

Workshop on Long Range Forecast for the 2023 Southwest Monsoon Season Rainfall and its application on South Asian Agriculture.

Background & Objectives

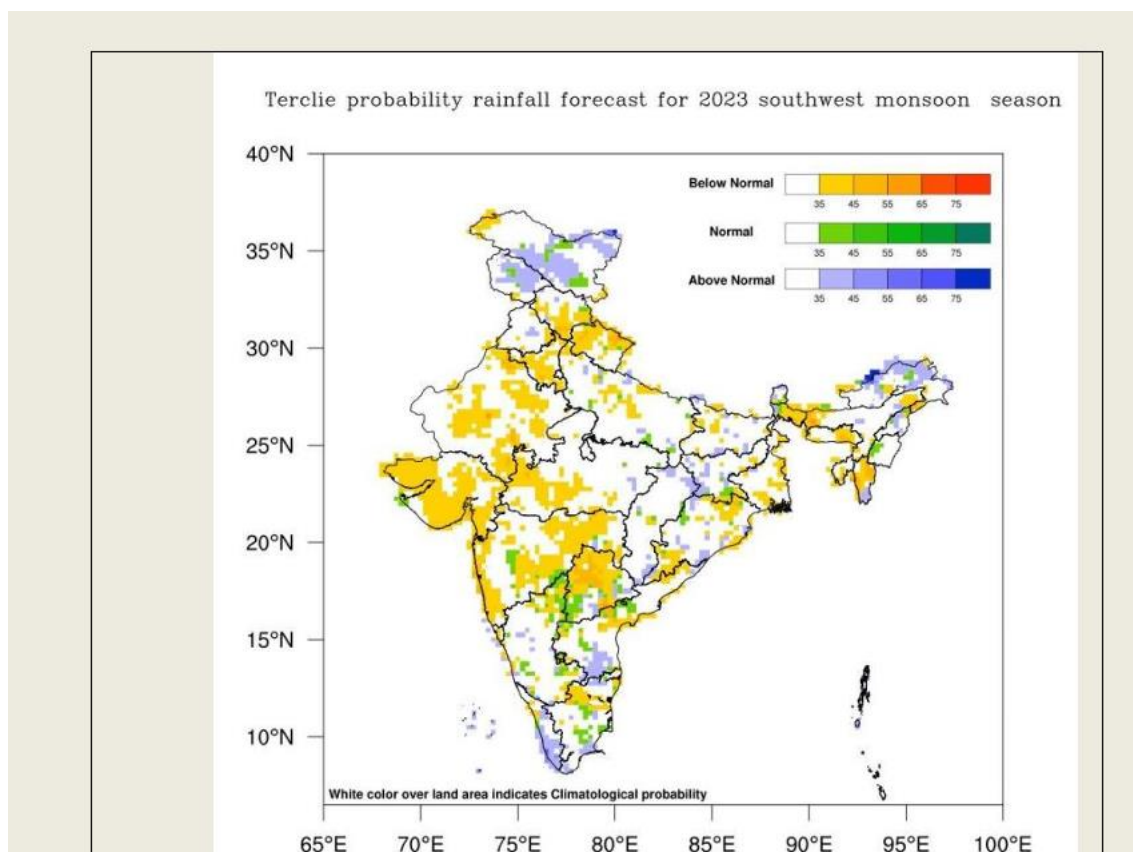
For the agricultural communities in South Asia, summer monsoon is considered one of the most important seasons as it coincides with major crops cultivation. For all the staple crops for the region, any damage or impact during the season would have a direct impact on the household food security. Farmers in India, Bangladesh, Pakistan and neighbouring countries depend on the warm, moisture-laden monsoon winds to water their crops and refill rivers and wells. Too little rain including long breaks in monsoon rain means harvests may fail, affecting food prices in this region.

Agriculture in South Asia can benefit substantially from long-range forecasts, for the month or the season, which can help to optimize farming operations and deal more effectively with the adverse impacts of climate variability, including extreme weather events. In the context of long-range forecasts also represent key elements for the development of adaptation strategies. In spite of an undeniable potential, long-range forecasts issued for instance by the National Hydrological & Meteorological Service (NHMS) have yet to find widespread application in South Asian agriculture.

At present both dynamical and statistical forecasting system are being used to generate long range forecast. Multi-Model Ensemble (MME) forecasting system based on coupled global climate models (CGCMs) from different global climate prediction centres are used to issue long range weather forecast in this region. India Meteorological Department (IMD) has been issuing the operational long-range forecast for the southwest monsoon seasonal (June September) rainfall averaged over the country as a whole in two stages. The first stage forecast is issued by IMD on 11th April. Long range forecast for the countries in South Asia is expected to be issued by South Asian Climate Outlook Forum. (SASCOF) on last week of April, 2023.

Currently La Niña conditions changed to Neutral conditions over the equatorial Pacific region. The latest MMCFS as well as other climate model forecast indicates that El Niño conditions are likely to develop during the monsoon season. At present, neutral IOD conditions are present over the Indian Ocean and the latest climate model forecast indicates that the positive IOD conditions are likely to develop during the southwest monsoon season. Sea surface temperature (SST) conditions over the Pacific and the Indian Oceans are known to have a strong influence on the Indian monsoon. Besides, the northern hemisphere snow cover areas during February and March 2023 were observed to be below normal. Winter and spring snow cover extent over Northern Hemisphere as well as Eurasia has a tendency of general inverse relationship with the subsequent summer monsoon rainfall.

The forecast based on both dynamical and statistical models by IMD suggests that quantitatively, the monsoon seasonal rainfall is likely to be 96% of the Long Period Average (LPA) with a model error of $\pm 5\%$. The LPA of the seasonal rainfall over the country as a whole based on data of 1971-2020 is 87 cm. Moreover, the spatial distribution suggests normal to above normal rainfall likely over many areas of Peninsular India and adjoining East Central India, Northeast India and over some parts of Northwest India. Normal to below normal rainfall is likely over some areas of Northwest India and parts of West central India and some pockets of Northeast India. It has also been informed that below rainfall over the many parts of India may occur in the second half of monsoon i.e., July onwards.



It is expected that almost similar information may be made available from the NHMS in other South Asian countries and from SASCOF as mentioned. A number of climate service programmes are being conceptualized to address these issues through different initiatives in South Asia.

Under this scenario, it is expected that increased intra-seasonal variability in terms of frequency as well as distribution of rainfall may become a major concern in India and probably in South Asia. Besides, the major concern may be the breaks leading to more droughts once farmers will sow the kharif crops. As a result, farmers in this region may face crop loss. Rainfed crops are likely to be worst hit due to limited options of coping with variability of rainfall resulting in a shift in sowing time and shorter growing season, which may necessitate effective adjustment in sowing and harvesting dates.

Considering all the facts and figures mentioned above, there is need to understand how the monsoon 2023 will behave considering the long range forecast for the southwest monsoon season rainfall and ultimately apply to manage the better crop production in each country in South Asia through on-going operational Agromet Advisory Services. In view of that, it is proposed to organise a workshop virtually on 13th May, 2023 inviting the members of SAFOAM, SAMA and other distinguished experts in the field of meteorology/agrometeorology.

<https://www.youtube.com/watch?v=jyhqm6LdbMU&t=11881s>