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ANNEXURE –II

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
28 September, 1974	304.0	69.1	CS (core pressure < 992 hPa) crossed Orissa coast, south off Paradip on 28 September evening. Details: 24 Sep LP Andaman Sea 25 Sep LP Southeast Bay 26 Sep DD 16.0 N / 92.0 E < 1002 27 Sep CS 17.5 N / 88.5 E < 1000 28 Sep CS 19.0 N / 87.5 E < 998	
28 November, 1974	312.0	52.4	SCH (core pressure < 996 hPa) crossed Bangladesh near Chittagong on 28 November noon and weakened rapidly. Details: 22 Nov LP Southwest bay 24 Nov DD 11.5 N / 87.0 E < 1000 25 Nov SCS 12.5 N / 85.0 E 26 Nov SCS 13.5 N / 87.0 E < 998 27 Nov SCS 17.5 N / 88.0 E < 996 28 Nov SCH 21.5 N / 91.0 E < 996	
6 August, 1975	262.0	26.2	D (core pressure < 994 hPa) crossed Orissa between Balasore and Chandbali on 6 August afternoon. Details: 3 Aug LP South Orissa, north Andhra Coast 4 Aug LP 18.5 N / 87.8 E < 998 5 Aug D 19.5 N / 87.5 E < 994 6 Aug D 21.2 N / 87.2 E < 996 7 Aug LP 23.5 N / 82.5 E < 998	

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
15 May, 1978	254.0	33.9	<p>SCH (core pressure < 992 hPa) crossed Burma coast near Akyab on 17 May at night.</p> <p>Details:</p> <p>13 May LP Southeast Bay.</p> <p>14 May DD 10.0 N / 89.0 E < 1000</p> <p>15 May CS 13.5 N / 91.2 E < 994</p> <p>16 May CS 16.1 N / 92.0 E < 992</p> <p>17 May SCH 18.2 N / 92.2 E < 992</p> <p>18 May D Over North Burma</p>	
12 July, 1978	266.0	34.6	<p>DD (core pressure < 995 hPa) crossed Orissa coast near Bhubaneswar in early hours of 12 July.</p> <p>Details:</p> <p>10 Jul LP 19.0 N / 87.0 E < 1000</p> <p>11 Jul LP 18.5 N / 87.0 E < 998</p> <p>12 Jul DD 20.3 N / 85.5 E < 995</p> <p>13 Jul DD Near Mandla (U.P) < 998</p>	
15 August, 1978	312.0	65.3	<p>DD (core pressure < 988 hPa) crossed Orissa coast between Gopalpur and Puri on 15 May afternoon.</p> <p>Details:</p> <p>12 Aug LP 21.0 N / 89.4 E < 997</p> <p>13 Aug D 19.5 N / 89.0 E < 994</p> <p>14 Aug DD 19.2 N / 87.7 E < 992</p> <p>15 Aug DD 19.2 N / 87.2 E < 988</p> <p>16 Aug DD Near Mandla (U.P) < 994</p>	

Paradip

20° 16' N 86° 42' E

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Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
23 June, 1979	308.0	50.1	DD (core pressure < 990 hPa) crossed Orissa coast near Cuttack on 24 June evening. Details: 22 Jun LP 19.0 N / 88.5 E < 998 23 Jun D 19.5 N / 88.5 E < 994 24 Jun DD 19.5 N / 87.5 E < 990 25 Jun DD Over M.P < 992	
8 July, 1979	300.0	44.5	D (core pressure < 994 hPa) crossed Orissa coast in the early morning of 8 July. Details: 6 Jul LP 21.2 N / 89.5 E < 998 7 Jul D 19.5 N / 90.0 E < 994 8 Jul D 20.5 N / 86.2 E < 996 9 Jul LP Over M.P < 998	
7 August, 1979	280.0	-5.77	SCS (core pressure < 980 hPa) crossed Orissa coast near Balasore in the early night of 7 August. Details: 5 Aug LP 22.1 N / 90.0 E < 996 6 Aug D 21.0 N / 90.0 E < 990 7 Aug SCS 21.5 N / 87.5 E < 980 8 Aug SCS 22.3 N / 85.0 E < 984	A negative surge. Balasore recorded the lowest MSL pressure of 970 hPa at 2100 hrs of 7 August.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
17 September, 1980	272.0	51.6	DD (core pressure < 998 hPa) crossed Orissa coast between Puri and Gopalpur on 17 September morning. Details: 15 Sep LP 19.6 N / 88.5 E < 1002 16 Sep D 18.0 N / 86.5 E < 1002 17 Sep DD 19.8 N / 84.8 E < 998 18 Sep DD 21.5 N / 82.3 E < 998	
17 September, 1980	272.0	51.6	DD (core pressure < 998 hPa) crossed Orissa coast between Puri and Gopalpur on 17 September morning. Details: 15 Sep LP 19.6 N / 88.5 E < 1002 16 Sep D 18.0 N / 86.5 E < 1002 17 Sep DD 19.8 N / 84.8 E < 998 18 Sep DD 21.5 N / 82.3 E < 998	
18 October, 1980	248.0	34.1	CS (core pressure < 1000 hPa) crossed Andhra Coast between Machilipatnam and Kakinada on 18 October morning. Details: 15 Oct LP 10.0 N / 88.0 E < 1009 16 Oct D 10.0 N / 88.0 E < 1006 17 Oct CS 14.5 N / 82.5 E < 1000 18 Oct CS 16.2 N / 81.7 E < 1000 19 Oct D 16.8 N / 81.5 E < 1004	This was only a border case of a cyclone. Machilipatnam reported the lowest pressure of 997.4 hPa at 0430 of 18 October.

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
7 August, 1981	298.0	94.7	CS (core pressure < 982 hPa) crossed Orissa coast close to and North of Puri on 8 August in the Morning. Details 5 Aug LP 19.5 N / 87.5 E < 996 6 Aug LP 20.5 N / 88.5 E < 996 7 Aug DD 19.0 N / 88.0 E < 992 8 Aug CS 20.0 N / 86.0 E < 982 9 Aug CS 22.0 N / 81.2 E < 990	
26 September, 1981	344.0	89.4	SCS (core pressure < 992 hPa) crossed Orissa coast near Puri on the early morning of 26 September. Details: 24 Sep LP 17.0 N / 91.0 E < 1002 25 Sep CS 18.0 N / 88.5 E < 994 26 Sep SCS 20.5 N / 85.5 E < 992 27 Sep DD 22.8 N / 80.5 E < 998	Puri reported the lowest pressure of 983.1 hPa at 0530 hrs of 26 September.
3 June, 1982	310.0	103.5	SCS (core pressure < 986 hPa) crossed Orissa Coast close to and North of Paradip around 2200 IST on 3 June. Details: 31 May LP 13.0 N / 91.5 E < 1002 1 Jun D 15.0 N / 91.0 E < 994 2 Jun CS 17.5 N / 89.5 E < 994 3 Jun SCS 19.0 N / 88.0 E < 986 4 Jun CS 21.5 N / 85.5 E < 990 5 Jun D 25.0 N / 82.0 E < 998	Ship M.V Renusagar anchored at Paradip port recorded the lowest pressure 952.0 hPa and northerly wind of 120 Knots.

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
19 July, 1982	296.0	34.0	DD (core pressure < 992 hPa) crossed Orissa coast between Gopalpur and Puri by early night on 19 July. Details: 17 Jul LP 16.6 N / 89.8 E < 998 18 Jul D 18.4 N / 88.5 E < 992 19 Jul DD 18.7 N / 86.5 E < 994 20 Jul D 21.0 N / 83.3 E <996	
28 August, 1982	236.0	43.4	D (core pressure < 996 hPa) crossed Orissa coast near Balasore on 28 August night. Details: 26 Aug LP 20.5 N / 88.5 E < 1000 27 Aug D 19.0 N / 88.5 E < 998 28 Aug D 21.0 N / 87.5 E < 996 29 Aug D 22.0 N / 86.0 E < 996	
10 September, 1982	276.0	31.1	D (core pressure < 998 hPa) crossed Orissa coast near Puri on 10 morning. Details: 8 Sep LP 18.0 N / 88.0 E < 1002 9 Sep D 18.0 N / 89.0 E < 998 10 Sep D 20.3 N / 85.0 E < 998	

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
24 June, 1983	294.00	40.4	DD (core pressure < 994 hPa) crossed south Orissa coast near Gopalpur on the forenoon of 25 June. Details: 23 Jun LP 18.5 N / 87.5 E < 999 24 Jun DD 18.0 N / 85.6 E < 996 25 Jun DD 19.0 N / 85.4 E < 994 26 Jun D 20.3 N / 84.0 E < 994	
9 November, 1983	310.0	44.8	SCH (core pressure < 996 hPa) crossed Bangladesh coast near Cox's Bazaar on 9 evening. Details: 6 Nov LP 12.5 N / 89.0 E < 1008 7 Nov CS 15.0 N / 89.0 E < 1000 8 Nov SCS 17.0 N / 89.5 E < 996 9 Nov SCH 20.0 N / 90.5 E < 996 10 Nov D 24.0 N / 95.0 E < 1006	The system did not affect the weather over India.
1 August, 1984	346.0	68.4	DD (core pressure < 992 hPa) crossed Orissa coast between Puri and Paradip on 1 August. Details: 30 Jul LP 19.5 N / 88.5 E < 998 31 Jul D 19.8 N / 88.0 E < 996 1 Aug DD 20.5 N / 84.0 E < 992	

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
15 August, 1984	300.0	36.2	DD (core pressure < 992 hPa) crossed North Orissa coast near Balasore on 16 morning. Details: 13 Aug LP 19.5 N / 90.5 E < 998 14 Aug LP 20.0 N / 90.0 E < 996 15 Aug D 20.0 N / 90.0 E < 992 16 Aug DD 21.5 N / 87.0 E < 992 17 Aug DD 23.0 N / 84.0 E < 994	Balasore reported a MSL pressure of 989.6 hPa at the time of landfall.
14 October, 1984	314.0	61.8	SCH (core pressure < 1000 hPa) crossed Orissa coast near Chandbali on the forenoon of 14 October. Details: 11 Oct LP 18.0 N / 88.5 E < 1006 12 Oct LP 19.0 N / 88.5 E < 1006 13 Oct SCS 19.5 N / 88.0 E < 1000 14 Oct SCH 20.7 N / 86.8 E < 1000 15 Oct DD 22.5 N / 85.0 E < 1006	This system very rapidly intensified into a hurricane from a stage of Depression within twelve hours.
25 May, 1985	226.0	42.3	SCS (core pressure < 980 hPa) crossed Bangladesh coast near Hatia in the early hours of 25 May. Details: 22 May D 15.5 N / 88.0 E < 998 23 May DD 16.5 N / 87.5 E < 994 24 May SCS 19.0 N / 89.0 E < 980 25 May SCS 23.0 N / 91.5 E < 986 1 Aug D 20.0 N / 88.0 E < 996 2 Aug LP 22.5 N / 83.0 E < 998	Caused tidal waves of 4.5 meters.

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
20 September, 1985	228.0	55.0	CS (core pressure < 998 hPa) crossed Orissa coast near Puri in the evening of 20 September. Details: 19 Sep LP 18.5 N / 90.0 E <1004 20 Sep CS 19.5 N / 87.0 E < 998 21 Sep D 21.5 N / 82.5 E < 1004	
16 October, 1985	296.0	65.1	SCS (core pressure < 994 hPa) crossed Orissa coast near Balasore in the early hours of 16 October. Details: 13 Oct LP 14.0 N / 95.0 E < 1006 14 Oct DD 16.0 N / 89.5 E < 1002 15 Oct SCS 19.5 N / 87.5 E < 994 16 Oct CS 21.2 N / 87.0 E < 996 17 Oct CS 24.5 N / 85.5 E < 998	Lowest Pressure at Balasore 987.8 hPa at 0330 hours of 16 October.
12 August, 1986	303.0	46.0	DD (core pressure < 992 hPa) crossed North Andhra coast near Kalingapatnam in the night of 12 August. Details: 9 Aug LP 18.5 N / 85.0 E <1000 10 Aug LP 17.5 N / 87.5 E < 998 11 Aug DD 18.0 N / 86.5 E < 994 12 Aug DD 18.0 N / 84.5 E < 992 13 Aug DD 19.5 N / 83.5 E < 992	

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
20 August, 1986	304.0	40.8	D (core pressure < 998 hPa) crossed Orissa coast in the early hours of 20 August. Details: 18 Aug LP 21.0 N / 88.5 E <1000 19 Aug LP 20.0 N / 88.5 E < 998 20 Aug D 21.5 N / 86.0 E < 998 21 Aug LP 23.0 N / 85.0 E < 1000	
25 September, 1986	265.0	36.8	D (core pressure < 1004 hPa) crossed Orissa coast near Balasore before noon of 25 September. Details: 23 Sep LP 18.4 N / 85.5 E <1008 24 Sep LP 19.6 N / 87.5 E <1006 25 Sep D 21.4 N / 86.5 E <1004 26 Sep D 21.7 N / 87.0 E <1002	Lowest pressure recorded at Balasore was 1000 hPa at 1730 hours of 25 September.
3 November, 1987	226.0	-17.3	SCS (core pressure < 996 hPa) crossed south Andhra coast just North of Nellore in the early hours of 3 November. Details: 31 Oct D 11.5 N / 86.0 E < 1006 1 Nov CS 14.0 N / 84.5 E < 1002 2 Nov SCS 13.5 N / 82.0 E < 996 3 Nov CS 14.9 N / 79.5 E < 1000 4 Nov LP 15.0 N / 76.5 E < 1000	

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
13 November, 1987	250.0	46.8	SCS (core pressure <1000 hPa) crossed South Andhra coast just south of Machilipatnam in the early hours of 13 November. Details: 9 Nov LP 10.0 N / 94.0 E < 1008 10 Nov LP 12.0 N / 90.0 E < 1006 11 Nov DD 13.0 N / 92.0 E < 1006 12 Nov CS 14.5 N / 84.5 E < 1000 13 Nov DD 16.0 N / 80.6 E < 1002	Became SCS at 1730 hours of 12 November and after crossing the coast weakened to DD.
17 July, 1988	302.0	46.3	D (core pressure < 993 hPa) crossed Orissa coast near Gopalpur in the night of 17 July. Details: 15 Jul LP 19.0 N / 86.5 E < 1002 16 Jul LP 18.5 N / 87.0 E < 1000 17 Jul D 18.0 N / 86.0 E < 994 18 Jul D 19.5 N / 83.5 E < 993	
18 November, 1988	309.0	40.9	SCS (core pressure < 996 hPa) dissipated over North East and adjoining East Central Bay of Arakan coast by the midnight of 18 November. Details: 14 Nov LP 07.0 N / 88.5 E < 1009 15 Nov D 08.0 N / 87.0 E < 1008 16 Nov CS 10.5 N / 89.0 E < 1002 17 Nov SCS 16.0 N / 90.5 E < 1000 18 Nov SCS 19.0 N / 93.0 E < 996 19 Nov LP 22.0 N / 93.0 E < 1012	

Paradip

20° 16' N 86° 42' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks																																				
28 November, 1988	289.0	34.8	<p>SCH (core pressure < 988 hPa) crossed West Bengal and Bangladesh coast 50 kms east of Sagar islands on 29 November afternoon.</p> <p>Details:</p> <table border="0"> <tr> <td>22 Nov</td> <td>LP</td> <td>06.5 N / 98.5 E</td> <td>< 1008</td> </tr> <tr> <td>23 Nov</td> <td>D</td> <td>09.8 N / 95.0 E</td> <td>< 1008</td> </tr> <tr> <td>24 Nov</td> <td>DD</td> <td>10.0 N / 94.0 E</td> <td>< 1008</td> </tr> <tr> <td>25 Nov</td> <td>CS</td> <td>11.5 N / 92.0 E</td> <td>< 998</td> </tr> <tr> <td>26 Nov</td> <td>SCS</td> <td>12.0 N / 86.5 E</td> <td>< 996</td> </tr> <tr> <td>27 Nov</td> <td>SCH</td> <td>13.5 N / 87.0 E</td> <td>< 988</td> </tr> <tr> <td>28 Nov</td> <td>SCH</td> <td>16.0 N / 87.0 E</td> <td>< 988</td> </tr> <tr> <td>29 Nov</td> <td>SCH</td> <td>19.5 N / 88.0 E</td> <td>< 1000</td> </tr> <tr> <td>30 Nov</td> <td>LP</td> <td>Over Assam and Meghalaya</td> <td></td> </tr> </table>	22 Nov	LP	06.5 N / 98.5 E	< 1008	23 Nov	D	09.8 N / 95.0 E	< 1008	24 Nov	DD	10.0 N / 94.0 E	< 1008	25 Nov	CS	11.5 N / 92.0 E	< 998	26 Nov	SCS	12.0 N / 86.5 E	< 996	27 Nov	SCH	13.5 N / 87.0 E	< 988	28 Nov	SCH	16.0 N / 87.0 E	< 988	29 Nov	SCH	19.5 N / 88.0 E	< 1000	30 Nov	LP	Over Assam and Meghalaya		<p>This was one of the super storms that affected the Indian Coast. The lowest estimated core pressure was 942 hPa at 1730 hrs of 29 November however Sagar island lighthouse recorded 990 hPa as the lowest.</p>
22 Nov	LP	06.5 N / 98.5 E	< 1008																																					
23 Nov	D	09.8 N / 95.0 E	< 1008																																					
24 Nov	DD	10.0 N / 94.0 E	< 1008																																					
25 Nov	CS	11.5 N / 92.0 E	< 998																																					
26 Nov	SCS	12.0 N / 86.5 E	< 996																																					
27 Nov	SCH	13.5 N / 87.0 E	< 988																																					
28 Nov	SCH	16.0 N / 87.0 E	< 988																																					
29 Nov	SCH	19.5 N / 88.0 E	< 1000																																					
30 Nov	LP	Over Assam and Meghalaya																																						

Annexure- II

Vishakhapatnam

17° 41' N 83°17' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
28 September, 1974	194.0	42.6	CS (core pressure < 992 hPa) crossed Orissa coast close to and south of Paradip on 28 evening. Details: 24 Sep LP 14.2 N / 94.7 E < 1007 25 Sep LP 13.2 N / 90.0 E < 1000 26 Sep D 16.2 N / 92.2 E < 1002 27 Sep CS 17.5 N / 88.5 E < 1000 28 Sep CS 19.0 N / 87.2 E < 998 29 Sep CS 22.2 N / 86.6 E < 994 30 Sep DD 25.0 N / 88.0 E < 1000	Paradip reported 989 hPa at 1930 hrs of 28 September.
8 October, 1974	190.0	56.6	DD (core pressure < 1004 hPa) crossed Andhra coast near Vishakhapatnam on 8 October evening. Details: 5 Oct LP 17.0 N / 87.0 E < 1006 6 Oct LP 13.5 N / 90.5 E < 1008 7 Oct DD 16.5 N / 86.0 E < 1004 8 Oct DD 17.2 N / 84.2 E < 1004 9 Oct LP 17.6 N / 79.5 E < 1004	
14 October, 1974	232.0	59.5	DD (core pressure < 1002 hPa) crossed Andhra coast between Vishakhapatnam and Kakinada during the early morning of 15 October. Details: 10 Oct LP 14.0 N / 94.0 E < 1009 11 Oct D 16.0 N / 92.0 E < 1004 12 Oct D 17.5 N / 90.5 E < 1004 13 Oct D 17.5 N / 87.5 E < 1004 14 Oct DD 17.5 N / 86.5 E < 1002 15 Oct DD 18.5 N / 81.5 E < 1004	

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
18 August, 1975	168.0	-9.2	DD (core pressure < 994 hPa) crossed west Bengal coast near Sagar islands on 18 August forenoon. Details: 16 Aug LP 20.2 N / 89.0 E < 1000 17 Aug D 20.0 N / 89.3 E < 1000 18 Aug DD 21.5 N / 87.8 E < 994 19 Aug DD 23.8 N / 86.0 E < 996	A negative surge.
9 September, 1975	202.0	7.75	D (core pressure < 996 hPa) crossed Orissa coast between Paradip and Puri on 9 September evening. Details: 7 Sep LP 21.5 N / 87.5 E < 1002 8 Sep LP 18.6 N / 86.0 E < 1000 9 Sep D 19.1 N / 86.0 E < 997 10 Sep D 21.2 N / 83.5 E < 996	
2 November, 1975	252.0	60.1	CS (core pressure < 1006 hPa) crossed Andhra coast on 3 November. Details: 30 Oct LP 12.0 N / 88.5 E < 1009 31 Oct LP 13.5 N / 87.0 E < 1006 1 Nov D 15.0 N / 84.5 E < 1008 2 Nov CS 15.5 N / 83.0 E < 1006 3 Nov LP 14.8 N / 81.5 E < 1006	The estimated pressure at the center of the storm is about 1000 hPa.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
9 November, 1975	200.0	53.5	DD (core pressure < 1004 hPa) crossed Bangladesh coast near Chittagong on 11 November night. Details: 5 Nov LP 12.0 N / 95.0 E < 1010 6 Nov LP 11.0 N / 89.5 E < 1008 7 Nov D 11.5 N / 88.5 E < 1006 8 Nov CS 13.8 N / 84.2 E < 1004 9 Nov CS 17.5 N / 84.5 E < 1004 10 Nov DD 17.0 N / 86.5 E < 1004 11 Nov DD 21.0 N / 89.5 E < 1004 12 Nov LP 22.5 N / 93.0 E < 1010	The cyclonic storm weakened into a DD by the morning of 10 November.
27 November, 1975	197.0	44.2	SCS (core pressure < 1002 hPa) passed off Tamilnadu coast during 24 November to 1 December. Details: 23 Nov LP South East Bay < 1010 24 Nov DD 09.0 N / 84.5 E < 1006 25 Nov CS 11.2 N / 82.0 E < 1002 26 Nov SCS 12.5 N / 81.0 E < 1004 27 Nov CS 14.0 N / 82.0 E < 1004 28 Nov CS 14.0 N / 84.0 E < 1004 29 Nov CS 15.5 N / 86.8 E < 1004 30 Nov D 18.0 N / 91.2 E < 1006 1 Dec D 14.0 N / 87.0 E < 1006	The SCS weakened and diffused over the central Bay.
13 August, 1976	137.0	-11.23	DD (core pressure < 994 hPa) crossed Orissa coast between Balasore and Contai on the early morning of 13 August. Details: 11 Aug LP 21.5 N / 89.5 E < 998 12 Aug D 20.5 N / 89.0 E < 996 13 Aug DD 22.1 N / 87.0 E < 994	A negative surge.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks																																								
19 October, 1976	154.0	30.4	<p>CS (core pressure < 1000 hPa) crossed Bangladesh coast near Chittagong in the early hours of 21 October.</p> <p>Details:</p> <table> <tr> <td>12 Oct</td> <td>LP</td> <td>08.5 N / 88.5 E</td> <td>< 1010</td> </tr> <tr> <td>13 Oct</td> <td>D</td> <td>10.5 N / 84.0 E</td> <td>< 1010</td> </tr> <tr> <td>14 Oct</td> <td>DD</td> <td>08.0 N / 90.0 E</td> <td>< 1009</td> </tr> <tr> <td>15 Oct</td> <td>DD</td> <td>09.0 N / 85.4 E</td> <td>< 1004</td> </tr> <tr> <td>16 Oct</td> <td>CS</td> <td>12.3 N / 83.0 E</td> <td>< 1000</td> </tr> <tr> <td>17 Oct</td> <td>DD</td> <td>13.5 N / 80.7 E</td> <td>< 1000</td> </tr> <tr> <td>18 Oct</td> <td>CS</td> <td>14.8 N / 81.0 E</td> <td>< 1000</td> </tr> <tr> <td>19 Oct</td> <td>CS</td> <td>16.0 N / 85.0 E</td> <td>< 1000</td> </tr> <tr> <td>20 Oct</td> <td>CS</td> <td>20.0 N / 88.0 E</td> <td>< 1000</td> </tr> <tr> <td>21 Oct</td> <td>CS</td> <td>23.0 N / 92.5 E</td> <td>< 1000</td> </tr> </table>	12 Oct	LP	08.5 N / 88.5 E	< 1010	13 Oct	D	10.5 N / 84.0 E	< 1010	14 Oct	DD	08.0 N / 90.0 E	< 1009	15 Oct	DD	09.0 N / 85.4 E	< 1004	16 Oct	CS	12.3 N / 83.0 E	< 1000	17 Oct	DD	13.5 N / 80.7 E	< 1000	18 Oct	CS	14.8 N / 81.0 E	< 1000	19 Oct	CS	16.0 N / 85.0 E	< 1000	20 Oct	CS	20.0 N / 88.0 E	< 1000	21 Oct	CS	23.0 N / 92.5 E	< 1000	
12 Oct	LP	08.5 N / 88.5 E	< 1010																																									
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18 Oct	CS	14.8 N / 81.0 E	< 1000																																									
19 Oct	CS	16.0 N / 85.0 E	< 1000																																									
20 Oct	CS	20.0 N / 88.0 E	< 1000																																									
21 Oct	CS	23.0 N / 92.5 E	< 1000																																									
4 November, 1976	170.0	40.5	<p>SCS (core pressure < 1004 hPa) crossed coast just North of Machilipatnam around 2030 hrs on 4 November.</p> <p>Details:</p> <table> <tr> <td>3 Nov</td> <td>D</td> <td>13.0 N / 87.5 E</td> <td>< 1009</td> </tr> <tr> <td>4 Nov</td> <td>DD</td> <td>15.0 N / 84.0 E</td> <td>< 1004</td> </tr> <tr> <td>5 Nov</td> <td>SCS</td> <td>17.2 N / 79.0 E</td> <td>< 1006</td> </tr> </table>	3 Nov	D	13.0 N / 87.5 E	< 1009	4 Nov	DD	15.0 N / 84.0 E	< 1004	5 Nov	SCS	17.2 N / 79.0 E	< 1006	A cyclone of narrow core (less than a degree in diameter). Lowest pressure of 985 hPa was recorded at Machilipatnam was recorded at 2100 hrs of 4 November.																												
3 Nov	D	13.0 N / 87.5 E	< 1009																																									
4 Nov	DD	15.0 N / 84.0 E	< 1004																																									
5 Nov	SCS	17.2 N / 79.0 E	< 1006																																									

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
25 November, 1976	176.0	1.09	D/CS (core pressure < 996 hPa) skirted Andhra coast upto 27, then moved North eastwards to Arakan coast and weakened on 30 November morning. Details: 22 Nov LP 07.0 N / 91.5 E < 1006 23 Nov DD 09.0 N / 88.2 E < 1004 24 Nov DD 10.0 N / 84.0 E < 1000 25 Nov DD 13.6 N / 80.5 E < 996 26 Nov DD 14.0 N / 80.2 E < 1006 27 Nov CS 16.3 N / 82.2 E < 1004 28 Nov DD 18.0 N / 87.0 E 29 Nov DD North West Bay	The D seems to have become CS on 27 morning for a short time.
13 May, 1977	126.0	20.6	SCS (core pressure < 994 hPa) crossed Bangladesh coast on 13 May morning. Details: 9 May LP 08.2 N / 85.0 E < 1006 10 May D 10.2 N / 83.5 E < 1004 11 May D 15.4 N / 86.5 E < 998 12 May CS 19.5 N / 89.4 E < 994 13 May SCS 22.5 N / 90.6 E < 994	
25 July, 1977	158.0	33.4	D (core pressure < 994 hPa) crossed Orissa coast near Balasore on 24 July night. Details: 23 Jul LP 19.5 N / 87.0 E < 996 24 Jul D 20.0 N / 88.0 E < 994 25 Jul D 22.0 N / 85.5 E < 994 26 Jul D 23.6 N / 82.0 E < 994	

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
30 October, 1977	174.0	38.5	SCS crossed south Andhra coast between Nellore and Ongole around noon of 31 October. Details: 27 Oct D 13.0 N / 91.5 E 28 Oct D 29 Oct CS 30 Oct CS 31 Oct SCS 15.0 N / 81.0 E	This emerged into the Arabian sea off Maharashtra coast as a LP.
18 November, 1977	150.0	44.8	SCH (core pressure < 960 hPa) crossed coast near Nizampatnam at about 1730 hrs of 19 November. Details: 13 Nov LP 07.0 N / 95.0 E < 1010 14 Nov DD 06.0 N / 92.0 E < 1008 15 Nov CS 06.8 N / 90.0 E < 1000 16 Nov SCH 06.6 N / 85.4 E < 1000 17 Nov SCH 10.0 N / 85.0 E < 960 18 Nov SCH 12.5 N / 82.5 E < 960 19 Nov SCH 15.2 N / 81.2 E < 970 20 Nov LP Over Telangana < 1004	Interacted with another SCS in the Arabian sea. They turned cyclonically around each other. Lowest pressure recorded in the 'eye' was 941 hPa. This is the infamous '1977 Andhra cyclone'. The tide guage at Chennai did not function after 17 November 1977.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
17 May, 1978	174.0	28.9	SCH (core pressure < 992 hPa) crossed Burma coast on 17 May in the evening. Details: 13 May LP South east Bay 14 May DD 10.5 N / 88.5 E < 1000 15 May CS 13.5 N / 91.2 E < 994 16 May CS 16.1 N / 92.0 E < 992 17 May SCH 18.2 N / 92.2 E < 992 18 May LP Over Burma	
17 June, 1978	167.0	33.2	DD (core pressure < 994 hPa) crossed coast south of Vishakhapatnam on 17 June afternoon. Details: 15 Jun LP 16.6 N / 85.6 E < 1001 16 Jun D 17.0 N / 86.0 E < 998 17 Jun DD 17.2 N / 84.2 E < 994 18 Jun LP 20.5 N / 81.5 E < 998	
15 August, 1978	171.0	37.8	DD (core pressure < 988 hPa) crossed Orissa coast between Gopalpur and Puri on 15 May afternoon. Details: 12 Aug LP 21.0 N / 89.4 E < 997 13 Aug D 19.5 N / 89.0 E < 994 14 Aug DD 19.2 N / 87.7 E < 992 15 Aug DD 19.2 N / 87.2 E < 988 16 Aug DD Near Mandla (U.P) < 994	

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
28 August, 1978	108.0	-18.1	CS (core pressure < 990 hPa) crossed North Orissa coast between Chandbali and Balasore by about noon on 27 August. Details: 25 Aug LP 19.8 N / 89.5 E < 1000 26 Aug DD 20.0 N / 89.0 E < 992 27 Aug CS 21.2 N / 87.5 E < 990 28 Aug DD 21.5 N / 82.8 E < 992	A negative surge. Balasore recorded 985.4 hPa at 0930 hrs on 27 August near the storm center.
18 November, 1978	160.0	35.5	SCH (core pressure < 996 hPa) crossed SriLanka coast on 23 night. Crossed Tamilnadu coast near Rameshwaram on 24 November evening. Details: 17 Nov D 06.5 N / 92.5 E < 1008 18 Nov LP 06.5 N / 92.0 E < 1008 19 Nov LP 07.0 N / 92.0 E < 1008 20 Nov CS 08.0 N / 91.0 E < 1008 21 Nov SCH 07.5 N / 88.5 E < 1002 22 Nov SCH 07.5 N / 86.0 E < 1000 23 Nov SCH 08.0 N / 83.5 E < 998 24 Nov SCH 08.7 N / 80.5 E < 996 25 Nov DD 11.5 N / 75.0 E < 1006	Pamban observatory reported lowest pressure of 993.4 hPa at 0345 hrs on 25 November. Emerged into the Arabian sea off Kerala coast as DD on 25 November morning.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
12 May, 1979	180.0	24.9	SCS crossed Andhra coast south of Ongole by the evening of 12 May.	This is the first time during the last 100 yrs that in the month of May an SCH formed at such a low latitude and also very heavy rain along and to the left of it's track is noteworthy. Nellore recorded the lowest pressure of about 980 hPa on 12 May evening.
			No details available.	
2 July, 1979	112.0	-15.5	DD (core pressure < 986 hPa) crossed Bangladesh coast on 28 June at night. Details: 28 Jun D 21.5 N / 90.0 E < 992 29 Jun D 22.5 N / 89.8 E < 988 30 Jun DD 24.0 N / 90.2 E < 986 01 Jul DD 25.0 N / 91.0 E < 988	A negative surge.
7 August, 1979	148.0	-30.4	SCS (core pressure < 980 hPa) crossed Orissa coast near Balasore in the early night of 7 August. Details: 5 Aug LP 22.1 N / 90.0 E < 996 6 Aug D 21.0 N / 90.0 E < 990 7 Aug SCS 21.5 N / 87.5 E < 980 8 Aug SCS 22.3 N / 85.0 E < 984	A negative surge. Balasore recorded the lowest MSL pressure of 970 hPa at 2100 hrs of 7 August.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
18 October, 1980	164.0	46.4	CS (core pressure < 1000 hPa) crossed Andhra Coast between Machilipatnam and Kakinada on 18 October morning. Details: 15 Oct LP 10.0 N / 88.0 E < 1009 16 Oct D 10.0 N / 88.0 E < 1006 17 Oct CS 14.5 N / 82.5 E < 1000 18 Oct CS 16.2 N / 81.7 E < 1000 19 Oct D 16.8 N / 81.5 E < 1004	This was only a border case of a cyclone. Machilipatnam reported the lowest pressure of 997.4 hPa at 0430 of 18 October.
7 August, 1981	153.0	30.4	CS (core pressure < 982 hPa) crossed Orissa coast close to and North of Puri on 8 August in the Morning. Details 5 Aug LP 19.5 N / 87.5 E < 996 6 Aug LP 20.5 N / 88.5 E < 996 7 Aug DD 19.0 N / 88.0 E < 992 8 Aug CS 20.0 N / 86.0 E < 982 9 Aug CS 22.0 N / 81.2 E < 990	
20 November, 1981	178.0	40.8	SCS (core pressure < 994 hPa) weakened into a D by 20 November evening and dissipated <i>in situ</i> the next day. Details: 16 Nov D 11.0 N / 93.0 E < 1009 17 Nov DD 12.0 N / 91.5 E < 1002 18 Nov CS 13.5 N / 90.0 E < 1000 19 Nov SCS 16.0 N / 90.5 E < 994 20 Nov SCS 19.0 N / 92.0E < 998 21 Nov LP 17.5 N / 92.0 E < 1010	The estimated lowest pressure at the core of the storm is 983 hPa.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
10 December, 1981	187.0	27.9	SCH (core pressure < 992 hPa) crossed west Bengal coast near Sagar island around 1830 hrs of 10 December. Details: 3 Dec LP 07.0 N / 90.0 E < 1010 4 Dec D 09.0 N / 92.0 E < 1011 5 Dec DD 10.0 N / 88.0 E < 1008 6 Dec DD 11.0 N / 88.0 E < 1004 7 Dec CS 12.0 N / 85.2 E < 992 8 Dec SCS 13.5 N / 86.0 E < 992 9 Dec SCH 16.0 N / 86.4 E < 992 10 Dec SCH 19.5 N / 97.0 E < 994 11 Dec D 24.2 N / 90.4 E < 1008	The lowest pressure recorded at Sagar was 983.5 hPa at 1745 hrs on 10 August.
2 May, 1982	113	-7.5	SCH (core pressure < 994 hPa) crossed Arakan coast around midnight of 4 May. Details: 1 May D 14.0 N / 82.5 E < 1009 2 May CS 16.5 N / 83.5 E < 1004 3 May SCH 17.5 N / 86.5 E < 996 4 May SCH 18.5 N / 91.5 E < 994 5 May D Over Thailand	A negative surge.
19 July, 1982	176.0	25.1	DD (core pressure < 992 hPa) crossed Orissa coast between Gopalpur and Puri by early night on 19 July. Details: 17 Jul LP 16.6 N / 89.8 E < 998 18 Jul D 18.4 N / 88.5 E < 992 19 Jul DD 18.7 N / 86.5 E < 994 20 Jul D 21.0 N / 83.3 E < 996	

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
10 September, 1982	166.0	40.0	D (core pressure < 998 hPa) crossed Orissa coast near Puri on 10 morning. Details: 8 Sep LP 18.0 N / 88.0 E < 1002 9 Sep D 18.0 N / 89.0 E < 998 10 Sep D 20.3 N / 85.0 E < 998	
*16 October, 1982 and **18 October, 1982	186.0	36.5	*LP crossed North Andhra coast just south of Kakinada in the early morning of 17 October. **SCS (core pressure < 1004 hPa) crossed south Andhra coast near Sriharikota around 2200 hrs of 18 October. Details: *14 Oct LP 13.0 N / 91.5 E < 1012 *15 Oct DD 15.5 N / 86.5 E < 1008 *16 Oct SCS 16.0 N / 83.0 E < 1002 *17 Oct LP 16.0 N / 78.5 E < 1008 **17 Oct D 11.0 N / 84.0 E < 1008 **18 Oct SCS 13.1 N / 81.2 E < 1002 **19 Oct DD 14.8 N / 79.0 E < 1005	Two events around the same period of Surge. *A narrow core system. SCS weakened to a LP. **Lowest pressure of 982.8 hPa was recorded at Sriharikota at 2000 hrs on 18 October. A narrow core system.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
25 June, 1983	166.0	23.5	DD (core pressure < 994 hPa) crossed south Orissa coast near Gopalpur on the forenoon of 25 June. Details: 23 Jun LP 18.5 N / 87.5 E < 999 24 Jun DD 18.0 N / 85.6 E < 996 25 Jun DD 19.0 N / 85.4 E < 994 26 Jun D 20.3 N / 84.0 E < 994	
4 October, 1983	198.0	53.1	CS (core pressure < 996 hPa) crossed north Andhra coast around 0100 hrs of 4 October. Details: 1 Oct LP 17.5 N / 88.0 E < 1004 2 Oct D 19.5 N / 86.5E < 998 3 Oct CS 18.0 N / 84.0 E < 996 4 Oct CS 17.8 N / 83.0 E < 996 5 Oct LP 17.5 N / 80.5 E < 998	Lowest pressure recorded at Vishakhapatnam was 989.5 hPa at 2000 hrs.
15 August, 1984	176.0	19.4	DD (core pressure < 992 hPa) crossed North Orissa coast near Balasore on 16 morning. Details: 13 Aug LP 19.5 N / 90.5 E < 998 14 Aug LP 20.0 N / 90.0 E < 996 15 Aug D 20.0 N / 90.0 E < 992 16 Aug DD 21.5 N / 87.0 E < 992 17 Aug DD 23.0 N / 84.0 E < 994	Balasore reported a MSL pressure of 989.6 hPa at the time of landfall.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks																				
14 October, 1984	183.0	40.6	<p>SCH (core pressure < 1000 hPa) crossed Orissa coast near Chandbali on the forenoon of 14 October.</p> <p>Details:</p> <table> <tr> <td>11 Oct</td> <td>LP</td> <td>18.0 N / 88.5 E</td> <td>< 1006</td> </tr> <tr> <td>12 Oct</td> <td>LP</td> <td>19.0 N / 88.5 E</td> <td>< 1006</td> </tr> <tr> <td>13 Oct</td> <td>SCS</td> <td>19.5 N / 88.0 E</td> <td>< 1000</td> </tr> <tr> <td>14 Oct</td> <td>SCH</td> <td>20.7 N / 86.8 E</td> <td>< 1000</td> </tr> <tr> <td>15 Oct</td> <td>DD</td> <td>22.5 N / 85.0 E</td> <td>< 1006</td> </tr> </table>	11 Oct	LP	18.0 N / 88.5 E	< 1006	12 Oct	LP	19.0 N / 88.5 E	< 1006	13 Oct	SCS	19.5 N / 88.0 E	< 1000	14 Oct	SCH	20.7 N / 86.8 E	< 1000	15 Oct	DD	22.5 N / 85.0 E	< 1006	This system very rapidly intensified into a hurricane from Depression stage within twelve hours. Paradip reported a pressure of 996.1 hPa at 0830 hrs on 14 October.
11 Oct	LP	18.0 N / 88.5 E	< 1006																					
12 Oct	LP	19.0 N / 88.5 E	< 1006																					
13 Oct	SCS	19.5 N / 88.0 E	< 1000																					
14 Oct	SCH	20.7 N / 86.8 E	< 1000																					
15 Oct	DD	22.5 N / 85.0 E	< 1006																					
25 May, 1985	166.0	33.0	<p>SCS (core pressure < 980 hPa) crossed Bangladesh coast near Hatia in the early hours of 25 May.</p> <p>Details:</p> <table> <tr> <td>22 May</td> <td>D</td> <td>15.5 N / 88.0 E</td> <td>< 998</td> </tr> <tr> <td>23 May</td> <td>DD</td> <td>16.5 N / 87.5 E</td> <td>< 994</td> </tr> <tr> <td>24 May</td> <td>SCS</td> <td>19.0 N / 89.0 E</td> <td>< 980</td> </tr> <tr> <td>25 May</td> <td>SCS</td> <td>23.0 N / 91.5 E</td> <td>< 986</td> </tr> </table>	22 May	D	15.5 N / 88.0 E	< 998	23 May	DD	16.5 N / 87.5 E	< 994	24 May	SCS	19.0 N / 89.0 E	< 980	25 May	SCS	23.0 N / 91.5 E	< 986	Caused high tidal waves of 4.5 meters.				
22 May	D	15.5 N / 88.0 E	< 998																					
23 May	DD	16.5 N / 87.5 E	< 994																					
24 May	SCS	19.0 N / 89.0 E	< 980																					
25 May	SCS	23.0 N / 91.5 E	< 986																					
6 August, 1985	120.0	-15.1	<p>D (core pressure < 994 hPa) crossed west Bengal coast near Sagar Island around noon on 6 August.</p> <p>Details:</p> <table> <tr> <td>4 Aug</td> <td>LP</td> <td>22.5 N / 89.5 E</td> <td>< 1004</td> </tr> <tr> <td>5 Aug</td> <td>LP</td> <td>21.5 N / 88.5 E</td> <td>< 1000</td> </tr> <tr> <td>6 Aug</td> <td>D</td> <td>21.0 N / 88.0 E</td> <td>< 996</td> </tr> <tr> <td>7 Aug</td> <td>D</td> <td>22.5 N / 84.0 E</td> <td>< 994</td> </tr> </table>	4 Aug	LP	22.5 N / 89.5 E	< 1004	5 Aug	LP	21.5 N / 88.5 E	< 1000	6 Aug	D	21.0 N / 88.0 E	< 996	7 Aug	D	22.5 N / 84.0 E	< 994	A negative surge.				
4 Aug	LP	22.5 N / 89.5 E	< 1004																					
5 Aug	LP	21.5 N / 88.5 E	< 1000																					
6 Aug	D	21.0 N / 88.0 E	< 996																					
7 Aug	D	22.5 N / 84.0 E	< 994																					

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
11 October, 1985	184.0	53.5	CS (core pressure < 998 hPa) crossed North Andhra coast near Vishakhapatnam in the early hours of 11 October. Details: 8 Oct LP 13.5 N / 90.5 E < 1006 9 Oct D 12.5 N / 90.0 E < 1006 10 Oct D 16.0 N / 85.5 E < 998 11 Oct CS 18.0 N / 82.0 E < 1000 12 Oct DD 20.5 N / 80.0 E < 1002	Vishakhapatnam recorded the lowest pressure 994.2 hPa at 0330 hrs of 11 October.
16 October, 1985	208.0	34.4	SCS (core pressure < 994 hPa) crossed Orissa coast near Balasore in the early hours of 16 October. Details: 13 Oct LP 14.0 N / 95.0 E < 1006 14 Oct DD 16.0 N / 89.5 E < 1002 15 Oct SCS 19.5 N / 87.5 E < 994 16 Oct CS 21.2 N / 87.0 E < 996 17 Oct CS 24.5 N / 85.5 E < 998	Lowest Pressure at Balasore 987.8 hPa at 0330 hours of 16 October. Tidal waves of 1.5 to 2 mts height were reported from Balasore district.
12 August, 1986	189.0	70.4	DD (core pressure < 992 hPa) crossed North Andhra coast near Kalingapatnam in the night of 12 August. Details: 9 Aug LP 18.5 N / 85.0 E <1000 10 Aug LP 17.5 N / 87.5 E < 998 11 Aug DD 18.0 N / 86.5 E < 994 12 Aug DD 18.0 N / 84.5 E < 992 13 Aug DD 19.5 N / 83.5 E < 992	985.2 hPa at Kalingapatnam at 1730 hrs of 12 August was the lowest pressure recorded.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
9 November, 1986	164.0	27.9	CS (core pressure < 1000 hPa) crossed Bangladesh coast in the forenoon of 9 November. Details: 6 Nov LP 12.5 N / 84.0 E < 1009 7 Nov D 14.0 N / 82.0 E < 1004 8 Nov D 18.0 N / 85.5 E < 1002 9 Nov CS 22.0 N / 89.5 E < 1000 10 Nov D Over Bangladesh < 1010	990 hPa was recorded at Paradip at 2000 hrs of 8 November.
16 October, 1987	132.0	35.4	CS (core pressure < 1000 hPa) crossed Andhra coast just north of Ongole on 16 October morning. Details: 13 Oct LP 10.0 N / 92.0 E < 1010 14 Oct D 13.0 N / 87.5 E < 1006 15 Oct CS 14.5 N / 83.5 E < 1000 16 Oct DD 15.8 N / 79.5 E < 1008	Ongole reported The lowest pressure of 995.1 hPa at 0730 hrs on 16 October.
3 November, 1987	172.0	39.0	SCS (core pressure < 996 hPa) crossed south Andhra coast just North of Nellore in the early hours of 3 November. Details: 31 Oct D 11.5 N / 86.0 E < 1006 1 Nov CS 14.0 N / 84.5 E < 1002 2 Nov SCS 13.5 N / 82.0 E < 996 3 Nov CS 14.9 N / 79.5 E < 1000 4 Nov LP 15.0 N / 76.5 E < 1000	Nellore recorded the lowest pressure of 984.3 hPa at the time of landfall. The remnant of the system entered the Arabian sea to become SCH later.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
13 November, 1987	190.0	70.1	<p>SCS (core pressure <1000 hPa) crossed South Andhra coast just south of Machilipatnam in the early hours of 13 November.</p> <p>Details:</p> <p>9 Nov LP 10.0 N / 94.0 E < 1008 10 Nov LP 12.0 N / 90.0 E < 1006 11 Nov DD 13.0 N / 92.0 E < 1006 12 Nov CS 14.5 N / 84.5 E < 1000 13 Nov DD 16.0 N / 80.6 E < 1002</p>	Machilipatnam recorded the lowest pressure of 994.8 hPa at the time of landfall. The remnant emerged into the Arabian sea and dissipated. The tide gauge did not function for about 2 days after the surge event.
17 July, 1988	174.0	25.4	<p>D (core pressure < 993 hPa) crossed Orissa coast near Gopalpur in the night of 17 July.</p> <p>Details:</p> <p>15 Jul LP 19.0 N / 86.5 E < 1002 16 Jul LP 18.5 N / 87.0 E < 1000 17 Jul D 18.0 N / 86.0 E < 994 18 Jul D 19.5 N / 83.5 E < 993</p>	Gopalpur recorded the lowest pressure of 990.5 hPa at 0500 hrs of 18 July.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
29 November, 1988	186.0	34.9	<p>SCH (core pressure < 988 hPa) crossed West Bengal and Bangladesh coast 50 kms east of Sagar islands on 29 November afternoon.</p> <p>Details:</p> <p>22 Nov LP 06.5 N / 98.5 E < 1008</p> <p>23 Nov D 09.8 N / 95.0 E < 1008</p> <p>24 Nov DD 10.0 N / 94.0 E < 1008</p> <p>25 Nov CS 11.5 N / 92.0 E < 998</p> <p>26 Nov SCS 12.0 N / 86.5 E < 996</p> <p>27 Nov SCH 13.5 N / 87.0 E < 988</p> <p>28 Nov SCH 16.0 N / 87.0 E < 988</p> <p>29 Nov SCH 19.5 N / 88.0 E < 1000</p> <p>30 Nov LP Over Assam and Meghalaya</p>	This was one of the super storms that affected the Indian Coast. The lowest estimated core pressure was 942 hPa at 1730 hrs of 29 November however Sagar island lighthouse recorded 990 hPa as the lowest.

Annexure- II

Chennai

13° 06' N 80° 18' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
2 November, 1975	202.0	43.0	CS (core pressure < 1006 hPa) crossed Andhra coast on 3 November. Details: 30 Oct LP 12.0 N / 88.5 E < 1009 31 Oct LP 13.5 N / 87.0 E < 1006 1 Nov D 15.0 N / 84.5 E < 1008 2 Nov CS 15.5 N / 83.0 E < 1006 3 Nov LP 14.8 N / 81.5 E < 1006	The estimated pressure at the center of the storm is about 1000 hPa.
27 November, 1975	166.0	33.4	SCS (core pressure < 1002 hPa) passed off Tamilnadu coast during 24 November to 1 December. Details: 23 Nov LP South East Bay < 1010 24 Nov DD 09.0 N / 84.5 E < 1006 25 Nov CS 11.2 N / 82.0 E < 1002 26 Nov SCS 12.5 N / 81.0 E < 1004 27 Nov CS 14.0 N / 82.0 E < 1004 28 Nov CS 14.0 N / 84.0 E < 1004 29 Nov CS 15.5 N / 86.8 E < 1004 30 Nov D 18.0 N / 91.2 E < 1006 1 Dec D 14.0 N / 87.0 E < 1006	The SCS weakened and diffused over the central Bay.
2 November, 1976	139.0	23.3	SCS (core pressure < 1004 hPa) crossed coast just North of Machilipatnam around 2030 hrs on 4 November. Details: 3 Nov D 13.0 N / 87.5 E < 1009 4 Nov DD 15.0 N / 84.0 E < 1004 5 Nov SCS 17.2 N / 79.0 E < 1006	A cyclone of narrow core (less than a degree in diameter). Lowest pressure of 985 hPa was recorded at Machilipatnam at 2100 hrs of 4 November.

Chennai

13° 06' N 80° 18' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
27 November, 1976	172.0	39.4	D/CS (core pressure < 996 hPa) skirted Andhra coast upto 27, then moved North eastwards to Arakan coast and weakened on 30 November morning. Details: 22 Nov LP 07.0 N / 91.5 E < 1006 23 Nov DD 09.0 N / 88.2 E < 1004 24 Nov DD 10.0 N / 84.0 E < 1000 25 Nov DD 13.6 N / 80.5 E < 996 26 Nov DD 14.0 N / 80.2 E < 1006 27 Nov CS 16.3 N / 82.2 E < 1004 28 Nov DD 18.0 N / 87.0 E 29 Nov DD North West Bay	The D seems to have become CS on 27 morning for a short time.
22 August, 1977	150.0	4.3	DD (core pressure < 996 hPa) crossed Orissa coast near Gopalpur on 22 August early morning. Details: 19 Aug D 19.0 N / 91.0 E < 1000 20 Aug DD 18.4 N / 89.6 E < 996 21 Aug DD 19.5 N / 87.0 E < 996 22 Aug DD 18.8 N / 85.0 E < 996 23 Aug DD 19.1 N / 82.2 E < 998	The pressure departure from normal at the core was about -12.0 hPa.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
12 November, 1977	183.0	36.4	SCS (core pressure < 1000 hPa) crossed Tamilnadu coast just South of Nagapattinam in the early morning of 12 November. Details: 8 Nov LP 08.0 N / 93.0 E < 1010 9 Nov D 08.0 N / 91.5 E < 1008 10 Nov CS 11.0 N / 87.5 E < 1000 11 Nov SCS 11.0 N / 82.3 E < 1000 12 Nov CS 10.9 N / 79.5 E < 1002	Later emerged into Lakshadweep as a DD. The eye had a diameter of 10 km. The estimated lowest sea level pressure is 979.0 hPa at the time of landfall.
15 August, 1978	144.0	-8.7	DD (core pressure < 988 hPa) crossed Orissa coast between Gopalpur and Puri on 15 May afternoon. Details: 12 Aug LP 21.0 N / 89.4 E < 997 13 Aug D 19.5 N / 89.0 E < 994 14 Aug DD 19.2 N / 87.7 E < 992 15 Aug DD 19.2 N / 87.2 E < 988 16 Aug DD Near Mandla (U.P) < 994	A negative surge.
4 November, 1978	185.0	36.1	DD (core pressure < 1002 hPa) crossed Tamilnadu coast around noon of 4 November near Cuddalore. Details: 3 Nov D 10.5 N / 82.0 E < 1004 4 Nov DD 12.5 N / 80.4 E < 1002	Weakened into a D; emerged into Arabian sea on 5 November.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
7 August, 1979	164.0	-22.0	SCS (core pressure < 980 hPa) crossed Orissa coast near Balasore in the early night of 7 August. Details: 5 Aug LP 22.1 N / 90.0 E < 996 6 Aug D 21.0 N / 90.0 E < 990 7 Aug SCS 21.5 N / 87.5 E < 980 8 Aug SCS 22.3 N / 85.0 E < 984	A negative surge. Balasore recorded the lowest MSL pressure of 970 hPa at 2100 hrs of 7 August.
2 November, 1979	173.0	23.3	LP (core pressure < 1008 hPa) crossed north Tamilnadu coast by noon of 2 November. Details: 29 Oct D 10.0 N / 89.5 E < 1010 30 Oct D 10.0 N / 86.5 E < 1008 31 Oct DD 12.0 N / 84.0 E < 1008 1 Nov DD 12.3 N / 81.5 E < 1006 2 Nov LP 12.5 N / 80.2 E < 1008	
24 November, 1979	180.0	36.8	CS (core pressure < 1000 hPa) crossed Tamilnadu Andhra coast near Sriharikota by about 1430 hrs on 25 November. Details: 22 Nov LP < 1010 23 Nov D 08.5 N / 87.5 E < 1008 24 Nov CS 10.5 N / 83.5 E < 1000 25 Nov CS 13.4 N / 81.0 E < 1004 26 Nov LP 12.0 N / 74.2 E < 1011	The lowest MSL pressure recorded at Sriharikota was 1001.2 hPa at 1430 hrs on 25 November.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
5 December, 1980	160.0	27.3	CS (core pressure < 1002 hPa) passed off Tamilnadu coast about 5 December. Details: 2 Dec LP 07.0 N / 87.2 E < 1008 3 Dec D 09.4 N / 84.8 E < 1006 4 Dec DD 11.4 N / 83.0 E < 1004 5 Dec CS 13.5 N / 83.0 E < 1002 6 Dec CS 14.0 N / 84.0 E < 1006	Estimated pressure at the core was 998 hPa.
17 December, 1980	160.0	26.1	CS (core pressure < 1002 hPa) crossed SriLanka coast near Trincomalee on 17 December forenoon. Weakened into a depression, emerged into Gulf of Mannar on the same evening, and weakened further to a low over Comorin on 18 December morning. Details: 12 Dec D 10.5 N / 91.5 E < 1008 13 Dec DD 11.0 N / 93.5 E < 1006 14 Dec DD 10.5 N / 93.6 E < 1006 15 Dec DD 09.0 N / 91.0 E < 1006 16 Dec CS 08.5 N / 87.0 E < 1002 17 Dec CS 08.5 N / 81.5 E < 1002 18 Dec LP Over Comorin	The core pressure on 17 December morning is estimated to be about 998 hPa.
21 June, 1981	180.0	24.2	DD (core pressure < 988 hPa) crossed West Bengal coast near Contai on 21 June morning. 20 Jun D 21.0 N / 89.0 E < 992 21 Jun DD 22.5 N / 87.5 E < 988 22 Jun DD 22.5 N / 85.2 E < 990	

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
26 September, 1981	162.0	12.0	SCS (core pressure < 992 hPa) crossed Orissa coast near Puri on the early morning of 26 September. Details: 24 Sep LP 17.0 N / 91.0 E < 1002 25 Sep CS 18.0 N / 88.5 E < 994 26 Sep SCS 20.5 N / 85.5 E < 992 27 Sep DD 22.8 N / 80.5 E < 998	Puri reported the lowest pressure of 983.1 hPa at 0530 hrs of 26 September.
2 November, 1981	180.0	33.3	D (core pressure < 1006 hPa) persisted off Tamilnadu coast for a few days and merged with the seasonal low over the Bay. Details: 31 Oct D 12.0 N / 87.5 E < 1009 1 Nov D 12.5 N / 86.0 E < 1006 2 Nov D 12.5 N / 84.0 E < 1009 3 Nov LP 12.5 N / 83.5 E < 1008 4 Nov LP 13.0 N / 84.0 E < 1009 5 Nov LP 14.5 N / 84.0 E < 1006	
18 October, 1982	186.0	38.8	SCS (core pressure < 1004 hPa) crossed south Andhra coast near Sriharikota around 2200 hrs of 18 October. Details: 17 Oct D 11.0 N / 84.0 E < 1008 18 Oct SCS 13.1 N / 81.2 E < 1004 19 Oct DD 14.8 N / 79.0 E < 1005	Lowest pressure of 982.8 hPa was recorded at Sriharikota at 2000 hrs on 18 October. A narrow core system.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
15 August, 1984	162.0	05.1	DD (core pressure < 992 hPa) crossed North Orissa coast near Balasore on 16 morning. Details: 13 Aug LP 19.5 N / 90.5 E < 998 14 Aug LP 20.0 N / 90.0 E < 996 15 Aug D 20.0 N / 90.0 E < 992 16 Aug DD 21.5 N / 87.0 E < 992 17 Aug DD 23.0 N / 84.0 E < 994	Balasore reported a MSL pressure of 989.6 hPa at the time of landfall.
14 November, 1984	206.0	57.2	SCS (core pressure < 998 hPa) crossed land near Sriharikota at about 0800 hrs on 14 November. Details: 9 Nov LP 09.0 N / 88.0 E < 1008 10 Nov DD 10.0 N / 86.0 E < 1002 11 Nov CS 10.5 N / 82.0 E < 998 12 Nov SCS 12.0 N / 80.8 E < 1002 13 Nov SCS 13.7 N / 80.5 E < 1004 14 Nov SCS 14.0 N / 80.2 E < 1006 15 Nov LP 14.0 N / 80.0 E < 1010	Sriharikota recorded lowest pressure 984.1 hPa at 0840 hrs on 14 November. Tide gauge did not function after the surge.
12 November, 1985	165.0	41.5	D (core pressure < 1004 hPa) formed and diffused off Tamilnadu coast on 12 November. Details: 11 Nov LP 11.5 N / 82.0 E < 1008 12 Nov D 12.5 N / 81.5 E < 1004 13 Nov LP 12.8 N / 81.5 E < 1008	Tide gauge break down on 15 November.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks																				
3 November, 1987	136.0	27.0	<p>SCS (core pressure < 996 hPa) crossed south Andhra coast just North of Nellore in the early hours of 3 November.</p> <p>Details:</p> <table> <tr> <td>31 Oct</td> <td>D</td> <td>11.5 N / 86.0 E</td> <td>< 1006</td> </tr> <tr> <td>1 Nov</td> <td>CS</td> <td>14.0 N / 84.5 E</td> <td>< 1002</td> </tr> <tr> <td>2 Nov</td> <td>SCS</td> <td>13.5 N / 82.0 E</td> <td>< 996</td> </tr> <tr> <td>3 Nov</td> <td>CS</td> <td>14.9 N / 79.5 E</td> <td>< 1000</td> </tr> <tr> <td>4 Nov</td> <td>LP</td> <td>15.0 N / 76.5 E</td> <td>< 1000</td> </tr> </table>	31 Oct	D	11.5 N / 86.0 E	< 1006	1 Nov	CS	14.0 N / 84.5 E	< 1002	2 Nov	SCS	13.5 N / 82.0 E	< 996	3 Nov	CS	14.9 N / 79.5 E	< 1000	4 Nov	LP	15.0 N / 76.5 E	< 1000	Nellore recorded the lowest pressure of 984.3 hPa at the time of landfall. The remnant of the system entered the Arabian sea to become SCH later.
31 Oct	D	11.5 N / 86.0 E	< 1006																					
1 Nov	CS	14.0 N / 84.5 E	< 1002																					
2 Nov	SCS	13.5 N / 82.0 E	< 996																					
3 Nov	CS	14.9 N / 79.5 E	< 1000																					
4 Nov	LP	15.0 N / 76.5 E	< 1000																					
12 November, 1987	124.0	38.1	<p>SCS (core pressure <1000 hPa) crossed South Andhra coast just south of Machilipatnam in the early hours of 13 November.</p> <p>Details:</p> <table> <tr> <td>9 Nov</td> <td>LP</td> <td>10.0 N / 94.0 E</td> <td>< 1008</td> </tr> <tr> <td>10 Nov</td> <td>LP</td> <td>12.0 N / 90.0 E</td> <td>< 1006</td> </tr> <tr> <td>11 Nov</td> <td>DD</td> <td>13.0 N / 92.0 E</td> <td>< 1006</td> </tr> <tr> <td>12 Nov</td> <td>CS</td> <td>14.5 N / 84.5 E</td> <td>< 1000</td> </tr> <tr> <td>13 Nov</td> <td>DD</td> <td>16.0 N / 80.6 E</td> <td>< 1002</td> </tr> </table>	9 Nov	LP	10.0 N / 94.0 E	< 1008	10 Nov	LP	12.0 N / 90.0 E	< 1006	11 Nov	DD	13.0 N / 92.0 E	< 1006	12 Nov	CS	14.5 N / 84.5 E	< 1000	13 Nov	DD	16.0 N / 80.6 E	< 1002	Machilipatnam recorded the lowest pressure of 994.8 hPa at the time of landfall. The remnant emerged into the Arabian sea and dissipated.
9 Nov	LP	10.0 N / 94.0 E	< 1008																					
10 Nov	LP	12.0 N / 90.0 E	< 1006																					
11 Nov	DD	13.0 N / 92.0 E	< 1006																					
12 Nov	CS	14.5 N / 84.5 E	< 1000																					
13 Nov	DD	16.0 N / 80.6 E	< 1002																					

Annexure -II

Kochi

09° 58' N 76° 16' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
25 November, 1974	109.0	23.3	LP (core pressure < 1010 hPa) formed and dissipated on 25 November. Details: 25 Nov LP 09.0 N / 73.5 E < 1010	
29 May, 1975	109.0	11.2	DD (core pressure < 1004 hPa) crossed Maharashtra coast near Alibagh on May late evening. Details: 28 May LP 07.0 N / 75.0 E < 1006 29 May LP 07.2 N / 74.8 E < 1007 30 May DD 12.0 N / 71.0 E < 1006 31 May DD 16.3 N / 70.2 E < 1004	
12 October, 1976	78.0	-8.5	SCS weakened into a D on 17 October near Socotra and dissipated later. Details: 11 Oct LP 08.0 N / 69.5 E < 1011 12 Oct LP 09.8 N / 70.2 E < 1010 13 Oct D 12.0 N / 69.0 E < 1008 14 Oct D 13.0 N / 66.0E < 1008	A negative surge. System became a CS on 14 evening, became SCS on 15 evening and later dissipated near Socotra.

Kochi

09° 58' N 76° 16' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks																																								
20 November, 1977	108.0	30.1	<p>CS (core pressure < 1000 hPa) crossed the coast between Mangalore and Honavar in the early morning of 22 November.</p> <p>Details:</p> <table> <tr> <td>13 Nov</td> <td>DD</td> <td>11.0 N / 75.0 E</td> <td>< 1006</td> </tr> <tr> <td>14 Nov</td> <td>CS</td> <td>12.0 N / 71.5 E</td> <td>< 1002</td> </tr> <tr> <td>15 Nov</td> <td>SCS</td> <td>13.1 N / 69.3 E</td> <td>< 1002</td> </tr> <tr> <td>16 Nov</td> <td>SCS</td> <td>13.8 N / 66.0 E</td> <td>< 1002</td> </tr> <tr> <td>17 Nov</td> <td>SCH</td> <td>10.0 N / 84.0 E</td> <td>< 960</td> </tr> <tr> <td>18 Nov</td> <td>SCH</td> <td>12.6 N / 82.5 E</td> <td>< 960</td> </tr> <tr> <td>19 Nov</td> <td>SCS</td> <td>15.2 N / 81.0 E</td> <td>< 960</td> </tr> <tr> <td>20 Nov</td> <td>SCS</td> <td>10.3 N / 71.5 E</td> <td>< 1000</td> </tr> <tr> <td>21 Nov</td> <td>SCS</td> <td>11.5 N / 75.0 E</td> <td>< 1000</td> </tr> <tr> <td>22 Nov</td> <td>DD</td> <td>14.5 N / 75.0 E</td> <td>< 1004</td> </tr> </table>	13 Nov	DD	11.0 N / 75.0 E	< 1006	14 Nov	CS	12.0 N / 71.5 E	< 1002	15 Nov	SCS	13.1 N / 69.3 E	< 1002	16 Nov	SCS	13.8 N / 66.0 E	< 1002	17 Nov	SCH	10.0 N / 84.0 E	< 960	18 Nov	SCH	12.6 N / 82.5 E	< 960	19 Nov	SCS	15.2 N / 81.0 E	< 960	20 Nov	SCS	10.3 N / 71.5 E	< 1000	21 Nov	SCS	11.5 N / 75.0 E	< 1000	22 Nov	DD	14.5 N / 75.0 E	< 1004	The SCS, which crossed Tamilnadu coast on 12 November, merged into the Arabian sea on 13 as DD. This intensified to a SCS. Interacted with the cyclone in the Bay, made a loop and weakened to a CS in the early hours of 22 November before landfall. The estimated core pressure is 974 hPa.
13 Nov	DD	11.0 N / 75.0 E	< 1006																																									
14 Nov	CS	12.0 N / 71.5 E	< 1002																																									
15 Nov	SCS	13.1 N / 69.3 E	< 1002																																									
16 Nov	SCS	13.8 N / 66.0 E	< 1002																																									
17 Nov	SCH	10.0 N / 84.0 E	< 960																																									
18 Nov	SCH	12.6 N / 82.5 E	< 960																																									
19 Nov	SCS	15.2 N / 81.0 E	< 960																																									
20 Nov	SCS	10.3 N / 71.5 E	< 1000																																									
21 Nov	SCS	11.5 N / 75.0 E	< 1000																																									
22 Nov	DD	14.5 N / 75.0 E	< 1004																																									
6 June, 1980	97.0	-7.0	<p>D (core pressure < 998 hPa) crossed North Maharashtra coast by 6 June afternoon.</p> <p>Details:</p> <table> <tr> <td>3 Jun</td> <td>LP</td> <td>14.5 N / 72.5 E</td> <td>< 1004</td> </tr> <tr> <td>4 Jun</td> <td>D</td> <td>15.0 N / 70.5 E</td> <td>< 1002</td> </tr> <tr> <td>5 Jun</td> <td>D</td> <td>16.5 N / 70.5 E</td> <td>< 1002</td> </tr> <tr> <td>6 Jun</td> <td>D</td> <td>19.0 N / 72.0 E</td> <td>< 998</td> </tr> </table>	3 Jun	LP	14.5 N / 72.5 E	< 1004	4 Jun	D	15.0 N / 70.5 E	< 1002	5 Jun	D	16.5 N / 70.5 E	< 1002	6 Jun	D	19.0 N / 72.0 E	< 998	A negative surge.																								
3 Jun	LP	14.5 N / 72.5 E	< 1004																																									
4 Jun	D	15.0 N / 70.5 E	< 1002																																									
5 Jun	D	16.5 N / 70.5 E	< 1002																																									
6 Jun	D	19.0 N / 72.0 E	< 998																																									

Kochi

09° 58' N 76° 16' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
19 December, 1980	112.0	22.0	CS from the Bay crossed SriLankan coast, emerged into southeast Arabian sea on 18 December. Details: 18 Dec LP 08.0 N / 75.5 E < 1008 19 Dec LP 08.0 N / 71.0 E < 1008 20 Dec LP 09.5 N / 69.0 E < 1010	
28 October, 1981	106.0	15.1	SCH (core pressure < 992 hPa) crossed Saurashtra coast close to Mangrol after midnight of 1 November. Details: 28 Oct LP 12.6 N / 71.5 E < 1008 29 Oct DD 12.0 N / 70.8 E < 1004 30 Oct CS 13.5 N / 68.0 E < 1002 31 Oct SCH 16.5 N / 68.0 E --- 1 Nov SCH 19.5 N / 69.5 E < 996 2 Nov SCS 22.2 N / 69.7 E < 992 3 Nov DD 27.0 N / 75.0 E < 1002	The estimated core pressure was 983 hPa.
9 August, 1983	102.0	-6.46	A land depression over Bangladesh on 4 August, traveled across India and emerged into Arabian sea on 9 August morning, intensified into a DD and crossed Oman coast around noon on 10 August. Details: 8 Aug D 21.7 N / 73.0 E < 994 9 Aug DD 22.5 N / 62.5 E < 994 10 Aug DD 21.5 N / 61.5 E < 988	A negative surge.
12 November, 1985	108.0	-11.7	LP (core pressure < 1006 hPa) formed and dissipated over sea. Details: 9 Nov LP 11.0 N / 73.0 E < 1010 10 Nov LP 08.0 N / 70.0 E < 1006 11 Nov LP 10.0 N / 69.0 E < 1007	A negative surge.

Kochi

09° 58' N 76° 16' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
8 November, 1986	94.0	15.7	DD (core pressure < 1004 hPa) dissipated over west central and adjoining southwest Arabian sea on 11 November. Details: 8 Nov LP 13.0 N / 71.0 E < 1006 9 Nov DD 13.0 N / 70.0 E < 1004 10 Nov DD 12.0 N / 66.0 E < 1008	LP persisting over east central Arabian sea since 1 November rapidly intensified to DD.
7 December, 1987	121.0	17.4	LP (core pressure < 1008 hPa) persisted off west coast of India for a long time and dissipated. Details: 5 Dec LP 09.0 N / 74.5 E < 1010 6 Dec LP 10.0 N / 74.0 E < 1008 7 Dec LP 08.5 N / 75.0 E < 1008 8 Dec LP 10.0 N / 73.0 E < 1010 9 Dec LP 10.5 N / 72.0 E < 1009	

Annexure- II

Marmagao

15° 25' N 73° 48' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
31 May, 1975	216.0	23.4	DD (core pressure < 1004 hPa) crossed Maharashtra coast near Alibagh on 31 May late evening. Details: 28 May LP 07.0 N / 75.5 E < 1006 29 May LP 07.2 N / 74.8 E < 1007 30 May DD 12.0 N / 71.0 E < 1006 31 May DD 16.3 N / 70.2 E < 1004	
31 May, 1976	235.0	24.1	SCH (core pressure < 994 hPa) crossed Saurashtra near Mahuva on the morning of 3 June and again near port Cambay on 4 June morning. Details: 29 May LP 12.0 N / 70.0 E < 1006 30 May D 13.0 N / 71.0 E < 1002 31 May CS 14.2 N / 72.0 E < 1000 1 Jun SCS 17.0 N / 71.0 E < 996 2 Jun SCH 18.5 N / 71.0 E < 994 3 Jun SCH 20.5 N / 72.0 E < 996	Bhavnagar reported MSL pressure of 983.4 hPa at 2300 hrs on 3 June.
8 June, 1977	228.0	14.1	SCH (core pressure < 984 hPa) passed through Masirah island on 13 June morning and entered Oman. Details: 8 Jun LP 15.5 N / 71.5 E < 1004 9 Jun DD 16.5 N / 70.2 E < 1000 10 Jun CS 18.5 N / 69.3 E < 984 11 Jun SCH 19.7 N / 64.3 E < 984	Masirah at the time of landfall reported lowest pressure of 959.0 hPa.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks																																								
14 November, 1977 22 November, 1977	250.0 206.0	19.1 14.2	<p>The SCS (core pressure < 960 hPa) from the Bay moved over the Peninsula and emerged into Lakshadweep on 13 November morning as a DD which became a SCS, interacted with another cyclone in the Bay, made a loop. Weakened into a CS and crossed the coast near Honavar in the early morning of 22 November.</p> <p>Details:</p> <table border="0"> <tr> <td>13 Nov</td> <td>DD</td> <td>11.0 N / 75.0 E</td> <td>< 1006</td> </tr> <tr> <td>14 Nov</td> <td>CS</td> <td>12.0 N / 71.5 E</td> <td>< 1002</td> </tr> <tr> <td>15 Nov</td> <td>SCS</td> <td>13.1 N / 69.3 E</td> <td>< 1002</td> </tr> <tr> <td>16 Nov</td> <td>SCS</td> <td>13.8 N / 66.0 E</td> <td>< 1002</td> </tr> <tr> <td>17 Nov</td> <td>SCH</td> <td>10.0 N / 84.0 E</td> <td>< 960</td> </tr> <tr> <td>18 Nov</td> <td>SCH</td> <td>12.6 N / 82.5 E</td> <td>< 960</td> </tr> <tr> <td>19 Nov</td> <td>SCS</td> <td>15.2 N / 81.0 E</td> <td>< 960</td> </tr> <tr> <td>20 Nov</td> <td>SCS</td> <td>10.3 N / 71.5 E</td> <td>< 1000</td> </tr> <tr> <td>21 Nov</td> <td>SCS</td> <td>11.5 N / 75.0 E</td> <td>< 1000</td> </tr> <tr> <td>22 Nov</td> <td>DD</td> <td>14.5 N / 75.0 E</td> <td>< 1004</td> </tr> </table>	13 Nov	DD	11.0 N / 75.0 E	< 1006	14 Nov	CS	12.0 N / 71.5 E	< 1002	15 Nov	SCS	13.1 N / 69.3 E	< 1002	16 Nov	SCS	13.8 N / 66.0 E	< 1002	17 Nov	SCH	10.0 N / 84.0 E	< 960	18 Nov	SCH	12.6 N / 82.5 E	< 960	19 Nov	SCS	15.2 N / 81.0 E	< 960	20 Nov	SCS	10.3 N / 71.5 E	< 1000	21 Nov	SCS	11.5 N / 75.0 E	< 1000	22 Nov	DD	14.5 N / 75.0 E	< 1004	The estimated core pressure is 974 hPa.
13 Nov	DD	11.0 N / 75.0 E	< 1006																																									
14 Nov	CS	12.0 N / 71.5 E	< 1002																																									
15 Nov	SCS	13.1 N / 69.3 E	< 1002																																									
16 Nov	SCS	13.8 N / 66.0 E	< 1002																																									
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18 Nov	SCH	12.6 N / 82.5 E	< 960																																									
19 Nov	SCS	15.2 N / 81.0 E	< 960																																									
20 Nov	SCS	10.3 N / 71.5 E	< 1000																																									
21 Nov	SCS	11.5 N / 75.0 E	< 1000																																									
22 Nov	DD	14.5 N / 75.0 E	< 1004																																									
7 November, 1978	214.0	19.3	<p>SCH (core pressure < 986 hPa) weakened to DD (core pressure < 1004 hPa) crossed Gujarat coast near Okha on the forenoon of 12 November.</p> <p>Details:</p> <table border="0"> <tr> <td>5 Nov</td> <td>D</td> <td>11.5 N / 74.5 E</td> <td>< 1004</td> </tr> <tr> <td>6 Nov</td> <td>CS</td> <td>12.2 N / 72.0 E</td> <td>< 998</td> </tr> <tr> <td>7 Nov</td> <td>SCS</td> <td>13.0 N / 68.5 E</td> <td>< 1002</td> </tr> <tr> <td>8 Nov</td> <td>SCH</td> <td>15.2 N / 64.6 E</td> <td>< 992</td> </tr> <tr> <td>9 Nov</td> <td>SCH</td> <td>17.5 N / 62.3 E</td> <td>< 986</td> </tr> <tr> <td>10 Nov</td> <td>SCH</td> <td>21.3 N / 64.5 E</td> <td>< 996</td> </tr> <tr> <td>11 Nov</td> <td>SCH</td> <td>23.0 N / 67.0 E</td> <td>< 998</td> </tr> <tr> <td>12 Nov</td> <td>DD</td> <td>23.0 N / 68.7 E</td> <td>< 1004</td> </tr> </table>	5 Nov	D	11.5 N / 74.5 E	< 1004	6 Nov	CS	12.2 N / 72.0 E	< 998	7 Nov	SCS	13.0 N / 68.5 E	< 1002	8 Nov	SCH	15.2 N / 64.6 E	< 992	9 Nov	SCH	17.5 N / 62.3 E	< 986	10 Nov	SCH	21.3 N / 64.5 E	< 996	11 Nov	SCH	23.0 N / 67.0 E	< 998	12 Nov	DD	23.0 N / 68.7 E	< 1004	The estimated core pressure on 8 November morning is 959 hPa.								
5 Nov	D	11.5 N / 74.5 E	< 1004																																									
6 Nov	CS	12.2 N / 72.0 E	< 998																																									
7 Nov	SCS	13.0 N / 68.5 E	< 1002																																									
8 Nov	SCH	15.2 N / 64.6 E	< 992																																									
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10 Nov	SCH	21.3 N / 64.5 E	< 996																																									
11 Nov	SCH	23.0 N / 67.0 E	< 998																																									
12 Nov	DD	23.0 N / 68.7 E	< 1004																																									

Annexure- II

Mumbai

18° 55' N 72° 50' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
5 May, 1975	367.0	41.2	SCS (core pressure < 1000 hPa) weakened into a LP and diffused over sea. Details: 30 Apr LP 1 May DD 09.0 N / 71.5 E < 1006 2 May CS 10.5 N / 71.0 E < 1004 3 May CS 10.8 N / 69.8 E < 1002 4 May CS 11.8 N / 71.2 E < 1002 5 May SCS 14.0 N / 70.5 E < 1000 6 May CS 14.5 N / 69.5 E < 1006 7 May CS 13.8 N / 67.5 E < 1004 8 May CS 14.5 N / 65.0 E < 1002 9 May CS 15.5 N / 64.2 E < 1002 10 May D 16.5 N / 64.5 E < 1000 11 May LP 18.0 N / 65.0 E < 1006	The estimated lowest pressure is 979 hPa on 8 May.
31 May, 1975	405.0	39.9	DD (core pressure < 1004 hPa) crossed Maharashtra coast near Alibagh on 31 May late evening. Details: 28 May LP 07.0 N / 75.5 E < 1006 29 May LP 07.2 N / 74.8 E < 1007 30 May DD 12.0 N / 71.0 E < 1006 31 May DD 16.3 N / 70.2 E < 1004	
24 June, 1975	412.0	27.1	D (core pressure < 994 hPa) moved over Saurashtra, weakened into a low and dissipated over North Arabian sea by 25 June evening. Details: 23 Jun LP 20.5 N / 71.8 E < 996 24 Jun D 22.0 N / 69.5 E < 994 25 Jun D 23.0 N / 67.5 E < 994	

Mumbai

18° 55' N 72° 50' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks																								
19 October, 1975	409.0	-16.5	<p>SCH (core pressure < 1000 hPa) crossed Saurashtra coast near Porbandar on 22 October afternoon.</p> <p>Details:</p> <table border="0"> <tr> <td>18 Oct</td> <td>LP</td> <td>14.0 N / 71.8 E</td> <td>< 1005</td> </tr> <tr> <td>19 Oct</td> <td>LP</td> <td>17.0 N / 72.3 E</td> <td>< 1002</td> </tr> <tr> <td>20 Oct</td> <td>D</td> <td>18.0 N / 70.0 E</td> <td>< 1002</td> </tr> <tr> <td>21 Oct</td> <td>CS</td> <td>19.5 N / 68.5 E</td> <td>< 1004</td> </tr> <tr> <td>22 Oct</td> <td>SCH</td> <td>20.8 N / 68.5 E</td> <td>< 1002</td> </tr> <tr> <td>23 Oct</td> <td>SCS</td> <td>23.8 N / 71.5 E</td> <td>< 1000</td> </tr> </table>	18 Oct	LP	14.0 N / 71.8 E	< 1005	19 Oct	LP	17.0 N / 72.3 E	< 1002	20 Oct	D	18.0 N / 70.0 E	< 1002	21 Oct	CS	19.5 N / 68.5 E	< 1004	22 Oct	SCH	20.8 N / 68.5 E	< 1002	23 Oct	SCS	23.8 N / 71.5 E	< 1000	<p>The estimated lowest core pressure of the cyclone on 22 October was 967 hPa, while Porbandar reported 972 hPa.</p>
18 Oct	LP	14.0 N / 71.8 E	< 1005																									
19 Oct	LP	17.0 N / 72.3 E	< 1002																									
20 Oct	D	18.0 N / 70.0 E	< 1002																									
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22 Oct	SCH	20.8 N / 68.5 E	< 1002																									
23 Oct	SCS	23.8 N / 71.5 E	< 1000																									
2 June, 1976	480.0	63.9	<p>SCH (core pressure < 994 hPa) crossed Saurashtra near Mahuva on the morning of 3 June and again near port Cambay on 4 June morning.</p> <p>Details:</p> <table border="0"> <tr> <td>29 May</td> <td>LP</td> <td>12.0 N / 70.0 E</td> <td>< 1006</td> </tr> <tr> <td>30 May</td> <td>D</td> <td>13.0 N / 71.0 E</td> <td>< 1002</td> </tr> <tr> <td>31 May</td> <td>CS</td> <td>14.2 N / 72.0 E</td> <td>< 1000</td> </tr> <tr> <td>1 Jun</td> <td>SCS</td> <td>17.0 N / 71.0 E</td> <td>< 996</td> </tr> <tr> <td>2 Jun</td> <td>SCH</td> <td>18.5 N / 71.0 E</td> <td>< 994</td> </tr> <tr> <td>3 Jun</td> <td>SCH</td> <td>20.5 N / 72.0 E</td> <td>< 996</td> </tr> </table>	29 May	LP	12.0 N / 70.0 E	< 1006	30 May	D	13.0 N / 71.0 E	< 1002	31 May	CS	14.2 N / 72.0 E	< 1000	1 Jun	SCS	17.0 N / 71.0 E	< 996	2 Jun	SCH	18.5 N / 71.0 E	< 994	3 Jun	SCH	20.5 N / 72.0 E	< 996	<p>Bhavnagar reported MSL pressure of 983.4 hPa at 2300 hrs on 3 June.</p>
29 May	LP	12.0 N / 70.0 E	< 1006																									
30 May	D	13.0 N / 71.0 E	< 1002																									
31 May	CS	14.2 N / 72.0 E	< 1000																									
1 Jun	SCS	17.0 N / 71.0 E	< 996																									
2 Jun	SCH	18.5 N / 71.0 E	< 994																									
3 Jun	SCH	20.5 N / 72.0 E	< 996																									

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
7 September, 1976	432.0	31.1	CS (core pressure < 996 hPa) weakened to a D, intensified to CS and weakened again. Dissipated over the sea. Details: 31 Aug CS 23.0 N / 69.0 E --- 1 Sep D 23.5 N / 65.5 E < 996 2 Sep D 24.0 N / 64.0 E < 998 3 Sep D 21.0 N / 66.0 E < 1000 4 Sep D 21.5 N / 67.0 E < 1002 5 Sep CS 21.0 N / 69.0 E < 996 6 Sep D 23.5 N / 66.5 E < 998 7 Sep D 23.0 N / 63.0 E < 1000 8 Sep D 22.0 N / 60.0 E ---	The system made a loop along the track.
10 June, 1977	387.0	56.0	SCH (core pressure < 984 hPa) passed through Masirah island on 13 June morning and entered Oman. Details: 8 Jun LP 15.5 N / 71.5 E < 1004 9 Jun DD 16.5 N / 70.2 E < 1000 10 Jun CS 18.5 N / 69.3 E < 984 11 Jun SCH 19.7 N / 64.3 E < 984	Masirah at the time of landfall reported lowest pressure of 959.0 hPa.
17 June, 1979	438.0	52.5	SCS (core pressure < 992 hPa) crossed African coast by the morning of 20 June. Details: 15 Jun LP 13.0 N / 71.5 E < 1002 16 Jun D 14.0 N / 70.5 E < 1000 17 Jun DD 16.5 N / 69.5 E < 996 18 Jun CS 18.0 N / 65.0 E < 994 19 Jun SCS 19.5 N / 62.5 E < 992	A ship 150 kms away from the storm center reported the lowest pressure of 989.1 hPa.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
16 November, 1979	412.0	46.6	DD (core pressure < 1002 hPa) weakened into a LP and diffused near Saurashtra on 17 November evening. Details: 13 Nov D 09.5 N / 72.0 E < 1008 14 Nov D 11.5 N / 70.5 E < 1006 15 Nov DD 14.0 N / 69.0 E < 1002 16 Nov DD 17.0 N / 71.0 E < 1002 17 Nov LP 19.5 N / 70.5 E < 1006	
22 November, 1979	460.0	22.8	LP (core pressure < 1008 hPa) formed and diffused off west coast of India. Details: 21 Nov LP 15.0 N / 70.0 E < 1008 22 Nov LP 18.5 N / 71.0 E < 1008 23 Nov LP 18.5 N / 70.0 E < 1011	
6 June, 1980	424.0	37.6	D (core pressure < 998 hPa) crossed North Maharashtra coast by 6 June afternoon. Details: 3 Jun LP 14.5 N / 72.5 E < 1004 4 Jun D 15.0 N / 70.5 E < 1002 5 Jun D 16.5 N / 70.5 E < 1002 6 Jun D 19.0 N / 72.0 E < 998	
31 October, 1981	455.0	70.4	SCH (core pressure < 992 hPa) crossed Saurashtra coast close to Mangrol after midnight of 1 November. Details: 28 Oct LP 12.6 N / 71.5 E < 1008 29 Oct DD 12.0 N / 70.8 E < 1004 30 Oct CS 13.5 N / 68.0 E < 1002 31 Oct SCH 16.5 N / 68.0 E --- 1 Nov SCH 19.5 N / 69.5 E < 996 2 Nov SCS 22.2 N / 69.7 E < 992 3 Nov DD 27.0 N / 75.0 E < 1002	The estimated core pressure was 983 hPa.

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
7 November, 1982	409.0	80.2	SCS (core pressure < 992 hPa) crossed Gujarat coast west of Kodinar at about 1700 hrs on 8 November. Details: 3 Nov LP 10.0 N / 72.0 E < 1009 4 Nov LP 11.0 N / 65.5 E < 1008 5 Nov CS 12.5 N / 62.5 E < 1000 6 Nov SCS 14.0 N / 64.0 E < 998 7 Nov SCS 15.5 N / 66.5 E < 992 8 Nov SCS 19.0 N / 69.5 E < 998 9 Nov CS 23.0 N / 73.5 E < 1000	Veraval reported lowest pressure of 963.7 hPa just before landfall.
28 May, 1985	402.0	30.8	Cs (core pressure < 996 hPa) dissipated over northeast Arabian sea. Details: 28 May D 15.0 N / 67.0 E < 998 29 May D 17.5 N / 67.0 E < 996 30 May CS 20.0 N / 68.0 E < 996 31 May LP 22.0 N / 65.0 E < 998	
5 October, 1985	364.0	23.4	D (core pressure < 1002 hPa) crossed Saurashtra coast near Mahuva, made a loop, entered the sea and crossed the Gujarat coast south of Bulsar in the forenoon of 8 October. Details: 5 Oct LP 18.5 N / 71.5 E < 1004 6 Oct D 19.5 N / 71.5 E < 1004 7 Oct D 21.5 N / 72.0 E < 1002 8 Oct D 20.5 N / 72.5 E < 1000	

Mumbai

18° 55' N 72° 50' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
5 November, 1987	424.0	-35.2	SCS from the Bay crossed the east coast on 2 November, moved over land and emerged into Arabian sea as LP on 5 November and dissipated over sea. Details: 2 Nov SCS 13.5 N / 82.0 E < 996 3 Nov CS 14.9 N / 79.5 E < 1000 4 Nov LP 15.0 N / 76.5 E < 1000 5 Nov LP 15.5 N / 71.0 E < 1008	A negative surge.
10 December, 1987	405.0	43.3	LP (core pressure < 1008 hPa) diffused over the sea. Details: 9 Dec LP 10.0 N / 72.0 E < 1009 10 Dec LP 11.0 N / 71.0 E < 1010 11 Dec LP 13.0 N / 71.0 E < 1008 12 Dec LP 12.0 N / 69.0 E < 1010	

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
22 September, 1979	229.0	22.3	SCH (core pressure < 1000 hPa) weakened to a DD and crossed Oman coast on 24 September night. Details: 17 Sep LP 13.0 N / 73.5 E < 1008 18 Sep D 12.0 N / 73.0 E < 1006 19 Sep D 13.5 N / 71.5 E < 1004 20 Sep D 15.2 N / 70.5 E < 1004 21 Sep D 17.5 N / 70.0 E < 1004 22 Sep CS 18.5 N / 66.5 E < 1004 23 Sep SCH 20.5 N / 62.4 E < 1000 24 Sep DD Over Oman < 1006	
18 November, 1979	228.0	42.8	DD (core pressure < 1002 hPa) weakened into a LP and diffused near Saurashtra on 17 November evening. Details: 13 Nov D 09.5 N / 72.0 E < 1008 14 Nov D 11.5 N / 70.5 E < 1006 15 Nov DD 14.0 N / 69.0 E < 1002 16 Nov DD 17.0 N / 71.0 E < 1002 17 Nov LP 19.5 N / 70.5 E < 1006	
22 November, 1979	244.0	27.2	LP (core pressure < 1008 hPa) crossed Gujarat coast on 22 November evening. Details: 21 Nov LP 16.5 N / 69.5 E < 1008 22 Nov LP 18.5 N / 71.0 E < 1008 23 Nov LP 18.5 N / 70.5 E < 1011	

Veraval

20° 54' N 70° 22' E

Date	Maximum sea level (cm)	Maximum surge level (cm)	Associated meteorological events	Remarks
20 June, 1983	200.0	39.1	DD (core pressure < 994 hPa) moved over Saurashtra on 20 June morning. Details: 19 Jun LP 20.5 N / 71.0 E < 998 20 Jun DD 21.5 N / 70.0 E < 994 21 Jun DD 22.0 N / 70.5 E < 994 22 Jun DD 22.5 N / 71.5 E < 996	System lasted for 3 ½ days over Saurashtra.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
22-11-48	SCS crossed near Dahanu, 50 miles north of Bombay at 1000 hrs. on 22 nd November.					Gust wind speed at Juhu was 94 mph at 0940 hrs. on 22 nd November. No reports on the damages in the coastal region.
21-09-49	DD crossed the east coast just north of Masulipatnam in the morning on 21 st October.					Bombay had 28.73 " of rainfall in 24 hrs. and 31.69 " in 48 hrs.
28-10-49	SCS crossed the Andhra coast near Masulipatnam on 28 th October at 0130 hrs.	800 human lives perished.		Severe damage to about 3 lakh houses. Heavy breach of road and railway lines. Breakdown of telecommunication links in four districts.	Damage to million acres of crops. The estimated loss to property, livestock and crops is several crores of rupees.	Masulipatnam recorded a pressure departure of 30 mb. from normal (976.9 mb). High wind speed of 85 mph. Surge level of 10-15 ft was reported. Net loss is estimated at several crores of rupees. 20 " rainfall in 12 hrs. at Machilipatnam.
10-6-50	CS crossed the coast near Saugor islands on 10 th afternoon.			Estimated property loss was at several lakhs of rupees.		Landslides at Darjeeling due to heavy rains (17.9" in 24 hrs.)

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
13-09-50	CS crossed Orissa coast on 13 th September night.					No reports
05-06-51	D crossed the Orissa coast near Balasore on 5 th June afternoon					No reports
11-06-51	D in east Arabian sea off Kathiawar coast moved in NW direction on 11 th June			Due to squally weather a 1600 ton cargo vessel sunk near Bhatkal on 10 th June.		No reports on the coastal region.
26-06-51	D crossed Orissa coast near Balasore on 26 th June on the evening.					No reports
21-07-51	D crossed Andhra coast to the south of Kalingapatnam on 22 nd July.					No reports
25-07-51	CS crossed Orissa coast between Puri and Gopalpur on 25 th July.					No reports
10-08-51	D formed in the evening of 10 th Oct. off the Orissa coast,	Heavy rains caused severe	Some loss of cattle.	Some loss of property		The system did not cross the coast.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	merged on the 15 th into another trough of LP, which existed off Konkan.	floods and loss of life.				
14-11-51	D on 12 th Nov. in the SE Arabian sea intensified into a CS by 14 th and became SCS by 15 th evening, 500 miles WSW of Bombay. Weakened later.	14 persons were drowned in Dwarka.		Breaches occurred in railway tracks		Wind speed 50mph occasionally in Dwarka. Heavy rainfall of 14 " in 24 hrs in Saurashtra. The system did not cross the coast.
25-11-51	DD, 50 miles south of Vishakapatnam, weakened later.					Heavy rainfall in Andhra and Orissa. The system did not cross the coast.
07-12-51	D in SE bay on 5 th Dec, intensified into a CS on 6 th , became SCS on 7 th , weakened rapidly as a LP off Chittagong-Arakan coast on 13 th evening			Low lying coastal areas were inundated and damage to light vessels was reported.		Despite the large distance from the system the entire east coast of India was affected with large swells. The system did not cross the coast.
19-05-52	DD formed in the southwest bay on 19 th evening near 13 ⁰ N 87 ⁰ E, deepened			Low-lying areas of Madras city were flooded		The system did not cross the coast.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	rapidly, became SCS on 21 st and rapidly weakened to a DD with its core close to the coast of Masulipatnam			and traffic was dislocated. Breaches occurred in railway lines.		
24-06-52	D moved from head bay to SW Uttar Pradesh between the 24 th and 28 th June giving abnormally heavy rains.					No reports in the coastal region.
04-07-52	CS in head bay on 4 th July, landfall at Contai					No reports
20-08-52	D in NW bay on 20 th August. Landfall near Orissa coast.					No reports
10-09-52	D was formed in NW bay by 10 th Sep. The landfall details are not available					No reports
09-10-52	D on 9 th Oct 1952 in SE bay crossed Orissa coast					No reports
16-10-52	D in west central bay on the 14 th of Oct.					No reports

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Landfall near south Circars coast between Ongole and Masulipatnam on 16 th night.					
24-10-52	DD in north Andaman sea concentrated into a CS on 23 rd evening, centered about 100 miles west of Bassein. Landfall near Akyab on 24 th morning					No reports
12-11-52	CS on 9 th November centered near 18 ^o N and 88 ^o E, weakened to a depression and landfall near Chittagong on 12 th November.					No reports.
30-11-52	SCS on 29 th Nov. about 400 miles southeast of Madras. Landfall on 30 th Nov. afternoon, at south of Nagapattinam.	168 human lives lost	7570 cattle were reported lost.	Strong winds uprooted a large no of trees. 11,954 huts and mud houses	Destroyed 10,000 acres of plantation and gardens.	The core pressure was 970 mb. 40 mb less than surroundings. Nagapattinam observatory measured a wind speed of 50 mph at

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				damaged. Caused dislocation of road, rail, telegraph and other communication in that area.		1130 hrs IST on the 30 th , after which the wind instrument got damaged.
01-05-53	D in SE bay on 29 th April, intensified into a SCS, landfall near Burma coast on 1 st May.					No report.
19-06-53	D in west central bay on 15 th June intensified into a CS on 19 th , landfall at Orissa coast on same afternoon.			Rail communication was temporarily dislocated between Bombay and Gujarat.		
30-06-53	D in northwest bay on 29 th June with its core near Sandheads, landfall on 30 th evening.					No reports

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
02-08-53	D formed in the head bay on 1 st August and intensified into CS on same night. Landfall near Balasore at night.					No reports
14-08-53	D formed at head bay on 10 th August, became DD then D and landfall near Chandbali on 14 th at night.			The river Dudh washed away the bridge over it. 300 villages on the banks of Ganges were inundated.		
23-08-53	D over the head bay, 40 miles south of Calcutta and landfall at night.					No reports
07-09-53	D on 7 th September about 220 miles south of Calcutta, landfall at night.					No reports.
26-09-53	D on 21 st Sep. in north bay turned to CS on 26 th morning, weakened to D and crossed coast near Contai at night.					No reports.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
22-10-53	D on 21 st October about 200 miles SE of Madras crossed coast near Nellore on 22 nd .					No reports
28-10-53	D formed in west central bay on 26 th October evening at 13.5 ^o N & 84.5 ^o E and weakened to a LP off circars coast.			About 20 irrigation tanks (12 major and 8 minor) were breached.	Thousands of acres of standing crops were affected.	
10-11-53	D on 3 rd Nov in SE bay; intensified into DD by 8 th Nov. and became a LP on 10 th evening.					No reports.
10-06-54	D in east Arabian Sea on 8 th June, about 160 miles west of Bombay. Crossed Saurashtra coast between Veraval and Porbandar on 10 th afternoon.			All India Radio station got flooded and temporarily stopped functioning		
06-07-54	D on 5 th July about 100 miles east of					No reports.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Puri crossed the Orissa coast on 6 th .					
08-08-54	D in northwest bay on 7 th August and landfall near Orissa coast on 8 th evening.					No reports.
02-09-54	D from NW bay moved over land.					No reports.
28-09-54	CS in west central bay on 26 th Sept crossed coast on 28 th near Circars coast.					No reports.
21-10-54	D in SE bay on 20 th Oct. Landfall near Cuddalore as DD on 21 st evening. Weakened and then intensified again to a D on the 24 th , later weakened and crossed Sundarbans coast between Barisal and Chittagong on 27 th early hours.			Destruction of about 2000 huts due to floods in Guntur in Andhra.	Standing crops were submerged in Guntur area.	Heavy rainfall in Tamilnadu and Andhra.
08-12-54	D formed over southwest bay on 8 th					Heavy rainfall activity in Tamilnadu.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Dec., about 150 miles east of Madras, weakened into a LP on 12 th and diffused later.					
16-12-54	CS on 16 th November at 7.5 ^o N and 86 ^o E moved northwestwards and diffused later near the Orissa coast on 19 th .					Did not cross the coast. Good rains in Orissa and Gangetic West Bengal.
07-05-55	D in SW and adjoining WC bay on 5 th May intensified into a CS on 6 th . Weakened to DD and the landfall near Kakinada on 7 th .			Breaches occurred in southern railway.		
18-05-55	D in SW bay on 17 th May about 200 miles east of Nagapattinam. Landfall near Cuddalore on 18 th .					Thunder showers in Tamilnadu.
03-09-55	D formed in the north bay on 1 st September	Lakhs of people were				Floods in Orissa; worst in 100 years.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Intensified to CS and crossed Orissa coast on 3 rd .	reported marooned.				
21-09-55	D formed in NW bay on 21 st Sept. and crossed the Orissa coast.					No reports.
30-09-55	CS formed in the north bay on 30 th Sept. and crossed the Orissa coast near Chandbali.					No reports.
09-10-55	D in east central bay on 5 th Oct 1955, weakened and later intensified into a CS on 9 th Oct. Landfall near Kalingapatnam on 11 th early hours.					Estimated max. wind speed at Kalingapatnam was about 60 knots. Whatever damages caused to the state were due to the associated rainfall and not due to the associated surge.
16-10-55	LP on 14 th Oct. over SW bay became D and diffused later off Andhra coast.					No reports.
21-10-55	D off Kalingapatnam diffused later off					No reports.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Gangetic West Bengal.					
06-11-55	SCS with its center at 0830 hrs IST of 6 th about 150 miles to the east southeast of kakinada, became a DD on 7 th and diffused gradually.					Did not cross the coast. No reports.
28-11-55	D in SW bay on 28 th Nov., became DD and intensified into a SCH, crossed the coast near Rajamadam in Tanjore district on 1 st December 1955 in the early hours.	About 200 saltpan workers were washed away. Total 500 human lives were lost.	1 lakh cattle heads were killed.	Heavy damage to property, seriously dislocating rail, road and telegraphic communication in the southern districts of Tamilnadu.		Estimated core wind speed was 80-120 mph. The tidal wave coincided with the epoch of the high tide.
29-04-56	D in bay at 10 ^o N and 89 ^o E on 27 th , intensified into CS on 28 th and crossed Nellore on 29 th night.					After landfall traveled over land and emerged into Arabian sea near Karwar on 30 th April and diffused off Bombay on 3 rd May.
31-05-56	D over NW bay near Saugor island on 29 th May, intensified into	More than a million people were		More than 10000 persons rendered	More than 30000 acres of paddy fields in the	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	SCH on 31 st May centered about 60 miles to the south of Calcutta and hit the coast near Contai.	affected by the cyclone in West Bengal.		homeless in Midnapore district. Many buildings and houses collapsed in Calcutta.	coastal West Bengal were inundated by the saline waters, due to breaches in embankments.	
24-06-56	D in west central bay on 24 th June, crossed coast near Kalingapatnam on 25 th at night.					No reports.
01-07-56	D formed off Orissa coast and crossed coast between Puri and Chandbali at night on 2 nd .					No reports.
01-08-56	D formed in bay, about 100 miles southeast of Cuttack on 1 st August and crossed the coast on 3 rd .					No reports.
07-08-56	D near Saugor island on 7 th August moved westwards.					No reports.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
16-08-56	D about 200 miles ESE of Gopalpur on 13 th August, crossed coast on 16 th Aug.					No reports.
09-09-56	D on 9 th September about 100 miles SE of Calcutta. Landfall between Contai and Balasore on 10 th .		Heavy loss of cattle.	Extensive floods caused collapse of 15,000 houses. Rail traffic was interrupted in east Uttar Pradesh and adjoining Bihar	Standing crops on 2 lakh acres of land were severely damaged in Uttar Pradesh and Bihar.	The damages caused were due to the heavy downpour.
30-10-56	D at 10 ⁰ N and 87 ⁰ E on 27 th October concentrated into a CS on 28 th . Landfall between Masulipatnam and Ongole on 30 th October as a DD.					No reports.
20-11-56	D on 18 th November at 8.5 ⁰ N and 84.5 ⁰ E. crossed coast between Nagapattinam and Cuddalore.	154 persons were reported killed.		Madras – Tuticorin express train met with tragic accident At Ariyalur as		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				one embankment was washed away by the flood.		
22-08-57	D on 18 th August at 20.5 ^o N and 90.5 ^o E, intensified into DD on 21 st morning, became a CS and crossed coast between Puri and Gopalpur on 22 nd morning.					No reports.
11-09-57	LP on 8 th September in north bay, intensified to a D which crossed the coast between Gopalpur and Kalingapatnam on 11 th September.					No damages in the coastal region.
10-11-57	D over southwest Bay on 8 th at 11.5 ^o N and 69.0 ^o E, turned to a DD on 9 th , a CS in the evening, to a					Heavy rains and no reports on the damages in the coastal region.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	SCS on 10 th and weakened gradually.					
25-12-57	DD at south bay on 25 th became a CS of small extent in the evening, weakened to a D on 27 th moved over to Arabian Sea and diffused later.					Did not cross the coast. No reports.
18-05-58	D at the central bay on 16 th evening, 640 km south of Calcutta became a CS on 17 th May and crossed east Sunderbans coast on the night of 18 th May.					No reports on damages in the coastal region. Heavy rainfall in Assam.
30-08-58	D on 29 th August in NW Bay, crossed coast near Puri on 30 th Aug.					No reports.
08-09-58	D in NW Bay on 8 th Sept., crossed coast near Chandbali on 9 th					No reports.
13-09-58	D in NW bay on 13 th September, crossed west Bengal coast			Several houses were destroyed in		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	near Contai on same evening.			the Kakdwip area and country boats sunk at Diamond Harbour due to heavy rains and squally weather. Dislocation of southeastern railway is reported.		
21-09-58	LP over north and adjoining central bay on 21 st Sept. which moved over Orissa.					No report on the damages near the landfall. Caused copious rains in UP, Rajasthan and Punjab and flood.
07-10-58	DD by 7 th October about 200 km. to eastsoutheast of Madras, weakened same evening and moved over land.			Breaches in railway track of southern railway.		Widespread rainfall. No reports on damages on the landfall. This emerged in Arabian sea and became a CS.
10-10-58	D in Arabian sea intensified rapidly into a SCS on 10 th					Did not cross the coast. No report on loss.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	October about 400 km. to the WSW of Bombay. Moved to area off Gujarat on 15 th morning and diffused later.					
17-10-58	LP concentrated into a D in the west central bay on 17 th Oct. about 300 km. to the southeast of Masulipatnam. Weakened and moved over Andhra.	20,000 people rendered homeless		Breaches in railway tracks by heavy rains.		Heavy rains in Andhra. No report on the coastal area.
23-10-58	D about 400 km. SSE of Calcutta intensified rapidly into a CS by 23 rd ; landfall at Sunderbans coast between Barisal and Noakhali on same night.			Railway communication between Dacca and Chittagong was dislocated.		No report on the Indian coast.
08-11-58	D on 6 th Nov. with its core about 250 km. southeast of Vishakapatnam					Did not cross the coast. No report.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	intensified into a CS on 8 th about 450 km. to the west of Sandoway in Burma. Later it weakened.					
18-11-58	D with center at 7.5 ⁰ N and 91.0 ⁰ E on 18 th became DD on 19 th and rapidly turned into a CS storm on 20 th at 400 km. to southeast of Madras. Weakened later and landfall over Madras coast as a D on 22 nd morning.			Heavy rains in Madras resulted flood in low-lying areas rendering 5000 families homeless.		This emerged in Arabian sea and intensified later.
26-11-58	D on 23 rd 150 km. NW of Mangalore became DD on 26 th with its center at 15.0 ⁰ N and 66.5 ⁰ E, intensified into a CS on 27 th and weakened thereafter a DD and further as LP off Gujarat coast.					Caused rains in Maharashtra state. No report on the damages in coastal area.
20-05-59	D on 19 th at 10.0 ⁰ N			Swells from the		Did not cross the coast.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	and 70.0° E, turned a DD on 20 th intensified into a CS on 21 st and became SCS on same evening and weakened gradually from next day.			storm caused the destruction of many saltpans around Bombay.		
28-06-59	D on 25 th June in east central Arabian sea turned a DD on 28 th and intensified into SCS in the evening.					No reports.
29-06-59	D in north bay on 27 th evening, became a CS at 280 km. to the SE of Puri and crossed coast between Puri and Chandbali on 29 th June.					No reports.
10-07-59	D on 10 th July over the Sunderbans coast moved over land and emerged in NE Arabian Sea on 15 th .			Collapse of several buildings and houses in Bhuj.		No reports on the damages in coastal region.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
01-10-59	D on 28 th September at 18.0 N and 89.0 E, intensified into SCS on 30 th morning about 250 km. south of Calcutta. Landfall near Balasore on 1 st October.	75 persons lost their lives.	1000 heads of cattle perished.	The storm blew off rooftops and uprooted electric and telegraphic poles, disrupted power supply in many districts of West Bengal, Bihar and Orissa.	About 8 lakh acres of standing paddy crops were destroyed in Balasore. Large number of trees uprooted.	At Calcutta, Hugli river has reached a all time tide record on 5 th October.
10-10-59	D in east central Arabian sea, south of Kathiawar coast on 10 th October crossed Saurashtra coast near Mahuva on 11 th and emerged in the Arabian sea as a DD on 15 th rapidly became CS at about 100 km. SSW of Veraval in the evening. Moving westward, became	Many human lives were lost.	Several cattle heads perished.	Several houses collapsed. One cargo vessel Premasavai and a few ferryboats and country craft were tossed by the winds and perished.		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	SCH and landfall on 18 th night in Arabia.					
30-10-59	D in SW bay on 27 th October about 100 km. NE of Trincomalee, crossed Sunderbans coast between Noakhali and Chittagong on 30 th .					Caused noteworthy amounts of rainfall all along the east coast of India.
28-11-59	D in SW bay about 300 km. ESE of Nagapattinam on 28 th November. Crossed coast between Nagapattinam and Pamban on 28 th night.			Railway tracks were flooded.		Causing heavy rains all along the system emerged into the Arabian sea.
08-12-59	D on 5 th December in SE bay about 300 km. WNW of car Nicobar had landfall over Andhra coast.					No report on damages.
10-10-60	LP entered the bay on 7 th , became a D, turned to SCS and crossed East					Considerable loss of life and property (not quantified).

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Pakistan coast on 10 th near Noakhali.					
31-10-60	D developed in the SE and SW bay on 29 th , intensified to SCS and crossed the East Pakistan coast near Chittagong.					The conditions in the landfall point due to the earlier storm were aggravated.
20-11-60	D developed in south bay at 10.5 ° N and 85.0 ° E and crossed coast near Madras on 20 th afternoon.	Some loss of life was reported. 20,000 people were rendered homeless.		Heavy damage to buildings and huts.	Numerous trees were uprooted in Madras and its suburbs.	
17-11-60	D at 11.5 ⁰ N and Long 66.5 ⁰ E intensified into a CS by the 19 th at 13 ° N and 62 ° E and weakened near Arabian coast.					No report on loss.
13-01-61	D developed in SW bay about 100 km. NNE of Trincomalee on 9 th evening. It crossed extreme			Squally weather near Tuticorin sank ten cargo boats off		Heavy rains in Madras state.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	south peninsula weakened and moved to SE Arabian sea.			Tuticorin port.		
09-05-61	D on 5 th May with centre about 350 km. ESE of Port Blair, intensified into a CS by 6 th , became a SCS on 7 th , crossed Sunderbans coast near Barisal on 9 th .	Over 1000 deaths were reported from ten districts of Bangladesh.		Several thousand houses were destroyed and scores of vessels laden with valuable cargo were sunk. At Agartala airport extensive damage was caused by winds of 90 knots.		Wind velocity was 100 mph. A tidal bore of 16 ft. high was seen. One ship reported 982 mb. atm. press. , 96 kmph of wind speed and mountainous swell and poor visibility on 8 th . On 9 th another ship reported a pressure of 994.5 mb. and a wind speed of 30 knots. The bay islands and Assam received heavy rainfall.
24-05-61	SCS crossed coast near Devgad on night of 24-25 th May			About 1700 houses were completely destroyed and 25,000 houses partly damaged.	The gales razed 5 lakh fruit trees to ground.	Caused good rainfall on the west coast of India and the advancement of the monsoon.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
30-05-61	D developed over north Andaman sea on 27 th , turned to CS in bay on 28 th , and a SCS on 29 th and crossed the East Pakistan coast on 30 th . May struck E. Pakistan near Chittagong.					No detailed report on loss. Heavy rains with gales and squalls occurred in the coastal districts of East Pakistan. Winds reached a speed of 100 mph and tidal waves were reported.
23-06-61	D about 200 km. WNW of Bombay on 21 st , turned to a CS on 23 rd , 150 km. West of Porbander, crossed Kutch coast near Naliya on same night.					No report on loss.
28-06-61	D formed in east central bay on 27 th became DD and crossed Sunderbans coast on 28 th afternoon.					No report on loss.
01-07-61	D over NW bay on 1 st July, crossed coast near Balasore.					No reports.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
01-09-61	LP crossed the Sunderbans and North Orissa coast.					No reports.
06-09-61	DD crossed Orissa coast near Contai on 6 th September.					No reports.
13-09-61	LP intensified into a CS on 12 th Sept. Landfall near Contai on 13 th morning.					No reports.
28-09-61	DD from NW bay crossed Sunderbans on 28 th .	Nearly 900 people lost their lives		100 feet of railway line was washed away. 2500 sq. miles with a population of 10 lakhs was affected by floods in Orissa. 3500 houses were completely destroyed and 5000 houses damaged.	Over 1 lakh acres of agricultural land was washed away.	
22-10-61	LP from east central bay on 22 nd ,					No reports.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	concentrated into a D on 24 th morning and crossed coast near Noakhali on 25 th October night.					
16-05-62	LP from SW bay on 13 th May, intensified into a CS by 15 th evening, 100 km. NE of Cuddalore; later crossed coast near Cuddalore on 16 th in the early hours.					No reports. This emerged into Arabian sea as a DD.
31-05-61	D formed in the central Arabian Sea at 17 ° N and 64 ° E, moved westwards and crossed Arabia coast.					No reports.
08-06-62	D formed in the north bay on 6 th , 200 km. ESE of Puri, crossed coast at Sunderbans.					Caused very heavy rains in Assam and Sub-Himalayan West Bengal.
12-06-62	LP over north and central bay turned to D by 11 th morning and crossed coast					The system merged with a D hovering over Saurashtra and this combination enhanced

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	near Gopalpur on 12 th .					the monsoon activity and caused heavy spells of rain, which caused heavy damages.
3 rd to 7 th & 7 th to 18 th August '62	A series of LPs from the North and NW bay moved inland causing heavy rains and serious flood in Uttar Pradesh, Bihar and Assam.	75 human lives lost.		10000 villages were affected and 38823 houses were damaged.		
08-09-62	D formed in the bay on 8 th and crossed the coast near Kakinada at night.					
17-09-62	D formed in the West Central bay and became DD and crossed the coast near Gopalpur.					
21-09-62	D from north bay on 20 th intensified to CS and crossed the coast at Sunderbans on 21 st .					Heavy flood in West Bengal and Uttar Pradesh.
26-10-62	LP from SW and SE bay on 19 th became					Heavy rains in Tamilnadu and Andhra. Low-lying

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	D on 23 rd , intensified to DD. Crossed the coast near Nellore on 26 th at night.					areas of Vishakapatnam were inundated. Emerged into Arabian sea.
30-10-62	D formed in the bay by 26 th evening, 150 km. south of Port Blair, intensified to CS on 29 th at 200 km. east of Masulipatnam and crossed East Pakistan coast near Chittagong by 30 th evening.					Caused heavy rains and gales in Andhra, Orissa, West Bengal and Assam, which aggravated the conditions in Andhra due to the earlier D.
30-11-62	D from east moved into Andaman sea on 26 th , moving westwards intensified to CS on 27 th evening, became a SCH and crossed coast near Nellore on 29 th night.					No details on damages.
08-12-62	D from SE bay on 8 th evening intensified to SCS on 10 th and					Very heavy rainfall in the bay islands.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	stayed so up to 12 th and weakened.					
26-05-63	LP from SE Arabian sea, became D on 18 th morning. Became CS at 10 ° N & 68.5 ° E on 20 th morning and SCH in the evening. Crossed Arabia coast.					No damages recorded. Heavy rainfall activity in Kerala.
28-05-63	D formed in the SE bay on 24 th , became a SCH on 27 th evening. Crossed the coast on 28 th night near Chittagong.					Flood in Brahmaputra; an all weather bridge in Dikronj river washed away.
09-08-63	D formed over the head bay on 9 th and crossed the coast near Contai at night.					Heavy rainfall in the coastal Orissa. No damages reported in the vicinity of landfall.
11-09-63	D in the bay became DD on 9 th at 80 km. ESE of Sandheads. Crossed the coast near Balasore at night of 11 th .					Heavy rainfall in the coastal Orissa, UP and Punjab. Major rivers flooded and caused damage to public property and loss of life.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
27-09-63	D moved into bay from the east turned to DD and crossed coast near Balasore in the early hours of 27 th .	15 persons lost their lives.		Serious damage to property in Orissa due to rains.		Heavy rainfall in Orissa and Bihar.
06-10-63	LP from east moved into bay, turned to D, intensified to DD and crossed the East Pakistan coast on 6 th night.					Heavy rains in Bay islands and Assam.
13-10-63	D on 13 th in the East Central Arabian sea became a CS on 14 th weakened later.					Did not cross the coast. No damages reported.
21-10-63	D formed over the SE bay at 9.5 ° N & 91.5 ° E intensified to SCS by 20 th and crossed the coast near Cuddalore during afternoon of 21 st . The weakened system recurved and emerged into the bay near Gopalpur on			Disruption of telecommunication, rail and air services in the Madras state.	Flood caused serious damage to standing crops in Andhra and Orissa.	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	26 th . Became a SCS, moved towards Burma and weakened.					
26-10-63	D formed in the bay on 24 th at 150 km. SSW of Port Blair and crossed the South Arakan coast on 26 th morning.					No report on damages.
07-12-63	D over SE Arabian sea intensified to CS on 2 nd and crossed Kuria-Muria coast on 7 th .					No reports on damages.
03-12-63	D over SE bay turned to a CS on 3 rd and weakened on 6 th .			Severe damage to public property.	37000 acres of paddy field submerged in flood.	The reported damages are due to the heavy rainfall associated with the CS in the bay.
08-05-64	LP from the South Andaman Sea turned to a D on 6 th and intensified to a CS by 7 th and crossed the Arakan coast at night on 8 th .					No damages reported.
12-06-64	LP from East Central	27 persons		Damages to		Cyclonic winds and tidal

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Arabian sea on 9 th became a SCS by 11 th at about 100 km. SW of Veraval and crossed the coast near Naliya on 12 th .	were killed.		public property along the Kathiawar coast. Many country craft and barges loaded with bauxite sunk.		wave of 15 ft. caused the havoc.
07-08-64	CS developed off Bombay on 7 th .	2 persons were killed.		2 small ships broke loose from their moorings.	Very extensive damage to Chiku and Plantain orchards in Thana.	No report on landfall. Heavy rains in konkan belt of west coast.
28-09-64	DD formed on 27 th in the west central bay crossed coast near Kakinada on 28 th afternoon.	Few fishermen were lost among the 500 caught in the high seas.		Disruption of rail and road communication and one bridge over the Krishna river was washed away.		Associated heavy rains caused the damages.
05-10-64	LP from east moved into bay turned to D on 4 th , intensified to DD on 5 th and crossed the East					No damages reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Pakistan coast near Barisal on 5 th .					
18-10-64	LP from Andaman sea on 16 th turned to DD by 18 th and crossed the coast near Gopalpur on 18 th night.					No damages reported.
02-11-64	LP from SE Arabian sea intensified to D, then CS on 4 th . This could not be traced after 8 th due to lack of observations at sea.					No damages reported.
07-11-64	D formed over the south Andaman sea, intensified to SCH on 6 th at 13 ° N & 84 ° E, weakened to CS on 7 th ; Crossed coast near Madras at night.					The weakened system emerged into Arabian sea and vanished. No reports on damages.
16-11-64	LP from east became a D at on 16 th at 13.5 ° N & 82.5 ° E, turned a SCS on 18 th , went close to Madras by	A few persons lost their lives.		Over 5000 huts were submerged and 30000 people were		The damages were due to the heavy rains. The system did not cross the coast.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	19 th , weakened to CS by 20 th , moved away from coast and diffused on 29 th .			rendered homeless.		
23-11-64	D from extreme SE bay on 17 th at 5 ° N & 93 ° E intensified to SCS on 20 th and crossed coast near Tondi in Tamilnadu on 23 rd afternoon.	Over 900 persons were dead including all passengers of a train which got washed off.		The railway bridge between Mandapam and Pamban was washed off by the tidal waters. Communication between the island and the main land was cut off.		Cyclonic winds and tidal wave ravaged, the landfall area, Dhanushkodi. Weakened to CS and emerged into Arabian sea and diffused later.
11-05-65	LP from SE bay became a D on 9 th then CS on 10 th and then SCH on 11 th evening and crossed the East Pakistan coast on 11 th night.					No damages were reported.
31-05-65	D formed on 26 th at 15 ° N & 89 ° E intensified to CS on 30 th and then SCS on					No reports on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	31 st near 20.5 ° N & 90.5 ° E.					
02-01-66	SCS with center about 150 km. east of Nellore on 2 nd . Landfall near Vishakhapatnam on 3 rd .					No reports on damages.
01-05-66	LP over the south Andaman sea on 25 th concentrated into a D by 28 th morning. It further intensified into a CS by 29 th morning and into a SCS by 30 th at 11.0° N and 84.0° E. Land fall just north of Cuddalore on 1 st May.			Rail and air traffic services were disrupted.		No loss reported.
25-09-66	LP moved from east into the SE bay on 25 th , became D on 27 th and crossed East Pakistan coast on 1 st October.					No reports on damages.
29-09-66	D over east central Arabian sea on 29 th ,					No reports on damages. Did not cross the coast.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	intensified to CS on 1 st October and later diffused.					
11-10-66	LP intensified to a D on 11 th at 12 ^o N and Long. 86 ^o E. and approached Andhra coast.					No reports on damages. Did not cross the coast.
03-11-66	LP of Andaman sea on 31 st October intensified into a D on 1 st November, intensified into a CS on 2 nd , turned to a SCH on 3 rd and crossed coast near Madras.	26 members of crew and a few on main land lost their lives.		Madras harbour suffered heavy loss. 3 ships got grounded. S.S Progress split into two. Communications were seriously interrupted.		The weakened system emerged into Arabian sea on 5 th , intensified to CS on 7 th , to SCH on 10 th and then weakened off Arabia coast on 12 th .
09-11-66	LP from SE bay on 7 th , intensified into a D on 8 th crossed Madras coast near Tondi at night on 9 th . Emerged into Arabian Sea on 11 th , intensified to SCS on			Coastal shipping and fishing crafts were affected. Heavy rains caused breaching of tanks and	Seriously affected the standing crops and harvesting operations.	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	12 th and crossed coast near Ratnagiri by 13 th evening.			inundation. Ratnagiri was cut off totally from rest of the places.		
21-11-66	D on 18 th at 9.5 ^o N & 87 ^o E intensified into a CS by 19 th then to SCS on 20 th and crossed coast near Kalingapatnam on 22 nd November.					Caused heavy rainfall in Andhra and Orissa.
28-11-66	LP from South Andaman sea on 22 nd , intensified into a D on 25 th , later to a CS on 27 th and intensified into a SCS at night and crossed coast near madras on 28 th morning.	2 adults and a child killed.		No property loss reported.		The weakened system emerged into Arabian sea on 30 th and weakened further.
12-12-66	D on 7 th at 8 ^o N and 88 ^o E turned to CS on 9 th and crossed East Pakistan coast near Chittagong on 12 th night.					Caused good rainfall.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
20-12-66	LP from South Andaman sea on 13 th became a D on 16 th , then a DD on 18 th and weakened to a LP off Madras coast. Moved close to cape and crossed the Maldives on 22 nd .					Good rainfall in bay islands and Madras state.
18-05-67	D on 5 th at 11.5 ^o N & 91.5 ^o E, intensified into a CS on 6 th , then to a SCS and crossed coast the Arakan coast on 18 th morning.					No reports on damages.
30-06-67	D from NW bay on 29 th crossed Orissa coast on 30 th .					No reports.
04-08-67	DD over NW bay crossed Orissa coast.					No reports.
18-08-67	D formed in head bay on 18 th August and crossed West Bengal coast.					No reports in the vicinity of the landfall.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
01-09-67	DD over head bay on 1 st , crossed West Bengal coast on 2 nd .					No reports in the vicinity of the landfall.
09-10-67	LP from east got into the north and adjoining central bay and intensified to a D at 18.5 ^o N & 89.0 ^o E on 8 th . On 9 th moved close to Orissa coast and intensified to SCS and landfall at Orissa coast between Puri and Paradip on 9 th . Moved along the coast and emerged back into the head bay at midnight of 9 th and crossed East Pakistan coast on 11 th night.	About 1000 persons lost their lives.	50,000 heads of cattle perished.	A stretch of 120 km land parallel to the coast was seriously damaged. Large number of villages destroyed. Damage to property ran into crores of rupees.		
21-10-67	CS of small extent over Comorin on 20 th with center about 100 km. west of Colombo. Crossed			CS caused serious floods and havoc in Ceylon.		No damages reported for Indian coast.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	west coast of Ceylon on 21 st .					
23-10-67	LP from east turned to a D on 20 th at 9 ^o N & 90 ^o E, became a SCS by 23 rd and crossed East Pakistan coast near Cox's Bazaar on 23 rd					No damages reported.
02-11-67	D over SW bay on 31 st October turned to a DD and crossed coast near Cuddalore on 2 nd .					Weakened after landfall to D and emerged into Arabian sea and diffused.
08-12-67	D at 5 ^o N & 88 ^o E intensified to a CS, crossed east coast of Ceylon near Batticola on 6 th . Intensified into a SCS by 7 th and crossed coast near Nagapattinam on 8 th .	7 lives lost. 15,000 people rendered homeless.		Rail and road communications were disrupted in Madras state.		Rameswaram island was totally cut off from the main land. Cyclone had caused havoc in Tanjore and Ramanathapuram districts in Madras state through gale winds and tidal waves.
10-05-68	LP from Andaman sea on 6 th turned to a D by 7 th at 14 ^o N & 95.5 ^o E, intensified into SCS by 8 th and	1000 people lost their lives in Akyab. One lakh		90 percent of Akyab was completely destroyed. Greek freighter		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	crossed Arakan coast near Akyab on 10 th .	people in Assam were affected by flood.		was reported to have sunk.		
12-06-68	D at head bay on 12 th crossed West Bengal coast on 12 th .					No damages were reported.
12-09-68	CS on 11 th over NW bay, crossed coast near Gopalpur on 12 th .					No report on loss.
02-10-68	D over central bay, intensified to CS on 1 st at 17 ^o N & 87 ^o E, then a SCS and crossed coast near Kalingapatnam on 2 nd October.	1000 persons lost their lives.		Heavy rains led to severe floods and landslides. Many villages were wiped off.		No reports on loss in the vicinity of the landfall. The damages given are at West Bengal due to the rains associated with the cyclone.
28-10-68	LP from Andaman sea turned to a D on 21 st , a CS on 23 rd , then a SCS. Landfall near Puri in Orissa on 28 th .	Many lost their lives.	Thousands of cattle heads lost.	Cyclonic storm left a trail of devastation in coastal districts of Ganjim, Puri and Cuttack. Floods affected a number of villages. Rail	Vast areas of paddy fields were damaged.	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				and road communication were completely disrupted due to breaches.		
05-11-68	LP from south bay concentrated into a D by 2 nd , intensified into a CS by 4 th and crossed coast near Nellore on 5 th .					No reports on damages.
14-11-68	LP from Andaman sea concentrated into a D on 9 th , rapidly intensified into SCS on 10 th , skirted Andhra and Orissa coasts. Became a CS and the landfall was near Saugor island on 14 th night.			The condition of Ganjim and Puri worsened. All modes of communications were paralysed.		
18-12-68	LP over south Bay on 8 th , concentrated to a D on 12 th , a CS on 14 th , weakened to a D on 17 th 100 km.					Caused heavy rains and no damages reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	east of Nagapattinam and moved across the cape and entered Arabian sea.					
17-05-69	LP in east central bay on 13 th , turned to a D on 14 th , became a CS on 16 th and crossed south Andhra coast near Bapatla on 17 th forenoon.	600 human lives lost.	A few lakh heads of cattle were killed.	A few villages were wiped out. There was extensive damage to major irrigation canal systems, irrigation tanks, roads and railway tracks. Disruption of all communication systems. Total loss was estimated at more than a 100 crore rupees.	Trees were uprooted. Several lakh acres of rich standing crops were destroyed.	
16-06-69	D from central Bay on 16 th moved over land towards south Assam by 20 th .				The floods in Assam caused serious damage to standing crops and property.	Damages due to the associated rains.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
14-08-69	D from north bay on 13 th turned to CS in the evening and crossed the Orissa coast on 14 th .					No damages reported.
06-09-69	D on 6 th September about 400 km. east of Vishakapatnam crossed coast.					No damages reported at the landfall point.
18-09-69	D formed in bay on 18 th about 450 km. east of Vishakapatnam, crossed south Orissa coast on same night.			Heavy rains in Telangana, caused flood in Godavari inundating low lying areas.		
23-10-69	LP from south bay on 19 th concentrated into a D on 21 st , intensified to a CS on 21 st night and crossed north Tamilnadu coast on 23 rd .			Torrential rains paralysed city life, left more than 20,000 slum dwellers homeless and caused breaches in railway lines in the Madras-Arkonam section		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
11-10-69	D in west central bay on 9 th about 500 km. SSW of Calcutta, intensified to CS on 10 th and crossed Bangladesh coast near Barisal on 11 th .					No reports on damages.
07-11-69	CS on 5 th about 300 km. NW of Port Blair, intensified to SCS on 6 th crossed Andhra coast between Kakinada and Masulipatnam on 7 th .	200 human lives are lost. 42 fishermen from Kolletikota island were washed away.		Damage to property in Krishna, east and west Godavari districts of coastal Andhra Pradesh.	Heavy damage to standing crops (particularly paddy and sugarcane).	Damages due to the cyclone are estimated to be Rs. 110 crores. Max. wind speed was estimated as 100-150 kmph.
21-12-69	D on 21 st at SE bay, intensified to a CS at 6 ° N & 85.5 ° E on 23 rd and after persisting for a while weakened to D on 25 th December.					Did not cross the coast. Caused good rains in Tamilnadu.
07-05-70	LP over Andaman sea on 30 th April moved into SW bay on 1 st May and					No report on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	concentrated to a D on 2 nd , became CS on 3 rd and then a SCS on 4 th . Crossed Bangladesh coast near Cox's bazaar on 7 th .					
23-05-70	D formed in the NE bay on 23 rd and crossed coast south of Cox's bazaar on same night.					No report on damages.
27-05-70	D on 28 th at 14.5 ° N & 71.5 ° E intensified to CS on 29 th May and then weakened to DD on 31 st and moved away.					No report on damages.
09-06-70	D formed in north bay, intensified to CS on 9 th and crossed the north Orissa coast the same night.					No report on damages.
30-06-70	DD moved from bay to north Orissa on 30 th June.					No report on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
08-07-70	DD moved from bay to Bihar. Landfall at West Bengal.					No report on damages.
17-08-70	D formed in West Central bay on 17 th and crossed coast on the same day.					No report on damages.
09-09-70	DD from north bay on 8 th crossed West Bengal coast on 9 th .	150 in UP and 80 lives in Bengal were lost.		Disastrous flood in West Bengal and UP.		
21-09-70	D moved from Central bay over land. Landfall on 21 st over Orissa coast.					No report on damages.
08-05-71	D formed in South Andaman sea on 3 rd , intensified to CS on 5 th and crossed the Chittagong coast on 8 th .					No report on damages.
Jun.– Sep. 1971						No detailed account of the events. June: One SCS in the first week and one D in the last week in the bay.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	29-09-71-CS Landfall on the West Bengal coast on 29 th September.	60 human lives were lost.		Thousands of houses collapsed in Calcutta.	Crops damaged	One D in the NE Arabian sea in the first week. July: Two Ds crossed West Bengal coast. August: One D moved from NW bay over land. September: Two land based D. Wind speed in Calcutta was 100-120 mph.
Oct.-Dec. 1971	CS from West Central bay crossed Andhra coast on 15 th October afternoon.					Good rainfall in Orissa, West Bengal and Andhra.
	D developed over Lakshadweep area became SCS and moved towards Somalia coast in the last week of October.					Good rains in Kerala.
30-10-71	SCS had a landfall on the Orissa coast	10000 people had	50000 heads of cattle died.	8 lakh houses were		Total damage of crops and other properties was

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	on 30 th early morning	lost their lives. One million rendered homeless.		damaged.		estimated to be a few crores. Maximum wind: 150 kmph and a tidal wave of 5m played havoc. Core pressure was 966 mb.
06-11-71	D from Andaman sea on 3 rd became SCS on 5 th and crossed coast near Chittagong on 6 th .					Caused heavy rains and flood in Manipur and Mizoram.
15-12-71	DD formed over SE Arabian sea turned to SCS and moved to Arabian coast.					Heavy rains in Kerala and Laccadives.
06-04-72	LP on 6 th from Andaman sea turned to a D on 7 th and became a SCS on 9 th and weakened on 11 th April.					No damages reported. Caused good rains in bay islands. Did not cross the coast.
25-06-72	D formed in NE Arabian sea and moved westwards.					No reports on damages.
29-06-72	LP over NE Arabian sea on 29 th June					No reports on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	moved westwards and turned to a D.					
05-07-72	D moved from Head bay crossed West Bengal coast on 5 th .					No reports on damages.
14-07-72	SCS on 14 th crossed North Orissa coast.			Heavy damage to railway tracks, irrigation works and houses.	Heavy damage to crops.	Train services were disrupted. Heavy rains caused flooding in Orissa.
12-08-72	DD moved from north bay over Bangladesh coast on 12 th .					No reports on damages.
10-09-72	SCS crossed North Andhra coast on 10 th .	90 people have lost their lives.	8000 cattle heads were lost.	Considerable damage to houses, tele-communication and other property in coastal Orissa.	Considerable damage to crops.	
22-09-72	SCS crossed South Orissa and North Andhra coast on 22 nd .			Considerable damage to houses.	Considerable damage to crops.	The SCS was not so intense but the damages were due to heavy rains.
05-10-72	DD crossed south Andhra coast on 5 th forenoon.			10000 persons were rendered homeless.	Flooded East Godavari dist. damaged	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				Train services were disrupted.	standing crops.	
23-10-72	LP over Arabian sea became a D on 19 th and turned to a SCS on 23 rd and moved westwards.					No damages were reported.
13-11-72	D from SE Arabian sea on 13 th , became DD on 15 th and moved towards Somalia coast.					No damages were reported.
22-11-72	DD from SE bay on 15 th turned to a SCS on 18 th and struck Sriharikota Island on 22 nd early night.			The coastal road to Sriharikota island was damaged. A large number of telegraph and electric posts were bent.	A large number of giant trees were uprooted. Casuarina and eucalyptus plantations near Sriharikota were damaged.	Heavy to very heavy rainfall in Andhra.
26-11-72	LP from Andaman sea turned to D on 26 th , became DD on 27 th and weakened.					No damages were reported.
06-12-72	D from SE bay on 1 st ,	80 persons		Several		Considerable damage to

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	became SCS on 4 th and crossed coast near Cuddalore on 6 th early morning.	have lost their lives.		thousands of houses were damaged. Several thousand were rendered homeless in 7 districts and in Madras alone 30000 were homeless. Rail and road communication cut off.		crops and other properties. Cuddalore reported the wind speed of 70-80 kts. Lowest recorded surface pressure was 984 mb.
06-12-72	Remnants of typhoon "Sally" moved into Andaman sea on 6 th as D and diffused.					No damages were reported.
20-12-72	D developed on 20 th in SW bay and weakened off Srilanka on 21 st .					Light to moderate showers in Tamilnadu.
26-05-73	D on 26 th over SW and WC Arabian sea became DD on 27 th and moved to Gulf of Aden.					No damages were reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
06-06-73	D on 6 th near 16 ° N & 68.5 ° E became DD on 7 th evening and CS on 10 th , weakened to D on 12 th and dissipated later.					No damages were reported. Did not cross the coast.
06-07-73	D formed in Arabian sea on 6 th and diffused off kutch.					No damages were reported. Did not cross the coast.
07-07-73	DD crossed Orissa coast between Puri and Paradip on 7 th morning.					No damages were reported.
13-07-73	DD crossed coast near Chandbali on 13 th afternoon.					No damages were reported.
19-07-73	CS crossed coast near Contai on 19 th night.				In Orissa floods caused damage to standing crops and property.	No indication of tidal waves or any serious effect due to winds.
27-08-73	D on the morning of 26 th near Sandheads crossed coast close to south of Balasore on same afternoon.					No damages reported in the vicinity of the landfall. After landfall the D became DD over land.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
11-10-73	CS crossed Orissa coast near Chandbali around midnight of 11 th Oct.	Less than a 100 people died in Orissa. 1.5 million people were affected by flood in Orissa.	Many heads of cattle died	More than 60,000 houses were damaged in north Orissa. Road, rail and telecommunica tions were disrupted and number of bridges damaged. In Midnapore 5000 houses were damaged and damage to property and crops was estimated to 10 lakhs.	Mild tidal waves affected large areas of agricultural land.	Core pressure of 994 mb. and a wind speed of 45 kts. was estimated.
24-10-73	D formed on 24 th and diffused on 27 th in Arabian sea off Maharashtra.					No damages were reported. Did not cross the coast.
09-11-73	D over SE bay on 3 rd intensified into SCS on 5 th . Landfall over Orissa coast close to			Saline water inundation affected 2070 acres of land.	Cyclone caused some damage to standing crops in the coastal	Core pressure of 989 mb was estimated.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Paradip on 9 th .				districts of Orissa.	
18-11-73	D on 14 th over SE bay intensified to SCS on 16 th , then weakened to CS on 17 th and crossed Bangladesh coast near Hatia as D on 18 th November.					Core pressure was estimated to be 994 mb and a max. wind of 55 kt. on 17 th . No report on the damages.
09-12-73	D on 5 th near 7.5 ° N & 88 ° E became CS on 6 th , became SCS on 7 th and crossed Bangladesh coast near Barisal on 9 th .	10 crew of a ship lost their lives.	Considerable damage to cattle life.	"Sonavati" was caught in the cyclone and sank.	Heavy rains in gangetic west Bengal caused some damage to crops in coastal districts.	Tidal wave of about 4.5 m was reported to have caused the damages in Bangladesh.
15-12-73	D on 13 th near 7 ° N & 88.5 ° E became DD on 14 th and crossed Tamilnadu coast near Pamban on 15 th .					No report on damages.
27-12-73	D on 25 th near 4° N & 89.5° E crossed coast near Batticoala in Sri Lanka.					No report on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
17-04-1974	D at SE Arabian sea on 12 th became a CS on 13 th and weakened on 16 th and dissipated.					No damage recorded. Did not cross the coast.
18-05-1974	D at SE Arabian sea on 17 th became CS on 18 th and weakened to D on 22 nd .					No damage recorded. Did not cross the coast.
30-05-1974	D on 29 th in the head bay intensified to CS on 30 th and crossed the Bangladesh coast near Patuakhali on 30 th night.			Vast area of Manipur valley was inundated by flood resulting in some damage to houses.	Damages to crops.	
16-06-1974	DD crossed Orissa coast near Puri on 16 th night.					No report on losses.
09-08-1974	D crossed Orissa coast near Balasore on 9 th night.					No report on losses.
15-08-1974	D on 13 th in the head bay turned to CS on 14 th , to SCS on 15 th and crossed West			Uprooted trees & telegraph posts, damaged houses & flooded some parts in	Damage to crops in Orissa.	SCS are rare in August and retention of their intensity

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Bengal coast near Contai on 15 th noon.			the districts of midnapore, MP, Gujrat.		over land for considerable distance is also rare. This SCS had these two exceptionally interesting features.
19-09-1974	D at East Central Arabian sea on 19 th intensified to CS on 21 st , turned to SCS on 22 nd , weakened to D on 24 th and dissipated over Northwest Arabian sea.					No damage recorded. Did not cross the coast.
28-09-1974	D on 26 th in Andaman sea became CS on 27 th and crossed Orissa coast close to Paradip on 28 th evening.					No damage recorded.
08-10-1974	D crossed Andhra coast close to					No damage recorded.

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Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Vishakapatnam on 8 th evening.					
15-10-1974	DD crossed Andhra coast between Kakinada & Vishakapatnam on 15 th morning.					No damage recorded.
24-10-1974	D formed on 24 th off Karnataka coast and diffused on 25 th off Maharashtra coast.					No damage recorded. Did not cross the coast.
28-11-1974	CS on 24 th over East Central bay turned SCS on 25 th and crossed coast near Chittagong on 28 th noon.					This cyclone did not cause any damage in India. Tidal wave of 3 to 4 meter reported.
04-05-1975	DD on 1 st May at SE Arabian sea turned to CS on 2 nd , SCS on 4 th , weakened to CS on 6 th , D on 10 th and diffused later.					No damages reported.
07-05-1975	D over Andaman sea on 4 th turned to CS on 5 th then SCS	Caused some loss of life in Arakan coast.		Damage to sailing vessels in south Arakan coast.		No damages in India.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	on 6 th and crossed Burma coast on 7 th .					
31-05-1975	D on 29 th at SE Arabian sea became DD and crossed the Maharashtra coast near Alibag on 31 st .					Road and rail communication were disrupted due to heavy rain and land slide and the steamer link was also dislocated.
07-06-1975	DD on 4 th in the head bay became CS on 6 th and crossed coast near chittagong on 7 th forenoon.	50 fishermen were missing off Bangladesh coast.		Caused damage to houses in Bangladesh.	Damage to crops in Bangladesh. Inundation of low lying area and standing crops in Tripura.	
18-06-1975	D crossed Orissa coast near Paradip on 18 th night.					No damage recorded.
27-06-1975	D crossed Orissa coast near Puri on 27 th morning.					No damage recorded.
17-08-1975	DD crossed West Bengal on 17 th .	About 10 lakh people were affected in 5000			The flood affected 9 lakh hectares.	Floods in Subarnarekha affected some

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
		villages.				parts of Midnapore district.
09-09-1975	D crossed Orissa between Paradip & Puri on 9 th evening.					No damages reported.
18-10-1975	D crossed Andhra near Ongole on 18 th .					No damages reported. This emerged into Arabian sea which triggered the SCH below
22-10-1975	D on 19 th at East Central Arabian sea turned to CS on 20 th and SCH on 21 st crossed Saurashtra coast on 22 nd afternoon near Porbandar.	About 85 people lost their lives.		Considerable damage to buildings & other properties. Estimated loss was about Rs.75 crores. Hurricane winds uprooted many trees and electric & telephone poles and blew off the roofs of houses. Thousands of houses were damaged due to hurricane winds. A train was blown off its rails.	Considerable damage to crops.	Jamnagar recorded a wind speed of 160-180 kmph. Swells of 4-6 meters were recorded. A pressure departure of 36 mb was recorded. The core pressure was estimated to be 967 mb.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
01-11-1975	D on 1 st intensified to CS on 2 nd and weakened to D on 3 rd and diffused off Andhra.					No damages reported. Did not cross the coast.
11-11-1975	D at SE bay on 7 th intensified to CS, weakened to DD on 10 th and crossed Bangladesh coast near Chittagong on 11 th night.					No damages reported. Widespread rains in Andhra.
24-11-1975	D at SW bay on 24 th became a CS on 25 th , turned to SCS on 26 th , weakened to CS on 27 th and weakened to D on 29 th and diffused.	Few deaths were reported.		Many thousands of slum dwellers were rendered homeless and about a thousand huts were damaged.		
02-05-1976	D on 29 th April in SE bay became CS on 30 th , SCS on 1 st May and crossed Arakan coast on 2 nd .					Bay islands received good rains. No damages.
03-06-1976	D of Lakshadweep sea on 29 th became CS on 31 st , SCS	70 persons lost their lives in Gujrat.	Nearly 4500 heads of cattle perished.	Loss of houses & crops around 3 crores in Gujrat. About 2500		The lowest pressure recorded was

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	around noon and was found to be SCH on 2 nd ; crossed Saurashtra coast near Gopinath point on 3 rd and again Gujarat coast near port Cambay on 4 th morning.	17 fishermen from Bombay lost their lives.		villages in 9 districts in Gujarat were affected. Trees, electric & telephone poles were uprooted in these places.		983.4 mb at Bhavnagar and a max. wind was 90 kt. and 110 kt. in gust. Swells of 10-15 m. were reported by some ships.
01-08-1976	D from NW bay on 1 st , became DD and crossed coast near Paradip on the same night.					No damages reported.
13-08-1976	D over north bay on 12 th became DD and Orissa coast on 13 th between Balasore & Contai.					No damages in the vicinity of the landfall area.
31-08-1976	CS close to Nalia on 31 st emerged into NE Arabian sea, weakened to D on 1 st , intensified to CS on 5 th , weakened again and moved off the coast.					No report on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
11-09-1976	D on 8 th at East Central bay became DD on 9 th , SCH on 10 th and crossed West Bengal coast near Contai on 11 th .	40 persons lost their lives.	4000 heads of cattle perished.	Considerable damage was caused by the cyclone in the coastal areas of Midnapore & 24-paraganas districts of WB & Orissa. Many trees & telephone poles were uprooted. Thousands of houses were damaged.	Crops in about 1.25 lakh acres were damaged.	Tidal wave of 2-3 m., Max. surface wind of 70-80 kt., gust of 85 kt. and surface pressure of 971.5 mb were recorded at Sagar island.
15-10-1976	D over SE Arabian sea on 12 th turned to CS on 14 th , SCS on 15 th weakened into a depression on 17 th and dissipated.					Caused widespread rain in Kerala and no damages reported.
21-10-1976	D in the bay became CS on 16 th at 12.5 ° N & 82.5 ° E, weakened to DD, turned to CS on 20 th and crossed the Bangladesh coast near Chittagong on 21 st .			Rail & road communication in the coastal areas of north Tamilnadu & south coastal Andhra Pradesh were disrupted due to breaches.	About 50 villages in Nellore districts were affected by flood resulting in damage to crops.	
04-11-1976	D on 3 rd over central bay became SCH on	18 people lost their lives.		Damage to large no. of houses in Andhra	Considerable damage to	No tidal wave was reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	4 th and crossed coast 50km. north of Masulipatnam on 4 th .			Pradesh. Many trees & electric poles were uprooted in Masulipatnam. Masulipatnam port suffered a damage of about 1 lakh rupees.	tobacco, cotton, banana, sugarcane & paddy crops from Krishna districts.	
16-11-1976	D near Andaman sea on 15 th , became DD on same day, rapidly a SCS on 16 th and crossed south Andhra coast between Nellore & Kavali on 16 th night.	30 people lost their lives.		Trees were uprooted. Electric & telephone poles were bent. About 10,000 houses were damaged. The total damage was estimated to be of the order of 3 crores of rupees.	Considerable damage to tobacco, betel vine, banana & mango gardens in Kavali & Kovur talukas of Nellore district.	Max. wind of 60 kt. and the estimated core pressure was 992 mb.
27-11-1976	D over southeast bay on 22 nd turned to DD on 23 rd , a CS on 27 th , moved off the east coast towards Arakan coast and weakened on 30 th . The CS during its curved path, skirted along the south Andhra	50 persons lost their lives in Madras city. About 3 lakh people were affected due to torrential and flood. The death toll was 45 in		Many houses collapsed in Madras city. Extensive damage to roads & telecommunication systems. Disruption of train services.	Crops in Nellore, Guntur, Krishna, Chittur, Cuddapah & East Godavari districts were damaged.	Due to 3 storms in Nov. the total loss in Andhra: Rs. 200 crores. About 160 persons killed and 2 lakh houses damaged. Paddy in 16

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	coast from 25 th to 27 th .	Andhra.				lakh acres and other crops in 4.5 lakh acres were severely affected.
31-12-1976	D over SE bay on 28 th became CS on 29 th , SCS on 30 th and a SCH on 31 st . Passed within 50 km. of Port Blair. Weakened to CS on 1 st Jan. and D on the same night.	Few lives were lost.		Heavy damages due to strong winds & very heavy rain. The roofs of several houses were blown off.	Several trees were uprooted; considerable damage to fruit orchards, vegetable gardens & crops in the fields.	On 31 st Port Blair recorded max. wind of 52 kt. in gust and 993 mb. pressure.
13-05-1977	D on SW bay on 9 th became CS on 11 th , SCS on 12 th and crossed Bangladesh coast on 13 th .	Few killed & several were lost in coastal districts of Bangladesh.				No damage in India.
13-06-1977	DD on 9 th off Maharashtra coast turned to CS on 10 th , SCS in the evening, SCH on 11 th and crossed the northern tip of	50 persons were killed in Masirah Island & in the mainland of Oman.		Caused severe damage in Masirah Island & in the mainland of Oman. 20,000 people were left homeless.	Severe damage to main agricultural crops and Thousands of palm & lime	No damage in India.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural trees.	
	Masirah Island on 13 th morning.					
05-07-1977	D over north bay on 4 th became DD and crossed near Contai on 5 th .					No damages reported.
24-07-1977	D from north bay on 24 th crossed West Bengal coast on the same day.					No damages reported.
04-08-1977	D over NW bay on 4 th crossed West Bengal coast on the same day.					No damages reported.
20-08-1977	D over East Central bay became DD on 20 th and crossed coast near Gopalpur on 22 nd morning.					No damages reported.
30-08-1977	D on 30 th crossed North Orissa coast on the same day.					No damages reported.
11-09-1977	D on 8 th over NE bay became DD on 11 th and crossed near Puri at night.					No damages reported.
01-10-1977	D on 30 th became					No damages

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	DD on 1 st October and crossed the coast near Masulipatnam at night.					reported.
31-10-1977	D on 27 th over East Central bay became CS on 28 th and SCS on 31 st . Crossed south Andhra coast near Kavali on 31 st .			One passenger bus overturned by gale. Telephone posts over 80km stretch for about 40 km on either side of the storm track stood slanting.	Tobacco crops in about 35000 acres were damaged.	No tidal wave was reported. Emerged into Arabian sea on 1 st November evening.
12-11-1977	D over the SE bay on 8 th became CS on 10 th , a SCS on 11 th and crossed Tamilnadu coast within 10 km south of Nagapattinam on 12 th .	560 persons lost their lives.	23000 heads of cattle (sheep included) & 5000 poultry perished.	Roofs of the buildings were blown off. Trees uprooted. Electric & telegraph poles were bent. Houses collapsed. About 10 lakh people were rendered homeless. Railway bridges washed away.	Crops over an area of 4 lakh acres were affected. Total estimated loss was Rs.42 crores.	No tidal wave was reported. Considerable loss to life and property in 7 districts of Tamilnadu in the vicinity of the landfall. Total estimated loss of life and property was Rs. 155 crores. After landfall weakened to

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
						CS and emerged into Arabian sea on 13 th as DD.
19-11-1977	DD over SE bay on 14 th became CS on 15 th , SCS in the evening, SCH on 16 th , reacting with a SCS in Arabian sea (both turned around each other cyclonically) changed course and crossed Andhra coast near Nizampatnam on 19 th evening.	Heavy loss of life was reported.		Trees were uprooted and telegraph & telephone posts were bent. Road & rail traffic were disrupted. Tele-communications & power supply in these coastal districts were affected. Steel column of the Vijayawada thermal power station under construction were sheared off.		Core pressure was recorded as 941 mb. (uncorrected). Gale reached 200 kmph. Tidal wave of height 5 m. was reported and 12 km. from the coast was affected due to that.
22-11-1977	DD in Lakshadweep sea on 13 th turned to CS on 14 th , SCS on 15 th , interacting with the Andhra cyclone changed course and became SCH on 17 th . Weakened to CS and crossed			Widespread damage from Quilon to Kasargode. About 8400 houses were totally damaged & 19000 houses partially damaged. 620 fishing vessels were damaged. Most	Crops over 40,000 acres were damaged. Loss to standing crops of paddy, coconut, sugarcane, arecanut, houses & other	This is the remnant of the SCS, which crossed Tamilnadu coast on 12 th .

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	coast between Mangalore & Honavar on 22 nd .			houses in Kalpeni Island in Lakshadweep were damaged.	property was estimated to be about Rs. 10 crores. Kalpeni Island in Lakshadweep was the worst affected. About a lakh of coconut trees, the main cash crop of the Island, were uprooted.	
24-11-1977	D with center near 8.5° N & 87.0°E moved over Sri Lankan coast.					No damages reported.
17-05-1978	DD over SE bay on 14 th became CS on 15 th , SCS on 17 th and probably SCH before landfall crossed Burma Coast just North of Kyaukpyu on 17 th .			Heavy damage to property was caused in Kyaukpyu town & neighbouring places.		No report on damages.
17-06-1978	D over north Andhra					No report on

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	coast on 16 th turned DD on 17 th and had landfall just south of Vishakapatnam on 17 th afternoon.					losses.
12-07-1978	D over NW bay on 11 th turned DD on 12 th had landfall over Orissa coast on 12 th .					No report on losses.
15-08-1978	D over north bay on 13 th turned DD and crossed Orissa coast near Gopalpur & Puri on 15 th .					No report on losses.
27-08-1978	DD over north bay on 26 th turned a CS on 27 th and crossed Orissa coast near Chandbali & Balasore on 27 th .	A fishing boat capsized killing one fisherman.		Many huts collapsed in Contai.	Some trees were uprooted and paddy fields in Contai were submerged.	
16-09-1978	D off Orissa coast on 15 th crossed coast near Gopalpur & Puri on 16 th .					No report on damages.
21-09-1978	D over NW bay on 21 st crossed Orissa coast on 21 st .					No report on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
04-10-1978	D over West Central bay on 2 nd turned DD on 3 rd and crossed over West Bengal near Contai on 4 th .					No report on damages.
25-10-1978	D over SE bay on 25 th turned to a CS on the same day and dissipated over north bay on 28 th .					No report on damages.
04-11-1978	D off Tamilnadu coast on 3 rd turned DD on 4 th and crossed Tamilnadu coast around noon near Cuddalore.	Flood & landslides due to heavy rain took a toll of about 120 human lives in Tamilnadu. About 90 persons died in Nilgiris district alone. About 50 persons died in Kerala due to floods & a house collapse.			Considerable damage to crops & houses was reported from Tamilnadu & Kerala.	It emerged into the Arabian Sea off north Kerala coast on 5 th evening.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
07-11-1978	D off Kerala coast on 5 th turned to CS on 6 th , SCS on 7 th morning, SCH in the evening and weakened to CS 11 th and DD on 12 th . DD crossed Gujrat coast near Okha on 12 th .	In Gujrat state, three crew lost their lives.		A sailing vessel sank. Asbestos sheets of the roof of the transmitter station at Bhuj airport were blown off. Almost all electric poles in the vicinity of the aerodrome near Naliya were bent. More than 60 kutchha houses were damaged in Jakhau. Huge stocks of salt belonging to the salt house at Jakhau port were washed away. Few glass panes of lighthouse tower & residential quarters at Dwarka were broken.	Damage to coconut trees & houses was reported from the northern islands in Lakshadeep.	This is the remnant of the D which crossed Tamilnadu coast on 4 th . Lakshadweep reported 3-4 m. of waves.
24-11-1978	D on 17 th over south Andaman sea turned to CS on 20 th , SCH on 21 st and crossed Sri Lankan coast on 23 rd near Batticoloa and then moved	1 thousand people lost their lives in Sri Lanka.		About 5000 huts were damaged in Ramanathpuram district. Large no. of trees uprooted. About 1000 country boats & mechanized fishing	Crops of betal vines, chillies, sugarcane & plaintain were also damaged in the interior talukas of	The system emerged into the Arabian Sea off Kerala coast as a DD on 25 th . Min. pressure

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	south of Pamban and crossed Tamilnadu coast between Killakarai & Roche Mary nagar in Ramanathpuram district on 24 th evening.			vessels were damaged. Boat building yards were also damaged. Materials & machinery stored for the construction of road bridge near Pamban were washed away. Extensive damage to roads. Thanjavur & Tirunelveli districts also suffered some damage to roads. Roads and rail communications were disrupted in south Tamilnadu. Serious loss of property was reported from Sri Lanka.	Ramnathpurnam district.	of SCH was 993.4 mb. Tidal wave of 3-5 m. affected the Rameswaram island. Total damage to property was estimated to be about 5 crores of rupees.
25-11-1978	DD off Kerala coast on 25 th turned to CS in the evening and weakened to D on 28 th and dissipated later.					This is a remnant of the SCH, which crossed Tamilnadu & Sri Lanka coast

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
						on 24 th . No damages reported.
12-05-1979	D on SE bay on 5 th turned CS on 7 th , SCH on 8 th crossed Andhra coast near Ongole on 12 th . Nellore recorded the lowest pressure of about 980 mb between 0600 and 1800 GMT on 12 th .	700 human lives were lost.	3 lakh heads of cattle lost.	Many trees were uprooted & electric poles were bent, which led to disruption of road transport & telecommunications & extensive damage to power lines. Enormous damage was caused to railway property in these districts by the swollen rivers & heavy rain. Two bridges near Tanguturu (Prakasam district) were washed away. 40 lakh of people were affected. 7 Lakh houses were damaged. Total damage to crops, houses & public utilities was about 170 crores of rupees.	Crops in 0.7 Lakh hectares were damaged.	First time in 100 years that in May a SCH formed at a low latitude. Another noteworthy feature of this storm was a very heavy rain along and to the left of its track over south coastal Andhra Pradesh and Telangana. Gale of 100 to 160 kmph was reported. Sea level of 3-4 m. was reported.
20-06-1979	D off Karnataka					No damages in

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	coast on 16 th turned DD in the evening, CS on 18 th , SCS on 19 th and crossed Arabia coast on 20 th .					India reported.
24-06-1979	DD crossed Orissa coast on 24 th .					No damages were reported.
28-06-1979	DD crossed coast of Bangladesh on 28 th .					No damages were reported.
08-07-1979	D crossed Orissa coast on 8 th .					No damages were reported.
07-08-1979	DD over north bay on 6 th turned to CS on 7 th , SCS afternoon and had landfall over Orissa coast on 7 th .		.	Road & Rail and Telephone & power services were disrupted.	Some damages caused to crops in Orissa and West Bengal. West Bengal suffered saline inundation.	Lowest pressure of 970 mb reported. No details on the loss in the vicinity of the landfall are available.
22-09-1979	D on Lakshadweep area on 18 th turned CS on 21 st , SCH on 22 nd , moved westwards and weakened.					No damages in India reported.
24-11-1979	D over SE bay on 22 nd turned to CS on				Some damage to harvested	No big damage was reported

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	24 th and crossed over Tamilnadu and south Andhra coast near Sriharikota on 25 th .				paddy crops in Krishna & Guntur districts due to rain.	associated with this storm.
06-06-1980	D crossed over Maharashtra coast on 6 th .					No damage was reported.
17-09-1980	DD crossed Orissa coast on 17 th .	About 200 persons in Orissa & about 60 persons in Andhra Pradesh lost their lives.	About 6000 cattle perished in Orissa & about 3000 in Andhra Pradesh	About 30,000 houses/huts were damaged in Andhra. Serious damage was caused to railway tracks in Srikakulam district.		The damages were due to the flash flood due to rain.
04-10-1980	D formed over north bay crossed coast of Bangladesh on 4 th .	3 lakh people marooned in Imphal due to flash flood.		80 villages in Manipur & Ekou bridge on the Imphal river were completely washed away.	Heavy loss to standing crops & property was reported in Manipur & Imphal areas.	
18-10-1980	D on SE bay on 16 th turned CS on 17 th , weakened to DD and crossed Andhra coast on 18 th near Masulipatnam.			Damage to roads, buildings and major irrigation works in Andhra.	Caused damage to standing paddy, banana and sugarcane crops in Andhra.	Damages are due to rain alone and not due to wind.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
04-12-1980	D on SW bay on 3 rd turned DD on 4 th , CS in the evening, weakened and diffused in the West central bay on 8 th .	.				No damage to life or property was caused by this system. Did not cross the coast.
16-12-1980	D on Andaman sea on 12 th turned a DD on 14 th , a CS on 16 th over SE bay and over Sri Lanka coast near Tricomalee on 17 th . Emerged as D in Gulf of Mannar.					No damage to life or property was caused by this system.
20-06-1981	DD crossed West Bengal coast on 20 th .			3500 houses were affected in Midnapore.	Affected 0.28 lakh hectares of paddy land. 51000 hectares of cultivated land was affected which resulted in crop loss of about 6.0 lakh.	The damages were due to rainfall.
07-08-1981	D over NW bay on 7 th turned to CS in	15 people lost their lives in		In Orissa, an area of 36,536 hectares was	Affected crop area was 3690	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	the evening and crossed the Orissa coast near Puri on 8 th .	Orissa.		affected. About 47 blocks in the state were affected covering 1017 villages. Over 500 houses collapsed and 1200 houses were partially collapsed. A total area of 2173 hectares of cultivated lands were reported to have been sand cast in the districts of Puri, Ganjam, & Phulbani.	hectares.	
14-08-1981	D crossed West Bengal coast near Contai on 14 th .			The whole of Ramnagar, Egra, Potaspur, P.S.contai sub-division was submerged due to rains.		
18-09-1981	D had landfall over Andhra coast on 18 th .			In Srikakulam district about 100 houses collapsed.	In Srikakulam district 800 acre of paddy field were affected.	
26-09-1981	D from Andaman sea on 24 th turned to CS on 25 th , a SCS			5 launches were lost. Many houses were damaged West Bengal		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	and crossed Orissa coast near Puri on 26 th .			and Orissa. Many villages in low lying areas were flooded. About 7000 acres of paddy lands were submerged.		
01-11-1981	D on Lakshadweep sea on 28 th became DD on 29 th , became CS on 30 th , SCS in the evening crossed Saurashtra coast close to Mangrol on 1 st .	One dozen persons died due to wall collapses.		In Junagadh & Jamnagar districts many trees, electric & telegraph posts were damaged or uprooted and about 5700 houses & an equal number of huts were partially or fully damaged. A few cargo ships & fishing boats sank near the coastal waters. There was damage to fishing boats and nets. Estimated loss to Veraval & Navlakhi ports was about Rs. 12.5 lakh.	Groundnut crop loss in Junagadh & Jamnagar districts was estimated to be about Rs. 52 crores.	No tidal wave was reported.
09-11-1981	D from Andaman sea on 8 th became a					No damages were reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	CS on 9 th over east central bay and weakened gradually.					
16-11-1981	D over Andaman sea on 16 th became CS on 17 th , a SCS on 19 th and weakened gradually off the Arakan coast.					No damages were reported.
08-12-1981	D on SE bay on 4 th became CS on 6 th , a SCS on 8 th , SCH on 9 th and crossed West Bengal coast near Sagar Island on 10 th .	About 200 people reported to have been died. At least one million people were affected in the three sub-divisions of 24 Parganas. Three died in Orissa.	About 400 livestocks were lost.	In Sunderbans 205 km of embankments were completely washed away. 315 km of embankment were either severely or partially damaged by tidal waves apart from 1,292 breaches. In Midnapore district about 1000 huts were reported to have been destroyed. All telegraph & telephone links snapped at Contain town. About 2800 villages & a population of about 13	About 1,97,000 acres of agricultural land were inundated by saline water. Crops worth Rs. 50 crores had been reported damaged in the cyclone hit districts of West Bengal. In Orissa, 57571 hectares of cropped area was affected due to cyclone & saline	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				lakh were affected. About 200 houses & 29.675 thatched houses were damaged. Damage to 1364 public institutions, roads, river embankments, etc. was estimated at about Rs. 317 lakh. Some fishing vessels berthed in Paradip port were sunk.	inundation leading to a loss of about Rs. 90 lakh. Loss to betel vines was about 162 lakh.	
04-05-1982	D on SW bay on 1 st turned to CS on 2 nd , SCS in evening off Andhra, SCH on 3 rd and crossed Arakan coast on 4 th .					Did not cause any significant weather.
03-06-1982	CS on central bay on 1 st turned to SCS on 3 rd , SCH in the evening and crossed the coast north of Paradip on 3 rd at night.	In Orissa human casualties were 245 and injured were 493.	In Orissa, 11463 cattle heads lost.	This storm caused considerable damage in Orissa. Damage to Paradip port was severe. In the port two ships experienced minor damage & about		The recorded lowest pressure was 952 mb and wind gust was 120 kt.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				<p>100 mechanised trawlers were lifted from the lagoon water & dumped on the sandy shores of Paradip port & a no. of vessels were sunk. It blew away the wireless station at Paradip.</p> <p>Cyclone affected a total population of 73.23 lakh covering 25,000 sq. km in Orissa.</p> <p>No. of houses fully or partially damaged were 8.19 Lakh & saline inundated area was 0.89 lakh hectare. About 3390 km P.W.D. roads were damaged. A large no. of electric line towers & electric & telephone poles were damaged or grounded.</p>		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
19-07-1982	DD on 19 th over NW bay weakened to D and crossed coast near Gopalpur & Puri on 19 th night.					No damages reported. Caused only widespread rain.
13-08-1982	D crossed coast near Chandbali on 13 th morning.					No damages reported.
18-08-1982	D crossed coast near Balasore & Contai on 18 th night.					No damages reported.
27-08-1982	D crossed coast near Balasore on 28 th night.	Loss of few human lives reported in Orissa.		Widespread damage to property.		Flood in Mahanadi and Kathjuri rivers caused the damage.
10-09-1982	D crossed coast near Puri on 10 th .					Last week's flood in Orissa was worsened due to this event.
29-09-1982	D crossed Chittagong coast on 29 th morning.					No damages in India reported.
16-10-1982	DD over West Central bay on 15 th became SCS by 16 th	Exceptionally heavy rain claimed 4 lives.		3000 huts were fully or partially damaged in Vishakapatnam. Loss		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	weakened to D and crossed north Andhra coast to the south of Kakinada by mid-night of 16 th .			due to damages to roads, minor irrigation canals etc., estimated at a few crores in coastal Andhra.		
18-10-1982	DD on 17 th off Tamilnadu became a CS in the evening, a SCS on 18 th and crossed south Andhra coast near Sriharikota on 18 th night.	59 human lives lost.		In Tamil Nadu about 300 to 400 huts were partially damaged. In Cuddapah district 2500 houses were damaged.	Lemon orchards & plantain gardens were destroyed in Nellore & Cuddapah districts of Andhra.	Min. press. recorded was 982.8 mb.
08-11-1982	D on SE Arabian sea on 4 th became CS on 5 th , a SCS on 6 th and crossed south Gujrat coast near Kodinar on 8 th .	507 people died in Gujrat. 4 died in Konkan region.	Livestock loss in Gujrat state was reported to be 1,50,332.	In Gujrat, about 12624 pucca & 54549 kutchha buildings were completely destroyed.	The crop damage was estimated at Rs. 127.23 crores.	Veraval reported lowest pressure of 963.7 mb, wind of 65 kt. and tidal wave of 2 m.
02-12-1982	D had landfall over Tamilnadu coast near Tondi on 4 th .					No damages were reported.
20-06-1983	LP off Maharashtra moved and crossed Saurashtra coast on 20 th as DD. This	Human lives lost were 594 with 1 missing, of these Junagadh	Cattle heads lost were 83,768.	About 17293 houses & 28977 huts collapsed.	68,894 hectares of agricultural land was washed away	The damage is due to the rains. The dams and

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	system lasted for 3½ days over Saurashtra causing incessant and torrential rains.	district accounts for the loss of 558 lives.			resulting in a loss of approx. Rs. 24 crores.	rivers started overflowing and inundated vast areas.
25-06-1983	DD crossed Orissa coast near Gopalpur on 25 th .					No damages were reported.
04-10-1983	D over NW bay on 2 nd turned to CS on 3 rd and crossed Andhra coast near Bheemunpatnam on 4 th .	120 persons lost their lives.	94,000 cattle heads perished.	Total loss to crops & property was estimated at about Rs. 520 crores. In Andhra, About 7,000 minor irrigation tanks breached. Flood damaged roads of about 26,000 km in length.		Lowest pressure recorded at Waltair was 989.5 hPa.
15-10-1983	D near Andaman sea on 14 th turned to DD in the evening, a SCS on 15 th crossed Bangladesh coast on 15 th evening.					No damages reported in India.
07-11-1983	D over SE bay on 6 th turned CS on 7 th					No damages reported in

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	over central bay and SCH before crossing the Bangladesh coast on 9 th evening.					India.
01-08-1984	DD over NW bay had landfall over Orissa coast between Puri & Paradip on 1 st .					No damages in the vicinity of the landfall.
15-08-1984	DD had landfall near Balasore on 17 th .	14 human lives were lost.			Extensive cropped areas were submerged.	3260 villages in six coastal districts of Orissa were severely affected.
14-10-1984	D over North and central bay on 12 th became SCH on 13 th and crossed coast north of Chandbali on 14 th .	10 people were injured in Midnapore district.		Heavy rain pulled down mud houses, uprooted trees & snapped telephone lines in Orissa. Several trees were uprooted & roofs of about 500 huts were blown off.	Standing paddy & biri crops were submerged & partially damaged in Rajnagar, Rajkanika, Aul & chandbali blocks in Orissa.	Remarkable characteristic of this system was very rapid intensification into a SCH from D stage within 12 hrs.
14-11-1984	DD in SE bay on 9 th evening became SCS on 11 th evening	A toll of 604 lives in Andhra & 54 lives in	Livestock perished were 90650 in	Swarnamukhi river bank was breached several places. About	Damages to crops in Andhra.	Sriharikota recorded lowest

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	off Tamilnadu, crossed coast near Sriharikotta on 14 th .	Tamilnadu of which 17 in Madras.	Andhra.	one foot high water entered Sulerpet town due to breach in the river bank. Low lying areas of Gudur town were submerged. Two railway bridges Sulerpet & Tada railway station were washed away disrupting rail services between Nellore & Madras. Large no. of irrigation tanks in Nellore district to some extent in southern parts of Prakasam district of Andhra Pradesh breached causing local floods. Sriharikota island was cut-off from the mainland. 3,20,000 buildings were destroyed completely in Andhra.		pressure 984 mb.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				Damages to crops & property in AP estimated at about Rs. 223.32 crores & that at Madras about Rs. 3 crores.		
01-12-1984	D on SW bay on 27 th Nov. turned to CS on 29 th Nov. and a SCS on 30 th Nov. and crossed the coast near Karaikal on 1 st Dec.	About 15,000 persons in east Thanjavur district & 20,000 persons in south Arcot district were affected by the storm.			Standing crops in 50,000 acres in Tamilnadu were submerged due to heavy rains.	Two villages were reported to have been marooned.
25-05-1985	D over central bay on 22 nd turned to CS in evening, SCS on 24 th and crossed Bangladesh coast near Hatia on 25 th .	In Bangladesh 2.5 million people were affected. Thousands of human lives were lost.	Thousands of cattle heads lost in Bangladesh.	Storm left a trail of devastation in coastal Bangladesh. Several coastal villages were almost completely swept away.		Tidal wave of 4.5 m reported. West Bengal and NE states received good rains. No reports on damages in India.
31-05-1985	D over West Central Arabian sea on 28 th turned to CS on 29 th ,					No damages were reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	dissipated over NE Arabian Sea on 31 st .					
02-08-1985	D had landfall near Chandbali on 2 nd .					No reports on damages.
06-08-1985	D had landfall near Sagar Island on 6 th .					No reports on damages.
15-08-1982	D had landfall near Chandbali on 15 th .					No reports on damages.
20-09-1985	D on East Central bay on 19 th turned to CS on 20 th and crossed Orissa coast near Puri on 20 th .	Six fishermen were drowned in Chilka lake.			Due to tidal bore in river Devi several villages in Orissa were under 1 m. of water. It caused widespread damages to paddy crops, roads & prawn culture tanks in Puri.	
02-10-1985	D had landfall near Ongole on 2 nd .					No reports on damages.
07-10-1985	D crossed near Mahua in Saurashtra coast on 7 th . It crossed South	Heavy rains claimed 13 lives.				

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Gujrat coast near Bulsar in evening.					
11-10-1985	D on SW bay on 9 th turned a CS on 10 th and crossed Andhra coast on 11 th near Vishakapatnam.			The storm affected five coastal districts of Andhra though the damaged caused by it was not significant. Damage to crops & properties, was estimated at about Rs. 31 Lakh.		Heavy rain at Narsapur on 11 th inundated low-lying areas due to which 1835 people had to be evacuated.
16-10-1985	D on East Central bay on 13 th turned SCS on 15 th and crossed Orissa coast near Balasore on 16 th .	13 persons lost their lives in West Bengal & 47 in Orissa. Also 38 persons were reported missing in Orissa. About 7.6 lakh were affected in West Bengal.	1570 cattle heads perished in West Bengal & 1073 in Orissa.	30,966 houses collapsed in West Bengal & 8703 in Orissa. Population of about 7.6 lakh was affected by the storm in West Bengal. High winds snapped electric wires in several places. Major irrigation installations in West Bengal were breached. The damage to crops & public utilities in	Crops in 72,000 hectares in 1204 villages of West Bengal & 3,24,795 hectares in 8509 villages of Orissa were affected. In Balasore district saline inundation of some low lying coastal areas damaged standing crops.	Tidal wave of 1-2 m. was reported in Orissa. Winds of 70 to 100 kmph in gusts blew over Sagar islands. Tidal wave of 3-3.5 m. was reported in Sagar islands.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				West Bengal was estimated to about Rs. 15.1357 crores.		
12-11-1985	D stayed about 40 km south of Tambaram on 12 th .			About 50,000 huts were damaged in low-lying areas of madras city due to rain & floods.		Did not cross the coast. Heavy rains due to D alone caused the damage.
15-11-1985	D over south bay on 15 th turned to CS on 16 th and dissipated over the west central Bay on 18 th .					No damages were reported. Did not cross the coast.
13-12-1985	D on SE bay on 11 th turned to CS on 12 th and crossed South Andhra coast near Sriharikota on 13 th .	12 persons reported to have been killed in Nellore district.		Four villages in Nellore district were cut off due to floods. Uprooted a few electric & telegraph poles.		Tamilnadu and Andhra received good rains.
12-08-1986	D crossed north Andhra coast near Kalingapatnam on 12 th night.	12 persons lost their lives in Vidarbha. Heavy rain & floods in Andhra claimed 115 lives.		The estimated cost of damages to crops & properties in Vidarbha districts was about 10 crores.		Heavy rains caused flood, which had caused the havoc.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
20-08-1986	D had landfall between Chandbali & Balasore on 20 th .					No damages were reported.
25-09-1986	D had landfall near Balasore on 25 th .	18 lives lost.		6.15 lakh people left homeless.		
09-11-1986	D on West Central bay on 7 th turned to CS on 9 th and crossed Bangladesh coast.		Several livestock lost.	Many fishermen living near Chilka coast lost their houses due to inundation by the lake water.	Considerable damage occurred to paddy & rabi crops in Orissa.	
01-02-1987	D over southeast bay on 30 th Jan. turned DD on 31 st , CS later, SCS on 1 st Feb. and dissipated over northeast Bay.					No damages were reported. A rare event of formation of SCS during January.
04-06-1987	CS had landfall over Bangladesh coast near Dakhin Shahbazpur on 4 th .					No damages in India.
16-10-1987	CS crossed south Andhra coast close to Ongole on 16 th .	17 human lives were lost. 6.2 lakhs in 157 villages in the coastal districts of Andhra were affected.		Damaged about 9000 houses in Andhra.	Damaged crops worth about Rs. 34 crores in Andhra.	Ongole recorded a lowest pressure of 995.1 mb.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
		The remnant of the storm caused several local storms in Bihar plains on 19 th & 20 th , which took 31 human lives.				
02-11-1987	D on SW bay on 31 st Oct. turned to CS by evening, SCS on 2 nd and crossed south Andhra coast near Nellore on 2 nd .	6.8 lakh people in 288 villages of Andhra were affected. Claimed a toll of 50 human lives.	In Andhra 25800 livestock lost.	Disrupted road & train services & damaged about 68,000 houses. The cost of damage due to storm was estimated to about rupees 60 crores. The sea breached the Buckingham canal embankment.	Inundated vast stretches of paddy field. Saline water from the swollen Buckingham canal in Nellore flooded the adjoining fields.	Min. pressure of 984.3 hPa was recorded.
13-11-1987	CS of West Central bay on 12 th turned to SCS crossed coast as CS near Machilipatnam on 13 th .	28 people lost their lives in coastal Andhra.		Damaged about 8,400 houses in coastal Andhra.		Min. pressure of 994.hPa was reported. Emerged into Arabian sea on 16 th .
09-06-1988	DD had landfall over West Bengal & north					No damages were reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Orissa coast near Contai on 9 th .					
17-07-1988	D had landfall over north Andhra & Orissa coast near Gopalpur on 17 th .					No damages were reported.
02-08-1988	DD had landfall over Orissa coast near Balasore on 2 nd .					No damages were reported. Heavy rains in Orissa.
01-10-1988	DD had landfall over Andhra coast north of Vishakapatnam on 1 st .					No damages reported in the vicinity of landfall area.
19-10-1988	D over NE bay on 18 th turned to CS over north bay and weakened.	In Bangladesh, 300 people were missing or feared drowned & 430 persons were injured.		Torrential rain submerged low-lying areas of Dhaka. 20 fishing boats were drowned in Chittagong & 15 boats & trawlers were sunk in Patuakhali.		No damage reported in India.
18-11-1988	CS over SE bay on 16 th turned SCS on 17 th and dissipated over NE & adjoining					No damages reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	east central Bay on 18 th .					
29-11-1988	D over Andaman sea on 23 rd turned CS on 25 th , SCS around noon, SCH on 27 th and crossed West Bengal and Bangladesh coast on 29 th .	532 people lost their lives in West Bengal. About 794 fishermen were missing in West Bengal. The storm affected a population of 28.29 Lakh in 3893 villages in West Bengal. 19 crew of a ship were drowned. Two launches of the forest dept. were drowned. A light vessel of Calcutta Port Trust, with 18 people of board was missing. Over 2000	Perished 57,600 cattle heads in West Bengal. In Bangladesh, the hurricane killed about 15,000 deer, 9 Royal Bengal Tigers & perished about 65,000 cattle heads.	Damaged either completely or partially about 3,45,530 houses. The estimated cost of damage to crops & properties in West Bengal was Rs. 137.77 crores. One ship was drowned.	Crops in 1,93,780 hectares damaged in West Bengal. Estimated cost of crops damage in Bangladesh was worth about Taka 9,400 millions.	The system was one of the super storms of Indian coast. Lowest core pressure was estimated as 942 hPa. Sagar Island lighthouse recorded a min. pressure of 990 hPa. The wind was 150-180 kmph over Sagar island.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
		people were killed and 6000 people were reported missing.				
26-05-1989	D over East Central bay on 23 rd turned to CS on 24 th , SCS on 25 th , SCH on 26 th and crossed Orissa and West Bengal coast near Balasore at night.	24 people lost their lives in Orissa & 37 in West Bengal. About 6.9 million people were affected.	Perished 1000 cattle heads in West Bengal & 1625 in Orissa.	Damaged completely or partially about 53160 houses in West Bengal & 92000 in Orissa. Affected about 3.2 million people in West Bengal & 3.7 million people in Orissa.	Damage to crops was considerable in West Bengal and Orissa. Sea water has intruded several villages in both the states.	Tidal wave of 3-6 m. was reported. Min. pressure of 970.4 mb was reported.
09-06-1989	D had landfall over Saurashtra coast near Veraval on 9 th .					No damages were reported.
13-06-1989	DD had landfall over Orissa and West Bengal coast on 13 th .					No damages were reported.
20-06-1989	D had landfall over north Orissa and West Bengal coast near Contai on 20 th .					No damages were reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
22-07-1989	D over West Central bay on 21 st turned CS and crossed Andhra and Orissa coast near Kalingapatnam on 22 nd .	140 persons lost their lives in Andhra.		Unprecedented rain over coastal Andhra & Telangana. Heavy rain caused breach in irrigation tanks in coastal Andhra causing severe floods. Thousands of houses in low-lying areas of Vijayawada town were submerged. 23 villages in Andhra were submerged.	Extensive damage to crops & properties in Andhra.	The damages in the vicinity of the landfall alone are given.
17-08-1989	DD on 17 th had landfall over Andhra and Orissa coast near Kalingapatnam.					No damages were reported.
17-10-1989	D had landfall over West Bengal and Bangladesh coast on 17 th night.					No damages were reported.
08-11-1989	SCH from Gulf of Siam crossed over Andaman Islands and crossed Andhra coast near Kavali on 8 th .	69 lives lost in Andhra. One life was lost in Andaman.	7100 cattle heads were perished in Andhra. About 34,000 poultry birds were lost.	Over 4 lakh people in 836 villages in coastal districts of Andhra were affected. Damaged about 1.49 lakh pucca houses &	Standing crops in thousands of acres of land were damaged in Andhra.	A unique SCH that over 100 years this is only the second SCH entering Indian

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				huts. Due to sea water inundation Jaladanki & Harijanwada villages, situated about 11 km west of Kavali were razed to the ground. Rail services between Madras & Vijayawada came to a standstill after the landfall. Railway track of a stretch of 40 km. was blocked by uprooted trees and electric traction masts. In Andaman about 709 houses were damaged and electric supply was disrupted due to falling of about 80 electric poles. About 1000 trees were uprooted.		seas from Gulf of Siam and only storm which has traveled 2600 km over Indian seas. The estimated core pressure and the maximum wind speed were 942 mb. and 100-120 kt. respectively. 3-4 m. tidal waves lashed the coast.
09-05-1990	DD over SW bay on 5 th turned to CS by evening, SCS on 6 th , SCH on 7 th and	967 human lives lost. The storm affected about 7.78 million	About 3.61 million livestock perished in Andhra.	Diviseema island formed by the two arms of the river Krishna was	Around 54000 hectares of agricultural land was inundated	A ship trapped in the core of SCH recorded the sea level

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	crossed the south Andhra coast near Machilipatnam on 9 th .	people in 5160 villages in Andhra.		completely marooned. Machilipatnam town was under 3 to 6 ft of water for 3 to 4 days. Vishakapatnam airport was under water for about a week. Ankapalla town was engulfed under 4 to 5 ft of water. Road traffic to Machilipatnam from Vijayawada remained closed for 2 days. The heavy rainfall breached road and railway tracks at many places. The rail link between Tuni and Vishakapatnam was suspended for more than three weeks. It had fully or partially damaged about 16 lakh houses in 10 districts of the state. Bapatla Meteorological observatory was	by seawater and 62000 hectares of land were sand cast Banana plantation, coconut trees and mango crops over a vast stretch of land were severely damaged. In Andhra about 3.08 lakh hectares crops were affected. Horticulture crops in 55,000 hectares of land were damaged.	pressure of 912 mb. The estimated max. wind speed and wave height were 150 kt and 10m respectively. Max. surge of 3-4 m. above normal tide was estimated. The loss of human lives in this cyclone was minimized by timely warnings issued & appropriate precautions taken. About 6.5 lakh people were evacuated to safer places from 546

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				<p>damaged. The multimet. radar antenna and the cups of the high- speed anemometer were blown off by gale winds.</p> <p>At Ennore, Tamilnadu the sea waves damaged the Kashi Viswanath temple and washed away a few fisherman colonies in Pulicat.</p> <p>As per the Andhra Govt. report, the estimated cost of the damages in the state were about Rs. 2289.63 crores under the following heads:</p> <p>(i) Damages to private dwelling units: Rs. 550.00 crores</p> <p>(ii) Damages to agricultural crops: Rs. 289.34 crores</p>		coastal villages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				(iii) Damages to horticulture crops: Rs. 530.35 crores (iv) Damages to irrigation dept.: Rs. 173.85 crores (v) Damages to Panchayat Raj Dept.: Rs. 246.00 crores (vi) Damages to transport, roads & buildings dept.: Rs. 138.50 crores (vii) Damages to Forest energy & environment dept.: Rs. 118.31 crores (viii) Damages to industry, social welfare & other Dept.: Rs. 243.28 crores.		
14-06-1990	DD had landfall near Contai in Orissa on 14 th .					No damage reported in the vicinity of the landfall area.
15-08-1990	D had landfall near Gopalpur in Orissa					No damage reported in the

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	on 15 th .					vicinity of the landfall area.
21-08-1990	DD had landfall near Paradip in Orissa on 21 st .					No damage reported in the vicinity of the landfall area.
08-10-1990	D had landfall near Contai in West Bengal on 8 th .	Thousands of people were marooned by flood in Midnapore district.		The system caused heavy rain in Orissa, West Bengal & Assam. About 384 villages in Midnapore district and 938 villages in Nadia district were badly hit by floods. Several districts of Gangetic West Bengal experienced damage due to floods.		
04-11-1990	DD had landfall over north Andhra-south Orissa coast on 4 th .	100 human lives lost due to flood.		A population of 6 lakh in 341 villages was seriously hit by the flash flood. Aska town was virtually under flood. Thousands of houses were washed away by flood waters	Immense damage to crops and properties due to flood.	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				of the rivers Rushikulya & Badanadi rendering lakhs of people homeless.		
14-11-1990	D had landfall near Nellore around midnight on 14 th .					No damages were reported. This system entered Arabian sea.
18-12-1990	SCS over West Central bay on 17 th had landfall over Bangladesh coast near Cox's Bazaar on 18 th .					No effect on Indian weather adversely. Caused considerable damage to Bangladesh coast.
29-04-1991	D over SE bay on 24 th became a SCS on 27 th and crossed Bangladesh coast around midnight on 29 th .	132000 lost in Bangladesh. People in cyclone-hit area were affected by diarrhoea & gastroenteritis. 2 human lives lost in Mizoram		About 40 Bangladesh air force planes on the runway were badly damaged and airfield was inundated by flood. Telecommunication links to the outside world were totally cut	Paddy crops over an area of approx. 1000 sq. km. were destroyed in Bangladesh. Considerable damage to the standing crops	Storm surge of 5.5m in height. Tidal waves carried a ship 2 km. inland from Chittagong port. Landslides in Mizoram were

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
		and 5 in Tripura.		off. 250 houses in West Bengal and 7000 houses in Tripura were damaged.	in India.	reported.
02-06-1991	CS had landfall over Bangladesh coast between Bhola & Hatia on 2 nd .	300 fishermen were missing in Bangladesh				Tidal waves of 1-2 m. were reported during landfall. No damages reported in India.
28-07-1991	D had landfall over Orissa coast near Paradip on 28 th .	17 people lost their lives in Orissa.			Vast areas of paddy field were inundated.	
22-08-1991	D crossed Orissa-West Bengal coast near Balasore on 22 nd .	11 human lives lost in Orissa and 9 in Rajasthan.			Submerged vast areas of paddy fields in Orissa.	
21-09-1991	D crossed Andhra coast near Kakinada on 21 st .					No damages were reported.
14-10-1991	D crossed the coast of Bangladesh on 14 th .	18 lost in Assam. Flood and heavy rain affected 5,94,249 people	109 cattle heads were lost in Assam.		Affected 47,680 hectares of Agricultural land.	Landslides occurred at several places in Assam. No report on the

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
		in 591 villages in Assam.				damages in Bangladesh.
29-10-1991	D crossed Tamilnadu coast near Pondicherry on 29 th .	21 human lives lost in Andhra Pradesh and 21 in Tamilnadu.				
13-11-1991	D on 11 th turned to CS on 13 th and crossed Tamilnadu coast on 14 th night.	185 persons lost in Tamilnadu & 16 in Nellore.	540 cattle heads perished in Tamilnadu.	Damage was estimated around Rs. 1508 million as a result of damages to buildings & public works.	Considerable damage to crops & properties; estimated damage due to crop loss – Rs. 1724 million.	
19-05-1992	D on 16 th turned to CS on 18 th and crossed Arakan coast around noon on 19 th .					No damages reported.
11-06-1992	CS formed over Arabian Sea and dissipated.					No damages were reported.
18-06-1992	DD crossed Orissa coast on 18 th near Puri.	Heavy rainfall in Orissa caused the death of 7 people.				

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
26-07-1992	DD crossed Orissa coast on 26 th near Chandbali					No reports on damages.
03-10-1992	DD formed over Arabian sea became CS and crossed Oman coast on 3 rd morning.					Did not cause any rainfall or damages in India.
09-10-1992	DD crossed south Andhra coast near Machilipatnam on 9 th .					No reports on damages.
21-10-1992	D on 20 th over north bay turned to DD on 21 st , CS in the evening and crossed Bangladesh coast near Cox's Bazaar at night.					No reports on damages.
06-11-1992	CS over east central bay on 4 th , dissipated over the ocean on 6 th .					No reports on damages.
12-11-1992	DD on 11 th over SW bay crossed Sri Lanka coast on 12 th noon, emerged into	Due to heavy rainfall, landslide and flood about 175 human lives				

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Gulf of Mannar and crossed south Tamilnadu coast near Tuticorin on 13 th around noon. This emerged into Arabian sea as D on 14 th , intensified to DD and crossed Karnataka coast near Honavar on 17 th evening.	were lost; About 160 reported missing in Tamilnadu & Kerala.				
21-11-1992	D on 15 th became CS on 17 th , SCH on 18 th and crossed over Bangladesh-Myanmar coast near Teknoff on 21 st afternoon.					Estimated core pressure was 942 mb. Did not cause any rainfall or damages in India.
17-06-1993	DD crossed the Bangladesh Coast on 17 th noon.	6 people lost their lives & more than 50,000 people in 100 villages were reeling under the flood in many districts				

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
		of Assam. 12 lost in Bangladesh due to flood.				
09-11-1993	D crossed south Tamilnadu coast near Tuticorin on 9 th .	30 people lost their lives in Tamilnadu.				
14-11-1993	D on 12 th over SE Arabian sea became CS on 13 th , SCS on 14 th , SCH in the evening, weakened to CS on 15 th .	About 50 fishermen were reported missing along the north Gujrat coast.				Heavy rains in Gujarat and Kutch.
04-12-1993	CS on 2 nd over south bay became SCS on 3 rd , SCH in the evening and crossed north Tamilnadu coast near Karaikal on 4 th .	Nearly 111 people were killed due to heavy rains & floods in south Tamilnadu.		Disrupted rail & road traffic & damaged the telecomm system.	Damage to standing crops.	
02-05-1994	CS over Andaman sea on 29 th April intensified to SCS on 30 th , SCH on 1 st May and crossed south Bangladesh–north Myanmar	200 people lost their lives and many fishermen were missing along the coast of Bangladesh.				No loss reported over India.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	coast on 2 nd May at midnight.					
09-06-1994	CS off Bombay in Arabian sea on 6 th , became SCS on 7 th and moved off to Saudi Arabian coast.					Did not cause any damage in India.
18-08-1994	DD crossed north Orissa coast near Chandbali on 18 th .					Caused flood and damages to the houses & property in the areas along the route of system.
05-10-1994	DD crossed Andhra Pradesh coast near Machilipatnam on 5 th morning.	38 human lives lost in Andhra Pradesh due to flood.				
31-10-1994	DD over SW bay on 29 th turned CS on 30 th , SCS in the evening and crossed the Tamilnadu coast near Madras on 31 st .	69 died in Tamilnadu. 235 died in Andhra Pradesh.		Road and tele-links were disrupted. Many telephone poles were damaged. 60,000 huts in Andhra Pradesh & 30,000 in Tamilnadu were damaged.	More than 60,000 hectares of crop area were damaged.	Total damage was Rs. 61 crores in Tamilnadu and about Rs. 3000 crores in Andhra. Tidal wave of 1-2 m. reported.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
04-11-1994	D had landfall over Tamilnadu coast near Karaikal on 4 th at midnight.				Caused damage to crops and property in Tamilnadu.	
19-11-1994	DD from SE Arabian sea on 16 th became CS on 18 th , SCS a few hours later, SCH on 19 th and crossed Somalia coast.					No damages reported.
06-05-1995	DD had landfall over north Tamilnadu coast on 6 th evening.	12 lost in Tamilnadu and 5 in Kerala.		Damage to about 400 houses in Tamilnadu.	Damage to standing crops.	The damages were due to heavy rains & flood.
09-05-1995	DD had landfall over Andhra coast near Tuni around on 9 th .	22 lost in Andhra.		About 40,000 houses were damaged.	Thousands of hectares of crops were destroyed.	Total estimated damage in Andhra was Rs. 470 crores.
16-05-1995	DD had landfall over West Bengal coast near Sagar Island on 16 th morning.	35 died in Orissa and 12 in West Bengal. 60 lost in Bangladesh.		Flood caused breaches in several embankments and damaged 20,000.		In Bangladesh, tidal waves made about 60,000 people homeless.
17-09-1995	D had landfall over north Orissa coast near Balasore on 17 th .					No report on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
26-09-1995	D over NW bay on 26 th crossed north Orissa coast near Balasore 26 th noon.			Many highways were blocked. Millions of people were affected due to flood in West Bengal.		
13-10-1995	CS formed over SE Arabian sea and diffused over sea.					No report on damages.
09-11-1995	CS over SE bay on 8 th turned SCS in the evening, SCH in 3 hrs. and had landfall over north Andhra and Orissa Coast near Ichchapuram in Kalingapatnam district on 9 th .	49 died in Andhra, 20 in Orissa and 4 in West Bengal. 240 persons were reported missing from these areas.		About 52000 houses were damaged or partially damaged due to the gale winds & heavy rains. Severe damage to roads, electric poles & telecommunications.	Crops of about 2 million hectares area were badly damaged.	
25-11-1995	DD over SE bay on 22 nd turned to CS afternoon, SCS on 23 rd , SCH at night had landfall over Bangladesh coast near Cox's Bazaar on 25 th noon.					No damages reported in India.
08-05-1996	DD had landfall over Bangladesh-					No reports on damages.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Myanmar coast near Cox's Bazaar on 8 th .					
16-06-1996	DD on 13 th over SW bay turned to CS on 14 th and crossed the coast near Vishakapatnam on 16 th .	Coastal districts of AP reported 68 human deaths. 41 killed in Tamilnadu.		In Andhra, 6000 houses were damaged and estimated loss was Rs. 82 crores. In Tamilnadu, 4 fishing vessels were drowned. Road & railway traffic was badly affected.		
19-06-1996	D at East Central Arabian sea on 17 th turned to DD on 18 th , CS in the evening, SCS at night and had landfall near south Gujarat coast close to Diu on 19 th .	In Gujarat and in Maharashtra respectively 33 and 14 human lives were lost.	In Gujarat 2082 cattle and in Maharashtra 31 cattle heads were perished.	In Gujarat, 161 talukas and 5573 villages were affected.		Estimated max. wind speed was 100 to 120 kmph. and storm surge was 3 to 4 m. above normal.
01-10-1996	D had landfall over South Andhra coast near Ongole on midnight of 1 st .	23 people were reported dead in Andhra due to rains.				
25-10-1996	D on West Central Arabian sea on 21 st turned to DD on 22 nd , Cs on 23 rd ,			11 fishing boats were missing off Veraval port and about 50 boats were stranded in		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	SCS in the evening weakened to CS on 25 th and diffused on 28 th off Gujarat coast.			the high sea due to strong winds.		
28-10-1996	DD on East Central bay on 25 th turned to DD at night and crossed coast near Indo-Bangladesh border on 28 th .	14 lives were lost in West Bengal. 100 fishermen were reported missing off West Bengal coast.		In West Bengal heavy rains caused breaches in embankments and affected 1,60,000 people. Nine fishing trawlers / boats were missing. In Bangladesh 20,000 people became homeless due to inundation.	Paddy crops and many houses were damaged.	Storm surge of 3 m. was reported.
06-11-1996	D over East Central bay on 4 th became DD on 5 th , CS later, SCS on 6 th , SCH later and had landfall over Andhra, south of Kakinada on 6 th .	1058 lost in Andhra. More than 1677 fishermen were missing.		A microwave tower at Kakinada collapsed due to strong winds. Extensive damage to property. 6800 fishing boats were damaged.		Strong winds of speed 150-200 kmph in gusts and tidal waves of 2.6 m. were reported.
06-12-1996	D over SE bay on 28 th Nov. became DD on 29 th , CS on 2 nd Dec., SCH on 3 rd	Did not cause any damage to life.				No reports on the damages. Unique event in the sense that

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	evening, weakened to SCS on 4 th and had landfall over Tamilnadu coast on 6 th .					the system has made two loops in its path before landfall.
19-05-1997	DD over south bay on 15 th turned to CS on 16 th , SCS on 17 th , SCH on 18 th and had landfall over Bangladesh coast near Sitakundu on 19 th .	In Bangladesh, 155 people were killed.		In Bangladesh 1,12,160 houses were fully damaged. Roads & other communications got badly affected.		Did not cause any damage in India. Lowest pressure recorded was 965 mb and max. wind was 126 kt.
27-06-1997	D over north bay on 26 th turned DD and had landfall near north Orissa – South West Bengal coast on 27 th .			500 houses were washed away. More than 40,000 people were rendered homeless due to breaches in the embankment. Due to heavy rains and flood normal life was disrupted. Many highways in West Bengal were blocked.		
30-07-1997	D over north bay on 29 th turned to DD on					The system did not cause any

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	30 th and had landfall over north Orissa coast near Chandbali in the evening.					damage.
05-08-1997	D over north bay on 4 th turned to DD on 5 th and had landfall over West Bengal coast near Sagar Islands in the afternoon.					Did not cause any damage.
20-08-1997	DD over NW bay on 20 th crossed north Orissa coast between Paradip and Chandbali in the afternoon of 20 th .	12 people died due to heavy rains & floods in Orissa.				
28-08-1997	D had landfall over Orissa coast between Paradip and Puri on 28 th .					No reports on damages.
27-09-1997	D on West Central bay on 23 rd turned to DD in the evening, CS on 24 th evening,	32 human lives lost in Andhra.	326 cattle were lost.	39 breaches to tanks and 1470 houses damaged.		

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	SCS a few hours later, weakened to CS still later and crossed Bangladesh coast near Hatia on 27 th .					
04-11-1997	CS over north Andaman sea on 4 th weakened to DD on 9 th and diffused.					Did not cause any damage.
20-05-1998	D over central bay on 17 th turned to DD on 18 th , CS on the same day, SCS on 19 th crossed the coast of Bangladesh on 20 th .					Did not cause any damage over India. Widespread rains over NE states of India.
09-06-1998	D on Lakshadweep sea on 4 th turned to DD later, CS on 5 th , SCS on 6 th , VSCS on on 7 th and had landfall over Gujrat coast near Porbandar on 9 th morning.	In Gujrat, 1173 lives were lost with another 1174 missing.		More than 2.5 lakh houses have been destroyed or damaged. The total extent of damage to the state of Gujrat was of the order of Rs. 190 crores.		Estimated core pressure and max. wind were 962 mb and 98 kt. respectively.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
14-06-1998	D over Central bay on 13 th turned to DD in the evening and had landfall over north Andhra coast near Vishakapatnam on 14 th .					No report on damages.
14-10-1998	D on West Central bay on 13 th turned to DD and had landfall near Narasapur on 14 th .	101 human lives were lost in Andhra.			50 villages got submerged and crops in thousands acres of agricultural land got damaged.	Andhra Govt. declared a total loss of Rs. 600 crores.
17-10-1998	D over SE Arabian sea on 11 th turned to DD on 12 th , CS on 16 th and had landfall near Veraval on 17 th morning.					No reports on damages.
29-10-1998	D over SE bay on 26 th turned to DD on 27 th and dissipated near 300 km. southeast of Machilipatnam.				Paddy, Sugar, Cotton crops submerged in water in all the coastal districts of Andhra.	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
15-11-1998	DD over south bay on 14 th turned to CS later, SCS on 15 th , VSCS after a few hours and crossed north Andhra coast just south of Vishakapatnam on 15 th evening.	16 people lost their lives in Vishakapatnam.		Thousands of houses got damaged and about 28000 families were affected in Vishakapatnam district.		Gale winds of 76 kt. were reported. Damage to the property worth of Rs. 306 crores was reported.
22-11-1998	D over Andaman sea on 19 th turned to DD in the evening, CS on 20 th , SCS on 21 st , VSCS later in the evening and had landfall over West Bengal coast between Sagar Island & Sundarban area of West Bengal on 22 nd noon.			Uprooted trees & electric poles. Parts of Sagar Island submerged & affected 25,000 people in eight villages and 3,000 mud houses were collapsed. Lakh of people were affected in 24-Paraganas & Midnapore districts.	Caused damage to crops.	Estimated core pressure and max. wind were 984 mb and 80-100 kmph respectively.
16-12-1998	D over SE Arabian sea on 13 th turned to CS in the evening, SCS on 14 th , weakened to CS on					Did not cause any damage over India.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	15 th and DD on 16 th and dissipated.					
03-02-1999	D over SE bay on 1 st turned to DD on 2 nd , CS at night, weakened to DD on 3 rd and dissipated.					No damages reported. Did not cross the coast.
20-05-1999	D on Lakshadweep sea on 16 th turned to CS on 17 th , SCS after 6 hrs, VSCS on 18 th and crossed Pakistan coast about 80 km. west of Naliya on 20 th .	453 persons (most of them were fishermen) lost their lives in Jamnagar, Mehsana & Kutch districts.	50448 cattle were lost.	More than 4,500 houses were damaged.		Estimated core pressure and max. wind were 946 mb and 102 kt. A storm surge of 2.5 m above the normal tide was reported.
17-06-1999	D over NW bay on 17 th turned to DD had landfall near Gopalpur on 17 th at night.	5 fishermen were missing in coastal districts of Andhra Pradesh.				
28-07-1999	D over NW bay on 27 th turned to DD in the evening and had landfall over West Bengal–Orissa coast on 28 th morning.					No report on losses.

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
07-08-1999	D had landfall over West Bengal coast near Digha on 7 th .					No report on losses.
17-10-1999	D over north Andaman sea on 15 th turned to CS on 16 th , SCS at night became a VSCS on 17 th and had landfall over Orissa coast near Gopalpur.	197 died in West Bengal.	More than 8,300 cattle were lost.	400 houses got damaged.	Crops over thousand hectares of land were damaged.	Storm surge of height 2 to 2.5 m. was reported.
29-10-1999	D over north Andaman sea on 25 th turned to CS on 26 th , SCS on 27 th , VSCS at night, became a Super CS on 28 th and had landfall over Orissa coast near Paradip on 29 th .	<u>In Orissa :</u> 9887 human lives lost and 40 missing. 2507 persons were injured. <u>In West Bengal :</u> 2 children died.	<u>In Orissa :</u> 4.44 lakh of livestock perished.	<u>In Orissa :</u> 16.49 lakh houses were damaged. 9085 fishing boats were lost. 22143 fishing nets were lost. Caused severe damage in 12 districts of Orissa state where all essential services were cut off. 129.22 lakh population were affected. 14643 villages were affected. <u>In West Bengal :</u> 10,000 people were	<u>In Orissa :</u> 18.42 lakh hectares of crop area affected.	Estimated core pressure and max. wind were 912 mb and 140 kt. respectively. After recording 80 kt. Paradip anemometer went out of order. A storm surge of 9 m. above normal tide and tidal inundation of 35 km. from the

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
		50 persons were missing.		affected. 100 houses were damaged.		coastal line were reported. Very heavy rainfall was observed at many places, ex: 43 cm. at Bhubaneshwar.
29-05-2000	D over SE bay on 27 th turned to DD on 29 th , CS in the evening and dissipated over sea.					No damage to life & property was reported.
23-08-2000	D over west central bay on 23 rd crossed north Andhra coast near Kakinada by midnight.	131 lost in central parts of Andhra. 98079 people were evacuated and kept in 189 relief camps.	About 5368 cattle were lost.	About 8651 houses were fully damaged, 27026 were partially damaged in 2886 villages/towns. 7435 km length of road was damaged. 1578 irrigation tanks were breached. 902 power transformers, 787 distribution transformers and 28 sub-stations were damaged. 225 and	An estimated 1,77,987 hectares of paddy and other crops were damaged.	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				6000 numbers of 33KV lines and 11 KV lines respectively, were damaged. Total estimated loss reported by Govt. of Andhra Pradesh was Rs. 776.75 crores.		
17-10-2000	D over west central bay on 15 th turned to DD at night, CS on 17 th and diffused.					No damage of life & property was reported.
28-10-2000	D over east central bay on 25 th turned to DD on 27 th , CS at night and crossed Bangladesh coast, east of Sagar Island on 28 th .	One child was injured in north 24 paraganas districts.	Caused loss of a large no. of livestock.	Six of the seven districts of Meghalaya state were affected. Extensive damage to infrastructure and damage to hundreds of houses were reported. Thousands of people were rendered homeless. The preliminary estimate of total damage was of the order of Rs. 60 crores.	Caused damaged to standing crops & plantation.	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
				In Gangetic West Bengal, two irrigation dams and an embankment were damaged. Many mud huts collapsed in south & north 24 Paraganas district.		
29-11-2000	D over SE bay on 26 th turned to DD at night, CS on 27 th , SCS on 28 th , VSCS after 6 hours and crossed north Tamilnadu coast near Cuddalore on 29 th .	10 persons in Tamilnadu and 2 in Pondicherry lost their lives.		Partial damage to more than 1000 kucha houses & 14 brick houses. Estimated loss in Cuddalore district was Rs. 20 crores. Total loss estimated in Pondicherry was Rs. 50 crores.	100 acres of Sugarcane, 30000 plantain trees, 50000 plantain saplings got destroyed in Tamilnadu.	Estimated core pressure and max. wind were 978 mb and 110-120 kmph respectively.
28-12-2000	D over south bay on 23 rd turned to DD on 24 th , CS on 25 th , SCS at night, VSCS on 26 th and crossed the Sri Lanka coast and emerged in Gulf of Mannar.		3 cattle in Tuticorin and 2 in Tirunelveli were lost.	350 houses in Ramanathapuram district, 162 houses (16 fully and 146 partially) in Tirunelveli district and 318 houses in Tuticorin district (65 fully & 253	281 hectares of Paddy crops, 650 hectares of plantain and 80 hectares of Petal crops were lost in Tuticorin.	

ANNEXURE -III

Date	Description of the meteorological event	Loss of		Property loss		Remarks
		Human lives	Livestock	Infrastructural	Agricultural	
	Weakened to SCS on 27 th evening and CS at night and crossed Tamilnadu coast south of Tuticorin on 28 th in the early hours.			partially) were damaged. 95 fishing boats were lost in Tuticorin district.		