



WWF

BRIEF

NOVEMBER

2016

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# THE ROLE OF THE MEKONG RIVER IN THE ECONOMY

## KEY FINDINGS

The Lower Mekong Basin is entering a critical period in which upcoming development decisions will echo in the economy for decades to come.

Only when the Basin countries make the connections between water resources, planning, and development can they create a resilient and prosperous economic future for all of the countries involved.



LOWER MEKONG BASIN

UPPER MEKONG BASIN

MEKONG RIVER

## MEKONG: ONE BASIN, ONE ECONOMY

The Mekong River functions as a lifeline for people, business and ecosystems in all four countries of the lower basin.

The river provides key resources such as water, sediment and nutrient flows and wild fisheries. These are linked to the economy as inputs to sectors such as agriculture, aquaculture and construction, are a key resource supporting livelihoods and the region's competitive labour costs, and underpin trade and investment in the basin. From an economic perspective, the countries of the Mekong River are connected by physical flows (such as water, sediment and fish), as well as trade in economic goods (such as food, electricity and manufactured products).

**Despite this interconnectivity, economic planning in the Mekong Basin remains fragmented on three levels:**

**Geographic fragmentation:**

Different countries within a single basin are all developing individual futures without sufficient consideration of each other or the functions of the river outside their boundaries.

**Thematic fragmentation:**

Sectors have their own development plans that are often not well aligned with each other, both within countries and between countries.

**Temporal fragmentation:**

Inadequate consideration of short, medium and long term impacts of different development futures within the Mekong.

In recent years, the story of the economies of the Lower Mekong countries has been one of growth and future promise. Average growth rates have been in the 5-8% range, and it is a region that is inextricably linked to China – not only via the Mekong itself, but via both historic and current trade routes. The high economic growth experienced in the region has come at the cost of land and water resources degradation, declining biodiversity and a reduction in ecosystem services. Increased water resources use, extraction of sand and gravel, overfishing, and deforestation have resulted in increased vulnerability to and economic losses from drought and floods, water pollution, geomorphic changes of the river bed (soil erosion upstream and river bank erosion and lowering of the river bed downstream).

**5 - 8%**

**AVERAGE ECONOMIC  
GROWTH RATE IN  
THE MEKONG REGION**

Projecting this growth a decade or more into the future gives a river under increasing pressure to supply food for the population, sand for land reclamation and construction, and electricity for urbanisation and manufacturing. These demands have an impact on the river and its ability to continue supplying clean water, replenishing sediment and maintaining fisheries.

This is bound to have consequences for the livelihoods of the inhabitants and the sustainability of the economic growth of these countries, which in turn will pose risks to investors and developers wanting to take advantage of the currently abundant resources and inexpensive labour. It is in the interests of business, government and development agencies to understand and address the interconnections, rather than continuing the current dysfunctional, fragmented approach to management.

Integration between sectors and countries in the Mekong is the only solution to secure the long term economic viability of the region. Only by looking at the portfolio of development across the entire interconnected, interdependent Mekong river system can decision makers see clearly the causes and effects of economic decisions. Taking this wider view will allow planners to optimise benefits equitably among the Mekong countries – and minimize associated trade-offs – within the ecological limits of the basin. This report highlights how the region's future economic growth is contingent upon optimized, systemic and sustainable management of the Mekong.



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## EXPLORING OPPORTUNITIES AND RISK

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The debate around economic development and water resources management needs reframing.

The river's natural resources and economic growth are tightly linked, but water resource and development planning in the Mekong Basin are taking place separately. With looming decisions around hydropower development, industrial expansion, fisheries and in general, economic growth in the Mekong River basin, decision makers simply cannot afford to operate in isolation any longer. Without a common vision for the future, all sectors and countries will suffer. The Mekong River in the Economy report highlights major risks and opportunities for different sectors in each Lower Mekong country through a series of short narratives, showing all the basin could lose by taking a narrow view of planning – and all that the Basin can gain through an integrated approach.

## VIET NAM: Dependent on everything that happens upstream

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In Viet Nam, the Mekong Delta covers a relatively small portion of the entire country. However, the region represents about one fifth of the total population and a quarter of the GDP of Viet Nam.

In recent years, sediments loads have been halved by existing dams, sand mining, and groundwater abstraction. The resulting subsidence of parts of the delta threatens prime agricultural land. The delta struggles with having both too little and too much water; in addition to concerns around sediment flows, upstream hydropower releases have caused uncertain flow regimes for Viet Nam. This increases salt water intrusion, and affects navigation within the delta and ecosystem functioning. Dykes have been built to prevent saline intrusion, which is especially challenging during the dry season. However, dyke construction has also increased flooding during the wet season by preventing the natural flow of water in the flood plains and into the sea. This may become more severe with the changing climate, alongside increasing development both within the delta and upstream. The report's key narratives are around:





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Upstream sand mining  
is directly linked to  
increased coastal  
erosion

### **Slowly sliding into the sea: sand mining and sediment dynamics**

The Delta is sinking and shrinking, putting its productivity at risk. Less sediment is flowing down the river to counteract erosion, while over-extraction of groundwater is causing the ground to shrink; sea level rise compounds the problem. Sand mining for construction is a major risk in the region, accelerating the subsidence of the Delta.

### **Changing flows: transport, irrigation and salt water intrusion**

Over-extraction of water from the Mekong River, both in the Delta and upstream, is causing low flows in the dry season. Sea water then flows up the river, causing major challenges to agriculture and the freshwater supply. These issues are made worse by poor water quality due to inadequate wastewater treatment and run-off from agricultural pesticides and fertilizers. Salinity intrusions are occurring more frequently in the Mekong Delta provinces, reaching further up into the Delta (up to 140 km); in 2015 alone the total economic loss was estimated to be more than USD \$700 million. Low flows in the Delta also makes river navigation difficult, negatively impacting trade, tourism, and domestic transport.

**2.7 BILLION**  
ANNUAL VALUE OF  
VIETNAMESE  
FISHERIES AND  
AQUACULTURE IN USD

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**Business of the Delta: agri-business, industrialisation and export economy**

Sediments and nutrients from upriver sustain the productive Mekong Delta, which in turn supports more than 50 percent of Viet Nam's staple food crop production and marine fisheries and aquaculture, worth up to USD 2.7 billion annually<sup>1</sup>. Therefore the sediment not only supports the rural livelihoods, but also domestic consumption and a growing export economy (including rice and fisheries).

The growing industrial development and foreign direct investments in the Delta also require sediment. However, in this case, it is for land reclamation or for construction of infrastructure such as buildings, roads or dykes. The value of the GDP contribution of investments in infrastructure needs to be weighed against the value of a functioning ecosystem for fisheries and agriculture.

**CAMBODIA:**  
**Completely dependent on a  
functioning Mekong River**

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Cambodia is almost completely reliant on the Mekong for water-related economic activity and domestic supply. Approximately 86 percent of Cambodia's territory is included in the Mekong Basin.

Many livelihoods are dependent upon fish protein and flood irrigation from the Mekong and the connected Tonle Sap, a critical flow buffer and productive ecosystem. In urban areas, the expansion of industries, including textiles, depends upon affordable labour. This in turn depends on the low cost of living, which is made possible by the availability of inexpensive protein, food and construction materials such as reeds, clay or sand from the Mekong. Cambodia's expanding industrial sectors are impacting water quality and ecosystems downstream, while their absorption of labour from agriculture poses a challenge to rice expansion with worrying implications for food security for Cambodia's growing population. Both tributary and mainstem hydropower opportunities will support energy demands, but may have profound consequences on fisheries, sediments and hydrological regimes.

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<sup>1</sup> [wwf.panda.org/what\\_we\\_do/footprint/water/dams\\_initiative/examples/Mekong](http://wwf.panda.org/what_we_do/footprint/water/dams_initiative/examples/Mekong)

For instance, mainstem hydropower development threatens livelihoods by disrupting sediment flows and fish migration. The key report narratives are around:

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Fish and processed fish products make up the vast majority of protein in the average Cambodian's diet

### **Fish Tails: protein, fisheries, connectivity and flows**

Fisheries provide 7 percent of Cambodia's national GDP. These fisheries are wholly dependent on the ecosystem function of the Tonle Sap and fish migration within the broader river catchment. The fisheries are the largest source of animal protein in Cambodia, and are critical to food and nutritional security across the country.

Readily available protein from fisheries is a major benefit to Cambodia that cannot be easily replaced. According to scenarios modelling the impact of the 11 proposed mainstem dams, replacing lost fisheries productivity with protein from livestock or crops would require 29-64 percent more water than currently used. Fish for food, nutrition and livelihoods income should

not be swapped for energy. The benefits of access to hydropower are not equal to those that fisheries provide. Therefore, hydropower development cannot be seen as a poverty reduction measure if fisheries are lost.

### **The Vulnerability of Crop Production: Agriculture, Irrigation and Variability**

Agriculture contributes 28 percent of Cambodia's GDP. Much of this value comes from the export of agricultural products to the region and globally; Cambodia is the third largest rice exporter in the world. The highly productive land in Cambodia is a direct result of the Mekong Basin. However, irrigation investment remains limited in the region. For Cambodia to meet its projected increases in agricultural production, significant investments into optimisation will be necessary. This is further compounded by the regional climate projections. The water-related impacts of this agricultural shift will need to be understood in the context of broader basin development.

**28%**  
AGRICULTURE'S  
CONTRIBUTION TO  
CAMBODIA'S GDP

### **Industrialisation: the promise and the curse**

Development and industrialisation is positive for Cambodia. This needs to be supported to grow the economy further. However, industrialization is using and affecting the same natural resource base that much of Cambodia's population depends on for their livelihoods. The value of ecosystem services supporting agriculture and livelihoods needs to be weighed against the benefits and costs of purely industrial development.

### **Digging the river: construction, sand mining and sediment**

Sand mined from the Mekong riverbed is used to fill in wetlands, reclaiming land to create industrial zones for continued industrial development. Sand is the preferred material for land reclamation, and most of the sand extracted from the river goes to this use. Sand and gravel from the Mekong are also key resources for the construction industry, and the industry is heavily dependent on these resources as there are fewer workable alternatives.

These demands on resources from the Mekong River and their inputs to Cambodia's GDP need to be weighed against competing needs for ecosystem function, livelihoods, water supply and flood control.

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An aerial photograph of a riverbed, likely the Mekong River, showing extensive sand mining. The riverbed is a mix of dark brown and light tan sand, with numerous tracks and pits from mining equipment. The text is overlaid on the left side of the image.

**15,000 - 20,000**  
**CUBIC METERS OF SAND PER DAY**  
**AMOUNT NEEDED TO SUSTAIN**  
**PHNOM PENH'S CONSTRUCTION**  
**BOOM**

SOURCE: JOE FREEMAN, "HOW SAND BECAME ONE OF PHNOM PENH'S HOTTEST COMMODITIES". NEXT CITY.

<https://nextcity.org/daily/entry/sand-dredging-phnom-penh-cambodia-hot-commodities>

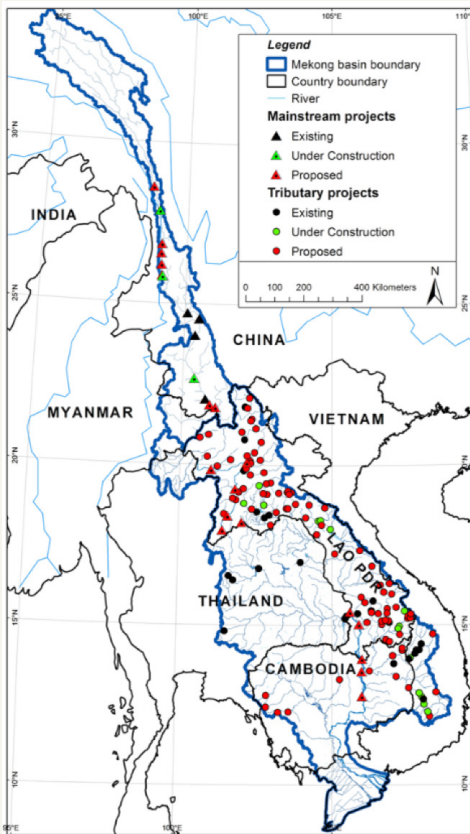


# LAOS:

## Balancing development and ecosystem functioning

Laos is intrinsically connected with the welfare and the flow of the Mekong. The country is dependent upon the Mekong for hydropower, to which the entire country's economic development trajectory is linked.

This power is already a major revenue generator for Laos and is set to increase: 90 percent of the hydropower production will be exported to Thailand and Viet Nam. The expansion of hydropower and mining has contributed to much of the country's recent GDP growth.



Construction is booming in Laos, especially infrastructure – specifically electrical – and real estate projects<sup>2</sup>. The boom in construction poses significant environmental challenges to the Mekong, particularly for downstream neighbours. Managing these impacts, through measures such as fish passes or sediment flushing, will reduce the potential for power generation, making energy more expensive. Climate change and sediment impacts on the dams may also result in diminished power generation in the long term. Furthermore, a large proportion of the population of Laos is dependent on agriculture to support their livelihoods. The future of Laos needs to take into account climate vulnerability alongside the livelihoods of the local population. The key report narratives are around:

### Powering Thailand: Hydropower for export

Laos is set to generate revenue by selling hydropower electricity to Thailand. However, these benefits come at a cost to downstream users.

<sup>2</sup> Devonshire-Ellis, 2016

Changes in water and sediment flows, fish migration and fisheries productivity will negatively impact livelihoods and other economic sectors in Laos. Downstream, Thailand, Cambodia and Viet Nam will also feel the consequences.

Laos' focus on hydropower exports has created a dilemma for the country. In selling all its hydropower generation to Thailand, Laos is curtailing its own mining or industrial development due to a lack of energy. Currently, Laos is exporting cheap hydropower to Thailand while using more expensive forms of power generation domestically. Much of Laos is not yet connected to the electrical grid. This leaves Laotians to turn to energy sources like biomass, which provided 68 percent of the country's total energy supply in 2014. Furthermore, wood is a major source of biomass and deforestation for energy generation is further degrading the watershed.

### **Feeding the people: Water supply, irrigation and livelihoods**

Agriculture in Laos is still focussed on food security and subsistence living. Poor households depend on home-grown rice production for 94 percent of their rice consumption, and even those in urban centres grow 50 percent of the rice they consume. The reliance on wild protein is also very high; up to 80 percent of fish and more than 20 percent of meat consumed comes from the wild. This is unlike Thailand and Viet Nam, where agriculture is focussed on commercialisation and intensification.

Commercialising the sector will fundamentally change the way that farming takes place, and therefore the economic landscape of the region. Water use as well as land management need to be a core focus during this transition to ensure landscape degradation does not become the norm.



Fishing plays an important role in most rural households in Laos, for both subsistence and additional cash income

The rise of other sectors, such as hydropower and mining, may also negatively impact food security. Decision makers need to carefully weigh the benefits of hydropower generation against the impacts on fisheries and the livelihoods they support. In Laos, more than 70 percent of rural households depend on fishing to varying degrees for subsistence and additional cash income. In Siphandone (Four Thousand Islands), on the Mekong mainstream in southern Laos, about 40 percent of households get some income from fish.

### **Extractives and their link to energy**

The expansion of hydropower and mining have contributed significantly to growth in Laos in recent years. Hydropower and mining now contribute 20 percent of total revenues; in the past 3 years, mining and hydropower have contributed 2.5 percent of the country's 7 percent economic growth.

Several questions remain regarding the impact of continued growth of hydropower and mining on the Mekong Basin. This includes the impact on sediment flows, fisheries and agriculture. Some understanding gaps remains on the costs hydropower and mining development to local, livelihoods and downstream countries.

Finally, there can be significant reputational risk around extractive industries, and companies investing in the development of hydropower and mining in Laos need to think deeply about the potential risk associated with these investments.

**THAILAND:** Thailand is home to approximately 18 percent of the total Mekong Basin area; this region is the north-eastern part of Thailand. The region is becoming increasingly important politically in the frame of the peace and reconciliation efforts.

**Small Mekong footprint, large indirect impacts**

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As a result, increasing investments have been made into local production such as agriculture, food and beverage manufacturing and sand mining for construction. All of these sectors depend heavily on Mekong River resources. Thailand's energy supply is another important economic linkage to the Mekong River. The electricity demands of Thailand, as a diversified economy, are partly dependent on Laos as an energy supplier. The downstream impacts of the hydropower generation in Laos (used by Thailand) are in turn felt by Thailand and other downstream countries. This is often viewed as the benefits of the power going to the healthy Bangkok population, while the rural poor suffer the negative impacts. As a result of the negative impacts on them downstream, Thai communities have opened legal enquiries into the Thai investments and the purchase of hydropower from Laos upstream. The key report narratives are around:



### **Developing the Northeast: Water supply/irrigation**

The northeast of Thailand is a hugely important area politically and geographically. The area accounts for 85 percent of the Mekong Basin in Thailand and one-third of Thailand's 68 million people live there. The region has also experienced major economic growth (40 percent between 2007 – 2011) compared to the rest of the country, which experienced only 23 percent GDP growth. However, there is still a large gap in living standards between the urban rich and the rural poor.

Increasing irrigation for crops in northeastern Thailand could lead to downstream water shortages

In northeastern Thailand, more than 80 percent of the cultivated area is used for growing rice, or a mix of rice and upland crops. Irrigation has continued to expand over time. This year, the higher extraction of water for irrigation during the dry season began to create concerns about reduced water supply downstream.

### **Building Cities: construction, sand-mining and sediment**

Infrastructure construction is a critical component of economic development in a country. It is difficult to temper this growth, especially when the development needs within a country (such as Thailand) are significant. However, continued sustained mining of sand and gravel may in fact undermine the successful economic development that has taken place. Development in the Mekong River basin is a castle built on a foundation of sand: continued development in the basin relies on using the very sediments that ensure a functioning and productive system.

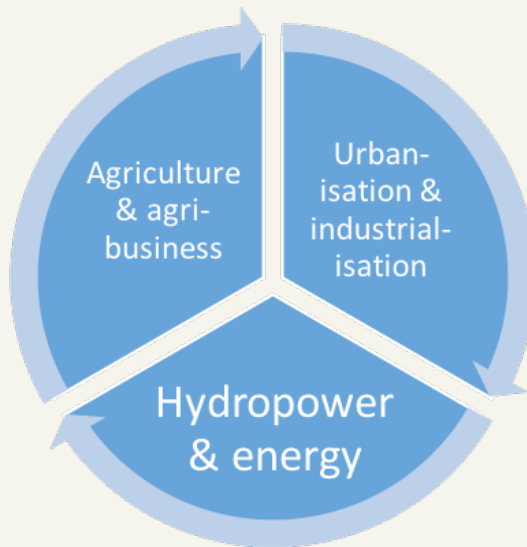
Hydropower dam development creates a further complication for the construction sector and its reliance on sediment. The reduction in the sediment flowing downriver may have serious consequences for Thailand, Cambodia and Viet Nam.



## DEVELOPMENT IN THE MEKONG: Opportunities are trade-offs

As the Lower Mekong Countries continue their rapid economic development, they all face significant trade-offs between prosperity today and sustained economic development for future generations.

**Decision makers must balance maximizing national and sectoral economic development and optimizing sustainable development of regional economies that respects the ecosystem functioning of the Mekong Basin as a whole.** The story of the Mekong is a continual tension between the development of hydropower with its power benefits and downstream externalities, food cultivation and agribusiness to support livelihoods and trade, and urbanisation with its input needs for sediment, food and electricity and its economic outputs.



## A CALL TO ACTION

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Development planning in the Mekong Basin remains fragmented across geographic, thematic and temporal scales.

Integration between sectors and countries in the Mekong is the only way to secure the region's long term economic viability. This is important not only for government and the public sector, but also for private businesses and development partners that are active within the region. These actors have an important role to play in ensuring the entire interconnected, interdependent Mekong river system is developed to optimise benefits equitably among the Mekong countries – and minimize associated trade-offs – within the ecological limits of the basin.

Benefit sharing can provide opportunities for all actors in the basin. Benefit sharing is an accepted way to spread resource utilisation benefits across the economy, catalyse broader-based growth and support social equity policies. In the struggle to craft a cohesive vision for the future of the Mekong out of the diverse, sometimes contested development trajectories of each individual country, benefit sharing could show a new way forward.

## PRIVATE BUSINESSES AND INVESTORS IN THE MEKONG

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For the private sector, there is little in their business that is not either directly or indirectly provided by the Mekong river system.

For instance, sediment in the river provides material for construction, which is used for infrastructure development. The flows of water and sediment provide fertile soils for agriculture, which in turn provide agro-processing opportunities. Livelihoods are supported by the river system through affordable access to protein (fish) as well as housing (sand for construction or reeds and grasses). This, in turn, ensures an affordable labour source for business, especially those in manufacturing and services. The private sector would benefit from taking a basin-wide view of investments in the Mekong and their cumulative impacts on the resources upon which they all depend.

As we have learned in other basins and countries, **the business sector can be well served through the creation of a corporate water stewardship platform.** This can help businesses communicate with their colleagues in the basin, share data and lessons, and ultimately create better collective outcomes. Ensuring that businesses understand common water risks and identify shared opportunities in the basin will support shared efforts and more sustainable development for the benefit of many.

## DEVELOPMENT AGENCIES, DONORS AND DIRECT FOREIGN INVESTORS

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Development agencies, donors and direct foreign investors have significant influence in the Mekong basin, providing financing and policy advice to Mekong countries.

If they do not consider the entire system and the multitude of projects under way before acting, they risk unintended negative consequences and even undermining their development goals. Therefore, WWF calls on development partners to:

1. Explicitly consider systemic linkages when financing projects.
2. Support policies that encourage the private sector to operate systemically.
3. Call upon Mekong Basin Countries to engage in systemic economic optimization to decrease planning compartmentalization.
4. Take stock of the challenges in the implementations of the MRC agreement and explore ways to address the transboundary cooperation gap from all perspectives listed above.

# GOVERNMENT AND PUBLIC SECTOR

For sustainable economic development, Mekong countries' governments' plans must consider their impact on neighbouring countries, as well as their impact on

different sectors in the economy.

This will require a new way of looking at planning, and in-depth analysis of all the plausible development scenarios. Though not an easy fix, sustainable management of river-related resources, including improved governance and integration from all Mekong countries and sectors, is necessary to ensure a viable economic future in the basin.

Water-related market based instruments: “government-led formal or informal rules consciously designed to change behaviour – of individuals, businesses, organisations or governments – to influence how markets work and their outcomes [on water]”<sup>3</sup>

New market-based policies can help Mekong Basin governments improve their river resources management.

By creating economic incentives to use water resources sustainably, governments can help re-align markets that are currently negatively affecting the Mekong. Five general options for policy makers to consider are:

- 1) Water-related taxes and subsidies
- 2) User fee systems (pricing/tariffs, user charges, deposit-refund, performance bonds)
- 3) Public spending on water-related goods and services
- 4) Tradeable water permits (cap-and-trade or effluent/withdrawal trading schemes)
- 5) Information and voluntary approaches (notably standards and disclosure)

<sup>3</sup> Modified from Blackmore, Emma (May 2011). “Shaping Sustainable Markets: Research Prospectus” (PDF). International Institute for Environment and Development.



#### Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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