Letters to the Editor

SYNOPTIC FEATURES DURING THE BREAK MONSOON IN 1965 AND 1966

1. A prolonged break of 12 days in August (i.e., 4th to 15th) and of 10 days in July (i.e., 2nd to 11th) occurred during 1965 and 1966 respectively. An examination of zonal and meridional components of wind was made during the break periods of 1965 and 1966.

During the period of break of August 1965 the rainfall was in excess in south Assam, Sub-Himalayan West Bengal, Rayalaseema, Tamil Nadu, south Interior Mysore and the Arabian Sea Islands and normal in north Assam and north Interior Mysore. It was deficient in Bay Islands, Gangetic West Bengal, Orissa, Jammu & Kashmir, Konkan, Madhya Maharashtra, coastal Andhra Pradesh and Kerala and scanty over the rest of the country eastwards to Rajasthan where there was no rain. During the period of break of July 1966 the rainfall was in excess in Assam, Sub-Himalayan West Bengal, Jammu & Kashmir, Tamil Nadu and Arabian Sea Islands and normal in Bay Islands, Gangetic West Bengal, Bihar Plains, east Uttar Pradesh, Himachal Pradesh, west Rajasthan and Kerala. It was deficient in Orissa, Bihar Plateau, west Uttar Pradesh, the Punjab, east Madhya Pradesh and coastal Mysore and scanty over the rest of the country.

2. Ramamurthy (1969) observed that in the upper troposphere, the strongest easterlies are near Lat. 8°N during the active monsoon periods, whereas during break periods the easterlies are nearly of the same strength over the whole of the south Peninsula. Raman and Ramanathan (1964) examined the relation between rainfall and the activity of upper tropospheric easterlies and concluded that when rainfall along the coast is small and negligible concentration of the easterlies on the next day is significantly absent, on a number of occasions. Ananthakrishnan and Ramakrishnan (1964) in a study of comparison of the upper tropospheric easterlies during active and break monsoon periods noticed that the upper tropospheric easterlies are comparatively stronger during the break periods.

3. An examination of the data of wind and rainfall during the break periods of 1965 and 1966 was made in the light of the observations mentioned in the previous para. Zonal winds at 150 mb level for Trivandrum, Madras, Bombay and Nagpur are shown in Fig. 1. The meridional and zonal components along Long. 77°E for the break periods are shown in Figs. 2 and 3 respectively. The following conclusions may be drawn:

(i) During the break periods easterlies continued to be strong and remained at the same latitude (i.e., between 8° and 13°N) as in strong monsoon periods. During the break

Fig. 1. Zonal easterly wind (kt) at 150-mb level during (a) August 1965 and (b) July 1966

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Fig. 2. Mean meridional components. Southerlies are positive (shaded)

Fig. 3. Mean zonal components. Westerlies are positive (shaded)
periods the rainfall is low along the coast but much difference is not observed in the strength of the upper tropospheric easterlies. The strength of the easterlies during active monsoon period did not appreciably differ from their strength during the break (Fig. 1).

(ii) The meridional circulation during the break period is compared with that of the mean meridional circulation. During the break period the southerlies dominated the middle and upper troposphere north of Lat. 15°N (Fig. 2) by replacing northerlies.

(iii) An examination of the zonal components of the winds (Fig. 3) showed that the easterlies descended and penetrated up to 700 mb (depth of westerlies decreased considerably) and the strongest easterlies at 150 mb continued to be observed at normal latitude of their occurrence.

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REFERENCES


INDIA’S MONSOON RAINFALL RELATED TO MID-LATITUDE ZONAL INDEX

1. Striking fluctuations in the intensity of the southwest monsoon over India are observed in association with some typical synoptic situations. Pisharoty and Desai (1956) concluded that passage of westerly waves across Tibetan Plateau and Himalayas in quick succession led to 'break' monsoon conditions over India, when the rainfall over most parts of the country becomes deficient. According to Ramaswamy (1962, 1965) ‘break monsoon’ condition occurs in association with low index situations.

In this note, zonal index is measured qualitatively as contour between 40° and 60°N averaged over the longitudes 40° to 150°E at 500 mb level. The departure of rainfall is calculated day by day for two periods, 4 to 31 August 1970 and 15 July to 4 August 1972. Relationship between the two quantities is presented in the form of a contingency table.

2. Two periods, one representing strong monsoon conditions for 26 days over the country (from 4 to 31 August 1970) and the other representing weak monsoon conditions over the country for 18 days (from 15 July to 4 August 1972) were studied. The contour values at 500 mb level between Lats. 40° and 60°N from Longs. 40° to 150°E were collected from daily weather charts of Germany (Täglicher Wetterbericht). The daily values of zonal index were then calculated. Departure from normal of the daily rainfall collected from Indian Daily Weather Reports for about 240 stations and the mean daily rainfall departure was calculated.

3. Contingency table for the daily zonal index in metres and the corresponding percentage departure of Indian rainfall from normal is shown in Table 1. Contour differences are as at 00 GMT of the day; rainfall figures are for the period of 24-hr ending at 0300 GMT of the same day. It will be seen that low values of zonal index (50 to 200 m) are associated with deficient rainfall over India, deficiency ranging from 20 to more than 80 per