

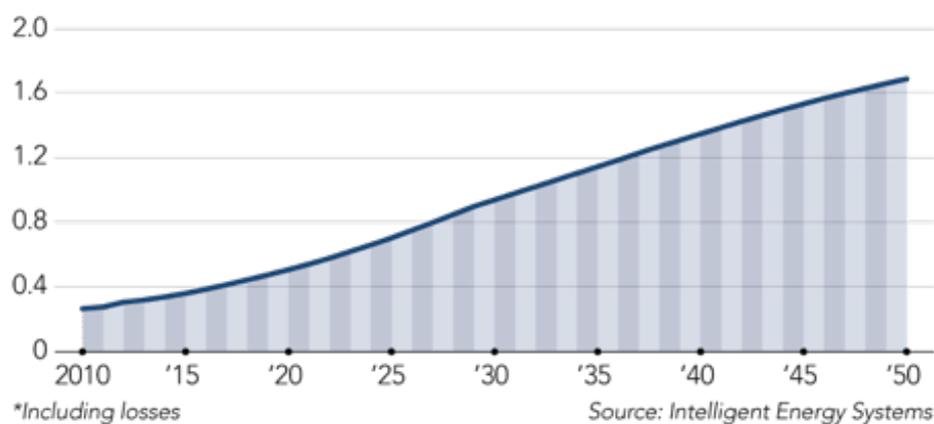
The Effect of Dam Building on the Greater Mekong Subregion

The role of China in hydroelectric dam schemes is mired in controversy. Historically, China has received support from influential organizations such as UNIDO which proposed internationalizing Chinese hydropower. Similarly, in 2016, Ban Ki-moon (UN Secretary General) said 'energy was central to social and economic wellbeing' and China's efforts in mitigating climate change should extend to developing countries to promote South East Asian cooperation. Increasingly, however, people living in the Greater Mekong Subregion (GMS), a trans-national region of the Mekong River Basin including Cambodia, China, Laos, Myanmar (Burma), Thailand and Vietnam, would likely disagree.

Figure 1

Projected electricity demand for Greater Mekong Subregion

(in thousands of terawatt-hours*)



Financial Times¹

In this essay I will be telling the story of the projected 540% increase (Figure 1) in electricity demand between 2010 and 2050 in the GMS and how the rise in hydroelectric sources built to supply this demand impacts the region. Whilst the reputation of renewable sources, i.e. dams built on the Mekong River, is stereotypically positive thanks to their advertised environmental and economic benefits (e.g. a reduction in carbon emissions), my evaluation of the dams will conclude that this does not hold true here. Instead, the scheme is overshadowed by negative environmental and social effects, and the potential exploitation of the balance of power between regional players.

My evaluation considers 1) environmental factors such as greenhouse gas emissions, relating to the COP-26 2021 aim 'to lower emissions', 2) economic impacts, including on vital industries such as fishing and transport which dictate the longevity of hydroelectric schemes, and 3) geopolitical factors and the COP-26 2021 aim 'to increase climate ambition' through international cooperation.

The growth in demand for electricity in the GMS can be explained by an overall lack of access to electricity, the intention to remedy this, and rapidly growing industries. In Cambodia, only 50% of households have electricity and the country aims to grow this to 70%.

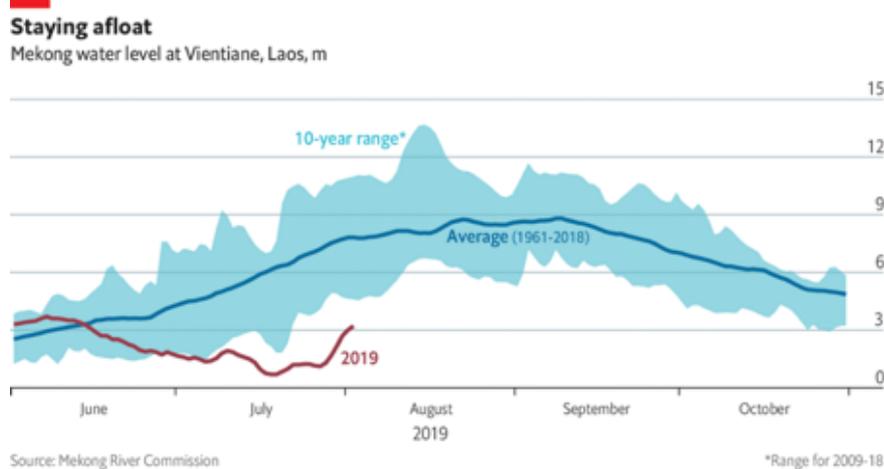
Hydroelectric power sources can seem an attractive option. They harness the energy of water flowing downstream to turn generators and produce electricity, as opposed to fossil fuels which release carbon dioxide leading to the greenhouse effect and global warming.

This is particularly significant in the GMS. China, with its reputation for massive carbon emissions (13.92 billion tonnes in 2019), backs 6 of 11 dams planned on the Mekong's lower mainstream, built 7 on the upper river and plans 21 more.

Fortunately, therefore, the International Centre for Environmental Management indicates that around 50 million tonnes CO₂/ year could thus be avoided by 2030.

However, the ICEM analysis fails to consider all emissions' pathways. In fact, 90% of the dams' emissions are made up of methane which traps 86 times more heat than CO₂ in the first 20 years after its release. In order to create the reservoir behind dams, landscapes are flooded, and rotting vegetation acts as a sink for carbon dioxide and methane gas. Furthermore, vegetation regrowth may be inundated again when water levels rise, allowing the cycle to continue.

Figure 2



Mekong River Commission via The Economist²

Dam building may also aggravate instability from climate change; a potential 30cm sea level rise in Vietnam's Delta area threatening 15% of its GDP (the area is known as the 'ricebowl') contrasts with water levels in Laos at their lowest point in 100 years (Figure 2) - 6m below the July long-term average. Whilst the situation in Laos resulted in part from the El Niño effect, resulting in a late and weak wet season, the increasing frequency in extreme weather events due to climate change means the issue of water levels may become chronic. The cost of unusual water activity is massive - flooding in the Lower Mekong Basin costs the region ~\$70 million whilst droughts can cost only \$8-10 billion, per the Mekong River Commission.

By exacerbating water insecurity, dam construction also threatens the livelihood of the ~60% of the Mekong Basin's population who work in agriculture. The expansion of agriculture is necessary to support the growing population. Yet the unpredictability and reduction of water flowing, particularly in the dry season, inhibits irrigation, ~70% of the area's water consumption.

Similarly, dam building disrupts connections between 13 unique ecosystems within the river reducing nutrients and sediment on which 18% of the world's freshwater fish yield depends. Studies have found that if the 40+ proposed dams were built by 2030, the 4 lower basin countries would suffer a net loss equivalent to 110,000 gigawatt hours of electricity in fishing output (per Mae Fah Luang University). Other lucrative industries such as transport of, for example, 73% of cargo in Vietnam, that depend on the continuity of the river are also jeopardised by the dams.

The building of dams is also significant politically; the interconnection of GMS power systems through the shared use of the river encourages international cooperation and streamlining could contribute to COP-26 2021 aims. However, the overall dysfunctionality of their construction may counteract this. One cause of unrest is the polarisation between those whose livelihoods and food-security are threatened including at least 60% of the Lower Basin's rural population who depend significantly on the river, and those who benefit, largely urban elites, powerful economies and foreign investors.

On an international scale, China's disproportionate control over the hydrological flow in the GMS – an average of 55% throughout the year - is also noteworthy. In fact, some critics of the scheme argue that it is redolent of China's militarization of artificial islands in the South China Sea, a source of prolonged international strain, as in both cases the superpower has obtained significant political leverage over economic production and natural resources of other countries – an increasingly valuable upper hand as tensions surrounding resource insecurity due to climate change augment.

In summary, it is clear that the benefits of dam building at least somewhat overshadowed by the widespread environmental and economic detriments to millions of people within the GMS; this highlights the importance of considering renewable electricity sources within their wider environmental, economic and political context to ensure that they contribute to an overall positive movement towards climate change aims.

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