



**PERFORMANCE OF SOUTH-WEST MONSOON
OVER TRIPURA DURING THE YEAR 2019
- A REPORT**

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1. Introduction

The onset of South-west monsoon over Kerala took place on 8th June 2019. It further advanced into the state of Tripura on 14th June 2019 and subsequently covered the entire country on 19th July 2019. Figure 1 shows the advance of Southwest Monsoon over the country during 2019.

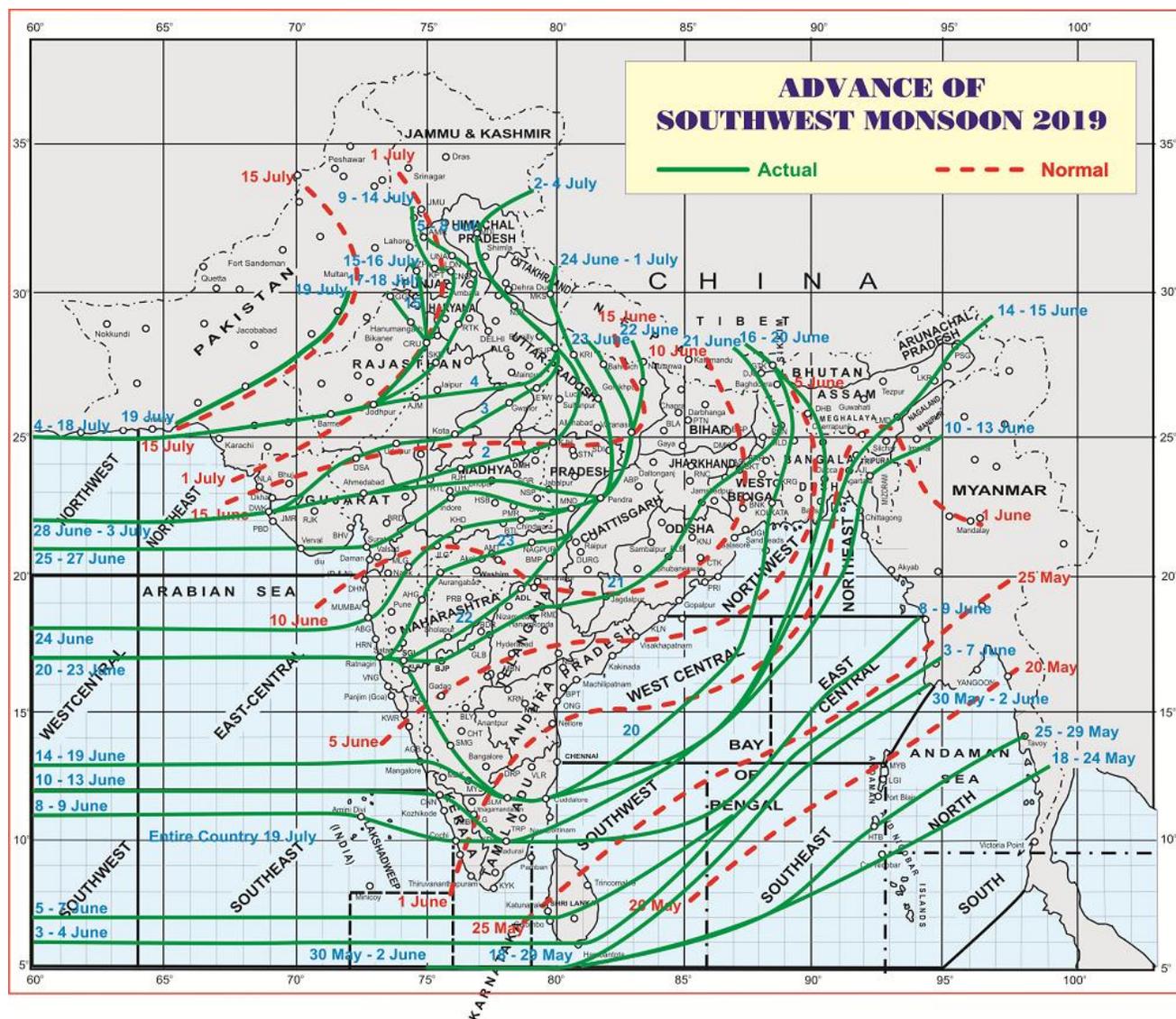


Fig. 1: Onset and advance of South-west Monsoon 2019 over the country
(Source: NWFC, IMD, New Delhi)

2. Analysis of Monsoon rainfall over Tripura

Tripura received a seasonal rainfall of 1386.6 mm during Monsoon 2019, against its normal value of 1457.8 mm. The seasonal departure of rainfall was -5%. Hence, monsoon rainfall was normal over the state during the year. Daily rainfall time series for the state has been shown in figure-2 along with its normal values. Daily rainfall was below normal for 67% of the days. There was an intense spell of rainfall during 8th to 16th July, in which period 30% of the seasonal was recorded.

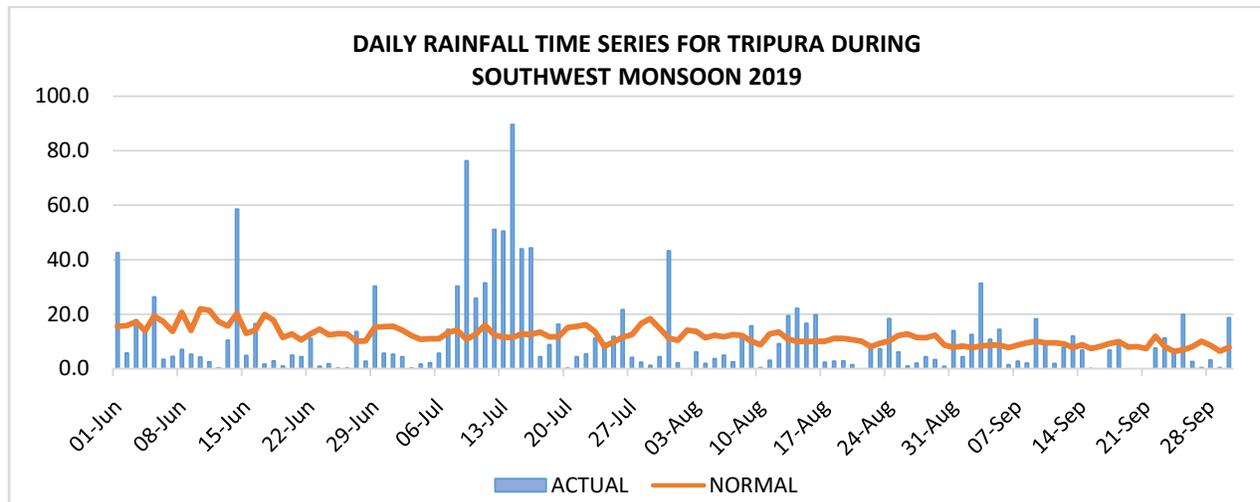


Fig. 2: Daily rainfall time series for Tripura during Southwest monsoon 2019

The daily cumulative rainfall values along with the normal cumulative values are shown in figure-3. From the figure, it is observed that the daily cumulative rainfall remained below normal initially. Then the prolonged heavy rainfall activity during second and third week of July caused it to reach above normal. After that, monsoon activity weakened once again and ultimately it ended in less than normal rainfall over the state.

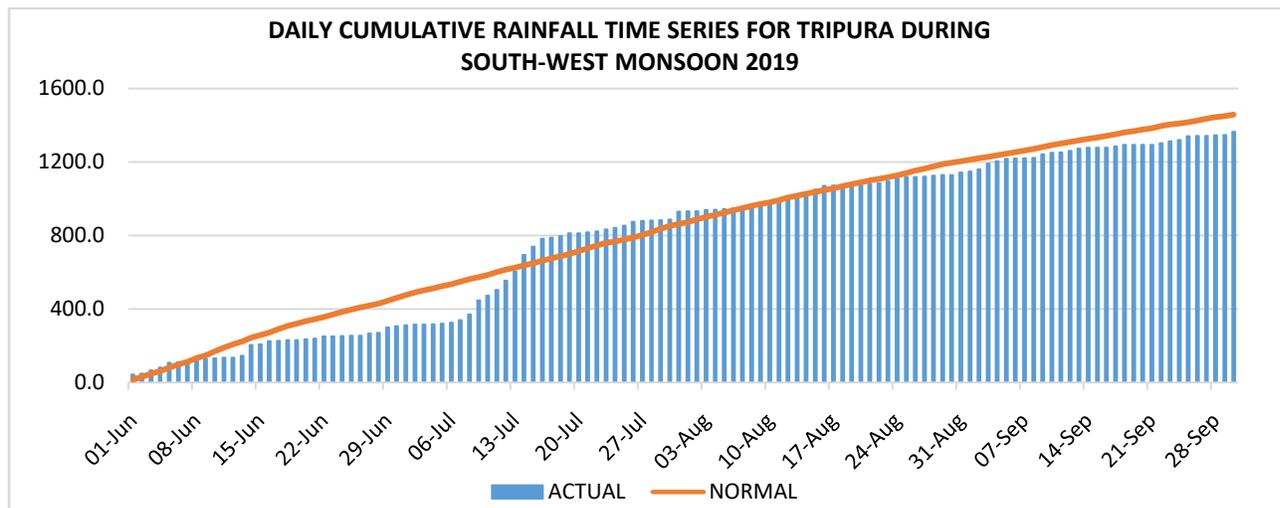


Fig. 3: Daily cumulative rainfall time series for Tripura during South-West monsoon 2019

3. District wise rainfall over Tripura

Out of eight districts in Tripura, seven districts namely, West Tripura, Sipahijala, Khowai, North Tripura, South Tripura, Unakoti and Dhalai received normal whereas Gomati district received deficient rainfall during the whole Monsoon 2019 season. Percentage departure of district wise rainfall from normal is shown in figure-4.

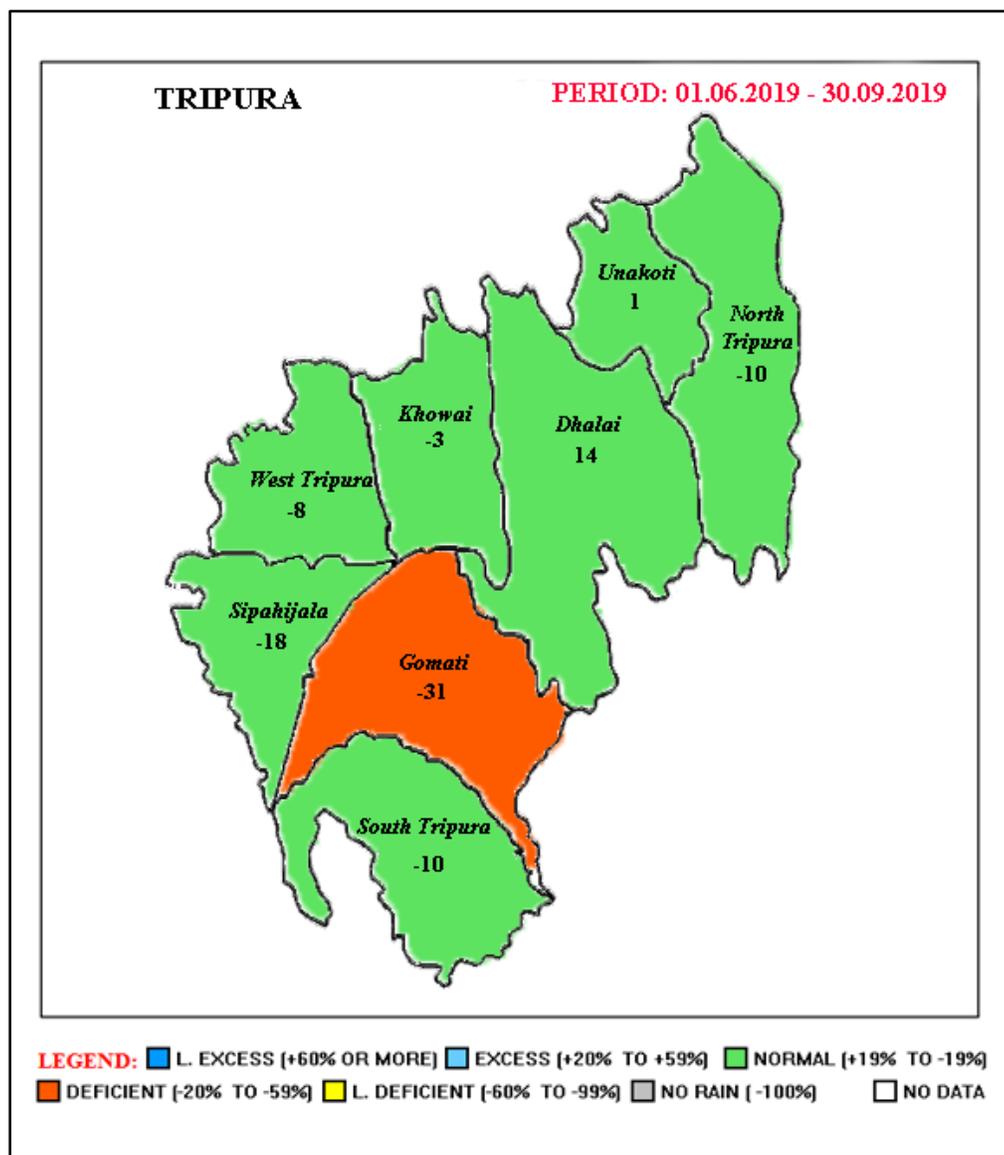


Fig. 4: District wise rainfall departure for Tripura during South-West Monsoon 2019

4. Month wise rainfall departure in Tripura

The monthly rainfall distribution for the month of June, July August and September for Tripura is shown in Table-1.

MONTHS	ACTUAL (mm)	NORMAL (mm)	% of LPA
June	316.7	460.1	-31
July	647.3	402.8	+61
August	194.9	340.9	-43
September	227.7	254.0	-10
JJAS	1386.6	1457.8	-5

Table 1: Month wise and seasonal rainfall departure for Tripura during SWM-2019

Number of districts with large excess, excess, normal, deficient and large deficient rainfall for the months of June, July, August and September 2019 in Tripura is shown in Table-2.

MONTHS	L.EXCESS	EXCESS	NORMAL	DEFICIENT	L. DEFICIENT	NO RAIN
June	0	0	4	2	2	0
July	2	5	1	0	0	0
August	0	0	1	7	0	0
September	0	0	4	4	0	0
JJAS	0	0	7	1	0	0

Table 2: Number of districts with large excess, excess, normal, deficient and large deficient rainfall in Tripura during SWM-2019

5. District wise summary of monthly rainfall

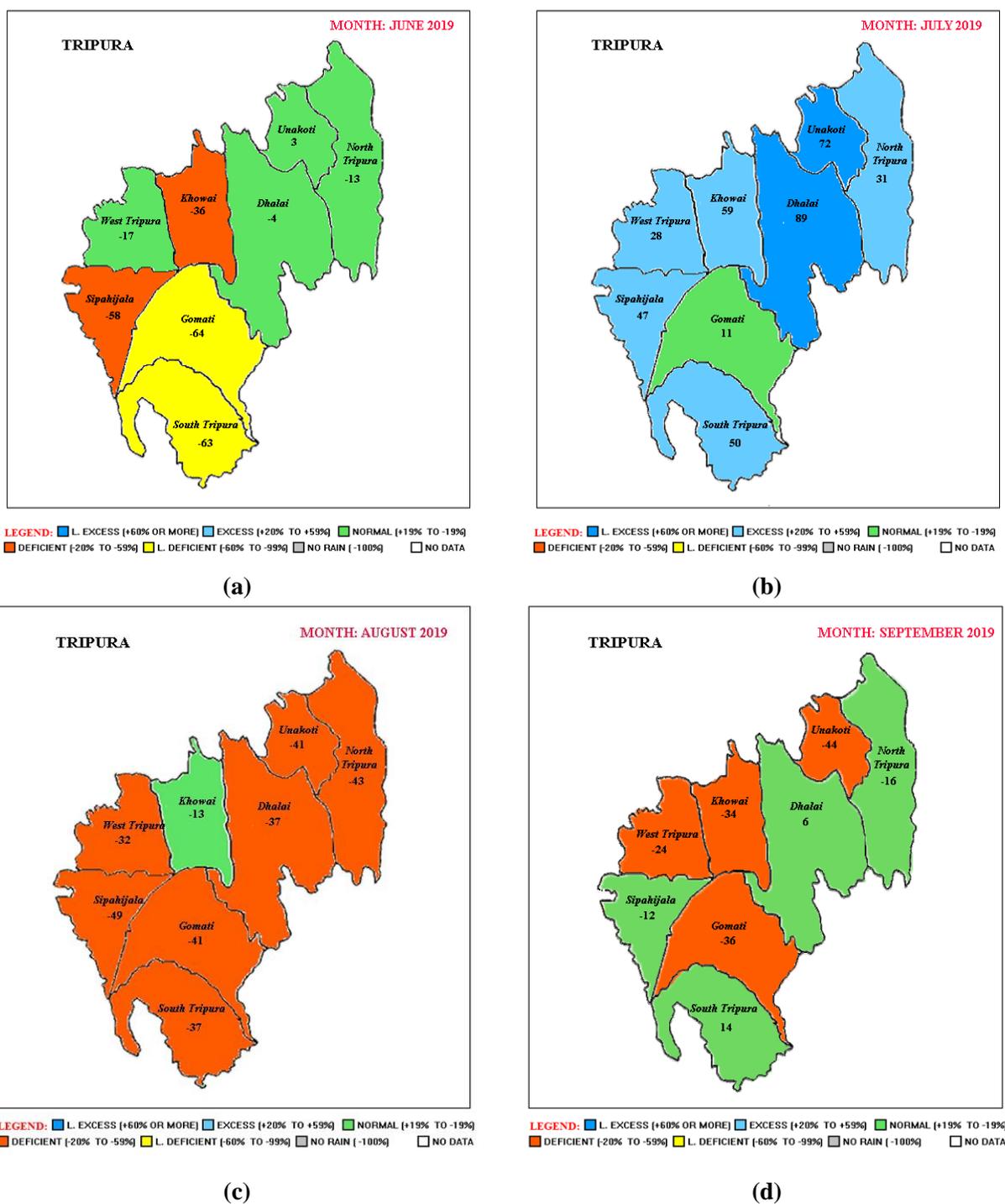


Fig. 5 (a-d): District wise rainfall departure for Tripura during June, July, August & September 2019

5.1 June 2019

During this month, rainfall in the southern parts of Tripura was comparatively less. Figure 5(a) represents the district wise rainfall departures for the month of June 2019. It is seen from the figure that West Tripura, North Tripura, Dhalai & Unakoti districts received normal rainfall; Sipahijala & Khowai districts received deficient rainfall and Gomati & South Tripura received large deficient rainfall during this month. For the state as a whole the rainfall was deficient for the month.

5.2 July 2019

There was a good rainfall distribution over the state during this month. Rainfall departure was positive for all the districts during this month. Figure 5(b) represents the district wise rainfall departures for the month of July 2019. Dhalai & Unakoti districts received large excess rainfall; West, Sipahijala, Khowai, South, North districts received excess rainfall and Gomati district received normal rainfall during the month. For the state as a whole the rainfall was excess for the month. Major floods were also reported in some parts of the state during this month.

5.3 August 2019

Once again less rainfall was observed in August after large excess rainfall during July. Figure 5(c) represents the district wise rainfall departures for the month of August 2019. Only Khowai district received normal rainfall during the month, whereas rainfall was deficient for remaining seven districts. For the whole state, rainfall was deficient of its LPA for the month.

5.4 September 2019

The negative departure of rainfall continued during September also. Figure 5(d) represents the district wise rainfall departures for the month of September 2019. Sipahijala, North, Dhalai & South districts received normal rainfall, whereas West, Khowai, Unakoti & Gomati districts received deficient rainfall during the month. For the whole state, rainfall was normal for the month.

6. Spatial Distribution of rainfall

The number of days corresponding to each category of spatial distribution of rainfall for the months of June to September 2019 is shown in the Table -6.1.

Month	Number of days with rainfall category				
	Dry (No Station reporting rain)	Isolated (1%-25% stations reporting rain)	Scattered (26%-50% stations reporting rain)	Fairly Widespread (51%-75% stations reporting rain)	Widespread (>75% stations reporting rain)
June	0	7	9	8	6
July	0	2	10	5	14
August	1	9	8	4	9
September	4	4	6	10	6
JJAS	5	22	33	27	35
% Days of the Season	4	18	27	22	29

Table 3: Number days corresponding to each category of spatial distribution of rainfall in Tripura during SWM-2019

7. Withdrawal of Monsoon

The withdrawal of South-West Monsoon took place completely from the state of Tripura on 14th October 2019. Finally, it was withdrawn from the entire country on 16th October 2019. Figure-6 shows the withdrawal of south-west monsoon from the country during 2018.

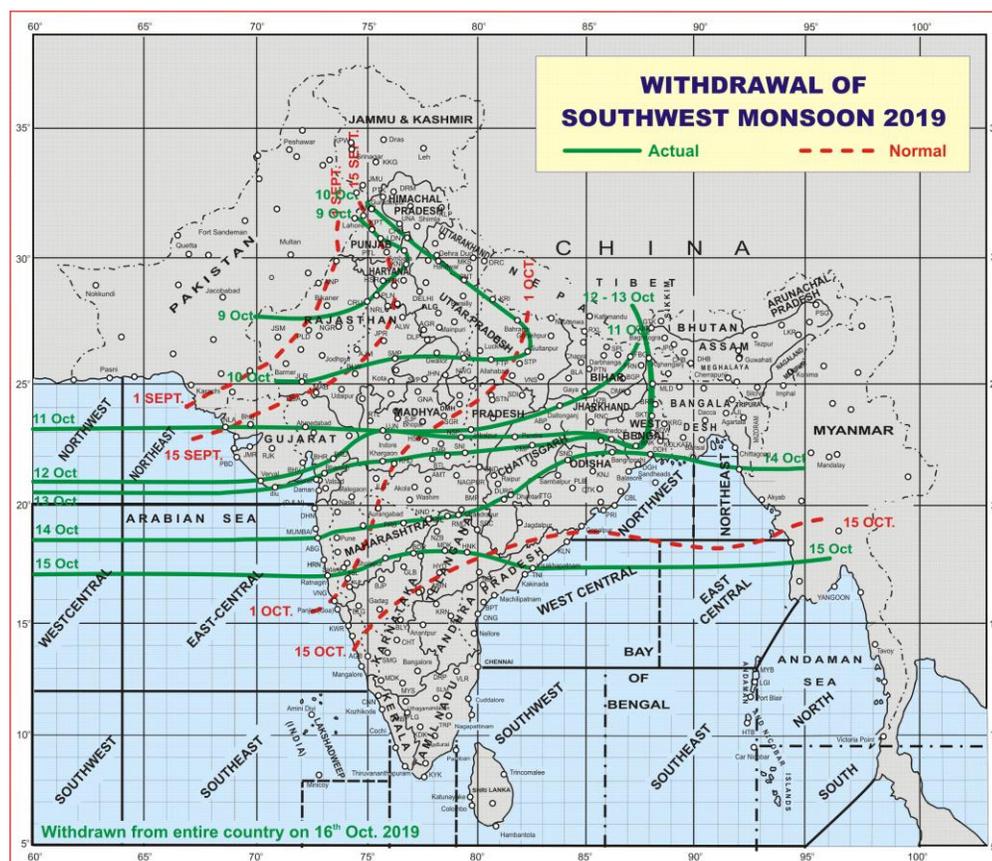


Fig. 6: Withdrawal of South-west Monsoon 2019 from the country (Source: NWFC, IMD, New Delhi)

8. Conclusion

The southwest monsoon 2019 arrived at Tripura on 14th June, about two weeks delayed than its normal date. This year happened to be a normal monsoon year for Tripura with a departure of -5% of its LPA. But the timely distribution of monsoon rainfall was not proper. Rainfall was large excess in July leading to major floods in some regions whereas both June and August witnessed deficient rainfall with departures of -31% and -43% respectively. In September also, rainfall departure was negative (-10%). 30% of the seasonal rainfall was observed during nine days from 8th to 16th July 2019. District wise, highest positive departure was observed over Dhalai district (+14%), with 14 heavy rainfall events over the station Kamalpur. The highest deficiency was observed in Gomati district with a departure of -31%. As a whole, 2019 was a normal monsoon over Tripura, but with improper temporal distribution.

Acknowledgement:

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