The Statesman- 16- September-2022

# Nepal's skewed hydropower ambitions

ACHYUT WAGLE

The Nepal Electricity Authority (NEA) and Nepali private hydropower investors appeared enthused alike by the news that Bangladeshi Prime Minister Sheikh Hasina during her India visit last week asked India to help her country import electricity from Nepal. India's facilitation in this regard is crucial, as the country must either provide a wheeling facility or allow the construction of a dedicated transmission line via its territory that separates Nepal and Bangladesh. However, this aspect of "cooperation" failed to feature among the seven bilateral pacts that India and Bangladesh signed at the conclusion of Hasina's visit.

The issue of transnational electricity trade beyond the adjacent neighbour has been discussed for at least half a decade now. There has been very little tangible progress since. But lately, the interests of two of Nepal's neighbours seem to be gradually converging. Indian energy major GMR Group, which has held the power development license of the 900 megawatt Upper Karnali Hydropower Project for the last 14 years due to its failure to make financial closure, has reportedly finalised a power sales agreement with the Bangladesh Power Development Board for the supply of 500 megawatts to Bangladesh and the rest to NTPC Vidyut Vyapar Nigam of India out of the plant's 792 megawatt capacity. Another state-owned Indian company Sutlej is expected to build a project of about 2,000 megawatts in the next five to seven years. This certainly puts an obligation on the Indian government to assist its own investors to find a market for the produced power.

According to a moderate estimate, Nepal's hydropower production capacity will reach about 13,000 megawatts in the next five years, while domestic demand is expected to be about 3,000 megawatts in the same period. This scenario, at least in theory, presents a lucrative prospect of clean energy export from Nepal to her neighbours. Within a year, Nepal, on a token basis, plans to export 50 to 100 megawatts to Bangladesh.

This undoubtedly is a very rosy picture portrayed by the industry and has an almost obsessive orientation towards exports. Among many issues surrounding Nepal's hydropower economy, some are more deeply critical than others.

First, Nepal's current installed capacity is 2,200 megawatts, and during the peak (monsoon) season, the country exports about 400 megawatts of electricity. Nepal has a population of around 29 million of which about 60 per cent have access to electricity. The installed generating capacity, including those of private producers, is only around 1,074 megawatts. Moreover, about 98 per cent of the electricity produced in Nepal comes from hydel projects, and therefore, is clean. But the per capita electric power consumption in Nepal is the lowest in the world - less than 200 kWh (kilowatt hours) compared to approximately 1,200 kWh in India, about 325 kWh in Bangladesh and the world average of 3,250 kWh. Even if domestic consumption could be raised to 3,000 megawatts, the per capita consumption will only come near 900 kWh, which could still be very low five years down the line, compared to the world average which is growing pretty fast.

Second, the impediments to evacuating power, by the private sector and foreign companies in particular, are increasingly becoming daunting. Government agencies and the main counterparty to private investors, the NEA, are often hesitant to provide the exact data on losses caused by lack of transmission lines. But the private sector laments that about 100 megawatts is wasted for failure to connect to the national grid. There are several projects short of only a few pylons out of the several hundred that are left to be constructed due to disturbances and disputes over land compensation. Locals have started demanding an unrealistically exorbitant price even for absolute wasteland. If these demands are not fulfilled, there is an evolving general trend of obstructing the project. The government appears reluctant to resolve this crisis even though it has been an irritant to almost all freshly launched projects. At least it can facilitate the process by fixing a land price ceiling. Even for international power trade, high-capacity transmission lines remain a key bottleneck.

The third is a huge investment gap. Hydropower production is highly capital intensive. Nepal, however, has successfully attracted substantial private sector investment, both domestic and foreign. The private sector claims that it contributes more than 56 per cent of the electricity in the system, and 215 projects with a combined capacity of 9,000 megawatts are in different phases of development with private investment. The energy sector is also the single largest attractor of foreign direct investment (FDI).

A study conducted by Nepal Rastra Bank states, "The electricity generation sector, particularly the hydropower sector in Nepal, has been emerging as a preferred sector for FDI in recent years. The latest survey shows that 27.5 per cent of FDI stock and 36.4 per cent of the total paid-up capital is in this sector. Moreover, the hydropower sector has also attracted other sources of external financing such as foreign loans in addition to FDI." But the overall inflow of FDI has not been impressive in recent decades.

Electricity is not an end product; it is an inevitable input for industrial production and productivity. Nepal awaits transformative improvement in her industrial output for the desired economic gains. But Nepal's private sector suffers from highly discriminatory tariff rates for households and industrial users. The latter are charged about Rs 30 per unit, three times more than what the average household rate. The industrial and commercial sector consumes about 42 per cent of the total output. Nepal's private sector has been demanding for long that the price they are being charged must not exceed the rate that foreign importers pay. The price in the export market, now only in India, barely crosses Rs 8 though it is dynamic. This indeed is antithetical to the idea of promoting consumption.

Reform in the NEA is overdue. The plan of vertically splitting it at least into three separate entities overlooking generation, transmission and distribution is nowhere near implementation. This has substantially held back the potential efficiency of the organisation. Until these issues are addressed with due urgency and scope, Nepal's prosperity may remain a mere pipedream. There is even a larger risk of the country suffering from the proverbial "Dutch disease" if it dreams of becoming rich by exporting electricity rather than using it for industrialisation and growth.

The Kathmandu Post/ANN.

The Pioneer- 16- September-2022

# Water-forest relations need to be respected

BKP SINHA

## Since forests are the primary source of almost 75 per cent of freshwater in the world, there's a need for concerted global efforts to conserve these

Approximately 75 per cent of the world's accessible freshwater resources come from forested watersheds on which over half of the global population relies for their basic needs. Forests and trees play essential roles in the water cycle and are therefore vital for our water security. They not only influence how and where the rainfalls take place but also act as a natural water purifier. They regulate the quantity, quality, and timing of water.

Despite the important interlinkages between forests and water, the forest-water relationship is often overlooked in policy-making and planning. Only 25 per cent of forests are managed, with water as the main yield. Water-related ecosystem services are crucial for sustainable and responsible forest management – contributing to Sustainable Development Goal (SDG) 12: sustainable consumption and production patterns – and maximizing water-related ecosystem services.

It is also fundamental for achieving many other SDGs, including providing clean water and sanitation, food security, combating climate change, etc. Over the past two centuries, forest cover and structures have been impacted globally by anthropogenic activities, like, fragmentation, over-exploitation, and land-use change. In consequence, these factors have influenced the hydrological processes in forested watersheds and altered the groundwater, base flows, and precipitation patterns at both local and regional levels.

Hence, balancing the competing demands for water and non-water natural resources from forests should be a major forest management challenge. Understanding how various environmental, physiological, and physical drivers interactively influence hydrological and biogeochemical processes in forest ecosystems is critical for sustainable water supply to forested watersheds.

According to a United Nations report, the world is likely to face a 40 per cent water deficit by 2030. Global water demand will increase by 55 per cent by 2050, largely due to climate change and galloping population growth. Therefore, forest management approaches focused on biomass production need to be transformed into a water-centered approach to prioritize water-related ecosystem services.

Comprehensive, integrated water and land management plans are urgently needed to tackle the problem of water quality and availability. We also require new management approaches, models, and best management practices to ensure healthy watersheds. For example, watershed restoration measures like slope stabilization, gully control, and landslide prevention can increase water-related ecosystem services.

Watershed programmes demand knowledge of the diverse local and regional contexts across India, where one-size-fits-all approaches are unlikely to succeed. The average rainfall in India is approximately 118 cm. Forest as a hydrological unit receives about 92 million hectares (Mha m) of precipitation, percolation into the soil, immediate evaporation, and surface water accounting for 49.5, 16.10, and 26.45 Mha m respectively.

> FORESTS PROTECT WATER BODIES AND WATERCOURSES BY TRAPPING SEDIMENTS AND POLLUTANTS FROM UP-SLOPE LAND USES. HOWEVER, THE EXTENT TO WHICH FORESTS PERFORM THESE FUNCTIONS DEPENDS ON LOCAL CONDITIONS, INCLUDING SOIL, FOREST TYPES AND THEIR DENSITY

About 23 per cent of the land is covered with forest vegetation, which transpires about 55 Mha, compared to 55 Mha m by irrigated and unirrigated crops that occupy 46.5 per cent of land area. Evaporation losses are lumped at 60 Mha m but work out to 13.8 Mha m for forested land.

The immediate evaporation is calculated at 70 Mha m and the forest area is estimated at 16.10 Mha m. Based on the available data, about 25 Mha m of water can be stored in the forest soil mantle on a sustained basis. Foresters seldom tried to understand the amount of water received from the forest and the quantity of water dispersed from it, for example -- Transportation of water from different forest stands or compartments; Interceptions from forest stands, forest types, management regime, etc; Permeability of forest soils; Inter and base flow from forested tracts and its impact on stream flow; Evaporation losses from forested areas as compared to their other land uses; Quality of water received, processed, and discharged.

If one was to restore water in a reservoir it would cost enormous money. Therefore, considerable efforts are needed to establish and maintain an extensive, intensive, and efficient network of forest meteorological stations for collecting data on snowfall, rainfall, hail, dew, wind, temperature, humidity, evaporation, radiations, etc. A better understanding of the interactions between forests and water (particularly in watersheds) is also essential for enhancing forest-water management strategies and action plans.

Forest management practices such as gap filling, restoration, and protection can increase water yields, regulate water flow, minimize surface runoff, and reduce drought effects. Forests intercept precipitation, moisture that evaporates from vegetation surfaces, transpire soil moisture, capture fog water, and maintain soil infiltration, thereby increasing the amount of water available from groundwater, surface watercourses, and water bodies. By improving soil infiltration and soil water holding capacity, they influence the quality and timing of water delivery.

Forests protect water bodies and watercourses by trapping sediments and pollutants from upslope land uses. However, the extent to which forests perform these functions depends on local conditions, including soils, forest types and their density, structure, vegetation, climate, mining, etc.

The effects of such plantations remain a major research question for the scientific community. Thus, forest management decisions must be based on science and an understanding of forest-water relationships at different temporal and spatial scales as well as changing climate conditions. In some circumstances, land use change may involve the removal of ground litter along with vegetation cover, resulting in increased soil erosion, sedimentation, and deterioration of water quality.

Forest managers need to strike a balance between optimizing water yield and keeping an adequate canopy to minimize soil erosion, maintain albedo and enhance water quality. They also need to consider the impact of land-use change on hydrological processes at local, regional, and global levels and across seasonal, annual, and multi-decade time frames.

Much-needed research and monitoring on forest-water interactions, along with forest and tree management for water-related ecosystem services are required. Therefore, awareness raising and capacity building in the forest-water nexus and forest hydrology is necessary to ensure that we apply our knowledge to better manage forests and trees for their multiple benefits, including water quantity, quality, regulation, and the associated socio-economic benefits.

The importance of embedding this knowledge and research findings in policies is paramount. It is also necessary to develop institutional mechanisms to enhance synergies in forests and water issues and to implement and enforce national and regional action programs.

However, management of forest and water resources often falls under different jurisdictions, and due to the narrow focus of both sectors on their respective subjects, it has been challenging to reach a consensus and ultimately establish collaboration between the forest and water sectors.

*(The author is Ex. Principal Chief Conservator of Forests, UP)*

Hindustan- 16- September-2022

# नदियों को प्रदूषित करने के लिए यूपी पर हर्जाना

**कार्रवाई**

■ प्रभात कुमार

नई दिल्ली। गोखरपुर स्थित रामगढ़ झील, रोहिणी, आमी और राप्ती नदियों को प्रदूषित किए जाने और शहर में ठोस कचरा प्रबंधन के लिए समुचित व्यवस्था नहीं करने पर राष्ट्रीय हरित अधिकरण (एनजीटी) ने उत्तर प्रदेश सरकार पर 120 करोड़ रुपये का हर्जाना लगाया है। ट्रिब्यूनल ने अपने आदेश में कहा है कि गोरखपुर स्थित झील और इन नदियों में सीवेज बहाने के लिए उत्तर प्रदेश सरकार जिम्मेदार है। एनजीटी ने मीरा शुक्ला की ओर से दाखिल याचिका पर यह आदेश दिया है।

एनजीटी प्रमुख न्यायमूर्ति ए.के. गोयल की अगुवाई वाली पीठ ने कहा है कि तथ्यों से जाहिर है कि गोरखपुर के नदियों में प्रतिदिन 5.5 करोड़ लीटर सीवेज बहाया जा रहा है। पीठ ने कहा है कि तथ्यों से जाहिर है कि जल प्रदूषण इलाके में फैले एंटरो वायरस (ईवी) का प्रमुख स्रोत है। एंटरो वायरस एक प्रकार का दिमागी बुखार है को जापानी इंसेफेलाइटिस (जेई) और एक्यूट इंसेफेलाइटिस सिंड्रोम (एईएस) की तरह है। पीठ ने सीवेज का पानी नदियों में बहाने और ठोस कचरा प्रबंधन का समुचित व्यवस्था नहीं किए जाने के लिए उत्तर प्रदेश सरकार को 120 करोड़ रुपये का हर्जाना एक माह के भीतर जमा कराने का आदेश दिया है।

पीठ ने राज्य के मुख्य सचिव को हर्जाने की रकम गोरखपुर के संभागीय आयुक्त की निगरानी वाली रिंग फेंस्ड खाते में जमा कराने का निर्देश दिया है। इस रकम का इस्तेमाल इलाके के पर्यावरण को हुए नुकसान की भरपाई और सुधार कार्य के लिए संयुक्त समिति की निगरानी के लिए किया जाएगा। मीरा शुक्ला ने अपनी याचिका में गोखरपुर स्थित रामगढ़ झील, रोहिणी, आमी और राप्ती नदी को प्रदूषण पर नियंत्रण की मांग की है।

## पर्यावरण सुधार के संयुक्त समिति का गठन

प्रदूषण से पर्यावरण को हुए नुकसान की भरपाई और सुधार कार्य के लिए एनजीटी ने छह सदस्यीय संयुक्त समिति का गठन किया है। पीठ ने इस समिति को एक माह के भीतर बैठक करने और शहर में प्रदूषण को कम करने और उचित उपचार के लिए कार्ययोजना तैयार करने का आदेश दिया है। समिति को सीईटीपी का संचालन, रामगढ़ ताल का संचालन, अतिक्रमण रोकने और वृक्षारोपण सुनिश्चित करने का आदेश दिया गया है ताकि छह महीने के भीतर ठोस परिणाम प्राप्त हो सकें।