

## Potential impact of large river dams in Eastern Himalaya on World Heritage Sites of Assam: Expression of Concern

Partha J Das (Head, 'Water, Climate & Hazard Programme')  
Bibhab K Talukdar (Secretary General)

Aaranyak, Guwahati (Assam, India)

The detrimental upstream and downstream impacts of large river dams on ecosystems and environment as a whole are now well known from many examples of what is happening all around the world. It is by now clear to scientists and environmentalists that the large dams being constructed and planned in Northeast India, more than 168 in number, will have serious impacts on the life-sustaining ecosystems and the fragile environment to various degrees in the entire region which has the largest forest cover in India (24.6% of the country's forest area) in a relatively small area (7.76% of the country's total geographical area) as well as an integral part of the Indo-Burma biodiversity hotspot, one of the 34 biodiversity hotspots in the world. Besides having serious impact on livelihood of thousands of people living in the catchment areas of the rivers that are being dammed it is feared that the Kaziranga National Park (KNP) and the Manas National Park (MNP), both with the status of UNESCO's World Heritage Sites of natural importance might be adversely affected due to dam building on the mainstem of the Brahmaputra as well as on some its major tributaries.

The KNP, located in the floodplain of the Brahmaputra River known worldwide for its population of greater one horned rhino, elephants and tigers as well as many other important species of flora and fauna, maintains its ecosystem health by interacting with the seasonal flood cycle of the Brahmaputra River and some of its tributaries. The spillage of seasonal flood waters into the KNP landscape replenishes the water bodies and enriches the soil with nutrients helping both the terrestrial and the aquatic ecosystems to clean-up and maintain their productivity and this process enables diverse species of wildlife to survive and flourish. The existence of different habitat types such as grassland, wetland and woodland is also dependent on the annual washing of the landscape by flood waters. The capability of the ecosystems to sustain certain type of grasses and other vegetation required for the survival of rhinos, elephants and other herbivores are determined by the natural ecological connectivity of the forests with the waters of the rivers. The large dams on the Siang, Dibang, Lohit and the Subansiri are likely to trigger changes in the flood cycle and hydrological relationship of the KNP forests with the river Brahmaputra maintained through exchange of surface, sub-surface and ground water flow. Such changes will significantly affect the supply of water, nutrient, and silt which are vital for sustenance of the forest and ecosystem types that KNP is made of.

The Lower Subansiri Hydroelectric Project (2000 MW) on river Subansiri, the Lower Siang HEP (2700 MW) on river Siang (the mainstream of the Brahmaputra that flows from Tibet), the Demwe Lower HEP (1750 MW) on river Lohit and the Dibang Multipurpose Project (3000 MW) on river Dibang that are now under different stages of construction may affect the natural hydrological regime of the Brahmaputra river throughout the year mainly by altering the diurnal flow pattern, the frequent rise

and fall of water level in the channel, rate of sediment carriage, nature of sediment deposition and river bank erosion in the stretch on which the KNP is located. Diurnal fluctuations in flow discharge and water level due to calculated pattern of release of water from these run-of- the river projects will create a high flow-low flow cycle on a daily scale rather than the natural seasonal scale. As a result of this high flow-low contrast occurring every day the hydrostatic pressure on the riverine and inner aquatic habitats will vary drastically all the time pushing the wildlife of the Park cum World Heritage Site, especially the aquatic wildlife to severe stress.

Ingress of flood water with just the right amount of nutrient and sand-silt mix from the river Brahmaputra to the KNP landmass may not occur regularly and adequately in the rainy season after all these dams become operational. Increase in rate of river bank erosion and uncertainty in anticipating the places where banks will be eroded is most commonly observed in alluvial plains downstream of dams. Any increase in bank erosion along the riparian stretch of the KNP will lead to loss of area of the wild habitat and even might lead to excessive sedimentation of inland water bodies and grasslands during annual peak floods and during those sure but unpredictable cases where floods are created by release of water in the event of extreme rainfall or landslide dam outburst floods in upstream of these basins. Considering all these possibilities we are concerned that the KNP ecosystems may in future undergo such changes that may reduce their productive and carrying capacity to sustain different species of flora and fauna due to changes in the local hydrological characteristics of the Brahmaputra River to be caused by the dams. If the cumulative impact of these dams being built in India is added to those due to the Chinese dams that are reportedly under construction as well as in active consideration, the impacts could still be more adverse than being assessed at present. It can be mentioned here that a total of 70 large dams have been proposed by Government of India over the basins of the Siang (20), Lohit (11), Dibang (17) and the Subansiri (22). There is every reason for concern for the survival of the KNP in a situation when these dams become operational one by one and tens of these will be functional soon in a time frame of about next twenty five years producing significant cumulative impact on the riparian ecosystems and human settlements downstream.

In a similar way the existing Kurichu HEP (60 MW) and the proposed Mangdechu HEP(720 MW) in Bhutan are likely to affect the forests and water bodies of the Manas National Park, which is also a World Heritage Site, in a way which would make the ecosystems less supportive of the wildlife. Manas is a WHS having unique species diversity such as pigmy hog, tiger, elephant, greater one horned rhino, hispid hare, golden langur, Bengal florican etc. Both the Kurichu and the Mangdechu rivers contribute to the flow of the Manas-Beki river system while the MNP is considerably sustained by the waters of the Manas River and many of its small tributary streams. The Kurichu dam has already affected the forests and wildlife of the MNP. A landslide dam that formed in the Tsatichu River (in Bhutan) in 2004 breached on July 10, 2004 resulting in a large flood wave flowing through the Kurichu River inside Bhutan. The Kurichu Hydropower project (60 MW) in Bhutan released the excess water that flooded several rivers in Assam including the Hakua, the Beki and the Manas. Moreover, it was a period of heavy monsoon. As a result it created an unprecedented flood hazards in western Assam. Flash floods carrying trees and huge amounts of silt washed away parts of the Manas National Park killing a large number of wild animals. A large number of fibre glass and inflatable boats of the Forest Department in the park were also washed away leaving the staff stranded. The road from Barpeta to Kokrajhar was breached completely cutting off access to the

park. Release of water from the Kurichu dam has been reported on several occasions in the last six years creating flood in areas belonging to the Manas Biosphere Reserve(MBR) while the excessive siltation caused by such flooding has made large areas of agricultural land unproductive thus creating a crisis in livelihood of the farmers.

Unfortunately although such negative effects of the dams on these two protected areas endowed with rich but fragile ecosystems are being observed, no significant study was done for assessing the probable impacts of these dams on these forests before these projects were given environmental clearance. UNESCO, the apex authority that selects and monitors the status of the natural world heritage sites, should take cognizance of the serious threats posed by the large dams being constructed in Arunachal Pradesh (India) and Bhutan to the world heritage sites of Kaziranga and Manas in Assam and ensure proper assessment of impacts and mitigation thereof so that the rich natural heritage of these two sites can be protected and conserved at any cost. Unless sincere efforts are made to check the large number of ecologically harmful and unsustainable dams being constructed and planned in the Eastern Himalayas, it will only be a matter of time before Kaziranga and Manas, the two renowned World Heritage Sites of Assam become severely degraded, impaired and lose the prestigious WHS status.

For more information please contact,

Dr. Partha J Das  
Programme Head  
Water, Climate & Hazard (WATCH) Programme, Aaranyak  
Email: partha@aaranyak.org, parthajdas@sancharnet.in, parthajdas@gmail.com  
Cell: 91-94351-16558

Dr. Bibhab Kumar Talukdar  
Secretary General, Aaranyak  
Email: bibhab@aaranyak.org  
Cell: +91-94351-13139

AARANYAK (A Scientific and Industrial Research Organisation of India)  
50 Samonwoy Path, Survey, Beltola, Guwahati-781 028, Assam, India  
Tel: +91-361-2230250  
Fax: +91-361-2228418  
www.aaranyak.org