Managing the Mekong River: Will a Regional Approach Work?

The Mekong River represents a last chance of sorts–the last chance to tap a large, relatively pristine river basin's potential to supply energy and water without destroying its environmental integrity. The Mekong is the world's 12th longest river, stretching 4,880 km from its source on the Tibetan plateau to its outlet on the coast of Vietnam. It is the 8th largest river in terms of annual runoff and perhaps the world's least exploited major waterway in terms of dams and water diversions. But the Mekong's 795,000 km^2 watershed includes six of Southeast Asia's richest and poorest nations–Cambodia, China, Lao PDR, Myanmar, Thailand, and Vietnam. All these governments are eager to promote economic development using the Mekong's water resources (MRC 1997:14–15).

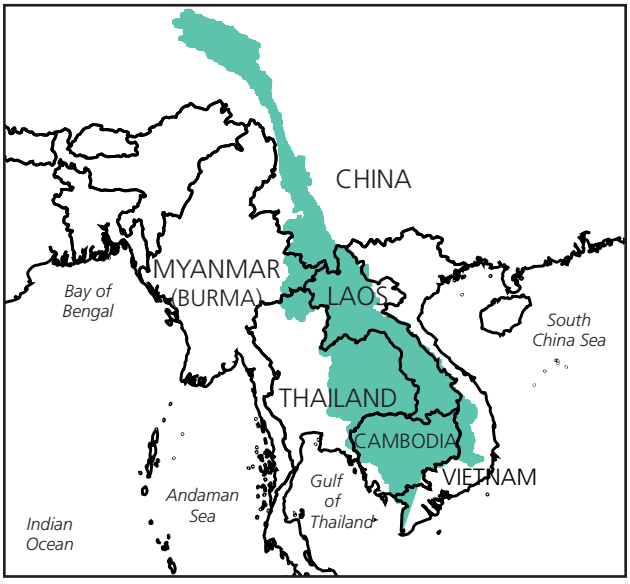
The drive to dam and divert the Mekong threatens the traditional uses of the river–as a source of fish and a barrier to salt water penetration into the rich Mekong delta soils. Ideally, a new model of coordinated regional water management will preserve those benefits while sharing new ones. The Mekong River Commission (MRC), originally known as the Mekong Committee, was established among the basin countries in 1957 to address potential conflict over hydropower development. The MRC provides a vehicle for joint management of the river and for the coordination of development strategies for the lower Mekong basin. In 1995, after almost 4 decades of political turmoil had hampered the Commission's effectiveness, the basin countries reaffirmed their interest in working together. Cambodia, Lao PDR, Thailand, and Vietnam signed the Agreement on Cooperation for the Sustainable Development of the Mekong River basin, which acknowledges the need for regional action. China and Myanmar have observer status.

Yet the MRC lacks any real power to develop or enforce a unified vision of sustainable water use in the basin, and each of the riparian countries is pursuing its ambitious development plans largely independently at this time. Can a truly regional approach to Mekong management evolve in time to influence the basin's environmental future?

Damming the Mekong

The Mekong River and its tributaries have a potential hydroelectricity generating capacity of 30,000–58,000 MW (MRC 1997:5–19). Although plans to construct major hydroelectric dams have been afoot for years, as of 1997 less than 5 percent of this potential had been exploited.

Now, however, scores of large dams are under serious consideration in response to both the growing regional demand



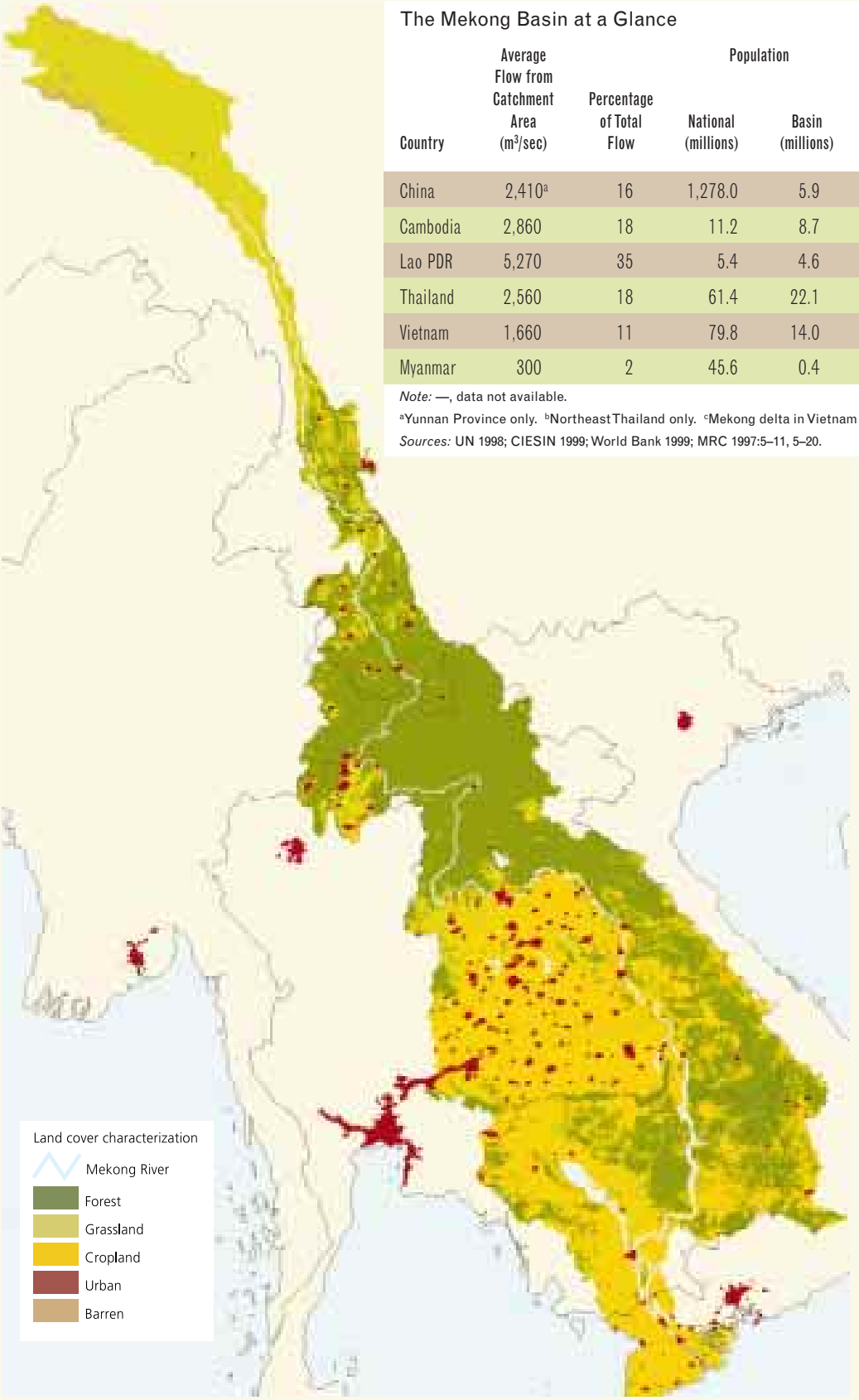
for electricity and the desire of the nations in the basin to earn foreign exchange from international sales of hydropower. The financial crisis that erupted in Asia in 1997 shook Thailand's economy particularly hard, slowing electricity consumption and delaying power purchase agreements and dam start-ups, but energy demand is expected to pick up again quickly as the recession recedes (EIA 1999). By 2020, electricity demand in the Mekong region could be six times greater than in 1993 (MRC 1997:5–9).

Hydropower potential varies greatly among the riparian nations. Highland countries like China and Lao PDR possess the greatest share, while countries like Vietnam and Cambodia–along the slower-moving, lower reaches of the Mekong–possess relatively little. Currently, major pressures on the Mekong include:

- China's Yunnan province at the top of the watershed is planning a cascade of up to 14 dams on the upper Mekong–known locally as the Lancang River. These dams would have a total installed capacity of 7,700 MW, equivalent to 20 percent of China's current energy consumption. Because of Yunnan's remoteness from China's more developed areas and the chance to earn export dollars, Yunnan authorities are likely to export electricity to Thailand. China has also proposed plans to divert water from the Mekong into the Yellow River to meet Northeast China's growing demand for water.

- Many of the tributaries feeding the Mekong in Thailand have already been dammed to provide power and irrigation water to its arid eastern provinces. However, Thailand has

Box 3.16 How the Mekong's Hydropower Resources Are Divided



The Mekong Basin at a Glance

Country	Average Flow from Catchment Area (m^3/sec)	Population: Percentage of Total Flow	Population: National (millions)	Population: Basin (millions)	GDP ($ billions)	Consumption: Electricity (KWh/ person/yr)	Consumption: Fish (kg/ person/yr)
China	2,410[a]	16	1,278.0	5.9	902.0	260[a]	—
Cambodia	2,860	18	11.2	8.7	3.0	55	13
Lao PDR	5,270	35	5.4	4.6	1.8	55	7
Thailand	2,560	18	61.4	22.1	153.9	900	15–27[b]
Vietnam	1,660	11	79.8	14.0	24.8	140	21–30[c]
Myanmar	300	2	45.6	0.4	—	60	—

Note: —, data not available.

[a]Yunnan Province only. [b]Northeast Thailand only. [c]Mekong delta in Vietnam only.

Sources: UN 1998; CIESIN 1999; World Bank 1999; MRC 1997:5–11, 5–20.

long-standing plans to divert water from the Mekong into the water-scarce Chao Phyra River, the main source of water for Thailand's economic heartland.

- One-third of the total flow of the Mekong originates in Lao PDR. Given its abundant rainfall and rugged topography, estimates of the country's hydropower potential reach 7,000 MW, of which only a fraction is currently exploited. Laos has prepared plans to construct as many as 17 new dams during the next decade to reduce the country's poverty. Most of the hydroelectricity will be sold to Thailand and Vietnam. Thailand already buys electricity from Lao PDR's Nam Ngum dam and is negotiating to buy power from the planned Nam Theun II dam.

Not all the proposed projects will be developed, however. Only a handful are both technically feasible and economically viable, and public and NGO outcry against some–like Nam Theun II–may stall construction. For those hydropower plans that do hold economic promise, the private sector stands ready to invest. Often the funding comes through "build-own-operate-transfer" (BOOT) projects, in which foreign investors finance, construct, and operate a dam, recouping their investment and sharing risk during a concession period, then transfer ownership of the project to the government.

Vulnerability Downstream

Although dams and diversion projects dominate the official development discourse, the Mekong has long provided many other environmental benefits to the basin's 55 million inhabitants. Approximately 30 percent of households in the Mekong delta are below the poverty line and most of the rural population depends on the river and its tributaries for their survival (MRC 1997:4–6).

For example, the fish caught in the Mekong are the source of 40–60 percent of the animal protein consumed by the population of the lower basin, and fish sustain an even higher percentage of people in much of Cambodia (Institute for Development Anthropology 1998:87–88). The 900,000 tons of fish harvested annually (Friederich 2000) and the Mekong's extraordinary fish species richness are threatened by dams, which interfere with spawning cycles by preventing fish migrations.

Dams also reduce the seasonal floods that sustain fish spawning and nursery grounds in the wetlands upstream and the delta region. The flood cycle, keyed to the monsoon rains, is a critical factor in the life cycle of many of the area's aquatic species. Even slight changes in peak flood flow could threaten the region's fish production and food security (MRC 1997:3–8). Impacts observed at dams already constructed on Mekong tributaries illustrate the area's vulnerability. At Nam Pong reservoir in Northeast Thailand, the number of fish species found in the river dropped from 75 to 55 after impoundment. Fishermen upstream of Thai dams at Tuk Thla and Kompol Tuol saw their catches decline from 5–10 kg/day to 1–2 kg/day after the dams were built (MRC 1997:5–14).

Altering the annual flood cycle, reducing the silt load of the water, or diverting the Mekong's flow could also have serious impacts on agriculture in the Mekong delta. Flood waters deposit 1–3 cm of fertile silt each year on the lowland floodplains in Vietnam and Cambodia, sustaining these intensively farmed areas (MRC 1997:2–17). In addition, river flows during the dry season are important for controlling salinity penetration into interior areas from the coast. According to the Vietnam Water Resources Sector Review, seawater penetrates up to 70 km inland during the dry season. If current trends in water abstraction in the delta continue, the area affected by salinity could increase from 1.7 to 2.2 Mha (Xie 1995:10). Increased salinity was cited as the primary cause of rice yield declines of 50–90 percent in Tra Vinh province over the last 30 years (Nguyen 1998:4).

The dangers that dams could pose to the biodiversity of the Mekong must also be considered in the context of the environmental degradation that the region has already suffered. A combination of deforestation, increasing conversion to intensive, chemical-dependent agriculture, continued population growth, and mangrove clearance for shrimp aquaculture in the delta region has compromised the basin's environmental health. Vietnam, for example, has already lost approximately 85–90 percent of its forest cover, largely because of decades of war and reconstruction. In Thailand, perhaps 55–65 percent of forests has been cleared for agriculture and tree plantations (WCMC 1994:106–107). Some of the highest rates of deforestation in the world continue to plague the riparian countries (FAO 1999:132). Many remaining forests are of poor quality, affecting water retention in the basin and promoting land degradation and soil loss in the uplands (MRC 1997:3–5). Disrupting flood cycles or decreasing base flows during dry times through water diversions could add significantly to these existing stresses.

Furthermore, where will countries resettle the thousands of people who will be displaced by dams? Just the nine proposed mainstream dam projects could displace 60,000 people (MRC 1997: 5–24).

Conflict Brewing?

With all its mighty waters, the Mekong ecosystem is finite and fragile. The array of current demands and future plans for the river has already led to increasing competition among the basin countries. The MRC was established to minimize the conflicts inherent in managing a river that crosses many

international borders, but its efforts at regional coordination have been largely unsuccessful (China Environment Series 1998). Although it collects hydrological data from the basin, the MRC has done little to analyze the data, promote debate among the partners on the cumulative effects of their water developments, or craft a common vision of how water should be shared. As a result, the governments of Cambodia, Vietnam, Lao PDR, and Thailand are competing for international funding for their dam-building projects and have "... adopted a rhetoric of cooperation and sustainable development to mask underlying conflicts and competition" (China Environment Series 1998).

Complicating the equation is the fact that China is not a member of the MRC, although it controls the upper reaches of the river and has an ambitious dam-building program in place. China is reluctant to join the MRC until water-use rules are clarified and it is assured that restrictions on dam building and water diversions will not interfere with its upper Mekong development plans. The agreement specifies that the watershed nations have neither the right to veto the use nor the unilateral right to use the water of the Mekong. This implies that dam construction on the river's mainstream would only proceed by consensus, a system unacceptable to China.

In reality, compromise will be difficult for all the basin countries, whose negotiating powers vary greatly as a function of their location within the river basin and their wealth. Based on the size of its economy, China has by far the greatest capacity to mobilize funding and technology to exploit its "share" of the Mekong. Because its portion of the river runs through sparsely populated territory, China also has a relatively small population that depends on the river for irrigation and fish production. China, therefore, has much to gain and little to lose from dam construction. Cambodia and Vietnam, on the other hand, are extremely vulnerable because of their downstream location, relative poverty, and the large number of people that depend directly on the Mekong for their livelihoods. Lao PDR, one of the poorest nations in the world, is desperate to develop its hydropower resources to spur economic growth. Thailand is in an intermediate position. It has the largest within-basin population among the riparian countries, but has the economic and human resources to withstand potentially negative changes in the river upstream.

A Regional Vision

Despite the current imbalance of power among the riparian countries and the potential for conflict, the benefits of a regional approach are compelling. Development of a regional electricity transmission grid, for example, would benefit from a coordinated plan to develop the basin's hydropower potential. A regional grid would facilitate China's ability to market hydropower to other energy users in the region, offering advantages all around. In addition, a regional growth plan that helps expand the economies of the lower Mekong basin countries and promotes open markets in the region provides a longer-term inducement for Thailand and China to cooperate.

A basin-wide approach to water management would also offer clear environmental advantages. It would, by definition, force the riparian countries to examine how dams on the upper reaches of the river would affect flow conditions downstream. Currently, upstream countries can pursue water withdrawals and hydropower production while ignoring repercussons such as salt water intrusion, decreased catches for subsistence fishing, and soil depletion.

Since the governments in the region unanimously favor developing the region's hydropower potential, a regional approach to water management would not necessarily mean less power generation, but it would offer a chance to distinguish between environmentally "good" dams and "bad" dams. The challenge is to select dams that meet strict environmental and economic standards. Some have argued, for instance, that dams on the Lancang and in the uplands of Lao PDR are "good" because they generate a lot of power without displacing many people and flooding large areas. Thus, the social and environmental costs are relatively small. It is also possible that dams could actually benefit the local environment in some ways. Planners of Lao PDR's Nam Theun II dam have proposed earmarking a portion of the hydropower revenue for forest conservation in the surrounding watershed. Protecting forests around dams is desirable because it reduces sedimentation, lowers maintenance costs, and prolongs dam life.

But capitalizing on the benefits of a regional approach to water development and use in the Mekong region will take quick action, given the rapid changes under way. Water experts warn that now is the time to rethink basin-wide water management, not after the dams and diversion schemes have been built and the environmental and geopolitical repercussions are felt.

The MRC has a critical role to play in promoting regional cooperation. It has been criticized for failing to seriously address the potential negative environmental impacts of proposed dams and diversion schemes, and it has failed to build the predictive modeling capacity that is needed to assess the trade-offs between river basin development options. But the MRC reaffirmed its commitment to environmental analysis and assessment in 1995 and to serving as a regional information center on environment and development in the Mekong River basin. These developments could help basin nations to better visualize the benefits of a regional approach to managing the Mekong watershed and to quantify the damage—environmental and social—that may occur if they pursue an uncoordinated approach.