

Interaction of an easterly system with a westerly system and its associated weather over southern Peninsula

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(Received 17 December 1996, Modified 14 August 1997)

सार — 11 से 17 अप्रैल 1996 के सप्ताह के दौरान दक्षिणी प्रायद्वीप में अच्छी वर्षा हुई विशेषकर 13 और 15 अप्रैल 1996 को तमिलनाडु में भारी वर्षा हुई जिससे 1 मार्च से 17 अप्रैल 1996 तक दक्षिणी कर्नाटक के भीतरी भागों में अत्यधिक तथा तमिलनाडु और उत्तरी कर्नाटक के भीतरी भागों में अधिक वर्षा हुई। इस शोध पत्र में उन सिनोप्टिक परिस्थितियों की जांच करने का प्रयास किया गया है। जिनके कारण इन क्षेत्रों में 11 से 17 अप्रैल 1996 के सप्ताह के दौरान अत्यधिक वर्षा हुई।

ABSTRACT. During the week 11-17 April 1996 southern Peninsula received good rainfall especially with heavy rainfall on 13 and 15 April 1996 in Tamilnadu making the seasonal rainfall from 1 March to 17 April 1996 into large excess in south interior Karnataka and excess in Tamilnadu and north interior Karnataka. In this paper, an attempt is made to investigate the synoptic situations leading to the large excess rainfall over these areas during the week 11- 17 April 1996.

Key words: Low level cyclonic circulation, Peninsular India.

1. Introduction

The Inter Tropical Convergence Zone (ITCZ) will be around 5° N in the month of April. Sometimes cyclonic vortices form in the Inter Tropical Convergence Zone, move east to west or northwest and affect the southern peninsula giving good amount of rainfall. The seasonal wind discontinuity in the lower troposphere runs north-south in interior portions of the peninsula though oscillates east and west depending on the systems moving across central India in association with western disturbances moving further north. The role of mid and upper tropospheric westerly trough in producing weather over south Peninsula has been emphasised by Srinivasan *et al.* (1973), Bhaskara Rao *et al.* (1986), Gupta *et al.* (1988) and Lakshminarayanan (1977). The objective of the present study is to emphasise the interaction of an easterly system in the low troposphere with a westerly system in the mid and upper troposphere in producing the unusual rainfall over southern Peninsula in April 1996.

2. Rainfall

The rainfall that occurred during the week 11-17 April 1996 was excess in Tamilnadu, Kerala and Karnataka and it made the seasonal rainfall for the period 1 March to 17 April 1996 large excess in south interior Karnataka, excess in Tamilnadu & north interior Karnataka, normal in coastal Karnataka & Kerala while it was deficient in Kerala and coastal Karnataka and scanty in Tamilnadu & interior Karnataka till the previous week ending 10 April 1996. The actual and percentage departure of rainfall for the sea-

TABLE 1

Met sub-division	11-17 April 1996	11-17 April 1996	1 March to 10 April 1996	1 March to 17 April 1996
	Rainfall (mm) for the period	% Departure for the period 11 April 1996	%Departure of rainfall for the period	% Departure of rainfall for the period
Kerala	34	+ 23	-27	-16
Tamilnadu	53	+294	-74	+28
South	49	+407	-63	+106
Interior Karnataka				
North	22	+284	-79	+27
Interior Karnataka				
Coastal Karnataka	10	+56	-34	-2

son 1 March to 10 April 1996 and for the season 1 March to 17 April 1996 for the meteorological sub divisions of Kerala, Karnataka and Tamilnadu alongwith the actual and percentage departure of rainfall during the week 11-17 April 1996 are given in Table 1.

Tamilnadu experienced widespread rainfall with a few heavy amounts on 13th and with one or two heavy rainfall amounts on 15th. Kerala and interior Karnataka experienced scattered to fairly widespread rainfall with one or two heavy amounts on 14th. About 20% of the stations in Tamilnadu on 13 April 1996 reported heavy rainfall and the same is given in Fig. 3. The rainfall recorded in Tamilnadu, Kerala and Karnataka for the period 13-15 April 1996 are given in Figs. 4 (a-c).

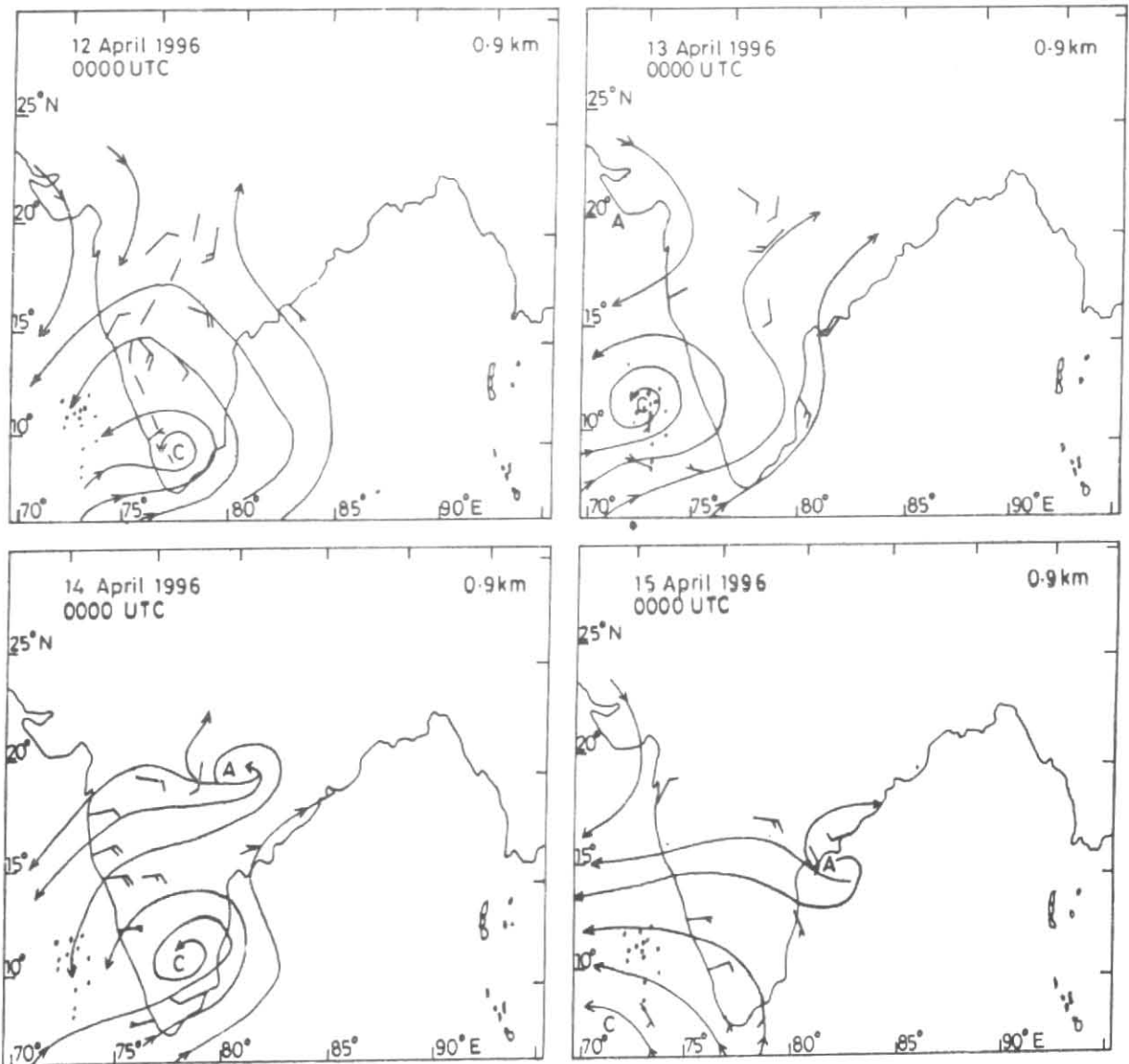


Fig. 1. Low level circulation at 0.9 km asl between 12 and 15 April at 0000 UTC

3. Synoptic situation

A low level cyclonic circulation extending upto 1.5 km asl lay over interior Tamilnadu and adjoining south interior Karnataka on 12 April 1996 morning. The cyclonic circulation moved westwards to Lakshadweep by 13 April evening. Another low level cyclonic circulation extending upto 1.5 km asl lay over interior Tamilnadu and adjoining south interior Karnataka on 14th morning and the same moved away westwards to Lakshadweep by 15th. The movement of these two low level cyclonic circulations at 0.9 km asl across south Peninsula is given in Fig. 1.

A large amplitude westerly trough in the mid and upper troposphere extending from west Madhya Pradesh to off Kerala coast across north interior Karnataka on 12th morning seen upto 100 hPa level moved eastwards and by 13th evening the southern portions of the trough became less marked and changed its orientation also. This trough was seen running from central Uttar Pradesh to central Arabian Sea across south Gujarat on 13th evening. The movement of the trough at 300 hPa during the period 12-15 April 1996 is shown in Fig. 2.

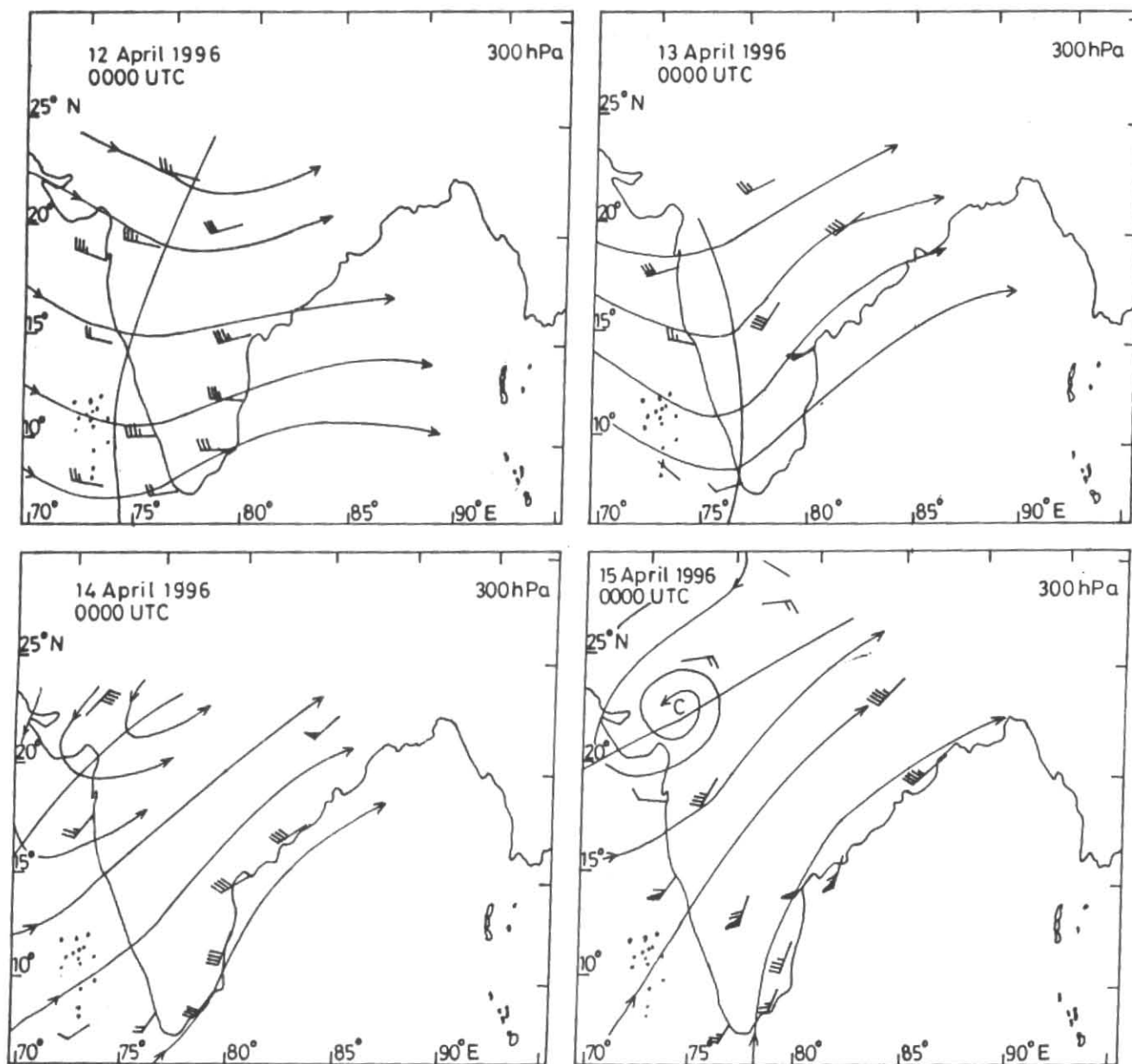


Fig. 2. Movement of upper air trough at 300 hPa during 12-15 April at 0000 UTC

4. Discussion and conclusion

Two low level cyclonic circulations moved east to west across south Peninsula between 12 and 15 April in quick succession and one large amplitude westerly trough extending upto 100 hPa moved eastwards between 12 and 13 April but later the southern portion of the trough became less marked. These systems were responsible for producing generally widespread rainfall in southern Peninsula especially in Tamilnadu with heavy rainfall in 20% of the stations on 13 April 1996.

The study reveals that the heavy rainfall over the southern Peninsula during the period 13 - 15 April 1996 was in association with the following:

(i) The two low level cyclonic circulations which formed over Tamilnadu and neighbourhood on 12 and 14 April in quick succession and its westward movement across south Peninsula to Lakshadweep.

(ii) The favourable position of mid and upper tropospheric trough in the westerlies at 300 hPa level and above and the change in its orientation at the time of its eastward movement during the period 12 - 15 April 1996.

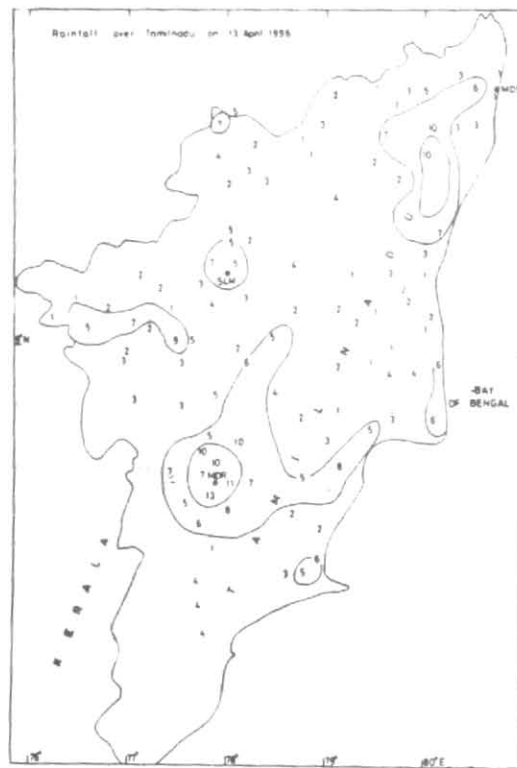
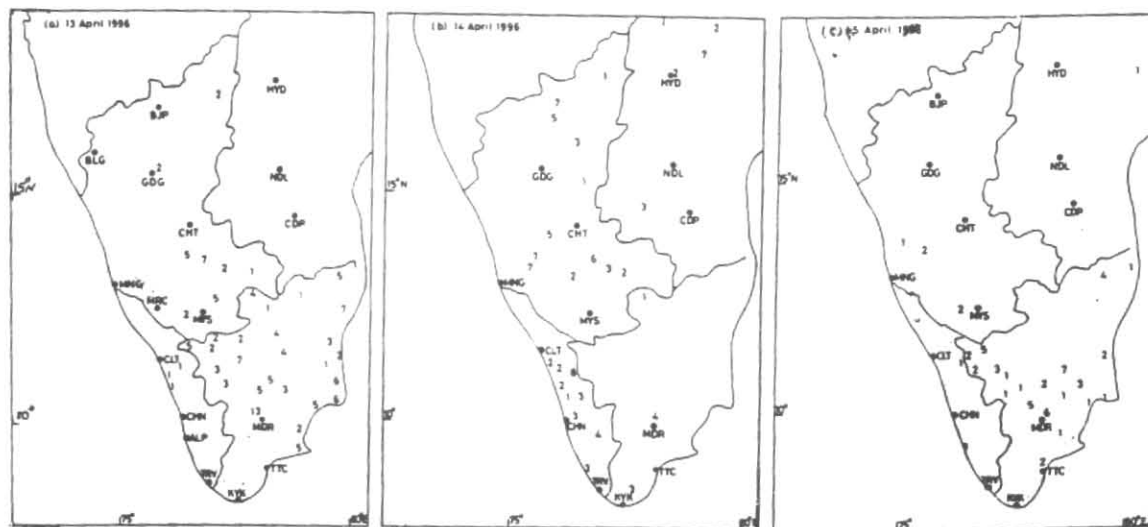


Fig. 3. Rainfall over Tamil Nadu on 13 April 1996



Figs. 4 (a-c). Rainfall recorded on (a) 13 April 1996, (b) 14 April 1996 and (c) 15 April 1996

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