Tipaimukh Dam and Its Impact on Bangladesh

Report prepared for the Government of Bangladesh
By the American Association of Bangladesh Engineers and Architects

Preamble

Government of India is undertaking Tipaimukh Dam project on the International Barak River in the state of Manipur, India which is located on the northern side of Bangladesh.

Bangladesh is a lower riparian state as the Barak River enters Bangladesh at Amalshid approximately 200 km downstream of the proposed Tipaimukh Dam. The Barrack River feeds Surma and Kushiyara rivers that flow into the Meghna River, one of the three major rivers in Bangladesh. Therefore, the impact of such mega project demands a thorough review.

This project will generate 1,500 MW of hydroelectric power in addition to controlling floods of the Barak River. The Dam is 390 meter long, 162.5 meter in height and its estimated cost is Indian Rupees 5,163 crores. North Eastern Electric Power Corporation Limited (NEEPCO), a Private Sector Enterprise under the Ministry of Power, Government of India has been entrusted to implement the project.

Although, there is no vital need for 1,500 MW of electricity for those part of India nor it will be economically viable to transmit the power to other parts of India, the construction of such a huge hydro power project raised questions to many experts both in India and abroad. Moreover, any type of obstruction on natural flow of water will always have negative impacts on downstream population.

Since it's an issue of the national interest for Bangladesh, AABE invited engineers and scientists with varied backgrounds in this seminar to understand this project from technical, economical, and social view points. Two papers were presented by two eminent engineers at the Silver Jubilee Celebration of AABEA at Rockville Campus of the University of Maryland. There was also a panel consisting of two experts on infrastructure and hydraulics and a representative of the Voice of America. The panelists reviewed the concerns and issued presented at the seminar including the influence of impacted flows on hydrologic, economical, cultural, social, and ecological balance of the nation. The panel further concentrated its review on impact of rivers and flows originated from the Tippara Hills which ultimately discharge into the Surma Basin. Panel also considered the severe shortage of food grains worldwide and its impact on Bangladesh since there is a shortage of arable farm land and this shortage is increasing every year. Based on presentations, discussions and numerous feedbacks both from NRB and International experts, all findings are compiled and recommendations are made solely for the national interest of

Bangladesh. It is the responsibility of Bangladesh Government to make decision considering facts but not the political interest.

The conclusions and findings are divided into three major phases of the project namely, the construction period; the commissioning of power plant, and the operational phase of the project.

A. Project Construction Phase

The natural flow of water will be stopped or be diverted during the construction phase of the project. For economic reason, the construction company could adopt a method of dam construction that may include diversion of water or construction of tunnel for flow control. If they choose diversion of water to areas outside the flood plain, there will be no flow to Bangladesh. If the construction company chooses to utilize cofferdam or other method of flow control, it will cause tremendous amount of low flow during construction. They can also divert the water to downstream using small channel that will cause reduction of flow to Bangladesh. If proper attention is not given during review or contract negotiation and precaution is not taken during the construction phase there will be no flow or a very small flow downstream thereby will be a significant negative impact on life and economy of Bangladesh. This impact will be for several years as construction of the dam will take few years which could be as much as five to seven years.

B. During the Commissioning of the Power Plant

India will impound water to accrue full benefits of power generation, based on the historical data of precipitation and water discharge through Barak River the filling up the of the reservoir will take 1.25 years in normal rainfall and in case of dry monsoon, it will take 2 years. During this reservoir filling period there will be no flow, or very minimum flow to the downstream, thereby will have a devastating effect on life and economy of Bangladesh. There is no reason why the operator of the power plant will take time to enter into power generation with its full efficiency.

C. During the Normal Operation of the Plant

Experts reviewed the impact of the project in Bangladesh after the project commissioning from the following aspects:

a. There will be increased water flow during the winter months
b. There will be about 30% reduction of flow during the monsoon and flooding season.
c. It is anticipated that during the time of boro harvesting, the reservoir level had to be lowered to prepare the reservoir to receive excess runoff during monsoon period of heavy rainfall. This will cause sudden and unexpected riser in water level during pre-monsoon time, the time of boro harvesting. This will have significant impact on rice cultivation.

The findings on this phase are as follows:

- The increased winter season flow will inundate a significant amount of arable boro crops within the Haor and Beel Basins of the Greater Sylhet, Greater Mymensing, and Northern Brahmanbaria Districts. This inundation will cause a loss of a significant amount of rice and has the potential to impact the food security of Bangladesh. Inundation also has the potential to displace traditional families and landowners. Economical devastation will also increase unemployment and is a potential indicator for anarchy and terrorism, which has no boundary.
- The dam will detain and retain the basic ingredient of nutrition of sediment. A lack of natural replenishment of organic nutrition will have negative impact on both agriculture and aquatic life. It will have a tremendous negative impact on nature by deforestation in the downstream area.
- The possible higher post-spring flow through the dam (to prepare for reservoir for flood flow during monsoon rains) will further complicate harvesting boro rice as boro rice requires three to four weeks of dry land for the rice grain to mature and ripen. Therefore, Bangladesh will suffer from increased food shortage.
- The increased dry season flow will inundate the areas from where sand, gravel, and cobbles are extracted for use as construction material from Chunaroghat, Tamabil, and other areas. Infrastructural construction cost will increase putting pressure on national development budget.
- The dam will reduce flood flow by 30%, which may have a beneficial impact. However, it will not flush all the chemicals/contaminants out of the stream corridor, which is causing environmental degradation. This will put extra burden on national health care issue.
- The reduction of flow will affect the flow vector of Padma-Meghna at Chandpur and has the potential to have Padma flow wipe out Chandpur and adjacent valuable and highly productive irrigated lands within the Chandpur Irrigation Project. Salt water intrusion, reduction of food growth and unemployment might shake the backbone of the nation.
- The reduced flood flow and increased winter flow will improve navigation and irrigation in some areas and have the potential for flushing salt water intrusion from the Bay of Bengal into the Meghna River, which will have significant problem for the nation.

The project could be turned into a win-win project if the above conditions are researched and a baseline survey is made.

Recommendations:

1. Tipaimukh Project should not be constructed without a full treaty with Bangladesh.
2. The treaty should be modeled like Indus Water Treaty under the auspices of World Bank or United Nations and the treaty must assure that no water will be diverted by India from the Barak River.
3. The treaty should spell out the operational aspects of the Dam. The operation of the Dam shall not cause widespread inundation of boro crop and release of the water from dam shall not inundate boro crop. In addition, an operational aspect of artificial flooding by pulsating flood of the Sylhet/Mymensigh area to create artificial but controlled flood during rainy season to flush the Haor Basin should be included. The frequency and

amount of the pulsating flood should be determined by full hydrologic study of the area by the Bangladeshi experts.

4. India shall not construct Phulertal Barrage ever to divert water.
5. India shall sell power to Bangladesh from this project on a long term agreement basis.
6. Bangladesh should use technical review irrespective of any political pressure and should set up commissions, comprised of national and international experts to review the project from technical, socio-economical, ecological, and environmental aspects.
7. Bangladesh government should take lessons from impacts of large international projects throughout the world (impacts before and after) to have first-hand knowledge on consequences of such projects.