Energy and Water from Himalayan Rivers

Need for Prudent Sharing of Benefits and Opportunities

The Himalayan rivers, such as the Ganges and Brahmaputra, are the chief sources of energy and water to most of the major cities in India. The Himalayan communities have a major role in the maintenance of these river systems. In this regard, **Dr Yashwant S Rawat** feels that Himalayan states must also be considered judiciously while providing energy and water supply from the Himalayan rivers as it is very essential for an inclusive development of the Himalayan states to combat climate change and poverty. It would help to build buoyant Himalayan communities as they are highly susceptible to climate change and natural disasters.

The Himalaya is one of the youngest mountain ranges in the world. It is a source for a large number of rivers and their tributaries. It acts as an elixir for nurturing the lives of millions of people, many of whom also associate these mountains with mythological and religious values. The Ganges, the Brahmaputra, and the Indus are the main transboundary rivers originating from the Himalayas. Their spiritual values are often cited; for instance, the River Ganges is a holy river in Hinduism. According to myths, the Ganges was brought by Bhagiratha to the earth from the heavens to wash sins, provide salvation, and supply water to the communities for their agricultural and economic activities. The Ganges has mainly been accessed to maximize food production and provide livelihoods, water, and energy supply. In no uncertain terms this river is a lifeline for millions of people. Mythologically, the water of the Ganges is considered pure and liberating. Additionally, the river also acts as a crematory for Hindus as the performance of last rites in this river is considered auspicious.

The Ganges is, however, ranked as the fifth most polluted river in the world. This pollution is a threat to the well-being of humans and the river ecosystem. In this regard, the Ganga Action Plan was an initiative by the Government of India (GoI). However, this programme has not yet achieved significant success due to red-tapism, and a lack of expertise as well as optimal public participation. Significantly, the GoI has recently signed a Memorandum of Understanding with the European Union (EU) to support the development of the programmes that facilitate adaptation of the EU's best practices, governance, business solutions, and research and innovation opportunities in the water systems.

Water and Energy

The Ganges, Brahmaputra, and Indus rivers are a reservoir of energy and water supply to the major Indian cities. Unfortunately, headwaters states (e.g., Uttarakhand) of these rivers, where dams are located, are hardly considered in the plans for the consistent supply of water and energy. Hence, headwaters states must be taken into consideration wisely

and conscientiously for an inclusive development to combat climate change, poverty eradication, prevent migration, entrepreneurship development, and livelihood options. It would help to build a resilient Himalayan community and natural resource management because Himalayan communities are highly sensitive to climate change and natural disasters.

For local communities, the supply of energy is inconsistent, as often nobody has a clue about the timings of availability of power. This has negative effects on the economy and communication and hinders the intellectual development of the people in the affected areas. In particular, the rural areas often go for periods of a week or more without electricity, and regrettably, a large number of villages are still not connected to the electrical grid and water supply lines. In the Himalayan towns and cities, water is generally supplied at specific time in the evening and morning, sometimes only in the morning. However, such water supply schedules are largely inconsistent for the rural areas. Although a large number of villages and village clusters are still not connected to the water supply lines, the 'Swajal' scheme, for instance, in Uttarakhand, has done remarkable work to supply water to the villages from the natural water sources. However, these natural sources of water have been greatly affected due to climate change, resulting in diminishing of the natural sources of water. Many of the traditional wells have dried up and traditional watermills (*gharats*: a pair of millstones) have been closed off due to scarcity of water in the streams.

While it is commendable that mega cities would largely benefit from the Himalayan rivers, however, the Himalayan villages and towns should not suffer at the cost of mega cities' benefits. Therefore, holistic mechanisms and plans are required to share the benefits and opportunities. A large number of stakeholders need to be engaged at various stages ranging from the planning stages to the stage of fair sharing of the benefits. Best practices are required to be adopted from the countries that are leading in the best kinds of innovation in energy and water conservation initiatives. For example, many towns in South Africa,

in spite of the country being water scarce, provide 24x7 water and energy (power) supply to its people. As a result, the citizens prefer using advanced energy-saving electric appliances (e.g., electric stoves, ovens, etc.), thereby, reducing the burden on the government to import gas, besides promoting environmental conservation, climate change adaptation, and socio-economic development. In light of this, in spite of massive water and energy resources in the Himalayas, the respective state governments have more or less failed to harness these resources due to corruption, and lack of expertise, willingness, funds, and coordination with the Central Government and vice-versa.

Sanitation and Hygiene

Sanitation and hygiene are also important for the well-being of society and biodiversity conservation. The GoI initiated a programme to develop the riverfronts and solve the pollution problem in the rivers. The 'Namami Gange Programme' is one of the initiatives to rejuvenate the River Ganges and its tributaries. For example, at 'Har ki Pauri' ghat in Haridwar (Uttarakhand), there is a shortage of toilets, refuse bins, and changing rooms, particularly for women. However, the Ministry of Water Resources, River Development and Ganga Rejuvenation has now released about ₹315 crore for building toilets along the rivers, particularly along the River Ganges. It also includes the beautification and development of the *ghats* along with sewage treatment plants and civic amenities along the banks of the river. The social, ecological, and economic aspects have been included in the programme to improve the nexus with nature, culture, and people. It is felt that international best practices for a proper implementation, monitoring, and evaluation protocols of the programme is required by setting up the standards and quality control of the work.

Payments for the Himalayan Ecosystem Services and Biodiversity

Himalayan communities have a great role in the maintenance of these river systems, and, therefore, conservation of biodiversity. These rivers also bring a large amount of soil and humus from the forests and agricultural fields of the Himalayan communities to the floodplains (such as the Gangetic plain) that improve the agricultural production. Therefore, it is important to have a compensation programme for the upstream communities that manage the biodiversity and maintain the headwaters of these rivers and their tributaries. Alternatively, there should be a mechanism such as payments for the maintenance of the Himalayan ecosystem services and biodiversity. This would require a developmental package to connect the Himalayan villages and towns to advanced roadways, health, education, water, and energy systems. Such kind of innovative developmental packages and payments, like in China, will support the upstream and downstream linkages and cooperation.

Biodiversity and Conservation

Pollution in the rivers, particularly in the Ganges, has greatly affected the river ecosystem. Reports often appear in the media that suggest that idol immersion during religious festivities adds plaster of Paris and synthetic colours to the river systems. It has been claimed that river dolphins have become endangered, and are on the verge of extinction due to increasing levels of pollution in the river. Additionally, the pollution has greatly affected society due to water-borne diseases and has also destroyed the livelihoods of many people. The sewage-sludge and factory waste that go into the rivers needs to be regulated and treated prior to entering the river systems. On a positive note, the afforestation programme (e.g., trees and grass planting schemes) in the 'Namami Gange Programme' of the GoI for the beautification of river banks and preventing soil erosion is indeed a restorative step.

Interlinking of the River Systems

The GoI has already identified 14 links in the Himalayan Rivers of northern India and 16 links in the peninsular rivers of southern India (Figure 1). The interlinking of the river systems has its positive and negative impacts on biodiversity and ecosystems. However, it has a huge advantage if surplus or a certain quantity

of water that does not affect the pristine ecosystem and biodiversity of the rivers can be leveraged from the links. In addition, it will also control the problem of floods and droughts. The positive and negative aspects of this project need to be debated to avoid ecological and socioeconomic disasters. These rivers are also the source of livelihoods for millions of people and as such this programme is considered as an important project for national interests and development. The Ministry of Water Resources, River Development and Ganga Rejuvenation says that the benefits include 35 million hectares of irrigation, raising the irrigation potential from 140 million hectares to 175 million hectares, and generation of 34,000 MW of power. The other benefits include flood control, navigation, water supply, fisheries, salinity and pollution control, etc.

The communities maintaining these river systems by conserving biodiversity, and by conserving soil and water need to be paid royalties. Although a river is considered as a common pool resource, it is important to note that if upstream communities are maintaining the river systems and downstream communities are benefitting largely due to their efforts and actions, then the former must be paid royalty and maintenance costs.

It has been said that the interlinking of the rivers could reduce outflow and lead to an acceleration in salinization of coastal groundwater as seawater might travel upstream, hence affecting the freshwater ecosystem. Moreover, the invasive species and diseases that can damage the ecosystem might be increased. It is against this background that control and management protocols are needed for inclusion in the planning and during the early stages of development and implementation of the programme. Moreover, corrective measures are required in the early stages of the programme to avoid loss of time, manpower, and budget. A society-awareness programme must be in place to encourage people's participation in the programme. ■

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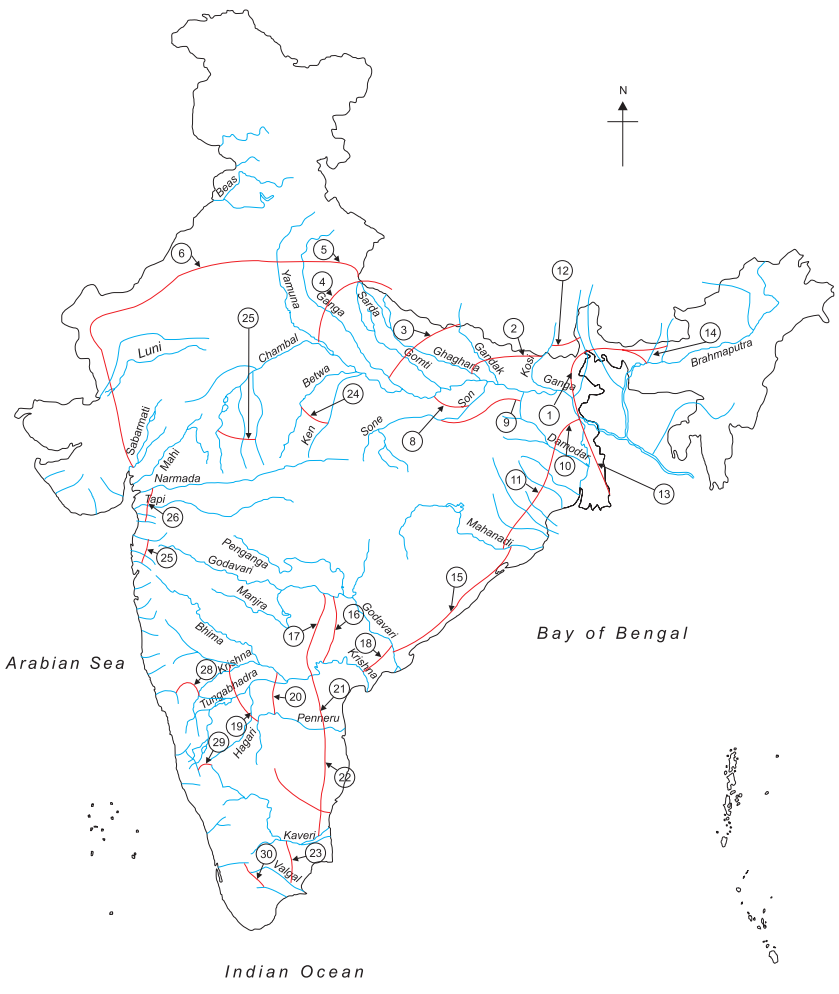

Figure 1: A proposed inter-river basin water transfer links in the Himalayan rivers and the peninsular rivers of India (*Source: Mission Ganga Knowledge Community*)