

This paper is dedicated to Prof. G. Furlan, Head, Training and Research in Italian Laboratories, the Abdus Salam International Centre for Theoretical Physics, who guided my original research paper.

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Long Term Forecast of Bangladesh Climate

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A Brief

Advance Prediction of Climate of a country/region is desirable from various economic consideration specially in the field of Agriculture as the farmers can take appropriate measures to plan and protect their crops in the light of advance information on climate. This has become possible in Bangladesh in view of the research conducted by the author while he was an Associate of the Abdus Salam International Centre for Theoretical Physics (ICTP) and presented by the author under the title Bangladesh Floods, Cyclones and ENSO in the International Conference on Monsoon Variability and Prediction held at the Abdus Salam ICTP during 9-13, May, 1994 sponsored by ICTP and WMO. The proceedings have been published as WCRP-84 and WMO/TD-No. 619 (1994). The paper found a strong correlation between the Southern Oscillation Index (SOI) and the Bangladesh Climate. Southern Oscillation Index (SOI) is a measure of the pressure difference between the eastern Pacific Ocean and the western Pacific Ocean and actually pressure anomaly difference between Tahiti Island in the Eastern Pacific and Darwin city of Australia is taken in the Western Pacific for its actual measurement. When SOI is strongly negative, the situation is known as El Niño and when the SOI is strongly positive, the situation is known as La-Nina. The paper has shown by taking hydrological data of Bangladesh rivers and the SOI index from 1950-1990 that an El Niño situation favours less rainfall in Bangladesh with the chances of drought and strong La-Nina could herald devastating floods. This follows from the findings of Sir Gilbert Walker who was the Director General of Indian Meteorological Department in the beginning of early twentieth

century that when pressure is high in the Pacific Ocean, it tends to be low in the Indian Ocean from Africa to Australia. This circulation has been named after him as the Walker Circulation. El Niño and SOI are sometime jointly called ENSO because of their interconnection.

Taking the research results into practical applications, the author has successfully made early prediction of the climate during 1997-2001 and the research results have been vindicated. For example, the devastating monsoon floods in Bangladesh in 1998 was predicted by the author well in advance, which enabled the Govt. to take appropriate measures and tackle the situation. It may be remarked that many in the West had feared large scale death and starvation would result as a result of the catastrophic flood of 1998 which lasted unusually for two and a half months covering nearly two third of the country. But nothing like this happened as a result of all the precautionary measures taken by the Govt. and the forecast made by the author was very helpful in this respect. During 1998, the SOI started rising sharply from a highly negative value to a highly positive value starting from May 1998 and continued to maintain very high positive value all through the monsoon and the author used this information in his prediction. The year 1997 was an El Niño year and the author has used this information to predict drought in that year which was again materialised and accordingly the Govt. advised the farmers to use irrigation instead of depending on rainfall. This averted great crops loss which otherwise could have caused a famine. It may be mentioned that the years 1769 and 1943 were El Niño Years when millions of people died in the great famines in the then undivided Bengal. There could have been serious crop losses due to drought in those El Niño years.

Again in the year 2001, the SOI started getting negative from April and the forecast was that it would maintain a negative value during monsoon and accordingly the author advised the Govt. that chance of a big flood in Bangladesh is nil this year and as a result the Caretaker Govt. was able to conduct the election successfully. The farmers were advised to use irrigation to face possible deficiency of rainfall in drought-prone areas.

During the years 1999-2000, SOI maintained moderate values during monsoon and there was normal weather during these years in Bangladesh though during Sept. – Oct., 2000, SOI rose sharply and there was some flooding in West Bengal of India and south-western Bangladesh.

This is how research conducted by the author at the Abdus Salam ICTP as an associate is being used to advise Bangladesh Govt. in its various policy issues specially in achieving food security and saving millions of human lives. It may be mentioned that from a food deficit country, Bangladesh has turned itself into a food surplus country recently and definitely the method developed by the author to make advanced prediction of Climate in Bangladesh has definitely contributed in this. It must be very satisfying to Abdus Salam ICTP that a research conducted here by one of its associate is helping Bangladesh in economic development and saving millions of human lives.

It may be mentioned that the Bangladesh Govt. has awarded the author with highest civilian award of the country-The Independence Day Award for his contribution to Science and Technology.

Enclosure

A few diagrams showing the Southern Oscillation Index, its correlation with Bangladesh hydrological data and some paper cuttings highlighting the author's forecast in some Bangladesh newspapers are enclosed.

Diagrams

- (1) Correlation between Southern Oscillation Index in two major rivers of Bangladesh during 1950-1990.
- (2) Southern Oscillation Index from 1997-2001.
- (3) Extracts of paper cuttings.

Extracts of paper cuttings

- (1) On 15th September 1997, Bangladesh Agriculture Dept. published an advisory urging the farmers to use irrigation in view of the possibility of drought forecast by the author.
- (2) The author gave a talk on 06-07-98 at the Bangladesh Institute of International and Strategic Studies (BISS) on El Niño and noting the sharp rise of SOI, forecast that there would be a great flood in 1998 in Bangladesh and that was published in various newspapers.
- (3) Forecast of 2001 as the year of no major flood by the author.
- (4) A few more cuttings.