

On the Climate Trail



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Mubina Akhtar 8 August 2012 9408 views

The recent waves of floods have left a trail of devastation in the entire Brahmaputra valley. More than a week of heavy rains in Assam has caused the massive Brahmaputra to exceed dangerous levels. Smaller rivers have also over burst their banks. Twenty-six of the 27 districts in the state have been hit by floods since June 24 as a result of the unprecedented torrential rains while the Brahmaputra river has breached its banks in at least nine places. Nearly 200 people lost their life and millions affected. The agriculture sector suffered huge losses with 254,935 hectares of cropland damaged and 50% of crops destroyed.

The Kaziranga National Park, a World Heritage Site and the Dibru-Saikhowa National Park are both ravaged by the recent waves of flood. According to the Union Environment and Forest Ministry, at least 595 animals, including 17 one-horned rhinos, have perished in the world-famous Kaziranga National Park and Tiger Reserve during the ongoing floods in Assam. Over 500 hog deer have been killed in the current floods, while 10 swamp deer, 28 wild boar, 15 Sambars, five porcupines, two hog badgers, two gaurs (Indian bison), two wild buffaloes and a fox perished in the deluge. However, local NGOs claim that over 1,000 endangered species have died. More carcasses were found floating once water levels receded. The park has been flooded since June 26 and within a couple of days nearly 80% of its 430 kilometres core area was inundated; only the natural and artificial highlands where the animals fled for shelter were spare.

The Kaziranga National Park, a World Heritage Site and the Dibru-Saikhowa National Park are both ravaged by the recent flood, are biodiversity hotspots in the Eastern Himalayas.

The two districts of Lakhimpur and Dhemaji are not only prone to seasonal floods, but to a series of flash floods throughout the year. A fortnight ago, incessant pounding rainfall on the upper reaches of Arunachal Pradesh caused flash floods in the Jiadhal River that inundated 40 villages in Dhemaji.

Floods and river-bank erosion pose a grave risk for the entire Brahmaputra valley. Globally, the Brahmaputra river system is perhaps the only one known for its loss of about 100 square kilometres of land every year due to bank erosion. Each year, a few months of hot, dry weather in India give way to the southwest monsoon in June-July followed by three months of strong winds and intense flooding. Floods have been occurring annually since 1950, causing havoc in the region. Due to seismic activity in the fragile geological base of the Himalayan plateau, in addition to a high level of annual precipitation, the Brahmaputra Valley is constantly under threat from flooding.

Of late, the northeastern part of the country has experienced the impact of climate change in excessive rainfall, flash floods, abrupt monsoon, longer summers, droughts, rising temperatures and increasing pest populations. The annual monsoon, crucial to India's food production and economic growth, hit earlier this year.

The UN Office for the Coordination of Humanitarian Affairs (OCHA) is preparing to support India and Bangladesh in their flood relief efforts.

"The office is monitoring the situation in both countries and stands ready to support if the authorities request international assistance," UN spokesperson Martin Nesirky was quoted as saying by Xinhua.

The countries of south and south-east Asia are home to more than 30% of the world's population and about half the population depends on agriculture, with rice as the staple food. According to the World Bank, global warming could reduce agricultural productivity in the region by 10- 50% over the next 30 years.

Local factors accelerating Climate Change in the region

Apart from climate change attributed to global warming, local factors contribute to the extreme weather in the northeastern region, particularly the Brahmaputra River Valley. Emissions from local industries, vehicles and natural gas-burning and burning of tropical forests for jhum cultivation accumulates increasing carbon dioxide and other heat-trapping emissions, raising regional average temperatures and triggering heavier precipitation events. Assam has been experiencing all the symptoms associated with alarming levels of black carbon pollution over the past five or six years: severe droughts in the state during 2005-06 and 2008-09 led to huge economic losses due to crop failure; extreme flash floods and abnormality in monsoon patterns; and strengthening of pre-monsoon tropical cyclonic systems.

Human induced climate change continues to warm the Brahmaputra valley. Higher temperature increase the amount of water that evaporates from the surfaces of water bodies in the region as well as the temperature of air that moves over the gulf, increasing the amount of water vapour it can hold.

According to a study by Indian Institute of Tropical Meteorology (IITM), by 2030 India can expect a 1 to 1.5 degree Celsius rise in temperature and more intense spells of rain. However, the number of rainy days will be fewer. This phenomenon will directly impact availability of water. It was also observed that over the last 30 to 40 years, night-time temperatures has risen, damaging rice yields in the country. IITM used the UK meteorological office's regional climate model PRECIS (Providing Climate Investigation Studies) that indicate that there will be between 8% and 10% more rainfall in India and the temperature will increase between 1 and 1.5 degree Celsius by 2030. But with emissions likely to rise in the future, these projections remain uncertain. Over the past century noticeable changes have occurred in the extreme rainfall events across India. While the frequency of heavy rainfall event is decreasing in major parts of central and northern India, it has been increasing in Indian peninsular, east and northeast India.

Assam suffers flooding almost every year, but this year's disaster is the worst in at least a decade, causing extensive economic losses. National and state government need to update their plans to prevent and mitigate increasing flood risks. Experts observe that after a heavy rainfall, there is less water vapour in the atmosphere, and therefore dry spells tend to last longer. In the absence of rain, higher temperatures contribute to longer and more intense drought periods. So it is feared that the eastern and north-eastern region may suffer from extreme drought.

According to Professor Nayan Sarma from the Indian Institute of Technology Roorkee, the possible reason for the recent floods in Assam is the changes taking place in climate. He said that a study done under an Indo-German Project indicated the likely impact of climate change with the temperature projected to increase in the Brahmaputra basin in the Parameters directly dependent on temperature, like potential evatranspiration are also assumed to show clear trends of rise. This will have a severe impact on the hydrology of the Brahmaputra River Basin. Different climate change indicators point to more frequent and prolonged droughts, Professor Sarma also added.

The Brahmaputra River Valley has been experiencing extreme regional climate in the recent years and the carbon emissions from Guwahati are believed to play a major role in warming the climate. A research team from the Desert Research Institute in Nevada, United States, with support from NASA, calculated that on average the high level of pollutants have resulted in an increased daily temperature of 2 degree Celsius. The research reveals the affect of black carbon aerosols, emitted from vehicles and other combustion sources, on the atmosphere of the region. Strong radiative heating due to wintertime black carbon aerosols in the Brahmaputra valley not only affects the climate, these pollutants are carcinogenic and present a serious health hazard.

According to the research paper published in the Geophysical Research Letters - Guwahati has one of the highest black carbon pollution levels in the world. The mass concentration of black carbon pollution during winter observed in the city was higher than levels in the other large cities in India and China and much higher than in the urban locations in Europe and the US. Rajan K Chakravarty, a researcher on the project who hails from Guwahati said that what is alarming is that these pollutants are being pushed out to the Himalayas, melting glaciers and permafrost and interfering with the monsoon cycle, causing abrupt rainfall and droughts.

The report also reveals that more than 400,000 vehicles ply Guwahati's roads everyday. About 70% of these vehicles don't have emission clearance certificates and emit excessive amounts of black carbon and other very toxic pollutants into the atmosphere. Another factor contributing to the city's pollution is the unplanned and open burning of solid waste disposal in the city.

This alarming issue has already been reported to the Forest and Environment Ministry, Assam. Black carbon is major health risk and a key source of global warming—the state needs to recognise this alarming rise in black carbon pollutants. Strong measures are needed to control vehicle pollution and the state machinery must quickly act upon it.

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