Why we must rethink our water management practices

AINUN NISHAT

Professor Emeritus at the Centre for Climate Change and Environmental Research, BRAC University.

KEY POINTS

1. Shift national policy from water development to integrated, climate-resilient water management.
2. Enforce existing water laws, prioritising wetlands, rivers, and ecological flows.
3. Reduce groundwater dependence by investing in surface water storage and seasonal planning.
4. Reform institutions to ensure coordination, authority, and accountability in water governance.
5. Elevate transboundary water negotiations to the highest political level.

I am writing this article to convey a very strong message. Water is a natural resource. It is essential for life. It is essential for economic development. It is essential for ensuring food security. It is essential for human health. I can give more parameters to explain why water is an element of life.

On an annual basis, we have enough water to meet our demand. But on a seasonal basis, the distribution is highly unfavourable to satisfy the demands and requirements of various competing sectors. I shall try to compare availability, demand, opportunities for development, and constraints to show why water is both a bane and a boon. Very briefly, I shall try to establish that we are fast approaching a crisis in managing this vital natural resource, which is finite in supply.

The popular notion has been that we have surplus water. But Bangladesh presents a paradoxical situation; at one part of the year, we have more water than we need—many people consider it to be surplus—but without considering the needs of the environment and ecology, this view must be adjusted. On the other hand, at other times of the year, the supply dwindles and becomes inadequate to meet all sectoral demands—and there are situations of serious shortfall. Very soon, this shortfall or shortage will become a major element in our life and livelihood management.

We have many laws and policy documents for the sustainable management of water resources, but we do not follow them, and thus we are on the road to a major crisis. Our Constitution demands that we protect our nature and wetlands. The time has come to evaluate various aspects and issues related to the effective management of this important natural resource and to apply policy statements and laws prudently and effectively.

Bangladesh is at a crossroads in the domain of water management. Bangladesh pushes for 'water development' at the expense of huge funds, but completed projects soon become ineffective due to the absence of 'water management' practices. The question now is—shall we continue to pursue the path that we are following? Or shall we make radical changes in our approach? Will it be possible to make changes in our management style? Do we have a proper understanding of the constraints? Do we have a proper understanding of where we are making mistakes? Do we have proper plans and capacity, including human capital, to shift our course in the right direction?

In short, my answer to the aforesaid questions is a loud no. Unless we correct our course towards water resources management, we are in for difficult days; future generations will blame us for not taking the right decisions, even now. Let us examine the issues.

According to a WHO–UNICEF report (2021), 68.3 million people in Bangladesh do not have access to safely managed drinking water. PHOTO: AFP

The first point I would like to make is that water availability comprises surface water, groundwater, and rainwater. It is seasonal variability that causes the problem. In the monsoon months, availability from all three sources is very high, often far exceeding demand. In the dry and winter months, the quantity of rainfall is almost negligible, the level of groundwater drops significantly, and surface supply becomes very low.

This situation is further aggravated as surface water coming from upstream regions diminishes, and most of the small rivers almost dry up. In the absence of any agreement with the upper riparian country, this situation may become even more acute in the coming years. The solution to this concern is largely dependent on political relationships. In the dry season, we are almost totally dependent on groundwater.

The three major river systems of the country—namely, the Ganges, the Brahmaputra, and the Meghna—carry some flow, but we do not use it for crop production. Some water from these three major rivers is pumped to nearby major cities for drinking purposes. Over-dependence on groundwater and lack of rainfall are major obstacles to the smooth management of water resources during the dry season.

My point here is that insufficient consideration of seasonal variability in our planning and water utilisation processes has been made, and this needs to be rectified.

In planning and management, the looming threat of climate change and the increasing impact of global warming will make water availability more unpredictable as well as more unmanageable. Rainfall patterns are going to change during the peak period of the monsoon (June, July, and August). Rainfall may be lower compared to average conditions. Rainfall may also be higher during the pre-monsoon period (April and May) as well as in the post-monsoon period (August and September). This will create unfavourable conditions at different times of the year and in different locations across the country. North-Western Bangladesh—that is, the Rangpur, Bogra, and Dinajpur areas—as well as the Rajshahi region, may experience long periods of very low rainfall. This could create drought-like situations that hamper the monsoon crop, *Aman*.

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The incidence of both floods and droughts will create additional complexity. Early flash floods in the north-eastern and northern areas—mainly in the Sylhet and Mymensingh districts—as well as in central and eastern areas, namely Comilla, may occur more frequently. To protect the dry season rice *(Boro crop)* in these areas, the use of submersible dikes has been considered the correct approach. This is a 100-year-old technique that has been practised since the creation of Bangladesh in the 1970s. However, this system to protect crops has failed, as has happened several times over the last four to five decades. These failures are the result of improper water management practices.

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The timing, intensity, frequency, and duration of monsoon floods are also changing. With an increasing population, people have settled in locations such as riverbanks and coastal shores, and in low-lying floodplains, etc. These areas are regularly submerged. These vulnerable areas often have ineffective protection, making the level of misery faced by affected people more acute compared to a situation with no protection at all. As rainfall intensity is set to increase, as is happening elsewhere in the world, the problem of drainage congestion will rise. Cities and towns are becoming more vulnerable in the coming days. Cities like Dhaka are going to face serious drainage congestion very soon.

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In professional life, we observe an almost total absence of coordination among agencies and organisations responsible for managing water. Controlled water availability is an important aspect of crop production, especially for paddy. If we take a broad and simplified approach to evaluating the major factors that control rice productivity, then we can identify three such factors. Again, I am overgeneralising and speaking in broad terms. These factors are: i) the quality of seeds, ii) other essential inputs such as fertilisers and insecticides, and iii) control over water availability. I am assuming that the quality and productivity of land resources are non-variable issues. At this stage, I am considering that the first two parameters guide productivity levels, and that the third element—control over water supply—is essential to regulate overall production. Too much water (that is, flooding) and too little water (that is, drought-like conditions) are the major challenges here.

We used to grow different varieties of rice. In the pre-Bangladesh period, submergence-tolerant deep-water varieties were grown, but the yield of these varieties was less than one tonne per hectare. By switching to varieties that must be grown in flood-free conditions and that require adequate irrigation—varieties that are high-yielding—we now produce 4–7 tonnes per hectare. Of course, the use of quality seeds and other inputs are the drivers of our success in the agriculture sector. But the management of water is an unavoidable condition.

Aman, grown during the monsoon period, was once the main food grain of the country, and national attention was directed towards flood management to protect the monsoon crop in the pre-independence era. Since the 1970s, the introduction of the high-yielding Boro variety has overtaken Aman production. For this crop, winter irrigation is sine qua non. This crop may also suffer from early flash floods. For managing low rainfall or drought-like conditions, particularly during dry periods, we are over-dependent on groundwater—surface water is not available in the regional rivers.

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So far, my focus has centred on rice production. But what about the demand for human consumption? There is a statement by Benjamin Franklin that "a wandering traveller in a desert understands the value of drinking water when he finds the well dry." All over the world, it is recognised that the availability of safe drinking water at an affordable price is a basic human right. Is our water safe to drink? Being uncertain, we have shifted towards costly commercially available bottled water. Drinking water is mostly managed by women in rural areas. They often need to walk 5–6 kilometres to collect just a pitcher of drinking water for the family. This problem is particularly acute in the coastal belt.

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The problem stated in the aforesaid paragraph is becoming more critical and acute in the coastal belt, where water is becoming saline. This is driven by global warming, which leads to sea-level rise and pushes salinity levels further inland. It appears that in 50 years' time, the southern one-third of Bangladesh will become as salty as seawater. Drinking water is already a major social and economic problem in the south-western districts of Khulna, Satkhira, Bagerhat, and Barguna. Production of rice has also become a problematic issue in these areas. I am told that even the production of shrimp varieties grown in these areas is facing problems.

It is urgent that agricultural practices, including the types of crops to be grown, are evaluated. While sunflowers (for oil), watermelon, and beetroot have already been introduced in these areas, the question is whether we are ready to explore the possibility of sugar production based on beetroot. Returning to the topic of the previous paragraph, access to an adequate water supply for the purposes of sanitation and hygiene remains critically low in many regions of the country. Water for drinking purposes, sanitation, and health (WASH) is mostly managed by local communities, while people in townships and cities receive support from the state. I shall also add hygiene to water supply, sanitation, and health (WASH) for future considerations.

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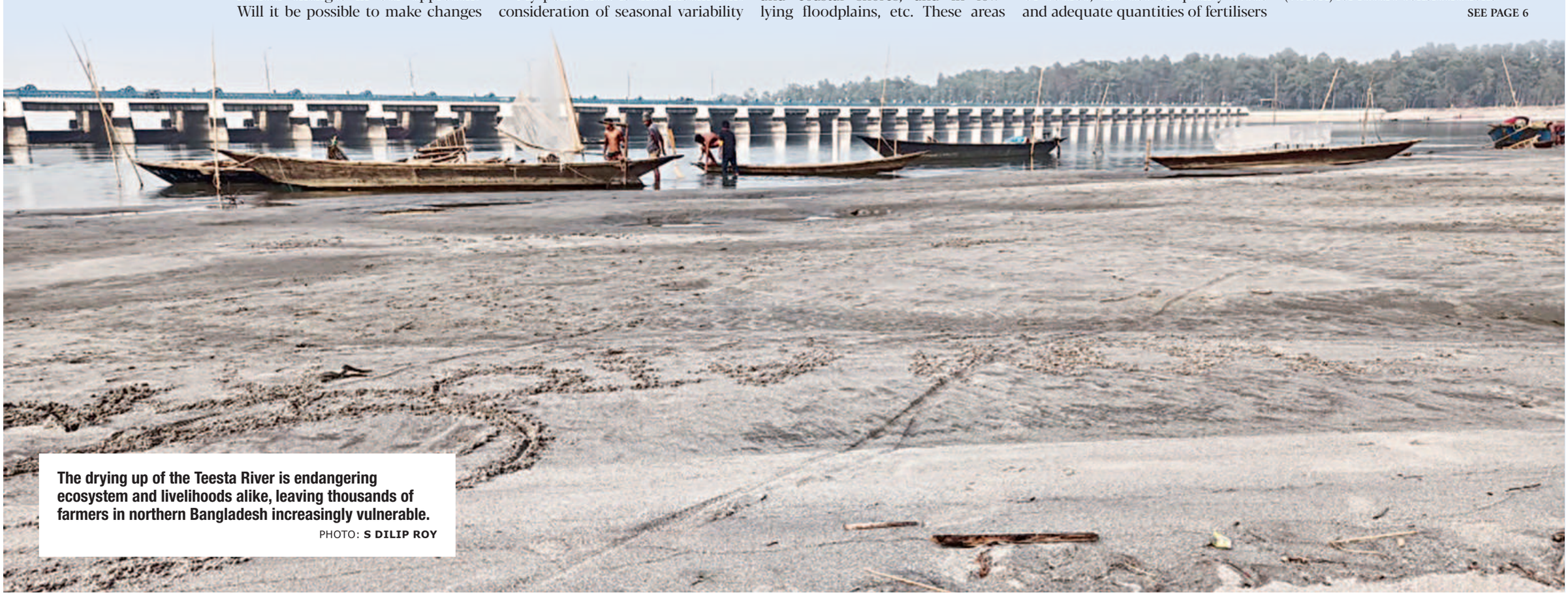

The drying up of the Teesta River is endangering ecosystem and livelihoods alike, leaving thousands of farmers in northern Bangladesh increasingly vulnerable. PHOTO: S DILIP ROY