

Introduction: Changing Waterscapes in the Mekong Region – Historical Background and Context

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INTRODUCTION

The Mekong region fans out from the folds of the eastern Himalayas that give birth to its main arteries, including, from west to east, the Irrawaddy, the Nu-Salween, the Chao Phraya, the Lancang/Mekong and the Red rivers (see Figure 1.1). These rivers have constituted defining features of Southeast Asian cultures, religions, ways of life and substantive economies. Winding through deep gorges in their upper reaches, the region's rivers, together with their tributaries, have lent themselves to the construction of dams and hydropower generation plants. Entering large plains and ending in wide deltas, they have been diverted to support large-scale irrigation, while all along their course, they have long provided fish and other aquatic products to local dwellers, as well as means of transportation. In upper catchments, their tributaries have, for centuries, been tapped by highlanders for small-scale irrigation and other domestic uses.

As a result, agrarian landscapes have traditionally been divided between forested highlands, exploited directly or through swidden farming techniques; intermountain valleys with bottoms mostly under paddy cultivation; large plains and deltas devoted to rice cultivation under various guises; and uplands planted to both rice and field crops. With time and the closure of agricultural frontiers,

water use and cultivation have intensified; greater levels of control over water have also been achieved through continuing investments in embankments, canals, drains, reservoirs, pumping stations and on-farm irrigation infrastructures. More recently, water came to be partly 'recaptured' and further domesticated by urban and industrial interests, supplying cities, diluting waste and generating hydroelectricity.

This book focuses on the dynamics of *waterscape transformation* in the Mekong region: by waterscape we mean here the surface and groundwater resources of an area of land and their interrelationships with other physical, climatic and biotic elements, as well as with human activities. Waterscapes are an expression of the interaction between humans and their environment and encompass all of the social, economic and political processes through which water in nature is conceived of and manipulated by societies. In other words, waterscapes are landscapes viewed through the lens of their water resources, taken as a defining element of both ecosystems and human life.

As the subtitle indicates, this volume puts particular emphasis on three dimensions of Mekong waterscape transformations: first, many current changes and challenges revolve around *hydropower*. For various reasons that include the Indochina wars and other political circumstances, the region is still characterized by a low density of large dams compared with other parts of the world. But current economic growth rates combined with high fossil fuel prices have spurred a rush towards hydropower generation that has the potential to completely remodel regional waterscapes. Second, *livelihoods* refer to the means of subsistence of rural, often impoverished, populations for whom a substantial part of their livelihoods is linked to the use and management of forest and wetland ecosystems, fisheries and the practice of rain-fed and irrigated agriculture. As such, they are directly threatened by large-scale transformations designed and decided in other spheres, often without their knowledge. The third issue of *governance* refers to the distribution of decision-making power. All transformative options that result in large-scale alterations of the hydrological regime, in terms of quantity, quality, timing or sediment load, tend to generate externalities that affect particular ecosystems and users. These externalities result from the nature of the hydrological regime, which interconnects individual or groups across river basins, and from its manipulation through hydraulic infrastructure and associated management rules. All interventions, whether implemented by the state (dams, flood control, irrigation schemes, inter-basin transfers, etc.) or resulting from combined small-scale decisions (e.g. individual well-drilling and construction of farm ponds), tend to generate costs, benefits and risks. Governance, thus, refers to the way in which decisions are made and power exercised, and to the spatial and social distribution of related benefits and externalities. The intent of this volume is to contribute to a better understanding of the transformation currently under way in the Mekong region, what is at stake, who benefits and who is at risk, and to improved water



Figure 1.1 *The main river basins of the Mekong region*

Source: adapted from Kummu (2008)

governance by reopening and investigating the political dimensions of decision-making over water resources in the Mekong region.

BRIEF HISTORY OF WATER RESOURCES DEVELOPMENT IN THE MEKONG REGION

Much scholarly work has described and analysed the history of water resources development in the Mekong region, notably the Mekong Basin itself, both in physical and institutional terms (see, for example, Bakker, 1999; Friesen, 1999; Thi Dieu, 1999; Browder, 2000; Hori, 2000; Le-Huu and Nguyen-Duc, 2003; Ratner, 2003; Hirsch and Jensen, 2006). This section only recaps the main historical benchmarks as a way of contextualizing the questions addressed in the chapters of this volume.

Early planning and the formation and demise of the Mekong Committee (1951 to 1975)

The initiation of ‘modern’ and coordinated efforts to ‘harness’ the Mekong River are generally associated with the establishment of the United Nations Economic Commission for Asia and the Far East (ECAFE), which was created in 1946 in an effort to promote post-war economic development in the region. But it was not until the seventh ECAFE session, held in 1951, that a call to study technical problems of river flood control would shape the Lower Mekong Basin’s water developmental visions for at least the next 40 years. By 1952, ECAFE’s Bureau of Flood Control had drawn up a working paper (ECAFE, 1952) that, far from dealing solely with flood control, also detailed a wider vision for water resources development in the Mekong Basin.

Apart from ECAFE’s interest in promoting regional development, the US increasingly looked at Southeast Asia as a critical terrain in its efforts to contain the spread of communism after Mao’s takeover of China in 1949, and saw economic development as one measure of its wider containment policy for the region. By 1955, the International Cooperation Administration (a precursor to the United States Agency for International Development, or USAID) commissioned the United States Bureau of Reclamation (USBR) to conduct a study that was published in 1956 (USBR, 1956)¹ but largely ignored by the riparian governments. ECAFE and its executive secretary produced their own study, which was presented at ECAFE’s tenth anniversary meeting (ECAFE, 1957). The consultants hired by ECAFE laid out a preliminary development scheme that identified five primary dam projects on the Lower Mekong mainstream (Pa Mong, Khemerat, Khone Falls, Sambor and Tonle Sap), two more mainstream possibilities (near Luang Prabang and Thakhek) and a tributary site (Nam Theun River in Laos).

In October 1957, the Committee for Coordination and Investigations of the Lower Mekong Basin (in short, the Mekong Committee) was established with the mandate to ‘promote, coordinate, supervise and control planning and investigations of water resources development projects in the lower Mekong Basin’ (Article 4 of the statute). It was also given the authority to prepare and submit plans for coordinated research, study and investigations, make special financial and technical funding requests, and recommend to the four riparian governments criteria for sharing water resources – an authority that would officially sanction the role of the committee in ‘harnessing’ the Mekong River (Friesen, 1999). An executive agent was posted in 1959 and a permanent office created later.

A review study of the earlier USBR (1956) and ECAFE (1957) reports was entrusted to Lieutenant General Raymond A. Wheeler, a retired engineer from the US Army Corps of Engineering, who recommended three top-priority projects: the Pa Mong, Sambor and Tonle Sap dams. Wheeler was seized by what he called ‘a majestic river’ and was readily ‘convinced of the great potential of the Lower Mekong for service to the riparian countries in the fields of navigation, hydropower generation, irrigation and other related water uses’. The Japanese, likewise, promoted the development of the Lower Mekong and surveyed 34 ‘promising’ tributaries, among them the rivers of northeast Thailand, for which they envisioned a ‘remarkable development of agriculture’ if the Mekong waters could be diverted to this otherwise little fertile region (Hori, 2000). US geographer Gilbert White’s (1962) report called for carefully designed tributary projects, but underlined the economic risk of over-enthusiasm and large ‘monolithic concrete structures whose immediate return is inflation of national ego’. The development focus of the Mekong Committee shifted somewhat to tributary projects, with a total of eight dams constructed up to the early 1970s under its auspices, including the Nam Ngum Dam in Laos and several others in northeast Thailand.

Thailand, the closest Cold War ally to the US in mainland Southeast Asia, received substantial economic aid and advice from the US and the World Bank, with an emphasis on electrification, roads, reservoirs and canals (Muscat, 1990). Technical and financial support were instrumental in helping Thailand to construct several large power generation projects, including the 535MW multipurpose Bhumipol (Yunhee) Dam on the Ping River (a tributary of the Chao Phraya), commissioned in 1964, and the early stages of Thailand’s electricity transmission network (Greacen, 2004). Under their advice, in 1968, Thailand established a state-owned electricity utility, the Electricity Generating Authority of Thailand (EGAT).

The 150MW Nam Ngum 1 Dam, the first large hydropower dam in Laos, was built with technical advice from the Mekong Committee and the World Bank in the late 1960s. Located in Vientiane Province, 90km north of the capital, the project was built as the US-backed Royal Army and the Vietnam-backed Pathet Lao Army fought for control of the country (Thi Dieu, 1999). To make way for the project, at least 800 families were resettled; yet none received any compensation

(Hirsch, 1998). Inaugurated in 1971 and foreshadowing what would become the predominant development strategy of Laos from the 1980s onwards, the Nam Ngum 1 Dam became a significant earner² for Laos and now sells 70 to 80 per cent of its power to Thailand.

The US was the largest non-riparian aid donor and provided 37 per cent of the total US\$86 million contribution to the Mekong Committee in the first ten years of its existence (Friesen, 1999). In 1958, the US government signed an agreement with the Mekong Committee for the collection of basic scientific data for the whole of the Lower Mekong mainstream, and in 1961 agreed to fund the phase 1 pre-feasibility study of the Pa Mong mainstream project, together with a later feasibility study. The Pa Mong Dam was the cornerstone and poster child of US strategy in the region. The dam, as laid out in studies by USBR (1970), was of truly awesome dimensions: 98m in height, a storage capacity of over 100 billion cubic metres, could generate up to 4000MW, irrigate some 2 million hectares and inundate a total area of almost 4000km² (see Figure 1.2). It would displace 250,000 people, a figure that was later revised upwards to 400,000. At the cost of US\$1 billion, the Pa Mong would be the world's largest multipurpose dam at the time, an engineer's dream and a 'once in a lifetime' project for Lyle Mabbott, the Pa Mong project manager (Jenkins, 1968).

In 1970, the Mekong Committee published its first major basin-wide development plan: the *Indicative Basin Plan* (IBP) (Mekong Secretariat, 1970). The report built on the previous studies and was, by any standards, grandiose and comprehensive, listing some 180 possible projects on the tributaries and the mainstream: it defined short- and long-term (up to the year 2000) goals; it emphasized that large-scale irrigation was necessary to transform the agricultural sector; it saw hydroelectric power generation as a key to securing industrialization for greater prosperity; it found that flood control relied on dikes and dams on the mainstream; and it foresaw transportation from the mouth of the Mekong in Vietnam to upper Laos facilitated by a series of cascading dams equipped with navigation locks (see Figure 1.3). While the tributary projects were seen as attractive in dealing with the short-term developmental needs of riparian countries, it was the long-term development potential of the major dams that would comprehensively uplift the region (see Figure 1.3). The IBP report also proposed additional field investigations that would include fisheries, forestry, resettlement, wildlife, sedimentation, Mekong River crossings, navigation facilities, urban studies, archaeological studies and environmental studies (Friesen, 1999).

Four mainstream sites were to be completed by the 1980s (the Pa Mong in 1983, the Stung Treng and Sambor in 1985 and the Tonle Sap Barrage in 1987) at a total cost of US\$10 billion. However, growing unrest and resistance by the Pathet Lao guerrillas in the region eventually derailed the Pa Mong Project, making it both too costly and too risky (Biggs, 2006). The Mekong Committee ultimately disbanded in 1975, when the Pathet Lao and the Khmer Rouge acceded to power, while Vietnam was about to reunify.

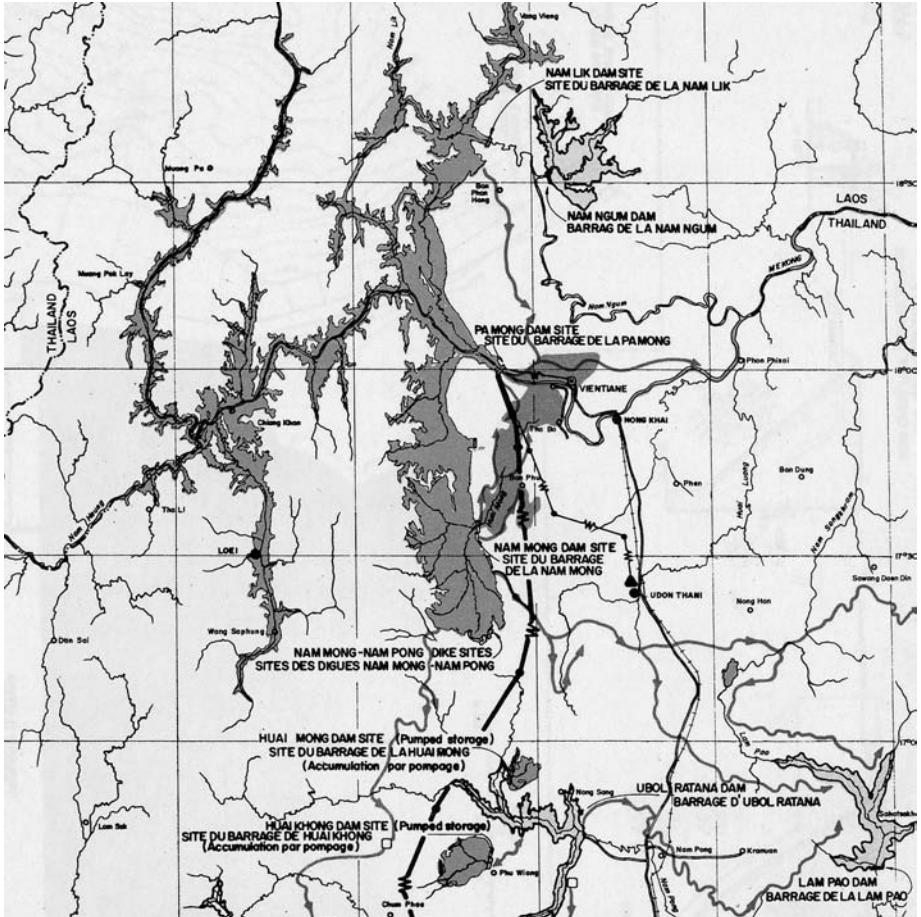


Figure 1.2 *The Pa Mong Dam Project (1970)*

Source: USBR (1970)

In Vietnam, throughout the Cold War period, Russia provided support in much the same way that the US and World Bank supported Thailand (Greacen and Palettu, 2007). Russian support for development of Vietnam's electricity sector was channelled through the state-owned monopoly, Electricity of Vietnam (EVN). Significant technical and financial support was provided for Vietnam's earlier hydropower projects, including the massive 1920MW Hoa Binh Dam that commenced in 1979, was completed in 1994, and remains mainland Southeast Asia's largest dam.

the focus of the committee shifted to smaller and national (tributary) projects. This, however, did not entail that the vision of comprehensive development of the mainstream had vanished. In 1980, an Interim Mekong Committee study reiterated that a mainstream cascade of dams should have priority once the committee was reunited to its initial four-member structure. In an effort to reframe and reassess the options for water resources development, a revised *Indicative Basin Plan* was published in 1987 (Interim Committee, 1988) as only 16 out of the 180 possible projects outlined in the *Indicative Basin Plan* had been implemented. Unlike the first basin plan, out of pragmatism and political realism, the 1987 plan refocused its attention on the development potential of each individual country, yet still proposing a cascade of eight dams on the mainstream as the best option for long-term development of the basin's water resources (Mitchell, 1998). The Pa Mong, still seen as the cornerstone of the overall development scheme, was now considered 'problematic' and its proposed height reduced from 250m above mean sea level (amsl) to 210m amsl in order to reduce the scale of resettlement. The Lower Pa Mong and Nam Theun 2 (NT2) projects were seen as 'enjoy[ing] very attractive economics ... [and] should, therefore, from an economic and technical point of view, be built as soon as possible'. Significantly, unlike the 1970 plan, the revision now saw the generation of hydropower as the largest benefit of developing a cascade on the Mekong mainstream, with other benefits, such as flood control, fisheries and navigation, insignificant in economic terms.

In the wake of the 1987 revised plan, in 1990 the Interim Committee commissioned another study of the potentialities for mainstream development: *Mekong Mainstream Development Possibilities: Summary Report* (Interim Committee, 1990). Although a more environmentally sensitive rhetoric was deployed and (minimal) changes to the cascade scheme were made, the report did not really change the overall configuration of the Mekong development project. Resettlement, however, was – at least in this report – considered a priority parameter of a project selection process guided by 'limitation imposed by resettlement requirements, conservation of the environment, minimum flow requirements for downstream interests, reduction of downstream effects caused by varying releases for power production in the case of peaking operations' (Interim Committee, 1990). The total number of people to be displaced by the development of the cascade, however, was still estimated at 330,000; and this was only a rough and preliminary estimate, which led to the conclusion that more studies on social and environmental impacts would be required on a project-by-project basis.

In the late 1980s, Laos started to parallel Thailand's effort at developing hydropower on the Mekong River's tributaries. Following a 1991 World Bank-endorsed feasibility study, which stated that it was the 'best option' for hydropower development in Laos, the NT2 Dam was more vigorously pushed forward; together with other plans at Ho Houay and Nam Theun-Hinboun, a total of 23 projects were targeted for construction up until 2010.

In 1991, the Mekong Secretariat commissioned the Compagnie Nationale du Rhône (France) and Acres International (Canada) to study (again) alternative ways of putting the Mekong River's resources to use. Unlike previous studies, the planners switched from the classical cascade of storage dams on the mainstream to a cascade of 'smaller' run-of-river projects (CNR and Acres International Limited, 1994).

The Mekong River Commission and its *Indicative Basin Plan* (1992 to present)

The geopolitical implications of the collapse of the Soviet Union in 1991 and the weakening of its satellite states since the mid 1980s set in motion substantial shifts in the Mekong region's political and economic landscape. In 1986, the governments of Laos and Vietnam, while remaining socialist states, initiated market-oriented economic reforms (*Doi moi tu duy* in Vietnam and the New Economic Mechanism in Laos). In Cambodia, the signing of the Paris Peace Accords paved the way for democratic elections in 1993 and the country's transition to a market-oriented economy. In Thailand, then Prime Minister Chatichai Choonhavan famously called for a transformation of the Mekong region 'from battlefields to marketplaces', heralding his government's policy shift from that of Cold War hostility towards the promotion of regional trade and investment and triggering renewed hope that the Mekong Committee could finally be reinstated with all its original member states.

As regional stability was restored step by step, Western bilateral aid agencies, the World Bank, and the Asian Development Bank (ADB) returned in earnest, offering aid and investment opportunities. Support for hydropower projects was high on their agendas (Ryder, 2004). By 1991, with funding from Sweden, Norway, the ADB and UNDP, the second largest hydropower dam in Laos, the 45MW Xeset 1 Dam, was completed, generating electricity for export to Thailand and domestic consumption. In 1995, a new arrangement between the four original members of the Mekong Committee was signed, and the four governments re-established their cooperative efforts under the new banner of the Mekong River Commission (MRC), despite its weakened mandate compared with that of the original Mekong Committee (Ratner, 2003; see Chapter 14 in this volume).

In 1992, the ADB launched the Greater Mekong Sub-Region (GMS) programme, endorsed by the region's governments, which set a path towards regional economic integration (ADB, 2007). Centred on establishing a market-based economy, the GMS programme, to date, has emphasized physical interconnectivity of the region, entailing the construction of major infrastructure projects such as transnational highways, railways, hydropower dams and regional transmission lines, and programmes that encourage cross-border trade and the integration of markets. The GMS programme has shaped many Western bilateral donors and the World Bank's aid strategies towards the Mekong region.

Undeniably, aggregate economic wealth has grown remarkably throughout the region. Far less, however, has been achieved in addressing the environmental and social issues that have accompanied this economic growth (Cornford and Matthews, 2007). The fact that much of the economic activity promoted under the GMS programme relies on the exploitation of the region's natural resources leads to a readily apparent contradiction within the programme's goals of widespread economic growth and helping to 'ensure sustainable development and conservation of natural resources' (ADB, 2007). Furthermore, much of economic growth has benefited urban areas rather than rural areas, leading to negative impacts on subsistence-based rural livelihoods and growing inequality (UNEP and TEI, 2007).

The ADB's GMS programme has replaced the earlier Mekong Committee as the principal framework for channelling economic development assistance into regional projects (Ratner, 2003). This allowed the ADB to focus unhindered on regional economic development, while leaving the potentially contentious management of the Mekong River to the MRC (see Chapter 14).

CURRENT CHALLENGES AND DYNAMICS

The Mekong region's economic dynamism is associated with social, economic and environmental transformations that include deforestation and environmental degradation; growing commercialization of agriculture and increasingly multi-sectoral rural livelihoods; urbanization and industrialization; increased migration and the spread of diseases such as HIV; and population growth in the Mekong Basin that rose from 35 million in 1970 to 65 million at present (Parnwell and Bryant, 1996; Rigg, 1997; de Koninck, 2003).

Natural resources are under pressure and countries such as Laos or Cambodia are opening up to foreign investors interested in exploiting mines or expanding plantations of trees for either pulp or oil/biofuel production. A paramount current dynamic is the groundswell of hydropower projects in the region. Dams recently concluded or under construction include a cascade of dams in China's upper reaches in the Lancang River (the Upper Mekong), the NT2 Dam in Laos, and several others in the '3S' region³ shared by Vietnam, Laos and Cambodia. The growing enthusiasm for hydropower is increasingly driven and exploited by private companies, financiers and government elites who largely bypass the traditional players such as the MRC, the ADB or the World Bank, with complex impacts upon political decision-making (Chapters 2 and 14). While electricity-dependent segments of society (particularly industry, but also urban elites) may benefit from hydropower plants, the manner in which many projects are currently being developed offers little comfort to those affected. Across the region, one finds no shortage of easy rhetoric about how export-oriented hydropower will help 'kick-start development', help 'eradicate poverty' or 'power progress', but far fewer

examples of tangible links between investor-owned dams and rural electrification or improved livelihoods.

In parallel with the interest in hydropower, Mekong countries display ongoing interest in expanding irrigation and flood control infrastructure. Despite disappointing experiences with recent irrigation development or rehabilitation projects in Laos and Cambodia, the promise of improved productivity, food security and poverty alleviation puts irrigation expansion on the agenda of politicians and development banks. Thai politicians also mobilize such arguments when making renewed proposals for massive irrigation development (e.g. with the Water Grid Project), most particularly in northeast Thailand (see Chapter 10). Opportunities for rent-seeking from large construction contracts may also drive irrigation agencies and consulting firms. Globally, the World Bank has argued that it is necessary to boost investment in water infrastructure (Grey and Sadoff, 2007), while high rice prices in 2007 to 2008 have quickened new donor interest in expanding irrigation works in Cambodia.

In the Mekong region, the burst of investor interest in hydropower and the revival of donor interest in irrigation take place in a governance context where developers externalize costs; where authorities do not systematically screen and rank projects according to economic, environmental and social criteria; and where planners think in terms of supply-side, not demand-side, alternatives (Greacen and Palettu, 2007). In short, recent water resources development occurs in a context where evidence of coordinated, rigorously justified river basin development is not strong. Despite a process of democratization and the emergence or strengthening of civil society organizations (NGOs, academics and community-based organizations), megaproject triumphalism complemented by faith that socio-political and ecological impacts can be mitigated and transcended remains pervasive.

As the volume's opening chapters on hydropower assert, currents of modernist progress in the Mekong are being challenged by important counter-currents of critique and resistance. Such critique, when informed by credible knowledge (e.g. regarding irrigation design and implementation) offers a set of lessons about making development work (see Chapter 6). But, of course, in the gulf between lessons offered and lessons learned we find the full spectrum of politics. How political processes unfold varies among Mekong countries; but one important dynamic since the 1990s is that of national and transnational civil society advocacy. Obvious targets for such advocacy are the MRC (ostensibly set up to harmonize river basin development plans) and international development banks. But advocacy networks have also raised concerns about the downstream impacts of China's plans to build a cascade of hydropower dams on the Lancang (Upper Mekong) and similar plans to develop hydropower on the Nu-Salween River in China, as well as in Myanmar/Burma.

The governments in the Mekong region have often dismissed or constrained critical conversations about water, social change and development. The techniques

of constraint can be direct, as with the suppression of dissent in the military regime of Myanmar, or indirect, through the production of knowledge (see Chapters 3 and 12) or *ad hoc* ‘participatory’ processes rolled out by a variety of agencies (see Chapter 13). But instead of drawing only pessimistic conclusions about democratization in the region, the chapters in this book invite the reader to explore more thoroughly how waterscapes have been, and are being, imagined and transformed.

STRUCTURE OF THE BOOK

This volume is divided into three parts that follow this introductory chapter. The first part focuses on hydropower expansion in the region, the second on issues of livelihoods and local development, while the third part reflects on knowledge, discourses and power.

Chapter 2 by Carl Middleton, Jelson Garcia and Tira Foran focuses on the phenomenon of ‘new’ hydropower developers and financiers, but also tracks how long-standing actors such as the World Bank and international civil society have responded to the entry of players with apparently lower environmental and social standards. Hydropower dam development in the region is then illustrated by three case studies of dams in various stages of development.

Chapter 3 by Tira Foran and Kanokwan Manorom provides an account of the history and politics of contention over Thailand’s Pak Mun Dam. Built between 1990 and 1994 in a context of local support *and* resistance, the Pak Mun case offers a wealth of insights into the challenges of fair compensation, mitigation and participatory management, as well as a window into the complexity of rural livelihoods and democratization. Chapter 4 by Shannon Lawrence reviews the development of the Nam Theun 2 Dam, the largest as well as one of the most publicized and contentious water resource projects in Laos. Containing a trans-basin water diversion, hydropower and rural development scheme of unprecedented size, complexity and aspiration, the project breaks new ground in terms of promises made to better the lives of affected people. The chapter explores the enormous challenges of ‘doing dams right’, while a different perspective on the same challenge is given by Patchamuthu Illangovan of the World Bank as a chapter appendix. Chapter 5 by Darrin Magee and Shawn Kelly takes us to the Salween River in Myanmar, describing the emerging plans to develop a series of large hydropower dams on both the upper and middle reaches of Asia’s longest undammed river. The authors explore, in particular, the 7000MW Tasang Project in Shan State, showing how private enterprise has taken the lead from the Thai state in tapping hydropower from Myanmar. In what has so far been a decidedly non-transparent undertaking, the authors shed light on the project’s investors and lenders, the production of feasibility studies, likely impact on local inhabitants, and measures to ensure transparency and accountability.

Part II of the book provides a series of case studies of distinctive Mekong livelihoods, situating them historically and in the context of modern development practices. Chapter 6 by Chu Thai Hoanh and colleagues explores irrigation, an activity that accounts for 80 to 90 per cent of all water abstractions in the Mekong region. Water is considered a key factor for shifting from single-crop, mainly rain-fed rice, to multiple cropping systems and increasing crop yields. Large investments in irrigation systems have been made in all Mekong countries; more effort is also being paid to improving the efficiency of existing schemes. But the rationale that underpinned irrigation development worldwide during the 1960s and 1970s is being increasingly questioned for countries such as Vietnam or Thailand. The potential for poverty alleviation in Laos or Cambodia seems substantial; but recent disappointing experience with projects demands caution.

Chapter 7 by David J. H. Blake, Richard Friend and Buapun Promphakping takes us to the Nam Songkhram, a river basin that drains into the Mekong River south of Vientiane. The Songkhram is Thailand's largest floodplain wetlands in the Mekong Basin. Its fertile flood-dependent waterscape, however, is recurrently the subject of various infrastructure proposals designed to 'develop' a region that authorities classify as infertile and view its population as poor and vulnerable to both flood and drought. On the other hand, environmental organizations have documented and defended the productivity and diversity of the Songkhram's flood and recession hydrology. Countervailing policy narratives, combined with new agricultural practices and markets, make the Songkhram a microcosm of social forces operating in the Mekong more broadly.

Vietnam's Mekong Delta is another microcosm of important social forces. Chapter 8 by David Biggs and colleagues seeks to understand why certain land and water-use policies prevailed over others and how historical patterns of land development and water use have had an enduring effect in local society and in the physical environment. The authors trace a transition from strategies of adaptation to strategies for regional state-driven technological control of the 'delta machine'. Technology played a very important role in later reclamation efforts and a culture of scientific positivism still largely animates state plans. The chapter considers how this historical trajectory of physical remodelling of the delta has created huge permanent maintenance costs that are likely to increase as sediments are retained by upstream dams and as sea-level rise threatens the stability of coastal areas. The allocation of these costs is central to the current political economy of the delta.

Chapter 9 offers another approach to learning from the past as ecological modellers Juha Sarkkula and colleagues reconstruct the essence of the Mekong flood pulse system using time series data in order to explore the nexus between hydropower development and fisheries impacts. The authors explain how hydropower development changes the natural flood pulse and the hydrograph, directly undermining the productivity of the system by reducing inundated habitats, delaying the onset of flooding and shortening growth periods for aquatic organisms, with negative impacts upon fisheries productivity, nutritional security

and economic activity for a significant portion of Cambodians, as well as other populations in the basin. Quantification of fisheries productivity is difficult because of the complex floodplain ecosystem and the diffuse fisheries. With the pace of hydropower development quickening, and with potentially damaging hydropower projects on the Lower Mekong, the authors argue that finding an acceptable balance between dams and productive fisheries is an urgent issue for the region.

Building on the historical, political and ecological case studies presented above, Part III offers a set of analytical perspectives that unpack discursive and ideological dimensions of power and reveal several dimensions of the politics of knowledge.

Chapter 10 by François Molle and colleagues reviews the post-World War II history of Thai water resources development in *Isaan*, the northeast region recurrently cast as overwhelmingly dry, poor, overpopulated, vulnerable to radicalism, and therefore in need of large-scale interventions to secure it and make it prosper. The authors offer insight into what they call ‘meta-justifications’ – powerful, self-evident, overriding rhetoric that has served as a tool of state-building and elite aggrandizement. Interestingly, they show that both large and small-scale irrigation projects have been proposed by authorities as preferred solutions during the past six decades. Despite repeated setbacks and failed implementation, large projects and basin-scale diversion schemes are perpetuated. They deliver not just loads of wealth, but symbolic advantages irresistible to those who seek power. The authors argue that hegemonic discourses of greening Thailand’s *Isaan* have endured even though the evolution of the overall national economic context makes it unlikely that massive injections of capital to grow a second crop of rice (aside from problems of soil salinity and lack of labour force) are the best way to generate growth or alleviate poverty.

In Chapter 11 by Louis Lebel and colleagues, the focus shifts to the region’s cities: places such as Bangkok, Hanoi and Ho Chi Minh City, situated in and expanding into flood-prone zones. A shift of focus – but the authors show how authorities have transformed landscapes by repeated appeal to ‘promises’ no less ideologically charged than the ones reviewed in the previous chapter. The authors demonstrate how difficult it is to keep all people and roads dry in these areas since preferred solutions privilege one area over another and inevitably displace the problem of unwanted water. They argue that better practices are possible, but require both a stronger state, able to restrict land use, and a more secure and reflexive state, able to make more realistic and considered promises.

Is this an impossibly tall order for Mekong societies? Chapter 12 by Richard Friend, Robert Arthur and Marko Keskinen deals with the neglected value of capture fisheries, a case that offers the reader further insight into the challenge of making governance more reflexive. With transformation- and engineering-oriented mindsets dominant, what are the odds that wild fisheries can be sustained at a level meaningful and vibrant enough to offer nutritional security? The authors show that part of the problem is a policy narrative that casts capture fisheries as inevitably in decline as a result of numerous impacts. According to this dominant storyline,

capture fisheries can be conserved, but will play no more than a marginal role in livelihoods and waterscapes of the future. The authors review empirical weaknesses in the dominant narrative. The time has come, they argue, for a counter-narrative in which fishers and capture fisheries are recast and reconceptualized as solutions to, rather than inevitable victims of, regional development challenges.

If dominant ways of thinking are to be challenged by new or better ideas, then advocates of alternative water futures might find it useful to understand how certain institutions and ways of knowing bind to and reinforce one another. Chapter 13 by Mira Käkönen and Philip Hirsch offers such an introduction and examines how the production and legitimizing of knowledge is closely linked to interests and power. The example illustrates the role of modelling in the production of knowledge at the Mekong River Commission, how the World Bank and ADB interpret and use that knowledge, and how participatory policies eventually further legitimize rather than challenge it.

Chapter 14 by John Dore and Kate Lazarus offers a governance practitioners' analysis of the Mekong River Commission, an organization subjected to great effort and attention from actors intent both on using it and crippling it. The authors review continuities and contrasts of the MRC from 1999 to 2007, drawing lessons from water-use negotiations and various basin and strategic planning processes. The authors argue that the MRC could play an important role as a space in which action is informed and deliberately shaped; but in order to do so, its member states need to use it more actively, rather than bypass it, which, of course, entails redistribution of authority and revised decision-making processes.

In the concluding chapter, François Molle, Louis Lebel and Tira Foran offer a synthetic reflection on water governance in the Mekong region. Two worldviews are clearly pitted against each other. One worldview is epitomized by the motto of the Lao official website on hydropower government: 'Powering Progress', which underpins a traditional developmentalist vision that associates capital and infrastructure investments with growth, and growth with poverty alleviation. The Mekong region and its 'exceptional untapped potential' is seen as 'ripe' for massive investments in hydropower, flood control and irrigation infrastructures. On the other hand, civil society groups operate with a more critical worldview, which emphasizes the social and environmental costs of transformations, and how they overwhelmingly benefit political or economic elites. Current project planning and implementation in the region tend to confirm that decision-making processes are often opaque and offer limited support to the claim that 'we have learned from past mistakes'. The authors, however, identify processes that operate between these two divergent worldviews: from examples presented in the book, the conclusion presents five 'pathways' that have the potential to challenge the process of knowledge production, instil a culture of negotiation and social learning, lessen power imbalances, and shift national and regional water governance.

NOTES

- 1 This 'quite modest' report (Friesen, 1999) stated that 'in the immediate future, power needs could probably best be met by continuing the present programme of addition small thermal and internal combustion plants as needed, and developing attractive small hydroelectric or multipurpose sites that may be found near load centres'. Regarding flood control, the report concluded that 'flood control was of doubtful value except in localized areas'. It noted that 'most of the officials questioned stated that floods were beneficial to agriculture, fish production and high water navigation, and the flood control was of doubtful value except in localized areas'.
- 2 During the late 1990s, it provided around one quarter of Laos's foreign exchange earnings, as well as most of Laos's domestic electricity (Hirsch, 1998). Yet, if grants and concessional loans had not paid for its construction, and Japanese aid provided for its repairs, it is highly doubtful the project would have been profitable (IRN, 1999).
- 3 This region includes the catchment of the Sesan, Srepok and Sekong rivers.

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