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Consensus Statement on the Forecast for the 2017 October to December (OND) Season Rainfall and Temperatures over South Asia

Summary

Below normal rainfall is most likely during the 2017 OND Season over some parts of SE Peninsular India, north Sri Lanka and some northeastern areas of the region. Above normal is most likely over southeastern part of the region and along the coastal areas adjacent to the north Bay of Bengal. Over remaining areas of the region including northwest and central areas that generally receive very little rain during the season, rainfall is most likely to be Normal.

Normal to slightly above normal temperatures are likely during the 2017 OND Season over most parts of the region.

Currently cool neutral ENSO conditions prevail in the Pacific Ocean and these conditions are likely to continue and turn to border line/ weak La Nina conditions in the early next year. It is also recognized that during the 2017 OND season, in the absence of SST forcings from Pacific and Indian oceans, strong intra seasonal features will have larger influence on the climate variability over the region leading to increased uncertainty in predictions of seasonally averaged rainfall and temperature patterns.

The consensus forecast outlook presented here has been developed through an expert assessment of the prevailing global climate conditions and forecasts from different climate models from around the world.

For more information and further updates on the northeast monsoon outlook on national scale, the respective National Meteorological and Hydrological Services (NMHSs) may be consulted.

A separate consensus statement for the winter season (December 2017 to February 2018) will be issued in November 2017.

Introduction:

During the season (October to December), many parts of South Asia receive significant amounts of rainfall which coincides with one of the major agricultural seasons of the region. The reestablishment of prevailing north easterly trade-wind regime over South Asia associated with the southward movement of the ITCZ ushers-in the so-called “Northeast Monsoon” (NEM), bringing rainfall to the southern parts of India, Sri Lanka and Maldives. In Sri Lanka, the October to November period is known as second Inter Monsoon (SIM) season. It has been recognized that there is moderate seasonal predictability for the Northeast Monsoon circulation over the region as the seasonal variability is strongly influenced by the slowly varying boundary forcings like sea surface temperatures. However, the predictability is also limited to some extent due to the high frequency atmospheric variability caused by the passage of the synoptic scale systems such as easterly waves, lows, depressions, cyclones etc. The seasonal predictability of the northeast monsoon over the region is also influenced by the Madden Julian Oscillation (MJO), which represents the major global scale intraseasonal variability pattern.

The current climate outlook was prepared during the eleventh session of the South Asian Climate Outlook Forum (SASCOF-11), which is also the third session devoted exclusively for the Northeast monsoon season. SASCOF-11 was held at Malé, Maldives, 25-27 September 2017. The forum meeting was attended by several experts from various South Asian countries such as Afghanistan, India, Maldives, Nepal and Sri Lanka. Experts from Bhutan and Myanmar though could not attend, send their forecast inputs to the forum. The forum was also attended by the experts from Japan Meteorological Agency (JMA), WMO Lead Center for Long-Range Forecast Multi-Model Ensemble (LC-LRFMME), Bureau of Meteorology (BoM), Australia and the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES). The Forum deliberated on various observed and emerging climatic features that are known to influence the climate of the region such as the El Niño-Southern Oscillation (ENSO) conditions over the equatorial Pacific, Indian Ocean Dipole (IOD) conditions over the Indian Ocean etc. The key features of these conditions are as follows.

ENSO Conditions over the Pacific Ocean

The El Niño/Southern Oscillation (ENSO) is one of the global scale climate phenomena that have significant influence on the year-to-year variability of the northeast monsoon rainfall as well as the surface temperatures over South Asia.

Warm ENSO neutral conditions prevailed from mid-March to end of July with SSTs over east-central tropical Pacific reaching close to El Niño threshold during mid-June to mid-July turned to cool ENSO neutral conditions in the latter half of August. Currently, cool ENSO neutral conditions continue. The atmospheric conditions over the Pacific also reflect patterns consistent with the observed changes in the oceanic conditions. Latest forecasts from global models indicate cool ENSO neutral conditions are most likely to continue through the OND season and turn to border line/ weak La Niña conditions during late this year or early next year.

Conditions over the Indian Ocean

In addition to ENSO conditions over Pacific, other factors such as the Indian Ocean Sea Surface Temperatures (SSTs) have also some influence on Indian monsoon. Over Indian Ocean, currently neutral Indian Ocean Dipole (IOD) conditions are prevailing. Latest forecasts from global models forecast indicate IOD neutral conditions to continue during the northeast monsoon season.

Consensus Outlook for the 2017 OND Season Rainfall over South Asia:

A consensus outlook for the OND season rainfall over South Asia has been prepared based on the expert assessment of prevailing large-scale global climate indicators mentioned above and experimental as well as operational long-range forecasts based on statistical and dynamical models generated by various operational and research centres of the world including WMO Regional Climate Centers (RCCs) and Global producing centers of LRF (GPCs).

There is unanimity among the experts that the prevailing cool ENSO neutral conditions in the equatorial Pacific and IOD neutral conditions in equatorial Pacific are likely to persist through the OND season and possibly turn into a border line/ weak La Nina conditions later this year. It is recognized that El Niño and La Niña are not the only factors that drive global climate patterns, and that the strength of ENSO does not automatically correspond to the strength of its effects. It is also recognized that in the absence any large

scale SST forcing from Pacific and Indian Oceans, there is significant uncertainty in prediction of climate of the region due to the high frequency atmospheric variability generally observed in the region.

The outlook for the 2017 northeast monsoon season (OND) rainfall over South Asia is shown in **Fig.1**. The figure illustrates the most likely tercile category¹ as well as its probability for each of the 1° latitude x 1° longitude spatial grid boxes over the region. The box-wise tercile probabilities were derived by synthesis of the available information and expert assessment. It was derived from an initial set of gridded objective forecasts and modified through a consensus building discussion of climate experts.

The outlook suggests that below normal rainfall is most likely during the 2017 OND Season over some areas of SE Peninsular India, north Sri Lanka and some northeastern areas of the region. However, above normal is most likely over some southeastern areas of the region and the coastal areas adjacent to north Bay of Bengal. Over remaining areas of the region that includes the northwest and central areas of the region which generally receive very little rain during the season, normal rainfall is most likely.

Normal to slightly above normal temperatures are most likely during the 2017 OND Season over most parts of the region.

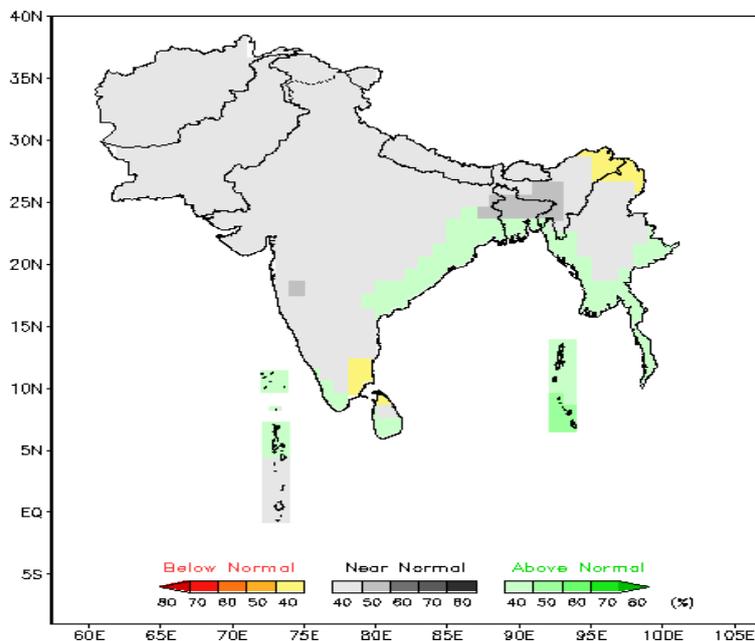


Fig.1. Consensus outlook for the 2017 OND season rainfall over South Asia.

¹Tercile categories have equal climatological probabilities, of 33.33% each.

Verification of the Consensus Forecast for the 2016 NE Monsoon Season Rainfall

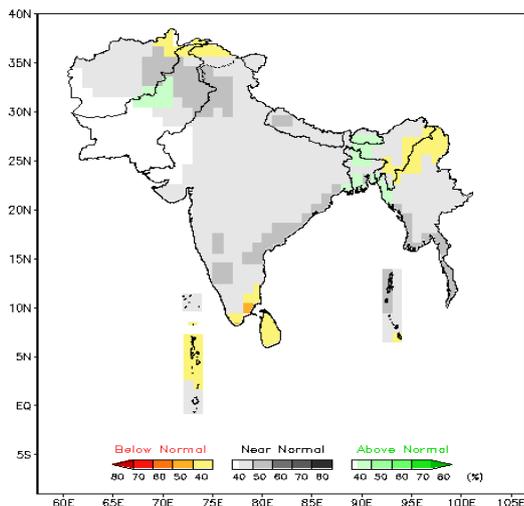


Fig.2. Consensus forecast map of the 2016 Northeast monsoon Rainfall over South Asia.

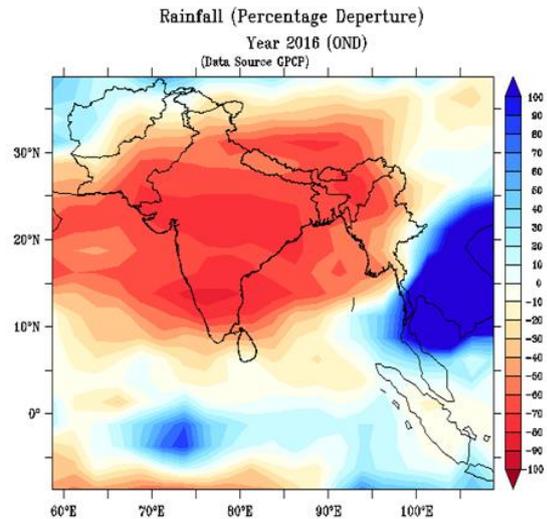


Fig.3. The observed rainfall anomaly (percentage departure) during the 2016 Northeast Monsoon Season over South Asia.

The consensus outlook map (**Fig.2**) for the northeast monsoon season (October to December) of 2016, developed in the ninth session of the South Asian Climate Outlook Forum (SASCOF-9) had indicated above normal rainfall over northwestern parts of Pakistan and some northeastern parts of the region, below normal rainfall over some areas of north and eastern parts of the region and normal rainfall over rest of the region. The observed rainfall anomaly map (**Fig.3**) shows below normal rainfall over most parts of the region except over southern parts of Myanmar & Maldives, where the season rainfall was normal to above normal. However, it is to be noted that the large below normal observed rainfall areas included climatologically significant rainfall areas of southeast Peninsular India, Sri Lanka and northern Maldives as indicated in the consensus forecast outlook.