Ecotourism to the Khone Phapheng Falls and fish migration in Southern Laos are threatened by the Don Sahong Dam.

Foretelling the Mekong River's Fate:

Key Findings of the MRC's Strategic Environmental Assessment on Mekong Mainstream Dams

With 11 large hydropower dams proposed to block the Lower Mekong River's mainstream, the future of the river lies at a crossroads. To inform decision-making, in October 2010, the Mekong River Commission (MRC) published a Strategic Environment Assessment (SEA) report that offers a critical appraisal of the dam plans. The report evaluates future economic benefits from power-generation against a wide-range of environmental costs and impacts to riverside communities and their local economies. As these dams threaten to irreversibly undermine the ecology of the Mekong River and will place at risk the livelihoods and food security of millions of people who depend upon the river's resources, the main recommendation of the SEA report is that decisions on whether to proceed with the mainstream dams should be deferred for a period of ten years until further studies can be conducted to ensure that decision-makers are fully informed of the risks. With so much at stake, it is crucial that the Mekong region's decision-makers endorse and adopt the SEA's recommendations before it's too late.

Mekong Mainstream Dams and the SEA Process

Since 2006, eleven mainstream dams have been proposed for the Lower Mekong River's mainstream. These dams offer a complex mixture of potential opportunity and enormous environmental and social costs. There are, however, wide knowledge gaps and significant uncertainties. The governments of Thailand, Laos, Cambodia and Vietnam are signatories of the 1995 Mekong Agreement that commits them to cooperate together to ensure the sustainable development of the Mekong River and its resources, while also making every effort to avoid, minimize, and mitigate harmful effects that might occur from development. As part of this Agreement, the governments have also committed to an inter-governmental consultation process prior to any individual government approving a mainstream dam. Given the ecological richness of the Lower

(© TERRA)

Mekong River and the significant implications these dams pose for millions of people, the decision represents one of the greatest shared challenges confronting the four countries.

Furthermore, in its role as a regional water governance institution, the Mekong River Commission (MRC) is obliged to conduct assessments for the protection of the environment and provide assistance to its member governments so that informed decisions can be taken regarding the fate of the river. Given this task and coupled with the understanding that decisions regarding the Mekong River should not be made only on a project by project basis but also at a cascade level, the MRC commissioned the International Centre for Environmental Management to carry out an intensive 16 month Strategic Environment Assessment (SEA) on the 11 proposed Mekong River mainstream dams.

The final SEA report was released in October 2010 and covered a range of strategic themes that would be affected by the proposed Mekong mainstream dams. The SEA is founded on comprehensive research that compiled the current state-of-the-art scientific knowledge of the Mekong River system and undertook consultation with regional government agencies, development partners and NGOs. It serves to determine the extent of risk, knowledge gaps, and, therefore, uncertainty about the mainstream dams, and provides a broad understanding of the costs and benefits in the context of achieving sustainable development goals.

The Current State of Knowledge on the Mekong River:

The Mekong River is characterized by high rainy season flows and low dry season flows, which is driven by the region's monsoonal rainfall. This strong flood pulse is a key reason why the Mekong River basin supports the world's largest inland fisheries. Of the more than 60 million people living in the Lower Mekong Basin, approximately 29.6 million people live within 15 km of the river. In turn, the Mekong River supports the livelihoods and food security of more than 70% of the basin's inhabitants through its fisheries, riverbank gardens, ecotourism opportunities, and fertile land for agricultural productivity.

Knowledge of the river's hydrology, biodiversity, sediment dynamics, and ecological integrity remains limited, due to the complex and interconnected nature of the Mekong River system. Furthermore, the river's significant economic, cultural and environmental value is not yet fully known or easily measured in economic terms. The SEA identifies numerous areas of significant knowledge gaps and scientific uncertainty and, given the enormity of impacts and costs the dams would have, concludes that "The state of knowledge about the Mekong is not adequate for making informed and responsible decisions about mainstream dams at this time." To better understand the dams' impacts on the river's physical, chemical and biological processes, the SEA recommends allocating sufficient resources to carry out numerous additional studies related to climate change, terrestrial systems, regional economics and more.

Assessing the Risks and Impacts of Mekong Mainstream Dams:

The SEA assessed the opportunities and risks that would emerge as a result of ecological changes to the river if mainstream dams are built, and the subsequent impacts these changes would have on affected people. The SEA's assessment highlights the significant environmental,

More than half of all riverbank gardens along the Mekong River would be lost if the mainstream dams are built. (© Pianporn Deetes)

economic and social impacts the dams are expected to have, and also warns that it is likely that costs and benefits will be distributed inequitably. The SEA identifies that the decision to move forward even with just one dam would result in permanent and irreversible changes to the sustainability of the river system's productivity, which in turn would impact millions of people who rely on a healthy river for their livelihood and food security.

Key impacts identified in the SEA include:

Altering the Flow and Nature of the River: The dams would transform 55% percent of the length of the Lower Mekong into a series of stagnant reservoirs and sections of rapidly fluctuating water flows located downstream of the dams. These changes would alter the natural flow of the river, as the river will no longer maintain the current character of its flood pulse and seasonal transitions.

Impacts to Inland Fisheries and Food Security: The dams would block vital fish migration routes, reduce wetland area and change the habitat necessary for the Mekong fisheries. These changes would result in a total estimated fishery loss of 26 to 42 percent, which would cost around USD 500 million per year. In turn, the livelihoods and food security of millions of people would be impacted, with Cambodia expected to suffer the most. The SEA affirms previous studies that there is no mitigation technology which could effectively mitigate the impacts to the Mekong fisheries and that reservoir fisheries would be unable to compensate for the loss of wild-capture fisheries, which could at best be expanded to produce one tenth of the lost fisheries production.

Threats to Aquatic Biodiversity: Through changes to the river's morphology, flow and aquatic habitat, the immense biodiversity of the Mekong River would be threatened. More than 100 species would be placed at risk. In addition, iconic and critically endangered species, such as the Irrawaddy dolphin and the Giant Mekong Catfish would likely be driven to extinction.

Terrestrial System Changes: The Mekong dams would have a major impact on terrestrial ecosystems as a result of inundation caused by the dam's reservoirs. Nearly half of the Lower Mekong River's land and forested areas are internationally recognized as Key Biodiversity Zones, while five percent of the land is composed of National Protected Areas and Ramsar sites. The dams will inundate important wetlands and river channel areas and impact terrestrial habitat for flora and fauna. Transmission lines and access roads would further alter the landscape.

Agricultural Losses: Agricultural production lost due to land inundation by the dams' reservoirs would amount to more than USD 5 million per year, while lost nutrients due to sediment trapping would require increased fertilizer usage, costing an additional USD 24 million per year. Lost agricultural production from riverbank gardens would amount to more than USD 21 million per year. Proposed irrigation schemes associated with the dams would only generate up to USD 15 million per year. Overall, therefore, there is a net economic loss in agricultural production.

By drastically reducing the Mekong's abundant fisheries, the mainstream dams threaten the livelihoods and food security of millions of people.

Reduced sediment loads: A predicted reduction of sediment flow of more than 50% would have serious consequences on the transport of critical nutrients, such as phosphorus and nitrogen, which fertilize riverbanks and flood plains including Cambodia's Tonle Sap system and the Mekong Delta in Vietnam thus affecting agricultural productivity, as well as affecting the inland and coastal fisheries. Reduced sediment deposition would also de-stabilize river channels and the coastline of the Mekong Delta, which is already at risk of climate change.

Livelihood, Culture and People: The livelihoods and food security of nearly 30 million people who depend on the Mekong River's rich fisheries would be undermined through the construction of the Mekong dams. Impacts to agricultural land, compounded by the impacts of climate change, could further reduce food security in the region. By changing traditional ways of living forever, the dams could lead to growing inequality and short to medium term poverty while undermining region-wide efforts to meet national poverty alleviation goals.

The Option of Mitigation?

Many of the serious risks associated with the Mekong mainstream dams can not be mitigated and would result in massive losses of economic, social and environmental assets. The SEA states, for example, that the decision to

Reduced sediment loads and associated nutrient flows to the Mekong Delta could incur significant economic costs for agriculture and marine capture fisheries in Vietnam (© Dr. Duong Van Ni)

Potential Revenue Generation versus the Real Cost

The main justification for the proposed mainstream hydropower dams is that long-term economic growth objectives could be stimulated through increased power supplies and the export revenue flows associated with selling the dams' electricity. Yet, the supposed benefit of revenue generation and foreign direct investment for host governments, profits for the private sector investors, and apparently cheap electricity is significantly diminished by the fact that the projects will permanently undermine a resource that is already generating significant economic benefits. The potential revenue benefits expounded by the project proponents are also not guaranteed. The SEA cautions that the ability to maximize revenue generation is dependent on having adequate institutions, capacity and governance conditions in place, yet warns this is currently not the case in the region, nor will it be in the foreseeable future.

Finally, the SEA also finds that the revenue generated is likely to be unequally distributed among countries and within countries. The region's poorest and most vulnerable would inequitably suffer the costs of the projects, yet see few benefits from the generated revenue.

go ahead with the dams must be taken with the knowledge that the loss in biodiversity "would be a permanent and irreplaceable global loss which could not be compensated." Additionally, impacts to food security resulting from fishery losses would prove difficult and expensive to compensate. While reservoir fisheries and aquaculture production may help meet losses, the SEA concludes that this form of mitigation would only compensate a small fraction of overall total losses.

Conclusion:

Given the importance of the Mekong River to local livelihoods and globally, the anticipated significant, permanent and irreversible impacts, and the large scientific uncertainties, the SEA's main recommendation is "Decisions on mainstream dams should be deferred for a period of ten years." The SEA, noting that so much is at stake, encourages decision-makers to explore alternative ways to meet energy needs.

Future Action:

Given the important findings of the SEA that deepens knowledge on the regional implications and risks associated with the Mekong mainstream dams, International Rivers recommends that the region's decision-makers initiate the following actions:

A Regional Moratorium on all proposed Mekong mainstream dams for at least 10 years, allowing implementation of the findings and recommendations of the SEA report.

Committed Public Engagement with all stakeholders. Formal multi-stakeholder consultations should be established within each country and at the regional level informed by the SEA's findings. The opinions of Mekong riparian communities should be central to any decisions taken on whether to proceed or not with the mainstream dams.

Commit to Investigating and Developing Alternative Energies: Economically-viable and environmentally and socially sustainable energy options do exist. Given the severity of the risks posed by the Mekong mainstream dams, reformed energy planning processes and comprehensive energy options assessments are urgently needed throughout the Mekong region. By committing to modern energy technologies and heavily promoting energy efficiency and demand-side management, the region's energy needs can be met and the Mekong River protected thus ensuring a peaceful, sustainable and prosperous Mekong region for the present and future generations.

Learn More:

To review the SEA documents, visit: www.mrcmekong.org/ish/SEA.htm. For more information about the Mekong mainstream dams, visit International Rivers' website: www.internationalrivers.org.

JOIN US!

For more information, visit International Rivers' website: internationalrivers.org, and the multi-lingual website: savethemekong.org.