

DHAKA WEDNESDAY FEBRUARY 25, 2009



Observed variations

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situated at Dhaka may work as a regional platforms for this purpose. SMRC has already completed a number of climate change related studies for this region.

Observed climate change, impacts and adaptation in Bangladesh

Temperature: The climate change of Bangladesh has been analysed using the country average meteorological data of 57 years (1948-2004) by the author. The analysis shows that the minimum temperature of all months expect May shows warming with very strong increasing trends in the range 0.13-0.25°C per decade (ten years) for the months of February-March and November-December. The warming of the minimum temperature in the months of December-February has adverse impacts on wheat production in Bangladesh.

On the contrary, the maximum temperature from January-April shows cooling with no change in May, while rest of the

months show strong warming at the rate of 0.14-0.29 °C per decade except the month September which do not show much of trend. The cooling in maximum temperature in the winter may be related with the enhanced fog and precipitation activities over Bangladesh, which has serious negative impacts on the Ravi crops such as mustard and pulses through the fungal attack. It has been found that the maximum temperature of September, October and November has negative correlation with Aman rice yield. The correlation is quite strong for October. Thus, higher maximum temperature for these months will lower the yield of Aman rice. The annual minimum temperature shows stronger increase (0.09°C/decade) compared to the maximum temperature (0.05 °C per decade). In a warmer atmosphere, the consumption of water will go up. The evaporation rate will be higher for higher temperature, which will cause rapid drying of the soil and the

reservoirs. Thus there are more chances of droughts in a warmer condition. Because of the rapid evaporation, the irrigation will need higher volume of water. In a warmer air temperature some diseases such as diarrhoea, malaria, dengue, heat stress and heart, lung and respiratory diseases are expected to increase.

The adaptation in the agriculture sector due to warming may be done through crop diversification and land-use change. Moreover, the heat resistant variety of wheat or other rabi crops may be developed using biotechnology.

Rainfall: The country average annual rainfall for 57 years (1948-2004) shows increasing trends of 45 mm/decade (2% with respect to the mean) with the seasonal distribution of 5.6 mm (7.1% in winter (December-February), 21.4mm (5%) in pre-monsoon (March-May) and 21.2mm (1.3%) in monsoon (June-September). Post-monsoon (October-November) does not show much of changes. The pre-monsoon indicates relatively strong increasing trends compared to the monsoon in terms of the percent increase relative to the mean. The pre-monsoon flash floods in the northeast and southeast Bangladesh have become very common. Though the monsoon rainfall does not exhibit much of trends, the variability was found to increase in the recent decades. This means that frequency of the extreme rainfall is increasing which causes more frequent floods and droughts of severe nature. The historic floods of 1974, 1987, 1988, 1998, 2004 and 2007 may be mentioned as the evidences of frequent occurrence of floods. The floods of 1988 and 1998 were caused by the rainfall over the northern Bangladesh and associated territories of India in the north and west. The other floods were contributed by the combined rainfall over Bangladesh and upstream territories of the neighbouring countries. The floods cause damages to the agricultural crops, economy, infrastructures and causes sufferings to the livelihood of the people. Because of the scarcity of

food and potable water during the floods, many diseases including diarrhoea, respiratory problems, typhoid and skin diseases prevail among the flood victims.

Some studies were conducted to understand the impact of variability of precipitation on Aman rice. It is found that the yield of Aman rice increases with the increase of rainfall up to certain level beyond which the yield decreases. The correlation of Aman yield with the rainfall of individual months show that excess rainfall in August lowers the yield while the rainfall of October increases the yield.

Surprisingly, the farmers of Bangladesh have adapted coping mechanism after 1988 and 1998 floods very efficiently by cultivating more and more bore rice during the subsequent winter. In some highly flood prone areas, the aman rice is cultivated as a bonus, while the boro rice is treated as the main crop. The October rainfall is crucial for good yield for aman rice. Thus if the weather prediction indicates low precipitation, supplementary irrigation is to be applied to the crop. Thus, weather services and agromet advisory are very important for adaptation to climate change. In the areas where water logging is a problem and the agriculture has suffered to a large extent, it is suggested that those areas are converted to shrimp and fish culture. For mitigating the floods, it is necessary to improve the drainage capacity of the rivers and canals and protect the socio-economically impor-

tant zones by embankments. The embankments require timely maintenance. The houses are to be made on high platforms higher than the highest flood level. In the same way, the foods and seeds are to be protected in the raised stores, where water will not reach. The tube wells are to be built in the high raised platforms so that drinking water is not contaminated. The farmers should prepare seed beds in the high lands so that they are able to transplant just after the recession of the floods. The flood warning activities of Bangladesh have developed a lot in Flood Forecasting and Warning Centre (FFWC), which is to be further improved and the system of dissemination of the warning is to be strengthened. The Information Technology (IT) and mobile phone system may play important role in addition to the Radio and TV broadcasting. I am sure the internet has the access to the upazila level. The flood warning is available in the websites. Any responsible person dealing disaster management may download the up-to-date warning and extract the flood warning for their areas and then communicate to the Union Parishad by telephone. In this way high technology can play role. Not only that. The agriculture extension may have their website with weekly prescription for agricultural crop management in case of disasters or unusual weather conditions and in the process described above the information can reach the target groups.

Coastal zone and Sea-level rise: The

The global sea surface temperature (SST) is increasing resulting in the volumetric expansion of the sea water. The melting of the polar ice and glaciers are being added causing further increase of the water volume. This is causing the sea level rise. According to IPCC (2007), though the global sea level rise is about 1.8 mm/year during 1961-2003 the rate was faster over 1993 to 2003, about 3.1 [2.4 to 3.8] mm per year. The sea level rise varies from basin to basin.

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