

Death of the Mekong, River of Buddhism

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Introduction

From its origin in the high plateau of Tibet, the Mekong river is 4500 km long and the 12th longest river in the world, flowing through six countries that include China, Myanmar, Thailand, Laos, Cambodia and Vietnam. Through its long course, the river is known as Lancang in China, Mekong in Myanmar, Laos and Thailand, and finally as River of Nine Dragons because it flows out to sea through nine estuaries in south Vietnam. True to its name (Mekong means Mother River in Laotian), the Mekong river is the lifeline to more than 65 million inhabitants, mainly in downstream countries of Laos, Thailand, Cambodia and Vietnam. The majority of these inhabitants are Buddhists and all three major Buddhist traditions are practiced: Theravada in Myanmar, Thailand, Laos and Cambodia; Mahayana in China and Vietnam; and Vajrayana in Tibet. Hence, the Mekong is called the “River of Buddhism”. Most residents along the river are poor fishermen living off the river fish catch or poor farmers using the river water and rich silt to grow rice. They also use the river as their principal means of transportation. In the next two decades, the number of the basin inhabitants is expected to increase to over 100 millions. Their daily life is constantly threatened by floods, deforestation, pollution as well as ill-planned development projects. The biggest threat to their livelihood is the gigantic hydroelectric dams built or planned in Yunnan Province and the smaller dams in Laos and on the Lower Mekong. Moreover, the Chinese have cleared and enlarged the river as a navigation channel for large commercial boats including oil transport vessels. These development projects cause serious economic and environmental consequences in countries within the river basin. All these environmental effects will be worsened by global warming in coming years (Khanh Tran, 2014). In going ahead with these hydropower projects, upstream countries have not considered the interests and concerns of downstream countries. They may be the causes for conflict, political crisis and even war in the near future. Even the survival of the river may be in serious doubt in the next few decades. The remaining sections will discuss the dams and their environmental effects, and a Buddhist-inspired response to ensure the peaceful and sustainable development of the river resources.



Exploiting the River

In the last twenty years, there has been an active program to build several dams for hydroelectric power on the Mekong river. (Richard Cronin, 2010; Scott Pearse-Smith, 2012). As of 2014, there are 26 dams on the mainstream, 14 on the Lancang river (the name of Upper Mekong in China) in the Yunnan Province of China and 12 on the Lower Mekong. China has built a cascade of large dams on the Lancang, beginning with the Manwan in 1993 with an electrical output of 1500 MW. The Dachaoshan dam was completed in December 2002 with an output of 1350 MW, a height of a

30-story building and a water reservoir of 88 km in length. Next was the Xiaowan dam, with an output of 4200 MW and a reservoir of 169 km in length and a cost of 4 billion USD. This dam is the tallest in the world, with a height of 300 m similar to a 100-story building. The largest and most expensive dam (about \$10 billion USD) on the Mekong so far, the Nuozhadu, was completed in 2014 with a height of 261 m, a reservoir of 226 km long and an output of 5850 MW. At least eight other big dams are also planned by the Chinese.

Starting in 2006, companies from Thailand, Malaysia, and China have conducted feasibility studies of 12 run-of-river dams in the Lower Mekong Basin. Among these dams, Xayaburi is considered the first mainstream dam located in Laos and outside of China's borders. With an output of 1260 MW and a total investment costs of \$3.5 billion USD, it is funded by four major Thai banks and a Bangkok-based company, Ch. Karnchang, is the builder. In October 2013, the Lao government notified the Mekong River Commission (MRC) of its decision to build the second mainstream dam Don Sahong. It is a run-of-river dam located near the Khone Waterfall in the Siphadone area of Champasak Province of southern Laos, only 2 km from the Laos-Cambodia border. Its output is to be small at only 260 MW, with a height of 30m and a width of only 100m. The dam would block the Hou Sahong channel, the main channel for fish migrating between Cambodia, Laos and Thailand year around. This channel is especially important in the dry season when most other channels become impassable due to low water levels. The disruption of fish migrations through blocking of this vital channel means the destruction of vital subsistence and commercial fisheries in the Lower Mekong Basin. In spite of intense and wide protests, the Lao government still intends to pursue the dam construction. The Mekong River Commission (MRC) has recently announced that a regional public consultation meeting for interested stakeholders on the Don Sahong Hydropower Project will occur on 12 December 2014 in Pakse, Lao PDR (MRC, 2014).

In 1866, a French expedition team was led by Doudart de Lagrée and Francis Garnier to sail upstream the Mekong. The French team was stopped by the underwater rocks and rapids in Upper Laos. In recent years, China has completed the dredging of the river and clear the underwater rocks and rapids on a 300-km stretch of the river, from the Burmese-Chinese border to Laos to facilitate the travel by large boats. Commercial boats larger than 100 MT can travel from the port of Simao in Yunnan to other ports in neighboring countries. Of particular note are the oil transport vessels since they pose severe dangers of oil spills which can quickly devastate the entire Mekong ecosystem (MRC, 2012).

Environmental Effects

Dam builders in China and Laos have stated that all the above hydroelectric and navigational development projects should bring large benefits to the countries downstream. They have also maintained that any ecological and environmental effects, if existed, are minimal. The hydroelectric dams should alleviate the flooding problem during the monsoon season and the drought problem during the dry season. Turning the river into a shipping channel should also increase trade between China and other neighboring countries and bring prosperity to all. These development projects are often conducted in secrecy and little details are known. The dam builders frequently minimize or hide all adverse environmental impacts.

Contrary to the findings of the builders, hydroelectric dams cause severe economic and environmental disasters, affecting the lives of millions in countries downstream. Mekong floods occur annually from June to October and hundreds have lost their life. Most of the flood victims are children who die of drowning due to lack of supervision by older members of their family. There are signs that the Yunnan dams have increased the flood intensity. Since the water reservoirs have been full, the dams have released excess water that further raised the floodwater level of the Mekong. The number of flood victims and damages to crops and homes have increased in Cambodia, Thailand and elsewhere.

During the dry season, the Mekong water level is markedly low because only the glaciers in Tibet and Yunnan remain the water sources. The average flow rate decreases from 50000 m³/s during the rainy season to only 2000 m³/s during the dry months. The dry season normally lasts from November to May. If the upstream dams do not release water because of drought or water needs of the reservoirs, serious consequences can occur downstream. All downstream countries will be affected by saltwater intrusion, and rice fields in many places will have to be abandoned because of saltwater or lack of water for growing crops.

In addition to changing the water levels and the natural cycles of the Mekong, water reservoirs at the dams retain the rich sediment. Lacking water and rich silt will render the rice fields downstream less fertile. Rice production will decrease drastically, especially in the Mekong delta of Vietnam. In the first ten years of Manwan Dam's operation, the annual mean sediment trapped by the Manwan Dam alone was estimated to be about 35% of total sedimentation transported from Lancang Basin to Lower Mekong. The amount of rich silt may decrease up to 50% because of the dams. This will cause large crop losses since the Mekong delta is the main rice producing area of Vietnam. It accounts for 50% of total annual production of 28 MT and 90% of export of 7 MT. The delta also accounts for 60% of fish and seafood exports from Vietnam. This will affect millions of people in the Lower Mekong Basin and elsewhere, as far as Africa due to reduced rice and fish export.

While rice fields downstream lack the rich sediment, the dams in Yunnan are silted up. The rate of silt flowing into the Manwan dam has doubled compared to initial estimates. One of the reasons that the Chinese have used to justify the building of the Xiaowan dam is that this dam is upstream of the Manwan dam and, therefore, can reduce the amount of silt flowing into the Manwan dam. Nevertheless, the Xiaowan dam and all other dams will be filled by silt in the next few decades. All water reservoirs will become vast and useless wastelands! On average, the useful life of each dam will be shortened to about 20 years, compared to the initial estimate of 70 years.

With 1245 fish species, the Mekong is the second river in the world with the most fish species, just behind the Amazon in South America. Among these are rare species like the giant catfish weighing up to 300 kg and the river dolphin. Each year about two million metric tons (MT) are

caught in downstream countries. Lake Tonle Sap in Cambodia alone has produced 400000 MT. The Lower Mekong dams are small in terms of power output relative to the Chinese dams, yet their ecological effects may even be larger. The section of the Mekong at the Khone Waterfall where the Don Sahong dam (with a tiny output of 260 MW) will be located is considered as the vital point of the entire ecosystem of the Mekong basin. Right at the foot of the Khone Waterfall, one can find a congregation of the largest variety of fresh water fish not only in Southeast Asia but also in the whole world. Many independent fisheries experts conclude that the dam would have a serious impact on fish migration as the channel is the only one within the Khone Falls complex that is passable to migratory fishes in the dry season, and the major migration channel year round (Ian G. Baird, 2011). Of particular note are the risks to the survival of the Irrawaddy dolphins that only 85 are known to survive along this stretch of the river.

The Yunnan, Lower Mekong and other dams modify the water levels, temperature and cycles of the Mekong river. All these changes adversely affect the birth and growth of all fish species. Dredging the river also makes its water flowing faster and cause the erosion of the river banks. Underwater rocks that are currently prime breeding sites for fish have been destroyed. Several fish species will disappear because they cannot adapt to the unnatural changes. Fishermen in several locations along the Mekong have already complained that their fish catch has drastically been reduced in recent years. This is an adverse impact affecting the livelihood and health of millions of people in Cambodia, Laos and Vietnam since fish is their primary source of protein.

The Chinese government initially stated that the Upper Mekong dams are to provide power and economic prosperity to the Yunnan Province which is a relatively poor area. Contrary to this initial statement, electrical power generated by these dams is used by large cities and industries on the Eastern coast. Similarly, electricity from the Lao dams is to be sold to Thai users. In addition to serious ecological effects shown above, dams and their reservoirs can cause earthquakes. They also emit large amounts of greenhouse gases which cause global warming, mainly methane from decaying vegetation and soil (International Rivers, 2007). Methane is known to be about 25 times more potent than carbon dioxide (CO₂). According to scientific studies, e. g. those from Brazil National Institute for Amazon Research (INPA), a hydropower plant has more global warming impact per kwh than a coal-fired power plant! Costing about \$10 billion USD, the new Nuozhadu dam only replaces 9 million tons of coal burned per year, a tiny amount compared to the 3 billion tons of coal used by China in 2010. Even the smaller Xayaburi dam is estimated to cost around \$3.5 billion USD, a large financial investment for the small economy of Laos (2013 GDP is \$11.14 billion USD). Thus, contrary to popular beliefs, HYDROPOWER IS EXPENSIVE and NOT CLEAN! This important finding is consistent with a study completed in November 2000 by the World Commission on Dams (WCD, 2000). This study has found that most big dam projects in the world have not resulted in any economic benefits when compared to the construction costs, the resettlement of people and adverse environmental impacts. In July 2012, US Secretary of State Hillary Clinton had urged a delay and further study of the Xayaburi dam (Hillary Clinton, 2012). She even stated that the US had made many mistakes in water projects and called on the Mekong nations to learn from the US experience, offering to help fund scientific studies on the impact of the proposed dams. She stated that *“We’ve learned some hard lessons about what happens when you make certain infrastructure decisions and I think that we all can contribute to helping the nations of the*

Mekong region avoid the mistakes that we and others made.”

A Buddhist Response

Starting from its origin in Tibet, the countries and peoples along the Mekong river are predominantly Buddhist. All three major Buddhist traditions are practiced by its inhabitants: the Theravada tradition in Cambodia, Laos, Myanmar and Thailand; the Mahayana tradition in China and Vietnam; and the Vajrayana tradition in Tibet. Despite some differences, all traditions share the same following basic Buddhist teachings:

- The Four Noble Truths,
- The Eightfold Noble Path,
- The Three Poisons,
- The Middle Way,
- The Dependent Origination,
- The Five Precepts,
- Karmic Retribution and
- Buddhist Virtues (non-violence, loving-kindness, compassion, joy and equanimity)

The three poisons, mainly greed and ignorance, are the fundamental causes of the environmental crises and conflicts on the Mekong. Greed in monetary profits and other economic gains has fueled the construction of dams. For the Lao dams, profit is the sole motive since the generated power will be sold to Thai users and the large loans required for building the dams are huge investments in a tiny economy such as Laos. In any case, this monetary gain is highly uncertain as the recession in recent years has depressed electricity demands. Ignorance or delusion cause us to think the permanence of all things, to misuse natural resources and to ignore the serious environmental effects. In the last three decades, China has adopted the policy of economic development at all costs and has now realized that this unwise policy has severely polluted its air, water and environment. The dams may have offered some short-term economic benefits to the local economies (e.g., construction jobs, large investments) but these are far outweighed by the long-term sufferings of thousands who had to resettle (e.g., 43000 people resettled for building the Nuozhadu dam) and millions of poor fishermen and rice farmers who become even poorer due to reduced harvests. Dams have created widespread suffering, especially in downstream countries.

Since upstream countries are reaping all benefits and downstream countries are suffering most, if not all, environmental impacts, conflicts and even wars may arise. The Mekong conflicts can be resolved by applying the principle of dependent origination. Whether upstream or downstream, we have to realize that we live in an interconnected and interdependent world where anyone's actions, however small, will affect everybody else and the planet as a whole. In recent years, well-known Buddhist virtues such as compassion and loving-kindness have also been proposed as response to global warming and other environmental crises (Khanh Tran, 2014). These virtues, together with sympathetic joy and equanimity, are the fundamental qualities of a Bodhisattva who vows to work tirelessly to liberate all other sentient beings from suffering. Sentient beings include not only humans but also animals, such as the giant catfish and river dolphins that are facing extinction, and the environment in general.

The Mekong conflicts between upstream and downstream countries remind us of the dispute over water rights of the Rohini river between the Sakya and Koliya clans in Buddha's time. Buddha had intervened in this dispute which arose from the suspicions of an unequal distribution of river water. He had resolved it peacefully by asking the involved parties whether human lives lost due to war would be more valuable than the river water. Buddha spoke thus: "*Great kings, ministers, commanders, soldiers why do you want to fight and kill each other, for a petty matter like the distribution of water. If I did not visit you today, you would have set flowing Rohini - A River of Blood. You have acted in an unbecoming manner. You live in enmity. You'll all indulging in the five kinds of hatred. Look at me. I live free from hatred. Both parties in the warpath, live with evil passion. Therefore, do not hate each other. Live as Peace loving people. Hatred will not take you anywhere. Be compassionate and be kind to all*" (from <http://enews.buddhistdoor.com/en/news/d/28739>).

Strategy for Sustainable Hydropower Development

As mentioned above, upstream countries often minimize the environmental impacts of the dams and largely ignore the interests and concerns of downstream countries. Thus, extensive communication and cooperation between countries are required for sustainable development. An objective evaluation of the project requires a comprehensive environmental assessment (EA) which openly and accurately presents the costs and benefits as well as environmental impacts. This environmental assessment needs to consider inputs from all stakeholders, from dam builders to local farmers/fishermen and downstream countries. It is to be performed transparently and objectively by third-party consultants that are not biased and well-known for their expertise. Environmental impacts of the proposed dam project at all levels (local, national and trans-boundary), its costs and benefits, mitigation measures and project alternatives should be fully analyzed in the EA. All four downstream countries (Thailand, Laos, Cambodia and Vietnam) are members of the Mekong River Commission (MRC), while the two upstream countries (China and Myanmar) have refused to join but have frequently sent in observers. According to the 1995 Mekong Agreement, any development project is subject to the MRC *Procedures for Notification, Prior Consultation, and Agreement*. Under this agreement, the host country for the project should notify and consult the governments of the other signatories. Thus, it is recommended that all countries, including China and Myanmar, strictly adhere to this MRC protocol. This will minimize the suspicions between countries and seriously consider the interests and concerns of all parties. The MRC should also be granted some enforcement authority so that it can actively participate in conflict resolution.

Alternative Strategy for Sustainable Power Development

As mentioned above, dams are not cost-effective when their building costs and environmental impacts are considered. Contrary to popular beliefs, they are also not a source of clean energy, since they generate substantial amounts of greenhouse gases. Thus, a sustainable approach would be to develop renewable energy sources which are truly clean such as wind and solar energy. These clean renewable energy sources do not suffer the severe environmental effects of the dams. As the world largest emitter of greenhouse gases, China has recently committed to reducing its emissions of greenhouse gases by 2030 by using less coal and more renewable energy. Since power generated by the Lower Mekong dams is primarily exported to Thailand and Vietnam and the electricity amounts to be supplied to these countries are rather modest (7000 MW to Thailand

and 5000 MW to Vietnam by 2020), the deployment of renewable energy in the Lower Mekong basin can also be a viable and sustainable option. With costs rapidly decreasing, wind and solar plants offer competitive alternatives to dams. Instead of building the Don Sahong dam with an output of only 260 MW, solar and wind plants with the same power output will certainly be much less expensive. A modeling study conducted for the World Bank Asia Alternative Energy program has shown that good sites for wind energy are available in the mountains of central and southern Vietnam, central Laos, and central and western Thailand (World Bank, 2001). Moreover, wind and solar plants do not require vast lands and the resettlement of thousands of local peoples. They also do not cause adverse impacts on fisheries as well as rice production in downstream countries.

Alternative Strategy for Sustainable Economic Development

Economic development is often cited as a primary reason for building the dams. These economic concerns are certainly legitimate since the regions where the dams are located are mainly poor and economically depressed. We have recently proposed light manufacturing as a sustainable approach for economic development in low-income countries (Hinh Dinh et al., 2014). Based on studies conducted by experts at the World Bank, light manufacturing such as textile, furniture and wood working has been shown to be responsible for the economic miracles in China, Korea and Taiwan. It has the potential of creating quickly thousands of jobs without large capital investment and extensive environmental impacts. Unlike temporary jobs created by dam construction, light manufacturing jobs are long lasting and can lift millions of low-skilled workers out of poverty. It certainly is appropriate for low-income countries such as Cambodia and Laos.

Special Role of the Sangha

Since the countries and peoples along the Mekong river are mainly Buddhists, the Sangha can play an important role in shifting the construction of dams to clean, renewable energy and light manufacturing. In countries with Theravada tradition (Cambodia, Laos, Myanmar and Thailand), the Sangha has enormous influence in respective societies. It can use its influence to guide the government in adopting the right policies. More importantly, it can educate its lay devotees and the general public about the costs and environmental impacts of dams, and the benefits of clean, renewable energy and light manufacturing. All this Buddha's work can be done for good karmic retribution since, according to a popular Vietnamese saying, "saving a life is worth more than building seven temples"!

Conclusions

The hydroelectric dams, both in Yunnan and the Lower Mekong basin, cause severe social, economic and environmental disasters, both locally and in downstream countries, especially Cambodia and Vietnam. The survival of these countries along with the livelihood of over 65 million people are threatened. Most dam projects have not brought any significant economic benefits when compared with their enormous costs and the adverse environmental impacts. Upstream countries need to realize that the Mekong river is not only for upstream countries but also for downstream ones. The Buddhist teaching of dependent origination requires mutual understanding, full cooperation, respect of interests and concerns of others. Compassion covers both humans and animals, especially the fish species that are facing extinction. It is

recommended that all countries, including upstream China and Myanmar, fully collaborate and strictly adhere to the Mekong River Commission procedures. A viable and sustainable alternative to dams is solar and wind energy. Light manufacturing has also been suggested as the viable strategy for economic development. Since the countries and peoples along the Mekong are mainly Buddhists, the Sangha can play an important role in influencing the government policies and educating the general public about the costs and environmental impacts of dams and the benefits of clean, renewable energy. Only through these efforts can future conflicts, economic and environmental disasters be avoided and the River of Buddhism can be spared of a terrible death in a very near future!

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