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MANAGEMENT STRUCTURES TO LEAD THE BRAHMAPUTRA BASIN INTO THE 21ST CENTURY

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Introduction

The Brahmaputra is one of the world's truly great rivers. The Brahmaputra river basin provides the basis for the production of food and fiber that supports millions of people in northeast India. At the same time, the Brahmaputra continues to pose a real threat to people's existence and livelihoods through periodically devastating floods. The river remains unregulated by large dams. Although there have been successive attempts over the past decades to control the river and harness its valuable resources, including the construction of thousands of kilometers of levees, such costly and resource-intensive interventions have generally had very suboptimal (and sometimes undesirable) impacts.

Yet there are real opportunities for the Northeastern Region to effectively harness the Brahmaputra's vast resources and truly transform the development of the Northeast through better management of existing assets and future development of water-based infrastructure. Existing institutional arrangements are inappropriate; they are simply too weak and fragmented to coherently manage complex river basins that cut across several different Indian states. It will therefore be critical to establish and maintain an appropriate cooperative management structure among all the Indian states sharing river basins in the Northeast in order to achieve the sustainable development of the Northeastern Region from its water and associated natural resources. Achieving such cooperation among states will not be an easy task. The challenge is to define and create a management structure that is fit for the purpose – one that is adapted to the particular characteristics of the basin, and provides sufficient incentives and benefits for all relevant states to willingly cooperate. This short Background Paper is intended to provide a basic framework for the necessary discussions that will help determine an appropriate structure to lead the management of northeastern water resources into the future.

1. River basins of the Northeast in context

Defining an appropriate management structure for the river basins of the Northeast first requires an understanding of the characteristics of its central Brahmaputra river basin. This section briefly outlines some of the Brahmaputra basin's most pertinent features, including the geomorphology, current socioeconomic status, development potential, and existing institutional barriers.

1.1 Geomorphology

The geomorphology of the Brahmaputra basin presents both great challenges and opportunities. One of the largest rivers of the world, it has an average annual flow of 585.6 billion cubic meters per year.[1] Compared to many other rivers, the Brahmaputra has reasonably reliable seasonal floods and dry season flow with relatively low variability. Every few years, however, the river also causes devastating floods. The river remains largely unregulated, partly due to the technical challenges of developing major water infrastructure, given the scale of the river; its extremely high sediment loads

[1] Data obtained from the India Water Resources Society: www.iwrsdelhi.org/indias_wr.htm.

(amongst the largest on earth); and significant and regular seismic activity in the river's upper reaches adjacent to the Himalayas.

1.2 Socioeconomic situation

Although the Brahmaputra is one of the main backbones of the economy of the Northeastern Region, the river basin remains both underdeveloped and suboptimally managed. Much of the population of the Northeast lives along its fertile floodplain, but their livelihoods derived from the river are vulnerable to frequently devastating floods. Marginal communities relying on subsistence farming along the floodplain are increasingly settling inside the leveed floodplain and are becoming particularly vulnerable to floods. In the absence of alternative livelihood opportunities, subsistence agriculture is likely to remain a dominant feature of the local economy for the next 20 years. Surface irrigation use is low compared to the overall water flow. Severe shortages of irrigation supplies occur in some locations in the dry season. At the same time, the environmental value of the river and floodplains has been altered through the construction of extensive levees and agricultural development, although some significant environment assets and values still remain. River transport routes are operational on the river's mid and lower reaches, but the economic potential remains largely undeveloped. The huge hydroelectricity potential of the Brahmaputra is arguably one of the Northeastern Region's most significant assets, but no individual state has had the capacity to harness it, nor have the existing arrangements via the Brahmaputra Board proved adequate.

1.3 Developing the basin: Rationale for change

The central government is now highly committed to seeking ways to enhance opportunities in the Northeastern Region through the development of the Brahmaputra basin. The multiple benefits derived from a coherent and cooperative development and management of water resources could be truly transformational. Income generation could be provided through tapping the hydropower potential in several states (with the host state receiving royalties of 12 percent of power sales to India's national power grid). The improvement of base conditions for development in the Northeastern Region needs an integrated approach covering hydropower for industrial development, flood infrastructure, and management to improve the livelihoods of farmers in flood-prone areas; watershed management activities in major watersheds and wetland preservation to improve livelihoods, prevent erosion, and conserve biodiversity; groundwater development for expanded winter and spring agriculture; and expansion of inland water transport to reach internal and export markets. Periodic social and economic losses related to devastating floods could be dramatically reduced through integrated water resource management combined with improved hazard risk management. Finally, cooperation on water and power with neighboring states could become a pillar for regional cooperation and development.

1.4 Barriers to development

This vision, and its associated benefits, has so far failed to materialize due to a number of key barriers that are hampering the development of the basin to its true potential. These include:

1.4.1 Cost of developing required water infrastructure

As noted above, the Brahmaputra is one of the largest rivers of the world, with huge sediment loads, and its upper reaches are located in areas with regular and significant seismic activity. It will therefore be difficult for any individual state to bear such large investment costs on its own, without cooperating with neighboring states.

1.4.2 Divergent interests and priorities

Unfortunately, cooperation between states has so far been precluded by serious tensions between states arising from diverging interests between potential resource uses and the distribution of benefits. For instance, the chief concerns of Arunachal Pradesh include generating revenue through hydropower while avoiding resettlement, whereas Assam's priority is flood management. As a result, Arunachal Pradesh has a strong preference for run-of-the-river projects, whereas Assam would benefit most from largely multipurpose dams. Tensions observed between states are also replicated within each state, where local communities and tribal populations may have diverging interests, with often little say in the distribution and development of resources upon which their livelihoods depend.

1.4.3 Fragmented institutional settings

In addition to being an international entity (which is beyond the focus of this paper), the Brahmaputra basin is shared between several Indian states (including Arunachal Pradesh, Assam, and Meghalaya). Thus, the current management of the river is weak and fragmented. Responsible institutions, including the Brahmaputra Board, are therefore unable to provide an integrated and coherent approach to manage the basin's diverse needs. Each state is therefore continuing to pursue its own development agenda. Moreover, policies have a narrowly sectoral focus, looking exclusively at flood control, irrigation, or hydro development, without considering the close linkages and potential overlapping benefits.

The above institutional barriers could be overcome through more effective coordination mechanisms between the states sharing the resources of the Brahmaputra basin. The development of more effective interstate coordination mechanisms would provide a more systematic and equitable framework to support development. Such a framework would explore tradeoffs, taking full account of multiple benefits and costs in order to identify acceptable developments. The second part of this Paper will now focus on the practical first steps required to design an appropriate institution for the management of resources in the Brahmaputra basin.

2. Defining effective institutions: A good practice approach

In order to overcome the current deadlock, several fundamental questions need to be addressed in order to design a framework with appropriate incentives to facilitate cooperation. These questions are:

- How do we achieve sufficient consensus on what needs to be done, who will do it, how will the benefits and costs be shared, and who will maintain the assets into the future?
- What does this mean for the management structure that will facilitate and manage as necessary the future development of the river?

There is no single approach that can be simply rolled out and applied to the Brahmaputra basin. There are, however, well-established principles that can be used to guide the development of an appropriate body that is fit for the purpose. The following sequence of questions and issues is intended to help facilitate discussion around an appropriate institutional approach to the development of the Brahmaputra basin. These questions center around four key issues: (a) What is the mission of the institution? (b) Who are the partners? (c) How will the institution be governed? (d) How will local communities participate? Each of these issues will be addressed in turn below.

2.1 What is the mission of the institution?

The first and most fundamental requirement when designing an institution is to clearly define its mission. The development objectives for the river basin must be clearly determined in order to guide the design of the institutional response required. The world of river basin management is littered with examples of authorities that have been established but are unable to successfully meet expectations. While there are many reasons that river basin authorities fail, the main reason is that the institution's mission is not clearly defined and supported. River basins without clear missions and objectives will not be adequately empowered to carry out their task.

There are several subquestions that will help formulate the institution's mission and design. These questions are as follows:

- Is the authority to operate across jurisdictions?
- Will the authority plan, construct, and manage, or only advise?
- What are the matters that the authority can act on (floodplain management, hydro development, irrigation development) and what will be its role in broader natural resource management?

As a point of discussion, a mission for a Brahmaputra river authority could be "To promote and coordinate effective planning and management for the equitable, efficient, and sustainable use of the water and related natural resources of the Brahmaputra basin and to manage the implementation of activities consistent with this mission."

When formulating a mission objective, it is important to remember that circumstances will evolve. Successful institutions will need to be able to remain flexible and learn to reinvent themselves. Two good examples of authorities that were able to succeed in the development phase of their work are the Tennessee Valley Authority in the United States of America and the Snowy Mountain Authority in Australia. Both authorities had a clear charter and were sufficiently empowered by political processes to drive their activities forward, yet neither authority exists today in its original form. For instance, the Tennessee Valley Authority has moved from its focus on integrated river development and flood mitigation to its current emphasis on electricity production.

2.2 Who should become partners, and how will these relationships be defined?

The second issue will be to identify institutional partners who will be important in delivering the mission. Many different options and permutations are possible depending on local circumstances and needs. There are a few examples of top-down approaches where a central government has taken the lead. In the case of the Tennessee Valley Authority, the United States federal government provided the necessary financial capital to implement the works and the policies necessary for development. Such top-down examples, however, have rarely been replicated in state federations such as India. In state federations, a more common approach has been the use of compacts (agreed arrangements). These compacts are generally negotiated by federal and state governments, and then the parties agree the terms of the partnership.

A number of additional questions may help further refine appropriate partnership arrangements. These questions include:

- Who wishes to participate? (This will generally be dependent on the mission's institutions.)
- Who has the legal authority to carry out what is being proposed?
- Who can contribute significant financial resources? (Those contributing larger amounts are likely to have greater decisionmaking powers.)
- What is needed to drive the initial change, given the history of the case and a realistic assessment of who has the capacity to contribute?

In the context of the Brahmaputra basin, it is likely that the central government will need to take a strong leadership role in the initial stages. The institutional design could even include an official hand-over to the states after a certain transition period.

2.3 How will the institution be governed?

A common institutional framework is to follow a two-tiered management and governance structure. The first tier would involve ministerial oversight of policy and budget, while the second tier would focus on the agency's managerial responsibilities regarding the delivery of programs and policies.

In the Northeast, given the number of parties potentially involved, it may also be worth considering whether a ministerial council representing the relevant governments and

their agencies could be established. Such a council would normally be chaired by a senior minister from the central government.

The type of governance arrangements required may be defined more clearly by answering the following questions:

- How does the organization obtain the necessary political support and direction?
- Who needs to be involved to ensure that implementation can occur?
- How will disputes be effectively resolved?
- What agencies are critical to the mission, and how should they be engaged?

2.4 How should communities participate?

All contemporary river basin authorities have provision to engage their communities in the decisionmaking process. Such engagement goes well beyond keeping communities informed of developments. Community participation is an active and managed process of involvement, which helps ensure that proposed developments are appropriate, generate a sense of ownership, and truly meet the needs of the communities.

Designing appropriate mechanisms for successful community participation will be particularly important and challenging in the Northeast, given the region's complex cultural and tribal fabric, underlying social tensions, and often dissimilar community needs. Community participation will help ensure a more equitable distribution of the local costs and benefits derived from infrastructure developments and policies.

The nature and level of desirable community participation will need to be carefully thought through. Once again, river basin management offers a diverse range of options for successful community participation. Some preliminary questions to be initially considered include:

- What level of participation is necessary to ensure the mission progresses?
- What arrangement should be put in place? (Numerous arrangements can help provide communities with a voice or decisionmaking powers, including standing committees or management committees.)

3. Conclusions

There is a strong rationale for the integrated management of the Brahmaputra basin and the Northeastern Region as a whole. The series of questions outlined in this Paper are not designed to provide complete answers but merely to provide a platform for structured discussion. These questions have been designed to focus attention on the Brahmaputra basin and the current and future development needs of the riparian northeastern states. This Paper can only help draw out some preliminary institutional outlines for the emerging river basin authority for the Northeast. The proposed institutional structures will then need to be carefully set within the overarching legal framework of the Indian Constitution. Once feasible institutional arrangement structures start to emerge, the extensive literature on river basin management can then usefully provide a range of options and lessons learnt specifically related to the selected institutional frameworks.