2-7. Livelihoods and Environmental Issues in Vietnam's Mekong River Delta[1]

Vietnam's Mekong River Delta

The Mekong River Delta is a huge tropical wetland that plays an important role in conserving the biodiversity of the Mekong River, an international waterway. The Mekong Delta is spread out over an area of 36,000 km^2. Of this, two million hectares (20,000 km^2) are farmland, the main crop being rice, the staple food of Southeast Asia.

The people of the Mekong Delta live on land lying less than 10 m above sea level, making this an area extremely vulnerable to climate change. If the sea level should rise one meter, 25% of the current land area of the Mekong Delta, home to 3.5 to 5 million people, would be lost.

The delta plays a crucial role in Vietnam's domestic food supply and exports, supplying 53% of rice and other grain production, 80% of the fish harvest, and 75% of fruit production.

The delta area consists of 12 districts, with Can Tho as the central city. The present population of the delta is 18.6 million, 26% of the total population of Vietnam. Historically, the people of the delta have made their livelihoods by settling densely along the banks of the river and the canals that branch off on either side. Separating the socioeconomic development of the delta from the water resource regime is totally inconceivable.

Water Resource Issues in the Mekong Delta

There are five limiting factors constraining agricultural production in the delta. Two of these, floods and the shortage of fresh water, concern water quantity. The remaining three factors of seawater intrusion, soil acidity and water pollution, concern water quality. In addition, water issues that transcend international borders, sea level rise due to climate change, and dam construction on the Mekong River mainstream are looming on the horizon as disturbing issues for the future. Each issue is discussed below.

Flooding: Floods occur in the Mekong Delta from August to October each year. The average discharge of the Mekong River in the wet season is about 39,000 m^3/sec. Roughly 1.2 to 1.9 million hectares of

the delta are inundated during this season, making agriculture impossible in the flooded areas. In the dry season, however, the average discharge of the Mekong River falls to between 1,700 and 2,500 m^3/sec. Moreover, not only does the water table drop two to three meters in the dry season, there is hardly any rainfall in the area during this period.

Seawater intrusion: Seawater (salinity) intrusion is caused by seawater flowing inland when insufficient freshwater is flowing through the estuaries. Sea tides also affect the delta's water regime. The mechanism of salinity intrusion in the Mekong Delta is very complex. At present, 1.7 to 2.1 million hectares (roughly 40 to 50% of the Mekong Delta) are affected by seawater intrusion.

Soil acidity: Extensive areas of the Long Xuyen Quadrangle, the Plain of Reeds, and other areas have surface soil acidity. The total area of this land amounts to about 1.6 million hectares, 40% of the total area of the Mekong Delta. It is known that artificial drainage of acid surface soil resulted in the acidification and accumulation of Fe^{2+} (iron ion) and Al^{3+} (sulfide ion) in canal water. Highly acidic water may be harmful to the health of humans, animals and plants.

Water pollution: Rapid population growth and the expansion of residential areas along the river banks are having adverse impacts on the water environment. Water quality parameters along the river and canals in the Mekong Delta are generally related to the use of fertilizers and pesticides in agriculture, nutrient-rich effluents from aquaculture and animal husbandry, and wastewater from industrial plants.

Climate change and sea level rise: According to the Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report, in the last ten years climate change has become one of the world's most serious socioeconomic and environmental problems, and the Mekong basin is considered to be one of the areas of the world most acutely affected by climate change and sea level rise (IPCC 2007). A study on the future impacts of climate change on the Mekong delta by Can Tho University and Thailand's Chulalongkorn University have shown that the Mekong basin will experience severe impacts related to floods from the upper reaches and seawater intrusion in the lower reaches.

Transboundary environmental problems caused by the Mekong River mainstream dams: The Mekong region is now facing a new issue. China already has six operational dams[2] and another two dams[3] planned on the Mekong River. Further downstream in the Mekong, 12 dams are also now in the planning and construction stages[4]; eight in Laos[5], two on the Thai-Lao border[6] and two in Cambodia[7].

If these Mekong River mainstream hydropower dams are completed, thousands of people will lose their homes and will be relocated, the flow of the river will be altered, sediment loss and erosion will increase, river navigation will be disrupted, biodiversity will be reduced, fish resources will be lost, and further potential negative impacts, as yet unknown, are likely to occur.

Of all the dam plans for the Mekong mainstream, the Xayaburi Dam is the farthest advanced. If constructed, this will be the first hydropower dam on the lower reaches of the mainstream of the Mekong River. The governments of Cambodia and Vietnam, located downstream from the dam, have been requesting that the government of Laos, which is constructing the dam, carry out cross-border environmental impact assessments. The government of Laos, however, has not answered this request. If the mainstream of the Mekong is blocked, the flow of the river will be altered and the approximately

30 million people living in the lower Mekong River basin may be seriously affected by adverse transboundary impacts.

Concluding Remarks

The impacts of climate change and transboundary dam development will bring about both quantitative and qualitative changes in the flow of the Mekong River, threaten the livelihoods of the people and food production, and further exacerbate the environmental issues we are now facing.

The Mekong delta's economy depends upon natural resources. People's food security is supported by an economy that has rice production at its center, and is made possible by aquaculture, agriculture, and services that are tied to the Mekong River. These are all crucially affected by water, land and climate.

Sustainable development in the Mekong Delta is founded upon a stable social system built upon the premise of secure access to water, which is the basis of food security. Collapse of this system will undoubtedly result in severe impacts on social stability and Vietnam's economic growth. Cooperation among scientists, policymakers, government agencies, NGOs and local people will be necessary to build a strategy and action plan to resolve these enormously complex problems.

References

Intergovernmental Panel on Climate Change (IPCC). 2007. *IPCC Fourth Assessment Report: Climate Change 2007 (AR4).* http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#1

Rported by Le Anh Tuan (Can Tho University) and Summarized by Mekong Watch

1. This article is a summary of a report given by Dr. Le Anh Tuan from the Research Institute for Climate Change (DRAGON Institute-Mekong), College of Environment and Natural Resources, Can Tho University (Vietnam) at the international workshop, *Establishing an East-Asian Civil Society Network to Discuss Sustainable Natural Resources Management in the Mekong River Basin* sponsored by Mekong Watch on December 12, 2012 in Tokyo, Japan.
2. Gongguoqiao, Xiaowan, Manwan, Dachaoshan, Nuozhadu, and Jinghong Dams
3. Ganlanba and Mengsong Dams
4. The number and status of the dams have been updated by Mekong Watch.
5. Pak Beng, Luang Prabang, Xayaburi (under construction), Pak Lay, Sanakham, Lat Sua, Thakho, and Don Sahong Dams
6. Pak Chom and Ban Koum Dams
7. Stung Treng and Sambor Dams