

AN OMINOUS TREND

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depends upon how badly the agricultural products are affected.

He highlights the recent floods in the Haor region, to explain his point.

"Had the floods arrived to the Haors a little later, the farmers would have cut their crops and they wouldn't have worried about the chest-high water. They would, on the contrary, be happy and singing *baul* songs because they would have gotten a bumper crop and that would have helped them live without any worries for three years. There are plenty of factors to consider," he says.

Lack of preparedness

He attributes the recent floods in the country to climate change and states the examples of Rangpur and Dinajpur regions which witnessed the worst ever floods in the last three decades.

"There was an unprecedented amount of water from the Tibetan Plateau, particularly from the slope coming from Nepal. The rainfall from Nepal and China gushed in during the last few days. The erratic rainfall and sharpness of the rapid flow were factors that were unprecedented. That's why I call it climate change. It goes beyond the variability of 30 years," explains Dr Atiq.

The lack of preparedness hurt these two places a lot more than the other areas.

"A woman in Kurigram, for instance, will keep dry wood on the rooftop before the season of the floods, because she knows that no matter what happens, she will have to cook. She has a transportable *chula*.

"But can you expect people in Dhaka

or Dinajpur to be like that? The amount of water that came into Rangpur and Dinajpur was unexpected. The floods in that region were not knee-high, not chest-high, but double the human height," says Dr Atiq.

"This was also the time before Eid and so they were fattening their animals. Their investment got affected badly. So that just made everything worse," he adds.

Cyclone windspeed on the rise

It is not just floods that are displaying an increase in intensity. Tropical cyclones have also shown a similar trend.

One of the most crucial factors for measuring the intensity of a cyclone is its wind speed. According to data from the SAARC Meteorological Research Centre (SMRC), between 1991 and 2009, Bangladesh witnessed five cyclones with a maximum wind speed of above 200 kph. On the contrary, between 1901 and 1990, the country had witnessed just one cyclone, in November 1970, which crossed the 200 kph barrier. This goes on to show that severe cyclones, or cyclones with high speeds, were a lot rarer in the early 1900s.

Again, the amount of destruction or

the number of casualties isn't exactly proportional to the increase in wind speed. For instance, the Bangladesh cyclone of 1991, which had a wind speed of 225 kph, reported more than one lakh casualties. Six years later, another cyclone hit the coast of Chittagong with a maximum windspeed of 230 kph. That cyclone, however, witnessed 155 deaths. What these numbers do show is that over the years Bangladesh has improved its resilience to cyclones with a systematic safety approach.

Bangladesh's latest tryst with cyclones was when Mora threatened the country

SPOTLIGHT

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at the coast. The highest possible warning signals were displayed in all the coastal areas and people expected the worst. However, fortunately, the cyclone made landfall during the low tide, which significantly decreased the effect.

Dr Atiq explains that the increase in wind speed over the years is a result of climate change.

"The earth's temperature has been gradually increasing ever since the pre-industrial era. As the temperature rises, evaporation increases and the cloud formation has a higher amount of water vapour. It carries more weight. It's like

how a heavy-weight boxer packs a bigger punch than a light-weight boxer," he says.

Aside from causing casualties and plenty of destruction, cyclones also push salt water into the fresh water areas in the coast, which increases the salinity of the water and in turn affects the farmers. Several farmers are then forced to quit their age-old profession and come to the city in order to support themselves.

Erratic rainfall

Aside from cyclones and floods, the changing pattern in rainfall is also adversely affecting the country. Professor

AKM Saiful Islam, who works at the Institute of Water and Flood Management in the Bangladesh University of Engineering and Technology (BUET), explains the erratic rainfall pattern.

"Our study shows that consecutive wet days will decrease in the future, although the total amount of rainfall in the country will increase. Therefore, the intensity of the rainfall will increase in the future, which can lead to an increase in extreme events such as flash floods," he says.

What he basically means is that while the total amount of rainfall in Bangladesh

has not decreased, the intensity has increased because there's more rain arriving in a shorter period of time.

This change may not only cause extreme events such as floods, it can also affect the farmers who plan what to grow based on the season.

Professor Saiful adds that there is a chance that the Haor regions may witness more flash floods.

"Many studies have already shown the connection between global warming and the changes in the frequency of certain extreme events on a global scale. Our studies have also shown the likely increase of the extreme precipitation in the Haor areas; consequently, flash floods could increase in the future. However, more extreme event attribution studies should be conducted to establish that global warming has added to the severity of flash flood events," he says.

Floods in South Asia this year have killed more than 1000, affected at least 40 million and prevented more than a million children from going to school. Let's not forget it has compelled Bangladesh's agriculture ministry to change its strategy within just a year.

One wonders what more it will take to change the mindset of certain influential world leaders, responsible for a large portion of the carbon up there in the atmosphere, who still don't seem to believe that climate change is real. Numbers related to cyclones and floods don't lie and it's quite clear that drastic measures need to be taken in order to ensure that these statistics don't reach a point of no return.



PHOTOS: ZIAUL HAQUE OISHARJH

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HOW FLOWS BECOME FLOODS

Failure of flood embankments and absence of alternative solutions are leading Bangladesh to a watery grave

MD SHAHNAWAZ KHAN CHANDAN

BWDB officials say that due to limited budgets, it usually repairs and reinforces embankments as a response to flood warnings and the demands of locals. "We know better now after this year's flood; we are planning to launch large-scale continuous embankment maintenance projects. We have also gotten permission to recruit 1000 more people. However, we cannot promise there will be no flood next year. Flood control is actually a long-term process," says Mahfuzur Rahman, Director General of BWDB. However, this organisation's efforts to control floods with embankments has proved quite ineffective in many cases due to flawed

construction and lack of maintenance. For instance, the Chouhali upazila dam, which cost over BDT 100 crore and took BWDB two years to construct, collapsed two times within six months.

According to Dr M A Matin, Professor of Water Resource Engineering Department of Bangladesh University of Engineering and Technology, says, "Quality of construction and proper maintenance are the two factors responsible for the premature collapse of the embankments." He argues that if the embankment can withstand an annual flood without collapsing, it can be assumed the design of the embankment



PHOTO: SHEIKH NASIR

is perfect. However, the structure needs regular maintenance, which is one of the biggest challenges in Bangladesh. "Manmade activities like building human settlements on the embankment, digging holes in the embankment for personal interests, and taking away concrete blocks and earth from the embankment for construction work are some of the common practices in Bangladesh which make the

embankment very weak and vulnerable," explains Dr Matin.

This is why he suggests that the maintenance work of the embankments should include two components: one, repairing the embankments, and two, creating awareness among local people of the significance of this protective structure. In regard to this, Rahman argues that guarding the embankment to protect it from manmade activities is

not possible for BWDB due to limited resources. He says, "We cannot guard every section of this massive network. We have a limited budget for maintenance and a workforce of some 6000 men to perform such huge tasks."

Considering these challenges of regular maintenance and resource constraints, experts suggested an alternative method of flood control 28 years ago after the deluge of 1988. In 1989, the Flood Action Plan of Bangladesh proposed a method called compartmentalisation. According to Dr Matin, "Compartmentalisation involves receiving flood waters, then preserving it through enclosed embankments, and finally distributing it through channels in a regulated way to all parts of the country to minimise the impact of flood without negating its contribution to our agriculture."

This method was proposed keeping in mind the inevitability of floods in Bangladesh due to its geographical location, its people's natural ability to cope with flood, and the beneficial impact of flooding in enhancing the fertility of agricultural lands. However, BWDB claims that implementation of compartmentalisation has recently faced serious challenges as it requires the availability of floodplains for regulated flooding, which has decreased significantly over the last 20 years.

"Human settlements have occupied most of the floodplains. Urban dwellers do not want any type of flooding, whether regulated or natural. Even our farmers do not want flooding nowadays. They can improve the fertility of their lands by using manure and irrigating with river- and ground-water. So, we have now discarded the compartmentalisation method and gone back to building embankments," says Rahman.

During the 1960s, the erstwhile Pakistani government prepared the first Master Plan for water management, which focused mostly on flood control through embankments and drainage improvements. Since then, Bangladesh's flood control system has not seen much progress. Failed initiatives like compartmentalisation and the frequent collapse of embankments have already cost us a vast amount of state resources and human lives. On the other hand, the trend of annual flooding clearly shows the growing intensity of floods in Bangladesh and its devastating impact on the country's agriculture-based economy. Without developing a cost-effective and sustainable flood control system as soon as possible, it will not be possible for Bangladesh to keep its wheels of economic growth in motion for long.

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