



# Investigating Waterscapes

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Mobile dam on the Bank Pakong River, Thailand

## Introduction

It has certainly not occurred to anyone that the fate of fishermen on Tonle Sap Lake in Cambodia could have something to do with the political power of the Thai Federation of Industries (TFI). Even less so that this could have to do with their respective uses of water. But consider the following chain of facts. In the last four decades of the twentieth century the TFI mounted a successful opposition whenever a hike in groundwater tariffs was proposed in order to curb the over abstraction of groundwater. Indeed, overabstraction in and around Bangkok was causing land subsidence to the extent that roughly 40% of the Thai capital is now under mean sea level. This dramatically increased flood risk and vulnerability, as was illustrated in 1995 and 2011. Yet in the late 1980s, induced vulnerability and flood occurrence/damages were ascribed to deforestation, carried out by both hill tribes and the logging industry. This led to a ban on logging, which, although only partially implemented, caused the logging industry to move into neighboring countries without such regulation, particularly Myanmar and Cambodia. Increased deforestation in the Tonle Sap catchment then led to dramatically increased erosion and high sediment load being transported

to the lake. The resulting turbidity affected fish spawning sites around the lake and, consequently, the productivity of the fisheries and local livelihoods.

Admittedly this causal chain between the TFI's political influence and the Cambodian fishermen's livelihoods is only part of the story, and at each node of this chain other relevant factors can be identified. (For example, Bangkok's vulnerability to flooding is not only a result of land subsidence, and there were ulterior motives for the logging ban and the growth in 'state enclosures' in northern Thailand.) Nonetheless, this overall causal chain is relevant enough to be factored into an analysis of social-ecological systems, where social dynamics and environmental transformations are intimately interwoven.

The narrative above illustrates the complexity of unpacking such historical transformations. How do demographic, economic, sociologic, technical, environmental and political changes combine and interact, 'jumping scales' and influencing one another? Historians try to tell these relational stories, while discipline-oriented analysts focus on one facet (agriculture, demography, markets, etc.), attempting to make sense of the changes they observe with the concepts of their own field and thus narrowing the analysis. All accounts tend to reduce



Dragon bone chain pump,  
Thailand

complexity to make it amenable to analysis from particular perspectives. Various 'problemsheds' can be defined according to the question posed and the focus adopted. These problemsheds may intersect with conventional ecological units, such as watersheds or aquifers, in different ways. Indeed, water can be a productive entry point into investigations of socio-ecological systems. Not only is it central to life, culture, ecosystems and economies but it also interconnects people in unique ways through its fluid, fluctuating and partly invisible circulation across the landscape. Changes in quality (pollution), quantity (droughts, floods), sediment load (silting, coastal erosion) continuously redistribute costs and benefits spatially and socially (Molle and Wester 2009).

Scholars in the field of environmental history focus on the interaction between human cultures and the environment and have thus taken to describing histories hinging, for example, on specific rivers – e.g. the Columbia (White 1996), or Asian rivers (Amrith 2018), or dam and irrigation development in Australia. Political ecologists have broadened or moved the focus of investigation to the larger web of causalities, beyond the immediate local actors to more systemic economic and political realities and discourses (see, for example, Forsyth & Walker 2008). They have often focused on urban settings, where the entanglements of the flows of water and power are more neatly demonstrated and readily comprehended.

Water is a definitional element of the history of Thailand's Chao Phraya River Basin and can serve as an entry point to illuminate its history of the past 150 years. In the second half of the nineteenth century this basin, which includes most of Northern and Central Thailand, was 90% forested and home to roughly 3 million people. Its agriculture was largely reliant on rainfall and flooding. Through a spectacular reshaping of its land, water and human elements this basin morphed into one of the most vibrant rice bowls of Asia, with forests retreating to 30% of the basin and people now numbering around 30 million, almost half of whom reside in Bangkok Metropolitan area and vicinity. The transformation was of course closely linked to a broader history of regional and global economic development: from the 1855 Bowring Treaty that incorporated Siam into the international rice market, to Thailand's industrialization of the late 1980s. Around 1900 the central region accounted for 70% of Siam's rice production and 100% of its exports, but it now yields a paltry 20%, making room for both agricultural diversification (notably shrimp farming) and massive urbanization.

The spatial transformation of agriculture, along with industrialization and urbanization, has been linked to technical, demographic and market changes, but also in a large part to the 'artificialization' of the basin's water regime and terrestrial landscape. Formidable investment in damming, dyking, dredging, well drilling, pumping, canalling, tunnel-



Floating machines to  
remove water Hyacinths,  
Bangkok



Raised beds, Damnoen Saduak, Thailand

ing, land leveling and earth moving by both the state and local individuals has created new waterscapes where material and social elements are re-configured through mutual interaction. But as water resources have come under what is conventionally, and somewhat misleadingly, called greater 'control' agricultural 'demand' (understood as the capacity to put water to productive use) has outpaced available resource. This has led to shortages that came to be labeled as 'scarcity' and motivated further infrastructural development. The ultimate proposal is to reopen the basin by importing water from the Salween Basin through a tunnel. In the dry season the basin is now 'closed', meaning that the available water is insufficient to support all ecological functions (not least controlling seawater intrusion into the delta) while meeting societal 'demand'. Groundwater overdraft has added to the delta's silt deficit to fuel land subsidence that has taken 40% of the capital below an otherwise rising mean sea level. Pollution from agrochemicals and waste, and contamination by industry and refuse landfills, have undermined water quality and aquatic ecosystems. A desire to flood-proof capital investment, such as property and industry, as well as fields in order to grow two or three crops of rice or to diversify, has restricted the space for spreading and dampening excess water, thus magnifying the risk of damage to unprotected areas. Through their large-scale modifications of the environment societies endlessly produce (partly unexpected) boomerang effects that are usually addressed by injecting more capital and infrastructure into an increasingly artificialized waterscape.

Conventional representations of such 'river basin trajectories' follow a Malthusian narrative, whereby a growing population's 'demand', the need to produce more food in the name of food security, or the imperative to protect against drought

and floods (often blamed on climate change), constitute a societal challenge. A benevolent state then tackles this challenge by deploying ever-growing resources to confront increasingly frequent extreme events. Yet exploring the unofficial script leads one to broaden and sometimes turn this narrative upside down by showing the pervasiveness of bureaucratic, economic, political but also ideational factors that each contribute to a historical trajectory that is by no means 'natural'. Rather, transformations reflect specific arrangements between a vast assemblage of humanity – peasants, landless workers, hill tribes, irrigation engineers, middlemen, royals, academics, foreign consultants, NGOs – and factories, dykes, canals, wells, stilt houses, shrines, shrimps, wild elephants, forests, etc. All are actants in a story that can only be unpacked through a relational account of how societies and their environments co-evolve.

#### References

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