3S Rivers Under Threat

Understanding New Threats and Challenges from Hydropower Development to Biodiversity and Community Rights in the 3S River Basin

April 2012

Mark Grimsditch

3S Rivers Protection Network

INTERNATIONAL RIVERS
people • water • life

3S Rivers Under Threat

Understanding New Threats and Challenges from Hydropower Development to Biodiversity and Community Rights in the 3S River Basin

April 2012

Mark Grimsditch

3S Rivers Protection Network

INTERNATIONAL RIVERS
people • water • life

About 3S Rivers Protection Network

The 3S Rivers Protection Network (3SPN) is a local civil society organization that works to support communities affected and threatened by hydropower dam construction on the Sesan, Srepok and Sekong rivers in northern Cambodia.

About International Rivers

International Rivers is a non-governmental organization that protects rivers and defends the rights of communities that depend on them. International Rivers works to stop destructive dams and promote water and energy solutions for a just and sustainable world.

Acknowledgments

This report was made possible by the generous support of Oxfam Australia. Special thanks to Oxfam-Brett Eloff, LICADHO, and the Foundation Towards Ecological Recovery and Regional Alliance (TERRA) for permission to use their photos and maps.

Authored by

Mark Grimsditch
markgrimsditch@gmail.com

Published by 3S Rivers Protection Network and International Rivers

3S Rivers Protection Network
P.O. Box 89007
Village 4, Banlung Town
Ratanakiri, Cambodia
Tel: +855 75 974 112
3spn.org

International Rivers
2150 Allston Way, Suite 300
Berkeley, CA 94704-1378 USA
Tel: +1 510 848 1155
Fax: +1 510 848 1008
Internationalrivers.org

Design and Printing by Wanida Press, Thailand

Front and Back Cover Photos: Oxfam-Brett Eloff

3S Rivers Protection Network

INTERNATIONAL RIVERS
people • water • life

Contents

Abbreviations and Acronyms

3S	Sesan, Sekong and Srepok rivers
ADB	Asian Development Bank
BOT	Build-Operate-Transfer
CNMC	Cambodian National Mekong Committee
CSG	China Southern Power Grid
CTL	Cambodia Transmission Ltd.
CUPL	Cambodia Utilities Pte. Ltd.
DTA-CLV	Development Triangle Area of Cambodia-Laos-Vietnam
EdC	Electricité du Cambodge
EdL	Electricité du Laos
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EVN	Electricity of Vietnam
EVNI	EVN International Joint Stock Company
GMS	Greater Mekong Subregion
HSAP	Hydropower Sustainability Assessment Protocol
IEE	Initial Environmental Evaluation
IRC	Inter-Ministerial Resettlement Committee
JICA	Japan International Cooperation Agency
KCC	Key Consultants Cambodia
MIME	Ministry of Industry, Mines and Energy
M-IWRM	Mekong Integrated Water Resources Management Project
MoE	Ministry of Environment
MOU	Memorandum of Understanding
NGO	Non-Governmental Organization
NMC	National Mekong Committee
NSDP	National Strategic Development Plan
NTFP	Non-timber forest products
PECC1	Power Engineering Consulting Joint Stock Company N°1
PID	Project Information Document
RCC	Rivers Coalition in Cambodia
RPTCC	Regional Power Trade Coordinating Committee
SIDA	Swedish International Development Cooperation Agency
TA	Technical Assistance
WUP	Water Utilization Programme

ha	Hectare
km	Kilometre
kV	Kilovolt
kWh	Kilowatt hour
MW	Megawatt

Executive Summary

The Sesan, Srepok and Sekong (3S) river basins currently stand at a crossroads. With more than 20 hydropower projects already built or under construction on the 3S rivers, plans to build 26 more dams threaten the rivers that are shared between Vietnam, Cambodia and Laos. Vietnam's hydropower development has been most extensive to date and has already taken its toll on the health of the Sesan and Srepok basins in the Central Highlands of Vietnam and downstream in northeastern Cambodia. Despite the harm these projects have had on the rivers' biodiversity, fisheries and the livelihoods of tens of thousands of affected people, Cambodia is now pursuing ambitious plans of its own to push forward development of hydropower projects along the 3S rivers, and Laos is in the process of developing its own generating capacities on the Sekong.

The 3S river system is a major tributary of the Mekong River, and the basins are widely recognized for their biological importance, rich ecosystems and key fish migration routes. Millions of people's lives are closely connected to these rivers, and their rich natural resources support the livelihoods of fishers, farmers and those who make a living by collecting non-timber forest products. More than 20% of the area has been designated as protected areas, including the Lumphat Wildlife Sanctuary and the Virachey National Park in Cambodia. Additionally, many of the basin's deep pools have been recognized as Fish Conservation Zones, as the three rivers support diverse fish and aquatic resources. However, current plans to develop large-scale hydropower projects in Cambodia, and the on-going development and expansion of hydropower in southern Laos and central Vietnam, threaten to drastically alter the ecology of the rivers. This is likely to have devastating impacts for those whose livelihoods are connected to the basin and its resources.

Map of the 3S Rivers Basin

Over recent years, electricity demand in both Vietnam and Thailand has risen sharply, while demand in Cambodia and Laos has also continued to climb, though at a slower rate. This has led to power shortages in all four countries, but also the realization that untapped water resources in Cambodia and Laos may be utilized to generate power both for domestic use and for the region. In addition to the policies and strategies of these countries to meet their own domestic needs and benefit from power sales to neighbours, external actors are also playing a key role in the development of hydropower in the area. Due to a lack of local capacity in Laos and Cambodia to develop large-scale hydropower, both foreign private and state-owned companies have moved into the picture and are developing projects under lengthy Build-Operate-Transfer agreements. In addition, international financial institutions such as the Asian Development Bank are providing support to develop links in regional power connection.

The construction and operation of existing large-scale hydropower dams in the upper reaches of the 3S rivers in Vietnam has already had severe negative impacts on downstream communities in both Vietnam and Cambodia through decreased fish stocks, erratic water fluctuations, and changes in the quantity and quality of water. These combined impacts have made it more difficult for people downstream to meet their daily food and income needs. There is now growing pressure to construct more than 26 new hydropower projects in the 3S basins, threatening sections of the rivers which are still largely intact. If built, these dams will alter the basins' natural resources through changes in water flows, water quality, land use and forest cover, blocking important fish migration routes and altering the aquatic habitat required for the spawning and feeding of fish. This in turn could disconnect people from their traditional livelihoods and forms of resource management, which would have serious economic and social implications on future environmental sustainability, landscape quality and biodiversity. Due to the close vicinity of many of these planned projects to the Mekong River and the important role the 3S rivers play in maintaining the Mekong River's abundant fisheries and nutrient rich sediment flows, the impacts of some of these projects are likely far-reaching and particularly destructive to the Mekong River mainstream.

The Sesan River is already heavily dammed in Vietnam, and although hydropower has yet to be developed on the Cambodian side of the border, there are two projects currently at the feasibility stage, in addition to the 400 megawatt (MW) Lower Sesan 2 Dam that was approved in early 2011. The Sekong River is still largely free-flowing, though Laos has plans for 22 large-scale hydropower developments along its course in the south of the country. Additionally, it was announced in late 2011 that Cambodia was considering the feasibility of a dam on the Lower Sekong on the Cambodian side of the border. On the Srepok River, a number of dams are now under construction and operational in Vietnam, and two projects are at the stage of feasibility study in Cambodia.

This report will focus on the largest hydropower projects proposed, planned and approved on the 3S rivers within Cambodia. They are:

- The Lower Sesan 2 (400 MW), Lower Sesan 1/5 (96 MW) and Lower Sekong (190 MW) hydropower dams, which are being developed or studied by the Vietnamese state power company, *Electricity of Vietnam (EVN)*.
- The Lower Srepok 3 (300 MW) and the Lower Srepok 4 (220 MW), both of which are under feasibility study by the Chinese state-owned company, *Huadian*.
- The Lower Sesan 3 (375 MW) which is being studied for feasibility by, *Korea Cable Co. Ltd. (KTC)*, a Korean company.

In total, the six dams discussed in this report have a combined potential capacity of over 1,500 MW. There are also a number of smaller dams planned for tributaries of the 3S rivers, such as the Prek Liang 1 (64 MW) and Prek Liang 2 (64 MW), which are located on the O'Tapob tributary of the Sesan River. These smaller dams are not covered by this report.

A man traveling down the Sesan River. Photo: TERRA

Information related to all of the projects covered in this report has proved difficult to access. This is with the exception of the Lower Sesan 2 Dam, as this project has been subject to much debate, and an environmental impact assessment (EIA) was first made public in mid-2008. As the first large-scale dam to be approved in the northeast of Cambodia, the Lower Sesan 2 has attracted considerable attention due to concerns about its potentially major negative environmental and social impacts. The dam is expected to flood an area of at least 334 km^2 and lead to the relocation of thousands of families. It is reported that the final approval of the dam in early 2011 was pushed through after the Vietnamese Government pressed Cambodia to hasten the approval process. Information on the other dams has at times been extremely difficult to obtain, and a large amount is sourced from media reports rather than official documents and statements, as these are not publicly available. It is known, however, that the Lower Sesan 3 threatens to flood an even larger area than the Lower Sesan 2 (more than 420 km^2), and that the Lower Srepok 3 and 4 will both be located in protected areas and will also create potentially huge reservoirs. These projects, as well as the Lower Sekong dam, have not yet reached the EIA stage and local communities have yet to be properly consulted.

As none of the proposed large-scale hydropower projects in the 3S area of Cambodia are yet to be constructed, it is still not clear what the full extent of the impacts are likely to be. However, several studies have raised concerns that the projects as currently proposed are likely to have serious and far reaching social and environmental consequences. Future scenarios can also be extrapolated from the lessons learned and impacts experienced in the 3S region due to the Yali Falls dam and other hydropower projects already constructed and operating upstream in Vietnam. This includes drastically reduced fish stocks, changes in the quality and quantity of water flows, and unpredictable surges that have resulted in destruction to property and even loss of life. Cambodia's proposed 3S dams are all located in relatively flat areas, which means the reservoirs created by these projects are likely to be extremely

large. The flooding caused by these reservoirs will inundate a huge amount of land and lead to forest and habitat loss, causing serious challenges to the area's biodiversity and local people's livelihoods. They will also claim the agricultural and residential land of thousands of Cambodians, including a sizable population of indigenous people. The exact impact of blocking fish migration on the Sesan and Srepok Rivers is still disputed, but it is clear that this will cause a number of species to disappear entirely from upstream of the dams. This has implications for tens of thousands who rely on fisheries for their livelihoods, both upstream and downstream. A number of scientists have claimed that the dam will interfere with fish migrations as far away as the Tonle Sap Lake and the Mekong Delta in Vietnam, however, the Cambodian Government disputes this claim.

In order to maintain the impressive growth rates of the last decade and capitalize on private sector interest in investing in Cambodia, legal and regulatory processes are often over-looked or only partially implemented. Both inside and outside the hydropower sector, there are numerous examples of projects that have been approved in the absence of an EIA, or when the EIA process is still on-going. In other cases, such as the Lower Sesan 2, although the EIA was completed in a timely manner and for the most part in compliance with Ministry of Environment standards, the final product was far below international standards. This is despite the fact that this is one of Cambodia's largest foreign investment projects and is to be developed by a company with decades of experience in the hydropower sector. After initially signing a memorandum of understanding with the Cambodian Government to study the feasibility of the project in 2007, the company went on to commission an EIA during the first half of 2008. The process of consultation was criticized by a number of civil society organizations and members of affected communities, as for the most part only those in close proximity to the actual dam site were consulted, and many of those who were consulted felt that they were not given adequate information. The EIA report published in 2008 was viewed by a number of observers as taking inadequate consideration of impacts on fisheries beyond the project area, and failed to adequately

Traditional fish traps used on the Srepok River

consider the cumulative impacts of the various hydropower projects proposed for the region. After several rounds of minor revisions, the EIA was officially approved in June 2010 and the project was approved in early 2011.

The process and quality of environmental impact assessment in Cambodia has been subject to criticism for a number of years, but there are now on-going discussions and activities that aim to improve capacity of officials in monitoring EIAs and also to develop this area of Cambodia's legal framework. However, there is still much work to do, especially in terms of raising awareness of the private sector and some officials and government ministries about the importance of high quality EIAs and full public participation. As stated by a Director from Cambodia's Ministry of Environment: "[t]he need for environmental assessment in Cambodia is still widely considered as secondary to the need for development. The significance of EIAs is not fully recognized by, for example, many of the government ministries responsible for infrastructure or industrial and agricultural development."[1]

Aside from the policies and agendas of the governments and developers discussed here, there are a number of additional actors with a stake in the development of hydropower in the wider 3S area. The Asian Development Bank (ADB) has been engaged in the Mekong region for a number of years, during which time it has supported a number of projects in Cambodia, Laos and Vietnam related to hydropower development and power transmission. This includes studies in the 3S region in 1999 and 2008, and funding for feasibility study of the Sesan 3 dam in Vietnam. Through the Greater Mekong Subregion (GMS) Program, the ADB is now supporting development of transmission lines to facilitate regional power sharing. This includes support for preparing a high voltage line connecting southern Laos to central Vietnam. This transmission line will provide the connection between southern Laos' extensive proposed network of hydropower plants and the Central Highlands of Vietnam. The ADB also has also funded Technical Assistance (TA) for power trading in the region, which aimed to update the regional master plan for power trade amongst the GMS countries.

Although the ADB may no longer be directly connected to any dam projects in the 3S region, its decision to support these transmission lines clearly feeds into the on-going development of hydropower projects in Laos, as without these dams, there would be no need for the transmission lines, and without the transmission lines, the feasibility of these hydropower projects would be questionable. Until recently, the World Bank was also supporting projects in the GMS program, including support for a 230 kV transmission line from southern Laos to Cambodia. However, this project has since been cancelled.

In addition to hydropower development in Cambodia's northeast, there are also a number of large mining concessions, and numerous economic land concessions (land granted for large scale agriculture) in the 3S area. Not only is there a lack of information and understanding of the likely long-term cumulative impacts of hydropower in the 3S area, but it is also unclear how these other industrial developments will factor in. If large scale mining does start up in the region, and when the many ELCs in the area reach full scale production, water resources will be stretched further, and pollution is likely to be a major concern. No doubt increased access to power in the area will stimulate increased investment. Although this may boost the local economy, if on-going trends are anything to go by, it will also lead to an increase in land conflicts as more concessions are granted and more development projects become operational. If one key recommendation should come from this report, it is that more information needs to be gathered as to the full impacts of hydropower development in the area, and this information must be made publicly accessible. All actors, including affected communities, local and national authorities and decision makers, developers, financiers and civil society, must gain a deeper understanding of the benefits and dangers of the current development model, and take appropriate action, before it is too late.

---

[1] Sam Chamroeun, Dept. of Environmental Planning and Legal Affairs, Ministry of Environment, *Cambodia Water Resource Development: A review of the existing policy and legislative framework*, 2007 (p10).

KEY EXISTING AND PROPOSED DAMS IN THE 3S RIVER BASINS

Introduction

The Sesan, Srepok and Sekong (3S) rivers basin is a major tributary and watershed of the Mekong River and is located in the countries of Vietnam, Cambodia and Laos. Throughout Cambodia and Laos many people live close to river systems and are highly dependent on the rivers' rich natural resources for their survival. The 3S basin supports nearly 3.5 million people, many of whom are ethnic minorities.[2] The area has been recognized for its biological importance due to its rich aquatic and terrestrial ecosystems, with over 20 percent of the basin currently designated as protected areas, including the Lumphat Wildlife Sanctuary and the Virachey National Park in Cambodia. Many of the basin's deep pools have been recognized as Fish Conservation Zones, as the three rivers support diverse fish and aquatic resources. Studies have identified more than 133 fish species in the Sesan, 204 species in the Srepok and 214 species in the Sekong.[3]

The majority of the 3S region's people depend on fishing, agriculture and collecting non-timber forest products (NTFPs) for their livelihoods[4] – for many thousands of people, the health of the rivers is central to their survival. However, recent years have seen an emphasis on developing large-scale hydropower along all three rivers, which threatens to drastically alter the ecology of the area and is likely to have devastating impacts for those whose livelihoods are connected to the basins' resources. The construction and operation of 20 large hydropower dams in the upper stretches of the 3S rivers in Vietnam has already had severe negative impacts on local communities in Cambodia through decreased fish stocks, erratic water fluctuations, and reduced water quality, which combined have made it more difficult for people to meet their daily food and income needs.[5] There is growing pressure to construct more than 26 new hydropower projects in the 3S basins, threatening large lengths of the river which are still largely intact. If built, these dams will alter the basin's natural resources through changes in the region's water flows and quality, land use and forest cover, and would block important fish migration routes and change aquatic habitat required for the migration, spawning and feeding of fish. This in turn could disconnect people from their traditional livelihoods and forms of resource management, which would have serious economic and social implications on future environmental sustainability, landscape quality and biodiversity.

Until recently the majority of the 3S region's hydropower plants were concentrated in Vietnam along the upper reaches of the Sesan and Srepok rivers, and most were developed by the Vietnamese state power company, *Electricity of Vietnam (EVN)*. More recently, new projects have been proposed in Cambodia, and the pace of approval and construction of dams in southern Laos has also picked up pace. In addition to *EVN* involvement there are now new actors moving into the sector, including Chinese state-owned companies and private enterprises from Korea and Russia. International financial institutions have become important players in the bigger picture of regional power sharing, with the Asian Development Bank and the World Bank committing significant funds to supporting the construction of high voltage transmission lines, with the eventual aim of creating a regional power grid. Plans are already underway in the 3S area to connect proposed hydropower plants to these transmission lines.

---

[2] 3S Rivers Protection Network (3SPN), *Civil Society's Reflection of Past and Present Hydropower Development in the 3S Rivers Basin Paves Concern Over Future Development Plans*, 31 May 2010.

[3] ADB-RETA 40082, *3S Technical Sheets Key Topic 5 – Biodiversity and natural resources*. http://reta.3sbasin.org/index.php?option=com_docman&Itemid=184&lang=en (accessed November 2011).

[4] ADB-RETA 40082, *3S Technical Sheets Key Topic 7 – People and livelihoods, 8a Hydropower Development*. http://reta.3sbasin.org/index.php?option=com_docman&Itemid=184&lang=en (accessed November 2011).

[5] Rutkow, E. et al. *Down River: The Consequences of Vietnam's Se San River Dams on Life in Cambodia and Their Meaning in International Law*. NGO Forum Cambodia, December 2005.

Bathing in the Sesan River. Photo: Oxfam-Brett Eloff

A number of studies have been conducted into the impacts of the area's existing dams, which have raised a number of serious concerns regarding their negative impacts on the environment and local communities. For more than a decade, these reports have documented how downstream communities on the Sesan River, and more recently on the Srepok River, in Cambodia have suffered from a cascade of seven dams built upstream in Vietnam. As many of the riparian communities in the region depend upon the river's fisheries and surrounding natural resources for their livelihoods and food security, the development of hydropower has increased poverty and hardship for many of these communities, due to depleted fish stocks, erratic water fluctuations and worsening water quality. Despite these well documented impacts, communities in Cambodia have never received remedy for the hardships experienced as a direct consequence of Vietnam's upstream hydropower activity.

Despite the impacts identified in the planning, approval and implementation of existing hydropower projects in the 3S area, there are concerns that the same mistakes are set to be repeated. As illustrated in this report, the push to approve and develop projects continues to take priority over serious analysis of the full impacts of individual projects, and there is an almost total absence of serious consideration of the cumulative impacts that the more than 46 hydropower projects are likely to have on the region. This lack of adequate analysis is exacerbated by the fact that hydropower planning and development continues to be considered a sensitive issue in the basin, consultation with affected communities is generally poor, and detailed and reliable information often inaccessible.

The effect of this lack of transparency is that those most likely to be impacted by these developments have very little awareness of the potentially life changing decisions that are currently being made without their input. Not only are communities in the dark about plans for the area, civil society and development partners working on community development, livelihood improvement and environmental protection remain unaware of how their projects are likely to be affected. Staff from the government's technical agencies, such as the fisheries and forestry administrations, are also beginning to quietly

Watering riverside gardens in Ta Veng district on the Sesan River.
Photo: Oxfam-Brett Eloff

voice their own frustrations at not being adequately consulted in the study and approval of these projects.

In order to better understand the challenges confronting the region's natural resources and its people, there is a need to identify and analyse the changes currently occurring in terms of the actors involved, the factors driving new developments, and the trends occurring throughout the hydropower planning and approval process. Once the new challenges confronting the region are better understood, civil society will be able to understand how to better engage with these new actors and provide more effective responses to the problems faced. For the most part focussing on Cambodia, this report aims to explore the actors involved in projects affecting the 3S rivers, and what factors are driving hydropower expansion in the area. It provides updates on the largest and most advanced projects proposed and the main impacts that can be expected to result from increased hydropower development in the basin. It is hoped that the report will fill crucial information gaps and promote discussion amongst all stakeholders, including affected communities and the wider Cambodian population, government and decision makers, project developers, and civil society.

Section 1

Hydropower slated to fuel regional growth

The three countries that share the 3S basin are all currently experiencing power shortages. Both Cambodia and Laos still have undeveloped generation and transmission capacity, and Cambodia in particular has a significant shortfall, which requires the country to import a large amount of its power from neighbouring countries. The remainder is generated domestically using expensive imported diesel fuel. Laos has been developing its hydropower capacities for a number of years, and has recently accelerated development in the south of the country. Likewise, Cambodia is pushing ahead with rapid development of its hydropower sector in order to meet its expanding energy needs. Vietnam's power generating capacity is significantly more developed than that of its neighbours, and the country has already commissioned a number of large scale hydropower dams, including the 720 MW Yali Falls Dam in the upstream of the Sesan River in Vietnam. However, rapid development in Vietnam has led to huge demand for power, which at present cannot be met by domestic power generation alone. For this reason, Vietnam is planning to fund and construct a number of dams in neighbouring Cambodia and Laos, with the intention of supplying a portion of the generated power to local markets and exporting the excess back to the national grid of Vietnam. Thailand has also stated that it has insufficient power to feed its domestic demand, and has signed agreements for exports of power from Laos.[6]

A large number of foreign private and state-owned companies have shown an interest in developing hydropower projects in Cambodia and Laos, as the technical and financial capacity to build these types of projects does not yet exist domestically. In most cases, these companies are negotiating Build-Operate-Transfer contracts of 25 years and up, and with energy demand increasing so rapidly, developing these projects has the potential to be highly profitable.

1.1 Cambodia

At present the Cambodian energy sector has insufficient capacity to meet domestic demand for power. Only 26% of the country is currently connected to the power grid, and those that are connected have to pay extremely high prices – in urban areas the costs are sometimes double that of neighbouring countries, and in rural areas even higher.[7] These electrification levels are amongst the lowest in

---

[6] It should be noted that in a 2006 report, it was claimed that the Thai Load Forecast Subcommittee has a "historical and persistent tendency to overestimate future demand". Greacen, C. & Footner, J. *Decentralizing Thai Power: Towards a Sustainable Energy System.* Greenpeace Thailand & Palang Thai, November 2006.

[7] World Bank website, *Cambodia: Villagers Enjoy Cheaper, Reliable Electricity*, 25 February 2011. http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CAMBODIAEXTN/0,,contentMDK:22842900~menuPK:293861~pagePK:2865066~piPK:2865079~theSitePK:293856,00.html (accessed November 2011).

Southeast Asia, and in rural areas less than 13% of households are connected to the grid.[8] Phnom Penh consumes around 90% of the country's electricity, despite only having 10% of the country's population.[9] In all parts of the country power cuts are common, and this expensive and unreliable energy supply not only impacts on the quality of life of Cambodians, but is often cited as a disincentive to potential investors.

In addition to the shortfall in supply, Cambodia's current power generation is very unclean, and at present the majority of the country's energy generation facilities produce electricity by burning diesel fuel. According to an official from the Ministry of Mines, Industry and Energy (MIME), more than 90% of Cambodia's total installed capacity in 2009 was generated by power plants using imported diesel fuel.[10] Because of the shortfall in electricity supply and the high cost of running diesel power plants, Cambodia imports a large amount of electricity from Thailand and Vietnam. In 2009, Cambodia reportedly spent US$59 million on imports from these two countries,[11] and in 2010 imports reached more than 40% of the country's total supply.[12]

Electricity demand has grown steadily over the past few years, and this increase is predicted to continue – although, reliable figures are difficult to obtain. One report based on data supplied by MIME put the local demand in 2010 at just over 430 MW. This was predicted to rise to 1,349 MW by 2015, and to 2,401 MW by 2020.[13] An ADB technical report from 2010 projects demand in the same years as 467 MW, 1,008 MW, and 1,610 MW.[14] It remains to be seen how accurate these figures are, but it is clear that Cambodia needs to improve its domestic capacity for power generation. In order to meet domestic demand, Cambodia is looking to attract private companies to develop energy generation facilities and energy transmission infrastructure. A number of coal fired power plants have recently been approved, and the government is pushing strongly for the development of the country's hydropower potential to be developed. At present one large hydropower dam, the Kamchay (193 MW) has been built and is now operation in Kampot province. There are four more hydropower projects under development, Stung Tatay (246 MW) in Pursat, and the Kirirom 3 (18 MW), Lower Russei Chrum (338 MW), and Stung Atay (120 MW), all located in Koh Kong province. Chinese companies are responsible for construction of all five of these projects, which have a combined cost of over US$1.6 billion, and have a combined capacity of over 900 MW.[15]

Cambodia's development strategy is guided by the "Rectangular Strategy for Growth, Employment, Equity and Efficiency." In terms of energy, the strategy calls for developing low-cost electricity supplies in order to sustain Cambodia's economic growth. This is to be achieved through promoting private sector participation in electricity production and distribution and supporting power transmission grids to facilitate electricity imports from neighbouring countries. This strategy was updated in 2009 by

---

[8] Presentation by Victor Jona, General Department of Energy of the Ministry of Industry, Mines and Energy, *Cambodia Energy Status and its Development*, 16 March 2011. http://www.cdri.org.kh/oc2011/11energy.pdf (accessed November 2011).

[9] Presentation by Chea Piseth, Hydroelectricity Department of the Ministry of Industry, Mines and Energy, *National Power and Hydropower Development Plans in Cambodia*, 16-17 July 2009. http://www.icem.com.au/documents/envassessment/mrc_sea_hp/1.%20inception/presentations/cambodia%20scoping%20workshop/pdf/National%20Power%20and%20Hydropower%20Development%20Plan%20in%20Cambodia.pdf (accessed November 2011).

[10] *Ibid.*

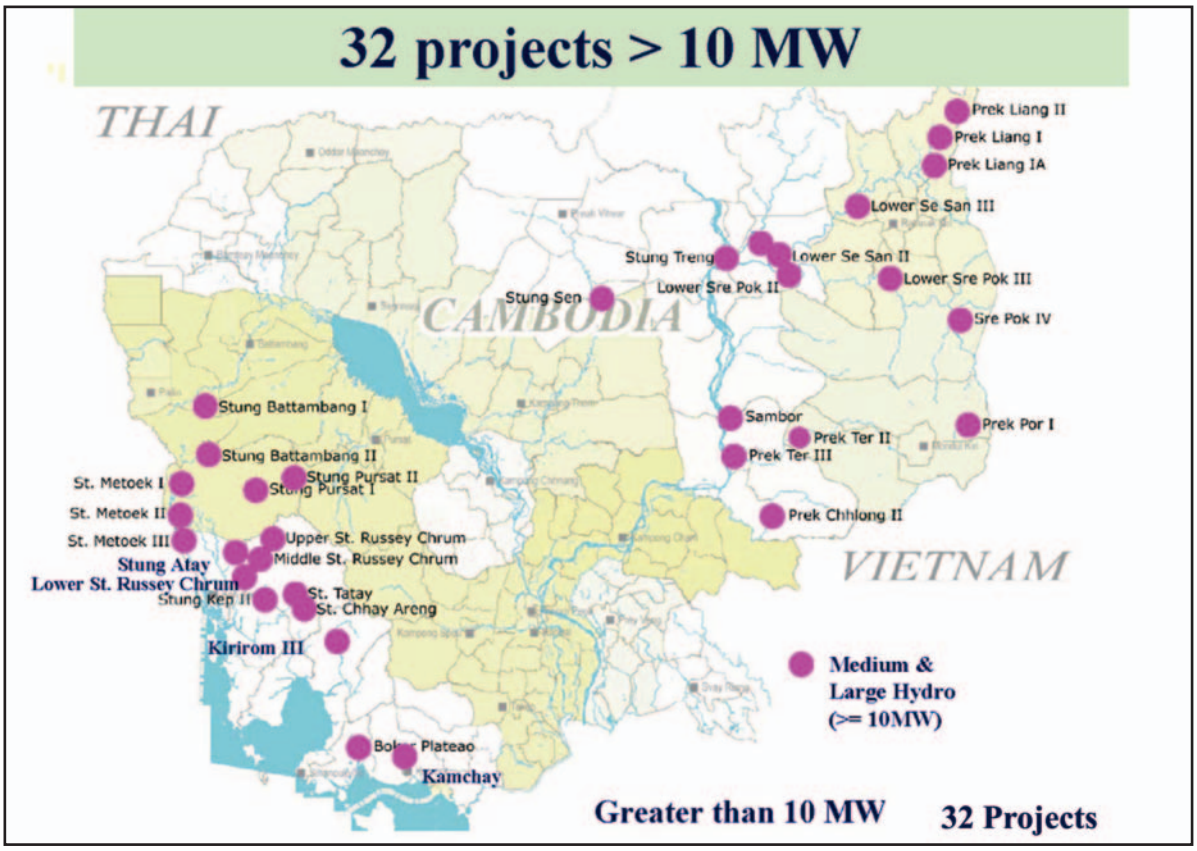
[11] Xinhua News Agency, *Cambodia spends 59 mln USD to import electricity in 2009*, 14 March 2010.

[12] Presentation by Victor Jona, 16 March 2011.

[13] MIME demand forecast, as reported by Economic Consulting Associates, *The Potential of Regional Power Sharing Integration: Greater Mekong Subregion Transmission and Trading Case Study*, January 2010, (p87).

[14] Asian Development Bank, *RETA 6440: Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion*, Final report - Component 1, Module 1: Update of the GMS Regional Master Plan, executive summary, 15 October 2010 (p25).

[15] http://www.investincambodia.com/power.htm (accessed November 2011).



Key Existing and Planned Dams in Cambodia. Source: MIME 2008

the National Strategic Development Plan (NSDP) for 2009-2013, which reiterates that the development of the energy sector is a key priority and sets objectives to increase electricity supply capacity and reduce costs. During the period of the NSDP 2009-2013, the Government aims to:[16]

- increase electricity supply capacity and reduce tariffs while strengthening institutional mechanisms and management capability;
- ensure reliability of electricity supply in order to facilitate and attract investment and to foster economic development;
- develop policy, legal and regulatory framework for the energy sector to ensure efficient management and utilisation of resources for economic development and to improve livelihoods; and
- encourage the efficient use of energy with minimal impacts on the environment.

The NSDP also sets out the role of MIME in working towards meeting electricity demands. This includes: promoting exploration of energy sources such as hydropower; ensuring confidence and stability in electricity supply; encouraging the efficient use of energy and mitigating adverse effects on the environment; encouraging the private sector to invest in the energy sector; and, promoting regional energy trade through bi- and multi-lateral cooperation.[17] The government has set targets of electrifying 100% of villages by 2020, and of providing grid-quality electricity supplies to 70% of households by 2030.[18] Hydropower figures heavily in the plan to achieve these goals, and this is reflected in the statements and policy of the Cambodian Government.

---

[16] Royal Government of Cambodia, National Strategic Development Plan Update 2009-2013, (p149).

[17] *Ibid*. (p149-150).

[18] Cambodian Government's Rural Electrification Fund website, http://www.ref.gov.kh/eng/index.php?fn=home.htm (accessed November 2011).

In numerous statements over recent years, Cambodia's Prime Minister, Samdech Hun Sen, has expressed strong support for developing Cambodian hydropower. For example, in a speech in Kratie in 2008, the Prime Minister stated:

> The provinces of Stung Treng, Ratanakiri and Mondulkiri, but also some parts of Kratie and Preah Vihear could become the 4th economic zone after Phnom Penh, Sihanoukville and Siem Reap. The potential we have here in the northeast is tangibly great. We could pick one to mention here – the hydropower station, which could provide electricity not only for local and internal markets but also to neighbouring countries as well.[19]

The Prime Minister has also stated that developing hydropower will lower the cost of electricity and in turn reduce the cost of doing business in Cambodia.[20] Available data and statements on Cambodian hydropower development show that the country's plans are ambitious. According to a 2009 presentation by the State National Economic Council, Cambodia aims to reduce its reliance on electricity imports and on electricity generated by diesel, and by 2020 will have access to electricity supplies of 6,000 MW, with 68% of this amount generated by hydropower.[21] A 2007 study by the Japan International Cooperation Agency (JICA) identified that in addition to 4 sites where projects were already committed, there were a further 29 potential sites for hydropower dams. Many of these potential sites are now under feasibility study, and a number have already been approved.[22]

1.2 Vietnam

At present, the biggest investor in hydropower in the 3S area is Vietnam. Of the six projects discussed later in this paper, the Lower Sesan 2, Lower Sesan 3, Lower Sesan 1/5, Lower Srepok 3 and 4, and the Lower Sekong, three are set to be developed by the state power company, *Electricity of Vietnam (EVN)*. Vietnam's interest in hydropower in northeast Cambodia is not surprising when one considers the geographical location of the 3S area, sitting across the border adjacent to the Central Highlands of Vietnam. The close proximity of the hydropower sites in Cambodia (and in southern Laos) means that it is feasible to export the power back into Vietnam. Vietnam also shares close political ties with the governments of both Cambodia and Laos.

Economic development in Vietnam has driven a huge growth in demand for electricity and between 1990 and 2008, power generation increased fourfold. The country's 2006-2020 Power Development Plan projects electricity demand to grow at 11% per year between 2011-2015 and 9% between 2016-2020.[23] According to *EVN*, during peak hours Vietnam has an electricity shortfall of 1,500 to 2,000 MW, which is resulting in regular power cuts.[24] This power shortage is predicted to continue through 2013 and 2014.[25] This ever-increasing demand for electricity has severely stretched the Vietnamese state power suppliers, and in order to relieve power constraints, the country is importing power from

---

[19] Cambodia New Vision: Issue 123, April 2008, available at http://www.cnv.org.kh/cnv_archives/cnv_archives.htm (accessed November 2011).

[20] Cambodia New Vision: Issue 149, July 2010, available at http://www.cnv.org.kh/cnv_archives/cnv_archives.htm (accessed November 2011).

[21] Presentation by Phallan Pann, Deputy Secretary General, Supreme National Economic Council, *Energy Sector in Cambodia*, September 2009. Available at http://cambodia.usembassy.gov/media2/pdf/energy_sector_in_cambodia.pdf (accessed November 2011).

[22] MIME-JICA, internal workshop presentation, *The Master Plan Study of Hydropower Development in Cambodia*, 13 November 2007.

[23] Economic Consulting Associates, *The Potential of Regional Power Sector Integration: GMS Transmission and Trading Case Study*, January 2010 (p71).

[24] Vietnam Financial Review, *Electricity shortfalls: gloom sets in*, 25 March 2011.

[25] Thanh Nien News, *Vietnam set to face serious power shortage in 2013*, 6 October 2010.

China and working to improve its domestic production capacity and production in neighbouring countries.

At an *EVN* conference in 2010, the Vietnamese Minister for Industry and Commerce urged *EVN* to increase the amount of energy produced and purchased in order to meet the country's demands.[26] However, in recent years Vietnam has been gripped by severe water shortages and this has had a huge impact, especially during the dry season, on the country's ability to generate hydropower, which supplies up to 40% of the country's electricity.[27] In January 2011, *EVN* estimated that a serious water shortage of 12 billion cubic meters in hydropower reservoirs may cause a 3 billion kilowatt hour (kWh) energy shortfall in 2011. At the time, the Yali Falls Hydropower Plant's reservoir was 20 meters lower than in previous years.[28] In March 2011, the water level of the reservoir at Yali Falls dropped to only 6 metres, which was a 50 year low, and its output for the first 6 months of 2011 was predicted to be 1-1.1 billion kWh, down from 1.8-2 billion KWh in previous years.[29] Another *EVN* owned hydropower plant in the central highland province of Lam Dong was producing only 9 million kWh per day, despite having a capacity of up to 15 million kWh. In the south of the country, the Tri An hydropower dam was producing the equivalent of 40% of 2010's figures. Some projects even face the prospect of having to go on standby until water levels rise.[30]

Over recent years, central Vietnam has suffered water shortages due to unpredictable weather patterns, but concerns are increasingly being raised that Vietnam's hydropower developments themselves are also contributing to the area's drought. For example, the Upper Kon Tum hydropower project in the

The Yali Falls Dam in Vietnam

[26] Voice of Vietnam News, *EVN urged to meet high demand for electricity*, 17 January 2010.

[27] World Bank website, *Vietnam and Energy*. http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPENERGY/0,,contentMDK:20506969~pagePK:34004173~piPK:34003707~theSitePK:574015,00.html (accessed November 2011).

[28] Saigon Gai Phong Daily, *Vietnam to face power shortfalls in dry season, EVN says*, 18 January 2011.

[29] Dantri International, *Central Highlands facing severe drought*, 3 March 2011.

[30] Saigon Gai Phong Daily, *Water level of hydropower reservoirs alarmingly low: EVN*, 29 March 2011.

Central Highlands has diverted water from the Sesan River to the Dac Snghe River and thus reduced water flow to low lying areas. According to Nguyen Thanh Cao, Chairman of the Union of Science and Technology in Kon Tum Province, this poses a serious threat to ecological diversity and the livelihoods of people living downstream along the Sesan. It has also reduced the power output of a number of other downstream hydropower sites.[31] There are even reports that upstream hydropower dams, unregulated sand dredging and waste water from mining operations are creating "dead rivers" across the Central Highlands.[32] The current state of health of central Vietnam's river systems should provide a warning to both Cambodia and Laos of the potentially disastrous impacts that poorly planned and hasty development of hydropower and other industries could have on the 3S rivers in their countries.

In response to the power shortage and reduced output of its hydropower plants, Vietnam is seeking to make up the shortfall in domestic generation capacity by importing electricity from neighbouring countries. In 2010, the Vietnamese government instructed *EVN* to initiate talks for long-term deals to import power from China and other countries in the region. This included purchasing power for transmission along existing power lines, conducting feasibility for new 500 kV transmission lines connecting Vietnam and China, and to accelerate projects "to tap hydropower sources in Laos and Cambodia as well as hastening construction of a common power line between Vietnam, Laos and Cambodia."[33] In addition to the dams Vietnam has proposed in Cambodia, it is also linked to at least 16 dams in Laos.[34] A 2010 ADB consultant report states that Vietnam's hydropower capacity will be absorbed by domestic power demand by 2025, which provides further impetus for the country to develop new generation and import options.[35]

EVN is already purchasing large amounts of electricity from China, and according to Vietnamese media, in the first two months of 2011 alone, Vietnam purchased 956 million KWh from China, which was an increase of 28% on 2010.[36] Vietnam also has a Memorandum of Understanding (MOU) with Laos for importing power, and with the support of the Asian Development Bank (ADB) has plans to develop transmission lines from Laos and Cambodia connecting its foreign projects to the national grid of Vietnam. According to the Ministry of Industry and Trade for Vietnam, the country plans to invest nearly $50 billion in the power sector in the next 10 years, two thirds of which will be used to build new power plants with the rest used to develop transmission systems.[37]

1.3 Laos

Laos has significant hydropower potential, with the Laos Government estimating its total exploitable potential at around 18,000 MW, although to date only around 2% of this has been exploited over the last 30 years.[38] A 2008 ADB document states that 33 potential sites have been identified and evaluated,

---

[31] Saigon Gai Phong Daily, *Hydropower plants depleting rivers*, 27 May 2011.

[32] Saigon Gai Phong Daily, *Central Highlands rivers dying*, 26 May 2011.

[33] The Saigon Times, *EVN told to start talks for long-term power import*, 5 September 2010.

[34] Cambodia-Laos-Vietnam Development Triangle Portal, *Vietnam, Laos strengthen hydropower cooperation*, 25 November 2010. http://clv-triangle.vn/portal/page/portal/clv_en/819084/823229?p_page_id=819084&pers_id=823688&folder_id=&item_id=8380772&p_details=1 (accessed November 2011).

[35] Asian Development Bank, *RETA 6440: Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion*, Final report - Component 1, Module 1: Update of the GMS Regional Master Plan, executive summary, 15 October 2010 (p25).

[36] Saigon Gai Phong Daily, *Water level of hydropower reservoirs alarmingly low: EVN*, 29 March 2011.

[37] Wall Street Journal Online, *Vietnam plans to raise $48.8 billion for power projects in 2011-2020*, 5 August 2011.

[38] See Powering Progress website, maintained by the Laos Department of Energy Promotion and Development (EPD): *The Energy Sector in Lao PDR*, http://www.poweringprogress.org/index.php?option=com_content&view=article&id=55&Itemid=27 (accessed November 2011).

of which 11 are expected to be developed in the next 15 years with a total output of 4,000 MW. Due to the lack of domestic capacity and financial resources, Laos is encouraging the private sector and foreign companies to invest and develop hydropower projects.[39] Laos has a small population and current domestic power demand is still below 600 MW, and predicted to rise to and stabilize at around 2,900 MW between 2015 and 2020.[40] The majority of power generated will therefore be exported.

Laos has agreements with Thailand to supply 5,000 MW of electricity up to 2015 and at least another 2,000 MW after 2015.[41] In 2008 the Vietnamese government agreed to purchase up to 5,000 MW from Laos by 2020.[42] Cambodia also has an agreement to purchase power from Laos. This agreement was signed in December 2007, and states that *Electricité du Laos* will supply 10 MW from its southern grid to meet local demand across the border. There is a further agreement in place between the two governments for the supply of 200 MW from Laos to Cambodia by 2020.[43] Power is currently exported to Cambodia along a 22 kV line.

Despite the on-going development of large-scale hydropower projects, many areas of Laos still experience power shortages, and in order to meet electricity demands the country has to import power from Thailand. In 2011, the Ministry of Mines and Energy stated that more plants needed to be constructed in order to also meet domestic demand.[44]

1.4 The Greater Mekong Subregion Program

Linked since 1992, the Greater Mekong Subregion (GMS) members are Cambodia, Laos, Myanmar, Thailand, Vietnam and the Yunnan province and Guangxi Zhuang Autonomous Region of China. The GMS strategy covers five main areas: strengthening infrastructure links; facilitating cross-border trade, investment, and tourism; enhancing private sector participation and competitiveness; protecting the environment and promoting the sustainable use of shared natural resources; and, developing human resources and skills competencies.[45]

In addition to the various country policies, bilateral and regional agreements currently in place, the Greater Mekong Subregion (GMS) Program has also been recognized by a number of observers as a key element of the on-going hydropower development occurring in the region. Through the GMS Program the ADB has supported a number of hydropower projects and is supporting regional power sharing infrastructure, and as such continues to play a key role in the development of power generation facilities and regional interconnection.

A key focus of the GMS Program is the energy sector, where its aim is: "to establish a competitive and integrated regional power market that will fully exploit the rich energy resources of the GMS, and help realize the GMS countries' poverty reduction and economic development goals."[46] It is predicted that

---

[39] Asian Development Bank, *Project 41450: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*, August 2008 (para 2).

[40] Vientiane Times, *More power plants needed to meet predicted demand surge*, 27 May 2011.

[41] Nam Theun 2 Power Company (NTPC) website: http://www.namtheun2.com/index.php?option=com_content&view=article&id=54&Itemid=60 (accessed November 2011).

[42] Asian Development Bank, *Project 41450: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*, August 2008 (para 3).

[43] http://www.poweringprogress.org/index.php?option=com_content&view=article&id=49&Itemid=53 (accessed November 2011).

[44] Vientiane Times, *More power plants needed to meet predicted demand surge*, 27 May 2011.

[45] ADB-GMS, *Strategy and Action Plan for the Greater Mekong Subregion Southern Economic Corridor*, 2010 (p1).

[46] ADB-GMS overview brochure, 2010.

developing power trade in the region will provide more affordable and stable power supplies, which in turn will lead to reduced investment costs. This will be achieved through developing policy and institutional framework for power sharing and adopting a master plan for interconnection.[47] One project under the GMS Program is the ADB supported southern Laos-Vietnam transmission line discussed later in this report, along with the World Bank funded southern Laos-Cambodia transmission line. Through the GMS Program, its members aim to support the establishment of a regional power grid, consolidating regional energy sectors and opening the regional power sector to private investment.[48]

As illustrated later in this report, high-voltage transmission lines are crucial to the viability of large-scale hydropower development. In Cambodia and Laos, which are both significantly less developed than Vietnam, transmission lines are needed for domestic power transmission and connecting hydropower projects to population centres. In addition, high voltage transmission lines are needed in order to export excess power generated in Cambodia and Laos to the neighbouring countries of Vietnam and Thailand. Put simply, without the impending expansion of hydropower in southern Laos and Cambodia, there would be no need for high voltage transmission lines, and without the lines, power exports would be impossible. Therefore, the ADB is playing a crucial role in the expansion of hydropower in the 3S area.

In comparison to its neighbours, Cambodia is a new player in the hydropower sector, after its first large-scale plant at Kamchay, in the southern province of Kampot, went online in December 2011. The JICA study referenced earlier identified 29 potential large-scale hydropower projects in Cambodia, nine of which are in the 3S basin.[49] In the following section, five of these proposed sites, and an additional site on the Cambodia-Vietnam border, are discussed in more detail.

The Kamchay Hydropower Project in Kampot, Cambodia. Photo: Mark Grimsditch

[47] *Ibid*.

[48] For more see: Both Ends Environmental and Development Service, *The ADB Support for Hydropower Dams and Power Grid – ADB and the Greater Mekong Subregion Program*. http://www.bothends.org/uploaded_files/hydropower-FINAL-1.pdf (accessed November 2011).

[49] The potential sites are: Lower Sekong, Lower Sesan 2 and Lower Srepok 2 (these have since been combined into a single dam), Lower Sesan 3, Lower Srepok 3, Lower Srepok 4, Prek Liang 1, Prek Liang 1A, and Prek Liang 2.

Section 2

Transforming the 3S Rivers in Cambodia

This section of this report provides background on some key hydropower projects proposed for the 3S area, including project details, their status, the process of approval and consultation so far, and information on the developers involved. This includes six proposed dams: the Lower Sesan 2, Lower Sesan 3, Lower Sesan 1/5, Lower Srepok 3 and 4, and the Lower Sekong.[50] There also follows a breakdown of available information on the main transmission lines that may connect these dams to the proposed Cambodian energy grid and to neighbouring countries.

In 2003, the Cambodian Ministry of Industry, Mines and Energy (MIME) and the Cambodian National Mekong Committee (CNMC) prepared a National Sector Review for hydropower, which identified 60 possible sites for hydropower development in the country. The same study estimated the country's total hydropower potential at 10,000 MW, of which 50% is on the mainstream Mekong, 40% on its tributaries and 10% in the southwest outside the Mekong basin. In a list of long term development plans for Cambodian hydropower, the review includes the Lower Sesan 2, Lower Sesan 3 and Lower Srepok 3 as priority projects.[51]

The following project summaries are in places incomplete, and although a number of official documents are referenced, in places they draw heavily on media sources to fill information gaps. This is unsurprising considering the lack of openness and access to information that has become a trend in Cambodian hydropower development. If the Cambodian energy sector is to be developed in a way that maximizes positive outcomes and minimizes harms to the environment and affected communities, increased transparency is crucial.

---

[50] For the sake of clarity, the dams on 3S rivers inside Cambodia all use the prefix "lower", and in Laos and Vietnam "upper".

[51] Cambodia National Mekong Committee (prepared by MIME), *National Sector Review 2003: Hydropower*, June 2003 (p5, 8-9).

2.1 Lower Sesan 2 Dam

Lower Sesan 2: The facts

Located on the Sesan River in Sesan District, Stung Treng Province, 1.5 km upstream of the confluence of the Srepok and Sesan rivers inside Cambodia. The Lower Sesan 2 Dam was approved in January 2011, with construction projected to begin in 2012 and completed by 2016. The dam will be operational by 2017.

Capacity:	400 megawatts
Size of dam:	75 metres in height, up to 6 km in length
Size of reservoir:	340+ km^2
Estimated cost:	US$816 million
Power generated for:	Cambodia and for export to Vietnam

Developers:

- The *Cambodia-Vietnam Hydropower Company* - a joint venture of *Electricity of Vietnam (EVN)* subsidiary *EVN International Joint Stock Company (EVNI)* and Cambodian conglomerate *Royal Group*.
- Feasibility study, resettlement plan and project design by *Power Engineering Consulting Joint Stock Company N°1 (PECC1)*.
- EIA conducted by *Key Consultants Cambodia (KCC)*.

Background

As the largest of the planned hydropower projects in the 3S area of Cambodia, the Lower Sesan 2 dam has already been subject of extensive discussion and debate for a number of years. The proposed dam will be located on the Sesan River close to its confluence with the Srepok, in Sesan District, Stung Treng Province, approximately 25 km upstream from the provincial centre of Stung Treng. In 2007, a Memorandum of Understanding (MOU) was signed between *Electricity of Vietnam (EVN)* and the Ministry of Industry, Mines and Energy (MIME) for *EVN* to undertake a feasibility study. An Environmental Impact Assessment (EIA) was completed between January and June 2008 and approved in June 2010.[52]

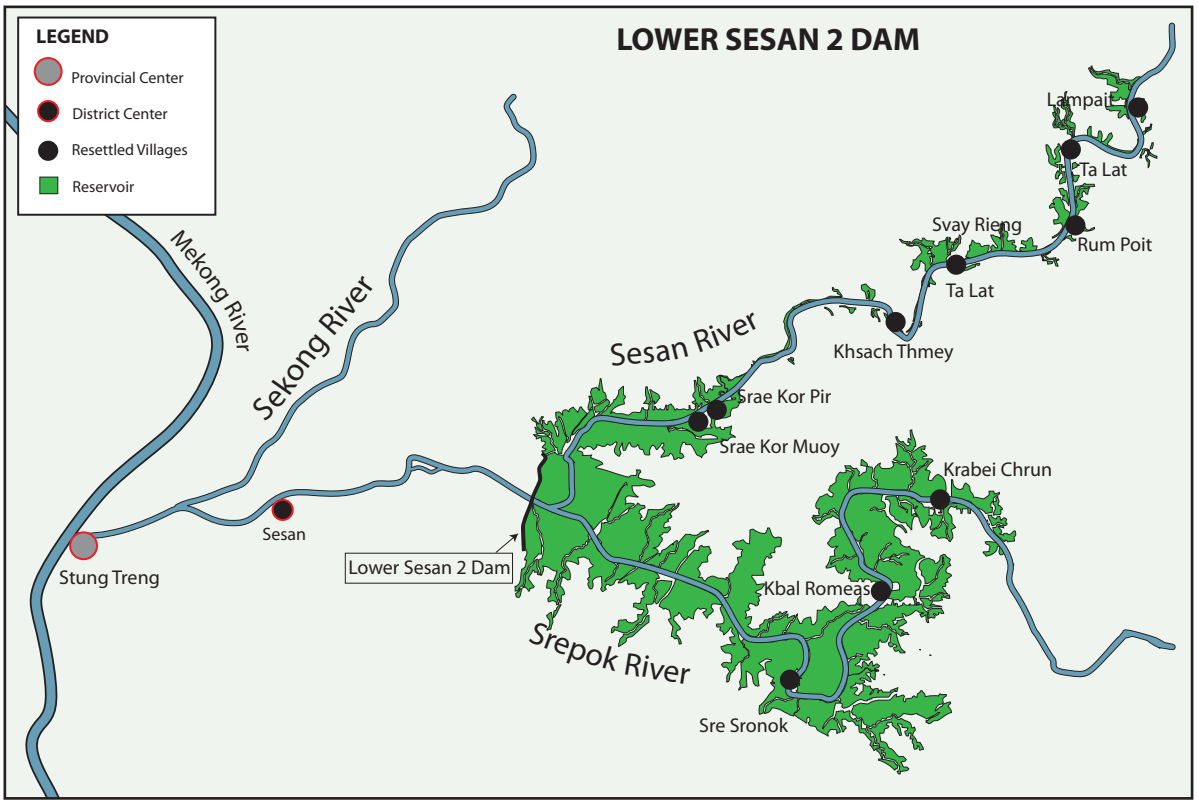
The proposed capacity of the dam is 400 MW and it has been reported that power generated will supply domestic demand as well as being exported to Vietnam (see more below). At a total cost of more than US$816 million, the project will employ up to 3,000 workers at peak construction, and once operational the dam has a predicted lifespan of 100 years. An earlier version of the EIA states that the dam will be 75 metres above sea level which is approximately 40 metres in height above the river bed.[53] According to the EIA, the reservoir area will cover 335 square kilometres.[54] However, in August 2011 the Saigon Times reported that according to the final EIA document the dam will be 6 km long dam and will flood 400 square kilometres.[55]

[52] PECC1 & KCC, *Environmental Impact Assessment for Feasibility Study of Lower Sesan 2 Hydropower Project, Stung Treng Province*, Cambodia, October 2008 (pS-1).

[53] *Ibid*. (pS-2)

[54] *Ibid*. (pS-2)

[55] The Saigon Times, *Sesan 2 hydropower plant behind schedule*, 9 August 2011.



The Lower Sesan 2 Dam and Reservoir

The company developing the proposed project is the *Cambodia-Vietnam Hydropower Company*, a joint venture between a subsidiary of the Vietnamese state-owned company *Electricity of Vietnam (EVN)* and the Cambodian conglomerate *Royal Group*. *EVN* has a long history of developing hydropower projects, but *Royal Group* is a newcomer to the sector – both companies are discussed in more detail below.

As mentioned above, an initial MOU for conducting a feasibility study for the dam was signed between Cambodia's Ministry of Mines and Energy and *EVN* in June 2007. Following this, *EVN* hired its subsidiary company, *Power Engineering Consulting Joint-Stock Company N°1* (PECC1) to undertake the feasibility study for the project. *EVN* is the majority shareholder of *PECC1*.[56] The feasibility study was conducted during 2008 and 2009, and as part of the study *PECC1* contracted *Key Consultants Cambodia (KCC)* to undertake the EIA. *EVN* will develop the project through its subsidiary company *EVN International Joint-Stock Company (EVNI)* under a 30 year Build-Operate-Transfer (BOT) agreement.[57]

In early 2011 it became public that *EVNI* had been joined by the Cambodian conglomerate *Royal Group* and will develop the project as a joint venture. According to *Royal Group* Chairman, Okhna Kith Meng, *EVN* owns 51% of the venture, with *Royal Group* holding 49%.[58] The joint venture was formally established in April 2011, and is called the *Cambodia-Vietnam Hydropower Company*. Soon after this was announced, a *Royal Group* statement announced that the dam is expected to commence commercial operations in 2017.[59]

---

[56] PECC1 Website, *Formation and development history*, http://www.pecc1.vn/History_269.aspx (accessed November 2011).

[57] EVN, *Summary Report: Lower Sesan 2 hydropower project*, 23 January 2010. http://www.evni.vn/Home/News/tabid/54/TopicId/54/language/en-US/Default.aspx (accessed November 2011).

[58] Phnom Penh Post, *Construction nears for Sesan 2*, 24 January 2011.

[59] Phnom Penh Post, *Sesan dam to proceed this year*, 25 April 2011; see also, Vietnam Business News, *Investment to Cambodia from Vietnam Increases*, April 2011.

According to a July 2011 media report, Cambodia has agreed to purchase 50% of the output from the Lower Sesan 2 plant. The article states that the two parties are conducting negotiations on electricity selling prices and power purchase agreements. *EVN* also plans to build a transmission line connecting to the Vietnamese national grid in order to sell the remaining 50% of the plant's output to Vietnam.[60] A report posted on *EVN*'s website shows that in February 2008 the company signed an MOU with MIME for construction of 220 kV transmission lines connecting the Lower Sesan 2 to Stung Treng town. Transmission lines will also run from the Lower Sesan 2, through the provincial capital of Ratanakiri, and on to a substation at the Lower Sesan 1/5 dam on the Cambodia-Vietnam border. Later in 2008, the Vietnamese Ministry of Industry and Trade approved plans to construct 220 kV transmission lines connecting this substation to the Vietnamese power grid.[61] This is discussed in more detail in Section 2.6 on transmission development.

From February to April 2008, public consultations were conducted in the immediate area of the dam site and reservoir. A second consultation was held in May 2008 including representatives of affected communities, provincial departments, several NGOs, holders of affected economic land concessions, the Ministry of Environment (MoE) and MIME. The majority of communities located upstream and downstream of the dam site were not consulted during the EIA process.

In December 2008, *EVN* submitted the preliminary EIA report to the MoE for review. In July 2009, the MoE requested *EVN* to carry out additional studies on fish migration; this additional study was completed in August 2009 and submitted to the Fishery Administration for review. The Fishery Administration approved the results of the study and it was incorporated into the EIA report. In May 2009, the MoE also requested an additional report on water flow, which was completed and submitted by the company in October that year. The updated EIA was then submitted to the MoE, and finally approved in June 2010.[62]

Soon after, reports began to circulate that Vietnam's Prime Minister Nguyen Tan Dung had personally asked Cambodian Prime Minister Samdech Hun Sen to speed up the approval of the project. This was confirmed by Cambodian Minister of Information Khieu Kanarith in November 2010, when following a meeting between the two premiers, he was quoted as saying: "Vietnam asked Cambodia to push the paperwork forward … Samdech [Hun Sen] asked [Minister for MIME] Suy Sem to move the forms forward."[63] The project received final approval in January 2011.

Vietnamese media reported that at a June 2, 2011, meeting in Phnom Penh with provincial and local leaders, *EVNI* representatives presented a compensation and resettlement plan and discussed the formation of a Compensation and Resettlement Committee and a Working Group headed by Cambodian state officials. *EVNI*'s Deputy General Director stated that he hoped the CRC and WG would start work in October that year.[64] It was later announced by a consultant to the Inter-Ministerial Resettlement Committee (IRC) at a workshop organized by the Rivers Coalition of Cambodia that the resettlement plan would be handled by the state power utility *Electricité du Cambodge (EdC)*. When questioned about this shift in responsibility, a Secretary of State from the Ministry of Environment stated that the resettlement plan should be under the IRC's charge. When questioned, the *EdC*'s Strategy and Planning Department and the district governor of Sesan district in Stung Treng province were unaware that *EdC*

---

[60] Vietnam News Agency, *EVN unit speeds up work on Lao, Cambodian dams*, 8 July 2011.

[61] EVN, *Summary Report: Investment Project of the Transmission Line Connecting Lower Sesan 1/Sesan 5 hydropower Projects into the Power Grid*, 23 January 2010. http://www.evni.vn/Home/News/tabid/54/TopicId/54/language/en-US/Default.aspx (accessed November 2011).

[62] Letter from Prime Minister Samdech Hun Sen, *Letter N°31: Clarification to the request by HE Son Chhay, Phnom Penh Parliamentarian, for delay in the implementation of the Hydropower Project of Lower Sesan II of the Vietnamese Company EVN in joint venture with the Royal Group Company*, 28 July 2011.

[63] Cambodia Daily, *VN Premiere Asks for Quick Dam Approval*, November 16, 2010.

[64] Vietnam News Agency, *EVN boosts hydroelectric power in Cambodia*, 3 June 2011.

was now responsible for handling the resettlement plan.[65]

At present it is not clear on what legal grounds and according to what legal process the resettlement and compensation will be conducted. Cambodian law protects the land rights of legal owners, legal possessors and indigenous communities, and any resettlement must be conducted according to the procedures set out in Cambodian law. In order to ensure respect for the rights of those affected by the project, it is crucial that the legal grounds for any land expropriation and resettlement are made clear by the authorities, and that the compensation and relocation action plan is made public.

Economic Feasibility and Efficiency of the Lower Sesan 2

Civil society and affected communities have raised serious concerns that the Lower Sesan 2 project will have wide ranging negative impacts on affected communities and the environment. In addition to the potential negative impacts, some observers have raised questions about the practicality and economic viability of the project as currently proposed. In practical terms, the Lower Sesan 2 is situated on a tributary system that is already heavily dammed upstream. As discussed in Section 1.2, the upstream dams inside Vietnam are already facing difficulty in producing enough electricity to meet demand due to increased drought caused by poorly managed upstream dam operations and unpredictable weather patterns. In particular, the Upper Kon Tum dam is currently being constructed on the Vietnamese side of the border at the headwaters of the Sesan River, and is diverting water away from the river basin.[66] This construction has already been reported to have reduced downsteam water flows and has impacted other *EVN* hydropower projects inside Vietnam.

Questions have also been raised regarding the value for money of the Lower Sesan 2 project. The predicted cost of the dam is in excess of US$800 million and will have a capacity of 400 MW, although this will drop to 100 MW in the dry season.[67] In addition, a study funded by the Asian Development Bank in 1999 found that the Lower Sesan 2 as proposed at that time was not financially attractive and would deliver little return. As part of a larger study, an ADB hired consultant team studied two dams, which at the time were called the Lower Sesan 2 and the Lower Srepok 2. The proposed Lower Srepok 2 was located 2km upstream of the confluence, and the Lower Sesan 2 proposed for a location 4km upstream of the confluence, both with capacities of just over 200 MW. However, this was later changed to a single dam 1.5km upstream of where the rivers merge. Although the site of the approved dam is slightly different, the concerns detailed in the 1999 report are similar to those raised now regarding the new site, principally the negative impacts associated with the dam's large reservoir, along with the significant resettlement issues and impacts on fisheries.[68]

In 2008, the ADB conducted the *Sesan, Sre Pok, and Sekong River Basins Development Study*,[69] which examined various aspects of the proposed development of hydropower in the 3S area (the study is discussed in more detail in Section 3). One technical sheet produced by the study indexes the various hydropower projects proposed for the 3S area and rates them according to various criteria. One of these criteria estimates the number of megawatts generated per square kilometre of reservoir. This can be used to indicate the trade-off between the amounts of power generated against the changes in land use. The higher the amount of energy generated per square kilometre of reservoir, the more

---

[65] The Cambodia Daily, *Sesan resettlement in hands of power utility*, 1 June 2011.

[66] International Rivers, *International Rivers Comments on the Thuong Kon Tum Hydropower Project (Vietnam) to Project Validator, TÜV NORD CERT GmbH (Former RWTÜV Systems GmbH)*, 2 June 2011.

[67] NGO Forum Cambodia, *Lower Sesan 2 Hydro Project EIA Review*, August 2009 (p2).

[68] Asian Development Bank, *Se Kong - Se San and Nam Theun Basins Hydropower Study Final Report*, 1999.

[69] Asian Development Bank, *TA6367 Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam*. Project Information Document: http://pid.adb.org/pid/TaView.htm?projNo=40082&seqNo=01&typeCd=2 (accessed November 2011).

efficient the project. If the project generates more than 10 MW per square kilometre of reservoir, the performance is considered good, 5-10 MW is moderate, and below 5 MW the project "needs to be carefully assessed". The Lower Sesan 2 receives a score of only 1.1 MW p/Km^2 of reservoir. The paper also rates four other dams that are discussed later in this report: the Lower Sesan 3 as 0.4 MW/Km^2, and the Lower Srepok 3 and 4 both as 0.3 MW/Km^2.[70] These very low scores call into question the efficiency of the projects. Additionally, these figures also raise questions as to how "green" the projects are. It is known that large reservoirs in tropical countries can in fact contribute to climate change due to the large amounts of rotting debris present in the areas that they inundate. These low scores also show that the trade-off between power generated and potential for greenhouse gas emissions is hardly favourable in these cases.

A man collects resin from trees to repair his boat in Kbal Romeas Village. Photo: Oxfam-Brett Eloff

Potential Impacts

A number of studies, including the EIA conducted by *KCC*, have identified significant and far-reaching social and environmental impacts if the Lower Sesan 2 dam goes ahead as proposed. The dam will create a reservoir covering more than 340 km^2 and, according to the 2008 EIA report prepared by *KCC*, the reservoir will displace 4,785 people (1,059 households) from seven villages in four communes. Six relocation sites have been proposed for those who will be displaced by the reservoir and construction, however, the EIA states that "many of the proposed resettlement areas are already located in approved forest/land concession areas which will likely be subject to considerable disturbance now and in the future."[71] According to notes prepared by *KCC*, of the total area proposed for resettlement over 4,000 ha

[70] ADB-RETA 40082, *3S Technical Sheets Key Topic 8 – Large scale infrastructure development in the 3Ss, 8a Hydropower Development*. http://reta.3sbasin.org/index.php?option=com_docman&Itemid=184&lang=en (accessed November 2011).

[71] PECC1 & KCC, *Environmental Impact Assessment for Feasibility Study of Lower Sesan 2 Hydropower Project, Stung Treng Province*, Cambodia, October 2008 (pS-5).

is located within the boundaries of forest concessions and reserved land.[72] The reservoir will flood more than 1,200 ha of agricultural land, which is 24% of the agricultural land in Sesan District, and although this will be replaced by land in the resettlement areas, it is acknowledged that this will require forest clearance.[73]

In addition to the impacts on residential and agricultural land, the reservoir will destroy up to 30,000 ha of forest land, including more than 10,000 ha of private forest concession.[74] In addition to the concession areas that will be affected, according to a report posted on the EVNI website, around 17,800 ha of state forest land are within the project area.[75] Although the project does not directly impact on any protected areas or wildlife sanctuaries, it will inevitably have impacts on biodiversity in the area. The EIA identifies loss of habitat for flora and fauna through inundation, and also through land use changes caused by relocation of residents and road diversions.

The Lower Sesan 2 Dam's hydrological post located near the dam site

Changes in the hydrology of the river will also impact on fish stocks and on the quality of the water. *KCC* estimated that at present 66% of the river's fish species move up and down through the proposed dam site, and that after the dam's construction many migratory fish species will disappear from upstream.[76] The EIA identifies that "the socio-economic impact from the consequent loss of fish will

[72] KCC, *Key Facts Sesan II for NGO meeting*, June 27, 2008.

[73] PECC1 & KCC, *Environmental Impact Assessment for LS2*, October 2008 (pS-5).

[74] *Ibid*.

[75] EVN, *Summary Report, Lower Sesan 2 hydropower project*, 23 January 2010.

[76] PECC1 & KCC, *Environmental Impact Assessment for LS2*, October 2008 (pS-4).

be one of the single largest impacts of the dam".[77] Impacts on fisheries will be felt by upstream communities living along the Sesan and Srepok who are dependent on fishing for their livelihood – *KCC* estimate there are around 40,000 people living upstream who are dependent on these fisheries.[78] The EIA states that fish species have been identified that migrate from the Tonle Sap Lake and Mekong River into the Sesan and Srepok Rivers, and that one species even migrates from as far away as the Mekong Delta.[79] This raises the possibility that the impacts on fisheries will be felt across the entire country, and even in neighbouring countries, not just upstream of the dam. The EIA makes little mention of downstream impacts on fisheries, and so the cost of impacts on downstream communities was not estimated, and no compensation budgeted for downstream communities who suffer reduced fish catches.

A number of independent studies have been conducted into fisheries along the Sesan and Srepok in Cambodia, which have found that a large number of fish species migrate along these rivers and into the Mekong. One study found that in the dry season at least 32 fish species migrate from the Tonle Sap Lake in Central Cambodia, up the Mekong River and into the Sesan and Srepok Rivers.[80] Baird states that amongst the species that will have migration routes blocked are fish that "are a key to the ecology of these rivers, as they are important algae eaters … 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."[81] Another study published by the Proceedings of the National Academy of Sciences in 2012 has estimated that the dam is the single worst tributary project currently planned in the Lower Mekong Basin for fish biodiversity. The study found that the Lower Sesan 2 would cause a 9.3% reduction of fish bio-mass basin-wide and would threaten to endanger around 56 fish species.[82] Changes in downstream water quality and sedimentation flow will also negatively impact on both migratory and non-migratory species. Drastically reduced sediment flows will cause erosion of river banks and impact on the deep-water pools that are refuges for fish during the low water of the dry season.[83]

An Environmental Action Plan (EMP) prepared by the developer sets out compensation for the people who will lose land, homes and access to fisheries, and in addition to providing land for relocation, projected affected people are to be compensated for loss of assets such as rice fields, trees, gardens, houses, and loss of fisheries. Despite failing to consider and budget for downstream impacts, the draft EIA estimated the cost of mitigating the project's negative impacts at US$127 million.[84] Although this figure is significant, there are still considerable concerns related to the impacts on fisheries as it is widely recognized that no amount of money can mitigate blocked fish migrations. An English version of the Environmental Management Plan was released in 2008, but was criticized for lacking detail in terms of specific budgets for compensation and mitigation activities, and having no clear roles and responsibilities for monitoring and implementation.[85]

---

[77] *Ibid*. (pS-4)

[78] *Ibid*. (pS-5)

[79] *Ibid*. (pS-4)

[80] 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.

[81] See Baird, Ian G. 2009 *Best practices in Compensation and Resettlement for Large Dams: The Case of the Planned Lower Sesan Dam 2 Hydropower Project in Northeast Cambodia*. Rivers Coalition in Cambodia, Phnom Penh (p39).

[82] Ziv, G., Baran, E., Nam, S., Rodriguez-Iturbe, I. & Levin, S. A., *Trading-off fish biodiversity, food security, and hydropower in the Mekong River Basin*, Proceedings of National Academy of Sciences. USA, 2012. http://www.pnas.org/cgi/doi/10.1073/pnas.1201423109 (accessed March 2012).

[83] Baird, Ian G. 2009 (p54-55).

[84] NGO Forum, *Lower Sesan 2 Hydro Project EIA Review*, August 2009 (p7).

[85] Rivers Coalition of Cambodia, *Comments on Chapter VIII Environment Management Plan of the Lower Sesan 2 Draft Environmental Impact Assessment by Key Consultants Cambodia*, 22 July 2008. See also: Baird, Ian G. (p29-38).

Fishing in the Sesan River. Photo: Oxfam-Brett Eloff

In June 2011, an opposition party lawmaker wrote a letter to the Prime Minister raising concerns related to the project and asking for clarification of the mitigation measures that will be put in place to limit the dam's negative impacts. The Prime Minister responded in July 2011, and soon after the letter was made public.[86] The letter clarifies that the dam will flood 34,307 hectares and impact on 4,620 people (slightly less than stated in the 2008 EIA). The relocation areas will apparently be provided with electricity supply, and improved livelihoods compared to their previous location. The breakdown of land to be flooded by the project is:

- 83 hectares of residential land
- 910 hectares of rice farm land
- 307 hectares of fields
- 17,806 hectares of State forest land
- 10,564 hectares of land granted to private firms as land concession, and
- 4,638 hectares of river/lake areas

The letter states that a request has been made for the company to deposit a fund equaling 8.27% of the total project value for dealing with project impacts – which if the total cost of the project is US$816 million, equals almost US$67.5 million. It should be noted that this is about half of the budget estimated in the 2008 EIA (US$127 million) as being necessary for adequately mitigating the project's impacts. In addition, the company will also invest approximately US$14.5 million to clear the reservoir land area before it is submerged, in order to reduce impacts on water quality. The Prime Minister's letter also deals with concerns related to fisheries impacts. It states that according to studies conducted, the Sesan and Srepok rivers are not sources of fish spawning or fish resources for the entire country and the impacts will only affect species living on the two rivers. In order to mitigate these impacts,

[86] Letter from Prime Minister Samdech Hun Sen, 28 July 2011.

there are plans to establish a fish research and raising center to breed fish for releasing into the reservoir and downstream of the dam.

There is a considerable disconnect between government assurances that fisheries will not be affected beyond the two affected rivers and a number of studies conducted on this issue. In 1999, the Asian Development Bank conducted the first detailed study on dams at the confluence of the Sesan and Srepok and found that the rivers "are important routes for fish migration into the upper Se San Basin and the Mekong. Dams will therefore obstruct important migration pathways and may have adverse impacts on the fisheries of the Lower and Middle Basin."[87] As already noted above, the project's 2008 EIA also noted the impact on fish migrating from the Mekong and Tonle Sap, as did a fisheries study that was conducted by the Cambodian Fisheries Administration and attached to the EIA. The fisheries study stated that one possible impact of the dam would be "impact on Tonle Sap fish and fisheries", specifically on "longitudinal migrating species those are feeding and growing [sic] in the downstream Mekong and Tonle Sap, and migrating upstream for spawning and completing their life cycle." During the course of the study, researchers observed four long distance migratory fish species "which could perform long distance migration between Tonle Sap or Cambodia lower Mekong and the project area." In terms of mitigating the impacts of the dam on fish migration across the project site, the EIA's fisheries study states that there is "no prospect that a fish pass could make a significant difference to the blocking effects of hydropower dam on fish migration."[88]

A 2009 study commissioned by the Rivers Coalition in Cambodia (RCC) claims that upstream impacts are likely to be much more serious than estimated in the EIA, with at least 78,000 people losing access to migratory fish. This includes 86 villages along the Sesan and Srepok Rivers and 87 villages living on its tributaries, a large number of which are populated by indigenous peoples. The report also found that over 22,700 people are likely to be affected downstream of the dam by changes in the hydrology of the river, which will impact on fisheries and water supplies. Significantly, the report raises concerns that the project's impacts may be felt by people across the country and even in neighbouring countries. It suggests that people as far away as the Tonle Sap Lake in central Cambodia, the Mekong Delta in Vietnam, and the middle Mekong River in Laos may be negatively affected by the disruption to regional fish migrations.[89]

Another potential impact that has received little attention is the effects that the dam will have on sediment flow. According to the International Center of Environmental Management in Hanoi, the Lower Sesan 2 will block almost half of all sediment flow from the 3S basin into the Mekong River. In turn, it is estimated that this will reduce total sediment loads in the Mekong by an average of 6 to 8 percent. This could potentially reduce the stability of river channels in the Mekong Delta, increase erosion and diminish productivity of aquatic systems and agricultural land in the Mekong flood plains and Tonle Sap Lake.[90]

The Cambodian government position is that adequate research has been conducted and that the benefits of developing large scale hydropower in the area outweigh the negative impacts. This is reflected in the recent approval of the Lower Sesan 2, and the strong defence of the project from Cambodian officials and the Prime Minister himself. Nonetheless, many observers still hold serious concerns that the full long-term impacts of the proposed 3S dams have still not been adequately investigated, and that there is a lack of understanding of the cumulative impacts of these dams and those in the 3S basins in Laos and Vietnam.

---

87 Asian Development Bank, *Se Kong - Se San and Nam Theun Basins Hydropower Study Final Report*, *Volume 4*, 1999 (p11-29).

88 Huot, V. et al., Faculty of Fisheries of Royal University of Agriculture, *Assessment on Fisheries Natural Resources for Lower Sesan 2 Hydropower Plant Project*, August 2009 (p8, 19, 27).

89 Baird, Ian G. 2009.

90 Cambodia Daily, *The battle for the 3S Rivers*, 10-11 September 2011.

Environmental Impact Assessment and Public Participation

Community march and flotilla in protest of the Lower Sesan 2 Dam held in February 2012

In addition to concerns related to the impacts of these dams, there is also a strong case to say that the public consultations were not adequate, and that to date there has not been an adequate opportunity for the Cambodian people to be properly consulted about the decision to develop these large-scale hydropower dams. The RCC report referred to earlier found that local people were extremely unhappy with the EIA process and expressed dissatisfaction with relocation and compensation provisions. Furthermore, the people who were interviewed stated that they opposed plans to build the project. The author suggests that although acknowledged, the impacts on areas located far from the proposed dam site and the trans-boundary impacts have not been adequately assessed, and no plan is in place to remedy them. Crucially, the EIA process for the most part only consulted those people living directly in the area of the proposed reservoir and adjacent to the dam site.[91]

A public consultation was held in February 2008 by the EIA company, *KCC*, with communities that "would be most affected by the project." At the end of this meeting, 85% of those present said they "disagreed with the proposal." A second consultation was held in April 2008, this time conducted by the developer *PECC1*. At this meeting it is claimed that 94% of people "were in agreement with the project." This complete reversal is interesting, and raises questions as to why the responses were so different in the two consultation meetings. A third meeting was held in Stung Treng town in May 2008 at which community representatives, NGOs, local government departments, private sector actors, MoE and MIME all attended. *KCC* and *PECC1* delivered PowerPoint presentations and "a few" participants were reported to have asked questions.[92]

A 2009 review of the EIA conducted by NGO Forum on Cambodia highlighted multiple areas of concern with the EIA document, and described the public consultation as inadequate. Despite the EIA estimating that the project will affect 40,000 people living upstream "only a few hundred people were consulted … By any standard, this is unacceptable."[93] Input from a wide and representative group of affected people is crucial to ensure that adequate consideration can be made of all impacts. These consultations should then be considered in the final decision whether or not to approve a project, and thereafter, to inform the design of adequate mitigation and monitoring measures.

---

[91] Baird, Ian G. 2009.

[92] PECC1 & KCC, *Environmental Impact Assessment for Feasibility Study of Lower Sesan 2 Hydropower Project, Stung Treng Province*, Cambodia, October 2008 (pS-8).

[93] NGO Forum on Cambodia, *Lower Sesan 2 Hydro Project EIA Review*, August 2009 (p5).

A number of activities are proposed to attempt to mitigate fisheries loss, including fish breeding and hatcheries for migrating species, compensation for lost income, and livelihood support for affected people. However, concerns have been raised with the assumption that the project implementers will take responsibility for fully mitigating the impacts of the dam – especially given *EVN*'s failure to mitigate the harms of other dams on the Upper Sesan and Srepok rivers. Experience in the region has shown that attempting to restore lost livelihoods and food security can be an extremely difficult and costly process, and *EVN* has been accused on multiple occasions over the last decade of irresponsible development along the Sesan and Srepok rivers and of not doing enough to mitigate the downstream impacts of its hydropower projects. If the company is lax in implementing mitigation measures, the responsibility will fall on the Cambodian authorities, who have no experience in managing the long-term impacts of large-scale projects such as this.

Electricity of Vietnam (EVN)

Electricity of Vietnam (EVN) is a state-owned utility that has projects in generation, transmission, and distribution of electricity.[94] *EVN* is the biggest power company in Vietnam and the country's third biggest enterprise. It works through a large number of subsidiaries, including *EVN International Joint Stock Company (EVNI) and Power Engineering Consulting Joint Stock Company N°1 (PECC1),* which are both active in Cambodia. The company is developing the Lower Sesan 2, Lower Sesan 1/5 and the Lower Sekong dams in the 3S area of Cambodia. *EVN* has also developed a number of dams along the Sesan and Srepok rivers in Vietnam and plans to develop a number of dams on Mekong tributaries in Southern Laos.

Despite being the largest power company in Vietnam, media reports in 2011 suggested that *EVN* is experiencing financial difficulties. The company owes large debts to other Vietnamese State owned companies, including US$400 million to *PetroVietnam* and around US$77 million to the mining giant *VinaComin* (as of March 2011). Both companies have submitted written requests to the Vietnamese Government calling on them to push *EVN* to repay all debts. The Ho Chi Minh City-based *Hiep Phuoc Power Co. Ltd.* also threatened to cut off power supplies to *EVN* if it did not repay its US$36 million debt.[95]

Vietnamese media has reported that due to a lack of funds, *EVN* has delayed and scaled back a number of hydropower projects and cut its investment by more than VND 12 trillion, or more than US$583 million (at November 2011 exchange rates). The company is now struggling to raise funds for its other projects. In order to make up for this shortfall in available funds, the company requested in July 2011 that the Vietnam Government approve an increase in power prices.[96] According to *EVN*'s Deputy general Director, in 2010 the company made a loss of VND 8 trillion (approximately US$384 million, at November 2011 exchange rates).[97] A September 2011 article put *EVN* losses for 2011 at US$562 million.[98]

[94] See company website: http://www.evn.com.vn/

[95] Vietnam Tuoitrenews, *PetroVietnam urges EVN to repay debt,* 13 July 2011.

[96] Thanh Nien News, *Vietnam power utility EVN request price hike,* 6 July 2011.

[97] VietnamNetBridge, *Giant EVN trying to negotiate for delay to pay its debts,* 28 April 2011.

[98] Reuters, *Vietnam's major state firms face big losses,* 9 September 2011.

Royal Group

Royal Group is a conglomerate based in Phnom Penh, Cambodia, and chaired by Okhna Kith Meng. It has numerous subsidiary companies with interests in property development, telecommunications, finance, media, hotels and resorts, and agriculture.[99]

In early 2011, it became public that Royal Group has joined EVN in a joint venture to develop the Lower Sesan 2 hydropower project. To date, the Royal Group has not been involved in any hydropower projects, although the company website states: "We are exploring current and future opportunities in oil and gas, mining, tourism, retail and property development, consumer and retail marketing, fast food and restaurants, healthcare, financial services, food and beverage, *energy and power."*[100] [emphasis added] One of Royal Group's most high profile partnerships is its joint venture with the *Australian bank, Australia and New Zealand Banking Group (ANZ).*[101] The joint-venture, ANZ Royal, is 55% owned by ANZ and 45% by the Royal Group.[102]

2.2 Lower Sesan 3 Dam

Lower Sesan 3: The facts

Located on the Sesan River, 12 to 15 km downstream of Ta Veng town, Ta Veng/Veun Sai district, Ratanakiri province. A feasibility study was submitted to the Government in late 2009, and is awaiting approval before the project proceeds to the EIA stage.

Capacity:	325 MW
Height of dam:	75 meters
Size of reservoir:	Estimated at 42,700ha (427 km^2)
Estimated cost:	US$700 million
Power generated for:	Unknown

Developer:

- Korean company *KTC Cable Co. Ltd.*

The proposed Lower Sesan 3 Dam is located close to Ta Veng town in Ratanakiri province and is currently subject to the feasibility study of the South Korean company *KTC Cable Co. Ltd*. According to a Phnom Penh Post article from October 2009, the output of the proposed dam will be 325 MW and the cost US$700 million. The company submitted its feasibility report to MIME in late 2009, but an EIA has yet to be conducted. The Post article also reported that the then *KTC* President Kim Myung-Il met Cambodian Prime Minister Hun Sen in October 2009 to discuss the company's plans.[103]

---

[99] See company website: http://www.royalgroup.com.kh

[100] Royal Group website: http://www.royalgroup.com.kh/our-portfolio/growth-and-opportunities.php (accessed November 2011).

[101] ANZ website: http://www.anz.com/personal/

[102] ANZ Royal website: http://www.anzroyal.com/en/About-Us/Our-Company/

[103] Phnom Penh Post, *South Korea's KTC Cable weighs $700m Ratanakiri dam project*, 15 October 2009.

The dam and its reservoir will cover an area spanning seven communes and three districts and will lie on or near the Ta Veng-Veun Sai district border. Ta Veng town would be completely inundated by the reservoir, which in total will flood up to 42,700 ha (427 km^2). Of the area of inundation, 65% is currently used for agriculture and 17% is primary forest. 38 villages fall within the reservoir area, including a number of indigenous minority groups, and the dam may lead to the relocation of at least 24 communities, comprising over 8,000 people.[104]

Ta Veng Town on the banks of the Sesan River. Photo: Oxfam-Brett Eloff

The inundated area will include 27,660 hectares of agricultural land, which thousands of Cambodians currently rely on for their livelihood. If the project is approved without any major alterations to its design, it is likely to prove difficult to find adequate replacement land for those who are displaced and for farmers who will lose land to the reservoir. As the area is heavily forested and there are already numerous agricultural concessions granted over the existing cultivable land, there is a high probability that the displaced will have to clear forest to create new land for agriculture. This is a trend that is increasingly being observed in Cambodia when people lose their land, and in addition to its environmental impacts, it leaves people exposed and especially vulnerable, as their forest clearance activities are most likely illegal and their tenure therefore unrecognized by the authorities. The dam lies south of the Virachey National Park, and there is real concern that that forest clearance could impact on this sensitive area. The reservoir will also inundate 1,560 hectares of seasonally inundated grassland, marsh and swamp which are sensitive areas with extremely rich biodiversity. The changed hydrology is likely to impact on wetlands downstream, and approximately 10,000 hectares of forest land are expected to be lost to the reservoir.

[104] 3SPN & PRCF, *Scoping Study of Environmental and Social Impacts of the Proposed Lower Sesan 3 Dam, Ratanakiri, Cambodia (DRAFT)*, June 2010. [It should be noted that this report is still in draft form, and due to the lack of public information available, an overview of the project has been taken from older sources that may since have become dated. The ESIA draws on recent Japan International Cooperation Agency (JICA) documents released during 2007-09, when the agency was developing the since abandoned master plan for Cambodia's hydropower development.]

No investigation has yet been done into the impacts on fisheries, though it can be expected that there will be significant repercussions on fish movements at the dam site. In addition to limitations on fish migration and impacts on water quality, a serious concern is the increased sedimentation of deep water pools, which fish rely on for their survival in the dry season along the Sesan River.

For the amount of energy this dam is predicted to produce, this is a huge reservoir, which raises serious questions about the efficiency of this project. As discussed above, the project was rated very poorly in an ADB technical paper that calculated the amount of power generated per square kilometre of reservoir as 0.4 MW per km^2, one of the lowest scores of all the projects surveyed. Hydropower dams, such as the Lower Sesan 3, located in low-lying flat areas often have very large reservoirs. Such large reservoirs are now being linked to increases in greenhouse gas emissions, primarily from the decomposition of plant waste and organic matter, and the conversion of terrestrial ecosystems to aquatic.

KTC Cable Co. Ltd., Kyung An Cable Co. Ltd. & Taihan Electric Wire Co. Ltd.

KTC Cable Co. Ltd. is a Korean company specializing in production and distribution of electrical cables.[105] KTC was established in Cambodia in 2005 and opened its cable factory on the outskirts of Phnom Penh in 2006. The company is closely linked with *Kyung An Cable Co. Ltd.*

KTC is listed as an overseas subsidiary of *Taihan Electric Wire Co. Ltd.* in *Taihan's* annual reports.[106] *Taihan* is a well-established Korean company and has been operating since the 1950s. The company has a number of overseas subsidiaries and offices around the world including in South Africa, Vietnam, China, Mongolia, Dubai, Australia, the US and Canada.[107]

The *KTC* website states that in 2007 and again in 2008, *KTC* won two rounds of bids for supplying World Bank funded improvements to the Cambodian national transmission grid, for the amounts of US$5 million and US$3 million respectively.[108] The website does not specify which projects, but information from the World Bank website shows that Korean company *Kyung An Cable* was awarded four contracts between September 2007 and January 2011 totalling around US$5.5 million for the supply of electrical equipment.[109] In 2008, *Kyung An* was awarded a US$2.6 million contract from the World Bank for supplying equipment under a joint proposal with *Han Baek* Co. Ltd.[110]

The above contracts were awarded to the company Kyung An Cable Co. Ltd., which as mentioned above is closely linked to *KTC*. Although the precise relationship is unclear, *Kyung An Cable* and *KTC* both have the same CEO, Mr. Kim Myung-Il, and the *Kyung An* website states in its history page that it established the Cambodian *KTC* factory. Similarly, on the *KTC* website *Kyung An* is listed as being part of *KTC*.[111]

---

105 *KTC* websites: http://www.ktc.com.kh/ (English), http://www.ktccable.co.kr/ (Korean)

106 See, for example: Taihan Electric Wire Co. Ltd. Annual Report 2009.

107 *Taihan* website: http://www.taihan.com/eng1/company/c_016-1.asp (accessed November 2011).

108 *KTC* website.

109 World Bank website, Contracts Awarded: http://web.worldbank.org/external/default/main?menuPK=293893&theSitePK=293856&piPK=64027241&pagePK=64027244&Supplierid=159620 (accessed November 2011).

110 World Bank website, Contracts Awarded: http://web.worldbank.org/external/default/main?pagePK=64027236&piPK=64027233&theSitePK=293856&menuPK=293893&contractid=1276867 (accessed November 2011).

111 Kyung An website: http://www.kyungan.co.kr/eng/pro_eng_history.htm (accessed November 2011).

There is no information available (at least in English) to show that either *KTC, Kyung An* or *Taihan* have any experience in developing hydropower projects. Nonetheless, in addition to the Lower Sesan 3, *KTC* is also connected to the development of another six hydropower projects in Cambodia, namely: Prek Liang 1 (64 MW) and Prek Liang 2 (64 MW) in Ratanakiri; the Upper Russei Chrum (32 MW) and the mid-Russei Chrum (125 MW) in Koh Kong; and Battambang 1 (24 MW) and Battambang 2 (36 MW), in Battambang province. All of these projects appear to be at the pre-feasibility stage.[112]

Prime Minister Samdech Hun Sen speaks at the opening ceremony of the KTC Cable factory in 2006[113]

KTC has also expanded into the leisure and telecom sectors. *KTC Leisure Co. Ltd.* runs a 200 hectares US$150 million luxury resort and golf course in Siem Reap. The company appears to have a good relationship with the Prime Minister, who personally opened the golf course in January 2009.[114] In one interview, CEO Kim Myung-Il stated that Hun Sen's strong leadership attracted *KTC* to invest in Cambodia.[115] In 2009, Korean president, Mr. Lee Myung-Bak visited the *KTC* plant during an official visit to Cambodia.[116]

112 Presentation by Chea Piseth, 16-17 July.

113 *KTC* website.

114 Invest in Cambodia website, http://www.investincambodia.com/golf.htm (accessed November 2011).

115 Cambodia Association of Travel Agents website, http://www.catacambodia.com/news_details.php?id=33 (accessed November 2011).

116 Koreanet, *President Lee Wraps Up State Visit to Cambodia,* 23 October 2009.

In October 2010, a new subsidiary, *KTC Telecom,* acquired a 100% share of the major Cambodian phone company, *Camintel.*[117] *KTC* is the sponsor of the Cambodian national football team,[118] and has also invested US$8 million in a water treatment facility in Siem Reap, from which it will sell water to the Siem Reap Water Authority.[119]

KTC also has interests in the banking sector, and holds shares in *Kookmin Bank Cambodia*. *Kookmin Bank Cambodia* is a joint venture between *KB Kookmin Bank* and *Khmer Union Bank*. *KB Kookmin Bank* owns a 53% share,[120] and the remaining shares are owned by Korean manufacturing companies including *KTC, Taihan,* and *Posco Engineering and Construction*.[121] *KB Kookmin* is one of the biggest banks in South Korea and is itself a subsidiary of *KB Financial Group*.

2.3 Lower Sesan 1/5 Dam

Lower Sesan 1/5: The facts

The dam will overlap the border of Vietnam and Cambodia, spanning from Duc Co District of Gia Lai Province on the Vietnamese side, to the Ou Ya Dao District of Ratanakiri Province in Cambodia. A feasibility study has been completed, but to date no public consultations have been conducted.

Capacity:	96 MW
Height of dam:	28 metres
Size of reservoir:	761 ha (Vietnam), 868 ha (Cambodia)
Estimated cost:	US$90 million
Power generated for:	Vietnam and Cambodia

Developer:

- *Electricity of Vietnam (EVN)*
- Feasibility study and project design by *Power Engineering Consulting Joint Stock Company N°2 (PECC2)*.

The proposed Lower Sesan 1/5 sits across a stretch of the Sesan River that forms the border between Vietnam and Cambodia. Therefore, half of the dam is in Cambodia and half in Vietnam (the dam is referred to as Lower Sesan 1 in Cambodia and Lower Sesan 5 in Vietnam). The Lower Sesan 1/5 is another *EVN* project and in a 2006 report by *PECC1*, Sesan 1/5 was identified as a priority project (along with Lower Sesan 2 and Lower Sesan 3). An MOU for conducting a feasibility study was signed between MIME and *EVN* in 2007.[122] This project may already have been subject to an EIA, but this is not publicly available at the time of writing.

---

117 *KTC Telecom* website: http://www.camintel.com/ (accessed November 2011).

118 ASEAN Football Association website, http://www.aseanfootball.org/?p=2550 (accessed November 2011).

119 http://cambodiastockmarket.info/siem-reap-set-to-raise-commercial-water-rate/ (accessed November 2011).

120 According to *KB Financial Group* Annual Report 2010.

121 Phnom Penh Post, *South Korea's largest bank launches in Cambodia,* 8 May 2009.

122 EVN, *Summary Report: Lower Sesan 1/Sesan 5 hydropower project*, 30 January 2010. http://www.evni.vn/Home/News/tabid/54/TopicId/54/language/en-US/Default.aspx (accessed November 2011).

According to summary documents from the *EVN* website the project will generate power to supply both Cambodia and Vietnam. The document states that the project will "meet the increasing energy demand of the locality in the project site of Cambodia as well as for Vietnam." According to this document, the Sesan 1/5 will be connected to the Vietnam National Grid via a 220 kV transmission line.[123] *EVN* has MOUs in both Cambodia and Vietnam to connect the Lower Sesan 1/5 to the Cambodian and Vietnamese power grids.[124]

The summary report states that the dam will require the requisition of over 900 ha of land in Vietnam and almost 1,000 ha in Cambodia. However, the document states that no one will be relocated, although agricultural land of 47 families, or 274 individuals, will be affected. A total of 1,382 ha of forest lies within the proposed project area.[125]

Rapids near the planned Lower Sesan 1/5 Dam in Oyado, Cambodia

As with the Lower Sesan 2, there are concerns related to the efficiency and practicality of the proposed dam. Firstly, it is possible that the Lower Sesan 1/5 will negate the impacts of the Sesan 4a regulator dam in Vietnam. The Sesan 4a was built and is meant to serve as a regulator dam in response to concerns about the trans-boundary impacts of Vietnam's hydropower projects on the Upper Sesan, although there are concerns that the project is generating electricity rather than regulating flows.[126]

---

123 *Ibid*.

124 EVN, *Summary Report: Investment Project of the Transmission Line Connecting Lower Sesan 1/Sesan 5 hydropower Projects into the Power Grid*, 23 January 2010.

125 EVN, *Summary Report: Lower Sesan 1/Sesan 5 hydropower project,* 30 January 2010.

126 Earthrights International's Mekong Legal Advocacy Network (MLAI), *Mekong River Dams: National Laws to Address Environmental and Human Rights Issues, and Obstacles to Enforcement,* December 2009. http://www.earthrights.org/sites/default/files/publications/Mekong-River-Dams-MLAI_0.pdf (accessed April 2012).

In 2006, a cumulative impact assessment was conducted into the downstream effects of Vietnam's hydropower dams, which identified a number of serious negative downstream impacts. One mitigation measure implemented after this evaluation was to construct a dam to regulate the flow of water into the Lower Sesan in Cambodia, in order to reduce the harmful effects of water surges and erratic water fluctuations.[127] The Sesan 1/5 will be built only a few kilometres downstream of this regulator dam, and may therefore impact on the utility of this dam in regulating downstream flow.

Additionally, the dam has already been rejected once due to an unfavourable economic assessment. In August 2009, Vietnamese media quoted Vietnam's Deputy Prime minister as saying that approval for the project was not granted "because of low economic efficiency."[128] Despite this initial rejection, in July 2011 it was reported that a feasibility study for the project had been completed,[129] though to date there has been no public consultation.

2.4 Lower Srepok 3 and 4

Lower Srepok 3 and 4: The facts

Lower Srepok 3: Lumphat District, across the stretch of river from Phou Deu Mountain to Phou Heen Khav Mountain, Ratanakiri province.

Lower Srepok 4: Mondulkiri province, Koh Nhek District, Sre Huey Commune.

A company has signed MOUs for feasibility studies for both projects. Testing is already underway for the Lower Srepok 3, though it is unclear if any activities have yet begun on the Lower Sesan 4 feasibility study.

Capacity of LS3:	300 megawatts
Size of LS3:	53 metres high and 10 km in length
Size of LS3 reservoir:	758 km^2
Estimated cost of LS3:	Unknown
Capacity of LS4:	220 megawatts
Size of LS4:	70 meters high
Size of LS4 reservoir:	540 km^2
Estimated cost of LS4:	Unknown
Power generated for:	Unknown

Developer:

- Previously *Guangxi Guiguan Electric Power Company Co. Ltd.*, a subsidiary of Chinese state-owned company *Datang Corporation*, signed an MOU for the feasibility studies in June 2008.
- In November 2010, a second MOU was signed by another state-owned enterprise, *Huadian Corporation*, for the projects' feasibility studies.

[127] Probe International, *Reclaiming the Sesan – Restoring natural flows by modifying hydropower dam operations*, 3 November 2008.

[128] VNBusinessNews, *Se San 5 hydropower project suspended*, 17 August 2009.

[129] VNA, *EVN unit speeds up work on Lao, Cambodian dams*, 8 July 2011.

The proposed Lower Srepok 3 and 4 dams are located in Ratanakiri and Mondulkiri provinces and were originally under feasibility study by the Chinese company *Guangxi Guiguan Electric Power Co. Ltd.* The initial MOU for the feasibility studies was signed back in June 2008.[130] It appears that this company has since pulled out of the project and been replaced by another Chinese state power company.

Officials from Cambodia and Chief Engineer from Guangxi Guiguan sign a memorandum of understanding in June 2008[131]

A second MOU for the dams' feasibility studies was signed in November 2010, when the Cambodia Prime Minister met with Chinese dignitaries, including the chairman of China's National People's Congress, and signed agreements to study the feasibility of 4 dams including the Lower Srepok 3 (300 MW) and Lower Srepok 4 (220 MW). This MOU was agreed with another Chinese state-owned enterprise, *Haudian Corporation*, which confirms that Guangxi Guiguan has pulled out of the project.[132] In April 2011, the Chinese press covered a trip by the CEO of *Huadian* to the Srepok project site in order to inspect the preparatory work being conducted.[133]

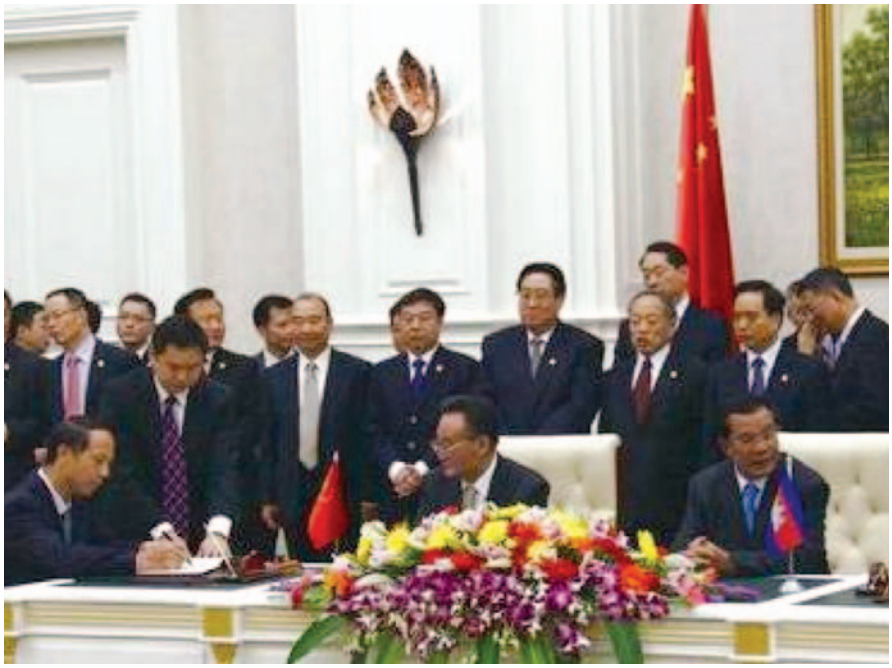
---

130 Xinhua, *Chinese company to conduct feasibility study on dams in Cambodia*, 14 August 2008.

131 Guangxi Guiguan Electric Power Co. website, *Guangxi Guiguan to expand business in Southeast Asia to develop international hydropower business*, 9 June 2008. http://www.ggep.com.cn/news_detail.asp?id=18 (accessed November 2011).

132 China Low-Carbon Media Network, *Wu Baoguo witnesses Cambodia Srepok hydropower signing ceremony*, 9 November 2010. http://www.cndtcm.com/news/7/6323.html (accessed November 2011). See also: China Huadian Corporation website, *MOU Signing Ceremony in Cambodia*, 8 November 2010. http://eng.chd.com.cn/news.do?cmd=show&id=6499 (accessed November 2011).

133 China Power, *Huadian Corporation arrives in Cambodia to conduct research on Srepok hydropower project*, 15 April 2011. http://www.chinapower.com.cn/newsarticle/1135/new1135829.asp, (accessed November 2011).



November 2010 signing of MOU for Lower Srepok 3 and 4 feasibility studies[134]

Huadian CEO visits project site, April 2011[135]

134 China Low-Carbon Media Network, *Wu Baoguo witnesses Cambodia Srepok hydropower signing ceremony*, 9 November 2010.

135 China Power, *Huadian Corporation arrives in Cambodia to conduct research on Srepok hydropower project*, 15 April 2011.

There is limited information publicly available regarding these projects, however, a little is known about the Srepok 3 development after community members witnessed company staff conducting preliminary tests in their area. During December 2010 and January 2011, community representatives in the Lumphat District of Ratanakiri observed Chinese company staff at work drilling and taking soil samples. Discussions with this group revealed that the team was conducting soil tests and would be returning to continue the testing from March to June 2011. When the community representatives contacted the local authorities for more information they found that local officials were unaware that this activity was happening.[136]

After discussing the project in more detail with the company team leader, the representatives were told that the proposed dam will be built across the stretch of river from Phou Deu Mountain to Phou Heen Khav Mountain, a total distance of approximately 10 km. The company stated that the dam will be approximately 53 metres high and it is anticipated to produce 300 MW of electricity.[137] A study conducted by the ADB in the 3S basins (discussed more in Section 3.1) estimated the size of the Lower Srepok 3 reservoir at a huge 758 km^2, or 75,800 ha.[138]

A Chinese journalist travelled to the area to investigate the project and found equipment of another Chinese company stored under one villager's house. The company in question was *China Southern Power Grid (CSG)*, which was presumably subcontracted by *Huadian* to conduct the feasibility study, or at least part of the study. Pictures of this equipment are posted on the journalist's online blog.[139] Until recently *CSG* was connected to another six hydropower projects in Cambodia, including the Sambor Mekong mainstream dam. Interestingly, the company has since announced that it has decided to pull out of all of its potential Cambodian power projects, reportedly because they were concerned about the social and environmental impacts these projects posed.[140]

If construction of the Lower Srepok 3 dam is approved, it will be located only a few hundred metres upstream from Thmei village, inside the Lumphat Wildlife Sanctuary in Ratanakiri, and the 758 km^2 is likely to have extensive impacts on this protected area. Little information is publicly available with regards to the exact details of the Lower Srepok 4 dam, although it is known that it is located within the Mondulkiri Protected Forest and the ADB has estimated the potential reservoir size as covering up to 540 square kilometres.[141] Both the Lumphat Wildlife Sanctuary and Mondulkiri Protected Forest are recognized by the International Union for the Conservation of Nature (ICUN), and both areas will suffer from inundation if the planned projects go ahead.

As is the case along the Sesan, fishing is a vital source of livelihood for people living close to the Srepok, and large scale dams in this area threaten to seriously impact on fisheries. A number of studies have found that fish migrate from the Mekong to the Sekong and Srepok and that the Srepok has a number of important spawning areas.[142]

---

136 Information from personal blog of 3SPN Advocacy Program Coordinator, http://www.wpiggy.blogspot.com/ (accessed November 2011).

137 *Ibid*.

138 ADB-RETA 40082, *3S Technical Sheets Key Topic 8 – Large scale infrastructure development in the 3Ss, 8a Hydropower Development* (p12). http://reta.3sbasin.org/index.php?option=com_docman&Itemid=184&lang=en (accessed November 2011).

139 http://zhanghong.blog.caixin.cn/archives/23408#comment_top (accessed November 2011).

140 South China Morning Post, *Controversial Chinese projects bow to public pressure*, 3 September 2011.

141 ADB-RETA 40082, *3S Technical Sheets Key Topic 8 – Large scale infrastructure development in the 3Ss, 8a Hydropower Development* (p12). Available at http://reta.3sbasin.org/index.php?option=com_docman&Itemid=184&lang=en (accessed November 2011).

142 WWF Greater Mekong – Cambodia Country Programme, *Consultancy Report: Fish Abundance Survey and Installation of Fish Monitoring System on the Srepok River*, June 2008.

Guangxi Guiguan Electric Power Co. Ltd. & China Datang Corporation

Guangxi Guiguan Electric Power Co. Ltd. is a Chinese company engaged mainly in generation and distribution of hydroelectricity and thermal electricity in mainland China.[143] *Guangxi Guiguan* is a subsidiary of the *China Datang Corporation*, which is a state-owned enterprise and one of the biggest power companies in China.[144]

In 2008, *Guangxi Guiguan* signed an MOU with the Ministry of Industry, Mines and Energy to study the Lower Srepok 3 and 4 dams in Cambodia. However, although there is no official word on this at the time of writing, it appears that *Guangxi Guiguan* has now pulled out of developing these two projects. A *Datang* strategy document from October 2010 called for the feasibility study of the project to be completed more quickly so that the company could decide whether to make a direct investment or consolidate.[145] Subsequent media reports show that another Chinese company has since signed an MOU to study the two projects, suggesting that *Guangxi Guiguan* did indeed decide to consolidate and pull out of this project.

China Huadian Corporation

A second MOU was signed for the Lower Srepok 3 and 4 when the Cambodian Prime Minister met Chinese dignitaries in November 2010. This MOU was signed with Wu Bangguo, Chairman and Party secretary of the Standing Committee of the National People's Congress of China, on behalf of a subsidiary of *Haudian Corporation*.[146] In April 2011, Chinese press covered a trip by the CEO of *Huadian* to the Srepok project site in order to inspect the preparatory work being conducted by *Huadian*.[147]

Huadian has already signed other deals for power generation in Cambodia, including an agreement to develop the Lower Russei Chrum hydropower station in Koh Kong province under a 30 year BOT contract. This project is projected to cost US$558 million and have a total installed capacity of 338 MW.[148] The *China Export-Import Bank* is co-financing the project, and according to the law firm that advised *China-Eximbank*, the deal "is expected to form a template for future investment by *China-Eximbank* and other Chinese developers in the Cambodian power sector."[149]

Huadian is also involved in the development of a number of coal-fired power plants in Cambodia in partnership with a Malaysian company.

---

143 See company website: http://www.ggep.com.cn/

144 China Datang Corporation website: http://www.china-cdt.com/en/index.html, Guangxi Branch website: http://www.dtgx.cn/index.php (accessed November 2011).

145 Datang Guangxi Website, *Datang Guangxi Branch Development Study,* http://www.dtgx.cn/article_detail.php?aid=703 (accessed November 2011).

146 China Low-Carbon Media Network, *Wu Baoguo witnesses Cambodia Srepok hydropower signing ceremony,* 9 November 2010.

147 China Power, *Huadian Corporation arrives in Cambodia to conduct research on Srepok hydropower project,* 15 April 2011.

148 Global Times, *China Huadian HK to build hydropower station in Cambodia,* 1 April 2010.

149 Herbert Smith website, *Herbert Smith's Singapore energy team advises China Eximbank on US$412m project financing of a greenfield hydropower plant in Cambodia,* 13 July 2010. http://www.herbertsmith.com/News/news130710.htm (accessed November 2011).

2.5 Lower Sekong Dam

Sekong Dam: The facts

The Lower Sekong dam is located approximately 20 km upstream from Stung Treng town. *EVN* has signed an MOU to conduct a feasibility study for the proposed project.

Capacity:	190 MW
Height of dam:	Unknown
Size of reservoir:	Unknown
Estimated cost:	US$407 million
Power generated for:	Unknown

Developer:

- *Electricity of Vietnam (EVN)*

In July 2011 it was reported in the Vietnamese press that *EVN* has signed an MOU with MIME for "jointly conducting a study on the 190 MW Sekong hydropower project which requires investment of US$407 million."[150] The dam will be located approximately 20 km upstream from Stung Treng town, but apart from this, very little information related to this project exists in the public domain.

2.6 Transmission lines

It is widely recognized that Cambodia's current capacity to generate energy is too low to meet domestic demand, transmission infrastructure is inadequate, and electricity costs are too high, all of which impacts on the lives of many Cambodian citizens, and is a potential hindrance to national development. However, it is not clear at present exactly how much of the power generated by the 3S hydropower dams will be used domestically and how much will be exported. It is also unclear which areas will benefit from the power generated, and what impact this will have on the electricity prices consumers will have to pay. In part this is due to conflicting statements by government officials and company representatives, and in part due simply to a lack of publicly available information. The information that is currently available and accessible is summarized below.

EVN has MOUs with both the Cambodian and Vietnamese governments to connect the Lower Sesan 2 and Lower Sesan 1/5 to the Cambodian and Vietnamese power grids. According to these MOUs the Lower Sesan 2 will be connected to a substation in Stung Treng provincial town by a double 220 kV transmission line. The dam will also be connected to a substation at the Lower Sesan 1/5 by a 172 km transmission line of the same voltage. On route to the Sesan 1/5, this line will run through Ratanakiri's provincial capital, Ban Lung, where a new substation will be constructed. The Sesan 1/5 will then be connected to Vietnam's national grid via a 220 kV transmission line. *EVN* documents state that the Sesan 1/5 will "meet the increasing energy demand of the locality in the project site of Cambodia as well as for Vietnam", although it is not clear how much of the output will be supplied to "the locality" and it should be noted that the dam is in a fairly remote border area where current demand for electricity is likely to be low.[151]

[150] VNA, *EVN unit speeds up work on Lao, Cambodian dams*, 8 July 2011.

[151] EVN, *Summary Report: Lower Sesan 1/Sesan 5 hydropower project*, 30 January 2010.

Over the last few years, statements on distribution of power generated by the Lower Sesan 2 have been vague and, more recently, conflicting. In 2011 it was reported that 50% of the power would be purchased by Cambodia and the remainder would be exported to Vietnam.[152] A number of observers have questioned the assertion that significant amounts of the power from the Lower Sesan 2 dam will be used in Cambodia. The main reason being that the capacity for transmission of the power beyond the northeast is not yet in existence, and demand for power in the sparsely populated northeast of the country is far below what the dam could produce at full capacity.

At a June 2011 NGO-led workshop, when pressed on where the power would be distributed, an official from the MoE stated that "[t]he Ministry of Environment has observed the situation closely. Only the left-over electricity from the use of local people will be sold to Vietnam."[153] In late July 2011 the Cambodian Prime Minister reacted to suggestions that the Lower Sesan 2 dam will not supply Cambodia, and stated that in fact 100% of the power would be used in Cambodia.[154] However, this is in contrast to statements from Vietnam that it has agreements with Cambodia to export 50% of the generated electricity from this dam to Vietnam. There is also a disconnect with the 2003 National Sector Review for hydropower prepared by MIME, which states that the size of the hydropower projects on the Mekong River and the biggest projects on its tributaries are "too large to be developed for domestic supply alone. If developed they will be built for export to southern Vietnam or Thailand where there are deficits of generating capacity."[155]

The Lower Sesan 2 Dam is not predicted to be up and running until 2017, and presumably construction of transmission lines will be coordinated with construction of the dam. In order to use anywhere near 50% of the power generated at Sesan 2 (or, indeed, 100% as was suggested by the Prime Minister), high voltage transmission lines will need to be constructed to connect the dam to other provincial towns and to the capital, Phnom Penh. There are plans to develop Cambodia's high voltage transmission network, with some parts already being developed. 3S hydropower projects could foreseeably be connected to this network. However, it is not clear at present if there is adequate funding for all sections of this network, and it is also unclear what impact assessments have been conducted to date. Below is a summary of the proposals to extend the Cambodian transmission network into the northeast, which in theory may eventually connect 3S hydropower projects to the rest of the country:

- **Stung Treng - Kratie:** South of Stung Treng and en route to Phnom Penh, Kratie is the next provincial town. The *Import-Export Bank of India* is providing financing of US$15 million for the strengthening of capacity of the transmission lines connecting the provinces to 230 kV.[156] MIME presentations on the National Power and Hydropower Development Plans suggest that Stung Treng will be connected to Kratie by 230 kV lines by 2012.[157]

- **Kratie - Kampong Cham:** According to MIME's Power Development Plan, Kratie is to be connected to Kampong Cham via 230 kV transmission lines by 2012. The developer listed as responsible for this line is *Cambodia Utilities Pte. Ltd. (CUPL)*[158] which is a subsidiary of Malaysian firm *LEADER Universal Holdings*.[159] However, *LEADER*'s website and annual report

---

152 VNA, *EVN unit speeds up work on Lao, Cambodian dams*, 8 July 2011.

153 Phnom Penh Post, *Electricity for Vietnam*, 1 June 2011.

154 Letter from Prime Minister Hun Sen, 28 July 2011.

155 Cambodia National Mekong Committee (prepared by MIME), *National Sector Review 2003: Hydropower*, June 2003 (p8).

156 Export-Import Bank of India, *Press Release: Exim Bank to Assist Transmission Line Project in Cambodia*, 5 March 2010.

157 Presentation by Victor Jona, 16 March 2011.

158 *Ibid*.

159 See LEADER's annual reports: http://www.leaderuniversal.com/investor_centre/annualReports.asp

makes no mention of this project. In a 2010 speech, Prime Minister Hun Sen said that the country was still seeking funding for this line.[160]

- **Kampong Cham - Phnom Penh:** In January 2010 the Cambodian government approved a proposed project to connect Kampong Cham to Phnom Penh by 230 kV transmission lines. The developer is *Cambodia Transmission Ltd. (CTL)*, another wholly owned subsidiary of Malaysian company *LEADER Universal Holdings*.[161]

  The transmission lines and associated substations will be developed under a 25 year BOT contract at a total cost of US$107.6 million. *CTL* will design, finance, construct, operate and maintain the project for the period of the contract. The project was proposed to commence by July 2011 and be completed by the end of 2013. According to the project agreement, the project "fulfils part of the planned development of the Cambodian grid system and provides for future 230 kV extension to other parts of the country around Tonle Sap, the largest freshwater lake in South East Asia, in Siem Reap, Cambodia."[162]

  In addition, the 2011 MIME presentation referenced above states that the existing Kampong Cham to Phnom Penh transmission lines will be upgraded to 230 kV in order to "transmit power from Lower Sesan II and Lower Srepok III". This reinforced line is predicted to be operational by 2017, the year that the Lower Sesan 2 dam is projected to go online.[163]

- **Kampong Cham - Kampong Thom - Siem Reap:** There are also plans for a 230 kV transmission line connecting Kampong Cham to Siem Reap via Kampong Thom. The Korean company *KTC* is listed as the developer of this line and the associated substations.[164] A feasibility study for this line was conducted by *KTC* and *OX Engineering* in 2007.[165]

- **Laos - Stung Treng - Vietnam:** As will be discussed later in Section 3.1, there is also discussion underway for a 500 kV transmission line connecting southern Laos to Stung Treng in Cambodia, before connecting to central Vietnam. Very little information is publicly available related to this transmission line.

Although at present Cambodia needs to import electricity from neighbouring countries in order to meet demands, MIME has stated that the country will be energy self-sufficient by 2012, exporting 1,000 MW of power by 2016,[166] and more than 4,000 MW by 2020.[167] The five dams already under construction in the south and southwest of the country (see Section 1.1) are bringing Cambodia closer to this target, and as can be seen here, if the action plan set out by MIME is followed through, there is the potential for connecting 3S dams to Cambodia's national grid as well as that of Vietnam. However,

---

160 Speech by Prime Minister Hun Sen, *Selected Comments at the Groundbreaking of the Construction of Russei Jrum Hydropower in the District of Mondul Seima, Koh Kong Province*, 28 December 2010, http://www.cnv.org.kh/2010_releases/28dec10_russeijrum-hydro-power_comments.html (accessed November 2011).

161 See LEADER's annual reports: http://www.leaderuniversal.com/investor_centre/annualReports.asp

162 LEADER Universal Holdings announcement, *Signing of power transmission agreement, implementation agreement and lease agreement for 230 kilovolt power transmission system project from Phnom Penh to Kampong Cham, Cambodia* http://announcements.bursamalaysia.com/EDMS%5Cedmswebh.nsf/LsvAllByID/482576120041BDAA482576B1003E5344?OpenDocument (accessed November 2011).

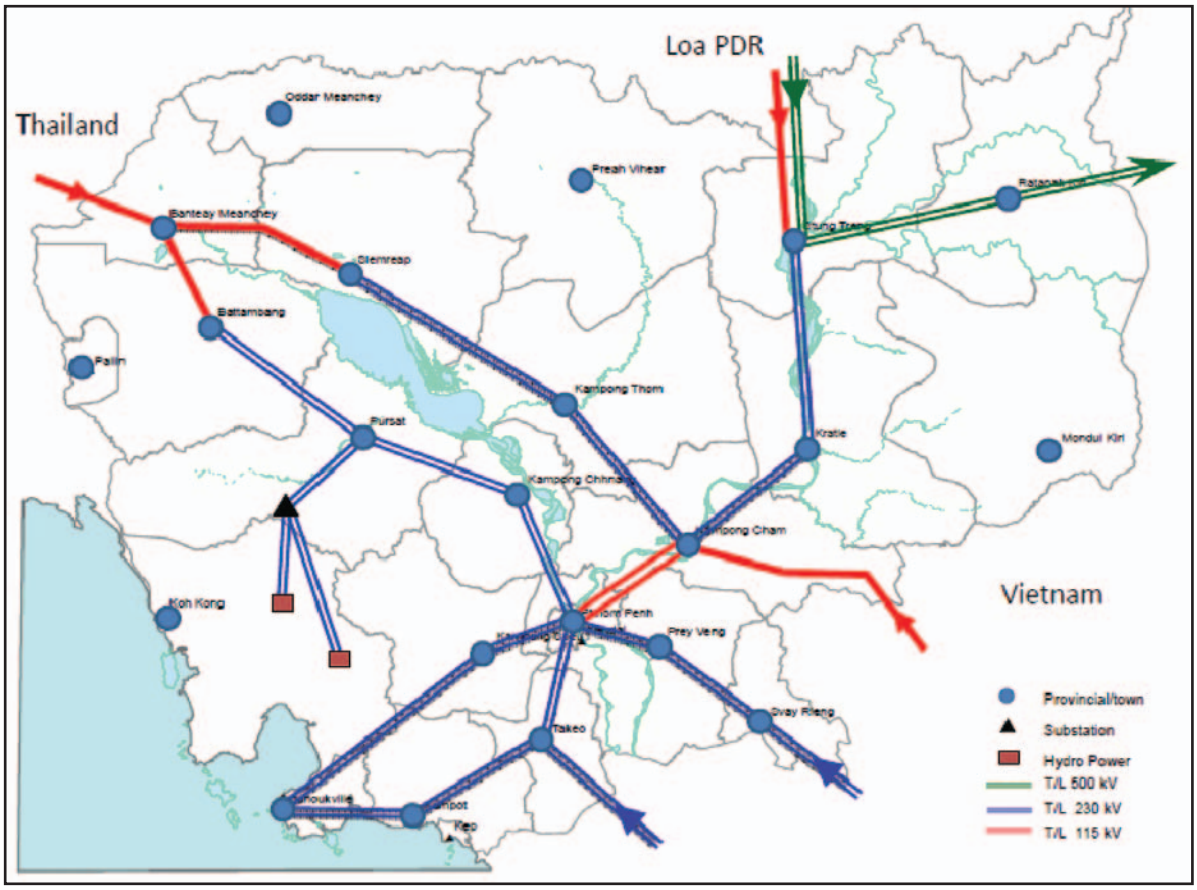
163 Presentation by Victor Jona, 16 March 2011.

164 Presentation by Victor Jona, 16 March 2011.

165 *KTC Cable* & *OX Engineering*, available online at: http://www.authorstream.com/Presentation/kim3532-220876-feasibility-study-transmission-line-electricity-cambodia-230kv-business-finance-ppt-powerpoint/ (accessed November 2011).

166 Phnom Penh Post, *Electricity exports expected by 2016, says govt official*, 30 March 2009.

167 Presentation by Victor Jona, 16 March 2011.



Proposed Cambodian transmission grid[168]

it is not clear if all sections of the proposed grid are yet financed, and it still remains to be seen how the eventual output of the 3S projects will be utilized.

There is currently no information publicly available on how power generated at the Lower Sesan 3, the Lower Srepok 3 and 4, or the Lower Sekong dam will be used.

Public Consultation

It is often the case in Cambodia that plans for large scale development projects are proposed, assessed and agreed behind closed doors. Bidding processes are often not publicized, if indeed they take place at all. Very often, more information can be found in local and foreign media sources than can be obtained officially in Cambodia. In some cases the local authorities are not even aware of the plans being made at the national level for their area. In the Lower Srepok 3 case mentioned above, local officials had no idea that Chinese company staff had been given permission to take samples from the area as part of the feasibility study for the proposed dam.

Very often, the first opportunity that communities have a chance to learn project details and voice their concerns is during the Environmental Impact Assessment (EIA) process. Public consultation is a legal requirement, and as stated in the Sub-Decree on Environmental Impact Assessment, the EIA process should: "encourage public participation in the implementation of the EIA process and take into account their input and suggestions in the process of project

168 Presentation by Victor Jona, 16 March 2011.

approval."[169] The Forestry Law adds to this and states that the law should be "implemented to ensure public participation in any government decision that has the potential for heavy impact on concerned general citizens, livelihoods of local communities and forest resources of the Kingdom of Cambodia." It goes on to say that "an Environmental and Social Impact Assessment shall be prepared for any major forest ecosystem related activity that may cause adverse impact on society and environment. Documents of the Environmental and Social Impact Assessment shall be made available for public comment."[170] As many, if not all, of the hydropower projects proposed in the 3S area will impact on forests, according to the Forestry Law, their EIAs should be made available for public comment once completed.

In reality, it can be seen that EIAs are often seen as little more than a step in the process to approval, rather than a crucial opportunity to conduct a genuine investigation into impacts, present findings to all stakeholders, and to hear from those who are likely to be affected. There are examples of large development projects with no EIA conducted at all, and others where an EIA has been completed, but only after project approval was already granted, or even after the project has commenced construction or operation. For example, as of November 2011, the EIA for the Kamchay Dam in the southern province of Kampot was still not given final approval, even though construction had been on-going for five years and the project went online in December 2011.

The only hydropower project in the 3S area that has so far been subject to a widely publicized EIA is the Lower Sesan 2, and a number of concerns were raised regarding the conduct of the EIA and its findings, as detailed in Section 2.1 above. The Lower Sesan 1/5 may also have been studied but no public consultations have yet been conducted, and no further information is publicly available.

The full extent of the impacts of hydropower development on the 3S area in Cambodia and the cumulative impacts of the development on the wider area are still unknown. Much depends on how many of the proposed hydropower projects are approved, how the projects are designed, and on what measures are taken to mitigate their impacts. Not only do the individual countries need to improve their commitments to fully assess impacts and consult with communities at the project site, they must also pay greater attention to the wider impacts downstream, and also across national boundaries. The region's delicate ecosystems, fisheries and wildlife are all deeply interconnected – and breaking this link is potentially disastrous for the livelihoods and food security of hundreds of thousands of people.

169 Sub-decree on Environmental Impact Assessment 1999, Article 1.

170 Forestry Law 2002, Article 4.

Section 3

The actors shaping the region's hydropower development

Although the Cambodian Government is responsible for creating the policy that guides the country's energy sector development, and for approving or rejecting proposed projects, a number of other influential actors are involved in the complex picture currently being painted in the 3S area. The following section of this report will focus on the various other actors playing a role in the development of the region's hydropower sector. This includes information on the programs of the international financial institutions active in the area, and the bilateral and regional initiatives that are concerned with promoting development in the region.

3.1 The Asian Development Bank

The Asian Development Bank (ADB) has been engaged in the Mekong region for a number of years, during which time it has supported a number of projects related to hydropower development and power transmission in the 3S countries. In 1999, the ADB commissioned a study of a number of proposed hydropower projects in the Sekong, Sesan and Nam Theun Basins, often referred to as the Halcrow Report, after the consultant firm that conducted the study.[171] The ADB also supported a feasibility study of the Sesan 3A Dam in Vietnam in 1999.[172] In 2006, the ADB offered a grant for technical assistance to conduct a study into hydropower development across the 3S region, with the aim of improving cross border cooperation in the management of the 3S river basins. At the outset of this project the three governments and the ADB identified that the development of resources in this area could contribute considerably to alleviating poverty in the area and stimulating regional development, if properly managed. Project documents also state that the basins and their resources are currently under enormous pressure, which is only likely to increase if current development trends continue. As stated in one Technical Assistance (TA) report produced under this study: "potential benefits and contribution to reducing widespread poverty in the basins are lost when planning is carried out in narrow country-specific or sector-specific contexts and without adequate consultation with stakeholders."[173] Against this backdrop, the ADB sought to improve regional dialogue, cooperation

---

171 Asian Development Bank, *TA-5697 REG: Se Kong-Se San and Nam Theun River Basins Hydropower Development Study*, project documents available at: http://www.adb.org/projects/project.asp?id=30003 (accessed November 2011).

172 Asian Development Bank, *TA-3222 VIE: Preparing the Se San 3 Hydropower Project*, project documents available at: http://www.adb.org/Projects/project.asp?id=31362 (accessed November 2011).

173 Asian Development Bank, *Technical Assistance Report: Project 40082, Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam*, December 2006, (para 4).

and information sharing, and create a road map for future development of the basins' resources. It was envisioned that this road map would form a basis for future ADB support to the sector.

The ADB 3S Study was assessed as being only partially successful, and at present the ADB has no publicized plans to support any future hydropower projects in the 3S area. However, the ADB is continuing with its support for developing capacity and infrastructure for regional power sharing, which is directly linked to hydropower development in Cambodia, Laos and Vietnam, including in the 3S basins. These power lines will connect to a large number of dams that are proposed or under construction in the 3S area, several of which have already raised concerns because of a lack of adequate consultation and consideration of downstream impacts. The following is a summary of the study and how current plans for ADB support to regional power sharing may impact on the 3S area.

The ADB's 3S Study

In 2006, at the request of the National Mekong Committees (NMC) of Cambodia, Laos and Vietnam, the Asian Development Bank developed plans to support a study with the aim of strengthening cross-border collaboration in the management of the Sesan, Srepok and Sekong river basins. In December 2006 a proposed grant of US$980,000 was approved for technical assistance for the *Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam* (hereafter referred to as the *3S Study*). The TA commenced in April 2008 and ended July 2010.[174]

The initial Technical Assistance Report identifies that the 3S region has substantial potential for development but that without adequate planning and consultation amongst all stakeholders, these benefits are likely to be squandered. Hydropower development is singled out as an example of a sector where planning has focused on "maximum economic benefits with little consideration of the need for upstream management of watersheds or of the downstream impacts on flow regimes. The result is unintended negative impacts on downstream communities."[175] The report goes on to say that "uncoordinated development will condemn these relatively healthy river basins to progressive degradation."[176] With this in mind, the TA aimed to improve capacity for cross-border and inter-sector planning of development in the 3S basin, and to review on-going and planned developments, including their expected socio-economic and environmental impacts.

One of the TA's main outputs was improved information sharing and improved stakeholder access to information. Through the TA, a website was developed for gathering and sharing information in order to facilitate dialogue and analysis.[177] These documents have been achieved and can be viewed at http://www.3sbasin.org/iucn/. The website has records of the 3S Study's findings, documents, reports, data, links and other useful materials. The final report for the 3S Study describes the website as "a tentative step paving the way for setting up tools for information sharing."[178]

The TA also sought to support improving dialogue. Towards this end, "visioning exercises" were conducted with stakeholders with the aim of looking at the current situation, trends and their implications, and visions for the future. These consultations were carried out in a number of workshops

---

[174] Asian Development Bank, *Final Report: TA6367 Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam*, July 2010 (p10).

[175] Asian Development Bank, *Technical Assistance Report: Project 40082, Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam*, December 2006, (para 4).

[176] *Ibid*. (para 9)

[177] ADB, *Final Report: TA6367*, July 2010 (p12).

[178] *Ibid*.

in each basin area, followed by national level workshops and finally trans-boundary workshops, which also involved representatives from community groups, NGOs, academia and the media.[179] A number of concerns were raised during these consultations, including reduced dry season flows, irregular water flow, reduced water quality and quantity, and increased pressure on water resources. The study's final report states that the consultation feedback "clearly indicates that there is a sense that the 3S is approaching some degree of a water crisis and that there are fundamental problems associated with current trends in resources use that threaten long term development ambitions."[180] It goes on to state that in "all countries there is a perception across stakeholders that the pace of change has been extremely rapid, and while in some cases it has delivered many tangible benefits, the degradation of water resources (and watershed) and growing pressure on these resources, suggests an extremely gloomy picture for the future."[181]

A key component of the 3S Study was for scoping and developing terms of reference for a future Cumulative Impact Assessment (CIA). This process included field trips in the three countries, data collection, meetings at various levels and preparation of provincial profiles. These meetings and the "visioning exercises" mentioned above served as the stakeholder consultation component for developing the CIA. The information gathered during the course of the study was fed into technical briefing notes of the 3S project which were then used to identify the key issues and develop a Terms of Reference for a full CIA to be conducted at a later date.[182]

One of the main outputs of the 3S Study was a draft "road map" for the future development of water resources in the 3S basin area. The road map includes monitoring situations and trends in the area, assessing the impacts and benefits of planned developments, managing and monitoring developments, and building institutions. According to the 3S Study final report, "[t]he Road Map is a key final product of the 3S [Study] and would form the basis for future support from the ADB to the countries."[183] The draft road map produced includes activities for the following 10 years. Included in the road map are plans to develop CIA country teams, build the capacity of national institutions and conduct a full CIA for hydropower development of the whole 3S region. The road map also contains plans for selecting a priority list of hydropower projects and assessing them using the Hydropower Sustainability Assessment Protocol (HSAP). A number of other activities were put forward including: improving information sharing, on-going monitoring of projects, monitoring water flow and quality, and establishing an early flood warning system. The plan also envisioned a regularly updated database of large scale infrastructure developments in the area.[184]

The 3S Study final report states that the study resulted in broad agreement on key shared principles. This included agreement that sustainable development and resources usage in the three basins requires recognition that:[185]

- balance between development and protection of resources, ensuring mutual benefits for all three countries and equitable sharing of benefits to the people are the key principles for a common 3Ss Basins vision;
- there has been dramatic change in the 3Ss basins over the last 20 to 30 years. Changes in the landscape and natural resource base can be clearly observed in parts of the basin, most notably in Vietnam, and similar changes are starting elsewhere in the basin;

[179] *Ibid*. (p13)

[180] *Ibid*. (p19)

[181] *Ibid*. (p4)

[182] *Ibid*. (p16-17)

[183] *Ibid*. (p33)

[184] *Ibid*. (p36)

[185] *Ibid*. (p8)

- these changes have brought many benefits with improvements in wellbeing and livelihoods for many people. But many people still remain poor according to some of the most important indicators – in terms of food security, health and access to safe water;
- the basin may well be approaching a critical crossroads. With growing demand and pressure on water resources for food, energy, domestic and urban use, being able to meet long-term development objectives will depend on managing water and land resources efficiently and effectively; and
- improving the way that development is planned and implemented, and improving the way that land and water resources are valued, conserved and used is necessary.

Despite the fact that the study managed to reach broad agreement on a number of key issues and principles, when the TA completion report was posted online in August 2011, the project was rated as only being partially successful. According to this report the outcome of the TA "was not fully achieved as no new formal collaborative arrangements were established in the 3Ss." Although the TA was assessed as being successful in increasing information exchange between stakeholders and raising awareness about key issues, it "was not successful in establishing a formal basin institution to sustain the initiatives fostered by the TA." As no institution was established to continue these initiatives, the road map will presumably remain in draft form and will not be cohesively implemented. However, a number of programs are proposed or being implemented by other institutions that will build on the collaboration established through the 3S Study. This includes the World Bank funded Mekong IWRM project (discussed in Section 3.2 below). The International Union for Conservation of Nature (IUCN) also has projects to strengthen cross-border collaboration and information sharing, including maintaining the 3Ss website established by the TA. [186] However, there are no indications at present that the ADB will follow up on future projects building on the implementation of the road map in the 3S area.

ADB support for Southern Laos-Central Vietnam 500 kV Transmission Lines

As discussed earlier, dams along the Sesan in the Central Highlands of Vietnam have had significant social and environmental impacts, and serious trans-boundary effects on Cambodia. North of the Cambodian border in Laos there are also a large number of dams proposed for the Sekong River. Similar concerns have been raised about the potential negative downstream impacts on Cambodian rivers and communities, and there has been criticism that there has not been adequate consideration of the potential trans-boundary impacts of these dams. Despite these concerns, the ADB is currently working with both governments to support the development of transmission lines connecting proposed dams in southern Laos to Vietnam's national grid.

In 2008, the governments of Laos and Vietnam signed a framework agreement providing for power sale arrangements of up to 5,000 MW by 2020. Plans are now under way to develop transmission lines connecting the two countries.[187] These transmission lines are a key part of the proposed Greater Mekong Subregion regional power trade plan, and will provide the connection between southern Laos' extensive proposed network of hydropower plants and the Central Highlands of Vietnam.

In 2009, the Asian Development Bank (ADB) approved Technical Assistance for "*Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*".[188] The total cost of the TA

---

[186] Asian Development Bank, *Technical Assistance Completion Report, TA 6367-REG: Sesan, Srepok and Sekong River Basins Development Study in Cambodia, Lao PDR and Vietnam*, August 2011.

[187] Asian Development Bank, *Project 41450: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*, August 2008 (para 3).

[188] ADB Website, *Project Information Document, TA6481: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion* http://pid.adb.org/pid/TaView.htm?projNo=41450&seqNo=01&typeCd=2 (accessed April 2012).

was $1,300,000, comprising $1,000,000 from the ADB and $150,000 from each of the governments of Laos and Vietnam. The proposed transmission lines will connect dams in southern Laos to Vietnam, and according to initial ADB documents will be operated and maintained by *Electricité du Laos (EdL)* and the *National Transmission Company (NTC)*, which is a 100% owned subsidiary of *Electricity of Vietnam (EVN)*.[189] Media reports from 2010 stated that the *Song Da Corporation* will be responsible for the construction of the transmission lines.[190]

Song Da Corporation

Song Da is a state owned enterprise under the management of the Ministry of Commerce of Vietnam. Although it is not a subsidiary of *EVN*, *Song Da* has constructed dams for the company, and *EVN* is listed as a partner on the company website.[191] *Song Da* is also constructing the Xe Kaman 1 Dam that is likely to be the first project to connect to the transmission lines.[192] In his address at the ground-breaking ceremony, Vietnam's Deputy Prime Minister stated that the project was one of Vietnam's biggest overseas investment projects and was considered a symbol of cooperation between the two countries. He also stated that the project would pave the way for many other projects and contribute to helping the two countries' electricity cooperation strategy to reach 5,000 MW by 2020. According to Vietnamese media *Song Da* is conducting feasibility studies on a further six hydropower plants in southern Laos.[193]

The ADB TA activities included preliminary design of the transmission lines, review and justification of the financial and economic rational of the project, preparing the EIA, resettlement plan and environmental management plan (EMP) for the substations and power lines, and to assess and draft legal documents for the proposed joint venture for operation of the facilities.[194]

The Project Information Document (PID) on the ADB website was updated in March 2012 and states that the project design for the 500 kV transmission line has now been agreed between the governments of Laos and Vietnam and the ADB.[195] However, at present there is no information publicly available regarding the final route, cost and potential impacts of the proposed project. Until documentation is made public, information gaps remain, and the summary below is based on the information currently available. Additionally, the TA discussed here concerned only "preparation" of the transmission lines, and it is still not clear if the ADB will commit further support for the construction of the transmission lines.

According to the initial ADB project documents, the development of the transmission line project will involve construction of a 65 km, 500 kV transmission line from the Ban Sok substation in Laos to the

---

189 Asian Development Bank, *Project 41450: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*, August 2008 (para 2).

190 The Saigon Times, *Vietnam-Laos power line ready by 2015*, 21 July 2010.

191 Song Da website, *Company history:* http://www.songda.vn/info/en/tabid/179/ItemID/1/View/Details/Default.aspx; *Song Da partners:* http://www.songda.vn/info/en/tabid/179/ItemID/6/View/Details/Default.aspx (accessed November 2011).

192 Song Da website, http://songda.com.vn/info/en/Detail/tabid/181/ItemID/1805/View/Details/Default.aspx (accessed November 2011).

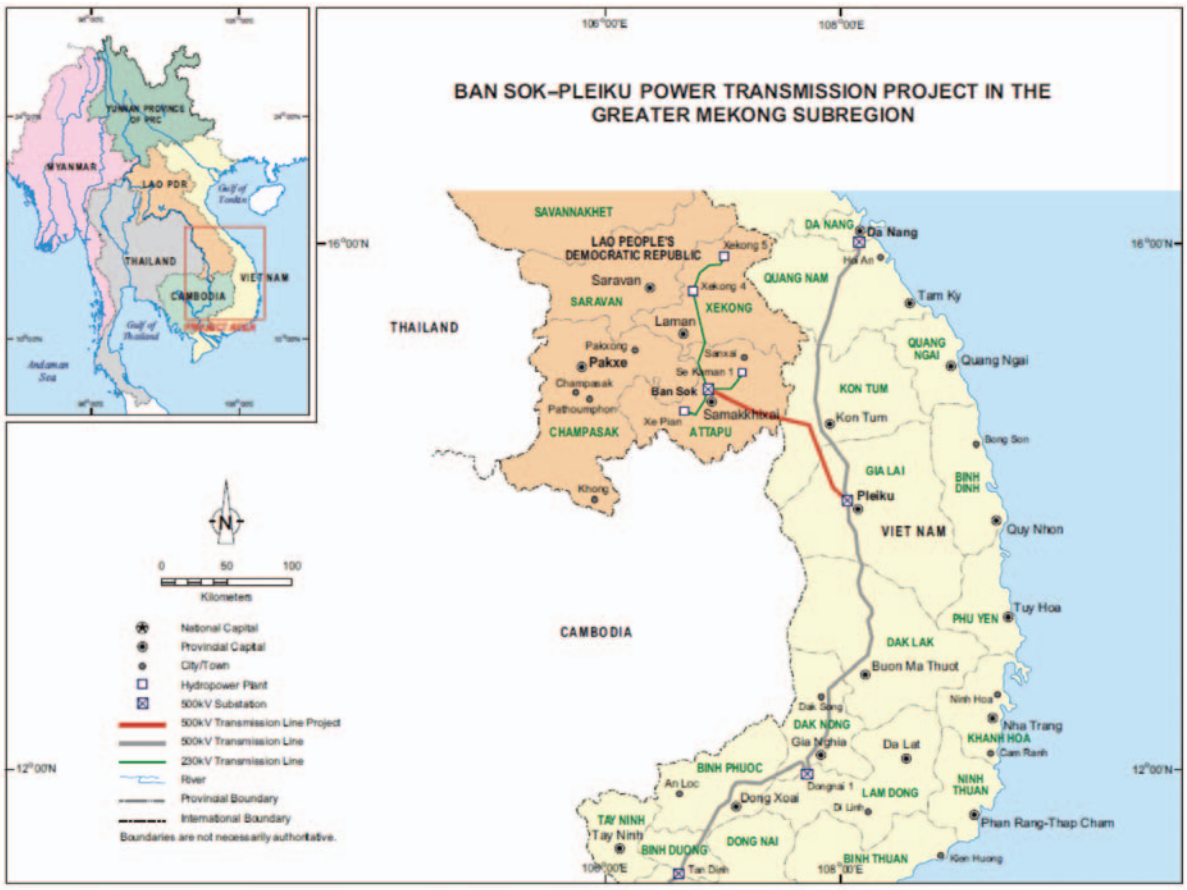
193 Vietnam News, *Work starts on Laos hydropower plant,* 7 March 2011.

194 ADB website, *Project Information Document: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion,* http://pid.adb.org/pid/TaView.htm?projNo=41450&seqNo=01&typeCd=2 (accessed April 2012).

195 *Ibid*.

Vietnamese border, and the construction of a 100 km, 500 kV line from the Lao border to the Pleiku substation in Vietnam. This will require construction of a substation at Ban Sok, and extension of the existing Pleiku substation. The route of the proposed line has since been altered, this is discussed more below. A 2010 ADB document on regional power trade states that 1,000 MW will be exported to Vietnam along this transmission line.[196]

The transmission lines were initially planned to connect to the Xe Kaman 1 (488 MW), Upper Se Kong 3 (152 MW), Lower Se Kong 3 (96 MW), and Dak Emeule (138 MW) hydropower projects in Southern Laos. The ADB project document states that a total of 11 hydropower projects have been identified in southern Laos with a total installed capacity of 1,300 MW, of which 1,000 MW will be exported through the Ban Sok–Pleiku power transmission line. According to this document "[e]ach hydropower project will construct a dedicated power transmission line to the Ban Sok substation."[197] The most recent publicly available documents show that the proposed connections have now changed, and the transmission lines will now connect to the Xekaman 1, Nam Kong 1 (229 MW), Se Kong 4 (464 MW) and Xe Kong 5 (388 MW).[198]



Map of the Ban Sok-Pleiku line taken from 2008 ADB project document[199]

196 Asian Development Bank, *RETA 6440: Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion*, Final report - Component 1, Module 1: Update of the GMS Regional Master Plan, executive summary, 15 October 2010 (p51).

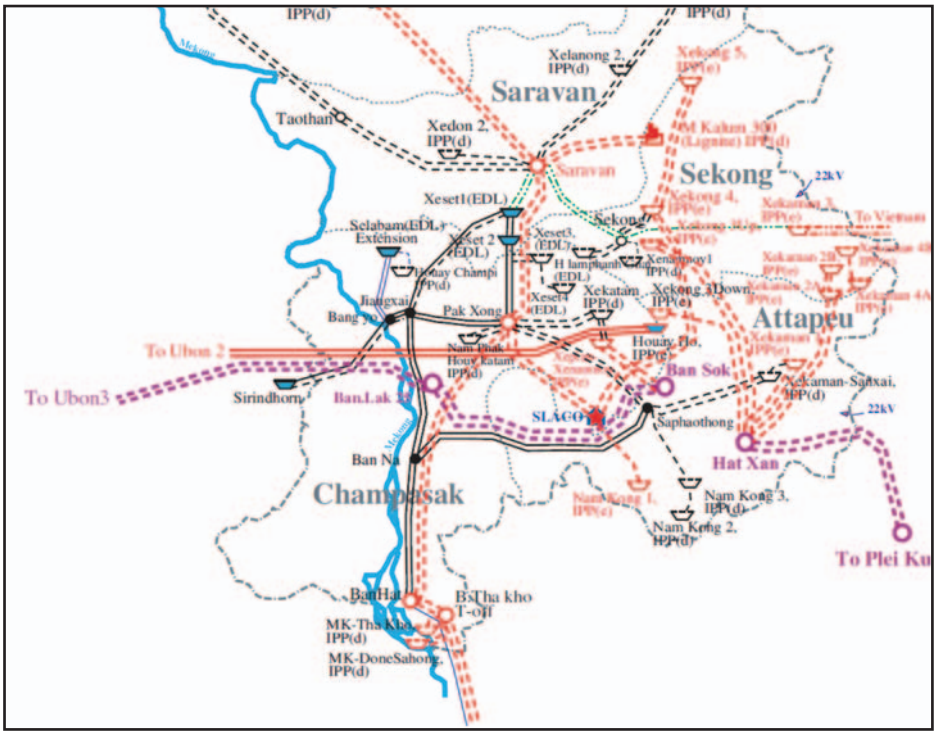
197 Asian Development Bank, *Project 41450: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*, August 2008 (para 6).

198 ADB website, *Project Information Document: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion,* http://pid.adb.org/pid/TaView.htm?projNo=41450&seqNo=01&typeCd=2 (accessed April 2012).

199 Asian Development Bank, *Project 41450: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*, August 2008.

The original TA documents projected the Xe Kaman 1 hydropower project would be commissioned by mid-2013. The same document states that the Ban Sok–Pleiku power transmission line and the associated substation should be complete and operating by the end of 2012.[200] However, according to a July 2010 media report, a senior official from *Electricité du Laos* stated that the line would not be up and running until 2015. According to the official, the developer of the project is Vietnam's *Song Da* Corporation, "and the Asian Development Bank (ADB) will hopefully be the provider of technical and financial support for the development of this project."[201] According to a Laos' Government website, the Xe Kaman is under construction and will commence operation in 2013.[202]

A 2010 ADB evaluation of the Laos energy sector states that the project was making slow progress and aside from the Xe Kaman 1, which is under construction, "there is little progress on the other projects."[203] Another ADB document suggests that the project has been delayed and that "some of the studies for the identified priority transmission lines did not push through due to the lack of sufficient hydropower projects that would utilize these lines. However, the development of hydro projects in southern Lao PDR could spur development of the Ban Hatsan-Kon Tum transmission line (formerly Ban Sok-Pleiku)."[204] This statement clearly indicates the interdependence of this project with the development of hydropower projects in southern Laos. It should also be noted that the change of name from "Ban Sok-Pleiku" to "Ban Hatsan-Kon Tum" indicates that the route of the transmission lines has now changed. According to the ADB, this change of route is due to a lack of available land at the original Ban Sok site.



Map of proposed dam connections to Ban Sok-Pleiku line.
Source: Electricité du Laos

200 *Ibid.* (para 7).

201 The Saigon Times, *Vietnam-Laos power line ready by 2015*, July 21, 2010.

202 http://www.poweringprogress.org/index.php?option=com_content&view=article&id=49&Itemid=53 (accessed November 2011).

203 Asian Development Bank, *Energy Sector in the Lao People's Democratic Republic, Reference Number: SAP: LAO 2010-42, Sector Assistance Program Evaluation*, October 2010 (pages 14-15).

204 Asian Development Bank, *Summary of discussions Special Meeting of the regional Power Trade Coordination Committee (RPTCC-9A)*, Bangkok, Thailand, December 14-15, 2010 (para 9).

As the ADB has already observed in its 3S Study, the current trends in hydropower development in the area pose serious threats to watersheds and downstream flows, and public consultation is often inadequate, as is consideration of cross-boundary impacts. However, the ADB's planned support for regional power sharing evidently supports and facilitates the continued expansion of hydropower, especially in southern Laos. Clearly the transmission lines would not be necessary without the expansion of hydropower in southern Laos, and likewise, without high voltage transmission lines the planned hydropower plants would not be feasible. As can be seen in a map above produced by *Electricité du Laos* for the country's Power Development Plan up to 2020, there are plans to connect many otherwise isolated hydropower plants to the 500kV Laos-Vietnam transmission line.[205]

As mentioned above, a number of the plants proposed for connection to the transmission lines have raised concerns amongst affected communities and observers. The Xekaman 1 project is likely to cause severe changes to the river's hydrology, impact on fisheries and reduce water quality. Site clearance and road construction began before social and environmental assessments had been completed or approved – which is a violation of Lao Law. It has also been reported that three other dams originally proposed for connection to this line are likely to have significant social and environmental impacts. The Sekong 4 will be the biggest dam to be built in southern Laos, and will completely block fish migrations, potentially affecting hundreds of thousands of people. The impacts of the Sekong 4 and 5 projects will also be felt downstream in Cambodia, however, according to International Rivers, no fieldwork or investigations have been conducted in Cambodia. International Rivers also claim that the resettlement conditions and livelihood restoration are inadequate for the 5,000 people likely to be displaced. The Nam Kong 1 will also block fish migrations, and will impact on large numbers of indigenous Brao people. The affected communities have received little information about the project, and there are concerns that the downstream impacts are not likely to be adequately mitigated or compensated, and that the project will have downstream impacts on the Sekong in Cambodia, which have not been adequately assessed.[206]

All ADB projects must be assessed before implementation and then monitored throughout the process to ensure that they are in full compliance with ADB safeguards. If the ADB does directly support the construction of the transmission lines, their safeguards will apply to the construction of the transmission lines and substations. For example, negative environmental impacts should be avoided or mitigated, and any resettlement must be carried out in compliance with ADB policy. Part of the TA to prepare the transmission lines includes the preparation of impact assessments of the project and its associated facilities, here defined as being "the transmission lines connecting the Ban Sok substation to the Xe Kaman 1, the Lower and Upper Xe Kong 3, and the Dak Emeule hydropower stations."[207] There is no mention of the TA considering the social and environmental impacts of the actual dam projects that will be connected to the substations at the hydropower sites.

However, it is not the transmission lines themselves that are the greatest source of concern to affected communities and civil society; it is the dams that will connect to those lines. It is unclear what efforts the ADB has made to ensure that its project is not encouraging the development of projects that may not meet the ADB's own minimum standards and safeguards, and in some instances may have even violated national law. The ADB Country Strategy for Laos states that it will "continue to incorporate sound environmental management in all its operations through application of its environmental and social safeguard policies, and, through policy dialogue, will encourage the Government to adopt similar standards for all large natural-resource intensive projects." However, if the proposed plan goes ahead

---

[205] *Electricité du Laos* website: http://www.edl.com.la/en/download/EDL_Network_PDP_Up9_06_2011.pdf (accessed November 2011).

[206] International Rivers, *Power Surge: The Impacts of Rapid Power Development in Laos*, September 2008.

[207] Asian Development Bank, *Project 41450: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*, August 2008 (para 14).

and does eventually connect to dams that would not meet ADB standards or national regulations, this claim is highly questionable. The ADB has stated in communications with the author that as the development of hydropower projects associated with the transmission lines will be undertaken by private developers, compliance with the ADB safeguard policy is not required for those projects. Although in transmission projects such as this, compliance with ADB standards may not be required, the ADB has conducted due diligence on associated projects in the past. For example, in an ADB funded transmission project in Yunnan Province, China, the bank conducted due diligence on an associated hydroelectric power project after concerns were raised related to involuntary resettlement, amongst other issues[208]. It is to be hoped that similar assessments will be conducted in the 3S area if the ADB is to approve support for the construction of the transmission lines.

As the project is still under discussion, at the time of publishing, the final route of the transmission line remains unclear, and it is not yet certain which dams the line will connect to, and how the construction will be funded.

In March 2012 the ADB approved a separate loan of US$730 million to support Vietnam to develop its domestic transmission network. The loan will be delivered over four tranches, the first of which was approved in March 2012.[209] Part of Vietnam's planned upgrade includes constructing 500 kV transmission lines connecting Pleiku to My Phuoc and Cao Bong. According to Vietnamese state media, the power lines "will also facilitate importing electricity from Laos to Vietnam and improve the power connections between Vietnam, Laos and Cambodia."[210]

Other ADB Technical Assistance on Regional Power Trading

The ADB has also funded a specific TA on power trading in the region. Starting in 2007, SIDA, the Swedish Government development agency, funded a TA through the ADB on "*Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion*."[211] The project has two main components: facilitating regional power trade, and building capacity for managing the impacts of power projects. This assistance includes support for finalizing a regional master plan for power interconnection, identifying priority power interconnection projects to be developed in the near term, and conducting feasibility studies and due diligence for these priority projects.[212]

A final report for the TA was discussed at the Regional Power Trade Coordinating Committee (RPTCC) in October 2010, and release to the public in November 2011. The report provides an update on the regional interconnection plan, but lacks detail on specific projects. The revised master plan does acknowledge the potential of regional connections between southern Laos and Cambodia to Vietnam: "Because of the number and geographic proximity of hydro projects in Southern Laos, Cambodia on one hand, and the proximity to load areas in Central and Southern Vietnam on the other hand, there is a variety of possible interconnections between these four areas." However, it goes on to state: "More detailed investigations and focussed studies…would be necessary to evaluate the different possibilities, which are largely dependent on national grid development and the actual hydro projects

---

208 Asian Development Bank, *Project Completion Report on the Yunnan Dachaoshan Power Transmission Project (Loan 1644-PRC) in the People's Republic of China*, August 2005, http://www2.adb.org/Documents/PCRs/PRC/pcr-prc-30474.pdf (accessed April 2012). (page 43, para 2)

209 ADB Website, Project Information Document, *Project 42039: Power Transmission Investment Program,* http://www2.adb.org/Projects/project.asp?id=42039 (accessed April 2012).

210 Nhan Dan Online, *VND 820 billion contract for power projects signed*, 13 March 2012.

211 Asian Development Bank, *Project 41018: Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion*, November 2007.

212 *Ibid*. (para 12)

selected for development."[213]

The final TA report identifies seven priority interconnection projects, two of which will have a direct impact on the 3S area. The two projects identified are the southern Laos-Vietnam transmission line, "Because of the hydro potential in Laos south (3,5 GW in South) and the large price gap between the two countries", and the connection between Cambodia and Vietnam for export of power from the Lower Sesan 2 Dam. A further three potential interconnection projects are listed as requiring additional study; this includes a Laos-Cambodia-Vietnam line.[214] According to a document posted on their website, *TEAM Consulting and Management (Cambodia) Co. Ltd.* has conducted a feasibility study for the transmission line connecting Lao-Cambodia-Vietnam. This study covered the technical design, economic and financial justification of the project, environmental and social impact assessment, procurement plan bidding documents, costing and implementation schedule.[215] When contacted, the ADB had no information available on this feasibility study.

As stated above, these transmission lines clearly feed into on-going hydropower development in Laos, as without these dams there would be no need for the transmission lines, and without the transmission lines, the feasibility of these hydropower projects would be questionable. Indeed, the final report for the ADB's regional power trading TA states: "The main mechanism for power exchanges in the GMS will be based on large scale hydro generation export." Discussion on these transmission lines has been on-going for a number of years, alongside the conduct of the ADB's 3S Study, which, as already discussed, identified that "uncoordinated development will condemn these relatively healthy river basins to progressive degradation."[216] The ADB has yet to make any public commitment to support the actual construction of any of the power connection projects summarized here, but it is to be hoped that if a decision is made to do so, the projects will not be narrowly focused on supporting the physical transmission infrastructure in isolation from the broader development trends that are currently shaping hydropower in the 3S basins.

3.2 The World Bank

The World Bank also supports projects in the GMS Program, and aims to play a "supportive and complementary role, reinforcing the ADB's lead role in coordination." The World Bank's current priorities in the GMS region include the development of power trade and water resource management.[217] Of the two projects discussed below, one has now been cancelled by the Cambodian Government, and one was recently approved.

World Bank support for Cambodia-Laos transmission lines

In 2006, Cambodia and Laos signed agreements for Laos to export electricity to Cambodia,[218] and in December 2007 *Electricité du Cambodge (EdC)* and *Electricité du Laos (EdL)* signed a power purchase

---

213 Asian Development Bank, *RETA 6440: Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion*, Final report - Component 1, Module 1: Update of the GMS Regional Master Plan, executive summary, 15 October 2010 (p43).

214 *Ibid*. (p72).

215 *TEAM Consulting and Management (Cambodia)* website: http://www.team-cambodia.com/projects_detail.php?projectID=2 (accessed November 2011).

216 Asian Development Bank, *Technical Assistance Report: Project 40082, Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam*, December 2006 (para 9).

217 World Bank, Southeast Asia Country Management Unit, *Strategy Note on World Bank Regional Support for the Greater Mekong Sub-Region*, October 2007 (executive summary).

218 Vientiane Times, *Laos to export electricity to Cambodia*, 12 June 2006.

agreement for *EdL* to supply around 10 MW from its southern grid to meet local demand across the border in Cambodia. The two countries also have an agreement for the supply of 200 MW from Laos to Cambodia by 2020.[219] Laos is already exporting a small amount of electricity to Cambodia through existing 22 kV transmission lines, and in 2007 the World Bank agreed to fund new high voltage transmission lines to connect the countries and increase Laos' capacity to export to Cambodia. However, from the outset the project was beset with delays, and in late 2011, the Cambodian Government cancelled the project.[220] Some activities were completed in Laos, but work on the main transmission line never commenced. It is not clear at present if the line will be abandoned entirely, or if a different financier will move in to fund the project. Below is a short summary of the project, as it still may be of relevance if a new financier steps in.

The World Bank support for the transmission lines was broken into two separate projects, one for each country.[221] The estimated total cost of the two projects was US$38.8 million, of which the World Bank was to contribute US$33.5 million.[222] The 230 kV lines were proposed to run for 27 km from Ban Hat to the border of Laos-Cambodia, then a further 47 km from the border to Stung Treng provincial town in Cambodia. The World Bank initially approved funding in 2007 for 115 kV transmission lines and substations, however, the project was delayed after Laos and Cambodia made a request in 2010 to upgrade the proposed transmission lines from 115 kV to 230 kV. This required restructuring of the project and updated environmental assessments.[223] According to communications with the World Bank, the project was not justified by any specific hydropower project in Laos and there were no plans to connect the transmission lines to any hydropower dam in Laos or Cambodia, rather the project aimed to connect the two countries' power grids and allow for Laos to export its excess power.[224]

The project inside Laos planned to build two lines, one connecting a substation at Ban Hat to the Cambodian border, and one connecting the existing Xeset 1 hydropower dam to Saravan. The Laos project also includes support for a feasibility study for the Houay Lamphan Gnai Hydropower Project in southern Laos. The project is implemented by *Electricité du Laos (EdL)*, and while some of the activities have already been completed or are in progress, the main transmission line to Cambodia never commenced construction.[225]

In line with World Bank policies, the projects were subject to Initial Environmental Evaluations (IEE) in both Laos and Cambodia. According to both evaluations, the negative impacts were limited, with minimal displacement, although a number of people would need to be compensated for loss of farmland. Though the line in Laos would require some tree cutting, for the most part, the line would follow the highway, where the forested area is already degraded.[226] In Cambodia, environmental and

---

219 http://www.poweringprogress.org/index.php?option=com_content&view=article&id=49&Itemid=53 (accessed November 2011).

220 Personal communication with World Bank, November 2011.

221 *GMS Power Trade (Cambodia) Project, P105329* http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P105329 and *GMS Power Trade (Lao PDR) Project, P105331* http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P105331 (accessed November 2011).

222 See project information on World Bank website: http://web.worldbank.org/external/projects/main?Projectid=P105329&theSitePK=40941&piPK=64290415&pagePK=64283627&menuPK=64282134&Type=Overview; and http://web.worldbank.org/external/projects/main?Projectid=P105331&theSitePK=40941&piPK=64290415&pagePK=64283627&menuPK=64282134&Type=Overview (accessed November 2011).

223 World Bank, *Status of Projects in Execution (SOPE) 2010: East Asia and Pacific Region, Lao PDR*, 3 October 2010.

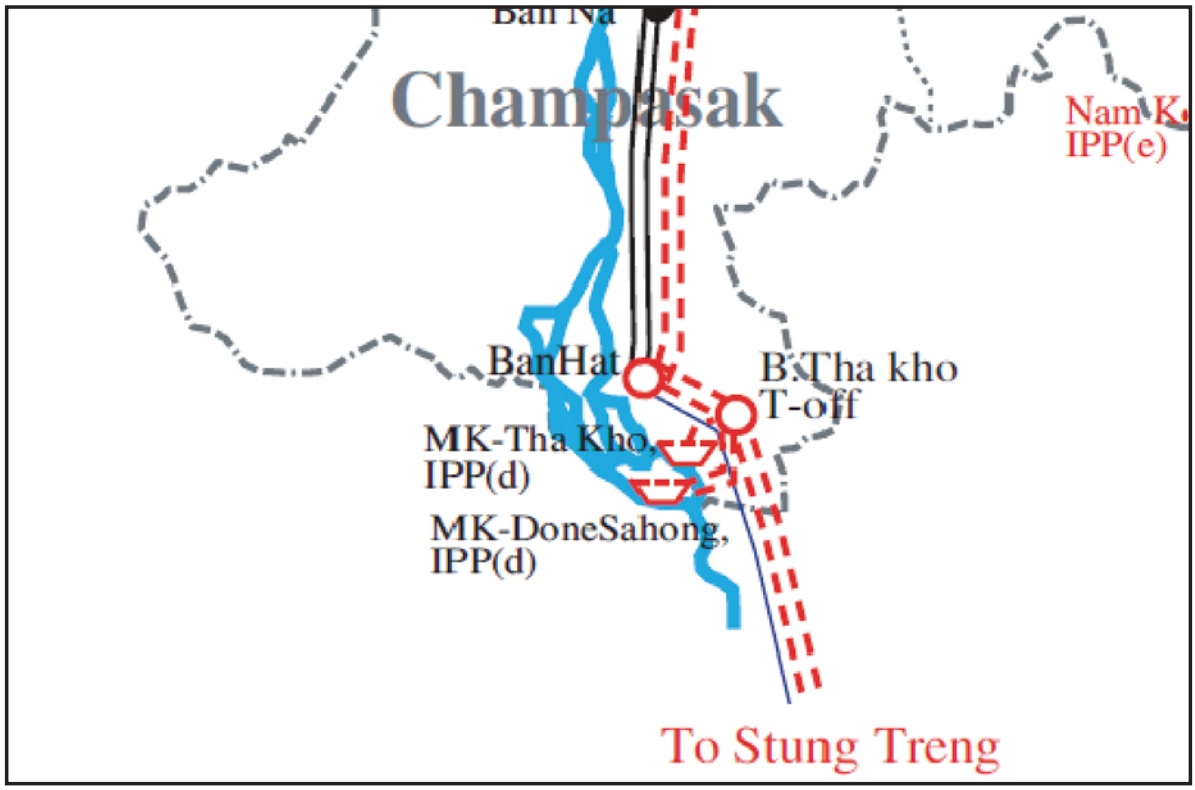
224 According to discussions with World Bank project staff, September 2011; see also: http://www.poweringprogress.org/index.php?option=com_content&view=article&id=49&Itemid=53 (accessed November 2011).

225 World Bank, *Implementation Status & Results, Lao People's Democratic Republic, GMS Power Trade (Laos) Project (P105331)*, March 2011.

226 Electricité du Laos, *Initial Environment Examination (IEE) for Ban Hat to Lao-Cambodia Border 230 kV Transmission Line Project*, February 2011.

social impacts were also judged to be minimal, although around 30 households were found to be residing in the path of the project.[227] All of those who were to be impacted by this project would have been entitled to both the protections of Cambodian and Laos law and the safeguards of the World Bank, however, as discussed above, the Cambodian Government has since cancelled the *GMS Power Trade (Cambodia) Project*.

If alternative financing is found for this transmission line, one concern that has been raised is the possibility that in the future it will be connected to Mekong River mainstream dams. As can be seen in the map below, which is taken from the same map referenced above in Section 3.1 showing *EdL*'s Power Development Plan for 2010-2020, Laos plans to connect the line to the proposed Don Sahong Dam by 2020. The Don Sahong project is of concern to many organizations working the region, as it may have serious impacts on fish migrations which may be felt not just in Laos, but also in Cambodia, Vietnam and Thailand.[228] Mainstream Mekong dams have raised such serious concerns related to impacts on fisheries that in 2010 a report commissioned by the Mekong River Commission recommended a 10 year moratorium on approving any mainstream dams.[229]



From Electricité du Laos' Power Development Plan for 2010-2020[230]

[227] MIME (prepared by KEPCO), *Initial Environmental Evaluation and Environmental Management Plan for GMS Subregion Power Project – Ban Hat to Stung Treng*, December 2010.

[228] For more information see: International Rivers, *Factsheet: The Don Sahong Hydropower Project*, September 2008. Available at http://www.internationalrivers.org/files/Don%20Sahong%20Fact%20sheet%20Sept%202008%20ENGLISH.pdf (accessed November 2011).

[229] World Bank, *World Bank Group Welcomes Strategic Environmental Assessment of Mekong Mainstream Dams: Confirms that it will not finance investments in mainstream hydro projects*, 22 October 2010 http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CAMBODIAEXTN/0,,contentMDK:22740418~menuPK:293875~pagePK:2865066~piPK:2865079~theSitePK:293856,00.html (accessed November 2011).

[230] http://www.edl.com.la/en/download/EDL_Network_PDP_Up9_06_2011.pdf (accessed November 2011).

World Bank's support for the Mekong Integrated Water Resource Management

From 2000 to 2007 the Mekong River Commission implemented the Water Utilization Programme (WUP) with support of the World Bank's Global Environment Fund, amongst other donors. The MRC established the Mekong Integrated Water Resources Management Project (M-IWRM) to follow up on the WUP.[231]

The M-IWRM project has significance to the 3S area and its objective is to "establish key examples of integrated water resource management practices in the LMB [Lower Mekong Basin] at the regional, national, and sub-national levels, thus contributing to more sustainable river basin development in the Lower Mekong." Originally the project was to be implemented by the MRC and its line agencies, along with the Water Resources and Environment Administration (WREA) in Laos and the Fisheries Administration of Cambodia. The project aimed to support various activities in both Laos and Cambodia at regional, national and local levels. In addition to working to support and build dialogue and cooperation capacities of the MRC and its national Mekong committees, the project also planned to support institutional development and implementation of IWRM tools and new legislation (Laos), to work to develop pilot projects in flood plain management and aquatic resource management in the mainstream Mekong and "regionally significant areas."[232] According to a 2010 World Bank evaluation document, the project area includes the lower part of the Sekong River in Laos and Cambodia.[233]

However, in 2011, due to a disagreement regarding the handling of resettlement issues connected to a World Bank funded land titling project, the Bank suspended future lending to Cambodia.[234] Subsequently the M-IWRM project was left in limbo. In March 2012, the World Bank announced that it had finally approved the M-IWRM project and provided an International Development Association grant of US$26 million to support this project. The Bank's announcement shows that the project will still cover trans-boundary issues, although there are no longer any Cambodia specific activities contained in the project.[235] Project documents confirm that the implementers of the first phase of the project will be the Laos Government and the MRC. Cambodia and Vietnam have expressed commitment to join phase 2 of the project, which will commence later with support from Japan.[236]

In addition to building institutional capacities and regional cooperation, the project aims to support the development of flood plain management and rehabilitate existing flood gates and irrigation infrastructure to support rice cultivation and fish-spawning. The component focussing on management of aquatic resources aims to support community-managed fisheries. This includes support for participatory management plans, training on fisheries management and conservation, development and implementation of alternative livelihood and commune development plans. The project also plans to strengthen public-sector fishery management, providing support to provincial and district fisheries institutions with fish-catch data collection, monitoring and regulation, and support for indigenous species aquaculture through rehabilitation of hatcheries, technical assistance and study tours for fisher people.[237]

---

231 Mekong River Commission Vietnam website news update, *National Consultation Meeting on Mekong Integrated Water Resource Management Project* , August 2010.

232 World Bank, Project Information Document (PID), Appraisal Stage, Mekong Integrated Water Resource Management Project, 13 February 2011.

233 World Bank, Mekong Integrated Water Resource Management Project, Initial Environmental and Social Examination, August 2010 (p2).

234 The Guardian, *World Bank suspends new lending to Cambodia over eviction of landowners*, 10 August 2011.

235 World Bank press release, *Effective Water Resource Management Practices - Key to Sustainable River Basin Development in the Lower Mekong Basin*, 8 March 2012. http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:23137258~menuPK:34463~pagePK:34370~piPK:34424~theSitePK:4607,00.html (accessed April 2012).

236 World Bank, *Project Information Document: Mekong Integrated Water Resources Management Project*, 15 February 2012.

237 World Bank, Mekong Integrated Water Resource Management Project, Cambodia: Environment and Social Management Framework, August 2010 (p5).

As widely acknowledged, fish stocks are under severe pressure in the Mekong basin due to various reasons including over-fishing, pollution and changes to hydrology and sediment flow caused by hydropower projects. Protection of deep water pools and spawning grounds is seen as crucial for the health of the rivers and the livelihoods of those who depend on them, and support for community-based management and cross border dialogue on watershed managements is very important. However, as already discussed, current plans for large scale hydropower development on the Mekong and its tributaries threaten to have hugely detrimental effects to fish migrations and sediment flows and if current trends continue in the 3S basins, projects such as the M-IWRM face an uphill battle to maintain and rehabilitate fisheries.

3.3 Regional and bilateral initiatives

Development Triangle Area of Cambodia-Laos-Vietnam (DTA-CLV)

The *Development Triangle Area of Cambodia-Laos-Vietnam* (hereafter referred to as the DTA) was established in 2004, and consists of 13 provinces. The DTA covers four provinces in northeast Cambodia, Stung Treng, Kratie, Ratanakiri and Mondulkiri; Kon Tum, Gia Lai, Dak Lak, Dak Nong and Binh Phuoc in Vietnam; and, Sekong, Attapeu, Saravan and Champasak provinces in Laos. The DTA covers over 143,000 square kilometres and has a population of 6.7 million people, many of whom are from ethnic minority groups.[238] The DTA has high-level support and was set up by the three Prime Ministers of Cambodia, Laos and Vietnam in order to generate economic growth in the area and to encourage development cooperation between the neighbouring provinces. According to the revised DTA master plan, the initiative will:

> Further bring into full play the advantages of each party for development cooperation, focusing on exploiting Laos' and Cambodia' advantages in land for investment, third country access markets, minerals, hydropower potential and Vietnam's advantages in human resources, investment capital and technology in some areas and sectors such as agriculture, hydro-power and processing industry.[239]

The DTA's original master plan was drafted in 2004 and updated in November 2010. The development plan covers various sectors, and its priority areas include: infrastructure (transport, energy, telecommunications, irrigation and water supply); agriculture; services (including tourism); industry; social issues (such as education and health); environmental protection and land management; security and defence; and, trade and investment.[240] The 2004 master plan includes multiple references to the three countries' plans to develop hydropower and increase power sharing.[241] The plan states: "[t]he three countries will join their efforts and cooperate in hydropower development. The Vietnamese side can assist the Cambodian and Laotian localities in the Development Triangle to prepare the technical design for and build small- and medium-scale hydropower projects."[242] The master plan makes specific references to conducting feasibility studies on hydropower development on the Sesan River,[243] and lists the Lower Sesan 2 Dam as a priority development project.[244]

---

238 CLV-DTA, *Report on Reviewing, Adjusting and Supplementing the Master Plan for Socio-Economic Development in Cambodia-Laos-Vietnam Development Triangle Area Up to 2020*, November 2010 (p77-78).

239 *Ibid*.

240 *Ibid*. (p79)

241 CLV-DTA, *Socio-economic Development Master Plan for Cambodia-Laos-Vietnam Development Triangle*, November 2004.

242 *Ibid*. (p157)

243 *Ibid*. (p155)

244 *Ibid*. (p166)

References to hydropower development and power sharing remain in the 2010 update of the master plan, and development of infrastructure, including electricity supply, is one of the priority development areas. The report states that further investment in hydropower is needed, especially on "cooperative projects among countries in the DTA," though it states that efforts should be taken to "[m]inimize negative impacts of hydro-power projects on environment."[245]

The report acknowledges that Cambodia's development is being held back by a lack of access to reliable electricity, and therefore needs to develop its own hydropower projects. Until those projects are up and running the country needs to improve facilities for importing power. At the same time, the electricity grid should be developed so that hydropower facilities in Laos and Cambodia can be connected to Vietnam's national grid so that electricity can be sold to Vietnam in the future.[246] The master plan includes a list of joint priority investment projects, which includes the Lower Sesan 1/5, Lower Se San 2, Lower Se San 3, Prek Leang 1 and Prek Leang 2 (both proposed for the O'Tapob tributary of the Sesan River) dams. The list of priority projects includes construction of the power grid connecting hydropower stations in Laos and Cambodia to Vietnam's national power grid for selling electricity to Vietnam, and also for supplying electricity from Vietnam to Laos and Cambodia. Under the plan, Laos is prioritizing ten hydropower projects, including the Sekong 4 and Sekong 5.[247] The plan projects construction of the Lower Sesan 2 Dam to last from 2012-2017, and the Lower Sesan 1/5 and Prek Liang from 2015-2020.[248]

The DTA master plan notes that Environmental Impact Assessment studies need to be conducted and implemented in order to reduce the impacts of these projects, and further studies need to be done to ensure their economic viability of these projects in the context of developing Cambodia.[249] Throughout the report are various references to the need to minimize environmental harms and protect bio-diversity in the area. In fact, "environmental protection and efficient land management" is listed as one of the DTA's development priority areas.[250] It states that the implementing agencies should "link socio-economic development to environmental protection, especially in the industries of hydro power, [etc.]." The importance of the EIA process is noted, and it is acknowledged that measures need to be taken to improve the process of EIA, especially for projects such as hydropower. In order to achieve this, the capacity of local government officials in conducting EIAs needs to be developed.[251] The report contains a list of priority activities suggested by each member country, and the Cambodian proposal contains some positive activities related to environmental protection. In addition to building the capacity of officials related to EIAs, the Cambodian proposal also includes conducting an environmental trans-boundary impact assessment in the four provinces, improving monitoring and evaluation of EIA reports and improving environmental management plans for projects.[252]

Another key area that the DTA master plan focuses on is the development of the tourism industry, in particular promoting the development of eco-tourism. The master plan identifies the need to protect and preserve national parks and natural protected areas, including Lumphat Wildlife Sanctuary, as they are "important assets for eco-tourism development and ensure ecological balance in the area."[253] This is at odds with the fact that the plan also calls for significant development of hydropower in the

---

245 CLV-DTA, *Report on Reviewing, Adjusting and Supplementing the Master Plan for Socio-economic Development in Cambodia-Laos-Vietnam Development Triangle Area Up to 2020*, November 2010 (p79).

246 *Ibid*. (p87-88)

247 *Ibid*. (p88)

248 *Ibid*. (p178)

249 *Ibid*. (p87-88)

250 *Ibid*. (p79)

251 *Ibid*. (p142-143)

252 *Ibid*. (p194)

253 *Ibid*. (p142)

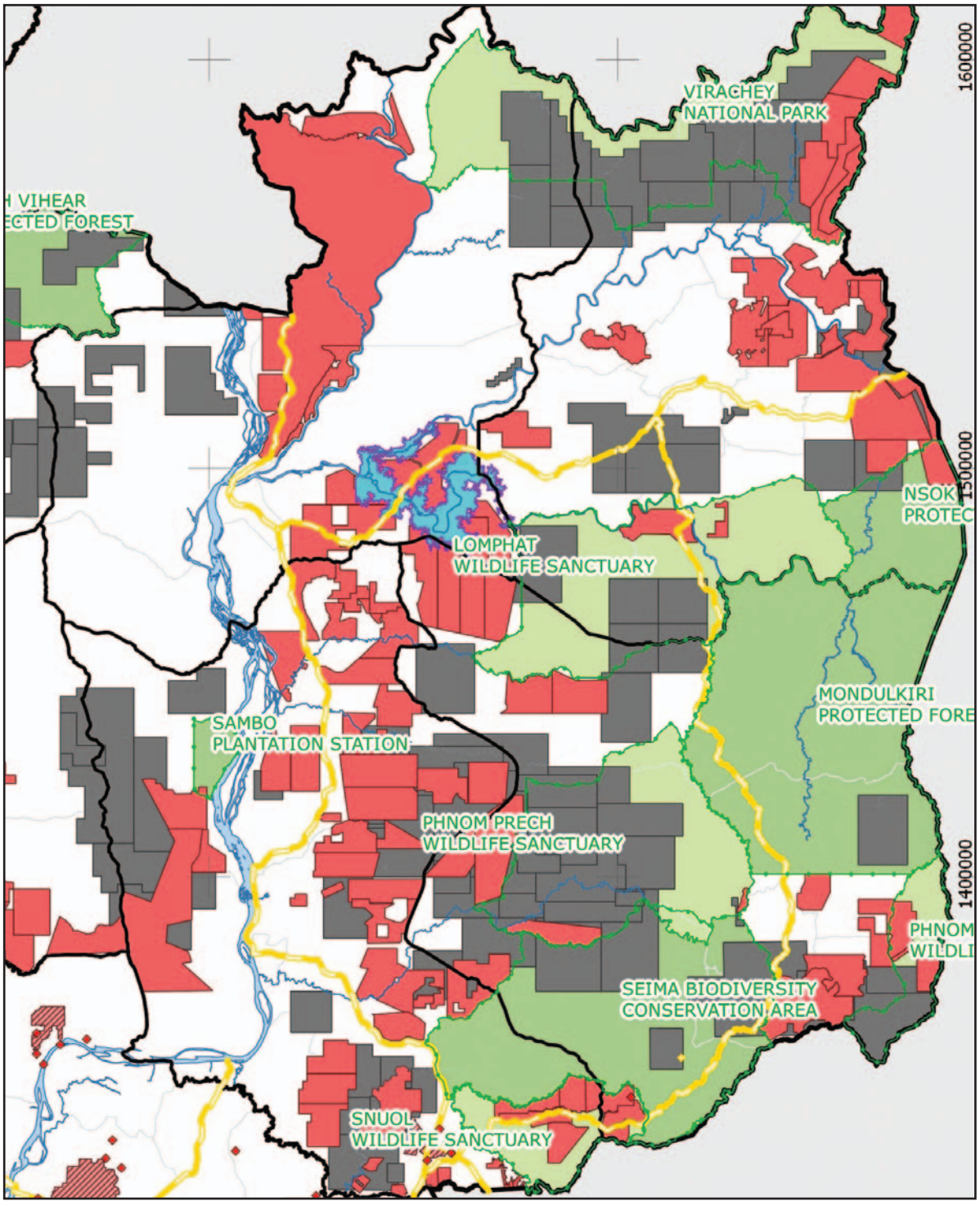
region, which threatens to have extensive impacts on the environment and the region's biodiversity. This includes the Prek Liang dams which are located within Virachay National Park, and are highlighted as a priority development project under the DTA plan. The report also states that the Mekong, Sekong, Sesan and Srepok rivers should also be "upgraded" as they are important for transporting goods and to attract tourists.[254] Again, this is in potential conflict with the plan's call for developing large-scale hydropower on the 3S rivers, which will drastically affect the quantity and quality of water flow along them. Hydropower developments on the three rivers also threaten to disrupt the continuation of cultural practices of indigenous communities living in the area, which is an important aspect of eco-tourism, especially in Ratanakiri Province.

Construction of a bridge on the Sekong River in Stung Treng Town. Photo: Oxfam-Brett Eloff

The 2010 master plan report states that the DTA's achievements are "still modest and limited, failing to create a breakthrough for socio-economic development of the localities in the Triangle and bridge their development gap with the average development level of each country." Cooperative infrastructure projects have stalled, and it appears that the master plan is not being developed on a regional basis, rather it is being implemented "through bilateral cooperative agreements at national level and by localities with shared border lines … without the real joint coordination of the three countries."[255] This lack of coordination is apparent when one observes maps outlining existing developments in the region. The map below shows the boundaries of known agricultural concessions (shown in red), and mining exploration areas (grey) in the northeast of Cambodia. As can be seen, a number of projects overlap with each other and with protected areas and forests (green), and many will be flooded if Cambodia pushes ahead with its hydropower development plans. Although it is unlikely that all the approved ventures will come to fruition, this picture displays a serious lack of coordination in the region's development, and a potentially unsustainable model:

[254] *Ibid*. (p83)

[255] *Ibid*. (p72-73)



Map showing approved development projects in the northeast of Cambodia.
Source: LICADHO[256]

[256] Provided by local Cambodian NGO, Licadho. March 2012.

Sesan and Srepok Bilateral Working Groups

In 2002 at the Mekong River Commission's 7th Council Meeting, the Cambodia-Vietnam Committees for the Management of the Sesan River was established. The committee was set up to resolve disputes arising from the downstream impacts of *EVN*'s Yali Falls Dam in central Vietnam,[257] though the group's focus was later expanded to include the Srepok River. The group has met infrequently since it was created, although it was somewhat active in negotiating mitigation measures for trans-boundary impacts of the Yali Falls Dam, which eventually led to the commissioning of EIAs into the downstream impacts of the dam in both Vietnam and Cambodia. The committee has also discussed issues including the Sesan 4A regulator dam in Vietnam, and the progress of PECC1's feasibility study and EIA planning for the Lower Sesan 2 and Lower Sesan 1/5.[258] Since its creation in 2002, the group has met only four times, the last meeting being held in 2008.

To many of the communities that have suffered the downstream impacts of hydropower development in Vietnam, and to civil society groups working on hydropower issues, the Committee has been a disappointment. In almost 10 years since its creation the group has met sporadically and only a handful of times, and many of the negative impacts it set out to address are still being experienced by downstream communities in northeast Cambodia. Despite a number of studies, including those commissioned by the Committee, acknowledging serious downstream impacts caused by the Yali Falls Dam, no one has ever been compensated for the deaths, injuries or material losses suffered. This lack of results displays an apparent lack of political will on both sides, and despite overwhelming evidence to show that the Yali Falls Dam is directly responsible for serious downstream impacts, it appears the company is too well connected to be held accountable. *EVN*'s lack of willingness, or lack of ability, to remedy the harms of its project in Vietnam does not bode well for those likely to be impacted by its proposed projects in Cambodia.

---

257 Hirsch, P. & Wyatt, A. *Negotiating local livelihoods: Scales of conflict in the Se San River Basin*. Asia Pacific Viewpoint, Vol. 45, No. 1. Victoria University of Wellington, 2004 (p51–68).

258 Minutes of the 4th meeting between Cambodia and Vietnam Committees for the Management of the Se San and Sre Pok Rivers, 4-5 March 2008.

Conclusions

In recent years, the economic growth witnessed in Thailand, Vietnam, Cambodia and Laos has maintained impressive levels. This growth has been accompanied by increases in demand for power, as the more developed economies of Thailand and Vietnam seek to fuel their industries and as Cambodia and Laos seek to meet the needs of their underserved populations and encourage investment. As Vietnam and Thailand struggle to generate power to meet domestic demand they have signed numerous agreements with neighbouring countries for power exports. For a number of years Laos has discussed its vision of becoming the "battery of Southeast Asia," and now Cambodia has ambitious plans to develop a series of large-scale hydropower plants which would produce far more electricity than required by its relatively small population. Both countries hope to develop their hydropower industries in order to meet domestic demand in the next ten years and sell surplus energy to their neighbours. A considerable amount of this development will be focused in the 3S basin.

Much of the anxiety surrounding the development of these projects is rooted in the fact that there is a great deal of uncertainty regarding the full extent of their social and environmental impacts. No major infrastructure project is free of negative impacts, and it is often the case that while harms occur to people and the environment, this is offset by the benefits that the project brings. However, this trade-off needs to be genuine, and based on a sound analysis of all potential negative impacts against concrete benefits. In the case of the 3S dams, it is clear that the research conducted does not support such an analysis. As a matter of urgency, further studies need to be conducted into the cumulative impacts of these projects, in particular the impacts of the drastically changed hydrology on fish migrations and watersheds.

A serious cause for further concern is the lack of publicly available information about plans for the development of the hydropower sector. The process that led up to the approval of the Lower Sesan 2 Dam was characterized by a lack of transparency, and many people feel that they have not been able to make their voices heard by decision-makers. Even now, after the project has been approved, there are conflicting statements about where the generated power will be utilized, and what percentage will be kept for domestic consumption and how much for export. There is even less information available on the other projects proposed for the 3S area, as people are rarely consulted until the EIA stage, and in general very little information is released during the feasibility study stage of a project. There is no clear information on whether these projects will reduce the cost that consumers will pay for electricity, and in a country with such serious transparency and governance issues as Cambodia, it remains a concern as to how revenues raised will be accounted for and how much will make it back to the national budget.

Poor environmental impact assessments and limited public consultations tend to further fuel anxiety about the impacts of such developments. They also raise concerns about the ability and willingness of developers to mitigate the impacts of their projects, and of the government to strictly enforce environmental regulations. In Cambodia, the development of the hydropower sector continues at pace, and as access to information related to bidding, feasibility studies and the economic justifications is generally unavailable to the public, this development is largely going on behind closed doors. It is generally acknowledged that in the eyes of many developers, and even government bodies, the EIA process is simply a step towards approval, rather than a crucial opportunity to weigh impacts against benefits, seek expert advice and gather public opinion before making a decision to approve or reject a proposed project. This is illustrated starkly in cases where EIAs are not completed until after project approval, or even after project operations have commenced.

It is apparent that the governments of Cambodia, Laos and Vietnam are impatient to move ahead with hydropower development in the 3S basin and beyond, as power shortages threaten to dampen high growth figures and deter potential investors. The lack of thoroughness in the EIA and public consultation process, and the absence of adequate studies into the long-term and cumulative impacts of these developments are indicative of this rush to push ahead with developments. In addition, it has become apparent that an attitude has emerged that some rivers are already so badly damaged that they are only fit for further exploitation. This is especially true of the Sesan. For example, one Cambodian government official stated in 2007 that as the Sesan River was already so badly damaged by dams on the Vietnamese side of the border, the best locals can hope for is to receive electricity from dams on the Cambodian side. "The river is already destroyed," he said. "The Cambodian people are entitled to get some of the benefits that dams can provide."[259] This type of statement neglects the seriousness of impacts the proposed dams inside Cambodia may have on the country's environment, society, and economy.

This scramble to exploit the area's water resources could spell disaster for the region, and its people. Rather than responding to the damage already done to the region's rivers by stepping up exploitation, concerted efforts need to be made to enhance protection of these resources. Not only is the 3S area extremely sensitive in terms of biodiversity, many thousands of people depend on the health of the river basins for their very survival. In recognition of this, a number of local, national and regional initiatives have been working for several years to protect and rehabilitate already damaged ecosystems. However, the current plans for hydropower development in the 3S basins threatens to cancel out the work done by various actors, including national and regional bodies, government departments, civil society and community organizations, and to enhance environmental protection and sustainable use of the area's resources.

Not only are the policies of the 3S countries key to the future development of the area, but outside actors must also be scrutinized to ensure that they are not feeding into potentially harmful development trends. In particular, the Asian Development Bank (ADB) has for a number of years been involved in the region's hydropower development and has supported two major studies in the 3S basin, first in 1999, then in 2008. Both studies identified the need for further study of the long-term and cumulative impacts of the three countries' hydropower developments in the 3S area, as well as the need for more collaborative and holistic approach to the development of the region's resources. However, whilst hydropower development pushes on, much of these studies' findings are yet to be acted upon. This has no doubt impacted on the ADB's reluctance to become involved in any specific hydropower projects in the area, but has not dampened its continued support for regional power sharing in the Greater Mekong Subregion, which potentially includes transmission lines connecting to a number of the proposed 3S dams.

Although the focus of this report is mainly on hydropower development within Cambodia, it is important that the concerns raised here are not viewed in isolation, rather as a section of a much broader picture of rapid development in the 3S Basin. This development is continuing in an environment of low accountability and inadequate consultation, and with limited consideration for cumulative and cross-boundary effects. Hydropower developments along the Sesan in Vietnam have already illustrated the need for adequate impact assessments and mitigation measures. However, it is not clear if these potentially valuable lessons have been learned, and without a change in approach to the management of the area's resources, the future of the 3S basin and its people remains uncertain.

[259] The Cambodia Daily, *Vietnam Offers To Build Two Hydropower Dams in Ratanakiri*, 20 July 2007.

Bibliography

Articles & Reports

3S Rivers Protection Network (3SPN), *Civil Society's Reflection of Past and Present Hydropower Development in the 3S Rivers Basin Paves Concern Over Future Development Plans*, 31 May 2010.

3SPN & PRCF, *Scoping Study of Environmental and Social Impacts of the Proposed Lower Sesan 3 Dam, Ratanakiri, Cambodia (DRAFT)*, June 2010.

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

Both Ends Environmental and Development Service, *The ADB Support for Hydropower Dams and Power Grid - ADB and the Greater Mekong Subregion Program*.

Economic Consulting Associates, *The Potential of Regional Power Sharing Integration: Greater Mekong Subregion Transmission and Trading Case Study*, January 2010.

Greacen, C. & Footner, J. *Decentralizing Thai Power: Towards a Sustainable Energy System.* Greenpeace Thailand & Palang Thai, November 2006.

Hirsch, P. & Wyatt, A. *Negotiating local livelihoods: Scales of conflict in the Se San River Basin*. Asia Pacific Viewpoint, Vol. 45, No. 1. Victoria University of Wellington, 2004 (p51–68).

International Rivers, *Factsheet: The Don Sahong Hydropower Project*, September 2008. KCC, *Key Facts Sesan II for NGO meeting*, June 27, 2008.

International Rivers, *International Rivers Comments on the Thuong Kon Tum Hydropower Project (Vietnam) to Project Validator, TÜV NORD CERT GmbH (Former RWTÜV Systems GmbH)*, 2 June 2011.

International Rivers, *Power Surge: The Impacts of Rapid Power Development in Laos*, September 2008.

NGO Forum Cambodia, *Lower Sesan 2 Hydro Project EIA Review*, August 2009.

NGO Forum Cambodia, *Lower Sesan 2 Hydro Project EIA Review*, August 2009.

Probe International, *Reclaiming the Sesan – Restoring natural flows by modifying hydropower dam operations*, 3 November 2008.

Rivers Coalition of Cambodia, *Comments on Chapter VIII Environment Management Plan of the Lower Sesan 2 Draft Environmental Impact Assessment by Key Consultants Cambodia*, 22 July 2008.

Rutkow, E. et al. *Down River: The Consequences of Vietnam's Se San River Dams on Life in Cambodia and Their Meaning in International Law*. NGO Forum Cambodia, December 2005.

Sam Chamroeun, *Cambodia Water Resource Development: A review of the existing policy and legislative framework*, 2007.

WWF Greater Mekong – Cambodia Country Programme, *Consultancy Report: Fish Abundance Survey and Installation of Fish Monitoring System on the Srepok River*, June 2008.

Ziv, G., Baran, E., Nam, S., Rodriguez-Iturbe, I. & Levin, S. A., *Trading-off fish biodiversity, food security, and hydropower in the Mekong River Basin*, Proceeding of National Academy of Sciences. USA, 2012.

Asian Development Bank Documents

ADB, *Project Information Document, TA6481: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*.

ADB-GMS overview brochure, 2010.

ADB-GMS, *Strategy and Action Plan for the Greater Mekong Subregion Southern Economic Corridor*, 2010.

ADB-RETA 40082, *3S Technical Sheets Key Topic 5 – Biodiversity and natural resources*.

ADB-RETA 40082, *3S Technical Sheets Key Topic 7 – People and livelihoods, 8a Hydropower Development*.

ADB-RETA 40082, *3S Technical Sheets Key Topic 8 – Large scale infrastructure development in the 3Ss, 8a Hydropower Development*.

ADB, *Energy Sector in the Lao People's Democratic Republic, Reference Number: SAP: LAO 2010-42, Sector Assistance Program Evaluation*, October 2010.

ADB, *Final Report: TA6367 Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam*, July 2010.

ADB, *Project 41018: Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion*, November 2007.

ADB, *Project 41450: Preparing the Ban Sok-Pleiku Power Transmission Project in the Greater Mekong Subregion*, August 2008.

ADB, *Project Completion Report on the Yunnan Dachaoshan Power Transmission Project (Loan 1644-PRC) in the People's Republic of China*, August 2005.

ADB, *Se Kong - Se San and Nam Theun Basins Hydropower Study Final Report*, 1999.

ADB, *Summary of discussions Special Meeting of the regional Power Trade Coordination Committee (RPTCC-9A)*, Bangkok, Thailand, December 14-15, 2010.

ADB, *TA6367 Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam*. Project Information Document.

ADB, *Technical Assistance Completion Report, TA 6367-REG: Sesan, Srepok and Sekong River Basins Development Study in Cambodia, Lao PDR and Vietnam*, August 2011.

ADB, *Technical Assistance Report: Project 40082, Sesan, Sre Pok, and Sekong River Basins Development Study in Kingdom of Cambodia, Lao People's Democratic Republic, and Socialist Republic of Vietnam*, December 2006.

Presentation by Yongping Zhai, Principal Energy Specialist, Infrastructure Division, Southeast Asia Department of ADB, *Regional Consultation on MRC Hydropower Program, GMS Regional Electricity Market and Hydropower Development*, 25 September 2008.

World Bank

World Bank, *Implementation Status & Results, Lao People's Democratic Republic, GMS Power Trade (Laos) Project (P105331)*, March 2011.

World Bank, *Mekong Integrated Water Resource Management Project, Initial Environmental and Social Examination*, August 2010.

World Bank, Project Information Document (PID), Appraisal Stage, *Mekong Integrated Water Resource Management Project*, 13 February 2011.

World Bank, Project Information Document (PID), Appraisal Stage, *Mekong Integrated Water Resource Management Project*, 15 February 2012.

World Bank, Southeast Asia Country Management Unit, *Strategy Note on World Bank Regional Support for the Greater Mekong Sub-Region*, October 2007.

World Bank, *Status of Projects in Execution (SOPE) 2010: East Asia and Pacific Region, Lao PDR*, 3 October 2010.

World Bank, *World Bank Group Welcomes Strategic Environmental Assessment of Mekong Mainstream Dams: Confirms that it will not finance investments in mainstream hydro projects*, 22 October 2010.

Government documents and presentation

Cambodia National Mekong Committee (prepared by MIME), *National Sector Review 2003: Hydropower*, June 2003.

CLV-DTA, *Report on Reviewing, Adjusting and Supplementing the Master Plan for Socio-Economic Development in Cambodia-Laos-Vietnam Development Triangle Area Up to 2020*, November 2010.

CLV-DTA, *Socio-economic Development Master Plan for Cambodia-Laos-Vietnam Development Triangle*, November 2004.

Committees for the Management of the Se San and Sre Pok Rivers, *Minutes of the 4th meeting between Cambodia and Vietnam Committees for the Management of the Se San and Sre Pok Rivers*, 4-5 March 2008.

Forestry Law 2002, Cambodia.

Letter from Prime Minister Hun Sen, *Letter N°31: Clarification to the request by HE Son Chhay, Phnom Penh Parliamentarian, for delay in the implementation of the Hydropower Project of Lower Sesan II of the Vietnamese Company EVN in joint venture with the Royal Group Company*, 28 July 2011.

MIME-JICA, internal workshop presentation, *The Master Plan Study of Hydropower Development in Cambodia*, 13 November 2007.

Presentation by Chea Piseth, Hydroelectricity Department of the Ministry of Industry, Mines and Energy, *National Power and Hydropower Development Plans in Cambodia*, 16-17 July 2009.

Presentation by Phallan Pann, Deputy Secretary General, Supreme National Economic Council, *Energy Sector in Cambodia*, September 2009.

Presentation by Victor Jona, General Department of Energy of the Ministry of Industry, Mines and Energy, *Cambodia Energy Status and its Development*, 16 March 2011.

Royal Government of Cambodia, *National Strategic Development Plan Update 2009-2013*.

Sub-decree on Environmental Impact Assessment 1999, Cambodia.

Media sources

BBC News Online, *World Bank blocks Cambodia loans amid Boeung Kak row*, 9 August 2011.

Cambodia Daily, *The battle for the 3S Rivers*, 10-11 September 2011.

Cambodia Daily, *VN Premiere Asks for Quick Dam Approval*, November 16, 2010.

China Low-Carbon Media Network, *Wu Baoguo witnesses Cambodia Srepok hydropower signing ceremony*, 9 November 2010.

China Power, *Huadian Corporation arrives in Cambodia to conduct research on Srepok hydropower project*, 15 April 2011.

Dantri International, *Central Highlands facing severe drought*, 3 March 2011.

Export-Import Bank of India, *Press Release: Exim Bank to Assist Transmission Line Project in Cambodia*, 5 March 2010.

Global Times, *China Huadian HK to build hydropower station in Cambodia*, 1 April 2010.

Koreanet, *President Lee Wraps Up State Visit to Cambodia*, 23 October 2009.

Mekong River Commission Vietnam website news update, *National Consultation Meeting on Mekong Integrated Water Resource Management Project* , August 2010.

Phnom Penh Post, *Construction nears for Sesan 2*, 24 January 2011.

Phnom Penh Post, *Electricity exports expected by 2016, says govt official*, 30 March 2009.

Phnom Penh Post, *Electricity for Vietnam*, 1 June 2011.

Phnom Penh Post, *Sesan dam to proceed this year*, 25 April 2011.

Phnom Penh Post, *South Korea's KTC Cable weighs $700m Ratanakiri dam project*, 15 October 2009.

Phnom Penh Post, *South Korea's largest bank launches in Cambodia*, 8 May 2009.

Reuters, *Vietnam's major state firms face big losses*, 9 September 2011.

Saigon Gai Phong Daily, *Central Highlands rivers dying*, 26 May 2011.

Saigon Gai Phong Daily, *Hydropower plants depleting rivers*, 27 May 2011.

Saigon Gai Phong Daily, *Vietnam to face power shortfalls in dry season, EVN says*, 18 January 2011.

Saigon Gai Phong Daily, *Water level of hydropower reservoirs alarmingly low: EVN*, 29 March 2011.

South China Morning Post, *Controversial Chinese projects bow to public pressure*, 3 September 2011.

Thanh Nien News, *Vietnam power utility EVN request price hike*, 6 July 2011.

Thanh Nien News, *Vietnam set to face serious power shortage in 2013*, 6 October 2010.

The Cambodia Daily, *Sesan resettlement in hands of power utility*, 1 June 2011.

The Cambodia Daily, *Vietnam Offers To Build Two Hydropower Dams in Ratanakiri*, 20 July 2007.

The Saigon Times, *EVN told to start talks for long-term power import*, 5 September 2010.

The Saigon Times, *Sesan 2 hydropower plant behind schedule*, 9 August 2011.

The Saigon Times, *Vietnam-Laos power line ready by 2015*, 21 July 2010.

Vientiane Times, *Laos to export electricity to Cambodia*, 12 June 2006.

Vientiane Times, *More power plants needed to meet predicted demand surge*, 27 May 2011.

Vietnam Financial Review, *Electricity shortfalls: gloom sets in*, 25 March 2011.

Vietnam Business News, *Investment to Cambodia from Vietnam Increases*, April 2011.

Vietnam News Agency, *EVN boosts hydroelectric power in Cambodia*, 3 June 2011.

Vietnam News Agency, *EVN unit speeds up work on Lao, Cambodian dams*, 8 July 2011.

Vietnam News, *Work starts on Laos hydropower plant*, 7 March 2011.

Vietnam Tuoitrenews, *PetroVietnam urges EVN to repay debt*, 13 July 2011.

VietnamNetBridge, *Giant EVN trying to negotiate for delay to pay its debts*, 28 April 2011.

VNA, *EVN unit speeds up work on Lao, Cambodian dams*, 8 July 2011.

VNBusinessNews, *Se San 5 hydropower project suspended*, 17 August 2009.

Voice of Vietnam News, *EVN urged to meet high demand for electricity*, 17 January 2010.

Wall Street Journal Online, *Vietnam plans to raise $48.8 billion for power projects in 2011-2020*, 5 August 2011.

Xinhua, *Cambodia spends 59 mln USD to import electricity in 2009*, 14 March 2010.

Xinhua, *Chinese company to conduct feasibility study on dams in Cambodia*, 14 August 2008.

Project documents

Electricité du Laos, *Initial Environment Examination (IEE) for Ban Hat to Lao-Cambodia Border 230 kV Transmission Line Project*, February 2011.

EVN, *Summary Report: Lower Sesan 1/Sesan 5 hydropower project*, 30 January 2010.

EVN, *Summary Report, Lower Sesan 2 hydropower project*, 23 January 2010.

EVN, *Summary Report: Investment Project of the Transmission Line Connecting Lower Sesan 1/Sesan 5 hydropower Projects into the Power Grid*, 23 January 2010.

Huot, V. et al., Faculty of Fisheries of Royal University of Agriculture, *Assessment on Fisheries Natural Resources for Lower Sesan 2 Hydropower Plant Project*, August 2009.

MIME (prepared by KEPCO), *Initial Environmental Evaluation and Environmental Management Plan for GMS Subregion Power Project – Ban Hat to Stung Treng*, December 2010.

PECC1 & KCC, *Environmental Impact Assessment for Feasibility Study of Lower Sesan 2 Hydropower Project, Stung Treng Province*, Cambodia, October 2008.

PECC1 & KCC, *Environmental Impact Assessment for LS2*, October 2008.

3S Rivers Protection Network

INTERNATIONAL RIVERS
people • water • life

3S Rivers Under Threat