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Biocultural Diversity in Monsoon Asia: The Mekong and the Forests

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Abstract

Deforestation and dam building together with climate change along the Lancang/Mekong have upended centuries and even millennia of biocultural management. The river and the rainforests in this part of monsoon Asia provide the livelihood for over 70 million people in Yunnan and SE Asia and are among the most important rainforest cover and carbon sinks in the world after the Amazon basin. It is a major biodiversity hotspot. The loss of local knowledge has contributed to greatly the loss of healthy ecosystems. The paper

considers not only this loss but also the ways in which indigenous communities and civil society organizations are pushing back against the overpowering profit motive of the “epistemic engine” of the capitalist nation–state system.

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In 2020, a group of 17 elephants began their journey northwards from

southern Yunnan province to the zone of the provincial capital, Kunming.

While two of them abandoned the herd midway, the remaining fifteen crossed the Yuanjiang river which had been the northern-most boundary of their movement and traveled about 500 km. By April 2021, Chinese authorities and media tracked their migration and the traveling elephants caught the attention of hundreds of millions of global viewers before they were finally induced to return to the nature reserve in Xishuangbanna in August 2021. Two months later, in October 2021,

Kunming held the Conference of the Parties to the Convention on Biological Diversity (CBD–COP15). Chinese scientists believe that the elephants were in search of their preferred foods of grass, leaves, fruits, and bark which had become increasingly insufficient due to the massive expansion of rubber and tea plantations in their southern habitat—by 91% and 120%, respectively, from 2005 to 2019 (Jiang et al., [2023](#)). Some may well wonder if the elephants had journeyed to also lodge a complaint at the COP15 Convention on Biological Diversity!

My goal is to explore the problem of biocultural diversity in the Anthropocene particularly along southwest China's Lancang River in Yunnan. The Lancang courses through the reserve home of the said elephants, and along the countries in Southeast Asia where it is known as the Mekong River, before flowing into the delta and the sea. The drainage basin of the river and its tributaries is historically one of the most densely forested in monsoon Asia. The advent of modernity that accompanied colonial and post-colonial regimes

and their hunger for resources from these frontier regions has led to the widespread destruction of once thriving ecosystems and reduction of local communities and their knowledge of the ecosystems.

Commodity-driven tropical deforestation accounts for up to 25% of global emissions, and Southeast Asian deforestation has been among the “largest sources of gross forest related emissions over the last 10 years” (Zhu et al., [2021](#)).

Deforestation and dam building together with climate change along Lancang/Mekong have upended centuries and even millennia of biocultural management. The rainforests of monsoon Asia together with Amazon are among the largest natural carbon sinks on the terrestrial planet. While the requirement of water for organic life is well known, the ecological role of the forests for water can be seen in four main aspects: (1) evapotranspiration which returns great amounts of water to the atmosphere in the rainforests. (2)

Forests act as a sponge to absorb and infiltrate groundwater for downstream users in dry seasons. (3) Forests serve as filtration systems to trap sediments and retain water quality. (4) Forests reduce water-related hazards such as floods and erosion.

Forests and rivers are thought to be best protected and defended by local or indigenous communities of “ecopeople”: people who are directly and immediately dependent on the

ecological commons for their livelihood (Gadgil, [2018](#)). Others have also called them “exemplary communities” (Conversi, [2021](#)). The UN Special Rapporteur on the Rights of Indigenous Peoples and member of the Global Steering Committee for the Interfaith Rainforest Initiative has reported that mapping reveals that the most successful or best-kept rainforests are in areas where rights of indigenous peoples are respected. It signals that these indigenous communities are among the most reliable stewards and custodians of the

rainforests. The loss of the commons and the communities leads to the loss of local knowledge to manage these natural resources sustainably, whether in the forests or the river, for future generations. I have developed the concept I call the “epistemic engine” —a mode in which capital and the nation-state are structured—to explain why this resource quest is so unquenchable and resistance to it so difficult, though not impossible, which I will address in a later section. Meanwhile, I explore both the modes

of resource exploitation and the forms of resistance that this has taken.

Yunnan: Forests and Dams

There are now several well-documented studies of the long history of human-environmental relations in China. I only wish to draw attention to Mark Elvin's curious title of a well-known article on the history of agriculture in China with the ironic title, "Three Thousand Years of Unsustainable Growth." I believe what

he meant by the irony is that while agricultural practices would appear by all accounts to be unsustainable, nonetheless, they had sustained a population of about four hundred million people until the beginning of the twentieth century. To be sure, many tens of millions were killed by catastrophic drought, famine, and war over the centuries, and Elvin refers to the environmental disasters also brought about by agricultural activities and policies. These agricultural activities led to building levees and dykes to control rivers and

enable transportation and irrigation for the increasing population. In turn, the rivers rose still higher and frequently broke through the embankments. Often, because of the increased acreage brought under agriculture, the waters were unable to find wetlands into which to drain causing highly damaging floods (Elvin, [1993](#)).

Nonetheless, the land continued to support the very large population not only because of return of nutrients to the land through silt and human

“waste,” but because Chinese farmers also continuously developed means of adaptation to their micro-environments (Gao, [2022](#)). Despite the unprecedented nature of environmental degradation in nineteenth and twentieth century China, many pockets of protected forests and waters have survived around China’s sacred mountains like Mount Tai or around Buddhist monasteries and Daoist temples. Moreover, Christopher Coggins and his collaborators have discovered instances of traditional conservation

practices that remain in many villages across a wide belt in South China called “fengshui forests” (风水林) or “wind and water forests.” These are a kind of sacred forests of old-growth trees around the village to protect the hydrological and ecological resources critical to community survival and well-being. Coggins and his collaborators have recently extended their research to survival and role of “sacred forests” across East, Southeast, and South Asia. They explore the indigenous and other rural communities which continue to

depend upon the disappearing forest resources and which they have traditionally protected by sanctifying them through their cosmological systems and with their knowledge of the local ecology (Coggins & Chen, [2022](#)).

Yunnan in southwest China has a population of 48 million people and is home to twenty-four ethnic minorities who constitute about 33% of the population. These minorities live in forested hills and mountains and maintain “fengshui” and other

collective forests (Menzies, [2007](#)). The province is the most densely forested borderland in southwest China. It had historically been considered a global biodiversity hotspot with twelve thousand species of plants, of which 29% can only be found here. The minority cultures have accumulated a vast storehouse of indigenous knowledge of natural resources in this unique environment (CEPF, [2002](#); p. 6). As a result, Yunnan had the reputation as the cradle of environmental activism. At the same time, activism also resulted from the

massive deforestation and dam projects in and around the province. The globally unprecedented rapidity of economic growth in China has led to massive environmental costs particularly through industrialization, deforestation, and dam building.

Of course, it is not only Chinese agencies and companies that exploit the environment domestically and in Southeast Asia; globally most countries with rainforests including Myanmar, Thailand, Laos, Cambodia, Vietnam, India, Indonesia, and the

Philippines in the region are also engaged in resource exploitation of these environments. We note here that at the same time that these states have permitted and collaborated with powerful multinational companies to penetrate deep into these resource frontiers to facilitate massive extractive and hydropower projects, they have also created conservation programs and protected zones, often following United Nations agreements and protocols. In these zones, they sometimes seek to recruit the

assistance of the local and indigenous communities.

There are many government agencies and non-governmental groups (NGO) who are sincere in their efforts at conservation, but, at best, their efforts have mixed results under conditions of corporate power and illegal or collusive gangs bent on extracting resources. Conservation practices can be helpful, but they often offer one-size fits all, homogenized models which conflict with local knowledge and community interests. Studies of

protected Areas and conservation in China (including Yunnan) reflect the mixed results. The neo-liberal approach to raise revenues through tourism often took place at the expense of conservation and indigenous and local communities who received only 3% of revenues. A few areas in which there have been more local participation were more successful (Zinda, [2012](#), 384–388). On the other hand, where genuine grass-roots participation is absent, protection is sometimes a front for

predation, as we will see in the Prey Lang forest case below.

Deforestation in Yunnan was rapid during much of the Maoist period, but state policy since 1981 encouraged afforestation and prohibited logging in 1998 which led to outsourcing China's lumber requirements.

Afforestation has, however, not led to biodiversity but to a plantation economy, whereby many forests were transformed into commercial rubber plantations. Thus, while tree cover in Yunnan is still maintained as the

highest among all provinces in China, its biodiversity has been lost.¹

Meanwhile, China has sought to outsource its forest resource requirements (Frayer et al., [2014](#), pp. 3260–3261).

Nonetheless, Yunnan's reputation as the cradle of environmentalism remained until about a decade ago. Home to six major river basins, Yunnan's Eastern Himalayan mountains which rise high above the valleys of the upper Nu/Salween and Lancang/Mekong acquired UNESCO

protected status. This protection was a result of campaign efforts to conserve and protect the mountains from logging, mining, and damming interests by Chinese and Southeast Asian civil society groups in the 1990s and the early 2000s (Duara, [2015](#)). In 2003, umbrella organizations, such as the Salween Watch Coalition composed of 80 NGOs from Myanmar and Thailand, together with several international NGOs including International Rivers Network and Conservation International, cooperated with their Chinese

counterparts such as Friends of Nature, Green Volunteers, and Yunnan Green Watershed to put pressure on the Chinese government to declare its protected status.

A media campaign was built up to raise national and international awareness of the issue and successfully appealed to Premier Wen Jiabao, himself a geologist by training, who responded by halting the Nu/Salween projects in April 2004. By one count, 159 newspaper articles were written on the project from 2003 to 2006. The

movement flared up again in 2009 when the permission was granted to hydropower corporations, Huadian and Huaneng, to construct a scaled back project of four dams on the river. Once again Premier Wen intervened, and work was once again suspended (Han, [2013](#); 323–324). The plan was resuscitated in March 2013, just ahead of Premier Wen's retirement, and though the new version seeks to build only five of the 13 original dams, the political circumstances leading to its revival were unclear for several years. Finally, the project was given up in

2016 because of persistent civic activism and seismological dangers (EJA 10.26.[2018](#)).

As of 2022, six large hydropower stations have been constructed on China's Upper Mekong (S&P 2023). A dozen more are planned. Note this is a highly fragile geological zone and geologists have also warned of future seismic activity. However, Chinese hydropower companies and Southeast Asian state agencies together with global financiers have planned dozens of other dams downstream in

Southeast Asia on both rivers. Most of the electricity to be generated is designed to reach urban consumers. Laos, for instance, exports electric power to Thailand and other countries and seeks to generate the bulk of its foreign exchange requirements from exporting power.

Meanwhile, this gargantuan dam building frenzy has led to severe habitat degradation and biodiversity loss in both aquatic and terrestrial ecosystems. Dam impoundment and reservoir creation has changed

sediment regimes and the chemical and biophysical quality of water.

Impoundment has flooded large areas of land which has affected forests, shrubs, agricultural lands, and loss of routes for migratory species and introduced invasive species. Most of these changes to natural systems are considered irreversible.

PRC Govt reports claim that 10 million people have been relocated in China because of dams, but alternative Chinese estimates put the figure at closer to 22 million. Yunnan had 81.12

GW of installed hydropower capacity as of the end of 2022 and is expected to reach 100 GW (compared to the US total of 100 GW) generated from the cascade of dams being built, mostly on the Upper Mekong (Wang et al., [2014](#), 77; Yin et al., [2023](#)). Brian Eyler suggests that once the last dam is built, “upward of eight million residents of these remote river valleys, most of them ethnic peoples, will be forced to relocate to lowland settlements far away from their upland homes” (Eyler [2019](#), 50). Furthermore, compensation has been

low and does not include the loss of embodied skills and community relationships. These minorities have lost their grazing and forest lands and need to find new occupations and communities (Wang et al., [2014](#), chap. 4).

Deforestation and Resistance in Prey Lang Forest, Cambodia

Prey Lang Forest, located in the Mekong Basin, west of the river in Cambodia, is the largest remaining lowland rainforest in mainland

Southeast Asia and an enormous carbon sink. The landscape of the region which traverses the divide between the Mekong basin and Tonle Sap Lake supports over 55 threatened species of plants and wildlife, including mega mammals such as the tiger, the Asian elephant, and the gaur. Prey Lang simply means “our forest” in the language of the 150,000–200,000 mostly Kuy people who depend on their livelihood and culture on the forest (UNDP Equator Initiative, [2018](#)). Over the last several decades, the forests have been ravaged

by illegal logging and government land concessions of many thousands of hectares to plantation companies for agro-industry of acacia and rubber trees. The Royal Government of Cambodia justified these concessions in the name of the UN's Clean Development Mechanism, but they have severely threatened the high value biodiversity and the ecosystem services for the forest people who depend on forest products and the valuable resin tapped from the *Dipterocarp* trees (Scheidel & Work, [2016](#). pp. 1–4).

Around 2002, the Kuy dwellers of Prey Lang forests began a movement of protest to conserve their old-growth forests (Scheidel & Work, [2016](#), p. 4). The local community developed a group known as the Prey Lang Community Network (PLCN) which protested not only the illegal logging but also the government-sanctioned plantations which were justified (or greenwashed) as improving conservation by, in the words of Scheidel and Work, “removing natural forest and replacing it with ‘artificial’ forests” ([2016](#), p. 4). PLCN organized

peaceful protests in Phnom Penh main public square for many years; they also followed the Buddhist practice of ordinating trees with saffron robes in order to sanctify them, making their logging a sin. Buddhist monks, some of whom are highly respected figures in the country, conducted these ordinations—a practice also well known in Thailand—and play an important role in the PLCN organization.

In 2011, the protests grabbed global public attention when the Kuy

protesters began to call themselves “Avatars” referring not only to the Hindu-Buddhist idea of a reincarnated soul, but to the Hollywood blockbuster film known by the same name (Hance, [2011](#)). They painted their faces green, covered their heads with large lotus leaves, and donned green clothing to echo the exploited (fictional) Navi beings in the film. Accompanied by their traditional drums, music, and prayers, around 200 Kuy protestors gathered around the capital square; they drew the attention of thousands among the youth and others in the

country as well as the global media. Several other activist indigenous groups from forests afar as Bolivia and India have or had also adopted the Avatar idea.

The Cambodian Avatars not only succeed in gaining name recognition for Prey Lang but also a great deal of support from Cambodian and international NGOs and were able to develop resources to strengthen PCLN activities. Among these activities is the organization of a routine project of community monitoring of the forests

during which they use motorcycles and cell phones to report illegal logging. The movement achieved a fair amount of success through the next decade in protecting the forests from loggers despite being without major external funding and lacking land-titles and legal power to enforce rules (Turreira-García et al., [2018](#)). The neighboring Areng community in the Cardamom Forests who are allied with PCLN also succeeded in preventing dam construction by a Chinese hydropower company in 2017 (Duara, [2017](#)). PLCN has built solidarity and

perhaps a new articulation of identity among forest dwellers as custodians of rainforests. Network members told stories not only of losses and damage to their own communities, but also about the endangerment of ecological services downstream to farmers and fishers. PLCN has played a crucial role in the cross-fertilization of ideas and knowledge between local communities and environmental NGOs (Parnell, [2015](#), p. 268–269).

Despite the successes, the Cambodian regime reveals the extraordinary

hypocrisy that is occasionally expressed in government proclamations about the successes of conservation and protection policies. We have noted how the Royal Government of Cambodia granted forestry concessions of many thousands of hectares to plantation companies in the name of the Clean Development Mechanism which had devastating impacts on the ground to the ecosystems and to the people (Scheidel & Work, [2016](#)). Meanwhile, the regime claims to have protected the forests from illegal logging by

creating a Wildlife Reserve Sanctuary in 2016 within Prey Lang forests. However, this reserve prevents the indigenous communities from entering and using the resources of this vital part of the forest (Flynn et al., [2022](#)). The regime has also suppressed and persecuted members of the PLCN under a widely criticized Law on Associations and Non-Governmental Organizations created in 2015 thus denying the legal right of local communities and Indigenous Peoples to participate in sustainable management. Meanwhile, illegal

logging with government collusion is rampant. Data published by the University of Maryland in partnership with Global Forest Watch show that “over 9,000 hectares of forest was lost during 2020. Twenty percent more trees were lost in 2020 than in 2019” (Amnesty International, [2021](#)).

Meanwhile, PLCN has been joined by other forest communities under an umbrella group implemented by Danish and Cambodian civil society organizations called Citizens Engaged in Environmental Justice for All (CEEJA) which has strengthened their

capacity to monitor and report illegal and unjust activities (Argyriou et al., [2022](#), pp. 6–16).

The Epistemic Engine

I introduce here the conceptual framework, albeit briefly,² in which I see the developments in these rainforest and riverine areas in the global context of the Anthropocene. The industrial forces and post-industrial technologies that drive change—whether progressive or devastating—can be understood through a concept I have called the

“epistemic engine.” The epistemic engine is a dynamic, circulatory force that emerged with colonial empires and the industrial revolution of the late eighteenth and early nineteenth centuries and continues to shape the world order today. The engine integrates the material and ideational dimensions of modernity. Materially, it is constituted by the economic and political structures that unceasingly seek resources, markets and profits globally. Here, I follow Giovanni Arrighi’s characterization of the relationship between state and

capitalism that made global capitalism possible “by the capture of mobile capital for territorial and population control, and the control of territories and people for the purposes of mobile capital” (Arrighi, [1994](#), 33–34).

At the same time, the episteme is grounded in the cosmological dualism between subject (human) and object (non-human/nature) that crystallized during the Enlightenment, particularly through Newtonian mechanistic science, and was charged with the goal of mastery and conquest

of nature in the name of progress. The episteme embeds Foucauldian forms of power within knowledge (power/knowledge). Foucault's notion of the episteme is the "apparatus" or "regime" which governs the separation not of the true from the false, but of what may, from what may not be characterized as acceptable knowledge—the conditions of possibility.

The vehicle or vector by which the epistemic engine circulates and structures the global order is none

other than the nation, and especially the nation form, i.e., the nation as an organized power and as an abstract form and norm. The nation is the epistemic engine that powers the circulation of Enlightenment cosmology and generates the legitimacy of the world order. It has been reproducing itself adaptively across the world over the last two and a half centuries. The nation form embeds the relatively durable ideas of popular, exclusive, and identitarian sovereignty, militarized territoriality, and Enlightenment progress.

Temporally, the nation form is expressed and naturalized in a linear and teleological history of self-same subject which realizes its glory through struggle and competition. The Subject is exemplified in the Spartan song “We are who you were, we will be who you are” (cited in Renan, [2018](#), 247). The nation is able thus to reconcile its requirement for a timeless essence (to claim territory and sovereignty) while promising progressive change. As the ur-form of all identity politics, the foundational sense of the Self in nationalism

requires a strong sense of the Other, and under certain circumstances, like the present, flares up with extraordinary virulence.

The goal of progress is framed in national terms and the competition between nations over control of global resources has historically been the fuel for the engine. Indeed, the circulation of ideas and practices of more successful nations are propelled by the high-octane fuel of competitive efficiency—in the manner of contemporary corporate firms—

learning, copying, adapting, and stealing from nations that are more successful in the productivity of its population and in garnering global resources. The history of the twentieth century in East Asia is one of the overhaul of older empires and polities to build nations because it seemed to them to be the only means of resisting imperialist competition and domination. It also became the means of beating them at their own game.

Thus, the epistemic engine absorbs and reproduces Enlightenment

axioms; it sanctions the unlimited consumption of energy and nature while discharging its exhaust on environment and society. At the same time, the Enlightenment also inspired Edenic ideals of nature which led to conservation measures in some colonies (Grove, [1995](#)), and doubtless these ideals have played a role in conservation projects of the nation-state system today. But the imperative in the engine to achieve progress and the “perfectibility of man” through the ruthless exploitation of nature has been overwhelmingly greater, even as

we have seen, in industrializing socialist societies. Indeed, over the last few decades, the epistemic engine has generated a runaway global technosphere with cascading consequences and counter-finalities that we now face.

The epistemic is *hegemonic* and not totalistic. Alternative worldviews shaped by historical and community experiences, such as religious ones, have, of course, always existed and are becoming increasingly visible. At the same time, as shown in the figure

below, these experiential worldviews tend to be expressed in the public sphere or politics in negotiation with or through the filter of the hegemonic engine. The question arises as to what extent these experientially based worldviews, whether religiously or historically based, drawing on *hyper-human* or *more-than-human* cosmologies, attentive to justice and planetary concerns can displace the hegemony of Enlightenment goals of mastery over nature as a resource for humans. The Prey Lang forest community and the global support

that they have drawn is an expression of the *more-than-human* cosmologies that attends to nature as a source of sustenance and care. Below, we will see ways in which local and indigenous groups combine with civil society and NGO groups, often around a conception of nature as sacred, even if the “sacred” is approached from different perspectives.

The Epistemic Engine

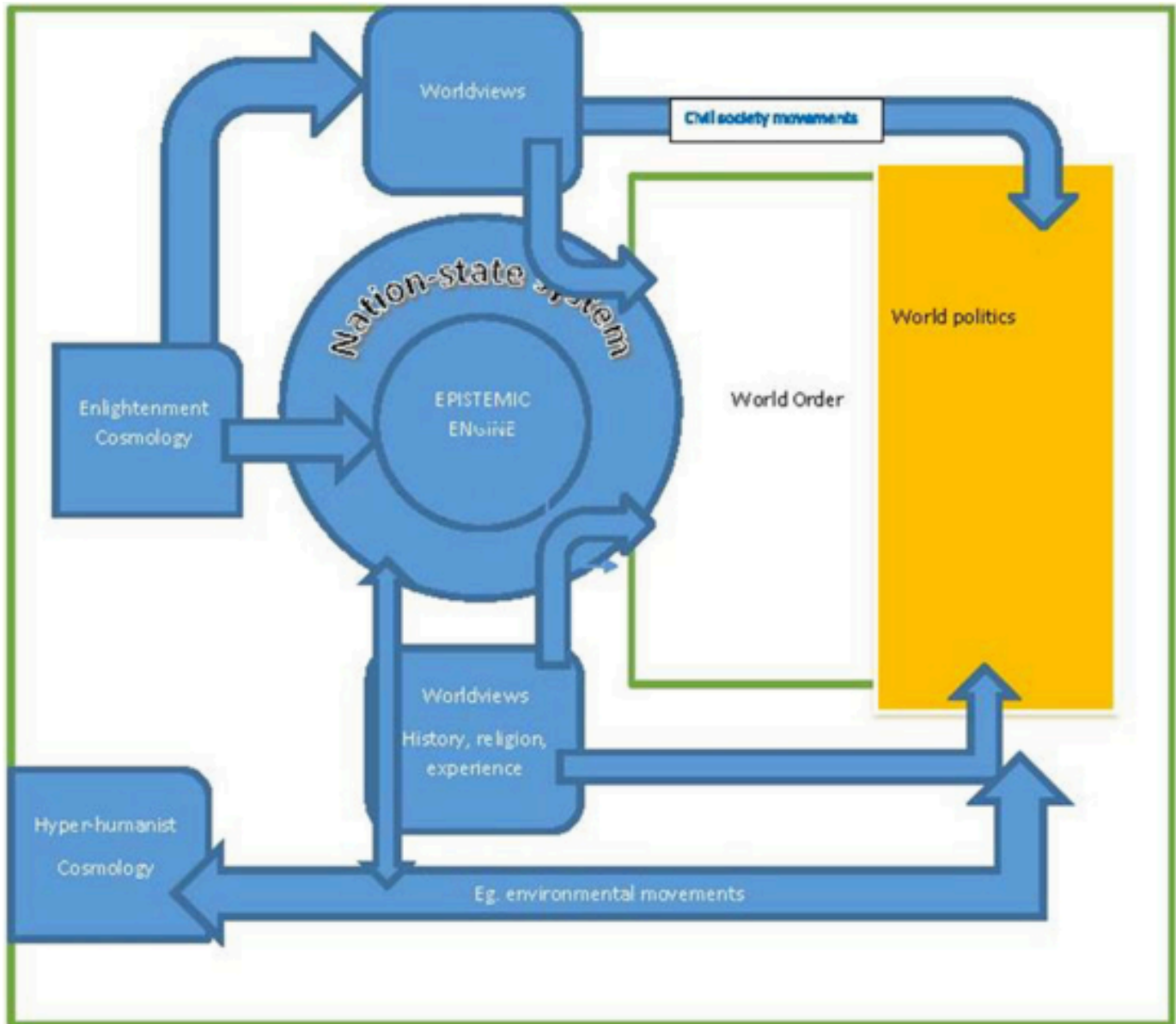
Notes: The World Order deriving from Enlightenment cosmology is the

represented in the evolving Westphalian–Vatellian–UN order. The epistemic engine mediates the relationship between the cosmology and the world order and world politics. Worldviews, also deriving often from the Enlightenment cosmology may directly play a role in world politics or more usually via the nation–state system.

In the lower part of the diagram, on the left–hand side, the Hyper–humanist or more–than–human cosmology box represents groups that

can directly seek to impact world politics but may also be mediated through the nation-state system. I will return to this box diagram in the conclusion. Diagram from Duara,

2022.



Dams and Their Local Effects

Although China has been very progressive with regard to many

aspects of climate change, it remains an increasingly significant part of the epistemic engine. Today China has the most developed non-fossil fuel energy in Asia representing over 50% of its energy consumption (Reuters, [2023](#)). China considers hydropower to be renewable and it constitutes about 16% of its renewable energy within the nation and accounts for over half the growth of hydropower in the world in the new century (IHA [2023](#)). Yet although hydropower does not emit greenhouse gases to the same extent as fossil fuels, we have seen that it is

highly damaging to the environment and local communities and populations downstream, particularly on rivers like the Lancang/Mekong which provision over 60 million people and represents a major hotspot of biodiversity. The multiplicity of cultures and variety of biodiversity are, as we have seen, closely co-related and below I show the loss of local knowledge and ecosystem services in this vital region as well as local community and environmental activist resistance.

As noted, China has already built eight dams upstream on the Lancang/Mekong in its territory, while Lao PDR has 16 dams on the tributaries with many more in the building and planning stages, five of which are on the Mekong, including the controversial Xayaburi dam.

Across the Mekong River Basin (MRB), more than 100 hydropower dams have recently been constructed (Pokhrel & Tiwari, [2022](#), p. 1005). Both the PRC and Lao PDR view water resources as the source of essential and highly profitable hydropower necessary for

the development of their nations.

About 40 Chinese SOEs and private firms, including Chinese multinational hydropower companies such as Huaneng, 3 Gorges Corpn, and SDIC, are often involved with local govts in building dams (Maurin & Yeophantong, [2013](#), 296).

But national governments in Southeast Asia are also working with other multinational engineering and financial corporates in this frenetic dam building rush. However much national and local governments may

declare and wish to address or redress the impact on the local population and the environment, the desire for potential profits and debt servicing to international finance drive them to make the financial rate of return of power output override all other priorities in the construction of dams. This is where we can see the imperatives of EE. Jerome Whittington writes about dam building in Laos after the 2000s when dam building became subject to tougher environmental laws and to scrutiny by environmental activists in several

Asian countries with active civil societies. Global corporate investors sought out countries with “stable” or “docile” political systems to generate electricity for demand elsewhere, principally—in this case, Thailand.

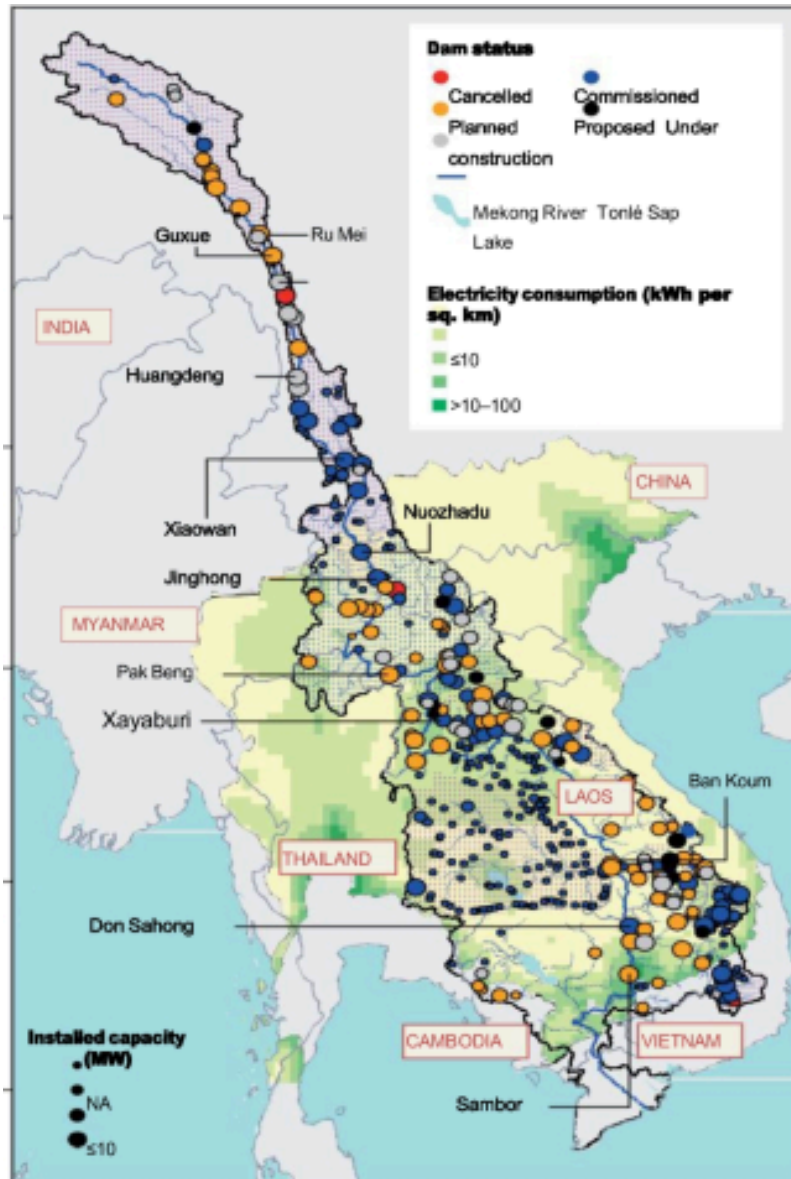
The Theun-Hinboun Dam on a tributary in Laos studied by Whittington had Thai, Norwegian, and Swedish financial backers. The Lao government owns a controlling share, while key managers are American, Canadian, and New Zealanders. Whittington writes, not

unsympathetically, about dam engineers and post-dam sustainability planners who collaborate with a transnational environmental activist group representing the well-known International Rivers Network. This collaboration represents a unique project and Whittington finds that the engineers' plans are frequently challenged by the activists, revealing gaps and problems in them.

Nonetheless, he suggests that the overriding concern is for the 17% financial rate of return required from the dam—which has to generate

power at the rate of 110 cubic meters per second of water volume—if it is to service the international debt and make a profit. This calculus takes priority over all social and environmental outlays (Whittington, [2018](#); loc. 449) It is the calculus of the

epistemic engine.



Dams and electricity consumption in the Mekong River basin. “The background image shows electricity usage for the year 2015 for Lower Mekong countries: Thailand, Cambodia, Laos and Vietnam. The blue hatches show areas obstructed by the Xayaburi dam while the magenta hatches show areas obstructed by other dams. Selected large dams — commissioned, under construction or planned — are labelled. The dam data are based on the database of the Research Program on Water, Land and Ecosystems (WLE), Greater Mekong. Dam status is colour-coded whereas the installed capacity (megawatts) is marked by circle size. The basemap data are from ESRI. NA, data not available.” (Pokhrel and Tiwari 2022, p1005)

By and large, state planners, engineers, developers, and technocratic elites engaged with dam planning and building, principally for

hydropower for urban consumers, appear not to see the multidimensional losses that occur to the ecosystems and the ecosystem services of the river basin or to the multitudes of people who are affected by these losses. Moreover, because these rivers cross national territories and have multiscale effects, they are not cognizant of how changes on one part of the 800,000 km² Mekong River Basin effects the river in another part or in another country.

Over 60 million people and a hundred different ethnic groups rely on the Mekong basin for their nutritional requirements and on ecosystem services generated, for example, by fish migrations, seasonal water-levels, and flows of sediments, nutrients, and larvae. Dam building and other riverine infrastructural activities alter, perhaps irreversibly, the hydrology of the ecosystem by decimating fish stocks, preventing natural fertilization of the floodplains, inundating agricultural and forest lands, and promoting saline intrusion

into the Mekong delta. It could result in a colossal security disaster made up of food shortages, destruction of livelihoods, and irregular movements of people that could—and have already—eventuate in violence and civil war.

If, to adapt a famous phrase from James C Scott, “seeing (the river) like a state” cannot envision or afford to view the immediate effects on the people and the long-term damage to the environment, the effects on the livelihoods of the people are becoming

abundantly clear to many in the countries involved. The Tonle Sap lake in Cambodia, the largest freshwater lake in Southeast Asia and connected to the Mekong by the Tonle Sap river before the former forms the delta and enters the sea in Vietnam, has among the most diverse ecosystems of lakes in the world. The livelihood of the population that live on and around the lake is dependent on the annual flood pulse that in turn is dependent on waters of the Mekong that backwash into the lake in the rainy season. During the summer monsoon, the lake

rises by as much as 26 feet until the fall, when it starts to drain again, “an event that Cambodians mark with a three-day festival of boat races and fireworks. The ecological term for such a cycle is a flood pulse, leading some to label the Tonle Sap the heartbeat of the Mekong region...The 2019 mark was 10 feet below normal” (Bengali, [2020](#)).

An international team of researchers has confirmed the long-term decline in flow of the Mekong into the Tonle Sap and the lower levels of inundation

between 2000–2009 and 2010–2020. The average annual discharge or the backflow of the Mekong water into the lake dropped by 21.7% between the two decades. During the latter decade, the inundation area shrunk by about 16%, of which 13% and 50% of the total change was attributable, respectively, to climate change and increased human activities in China and downstream (Morovati et al., [2023](#), p.10). Grundy–Warr and Lin have concluded that the multiple megaprojects in the vast Mekong River Basin have compromised the

hydrology of the flood pulse and produced an “urgent socio-ecological security issue facing the Mekong region” (Grundy-Warr & Lin, [2020](#), p. 249).

The fertile Mekong Delta in Vietnam was built up by sedimentation and nutrients bound in the sediment in its 3000-mile course over the past 7000 years during the Holocene. The delta is extremely fertile, supporting 17 million people and producing 7 to 10% of all rice traded internationally. It is, however, in danger of subsiding

and becoming part of the sea by the end of this century largely because of the blockage of sediment and organic materials flows. As we have seen, it is hydrologically connected to the Tonle Sap Lake which stores the water during the monsoons, preventing extreme floods in the delta, while gradually releasing it during the dry season which sustains its agriculture in this season (Kondolf et al., [2018](#), p. 118). The extensive dam building, sand mining, and other human activities in the rivers and tributaries, together with climate change and sea-level

rise, have significantly reduced the sediment load which had built the entire delta. The Mekong Delta's sediment surface is “a ‘critical zone’ that involves complex interactions of soil, water, air and organisms, which regulate the human and natural habitat and largely determine the availability of life-sustaining resources.” This geomorphology has been compromised by rapid and accelerating sedimentation loss over the last thirty years or so. The livelihoods of the people are being severely strained and the delta itself is

drowning (Kondolf et al., [2018](#), p. 118; [2022](#)).

Resistance

The Mekong River Commission (MRC), an inter-governmental organization, was originally established (as the Mekong River Committee) under the aegis of UNDP to promote large dams in Southeast Asia during the 1950s. Since the 1990s, and especially in the 2000s, transboundary community and civil activism across Southeast Asia particularly along the Mekong basin,

has directed its critical ire at the MRC. A letter signed by over 200 civil society groups and others from the Mekong and other countries in 2007 launched a scathing critique of “extraordinary abdication of responsibility” on the part of the Commission. In 2008, the international conference on “Mekong mainstream dams: People’s voices across borders” held in Bangkok presented a report that effectively articulated the normative role and responsibilities of the Commission. These civil society groups have since

been increasingly pressing the Mekong River Commission to adhere to the more inclusive and sustainable priorities and procedures of the World Commission of Dams adumbrated around the year 2000. Nonetheless, the corporates and state power together with local state elites remains the principal player for all parties in inland Southeast Asia (Duara, [2015](#) chap. 7).

The activism of communities and NGOs along the Mekong basin has led national governments to require dam

builders to carry out environmental and social impact assessments. But “the technical ‘experts’ who produce assessment reports often reinforce discursive framings that support governance systems designed for the benefit of growth-oriented development policies” (Green and Baird, [2020](#), p. 3). In response, affected communities join with coalitions such as Save the Mekong Network and regional organizations like Towards Ecological Recovery and Regional Alliance (TERRA) who bring together disparate NGOs and civil

society groups, to contest the assessments and demand appropriate redress, albeit with mixed results. This kind of activism has helped communities scale up all the way to the World Commission of Dams and even the World Bank to downsize or reduce impact of dams in other ways. But of course, community and NGO activism also has limits and sometimes in places like Cambodia, they have had to adjust to compromise solutions. They have had to, for instance, limit compensation only to the people displaced by the reservoir

rather than the wider, even transboundary spaces, where the dam's effects on migrating fish and water levels have displaced communities up and downriver (Green and Baird, [2020](#), 3–5).

In this context, the case study of the Rak Chiang Kong community movement which functions on the transboundary zone of the Mekong marking the border between Thailand and Laos represents success and adaptation based on local knowledge by communities. We have noted how

the more unpredictable flows along the Mekong have led to livelihood insecurity due to the loss of previously predictable fishing zones. In Northern Thailand's Chiang Kong district on the southwest bank of the Mekong on the Thailand-Laos border, a community-based environmental movement known as the Rak Chiang Kong succeeded in preventing the Chinese initiated plan to slow the rapids by blasting the river so that ships linking Yunnan with Laos could navigate more smoothly. Ming Li Yong has shown how the Rak Chiang Kong movement

for conservation of their livelihood and cultural practices may be understood by “a deeper comprehension of the ways in which they value the Mekong River” (Yong, [2020](#), p. 203).

Historically, the rapids in this part of the Mekong had enabled the communities to fish on both sides of the border. Migrating fish migrate spawn within nine large rapids that alternate with deep pools along the 175-km stretch of the river and the floodplains formed by the annual

pulse of the river and its tributaries. In the district, there had been traditional fishing zones around the pools known as the *luang* and each zone could be shared by villages on both sides of the river. The *luang* were unmarked, but known by the villagers and appeared to work well enough. Even before the Chinese proposal, upstream dam construction as well as dynamiting and electric fishing (apparently from the Laos side) had reduced the fish which led to many fisherfolk on both sides of the Mekong to move to farming instead. The community re-

arranged their traditional mode of sharing the fish along the river and across the transboundary jurisdictions with the Laotian fishing communities. The Rak Chiang Kong devised a system where boats would have to queue daily and were given three turns to fish a day; boats would have to pay a maintenance fee during the season for the upkeep of the *luang*. In this way, they were able to use their local knowledge to innovate and sustain their livelihood practices in the common space (Yong, [2020](#), pp. 208–209).

Upon being alerted to surveys conducted by the China-led Navigation Channel Improvement Project designed to blast the rapids and sand banks over 300 km, arriving in their part of the rapids, the Rak Chiang Kong leadership rallied the riparian communities to oppose those plans and prepare an alternative survey from the perspective of the riverine communities. The movement was led by Kru Tee, a local leader who was also involved in the regional movement opposed to Mekong dams, particularly, the Xayaburi dam in Laos

which had significant Thai capital involvement. Ormboon Thipsuna, an activist who survived a 2008 megaflood that locals believe was caused by dams in China, said,

Kru Tee made us aware of the dams' impacts. Since then, we have done many campaigns together. I learned about his experiences in conservation movements. We formed the Thai Mekong People's Network from Eight Provinces, and co-filed a lawsuit to challenge the

Xayaburi dam project (quoted in Chinvarakorn & Jitjang, [2021](#))

The leadership argued that they were opposed not only because it affected the fishing environment and other organic material, but that the expansion would only re-arrange the locations of sand bars and beaches in the river and would continue to hamper shipping. In 2002, they succeeded in their petition to the Thai Senate to cancel the project, and in 2003 the project was cancelled beyond the first stage and before it reached

Chiang Kong. It is believed that there were also security considerations for the Thai govt's decision. Although the idea of the project was revived again in 2016, by early 2020, the Thai government cancelled the "Lancang-Mekong Navigation Channel Improvement Project" long pushed by China (Chinvarakorn & Jitjang, [2021](#)).

The Rak Chiang Kong continued to strengthen their organizational and community defenses against transnational powers by reconstituting their traditional

territory of the *luang* as elements of conservation zones for locally regulated fishing. The Khong also provided an alternative environmental impact assessment from the perspective of the villagers. Using traditional ecological knowledge of the many species of fish, with descriptions of typical weight, length, habitat, behavior, eating, spawning seasons etc., they kept records to document changes to the river caused by the new projects as well as natural events. In 2016, they set up the Mekong School of Local Knowledge (Yong, [2020](#), 212–

213). Kru Tee, the leader firmly believes “the process of grassroots research, wherein locals collect information and analyse it themselves, will transform their own worldviews and attitudes.

Contributions by academics from different fields and universities will strengthen and add credibility to this unique body of knowledge”

(Chinvarakorn & Jitjang, [2021](#)). At the same time, existing temples, rocks, and Buddha statues on both sides of the river now ceremonially ordained by monks were incorporated into the

conservation zone and the entire zone was brought under the Thai notion of Thamachat, a master conception in Thai of the inseparable relations between humans and non-humans. The sacred ecology thus created provided an authoritative defense not only against violators and free-riders but also against possible extension of the navigation projects and other megaprojects in their region (Yong, [2020](#), 214).

As in the Prey Lang and more generally, the Cambodian resistance

cases, there are two notable points in relation to the preservation of biodiversity and local knowledge and cultures. The first is that while historically cosmological notions and local knowledge had sustained the commons of these marginal communities, they were by no means sufficient to resist the gigantic hydropower and logging interests representing the epistemic engine of capitalist nationalism. They needed to be combined with modern knowledge and media technologies to be able to hold them off. This brings us to the

second and related point: the need to scale up the resistance. Ecological entrepreneurs such as Kru Tee had not only experience in the wider anti-Mekong dam movement that swept through the 2000s, but also the capacity to scale up and petition the Thai Senate Committee on the Environment on the environmental impacts and evoke the Thai state's traditional security concerns on the Thai-Lao-China frontier region (211). The navigation project was called off in 2020. Prey Lang used the Avatar motif to draw attention to them again

at a multiscale level and successfully stave off loggers from a major part of their forests.

Conclusion

Given the planetary scale of the epistemic engine, it goes without saying that the effects of subsidence and disruption of local and river-wide ecosystems discussed above are a global phenomenon. In recent times, there are about 6000 existing or planned hydropower dams greater than 15m in height, worldwide, in addition to innumerable small dams.

Globally, 48% of rivers (expressed as river volume) are moderately to severely impacted by either flow regulation, fragmentation, or both. According to two Austrian hydrological and hydrobiological experts, “Dams are among the most damaging human activities in river basins, deeply modifying the physiography of watersheds” (Schmutz and Moog, [2018](#), 117). The ecosystemic, morphological, hydrological, and climatological changes they entail are drastic and often irreversible.

To cite a few instances of the hydro-morphological changes, two dam cascades were completed around 1960, the Volgograd and the Aswan High dam on the Nile River. The cascade on the Volga which generated major riverbed incision³ reduced the connection of the river to its vast floodplain and affected the productivity of the entire floodplain system (123). The Aswan High Dam in Egypt severely affected the magnitude and duration of the annual flood pulse downstream of the dam, disrupting the natural inundation of the

floodplain and affecting the ecology of the region that had sustained the Nile valley for millennia. Not to be deterred, the Ethiopian state has launched The Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile River which has the potential to further affect the flow of the Nile River downstream in Egypt and Sudan.

Like the Tonle Sap in Cambodia, Dongting Lake and Poyang Lake on the Yangzi river have also historically served as natural backwater reservoirs storing potential floodwaters until the

peak flood season has passed. With the construction of large-scale dams on the river such as the Three Gorges Dam and others, these lakes have expressed a tendency to “less flooding during the flood season and more drying during the dry season.” The hydro-morphology of these lakes has been severely affected as has the productivity levels of the floodplain system (Yu et al., [2018](#); Mu et al., [2022](#)).

Delta subsidence in several parts of the world, for instance in the Rhine River

Delta in the Netherlands, in the Indus Delta in South Asia, and the Mississippi River Delta, has also been largely caused in recent centuries and decades due to human activities such as land reclamation, flood control measures, urban development, and, not least, extractive industries. The rapid subsidence of the Mississippi River Delta was said to average about 8 to 12 mm/year between 1965 and 1993, whereas average geological rates of subsidence for the past 5000 years were about 1 to 5 mm/year. Oil and gas drilling requires great volumes of

ground water even before the age of fracking. Geologists have concluded that regional subsidence and local fault reactivation yielding almost the entire Mississippi Delta Region to the sea by 2100 have been significantly induced by hydrocarbon production in oil and gas fields over the last century or so (Morton et al., [2005](#), p. 566).

My goal has been to study the impact of these planetary disruptions generated by modern epistemic and political economic structures upon small communities and their local

modes of sustainability. Despite the massive odds against being heard and listened to in the global public sphere dominated by the epistemic engine, these movements have been able to increasingly make their voices heard, and more importantly, express their agency by stopping activities that have hurt their livelihood and commons, even if with limited or temporary success. Retaining what remains of the planet's biocultural diversity is the vital role played by indigenous peoples, island and coastal communities, forest dwellers,

marginal rural people directly dependent on natural resources, and their knowledge of the commons in global civic activism. Over the last few decades, these communities have been increasingly active and joined by NGOs and other civic groups of professionals, scientists, youth groups, and various local and transnational entities both large and small, in the effort to protect the environment by pressuring governments and organized capital and holding their feet to the fire.

To be sure, this encounter of the two communities, one with modern scientific knowledge and the other with local knowledge of the ecosystem services and their frequently animistic (or panentheistic) cosmology, generates contradictions and problems, but they converge on a cosmology that is different from that of the epistemic engine. Rather than the binary between humans and nature permitting humans to dominate nature, they tend to adhere to a *more-than-human* cosmology (see diagram) which emphasizes the

interdependence of humans with the diverse natural world. This coming together of the two groups of people committed to environmental protection and justice represents an alternate global civil society and connects to a new notion of the sacrality of nature with social, discursive, and legal underpinnings. While for many of the threatened subaltern communities this sacrality is part of the ecology of life and livelihood, for the more disenchanting moderns, the sacrality of nature is expressed through the notion of legal

protection as the “common heritage of humankind.” I call these natural spaces sacred because they represent an *inviolability* arising from the elemental urge to protect the sources of life.

Legislation and judicial decisions of this kind have often been initiated, advocated, and pushed through by these groups. On several occasions, these efforts have begun to succeed. We have mentioned the Eastern Himalayas protected zone in Yunnan, above. In Bolivia, the USA, Canada,

India, New Zealand, and Ecuador, to name a few countries, indigenous communities have initiated movements to protect the commons that have succeeded in securing legal “rights of nature” sanctioned by the highest courts in the land. According to the Protected Planet’s collection of databases of protected areas, as of September 2023, 16% of the planet’s terrestrial and inland waters were in areas protected by nations and local jurisdictions, including several hundred Natural World Heritage sites. Of course, as we have noted, some of

these protected areas also represent camouflage for local and corporate exploitation, displacement, and misdirected conservation.

Nonetheless, the struggles and efforts to develop the alternate civil sphere of publicity and activity to manage the planet sustainably also continue.

These struggles and efforts are obligated to function within the legal systems of the epistemic engine, but they are equally impelled to stretch these systems to place nature at the heart of the global agenda.

Notes

1. According to a 2023 publication which used high spatial resolution satellite data, Yunnan had the greatest forest coverage of all provinces in China. However, when defined in terms of “forest area as proportion of total land area,” the percentage amounted to 54% and was exceeded by Fujian (70%), Jiangxi (61.70%), and Hainan (58%) (Xiaomei Zhang et al., [2023](#), p. 1017).

2. For a fuller discussion, see Duara [2022](#).

3. Incisions in a river occur when sediment is trapped (often by a dam reservoir), thus increasing flow by cutting downward into its bed downstream to try to maintain equilibrium.

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