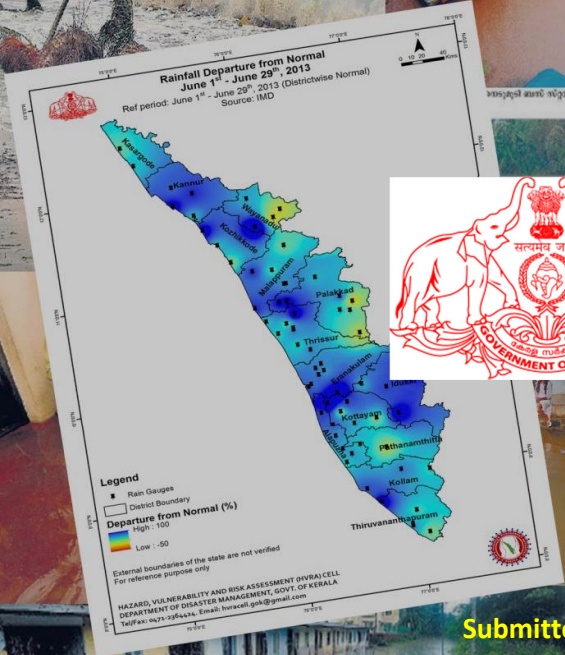


# Preliminary Memorandum

## Monsoon Calamity Losses

1 June to 1 July 2013



Submitted by  
State Relief Commissioner & Secretary  
Department of Revenue and Disaster Management  
Government of Kerala

4-07-2013

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# 1. Situation Assessment

## 1.1. Introduction

Monsoon preparedness in the State of Kerala began with the long range forecast of the monsoon issued by the Indian Meteorological Department on 26<sup>th</sup> April 2013. In its forecast the IMD indicated that

*“Southwest monsoon seasonal rainfall for the country as a whole is most likely to be Normal (96-104% of Long Period Average (LPA)) with the highest probability of 46%. The probability (27%) of seasonal rainfall to be below normal (90-96% of LPA) is also higher than its climatological value. However, the probability for the seasonal rainfall to be deficient (below 90% of LPA) or excess (above 110% of LPA) is relatively low (10% and 3% respectively). Quantitatively, the monsoon seasonal rainfall is likely to be 98% of the LPA with a model error of  $\pm 5\%$ .”*

This prediction was not very promising for Kerala’s situation given the fact that the State was suffering from severe drought when this prediction of IMD was released. The situation that was created by the drought (historic low in all major reservoirs and alarmingly low ground water levels) which began in August 2012 had already pushed the State exchequer and the State Disaster Response Fund to its limits. The drought situation and the interim intense rainfall in few parts of Kerala had depleted the funds substantially and the Government of Kerala had approached the Government of India with three separate memoranda seeking central assistance for drought relief (dated 31-10-2012 & 23-02-2013) and landslide and flood losses (dated 17-09-2012).

While decision is still awaited on these memoranda, the Government of Kerala is presently forced by the calamity situation caused by intense and excessive monsoon rainfall to approach Government of India again with a memoranda seeking assistance to tide over the compounding financial burden caused by the historic drought of 2012-13 and the on-going excessive monsoon rainfall and related calamity.

Given the prediction of ‘normal monsoon’ by IMD the Government was preparing for facing a normal monsoon. IMD declared onset of monsoon on 1<sup>st</sup> June 2013 and from that date onwards the State was lashed by heavy rainfall. On contrary to the prediction by IMD, the monsoon exceeded expected limits. This resulted in landslides and floods in several

districts of the State and consequently heavy loss to life and property. Beach loss and coastal flooding caused significant damages across the coastline of the State. Floods caused several villages to be evacuated and housed in relief camps. Many more were moved to the houses of relatives by the respective district administration.

As the State Governments machinery could not cope with the disastrous situation the National Disaster Response Force and the Coast Guard was pressed into service. Thus the events that occurred in Kerala since 1 June 2013 qualifies to be **disasters** as they *exceeded the ability of the 'affected people (the State Government)' to cope using their own resources*. This document provides a detailed report of the damages that occurred to life and property in the State due to landslides and floods during the South West Monsoon season of 2013.

## 1.2. Monsoon preparedness of the State

Anticipating a normal monsoon, the State government undertook the following preparedness measures.

Sl. No	Action taken	GO/UO note/Letter No. & date
1	Special Cabinet on drought and monsoon calamity – reviewed the drought situation and evaluated the monsoon predictions of IMD	30 April 2013
2	A list of activities recommended for mitigating monsoon calamities, prepared by the Hazard, Vulnerability and Risk Assessment Cell, Department of Disaster Management, was communicated to the Government	HVRA/Proj/94/2012 dated 07-05-2013
3	As per the recommendation of HVRA Cell, DMD department recommended to Secretary, LSGD to convene a meeting of all LSG heads to coordinate with District Administration	Ltr. No. 23410/K1/2013/DMD dated 15-05-2013
4	Head (Scientist), HVRA Cell appointed as State Nodal Officer for Monsoon Calamity data collection and memorandum preparation	GO (Rt) No. 2834/2013/DMD dated 20-05-2013
5	As per the recommendation of HVRA Cell, Office of KSDMA was instructed to ensure proper functioning of the VHF control rooms under Revenue department, across the state	Ltr. No. 23410/K1/2013/DMD dated 23-05-2013
6	As per the recommendation of HVRA Cell, Dept. of Health was instructed to stock enough	UO Note. 23410/K1/2013/DMD dated

	medicines in all PHC and Health Care Centres to tackle wet period epidemics	23-05-2013
7	As per the recommendation of HVRA Cell, Dept. of Food and Civil Supplies was instructed to stock rice (100 kgs), cereals (two kinds; 20 kg each), cooking oil (10 ltrs) & kerosene (75 ltrs) per taluk & the provisions shall be made available to any location within the district as per the direction of the District Collector. Additional supplies also may be arranged in case of further necessity in short notice.	UO Note. 23410/K1/2013/DMD dated 23-05-2013
8	Secretary, Revenue and Disaster Management as State Relief Commissioner convened the statutory pre-monsoon meeting with departments	Held on 27-05-2013
9	Direction sent to all District Collectors to furnish daily natural calamity report via email to Revenue Department and HVRA Cell and instructed them to open district level control rooms in wake of any emergency	Ltr. No. 30816/K2/2013/DMD dated 03-06-2013
10	Based on the recommendation of HVRA Cell, DM department released an amount of Rs. 6.24 crores from SDRF to District Collectors for meeting the requirements of South West Monsoon 2013	GO (Rt) No. 3248/2013/DMD dated 07-06-2013
11	Minutes of the pre-monsoon meeting issued as circular to District Collectors and directed them to ensure strict compliance to the same	23410//K1/2013/DMD dated 13-06-2013
12	Special Cabinet for assessing Monsoon Calamity loss	20-06-2013
13	Video conference of Honb'le Chief Minister and Honb'le Minister for Revenue with all District Collectors to assess Monsoon Calamity <ul style="list-style-type: none"> <li>• Honb'le Chief Minister directed Ministers in-charge of each districts to convene urgent meeting of People's Representatives and Officials for monsoon calamity management in the respective districts</li> <li>• Monsoon calamity memorandum to be submitted to Government of India by 2<sup>nd</sup> week July</li> </ul>	21-06-2013
14	Letter requesting free ration allocation from Central Govt. sent to Minister of Food and Civil Supplies by Honb'le Chief Minister – Requested for 5900 metric tonnes of rice and 657 metric	21-06-2013

	tonnes of wheat for two weeks free rationing at BPL rates	
15	Letter informing the calamity situation sent by Secretary, R & DM to Member, NDMA; Secretary, MHA & Secretary, NDMA	21-06-2013
16	Government decided the following and issued Government Order <ul style="list-style-type: none"> <li>• Rs. 2000/- as lump-sum grant for each family in the relief camp</li> <li>• Rs. 1,00,000/- for fully damaged houses and houses certified as unsafe</li> <li>• Ex-gratia for adults – Rs. 2 lakhs</li> <li>• Ex-gratia for children – Rs. 1.5 lakhs</li> <li>• Rock and soil quarrying to be banned until another order</li> <li>• Interim assistance for cremation of dead bodies – Rs. 10,000/-</li> <li>• District Collectors empowered to declare holiday for schools if they deem necessary</li> </ul>	GO (Ms) 270/2013/DMD dated 21-06-2013
17	Rs. 27.59 crs was distributed to all districts from SDRF	GO (Rt) No. 3614/2013/DMD dated 25-06-2013
18	Rs. 5 crs was distributed from SDRF to Alappuzha district considering severe flooding in the district	GO (Rt) No. 3705/2013/DMD dated 29-06-2013

<b>Highlights of the pre-monsoon meeting (27-05-2013) decisions</b>	
<b>Sl. No</b>	<b>Decision</b>
1.	The pre-monsoon meeting recommended to Department of Local Self Government to accord permissive sanction to Grama Panchayaths, Municipalities and Corporation to apportion at least Rs. 5000/- per grama panchayath wards, Rs. 10,000/- per municipal corporation wards and Rs. 15,000/- per city corporation wards from their own funds as ' <b>ward calamity response fund</b> '. This fund may be used for ensuring immediate response to any calamities that may occur in the respective ward. This was to ensure that grass root level public participation and accountability will be ensured in disaster response and risk reduction.
2	District Collectors shall <ol style="list-style-type: none"> <li>a) To place warning sign boards along landslide and flash flood prone stretches of Ghat roads in consultation with the district officers of PWD. The sign board should advise public not to stop along rivulets and culverts in the Ghat roads during rainy period.</li> <li>b) To place warning sign boards along river banks indicating probability of flash floods and in the banks near to which whirlpools (chuzhi) and deep pits due to sand extraction exists in consultation with respective local self-governments and Irrigation.</li> </ol>

	c) To place warning sign boards along coastline deemed necessary indicating high wave probability in consultation with District Police, District Officer of Harbour Engineering Department and Irrigation.
3	District Collectors are empowered to stop <b>quarry blasting temporarily</b> if rainfall persists in a village for more than 2 days, if such a ban is deemed necessary by the respective District Collector. The ban should be in place until 24 hrs rain free day occurs, after which the blasting may resume with the written concurrence of the District Officer of the Mining and Geology Department. This power shall be accorded to the District Collector from 1 <sup>st</sup> June to 31 <sup>st</sup> December 2013, in light of the possibility of quarry blasting leading to rock fall accidents in the quarry and triggering of debris flows (Urul Pottal) in areas adjoin such quarry.
4	District Collectors may through suitable departments, drain polluted water in abandoned quarry and prepare such quarry ponds for holding fresh water
5	Harbour Engineering Department shall be directed to collect GPS based information regarding the sea wall stretches that are damaged and supply this information same to respective District Collectors and HVRA Cell
6	PWD shall be directed to clean parallel drains and culverts along the Ghat roads for ensuring smooth flow of water

### 1.3. Monsoon calamity – 1 June 2013 to 30 June 2013

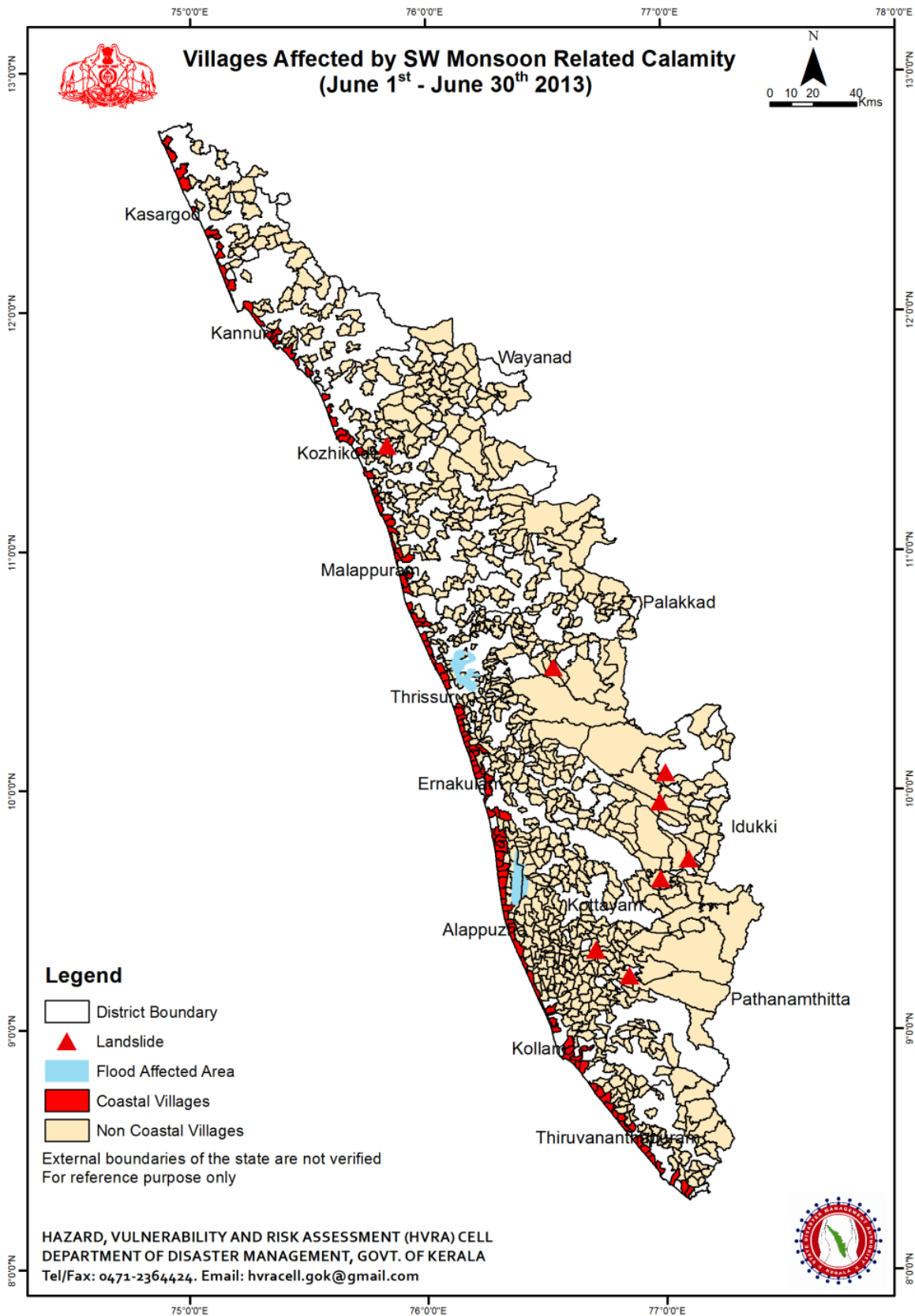
Figure 1 shows some photographs depicting damages due to the on-going monsoon calamity in Kerala. A total of 891 villages (134 coastal and 757 non-coastal) villages have so far been affected by monsoon calamity. Figure 2 shows the villages affected by monsoon calamity (landslide, floods and/or windfall) from 1<sup>st</sup> June to 30 June 2013. It may be noted that almost the entire coastline of Kerala which is one of India's most densely populated belt has been affected by the severity of the on-going monsoon.

Landslides were reported from four districts namely Kozhikode, Palakkad, Idukki and Pathanamthitta. Flood situation is still prevailing in the Kuttanad region of Alappuzha district and the Kol lands of Thrissur district particularly given the on-going heavy discharge from the rivers that drains in to these paddy cultivated area.

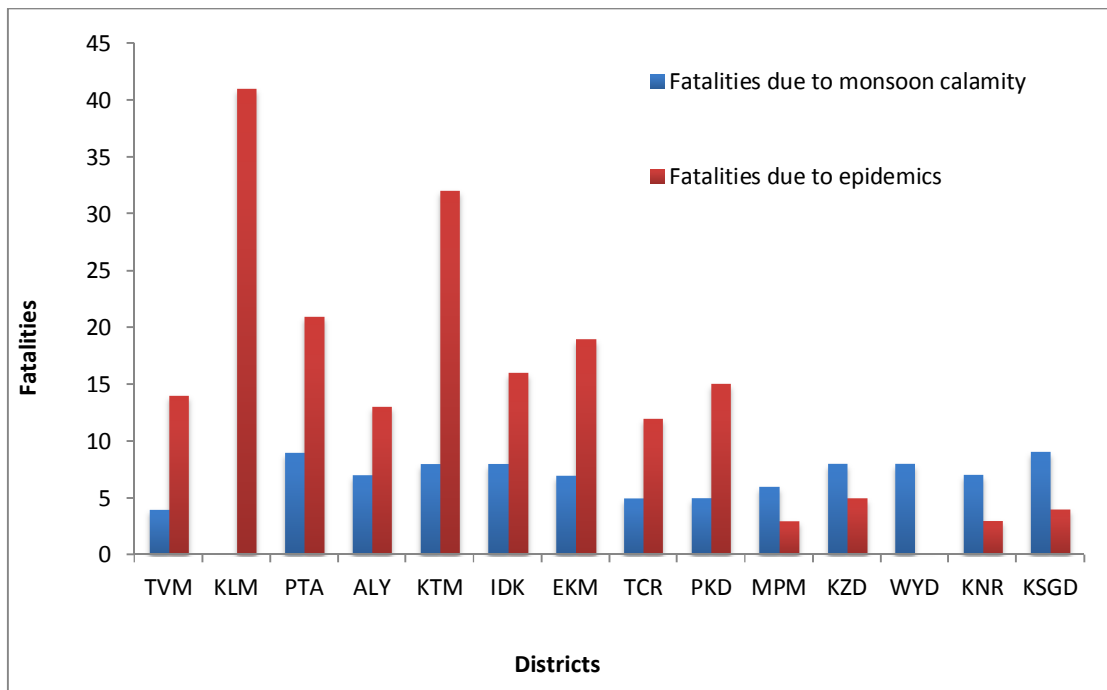
Ninety one (91) valuable lives have been lost till 1 July 2013 directly due to monsoon calamity namely drowning in flood waters, windfall and landslips. Unlike previous years as the monsoon succeeded a severe drought situation, several epidemics also set in which caused numerous fatalities. Figure 3 shows district wise details of fatality due to monsoon calamity (reported by District Collector) and epidemics (collected from media reports).







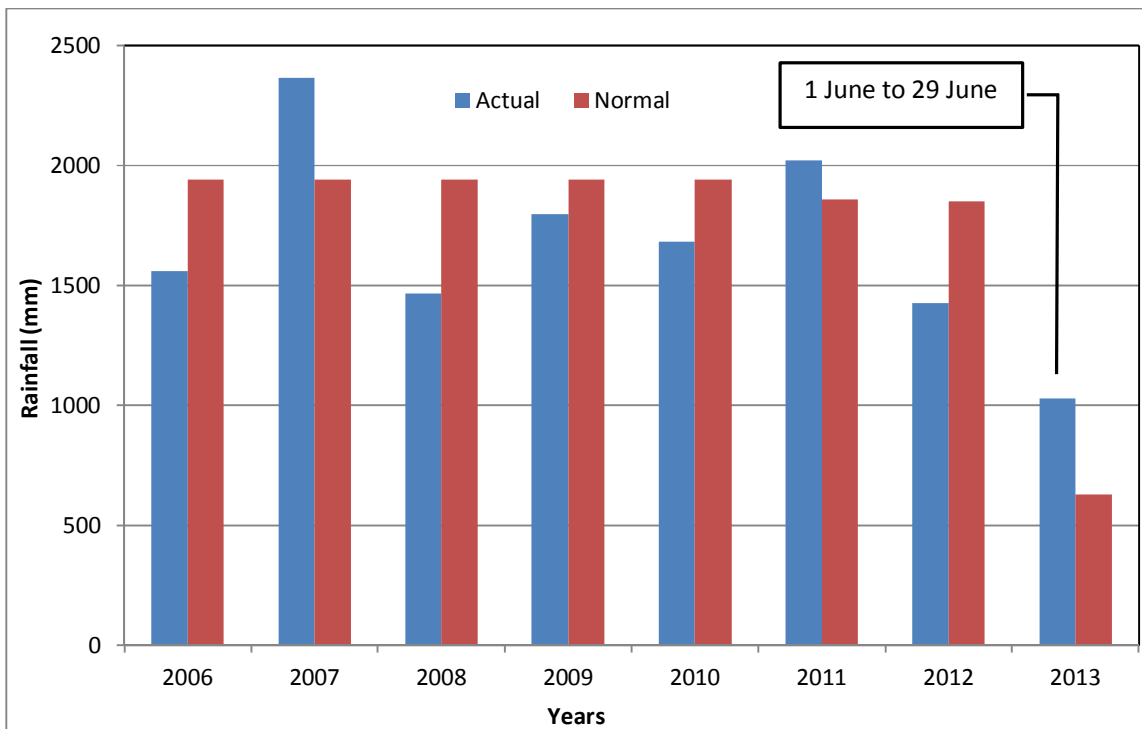
**Figure 2: Villages affected by Monsoon Calamity from 1 June 2013 to 1 July 2013**



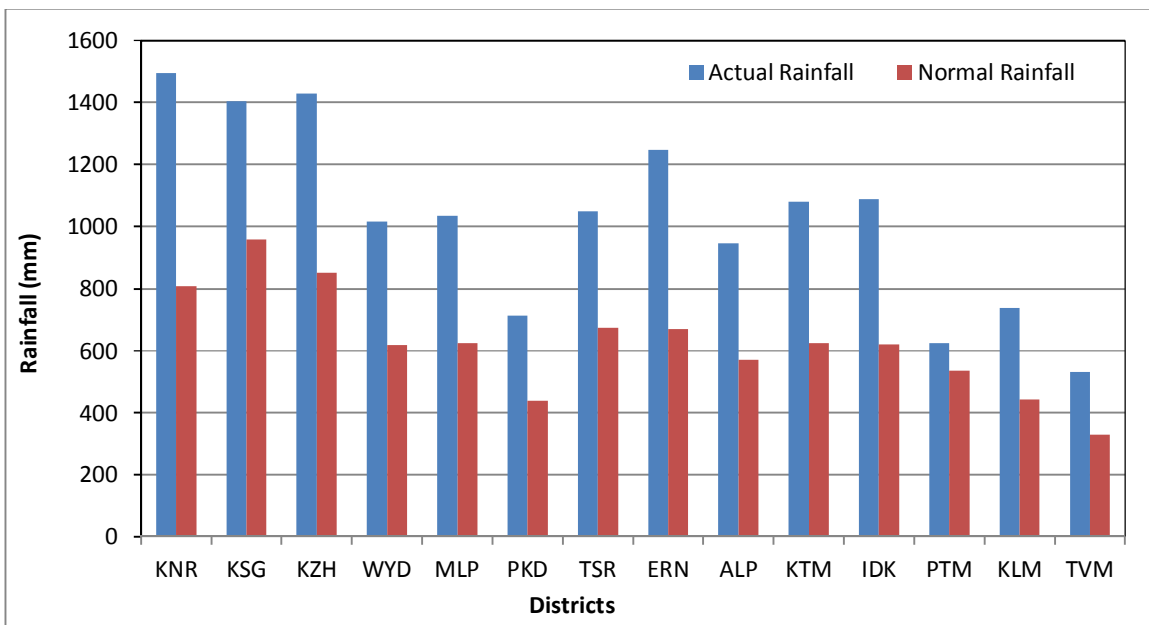
**Figure 3: Details of fatalities due to monsoon calamity (based on reports from District Collectors) and epidemics (based on media reports) from 1 June 2013 to 1 July 2013**

#### 1.4. Rainfall – 1 June to 1 July 2013

Figure 4 shows the comparison of actual and expected (normal) rainfall for the current and the preceding 7 years as per IMD data. From the figure it is evident that the state received almost of 150% excess rainfall in the very first month of South-West Monsoon. The intra-state variability of rainfall in Kerala is very high; instantaneous rainfall at 1000 m above mean sea level can be 150% higher than at 40 m above MSL. Figure 5 shows the district wise actual and expected (normal) rainfall from 1 June 2013. Figure 6 shows instances of cloud cover (INSAT Satellite Images) over Kerala from 1 June 2013 to 1 July 2013. The thick clouds covering the entire state indicate the intense nature of South West Monsoon and this intense of monsoon activity was confirmed by IMD. It is evident from Figure 5 and 6 that Kerala is experiencing excessive rainfall which is the reason for the high rate of calamity in the State.



**Figure 4: Rainfall from 1 June to 29 July 2013 in comparison with the South-West Monsoon rainfall of 2006 to 2013 (Data source: IMD)**



**Figure 5: District wise actual and expected rainfall of 2013 (1 June to 29 June) (Data source: IMD)**

Table 2 compiles the actual and expected (normal) rainfall received from 1<sup>st</sup> June 2013 to 1 July 2013 in the rainfall stations monitored by IMD. Figure 7 shows the percentage of excess rainfall across the State as derived from the stations monitored by IMD. It is evident from the available rainfall figures that the monsoon rainfall has saturated the soil column of Kerala within the 1<sup>st</sup> month of monsoon rainfall. Considering the current trend, if the rainfall intensity and

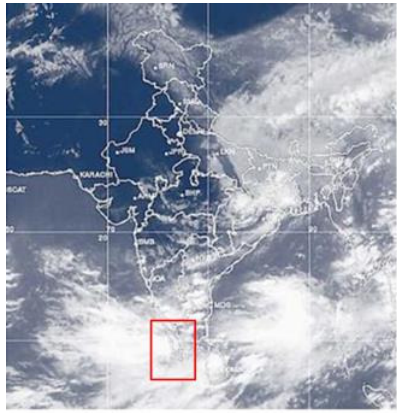
amount remains high in the coming months of the South West Monsoon, the figures of natural calamity is to increase significantly.

**Table 2: Actual and expected rainfall (mm) in the 67 rain gauges across Kerala (Source: IMD)**

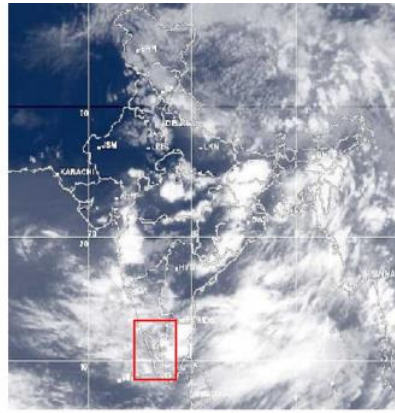
ID	Station	District	Normal RF (mm)	Actual RF (mm)	Departure %
1	Kannur	Kannur	809	1693.8	109
2	Taliparamba	Kannur	809	1455.8	79
3	Thalasserry	Kannur	809	1246.9	54
4	Irikkur	Kannur	809	1585	95
5	Hosdurg	Kasaragod	959	1467	52
6	Kudulu	Kasaragod	959	1342.7	40
7	Kozhikode	Kozhikode	851	1125.4	32
8	Vadakara	Kozhikode	851	1860	118
9	Quilandy	Kozhikode	851	1304.7	53
10	Mananthavady	Wayanad	651	1031.2	58
11	Vythiri	Wayanad	651	1709	162
12	Ambalavayal	Wayanad	651	644.6	-0.98
13	Kuppady	Wayanad	651	676.6	3.93
14	Nilambur	Malappuram	624	851	36
15	Manjeri	Malappuram	624	885	41
16	Perinthalmanna	Malappuram	624	1023.5	64
17	Ponnani	Malappuram	624	1222.3	95
18	Angadippuram	Malappuram	624	1032	65
19	Karipur AP	Malappuram	624	1192.4	91
20	Palakkad	Palakkad	438	754.9	72
21	Mannarkad	Palakkad	438	684.5	56
22	Ottappalam	Palakkad	438	991.2	126
23	Alathur	Palakkad	438	672.2	53
24	Chittur	Palakkad	438	401.4	-8.3
25	Kollengode	Palakkad	438	629.9	43
26	Pattambi	Palakkad	438	924.8	111
27	Thrithala	Palakkad	438	890.1	103
28	Parambikulam	Palakkad	438	481	9.8
29	Thrissur	Thrissur	673	1156.6	71
30	Kodungallur	Thrissur	673	1173.6	74
31	Irinjalakuda	Thrissur	673	994.8	47
32	Vadakkancherry	Thrissur	673	904.2	34
33	Kunnamkulam	Thrissur	673	1019.2	51
34	Chalakudy	Thrissur	673	1113.8	65
35	Enamackel	Thrissur	673	969.8	44
36	Vellanikkara	Thrissur	673	1067.2	58
37	Kochi AP	Ernakulam	669	1245.1	86
38	Aluva	Ernakulam	669	1137	69
39	Piravom	Ernakulam	669	1796.7	168
40	Perumbavur	Ernakulam	669	1059	58
41	CIAL Kochi	Ernakulam	669	1114	66
42	Ernakulam South	Ernakulam	669	1129	68
43	Alappuzha	Alappuzha	571	1031.8	80

44	Kayamkulam	Alappuzha	571	861	50
45	Mavelikkara	Alappuzha	571	929.6	62
46	Cherthala	Alappuzha	571	1061.2	85
47	Mancompu	Alappuzha	571	943.8	65
48	Haripad	Alappuzha	571	923.1	61
49	Chengannur	Alappuzha	571	870.1	52
50	Kottayam	Kottayam	625	980.9	56
51	Vaikom	Kottayam	625	1614.4	158
52	Kumarakom	Kottayam	625	815.1	30
53	Kozha	Kottayam	625	1160	85
54	Kanjirappally	Kottayam	625	834.6	33
55	Peermade	Idukki	620	1371	121
56	Thodupuzha	Idukki	620	969.9	56
57	Munnar	Idukki	620	1345.5	117
58	Idukki	Idukki	620	1163.8	87
59	Thiruvalla	Pathanamthitta	535	624	16
60	Kollam	Kollam	443	813.6	83
61	Aryankavu	Kollam	443	653.4	47
62	Punalur	Kollam	443	745.4	68
63	Trv City	Thiruvananthapuram	329	493.9	50
64	Trv AP	Thiruvananthapuram	329	555.6	68
65	Nedumangad	Thiruvananthapuram	329	478	45
66	Neyyattinkara	Thiruvananthapuram	329	430	30
67	Varkala	Thiruvananthapuram	329	703.7	113

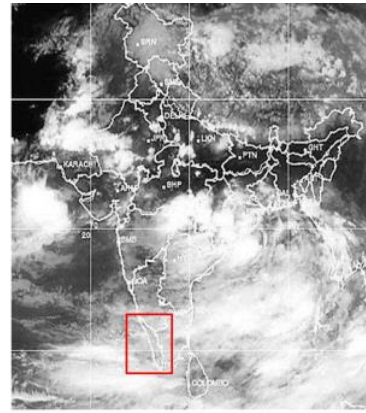
This excessive rainfall has caused significant damage to life and property, the details of which is given in the subsequent chapters.



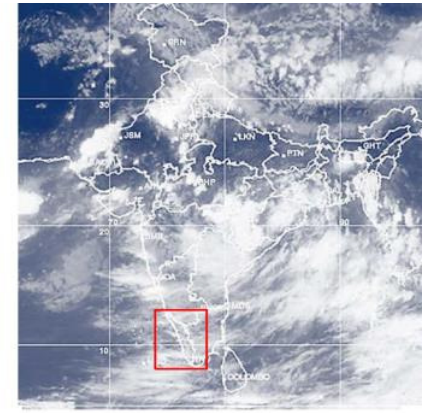
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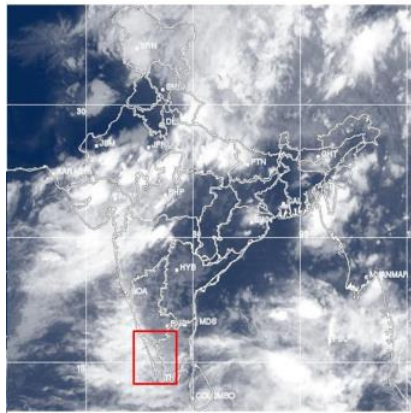
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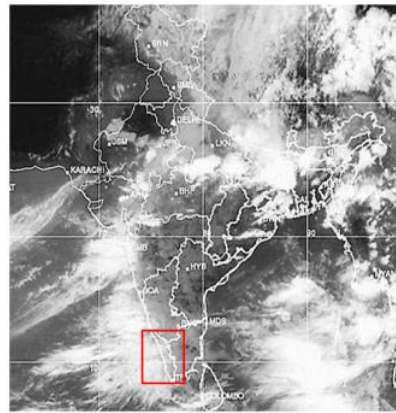
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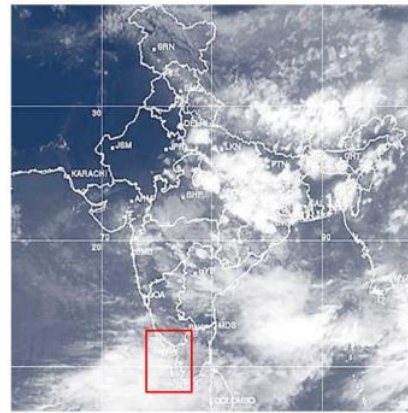
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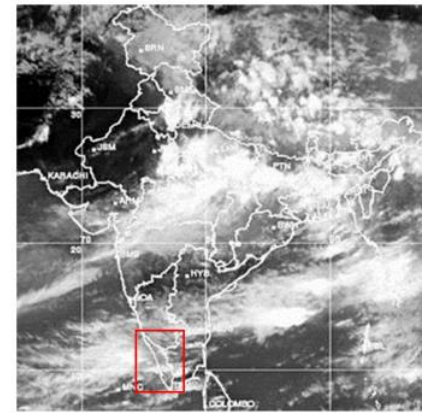
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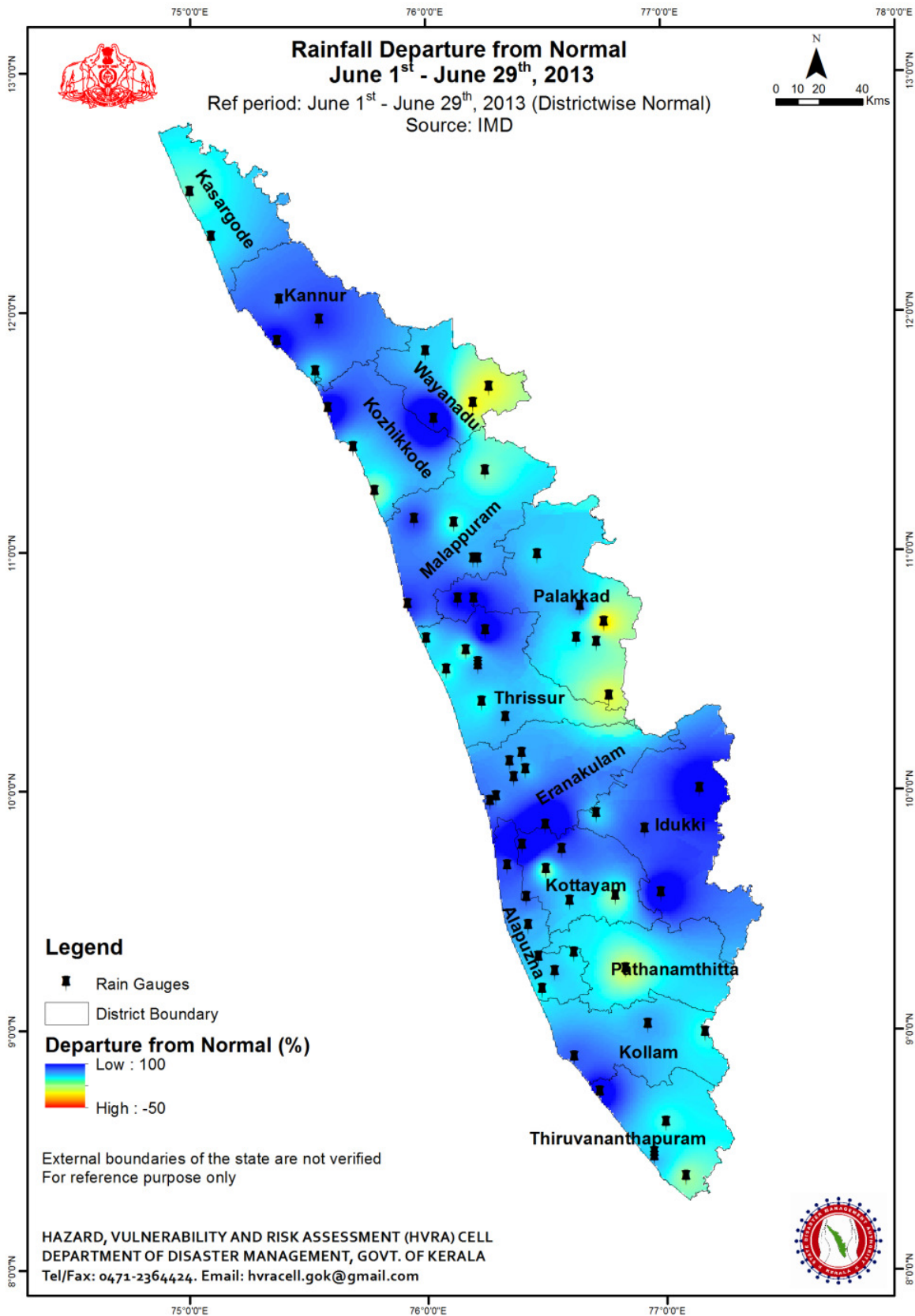


**23.06.2013**



**28.06.2013**

**Figure 6: INSAT pictures from 1 June 28 June 2013 (Source: IMD)**



**Figure 7: Rainfall departure from normal, 1 June 29 June 2013 (Source: IMD)**

## 2. Losses

### 2.1. Human Fatalities

In the heavy rain and landslides that hit the State, 93 lives were lost till 1 July 2013.

Table 3 shows the district wise human fatalities and injuries reported.

**Table 3: District wise human fatalities and injuries**

District	Fatalities		Injuries		Total
	No	Amount	No	Amount	
Thiruvananthapuram	5	7,50,000	0	0	7,50,000
Kollam	0	0	0	0	0
Pathanamthitta	9	13,50,000	0	0	13,50,000
Alappuzha	8	12,00,000	1	9300	12,09,300
Kottayam	9	13,50,000	0	0	13,50,000
Idukki	7	10,50,000	12	55,800	11,05,800
Ernakulam	7	10,50,000	0	0	10,50,000
Thrissur	7	10,50,000	5	15,500	10,65,500
Palakkad	3	4,50,000	0	0	4,50,000
Malappuram	8	12,00,000	39	13,33,300	25,33,300
Kozhikode	8	12,00,000	1	3100	12,03,100
Wayanad	0	0	0	0	0
Kannur	12	18,00,000	5	34,100	18,34,100
Kasargode	10	15,00,000	2	6200	15,06,200
<b>Total</b>	<b>93</b>	<b>1,39,50,000</b>	<b>65</b>	<b>2,57,300</b>	<b>1,42,07,300</b>

### 2.2. Houses damages

A large number of houses were completely or severely damaged. Affected people were accommodated in relief camps. The actual loss to housing sector due to this is inestimable. District wise details of number of houses damaged (fully and partially) with estimated loss is given in Table 4, 5 and 6:

**Table 4: District wise house damage estimates - Pucca**

District	Pucca houses						Total
	FD		SD		PD		
	No	Amount	No	Amount	No	Amount	
Thiruvananthapuram	56	19,60,000	637	22,93,200	709	13,47,100	56,00,300
Kollam	11	3,85,000	227	14,30,100	213	4,04,700	22,19,800
Pathanamthitta	6	21,00,000	213	13,41,900	116	2,20,400	17,72,300
Alappuzha	41	14,35,000	995	62,68,500	1455	27,64,500	1,04,68,000
Kottayam	10	3,50,000	523	32,94,900	272	5,16,800	41,61,700
Idukki	32	11,20,000	351	22,11,300	53	1,00,700	34,32,000



Ernakulam	13	4,55,000	228	14,36,400	283	5,37,700	24,29,100
Thrissur	28	9,80,000	132	8,31,600	331	6,28,900	24,40,500
Palakkad	12	4,20,000	157	9,88,500	71	1,34,400	15,42,900
Malappuram	26	9,10,000	149	9,38,700	274	5,20,600	23,69,300
Kozhikode	13	4,55,000	174	10,96,200	185	3,51,500	19,02,700
Wayanad	19	66,500	572	36,05,100	494	9,38,600	46,10,200
Kannur	17	5,95,000	442	27,84,600	56	1,06,400	34,86,000
Kasargode	27	9,45,000	123	7,74,900	99	1,88,100	19,08,000
<b>Total</b>	<b>311</b>	<b>1,02,86,500</b>	<b>4923</b>	<b>2,92,95,900</b>	<b>4611</b>	<b>87,60,400</b>	<b>4,83,42,800</b>

**Table 5: District wise house damage estimates – Kutcha**

District	Kutcha						Total loss
	FD		SD		PD		
Thiruvananthapuram	604	9060000	184	588800	586	1113400	10762200
Kollam	19	2,85,000	384	12,28,800	79	1,50,100	1663900
Pathanamthitta	2	30000	4	12800	47	89300	132100
Alappuzha	7	105000	298	953600	921	1749900	2808500
Kottayam	Nil	Nil	178	569600	Nil	Nil	569600
Idukki	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Ernakulam	3	45000	9	28800	13	24700	98500
Thrissur	1	15000	Nil	Nil	65	123500	138500
Palakkad	1	15000	Nil	Nil	Nil	Nil	15000
Malappuram	Nil	Nil	18	57600	34	65000	122600
Kozhikode	NIL		158	505600	35	66500	572100
Wayanad	37	555000	131	418800	111	211100	1184900
Kannur	Nil	NIL	4	12800	5	9500	22300
Kasargode	2	30000	Nil	Nil	2	3800	33800
<b>Total</b>	<b>676</b>	<b>10140000</b>	<b>1368</b>	<b>4377200</b>	<b>1898</b>	<b>3606800</b>	<b>18124000</b>

**Table 6: District wise house damage estimates - Huts**

District	Number	Amount
Thiruvananthapuram	15	37,500
Kollam	13	32,500
Pathanamthitta	1	2500
Alappuzha	155	3,87,500
Kottayam	0	0
Idukki	0	0
Ernakulam	0	0
Thrissur	28	70,000
Palakkad	0	0
Malappuram	0	0

Kozhikode	0	0
Wayanad	52	1,30,000
Kannur	0	0
Kasargode	0	0
<b>Total</b>	<b>264</b>	<b>6,60,000</b>

**Table 7: District wise house damage estimates - Total**

District	Total loss
Thiruvananthapuram	1,64,00,000
Kollam	39,16,200
Pathanamthitta	19,06,900
Alappuzha	1,36,64,000
Kottayam	47,31,300
Idukki	34,32,000
Ernakulam	25,27,600
Thrissur	26,49,000
Palakkad	15,57,900
Malappuram	24,91,900
Kozhikode	24,74,800
Wayanad	59,25,100
Kannur	35,08,300
Kasargode	19,41,800
<b>Total</b>	<b>6,71,26,800</b>

### 2.3. Agriculture damages

The floods, windfall and landslides have caused severe damages to crops in the affected areas. Rivers were in-spate and it breached banks at many places, inundating low-lying areas resulting in crop damage, apart from that caused by the landslides. The details of district wise crop losses are given in Table 8:

**Table 8: District wise agricultural damages (Details provides as Annexure 3)**

District	>50% crop loos extent (ha)	Loss (Rs. in lakhs) as per norms
Thiruvananthapuram	116.43	7,60,000
Kollam	152.06	8,23,500
Pathanamthitta	354.6	25,78,600
Alappuzha	2199.2	1,31,64,500
Kottayam	1003.1	60,31,200
Idukki	233.8	17,12,600
Ernakulam	129.95	7,75,000
Thrissur	170.34	10,31,600
Palakkad	194.59	11,79,100
Malappuram	89.47	5,78,300

Kozhikode	366.87	26,04,800
Wayanad	628.17	34,00,700
Kannur	66.57	4,38,300
Kasargode	105.08	7,89,400
<b>Total</b>	<b>5810.2</b>	<b>3,58,72,200</b>

### 3. Relief and recovery

#### 3.1. Relief camps and medical care

Several camps were opened in all except 3 districts during the period accommodating around 2,09,521 people including women and children. Details of camps are shown in Table 9:

**Table 9: District wise cost of relief camps**

District	No. of Camps	Cost (Rs.)
Thiruvananthapuram	7	19,04,000
Kollam	0	0
Pathanamthitta	34	16,20,000
Alappuzha	492	24,96,86,255
Kottayam	71	44,56,000
Idukki	5	5,51,256
Ernakulam	21	23,06,421
Thrissur	39	15,79,000
Palakkad	0	0
Malappuram	1	10,800
Kozhikode	5	1,91,240
Wayanad	39	15,06,085
Kannur	1	32,900
Kasargode	0	42,880
<b>Total</b>	<b>715</b>	<b>26,38,86,837</b>

#### 3.2. De-silting of agricultural land

Kannur district which faced heavy floods incurred losses due to siltation of agricultural land. Table 10 shows the area affected and the cost incurred for de-silting the agricultural land area.

**Table 10: District wise cost of de-silting of agricultural land (@Rs. 8100/ha)**

District	Area (ha)	Cost (Rs.)
Thiruvananthapuram	0	0
Kollam	1310	1,06,11,000
Pathanamthitta	154	12,47,400
Alappuzha	2504	2,02,82,400
Kottayam	1038	84,07,800
Idukki	1000	81,00,000
Ernakulam	85	6,88,500

Thrissur	130	10,53,000
Palakkad	227	18,38,700
Malappuram	84	6,80,400
Kozhikode	145	11,74,500
Wayanad	129	10,44,900
Kannur	14	1,13,400
Kasargode	247	20,00,700
<b>Total</b>	<b>7067</b>	<b>5,72,42,700</b>

### 3.3. Debris clearance

The events caused extensive debris accumulation in households and public area. Table 11 shows the first estimate of the foot print area to be cleared of debris accumulation from the flood and landslide events.

**Table 11: District wise cost of debris clearance from households and public area**

District	Area (ha)	Cost (Rs.)
Thiruvananthapuram	0	0
Kollam	0	0
Pathanamthitta	0	0
Alappuzha	8000	79,96,50,000
Kottayam	1000	1,00,08,000
Idukki	38.06	4,04,62,000
Ernakulam	0	0
Thrissur	7.5	1,95,00,000
Palakkad	0	0
Malappuram	0	0
Kozhikode	25	5,00,89,000
Wayanad	0	0
Kannur	580	9,05,94,500
Kasargode	5	57,84,450
<b>Total</b>	<b>9655.56</b>	<b>101,60,87,950</b>

### 3.4. Debris clearance – agricultural land

As detailed in Section 3.2, 7063 ha of land was damaged due to the events. Debris was accumulated over most of the affected area; earth removers and manual labour was used for the removal of the same. Table 12 shows the area affected and the cost incurred for debris clearance from the affected agricultural land area. It may be noted that the floods hit hard at the beginning of the cropping season and a lot of crop seedling were inundated, the loss of which cannot be valued yet.

**Table 12: District wise cost of debris clearance from agricultural lands**

District	Area (ha)	Cost (Rs.)
Thiruvananthapuram	0	0
Kollam	0	0
Pathanamthitta	0	0
Alappuzha	4000	39,98,25,000
Kottayam	500	50,04,000
Idukki	19.03	20,23,1000
Ernakulam	0	0
Thrissur	3.75	97,50,000
Palakkad	0	0
Malappuram	0	0
Kozhikode	12.5	2,50,44,500
Wayanad	0	0
Kannur	0	0
Kasargode	0	0
<b>Total</b>	4535.28	45,98,54,500

### 3.5. Draining of flood water

Severe flooding conditions prevailed in many parts of the State. Flood water draining using pump sets was required at many locations in Alappuzha and Thrissur districts. Table 13 shows the cost incurred for flood water draining.

**Table 13: District wise cost of draining flood water**

District	Number of pump sets operated (No of days)	Cost (Rs.)
Thiruvananthapuram	0	0
Kollam	0	0
Pathanamthitta	0	0
Alappuzha	87 (12 days)	2,20,00,000
Kottayam	5 (5 days)	80,00,000
Idukki	0	0
Ernakulam	0	0
Thrissur	40 (10 days)	1,10,00,000
Palakkad	0	0
Malappuram	0	0
Kozhikode	0	0
Wayanad	0	0
Kannur	0	0
Kasargode	0	0
<b>Total</b>	132 (27 days)	4,10,00,000

### 3.6. Funeral and burial of the dead bodies

Ninety one individuals perished in the monsoon calamities in the State. Table 14 shows the cost incurred for the funeral and burial of the dead bodies.

**Table 14: District wise cost of funeral and burial of dead bodies**

District	Fatalities	Cost (Rs.)
Thiruvananthapuram	5	50,000
Kollam	0	0
Pathanamthitta	9	90,000
Alappuzha	8	80,000
Kottayam	9	90,000
Idukki	7	70,000
Ernakulam	7	70,000
Thrissur	7	70,000
Palakkad	3	30,000
Malappuram	8	80,000
Kozhikode	8	80,000
Wayanad	0	0
Kannur	12	1,20,000
Kasargode	10	1,00,000
<b>Total</b>	<b>93</b>	<b>9,30,000</b>

### 3.7. Search and rescue

As the State's machinery was not sufficient to cope with the situation, central forces such as NDRF and Coast Guard, and other voluntary forces had to be pressed into service in addition to the Fire and Rescue Services and the Kerala Police. Table 15 shows the cost incurred for search and rescue in the affected area.

**Table 15: Cost (in Rs.) incurred for search and rescue measures**

District	Cost (Rs.)
Thiruvananthapuram	2,00,000
Kollam	0
Pathanamthitta	0
Alappuzha	530000
Kottayam	260000
Idukki	1,00,000
Ernakulam	2,00,000
Thrissur	50,000
Palakkad	0
Malappuram	60,000
Kozhikode	0

Wayanad	96500
Kannur	100000
Kasargode	0
Total	15,96,500

### 3.8. Repair/restoration of damaged infrastructure

Losses were incurred to roads, irrigation canals and community owned open wells. Most of the village roads had to be restored to motor-able condition. The breach of canals resulted in flooding of several localities and hence the bunds had to be restored and reinforced. Open wells are the only source of drinking water in many of the rural hilly regions of the state and hence, those wells of which the walls collapsed and got silted had to be restored with immediate effect. Table 16 shows the length of roads, the length of canals and the number of open wells that had to be repaired in each district.



**Table 16: Cost incurred for immediate restoration of infrastructure**

District	Number of open wells	Cost (Rs.)	No. of damaged pumps	Cost (Rs)	Length of damaged drinking water pipelines (Km)	Cost (Rs)	No.of damaged water supply tanks	Cost (Rs)	Length of damaged village roads (Km)	Cost (Rs)	Total
Tvm	10	1,50,000	2	4,000	0	30,000	5	2,50,000	10	50,00,000	54,34,000
Klm	8	1,20,000	9	18,000	32	32,00,000	13	6,50,000	2	10,00,000	49,88,000
Ptn	10	1,50,000	9	18,000	0	0	6	3,00,000	5	25,00,000	29,68,000
Alp	200	30,00,000	160	3,20,000	0	16,000	25	12,50,000	80	4,00,00,000	4,45,86,000
Ktm	80	12,00,000	60	1,20,000	0	0	0	0	54	2,70,00,000	2,83,20,000
Idu	30	4,50,000	39	78,000	8	7,83,000	8	4,00,000	130	6,50,00,000	6,67,11,000
Ekm	10	1,50,000	3	6,000	0	0	0	0	50	2,50,00,000	2,51,56,000
Tsr	8	1,20,000	6	12,000	0	0	3	1,50,000	70	3,50,00,000	3,52,82,000
Pkd	0	0	0	0	0	0	0	0	0	0	0
Mal	0	0	0	0	0	0	0	0	0	0	0
Koz	15	2,25,000	12	24,000	0	0	0	0	40	2,00,00,000	2,02,49,000
Way	1	15,000	0	0	0	0	0	0	28	1,40,00,000	1,40,15,000
Kan	8	1,20,000	6	12,000	0	0	10	5,00,000	15	75,00,000	81,32,000
Ksg	19	2,85,000	15	30,000	0	0	0	0	10	50,00,000	53,15,000
Total	399	59,85,000	321	6,42,000	40	40,29,000	70	35,00,000	494	24,70,00,000	26,11,56,000

## Abstract

<b>MAJOR LOSS AS PER ESTIMATED LOSS &amp; CENTRAL NORMS DUE TO MONSOON CALAMITY FROM 1 JUNE TO 1 JULY 2013</b>			
Code No.	Item	Estimated (lakhs)	Loss Loss as per CRF norms (lakhs)
1	2	3	4
1	<b>Gratuitous Relief</b>		
a	Ex-gratia payment to families of deceased persons (93 people)	NA	1,39,50,000
b	Ex-gratia payment for loss of a limb or eyes	NA	0
c.i	Grievous injury requiring hospitalization for more than a week (65 people)	NA	2,57,300
c.ii	Grievous injury requiring hospitalization for less than a week	NA	0
d	Clothing and Utensils	NA	0
e	Gratuitous Relief for families in dire need (Free Ration)	NA	0
2	<b>Search and Rescue</b>		
a	Services of Indian Navy	NA	0
b	Services of NDRF	NA	0
c	Cost of search and rescue	NA	15,96,500
d	Cost of evacuation	NA	0
3	<b>Relief Measures</b>		
a	Provision for temporary accommodation, food, clothing, medical care etc. for people affected/evacuated and sheltered in relief camps (715 camps)	NA	26,38,86,837
b	Air dropping	NA	0
c	Provision of emergency supply of drinking water in rural areas and urban areas	NA	0
4	<b>Clearance of affected areas</b>		
a	Clearance of debris in households and public area (9655.56 ha; actual figures)	1,70,00,00,000	1,01,60,87,950
b	Draining of flood waters in affected areas (132 pumps; 27 days; actual figures)	9,00,00,000	4,10,00,000
c	Funeral and burial of dead bodies (93 fatalities)	NA	9,30,000
5	<b>Agriculture</b>		
i	<b>Assistance to small and marginal farmers</b>		
A	<b>Assistance for land and other loss</b>		

a	De-silting of agricultural land (their thickness of sand/silt deposit is >3 inches, to be certified by the competent authority of the State Government) – 7067 ha	20,00,00,000	5,72,42,700
b	Removal of debris on agricultural land (4535.28 ha)	75,00,00,000	45,98,54,500
c	De-silting/restoration/repair of fish farms	Not estimated as yet	
d	Loss of substantial portion of land caused by landslide/avalanche/change of course of rivers	Not estimated as yet	
<b>B</b>	<b>Input subsidy (where crop loss is 50% and above)</b>		
a	For agricultural crops – rainfed, irrigated and perennial	61,70,74,000	3,58,72,200
b	Plantation crops	Not estimated as yet	
c	Sericulture	Not estimated as yet	
ii	<b>Input subsidy to farmers other than small &amp; marginal farmers</b>	Not estimated as yet	
<b>6</b>	<b>Animal husbandry</b>		
i	Replacement of milch animals, draught animals or animals used for haulage	Not estimated as yet	
ii	Provision of fodder/feed concentrate in cattle camps	Not estimated as yet	
iii	Water Supply in cattle camp	Not estimated as yet	
iv	Additional cost of Medicines and Vaccines	Not estimated as yet	
v	Transport of fodder to cattle outside cattle camps	Not estimated as yet	
<b>7</b>	<b>Fishery</b>		
i	Assistance to Fishermen for repair/replacement of boats, net – damaged or lost	Not estimated as yet	
ii	Input subsidy for fish seed farm	Not estimated as yet	
<b>8</b>	<b>Handicrafts/handloom - Assistance to artisans</b>		
i	For replacement of damaged tools/ equipment	Not estimated as yet	
ii	For loss of raw material/goods in process/finished goods	Not estimated as yet	
<b>9</b>	<b>Housing</b>		
a	Fully damaged/Destroyed houses		
i	Pucca Houses (311 houses)	20,57,30,000	1,02,86,500
ii	Kutchra Houses (676 houses)	10,14,00,000	1,01,40,000
b	Severely Damaged Houses		
i	Pucca Houses (4923 houses)	29,29,59,000	2,92,95,900
ii	Kutchra Houses (1368 houses)	2,18,86,000	43,77,200
c	Partially damaged houses - pucca/kutchra (Other than huts) (6509 houses)	3,71,01,600	1,23,67,200
d	Damaged/Destroyed huts (264 houses)	33,00,000	6,60,000

e	Cattle shed attached with house	Not estimated as yet	
10	<b>Infrastructure</b>		
	Repair/restoration (of immediate nature) of damaged infrastructure		
	i) Road & bridges (494 km)	74,10,00,000	24,70,00,000
	ii) Drinking water supply works (40 km)	80,00,000	40,29,000
	iii) Irrigation	Not estimated as yet	Not estimated as yet
	iv) Power		
	v) Schools		
	vi) Primary health centres		
	vii) Community assets owned by panchayaths (pumps – 321; open wells – 399; water supply tanks – 70)	5,00,35,000	1,01,27,000
11	<b>Procurement</b>	0	0
<b>Total</b>		<b>4,81,84,85,600</b>	<b>2,21,89,60,787</b>
<b>Estimated loss in real terms: 481.84856 crs</b>			
<b>Estimated loss as per CRF Norms: 221.8960787 crs</b>			

Sd/-  
T.J Mathew IAS  
State Relief Commissioner

ANNEXURE 3 - AGRICULTURAL LOSSES IN THE DISTRICTS										
Sl. No	District	Total Agricultural area affected (ha)	Total agricultural where crop loss is >50%	Out of (4) area belonging to			Assistance sought for			Total assistance sought (Rs. in lakhs)
				5A	5B	5C	6A	6B	6C	
1	2	3	4	Rain-fed	Irrigated	Perennial	Rain-fed (Rs.3000xCol.5A)	Irrigated (Rs.6000 x Col.5B)	Perennial (Rs.8000xCol.5C)	6A+6B+6C
1	Tvm	116.43	116.43	3	75.9	37.53	0.09	4.554	3.002	7.646
2	Klm	152.06	152.06	40	96.49	15.571	1.2	5.79	1.246	8.235
3	Ptn	354.6	354.6	22.1	73.86	258.645	0.663	4.432	20.692	25.786
4	Alp	2199.2	2199.2	39.4	2115.92	43.847	1.182	126.955	3.508	131.645
5	Ktm	1003.1	1003.04	41.7	892.32	69.022	1.251	53.539	5.522	60.312
6	Idu	233.8	233.8	15.2	40.92	177.685	0.456	2.455	14.215	17.126
7	Ekm	129.95	129.95	21.5	78.55	29.905	0.645	4.713	2.392	7.75
8	Tsr	170.34	170.34	17.1	122.79	30.445	0.513	7.368	2.436	10.316
9	Pkd	194.59	194.59	0	188.82	5.769	0	11.329	0.462	11.791
10	Mlp	89.47	89.7	4.4	57.76	27.31	0.132	3.466	2.185	5.783
11	Koz	366.87	366.87	3.1	157.34	206.43	0.093	9.44	16.514	26.048
12	Way	628.17	628.18	145.6	448.36	34.226	4.368	26.901	2.738	34.007
13	Kan	66.57	66.57	2	42.16	22.412	0.06	2.53	1.793	4.383
14	Kaz	105.08	105.08	0	25.61	79.465	0	1.537	6.357	7.894
<b>Total</b>		<b>5810.23</b>	<b>5810.41</b>	<b>355.1</b>	<b>4416.8</b>	<b>1038.262</b>	<b>10.653</b>	<b>265.009</b>	<b>83.062</b>	<b>358.722</b>

Sd/-  
Director of Agriculture

Utilization certificate of SDRF/NDRF will be submitted subsequently during the visit of the Central Team