

DAMS, POWER AND SECURITY IN THE MEKONG: A NON-TRADITIONAL SECURITY ASSESSMENT OF HYDRO-DEVELOPMENT IN THE MEKONG RIVER BASIN

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Abstract

The rapid hydropower development in the Mekong River Basin brings with it a growing number of security challenges for state and regional policymakers. While the interrelated challenges range from local, human security issues, to regional-level concerns, all stem from the externalities brought about by hydro-development. This paper analyses the ramifications of the current 'hydropower gold-rush' on and around the Mekong. By specifically examining the non-traditional security concerns of food and water security and how these threaten to drive human insecurity, migration and instability within the region, it is able to challenge the dominant development and economic mindset that continues to encourage development at the cost of livelihoods. Instead of an economic hydro-boom as anticipated by many, continued dam building on the Mekong and its tributaries could result in a non-traditional security disaster characterised by severe food shortages, destruction of livelihoods and large irregular movements of people.

About this paper

This paper is the result of research conducted during the author's Consortium of Non-Traditional Security Studies in Asia (NTS-Asia) Research Fellowship in conjunction with the Centre for International Security Studies (CISS), University of Sydney. Organised by the Centre for Non-Traditional Security (NTS) Studies at the S. Rajaratnam School of International Studies (RSIS), which is the NTS-Asia Secretariat, the annual NTS-Asia Research Fellowship allows young scholars to conduct research on non-traditional security issues in any of NTS-Asia's 20 member institutes. Find out more about NTS-Asia at www.rsis-ntsasia.org. More information about the RSIS Centre for NTS Studies can be found at www.rsis.edu.sg/nts.

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Biography

Christopher G. Baker is a PhD candidate and Research Analyst at the University of Sydney's Centre for International Security Studies (CISS). He is a member of the Food Security in Asia Project team co-sponsored by the MacArthur Foundation and CISS. In 2011, he was a Consortium of Non-Traditional Security Studies in Asia (NTS-Asia) Research Fellow with the Centre for Non-Traditional Security (NTS) Studies at the S. Rajaratnam School of International Studies (RSIS). Chris has a keen interest in the links between the environment and violent conflict, as well as environmental security issues in Asia. He has spoken and lectured on these subjects internationally.

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Introduction

The Mekong River may not be the longest in Asia, and it is certainly not yet the most developed, but events surrounding this river in the coming decade may be as crucial to the future of peace and stability in Asia as the events currently unfolding in the South China Sea. The nations of continental Southeast Asia are currently facing a range of challenges, from poverty to underdevelopment, corruption, transnational crime and climate change. The development imperative is strong and the need for sustainable development is clear. There are serious questions, however, regarding how sustainable some developments in the region are. Of particular concern is the hydropower sector which is developing at a phenomenal rate.

The hydro-development presently underway on the Mekong and its tributaries is, from a purely economic perspective, of benefit to the riparian states of the Mekong. When viewed from a more holistic point of view, however, a very different situation emerges. Loss of livelihoods, decimation of fisheries, destruction of crops and general human insecurity not only threaten the economic growth of continental Southeast Asia, but risk ending the more stable political environment that the region has been witnessing in recent years. Instead of an economic hydro-boom as anticipated by many, continued dam building on the Mekong and its tributaries could result in a non-traditional security disaster characterised by severe food shortages, destruction of livelihoods and large, irregular movements of people.

Arriving at this conclusion requires both technical knowledge of the Mekong River Basin – including the pressures on its environment from current and planned hydro projects – and an awareness of the political and security ramifications of unabated hydro-development. This paper will present a multifaceted analysis of the regional challenges to security from hydro-development.

Divided into three sections, the analysis will incorporate traditional international security as well as non-traditional security perspectives. The first section will briefly outline current and planned hydropower projects on the Mekong. The second will examine the impacts that these dams are having from a micro as well as macro perspective, looking first at the effects of a single dam in Lao PDR, and then at the wider basin-wide impacts. Finally, the ramifications of current and planned hydro-developments for both traditional and non-traditional security will be explored.

This paper will contribute to the current discussion surrounding dam building on the Mekong and help to frame the issues within the context of international security. It is written as both a warning about the dangers of continuing along the current path of development and as a recommendation that the precautionary principle is the best way forward for both the governments and the people of the Mekong River Basin.

Section 1: The current situation

Overview

From its source in the eastern part of the Tibet Autonomous Region, the Mekong River flows through the south-western regions of China. Known as the Lancang Jiang in Chinese, it runs through China for nearly half of its length of over 4,800 kilometres, cutting through the western area of Yunnan province. It then flows through Myanmar, Thailand, Lao PDR, Cambodia and finally meets the sea through the channels of the great Mekong Delta in the southern regions of Vietnam.

The Mekong River Basin, spanning an area of approximately 795,000 square kilometres,¹ is home to an estimated 60 million people² and 100 different ethnic groups.³ Overall, nearly 300 million people⁴ live in the territories that the river flows through (an area spanning five countries and Yunnan Province), with 30 million living within 15 kilometres of the mainstream,⁵ and at least 17 million in the Delta alone.⁶ The Mekong is vital as a source of fish, food and fresh water to tens of millions of people.

Hydropower development on the Mekong River has been ongoing for over two decades, beginning with the Manwan dam in China's section of the river sometime around 1988. Although a river knows no political boundaries, the geopolitical landscape impacts significantly on the Mekong. For this reason, it is easier to understand the Mekong mainstream dams, and the Mekong River Basin itself, in terms of an upper and a lower basin.

The Upper Mekong Basin, the section controlled by China, constitutes 16 per cent of the annual flow at the Delta and 30 per cent of the dry season flow.⁷ The Lower Mekong Basin (LMB) is shared by the down-stream riparians. As there are currently no known plans to build dams on the Myanmar section of the river, and the country plays a relatively insignificant role in the life of the river itself – contributing only 2 per cent of the overall flow – it will not be discussed as part of this analysis.

The delineation of the river into an upper and a lower basin is not an arbitrary one. Geographically, the majority of the Mekong's descent from over 5,000 metres above sea-level occurs in the Upper Mekong Basin.⁸ China has already built several hydropower projects on the Mekong, it is the continental regional hegemon and the furthest up-stream riparian – these facts make it an exceptional case. Also, China has excluded itself from the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (Mekong Agreement) signed in 1995 by Cambodia, Lao PDR, Thailand and Vietnam. The Agreement

¹ Richard P. Cronin and Timothy Hamlin, *Mekong tipping point: Hydropower dams, human security and regional stability* (Washington, DC: The Henry L. Stimson Center, 2010), 1.

² Judy Eastham et al., *Mekong River Basin water resources assessment: Impacts of climate change*, Water for a Healthy Country National Research Flagship (Clayton: Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2008), 11.

³ Aviva Imhof, 'The Mekong: Diverse, magnificent, threatened', *World Rivers Review* 22, no. 2 (June 2007), 1.

⁴ Sokhem Pech and Kengo Sunada, 'Population growth and natural-resources pressures in the Mekong River Basin', *Ambio* 37, no. 3 (May 2008): 219.

⁵ David Hall and Lilao Bouapao, *Social impact monitoring and vulnerability assessment: Report on a regional pilot study for the Mekong corridor*, MRC technical paper no. 30 (Vientiane: Mekong River Commission, 2010), 11.

⁶ Mekong River Commission, *State of the basin report 2010: Summary* (Vientiane: Mekong River Commission, 2010), 7.

⁷ Geoff Podger et al., *Modelled observations on development scenarios in the Lower Mekong Basin* (Vientiane: World Bank, November 2004), 7. Although 16 per cent of the flow at the mouth of the Mekong comes from the Chinese section, this amount increases significantly closer to the Chinese border.

⁸ Mekong River Commission, *Overview of the hydrology of the Mekong Basin* (Vientiane: Mekong River Commission, November 2005), 5.

is overseen by the Mekong River Commission. Although China has recently agreed to share hydrological information with the riparians down-stream of it, the country does not have any obligation to these neighbours regarding water sharing.

The Upper Mekong Basin: The Lancang dam cascade

Riparians down-stream of China were not aware of the Manwan dam until near its completion in 1996.⁹ Since that time, China has developed more dams across its section of the river – four of the planned eight dams known as the ‘Lancang dam cascade’ have been completed, with the fifth well under construction. The Lancang dam cascade has a combined hydropower capacity of over 14,000 megawatts (MW) capturing 40 billion cubic metres of water from the river system.¹⁰ To give some idea of the scale of the Lancang dam cascade, the Three Gorges Dam – the world’s largest dam – holds about the same amount of water in its reservoir, with an equal initial generating capacity.¹¹ The impacts resulting from these dams are significant, and they will be discussed in greater detail in Section 2.

The LMB: The ‘hydropower gold-rush’

There are currently no dams on the Lower Mekong mainstream, although several are in advanced stages of planning. Lao PDR has the highest number of hydropower projects. The country, in an attempt to become the ‘battery of Southeast Asia’ or ‘Southeast Asia’s Kuwait’,¹² currently has 16 dams (>10 MW) on the Mekong tributaries with 9 dams under construction.¹³ Another 23 are at the planning stage, out of which 5 are on the Mekong mainstream. According to the Lao PDR Department of Energy Promotion and Development, the country also has 33 large dams at the feasibility stage with 4 on the Mekong.¹⁴

One of the most critical regions for the health of the river and one that is often less considered is known as the 3S (Sesan, Srepok and Sekong) basin. The Sesan, Srepok and Sekong rivers are major tributaries, converging with the Mekong in Cambodia’s Stung Treng province. The 3S basin is shared by Cambodia, Lao PDR and Vietnam, and each of the three countries has existing, under construction and planned dams. Altogether, there are plans to build up to 41 dams in the 3S basin alone, with an active storage of over 26 billion cubic metres.¹⁵

⁹ Evelyn Goh, ‘China in the Mekong River Basin: The regional security implications of resource development on the Lancang Jiang’ (Singapore: Institute of Defence and Strategic Studies, July 2004), 4.

¹⁰ Kate Lazarus et al., *An uncertain future: Biodiversity and livelihoods along the Mekong River in northern Lao PDR* (Bangkok and Gland: The World Conservation Union (IUCN), 2006), 31; Podger et al., *Modelled observations on development scenarios*, 26.

¹¹ Peter H. Gleick, ‘Three Gorges Dam project, Yangtze River, China’, Water Brief no. 3, in *The World’s Water 2008–2009*, ed. Peter H. Gleick (Washington, DC: Island Press, 2009),

<http://www.worldwater.org/data20082009/WB03.pdf>. Both the size and discharge of the Mekong River Basin are roughly only 60 per cent of the Yangtze. See: Huh et al., ‘Yangtze River delta, China, Asia’, *The World Delta Database* (2004), <http://www.geol.lsu.edu/WDD/ASIAN/YangtzeKiang/yankze.htm>

¹² Aviva Imhof, ‘A river of the heart’, *World Rivers Review* 22, no. 2 (June 2007): 2.

¹³ According to the Lao PDR Ministry of Energy and Mines, the controversial Xayaburi dam counts as a 10th dam currently under construction. In this paper, the Xayaburi is counted as one of planned dams. See: Ministry of Energy and Mines, Lao PDR, ‘Electric power plants in Laos January 2012’, *Powering Progress* – website of the Department of Energy Promotion and Development of Lao PDR, January 2012,

http://www.poweringprogress.org/download/Electric_Power_Plants_in_Laos_January_2012.pdf

¹⁴ It can be assumed that Thakho is not officially counted as a Mekong mainstream dam because it is considered to be a water diversion project. A notable absence from the Lao PDR government’s official dams list is the controversial Pak Chom dam that, when built, would alter the border between Thailand and Lao PDR.

¹⁵ Stimson Center, ‘Dr. Tom Cochrane and Dr. Thanapon Piman at Stimson’, *Stimson*, 31 August 2011, <http://www.stimson.org/video/interview-with-dr-tom-cochrane/>

Figure 1: Dams on the Mekong mainstream.



Source: Foundation for Ecological Recovery, <http://www.terraper.org>

Of the 12 hydropower projects planned for the Lower Mekong mainstream, 10 are, as noted earlier, in Lao PDR and the other 2 are in Cambodia.¹⁶ Of all the hydropower projects in the LMB, the proposed mainstream dams are the most controversial. If all of these dams were to be built, 55 per cent of the river between Chiang Saen, Thailand (near the Chinese border), and Kratie, in Cambodia, would become a reservoir; effectively turning the Mekong into a highly regulated body of water, dramatically impacting its ecology and the services it provides.¹⁷ The two most controversial of the proposed dams, which will be examined in more detail in Section 2, are the Don Sahong and the Xayaburi dams, both in Lao PDR.

¹⁶ International Centre for Environmental Management (ICEM), *MRC strategic environmental assessment (SEA) of hydropower on the Mekong mainstream: Summary of the final report* (Hanoi: ICEM, 2010), 6.

¹⁷ Stimson Center, 'Dr. Tom Cochrane and Dr. Thanapon Piman'.

The Mekong River Basin is currently experiencing what might be called a 'hydropower gold-rush'. State-owned enterprises from China, Lao PDR and Vietnam are competing with commercial hydropower operations from Thailand, France, Korea, Japan and Norway for the rich hydro resources of the basin.¹⁸ It is clear that the waters of the Mekong are profitable for those who see development in terms of energy production and wealth creation. In Section 2, the impacts of the dams will be considered from a more holistic point of view, and the ways in which the dams affect the lives of those who live on and rely on the services of the river for their well-being and livelihoods will be examined.

Section 2: Impacts of hydropower development on the Mekong

In order to understand the impacts of current and proposed hydropower dams, it is important to explore the issues from a micro as well as macro perspective. This section will begin by outlining the impacts of hydropower on the basin as a whole, first examining the upper and then the lower section. Given the large and complicated nature of the Mekong, the details will be necessarily brief. The second part of this section focuses on the impacts of a single dam – the Nam Theun 2 (NT2) – in central Lao PDR, and is based on a fieldwork study recently undertaken by the author at and around the NT2 dam site.

Upper Mekong Basin dams: Implications for down-stream riparians

As would be expected with such a large project, the Lancang dam cascade has had a significant impact on the river. An International Rivers Network brief warned, in 2002, before the completion of the Dachaoshan dam, that these dams would affect fisheries, dry and wet season flows and agriculture, as well as hinder the siltation process.¹⁹ A 2004 World Bank report echoed the warning, confirming that there were already significant irregular flows occurring hundreds of kilometres down-stream from the Manwan dam.²⁰ This was reiterated in 2008 in a paper examining the difference between the period before the construction of the Manwan dam and the period after, indicating that the post-dam period 'indeed had a lower water flow than the pre-dam period'.²¹

The flow regime in the upper section of the LMB has changed significantly, with the difference between dry and wet season flows decreasing. It has been argued that the evening out of the flow of the river between the wet and dry season will help to slow the intrusion of salinity into the lower reaches of the Delta during the dry, or low flow, season.²² However, this change in the flow regime brings with it significant costs – both to the river's ecology and to those who live on and around the Mekong. There is much evidence illustrating how this affects fisheries and agriculture. Villages in the Laotian and northern Thai section of the river have, for generations, planted crops in the sedimentary soils on the banks of the Mekong during the dry, or low river, season. These crops and gardens are now being regularly washed away before they can be harvested due to large releases of water from the up-stream dams, which have the secondary effect of causing heavy bank erosion.²³ Furthermore, '[c]omplaints about

¹⁸ See, for example: Shannon Lawrence, ed., *Power surge: The impacts of rapid dam development in Laos* (Berkeley, CA: International Rivers, 2008), 8–9.

¹⁹ See: International Rivers Network, 'China's Upper Mekong dams endanger millions downstream', Briefing paper no. 3 (Berkeley, CA: International Rivers Network, October 2002).

²⁰ Podger et al., *Modelled observations on development scenarios*, 107.

²¹ Lu Xi Xi, Wang Jian-Jun, and Carl Grundy-Warr, 'Are the Chinese dams to be blamed for the lower water levels in the Lower Mekong?', in *Modern myths of the Mekong: A critical review of water and development concepts, principles and policies*, Water and development publications vol. 1, ed. Matti Kummu, Marko Keskinen and Olli Varis (Helsinki: Helsinki University of Technology, 2008), 47.

²² Podger et al., *Modelled observations on development scenarios*, 15. The Lao PDR government also uses the more even flow of the Mekong to justify its mainstream dams; the less the difference between high and low season water, the less the interruption to hydropower production.

²³ 'The Mekong Part 1', *Assignment Earth*, Al Jazeera, broadcast 23 June 2007.

irregular water levels and reduced fish stocks have been commonplace since the completion of the first two dams'.²⁴

The risks of significantly changing the river's flow are recognised by the LMB riparians, and this is reflected in the fact that one of the most important components of the Mekong Agreement, signed by the four member states of the Mekong River Commission, is Article 6, which addresses the maintenance of flows on the mainstream.²⁵ This issue was considered to be so important that a sub-document was signed outlining the details.²⁶ Apart from securing a minimum flow level in the dry season, the Agreement attempts to ensure that water extraction or diversion from the Mekong mainstream does not hinder the annual flood which is crucial for the reverse flow of the Tonle Sap river. The Tonle Sap lake is reliant on the annual cycle of flooding which backs up near Phnom Penh in Cambodia, causing a remarkable natural phenomenon that reverses the water flow, pushing water inland, filling this massive lake, supplying millions of locals with water and fish, and providing a spawning area for a multitude of fish and aquatic species. It would be a disaster if the Mekong did not flood. The Mekong River Commission, in its annual flood report, goes to great lengths to point out that the economic benefits of flooding far outweigh the costs on average.²⁷ So although there may be some down-stream benefits from regulating the river flow, the costs of getting it wrong are very high. Additionally, any down-stream benefits are effectively erased by other negative impacts as discussed below.

Apart from affecting the flow regime of the river, the Lancang dam cascade also has other deleterious down-stream impacts. The Mekong River Commission's recently released *Basin development strategy* singles out the massive 292-metre high Xiaowan dam and the under-construction Nuozhadu dam, and their impact on sediment transfer and seasonal water flows.²⁸ Down-stream riparians have serious concerns about the negative effects of these dams. Given that the impacts described above have mostly occurred as a result of the first three dams of the Lancang dam cascade, and the combined storage of those is less than 10 per cent of the combined storage of the Xiaowan and Nuozhadu, their concerns are understandable.²⁹ The Xiaowan alone has the capacity to withhold one season's annual flow of the upper half of the Mekong River,³⁰ and it is expected that these dams will take approximately 10 years to fill.

As noted earlier, the Upper Mekong Basin contributes around 16 per cent of the annual water flow at the Delta. However, as the most recent *State of the basin report* by the Mekong River Commission states, its sediment contribution is much more significant:

About half of the total sediment contribution to the Lower Mekong Basin originates from the Upper Mekong. It is estimated that the Yunnan cascade of dams being built in China will trap some 90 per cent of this sediment.³¹

²⁴ Shi Jiangtao, 'Contentious dam begins power generation', *South China Morning Post*, 23 June 2008; 'Chinese dams disrupt Mekong lives', *Al Jazeera*, 18 June 2007.

²⁵ Mekong River Commission, *Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin*, 5 April 1995, <http://www.mrcmekong.org/assets/Publications/policies/agreement-Apr95.pdf>

²⁶ Mekong River Commission, *Procedures for the maintenance of flows on the mainstream*, 22 June 2006.

²⁷ Mekong River Commission, *Annual Mekong flood report 2008* (Vientiane: Mekong River Commission, 2009).

²⁸ Mekong River Commission, *Integrated water resources management-based basin development strategy for the Lower Mekong Basin, 2011–2015* (Vientiane: Mekong River Commission, 2011), 13.

²⁹ Lazarus et al., *An uncertain future*, 31.

³⁰ Richard P. Cronin, 'Testimony before Senate Foreign Relations hearing on water and security in Southeast Asia', *Stimson*, 23 September 2010, <http://www.stimson.org/summaries/testimony-before-senate-foreign-relations-hearing-on-water-and-security-in-southeast-asia/>

³¹ Mekong River Commission, *State of the basin report 2010: Summary*, 21.

The scale of the sediment impedance is becoming apparent even to China's hydropower companies, with estimates of the life of the dam cascade being slashed from 100 years to only 30.³²

The sediment capture is significant for two main reasons. The impacts of the Upper Mekong Basin dams are felt as far as the furthest reaches of the LMB, at the Mekong Delta. The Delta, in the southernmost part of Vietnam, has been built up over millennia by the slow but steady deposit of fluvial sediment from the river and is already facing pressure from sea-level rise. The capture of silt by the Lancang dam cascade has the effect of increasing the speed at which the natural subsidence of the Mekong Delta occurs. When there is 'accelerated subsidence', as the phenomenon is known,³³ deltas may experience apparent (or effective) sea-level rise which may be greater than eustatic (or normal) sea-level rise.³⁴ In the case of the Mekong Delta, the Lancang dam cascade is contributing to the 'sinking' of the Delta at a rate twice the speed of the current eustatic sea-level rise.³⁵ The rate of subsidence can be expected to increase as dam building continues.

The most serious consequences of sea-level rise in the Delta are inundation and coastal erosion. They have the effect of forcing population movements, and the increasing salinity harms agricultural production. Most of the Delta is less than 2 metres above sea-level so even a slight sea-level rise could have large impacts.³⁶ Coastal erosion is already significant, with some sections of coastline eroding at a rate of 30–50 metres per year,³⁷ creating a feedback loop. The erosion of the natural protection provided by established shorelines and mangroves results in greater vulnerability to sea-level rise and the impacts of storms and flooding, because, as the coastline recedes, there is less protection from these events for the population inland. Floodwaters, tidal and storm surges, and seawater with its higher salinity have the ability to penetrate further inland which in turn adds to coastline recession.

The second significant impact of silt capture behind the Lancang dam cascade is the removal of natural fertiliser. Farmers either compensate for this loss with expensive industrial fertilisers or experience decreases in crop yields. The Mekong Delta is one of the most fertile deltas in Asia and is commonly referred to as the rice bowl of Southeast Asia. It produces upwards of 16 million tonnes of rice for export,³⁸ enough rice for nearly 100 million people.³⁹ This contributes to making Vietnam the third largest exporter of rice in the world.⁴⁰ A reduction in rice production in the Delta will have food security implications for much of Asia.

³² Evelyn Goh, 'Regionalism and regional security', Special Issue: Developing the Mekong, *The Adelphi Papers* 46, no. 387 (2006): 49.

³³ Jason P. Ericson et al., 'Effective sea-level rise and deltas: Causes of change and human dimension implications', *Global and Planetary Change* 50, nos. 1–2 (2006): 66.

³⁴ *Ibid.*, 65.

³⁵ *Ibid.*, 64.

³⁶ Reiner Wassmann et al., 'Sea level rise affecting the Vietnamese Mekong delta: Water elevation in the flood season and implications for rice production', *Climatic Change* 66, nos. 1–2 (2004): 90; Antarctic Climate & Ecosystems Cooperative Research Centre, *Position analysis: Climate change, sea-level rise and extreme events: Impacts and adaptation issues* (Hobart: Antarctic Climate and Ecosystems Cooperative Research Centre, 2008), 11.

³⁷ Pham Thi Thuy Hanh and Masahide Furukawa, 'Impact of sea level rise on coastal zone of Vietnam', *Bulletin of the Faculty of Science of the University of the Ryukyus* 84 (2007): 55.

³⁸ See: Mekong River Commission, 'About the Mekong Delta: Special places', n.d., http://ns1.mrcmekong.org/about_mekong/special_place.htm

³⁹ See: Lester R. Brown, Gary Gardner and Brian Halweil, *Beyond Malthus: Nineteen dimensions of the population challenge* (London: Earthscan, 2000), 33–36.

⁴⁰ Liliana Carvajal, 'Impacts of climate change on human development', Human Development Report Office occasional paper (UN Development Programme, March 2007), 9.

Although Chinese engineers have concluded that ‘the Xiaowan project will have limited impacts on the lower reaches of the river’,⁴¹ the evidence above strongly contradicts this. Clearly, the impacts of sediment capture by the Lancang dam cascade have significant and serious consequences for the 17 million people living in the Delta and the millions who rely on the Tonle Sap for their livelihoods and subsistence. This strongly demonstrates why a holistic view of the river is essential when examining the Mekong. Looking at a dam in isolation, taking into account only its immediate area, is inadequate when it comes to making an assessment of its impacts. As will be seen below, this is extremely pertinent to the proposed LMB dams.

LMB mainstream dams: Development at what cost?

By some estimates, the 12 hydropower projects on the Lower Mekong could generate USD15 billion net present value, create up to 400,000 jobs during their construction and operation phases, and reduce carbon dioxide (CO₂) emissions by 50 million tons per year by 2030.⁴² However, the question must be asked: at what cost? From a purely economic perspective, this outcome looks good, but when balanced against environmental and livelihood losses, the outlook is not nearly as positive.

The impact on fisheries is crucial as fish provide the main source of protein for nearly all of those who live in the LMB.⁴³ The LMB is the most productive inland fishery in the world, producing between 2–3 million tonnes of fish per annum with a value of USD2–3 billion at first sale and a retail value of nearly USD8 billion.⁴⁴ As the majority of fish collected from the Mekong River Basin is also consumed there, this valuation is indicative only of the economic cost of replacing this vital protein source if depleted or stressed. Although the impact on fisheries and livelihoods in the Upper Mekong Basin is of concern, the majority of the Mekong River Basin’s fish catch is in the Delta and Tonle Sap. From an economic perspective, and based purely on the economic value of the fisheries, if the LMB fisheries were to be devastated by the building of lower Mekong dams – which is a highly likely outcome – then the economic losses would be massive.

Don Sahong dam

The LMB mainstream dams that are in the most advanced stages of planning are the Don Sahong and the Xayaburi. The intended location of the Don Sahong dam is near the Khone Falls in the southernmost regions of Lao PDR, just a few kilometres from the Cambodian border. The Don Sahong dam will generate a relatively modest 240 MW of power but will block a part of the river vital for fish migration. A technical paper released by the Mekong River Commission in 2002 warned of the serious implications of blocking the migration routes of fish on the mainstream.⁴⁵ A more recent report by Baird, which carefully analyses the

⁴¹ ‘Xiaowan dam, a reservoir for progress’, *China Daily*, 16 September 2002, <http://www.china.org.cn/english/environment/42990.htm>

⁴² Mekong River Commission, *Integrated water resources management-based basin development strategy*, 19; see: Robert Costanza et al., *Planning approaches for water resources development in the Lower Mekong Basin* (Portland: Portland State University and Mae Fah Luang University, July 2011). It should be noted that these estimates are contested. Once the construction phase is completed, most labourers will lose their jobs. There is also growing evidence that dam construction results in negligible carbon dioxide (CO₂) production. See, for example: Philip M. Fearnside, ‘Greenhouse gas emissions from a hydroelectric reservoir (Brazil’s Tucuruí dam) and the energy policy implications’, *Water, Air, and Soil Pollution*, 133 (2002): 91–2.

⁴³ Estimates range between 80 to 95 per cent. See: Imhof, ‘The Mekong’, 1; and Jens Grue Sjørslev, ed., *Luangprabang fisheries survey* (Vientiane: Mekong River Commission Fisheries Programme – Assessment of Mekong Fisheries Component and Living Aquatic Resources Research Center (LARReC), 2000), 3.

⁴⁴ Australian Mekong Resource Centre, ‘What do MRC studies tell us about the implications of Mekong mainstream dams for fisheries?’, Mekong Brief no. 9 (Sydney: Australian Mekong Resource Centre, November 2008).

⁴⁵ A.F. Poulsen et al., *Fish migrations of the Lower Mekong River Basin: Implications for development*,

migration of fish through the Khone Falls and Hou Sahong channel (which would be blocked by the dam) gives a clear indication of the extent of damage to fisheries that could be caused by this one dam: '[i]f fish were unable to migrate above the Khone Falls, they would not be able to feed, reproduce or complete other parts of their lifecycles above the Khone Falls.'⁴⁶ This would significantly impact fisheries in Cambodia's Tonle Sap and the Mekong Delta as well as much further up-stream from the dam.

Attempting to mitigate the impacts of the dam by creating fish passes is seen by Baird as problematic. There are no examples of fish passes that work in the Mekong River Basin and far too little known about the variety of fish.⁴⁷ The Columbia River is held up as an example of the successful use of fish passes. However, the river is home to only five to eight salmonoid species⁴⁸ whereas the Mekong is home to over 1,500 highly varied species.⁴⁹ The sheer volume of fish passing through the Mekong is another problem. During the peak fish migration season, 'at least 50,000 fish per minute are swimming past a given point on the Tonle Sap river'.⁵⁰ Essentially, any dam built on the Mekong with high expectations that a fish pass will be successful would be highly risky and experimental at best; reckless and irresponsible at worst. A technical report written for the Mekong River Commission sums up the situation well when it notes that '[o]n the mainstream, the choice therefore remains: fish or dams'.⁵¹

Xayaburi dam

The most controversial of the proposed LMB dams is the Xayaburi, which is intended to be built about 350 kilometres up-stream of Vientiane, in the remote areas of northern Lao PDR. Although presented as a run-of-river dam, it would in fact block the Mekong with a 49-metre high, 830-metre long dam wall, creating a reservoir at least 60 kilometres in length.⁵² Given what is at stake when it comes to mainstream dams, the environmental impact assessment (EIA) for the Xayaburi is limited at best. Although the dam would be built on an international river, the EIA only assesses the impacts to a distance of 10 kilometres down-stream. No assessments are given of the impacts on down-stream hydrology, migratory fish and sediment loads.⁵³ Although two fish passes are proposed as part of the project, no evidence for why their design is appropriate is given. In fact, the 'steps' on the fish ladders are 37 centimetres high, 7 centimetres higher than what is recommended for the powerful salmonoid species. This height is also 24 centimetres greater than the size of the dominant cyprinid species in the Mekong.⁵⁴

planning and environmental management, MRC technical paper no. 8 (Phnom Penh: Mekong River Commission, 2002), 21.

⁴⁶ Ian G. Baird, *The Don Sahong dam: Potential impacts on regional fish migrations, livelihoods and human health* (Victoria, BC: University of Victoria, August 2009), 21.

⁴⁷ *Ibid.*, 25.

⁴⁸ Australian Mekong Resource Centre, 'What do MRC studies tell us'.

⁴⁹ Podger et al., *Modelled observations on development scenarios*, 115.

⁵⁰ Gary Lee and Natalia Scurrah, *Power and responsibility: The Mekong River Commission and Lower Mekong mainstream dams* (Sydney: Australian Mekong Resource Centre, University of Sydney and Oxfam Australia, October 2009).

⁵¹ S. Sverdrup-Jensen, *Fisheries in the Lower Mekong Basin: Status and perspectives*, MRC technical paper no. 6 (Phnom Penh: Mekong Resource Centre, May 2002).

⁵² Eric Baran et al., *Review of the fish and fisheries aspects in the feasibility study of the environmental impact assessment of the proposed Xayaburi dam on the Mekong mainstream* (WWF Greater Mekong, 31 March 2011), 4.

⁵³ *Ibid.*, 23.

⁵⁴ *Ibid.*, 28.

The impacts of the Xayaburi dam on the Mekong River and the basin as a whole are so poorly understood because the assessment and planning process has been rushed through. The EIA is so far below world standards that the recent comment made by the Lao PDR Deputy Minister of Energy and Mines, Viraphon Viravong, that 'Laos will make sure that this dam will not impact countries in the lower Mekong River basin'⁵⁵ is simply not credible. As far as fish migrations, sediment capture and other ecological impacts are concerned, the Xayaburi dam would be a very large experiment, with the probable long-term costs being the loss of livelihoods and economic productivity in the Tonle Sap and the Delta. Yet the dam is more than just a plan. Visits to the proposed dam site show that infrastructural activity is already occurring.⁵⁶

The government of Lao PDR and the Thai hydro company CH. Karnchang Public Company Limited have been pushing hard to get this project through. This is against the wishes of the Vietnamese government which has, in line with Mekong River Commission's comprehensive strategic environmental assessment (SEA), asked for a 10-year moratorium on mainstream dams so that better baseline assessments can be made about the state of fisheries and the ecology of the river in general.⁵⁷ Additionally, doubt has been cast on the need for the electricity generated by the dam in that demand in Thailand for energy may not be as strong as initially projected.⁵⁸ The politics of this will be examined in more detail below, but in a recent Mekong River Commission meeting in December 2011, an agreement to suspend construction on the Xayaburi dam was reached. Whether actions will follow words, and how long the project will remain suspended, is still to be determined, but the decision is a positive step towards slower and more cautious hydro-development in the Mekong River Basin.

LMB tributary dams: The case of the Nam Theun 2 (NT2)

The number of constructed, under construction and planned dams on the tributaries of the Mekong has been outlined in Section 1. There is a large amount of literature on the impact of these dams, on the ecology of the rivers and on the livelihoods of those living near the affected rivers. The forced dislocation of villagers as a result of these hydropower projects is another issue that has been well-covered.⁵⁹ Given the number of dams and scope of the literature, it is not possible to attempt more than a rudimentary summary here. Instead, this section will focus on a single hydropower project – the NT2 on the Nakai plateau of central Lao PDR. A firmer grasp of the details of a single dam would allow a much better understanding of the current and potential impacts of the scores of dams built and planned for the Mekong and its tributaries.

The NT2 is one of the most studied hydropower projects in the world. This is because it is considered a best-practice or model dam, with funding from the World Bank as well as the Asian Development Bank.⁶⁰ The developer for the USD1.45 billion project is the Nam Theun 2 Power Company (NTPC), a conglomerate comprising Electricité de France International, the Electricity Generating Public Company Limited of Thailand, the Italian-Thai Development

⁵⁵ Saritdet Marukatat, 'Xayaburi vote to test Mekong friendships', *Bangkok Post*, 7 December 2011.

⁵⁶ 'Illegal construction on the Xayaburi dam forges ahead', *International Rivers*, 4 August 2011, <http://www.internationalrivers.org/en/node/6787>

⁵⁷ ICEM, *MRC strategic environmental assessment (SEA) of hydropower*, 22.

⁵⁸ Chris Greacen, *Decentralizing Thai power: Towards a sustainable energy system* (Bangkok: Greenpeace Southeast Asia, November 2006). See also: Chuenchom Sangarasri Greacen and Chris Greacen, 'Alternative power development plan for Thailand', *International Rivers*, 2 December 2011, <http://www.internationalrivers.org/en/node/7010>

⁵⁹ One of the best examples can be found in: Lawrence, *Power surge*.

⁶⁰ An Asian Development Bank report notes that 'the Project has been designed to be a model for large hydropower projects'. Asian Development Bank, *Technical assistance report Lao People's Democratic Republic Greater Mekong Subregion Nam Theun 2 Hydroelectric Project – Social safeguards monitoring* (Manila: Asian Development Bank, June 2008), 1.

Public Company Limited, also of Thailand, and the Lao PDR government.⁶¹ Ninety-five per cent of the 1,070 MW generated by the project is to be exported to Thailand with the remainder being fed into the local grid. At least 6,200 Laotians have been relocated to make way for the 450-square-kilometre reservoir and channel, with another 120,000 villagers impacted down-stream by the changes brought about by the dam. The NT2 project blocks the Nam Theun river with a 39-metre high dam, dropping the water in the reservoir on the Nakai plateau 350 metres to the power station below. This diverts 93 per cent of the Nam Theun river's flow to the Xe Bang Fai river, a major Mekong tributary, transferring the discharged water along a 27-kilometre man-made channel.⁶²

One of the more unique aspects of the dam is the built-in compensation for relocated villagers and down-stream negative impacts. The support and funding from the World Bank and the Asian Development Bank are based on '[ensuring] that social and environmental impacts of the project are addressed through a detailed program of mitigation compensation and offset measures'.⁶³ The international banks may have funded this programme with the best of intentions and in the hope of positive outcomes for Laotians, but there were many warnings that the project was neither environmentally nor socially sustainable.⁶⁴ Although NTPC communications give the impression that the NT2 is a socially responsible dam that improves the lives of all of those who have been impacted by it, the reality on the ground is very different.

Impacts on the Nakai plateau

The main disruptions brought about by the construction of the NT2 were the relocation of the 6,200 villagers on the Nakai plateau and the down-stream impacts seen along the Xe Bang Fai river. The outcomes are mixed for those who have been relocated. Life on the plateau was generally difficult before the NT2. Relocation has, in most cases, resulted in better housing for villagers, with access to roads, wells and sanitation. Most on the plateau are subsistence farmers and fishers, and the NTPC is mandated to provide compensation for land as well as training in, and assistance to, pursue other livelihood options. One problem that has arisen from the land compensation scheme is that each resettled family received 0.6 hectares, regardless of whether the family was large or small. While 0.6 hectares is usually considered sufficient for a family of four, it is not possible to produce enough rice for larger families on that amount of land.⁶⁵

One of the most significant issues for those who are relocated because of a dam is that the reservoir usually floods the most productive and fertile land. On the Nakai plateau, the quality of the allocated land varies, with some productive and others in rocky upland slopes not suitable for growing rice.

The remoteness of the allocated land can also be a challenge. One affected family explained that the land provided to them in compensation is so far from their home that, because of the petrol bill involved to access it, it is more cost-effective to let their plot lie fallow. This has changed their livelihood options significantly as, instead of growing rice, they now have to

⁶¹ Shannon Lawrence, *Nam Theun 2: Trip report and project update* (Berkeley, CA: International Rivers, February 2008), 20. This section serves, not as a critique of the role of the Nam Theun 2 Power Company (NTPC), the Asian Development Bank or the World Bank in the project, but to provide an overview of the conditions faced by those living in the areas impacted by the dam.

⁶² For more, see: Nam Theun Power Company, 'About NT2: Technical information', http://www.namtheun2.com/index.php?option=com_content&view=category&id=43&Itemid=57

⁶³ Asian Development Bank, *Technical assistance to the Lao People's Democratic Republic for preparing the Greater Mekong Subregion: Nam Theun 2 Hydropower Development Project* (Manila: Asian Development Bank, November 2003), 2.

⁶⁴ See, for example: David F. Hales, 'Nam Theun dam: The World Bank's watershed decision', *World Watch magazine*, May/June 2005.

⁶⁵ Villager, interview by author, Nakai plateau, Khammouane Province, Lao PDR, October 2011.

purchase it. The only legal option left to them is to catch fish and then sell them in order to be able to afford to buy the rice needed for their family.⁶⁶ The situation highlights the importance of fish for subsistence livelihoods in the LMB. In this circumstance, it is a case of 'if we cannot catch fish, we cannot eat rice.'⁶⁷

'Sticky rice', as it is known, is the staple food in Lao PDR. The many resettled villagers who are not able to meet their daily demands for sticky rice generally turn to fishing in the reservoir. The fish is then either consumed or sold. Apart from buffalo, the main source of income for those living on the plateau is fish. Villagers report that fishing stocks are declining rapidly, with some estimating that catches have decreased by 50–90 per cent since the reservoir has been filled. At the same time, the price of fish is purportedly becoming lower. A recent report by a panel of experts appointed by the Asian Development Bank to oversee the social impacts of the project notes the existence of illegal fishing in the reservoir by outsiders with better fishing and business skills than the resettled villagers.⁶⁸ The competition for fish between these skilled fishers and unskilled villagers may help to explain why villagers are reporting lower prices even as the catch decreases.

The main issue on the Nakai plateau is a lack of livelihood options. Although the NTPC promised the relocated villagers jobs and training, these have not been forthcoming or else they have been rolled out in an ad hoc way. One of the main options was meant to be forestry. Unfortunately, there are now many illegal forestry operations and many villagers are participating in such illegal activities as a way of making ends meet.

The willingness to participate in illegal forestry activities may stem from the perceived corruption surrounding the logging industry on the Nakai plateau.⁶⁹ Before the filling of the reservoir, the biomass in the flooded area was meant to be cleared to reduce such down-stream impacts as anoxic water and mercury leaching.⁷⁰ The Lao PDR government and the NTPC hired 'private contractors' in an attempt to carry out the programme, but clearing started too late to adequately clear all of the biomass.⁷¹ An elder in a village on the Nakai plateau, who witnessed what occurred when these contractors came, claimed that they removed valuable wood such as teak, and left the rest.⁷² When he requested permission from the NTPC to remove the remainder to supply the village with timber, he was refused. He pointed to a stand of rotting trees in an area flooded by the reservoir, saying that those were the trees he had wanted to take away.

⁶⁶ Many villagers have turned to the rampant illegal logging trade – especially of teak wood.

⁶⁷ Villager, interview by author, Nakai plateau, Khammouane Province, Lao PDR, October 2011.

⁶⁸ David McDowell, Thayer Scudder and Lee M. Talbot, *Sixteenth report of the International Environmental and Social Panel of Experts for the Nam Theun 2 multipurpose project Lao People's Democratic Republic* (Manila: Asian Development Bank, 25 February 2010), 20–1.

⁶⁹ *Ibid.*, 16–18.

⁷⁰ Lawrence, *Nam Theun 2: Trip report and project update*, 10–11.

⁷¹ Asian Development Bank, *Update on the Lao People's Democratic Republic Nam Theun 2 Hydroelectric Project* (Manila: Asian Development Bank, 21 July 2008), 11.

⁷² Villager elder, interview by author, Nakai plateau, Khammouane Province, Lao PDR, October 2011.

Figure 2: Rotting trees in the Nam Theun 2 (NT2) reservoir, Nakai plateau, Lao PDR.



Credit: Author.

Overall, then, the living conditions of many of those who have been resettled on the Nakai plateau have improved. Livelihood options, however, have not, and villagers are engaging in what appears to be unsustainable ways of making ends meet. For this reason, the resettlement programme on the Nakai plateau is far from ready to be declared a success. The resettlement process is ongoing and more time will be needed to assess whether this 'model dam' can provide long-term livelihood options for resettled villagers.

Impacts along the Xe Bang Fai

The most significant of the environmental and social concerns that were raised before construction commenced on the NT2 were those projected to occur down-stream along the Xe Bang Fai.⁷³ All expectations of the damage caused by the dam have been met and exceeded and the implications for food security are serious. Although the NTPC has provided sanitation facilities such as communal toilets and access to drinking water through wells, the people living along the Xe Bang Fai are experiencing very serious hardships. It cannot be expected that 93 per cent of the flow from one Mekong tributary can be channelled into another without significant adverse impacts. Since the NT2 began operating in 2010, there have been severe erosion, record flooding, decreases in fish catches and losses of rice. The exceptionally high levels of rain in the 2011 wet season exacerbated an already challenging set of environmental circumstances for the Xe Bang Fai and those whose livelihoods depend on it.

⁷³ See: Asian Development Bank, *Summary environmental and social impact assessment: Nam Theun 2 Hydroelectric Project in the Lao People's Democratic Republic* (Manila: Asian Development Bank, November 2004).

The flow of the Xe Bang Fai has doubled since the dam began operation and one of the biggest impacts of this has been erosion, in part because the erosion prevention measures promised by the NTPC have not eventuated. As is the case throughout the Mekong River Basin, during the dry season, villagers grow vegetables in the rich soil beside the river. The NTPC had estimated that 30–70 per cent of these riverside gardens would initially be lost but it was ‘expected that these losses [would] be quickly recovered by moving gardens higher up the banks’.⁷⁴ Unfortunately, in many places along the Xe Bang Fai, the banks have disappeared completely, to be replaced by eroded walls of earth that frequently collapse. Riverbank gardens have effectively been wiped out, taking with them a vital source of generational food security and income. For most of those that qualified for compensation, the NTPC gave a one-time payment of 5,000 kip (about USD0.65) per square metre for riverbank garden losses.

Figure 3: Severe erosion on the Lower Xe Bang Fai, Lao PDR.



Credit: Author.

⁷⁴ Les Amis de la Terre, Bank Information Center, Campagna per la Riforma della Banca Mondiale, and Environmental Defense, ‘NGO visit to the proposed Nam Theun 2 Hydroelectric Project in Laos, December 2003: Trip report’ (Berkeley, CA: International Rivers, February 2004), 7, <http://www.internationalrivers.org/files/nt2tripreport0904.pdf>

The increased flow has created another food security dilemma. All the villages along the Xe Bang Fai are involved in fishing. The increased summer flow has had severe repercussions for fishing. The dry season used to be the time when most fish along the river were caught. However, with an increase of 5.8 metres due to the greater summer flow, fish are now difficult to catch as fishers are not equipped for these conditions.⁷⁵ Villagers also report being afraid of the river due to the high flows. Instead of fishing in the main river, villagers now try to catch fish in smaller streams or ponds, although the sustainability of this is in question. Attempts to shift the source of fish from wild catch to aquaculture and fish ponds have been largely unsuccessful, with many villagers ending up in debt due to the high costs and risks involved.⁷⁶ Building and maintaining a fish pond is an expensive exercise as it requires inputs such as fish food and antibiotics. It also demands a level of technical knowledge that villagers do not currently possess. Although the NTPC provides a micro-lending system known as a 'community bank', the lack of livelihood re-skilling to accompany this has resulted in the failure of fish farms and left many villagers in debt with an uncertain financial future.

Rice has also been impacted, with yields decreasing since the dam began operation. One of the promised benefits of the dam was higher low-season flows that would make irrigating easier.⁷⁷ Although the river is, on average, much higher in the dry season than previously, the flows are erratic, depending on the release of water from the regulating pond. Large fluctuations in the water level cause damage to pumps. Thus, the pumps have to be moved, and in some cases, it takes up to 10 men to adjust a pump each time the river changes level. Villagers have complained about having to incur the cost of pump repairs when they have not been able to move them in time. Previously, with a regular wet and dry season, this was not a problem. Cheaper electricity prices were also promised as a means of decreasing the cost of irrigation. This has not eventuated on either the Xe Bang Fai or the Nakai plateau, with the price of electricity increasing significantly since the dam was built.

Villagers also complain about 'dirty water' that damages and kills crops when they irrigate using water from the river. The quality of the water has decreased so significantly that whereas they used to be able to drink from the river or dig shallow wells on the banks, they now rely entirely on the wells dug by the NTPC – about half of which both work and have clean water. They now also avoid swimming in the river in the dry season as those who do so report getting a rash or eczema. The fact that almost all of the dry season flow now comes from the Nakai reservoir strongly suggests that it is the root cause of these water issues. However, whether the problem is anoxic water, mercury that has leached from the soil or some other factor is still not publicly known.

As anticipated, flooding on the upper and lower Xe Bang Fai increased significantly once the dam started operation.⁷⁸ The flooding in 2011 was the worst in living memory,⁷⁹ devastating the rice crop along the length of the river. In many villages, including the upper Xe Bang Fai town of Mahaxai, the entire annual crop was destroyed. In one lower Xe Bang Fai village, of 450 hectares, only 10 hectares were harvestable. The pattern was repeated throughout the region, with many dam overflows occurring, impacting on rice stocks throughout Lao PDR.⁸⁰

⁷⁵ Asian Development Bank, *Summary environmental and social impact assessment*, 27.

⁷⁶ Lawrence, *Nam Theun 2: Trip report and project update*, 8.

⁷⁷ Asian Development Bank, *Summary environmental and social impact assessment*, 28.

⁷⁸ The NTPC claimed that the Nam Theun 2 (NT2) did not add to the problem because they stopped dam releases throughout the flooding. Due to the opaque conditions under which they operate, it is difficult to ascertain if this was the case. See: Nam Theun 2 Power Company (NTPC), 'Statement of the Khammouane flooding', Press release, 9 August 2011,

<http://www.namtheun2.com/images/stories/Press/Khammouane%20Flooding%20Aug2011.pdf>

⁷⁹ Village elder, interview by author, Nakai plateau, Khammouane Province, Lao PDR, October 2011. Shortly after this interview, I spoke with a woman who claimed to be 110 years old. She stated that she had never seen flooding like the one in 2011. Hydrological data from the Mekong River Commission was not available at time of publication.

⁸⁰ Khamphone Syvongxay, 'Floods deplete rice seed stocks', *Vientiane Times*, 14 October 2011.

The food security impacts from the floods were more than just losses of rice. All villages experienced losses of livestock including cattle, buffalo, goats, chickens and ducks. Even wild food options such as frogs were destroyed.

To cope with losses such as these, villagers sell buffalo if they have them, or borrow from the community fund set up by the NTPC. The fund gives low-interest loans of around USD100. Villagers who had borrowed for rice that had been washed away, fish ponds that had not worked, or pig farms that had failed, are now in debt and must try to find ways to pay their debts with their meagre means. Their future is uncertain and many hope that the government will help them with the next year's rice seed. In fact, the future for all of those who live along the Xe Bang Fai is uncertain. With losses to rice, fisheries, fresh water and livestock, the villages around the Xe Bang Fai are sitting on a food security disaster. As one village headman put so succinctly: 'I cannot talk about [the NTPC], but if they build more dams we will die.'⁸¹

The NT2 is meant to be a best-practice dam, with careful planning, preparation, funding and villager compensation. The NT2, and the NTPC, was even awarded Hydroelectric Power Project of the Year by *Global Energy Magazine*.⁸² Some villages are better off than others, but the worst off are destitute with few livelihood options. The argument that dams are decreasing poverty in Lao PDR is evidently untrue for those that live along the Xe Bang Fai. If the negative impacts described above are the results of a 'model' dam, then there is no reason to expect that the impacts of a worst-practice, poorly researched dam, such as the Xayaburi, will not be even more disastrous.

Section 3: The security implications of unabated hydropower development in the Mekong River Basin

The security issues in the Mekong River Basin are at the confluence of non-traditional security considerations such as food, water and migration. The main challenges stem from the loss of renewable resources such as fish, rice, soil and water brought about by the changes in the environment caused by hydropower projects.⁸³ Because these non-traditional security concerns surrounding renewable resources are far less well understood than traditional security concerns of the interactions between states, they are more difficult to mitigate. However, the consequences of getting assessments wrong here are no less critical for ongoing regional peace, security and cooperation.

This section will look at the security implications of the current and expected impacts brought about by the environmental changes occurring on the Mekong as a result of hydropower projects. The impacts of the dams can roughly be broken into three concerns: first, food and water security, second, irregular migration, and third, state (in)stability.

<http://laovoices.com/floods-deplete-rice-seed-stocks/>

⁸¹ Village headman, interview by author, Lower Xe Bang Fai, Khammouane Province, Lao PDR, October 2011.

⁸² Graeme Burton, 'Finally, the results of the 2011 Global Energy Magazine Awards are ...', *Global Energy Magazine*, 16 April 2011,

<http://www.globalenergymagazine.com/2011/04/and-the-winners-of-the-2011-global-energy-magazine-readers%E2%80%99-poll-awards-are%E2%80%A6/>

⁸³ For a more detailed analysis of environmental scarcities and security, see: Thomas F. Homer-Dixon, 'Environmental scarcities and violent conflict: Evidence from cases', *International Security* 19, no. 1 (1994): 5–40.

Food and water security

The increasing frequency of severe climatic events such as floods and droughts, an increasing global population as well as localised food and water shortages, have helped to stimulate a great deal of interest in food and water security among policymakers and academics in the last decade.

Most of the writing and current academic conversation focus on what should really be described as food and water ‘availability’ rather than what international relations scholars would refer to as ‘security’.⁸⁴ This is partly because the main – and undoubtedly an important – emphasis has been placed on the production, conservation and utilisation of food and water. It is also partly due to the fact that traditional understandings of international security revolve around state-level interactions and, in other cases, global cooperation.⁸⁵ National issues such as food, water, the local environment and sub-national conflict are usually outside the scope of international security analyses.

This paper makes no attempt to define the meanings of water and food security. Instead, it will place the food and water challenges in the Mekong River Basin within the framework of international security and politics. That is to say, what defines these as food and water security issues is that they intersect with political concerns.

To grasp the security implications of continued hydro-development in the Mekong River Basin, we must briefly review what is already occurring. The Mekong River Basin is home to tens of millions of people, most of whom rely on fish as their main source of protein, and rice as their staple carbohydrate. The reason that the LMB is so populous is because the river has, for thousands of years, provided the renewable resources for both the means of living and that of employment.⁸⁶ Yet, both fish and rice are in serious jeopardy from the current and planned hydropower developments.

As has already been observed, a river knows no political boundaries. Although the Mekong itself is used to demarcate national boundaries, the geography is determined by millennia of natural phenomena. The ecosystem of the river and the services that it provides are essentially common-pool resources. This makes the Mekong and other international rivers a challenging issue for policymakers as well as for those who rely on these rivers for their sources of livelihood. The overview of hydro-developments and their environmental impacts above demonstrates very clearly that the Mekong is a complex ecosystem that provides renewable resources, especially food and water, to those who live in the basin. What is significant though, is the fact that development in one area of the river can have impacts thousands of kilometres away. The Lancang dam cascade exemplifies this.

The Lancang dam cascade is already having significant impacts on the river, affecting the flow regime and capturing sediment. The food security consequence of the variable flow is the destruction of alluvial low-season crops which have now been significantly impacted in the upper section of the LMB. In the Mekong Delta, the sediment capture up-stream is adding to the accelerated subsidence caused by climate change and, at the same time, it is withholding the natural fertiliser that has helped to make the Delta one of the most productive rice-growing regions of Asia. With the completion of the Xiaowan dam and the continued construction of the massive Nuozhadu dam, this situation will only worsen.

⁸⁴ See, for example, the International Conference on Asian Food Security held in Singapore in August 2011, details of which can be found at: RSIS Centre for Non-Traditional Security (NTS) Studies, ‘International Conference on Asian Food Security (ICAFS) “Feeding Asia in the 21st century: Building urban-rural alliances”’, 2011, <http://www.rsis.edu.sg/nts/article.asp?id=163>

⁸⁵ Here, I am referring to the dominant discourses of Realism and Liberalism.

⁸⁶ The modern economic idea of ‘employment’ is a fairly recent introduction to most in the region.

On the tributaries of the LMB, dam construction – especially in Lao PDR – is, in destroying livelihoods and increasing the threat of starvation and poverty, helping to create a human security disaster. The NT2 dam demonstrates that even with reasonable planning and a genuine desire on the part of the funders to offset some of the negative impacts, the outcome for villagers is, on average, poor. The political power disparity in countries such as Lao PDR and Cambodia means that villagers have very little information and almost no say in what happens to them as a result of hydropower developments – despite being the ones faced with all the risks and suffering all the consequences. The result is that the one-off compensation of land and the destruction of fisheries and crops have increased rather than decreased poverty, and, at the same time, increased vulnerability and food insecurity.

While the negative environmental and social consequences of the dams in the Upper Mekong Basin and the LMB tributaries are still playing out, the plans for the Lower Mekong mainstream dams are pushing ahead regardless. The strong opposition of the scientific community and civil society to the Don Sahong dam perhaps helps to explain the Lao PDR government's shift in focus to the Xayaburi. By submitting an almost worthless EIA, which did not account for any trans-boundary or fishery impacts, and passing off the 49-metre high, 830-metre long wall as a run-of-river dam, the Lao PDR government was able to move the Xayaburi project forward, helped by the remoteness of the region and the paucity of quality baseline data. As discussed earlier in Section 2, research shows that the highly likely outcome of the construction of the Don Sahong dam would be the destruction of a large percentage of the fisheries in the Delta and the Tonle Sap, creating a long-term food security crisis. Although the impacts of the Xayaburi may not initially be as serious as those of the Don Sahong, the construction of this one dam – as the first dam to block the Lower Mekong mainstream – carries with it another more significant political consequence.

It could be foreseen that the completion of the first LMB mainstream dam will lead to a classic case of what Hardin refers to as a 'tragedy of the commons'.⁸⁷ To briefly summarise Hardin, it is possible to imagine a common field shared by several villagers, each of whom keeps a herd of buffalo. Each of the villagers, as rational individuals, seeks to maximise their gains by adding more and more buffalo to their herds. At some point the common-pool resource is over-utilised and over-grazing occurs, threatening the commons as a whole. As a group, the interests of the villagers would be best served by not adding to their herds, ensuring that they do not over-utilise the common resource. However, as individuals, the rational thing to do – to maximise their own gains – is to add more buffalo to their herds.⁸⁸ This leads to the inevitable, yet foreseeable, tragedy – the collapse of the services provided by the common resource.

Renewable resources create the perfect environment for tragedies of the commons, and the Mekong is like a textbook case, with the fish, the soil and the river itself each a trigger for a potential tragedy. As the Thai Natural Resources and Environment Minister has said: '[o]ther Mekong countries have already taken benefits from the river but Thailand has done nothing.'⁸⁹ Or as Hirsch of Sydney University's Mekong Research Group points out: 'the Lao government in particular sees no reason why it should hold back on developing a shared river when an upstream country is already doing so.'⁹⁰

The writers of the Mekong Agreement understood the importance of cooperation 'for social and economic development and the well-being of all riparian States ... [in order] to protect ... the ecological balance exceptional to this river basin'.⁹¹ Although the Mekong River

⁸⁷ Garrett Hardin, 'The tragedy of the commons', *Science* 162, no. 3859 (December 1968): 1243–8.

⁸⁸ Ibid., 1244. This problem is also associated with what is known in game theory as the 'prisoner's dilemma'. For more, see: Steven Kuhn, 'Prisoner's dilemma', *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Spring 2009, <http://plato.stanford.edu/archives/spr2009/entries/prisoner-dilemma/>

⁸⁹ Apinya Wipatayotin and Achara Ashayagachat, 'Mekong dam plans revived', *Bangkok Post*, 27 March 2009.

⁹⁰ Philip Hirsch, 'China and the cascading geopolitics of Lower Mekong dams', *The Asia-Pacific Journal* 9, issue 20, no. 2 (2011).

⁹¹ Mekong River Commission, *Agreement on the Cooperation for the Sustainable Development of the Mekong*

Commission has no coercive or enforcement power, it nevertheless enables member states to come together to discuss issues and share information. China's ongoing refusal to join the Mekong River Commission and its insistence on continuing with the Lancang dam cascade in the face of the harm that it causes is a constant challenge for the LMB riparians. China has an advantage as it is the uppermost, as well as by far the wealthiest and most politically powerful, riparian. The Lancang dam cascade has been presented as a *fait accompli* with riparian states barely being informed, let alone consulted. Although in recent years Chinese authorities have agreed to share some hydrological data, their attitude on the Mekong can hardly be described as 'cooperative'.⁹² With China gaining immensely from the river – to the tune of at least 14,000 MW – it is understandable and normal for the LMB riparians to want to benefit from the same resource. Given the impacts of the Lancang dam cascade on the LMB, it was only a matter of time before the problems associated with a tragedy of the commons came into play.

It is unsurprising then that Lao PDR, as the country most impacted by the irregular flows caused by the Lancang dam cascade, and with far less to lose from the destruction of fisheries than those downstream, is the first Mekong River Commission signatory to push forward with mainstream dams. By the same logic though, once one LMB mainstream dam is built, there will be less resistance to building further dams, especially given that the majority of those planned are in Lao PDR. The impacts of the Lancang dam cascade are severe, but the impacts of the construction of all or even a few of the LMB dams would be devastating. Although proponents of the dams claim that the gains, in a best-case scenario, could be up to USD33 billion, the worst-case scenario could mean basin-wide losses of over a quarter of a trillion US dollars, with Lao PDR the only LMB riparian to gain financially under that scenario.⁹³ The financial risks are extraordinary, but it is the human impact of these losses that are most striking.

The capture of one common renewable resource, the Mekong's water, would lead to the loss of another common renewable resource, fish. According to the scientific literature, the Tonle Sap and the Delta in particular would be severely affected by the LMB dams as both are heavily populated with migratory fish.⁹⁴ Calls to replace the 2–3 million tons of wild fish caught annually on the Mekong with fish from aquaculture do not recognise the value of the fisheries in terms of subsistence. A large majority of the tens of millions of people who rely on the Mekong fisheries as their main source of protein are subsistence farmers and fishers. The idea that the bulk of these people could raise the capital to build fish farms and cover the significant cost of inputs in the production of cultured fish, let alone quickly and inexpensively gain the technical skills required, is profoundly naive.⁹⁵ This is one of the lessons of the NT2 dam: even though the NTPC set up a micro-lending facility to enable farmers to turn to aquaculture to compensate for fisheries losses, the lack of technical knowledge or ongoing funding for inputs resulted in these schemes failing and the farmers left with either a burden of debt or the need to leverage assets such as buffalo in order to try and cover costs. The NTPC's failure in the face of the fisheries losses on the Xe Bang Fai and the Nakai plateau is a warning for any who believe that it would be inexpensive, effective or simple to replace capture fisheries with aquaculture.

River Basin.

⁹² Alex Liebman, 'Trickle-down hegemony? China's "peaceful rise" and dam building on the Mekong', *Contemporary Southeast Asia* 27, no. 2 (2005): 296.

⁹³ Costanza et al., *Planning approaches*, 25.

⁹⁴ See for example: ICEM, *MRC strategic environmental assessment (SEA)*, 11; Baird, *The Don Sahong dam*, 21–2; Lee and Scurrah, *Power and responsibility*, 27–8; Patrick J. Dugan et al., 'Fish migration, dams, and loss of ecosystem services in the Mekong basin', *AMBIO* 39, no. 4 (2010): 344–8.

⁹⁵ Podger et al., *Modelled observations on development scenarios*, 118.

Furthermore, fisheries are more than just a means of subsistence; they also provide jobs for many. Fishers are 'overrepresented in poor and vulnerable LMB communities which would be affected by fisheries losses'.⁹⁶ Fishing puts food on the table, it provides employment, and the money gained from selling excess catch is used to buy household items and meet other expenses. Any level of fisheries losses in the LMB would have a doubly negative impact on food security by taking away both the primary source of protein and the economic means to replace the losses. Serious fisheries losses, as is expected to occur following the construction of the LMB hydropower projects, would be devastating in terms of food security. Simultaneously, rice production would be heavily affected. Most of the sediment escaping capture in the Lancang dam cascade would be stopped by the series of dams on the Lower Mekong mainstream. The speed of the Delta's demise would increase as would the cost of inputs for fertiliser.⁹⁷ Expectations are that in both the Delta and the Cambodian floodplain, the natural fertilisation would be reduced by 75 per cent.⁹⁸ Farmers not able to cover the costs of fertiliser would have to cope with lower rice yields, putting further pressure on the availability of food. On top of this, the LMB projects coupled with the Upper Mekong Basin dams would turn about 60 per cent of the Mekong into a holding pond. This creates a strong possibility that much of the water would be anoxic from the rotting bio-matter in the catchment reservoirs for years after the dams begin filling.⁹⁹ This has happened in many tributary dams and there is no reason to suspect that it would not occur in the mainstream dams, the difference being the number of people that would be affected.

Understanding the food and water security issues in the Mekong River Basin requires a fairly complex understanding of the environmental issues and political environment. The LMB mainstream dams will undoubtedly exacerbate what are already significant environmental impacts on the basin from the Lancang dam cascade and the LMB tributary dams. Although the LMB mainstream dams are advertised as a way of increasing revenue and thus decreasing poverty and enhancing development, they are also, in large part, a money generating enterprise for profit-centred hydropower companies and a few elite policymakers. As is currently the case with the NT2, the Xayaburi will export 95 per cent of its electricity to Thailand. If this mindset continues, the outcome will be economic benefits for a few while many suffer the consequences and bear the risks. The human security dilemma, as Cronin and Hamlin note, is this:

If lost food production needs to be replaced by imports, how will millions who depend on the subsistence livelihoods afford to buy domestically redirected or imported food?¹⁰⁰

The sad irony of LMB mainstream dams is that the destruction of the fisheries and rice crops brought about by the dams – officially slated to reduce poverty – will create a large number of hungry, jobless poor.

Migration

Food and water security issues are, at their core, human security issues. The existential importance of food and water is due to the fact that they are essential priorities for life. We have seen above that when political decisions and the actions of private corporate enterprises lead to the capture of common renewable resources, there can be severe changes in the environment, causing challenges to the availability and quality of food and water. One of the primary adaptation measures under such conditions is migration. Although many scientific reports on environmental change in the Mekong refer generally to the risks in terms of migration and/or conflict, this section seeks to understand the risks more specifically.

⁹⁶ ICEM, *MRC strategic environmental assessment (SEA)*, 11.

⁹⁷ *Ibid.*, 59.

⁹⁸ *Ibid.*, 79.

⁹⁹ Baran et al., 'WWF Xayaburi Review', 16–17.

¹⁰⁰ Cronin and Hamlin, *Mekong tipping point*, 14.

There is a growing body of research on migration as a coping mechanism for environmental change. The terms 'environmental forced migration', 'climate refugees' and 'economic migration' are among those used for people who are forced or choose to move in order to adapt to changes in their environment. The use of the word 'refugee' is particularly contentious given the UN High Commissioner for Refugees' (UNHCR) specific criteria of who fits this definition and its apparent monopoly on the term.¹⁰¹ This paper will in no way enter into this definition debate and so the neutral terms 'regular migration' and 'irregular migration' will be adopted.¹⁰² The growing body of literature on the subject is becoming more polarised, with those who 'securitise' migration and migrants as threats to the state on one side,¹⁰³ and those that consider environmental migration primarily from the perspective of human security and vulnerability on the other.¹⁰⁴ This paper takes a more nuanced and less dichotomous approach. It disagrees with the notion that large migration is *a priori* a driver of conflict. On the other hand, instead of taking the position that migration is essentially benign, it sets forth an argument that migration can exacerbate tensions and increase state instability.

Migration is often explained in terms of push and pull factors. There will be tens and possibly hundreds of thousands of people forcibly displaced by the reservoirs and hydro projects in the LMB. The millions who live in the Delta and around the Tonle Sap floodplain are the most significant of the vulnerable populations. Whether alternative livelihood options will be put into place for these people, as has been attempted with the NT2, is unclear and will depend on the hydro developer and on government conditions and enforcement. A strong argument has been made above as to why continued LMB hydro development will result in strong push factors that come from the problems associated with food and water security issues.¹⁰⁵ Scarcity of food and destruction of livelihoods are two of the strongest possible push factors for irregular migration.

The question then is: where will migrants go? In Southeast Asia and Asia as a whole, there is a clear trend of rural-urban migration, with migrants moving to cities in search of better jobs and income.¹⁰⁶ Inter-state migration is common in continental Southeast Asia which has some of the most porous borders in the world – due in large part to the rivers and water courses so common to the region. There are an estimated 1 million Vietnamese migrants in Cambodia, but the most attractive regional destination by far is Thailand, especially for Cambodians and Laotians.¹⁰⁷ A headman in one of the villages along the Xe Bang Fai reported the occurrence of economic migration to Thailand. Teenagers from his village had moved to Thailand and were working illegally as house-maids, as labourers in rubber plantations and in the fishing industry. All were remitting money to the village to assist their families who were struggling to cope with the impacts of the NT2 dam.¹⁰⁸

¹⁰¹ The UN High Commissioner for Refugees (UNHCR) identifies a refugee as a person who has a 'well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion'. UN General Assembly, *Convention Relating to the Status of Refugees*, UN Treaty Series 189 (28 July 1951), Article 1(A)2. Note the absence of 'environment'.

¹⁰² For a more detailed discussion, see: Khalid Koser, 'Irregular migration, state security and human security' (Global Commission on International Migration, September 2005), 5.

¹⁰³ See Alan Dupont, 'The strategic implications of climate change', *Survival* 50, no. 3 (2008): 29–54. In particular, see the discussion of Schwartz and Randall, pp. 42–4.

¹⁰⁴ For example, see: RSIS Centre for Non-Traditional Security (NTS) Studies, *Study Group on Climate Change, Migration and Human Security in Southeast Asia (26 May 2011)* (Singapore: RSIS Centre for Non-Traditional Security (NTS) Studies, 2011),

http://www.rsis.edu.sg/nts/HTML-Newsletter/Report/pdf/Climate_Migrate_Report.pdf

¹⁰⁵ It must be kept in mind that individuals, families and communities make migration decisions based on their specific set of circumstances. Often, remittances are sent home to families which enable them to stay in situ.

¹⁰⁶ Philip F. Kelly, 'Migration, agrarian transition, and rural change in Southeast Asia', *Critical Asian Studies* 43, no. 4 (2011): 490–1.

¹⁰⁷ *Ibid.*, 487–9.

¹⁰⁸ Village headman, interview by author, Lower Xe Bang Fai, Khammouane Province, Lao PDR, October

International migration is not normally the migrants' first choice. Rural-urban migrants usually move to cities or towns within their own country before moving across borders to cities with real or perceived improved opportunities.¹⁰⁹ This lines up with findings in the upper Xe Bang Fai, where migration within the province for the purpose of finding work was reported.¹¹⁰ Regional centres are the main target. In the LMB, the centres experiencing rapid growth in rural-urban migration include Ho Chi Minh City, Can Tho city in the Mekong Delta,¹¹¹ Phnom Penh, Siem Reap, Bangkok, Chiang Mai and Vientiane.

Predicting when, where and to what degree irregular migration will occur is not an exact science. Instead, it is best to try and understand the conditions under which such migration would occur as well as the possible outcomes. There is no doubt that the LMB mainstream dams will encourage migration. This may play out in several ways: the first could be described as moderate, ordered migration; the second, heavy, unstable migration; and the third, severe, chaotic migration.

If the impacts of the LMB dams are minor, with only some losses to fisheries and livelihoods, regular, or economic, migration will increase, with more people moving to urban centres for work and remitting money home. Such moderate-scale migration can come with both beneficial and negative impacts for receiving areas. Migrant workers are often a welcome source of cheap labour for positions employers struggle to fill. From a regional perspective, this is currently the case in Thailand, with migrants from Myanmar and Cambodia working as maids, in factories and in the fishing industry. On the flip side, such migration brings with it upward pressure on unemployment and inflation in the receiving areas at the same time as wages being pushed down. This will be a challenge for policymakers who may then decide to try to channel migrants to other regional centres or peri-urban areas. With the right policy responses, such increased migration will hopefully be met with an ordered and humane response.

If the dams result in more serious impacts such as hunger and the loss of many livelihoods, then irregular migration to both intra- and inter-state centres could increase significantly. This puts even more pressure on inflation as more people share the limited resources of the urban centre. Infrastructure requirements also increase, and whether the housing and transportation needs of urban dwellers are met will depend largely on the policy responses as well as the economic and bureaucratic capacity of the country involved. Of the four LMB riparians, Thailand is likely to be the only state to successfully cope on both fronts. The quasi-legal nature of those who have crossed borders means that the state is hit with the need for high infrastructure investment without an accompanying increase in tax receipts. Heavy migration such as this is inherently socially and politically unstable. The political responses to such large migrations could be to attempt to reverse the flow of local migration through financial incentivisation; or, for those found to be living in the country illegally, to impose punitive measures such as internment, imprisonment and fines.¹¹² The social ramification of such migration is often resentment in the receiving communities against the new arrivals, and there is documented evidence of this exacerbating ethnic or political tensions, triggering violent conflict.¹¹³

2011.

¹⁰⁹ Thai senior academic, interview by author, Bangkok, Thailand, October 2011.

¹¹⁰ Village headman, interview by author, Upper Xe Bang Fai, Khammouane Province, Lao PDR, October 2011.

¹¹¹ See, for example: Olivia Dun, 'Migration and displacement triggered by floods in the Mekong Delta', *International Migration* 49, no. 1 (2011): e211–2.

¹¹² Koser, 'Irregular migration', 14.

¹¹³ Homer-Dixon, 'Environmental scarcities', 20–2; also see: Ashok Swain, 'Environmental migration and conflict dynamics: Focus on developing regions', *Third World Quarterly* 17, no. 5 (1996): 959–73.

In the worst-case scenario, hydropower developments will severely impact fisheries and rice production. Under this scenario, the livelihoods of the majority of those that live on and around the Delta and the Cambodian floodplain will be devastated and few options will be left for those most affected. International aid will be needed in a similar fashion to what is witnessed in severe African droughts. It will not be unexpected to see cities become homes to increasing numbers of slum dwellers and camps of refuge. If the situation unfolds quickly, it can lead to knee-jerk policy reactions that view arriving populations as a threat to either the state or the receiving community. On top of the regular and irregular migration described above, there could be an accompanying refugee-like flow of people seeking the means of subsistence wherever they can. This migration would not necessarily be only to urban centres, but also to towns and other rural areas. This is because first-flow migrations comprise those with more capacity to find gainful employment and travel longer distances.¹¹⁴ The poorest and the frail often have no option but to stay where they are, or to migrate to nearby areas, and try to adapt as best as possible.

These three scenarios are real possibilities, and they give some idea of what is at stake as far as human security and migration are concerned. To get the full picture, however, we must give these movements of people more context. Each of the migration scenarios above – and all the possibilities in between – would be accompanied by regional shortages of food.

In the moderate, ordered scenario, migration occurs while the price of food increases. The impacts of the dam developments on fisheries and on the production of rice mean that local supply will struggle to meet demand. There will be an accompanying need to slow exports, possibly increase imports and, where possible, shift dietary habits. All of these create real inflationary pressure, and this would have an impact on both rural and urban areas.

In the more serious scenarios, the inflationary pressures will be greater and will coincide with localised or regional food shortages due to the devastation of fisheries and agriculture. One of the most serious issues in such cases is that the migrants are fishers and farmers from areas that supply urban centres with produce, who have migrated in large numbers because they themselves have been unable to secure the basics of life. The result is a downward spiral of hunger and poverty in both rural and urban areas. The flow-on effect from this is that, although the migrants are themselves victims of environmental changes, the receiving community links their arrival with severe inflation and food shortages, helping to sow discontent and increase the risk of conflict. Such an effect can also be observed at the regional level: decreased or ceased exports of rice in order to meet local supply bring regional inflationary pressures such as the food price spikes witnessed in 2008 and 2011.¹¹⁵

Although these migration scenarios are somewhat speculative and obviously simplified, they are neither arbitrary nor implausible. The risks to human security from the loss of renewable resources brought about by dams in the Mekong River Basin are serious. Impacts on food security and livelihoods threaten to create a situation where migration, as a preferred coping mechanism, leads to even greater pressures on populations and states. It must be kept in mind that migrants in these situations are victims of the environmental changes brought about by hydropower projects rather than perpetrators of violence.¹¹⁶ If violent conflict ensues, it is as a result of a set of root causes that these vulnerable populations had no control over in the first place.

¹¹⁴ Priya Deshingkar, 'Migrant transfers and local development' (London: Overseas Development Institute, 25 September 2009).

¹¹⁵ See: Food and Agriculture Organization of the United Nations (FAO), 'World food situation: FAO food price index', <http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/>

¹¹⁶ Lorraine Elliot, 'Climate change, migration and human security in Southeast Asia', Policy Brief no. 13 (Singapore: RSIS Centre for Non-Traditional Security (NTS) Studies, October 2011), 3–4.

State instability and international politics

The ramifications of the impacts from the dams, especially those on the LMB mainstream, for state stability and international politics are often misunderstood, ignored or downplayed by regional policymakers. The dominant discourse surrounding the dams, at least from the perspective of the Lao PDR government and the hydro developers, is that the dams are good for the country and neutral for other riparians. Clearly this is not the case. The environmental impacts could, according to assessments that have been carried out, be severe, and the accompanying threats – in terms of food and water security as well as migration – are significant. How these play out in terms of their impacts on state instability is another matter.

As has already been discussed, China's mainstream dams are significantly affecting the river, with the externalities being mainly felt down-stream. The economics of LMB dams look good for Lao PDR with gains in both foreign revenue and energy. For Thailand, the picture is more ambiguous. They stand to gain, in terms of economic development and energy, from the LMB hydro projects, but the social, political and economic costs that would accompany heavy and severe migration would be a substantial challenge.

Cambodia and Vietnam stand to lose significantly – economically and ecologically. These states would also witness serious impacts from migration. There would be fisheries losses as well as reduced rice and cash-crop production, which would affect food supply, both for local consumption and export. There would also be replacement costs for fertiliser, increased infrastructural demands, and adaptation costs at village and regional levels. At the same time, tax receipts would decrease due to lower revenue. In addition, there would be costs associated with adapting to or controlling migration. Losses to livelihoods and an accompanying increase in unemployment would be a rising concern. With the bureaucracy having to deal with all these issues, it would be overburdened. As a consequence of these multiple stress factors, state capacity to act would be jeopardised at a time when it is needed the most.

It is possible that Vietnam, with a gross domestic product (GDP) of USD103 billion, would have the capacity to absorb the costs. It would come, though, with serious consequences for growth and would undoubtedly retard the development and implementation of other policies such as poverty alleviation and climate change adaptation. How the Vietnamese government would deal with migration is another matter. Rural-rural migration in Vietnam is already high, with many moving to the central highlands.¹¹⁷ As has been observed, the number of people potentially affected is large. The city of Can Tho, known as the capital of the Delta, has 2 million living in the greater city area, and already faces significant threats from climate change. Rural-urban migration is already taking place here as farmers struggle to cope with the changes brought about by the Lancang dam cascade and other environmental factors.¹¹⁸

¹¹⁷ Kelly, 'Migration, agrarian transition', 492.

¹¹⁸ Vietnamese academic, interview by author, Can Tho, Vietnam, October 2011; Dun, 'Migration and displacement', e202-4 and e210.

Figure 4: Urban population vulnerable to sea-level rise and flooding, Can Tho, Vietnam.



Credit: Author.

Given the single-party communist government, the state is unlikely to face a crisis of authority. The Vietnamese government has a history of being proactive in terms of environmental adaptation in the Delta and this experience may position them well in terms of coping with the changes brought about by the dams.¹¹⁹ But even if discontent among its people grows, the Vietnamese government controls most channels of information and has the means of social control if necessary. The more likely outcome is that if severe negative impacts were to occur, resulting in growing poverty and driving the cost of living up, the Vietnamese government may instead turn to the familiar theme of nationalism and focus the discontent outwards. The obvious target in this case would be China as it controls the headwaters of the Mekong. The Lancang dam cascade has grated on the Vietnamese public for years, with droughts in the LMB being blamed (rightly or wrongly) on the Upper Mekong Basin dams. The involvement of Chinese companies in several of the LMB mainstream hydropower projects would add weight to the argument. There is already a good deal of tension existing between the two governments due to incidents in the South China Sea, and serious impacts to Vietnam's social and economic health from the Mekong mainstream dams are only likely to heighten this.

Cambodia's ability to deal effectively with even moderate impacts from LMB dams is much less likely. With a GDP a tenth of Vietnam's, Cambodia is considered one of the Least Developed Countries and has some of the most significant challenges to poverty and corruption in the region. Cambodia is still recovering from the rule of the Khmer Rouge and its institutional capacity is low, with the country relying on international aid for many social and poverty alleviation projects. The current autocratic governance style would likely lead to a confused response which may well include the building of the Sambor and Stung Treng dams, adding to the severity of impacts in Cambodia.

A collapse in fisheries or rice production in the Cambodian floodplain would be disastrous. With already low institutional capacity and inadequate social welfare programmes, those affected would become even more reliant on international aid. The 2011 *World development report* suggests that states with high stresses and weak institutions are at the greatest risk of violent conflict.¹²⁰ In Cambodia, hunger, migration and discontent would likely increase support for political opposition to the Cambodian People's Party. However, no matter which

¹¹⁹ Songpol Kaopatumpit, 'Living with floods: Through adaptation methods, Vietnamese living in the Mekong River Delta are benefiting from the annual inundation', *Bangkok Post*, 25 May 2008.

¹²⁰ World Bank, *World development report 2011: Conflict, security and development – Overview* (Washington, DC: World Bank, 2011), 9.

party controls the state – the current leadership, or a new one – it would have to deal with the severe social and economic challenges caused by dams.

Thailand is not immune to environmental challenges or political strife and violent conflict. The streets of Bangkok have, in recent years, witnessed both severe flooding and pitched battles between the army and protesters. The Red/Yellow divide is alive and well and these strong political undercurrents would influence the public debate and policymakers trying to deal with large numbers of irregular migrants arriving in Thai cities. The accompanying social and economic impacts as well as regional instability would pose a challenge to the LMB's wealthiest nation. How Thai leaders would react would of course depend on the circumstances. What is clear is that development of LMB mainstream dams carries risks for Thailand also. Knowledge of this may encourage Thai policymakers to re-evaluate the drive for energy and the current involvement of Thai companies in hydro energy projects in the Mekong River Basin.

Although the economic benefits to Lao PDR of the tributary and mainstream dams are clear, the overall benefit is not. The NT2, and especially conditions along the Xe Bang Fai, demonstrates that revenue gained from dams can come at a great cost. The natural resources of Lao PDR are being systematically sold off, without the benefits flowing to the people. The single-party system has a strong control over the Laotian population, but discontent and desperation are growing due to the many hydropower projects and land concessions for rubber and forestry. The Lao PDR government are said to 'walk the fine line between control and desperation',¹²¹ and with desperation on the increase, the means of control will likely need to become more clandestine.

Conclusion

This paper demonstrates the importance of incorporating non-traditional security concepts into international security assessments. In this particular case, without an understanding of the environmental impacts of hydropower projects, especially to food and water security, it would be impossible to obtain an accurate understanding of the risks to the people of the Mekong River Basin and the states in which they live. Rather than a top-down state-centric approach or a bottom-up approach focusing primarily on the individual, this more nuanced approach examines the interplay between the two. The potential impacts on food and water security, irregular migration and state stability that this analysis has uncovered should be a serious concern to all regional policymakers.

If a collapse in renewable resources and the accompanying increase in environmental scarcities run ahead of the political means to control the situation, then parts of Southeast Asia may experience their own 'awakening' similar to those experienced in the Arab world in 2011.¹²² This is not a pre-determined end, and neither should it necessarily be a desired outcome. The Arab Spring was realised, in most cases, through violent protests, and has led to a range of outcomes including state disintegration, brutal repression and civil war. This would be a tragedy for Southeast Asia which is gradually getting back on its feet after almost a century of violence.

The 2011 *World development report* notes that violence often works in cycles and countries that have experienced violence in previous decades are more likely to experience it again due to low institutional capacity.¹²³ This finding suggests that most of the Mekong riparians are at risk. It is the commonality of the resources of the Mekong and the fact they are linked to the very existence and subsistence of those that live on and around the river that pose the greatest risks to regional peace and security. When these common resources and existential

¹²¹ Laotian NGO leader, interview by author, Vientiane, Lao PDR, November 2011.

¹²² International aid donor representative, interview by author, Bangkok, Thailand, October 2011.

¹²³ World Bank, *World development report 2011*, 2–5.

issues interact with state-based economic and energy demands, they create a dichotomous situation. So far, the contradiction remains unresolved as Westphalian mentalities clash with the need for regional sustainable development.

Creating trust and strengthening institutions is the best way to circumvent violence, and now is the time for leaders of ASEAN and the ASEAN Regional Forum (ARF) to do this. It is also vital that each of the riparians involved takes responsibility for its own actions. The government of Lao PDR is currently causing the most obvious tension. Policymakers there need to realise that their actions risk state and regional instability. Cambodia and Vietnam must reflect on their own role in hydro-development, especially in the 3S river system and the lowest mainstream dams. Thailand's thirst for energy, and further Thai involvement in regional hydropower projects, also needs to be re-evaluated.

At the heart of the matter is China. Its dams are inequitably taking resources from the river and indiscriminately impacting downstream riparians. Although China continually claims a 'peaceful rise', the eight-dam cascade on the Lancang Jiang speaks volumes about China's regional intentions and how it views its neighbours. If China wishes to avoid fragmenting its relationships in Southeast Asia and chooses instead to encourage peace and prosperity, then it must, in good faith, cease all dam construction on the Lancang Jiang and begin to participate in coordinated efforts to equitably share the common resources of the river and its sediment flow. This participation must go further than the current token efforts. It is not enough for China to hold 'observer' status at Mekong River Commission meetings, or to share limited hydrological data. The current crisis on the Mekong presents an opportunity for China to lead and signal to the region that it is both willing and able to negotiate over water resources.

It is not the task of this paper to offer comprehensive solutions to the problems described. That will be up to those involved and will undoubtedly require hard work, tough diplomacy and a serious willingness to cooperate with each other. The aim of this paper is instead to set out clearly what is at stake if regional leaders fail to work together, and hydropower development continues unabated in the Mekong River Basin. If states and their leaders continue to see the Mekong River Basin from a blinkered economic perspective, seeing rivers only in terms of their capacity to generate electricity, acting only in their own interests and for the benefit of profit-centred hydropower companies, then they put at risk the region's peace and stability. If they get it wrong, then, in a best-case scenario, millions in the Mekong River Basin will face hunger, increased poverty and negative impacts to their livelihoods. Under a more serious set of circumstances, the region will face severe food shortages, economic hardship, large-scale migration, state instability and an increased risk of violent conflict. It can only be hoped that an awareness of the gravity of the situation will motivate policymakers to do everything possible to avoid the tragedy that could unfold.