, an opportune time to carefully consider social and environmental issues associated with the project.

As of this writing, the final version of the EMP is apparently in the last stages of preparation. To date, it is believed that a project agreement for the dam has not been signed by representatives of the government of Cambodia. A decision has apparently not been made by the Cambodian government, which has only granted permission for EVN to conduct a feasibility study for the project. However, if the government of Cambodia approves the project, construction is expected to begin in 2010 (KCC 2008a & b) and be completed by 2014 (KCC 2008b). The cost of the dam is expected to be US\$662.62 million (KCC 2008b).¹³

The purpose of this report is not to provide a detailed SIA and EIA for the Sesan 2 dam that would include all associated mitigation, resettlement and compensation plans, although such a study should be conducted. Indeed, insufficient time or resources were available to visit all the communities that would be affected by the Sesan 2 dam, or to study all the potential impacts of the project in sufficient detail. In addition, the financial burden for conducting such a comprehensive study should be borne by the project developer, not non-government organisations (NGOs). Instead, this study involved independently visiting and consulting with some representative communities that would be variously impacted by the dam, engage in discussions with local people regarding the project and various expected impacts, and consider what would be required to improve the standards of the social and environment impact studies in relation to the project. An attempt is made to take into account national, regional and international standards, including the 'best practices' literature from the region and globally. Essentially, the report's purpose is to contribute some ideas that might be useful for improving the Sesan 2 dam's social and environmental impact assessments—especially in relation to resettlement and compensation standards—but also to help improve standards for dam-related social and environmental impact assessments throughout Cambodia more generally. Crucially, this report presents the views of villagers who would be affected by the dam, and considers their

¹¹ These ten priority projects were selected from a list of 29 projects.

¹² There are discrepancies in different documents regarding the exact number that would be resettled. More details are provided later in this report.

¹³ In July 2007, the dam was expected to be 420 MW and cost US\$420 million to build (Lor & Quinn 2007).

opinions in relation to mitigation, resettlement and compensation measures proposed in the EMP and other documentation obtained about the Sesan 2 dam.

The specific objectives of this study were:

- 1) To develop an independent resettlement and compensation proposal for the Lower Sesan 2 hydropower project that addresses the concerns and needs of affected communities and civil society and is based on consensus among those affected.
- 2) To provide detailed recommendations on what the Lower Sesan resettlement and compensation package should look like based on comparative research on "best practice" standards and practice in resettlement and compensation internationally.

2 Methodology

In order to achieve the above research objectives, the study required detailed preparations. First, it was necessary to become familiar with legal issues associated with industrial developments and associated resettlement and compensation issues in Cambodia. This was done with the support of NGO Forum on Cambodia (NGOF) in Phnom Penh and other NGOs working on resettlement issues during the first days of research planning.

Next, all available literature related to the Sesan 2 dam, and more particularly, large dams and social and environmental ‘best practices’ was gathered. Previous involvement in various activities and projects in the Sesan River Basin over the years helped make this job relatively easy.

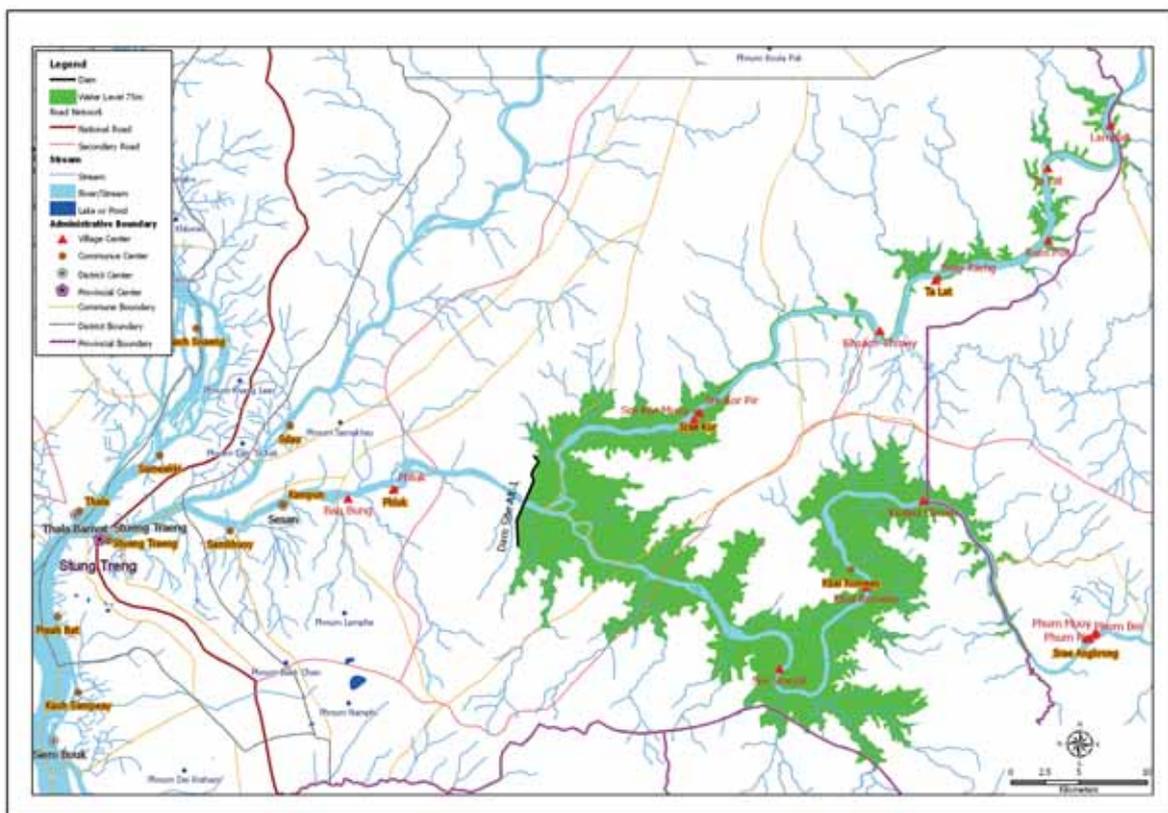


Figure 2 Map of Surveyed Villages Enlargement

Eleven villages (10 locations) were then visited over a three-week period, working closely with Cambodian counterparts associated with 3SPN in Ratanakiri and CEPA in Stung Treng (both NGOs have close links with communities that would be potentially impacted by the Sesan 2 dam) (see Figure 2). In most cases we stayed one night in each village, although two nights were required for villages located in the dam’s reservoir area. We did not stay overnight in two villages. During the village visits local people were engaged in both informal discussions about the project and more structured village meetings also directly related to the Sesan 2 dam. Many of the questions posed to local people were related to the EMP. A series of questions were also

posed in particular reference to fish migrations. However, because each interview tended to build on the knowledge acquired from previous interviews, there were not a set of predetermined questions that were asked in each and every village. Instead, the circumstances and context of each situation dictated the questions asked. Local languages were used in all the village meetings organised during fieldwork.¹⁴ Table 1 is a travel schedule for the research conducted, and includes a list of the villages visited.

It is crucial to understand that in order to adequately consider compensation and resettlement issues associated with the Sesan 2 dam, it was necessary to analyse the broader social and environmental impacts of the dam. Without doing that, it would have been impossible to consider what compensation and resettlement arrangements would be appropriate. It is, in fact, impossible to separate compensation and resettlement issues from the broader social and environmental issues associated with a project. They are necessarily closely interlinked.

In order to represent the ideas of people from villages as accurately as possible, individual report sections were prepared for each village visited, in order to allow for the unique concerns of each community to be clearly expressed. These village reports included statements offered by participants in the village meetings. The meetings were open to all community members.

Data about fish and fisheries issues were compiled based on the available literature, as well as interviews with fishers during fieldwork. Knowledge of fish and fisheries in the region was also utilised in order to attempt to zero in on important issues. The methods used generally followed the local knowledge fisheries research protocol laid out by Baird (2006c). That is, fish were identified by cross referencing data related to fish photograph identification, local fish names, and fish species behaviour. It was not possible to investigate fish species that are too small to be of special interest to fishers.

After the fieldwork for this study was completed in December 2008, a draft report was prepared, which was presented, in local languages, to representatives of all the communities visited.¹⁵ This was done during two one-day validation workshops held in Ban Lung, Ratanakiri Province on January 28, 2009, and in Stung Treng Town, Stung Treng Province on February 5, 2009. This validation process was designed to help ensure that villagers agreed with the statements attributed to them in the report. Village representatives were also encouraged to add to or otherwise amend their statements, provided that the amendments did not totally contradict the sentiments of community members at the village meetings. The material was orally translated into Lao language, which representatives of all the villages speak (most as their first language). To ensure full understanding, all communications were translated into Khmer. Villagers' comments were incorporated into the draft report following the two validation workshops.

¹⁴ The Brao and Kreung languages, which are closely related (Keller et al. 2008), were used in three village meetings, Lao was used in six village meetings, and a combination of Lao, Khmer and Bunong languages were used during one village meeting.

¹⁵ The only village not represented at the data validation workshops was Rumpoat, although villagers were invited. They apparently did not attend because of problems travelling from their village to Stung Treng Town.

Table 1. Schedule of study fieldwork visits

Date	Village¹⁶	Commune	District	Province	Ethnic Group
Dec 1-3, 2008	Ban Lung	Ban Lung	Ban Lung	Ratanakiri	Many (Khmer, Lao & highlanders)
Dec 3-4, 2008	Ta Bouk	Ta Veang Leu	Ta Veang	Ratanakiri	Brao
Dec 4-5, 2008	Sieng Say	Ta Veang Kraom	Ta Veang	Ratanakiri	Brao
Dec 6-7, 2008	Veun Hay	Hat Pak	Veun Sai	Ratanakiri	Lao
Dec 8-9, 2008	Phum Thmei	Chey Otdam	Lumphat	Ratanakiri	Lao
Dec 10-11, 2008	Stung Treng	Stung Treng	Stung Treng	Stung Treng	Many (Khmer, Lao & some Chinese)
Dec 11-13, 2008	Kbal Romeas	Kbal Romeas	Sesan	Stung Treng	Bunong
Dec 13-15, 2008	Srae Kor 1 and 2	Srae Kor	Sesan	Stung Treng	Lao
Dec 15-16, 2008	Rumboat	Ta Lat	Sesan	Stung Treng	Kreung
Dec 17-19, 2008	Phluk	Phluk	Sesan	Stung Treng	Lao
Dec 19, 2008	Ban Bung	Phluk	Sesan	Stung Treng	Lao
Dec 20, 2008	Hang Khou Suon	Samaekki	Stung Treng	Stung Treng	Lao/Khmer
Dec 20-23, 2008	Kandal	Stung Treng	Stung Treng	Stung Treng	Khmer/Lao

The final draft report was then sent to members of the RCC, including NGOF, CEPA and 3SPN, for comments, which were integrated into the report. Comments of other experts in the field were also solicited.

Once the report was finalised, it was translated into Khmer. Khmer versions are being sent to all the villages that participated in the study, as well as other communities in the project area, and to relevant government agencies and civil society organisations.

¹⁶ The village, commune and district name spellings used in this report originate from the Cambodia National Institute of Statistics (Ministry of Planning) website: http://statsnis.org/areaname/area_name.htm. It should be noted the author recognises that some of these spellings are incorrect or otherwise problematic, but in order to be in-line with the Cambodia government's office list of names, they have been included nonetheless.



Photo 1 Data validation workshop organised in Ban Lung Town, Ratanakiri Province



Photo 2 Data validation workshop organised in Stung Treng Town, Stung Treng Province

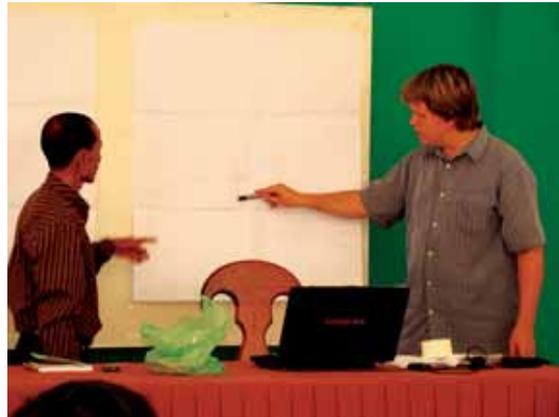


Photo 3 Data validation workshop organised in Stung Treng Town, Stung Treng Province

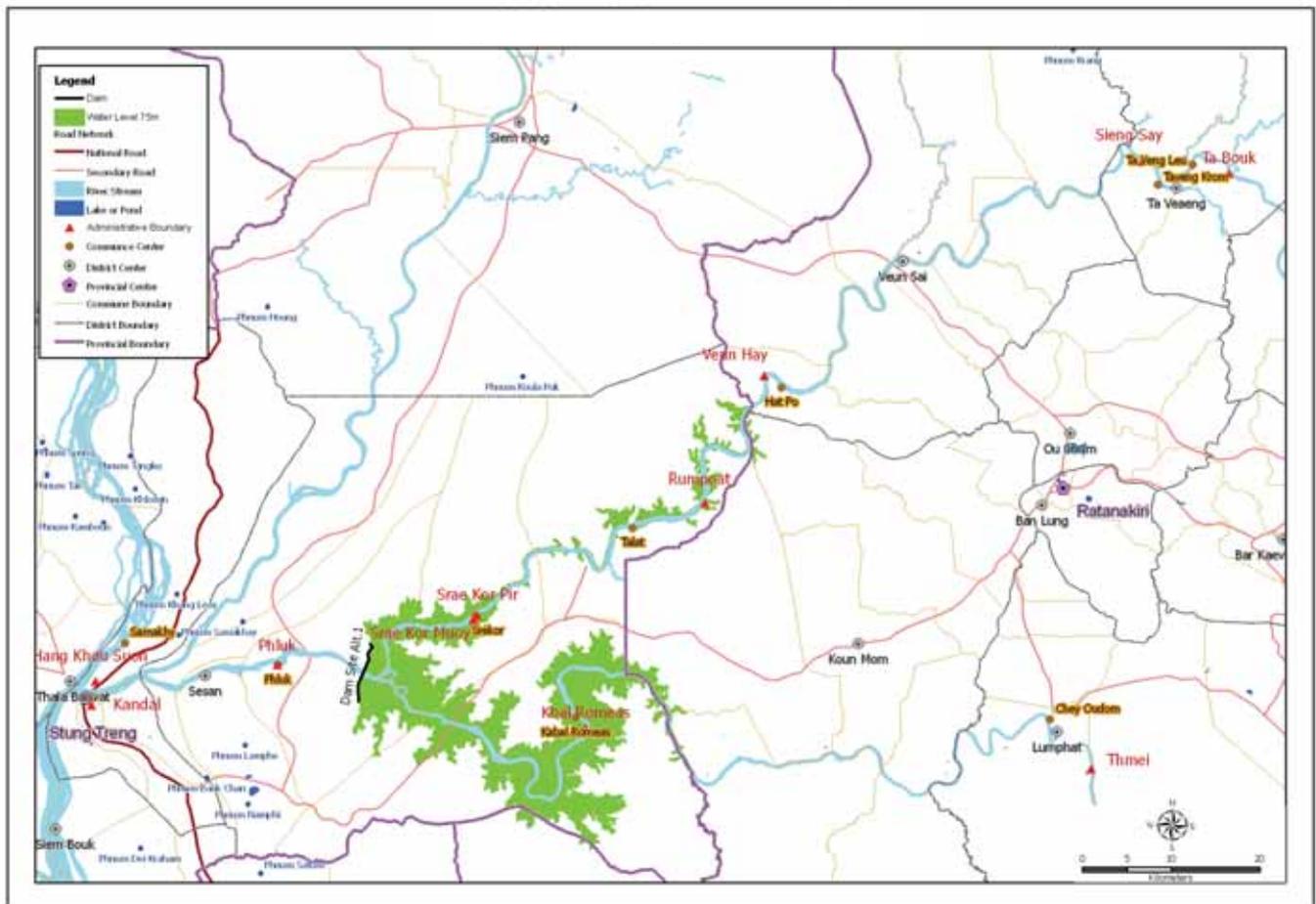


Figure 3 Map of Surveyed Villages by Environment Team

3 Review of Specific Expected Impacts of the Lower Sesan 2 Dam

This section reviews some of the main expected impacts of the Sesan 2 dam, combining insights provided by villagers during fieldwork with scientific and other information drawn from relevant literature, as well as other sources. This review was necessary to adequately assess important compensation and resettlement issues associated with the dam.

3.1) Relocation Due to Inundation

“Relocation is perhaps the most difficult of all tasks involving resettlement, because recreating living conditions and, in some cases the settlement and living patterns of entire communities, can be a very challenging and complex task” (ADB 1998: 55).

The villages that would be resettled from the Sesan 2 dam reservoir area include Srae Kor 1 and 2, Srae Sranok, Kbal Romeas, Kbal Spean Srepok (Chrab). The resettlement of Krabei Chrum, Khsach Thmei, Svay Rieng, Rumpoat and other villages still needs to be confirmed.

Before considering the compensation plan for relocated communities, which is covered in section four of this report, it is worth initially assessing the relocation and resettlement plans associated with the Sesan 2 dam. Although the dam is not expected to be constructed until 2010, Meach (2008) reported that people living in the reservoir area of the dam could be relocated as early as 2009.¹⁷ According to the EMP, at a height of 75 m, it is expected that 1,059 households (332 from Srae Kor Commune, 453 from Kbal Romeas Commune, 267 from Ta Lat Commune, and 7 from Phluk Commune) would have to be resettled as a result of the dam (KCC 2008a). However, KCC (2008b) reported that 4,754 people in 1,052 families would need to be relocated. But according to PECC1 (2008a), 613 households (332 from Srae Kor Commune, 267 from Kbal Romeas, and 14 from Phluk Commune) and 2,777 people are expected to be relocated. The exact number of people that would need to be relocated is, thus, unclear.

3.1.1) Problems Related to Relocation

“Location and quality of the new relocation site(s) are critical factors in relocation planning because they ultimately determine access to land, social support networks, employment, business, credit, and market opportunities. Each site has its own constraints and opportunities. Selecting sites that match closely the previous site in terms of environmental, social, cultural, and economic characteristics will make it more likely that relocation and income restoration will be successful” (ADB 1998: 56).

¹⁷ Meach (2008) reported that 12 villages, including two unofficial ones, are expected to be relocated from the reservoir area, but more recent estimates suggest that as few as five or six villages could be scheduled for relocation. As will become clear later in this report, the actual number of villages that would be resettled remains unclear for various reasons.

There are a number of problems with the resettlement plans outlined in the EMP. First, they provide insufficient details about the proposed suitability of resettlement sites. As indicated in the village meeting section of this report (see below), the villages visited that are expected to be resettled are uncertain about plan details.¹⁸

Srae Kor 1 and 2 villages do not want to be relocated to their expected resettlement site, which is far from any perennial water bodies and is located about 10 km north of the Sesan River. However, villagers are unable to identify a resettlement site that is more suitable. In Kbal Romeas village the situation is different, with some villagers feeling that if they have to move, they would prefer to relocate to areas south of the Srepok River. Others would prefer to stay north of the Srepok River, on the side of the river where they are presently living. What is similar for the two communities is that their options for resettlement have been badly affected by economic land concessions, especially for industrial rubber cultivation. This important issue has been completely ignored in the EMP. The EMP only mentions providing compensation to companies with economic land and logging concessions in the reservoir area. It states that problems with land concession companies need to be resolved before the dam is constructed, but issues related to available agriculture and forest lands for villagers are not adequately addressed, and does not appear to be a priority. Villagers do not appear to be scheduled to receive any compensation for lost forests and grazing lands.

The situation with regard to Rumpoat Village is different but quite problematic nonetheless. It does not appear that there are plans to resettle the village. However, as explained in the village meeting section, the main lowland paddy area of the community is likely to be subject to increased seasonal flooding once the dam is built, possibly leading to the area being unusable for rice cultivation. This could make the continued habitation of the present village site untenable, although villagers are adamant that they do not want to resettle and are fully opposed to the dam. So, the question of what might happen with Rumpoat Village remains difficult to answer. In any case, the villagers would certainly deserve compensation for flooding damage to lowland rice fields if the dam is built. In addition, if villagers decide that they cannot subsist in their present village after the dam is built, they should be allowed to relocate with full funding and logistical support provided by the Sesan 2 dam developers. However, one problem that the villagers anticipate is with finding a new place to live due to the existence of one or more logging concessions in the area. Furthermore, villagers oppose the notion that they should relocate into another ethnic Lao or Khmer Khék villages in the area, as they believe that this would lead to demise of their Kreung culture and language. There would probably also be problems with differences in land and resource allocation, and the use of village space. There are concerns that the village could be resettled to a location without available or appropriate agricultural land, or access to forest resources, thus leading to serious negative livelihood impacts. It is likely that the situation is similar for other villages living along the Sesan and Srepok Rivers in the upper part of the reservoir area.

Although Srae Sranok village, which is in Kbal Romeas Commune and adjacent to the Srepok River, was not visited during this study, the community is scheduled to be resettled, and we were

¹⁸ KCC (2008b) claims that six resettlement areas are planned, but that 4,012 ha, or 57% of the 7,082 ha of land surveyed at 12 sites, is already inside approve land and forest concessions.

able to gather some information about potentially difficult resettlement circumstances related to this village. Villagers from Kbal Romeas told us that Srae Sranok Village is expected to be resettled to the edge of Khieu Mountain, south of the Srepok River, an area that villagers claim to have no potential for developing lowland wet-rice paddy farmland. The area is also apparently an important area for wildlife.

The situation for Krabei Chrum (Kompong Som) Village, which is also in Kbal Romeas Commune, and is adjacent to the Srepok River, is more ambiguous. According to a map of the area expected to be permanently inundated by the Sesan 2 dam reservoir, and the draft EMP, the village would be entirely flooded by the dam's reservoir (KCC 2008a). However, other project documents prepared by PECC1 (2008a) suggest that the village would not be inundated by the dam's reservoir. Those documents classify the village as being a community that could be affected by 'backwater and safety (1 m)', which apparently indicates that the village is on the edge of being flooded. The exact status of this village appears to be uncertain. The situation appears to be the same for Khsach Thmei (Saisamy) village, in Ta Lat Commune, which is adjacent to the Sesan River. According to the EMP, the village of 267 households and 1,229 people would have to relocate (KCC 2008a). However, PECC1 (2008a) does not list the village as being slated for relocation, but rather as a village on the edge of the flood area. It is unclear what the plans are for Krabei Chrum and Khsach Thmei villages.

There appear to be discrepancies between the dam company's reservoir inundation map and the company's resettlement estimates. For example, company's map shows that if the dam is 75 m high, Kalapu Village, which is located on the north side of the Sesan River, and is officially part of Svay Rieng Village, would be at least partially flooded. If the map is correct, there would need to be some resettlement from Kalapu, but the company claims that nobody in Ta Lat Commune would need to be resettled. More research is required.

It also appears as if the map prepared to show the expected reservoir area for the dam is inaccurate, and may underestimate some flooding impacts. For example, there is a large perennial stream named Ou Chan that runs into the Sesan River not far upstream from Khsach Thmei (Saisamy in Lao) Village. The company's map indicates that there would be a lot of flooding up the stream if the dam was 80 m high, but that there would be no flooding at 75 m. From direct observations during this study, it seems likely that there would be at least some dam-induced flooding along the stream. This map should be critically re-examined.

More study is required to determine the potential cumulative impacts of the dam reservoir and releases of water from upstream dams in the Sesan River and Srepok Basins in Viet Nam in terms of possibly increasing rainy season flooding and other associated impacts. Villages in Ratanakiri Province remain concerned with the possibility of flooding impacts (see section four below).

Downstream from the dam site there are presently only plans to resettle seven families in Phluk Commune, all of which live near the dam site. However, both Phluk and Ban Bung Villages are not far downstream from the proposed Sesan 2 dam site. Thus, these communities, while not wanting to resettle, may find it untenable to remain in their present locations. This would be due

to severe downstream hydrological and water quality changes, and associated erosion. Since downstream impacts have not been adequately studied or analysed in the EMP, it is difficult to know whether communities immediately downstream from the dam site would be able, or willing, to continue in their present locations or not. The same is true for other villages downstream in Khamphun Commune, or further downstream. Therefore, it would be prudent to prepare contingency plans for relocating some or all of the villages immediately downstream from the dam, in the case that the villagers themselves decide, after the dam is built, that it is untenable for them to continue living next to the Sesan River. However, so far, according to villagers and commune and district government officials, only Phluk Village has been surveyed for possible relocation (based on the initially considered possibility of building the dam at the dam site closer to the village). According to villagers, other downstream villages, including Ban Bung, have not been formally visited by the project representatives. Certainly much more needs to be done. Downstream communities have not been given opportunities to participate in planning or decision-making processes.

One of the overall deficiencies of the Sesan 2 dam resettlement plan is that the government of Cambodia does not have a clear resettlement policy or associated legislation to guide it in the development of high quality resettlement and compensation plans. This is one of the reasons that human rights organisations such as Amnesty International (2008) have criticised the high level of “forced evictions” in Cambodia, including the lack of rule of law in guiding resettlement processes. Without a policy, developers can essentially establish their own standards as they go along. This is very problematic.

In early 2009, the *Cambodia Daily* newspaper reported that the ADB and the World Bank had called on the Cambodia government to create a policy on involuntary resettlement undertaken for the sake of development projects. However, it is not clear how much effort they have actually put into lobbying the Cambodia government to adopt a clear policy. The deputy director of the Finance Ministry, Im Sethyra, responded that work was being done on this, but that the government had relatively limited experience in handling involuntary resettlement issues (Vrieze 2009). This is all the more reason why a policy needs to be developed as soon as possible. In fact, resettlement and compensation legislation has been drafted, with the most recent publically available version dated November 2007, but since then the legislation has stalled, or has at least been delayed, with no indication when it might be revived for possible approval by the government and the National Assembly.

NGOs and other civil society organisations have been urging the Cambodia government to adopt involuntary resettlement legislation, but while the ADB has focussed on pointing out that having clear resettlement and compensation guidelines are important for reducing costs and ensuring smooth foreign investment and project implementation (Vrieze 2009), the NGOs are more concerned about ensuring that the rights of people threatened by development projects are protected from powerful developers. They have demanded that the government’s draft involuntary resettlement legislation be revised significantly to fit with local realities and international standards.¹⁹ There also needs to be a policy in relation to so-called voluntary resettlement.

¹⁹ *Pers. comm.*, NGO meeting at the office of NGO Forum on Cambodia, Phnom Penh, November 26, 2008.

3.1.2) Compensation and Relocation

The EMP presently proposes to provide asset replacement compensation (houses, fruit trees, lowland rice fields and gardens) for villages scheduled to be relocated from the Sesan 2 dam's reservoir area (KCC 2008a).²⁰ Many countries that have adopted a fair and just compensation scheme require that processes must include the following considerations: 1) notice; 2) public participation or opportunities for negotiation; 3) independent adjudication; 4) judicial review; 5) prompt compensation; and 6) compensation prior to development (Anonymous n.d.).

Villages living upstream from the Sesan 2 dam's reservoir on the Sesan and Srepok Rivers are also expected to receive one lump-sum compensation package for a single year of migratory fish losses, fish that would not be able to migrate from below the dam site upstream. This is insufficient for the permanent loss of these important fisheries.

It appears that no compensation is expected to be provided for downstream communities, either for fisheries or specifically for other impacts. All the statements regarding downstream impacts are vague and not quantified in the project budget (KCC 2008a). Illustrative of what should have been done, Norconsult (2002) wrote that, "all environmental costs related to hydropower should be quantified and evaluated in monetary terms and incorporated into the economic analysis of the various generation projects as well as the transmission line projects. This includes social costs related to loss of habitat and resettlement, which are complex and difficult to handle in traditional cost-benefit analysis."

There are serious problems with the draft compensation plan prepared for the Sesan 2 dam, as voiced through the comments provided by affected communities during village meetings (see section four of this report). It is worth summarising the problems associated with different elements of the compensation plan, breaking down the issues into three groups: villages in the reservoir area, villages upstream from the proposed reservoir area, and villages located downstream from the proposed dam site. It seems highly likely that the EMP's claim that local people would receive "reasonable compensation at real cost in the local market" (KCC 2008a: 125) is exaggerated, to say the least.

Right now, the overall compensation package for people scheduled to be resettled as a result of the Sesan 2 dam is small compared to what is being provided to those resettled in Laos due to the Nam Theun 2 dam (1088 MW) (International Rivers 2008a). In addition, it has been announced by the Vietnamese that over US\$30,000 is going to be spent on each family resettled due to the Son La dam (2400 MW) in northern Viet Nam.²¹

3.1.2.1) Villages in the Reservoir Area

²⁰ Anonymous (n.d.) reported that 'replacement cost' has been defined by the World Bank as "the fair market value plus other costs of resettlement, taxes, etc." The United States and others have also adopted this definition.

²¹ *Pers comm.*, Grainne Ryder, Probe International, July 2008, Dao Trong Hung, Vietnam Academy of Science and Technology, stated that this was the case in an article published by the Vietnam News Agency.

There are many problems with the compensation package for resettled villages proposed in the EMP. These problems can be broken down into various categories: house replacement and compensation; fruit tree compensation; agriculture land replacement and compensation; forestry resource and grazing land compensation; fisheries compensation; and other compensation issues.

3.1.2.1.1) House Replacement and Compensation

Villagers living in the proposed Sesan 2 dam reservoir area are concerned about the proposed compensation package related to house replacement and compensation. So far, as outlined in the village meeting section below, village houses in the expected inundation area have been measured and documented by PECC1 (2008a). It is expected that present village houses would not be moved to the new resettlement sites, and that new houses would instead be constructed for relocated people. These new houses are expected to be raised on stilts, as is customary for local people in the area, be mainly built with wood, and have cement main posts and corrugated iron roofs. The floor space for each would vary according to the family size (see Table 2). Each resettlement house would also get a small bathroom and toilet (PECC1 2008b).

Table 2. Resettlement housing floor space according to number of people per family

Number of people	Floor space of house
1 or 2	40 m ²
3 or 4	55 m ²
5 to 7	70 m ²
8 or more	80 m ²

There are a number of problems and uncertainties associated with the house replacement and compensation measures being proposed in relation the Sesan 2 dam, many of which are described in detail in the villager meeting section below. In summary, while villagers' houses were measured, no data were collected regarding the types of wood used to build the houses, even though villagers generally use high quality wood to build their houses. Villagers are concerned that houses made of good quality wood would be replaced with houses made of low quality wood, thus leading to considerable losses for villagers. Essentially, the categories used for houses are too simplistic, a problem that also occurred in relation to compensation determination for house loss in relation to the ADB-funded National Highway 1 expansion project in south-central Cambodia.²² Second, there are general problems related to the compensation rates proposed for house compensation, as the rates proposed are believed to be generally too low to fund actual 'replacement' costs. Again, this problem has been evident with the National Highway 1 expansion project.²³ There are also concerns about the sizes of the houses that would be built, as many people have houses that are larger than the ones that would be built to replace them.

²² *Pers comm.*, Doi Toshiyuki, Mekong Watch Japan, January 2009.

²³ Here, 'replacement' means not only acquiring the lost asset, but also gaining all the other entitlements that are required to provide the people with security, such as land titles, etc.

It appears that a market survey was not conducted prior to determining compensation rates for houses, so as to ensure that people were actually scheduled to receive a fair rate. This has also been a problem with land compensation for people affected through the development of National Highway 1, which was developed with ADB funding. There, too, rates for replacing lost houses have not been based on a market survey. Instead, the amounts were allocated arbitrarily.²⁴

According to international law, a government that exercises eminent domain without just compensation for a person's home is in practice exercising forced eviction (Anonymous n.d.), a practice that international human rights organisations and villagers have opposed strongly in the Cambodian context (Amnesty International 2008). If the present house replacement and compensation plan were to be implemented, fair compensation would not be provided, thus leading to forced eviction.

3.1.2.1.2) Fruit Tree Compensation

There are serious problems with the proposed compensation measures for fruit trees losses associated with flooding in the Sesan 2 dam's reservoir. According to documents prepared by PECC1 (2008a), but not included in the EMP, fruit tree compensation is expected to be very low, well below locally acceptable rates, and certainly not in line with international standards. For example, villagers are generally dissatisfied with orange tree compensation (proposed at US\$8 or 32,000 riel per tree), custard and star apple tree compensation (US\$6 or 24,000 riel), and guava tree compensation (US\$5.50 or 22,000 riel) (PECC1 2008b). Compensation for banana tree clumps is also exceptionally low, with only US\$6 expected to be paid for each clump of banana trees. Local people claim that they can sell the fruits grown on a single banana tree in one year for more than what would be provided for the losses of a clump of banana trees, with a clump typically including multiple banana trees.

Villagers claim that they can sell fruit from most fruit trees in a single year for more than is expected to be provided for the losses of many years of income if the fruit trees are lost. Fruit tree compensation associated with the Kamchay dam in southern Cambodia is expected to be much higher, reaching US\$500 for most fruit tree species.

3.1.2.1.3) Agriculture Land Replacement and Compensation

As indicated in individual village meetings (see section four below), it is highly unlikely that the resettlement area would include agriculture land of as high quality as what villagers are presently farming, even though that is what the EMP promises (KCC 2008a).

The Sesan 2 dam is expected to lead to the loss of 1,290 ha of lowland agricultural land, or about one quarter of all the wet rice paddy land in Sesan District (KCC 2008a). There are many serious problems with the proposed replacement and compensation plan for agriculture land expected to be inundated and permanently lost to the Sesan 2 dam's reservoir. It appears that villagers faced with losses of agricultural land are being given the option of either receiving support for developing new agricultural land or receiving cash payments for lost land. Both options are not

²⁴ *Pers comm.*, Doi Toshiyuki, Mekong Watch Japan, January 2009.

attractive for various reasons. The option of cash payments is not acceptable to local people because it is presently being proposed that only US\$500 would be provided to compensate for the loss of good quality lowland paddy land, which is well under what it would cost to buy equivalently good quality agricultural land elsewhere in Stung Treng Province. The price of US\$740 for each hectare of lost garden land to flooding is also believed to be well below the market rate, as is US\$230 per hectare for fallow swidden land (PECC1 2008b).²⁵ Like the ADB-funded National Highway 1 expansion project, it appears that neither PECC1 nor KCC conducted a market survey in advance of setting the above rates, so as to determine if agriculture land of equivalent quality to what is being taken from them can be purchased for the compensation being offered. In addition, it needs to be determined whether the proposed compensation is really enough to 'replace' what would be lost, including paying for all the associated entitlements required, such as land titles.

The other option of accepting new replacement land is also very problematic for a number of reasons. First, there are only limited options for acquiring new land because much of the previously available agricultural land has been taken over by economic land and logging concessionaires. The owners of these concessions now consider the land to be theirs, thus limiting opportunities for villagers. In addition, the lowland rice paddy that would be lost in places such as Kbal Romeas and Srae Kor is good quality lowland rice farmland, but what little replacement land is available in other areas is not nearly as good quality, and even this low quality rice farmland is only available in limited amounts, and is often scattered over wide areas. In addition, even if heavy equipment was used to open new areas for lowland rice production, it would be totally unrealistic to expect that these areas would produce high yields of rice soon after being opened up. It is generally recognised by farmers that even under the best conditions, it generally takes at least three years for the soil pan of newly opened up farmland to transform so that water is easily retained in rice fields. Before that happens, harvests can be expected to be low. However, providing compensation for lost rice production during the time that new farmland is being developed is not proposed in the EMP. Instead, the simplistic notion that compensating one hectare of agriculture land with one hectare of new agriculture appears to be the norm. For example, it is deemed acceptable to replace one hectare of lowland rice fields with an average annual yield of, for example, 1,500 kg/ha/year, with one hectare of lowland rice fields capable of producing only 750-1000 kg/ha/year, even though such compensation would clearly leave villagers with less food and income, thus contradicting the government of Cambodia's plans to reduce and eventually eliminate poverty in rural areas. Clearly, the compensation measures for lost agriculture land are inappropriate and need to be fully reconsidered.

There are also other problems with land compensation provisions. According to PECC1 (2008b), it is stated that those occupying land must have "enough legal documents or registered land area" to be eligible for either replacement land or cash compensation. However, nobody in the project

²⁵ GXED & SBK (2008) reported that the developers of the Stung Cheay Areng Hydropower Project planned to provide the same rate of US\$0.05 per square metre or US\$500 per hectare for lowland rice paddy. However, GXED & SBK (2008) are planned to pay US\$1,000 per hectare for lost garden land, which is significantly more than the US\$700 per hectare being offered for the Sesan 2 dam. GXED & SBK (2008) also plans to provide more compensation for fallow swidden land: US\$300 per hectare, as compared to US\$230 for the Sesan 2 dam (PECC1 2008b).

area have land titles or other official land documents. Therefore, according to Provision 6 of the draft 'Policy Framework on Compensation Allowances and Resettlement' for the Sesan 2 dam, government authorities have the authority to decide whether people are eligible compensation for land losses or not. Therefore, some may end up without any compensation. This makes local people quite vulnerable to intimidation and abuse. In addition, PECC1 (2008b) states that if it costs more to buy replacement land than what has been allocated for lost land, they would not pay the difference. That means that they are not offering real 'replacement costs', as is commonly understood internationally.

While villagers in the Sesan 2 dam resettlement area have so far been told that they would receive compensation for lost house and agriculture land, villagers in other parts of Cambodia have had problems receiving compensation for house and agriculture land lost taken over to make way for dam projects. For example, in Prey Thum Commune, Kep Province, villagers have lost 65 hectares of land to make way for an irrigation project. The 31 families who have lost land have had problems getting any compensation because the government has classified the land that they lived on and farmed (many since the 1980s) as 'state land' rather than 'private land', and according to Cambodia's Land Law (2001), people are not eligible for compensation when 'state land' is confiscated (May Titthara 2009).

In the case of the planned Stung Cheay Areng Hydropower Project in Koh Kong Province, south-western Cambodia, villagers in the reservoir area are considered to be illegal settlers. The land that they are using is considered to be state land, and the people are not expected to be compensated for the land they lose (GXED & SBK 2008).

3.1.2.1.4) Forestry Resources and Grazing Land Compensation

The Sesan 2 dam would cause the loss of forest and grazing lands that are important to local livelihoods. However, there are no provisions in the EMP for compensating villagers for these considerable losses, apparently because this land has been defined as 'state land'. Moreover, the implications of these losses on local people and their livelihoods have not been studied in any detail. Nor has the issue been adequately analysed or conceptualised in relation to providing appropriate compensation to local people. It is wrong to expect villagers to give up these important resources without any compensation or other recourses being considered or proposed. Local people rely on forests for various food, wood and non-timber forest products (NTFPs), and grazing lands are crucial for raising buffaloes and cows, which are amongst the most important assets that local people own. Livestock are important for tilling the soil, pulling ox carts, and are savings banks for local people. When there are emergencies, there is always the option of selling a cow or buffalo to raise quick cash. Without adequate grazing areas, raising livestock would become increasingly difficult and time-consuming.

Right now the EMP proposes that the Sesan 2 dam provide the Royal Cambodia Government with US\$1 million a year to compensate for forest and wildlife habitat losses due the project. Unfortunately, there is no mention of compensation for villagers for these losses. The funds are only supposed to be used for wildlife conservation programmes in Stung Treng and Ratanakiri

(KCC 2008a). There is no reason to believe that these funds would be used to benefit villagers in any way. Local people should be eligible for compensation for these losses.

3.1.2.1.5) Fisheries Compensation

From the EMP, it is presently unclear whether villagers living in the reservoir area would be eligible for fisheries compensation, but they should, since all the villages in the reservoir are upstream from the planned dam site, and therefore would definitely lose migratory fish species from the Mekong and Sekong Rivers (KCC 2008a).

In an early draft of environmental and social impact assessments for the Sesan 2 dam conducted by KCC, KCC proposed that annual payments be provided to compensate for upstream migratory fish losses. Initially, KCC estimated that there are 28,951 people living along the Sesan River in Cambodia upstream from the dam site, and 11,025 people living along the Srepok River in Cambodia upstream of the dam site. KCC also estimated, based on fisheries statistics compiled from the Sesan River by Baird & Meach (2005), that 78% of the fish caught upstream of the dam site in both rivers migrate from downstream of the dam site, and would thus be lost upstream if the dam were built. KCC also estimated, based on studies they conducted,²⁶ that the average daily fish catch per family is 0.49 kg, or 0.1 kg per person (the average family has 4.9 people, according to KCC). Therefore, based on a fish price of 10,000 riel/kg (market price in Ban Lung, Ratanakiri Province at the time), it was estimated that each person's average fish catches are valued at 1,000 riel per day. Therefore, if 78% of the fish are migratory and would all disappear from the river due to having their migrations blocked by the Sesan 2 dam,²⁷ KCC estimated that the total loss would be 780 riel per day per person. That equals a total of 22,581,780 riel (US\$5,645) per day, or US\$2.06 million per year, for Sesan River migratory fish losses. This amounts to a total of 8,599,500 riel (US\$2,150) per day, or US\$784,750 per year, for Srepok migratory fish losses each year. Therefore, according to KCC's early calculations, US\$2.84 million should be provided per year for only upstream migratory fish losses. However, US\$2.84 million somehow became US\$2.3 million. It is hard to imagine why KCC's draft EMP only offers US\$2.3 million in single lump-sum payments for all fisheries losses expected to be caused by the Sesan 2 dam (KCC 2008a). It is also hard to understand why lump-sum fisheries compensation payments are being proposed now, whereas KCC (2008b) stated that payments would not be made on a lump-sum basis, but rather as annual payments, which seems much more appropriate.

There are, indeed, a number of problems with the fisheries compensation plan proposed for the Sesan 2 dam. The first major problem, which is already mentioned above, is that the EMP proposes providing upstream fisheries compensation for a single year of fisheries losses, even though villagers would lose access to fish for at least as long as the dam is in place, and possibly forever. Secondly, KCC underestimated the number of villages and people that would be

²⁶ One has to wonder how participatory these studies were, considering that none of the villages visited expected from the beginning of the study to be upstream from the dam site reported participating in the so-called PRA. No villages in Ratanakiri were apparently visited by anyone from KCC, with the exception of villages in Koun Mom District, since they were initially expected to be inundated by the dam's reservoir.

²⁷ KCC (2008b) estimated, however, that 66% of the fish migrate between above and below the dam site.

negatively impacted upstream from the dam site. While they estimated that a total of 39,976 people would suffer fisheries losses above the Sesan 2 dam, this study shows that the actual number of people who would lose access to migratory fisheries above the dam in the Sesan and Srepok River Basins in Cambodia to be much higher. There are at least 38,675 people belonging to 7,340 households and 87 villages located along the Sesan and Srepok Rivers alone (see Tables 4 and 6). Crucially, however, KCC apparently only considered the people living directly along the Sesan and Srepok Rivers, even though many other people living along tributaries of these two rivers would also be impacted by losses in migratory fish, since those fish also migrate into the tributaries and past their villages. It appears that at least 87 villages in Cambodia located away from the Sesan and Srepok Rivers would lose access to migratory fish (see Tables 7 and 8). If these 87 villages have the same average number of people living in them than the villages adjacent to the Sesan and Srepok Rivers above the proposed Sesan 2 dam site, an additional 38,270 could be added to the total. This means that a total of about 78,000 people could lose fish upstream of the Sesan 2 dam in Cambodia alone (we have not been able to assess possible impacts in Viet Nam). This does not even include people who do not live next to the river but travel there regularly or occasionally to go fishing. They too should be compensated. This issue clearly needs to be re-investigated, as KCC has certainly underestimated the number of people that would be impacted upstream of the dam due to fish losses.

KCC and PECC1 have been even more neglectful of people living downstream from the dam site in relation to fisheries impacts, providing no detailed lists of communities that would be impacted, nor compensation or mitigation plans for dealing with downstream impacts (KCC 2008a; PECC1 2008b).

Yet another problem is that the amount of fish that KCC (2008a) estimated that each family catches is lower than the amount that village estimates for fish catches (see section four below).

One more problem is that KCC only considered that migratory fish would be lost due to being blocked by the Sesan 2 dam. However, some of the fish species that would be lost, like *Henicorhynchus lobatus*, are keystone fish species that are important food sources for other fish species that are not long distance migrators (Roberts & Baird 1995; Baird *et al.* 2003). Therefore, if the keystone species are lost, other less migratory predatory fish species can also be expected to be negatively impacted. However, KCC does not consider this cumulative loss.

As outlined in the village meeting section below, local people have rejected one-time lump sum compensation, instead demanding annual compensation payments for the life of the project. Communities have also rejected the other fisheries compensation measures proposed in the EMP, including setting up a fisheries research station to investigate ways of mitigating fisheries impacts, releasing fish into the rivers, raising fish in ponds, and receiving technical support for chicken and pig raising.

The fisheries compensation package proposed for the Sesan 2 dam needs to be completely reconsidered, revised and greatly expanded so that it considers all fisheries related impacts, including both the short-term and long-term implications of the project.

3.1.2.1.6) Domestic Ground Water Compensation

It is clear from the village meeting section below that villages located in the reservoir area and below the dam site would require replacement water sources if the Sesan 2 dam were to be built. One of the likely options is to drill wells to provide ground water for domestic consumption. There is one serious problem with this option, one not mentioned in the EMP. Arsenic poisoning of water wells is being increasingly recognised as a serious problem in rural Cambodia (Chaeng 2006; WHO 2001). Since the 1990s, when the NGO Partnerships for Development (PFD) paid for a large number of wells to be built in villages located along rivers in Stung Treng Province, including the Sesan and Srepok Rivers, it has also become a problem in Stung Treng Province. PFD discovered that many of these wells, especially located near large rivers in alluvial areas, were excessively contaminated with arsenic. In fact, long-term arsenic contamination can cause many serious health problems, including death (WHO 2001). Therefore, caution would need to be taken to ensure that all wells dug as compensation for lost water sources have low enough arsenic contamination levels to meet World Health Organisation (WHO) standards. This may be difficult considering the history of arsenic contamination of wells in Stung Treng Province.

3.1.2.1.7) Other Compensation Issues

One important compensation issue that has not been included in the Sesan 2 dam's EMP relates to the loss of culturally important places. While flooded Buddhist temples are expected to be replaced in resettlement sites, the EMP does not mention what would be done to compensate for the loss of sacred places, as many of the affected people have animist beliefs, including those who also believe in Buddhism. The spirit house (named *Ta Kho Deng* in Lao) at the *Thada* rapids, downriver from Srae Kor Village, would, for example, be completely inundated by the dam. As outlined in the village meeting section below, local people living along the Sesan River are concerned about the negative impacts that could result if this area is inundated, as locals believe that a powerful spirit inhabits the area, and could become enraged if its abode is destroyed. They expect that local people could be vulnerable to the wraith of the spirit, and they believe that appropriate measures should be taken to ensure that these impacts are mitigated if the dam goes ahead. Although villagers stated that further consultations with village elders would be necessary to determine the appropriate measures required, they stated that it is likely that sacrifices of buffaloes and pigs would be needed to meet the cultural requirements of local people. Sacrifices would also be necessary in relation to the flooding of the village '*Thada*' (spirit house) site in Srae Kor 1 and 2 Villages.

The Sesan 2 dam would obstruct river traffic between communities living along the Sesan and Srepok Rivers upstream from the dam site and areas downstream from the dam, including Stung Treng Town. People would effectively lose access to downstream areas, which would make it increasingly difficult to transport seriously ill and injured people to the hospital in Stung Treng by boat. Local people would also have a more difficult time reaching Stung Treng market, where goods are reportedly cheaper than other markets. Although the villagers mentioned these issues in village meetings, the authors of the EMP expect that boat navigation issues would only be relevant during the construction period (KCC 2008a). Nor are there any long-term provisions proposed for mitigating long-term navigation impacts, although ideas for making routes during

the construction stage are suggested. For example, there are apparently not any plans to set up a system for the movement of boats from the head of the dam's reservoir to downstream areas. This issue needs to be better studied and analysed, and villagers should be compensated for impacts to boat navigation during the dam's construction and operation periods.

3.1.2.2) Villages Upstream from the Proposed Reservoir Area

There are also serious problems with the compensation package being proposed for villages located on the Sesan and Srepok Rivers upstream from the Sesan 2 dam's reservoir, as indicated by the responses of villagers in meetings (see section four). For example, at present the dam builders only plan to provide one-time lump-sum compensation packages for fisheries losses to communities located upstream from the dam. As already mentioned, the Sesan 2 dam would block all fish migrations upstream and downstream of the dam site, for just for a single year, but for at least as long as the dam is operational. Therefore, it is crucial that compensation not be provided in single lump-sum payments for a single year of impacts.

As indicated in section four, villagers also reject other compensation measures proposed in the EMP (KCC 2008a), including releasing fish into the Sesan River, establishing a fisheries research station to study ways to mitigate dam impacts on fisheries, fish-raising in ponds, and technical support for raising pigs and chickens. Instead, villagers would prefer to have cash compensation or at least other forms of material compensation, such as live chickens, pigs, cows and buffaloes.

They would like to receive compensation directly from the company, rather than through middle men or government officials. They are concerned that some individuals might not deliver all the compensation allocated to them, and instead keep some or all of the compensation for themselves.

Villagers also reject the idea of receiving electricity from the project as a form of compensation (see section four). However, they would not reject electricity as a form of standard development. They just do not want to receive electricity in lieu of other compensation.

3.1.2.3) Villages Downstream from the Proposed Dam Site

“The water quality downstream of the [Sesan 2] dam site in the Se San River will be reduced at construction state due to cutting of forest, earth works, disposal of waste into the river course or on the open spaces nearby, especially the spilling of fuel, lubricants, and other toxic materials from construction machinery/vehicle and construction work [sic]” (KCC 2008a).

The EMP acknowledges that the Sesan 2 dam would cause significant downstream impacts to the hydrology and water quality of the Sesan River, during the construction period and within the first one to three years of operation (KCC 2008a). However, the EMP does not appear to acknowledge the long-term downstream water quality and hydrological impacts of the dam, even though during the operation of the dam there would only be a firm discharge of 466.7 m³/second,

with a design discharge of 2,119.2 m³/second (KCC 2008a). There would be considerable flow changes at different times of the day, since most electricity would be created during peak power periods, when consumer demand is at its highest. In fact, this is indirectly acknowledged by KCC (2008a), which states that villages would need to be warned about peak water releases in order to avoid material and other losses. It is also predicted by KCC (2008a) that water could be contaminated with pathogenic bacteria, viruses and other vectors. Disease transmission might also occur, including for malaria, dengue fever and schistosomiasis.

The downstream compensation package proposed in the EMP is undoubtedly the most problematic part of the compensation package proposed for the Sesan 2 dam. It is essentially non-existent, even though a number of short-term and long-term fisheries impacts downstream are identified in the EMP, especially in relation to impacts on migratory fish (KCC 2008a). There would also be other downstream impacts, as already outlined earlier in this report.

There does not appear to be any plan for providing downstream communities with meaningful compensation for either fisheries or other downstream impacts related to hydrological and water quality changes (KCC 2008a). The present plan does not even get close to meeting regional standards, let alone the international standards outlined by the World Commission on Dams (WCD) (2000)²⁸, which are considered by many to be the most important benchmark for social and environmental standards for building dams (International Rivers 2008b). Therefore, it is imperative that a detailed study be conducted related to this crucial compensation issue before the Sesan 2 dam is approved, as prematurely authorising the project before such impacts and compensation issues are factored into project budgeting and plans could lead to large number of unmitigated or uncompensated downstream impacts in Cambodia. These would not only be in relation to fisheries but also material losses due to hydrological changes in the river, such as boat and fishing gears being washed away, as well as losses of riverbank vegetable gardens, edible wild vegetables, other aquatic resources, and losses due to erosion, reductions in water quality and problems associated with human and domestic animal health, possible increases in downstream flooding in the wet season, and human and domestic animal safety due to unexpected rapid and strong water releases.

3.2) Fisheries

“As we learn more about the complex migratory patterns of Mekong fish, it is becoming increasingly clear how vulnerable so many fish stocks are to large dam

²⁸ The WCD was initiated by the World Bank and IUCN-The World Conservation Union in May 1998 under the chairmanship of Professor Kader Asmal, then Minister of Water Affairs and Forestry in the South African Government. The WCD's Secretariat was located in Cape Town, South Africa. Many felt that the contested nature of the dam debate would pull the Commission apart. However, the twelve Commissioners from diverse backgrounds developed an understanding and approach based on mutual respect that saw them through many contested discussions. The result was an innovative framework within which to examine dams, both existing and planned. The WCD's final report, *Dams and Development: A New Framework for Decision Making* was launched under the patronage of Nelson Mandela in November 2000.

construction, which can not only block migrations, but change hydrological patterns and water quality, which are essential for the life-cycles of Mekong fish” (Baird & Flaherty 2004: 295).

Singh *et al.* (2006: 1) reported the results of a wildlife trade survey in Stung Treng Province. They wrote that “Villagers [in Stung Treng Province] consistently reported fish as being the most important type of natural resource for consumption, exchange, and income-generation.” This is important, as the most serious expected negative impacts of the Sesan 2 dam, and certainly the most wide-ranging impacts, would be on fish and fisheries.

Various fish populations are expected to be negatively impacted by the Sesan 2 dam, and there are a number of ways that fish and fisheries can be expected to be impacted. These impacts can be broken down into various categories: fisheries impacts upstream from the dam reservoir in the Sesan and Srepok Rivers in Ratanakiri Province; fisheries impacts in the reservoir area in Stung Treng Province; fisheries impacts in areas immediately downstream from the dam in Stung Treng Province; and widespread fisheries impacts in the Mekong River and the Tonle Sap.

3.2.1) Fisheries Impacts Upstream from the Dam Reservoir in the Sesan and Srepok Rivers in Ratanakiri Province

If the Sesan 2 dam is built, there would be considerable negative impacts to fish and fisheries in the Sesan and Srepok Rivers upstream from the dam’s reservoir. There is at least one thing that everyone involved with the Sesan 2 dam agrees, whether villagers or dam builders. No migratory fish would be able to migrate past the dam. There would be a total absence of migratory fish passing from below the dam to above the dam in the Srepok and Sesan Rivers. There would certainly be a serious loss of biodiversity, and this would cause serious impacts on the livelihoods of local people who rely on aquatic animals, as pointed out in the EMP (KCC 2008a).

As outlined in the village meetings section below, a number of important groups of migratory fish that travel up the Srepok and Sesan Rivers would not be able to migrate above the dam site. These include *Scaphognathops bandanensis* (*trey chrakaing*), *Mekongina erythrospila* (*trey pa sa-i*), *Hypsibarbus malcolmi* (*trey chhpin*), *Labeo erythropterus* (*trey pa va*), *Bangara behri* (*trey pa va mok pi*) and *Cirrhinus moliterella* (*trey phkar kor*), which normally migrate upriver in around May-June, and migrate downstream to the Mekong River between October to December (Baird & Flaherty 2004).

Another important group of fishes that would be blocked from migrating above the dam would be *Henicorhynchus lobatus*, *Paralaubuca typus* and at least 30 other species. These fish migrate up the Mekong River from the Tonle Sap River each year between December and February (Baird *et al.* 2003). These fish also migrate far up the Sesan and Srepok Rivers, and are a key to the ecology of these rivers, as they are important algae eaters (Baird 1995). They are also important food sources for many predatory fish species, ones whose migrations might not be blocked by the dam. Therefore, the loss of these fish would reduce the populations of other fish and wildlife species as well.

Another large group of fish whose migrations would be blocked by the dam are Pangasid catfish species such as *Pangasius conchophilus*, *Pangasius larnaudii*, *Pangasius hypophthalmus*, *Pangasius krempfi*, *Pangasius bocourti*, *Pangasius macronema* and potentially other species of pangasid catfish. These species migrate upriver between April and July, and their larvae are believed to float downstream at the height of the high water season, after spawning occurs in major rivers (Baird *et al.* 2001a; 2004; Hogan *et al.* 2007).

There are a number of other species of fish whose migrations are likely to be disrupted by the Sesan 2 dam, such as *Belodontichthys* sp., *Wallago* spp., *Probarbus* spp., and others. However, more data are required to determine the extent of impacts. So far, KCC has not collected sufficient data about the migratory patterns of fish that would be affected by the Sesan 2 dam.

It is also certain that many of the less migratory predatory fish species, such as *Hemibagrus wyckiodes*, *Hemibagrus nemurus*, *Channa* spp., and others, would also be negatively affected if fish were unable to migrate upstream past the Sesan 2 dam, as these species feed heavily on many of the algae-eating fish (such as *Henicorhynchus lobatus*) that migrate upriver in the dry season.

There are some less common fish species that would be obstructed from upstream migrations, including the large Anguilla eel, *Anguilla marmorata* and the large freshwater shrimp *Macrobrachium rosenbergii*.²⁹ In addition, the now endangered Irrawaddy dolphins (*Orcaella brevirostris*) (*trey pasout* in Khmer) of the Mekong River previously travelled up the Sesan River as far as Andoung Meas District in Ratanakiri Province (Baird & Beasley 2005), and have previously inhabited parts of the Srepok River (Lloyd 2008). If the Sesan 2 dam is built, this previously available dolphin habitat would not be accessible by dolphins. Siamese crocodiles (*Crocodylus siamensis*) are also found in the Srepok River (Lloyd 2008), and could be negatively impacted by Srepok dams.

Table 3 includes a list of villages located directly adjacent to the Srepok River above the Sesan 2 dam site in Cambodia, all of which would lose all fish that presently migrate between the Srepok River and the Mekong River. Table 4 includes statistics related to these villages, as well as information about the ethnicities of the people who live in the villages. It is estimated that there are 12,066 people in 2,528 families, 2,271 households and 22 villages living directly adjacent to the Srepok River in Cambodia upstream from the proposed Sesan 2 dam site.

Table 5 includes a list of villages located directly adjacent to the Sesan River above the Sesan 2 dam site in Cambodia, all of which would lose access to all fish that presently migrate between the Srepok River and the Sesan, Sekong and Mekong Rivers. Table 6 includes population statistics related to these same communities, as well as information about the ethnicities of the people who live in the villages. It is estimated that there are 26,609 people in 5,550 families, 5,069 households and 65 villages living directly adjacent to the Sesan River in Cambodia upstream from the proposed Sesan 2 dam site.

²⁹ See Baird (2001) for more information about the migratory patterns of these species.

Table 3. Villages directly adjacent to the Srepok River that would be impacted by losses of migratory fish from the Sesan, Sekong and Mekong Rivers

#	Village	Commune	District	Province	River/Stream
1	Koh Mayael Leu (Lo Man Yeun Neua)	Nong Khi Loek	Koh Nhek	Mondolkiri	Srepok
2	Koh Mayael Kraom (Lo Man Yeun Tai)	Nong Khi Loek	Koh Nhek	Mondolkiri	Srepok
3	Chi Miet (Samat)	Nong Khi Loek	Koh Nhek	Mondolkiri	Srepok
4	Srae Chhuk Leu (Nong Bua Neua)	Nong Khi Loek	Koh Nhek	Mondolkiri	Srepok
5	Kaeng San	Seda	Lumphat	Ratanakiri	Srepok
6	Phum Thmei (Ban Mai)	Chey Otdam	Lumphat	Ratanakiri	Srepok
7	Dei Lou	Chey Otdam	Lumphat	Ratanakiri	Srepok
8	Lumphat	Chey Otdam	Lumphat	Ratanakiri	Srepok
9	Ou Kan	Chey Otdam	Lumphat	Ratanakiri	Srepok
10	Sam Kha	Chey Otdam	Lumphat	Ratanakiri	Srepok
11	Srae Chhuk (Nong Bua)	Chey Otdam	Lumphat	Ratanakiri	Srepok
12	Neang Dei (Nong Dy)	Serei Mongkol	Koun Mom	Ratanakiri	Srepok
13	Srepok Touch (Thong)	Serei Mongkol	Koun Mom	Ratanakiri	Srepok
14	Srepok Thum	Serei Mongkol	Koun Mom	Ratanakiri	Srepok
15	Bram (5) or Sangkhom	Serei Mongkol	Koun Mom	Ratanakiri	Srepok
16	Phum 1	Srae Angkrong (Seang Kalong)	Koun Mom	Ratanakiri	Srepok
17	Phum 2	Srae Angkrong (Seang Kalong)	Koun Mom	Ratanakiri	Srepok
18	Phum 3	Srae Angkrong (Seang Kalong)	Koun Mom	Ratanakiri	Srepok
19	Krabei Chrum (Kompong Som)	Kbal Romeas	Sesan	Stung Treng	Srepok
20	Kbal Romeas (Kbal Lamat)	Kbal Romeas	Sesan	Stung Treng	Srepok
21	Srae Sranok	Kbal Romeas	Sesan	Stung Treng	Srepok
22	Kbal Spean Srepok (Chrab)	Kbal Romeas	Sesan	Stung Treng	Srepok

Table 4. Statistics for villages in the Srepok River Basin in Cambodia that would be directly impacted by the Sesan 2 dam blocking migratory fish from the Sesan, Sekong and Mekong Rivers

#	Village	Families	Households	Population	Ethnicity
1	Koh Mayael Leu (Lo Man Yeun Neua)	72	72	415	Bunong/Lao
2	Koh Mayael Kraom (Lo Man Yeun Tai)	94	94	462	Bunong/Lao
3	Chi Miet (Samat)	102	102	520	Bunong/Lao
4	Srae Chhuk Leu (Nong Bua Neua)	104	104	524	Bunong/Lao
5	Kaeng San	88	66	437	Bunong/Lao/ Tampuan
6	Phum Thmei (Ban Mai)	168	145	806	Lao
7	Dei Lou	152	116	712	Khmer
8	Lumphat	208	208	954	Lao/Khmer
9	Ou Kan	55	55	376	Khmer
10	Sam Kha	69	68	388	Khmer/Lao
11	Srae Chhuk (Nong Bua)	104	104	524	Lao
12	Neang Dy (Nong Dy)	36	30	142	Lao
13	Srepok Touch (Thong)	130	127	263	Lao
14	Srepok Thum	173	158	825	Khmer/Lao
15	Bram (5)	16	11	80	Khmer
16	Srae Angkrong 1	95	75	469	Lao/Khmer
17	Srae Angkrong 2	121	102	623	Lao/Khmer
18	Srae Angkrong 3	118	104	613	Khmer
19	Krabei Chrum (Kompong Som)	160	130	765	Lao
20	Kbal Romeas (Kbal Lamat)	117	82	591	Bunong
21	Srae Sranok	92	82	487	Khmer Khek, Bunong, Brao
22	Kbal Spean Srepok ³⁰ (Chrab)	254	236	1090	Khmer, Lao and others (soldiers)
Totals		2528	2271	12066	

³⁰ These population statistics are for the whole of Chrab Village. However, only a small amount of the community is actually located at Kbal Spean Srepok.

Table 5. Villages upstream from the Sesan 2 dam on the Sesan River in Cambodia that would be impacted by a lack of fish migrations from the Sesan, Srepok, Sekong and Mekong Rivers

#	Village	Commune	District	Province	River or Stream
1	Phi	Sesan	Ou Ya Dav	Ratanakiri	Sesan and Ou Kral and Ou Tav
2	Pa Tang	Sesan	Ou Ya Dav	Ratanakiri	Sesan and Ou Tav
3	Pa Dal	Sesan	Ou Ya Dav	Ratanakiri	Sesan and Ou Chva and Ou Lom
4	Bokham	Nhang	Andoung Meas	Ratanakiri	Sesan
5	Katae	Nhang	Andoung Meas	Ratanakiri	Sesan and Ou Kop
6	Ka Chut Tonle	Nhang	Andoung Meas	Ratanakiri	Sesan
7	Lom Leng (District Centre)	Malik	Andoung Meas	Ratanakiri	Sesan and Ou Kop
8	Dal Pok	Nhang	Andoung Meas	Ratanakiri	Sesan
9	Dal Veal Leng	Nhang	Andoung Meas	Ratanakiri	Sesan
10	Ka Nat Touch	Ta Lav	Andoung Meas	Ratanakiri	Sesan
11	Kak	Ta Lav	Andoung Meas	Ratanakiri	Sesan
12	Ta Nong	Ta Lav	Andoung Meas	Ratanakiri	Sesan
13	Ta Lav	Ta Lav	Andoung Meas	Ratanakiri	Sesan
14	In	Ta Lav	Andoung Meas	Ratanakiri	Sesan
15	Chan (Mas)	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
16	Chuoy ('Nchuy)	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
17	Ta Bouk (Trabok)	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
18	Pangkit	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
19	Sanh	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
20	Rieng Vinh	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
21	Ke Kuong Leu	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
22	Phlueu Thum	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan

23	Phlueu Touch	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
24	Ta Veang (including district town)	Ta Veang Leu	Ta Veang	Ratanakiri	Sesan
25	Vieng Chan	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
26	Tumpuon Reung Thum	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
27	Ke Kuong Kraom	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
28	Phyang (1 and 2)	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
29	Tumpuon Reung Touch	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
30	Phav	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
31	Kaoh Pong Touch	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
32	Sieng Say	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
33	Ta Ngach	Ta Veang Kraom	Ta Veang	Ratanakiri	Sesan
34	Pa Hay	Kaoh Pang	Veun Sai	Ratanakiri	Sesan
35	Pa Toeng	Kaoh Pang	Veun Sai	Ratanakiri	Sesan
36	Lang Av	Kaoh Pang	Veun Sai	Ratanakiri	Sesan
37	Kaoh Peak	Kaoh Peak	Veun Sai	Ratanakiri	Sesan
38	Phak Nam	Kaoh Peak	Veun Sai	Ratanakiri	Sesan
39	Khuon Thum	Kaoh Peak	Veun Sai	Ratanakiri	Sesan
40	Ka Choun Leu	Ka Choun	Veun Sai	Ratanakiri	Sesan
41	Ka Chuon Kraom	Ka Choun	Veun Sai	Ratanakiri	Sesan
42	Ka Loem	Ka Choun	Veun Sai	Ratanakiri	Sesan
43	Tiem Leu	Ka Choun	Veun Sai	Ratanakiri	Sesan
44	Ban Pong	Ban Pong	Veun Sai	Ratanakiri	Sesan
45	Fang	Ban Pong	Veun Sai	Ratanakiri	Sesan
46	La Meuy Tonle	Kok Lak	Veun Sai	Ratanakiri	Sesan
47	Veun Sai	Veun Sai	Veun Sai	Ratanakiri	Sesan
48	Thmei (Ban Mai)	Veun Sai	Veun Sai	Ratanakiri	Sesan
49	Thmei Chin	Veun Sai	Veun Sai	Ratanakiri	Sesan
50	Pak Kae Se	Veun Sai	Veun Sai	Ratanakiri	Sesan
51	Ka Lan	Veun Sai	Veun Sai	Ratanakiri	Sesan
52	Pa Kalan	Pa Kalan	Veun Sai	Ratanakiri	Sesan
53	Kompong Cham	Pa Kalan	Veun Sai	Ratanakiri	Sesan
54	Phnum Kok Lao	Phnum Kok	Veun Sai	Ratanakiri	Sesan
55	Phnum Kok Brao	Phnum Kok	Veun Sai	Ratanakiri	Sesan
56	Tiem Kraom	Phnum Kok	Veun Sai	Ratanakiri	Sesan

57	Hat Pak	Hat Pak	Veun Sai	Ratanakiri	Sesan
58	Veun Hay	Hat Pak	Veun Sai	Ratanakiri	Sesan
59	Lam Pat	Hat Pak	Veun Sai	Ratanakiri	Sesan
60	Ta Lat	Ta Lat	Sesan	Stung Treng	Sesan
61	Rumpoat (Lam Pat)	Ta Lat	Sesan	Stung Treng	Sesan
62	Svay Rieng (including Kalapu)	Ta Lat	Sesan	Stung Treng	Sesan
63	Khsach Thmei (Saisamy)	Ta Lat	Sesan	Stung Treng	Sesan
64	Srae Kor 2	Srae Kor	Sesan	Stung Treng	Sesan
65	Srae Kor 1	Srae Kor	Sesan	Stung Treng	Sesan

Table 6. Statistics for villages in the Sesan River Basin in Cambodia that would be directly impacted by the Sesan 2 dam blocking migratory fish from the Sesan, Srepok, Sekong and Mekong Rivers

#	Village	Families	Households	Population	Ethnicity
1	Phi	102	102	439	Jarai
2	Pa Tang	42	42	225	Jarai
3	Pa Dal	88	88	408	Jarai
4	Bar Kham	25	14	130	Jarai
5	Katae	27	13	126	Jarai
6	Ka Chut Tonle (Kraom)	41	12	213	Kachok
7	Lom Leng	30	15	108	Jarai/Khmer
8	Dal Pok	37	13	167	Jarai
9	Dal Veal Lang	45	21	185	Jarai
10	Ka Nat Touch	27	17	130	Kachok
11	Kak	50	23	358	Kachok
12	Ta Nong	43	20	230	Kachok
13	Ta Lav	72	49	453	Lao
14	In	59	33	369	Kachok
15	Chan (Mas)	39	39	131	Kreung
16	Chuoy (Nchuay)	88	88	409	Kreung
17	Ta Bouk (Trabok)	92	92	405	Brao
18	Pangkit	63	63	306	Brao
19	Sanh	42	42	176	Brao
20	Rieng Vinh	35	35	268	Brao
21	Ke Kuong Leu	40	40	226	Brao
22	Phlueu Thum	39	39	159	Brao
23	Phlueu Touch	37	37	129	Brao
24	Ta Veang (including village proper and district centre)	208 (17 village proper)	208 (17 village proper)	1011 (190 village proper)	Brao
25	Vieng Chan	32	32	116	Brao
26	Tumpuon Reung Thum	126	126	457	Brao
27	Ke Kuong Kraom	20	20	94	Brao
28	Phyang (1 and 2)	51	51	235	Brao
29	Tumpuon Reung Touch	63	63	114	Brao
30	Phav	169	169	1227	Brao
31	Kaoh Pong Touch	18	18	53	Brao
32	Sieng Say (with Hamok)	55	55	203	Brao
33	Ta Ngach	38	38	101	Brao

34	Pa Hay	36	36	199	Brao
35	Pa Taeng	78	42	288	Brao
36	Lang Av	69	49	367	Brao
37	Kaoh Peak	201	201	1067	Kachok
38	Phak Nam	293	190	1118	Kreung
39	Khuon Thum	128	64	580	Kreung
40	Ka Choun Leu	99	76	452	Tampuan
41	Ka Chuon Kraom	98	87	582	Tampuan
42	Ka Loem	48	48	265	Brao
43	Tiem Leu (Randeam Peung)	74	53	343	Kreung
44	Ban Pong	179	179	1086	Lao
45	Fang	287	284	1451	Lao
46	La Meuy Tonle	46	46	191	Kavet
47	Veun Sai	83	55	274	Lao
48	Thmei (Ban Mai)	24	24	126	Lao
49	Thmei Chin	48	48	238	Chinese
50	Pak Kae Se	22	22	124	Lao
51	Ka Lan	164	164	999	Lao
52	Pa Kalan	128	128	654	Lao
53	Kampong Cham	90	90	470	Lao
54	Phnum Kok Lao	66	66	322	Lao
55	Phnum Kok Brao	58	54	301	Brao
56	Tiem Kraom	80	80	336	Kreung
57	Hat Pak	207	179	910	Lao
58	Veun Hay	65	63	393	Lao
59	Lam Pat	14	10	54	Kreung
60	Ta Lat	71	71	385	Khmer Khek
61	Rumpeat (Lam Pat)	55	55	247	Kreung
62	Svay Rieng (including Kalapu)	256	256 ³¹	1050	Khmer Khek
63	Khsach Thmei (Saisamy)	269	269	930	Khmer Khek and Lao
64	Srae Kor 2	140	185	719	Lao
65	Srae Kor 1	131	178	727	Lao
	Totals	5550	5069	26609	

3.2.1.1) Streams in the Srepok River Basin in Cambodia

“The Srepok River and its tributaries provide an important habitat for the reproduction of fish stocks, supporting fisheries both within the basin and throughout the country” (Lloyd 2008: 25).

³¹ There are apparently about 49 households and 202 people in the part of the village called Kalapu (CEPA 2007).

One problem frequently encountered in social and environmental impact assessments (SIAs and EIAs) is for only those located along main rivers to be considered impacted by particular dams. However, the reality is that many fish found in large rivers spend part of their lifecycles in other water bodies, especially streams and other seasonally inundated wetlands where they migrate during the high-water monsoon season. Therefore, if fish are unable to migrate up the large rivers that they pass before getting to smaller streams, then they certainly would not make it into the streams either. This would lead to fisheries losses for villagers. This issue was addressed by Shoemaker *et al.* (2001) in relation to the Xe Bang Fai Basin in central Laos, and the potential fisheries impacts associated with the Nam Theun 2 dam. It is also very relevant in relation to the Srepok and Sesan Rivers, although the impacted villages that are not adjacent to the rivers were not mentioned in the EMP (KCC 2008a).

Apart from the 22 villages in Cambodia located directly adjacent to the Srepok River in Cambodia (Table 4), there are at least 42 villages located near large streams that run into the Srepok River (Table 7). All of these villages would lose access to migratory fish species blocked by the Sesan 2 dam, since there are no biogeographical barriers between these communities and the mainstream Srepok River, which itself does not have any biogeographical barriers on it, at least in Cambodia. However, none of these villages are considered to be potentially impacted villages according to the EMP (KCC 2008a). The EMP thus greatly underestimates the number of people that would be negatively impacted by migratory fish losses due to the Sesan 2 dam.

In addition, many people who live away from the Srepok River also fish there occasionally or frequently. The following section, taken from Swift (2006), is worth presenting to indicate this:

“Many people from a number of villages near the district center of Koh Nhek, most of them Khmer, transport their boats by oxcart to the upper Srepok, in the area of Mroeche (a police post several kilometers from the Vietnamese border). They do this in November or December, then bring the boats back home in May or June. They fish in Ou Phlay [a tributary of the Srepok River], which forms the border with Viet Nam, and the upper Srepok, and have to pay fees to the police stationed there. Some people who do not have boats use plastic jugs for flotation, or make rafts. A woman we interviewed who fishes in this area using a non-motorized boat reported catching 50-70 kg a night in Ou Phlay with gillnets in October and November, and 10-20 kg a night in the uppermost part of the Srepok in other months. She said that people with motorized boats could catch 40-50 kg of fish a night in the latter area in these months. The number of fishers in this area has increased year by year. Fish traders come to Mroeche and sometimes Ou Phlay, overland from Mondulkiri provincial town or Koh Nhek district town, and by boat from Viet Nam.”

Table 7. Villages not adjacent to the Srepok River but which are in the Srepok River Basin and in range of migratory fish from the Sesan, Sekong and Mekong Rivers³²

#	Village	Commune	District	Province	Ethnic Group	Stream
1	Sre Charay	Nong Khi Loek	Koh Nhek	Mondolkiri	Khmer/Bunong	Ou Chbar
2	Nong Khi Loek (Samat village people)	Nong Khi Loek	Koh Nhek	Mondolkiri	Bunong/Lao	Ou Chbar
3	Koh Nhek	Koh Nhek	Koh Nhek	Mondolkiri	Tampuan	Ou Chbar
4	Ka Laeng Sre	Ka Laeng	Lumphat	Ratanakiri	Tampuan	Ou Chaloi
5	Ka Laeng Phnum	Ka Laeng	Lumphat	Ratanakiri	Lao	Ou Chaloi
6	Veal Thum (Thong Nhai)	Ka Laeng	Lumphat	Ratanakiri	Tampuan	Ou Chaloi
7	Sano	Ka Laeng	Lumphat	Ratanakiri	Khmer/Tampuan/Lao	Ou Chaloi
8	Sayas Phnum	Ka Laeng	Lumphat	Ratanakiri	Tampuan	Ou Chaloi
9	Sayas Sre	Ka Laeng	Lumphat	Ratanakiri	Tampuan	Ou Chaloi
10	Lung Khung	Lung Khung	Bar Kaev	Ratanakiri	Tampuan	Ou Chaloi
11	Pa Ar	Lung Khung	Bar Kaev	Ratanakiri	Tampuan	Ou Chaloi
12	Chreak	Lung Khung	Bar Kaev	Ratanakiri	Tampuan	Ou Chaloi
13	Pa Tat	Seda	Lumphat	Ratanakiri	Tampuan like Lao	Ou Chanum to Ou Chip
14	Samot Leu	Seda	Lumphat	Ratanakiri	Tampuan like Lao	Ou Sambot to Ou Chip
15	Samot Kraom	Seda	Lumphat	Ratanakiri	Tampuan like Lao	Ou Chip
16	Thmei Seda (Mai	Seda	Lumphat	Ratanakiri	Tampuan like	Ou Chip

³² It should be noted that this is just a rough list of villages. A detailed assessment of the villages is required.

	Sida)				Lao	
17	Tra Peang Jarai (Nong Hai)	Seda	Lumphat	Ratanakiri	Brao Tanap	Ou Chip
18	Ka Chanh	La Bang 2	Lumphat	Ratanakiri	Bunong	Ou Ka Teung
19	Ka Tieng	La Bang 2	Lumphat	Ratanakiri	Jarai	Ou Ka Teung
20	Ka Tieng	La Bang 1	Lumphat	Ratanakiri	Jarai	Ou Ka Teung
21	Kam Phlenh	La Bang 1	Lumphat	Ratanakiri	Kreung	Ou Ka Teung
22	Ta Tueng	La Bang 1	Lumphat	Ratanakiri	Tampuan	Ou Ka Teung
23	Ka Long	La Bang 1	Lumphat	Ratanakiri	Tampuan	Ou Ka Teung
24	Pa Tang Phnum	Pa Tang	Lumphat	Ratanakiri	Tampuan	Ou Chaloï
25	Ul	Pa Tang	Lumphat	Ratanakiri	Tampuan	Ou Chaloï
26	Pa Tang Kraom	Pa Tang	Lumphat	Ratanakiri	Brao Tanap.	Ou Kan
27	Pruok	Pa Tang	Lumphat	Ratanakiri	Brao Tanap	Ou Kan
28	Pa Tang Srae	Pa Tang	Lumphat	Ratanakiri	Brao Tanap	Ou Kan
29	Chamkar Thmei	Pa Tang	Lumphat	Ratanakiri	Khmer	Ou Kan
30	3 Srok		Ban Lung	Ratanakiri	Tampuan	Ou Chaloï
31	Ka Teung	Kachanh	Ban Lung	Ratanakiri	Tampuan	Ou Ka Teung (?)
32	Ou Phlong (District centre)	Tra Peang Chres	Koun Mom	Ratanakiri	Tampuan	Ou Phlong
33	Ta Ang 2	Ta Ang	Koun Mom	Ratanakiri	Tampuan	Ou Cheng to Ou Ka Teung
34	Ta Kok Phnong	Bar Kham	Ou Ya Dav	Ratanakiri	Tampuan	Ou Chen Tai to Ou Tang (Phnong)
35	Ta Kok Jarai	Bar Kham	Ou Ya Dav	Ratanakiri	Tampuan	Ou Chen Lav to Ou Tang
36	Lam	Pak Nhai	Ou Ya Dav	Ratanakiri	Tampuan	Ou Tang
37	Kh mang	Laming	Bar Kaev	Ratanakiri	Tampuan/Khmer	Ou Laming to Ou

						Chip
38	Seung	Seung	Bar Kaev	Ratanakiri	Tampuan	Ou Laming to Ou Chip
39	Yaem	Seung	Bar Kaev	Ratanakiri	Tampuan	Ou Laming to Ou Chip
40	Nhol	Laming	Bar Kaev	Ratanakiri	Brao Tanap	Ou Laming to Ou Chip
41	Su	Laming	Bar Kaev	Ratanakiri	Brao Tanap	Ou Chip
42	Smach	Seung	Bar Kaev	Ratanakiri	Brao Tanap	Ou Chip

Swift (2006) also shows that even people outside of the Sesan River Basin sometimes fish in the Srepok River,

“Some people from outside the basin fish within it, most notably people from Stung Treng. A group of people from Thalla Barivath District in Stung Treng Province fish seasonally in the uppermost reaches of the Srepok, as far as the Vietnamese border. They primarily fish upriver of Koh Meayoel Loe, where there are no villages.”

This is yet another important issue that requires more careful investigation and analysis, as these groups of people also deserve to receive fair compensation for their fisheries losses.

3.2.1.2) Streams in the Sesan River Basin in Cambodia

Apart from the 65 villages located adjacent to the Sesan River in Cambodia above the proposed Sesan 2 dam site (Table 5), there are at least 44 villages located near streams that flow into the Sesan River (Table 8). There are no biogeographical barriers to fishes along the Sesan River in Cambodia, or between the Sesan River and these communities adjacent to connecting streams, thus making it possible for migratory fish—ones that would be blocked by the Sesan 2 dam—to reach all these communities. Losses would definitely be heavy.

Table 8. Villages in the Sesan River Basin in Cambodia, not adjacent to the Sesan River, but in range of migratory fish from the Lower Sesan, Sekong and Mekong Rivers³³

#	Village	Commune	District	Province	Ethnicity	Stream
1	La Lai	Kok Lak	Veun Sai	Ratanakiri	Kavet	Ou La Lai
2	La Meuy	Kok Lak	Veun Sai	Ratanakiri	Kavet	Ou La Lai
3	Rak	Kok Lak	Veun Sai	Ratanakiri	Kavet	Ou La Lai
4	Trak	Kok Lak	Veun Sai	Ratanakiri	Kavet	Ou La Lai
5	Kang Nak	Veun Sai	Veun Sai	Ratanakiri	Kavet	Ou La Lai
6	Kalai Ta Vang	Phnum Kok	Veun Sai	Ratanakiri	Kreung	Ou Tang
7	Kalai Sapun	Phnum Kok	Veun Sai	Ratanakiri	Kreung	Ou Tang
8	Vay	Ka Choun	Veun Sai	Ratanakiri	Kreung	Ou Ling
9	Vang	Ka Choun	Veun Sai	Ratanakiri	Kreung	Ou Ling
10	Bong (Yon) (officially part of Ta Bouk village)	Ta Veang Leu	Ta Veang	Ratanakiri	Brao	Ou Ta Bouk
11	Tun	Ta Veang Leu	Ta Veang	Ratanakiri	Kreung	Ou Ka Chuon
12	Ou Chum 1	Ou Chum	Ou Chum	Ratanakiri	Kreung	Ou Ka Seng
13	Ou Chum 2	Ou Chum	Ou Chum	Ratanakiri	Kreung	Ou Ka Seng
14	Trong Svay	Ou Chum	Ou Chum	Ratanakiri	Kreung	Ou Ka Seng
15	Trong Jong	Ou Chum	Ou Chum	Ratanakiri	Kreung	Ou Ka Seng
16	Thuy Tum	Cha Ung	Ou Chum	Ratanakiri	Kreung	Ou Ka seng
17	Krieng	Ke Chong	Bar Kaev	Ratanakiri	Tampuan	Ou Chva
18	Pa Ar	Ke Chong	Bar Kaev	Ratanakiri	Tampuan	Ou Tamo
19	Tien	Ke Chong	Bar Kaev	Ratanakiri	Tampuan	Ou Kop
20	Leu Yuon	Ke Chong	Bar Kaev	Ratanakiri	Tampuan	Ou Kop
21	Kop Touch	Ke Chong	Bar Kaev	Ratanakiri	Tampuan	Ou Kop
22	Ong Kop	Ting Chak	Bar Kaev	Ratanakiri	Jarai/Tampuan/Kachok/Khmer/Cham	Ou Kop
23	Lut	Ting Chak	Bar Kaev	Ratanakiri	Tampuan	Ou Kop
24	Tuy	Ting Chak	Bar Kaev	Ratanakiri	Tampuan	Ou Kop
25	Trom	Laming	Bar Kaev	Ratanakiri	Tampuan	Ou Kop
26	Ka Nat Thum	Ta Lav	Andoung Meas	Ratanakiri	Kachok	Ou Tamo
27	Muoy	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Unchan
28	Peaeng	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Unchan
29	Tang Malu	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Katae to Ou Mang, Ou Lom

³³ It should be noted that this is just a rough list of villages. A detailed assessment of the villages is required.

30	Nhang	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Lom and Ou Katae and Ou Mang
31	Tang Balu	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Lom
32	Tang Lom	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Lom and Ou Katae and Ou Mang
33	Tang Chi	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Bla
34	Ka Chut Sre (Leu)	Nhang	Andoung Meas	Ratanakiri	Kachok	Ou Pruol
35	Chay	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Yeng Sang
36	Chay Touch	Nhang	Andoung Meas	Ratanakiri	Jarai	Ou Yeng Sang
37	Nay	Nhang	Andoung Meas	Ratanakiri	Kachok	Ou Dong
38	Lom	Malik	Andoung Meas	Ratanakiri	Jarai/Kachok/ Khmer	Ou Kop
39	Kahol	Malik	Andoung Meas	Ratanakiri	Tampuan/ Jarai	Ou Kop
40	Som Keul	Saom Thum	Ou Ya Dav	Ratanakiri	Jarai	Ou Chva
41	Leng	Pate	Ou Ya Dav	Ratanakiri	Jarai	Ou Chva
42	Pak Nhai	Pak Nhai	Ou Ya Dav	Ratanakiri	Jarai	Ou Tav
43	Yuang	Pak Nhai	Ou Ya Dav	Ratanakiri	Jarai	Ou Tav
44	Pak Touch	Pak Nhai	Ou Ya Dav	Ratanakiri	Jarai	Ou Tav
45	Pham Lom	Pak Nhai	Ou Ya Dav	Ratanakiri	Jarai	Ou Tav

In addition, and like the Srepok River, it would be necessary to learn more about people who do not live adjacent to the Sesan River or its tributaries, but whom occasionally to frequently travel there to go fishing, as this group of people would lose fisheries resources, and would thus also be negatively impacted by the Sesan 2 dam. They should be compensated for the impacts of the Sesan 2 dam on their livelihoods.

3.2.2) Fisheries Impacts in the Reservoir area in Stung Treng Province

The fisheries habitat within the area expected to become the Sesan 2 dam reservoir would change dramatically if the dam were to be built. There would certainly be a much larger body of water in the area; the reservoir would cover a surface area of an estimated 309.74 km² (KCC 2008a).

However, the reservoir would not be an attractive place for aquatic life for a number of reasons. First, the reservoir would be eutrophic (algae blooms), since it would flood a lot of non-cleared vegetation in the inundation area. Secondly, much of the reservoir would constitute very deep inactive storage, thus creating a large quantity of anoxic water, a habitat where few fish can survive. Third, this reservoir, like most others, would include a ‘draw down zone’ surrounding the reservoir. The unusual changes in water levels in the reservoir are likely to result in this area

being non-vegetated. Therefore, there would be very little vegetative habitat along the edge of the reservoir. As Baird (2007) has shown for the Mekong River in southern Laos and northeastern Cambodia, terrestrial forests and other riverbed tree and shrub species are important sources of food for many fish species, especially in the rainy season.

Most native fish species are unlikely to adapt well to reservoir conditions, and the overall fishery in the reservoir is unlikely to be very productive. The EMP hardly mentions the reservoir fishery, indicating that KCC also does not expect it to be very productive. Even if most species would not do well in the reservoir, it is likely that one or even a few species could become more prevalent in the reservoir. This has, for example, been the case for a non-native goldfish species *Carassius auratus* (*pa fek* in Lao) in the Theun-Hinboun dam reservoir, while the minnow *Clupeichthys aesarnensis* (*pa keo* in Lao) increased in numbers in the reservoir of the Nam Ngum dam after the area was inundated.

3.2.3) Fisheries Impacts Downstream from the Sesan 2 Dam in Stung Treng Province

Hydropower dam planners in the Mekong region, such as the United Kingdom-based Sir William Halcrow and Partners, have recognized for at least the past decade that increased dry season flows below dams are rarely if ever beneficial for fisheries, despite what some dam proponents claim.

“It has been proposed that the increase in dry season flows that will occur below hydropower schemes must be beneficial, because more water is seen as being ecologically ‘better’ than less. This is an unsound assumption. The ecology of river systems that experience alternate seasonal extremes of flow may be highly developed to exploit the very different environmental conditions that exist at different times of the yearly cycle” (Halcrow and Partners 1998: 3-13).

The original EIA for the Yali Falls dam is a vivid example of how downstream impacts, on both fisheries and in relation to other issues, are sometimes dramatically underestimated. Electrowatt (1993) only considered the impact area for that the Yali Falls dam to be 7 km downstream, a mistake that is now well recognised (Wyatt & Baird 2007). The Sesan 2 dam’s EMP provides insufficient information and mitigation measures to deal with downstream issues, although it does acknowledge that fisheries far downstream of the dam, even to the Tonle Sap, would be seriously negatively impacted due to the dam. The EMP also recognises some downstream impacts during construction (KCC 2008a), but there is generally insufficient recognition of the downstream impacts of the project, especially during the dam’s operation period. Furthermore, no significant measures are proposed for mitigating impacts or compensating those expected to be negatively impacted.

The dramatic change of hydrological conditions and water quality downstream of the Sesan 2 dam would have severe impacts on the ecological conditions and all life associated with the river. Hydrological conditions would change dramatically due fit with operational requirements for producing power during peak times of the day, and at all times of year. Changes in water quality would also negatively impact fish. Downstream, there would be an almost complete

blockage of upstream sediment, which would cause major changes in the ecology of the river. This would cause severe erosion of the river bed, and the loss or destruction of downstream habitats. Water chemistry would also be fundamentally changed due to changes in water quality in the large reservoir of Sesan 2 (Halcrow and Partners 1999). Cumulatively, the river would be completely transformed, and at least for the first twenty or so kilometres, until the Sesan River is joined by the Sekong River, few fish could survive. Even below there, along the lower Sekong River, conditions would likely be quite poor. Even water quality and hydrological conditions of the Mekong River near Stung Treng Town and downstream are likely to be negatively affected, although the extent of the impacts are difficult to know without modelling changes in hydrology based on a clear understanding of the planned operation strategy for the dam. This information has so far not been released, thus making such an assessment impossible. However, when one considers that changes in the Sesan River have been felt almost 400 km downriver from the Yali Falls dam to the Mekong River at Stung Treng, it seems highly likely that the downstream impacts of the Sesan 2 dam would be very severe.

Table 9 includes a list of 19 villages that would be affected by downstream impacts along the Sesan and Sekong Rivers in Stung Treng Province. Table 10 includes population and ethnicity information. There are approximately 22,277 people in 3,880 households and 4,553 families located in these 19 villages.

Deep-water pools (*anlong* in Khmer) are considered important fish habitat throughout much of the Mekong River Basin (Halls 2008; Baird 2006b; Viravong *et al.* 2006; Baird & Flaherty 2005; Baran *et al.* 2005; Poulsen *et al.* 2002; Baird *et al.* 2001b). Deep-water pools sometimes serve as important low-water refuges for various fish species, especially large brood stock. Fishers have long known this to be true, and there are presently large numbers of deep-water pools protected in various ways and in different parts of Laos (Baird 2006b). Baird & Flaherty (2005) have shown that various types of deep-water pools in the Mekong River in southern Laos are inhabited by different fish species and communities of aquatic life. The Ratanakiri Province Fisheries Office & NTFP (2000), Baird & Meach (2005) and Wyatt & Baird (2007) have also explained how deep-water pools in the Sesan River have become increasingly shallow as a result of downstream erosion and sedimentation caused by the Yali Falls dam in Viet Nam. This habitat loss has negatively impacted fisheries along the Sesan River in Ratanakiri and Stung Treng Provinces. Some species, such as *Boesemania microlepis*, a species found in the project area, are particularly dependent on deep-water pools (Baird *et al.* 2001b). Many other fish species use deep-water pools in particular seasons, especially when water-levels are low (Baird & Flaherty 2005; Baird 2006b; Baran *et al.* 2005).

It is possible that fisheries downstream from the Sesan 2 dam could be negatively affected by 'gas bubble trauma', a result of what is known as 'gas supersaturation'. This can occur in rivers when water spills over waterfalls or through the spillways of hydroelectric dams, and has been recorded below the Khone Phapheng waterfalls on the Mainstream Mekong River in southern Laos, just upriver from the border with Cambodia. Gas bubble trauma can result in a number of physiological signs that can be harmful or fatal for fish and other aquatic organisms (Baird *et al.* 1999b). Even though the Sesan 2 dam would be high, with a large amount of water passing

through its turbines, the EMP does not mention the possibility of gas supersaturation occurring below the dam (KCC 2008a). This is another deficiency of the EMP.

Table 9. Villages downstream from the Sesan 2 dam on the Sesan and Sekong River in Stung Treng Province

#	Village	Commune	District	Province	River or Stream
1	Phluk	Phluk	Sesan	Stung Treng	Sesan
2	Ban Bung	Phluk	Sesan	Stung Treng	Sesan
3	Khamphun	Khamphun	Sesan	Stung Treng	Sesan
4	Sesan	Khamphun	Sesan	Stung Treng	Sesan
5	Ban Mai	Khamphun	Sesan	Stung Treng	Sesan
6	Ba Daeum	Samkhuoy	Sesan	Stung Treng	Sesan
7	Samkhuoy	Samkhuoy	Sesan	Stung Treng	Sesan
8	Hang Savat	Samkhuoy	Sesan	Stung Treng	Sekong/Sesan
9	Srae Taban	Samkhuoy	Stung Treng	Stung Treng	Sekong
10	Srae Pou	Sarh Ruessei	Stung Treng	Stung Treng	Sekong
11	Leu	Sarh Ruessei	Stung Treng	Stung Treng	Sekong
12	Thma Leap	Sarh Ruessei	Stung Treng	Stung Treng	Sekong
13	Spean Thma	Stung Treng	Stung Treng	Stung Treng	Sekong
14	Tra Peang Pring	Stung Treng	Stung Treng	Stung Treng	Sekong
15	Kandal	Stung Treng	Stung Treng	Stung Treng	Sekong
16	Preaek	Stung Treng	Stung Treng	Stung Treng	Sekong
17	Hang Khou Ban (including Sakhun)	Sameakki	Stung Treng	Stung Treng	Sekong
18	Hang Khou Suon	Sameakki	Stung Treng	Stung Treng	Sekong/Mekong
19	Ba Chong	Preah Bat	Stung Treng	Stung Treng	Sekong/Mekong

Table 10. Statistics for villages located downstream of the dam site of the Sesan 2 dam along the Sesan and Sekong Rivers in Cambodia

#	Village	Families	Households	Population	Ethnicity
1	Phluk	217	163	864	Lao
2	Ban Bung	76	59	365	Lao, Some Khmer
3	Khamphun	337	337	1337	Lao/Khmer
4	Sesan	73	73	323	Khmer
5	Ban Mai	96	96	409	Lao
6	Ba Daeum	131	131	547	Lao
7	Samkhuoy	114	114	482	Lao
8	Hang Savat	137	137	555	Lao, some Khmer
9	Srae Taban	119	108	537	Lao/Khmer
10	Srae Pou	373	312	1601	Lao/Khmer
11	Leu	148	103	706	Khmer/Lao
12	Thma Leap	205	147	889	Lao/Khmer
13	Spean Thma	405	356	2216	Khmer/Lao/Chinese/Viet
14	Tra Peang Pring	333	333	1840	Khmer/Lao
15	Kandal	283	241	1423	Khmer/Lao/Chinese/Viet/Cham
16	Preaek	888	706	4687	Khmer/Lao/Chinese/Viet
17	Hang Khou Ban (including Sakhun)	146	76	821	Lao/Khmer
18	Hang Khou Suon	239	234	1349	Khmer/Lao
19	Ba Chong	233	154	1326	Khmer/Viet/Lao
	Totals	4553	3880	22277	

Considering the serious downstream impacts that were caused by the Yali Falls dam, it can also be expected that many other villages situated along the Mekong River would be negatively impacted by water releases associated with the construction and operation of the Sesan 2 dam. Communities located both upstream and downstream of the Sekong River's confluence with the Mekong River would be negatively impacted. So far there have been no surveys of these villages in relation to the Sesan 2 dam (KCC 2008a), even though hundreds or even thousands of villages could be negatively impacted.

The Sesan 2 dam would also negatively impact on the 37 km long Stung Treng Ramsar site in the mainstream Mekong River, which runs between just five kilometres upriver from Stung Treng Town and just three kilometres downstream from the Laos-Cambodia border (Thuan & Chambers 2006).³⁴ This area has long been recognised as an important area for fisheries, and in

³⁴ The Stung Treng Ramsar site covers 14,600 ha, and includes 500 m on each side of the Mekong River (Thuan & Chambers 2006).

1987, the Ministry of Agriculture, Forestry and Fisheries (MAFF) declared the provinces of northeastern Cambodia as protected areas for fish spawning grounds. Fishing lots and large-scale commercial fishing was prohibited in the two provinces (Thuan & Chambers 2006).

The downstream areas that would be affected by the Sesan 2 dam should be surveyed. If the Sesan 2 dam is built, impacted communities should be provided with substantial long-term compensation. Some compensation may need to be paid to fishers in Laos and Thailand. Ways to mitigate negative impacts on these communities should also be carefully considered, including adopting an 'environmental flows' regime, in which attempts are made to time water releases so that hydrological regimes downstream more closely replicate natural flows (Richter & Thomas 2007; Dyson *et al.* 2003; Bunn & Arlington 2002 (in particular reference to the Sesan River dam situation, see Hirsch & Wyatt 2004; Lindholm 2007).

Although introducing an environmental flows management system for the Sesan River would certainly mitigate some of the worst downstream hydrological impacts, and deserves to be carefully considered, it should be recognised that implementing environmental flows management systems for dams tend to be less effective in mitigating negative water quality impacts downstream than in solving hydrological problems.

3.2.4) Widespread Downstream Fisheries Impacts in the Mekong River, Tonle Sap and Mekong Delta

The EMP acknowledges that, "The [Sesan 2] dam across the Se San River will impact not only the fishery in the area [near the dam] but also the fishery in the Mekong downstream, Mekong Delta, as well as in Tonle Sap Lake too" (KCC 2008a: 124). Indeed, this is likely to be true. Halcrow and Partners (1998: 2–4) also emphasised the potential negative effects of upstream hydropower development on downstream areas in the Sesan, Sekong and Nam Theun River basins. They wrote, "The most notable issues are in fact the impacts of changes on the fish resources of the Cambodian Great Lake, and the stability and productivity of the estuary in Vietnam." The Sesan 2 dam would certainly result in significant negative fisheries impacts on Cambodia, Viet Nam, Laos and Thailand.

Considering the transboundary implications of the Sesan 2 dam, the project seems like a perfect candidate for a Transboundary Impact Assessment (TIA), which is essentially an EIA/SIA across national boundaries (Bruch *et al.* 2007). Nhung & Gooch (2007) have emphasised the need for better transboundary management of the Sesan River between Viet Nam and Cambodia. In fact, for a dam like the Sesan 2, with expected broad fisheries impacts throughout the basin, it would appear that more than just Viet Nam and Cambodia should be involved in addressing transboundary issues associated with the project. Impacts need to be conceptualised and seriously addressed at a basin-wide level, as advocated by the WCD (2000).

It would not be possible to mitigate key migration blockage problems caused by constructing the 75 m high Sesan 2 dam. Because of the height of the dam, building a fish ladder, lift or other kind of pass to allow fish to pass is not at all realistic in a system like the Mekong where there are so many different species of fish, each with their own seasonal habitat requirements (see

Dugan 2008). However, the EMP suggests, unrealistically, that installing a fish pass could be an option for the Sesan 2 dam (KCC 2008a). Neither is it likely that a fish research centre, as proposed as another option by KCC (2008a), would lead to any significant gains for the fishery or local people, at least in the short-term.

One major migratory fishery that the Sesan 2 dam would negatively impact is the dry season migration of small cyprinid fishes from the Great Lake and Tonle Sap River. Of the at least 32 species that are known to make this long migration (see Table 11), the most abundant are typically *Henicorhynchus lobatus* and *Paralaubuca typus* (Baird *et al.* 2003). If the Sesan 2 dam were built, these fish would no longer be able to migrate up the Sesan and Srepok Rivers past the Sesan 2 dam, and thus they would become completely absent above the dam. There would also be less fish downstream.

Table 11. Fish species that migrate up the Mekong River from the Tonle Sap River each dry season. They migrate up the Sesan and Srepok Rivers from the Mekong River as well (adapted from Baird *et al.* 2003)

#	Latin Name	Khmer Name	Lao Name
1	<i>Henicorhynchus lobatus</i>	Trey riel	Pa soi houa lem
2	<i>Henicorhynchus siamesis</i>	Trey riel thum	Pa soi houa po
3	<i>Henicorhynchus lineatus</i>	Trey riel	Pa soi lai
4	<i>Cirrhinus microlepis</i>	Trey krawlang (sm) or trey pruol (lg)	Pa phone mak koke (sm) or pa phone (lg)
5	<i>Paralaubuca typus</i>	Trey slak russey	Pa tep
6	<i>Labiobarbus leptocheilus</i>	Trey khnawng veng	Pa lang khon
7	<i>Thynnichthys thynnoides</i>	Trey linh	Pa koum
8	<i>Lobocheilus melanotaenia</i>	Trey changwa ronoung	Pa khiang
9	<i>Garra fasciacauda</i>		Pa kom
10	<i>Barbodes altus</i>	Trey kahe krour horm	Pa vian fai
11	<i>Gyrinocheilus pennocki</i>	Trey smok	Pa ko
12	<i>Sikukia gudgeri</i>		
13	<i>Puntioplites falcifer</i>	Trey chrakaing	Pa sakang
14	<i>Cyclocheilichthys enoplos</i>	Trey chhkok	Pa chok
15	<i>Cyclocheilichthys sp. or spp.</i>	Trey srawka kdam	Pa doke ngieu
16	<i>Cosmocheilus harmandi</i>	Trey kampoul bay	Pa mak ban
17	<i>Epalzeorhynchus frenatum</i>		
18	<i>Crossocheilus reticulatus</i>		Pa khang lai
19	<i>Crossocheilus siamensis</i>		Pa khang lai
20	<i>Osteocheilus melanopleurus</i>	Trey krum	Pa nok khao
21	<i>Osteocheilus microcephalus</i>	Trey kros	Pa khang lao
22	<i>Amblyrhynchichthys truncates</i>	Trey kambot chramos	Pa ta po
23	<i>Luciosoma bleekeri</i>		
24	<i>Leptobarbus hoeveni</i>	Trey chrawlang or trey knuoch	Pa phong
25	<i>Rasbora sp.</i>	Trey changwa	Pa sieu ao
26	<i>Tenuialosa thibaudeaui</i>	Trey kbork	Pa mak phang
27	<i>Schistura sp.</i>		
28	<i>Acantopsis sp.</i>	Trey ruschek	Pa hak kouay
29	<i>Botia modesta</i>	Trey kanchrouk krawhorm	Pa mou man
30	<i>Botia helodes</i>	Trey kanchrouk chhnoht	Pa kheo kai
31	<i>Botia caudipunctata</i>	Trey kanchrouk	Pa mou man
32	<i>Parambassis wolfii</i>	Trey kanchanh	Pa khap Khong

Migratory *Scaphognathops bandanensis* (*trey chrakaing*), *Mekongina erythrospila* (*trey pa sa-i*), *Hypsibarbus malcolmi* (*trey chhpin*), *Labeo erythropterus* (*trey pa va*), *Bangara behri* (*trey pa va mok pi*) and *Cirrhinus moliterella* (*trey phkar kor*) would be badly impacted due to their migrations being blocked by the Sesan 2 dam, and also as a result of hydrological and water quality changes in the Sesan 2 reservoir area and below the dam (see Baird *et al.* 2004).

Large *Mekongina erythrospila* is the most famous fish species in Stung Treng, and the most expensive fish species as well, with 2 kg fish selling for up to 160,000 riel per kg in Stung Treng. Fish weighing over 1 kg sell for about 70,000 riel/kg, while those weighing 600-900 grams sell for about 30,000-60,000 riel per kg. There is even a statue of a '*trey pa sa-i*' in downtown Stung Treng Province (see back cover), and the species is mentioned in tourist guides. These fish are amongst the most valuable fish in the country, and their loss would represent a significant loss of income for fishers and traders, and a loss of face for government officials.

The Sesan 2 dam would block the movements of Pangasid catfish and various other fish species, including *Pangasius macronema*, *Pangasius larnaudii*, *Pangasius bocourti*, *Pangasius hypophthalmus* and *Pangasius conchophilus*, as these species migrate between the Mekong and Sesan and Srepok Rivers (Baird 1995; Baird & Meach 2005). Thus, the dam would reduce their numbers above and below the dam.

Changes in water releases down the Sesan River could seriously disrupt the timing and 'triggers'³⁵ associated with fish migrations for many fish species, including members of the Pangasid catfish family, including *Pangasius krempfi* (Baran *et al.* 2005; Baran 2006). Other species could also be impacted by hydrological changes, but so far little empirical research has been done on this important issue. Still, some believe that changes in water flows down the Sesan and Sekong Rivers near the Mekong River may be affecting decisions regarding channel use by fishes migrating up the Mekong, Sekong, Sesan and Srepok Rivers. However, more research is required.³⁶

Changes in the hydrology and water quality of the Sekong River would also negatively impact *Probarbus jullieni* (*trey trasok*) and *Probarbus labeamajor* (*trey trasok sol*) fisheries at various locations. *P. jullieni* is an appendix 1 listed species in relation to the Convention on the International Trade in Endangered Species (CITES) (Baird 2006a).

One widespread possible downstream impact of the Sesan 2 dam would be on the distribution of fish larvae. For example, the large catfish *Pangasius krempfi* is known to migrate up the Sesan and Srepok Rivers at beginning of the rainy season (Baird 1995). When they are migrating upriver they are full of eggs and are not eating. They are believed to spawn in these two rivers later in the rainy season, when water levels are high. Their larvae are probably washed downriver by the strong currents. The young fish end up in the Mekong Delta of Viet Nam, where they grow until they too are mature enough to conduct migrations far upriver (Hogan *et al.* 2007; Baran *et al.* 2005; Baird *et al.* 1999a; 2004). Baird & Flaherty (2004) also specifically discuss this problem in relation to the possible construction of dams on the mainstream Mekong River.

³⁵ Triggers are hydrological conditions that trigger certain migratory or other behaviour.

³⁶ *Pers. comm.*, Dr. Ashley Halls, Fisheries Programme, MRC, Phnom Penh, November 2008.

There would undoubtedly be many other fish species impacted due to blocked downstream larvae flows, including important ones, such as *Henicorhynchus lobatus*.

3.3) Forestry and Wildlife

3.3.1) Forestry

The Sesan 2 dam reservoir would inundate over 305 km² of land, much of it forested. According to the EMP, an additional 7,086 ha³⁷ of forest would also be damaged by the resettlement of villages from the inundation area. More forest would be destroyed to re-route National Road #78 due to flooding. According to the EMP, 23,093 ha of deciduous forests would be lost for the project, along with 3,516 ha of semi-evergreen forest, 248 ha of evergreen forest, and thousands of hectares of other forest and grasslands (KCC 2008a).

However, the EMP (KCC 2008a) does not consider seasonally inundated forests within the Sesan and Srepok Rivers to be ‘forest’, even though these specially adapted plant species do, in fact, represent a type of ‘forest’ (Baird 2007).

Although a large amount of forested area would be damaged either directly or indirectly by the Sesan 2 dam, the EMP does not propose providing communities with any compensation or other benefits in lieu of forest losses. The EMP only proposes compensating companies that have economic land and logging concessions for their losses. The plan is to settle with these companies before construction begins (KCC 2008a). The national government would also receive compensation from the dam developers for ‘state forest’ losses. ‘Forest land’ is valued at just US\$17.50/hectare (PECC1 2008c), a very low amount.

Grand Land Company is expected to lose 4,470 ha of forest land, Anmady is expected to lose 997 ha, Siv Geach Agro-Industrial is expected to lose 1,690 ha, and Sopheak Nika Investment Agro-Industrial is expected to lose 431 ha. In addition, the Pheapimex logging concession is slated to lose 5,606 ha of forest (PECC1 2008b).^{38 39} The lost ‘natural forest land’ is expected to be 18,670 ha, including the loss of 4,896 ha of lost rivers and streams. The lack of compensation to communities for forest losses represents a considerable injustice, since villagers have a long history of using forest resources near their communities to support local livelihoods, but it appears that newly arrived concession owners are considered more important. Villagers should have been the recipients of significant compensation for losses, both from the developers of the Sesan 2 dam, and also from the companies that have gained economic land and logging concessions near villages. In both cases, essential resources for local livelihoods are expected to be sacrificed by villagers without any consultation, negotiation, or without villagers receiving any compensation for their considerable losses. This is one of the most important deficiencies of

³⁷ According to KCC (2008a), this area includes 4,618 ha of deciduous forests, 1,556 ha of semi-evergreen forest, 102 ha of evergreen forest, and hundreds of hectares of other forest.

³⁸ However, this contradicts KCC (2008b), which claims that 10,399 ha, or 31% of the 33,560 ha of land that would be inundated by the dam’s reservoir, is already “approved land and forest concession areas”.

³⁹ The EMP states that Sal Sophear Trade also has an ‘industrial’ concession in the reservoir area (KCC 2008a) but this concession is not mentioned by PECC1 (2008a).

the Sesan 2 dam EMP as well as the economic land and logging concession arrangements presently in place in Stung Treng Province. According to PECC1 (2008b), rubber plantation owners are expected to receive US\$2,000 per hectare for each hectare of rubber they have already planted.

One irony that has recently emerged in Kbal Romeas, Srae Kor and Ta Lat Communes, in Sesan District, is that soldiers have been sent to the villages to stop locals from cutting trees and selling wood. Some might congratulate the government for trying to decrease illegal logging in order to conserve valuable forestry resources, but it appears that conservation is far from the motive for these efforts. Instead, the soldiers appear to be trying to stop villagers from gaining access to wood so that the concession owners working in these communes can cut down and sell the trees themselves. This is indicated by the fact that the two soldiers who arrived in Kbal Romeas Village in early December 2008 did not seem concerned with stopping Anmady Company from bulldozing trees down adjacent to the road that they travelled along to reach the village. They made no mention of the company's destructive practices in relation to the forest. Instead, they focussed on stopping villagers from cutting wood in areas inside concessions, which appears to be the vast majority of the forests in the area.

3.3.2) Wildlife

The Sesan 2 dam would negatively impact wildlife populations in various ways. To begin with, a large amount of important riverine and terrestrial wildlife habitat would be inundated by the dam's reservoir. The impacts of the Sesan 2 dam on fish upstream and downstream from the project would also indirectly negatively impact on various wild mammals and birds that are dependent on fish for food.

Some bird species that would be negatively impacted include various sand bar birds—including the blackbellied tern (*Sterna acuticauda*), river tern (*Sterna aurantia*), river lapwing (*Vanellus duvaucelii*), great thick-knee (*Esacus recurvirostris*), small pratincole (*Glareola lactea*), and little ringed plover (*Charadrius dubius*), and the Mekong wagtail (*Motacilla samveasnae*)—whose breeding habitat would be impacted downstream (see Claasen 2004), and also negatively impacted due to reservoir inundation.

The dam's reservoir would also inundate some habitats identified by World Wide Fund for Nature (WWF) as particularly important for Cambodia. Eld's deer, dhole, banteng and three species of critically endangered vultures would be negatively impacted by reservoir inundation as well as other dam-related activities, including the encroachment of people near the Srepok River due to being relocated from the Sesan 2 dam reservoir (particularly Kbal Romeas and Srae Sranok Villages) (KCC 2008a). WWF has provided evidence that these species are found within a few kilometres to the south of the Srepok River not far from the present locations of the same two villages. Camera traps were used to photograph the animals a few years ago. WWF previously helped to develop a vulture-viewing ecotourism project in the Srae Sranok Village area (Andy Maxwell, WWF, *pers. comm.* 2008). One 'vulture restaurant' that is being managed by the Cambodian Vulture Conservation Project, and is located south of the Srepok River near Srae Sranok Village and Lumphat Wildlife Sanctuary, may be inundated by the dam's reservoir,

or otherwise disturbed by the settlement of people moved from the dam's reservoir area. Red-headed (*Sarcogyps calvus*), white-rumped (*Gyps bengalensis*) and slender-billed (*Gyps tenuirostris*) vultures are all considered to be critically endangered species, and the populations of these species have declined rapidly throughout much of their range since the early 1990s (Pech & Rainey 2008). In 2006 seven active slender-billed vulture nests were found near Srae Sranok Village, the first nests of the species ever found in Cambodia (WWF Cambodia 2006). Then, in January 2007, another slender-billed vulture nest was found in the same area, as well as nest of a red-headed vulture (Song 2007). This important wildlife habitat would all be endangered by the Sesan 2 dam, either through direct inundation or from in-migration of people from the inundation area. Eld's deer is one of the rarest mammals in mainland Southeast Asia, and they are only known from a few locations in the region.



Photo 4 Dhole and pups in the wild in project area. Photo Courtesy of WWF



Photo 5 Douc Langur in the wild in project area. Photo Courtesy of WWF



Photo 6 Eld's Deer in the wild in project area. Photo Courtesy of WWF

The Sesan 2 dam's wide (1-7 km), long (30-50 km) and deep (20-35 m) reservoir would also constitute a significant barrier for wildlife movements from one side of the reservoir to the other, thus further fragmenting wildlife populations (KCC 2008a), although no detailed studies of this impact have been conducted.

The villages slated to be relocated from the Sesan 2 dam reservoir area include Srae Kor 1 and 2, Srae Sranok, Kbal Romeas, Kbal Spean Srepok (Chrab). In addition, Krabei Chrum, Kchaich Thmei, Svay Rieng, Rumpoat and other villages may be fully or partially resettled. The movement of these human populations would have a negative impact on wildlife in other areas. KCC (2008a) proposes that new land reclamation occurs, and that hunting be banned near these resettlement sites to reduce the impact on wildlife. However, the resettled people would already have difficult livelihood situations due to being uprooted from their homes, so it would be both unreasonable and unrealistic to expect that people could be kept from using the forest. It seems that there is little recognition by the project developers of the importance of forests to villager livelihoods. Simply excluding relocated people from using the forest after the river has already been taken away from them seems unlikely to be successful, and the plan indicates that the project has not been well conceived.

3.3.3) National Protected Area Management

The Sesan 2 dam would have negative impacts on two National Protected Areas, the Lumphat Wildlife Sanctuary and Virachey National Park. At a height of 75 m, the Sesan 2 dam reservoir would inundate the north-western buffer zone of the Lumphat Wildlife Sanctuary, and reach within 2 km from the boundary of the protected area (KCC 2008a). This would reduce the available habitat for wildlife found in the protected area. In addition, fish biodiversity inside the wildlife sanctuary would decline considerably, since migratory fish from the Mekong River would not be able to reach the protected area. This, in turn, would negatively affect other species of mammals and birds that feed or otherwise depend on fish. In addition, villagers negatively impacted by the Sesan 2 dam would become more dependent on the forests and NTFPs found inside and near the protected areas, since they would not be able to turn to the river for food. All in all, these conditions would lead to declines in natural resources.

Impacts on Virachey National Park, considered to be one of Cambodia's most important protected areas (Baird & Dearden 2003), would be less direct, as the protected area is farther from the reservoir of the Sesan 2 dam than Lumphat Wildlife Sanctuary. However, Virachey National Park would be impacted due to losses of aquatic biodiversity, especially migratory fish from the Mekong River. This would have indirect negative impacts on various species of birds and mammals that feed on fish. In addition, villagers would become more dependent on hunting and forest products collection activities near and within the protected area, due to fisheries losses, thus potentially contributing to a reduction of wildlife and overall biodiversity inside the park.

3.4) Re-routing National Road #78

If the Sesan 2 dam is built, approximately 7 km of National Road #78, running between Stung Treng town and Ban Lung town, would be permanently inundated along with the bridge that crosses the Srepok River. One troubling aspect of the plan to build the Sesan 2 dam is that even though the dam has not been approved, work is apparently already underway to build a new road around the dam's expected reservoir area. The new road, which KCC claims is being constructed by a Chinese company,⁴⁰ is expected to run south from near the main part of Chrab Village, which would not be flooded, and around the proposed reservoir area. It is expected that a new bridge would be constructed over the Srepok River at a place known as Kaki Stream, which is apparently upstream from Krabei Chrum (Kampong Som) Village, in Kbal Romeas Commune, and south of Srae Angkrong Commune in Koun Mom District, Ratanakiri Province. Based on international standards, new road construction work should not occur until the EMP has been finalised and approved by regulatory government agencies, including the MoE. But construction has already begun even before the MoE has seen the EMP, thus violating Cambodian law. In addition, the EMP states that the route of the new road would be selected to reduce social and environmental impacts. However, since the EMP has not yet been finalised, and the route has apparently already been chosen, it would appear that the developers are not following all the measures proposed by KCC (2008a).

3.5) Tap Water Supply in Stung Treng

One important impact of the Sesan 2 dam that the EMP does not adequately consider is the project's impact on the domestic water supply in Stung Treng town. The EMP acknowledges that the quality of water supplied to Stung Treng town would decline during the dam's construction period, and that water treatment costs would increase. The EMP also acknowledges that water quality might remain low for one to three years after the construction period is completed (KCC 2008a). However, the reality is that downstream water quality of the water downstream would not only decline during the construction and early in the operation period, but for many years into the dam's operation period, a fact that is vastly overlooked in the EMP. The project's budget for solving this serious problem is not clear.

At present, six villages in Stung Treng municipality (Srae Pou, Leu, Spean Thma, Kandal, Tra Peang Pring and Preaek villages) have access to tap water. There are about 1,500 'water counters' (houses, businesses, offices, etc.) that receive tap water. This tap water is pumped from the Sekong River in front of Stung Treng Town, which is about 25 km downstream from the planned Sesan 2 dam site. According to Mr. Op Saran from Stung Treng's MIME provincial office, approximately 900 m³ of water is pumped from the Sekong River each day (about 25-30% of this is lost through leakage), with the remaining amount being used by residents of the six communities in Stung Treng town. This water is put into basins, where it is treated with chlorine. However, the tanks are not large enough, and so treatment does not meet World Health Organisation (WHO) drinking water standards. Full treatment is not presently possible because the volume of water pumped from the Sekong exceeds the capacity of the storage basins.

⁴⁰ Minutes of meeting between members of the Rivers Coalition in Cambodia and Key Cambodia Consultants, Phnom Penh, June 27, 2008.

It can be expected that the quality of water releases from the Sesan 2 dam reservoir would be poor, both during construction and operation stages of the project. For one, a full vegetation removal programme for the reservoir area is not mentioned in the EMP, although it is expected that some wood would be cleared during the dry season (KCC 2008a). It is likely that only commercial valuable timber would be removed from the reservoir area. This would lead to eutrophic conditions in the reservoir. Bottom parts of the deep reservoir would also be anoxic, or oxygen deficient, further contributing to poor quality water downstream.⁴¹ In addition, experiences from the Yali Falls Hydropower Project indicate that toxic blue-green algae was created in the dam's reservoir and was released downstream causing various ecological and human health problems (Tiodolf 2008; Wyatt & Baird 2007; Probe International 2007; SWECO 2006a). It seems likely that toxic algae would also be produced in the Sesan 2 dam reservoir, further contributing to low quality water releases downriver.

These conditions would certainly affect the quality of water pumped from the Sekong River just downstream from where the Sesan and Sekong Rivers converge, endangering the tap water system of Stung Treng. Toxic blue-green algae contamination could, for example, lead to serious illness outbreaks amongst tap water users. This is a serious problem and deficiency of the EMP. If the Sesan 2 dam is built, a full mitigation and compensation package should be prepared to address this issue. The cost of such a plan would undoubtedly be necessary but expensive.

3.6) Fish Losses and Nutritional Problems

There are likely to be serious problems associated with human nutrition as a result of fish losses caused by the Sesan 2 dam. Already, the Stung Treng Provincial Department of Planning (2003) reported that 44.8% of children under five years old in Stung Treng were found to be underweight. Thus, people are already not consuming enough animal protein, and a further reduction of fish without replacement protein could lead to further nutrition problems, which could jeopardise the government's efforts to alleviate poverty and meet the Cambodian Millennium Development Goals by 2015 as planned (Government of Cambodia; CEPA 2007). Therefore, it is crucial that efforts be made to ensure that people who lose fish as a result of the Sesan 2 dam have enough meat and fish to eat after the dam is built. This is especially important considering that fish and other aquatic animals are by far the most important source of animal protein in Stung Treng and Cambodia more generally.⁴²

Recent research by the World Food Programme (WFP) in Laos indicates that the rural population there is also experiencing serious nutritional problems, with 50% of all children being chronically malnourished. It has been found that advances in general development have not translated into improved nutrition for the people, with nutrition levels being about the same as they were a decade ago. In particular, the population is lacking in meat, fish and edible oils

⁴¹ For more information about downstream water quality problems with dams, see, for example, Schouten 1998, which relates to the Nam Ngum 1 dam in Central Laos.

⁴² Hortle (2007) estimates that Cambodians consume 32.3 kg of inland fish per capita/per year, as well as another 4.5 kg of other aquatic animals. This compares to 24.5 kg of inland fish consumption per capita/per year in Laos. The estimated consumption of fish and other aquatic animals in the Mekong River Basin is estimated to be 2.6 million tonnes annually.

(Krahn 2007). Local people living near large rivers in the Sekong River basin in the southern Lao province of Attapeu have also been found to be consuming insufficient amounts of fats and animal protein (Meusch *et al.* 2003). The WFP report states, “Managed access to wild meat and aquatic resources (animal protein) is critical for ensuring food security for vulnerable groups. Wild meat and aquatic resources, especially wild fish, is the biggest source of animal protein in rural Lao PDR (Krahn 2007: 10). The situation in northeastern Cambodia can be considered to be much the same, and therefore the people who stand to lose fish as a result of the Sesan 2 dam can be considered to be quite vulnerable, especially considering that Stung Treng and Ratanakiri are already considered two of the poorest provinces in Cambodia. The problem is particularly difficult considering recent reports that the percentage of children classified as acutely malnourished in Cambodia—the number of which had fallen by half between 2000 and 2005—increased from 8.4% in 2005 to 8.9% in 2008, representing a considerable setback (Corey-Boulet 2008). Certainly, if the Sesan 2 dam is built, it can be expected that nutritional statistics in northeastern Cambodia would decline even more, thus making it difficult for the Cambodian government to achieve poverty alleviation targets.

3.7) Cumulative Impacts

One of the most important problems with the present Sesan 2 dam EMP is that it almost completely ignores the issue of cumulative social and environmental impacts. There are, in particular, two main cumulative impacts that require special attention. First, the impacts of the Sesan 2 dam need to be considered in relation to the impacts of dams being constructed and ones already built in the Sesan and Srepok River Basins in Viet Nam. This is especially important, as EVN is responsible for the construction and management of all the dams in the Sesan and Srepok River Basins in Viet Nam.

In addition, it is crucial to consider the negative impacts of the Sesan 2 dam in the context to other important changes in the landscape and with local livelihoods. In particular, the dramatic conversion of forests into mono-culture rubber plantations by companies with large economic land concessions approved by the Cambodian government is a crucial issue that should be considered carefully (see section below). Right now villagers feel as if they are being squeezed from all sides. On the one hand, they are concerned about losing their river resources; however, they are also being severely affected by the expansion of rubber plantations, which has stripped the forests which people have long relied upon for NTFPs and various other services, and replaced them with plantations that are of no benefit for villagers. The EMP does not adequately assess the impacts being caused to local people as a result of other projects, and which would be directly relevant to Sesan 2 dam planning. For example, it is crucial to consider mining developments, logging concessions and other developments in the area. The cumulative impacts of these initiatives are severely challenging the ability of local people to adapt to the circumstances. This ‘double whammy’ (or triple or quadruple) of impacts is putting local people in very vulnerable positions. These issues are largely left unmentioned in the EMP (KCC 2008a), even though they are of great relevance to the resettlement and compensation plans related to the Sesan 2 dam.

The cumulative impacts of various developments on fish and fisheries resources are another important aspect that requires careful consideration. Clearly the fisheries in the Mekong River Basin, including the Sesan, Srepok and Sekong Rivers, are under serious pressure from various destructive practices, and in particular large dam construction in the region. The Sesan 2 dam is, however, a key project, as it would cause negative social and environmental impacts that are much more serious than any other projects in the region have caused so far, including the Yali Falls dam. Combined with the large dams already built, under construction, and planned, the Sesan 2 dam would severely damage the local economy in much of northeastern Cambodia, as well as parts of Laos, Thailand, and Viet Nam. Fisheries authorities in the region should understand these impacts.

3.8) Livelihood Losses

Many international development agencies are well aware of how devastating involuntary resettlement can be on people's livelihoods.

“[I]nvoluntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social, and environmental risks: production systems are dismantled; people face impoverishment when their productive assets or income sources are lost; people are relocated to environments where their productive skills may be less applicable and the competition for resources greater; community institutions and social networks are weakened; kin groups are dispersed; and cultural identity, traditional authority, and the potential for mutual help are diminished or lost” (World Bank, 2002, Operational Policy 4.12, paragraph 1).

“Income restoration is an important component of resettlement where APs [affected peoples] have lost their productive base, businesses, jobs, or other income sources, regardless of whether they have also lost their houses. However, APs who lose housing as well as income sources may be most at risk. When displaced people are worse-off, they risk impoverishment and alienation, which may result in landlessness, joblessness, homelessness, marginalization, morbidity, food insecurity, loss of access to common property assets, and social disorganization including crime and substance abuse” (ADB 1998: 61).

According to the ADB's policy to restore the economic and social base of people who lose their livelihoods, three things are required: 1) compensation for lost assets and income; 2) transfer and relocation assistance; and 3) help to rehabilitate and restore their lives (ADB 1998: 6). However, Michael Cernea (2003) has argued that the magnitude of the combined material and non-material impoverishment risks and losses experienced by people displaced by dams and other development projects tends to far exceed the redeeming powers of most narrow compensation-centered solutions offered by conventional economics, including typical resettlement and compensation plans.

Based on information already provided in this report, it should be clear that the Sesan 2 dam would cause various serious and mainly negative impacts to the livelihoods of villagers living in the reservoir area, upstream of the dam's reservoir area, and downstream from the project. The project would also have negative impacts on local culture and minority languages. Considering these impacts, one of the most difficult and challenging tasks in relation to the Sesan 2 dam would be to successfully manage livelihood changes so as to ensure a reasonably smooth livelihood adaptation process amongst dam affected people. For villagers residing in relatively 'traditional' villages, such as most of the people living in the Sesan 2 dam affected area, such a transition would certainly be difficult, even traumatic for many. Unlike physical assets, this is not just about 'replacement', but about restoration of the capital required to adjust or alter occupations.

One framework that is frequently utilised to consider this sort of issue relates to the different types of 'capital' required for successful livelihoods maintenance, and also for successful livelihood transformation. These include human, social, natural, economic, and physical capital. It is generally recognised that adequate forms of all forms of capital are necessary for the realisation of sustainable livelihoods, and that if one or more forms are lacking, it is often not easy to successfully transform livelihoods. This is particularly important in the context of the EMP, which generally only considers issues associated with the replacement of physical capital, without adequately assessing or analysing the necessity of other forms of capital, or the links between physical and other forms of capital.

The transformation process at different stages of the Sesan 2 dam would be different and require varying forms of support. For example, for those resettled from the reservoir area, short-term resettlement period problems would undoubtedly be different from problems that would be faced many years after being resettled. In fact, all stages of change need to be considered carefully, and each would require different forms of intervention and support. The EMP does differentiate between project construction and dam operation periods, and associated forms of mitigation and compensation, but there is insufficient consideration of the types of support that would be required soon after resettlement, as opposed to a few or many years later. This problem needs to be rectified.

Adjusting livelihoods is not easy, and can take a considerable amount of time, and in some cases may only be partially successful at best. That is why tort law recognises that those who have lost the ability to pursue their livelihoods are eligible for redress in the courts. For example, in Vancouver, Canada, a young man was awarded CAN\$300,000 by the courts for "loss of income earning capacity", after he was seriously injured by a careless driver who ran his motorcycle into his car, leading it to crash into a telephone pole. In this particular case, the judge ruled that such compensation was justified because the man, due to injuries, was unable to work in his previous profession, thus leading him to lose significant opportunities for gaining income (Heyes and Cabrera v. Lanphier *et al.* 2003). When dams are built, and people's resources and lives are transformed, the loss of opportunities for people to gain income within the particular environment and socio-cultural conditions that they are familiar with can be serious.

4 Field Research Results

This section presents the individual results of ten village meetings conducted in two provinces, four districts, nine communes, and 11 villages in northeastern Cambodia (see Table 12).⁴³ 406 people, including 281 women, attended the ten village meetings (see Table 13). Villagers were provided some basic information about the planned design and operational regime of the Sesan 2 dam. They were then questioned about their opinions regarding the project and its various expected impacts. Villagers were also asked to raise their hands if they agreed that the dam should be built, and then to raise their hands if they opposed the building of the dam. The numbers of participants in favour of and against the dam were recorded. Villagers were asked to comment on various relevant aspects of resettlement and compensation plans for the project, as outlined in the draft EMP (KCC 2008a). Finally, villagers were asked to identify any other aspects of the project of concern to them, but which were not mentioned during initial discussions. In addition, during these meetings, and at other times during the study, villagers also identified other issues not directly related to the Sesan 2 dam project, but nevertheless of relevance to the villagers. These issues are of importance in the context of the mitigation, resettlement and compensation plans for the project.

4.1) Individual Villages

During fieldwork, and as already explained above, data were collected in the 11 villages. Some additional information was collected informally in Stung Treng town.

Table 12. Household and population statistics for villages visited⁴⁴

#	Village	Commune	District	Families	Population
1	Ta Bouk	Ta Veang Leu	Ta Veang	92	405
2	Sieng Say	Ta Veang Kraom	Ta Veang	58	203
3	Veun Hay	Hat Pok	Veun Sai	65	393
4	Phum Thmei	Chey Otdam	Lumphat	165	704
5	Kbal Romeas	Kbal Romeas	Sesan	117	591
6	Srae Kor 1	Srae Kor	Sesan	185	719
7	Srae Kor 2	Srae Kor	Sesan	178	727
8	Rumboat	Ta Lat	Sesan	55	158
9	Phluk	Phluk	Sesan	217	864
10	Ban Bung	Phluk	Sesan	76	365
11	Hang Kho Suan	Sameakki	Stung Treng	239	1349
	Totals			1447	6478

⁴³ One meeting was conducted in the Buddhist temple at Srae Kor. People from both Srae Kor 1 and 2 Villages attended. That is why it was possible to attend ten meetings in 11 villages.

⁴⁴ It should be noted that contradictory human population statistics were frequently received during interviews, and therefore it should be recognised that the population statistics included in this report may not be entirely accurate.

Table 13. Village meeting participation statistics and the percentage of villagers in those meetings who indicated that they are opposed to the construction of the Sesan 2 dam

Village	Commune	District	Province	Meeting Participants	Women	% opposed to the Sesan 2 dam
Ta Bouk	Ta Veang Leu	Ta Veang	Ratanakiri	30	10	100%
Sieng Say	Ta Veang Kraom	Ta Veang	Ratanakiri	14	4	100%
Veun Hay	Hat Pak	Veun Sai	Ratanakiri	43	16	100%
Phum Thmei	Chey Otdam	Lumphat	Ratanakiri	49	24	100%
Kbal Romeas	Kbal Romeas	Sesan	Stung Treng	36	25	100%
Srae Kor 1	Srae Kor	Sesan	Stung Treng	74	50	100%
Srae Kor 2	Srae Kor	Sesan	Stung Treng	71	43	100%
Rumpoat	Ta Lat	Sesan	Stung Treng	32	18	100%
Phluk	Phluk	Sesan	Stung Treng	104	57	100%
Ban Bung	Phluk	Sesan	Stung Treng	47	32	100%
Hang Khou Suon	Samaekki	Stung Treng	Stung Treng	6	2	100%
Totals				406	281	100%

4.1.1) Ta Bouk⁴⁵ Village, Ta Veang District, Ratanakiri Province

So far, those involved in the Sesan 2 dam feasibility study, and associated social and environmental assessments, have apparently not visited Ta Bouk Village, or, to the knowledge of local people, any other villages in Ta Veang Leu Commune. Prior to the visit to their village for this study, local people knew very little about the Sesan 2 dam, or its expected impacts.

The main negative impacts expected to be caused to the inhabitants of this village as a result of the Sesan 2 dam are related to fisheries losses, and particularly the blocking of fish migrations between the Sesan and Mekong Rivers (see sections below for details). Indeed, the EMP for the Sesan 2 dam acknowledges that all fish migrations between below and above the dam would be

⁴⁵ Pronounced ‘Trabok’ in Brao language.

blocked, and that upstream communities like Ta Bouk Village would lose access to fish that presently migrate from below the dam site up past their community (KCC 2008a).



Photo 7 Village headman stands and speaks during village meeting about the Lower Sesan 2 dam in Ta Bouk Village, Ta Veang Leu Commune, Ta Veang District, Ratanakiri Province.



Photo 8 Sesan 2 dam in Ta Bouk Village, Ta Veang Leu Commune, Ta Veang District, Ratanakiri Province.

Local people in Ta Bouk consider that the compensation package outlined in the EMP to be entirely inappropriate. The EMP claims that compensation for losses of migratory fish would be paid to villagers for a one year period (KCC 2008a). This is the first major problem. Villagers argue that the dam would not simply block fish migrations for a single year, but for as long as the dam is standing. Therefore, villagers believe that they should be provided with compensation for migratory fish losses for at least the life of the project.

The second problem with the compensation package, as perceived by villagers, is the nature of proposed compensation payments. The EMP argues that single lump-sum payments should be provided to villagers so that they can use the compensation provided to invest in productive livelihood activities (KCC 2008a). However, the villagers have a very different view. They worry that if single payments are provided, most people would quickly spend the money on unproductive items and other good, leaving nothing for later, including future generations. Instead, they would prefer to receive annual compensation payments for the life of the project. They ask that these payments be made directly to affected families, rather than being remitted through middle men who might not give them the full amount of compensation allocated to them.

In addition, the EMP has indicated a number of non-monetary compensation measures that could be introduced as forms of compensation. First, it is proposed that fish be released into the Sesan

River above the dam site to provide fish to replace those lost due to the dam. It is also proposed that a fisheries research station be established to study ways to increase fish production upstream from the dam site (KCC 2008a). However, during the village meeting in Ta Bouk, local people firmly rejected both ideas. They are unconvinced that either measure would significantly benefit them. They believe that the released fish would get washed downriver. They do not expect that the research station would result in any tangible benefits for local people.

The EMP also suggests that compensation could be provided by supporting small-scale pond fresh-water finfish aquaculture in affected villages (KCC 2008a). Villagers in Ta Veang have had some recent experiences with attempts at small-scale fish raising, having been supported to do so in some newly dug ponds with support provided by the international NGO, German Agro Action (GAA). According to villagers, the soil in the area is generally sandy, and does not hold water well in the dry season, resulting in the ponds drying out as soon as the Sesan River declines at the end of the rainy season. This has not left enough time for fish fingerlings released into the ponds to grow. In addition, locals have encountered some problems with wild predator fish (particularly *Channa striata*) getting into the ponds during the rainy season, leading to high mortality rates for released fish fingerlings. Together, these two factors have led to low harvests of fish from the fish ponds. The overall results have been very disappointing, and villagers generally feel that they have wasted their time digging fish ponds and looking after the fish provided by GAA, although they appreciate other support that GAA has provided in recent years. There are also concerns about future availability of fish fingerlings to stock the ponds, as there are no fish fingerlings for sale in the province, making it very difficult for villagers to access fish fingerlings without outside support. Furthermore, villagers are concerned about the lack of availability of food to feed the fish. With these factors in mind, the villagers firmly rejected pond-based aquaculture as a viable replacement for Sesan migratory fish losses.

Another compensation option for fish losses upstream of the dam proposed in the EMP involved providing the villagers with technical support to improve their abilities to successfully raise chickens and pigs in the village (KCC 2008a). Villagers in Ta Veang have also had recent experiences regarding this form of development assistance, again through the NGO GAA. They claim that this kind of support has failed to lead to any improvements in local capacity to raise chickens and pigs, and villagers are, therefore, not confident that future compensation of this nature would be a good use of compensation funds allocated to them.

Overall, the villagers would much prefer it if the dam was not built at all. However, if it must be built, they would like to receive annual payments for the life of the project. If non-monetary compensation is to be provided, they would like to receive live and healthy chickens, pigs, cows and buffaloes as compensation, or other forms of direct tangible compensation.

When asked if local people would be able to continue to live along the Sesan River if the Sesan 2 dam were to be built, a prominent village elder and retired senior government official in the village said, "If the government causes the people here to suffer, what can we do but move away from the river." He also said, "If the dam causes problems, the company should assist in protecting all the life that would be impacted by the dam." Therefore, it can be expected that villagers may feel compelled to move away from the Sesan River if conditions along the river

continue to deteriorate. Relocation away from the Sesan River in Ratanakiri Province as a result of downstream impacts caused by the Yali Falls dam has already been documented (3SPN 2007). Villagers from Ta Bouk believe that this problem could become worse in the future.

All the people at the village meeting indicated clearly that they are opposed to the dam. Nobody indicated any support for the project.⁴⁶

4.1.1.1) Ta Bouk Stream Dams

Apart from concerns related to dams upstream in the Sesan Basin in Viet Nam, and the Sesan 2 dam, villagers are concerned about plans to build two dams on the Ta Bouk Stream in their village territory.⁴⁷ The Ta Bouk Stream is a major tributary of the Sesan River in Ta Veang District. It flows from the Laos-Cambodia border south into the Sesan River. So far, villagers report that surveyors visited the area to study these projects twice in 2008. In each case, two foreigners and one Khmer stayed near the dam sites for about three days. However, according to villagers, the surveyors did not have any communications with people from the village.

At least one of the expected dam sites is apparently inside Virachey National Park at a waterfall area known to the ethnic Brao people in the area as '*Krung Yung*' (*Cheuang* in Lao) after one of this ethnic group's most important mythical figures. The dam site is located about 30 km upstream from the confluence of the Ta Bouk Stream with the Sesan River, and there are apparently tall mountains on both sides of the river in this area. It is considered to be a special 'taboo' place by the ethnic Brao locals, and local people are very concerned that building a dam there could cause power spirits to become angry and take their vengeance out on local people. A village elder said, "The spirits make the mountains and the forest, not us. If the dam at Krung Yung is built, people would get sick."

According to village elders, nobody is allowed to do swidden agriculture in the proposed dam-site area, and if anyone dared, locals believe a powerful cyclone-like wind would strike, killing those who have violated the taboo. The restricted area begins about one kilometre south of Krung Yung, at a place called '*Ding Jeu Hai*' by locals. This taboo area continues 40-50 km upstream in Cambodia, to an area previously inhabited by ethnic Brao Ka-nying people now living in Laos (they fled heavy bombing in the area in 1970).

In addition, although the village-proper is located along the Sesan River, local people rely heavily on the Ta Bouk Stream for fishing and other domestic water uses. People from other villages in Ta Veang and Veun Sai Districts also frequently go to fish in the Ta Bouk Stream, since there are now less fish in the Sesan River. Thus, the dam would cause serious livelihood impacts to local people living downstream for the planned dams, not only in Ta Bouk but also for many other villages farther away.

⁴⁶ It should be noted, however, that Meach Mean (2008) reported that a small number of people, especially those who stand to gain from importance, are in favour of the dam. However, I did not meet anyone who claimed to support the dam during field investigations.

⁴⁷ These are apparently the Prek Liang 1 and 2 dams (both expected to have the capacity to produce 64 MW of electricity each).

4.1.1.2) Mysterious Mining Surveys in the Ta Bouk Area

The people of Ta Bouk Village are also concerned and unhappy about the mining surveys that one or more companies have been conducting on their lands north of the Sesan River in recent months. These surveyors have so far failed to inform local communities about their activities, let alone consult with locals. Villagers are unclear as to what the companies are doing on their land, but they do believe that they have been taking soil and rock samples. They are not sure what minerals are being investigated, or what form future mines might take. They are afraid of losing land and resources to these mines. They feel like their resources are being stolen from them. They have expressed their concerns to commune and district government officials and organisations working in the area, but so far they have not received satisfactory responses.

4.1.2) Sieng Say Village, Ta Veang District, Ratanakiri Province



Photo 9 Villagers from Sieng Say Village, Ta Veang Kraom Commune, Ta Veang District, Ratanakiri Province examine a map showing the expected reservoir area of the Lower Sesan 2 dam during a village meeting.

So far, those involved in the Sesan 2 dam feasibility study, and associated social and environmental assessments, have apparently not visited this village, or, to the knowledge of local people, any other villages in Ta Veang Kraom Commune. Prior to our visit, the local people knew very little about the Sesan 2 dam, or its possible impacts on their community.

The main negative impacts expected to be caused to this village as a result of the Sesan 2 dam are related to fisheries losses, caused by the blocking of fish migrations between the upper Sesan River and the Mekong River.

The responses of villagers to information provided to them about plans for the Sesan 2 dam, and the associated fisheries compensation programme laid out in the EMP, were virtually identical to the opinions of those in Ta Bouk Village. That is, they too want compensation to be paid annually, and for the life of the dam. They also rejected pond-based fish-raising, fish releases

into the Sesan River, and technical support for chicken and pig-raising, for the same reasons given by people from Ta Bouk Village (see above).

They added that support for raising vegetables would be an unwelcome form of compensation, since GAA is already supporting villagers to do that.

Furthermore, although the EMP does not propose that electricity be provided to villages along the Sesan River (KCC 2008a), local people still rejected the idea of receiving electricity as a form of compensation. Free electricity would be welcomed, but people would not be happy if they had to pay for electricity, as they do not have the income to make such payments, and once the dam is built their incomes would decline further, they believe. They also anticipated that the food available to villagers would decline significantly.

Like Ta Bouk, if non-monetary compensation is provided, they would like it to be in the form of chickens, pigs, cows and buffaloes. They would also like any cows or buffaloes they receive to be regularly vaccinated to prevent them from dying from diseases. They would like to receive compensation directly to each family, rather than having it sent to them via intermediaries, like government officials, who might not deliver all the compensation.

Also like Ta Bouk, villagers expressed concerns about being able to make a living along the Sesan River. One villager commented, “If the government does not help us, we would have no choice but to return to the mountains [north of the Sesan River].” It should be noted that in the 1960s this village was located in the mountains north of the Sesan River. However, they were relocated to the lowlands by the Sihanouk government.

The people also commented that having fish to eat is crucial for local diets, and that reductions of fish already evident due to dams upstream in Viet Nam has resulted in people frequently eating meals with just rice, salt, monosodium glutamate, and maybe some chillies. If the fish population were to decline further due to the Sesan 2 dam, local people would face even more serious problems. Already, the ethnic Brao villagers believe that many people, and especially elders and children, have been suffering as a result of deficiencies of fish.

All the people who attended the village meeting for the study raised their hands when asked if they did not approve of the dam.

4.1.3) Veun Hay Village, Veun Sai District, Ratanakiri Province

So far, those involved in the Sesan 2 dam feasibility study, and associated social and environmental impact assessments (SIAs and EIAs), have not visited Veun Hay Village, or, to the knowledge of local people, any other villages in Veun Sai District. Prior to our visit, the local people knew little about the Sesan 2 dam, or its expected impacts on their community. However, they had heard of the project and expected that the dam would have negative impacts on them. In addition, they were concerned that even if they are not located in the dam’s reservoir area, they might be flooded in the rainy season by the dam’s reservoir, or as a result of the combined impact of the reservoir downstream and large releases of water from upstream dams in Viet

Nam. One elder asked, “What would happen if our rice fields are flooded due to water coming up from the dam [reservoir] and water released from the dams upriver?” The villagers said that they wanted the dam company to visit their village to record all the things that might be lost due to flooding, including measuring the sizes of their houses, agricultural fields, fruit trees, gill nets, boats, vegetable gardens, etc. They said that if there is any flooding in their village resulting from the dam, they should be fully compensated for all losses by the dam company. It is unclear whether village flooding could result from the Sesan 2 dam, combined with impacts from upstream dams. The EMP does not mention this issue (KCC 2008a).



Photo 10 Village meeting in Veun Hay Village, Hat Pak Commune, Veun Sai District, Ratanakiri Province regarding the Lower Sesan 2 dam.



Photo 11 Villagers in Veun Hay Village, Hat Pak Commune, Veun Sai District, Ratanakiri Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.

The main negative impacts expected to be caused to this village as a result of the Sesan 2 dam are related to fisheries losses caused by the blocking of fish migrations up the Sesan River that come from the Mekong and Sekong Rivers. Villagers estimate that they presently catch over 500 kg a fish per family per year, on average, and that most of these fish are migratory and would be lost due to the dam. Other remaining fish would also be affected due to a lack of other fish to eat.

The response of villagers to information about plans for the Sesan 2 dam, and the associated fisheries compensation programme laid out in the EMP, were essentially the same as those from Ta Bouk and Sieng Say Villages in Ta Veang District. If the dam must be built, they want compensation for the life of the project, and annual rather than lump sum payments. They also rejected pond-based fish aquaculture, fish releases into the Sesan River, and technical support for chicken and pig-raising, for the same general reasons given by people from Ta Bouk and Sieng Say Villages (see above).

Like Ta Bouk and Sieng Say, if non-monetary compensation is provided, they would like it to be in the form of tangible items, like chickens, pigs, and particularly cows and buffaloes. They would also like any cows or buffaloes they receive to be regularly vaccinated to prevent them from dying from diseases. In the past, villager buffaloes were vaccinated once every six months, but over the last two years no vaccination support has been provided.

They would also like to receive compensation directly to each family, rather than having it sent via intermediaries, like government officials, who might not deliver all the compensation allocated.

The villagers rejected the idea of receiving electricity as a form of compensation, free or not. They are concerned that if electricity is provided the dam developers might not provide compensation to them for fisheries losses.

While the villagers were all fully opposed to plans to construct the Sesan 2 dam (everyone raised their hands to that effect during the village meeting), they asked that if it had to be built, it should be reduced from being 75 meters high to being 70 meters high, in order to decrease the chances of their village being flooded in the rainy season.

Villagers also reported another impact of the Sesan 2 dam unrelated fisheries. They mentioned the problems that the Sesan 2 dam would cause for those who take their small (mainly 5.5 hp) long-tailed motorised boats to Stung Treng for shopping trips. Boats are also used to transport sick people to medical facilities. They mentioned that not all villagers travel by boat to Stung Treng town every year, but that since goods are generally less expensive there than in Ratanakiri, when they do go other friends and relatives generally ask those making the trip to buy goods for them. Therefore, if these trips were not possible, many people would be indirectly impacted.

4.1.4) Phum Thmei (Ban Mai) Village, Lumphat District, Ratanakiri Province



Photo 12 Villagers in Phum Thmei Village, Chey Otdam Commune, Lumphat District, Ratanakiri Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.

So far, those involved in the feasibility study, and associated social and environmental assessments, have not visited Phum Thmei (Ban Mai) village, or, to the knowledge of local people, any other villages in Lumphat District. Prior to our visit, the local people knew very little about the Sesan 2 dam, or its expected impacts on their community.

The main negative impacts expected to be caused to this village as a result of the Sesan 2 dam are related to fisheries losses, caused by the blocking of fish migrations up the Srepok River that come from the Mekong, Sekong and Sesan Rivers. People in the village estimated that they catch an average of 500 kg of fish per year. The price of fish is now about 10-15,000 riel/kg (Ban Lung town price) (in the future the price may rise, fear villagers, who frequently sell fish to the market). Therefore, the value of their catch is estimated to be 7,500,000 riel per family per year on average. They believe that most of this catch would be lost if the dam were to be built.

All the villagers who attended the community meeting expressed strong opposition to building the Sesan 2 dam, as income and food from fisheries would significantly decline. They all raised their hands when asked if they opposed the project. An elder asked, “Do those planning to build the dam want to kill us?”

The responses of villagers to information about the plans for the Sesan 2 dam, and the associated fisheries compensation programme laid out in the EMP, were basically the same to the opinions of those from villages in Ta Veang and Veun Sai Districts. While opposed to the dam, if it had to be built, they wanted compensation for the life of the project, and annual rather than lump sum payments. They also rejected pond-based fish-raising, fish releases into the Sesan River, and technical support for chicken and pig-raising, for the same reasons given by people from Ta Bouk, Sieng Say and Veun Hay Villages. They asked that compensation be paid directly to affected families rather than through middlemen.

Like people in Ta Veang and Veun Sai, those from Phum Thmei said that if non-monetary compensation is provided, they would like it to be in the form of chickens, pigs, and particularly cows and buffaloes. They would also like any cows or buffaloes they receive to be regularly vaccinated to prevent them from dying from diseases. They would also like to receive direct compensation to each family, rather than having it sent to them via intermediaries, like government officials, who might not deliver all the compensation allocated to them.

The villagers rejected the idea of receiving electricity as a form of compensation. They expressed concerns about not having enough money to pay for electricity.

Like those from Veun Hay Village, the villagers from Phum Thmei mentioned the problems that the Sesan 2 dam would cause for those who take their small long-tailed motorised boats to Stung Treng town for shopping trips, and also to transport sick people to medical facilities in Stung Treng. They believe that they should be compensated for this impact.

4.1.4.1) Concerns about Upstream Dams in the Srepok River Basin in Viet Nam

Villagers also expressed serious concerns regarding the downstream impacts of dam construction and operation in the Srepok River Basin in Viet Nam. They mentioned that in 2008 the Srepok River has been more turbid than ever before at this time of year, and they also claimed that water levels have been unusual for at least a year, if not longer. They claimed that changes in river hydrology were causing a lot of river bank erosion in their village area. Some river bank gardens near the edge of the river have been flooded due to unexpected changes in river hydrology

attributed to upstream dams. They also mentioned that '*kok khai kin mak*' (in Lao) (*Telectadium edule* H. Baille (Asclepiadaceae)) riverine plants have not emerged in the river yet due to unusually high water levels. They were concerned that riverine plants were being negatively impacted by changed in water levels. Locals have noticed that the overall quality of the river water has declined. They have also observed that a particular type of edible ('*khai hin*' in Lao) algae has disappeared since the river water quality has changed. This may indicate a major change in the water chemistry of the river.

4.1.4.2) Concerns about Plans to Build the Lower Srepok 3 Dam

Villagers also expressed concerns regarding plans by a Chinese company to build the Lower Srepok 3 dam approximately 3 km upstream from their village on the Srepok River in Lumphat District.⁴⁸ According to villagers, representatives from the Chinese company planning to build the dam visited the area to conduct a survey in early December 2008. Rutherford *et al.* (2008) reported that a Chinese company, Guangxi Guiguan Electric Power Company, had signed a MoU to conduct per-feasibility and feasibility studies on the Lower Srepok 3 and 4 dams.⁴⁹ A few people at the village meeting had recently visited the Kamchay dam, in southern Cambodia, and they were afraid that they would be treated as poorly as those people who have been impacted by the Kamchay dam that Sinohydro is building.⁵⁰ An elder said, in relation to this project, "The government likes [the dam]; the people don't like [the dam]. What are we to do?" One person said that the people were afraid that they would end up looking for left over poor quality land in the mountains. Others agreed.

Halcrow and Partners (1999) studied the potential for dams on the Srepok River within Cambodia and concluded that none of the projects were commercially viable, and that all would result in serious negative environmental and social impacts in Ratanakiri and Stung Treng Provinces.

4.1.5) Kbal Romeas Village, Sesan District, Stung Treng Province

Unlike the villages surveyed in Ratanakiri Province, none of which are scheduled for resettlement as a result of the Sesan 2 dam, Kbal Romeas Village is in the area along the Srepok River scheduled to be permanently inundated by the dam's reservoir. Therefore, the situation in this ethnic Bunong (Phnong) community is more complicated than what has already been described for upstream villages outside of the reservoir area.

During the village meeting organised in Kbal Romeas, locals expressed strong opposition to the Sesan 2 dam, with everyone raising their hands to express their opposition to the project. In fact, some people objected to discussing resettlement or other compensation options in relation to the

⁴⁸ The dam is expected to have the capacity to produce 235 MW of electricity (Lloyd 2008). Although a pre-feasibility study for the dam is apparently being conducted, no details related to the survey have been released to the public so far. The dam would have a significant negative impact on the Lumphat Wildlife Sanctuary if built (Lloyd 2008).

⁴⁹ However, Lloyd (2008) reported that the Yunnan Copper Corporation had been granted a MoU by MIME to conduct a pre-feasibility study regarding the Lower Srepok 3 dam.

⁵⁰ This company was involved with building the Three Gorges dam in China.

dam. A prominent village elder claimed, “I want to meet Hun Sen to tell him what we think and to ask him not to approve the [Sesan 2] dam.” Another villager said that any amount of compensation for losses would not be sufficient, not even US\$100 million.



Photo 13 Villagers in Kbal Romeas Village, Kbal Romeas Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.

Villagers also cited Cambodia’s 2001 Land Law, stating that according to the law ‘indigenous peoples’ (*‘chun chiet daeum phiak tech’* in Khmer) are permitted to control their own land. They also said that development should not just be for people in towns but also for poor people in the countryside, such as them. They claimed that the dam was not really ‘development’ (*‘aphiwat’* in Khmer), as it would not improve their lives; it would just make them poorer. Villagers also said that they have long lived next to the Srepok River, and that they do not want to live far from the river, as they rely on it. Their livelihoods are closely linked to the natural river, they claimed.

4.1.5.1) Problems with Resettlement Sites

There are a number of reasons why the community is opposed to the Sesan 2 dam. First, the villagers are not satisfied with the proposed resettlement site(s), even though the EMP gives the impression that resettlement sites have already been clearly determined (KCC 2008a). However, the villagers perceive that decisions related to resettlement sites still need to be made. They believe that there are two broad options for resettlement sites, both of which are problematic for various reasons.

The first option for resettlement, as perceived by villagers, would be to relocate away from the Srepok River to somewhere north of the river. There are, however, serious disadvantages with this option. For one, most of the good quality land in the area is within 2 km of the Srepok River, land expected to be flooded by the dam. The land outside of the flood area is mainly sandy and rocky, and is generally poorer quality than land south of the Srepok River. There is apparently

not much land that could be developed for cultivating lowland wet rice, and villagers believe that there is only a small amount of land suitable for swidden cultivation. This option is also problematic because a concession for cultivating rubber north of the Srepok River near the present village of Kbal Romeas has already been given to Anmady Investment Group.⁵¹ It apparently has a 3,000 hectare concession for cultivating rubber in the area.⁵² This concession covers much of Kbal Romeas' land outside of the dam's inundation area, even though the company has so far only cleared the forest and planted rubber in an approximately 100 ha area not far from the village, possibly inside the expected inundation area.

There are serious concerns that it would be hard for the villagers to claim much land north of the Srepok River, and that the few areas where the villagers could potentially conduct agriculture are already claimed by Anmady Company. In addition, the village headman believes that even if Anmady Company was not in the area, there would still not be any places with enough potential agriculture land nearby to justify establishing a new village. People would have to be scattered at various locations, claim villagers. This would make it difficult to organise village meetings, and to establish a school that would be close enough to everyone to make travelling to and from it a viable option for all students, especially younger ones living farther away. There are also serious concerns that locals would not have access to sufficient grazing lands for their livestock if they stay on the north side of the Srepok River, again because most of the land has been claimed by Anmady Company and is slated to be turned into rubber plantations. Specifically, villagers were previously informed that they could claim up to 200 m on each side of Route #78 for them to relocate to, and that Anmady would not have access to this land. However, since then they have noticed that the company has been claiming land inside this 200 m area. There is not much land left, claim the villagers.

The situation north of the Srepok River has been greatly complicated by conflicts that have emerged between Anmady Investment Group and villagers. Initially, relations between the company and the villagers were amicable, with company representatives promising that the company would help develop the access road to their village from Route #78. They also provided funds to the village to build a wooden building on stilts (*'sala than'* in Lao) that the villagers can use for meetings and for accommodating Buddhist monks when they are occasionally invited to the village from neighbouring communities to conduct religious services. However, relations rapidly and dramatically deteriorated in 2007 after the villagers became aware that the company was not improving the road to the village for their benefit, but rather in order to access good quality land near the village for cultivating mono-culture rubber. In particular, the company took control of an approximately 20 ha piece of land not far from the village that locals had claimed and had already begun developing into new lowland paddy areas. When the villagers complained, the company agreed to develop some new lowland wet rice paddy land for the village near their present fields, to compensate seven families for lost farmland. In 2005,

⁵¹ The EMP records the name of the company as Phumady Investment Group (KCC 2008a & b), but all the villagers in the area believe the company's name is 'Anmady' or 'Amady'. Therefore, we will refer to the company as Anmady in this report, even if the name is not correct.

⁵² It is also possible that the company is actually a different one, operated by the son-in-law of *Okhna* Mok Khamhong. This has been reported by Sesan District officials. What this all indicates is that villagers have not received clear information regarding the company.

villagers received written approval from district and commune officials to develop 555 ha of forest land outside of the village, including the contested land, for rice cultivation. Five hectares of land was allocated to each family. However, since then Anmady had apparently been allocated about half of the 555 ha of land for which the villagers had already secured documentation. According to villagers, government officials did this without consulting people in Kbal Romeas village.

In any case, after the 20 ha of land was taken over by Anmady, the company promised to open up an equivalent amount of new land to replace what was lost. However, they only ended up opening up 3.5 ha of land for the affected families, before moving the heavy equipment out of the area. This enraged the villagers who protested against the company. This and other problems eventually led, in 2006, to villagers from Kbal Romeas, Srae Sranok and Chrab Villages, all in Sesan District, to gather together to protest against the land concession. This protest led, in May 2008, to four village men, labelled as the ring leaders, having to temporarily flee the village to escape police officers who were pursuing them.

While these people have returned to the village, and are not being sought by authorities at present, villagers are still unhappy with the actions of the company, even if open tensions have declined. For example, none of the villagers are working for the company, but some were recently hired to build a fence around Anmady's newly planted rubber plantation area near the village, in order to prevent village buffaloes and cattle from entering the area. The villagers received 200,000 riel for each 100 m of fence that they built for the company. Still, villagers are angry, claiming that their farmland, forests, and grazing lands were arbitrarily given to the company by the government without even consulting with villagers.

According to villages, the company claims that villagers would have to pay US\$200 for each rubber tree that their livestock damages, which appears to be an unrealistically high rate for replacing very small seedlings.

The company's representatives originally claimed that it only wanted the land on the west side of the road from Route #78 to Kbal Romeas Village, but in 2008 it began cutting trees on the east side of the road, although they have so far not cleared any land on that side of the road for planting rubber. Villagers are afraid that the company workers are lying and that the company plans to take over that land.

Villagers also complain that the people working for Anmady Company are using dangerous agricultural poisons purchased to kill termites when rubber seedlings are planted, in order to kill large numbers of spotted doves for food. They disagree with using these chemicals for agriculture or to kill birds.

The second option for relocating Kbal Romeas Village is to move to the south side of the Srepok River, an area apparently not inside the concession of Anmady Investment Group. Village leaders have visited this area, and there is apparently some land there that could be developed into lowland rice paddy, but the quality of the land is worse than the village's present lowland paddy land. The land is also not good for growing coconuts or bananas, and is generally

unsuitable for swidden agriculture. Another major problem is that the available land is scattered in small sections in various places, thus making it difficult for the whole village to relocate to a single area. One problem that villagers perceive is that families would have to move to different places, sometimes many kilometres away from each other. They might even have to be located farther apart than with option one, making school access and organising village meetings difficult. Villagers also claim that they don't want to be split up, as most of the villagers are related to each other. They also fear that their language and culture could be damaged if they were separated into smaller groups. Finally, the villagers have heard rumours that a company (not Anmady) has already received an economic land concession for rubber cultivation south of the Srepok River, and they fear that it might be difficult for them to resettle into an area already claimed by rubber growers.

Apparently Land Office Department government officials in Stung Treng Province have urged the leaders of Kbal Romeas to prepare documents in order to propose where they would like to move if the community is forced to relocate due to the Sesan 2 dam. However, this has not been done yet because the villagers are not happy with any of the options available. Furthermore, the community is divided in terms of where they would prefer to resettle. According to the village chief, if relocation is necessary 60% would prefer to move south of the Srepok River and 40% would rather try to find a resettlement site on the north side of the Srepok River. However, everybody would rather not move at all.

4.1.5.2 Compensation Problems

Apart from the serious problems related to finding a suitable resettlement site, a problem that has been greatly compounded by the presence of economic land concessions for rubber, there are also problems with the level of compensation that PECC1 has proposed for material losses associated with village inundation. According to documents prepared by PECC1 (2008b), and acquired by the NGO Development Partners in Action (DPA) in Stung Treng, resettled villagers are expected to receive low compensation rates for material losses associated with the creation of the dam's reservoir and village resettlement. For example, compensation for coconut trees is scheduled to be between US\$2 (8,000 riel) for very young trees and US\$22.50 (90,000 riel) for trees between six and 16 years old (PECC1 2008b). This price is totally unacceptable to villagers, who can generally sell fruit from mature coconut trees in a single year for almost the same amount as what is being proposed as compensation for many years of potential loss of income. For example, it is typical for a single mature coconut tree to bear about 60 fruits, which can be sold in the village for 1,000 riel each or 2,000 riel if they are sold next to Route #78. Therefore, a farmer can generate between 60-120,000 riel a year from selling fruits, which is more income in a year than the dam builders would like to provide for lifetime compensation for lost fruit trees. Villagers were quick to point out that it takes at least 15 years for a coconut tree to reach the size that it produces good harvests. Therefore, if they had to replant trees it would take many years before they could gain the same income from selling coconuts.

Villagers are also unhappy with the compensation rate for mango trees, which has been pegged at just US\$7.50 (30,000 riel) per tree (PECC1 2008b).

Similarly, the compensation proposed for the loss of a clump of banana trees is only expected to be US\$6 (24,000 riel) (PECC1 2008b). Villagers believe that this is a totally unacceptable rate, claiming that a single banana tree can produce fruits in a single year that are valued at more than the amount of compensation being proposed.

Another very problematic element of the compensation plan for the Sesan 2 dam relates to house compensation and replacement. According to company documents provided by DPA, the present plan is to replace flooded village houses with 3-4 member families receiving new single story wooden houses on cement stilts with 55 m² of floor space⁵³ (PECC1 2008b), equivalent to about 7 x 8 m². These houses are expected to be built by the dam builders in agreed upon resettlement areas. If, however, villagers presently have houses that are larger, they are entitled to receive cash compensation for the excess floor space that would be lost. This compensation is expected to be provided at the following rate: (1) Those with houses with bamboo walls and grass roofing would be compensated at a rate of US\$22 (88,000 riel) per each m² lost, (2) those with houses with bamboo walls and corrugated metal or clay tile roofs would be compensated at a rate of US\$23.50 (94,000 riel) per each lost m², and (3) those with houses with wooden walls and corrugated metal or clay tile roofs would be compensated at a rate of US\$28.50 (114,000 riel).⁵⁴ The compensation rate for lost house land is just US\$1.60 (6,400 riel) per m² (PECC1 2008b), which is believed by locals to be below market value.

There are also problems with house compensation. While PECC1 apparently measured all the houses in the village, they failed to identify what types of wood were used to build the houses. This is a very important issue for villagers, as they typically make their houses with high quality wood that can last for long periods of time. Villagers are very concerned that their high quality wood houses would be replaced with company constructed houses made with inferior quality wood. They cite the example of the many houses that the government recently built for military families beside Route #78 in Sesan District. According to villagers, these houses were built with inferior wood, such as '*roka*' (in Khmer) trees ('*mai mak nyieu pa*' in Lao). One villager said, "Even if termites don't eat the wood, the houses would fall part in 2-3 years just from being exposed to rain." Villagers are very concerned that replacement houses provided for them could be of similarly poor quality, thus leaving them with considerable losses.

The amount of compensation being proposed for those with large houses is deemed far too low. The replacement cost for these good quality houses would be much higher, they claim. For example, the village headman of Kbal Romeas has a house that has 9 x 12 m of floor space, or a total area of 108 m², which means that his house is twice the size as the one that he is expected to live in once resettled. Since his house has a corrugated metal roof and wooden walls, he is supposed to receive US\$28.50 for each of the 56 m² of floor space that his family would be losing, which equals US\$1,596, or 6,384,000 riel. However, the headman insisted that the cost of only the materials required to build his house using the same types of wood he has at present would be much more than that. Moreover, many of the types of wood that villagers have used to

⁵³ If families have fewer or more members, the amount of floor spaces changes (PECC1 2008b). See below.

⁵⁴ There are also other rates for other kinds of houses, but those varieties are either rare or non-existent in the study area, and are therefore not worth recording here.

build their houses are now protected or restricted varieties. Therefore, even if there were enough funding to buy this expensive wood, it might still be hard to find places to buy it.

There are also construction costs. Villagers believe that they should be compensated for these costs, even if they built their own houses, as is typical for them. It is, however, to know at one rate construction costs should be compensated at. In Stung Treng town, carpenters are typically hired for 4-5 'hun' of gold⁵⁵ for each m² of floor space in a house. The cost in villages is, however, somewhat less. This includes roofing and other construction activities. Therefore, to make a 108 m² house, it would cost up to US\$2,970, or 11,880,000 riel, if town construction rates are used. Employers are also expected to provide carpenters working in the countryside with food and whiskey, although this may or not be the case for those working in towns.

At present, most people in Kbal Romeas cultivate lowland wet rice. Some also rely partially or totally on swidden cultivation for subsistence. Many families rely on both lowland wet rice and swidden cultivation. Another serious problem with the compensation plan prepared by PECC1 is related to the concept of land replacement and compensation proposed by the dam builders. People are expected to either accept cash compensation for lost lowland wet rice paddy or active garden land, or replacement land for lost agricultural land. There do not appear to be any options for receiving both compensation and the provision of new agriculture land.



Photo 14 Land taken from villagers from Kbal Romeas Village in order for a company to develop a commercial rubber plantation.

⁵⁵ One 'hun' of gold is presently valued at about US\$5.50 (or 22,000 riel).

One major problem is that compensation levels are considered to be very low, at just US\$500 (2,000,000 riel) for each hectare of lowland wet rice paddy land,⁵⁶ and US\$740 (2,960,000 riel) for each hectare of garden land. US\$230 is slated to be provided as compensation for “burnt over land”⁵⁷ (PECC1 2008b). Villagers cannot say what the value of rice paddy land should be, as they have never sold land before, but they were adamant that US\$500 was too low. They had heard that US\$1,000 was being provided to people who are losing paddy land to the Stung Chinit Irrigation Project. They also heard that villagers in Kampong Thum Province were getting between US\$500 and US\$700 for rice paddy land that is much lower quality than the land that villagers in Kbal Romeas would lose. The key for these types of situations is that the actual replacement cost for equivalent quality land has to be considered, along with all the other costs associated with full replacement. As the ADB (1998: 6) puts it, “Cash for land acquisition has never been a satisfactory mode of compensation if it is not paid at replacement values.”

Villagers in Kbal Romeas reportedly have 370 ha of lowland paddy land, all of which is considered to be good quality land. Villagers are critical that the Vietnamese surveyors appear to be valuing all lowland rice paddy land the same, regardless of the quality of the soil. They reject this formula for determining compensation rates, fearing that good land would be replaced with much poorer land. Villagers believe that this paddy land should be valued at US\$1,000 per hectare or more. They also have 77 ha of upland gardens (*chamkar* in Khmer). It is not clear if these are being classified as ‘burnt over land’ or ‘gardens’.

Another problem relates to the concept of land replacement. While the dam builders are expected to provide heavy equipment to open up new lowland wet rice paddy areas, there are concerns that new paddy areas have inferior soils compared to the areas that villagers are already cultivating. Therefore, the idea that one hectare of flooded paddy land would be replaced with one hectare of new land is flawed, because villagers estimate that the new land might only be able to produce about half as much rice as their present paddy land. This can certainly not be considered fair compensation, and to make matters worse, newly opened-up paddy land never produces as well as mature paddy areas, as the soil pans of newly opened up land cannot retain water like older paddy areas. However, there does not appear to be any provisions for providing any additional compensation to cover rice harvest losses during the first few years after new rice paddy areas are opened up, even though it is likely to take at least three years before the soil pans of newly opened up paddy areas are developed enough to allow rice yields to substantially increase. Therefore, the options for receiving compensation for land or land replacement are both unattractive and generally unacceptable to villagers.

There is also the matter of lost fisheries, and since Kbal Romeas is located upstream from the dam site, the EMP indicates that they should receive one-time lump sum payments to compensate for fisheries losses for a single year (KCC 2008a). As with the villages located upriver from the dam in Ratanakiri Province, those from Kbal Romeas rejected the idea of receiving one-time payments to compensate for fisheries losses. They also believe that they should receive annual payments for the life of the project. They estimate that they presently catch

⁵⁶ However, another document prepared by PECC1 listed the price for wet rice paddy land as US\$350/hectare (PECC1 2008a).

⁵⁷ This apparently means swidden cultivation land.

an average of 300 kg or more of fish per year per family, and that most of those fish would be blocked from migrating by the dam. Others in the reservoir would also be lost to habitat and water quality changes. The reservoir for the dam is not expected to be a productive environment for fish, and the EMP makes no mention of the reservoir in terms of fisheries potential.

Villagers would also use access to fertile river bank areas, which they use for cultivating vegetables and other crops. They believe that they should be compensated for the loss of this productive land, but so far there do not seem to be detailed plans for doing this.

Another impact on the village would be the loss of boat access to Stung Treng market and health services. At present, motor boats in the village travel to Stung Treng via the Srepok, Sesan and Sekong Rivers a few times a month on average. Villagers claimed that these trips are especially important for transporting particularly sick people to the hospital, and that taking these people to the hospital on the back of a motorcycle is not an option as the people are too sick. When travelling in boats, the ill can lay down. This is not possible when riding on a back of a motorcycle.

4.1.5.3 Problems with Data Collection

Overall, villagers in Kbal Romeas are unhappy with the resettlement and compensation data collection and community consultation processes so far initiated by PECC1 in relation to the Sesan 2 dam. They claim that Vietnamese investigators, who worked with a Khmer translator, visited their village at least three times in 2008. They also state that various problems emerged. First, villagers are unhappy that only company representatives have come to the village. They have not received any visits related to the dam from government officials, and have so far not received any detailed information about the dam from company or government representatives. Only DPA and CEPA have provided them with detailed information about the Sesan 2 dam. Villagers feel that they have been totally neglected by government officials, who have not investigated the work of the Vietnamese, the situations in the village, or the opinions of villagers. They think that officials should have overseen the investigations already conducted rather than leaving such important work to an outside company.

One serious problem with the work done to date relates to PECC1's collection of data about assets that villagers would lose as a result of reservoir flooding. The Vietnamese who led the study did not speak local languages, and instead relied on a single Khmer translator. The surveyors therefore recorded some of the information in Vietnamese and some of it in Khmer. The village headman helped collect some of the data. Once the data were collected, each family was expected to thumb-print the completed forms, in order to verify the accuracy of the data. The problem is that the villagers were not given adequate opportunities to read the forms and confirm that the data recorded were correct. Furthermore, since much of the information was recorded in Vietnamese, the villagers could not have read all the content anyway. No attempt was made to read and translate the information recorded on the forms for villagers. They were just told to thumb-print the documents without reviewing the recorded information. They were told that they would not receive compensation unless they thumb-printed the documents, so they did. They

now realise that they should not have agreed to thumb-print the documents, and they therefore reject the data collection process conducted by PECC1.

4.1.6) Srae Kor 1 and 2 (Na Kor) Villages, Sesan District, Stung Treng Province

Like Kbal Romeas Village, the two adjacent villages of Srae Kor 1 and Srae Kor 2 (treated here as a single community, since the two villages were originally a single village, and are directly adjacent to each other and share the same Buddhist temple) are inside the area along the Sesan River expected to be inundated by the reservoir of the Sesan 2 dam. Therefore, like Kbal Romeas, the circumstances in Srae Kor are more complex than for the communities upstream of the dam and outside of the project's planned reservoir area.

As with Kbal Romeas, the residents of Srae Kor Commune, including the village heads and members of the commune council, are strongly opposed to the construction of the Sesan 2 dam. This was made very clear in this study's meeting, which was organised for all of the representatives of families in the commune. Everyone at the meeting indicated their opposition to the project.



Photo 15 Villagers in Srae Kor 1 Village, Srae Kor Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.



Photo 16 Villagers in Srae Kor 2 Village, Srae Kor Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.

4.1.6.1) Resettlement Issues

Unlike Kbal Romeas Village, Srae Kor villagers claim that there is only one possible resettlement site for their community, especially considering that most of the land south of the Sesan River has already been claimed by rubber concessionaires. Although local people are very worried about resettling from their present location, they believe that if they have no choice but

to move, the only place that might encompass enough land is located about 10 km north of the Sesan River, and approximately 20-30 km east of the Sekong River in Siam Pang District, Stung Treng Province. However, there are a number of serious problems with this resettlement site, the main one being that there are no perennial water bodies in the area. There is certainly little potential for fishing, and even worse, villagers anticipate that it would be difficult to find enough water for drinking and other domestic uses, let alone for their cows and buffaloes to drink. Villagers are concerned that the quality of water might be low in the wells that would be built to replace the ones presently in the village, and to replace other sources of water sources. Wells built in their present village produced bad smelling water and many of them broke down within a year. Therefore, villagers insist that it be confirmed that the well water is good quality before people are moved and required to use the wells. Maintenance support for the wells should also be provided for the life of the dam. However, some villagers did not want to talk about wells at all, insisting that all they wanted was to stop the dam from being constructed.

Villagers are concerned that there might not be enough suitable paddy land for villagers if they were resettled, and that the dam-building company might not use heavy equipment to open up enough land to allow local people to meet previous rice production levels, or even subsistence rice needs.

For the ethnic Lao people of Srae Kor, resettling to north of the Sesan River is problematic, as the people's livelihoods have long been closely linked to the Sesan River. Not having access to the river is like changing them from being ducks to being dry land birds, as they put it. This is certainly not an easy task. They are not ready to change their livelihoods or eating habits. Villagers are used to consuming a lot of fish, not small lizards, which are apparently abundant in the projected resettlement area. But even these small lizards are expected to become rare soon after the commune's residents are resettled. Indicative of the anger of local people, some of those who attended the village meeting organised for this study demanded that if the people are forced to relocate to the new resettlement area, the dam builders should be required to dig a new river the size of the Sesan River next to the resettlement site, so that they can continue to have access to a river. They also demanded that all the fish and other aquatic life in the river should be transplanted to the new river.

Villagers are also concerned that their relocation would have deleterious effects on the wildlife presently found in the general area of the new resettlement site, as an influx of such a large number of people to the area would certainly lead to increased hunting and other activities destructive to wildlife. This was mentioned by a number of people.

4.1.6.2) Economic Land Concession Problems

Like Kbal Romeas Village, the villagers of Srae Kor are facing many serious problems related to economic land concessions that have taken over much of their forest land south of the Sesan River. Villagers believe that there are two rubber concessions near their villages, one operated by Anmady Company (like in Kbal Romeas) and another operated by Grand Land Company, a Chinese-owned enterprise, which has apparently taken over the area east of Srae Kor, an area

that was originally planted with rubber by Anmady.⁵⁸ According to villagers, Anmady sold this area to Grand Land. Before giving up the area, Anmady representatives apparently tried to befriend the villagers. They purchased a generator for the commune's Buddhist temple, but within a few months it was broken, and before long the friendly company representatives were gone. They had gained access to village lands; their mission was completed. However, Anmady is apparently still actively developing new rubber plantations west of the area controlled by Grand Land Company.



Photo 17 A rubber seedling nursery near Srae Kor Village. The rubber seedlings are being plantation on what was previously land used by villagers.

Villagers are presently faced with serious problems related to raising cattle and buffalo near their villages. The Chinese operators of the Grand Land concession have told the villagers to not allow their livestock to damage their rubber seedlings.⁵⁹ However, unlike adjacent to Kbal Romeas, the Chinese have not bothered to build fences around their plantations. They insist that it is up to the villagers to keep their animals away. If livestock get near the plantations, company workers frequently inflict serious machete or knife wounds to the animals, killing some. Others have been caught in snares set near the plantation areas. Many villagers' livestock have simply disappeared, and villagers believe those working on the plantations for the company have already killed many

⁵⁸ However, Sesan District officials have reported that Grand Land operates between Phluk Village and the bridge across the Srepok River. Therefore, the company that villagers from Srae Kor believe to be Grand Land may actually be another Chinese company. The situation with the many companies cultivating rubber in Sesan District is confusing.

⁵⁹ There are presently 40 ethnic Khmer families from southern Cambodia working for Grand Land in order to prepare new rubber seedlings for expanding their rubber plantations. The company provides the labourers with materials, such as a water pump, seeds, and piping, and then the villagers are supposed to be paid 400,000 riel for each 100 good quality rubber seedlings they produce. The people from Srae Kor claim that they could work for Grand Land if they wanted to, but that they do not because they said it is too 'difficult' to work for the company.

Srae Kor livestock for food, without informing, let alone compensating, villagers. The problem is made worse due to communication problems, since the Chinese working for the plantation do not speak Khmer or Lao.

The villagers from Srae Kor, like those from many other communities in Cambodia and the region more generally, have a long history of releasing their cows and buffaloes into the wild during the dry season so that they can graze in the natural fields and forests that surround their community. However, with livestock becoming injured or going missing due to the land-use conflict with Grand Land Company, most locals on the south side of the Sesan River have been forced to tether their livestock in the dry season. This means that people have to expend much more effort to look after their livestock in the dry season compared to what was the case in the past. In turn, this is preventing villagers from engaging in subsistence-oriented or other income generating activities.

Villagers in Srae Kor are worried about many of the same issues that people from Kbal Romeas are concerned with, and which have been outlined in the previous section. For example, the values of lowland wet rice paddy and gardens are considered too low. In addition, the land available for wet rice paddy development in the resettlement area is much lower quality than the land that villagers are presently farming (about half the production potential), and there are rocks in the fields, unlike their present ones. This means that a one hectare for one hectare agriculture land replacement strategy would leave the villagers with much reduced rice production. Villagers also believe that once new wet rice paddy fields are created, villagers should be compensated for lost rice production until such a time as they are able to produce the same amount of rice as they presently do. Locals have asked that compensation should be based not only on the amount of lost land, but on the amount of lost rice production.

4.1.6.3) Compensation Issues

Srae Kor villagers are concerned about low compensation rates for the loss of their houses. In particular, they are concerned that the type of wood that their new houses are made of might not be taken into account, and that they could instead end up with small houses made of very low quality wood. Normally, good quality houses are made with '*kor kor*' ('*mai te*' in Lao) floors, '*chan krong*' ('*mai deng*' in Lao) or '*tabeng*' ('*mai tabeng*' in Lao) walls, and '*chan krong*', '*reang*' ('*mai hang*' in Lao) and '*thanong*' ('*mai dou*' in Lao) posts. They would like their new houses to be built with the same types of wood as their old ones. They believe that this wood may be difficult to purchase,⁶⁰ presenting a serious obstacle for receiving appropriate compensation. In addition, it is typical for the people in Srae Kor for newly married couples to live with the wife's parents. Therefore, there are often two families living in a single house. But if the houses are only 55 m² for 3-4 people (approximately 7 x 8 m), they would be too small for two families, so in these cases they would like the houses of two houses to be combined to make single larger houses. They also believe that they should be compensated for the labour that went

⁶⁰ Villagers suspect that these good types of wood would cost at least US\$500/m³ of wood if purchased in Stung Treng Town. Villagers estimated that it would take about 14 m³ of wood to build a 7 x 8m house, which would mean that the cost of wood alone would be US\$7,000, plus about US\$650 for corrugated metal roofing sheets.

into building their old houses. They believe that they should get 100,000 riel to cover labour for each m² of floor space lost.

Like Kbal Romeas, the people of Srae Kor are dissatisfied with the low rates of compensation being proposed for fruit tree losses. They too reject the present rates being proposed by PECC1, claiming that they are totally unacceptable. For example, villagers said that they should be provided with US\$22.50 for a mature coconut tree not just for one year, but for many years, until new trees could grow that produced as many fruit as their old trees used to produce. They suggested that 1,000,000 riel (US\$250) would be a more appropriate level of compensation for coconuts and jack fruit trees. They also rejected the US\$6 compensation rate for banana trees, claiming that 500,000 riel (US\$125) would be appropriate. Compensation rates for other tree species are also considered inappropriate.

Villagers believe that it likely that illness and disease would increase if they were to be relocated. Therefore, they think that there should be specific provisions in place to provide resettled people with free medical care and medication. They believe that a permanent health post should be constructed at the resettlement site before people are relocated.

The villagers also insist that they should be compensated for the loss of their Buddhist temple, and that a new temple should be built for them if they have to relocate. There is also a small '*sala phum*' structure at the edge of the river that they believe should be rebuilt for them as well.

While documents prepared by PECC1 claim that compensation would be provided for lost forest land (US\$17.50/m²) (PECC1 2008b), it does not appear that villagers would themselves receive any compensation for forest losses. Instead, it appears that the main recipients for forest compensation are the companies with land and forest concessions in the dam's inundation area, and the government. However, villagers feel that they should be the recipients of compensation for inundated land, since they are the long-time inhabitants of the area to be flooded, and would lose access to various NTFPs in the forests. They also need forests for grazing their cattle and buffaloes. Locals fear that once they are resettled they would be restricted from using the forests surrounding the resettlement area. They demand that they receive adequate forest and grazing land rights before they are relocated to the resettlement area.

The commune chief of Srae Kor told us that he had participated in two meetings in the provincial capital of Stung Treng relating to compensation issues associated with dam resettlement. He claimed that provincial and district officials at the meeting also rejected the proposed compensation rates as being totally unrealistic and unacceptable. The district chief of Sesan District also told us that the compensation rates set by the Vietnamese were not appropriate, and that the government does not accept the study conducted by the Vietnamese. He said that the government planned to ask the Vietnamese to redo the study.

There is also the matter of lost fisheries, and since Srae Kor is located on the Sesan River upstream from the dam site, the EMP indicates that they should receive one-time lump sum payments to compensate them for fisheries losses for a single year (KCC 2008a). However, as with the villages located upriver from the dam in Ratanakiri Province, villagers from Srae Kor

rejected the idea of receiving one-time payments to compensate for fisheries losses. They believe that they should receive annual payments for the life of the project. They also rejected fish releases into the Sesan River, fish pond development, and technical support for raising chickens and pigs as forms of fisheries compensation. If non-monetary fisheries compensation is to be provided, it should be in the form of actual chickens, pigs, cows and buffaloes, which should be given directly to affected families rather than passing through middlemen.

Villagers estimated that they presently catch an average of 500-800 kg of fish per year per family, and that most of those fish would be blocked from migrating by the dam. They would lose almost all of their fish production if they were moved far from the river, as is presently the plan. In addition, fisheries production in the reservoir is expected to be very low, due to habitat losses and dramatic water quality changes.

Villagers would also lose access to fertile river bank areas, which they sometimes use for cultivating vegetables and other crops. They should be compensated for the loss of this productive land, but so far there does not seem to be a detailed plan for doing this.

In addition, although villagers vigorously oppose the dam, they demanded that if they have to be moved, their new resettlement area should be fully prepared by the company before people are moved there. They also insist that the cost of moving their belongings to the new resettlement site be entirely covered by the dam company. They believe that a written contract between the project and the villagers should be prepared in advance, so that the villagers have legal recourse if appropriate and planned compensation is not forthcoming. They are afraid that the company would not follow through with promises for compensation. Agreements need to be in writing.

4.1.6.4) Other Impact Issues

One of the impacts of the Sesan 2 dam that has not been adequately considered in the EMP is the impact of the project on culture and language. The people in Srae Kor are all Cambodian citizens of Lao ethnicity. The large size of their community has helped them to retain their culture and language. Villagers are concerned that if they are forced to resettle, it would result in many people moving to different places, thus fragmenting the community and negatively impacting on local language and culture.

Another impact on the village would be the loss of boat access to Stung Treng market and health services. At present, motor boats in the villages occasionally travel to Stung Treng via the Sesan and Sekong Rivers. Villagers claimed that these trips are especially important for transporting particularly sick people to the hospital, and that taking these people to the hospital on the back of a motorcycle is often not an option. When travelling in boats, the ill can lay down.

Another transportation problem that Srae Kor would face if the people were resettled north of the Sesan River relates to gaining access to Stung Treng town by motorcycle and especially car or van.⁶¹ To reach Stung Treng people would either have to cross the Sesan 2 reservoir, or they would have to cross the Sekong River. However, there are no plans for bridges across either.

⁶¹ There are nine cars and vans presently in Srae Kor 1 Village, and five in Srae Kor 2 Village.

Neither does the EMP suggest that villages would be provided with boat or barge facilities for transporting motorcycles or larger vehicles across either river. This is an important oversight that needs to be rectified.

Once moved to the new resettlement site, many people in the village who presently generate income from selling drinks and food to residents and those who visit the community would lose much of their income-generating potential, since the new resettlement area is much more remote than the present village location, and would therefore get much fewer visitors. However, compensation for lost income for small sellers in the village is not mentioned in EMP (KCC 2008a), although it should be.

In addition, villagers would be much farther away from the market, resulting in them receiving lower prices for the various products that they sell, since transportation costs for getting the goods to market would increase. This would ultimately reduce the incomes of local people. The cost of bringing things to the village would also increase.

One serious negative impact of the Sesan 2 dam that is not mentioned in the EMP but which is of considerable importance to local people relates to the loss of two sacred places to permanent flooding if the dam goes ahead. One is a very important spirit house located at Thada rapids, on the Sesan River just above where the Srepok River runs into the Sesan. This spirit house is well-known to villagers living on the Sesan River, as people believe that spirits would put them in danger when passing these rapids unless they make a small offering to the spirit of the rapids. The second site is a spirit house that is located just upstream from Srae Kor 2 Village. It is also known to locals as '*Thada*'. It was not possible for village elders to tell us exactly what sort of compensation would be required to appease the spirits that locals believe occupy these two important places. However, some elders suggested that buffaloes and cows would need to be sacrificed to appease the angry spirits. In addition, provisions need to be made for compensating the people for the loss of their graveyard. Further consultations with villagers related to this issue are required.

Villagers insist that the telephone server station near their village be replaced in the new resettlement area if they are forced to relocate.

Villagers rejected the idea of receiving electricity from the dam in lieu of other compensation for their losses. They would not object to free electricity apart from compensation.

4.1.6.5) Problems with Data Collection

Villagers claim that PECC1 representatives visited Srae Kor to collect data at least four times in 2008. The first time they asked the people what they thought about the dam. Most of the villagers apparently told the Vietnamese that they were opposed to the project. The second time they measured the houses, agricultural fields and fruit trees of the people. The third time they checked on the planned resettlement site for the village. The last time was apparently to check the quality of the soil, but not in village or in resettlement site but along the riverbank.

Overall, the villagers, including their leaders, in Srae Kor Commune firmly reject the validity of the previous study conducted in the commune by PECC1. There are many reasons why villagers are dissatisfied. For one, as in Kbal Romeas, they feel as if they were pressured into thumb-printing the data collection documents without having a chance to verify that the information recorded was accurate. Vietnamese was mainly used to record the data, a language that local people do not speak, let alone read. Secondly, they feel as if many important issues were excluded from the data collection process, thus making the information collected incomplete. For example, information about the types of wood used for houses was not collected. Fisheries issues were not discussed. Thirdly, the Vietnamese from PECC1 did not visit all of the agricultural areas that would be lost by the villagers, thus resulting in some statistics being inaccurate. For example, on the north side of the Sesan River the surveyors apparently only surveyed rice fields near the river, thus missing many areas farther from the water. In many cases the sizes of rice fields were crudely estimated. The villagers believe that exact measurements should be taken. Some field houses were also not visited. Many gardens were not measured. In addition, sometimes the owners of houses were not at home when the Vietnamese surveyors were collecting data. Villagers feel that they should have had the chance to declare their own assets, rather than leaving this important job to less experienced family members who happened to be home at the time, such as their children or grandchildren. They fear that these people may have forgotten to declare certain assets, or incorrectly declared them. They may not have seen the importance of the data collection process. The villagers would like a new more comprehensive and participatory data collection process to occur, one that would allow villagers chances to identify additional issues not considered in the previous Vietnamese study, and give them full access to information collected, in order to confirm that it correct.

4.1.7 Rumpoat (Lam Pat) Village, Sesan District, Stung Treng Province

Rumpoat Village is located at the edge of the expected upper part of the Sesan 2 dam's reservoir. If the original plan to build an 80 m high dam had been chosen by the project developers, this community would have been scheduled for relocation. They were originally expected to move to the ethnic Khmer Khek village of Kalapu (officially part of Svay Rieng Village, CEPA 2007). Villagers were opposed to this plan, as they are ethnic Kreung, and were afraid that their language and culture would be negatively impacted if they were integrated into a larger ethnic Khmer community.

Now, however, company documents indicate that the village is no longer slated for resettlement as a result of dam, and the villagers also claim that they were told by Vietnamese dam officials that they are no longer slated to receive compensation for lost houses and fruit trees. However, after surveying the village area with locals, and listening to information provided by villagers, it became clear that the ability for the villagers to stay in their present location could be in serious jeopardy if the dam is built.



Photo 18 Villagers in Rumpoat Village , Ta Lat Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.

The village-proper may not be flooded, but cement water measurement markers put up by Vietnamese dam surveyors along two streams directly upstream (Luluit Stream) and downstream (Preal Stream) from the village indicate that both would be partially inundated by the dam's reservoir if the project goes ahead. This can be expected, in turn, to lead to extensive flooding of the village's 50 ha of lowland rice paddy lands, which are low-lying and located near both streams.⁶² In the past, these rice fields have been exposed to periodic rainy season flooding, sometimes for short periods (in which cases the rice survives and also benefits from the riverine nutrients deposited by the floodwaters), and at other times for longer and more destructive periods, some of which have been attributed to rapid large water releases from the Yali Falls dam reservoir. However, if the two streams were already partially inundated by the Sesan 2 dam's reservoir, it is likely that additional rain water would lead to much more frequent instances of destructive flooding. This could seriously endanger the village's rice supply. However, comments made to the villagers by surveyors working for PECC1 indicate that the project developers are not sensitive to the risks to the village by the dam. One worker said that any new flooding of rice fields would not be a result of the dam, but would occur due to "natural conditions". Clearly, however, increased floods caused by a combination of higher waters in the reservoir and natural rains cannot be reasonably attributed to "natural conditions". The increased water levels should be recognised as being directly caused by the Sesan 2 dam. But still, the villagers do not want to relocate. One woman said, "We don't want to move. We are ready to die here."

There is also the matter of lost fisheries, and since Rumpoat is located on the Sesan River upstream from the dam site, the EMP indicates that they should receive one-time lump sum payments to compensate for migratory fisheries losses for a single year. As with the villages located upriver from the dam in Ratanakiri Province, villagers from Rumpoat reject the idea of receiving one-time payments to compensate for fisheries losses. They believe that they should receive annual payments for the life of the project. They also reject the other compensation

⁶² There are 4 ha of lowland wet rice paddy fields owned by the village located on the north side of the Sesan River. The Vietnamese surveyors did not survey villager agriculture land north of the Sesan River.

measures for fisheries proposed in the EMP. They believe that receiving chickens, pigs, cows and buffaloes as compensation for fish losses would not be acceptable, as meat from those animals only make up a small part of their regular diet. It is fish that are relied upon for food on a daily basis. Even when fresh fish are not available, people typically eat fish paste (*prahok* in Khmer and Kreung) with rice. Families generally consume between two and five jars of fish paste each year, with each jar containing 30 kg of fish.



Photo 19 Flood-level cement marker located in streambed adjacent to Rumpoat Village, and concerned villager.



Photo 20 Flood-level cement marker located in streambed adjacent to Rumpoat Village

Villagers estimated that most of the fish that they presently rely on for subsistence and income would be blocked by the dam. Others fish would also be lost due to habitat and water quality changes in the reservoir area. Locals estimated that they catch an average of 500 kg of fish a year, some of which are sold. Nobody associated with the dam project has ever discussed fisheries issues directly with villagers.

Villagers would also lose access to fertile river bank areas, which locals sometimes use for cultivating vegetables and other crops. Gardens are also sometimes made on sandbars in the river. These river banks and sandbars would be inundated by the dam. Villagers believe that they should be compensated for the loss of this productive land, but so far there does not seem to be a plan to do this.

Local people are opposed to the Sesan 2 dam. Indicative of this, many in the community did not want to talk about resettlement. They just wanted plans for the dam to be cancelled. They were also the only village that we visited in the possible reservoir area of the dam where the people refused to thumb-print or sign the household survey forms that PECC1 used to collect

information about houses, fruit trees, and agricultural land. Since the people are opposed to the project, they did not want to thumb-print the documents, in case their thumb-prints were misinterpreted as representing their agreement with constructing the dam. Villagers were also suspicious because the company officials would not let the villagers look at what they wrote on the forms. The company workers were apparently angry with the villagers, but the people refused to give in. They simply told the dam representatives that they were not in favour of the dam and would therefore not cooperate. Villagers said that PECC1 representatives visited their village twice. During the second trip they took photographs of the villagers' houses. Villagers also told us that they believe that nobody in Ta Lat Commune supports the dam.



Photo 21 Ritual objects used by the Kreung people in Rumpoat Village to bless their rice crops.



Photo 22 Lowland rice paddy fields behind Rumpoat Village that are endangered of being flooded due to the Lower Sesan 2 dam.

Villagers from Rumpoat reported problems with a logging company operating in the area. Despite villager objections, the company has been cutting a lot of trees down, including important wood resin trees (*Dipterocarpus alatus* and spp.) that belong to villagers. No compensation has been provided to local people for their losses, even though the price of resin

has gone up considerably over the last two years,⁶³ thus making it an important source of income for local people. Villagers would like to stop the loggers from cutting their resin trees down, an act that is illegal according to Cambodian law, but they dare not confront the loggers, which are apparently being protected by Royal Cambodian Armed Forces (RCAF) soldiers, who have been hired by the company.

4.1.8) Phluk Village, Sesan District, Stung Treng Province

The Sesan 2 dam site would be located in the area that has long belonged to Phluk Village. During the initial stages for the feasibility study for the dam, two locations were assessed as possible dam sites, one just upstream from the village, and the other about 7 km upriver from the village-proper, but still within the territory of Phluk village. The dam site is now expected to be built at this location, near the mouths of the streams, Ou Peut and Ou Kaya.

A survey team from PECC1 surveyed the village in a similar way as Kbal Romeas, Srae Kor and Rumpoat villages were surveyed, since it was expected that if the downstream dam site was chosen, at least half of the village would need to be resettled (all the houses upstream from the village temple). Houses were measured as were lowland rice farmland. Houses were photographed, as in other villages. Fruit trees were counted, and other assets were also recorded. However, now that it seems likely that the upper dam site is the preferred location for the project, the risk of resettlement for most of the community has apparently been greatly reduced. However, seven families living near Veun Chanh,⁶⁴ an important deep-water pool just downstream from the dam site, are still scheduled to be relocated if the dam proceeds. Those families have moved to the area in recent years, and are originally from other ethnic Lao communities located downstream from Phluk, such as Ba Daeum and Samkhuoy Villages. These people mainly rely on fishing for their livelihoods, although they also have upland fields and fruit orchards near their houses.

Veun Chanh is one of the most important fishing areas in the Sesan River, and this is indicated by the large number of Vietnamese and Khmer fishers who fish in the area. Baird & Beasley (2005) reported that in 1997 there were still a couple of Irrawaddy dolphins (*Orcaella brevirostris*) living in the deep-water pool, but according to villagers from Phluk there has not been any dolphins seen in the area in recent years.

Villagers reported that in late 2007 or early 2008 the provincial governor of Stung Treng, H.E. Loy Suphat, and the Minister for Water Resources, H.E. Soy Sem, visited their village. Villagers were gathered for a meeting at the village Buddhist temple. The governor and minister did not mention any of the expected negative impacts associated with the Sesan 2 dam. They just said that dams are an important part of 'development' (*aphiwat* in Khmer), and that Sesan 2 would produce a lot of electricity. The villagers were not asked to express their opinions about the project and were not given the chance to ask any questions about the dam. Locals did not get the opportunity to express their opposition to the dam. Although villagers were afraid to speak out, somebody did manage to ask whether the people would have to pay for the electricity. The

⁶³ This year the price for 30 kg containers of wood resin is between 40-60,000 riel in the village.

⁶⁴ PECC1 (2008a) indicate, however, that 14 families might need to be resettled in Phluk Commune.

response was uncertain, and the official who responded said that this matter would have to be investigated further. The EMP does not mention the provision of electricity to villages affected by the project. According to a village leader, “When people first came to visit our village to discuss the dam we were still stupid. We could not think of what to say.”



Photo 23 Men in Phluk Village, Phluk Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.



Photo 24 Women in Phluk Village, Phluk Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.



Photo 25 Villagers in Phluk Village, Phluk Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.

There are presently Vietnamese men staying near the proposed dam site. They are collecting hydrological and rainfall data, while waiting for the dam to be approved. There are also two camps downstream from where they are staying, although nobody was staying at either at the time of this study. However, there is a large amount of equipment for collecting core soil and

rock samples at each site. A man from Phluk Village has been hired by the Vietnamese to guard the equipment.

4.1.8.1) Downstream Impacts

Most of Phluk Village can now be classified as being located directly downstream from the Sesan 2 dam. Therefore, the village is seriously threatened by various major hydrological and water quality changes that would occur if the Sesan 2 dam goes ahead. For example, there is nothing between the dam and the village to mitigate water releases, which can be expected to be especially severe during the construction period, but also serious during the dam's operation, since the project would almost certainly generate electricity during peak power-use periods, such as in the early evenings, in order to maximise profits. This means that there would be dramatic daily changes in water levels, similar to the changes associated with the operation of the Yali Falls dam (see Wyatt & Baird 2007). However, the villages affected in Ratanakiri Province by downstream water releases from the Yali Falls dam are at least 70-80 km away from the source of discharge, whereas Phluk would be less than seven kilometres from the discharge point for the Sesan 2 dam.

It can therefore be expected that if the Sesan 2 dam is built, local livelihoods in Phluk would be severely altered. Water releases may make the river virtually unusable for people in Phluk, due to the danger associated with these releases. Even dams far upstream in Viet Nam have been implicated by people in Phluk for causing hydrological changes downstream at their village that have led people to drown. Most recently, in early May 2008, the three year-old grandson of the village headman, Mr. Thong Tha, was the most recent victim. On the day that the young boy decided to go to the Sesan River to play, it was about 4 pm and water levels had not yet gone up due to rains associated with the beginning of the monsoon rains. His parents did not know he had gone to the edge of the river. Then, all of a sudden a surge of water arrived. The boy was apparently caught off guard, and was washed down river and drowned. After an extensive search, his body was found many kilometres downriver in front of Hang Savat Village, near where the Sesan and Sekong Rivers converge. Certainly the surges that from the Sesan 2 dam would be much more dramatic, and present a much more serious threat to people, domestic animals, riverside agriculture, boats and fishing gears. Again, the case of the Yali Falls dam is a good example of what can happen, but the situation would be much more severe for downstream villages, since the dam would be much closer to heavily populated areas.

Water quality would also be affected dramatically, partially due to hydrological changes, and also because the water that would be released from the dam's reservoir would be very poor quality, especially in the earlier years after the reservoir is created, but even many years later. The EMP only acknowledges that water quality would decline during the construction period and the early years of operation (KCC 2008a), a considerable oversight. In any case, reductions in water quality would greatly damage the water supply of villagers, including water for their livestock, potentially leading to considerable sickness and possibly human and livestock death from water-based diseases, including toxic blue-green algae. Fish would not be able to survive in the low quality water released, at least in areas directly below the dam site.

Right now Phluk Village has five working pump wells (they used to have eight but three are broken). These wells were provided as development assistance in the 1990s. Since the water in the Sesan River can be expected to be not useable, more wells would be required to meet human demand. There is also the question of where water would come from to feed domestic animals. Indicative that the Vietnamese surveyors anticipate a water problem in the village, one woman mentioned in the village meeting organised for this study that she was surprised when one of the Vietnamese surveyors asked her how many buckets of water her buffalo drank in a day. She had never counted before. PECC1 (2008b) stipulates that there should be one well for every five households in resettlement areas for the Sesan 2 dam.

The villagers in Phluk are concerned about the hydrological and water quality changes that can be expected if the Sesan 2 is built. As with other communities surveyed in Ratanakiri and Stung Treng Provinces, the people who attended the village meeting at Phluk, including village and commune council representatives, all clearly stated that they are strongly opposed to the Sesan 2 dam. They ask that the dam not be built.

Villagers would also lose access to fertile river bank areas, and islands in the Sesan River, which they use for cultivating various kinds of vegetables and other crops. Villagers should be compensated for the loss of this productive land, but so far there does not seem to be a detailed plan to do this. According to the village headman, the Vietnamese surveyors did ask whether people were growing tobacco, watermelons or vegetables next to the river. However, they apparently did not ask how much were being grown. In fact, some villagers grow considerable amounts of different crops, including cashew trees, bananas, sugar cane, beans, watermelons, tobacco, chillies, and various kinds of vegetables. In the village there are reportedly five islands in the Sesan River where people conduct agriculture (Peut, Lai, Puk, Sa-nyeng and Dambong Islands). Swidden rice is sometimes grown on the islands, especially in years when there are rice shortages. This year about 15 families are expected to do swidden agriculture on these islands.

However, the reality is that the strong surges of water released from the dam, as well as rapid hydrological changes and changes in water quality would almost certainly lead to increased erosion of these islands, as well as along the banks for the river. This could lead some of these islands to completely disappear. Heavy erosion of the river bank could also pose a risk to the village road, fruit trees, and houses.

4.1.8.2) Compensation Issues

One of the serious problems with the EMP is that while it does identify serious downstream fisheries impacts associated with the construction and operation of the Sesan 2 dam (KCC 2008a), there are apparently no definite provisions for fisheries related mitigation or compensation for those living downstream from the dam. Instead, fisheries compensation is only expected to be provided for villagers who lose access to migratory fish upstream from the dam site. The total lack of a comprehensive mitigation and compensation package for people reliant on downstream fisheries is one of the most important deficiencies of the EMP. In Phluk, it can be expected that most, if not all, fishing would have to stop, at least during the construction period and possibly during the dam's operational period. Even if fishing were possible, there would

certainly not be many fish to catch, considering the dramatic changes that would occur to the river just below the dam. Villagers estimate that they catch, on average, 500 kg of fish per family per year. They believe that they should be compensated for all fisheries losses that they experience. The average price for fish in their village at present is 10,000 riel/kg.

In addition, like other communities studied, villagers from Phluk rejected the idea that fisheries compensation should be provided on a one-time lump-sum basis. Also like the other villages, they rejected the other fisheries compensation provisions laid out in the EMP (KCC 2008a), including pond-based aquaculture, fish releases into the Sesan River, and receiving technical support to improve chicken and pig raising. They too believe that they should be compensated annually for the life of the project. Some villagers said that they should also receive fresh fish as compensation. One man said, “In the past when I decided I wanted to eat a certain kind of fish I could go out and catch it. I could eat what I wanted. If the dam is built, that would not be possible. I want things to be like before, so we should be able to telephone to the company and tell them what kind of fish we want to eat on a given day. When I want *trey riel* (*Henicorhynchus lobatus*) they should find some for me and deliver the fish to me. When I want *trey pa va* (*Labeo erythropterus*) they should do the same, and so on.” People said that receiving compensation in chickens, pigs, cows and buffaloes would be acceptable, but that fish is the main food that they are used to eating on a regular basis.

Although Phluk Village would largely end up downstream from the dam, villagers insisted that it is important to recognise that their village territory extends up along the Srepok River to just downstream from the present Srepok Bridge. Therefore, much of the village’s territory would be inundated by the dam’s reservoir. Villagers believe that they should be fully compensated for the land of theirs that is inundated by the dam, or otherwise lost due to the project. They also believe that they should be compensated for the land that they lost to the rubber concessions.

In the village meeting in Phluk organised for this study, villagers insisted that they do not want to receive electricity in lieu of other compensation that they believe is due to them. It is not that they do not want electricity in the village, but they only want electricity if it is being provided as a general government service. Villagers believe that it should not be provided instead of proper compensation.

Health problems may increase considerably in Phluk Village after dam construction begins, especially due to water quality problems. Therefore, villagers believe that a health post should be established in the village, and that the dam company should provide free medical treatment and medicine for people who become ill as a result of the dam.

Villagers are also unhappy with the proposed compensation for lost fruit trees. For example, US\$6 for a clump of bananas is too low, as a banana tree generally produces one stock of fruits a year, and each stock has 9 or 10 bunches of bananas. Since bananas sell for about 2,000 riel a bunch, a single year of fruit production for a single banana tree fetches about the same amount of money as the compensation proposed for the permanent loss of a whole clump of banana trees. There are often ten or more banana trees in a clump of banana trees. The productive life of a banana tree is apparently about a decade. Similarly, villagers reported that a mature jackfruit tree

tends to produce between 10 and 20 fruits a year, which sell for between about 6,000 and 8,000 riel each in the village. Therefore, the low compensation proposed for each jackfruit is not acceptable. Some villagers at the meeting had recently visited Kamchay dam in southern Cambodia. They explained that jackfruit and coconut tree compensation for that dam is US\$500 a tree, whereas people are receiving US\$30 for each banana and papaya tree they lose.

As with Kbal Romeas and Srae Kor villagers, those in Phluk also feel strongly that the compensation proposed for houses is too low, and they also think it is important to consider the types of wood used to make houses. They are also afraid that if they have to resettle they would end up with low quality houses made of *'roka'* (*'mai mak nyieu pa'* in Lao), *'salat'* (*'mai mak leuam'* in Lao), *'pon'* (*'mai mak koke'* in Lao), and other low quality types of wood. They also claimed that it was not possible to buy high quality wood in Stung Treng town. They said that the best that is available is *'chheuteal'* (*'mai nyang'* in Lao) wood and *'padea'* (*'mai bak'* in Lao). This would make fully compensating villagers for house losses very difficult.

Phluk Village, like Kbal Romeas and Srae Kor Villages, is facing serious problems as a result of losing large areas of forest and grazing lands to rubber plantation concessions near their community. They claimed that they are being affected by the operations of both Grand Land and Anmady. According to villagers, Grand Land Company has already cleared most of the land within a couple hundred meters of the village's lowland paddy fields,⁶⁵ while Anmady Company is apparently within about 500 m from the village's lowland rice fields. According to villagers, the rubber company representatives told them, when they first came to the village in 2006, that villagers would be allowed to continue collecting NTFPs and other wood products for their subsistence uses in concession areas, but now the companies have taken all the land and resources, not leaving the villagers with much. Soldiers have even been sent out to keep the villagers from cutting wood in any of the concession areas. Villagers feel like all the forest is going to be lost, and that it would thus be better for them to get the wood than to leave it for the companies to take.

Since Phluk can be expected to essentially lose access to the Sesan River once dam construction begins, they are faced with serious livelihood problems, as they are being squeezed between rubber plantations and the dam, thus giving local people few options for making their livings. The cumulative impacts of these two initiatives are important to understand. To make matters worse, villagers from Phluk claim that they have heard that yet another rubber plantation company has been given the land north of the Sesan River near Sdau 1 and Sdau 2 Villages. This situation is also important to consider, because if the village is unable to continue living at their present location due to problems related to the dam, they would have a very difficult time finding an appropriate resettlement site, since most of the land surrounding the village has been taken over for rubber plantations, thus seriously reducing the village's options. As one village leader said, "We are trapped here like pigs in a pen."

Villagers from Phluk were initially relieved to know that they would not have to relocate because of the dam. However, they are now not so sure that they are as lucky as they thought. One

⁶⁵ They are supposed to stay 200 m from village rice fields, but according to one commune council member at the village meeting at Phluk, they have cleared land as close as 50 m from the rice fields.

prominent village leader even said, “The people above the dam in the area that would be flooded have it easier than we do. Once they are resettled they can gradually improve their lives, but we are going to have to live with the fear of the dam just above us for much longer.”

4.1.8.3) Other Impact Issues

The EMP acknowledges that tourist areas would be negatively impacted downstream of the Sesan 2 dam, mentioning, in particular, the rapids in Phluk Commune (KCC 2008a). In fact, every year during just before the Khmer New Year, when water levels are at their lowest, villagers from Phluk make temporary bridges between their village and islands in the Sesan River. In April 2008 one bridge was made to Pian Island, and another was made to Phaluk Island. Villagers and guests pay 1,000 riel per person to cross these bridges. On the islands there is merry-making, and the villagers sell food and alcohol. The village has become somewhat famous for making these island bridges, which are taken apart soon after the end of celebrations and before water levels rise. According to the village headman of Phluk, it was expected that in 2009 villagers might make up to four bridges to islands. However, during the village meeting organised for this study, one of the deputy commune chiefs read a letter sent from the National Mekong Committee of Cambodia. The letter, written in Khmer and dated 12/12/2008, warned that for a three month period between March and May villagers should remain vigilant because there are expected to be up to 100 m³/second water releases in the Sesan River from the Sesan 4 dam, which is presently under construction along the border between Viet Nam and Cambodia. It made many realise that their New Year celebration plans might have to be abandoned, as the bridges would certainly be endangered if large surges of water suddenly came downstream when people were crossing the fragile and low bridges. This was shocking news for the villagers. Many realised when they heard the information included in the letter that the downstream impacts of the Sesan 2 dam on their community could be much more severe than they initially realised.

According to the EMP, in 1978 there was an earthquake with a 5.3 magnitude in the general area where the Sesan 2 dam would be built (at the second dam site, the one not chosen) (KCC 2008a). Of course, if there were a serious earthquake during the time the dam is being built, or afterwards, the consequences could be catastrophic for people living downstream, including those residing in the capital city of Stung Treng. Tens of thousands of people could die. KCC (2008a: 126) wrote, “[T]he Lower Se San 2 HPP implementation will risk with seismic/earthquake activities due to dam construction and reservoir with millions cubic meter storage capacity (sic).” In the village meeting in Phluk, one of the villagers correctly pointed out that earthquake danger could increase after the dam is built because the large quantity of water in the reservoir would be heavy, thus potentially triggering earthquakes below. It is unclear where the villager learned this, but this is a legitimate safety concern that should be carefully considered. Thousands of lives could be at risk.

When it was still unclear where the company wanted to build the Sesan 2 dam, villagers were told by dam officials in early 2008 that they might have to move away from the village during periods when rock blasting was taking place. That would have been very difficult for the people, as they would also have had to take their domestic animals as far from where the blasting was

taking place. Now that the upper site has been chosen, it may no longer be necessary to evacuate the village during blasting. However, villagers are still concerned about this potential problem.

4.1.8.4) Dam Worker Issues

Another important issue for Phluk Village relates to the construction of the Sesan 2 dam, and the massive influx of 3,000 Vietnamese workers to the area for a number of years. Villagers are very concerned about the impact of these migrant workers on the peace and safety of their community. Women are particularly worried about their safety when they go to the forest to collect fire wood and various NTFPs. Negative impacts on local culture is another potentially serious problem, as are possibilities for introducing various communicable diseases, including the AIDS virus, syphilis, etc. The introduction of dangerous addictive drugs could also be a problem. During the study village meeting organised in Phluk, villagers asked that if the dam goes ahead, the Vietnamese working on the project should be tightly restrained in their movements. They should not be allowed to come near the village, locals stated. This goes beyond the EMP, which does recognise the ‘cultural’ impacts of such an influx of workers from outside areas, but simply states that project workers should be trained on appropriate behaviours, and that they should be punished if they act inappropriately (KCC 2008a).⁶⁶ However, KCC (2008b) wrote that strict rules and regulations would be developed for project workers to follow so as not to disturb local cultures in the area.

4.1.8.5) Problems with Data Collection

Villagers from Phluk are adamant that the Vietnamese representatives of the dam who collected data in their community did not do a good job. Although data were collected about house sizes, the sizes of agriculture land, fruit trees and boats in the village, data were not collected about all the structures and farmland in the village. In addition, some of the data were written in Khmer and some in Vietnamese. Villagers claimed that they were essentially forced into thumb-printing forms that they were not allowed to look at, and in any case, could not have read if data were recorded in Vietnamese. They are also unhappy that many relevant issues were not included in the survey. For example, there were no data collected about fisheries impacts or compensation. The villagers believe that the study should be conducted again, but in a much better way.

4.1.9) Ban Bung Village, Sesan District, Stung Treng Province

Ban Bung Village is located adjacent to the Sesan River, about 3 km downstream from Phluk Village and 10 km downstream from the expected site of the Sesan 2 dam. Therefore, like Phluk, and other villages located downstream from the planned dam site along the Sesan River in Sesan District, this community would be subjected to many serious downstream hydrological impacts ranging from large water releases and other periods when the river dries out. Water quality would also decline significantly in the Sesan River near their village. As outlined for Phluk village, many serious livelihood, health and security impacts can be expected to occur in Ban Bung. Boats and fishing gears would be in danger of being washed away by water surges. There are presently about 50 boats in the village, of which about 20 have long-tailed motorised engines

⁶⁶ It is also expected that Chrab Village would be similarly impacted by migrant workers (KCC 2008a).

(usually 5.5 hp but sometimes larger). There could be similar problems for people and domestic animals. The ecology of the river would be rapidly and heavily altered, with fish and other aquatic life being heavily impacted.

Villagers would lose access to fertile river bank areas, which they sometimes use for cultivating vegetables and other crops. There are no islands near the village, as is the case with Phluk. In any case, about half the families in the village sometimes grow vegetables adjacent to the river, and they should be compensated for the loss of this productive land. However, so far there does not seem to be a detailed plan for doing this.

Natural vegetation along the Sesan River would also be badly affected, including a number of species that people regularly consume. For example, '*kok khai kin mak*' (in Lao) (*Telectadium edule* H. Baille (Asclepiadaceae)) plants in the river bed would be badly damaged and possibly disappear as a result of hydrological changes. Many other species would also be affected. In fact, all life dependent on the river would be affected.

Water quality problems would negatively impact humans and domestic animals that drink river water or bath in the river, and changes in water quality would also negatively impact on the river ecology more generally, including fish and various types of other aquatic life.

At present there are five pump wells in the village. This would certainly not be enough, and it was suggested that 10 wells would be the minimum required, which is almost the number deemed appropriate for resettled villages by PECC1 (2008b). However, some suggested that even more would be required. It would be very difficult, however, to pump all the water required to feed one's cows and buffaloes, as a buffaloes generally require four pails of water, three times a day. This could lead to a lot of pumping, especially when somebody has many animals. Therefore it might be necessary to build a pond with a cement bottom to prevent leakage. This pond could then be used for animals to feed and bath if going to the Sesan River is not advisable.

Villagers in Ban Bung said that people in their community presently do not eat fish every day, they eat it almost every meal. In other words, fish is an essential part of their diets. Even when pig or chicken are consumed, fish paste is almost always on the menu. Villagers estimate that they catch about 500 kg of fish per family each year. Fish is valued at about 10,000 riel a kg at present. However, as with Phluk it can be expected that fishing would be either greatly curtailed, or it may not even be possible due to dramatic changes in water quality and hydrology. Even though damage to the river ecology directly downstream from the dam might be even more severe than to communities above the reservoir area, there are apparently no plans to compensate Ban Bung villagers for fisheries losses or any other downstream impacts associated with the dam. This is indicated by the fact that nobody from the dam project has visited Ban Bung to discuss the dam with villagers so far. So far, villagers have not received any information from the government or the dam company about any aspects of the project.

Villagers from Ban Bung believe that they should be compensated for all the negative downstream impacts of the Sesan 2 dam. As with other villages studied, they too believe that fisheries compensation should be for the life of the project, and that annual payments should be

made to each family impacted. Villagers from Ban Bung also reject the other non-monetary compensation measures outlined in the EMP (KCC 2008a).

Villagers are concerned that river bank erosion caused by the Sesan 2 dam could lead to the village's spirit house, or *'ta ho'* in Lao, to fall into the river. If this happens, compensation should be forthcoming, in the form of a water buffalo and a pig, as well as money to build a new building for the village spirit to reside in.

Villagers insist that if river bank erosion causes any houses, other structures, or fruit trees to fall into the water, compensation should be provided. Villagers state that the same types of wood should be used to build replacement houses as was used to build lost houses. Villagers believe that US\$500 compensation for each lost coconut or jackfruit tree would be acceptable. Villagers also believe that if there is any wet season flooding in their village caused by the construction or operation of the Sesan 2 dam, the company should provide compensation for lost production.

Villagers expect that the changes in the Sesan River caused by the Sesan 2 dam could lead to serious health problems for people who drink the water from the river or bath in it. Therefore, they believe that a health post should be built in their village, and that medical treatment and medicine should be provided for free to those who become ill as a result of the Sesan 2 dam. The EMP includes provisions for providing medical assistance to some communities near the dam site (KCC 2008a), but crucially, they do not appear to proposing doing so for downstream communities.

It is much more difficult to think of what might be appropriate compensation in the case that someone is drown or otherwise dies as a result of the dam. One woman in the village meeting suggested 6 million riel, but others stated that it should be at least 100 million riel.

One major problem that villagers may face is keeping children and domestic animals from going to dangerous places near the Sesan River. It may be necessary to build some sort of fence or barrier between the village and the water in order to keep people and animals from going to the water. The dam builder should be responsible for building the fence.

If any non-monetary compensation is to be provided to the community, villagers would mainly like to receive chickens, pigs, cows and buffaloes. They would like all forms of compensation to be delivered directly to them, and they would like the company to come to their village to collect information about problems that the village could face due to the Sesan 2 dam. The company apparently did come to get general statistics about the village, including population statistics and statistics about the total amount of agriculture land in the village, but no detailed data were collected, and no consultations took place. Statistical information was taken from the village with promises that the only copy of this data would be returned to the village later. However, the data were never returned and the village has not heard from the company since the statistical information was provided.

Local people from Ban Bung appear to be unanimous in their opposition to the Sesan 2 dam, as was indicated at the meeting organised in the village for this study when participants were asked

to indicate whether they supported the project or not. Like those in Phluk, villagers are concerned about the various impacts that may occur.



Photo 26 Villagers in Ban Bung Village, Phluk Commune, Sesan District, Stung Treng Province raise their hands to indicate their opposition to the construction of the Lower Sesan 2 dam.

Villagers also stated that do not wanted to receive access to electricity as a substitute for compensation that villagers should receive if negative impacts occur.

As with Phluk and other villages expected to be seriously impacted by the Sesan 2 dam, Ban Bung is also presently losing much of its forest and grazing lands to rubber plantations. While Anmady Company is still about 10 km from the village, they are gradually moving closer, taking more and more land. While the people of Ban Bung would rather not resettle, it is not yet clear if the conditions near the dam would be amenable to continued human habitation of the area or not. However, one problem is that the rubber companies are rapidly consuming the remaining land. Thus finding somewhere new for the people to move to would be difficult.

As with Phluk, villagers are also afraid of the 3,000 Vietnamese labourers that are expected to be brought in to construct the Sesan 2 dam. They too would like there to be restrictions to keep these labourers out of their village area, including surrounding agricultural land and forested areas. Women are especially worried about their safety.

Villagers are concerned that there would be a lot of traffic along the road that passes through their village if the Sesan 2 dam is constructed, and they would like strict restrictions to be placed on truck drivers who pass by the village. “They need to drive slowly and carefully”, said one man. This is also deemed important to protect the small bridges along the road. KCC (2008b) reported that traffic in the project area would have to obey road rules and that the dam

developers would be responsible for any damage that would be caused to roads or bridges as a result of heavy traffic.

4.1.10) Hang Khou Suon, Stung Treng District, Stung Treng Province

Hang Khou Suon Village is located about 25 km downstream from the site of the planned Sesan 2 dam, at the confluence of the Sekong and Mekong Rivers. The community would undoubtedly be affected by downstream impacts associated with changes in hydrology and water quality.

The meeting in this village took a different form than those held in other villages. Due to time constraints, it was not possible to organise a full village meeting. Instead, the main purpose of the meeting in this village was to meet with villagers with expertise in fish and fisheries related issues. Although the main characteristics of the dam and the expected downstream impacts of the project were discussed, the main points of conversation were related to the impacts of the Sesan 2 dam on fish migrations, and associated impacts on communities located near the lower part of the Sekong River, which the Sesan flows into a few kilometres upstream from where the Sekong River flows into the Mekong River. Another important objective of visiting this village was to gauge the general opinion of villagers living in communities adjacent to the Mekong River in Stung Treng Province and beyond.

While most of the discussion in Hang Khou Suon related to fisheries, the people at the meeting indicated that they are concerned that water releases from the Sesan 2 dam could combine with high water levels in the Mekong River and result in the flooding of lowland wet rice paddy fields in the village. In the past, the rice farmland in the village has become inundated, as has the village itself. The main occupations in the village are rice growing and fishing.

Another concern of villagers is the water quality of the Mekong and Sekong Rivers near their village, as at present locals are almost entirely depended on the rivers for their domestic water needs. There are only two water pump wells in the whole village. Villagers are concerned that the water quality in the Sekong River would decline considerably due to low quality water releases from the Sesan 2 dam, and that this could cause problems for human and domestic animal health.

In relation to fisheries, local people from Hang Khou Suon are very concerned that the Sesan 2 dam would damage fisheries that they depend on, as they catch large amount of fish for both subsistence and income. For example, most families make 100 kg of fish paste a year for their own consumption. Villagers estimated that they catch over 365 kg of fish a year per family. Some catch much more. One villager at the meeting caught over 300 kg of *Henicorhynchus lobatus*/spp. in a ten day period last year. While they are concerned that changes in hydrology and water quality below the dam would negatively affect fish habitat and thus fisheries, they are also concerned that the Sesan 2 would block fish migrations that are important for the livelihoods of villages. For example, villagers are concerned that the Sesan 2 dam would block fish migrations from both the Sesan and Srepok Rivers, thus negatively impacting the *Scaphognathops bandanensis* (trey chrakaing), *Mekongina erythrospila* (trey pa sa-i), *Hypsibarbus malcolmi* (trey chhpin), *Labeo erythropterus* (trey pa va), *Bangara behri* (trey pa

va mok pi) and *Cirrhinus moliterella* (*trey phkar kor*) fishery near their villages. As recorded by Baird & Flaherty (2004), these fish migrate from the Sekong, Sesan and Srepok Rivers every year between October and December. Initially, they travel downstream to near the border between Stung Treng and Kratie Provinces. Then, for unknown reasons, they turn around and migrate upriver past the mouth of the Sekong River. They eventually migrate up past the Khone Falls in Laos and up the Mekong River into Thailand and Laos. If the Srepok and Sesan Rivers are blocked, the only fish remaining would be from the Sekong River, thus reducing the size of the fishery considerably. Poulsen & Jorgensen (2000) have, in fact, reported that migrations of the famous *Mekongina erythrospila* mainly come from the Sesan and Srepok Rivers. CEPA (2008) reports that this species has become a symbol of Stung Treng, as well as the pride of the province, with it taking on special cultural significance for the people of Stung Treng. This is vividly indicated by the statue of the species in the centre of Stung Treng town, adjacent to the Sekong River.

Of particular concern are the impacts of the dam on the famous fish, *Mekongina erythrospila* which is not found in the Mekong River south of the Stung Treng-Kratie border, and only migrates to the Mekong each year from the Srepok, Sesan and Sekong Rivers. Of those, the Srepok is considered the most important river for this fish, with the Sekong River being recognised as the second most important river for the species. The Sesan River, while still important, is considered the least crucial of the three. The Srepok is believed to be the most important river because it has rockier habitat, and many deep-water pools (29 were identified in the Srepok in Cambodia by Swift 2006). Rocky habitat is preferred by *Mekongina*. Ou Phlay, a tributary of the Srepok River near the Viet Nam-Cambodia border is believed to be particularly important for the species.⁶⁷ Therefore, it can be expected that if the Sesan 2 dam is built, the stocks of this species in the Sesan and Srepok Rivers would disappear, leaving just the stock from the Sekong River. However, with many dams planned for the Sekong River in Laos, this fish species could become endangered and disappear entirely (Baird & Shoemaker 2008; International Rivers 2008a). The situation is expected by villagers to be similar for *Labeo erythropterus* and *Bangara behri*, although these species are believed to be somewhat more widespread than *M. erythrospila*.

The second major migratory fishery that the Sesan 2 dam is expected to negatively impact is made up of dry season migratory small cyprinid fishes from the Great Lake and Tonle Sap River. The most prominent species in this migration are *Henicorhynchus lobatus* (*trey riel*) and *Paralabuca typus* but also at least 30 others species (Baird *et al.* 2003). These fish would no longer be able to migrate up the Sesan and Srepok Rivers past the Sesan 2 dam, thus reducing their available habitat. Initially, it might cause more fish to migrate up the Mekong and Sekong Rivers to Laos.

Changes in the hydrology and water quality of the Sekong River can also be expected to negatively impact *Probarbus jullieni* (*trey trasok*) and *Probarbus labeamajor* (*trey trasok sol*) fisheries in the area. Both are protected species in Cambodia.

Finally, changes brought on by the Sesan 2 dam would block migrations of highly migratory catfish, including *Pangasius conchophilus* (*trey ke*) *Pangasius larnaudii* (*trey po*), *Pangasius*

⁶⁷ Swift (2006) reported that a lot fish are caught there by people from Mondolkiri who travel there seasonally.

krempfi (*trey bong lao*), *Pangasius bocourti* (*trey pra kchau*), and *Pangasius macronema* (*trey chhwiet*) and other catfish species that migrate up the Sesan, Srepok, Sekong and Mekong Rivers each year (Baird *et al.* 1999a; 2001a; 2004; Hogan *et al.* 2007).

Apart from generally damaging fisheries in Stung Treng, it is important to recognise the national and regional implications of constructing the Sesan 2 dam. Villagers realise that this is the case, and this is also acknowledged in the EMP (KCC 2008a). However, PECC1 has no specific plans for mitigating these significant impacts or to compensate affected people for negative impacts. Villagers believe that all the people affected by the changes should receive compensation for their losses. If that compensation is too much to pay, the dam should not be built, they claim.

While the form of the village meeting was different and more restricted in the number of participants and the issues discussed, compared to other villages, the opinions of villagers regarding the Sesan 2 dam were similar to what was encountered in all the other villages during this study. That is, all the people who attended the meeting indicated that they are opposed to the project. One participant said, “Won’t the governor [of Stung Treng] think about the people and the environment of Stung Treng?” She also said, “There is no problem with electricity, as there are already plans to bring electricity from Laos.” Another woman said, “The province [provincial government] doesn’t understand about our problems. They are mainly rich people. Only we poor people understand the problems.” Furthermore, participants claimed that the general opinion of people living in communities along the Mekong River in Stung Treng Province is that the negative impacts of the Sesan 2 dam represent an unacceptable cost, and they hope that the dam will not be built.

4.2) Stung Treng Town

While specific meetings were not organised with people in Stung Treng town, many people living there stated that they oppose the Sesan 2 dam. When talking to some people about the dam at a small food stall next to the Sekong River, a woman exclaimed suddenly that she disagreed with plans to build the Sesan 2 dam. She claimed that many others in Stung Treng town are also opposed to the project. She claimed that there are many poor people in Stung Treng town, and that these people are especially concerned about the project. Others at the stall appeared to agree with her.

Another woman said that even the market traders in Stung Treng town would be negatively impacted by the Sesan 2 dam, as these people depend on rural people to buy their goods. Thus, if the livelihoods of those people are damaged it would ultimately negatively impact the livelihoods of those who sell them goods. In turn, government coffers and the overall economy of the province would also be negatively impacted.

One person mentioned that the Japanese government provided development assistance to build the road adjacent to the Sekong River in front of Stung Treng town. She wondered if river bank erosion in Stung Treng town that would be caused by the Sesan 2 dam might damage this expensive infrastructure.

5 *Best Practices*

One of the objectives of this study is to present some ‘best practices’ in relation to social and environmental impact assessment for large dams, and in resettlement and compensation planning in particular. ‘Best practices’ can be defined as the most efficient (least amount of effort) and effective (best results) ways of accomplishing a task, based on repeatable procedures that have proven themselves over time for large numbers of people. However, what may be ‘best practice’ in one circumstance might not be in another. Therefore, there are never simply single ‘best practices’ for anything. Instead, it is crucial to consider the specific contexts of particular circumstances, and try to choose or adapt best practices from elsewhere so that they fit well with the situation in questions. Best practices can thus be seen as a series of tools that can be useful for guiding one. However, exactly how different practices are best applied and combined in particular circumstances depends on various factors. Yet, following best practices can help ensure community buy-in and overall cooperation. The key to the approach advocated here is to consider various practices applied in other places, and then try to combine and adapt them to meet the particular needs of the people involved.

For this study, there is not enough data available, and crucially not all potentially affected communities were consulted. Therefore, preparing detailed compensation and resettlement plans is not possible, and trying to do so would be unethical, and fundamentally go against the most important ‘best practice’ of them all: good public participation.

However, it is possible to recommend some key principles and practices that should be considered for inclusion in any SIA and EIA processes. These principles and practices have been chosen based on a review of available literature, combined with ideas provided by villagers and the author of this report.

5.1) *Participation of Affected People*

“[A]ffected people should be fully informed and closely consulted on resettlement and compensation options. Consultation with APs [Affected Peoples] is the starting point for all activities concerning resettlement. People affected by resettlement may be apprehensive that they will lose their livelihoods and communities, or be ill-prepared for complex negotiations over entitlements. Participation in planning and managing resettlement helps to reduce their fears and gives APs an opportunity to participate in key decisions that will affect their lives. Resettlement implemented without consultation may lead to inappropriate strategies and eventual impoverishment” (ADB 1998: 39).

The ADB (1998: 3) defines ‘Affected Persons’ “as those who stand to lose, as a consequence of the project, all or part of their physical and non-physical assets, including homes, communities, productive lands, resources such as forests, range lands, fishing areas, or important cultural sites, commercial properties, tenancy, income-earning opportunities, social and cultural networks and activities. Such impacts may be permanent or temporary.” That being the case, it is clear that the

EIA team has not adequately consulted with the vast majority of affected people, and the consultations that have occurred in some villages have not been participatory or ‘open’.

The most fundamental aspect of any SIA/EIA process is public participation, and there is considerable evidence globally that the more the public is involved, the more accurate and useful the results of these sorts of studies tend to be (Bruch *et al.* 2007). Therefore, it is essential to facilitate participatory processes with all affected people, not only those from one particular group of affected peoples, but also others as well. This is certainly one of the most important conditions for good planning and management of all kinds of projects, including hydropower dams.

Good public participation means informed participation, in which people are provided with considerable information before being asked to ‘participate’. The details of what good public participation involves are laid out by the World Commission on Dams (WCD) (2000), which considers public acceptance to be crucial, as well as the recognition of rights, the assessment of risks, negotiated agreements and decision-making processes based on free, prior, and informed consent, especially when projects affect vulnerable people, including indigenous and tribal peoples.

So far PECC1 and KCC have dismally failed to meet even minimum standards for public participation in relation to the Sesan 2 dam. First, the research conducted with villagers living inside the planned reservoir, and just below the proposed dam site, was not at all participatory, and did not involve providing any substantial information to villagers. Neither did the work encourage discussions focused upon crucial issues. In addition, detailed village-level consultations or other studies were not conducted upstream from the proposed dam site in most of Ratanakiri Province or downstream from the dam in Stung Treng Province. For example, communities in Veun Sai District, located not far upstream from the reservoir area of the dam, were not visited. Similarly, communities in Lumphat District, Ratanakiri Province, just upstream from the dam’s reservoir area in the Srepok Basin, were also not visited. Downstream from the dam, some research was done by PECC1 in Phluk Village (probably because the village was initially scheduled for resettlement), but none was done in villages downstream from Phluk. Even Ban Bung Village, which is just 3 km downstream from Phluk Village and is less than 10 km downstream from the planned dam site, was not consulted. This lack of research and community consultations represents a huge deficiency of the Sesan 2 dam EMP. Indicative of this, all the villages visited rejected the validity of the research already conducted, as did village heads, commune chiefs, district officials, and the chief for Sesan District

5.2) Transparency

Transparency is essential if the rights and entitlements of affected people are to be taken seriously. Being transparent requires that all those involved, including affected people and the public more generally, are given access to crucial information about all aspects of a project. ‘Full disclosure’ is a key part of good governance and transparency (Schneider 2007), and affected people do have a right to know how projects might affect them. According to the International Hydropower Association (2004: 10), “Stakeholders should be given opportunities to participate

in decision-making processes. Their roles, and rights to access information, should be documented in language relevant to their needs.”

However, so far PECC1 has not been nearly as transparent or forthcoming with its research or decision-making processes as would be appropriate for a project of the size and potential importance of the Sesan 2 dam. For example, many villages have simply not been visited or informed about the dam, and even for places that were visited, villagers have not received any substantial background information, orally or via written documentation, regarding the project. No written information about the project is available in Khmer language. Even Cambodian government agencies have not been adequately informed or consulted regarding the project. There is an urgent need for increased transparency in relation to all aspects of the SIA/EIA processes for the Sesan 2 dam.

5.3) Full-Cost Accounting and Unconditional Compensation

It is now generally recognised that full-cost accounting for large development projects, including large hydroelectric dams, is advantageous for various reasons (WCD 2000). It is, in fact, an important part of being transparent. In particular, it is important to determine whether the costs to society of a particular project, such as the Sesan 2 dam, are simply too high to justify government approval.

Crucially, affected people should be entitled to full compensation for losses caused by dams, regardless of whether they are short-term, medium-term or long-term losses. The costs of this compensation should be seriously estimated when EIAs and SIAs are prepared for projects, and long-term costs should be estimated and budgeted into the overall project development costs. However, this has rarely been done in the past, thus resulting in the benefits of dams being frequently overestimated, and the impacts being underestimated. It is clear that this certainly has not been done in the case of the Sesan 2 dam, where local people and the Cambodia government are likely to bear many costs if the Sesan 2 dam is built.

5.4) Focus on Vulnerable Groups

It is well known that the most vulnerable people generally have a harder time adjusting to changes than average or better off groups of people (Cernea 2003). Therefore, it is recognised that such groups often require special consideration. For the most part, the poorest people are considered to be the most disadvantaged, but there are also other reasons why people are vulnerable. For example, indigenous peoples are frequently categorised as vulnerable peoples, not only because they are frequently poorer than other groups, but also because of their unique social and cultural circumstances. These characteristics tend to justify special programmes to ensure that vulnerable peoples do not end up comparatively worse off than others, thus widening the gap between the richer and the poorer, and the powerful and weak.

One of the weaknesses of the Sesan 2 dam EMP is that no special measures have been established to support the most disadvantaged of those who would be negatively impacted by the project. Future assessments related to the Sesan 2 dam should include a survey of vulnerable

groups and a special plan should be developed to address the special needs of those people. Many of those who would be directly impacted by the Sesan 2 dam are 'indigenous peoples', and these people should receive special treatment, as is standard practice amongst multi-lateral banks such as the World Bank and the Asian Development Bank (World Bank 2002; ADB 1998).

5.5) Transboundary Impact Assessment

Any large dam project with potential transboundary social and environmental impacts, regardless of whether it is located on the mainstream Mekong River or one of its tributaries, should be subjected to what has become known as a Transboundary Impact Assessment (TIA) (Bruch *et al.* 2007). Even tributary dams in the Mekong region should be subjected to TIAs. For example, the World Bank and ADB required that a TIA be conducted in relation to the Nam Theun 2 dam in central Laos.

It is important to recognise, however, that as with EIAs, TIAs tend to under-predict transboundary impacts more often than they overestimate impacts. Furthermore, because public participation is crucial for any EIA process, TIAs may not be effective as they could be unless good public participation is encouraged across international borders. It is crucial that a regulatory framework be put into place to allow this to happen.

Although the draft EMP for the Sesan 2 dam clearly indicates that the project would result in transboundary impacts in Viet Nam, Laos and Thailand, especially in relation to fisheries losses, so far there have been no efforts to conduct a comprehensive TIA regarding the project. It can be argued that the 1995 Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (MRC 1995), which created the Mekong River Commission does not include a viable framework for conducting TIAs, especially when it comes to dams on tributaries. Others have shown that national interests in the Mekong region and an inappropriate framework for addressing transboundary issues within the MRC, has made dealing with transboundary environmental and social issues caused by hydroelectric dam extremely difficult (Hirsch & Jensen 2006).

5.6) Environmental Flows

One important emerging best practice when it comes to managing the everyday operations of large hydroelectric dam projects relates to implementing 'environmental flows' approaches. In the past, dams were largely operated to maximise certain benefits, such as power generation, even when doing so tended to result in unusual downstream water releases and associated downstream impacts. Now, however, people are thinking a lot more about managing dams so as to reduce downstream impacts, even when that means not being able to produce as much power during peak power periods, etc. (Bunn & Arlington 2002; Dyson *et al.* 2003; Richter and Thomas 2007).

Lindholm (2007) explains that initial global experiments related to 'environmental flows' emphasised maintaining minimum water levels in regulated rivers. There were few field studies done to determine the conditions required for different aquatic species during different seasons.

However, in recent years more holistic approaches have been developed, as well as models for considering exactly what conditions are required at different times of years for particular species. In particular, new approaches to environmental flows are considering complex geological, hydrological, biological, cultural and economic factors.

Considering the many villages located directly downstream from the Sesan 2 dam, and the ecological importance of the region, it would be crucial to consider implementing an environmental flows regime if the Sesan 2 dam is built. This would, however, reduce the benefits of the dam in relation to power generation. It is important for the operation regime for the dam be determined and agreed upon by all involved before the dam is built, so that appropriate mitigation and compensation measures can be implemented. So far, this has not been done for the Sesan 2 dam.

5.7) Cumulative Impacts

Cumulative impacts are crucial for all EIAs and SIAs related to large and far reaching projects, such as many large hydroelectric dams (WCD 2000). It is, however, not enough to simply identify cumulative impacts. It is also crucial to develop specific plans to mitigate and compensate for impacts. The full costs of impacts need to be integrated into project plans at an early stage, so that the real costs of projects, such as the Sesan 2 dam, are clear to everyone.

5.8) Considering Other Options

One widely accepted best practice for large dam development relates to investigating alternative approaches to electricity generation and distribution. This is, for example, this is frequently required for World Bank and ADB funded projects, and is also recommended by the WCD (2000). However, one of the problems with these alternative studies is that the developers that pay for the studies often have their own vested interests in pushing for favourable results, thus frequently leading to predictable results. Still, if transparent systems are put in place, these sorts of studies can be useful. So far, however, an alternatives study has not been conducted in relation to the Sesan 2 dam.

5.9) Guiding Principle-based Compensation

One useful way of approaching compensation issues for large projects such as the Sesan 2 dam would be to first determine the guiding principles for providing compensation. This is better than simply coming up with a list of activities or actions that are perceived as being necessary to provide adequate compensation. It should be agreed, for example, that the principle that everyone should have clean drinking water should be followed, rather than simply deciding to build a certain number of wells or other drinking water systems. The problem with activity-based approaches is that it tends to be too highly dependent on the cost of activities rather than on whether actions are useful for following guiding principles. Principles should first be agreed upon, and then the specifics of what are required to meet those guiding principle can be arranged. This has, for example, been done for certain large development projects in Africa.⁶⁸

⁶⁸ David Hall, *pers. comm.* February 2009.

In reality, there are many similarities between results-based compensation, which is outlined below, and the guiding principle-based compensation approach outlined in this section. In fact, the two approaches are compatible, as they are both based on the idea that following principles and achieving results are crucial to providing appropriate compensation for dam affected people.

5.10) Result-Based Compensation

The concept of ‘Results-based Compensation’ can be useful. It loosely draws upon the WCD’s ‘rights and risks’ approach, where affected peoples’ rights are recognised, and the risks that they face are assessed at various stages of dam development (WCD 2000).

Dam developers frequently prepare their own compensation plans. If they decide to implement these plans, they generally contract out the work. They decide on budgets for compensation and are generally not obliged to spend more money once budgets have been depleted. Of course, there are compensation-based goals attached to these plans, but there are rarely crucial performance bench-marks. Therefore, if there is not enough money allocated to pay for the necessary work, or the contractor does a poor job and little is achieved, the impacted people have to suffer due to unsuccessful compensation and mitigation measures. In other words, the work is considered done once the money allocated for the work runs out, regardless of whether the anticipated objectives of the work have been achieved.

Results-based compensation switches the onus of responsibility from affected people to the dam developer. The amount of money allocated by a dam developer for compensation and mitigation work is not very relevant under this framework. Instead, the actual results of work conducted are considered crucial. This approach encourages companies to implement compensation work more efficiently, and to make sure that quality work leading to real results is achieved. At present, the system tends to reward companies for cutting costs and reducing the quality of work. Affected people have no ways to demand that expected results are actually achieved.

5.11) Compensation +1

“People affected should be at least as well off after resettlement as they were before” (ADB 2008: 6).

It is common to hear dam developers and their supporters, including representative of multi-lateral banks like the ADB and the World Bank, claim that dam-affected people should not be left worse off than they were before a project is developed. This is also one of the principles of the WCD (2000). People affected by dams should, according to the WCD, end up better off than before the project started. But in reality this is almost never the case (See McCully 1996; WCD 2000). Rarely are measures taken to ensure that people are actually better off than they were before a large dam was developed. However, in some parts of the world this is becoming standard practice.

For example, some projects in Africa, such as the Kao Diamond Mine in Lesotho, have implemented what some call ‘compensation +1’. That is, full compensation is provided, and then additional support is given above and beyond what is required as compensation (Hall 2008a). Essentially, benefits are provided as an extra, beyond providing compensation, not as a substitute for legitimate compensation. For example, a farmer who loses a hut would not just receive a replacement hut, but might also have an additional hut built for him. That way the farmer is left with two huts rather than one, or ‘compensation +1’. If developers and the government are truly interested in using large development projects as a means to alleviate poverty, the compensation +1 concept should be attractive. However, in the Mekong region this principle has apparently not been applied, and PECC1 appears to have little interest in doing so.

5.12) Long-Term Perspective

“People unavoidably displaced should be compensated and assisted, so that their economic and social future would be generally as favorable as it would have been in the absence of the project” (ADB 1998: 2).

To do what the *ADB’s Handbook on Resettlement: A Guide to Good Practice* (1998) suggests above, it is crucial that mitigation and compensation issues be prepared with a long-term perspective. It is no longer acceptable to propose one-time lump sum payments in lieu of long-term social and environmental problems, as has been done in the EMP for the Sesan 2 dam (KCC 2008a). Instead, environmental and social impact assessments need to carefully consider the impacts, and the measures to deal with them, over the short-term, medium-term and long-term.

While Haag & Tung (2007) essentially propose separating short-term compensation and mitigation from medium and long-term compensation and mitigation, this approach is not advocated here, and does not appear to fit with established standards (World Bank 2002; ADB 1998). Instead, it is important to consider all aspects of hydropower dam projects, from their construction to their removal, within the same overall development framework, although this does not mean that different work should not be appropriately timed for appropriate implementation later.

One important principle that fits with this framework is that if impacts are long-term, so should compensation be provided over the long-term. This may take the form of periodic cash payments or other in-kind support. Essentially, impacted people should be eligible for compensation for at least as long as they are experiencing negative impacts caused by a dam. This should be the case if payments need to be made for the life of a project, or even if they need to be provided for generations.

5.13) Payments for Ecological Services

One option that should be considered is for dam developers to pay local people and the government for the ecological services provided to hydropower projects by surrounding forested watersheds. These funds could be both used to protect natural resources, and also to help

improve the lives of local people. Again, this sort of funding should not be provided on a one-time basis, but for the life of the project.

5.14) Livelihood Restoration

One best practices principle that should be adopted globally is that compensation for affected people should not just involve asset replacement, but also livelihoods restoration as well. This is crucial, as livelihoods restoration is frequently a more costly and time-consuming task than asset replacement, especially when vulnerable groups are involved. Therefore, it is not just important that people are fully compensated for lost assets, but also that they receive enough support to restore their livelihoods to above their previous levels. This is a principle that is recognised by the WCD (2000).

Unfortunately, the present Sesan 2 dam EMP does not pay sufficient attention to livelihoods restoration issues, instead concentrating on asset replacement issues (KCC 2008a). This is a serious shortcoming of the EMP.

5.15) Making Dam Affected People into Full Project Shareholders

“Successful income restoration was achieved primarily when projects allowed resettlers to share in the immediate benefits created by the very project that caused displacement” (ADB 1998: 61).

The above statement did not refer to providing affected people with actual shares in projects, but rather providing them with access to entitlements associated with projects, such as irrigated farmland, special resource entitlements, etc. The principle of making affected people into project shareholders when they want to be is not a bad one. However, making people shareholders should not be substitute for providing full and fair compensation. It would be particularly empowering if project affected peoples were actually made into full shareholders of dam projects that affect them. Then they would not only receive project benefits, but would be empowered to vote on various measures that are locally important. It would make dam operations much more transparent, since affected people would have access to the financial statements and decision-making processes of dam development companies. It would make it more likely that a higher proportion of funds allocated for compensation would actually be spent on things that are of concern to local people, and that less of the money would be wasted or corrupted. It is important that affected people be aware of project budgets: how much money is supposed to be spent on certain activities? How much is going to affected people as opposed to government agencies, etc.? This helps ensure accountability.

Already, this approach has been applied for some projects in Lesotho, Africa. In some cases committees have been set up to manage compensation efforts. Local people are given prominent roles on these committees. Representatives of impacted people are then empowered to help solve problems affecting their own people. They have crucial roles in preparing their own compensation plans (Hall 2008b).

In Canada there have been a number of large development projects that have exchanged access to natural resources with equity for local people in the projects. This has especially been the case for native people (First Nations people) in Canada. In the Mekong region, Norconsult (2002) has suggested that some of the profits from dams should be returned to people negatively affected by projects. This sort of system could also be established in relation to the Sesan 2 dam. However, so far there have been no efforts to do so.

5.16) Secure Land Rights

For people who are resettled as a result of a dam such as the Sesan 2 dam, it is crucial not only to be offered replacement land in lieu of what has been lost to the project, but that affected people receive replacement land with secure tenure over it prior to developing projects. The World Bank's fair and just compensation standard means replacement cost for affected peoples and is defined as follows:

“For agricultural land, it is the pre-project or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes”
(World Bank, 2002, Operational Policy 4.12, annex A).

If one looks at other examples of dam construction in the Mekong region, it can be seen why this is a crucial point. For example, in the late 1990s a large number of indigenous Nya Heun (Heuny) people were resettled as a result of the construction of the Houay Ho dam on the Boloven Plateau in southern Laos. Government officials provided the resettlement people with agricultural land once they were resettled, but the locals did not receive land deeds or other secure tenure for the land allocated to them. Soon after moving, however, people from neighbouring villages reclaimed most of the land allocated to the resettled people, claiming that the land was their fallow swidden land. This left the resettled people with insufficient land for farming (IRN 1999; International Rivers 2008). If they had received land with clear tenure over it initially, they would have been in a much better situation.

5.17) Formalisation of Plans and Appropriate Implementation

“A major problem in resettlement management and implementation is the lack of an appropriate institutional framework at both the agency and field levels. It is important to ensure that appropriate agencies mandated to plan and implement compensation, income restoration, and rehabilitation programs are identified as early as possible in project preparation” (ADB 1998: 67).

It is crucial that resettlement and compensation plans are developed to deal with all dam affected peoples, and that the conditions of those plans are clearly documented and agreed to by all, before dam construction begins. This includes identifying competent implementers of required mitigation and compensation actions. According to the ADB (1998), a ‘resettlement plan’ should be prepared for everyone who loses assets or whose livelihood is affected, regardless of whether

they are actually resettled or not. For the Sesan 2 dam, this has not been done. Only villages within or very near the reservoir area of the dam have been visited, even though many other communities would be negatively impacted. Even those investigated have not been assessed in relation to livelihoods issues.

The WCD (2000) endorses the idea that the formalisation of resettlement and compensation plans are crucial for ensuring that companies follow through with their commitments. According to the WCD, legally enforceable agreements are essential for successful resettlement and development planning. In the past, companies have often chosen to not follow their own plans, in order to save money or time. Because of poor regulatory oversight by the government, companies have often been able to implement much more modest programmes than were originally conceived in their own project documents. This ‘under performance’ problem needs to be avoided.

In addition, if people are to be relocated, resettlement sites should be fully prepared in advance of any movement of people. This includes ensuring that houses have been built, water systems have been prepared and tested, schools and health clinics have been constructed and equipped, agricultural land has been prepared, and all other infrastructure and services promised have been provided. Provisions for livelihood development should begin before people are expected to change their lives.

5.18) Timely Compensation Payments

Property or other entitlements can be taken from people on the grounds of eminent domain, an extraordinary state power that can be used in cases when the greater good is deemed to be the case. However, it is crucial that people begin receiving compensation for their losses at the same times that losses occur, which is often when site preparation begins. It is also important that they receive compensation for as long as they are being impacted (ICESCR 1997). In the past, people have sometimes not received compensation until years after their livelihoods were negatively impacted by a project. This is unacceptable.

In the United States of America and other countries, compensation must be equivalent to the value of the property taken and must be paid at the time that property is taken, or with interest from the date of confiscation (Anonymous n.d.). Cambodian law also explicitly provides for fair and just compensation. Article 5 of the 2001 Cambodia Land Law states that:

“No person may be deprived of his 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.”

This comes from Article 44 of the Cambodian Constitution, which states that:

“The right to confiscate properties from any person shall be exercised only in the public interest as provided for under the law and shall require fair and just compensation in advance.”

As can be seen from the above, the government of Cambodia supports the principle of paying compensation at the time of impacts. However, that does not always happen in reality.

In relation to the Sesan 2 dam, the Cambodian government should demand that EVN fulfils its requirements in relation to compensation and resettlement prior to dam construction. The requirements of EVN need to be included in an agreement in advance of any construction work proceeding, and this agreement should be fully disclosed to the public so that progress can be transparently monitored.

When affected people are not compensated in a timely manner, they are often forced to become indebted while they are waiting for compensation. This can lead to serious debt problems for affected people. This has, for example, been part of the problem with the National Highway #1 compensation process—people were not provided with appropriate compensation until many years after initially being impacted, thus forcing people to become indebted while waiting to receive compensation. At present, for Highway #1, some affected families have requested support from the ADB to alleviate the debt that they incurred while waiting for compensation to be paid.⁶⁹

To achieve ‘fair and just compensation’ the government must adopt a fair and just process through which villagers can be ensured of good opportunities to voice their concerns. Without a mechanism to guarantee implementation, a promise of fair compensation is not very meaningful. Effective due process is essential in assuring that the substantive compensation right is executed. Due or just process includes adequate notice, public participation (meaningful), independent and impartial adjudication, access to adequate judicial review, expeditious compensation, and compensation prior to development.

5.19) Grievance Redress Procedures

It is crucial that grievance redress procedures are put in place when compensation is to be provided to affected people. These procedures need to include time frames for affected peoples to express grievances, and mechanisms for investigating and resolving complaints. A grievance procedure needs to go through a neutral body unconnected to the project developer, such as local committees with affected peoples as members, as well as ‘secondary stakeholders’⁷⁰ (WCD 2000). There is apparently no plan to set up such institutions in relation to the Sesan 2 dam, which is another weakness of the project’s EMP.

Grievance redress procedures should be interlinked with overall monitoring and evaluation mechanisms, and be designed to assess the success or failure of particular compensation

⁶⁹ *Pers comm.*, Doi Toshiyuki, Mekong Watch Japan, January 2009.

⁷⁰ Defined by the ADB (1998) as those people who are not directly impacted by a project, such as NGOs, civil society groups, business organisations, etc.

measures. There needs to be two kinds of monitors: those responsible directly to the dam developer, and those who are responsible for independently regulating resettlement and compensation measures. Monitors are likely to provide training support in order to do their jobs well, a cost that the dam developer should bear.

5.20 Viet Nam's 'Benefit Sharing' Scheme—Is it a Step Forward?

In 2007, the Electricity Regulatory Authority of Vietnam (ERAV), funded through a technical assistance grant provided by the Asian Development Bank (ADB), prepared a report entitled, 'Benefit sharing mechanisms for people adversely affected by power generation projects in Viet Nam' (Haag & Tung 2007). The views included in that report apparently reflect many of those advocated by the Viet Nam government, and since EVN and the ERAV are state-owned enterprises, their views are very relevant in relation to plans for developing the Sesan 2 and other large dams in the region.

According to the concept, dam affected or 'host' communities that are supposed to gain from 'benefit sharing' are expected to receive a package of benefits that could include, 1) project outputs and services (i.e. access to electricity, etc.), 2) monetary benefits (i.e. money for paying for mitigation measures, material benefits, etc.), and 3) non-monetary entitlements to natural resources (i.e. special rights to reservoir fisheries, forest use, etc.).

Unfortunately, what appears from its title to be a promising study and initiative falls far short of what might have been hoped for or expected from a well-funded study supervised by a major donor such as the ADB. The plan outlined in the report is to allocate a undetermined amount of revenues from electricity sales to people adversely affected by hydroelectric dams in Viet Nam⁷¹ "for long-term local development and welfare improvement schemes in the project impact zone" (Haag & Tung 2007: 9). However, one can hardly call this sort of scheme one that is really based on 'benefit sharing', as its name would suggest. If the scheme really was about benefit sharing, it would presumably require that dam affected people receive a share of the ultimate project 'benefits', above and beyond what they deserve as fair compensation for short, medium and long-term losses. However, it appears that what is actually being proposed is not to 'share benefits' per se, but rather to create a mechanism for financing medium and long-term compensation for people negatively affected by dams, especially those who were not allocated appropriate compensation during initial dam planning, construction or operation. In other words, the so-called 'benefit sharing' really appears to be another way of paying people what they deserve as compensation for past losses.

The way that Haag & Tung (2007) justify their position is odd and surprising. Their report arbitrarily distinguishes between short-term one-time resettlement assistance and compensation and all other forms of medium and long-term forms of mitigation and compensation. According to the ADB, only the initial short-term compensation measures are explicitly considered the responsibility of the dam developer (apparently to keep investment costs down). Other legitimate medium and long-term impacts are apparently not considered worthy of specific compensation,

⁷¹ In India, 2% of revenues have been allocated to local area development funds, while 10% is going to the provinces (Haag & Tung 2007). However, it is unclear what percentage Viet Nam might agree to.

as would be expected under most international EIA and SIA processes. Instead, the ADB-funded study proposes introducing ‘benefit sharing’ for those people living upstream or downstream from dams, or who have been resettled from dam inundation areas.

However, rather than basing the amounts of compensation (or ‘shared benefits’) provided on actual losses, the amount to be paid are apparently determined through setting an arbitrary limit, which is not determined by actual impacts, but rather on the ‘competitive market for [power] generation.’ This seems to be a very inappropriate way of compensating dam affected people, who are referred in the documents as dam project ‘hosts’. The concept of trying to compensate people for particular impacts does not seem to be relevant in the ‘benefit sharing’ plan. Instead, the idea is that everyone in the project area should benefit, apparently regardless of whether they suffered more or fewer losses. It seems that the idea is to provide some compensation for people affected by dams without actually calling it compensation. It may be that the Viet Nam government wants to avoid setting precedent for spending the large amounts of money that would be required to pay the full-cost of impacts caused by dams. So they are calling it something else. This is ironic considering that the report claims that, “ultimately the cost of revenue sharing is internalised in the retail electricity price” (Haag & Tung 2007: 19). This may be true, but the costs of project development, whether one calls them compensation expenses or benefit sharing, have certainly not been internalised into the costs of the projects themselves. By using this framework, it is possible to externalise costs that are added later and paid for by electricity consumers through higher electricity rates rather than being a direct burden or obstacle to investors.

‘Revenue sharing’ or ‘benefit sharing’ is a concept that should be developed, as already recommended earlier. However, the problem with the ADB-supported framework is that it is being introduced as a substitute for deserved compensation, rather than as something being provided beyond fair compensation. This is unacceptable and would appear to go against international best practices standards. The full costs of building a dam should be estimated, including compensation and mitigation for the short, medium and long terms. The compensation should not be subject to being divided amongst the whole population in the form of ‘benefit sharing’. It should, instead, go to those who have suffered and deserve it. Then, if after all appropriate compensation has been allocated, revenue sharing can help developers realise the real promise of so many dam projects – to make people better off than before the project was developed. Right now, there does not appear to be any attempt to meet that target. Instead, even with ‘benefit sharing’, it is possible or even likely that many people will end up being worse off than before the project was developed, which goes against the principles of project development.

Therefore, instead of adopting the ADB framework for ‘benefit sharing’, as proposed by Haag & Tung (2007), I instead propose introducing a number of other ‘best practices’ principles related to compensation practices when it comes to large dams.

6 *Some Conclusions regarding the Lower Sesan 2 Dam*

“Based purely on environmental and particularly social conditions the [Sesan 2 dam] project is very questionable” (KCC 2008b).

The results of this study indicate that the Sesan 2 dam would indeed cause very serious social and environmental impacts, not only in the reservoir area, but also upstream along the Sesan and Srepok Rivers, and their tributaries, and downstream along the Sesan, Sekong and Mekong Rivers. It is estimated that approximately 100,000 people would be negatively impacted by the Sesan 2 dam along the Sesan, Srepok and Sekong Rivers in Ratanakiri and Stung Treng Provinces alone, of which three quarters are living above the proposed dam site, and a quarter are living downstream from the dam. However, this does not include impacts along the Mekong River or upper parts of the Sekong River in Cambodia. If those populations are also considered, the amount of people that would be impacted could rise significantly.

The Sesan 2 dam would also cause transboundary impacts along the Mekong and Sekong Rivers, thus necessitating that a Transboundary Impact Assessment (TIA) be conducted to consider the project’s regional implications. The ecological impacts of the project would be region wide, and would thus leave future generations of people throughout the region with much degraded natural resources.

It is crucial to recognise that the people in Ratanakiri and Stung Treng Province are strongly opposed to the Sesan 2 dam. From the section of this report that deals with villager opinions, it should be clear that there is a large amount of opposition to the dam above throughout the project’s potential impact area. In a number of cases villagers expressed strong reservations about even discussing possible compensation measures. Instead, they demanded that the dam simply not be built. They feel that anything less would leave them to face very heavy and unacceptable impacts. The level of local opposition to this dam is exceptional, and cannot be overemphasised. Throughout the fieldwork not one person was encountered, including villagers and government officials, who expressed support for the project.

Since the most important ‘best practice’ advocated here is to fully inform, consult with, and listen carefully and sincerely to the concerns of those expected to be affected by the Sesan 2 dam, the only reasonable conclusion that can be drawn from this study is that for local people the only acceptable outcome to the present dam planning process would be to abandon plans to build the Sesan 2 dam. This is the conclusion that local people advocated throughout the study.

A major finding of the study is that the compensation package included in the draft EMP is both inappropriate and hugely deficient in many ways, especially in relation to fisheries impacts, compensation for communities targeted for relocation, downstream hydrological and water quality impacts, and with regard to resettlement sites and associated livelihood issues. All the communities and government officials consulted have rejected the validity of draft EMP.

The implication is that PECC1, which is working on behalf of EVN, has so far failed to prepare appropriate social and environmental impact assessments, and related mitigation, resettlement

and compensation plans. Many issues have received insufficient attention and study, with many impacts either being underestimated or not quantified in relation to impacts and compensation, thus removing these impacts from the compensation package altogether.

It is clear that if the Sesan 2 dam is built, it would cause serious environmental and social impacts, including seriously impacting thousands of people inside the reservoir area in Stung Treng Province, tens of thousands of people above the dam in Stung Treng and Ratanakiri Provinces, and hundreds of thousands of people living downstream from the proposed dam site. The dam can be expected to increase poverty and malnutrition amongst those affected, making it difficult for Cambodia to reach its poverty alleviation and Millennium Development Goals.

7 Recommendations

Apart from the various general ‘best practises’ principles and practices outlined above, which apply to the Sesan 2 dam as well as other dams in Cambodia and the region more generally, the following are some specific recommendations that relate specifically to the Sesan 2 dam:

- 1) The most important recommendation in relation to the Sesan 2 dam that has become evident through this study is that truly participatory processes with all local communities that would be affected by the Sesan 2 dam are necessary, but have so far not occurred. Only a small number of the villages that would be seriously impacted have been visited, let alone consulted, by the dam developers. This lack of good public consultation is the basis for many of the criticisms levelled against the EMP here. Therefore, the SIA and EIA for the Sesan 2 dam should be redone, using internationally recognised participatory practices. This suggestion is in line with recommendations provided by local government officials consulted in Stung Treng Province during the study.
- 2) It is important to recognise that it is not possible to adequately assess compensation and resettlement issues in relation to large dams such as the Sesan 2 without carefully considering the overall environmental and social impacts of a project. Considering resettlement and compensation processes outside of the broader social and environmental impact assessments does not make sense. Therefore, it is crucial that good foundational SIAs and EIAs are the basis for appropriate resettlement and compensation plans.
- 3) It is crucial that projects like the Sesan 2 dam be recognised for having short, medium and long-term implications, all of which developers need to be responsible for. Therefore, single lump-sum compensation payments are rarely, if ever, sufficient to address all impacts, especially long-term ones. This is a crucial problem with the EMP for the Sesan 2 dam. For some impacts, such as those related to the loss of fisheries resources, negative impacts would continue for at least as long as the Sesan 2 dam exists. Compensation needs to be provided for the same period.
- 4) It is crucial that all the negative impacts brought on by projects such as the Sesan 2 dam are carefully assessed, and that all the expected impacts are integrated into compensation plans, so as to adopt a clearly holistic perspective to project development and costing. This has not, even minimally, been the case for the Sesan 2 dam. It should be done.
- 5) It is essential that all those impacted by projects like the Sesan 2 dam be considered for full and fair compensation, not just those in the reservoir area of the project, but also others located upstream and downstream from the centre of dam, including those living along streams where migratory fish that would be impacted are found. So far, this has not been the case for the Sesan 2 dam. A much wider impact footprint needs to be recognised for the Sesan 2 dam.
- 6) It is important that transparent full cost accounting of social and environmental impacts of large dams like Sesan 2 is fully incorporated into all compensation and resettlement

plans. This has, however, not been done in relation to the Sesan 2 dam. Many of the costs of the project remain externalised. This is a problem, as all project expenses should be borne by the developer, not by communities or the Cambodian government.

- 7) It is crucial that all resources that villagers rely on for their livelihoods and which would be negatively impacted by the Sesan 2 dam are carefully assessed. Villagers should be fully compensated for the long-term losses of these resources, not just short-term losses. This includes compensating villagers for losses of forestry resources that they rely on, even when they are not private property resources owned by villagers. Forestry resources are important for local people, but their losses as a result of the Sesan 2 dam have not been adequately considered in relation to impacts on villager livelihoods. These forests have been considered 'state lands' even though local people have long relied heavily on them for their livelihoods.
- 8) It is crucial that the cumulative impacts of projects like the Sesan 2 dam be considered carefully and comprehensively. This includes both the cumulative impacts caused by the project itself, and also cumulative impacts of the project and other impacts caused by other circumstances and projects. This has not been done in relation to the Sesan 2 dam. More studies are required.
- 9) It is crucial that results-based compensation and mitigation work is done in relation to dams. That is, the burden on achieving good results should be on the developer rather than on affected people. Therefore, compensation work should be done so as to meet particular pre-defined results-based objectives. If plans are not successfully implemented, problems should be the responsibility of the developers, not of the dam affected people. More investment should be required until the desired results are achieved, regardless of whether original estimates for compensation costs need to be increased or not.
- 10) If the Sesan 2 dam is built, it would be important to establish community compensation committees so as to help develop and manage compensation efforts. Affected people should have leading roles in these committees. Affected peoples should have strong roles in determining what kind and amounts of compensation are appropriate, and how such compensation is provided.
- 11) It is important that measures in relation to resettlement and compensation be documented fully and agreed upon by all sides before implementation, in order to ensure that such plans are accepted by all sides and are implemented according to plans. This also allows for legal challenges, if necessary.
- 12) It is crucial that people affected by projects such as the Sesan 2 dam receive compensation in a timely manner, beginning with as soon as they are subjected to losses. In addition, all housing and facilities need to be in place before people are relocated.

- 13) If the Sesan 2 dam is built, it would be important for dam affected people to be provided with secure land title and resource entitlements as part of any resettlement and compensation plans associated with the Sesan 2 dam.
- 14) If the Sesan 2 dam is built, it would be crucial that appropriate mechanisms be set up to monitor the implementation of resettlement and compensation plans. In addition, villagers need to have access to an independent grievance process, in case they are unhappy with plan implementation.
- 15) It is fundamental that it be recognised that livelihood impacts are not easy to correct, as they often involve various kinds of capital, not just economic capital. It is important that the restoration of livelihoods be considered a long-term endeavour. Asset replacement is not enough.
- 16) Last, but certainly not least, it is important that communities affected by the Sesan 2 dam end up being better off, both materially and otherwise, than prior to dam construction. This is crucial for ensuring that poverty is alleviated and Cambodia is able to meet its Millennium Development Goals.

References Cited

- 3SPN 2007. Abandoned villages along the Sesan River in Ratanakiri Province, northeastern Cambodia. 3S Rivers Protection Network, Ban Lung, Ratanakiri, Cambodia, 22 pp.
- Amnesty International 2008. Rights razed: Forced evictions in Cambodia. AI Index: ASA 23/002/2008, 64 pp.
- Anonymous. n.d. Fair and just compensation in the Kingdom of Cambodia, 5 pp.
- ADB [Asian Development Bank] 1998. *Handbook on Resettlement: A guide to good practice*. Asian Development Bank, Manila, 115 pp.
- Baird, I.G. 2007. Fishes and forests: the importance of seasonally flooded riverine habitat for Mekong River fish species. *Natural History Bulletin of the Siam Society* 55(1): 121-148.
- Baird, I.G. 2006a. *Probarbus jullieni* and *Probarbus labeamajor*: the management and conservation of two of the largest fish species in the Mekong River in southern Laos. *Aquatic Conservation: Freshwater and Marine Ecosystems* 16(5): 517-532.
- Baird, I.G. 2006b. Strength in diversity: Fish sanctuaries and deep-water pools in Laos. *Fisheries Management and Ecology* 13(1): 1-8.
- Baird, I.G. 2006c. Conducting rapid biology-based assessments using local ecological knowledge. *Natural History Bulletin of the Siam Society* 54(2): 167-175.
- Baird, I.G. 2001. Aquatic biodiversity in the Siphandone wetlands. Pages 61-74 In: Daconto, G. (ed.), *Siphandone Wetlands*. Environmental Protection and Community Development in Siphandone Wetland Project, CESVI, Bergamo, Italy.
- Baird, I.G. 1995. A rapid study of fish and fisheries; and livelihoods and natural resources along the Sesan River, Ratanakiri, Cambodia. Unpublished Livelihoods and Natural Resources Study report, Oxfam (UK and Ireland) and Novib, Ban Lung, Ratanakiri, Cambodia, 54 pp.
- Baird, I.G. & B. Shoemaker 2008. *People, Livelihoods and Development in the Xekong River Basin of Laos*. White Lotus Press, Bangkok, 435 + pp.
- Baird, I.G. & I.L. Beasley 2005. Irrawaddy dolphins (*Orcaella brevirostris*) in the Mekong River in Cambodia: An initial survey. *Oryx* 39(3): 301-310.
- Baird, I.G. & M.S. Flaherty 2005. Mekong River fish conservation zones in southern Laos: Assessing effectiveness using local ecological knowledge. *Environmental Management* 36(3): 439-454.
- Baird, I.G. & M. Meach 2005. Sesan River Fisheries Monitoring in Ratanakiri Province, Northeast Cambodia: Before and after the Construction of the Yali Falls Dam in the Central Highlands of Viet Nam. 3S Protection Network, Ban Lung, Ratanakiri, Cambodia.
- Baird, I.G., M.S. Flaherty & B. Phylavanh 2004. Mekong River Pangasiidae catfish migrations and the Khone Falls wing trap fishery in southern Laos, *Natural History Bulletin of the Siam Society* 52(1): 81-109.
- Baird, I.G. & M.S. Flaherty 2004. Beyond national borders: Important Mekong River medium sized migratory carps (Cyprinidae) and fisheries in Laos and Cambodia. *Asian Fisheries Science* 17(3-4): 279-298.
- Baird, I.G., M.S. Flaherty & B. Phylavanh 2003. Rhythms of the river: Lunar phases and migrations of small carps (Cyprinidae) in the Mekong River. *Natural History Bulletin of the Siam Society* 51(1): 5-36.
- Baird, I.G. & P. Dearden 2003. Biodiversity conservation and resource tenure regimes – A case study from northeast Cambodia. *Environmental Management* 32(5): 541-550.

- Baird, I.G., M. Baird, Chum Moni Cheath, Kim Sangha, Nuon Mekradee, Phat Sounith, Phouy Bun Nyok, Prom Sarim, Ros Savdee (Phiap), H. Rushton & Sia Phen 2002. A community-based study of the downstream impacts of the Yali Falls dam along the Se San, Sre Pok and Sekong Rivers in Stung Treng province, northeast Cambodia, Se San Protection Network Project, Partners For Development (PFD), Non Timber Forest Products Project (NTFP), Se San District Agriculture, Fisheries and Forestry Office, and Stung Treng District Office, Stung Treng, Cambodia.
- Baird, I.G., Z. Hogan, B. Phylavanh & P. Moyle 2001a. A communal fishery for the migratory catfish *Pangasius macronema* in the Mekong River. *Asian Fisheries Science* 14: 25-41.
- Baird, I.G., B. Phylavanh, B. Vongsenesouk & K. Xaiyamanivong 2001b. The ecology and conservation of the Smallscale Croaker *Boesemania microlepis* (Bleeker 1858-59) in the mainstream Mekong River, southern Laos. *Natural History Bulletin of the Siam Society* 49: 161-176.
- Baird, I.G., V. Inthaphaisy, P. Kisouvannalat, B. Phylaivanh & B. Mounsouphom 1999a. *The Fishes of Southern Lao* (In Lao). Lao Community Fisheries and Dolphin Protection Project, Ministry of Agriculture and Forestry, Pakse, Lao PDR, 162 pp.
- Baird, I.G., M.S. Flaherty and B. Phylavanh 1999b. Preliminary evidence of gas supersaturation below the Mekong River's Khone Falls in Southern Laos. Environmental Protection and Community Development in Siphandone Wetland, Champasak Province, Lao P.D.R., CESVI Cooperazione e Sviluppo, Pakse, Laos, 14 pp.
- Baran, E. 2006. Fish migration triggers in the Lower Mekong Basin and other tropical freshwater systems. MRC Technical Paper No. 14, Mekong River Commission, Vientiane, 56 pp.
- Baran, E., I.G. Baird & G. Cans 2005. Fisheries bioecology in the Khone Falls area (Mekong River, Southern Laos). WorldFish Center, Penang, Malaysia, 80 pp.
- Berge, D. 2007. New report on Sesan basin released. *The STRIVER Bulletin*, No. 2: 5.
- Bruch, C., M. Nakayama, J. Troell, L. Goldman, & E.M. Mrema 2007. Assessing the assessments: Improving methodologies for impact assessment in transboundary watercourses. *Water Resources Development* 23(3): 391-410.
- Bunn, S.E. & A.H. Arthington 2002. Basic principles and ecological consequences of altered flow regimes for aquatic biodiversity. *Environmental Management* 30:492-507.
- CEPA 2007. Community profiles in Stung Treng Province. Unofficial translation from Khmer to English.
- CEPA 2008. Sekong River-based livelihoods study in northeast Cambodia. Phnom Penh.
- Cernea, M. 2003. For a new economics of resettlement: A sociological critique of the compensation principle. *International Social Sciences Journal* 175.
- Chaeng Sokha 2006. Well-water users show signs of arsenic poisoning. *Phnom Penh Post*, 21 September – 5 October: 4.
- Claasen, A.H. 2004. *Abundance, Distribution, and Reproductive Success of Sandbar Nesting Birds below the Yali Falls Hydropower Dam on the Sesan River, Northeast Cambodia*. WWF-World Wide Fund for Nature/Danida/Wildlife Conservation Society/Bird Life International, Phnom Penh.
- Corey-Boulet, R. 2008. Emerging trends threaten health gains. *Phnom Penh Post*, February 27.
- Dugan, P. 2008. Mainstream dams as barriers to fish migration: International learning and implications for the Mekong. *Catch and Culture* 14(3): 9-15.

- Dyson, M., G. Bergkamp & J. Scanlon (eds.) 2003. *Flow: The Essentials of Environmental Flows*. IUCN, Gland, Switzerland.
- Electrowatt 1993. Environmental and Financing Studies on the Yali Falls Hydropower Project; Volume 1, Mekong Secretariat and Ministry of Energy, Socialist Republic of Vietnam, Hanoi.
- Fisheries Office, Ratanakiri Province & NTFP Project 2000. A study of the downstream Impacts of the Yali Falls dam in the Se San River basin in Ratanakiri province, northeast Cambodia. Ban Lung, Ratanakiri Province, Cambodia, 66 pp.
- Government of Cambodia 2005. National Strategic Development Plan 2006-2010, Cambodia, Phnom Penh.
- GXED & SBK 2008. Stung Cheay Areng Hydroelectric Project. Resettlement Plan. Guangxi Electric Power Industry Investigation Design and Research Institute (GXED) and Social and Business Khmer Research and Development (SBK), Phnom Penh, 117 pp. +
- Haas, L.J.M. and Dang Vu Tung 2007. Benefit sharing mechanisms for people adversely affected by power generation projects in Viet Nam. Prepared for the Electricity Regulatory Authority of Vietnam (ERAV), Asian Development Bank, Manila.
- Halcrow (Sir William) and Partners 1998. Se Kong, Se San and Nam Theun River Basins hydropower study. Initial Environmental Examination, Asian Development Bank, Manila.
- Halcrow (Sir William) and Partners 1999. Se Kong, Se San and Nam Theun River Basins hydropower study. Final Report, Asian Development Bank, Manila.
- Hall, D. 2008a. Kao Diamond Mine resettlement, compensation and mitigation plan: Incorporating land use plan and environmental impact assessment. Kao Diamond Mine (Pty) Limited, Lesotho, 96 pp.
- Hall, D. 2008b. Metolong Authority Community Outreach Programme: Guidelines for community engagement, 7 pp.
- Halls, A.S. 2008. Deep pool mapping and research. *Catch and Culture* 14(2): 8-12.
- Heng Soy 2007. Suy Sem asks Vietnam to build hydroelectric dams on the Sesan River (In Khmer). *Rasmei Kampuchea* newspaper, July 17.
- Heyes and Cabrera v. Lanphier et al. 2003 British Columbia Supreme Court 1126. Vancouver, B.C., Canada, 27 pp.
- Hirsch, P. & A. Wyatt 2004. Negotiating local livelihoods: Scales of conflict in the Se San River Basin, *Asia Pacific Viewpoint* 45(1): 51–68.
- Hirsch, P. & K.M. Jensen 2006. National interests and transboundary water governance in the Mekong. Australian Mekong Resource Centre, Danish International Development Assistance, Sydney, Australia.
- Hogan, Z., I.G. Baird, R. Radtke & J. Vander Zanden 2007. Long distance migration and marine habitation in the Asian catfish, *Pangasius krempfi*. *Journal of Fish Biology* 71: 818-832.
- Hortle K.G. 2007. Consumption and the yield of fish and other aquatic animals from the Lower Mekong Basin. MRC Technical Paper No. 16. Mekong River Commission, Vientiane, Lao PDR. 87 pp.
- ICESCR [International Committee on Economic, Social and Cultural Rights] 2007. The right to adequate housing (Art. 11.1): forced evictions, 20/05/97, United Nations.
- International Hydropower Association 2004. Sustainability Guidelines, 24 pp.
- IRN [International Rivers Network] 1999. Power Struggle: The impacts of hydro-development in Laos. International Rivers, Berkeley, CA.

- International Rivers 2008a. *Power Surge: The impacts of rapid dam development in Laos*. International Rivers, Berkeley, CA, 88 pp.
- International Rivers 2008b. Social and environmental standards for large dams. International Rivers, Berkeley, CA, 29 pp.
- JICA and Nippon Koei 2008. Progress of the master plan study of hydropower development in Cambodia. Japan International Cooperation Agency and Ministry of Industry, Mines and Energy. Presentation, February 12, 2008.
- KCC 2008a (draft). Environmental Management Plan (EMP). Lower Sesan 2 Hydropower Project, Key Consultants Cambodia, Phnom Penh, June 2008.
- KCC 2008b. Key facts Sesan II dam for NGO meeting 27 June 2008. Key Consultants Cambodia, Phnom Penh, 3 pp.
- Keller, C., J. Jordi, K. Gregerson & I.G. Baird 2008. The Brao dialects of Cambodia: Lexical and phonological variations. *Revue de l'Institut de la Langue Nationale de l'Académie Royale du Cambodge*. Institut de la Langue, Phnom Penh, *Special Issue*, July 2008: 87-152.
- Krahn, J. 2007. *Lao PDR: Comprehensive Food Security and Vulnerability Analysis*. World Food Programme, Vientiane, 139 pp.
- Lerner, M. 2003. *Dangerous Waters: Violations of international law and hydropower development along the Sesan River*. Unpublished document. Oxfam America, Phnom Penh.
- Lindholm, M. 2007. Environmental flow - how ecological can it be? *The STRIVER Bulletin 2*: 13.
- Lloyd, R. 2008. Baseline profile of Lumphat Wildlife Sanctuary. Birdlife International in Indochina, Phnom Penh, 69 pp.
- Lor Chandara & F. Quinn 2007. Vietnam Offers To Build Two Hydropower Dams in Ratanakiri. *Cambodia Daily*, July 20, p. 20.
- May Titthara 2009. Kep farmers wait on new dam payouts. *Phnom Penh Post*, January 28.
- McKenney, B. 2001. Economic Valuation of Livelihood Income Losses and other Tangible Downstream Impacts from the Yali Falls Dam to the Se San River Basin in Ratanakiri Province, Cambodia Prepared for Oxfam America. Oxfam America Southeast Asia Regional Office, Phnom Penh.
- Meach Mean 2008. The Lower Sesan 2 Dam: Potential impacts of relocation on affected communities. EarthRight Mekong School, EarthRights International, Stung Treng, Cambodia, November 8.
- MRC 1995. *Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin*, 5 April, Mekong River Commission, Bangkok.
- Meusch, E., J. Yhoun-Aree, R. Friend & S.J. Funge-Smith 2003. The role and nutritional value of aquatic resources in the livelihoods of rural people: A participatory assessment in Attapeu Province, Lao PDR. FAO Regional Office Asia and the Pacific, Bangkok, Publication No. 2003/11, 37 pp.
- MoE 1996. Law on Environmental Protection and Natural Resource Management, November 18, Preah Reach Kram/NS-RKM-1296/36, Ministry of Environment, Phnom Penh, Cambodia.
- MoE 1999. Sub-decree (*Anukret*) on the Environment Impact Assessment Process. Ministry of Environment, Phnom Penh, Cambodia.

- NGO Forum on Cambodia 2005. *Down River. The consequences of Vietnam's Se San River dams on life in Cambodia and their meaning in international law*. NGO Forum on Cambodia, Phnom Penh.
- Nhung, Dang Kim & G.D. Gooch 2007. Need for a strong river basin organisation in Sesan River Basin. *The STRIVER Bulletin* 2: 12.
- Nippon Koei 2008. The Master Plan Study of Hydropower Development in Cambodia. Explanation to NGOs, 15 September.
- Norconsult 2002. Master Plan for Regional Power Interconnections and Power Trade in the Greater Mekong Subregion, Asian Development Bank, Manila.
- Ojendal, J., M. Vikrom, & Mak Sithirith 2002. *Environmental Governance in the Mekong: Hydropower site selection processes in the Se San and Sre Pok Basins*. Stockholm Environment Institute, Stockholm.
- PECC1 2008a. Main parameters of Lower Se San 2 Hydropower Project. Lower Sesan 2 Hydropower Project.
- PECC1 2008b. Draft Policy Framework on compensation allowances and resettlement. General provisions. Lower Se San 2 Hydropower Project, 15 pp.
- Pech Bunnat & H. Rainey 2008. Cambodian vulture conservation project. Annual activities report June 2007 – June 2008, Wildlife Conservation Society, Phnom Penh, 12 pp.
- Poulsen, P. and J. Valbo Jorgensen (eds.) 2000. Fish Migrations and spawning habits in the Mekong Mainstream: A survey using local knowledge (Basin-wide). AMFP Technical Report, Mekong River Commission, Phnom Penh.
- Poulsen A.F., P. Ouch, S. Viravong, U. Suntornratana & N.T Tung 2002. Deep pools as dry season fish habitats in the Mekong Basin. MRC Technical Paper No. 4, Mekong River Commission, Phnom Penh, 22 pp.
- Probe International 2007. Toxic Algae in Vietnam's Second Largest Hydro Reservoir Linked to Illnesses in Downstream Cambodia. Press Advisory, July 5.
- Richter, B.D. & G.A. Thomas 2007. Restoring environmental flows by modifying operations. *Ecology and Society* 12(1).
- Roberts, T.R. & I.G. Baird 1995. Traditional fisheries and fish ecology on the Mekong River at Khone Waterfalls in Southern Laos. *Natural History Bulletin of the Siam Society* 43: 219-262.
- Rutherford, J., K. Lazarus & S. Kelley 2008. *Rethinking Investments in Natural Resources: China's Emerging Role in the Mekong Region*. Heinrich Böll Stiftung Cambodia, WWF Denmark, International Institute for Sustainable Development. Phnom Penh, Copenhagen and Winnipeg, 62 pp.
- Schneider, P. 2007. Best practices in compensation disclosure. Canadian Coalition for Good Governance. www.ccgga.ca
- Schouten, R. 1998. Effects of dams on downstream reservoir fisheries, case of Nam Ngum. *Fish Catch and Culture* 4(2).
- Shoemaker, B., I.G. Baird & M. Baird 2001. *The People and Their River: A Survey of River-based Livelihoods in the Xe Bang Fai River Basin in Central Lao PDR*. Lao PDR/Canada Fund for Local Initiatives, Vientiane, Lao PDR, 79 pp.
- Singh, S., R. Boonratana, M. Bezuijen & A. Phonvisay 2006. *Trade in Natural Resources in Stung Treng Province, Cambodia: An assessment of the wildlife trade*. TRAFFIC, MWBP, Vientiane, Lao PDR.

- Song Chansocheat 2007. Trip Report. Checking vulture nests, reported by commune counterpart. Srae Sranok Village, Sesan District, Stung Treng Province, Cambodia, January 8-12, 2007. MoE, WCS and WWF.
- Stung Treng Provincial Department of Planning 2003. Second Five Year Socio-Economic Development Plan in Stung Treng 2001-2005. Stung Treng Province, Cambodia.
- SWECO Grøner (in association with the Norwegian Institute for Water Research, ENVIRO-DEV and ENS Consult) 2006a. Environmental impact assessment on the Cambodian part of the Se San River due to hydropower development in Vietnam. Prepared for Power Engineering Consulting Company (PECC1), Electricity of Vietnam.
- SWECO Grøner, NIVA, Enviro-Dev and ENS Consult 2006b. Final report: Environmental impact assessment on the Cambodian part of Srepok River due to Hydropower Development in Vietnam.
- Swift, P. 2006. *Livelihoods in the Srepok River Basin in Cambodia: A baseline survey*. NGO Forum on Cambodia, Phnom Penh.
- Thuan Try & M. Chambers 2006. Situation analysis Stung Treng Province, Cambodia. A publication of the Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme, UNDP, MRC, IUCN, GGF, Stung Treng, Cambodia.
- Tiodolf, A.M. 2008. Limnological study of the Se San River in Cambodia: Focus on toxic algae. STRIVER, Norway.
- Viravong, S., S. Phounsavath, C. Photitay, S. Putrea, S. Chan, J. Kolding, J. Valbo Jorgensen, and K. Phoutavong 2006. Hydro-acoustic surveys of deep pools in Southern Lao PDR and Northern Cambodia. MRC Technical Paper No.11, Mekong River Commission, Vientiane. 76 pp.
- VNA [Viet Nam News Agency] 2007. EVN to look at Cambodian power projects. Vietnam News Agency, June 16.
- Vrieze, P. 2009. Foreign banks urge gov't to create resettlement policy. *Cambodia Daily*, February 24.
- WCD [World Commission on Dams] 2000. *Dams and Development: A New Framework for Decision-Making*. Report of the World Commission on Dams. Earthscan Publications, London, UK. 356 pp.
- WHO [World Health Organisation] 2001. Fact Sheet on Arsenic in drinking water, World Health Organisation. <http://www.who.int/mediacentre/factsheets/fs210/en/index.html>, accessed February 20, 2009.
- World Bank 2002. Operational Policy on Involuntary Resettlement (OP 4.12). World Bank, Washington D.C.
- WWF Cambodia 2006. Nests of critically endangered vulture species found in Cambodia's Northeast. *The WWF Cambodia Newsletter*, Oct-Dec, 1(4): 1.
- Wyatt, A.B. & I.G. Baird 2007. Transboundary impact assessment in the Sesan River Basin: The case of the Yali Falls Dam. *International Journal of Water Resources Development* 23(3): 427-442.

