

Memorandum

Monsoon Calamity Losses

1st June to 15th September 2014



Submitted by
Principal Secretary, Revenue & Disaster Management
(State Relief Commissioner)
Government of Kerala

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1. Introduction

1.1. Forecast and preparations

The monsoon season started-off calmly. The Indian Meteorological Department declared the onset of monsoon over Kerala on 6th June 2014. 'Quantitatively, the monsoon seasonal rainfall was likely to be 95% of the Long Period Average (LPA) with a model error of $\pm 5\%$ ' (1st Long Range Forecast of IMD, 24th April 2014). IMD also predicted that there is 23 to 33% probability for the seasonal rainfall (June to September) to be below normal to deficient.

Based on this forecast, the State Emergency Operations Centre of Kerala put forward the following disaster outlook valid for the state during the monsoon season (June to December) of 2014:

- Trends in the IMD's predictions indicates that monsoon rainfall (June to September) will be below normal. This does not imply that there will not be intense rainfall and consequent calamities.
- As there is a higher than normal probability of seasonal rainfall being deficient, attempt should be to save as much water as possible particularly in the dams until safety thresholds are achieved.
- Efforts should be focused on water conservation, including through public advertisement and press meetings by Hon'ble Ministers in-charge of respective districts prior to monsoon (1st June).
- Given the intense pre-monsoon rainfall (rainfall in the month of April), especially along the southern districts (Thiruvananthapuram to Ernakulam), there is a probability of landslides and debris flows in these districts in the early half of South-West monsoon (June-July).
- There have been many earthquake tremors (8 in Kozhikode-Malappuram region) in the northern districts in 2013. These tremors may have loosened up soil along the hilly parts of Kozhikode-Wayanad border and hence, landslides may occur in such belts in the second half of the South-West Monsoon (July-August).

- Alappuzha, Kottayam and Thrissur shall prepare for facing flooding in Kuttanad (Alappuzha and Kottayam) and Kol lands (Thrissur) in the months of late June and August.

Considering the predictions of IMD and the Disaster Outlook, 2014, the State Relief Commissioner convened a meeting of the heads-of-the-departments of all nodal departments on 14th May 2014 (Minutes issued vide Govt. Ltr. 24121/K1/2014/DMD dated 22-05-2014; Annexure 1) in which individual departments were assigned specific tasks for implementation. Preparedness at the district level was reviewed by the State Relief Commissioner on 19th May 2014 via video conference and specific instructions were issued regarding the implementation of the decisions of the monsoon preparedness meeting.

1.2. Situation in the state prior to onset of south-west monsoon

Unlike previous years, Kerala was ravaged by intense pre-monsoon cyclonic activity between 1st April and 8th May 2014 forcing the state to submit a memorandum requesting an assistance of Rs. 141 crores from National Disaster Response Fund. An Inter-Ministerial Central Team lead by Ministry of Home Affairs visited Kerala from 12th to 16th June 2014 and has furnished their report to Government of India. The pre-monsoon season in Kerala was expected to experience only convective rainfall and thunder storms in pockets. The season is traditionally a relatively calm and rain free one during which much of the construction and monsoon preparedness activates in the state takes place. The events during the pre-monsoon season were extremely catastrophic. Before the state could recover from the damages caused by the pre-monsoon cyclonic activity, the South West Monsoon hit the state.

It may be noted that Kerala was ravaged by a severe drought in 2012-13 and major monsoon calamity damages in 2013 (June to December). The cumulative committed expenditure from these calamities has stretched the State Disaster Response Fund to its limits. Government of Kerala approached the Government of India for assistance in the events of these calamities. However, funds provided are not enough for meeting the commitments, the on-going calamities, the monsoon season (June to December 2014) and the following summer season (January to March 2015) in this financial year. It is also brought to the kind notice of Govt. of India that this being the last year of the 13th Finance

Commission period, the SDRF/NDRF pending claims cumulated over a period of 2010-2014 needs to be completely settled.

The SDRF has a commitment deficit of not less than Rs. 147 crs which has forced the Government from not clearing many of the bills that were incurred for dealing with drought (2012-13) & floods works (2013-14) and agricultural losses (2012-14). This situation has further aggravated given the claims from various districts due to the recent pre-monsoon rainfall related calamity for which no additional grant from NDRF has been released as yet.

Hence, Government of Kerala is forced to approach Government of India with a memorandum for additional assistance from the National Disaster Response Fund. The rainfall situation assessment and the losses incurred during the period 1st June to 15th September 2014 is given below for kind perusal.

2. Monsoon rainfall assessment (1st June to 30th September)

Figure 1 shows the comparison of average actual and normal (long period average) rainfall of the districts for the season. State wide, the expect LPA rainfall was 2039.7 mm while the actual received was 2163.3 mm. Thus the state received an excess of about 7%. This necessitates drinking water supply in many parts, particularly the islands and villages that adjoin brackish water. However, 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. Several instances of such peak rainfall occurred in almost all parts of Kerala as evident from the district wise rainfall graphs shown in Figure 2.

Figure 3 shows the spatial distribution of the rainfall over Kerala. Figure 4 shows the cloud cover (INSAT Satellite Images) over Kerala during the monsoon season. The thick clouds covering the entire state indicate the intense nature of monsoon showers. It is evident from Figure 2 and 4 that Kerala experienced intense rainfall on many days during the period at different parts of the state which lead to floods and landslides and consequently high rate of calamity damage.

This intense rainfall spells have caused significant damage to life and property, the details of which is given in the subsequent chapters. Table 1 compiles the actual and expected (normal) rainfall received during the south-west monsoon in the rainfall stations monitored by IMD.

Note: Normal (expected) rainfall - The Indian Meteorology Department derives long period average rainfall for each day based on the historic data (over 60 years).

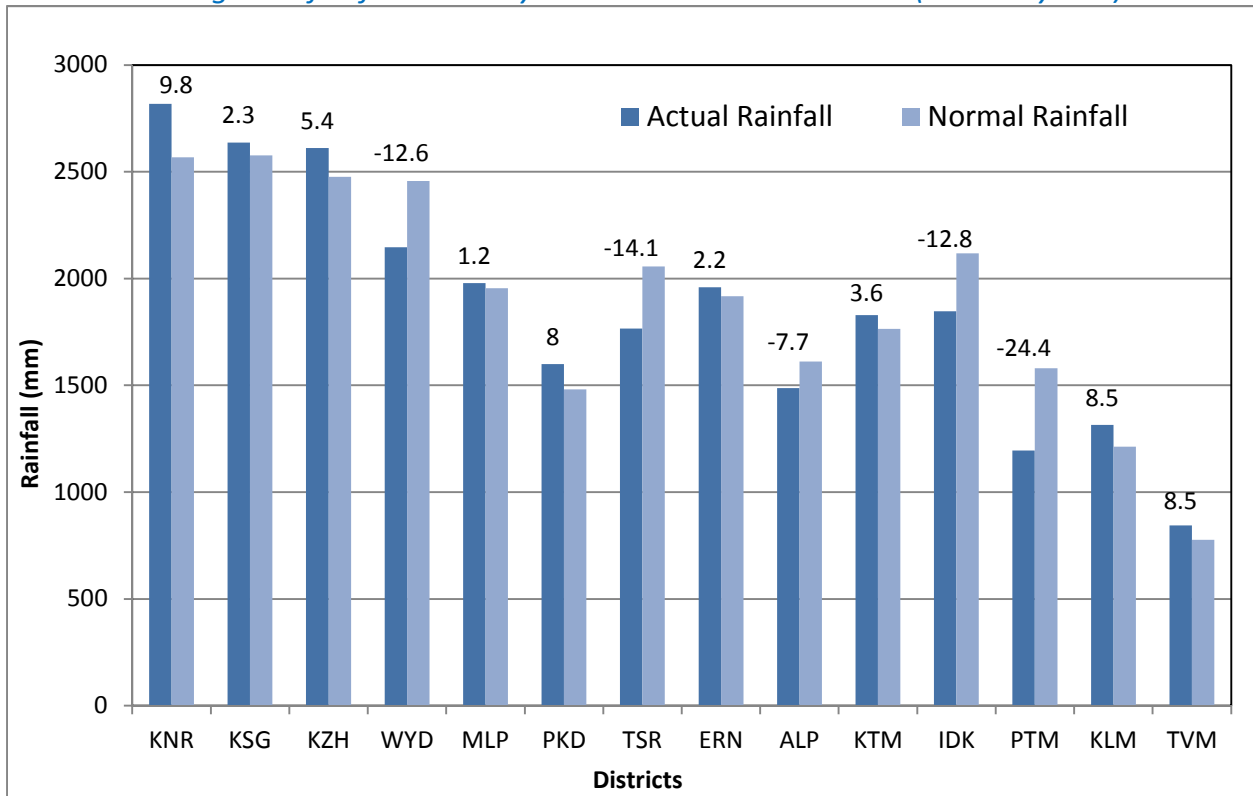
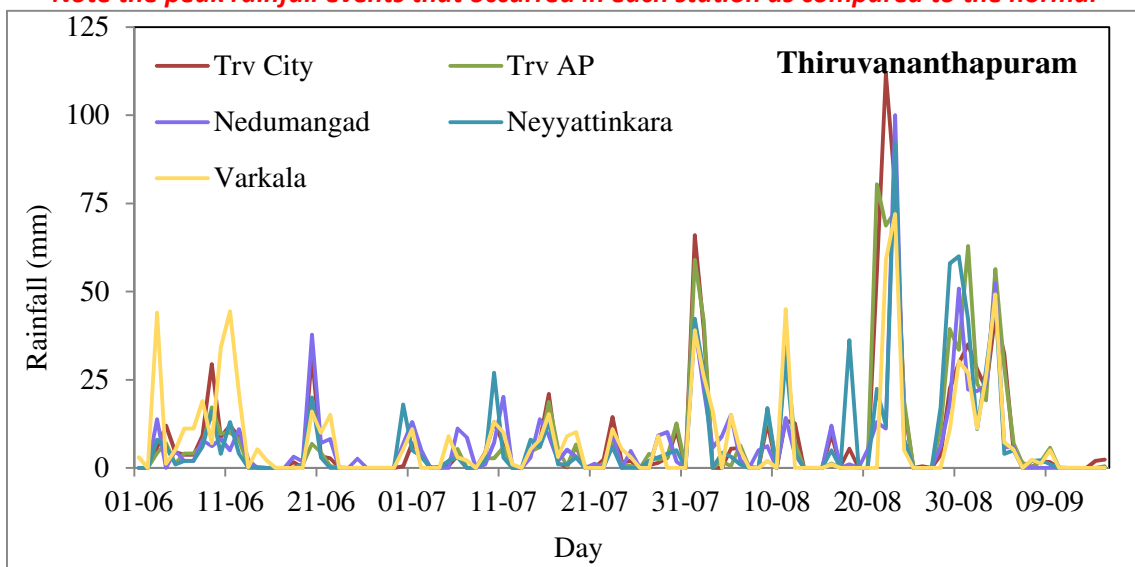
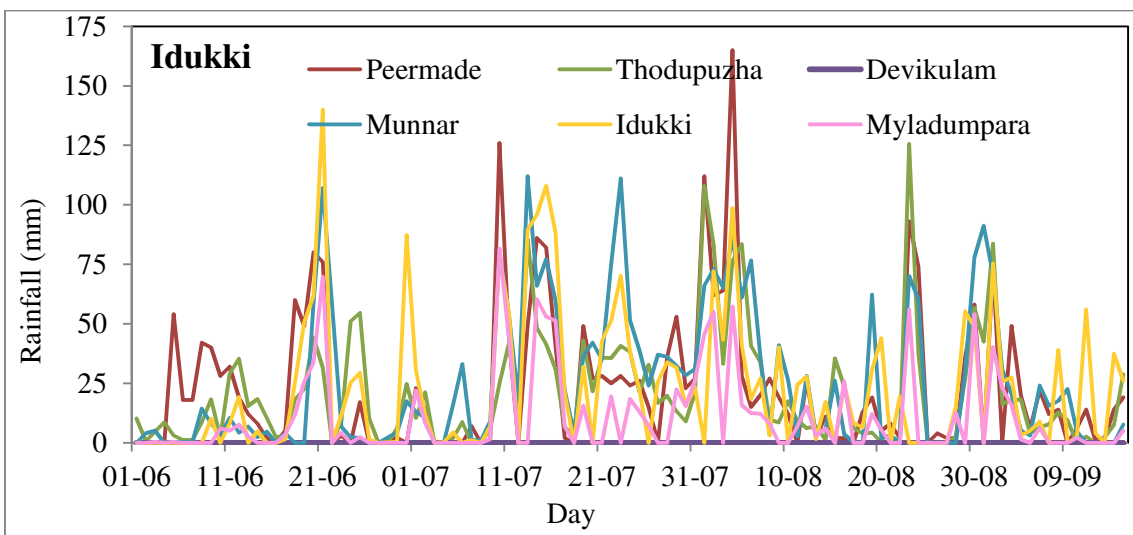
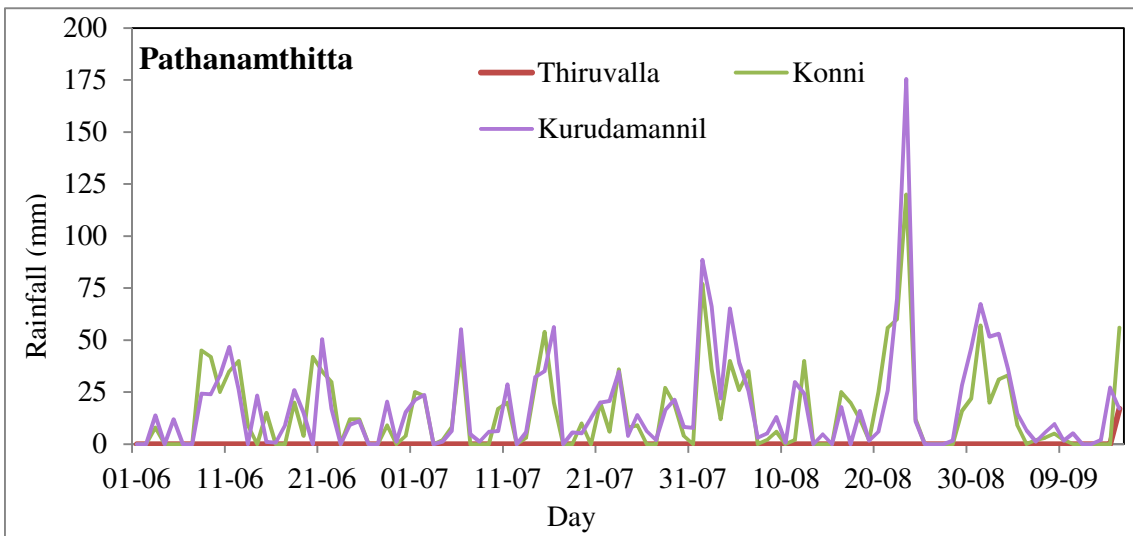
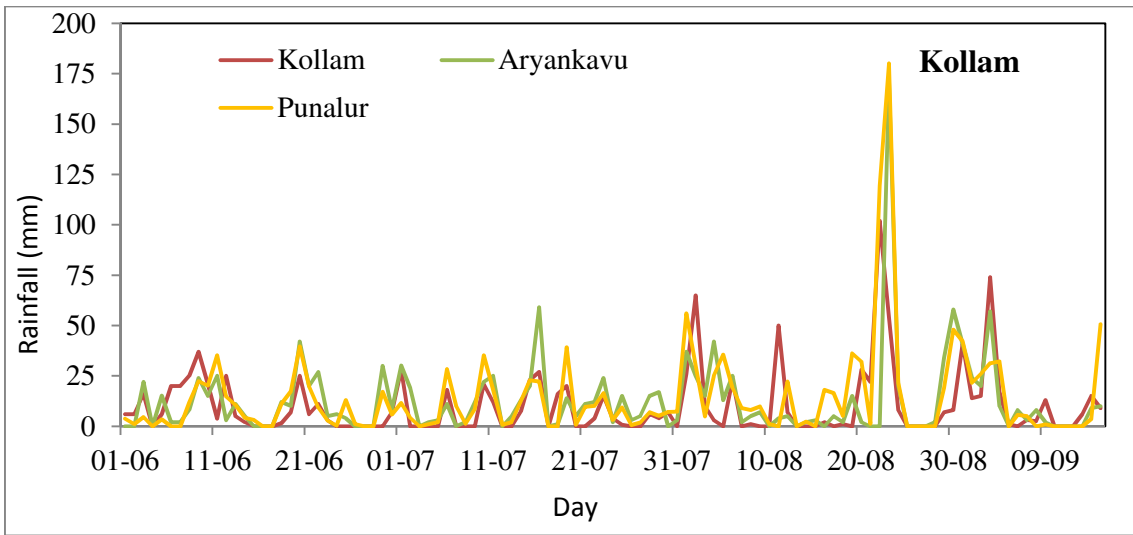
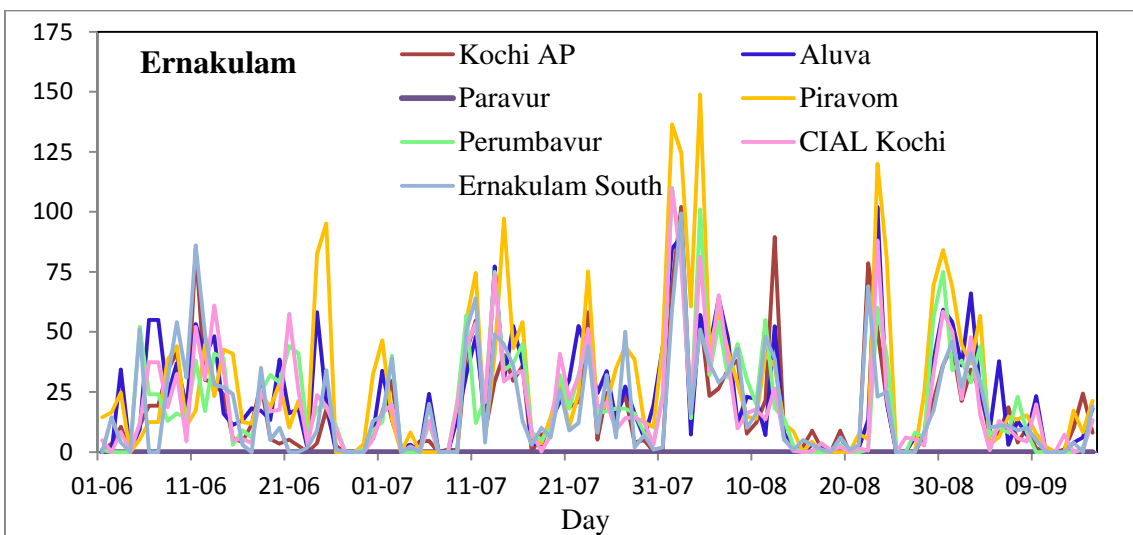
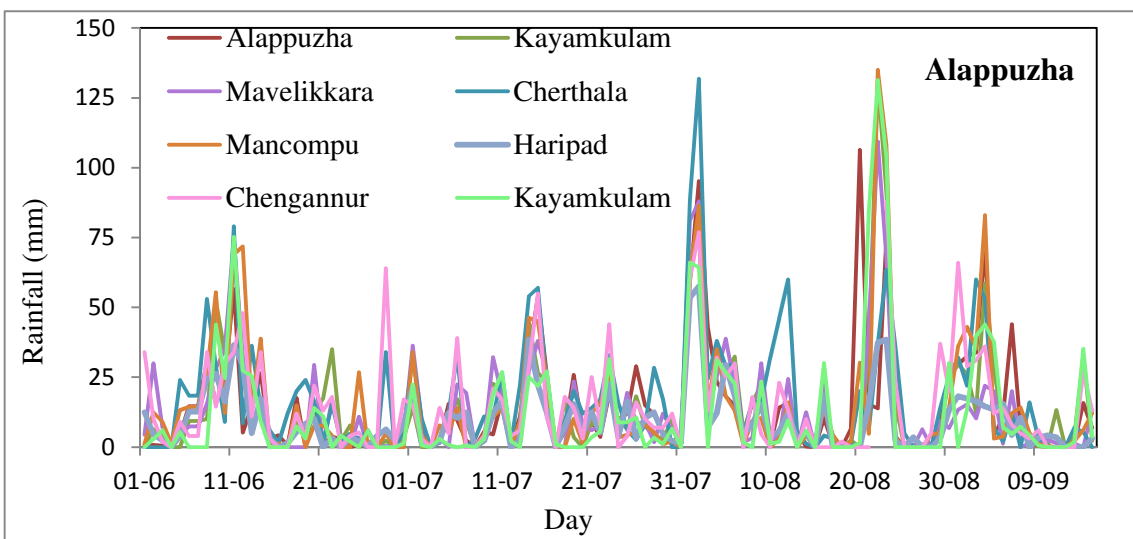
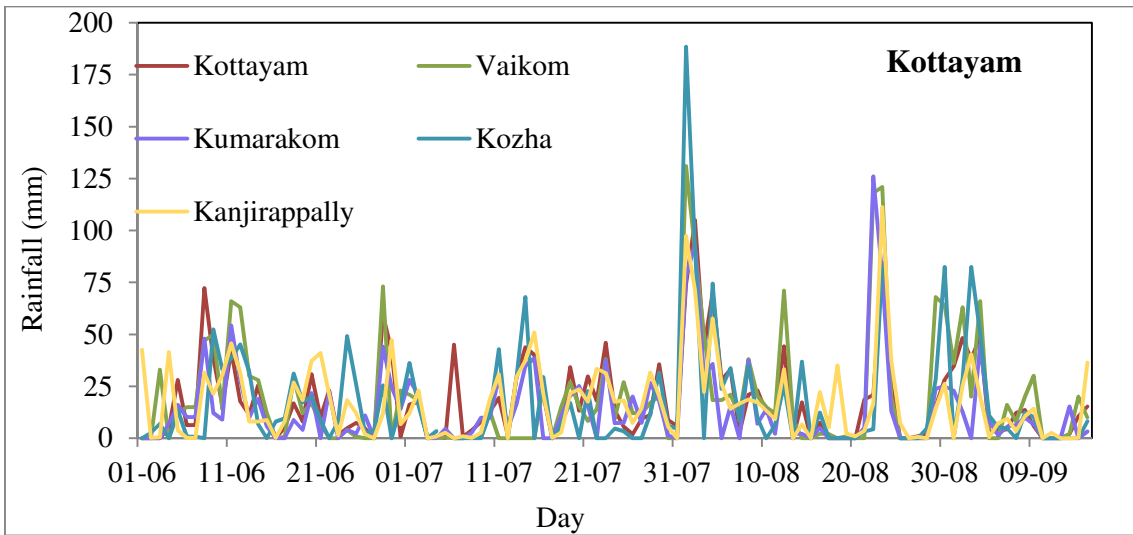


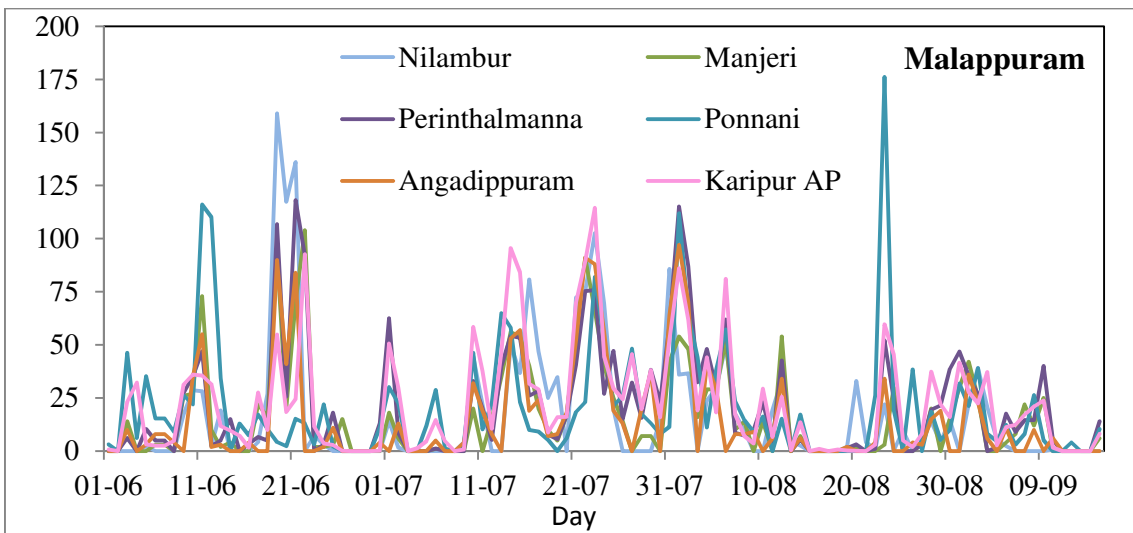
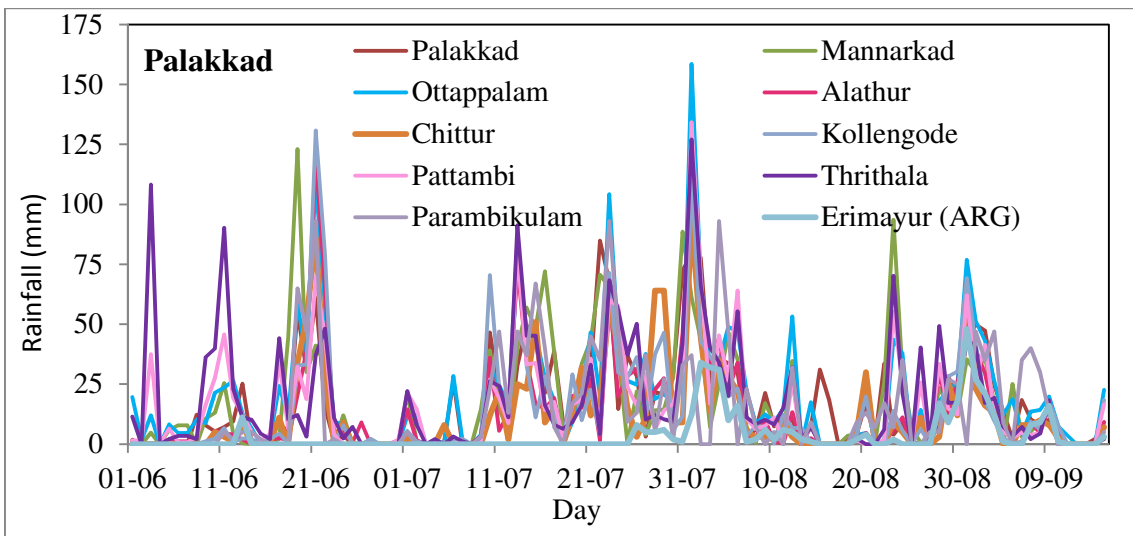
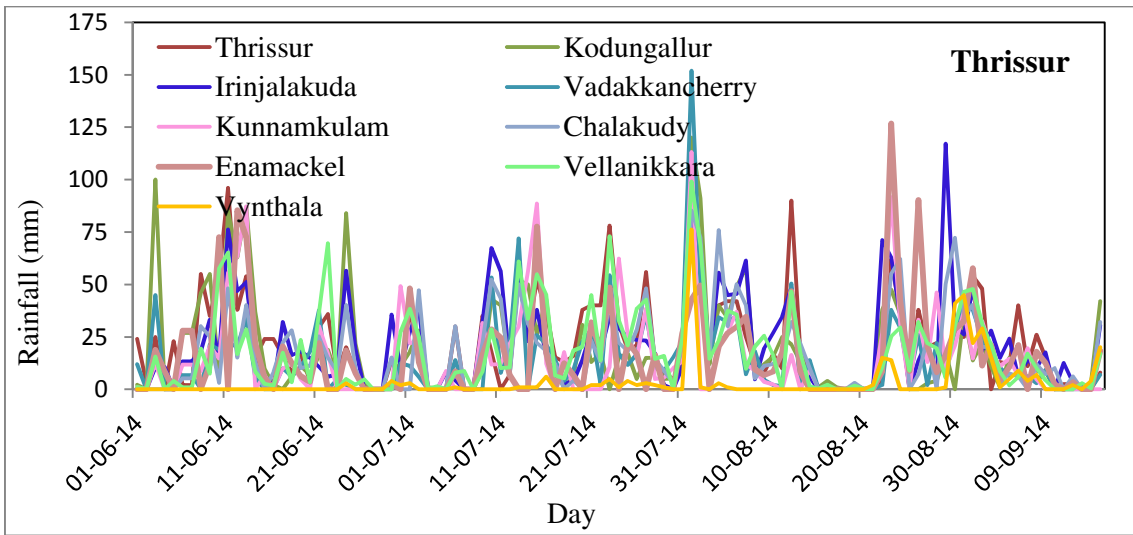
Figure 1: District wise actual and expected rainfall of 2014 (1st June to 17th September) (Data source: IMD)
 Values given above each graph is the % of departure of actual rainfall from normal rainfall

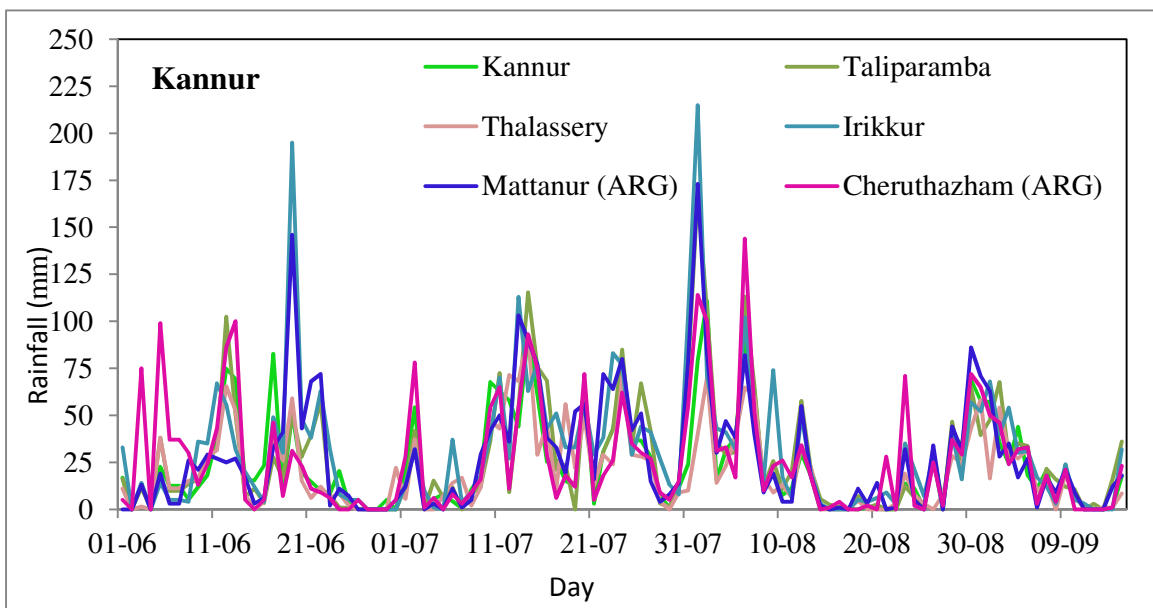
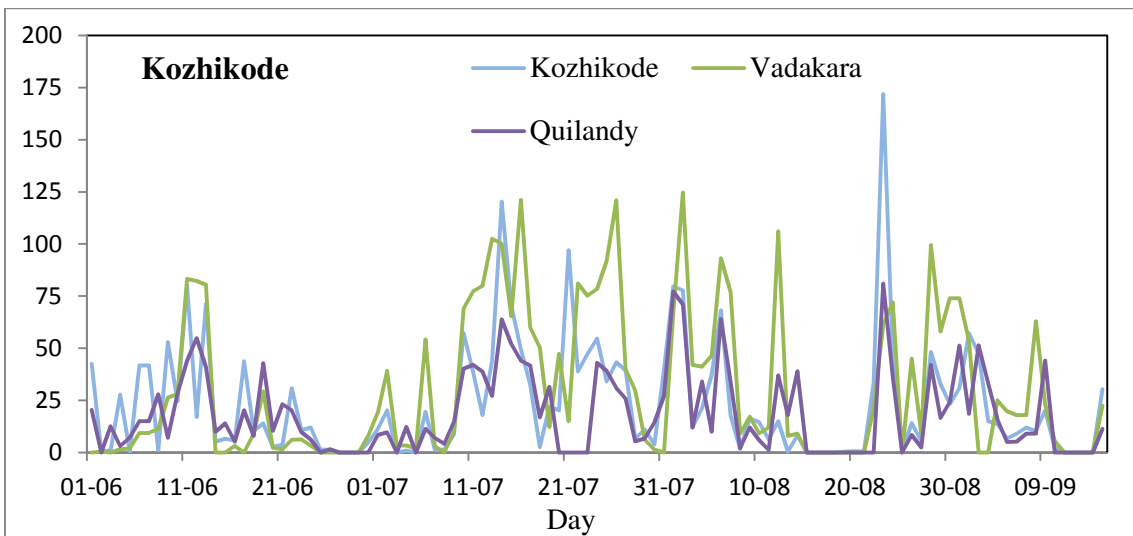
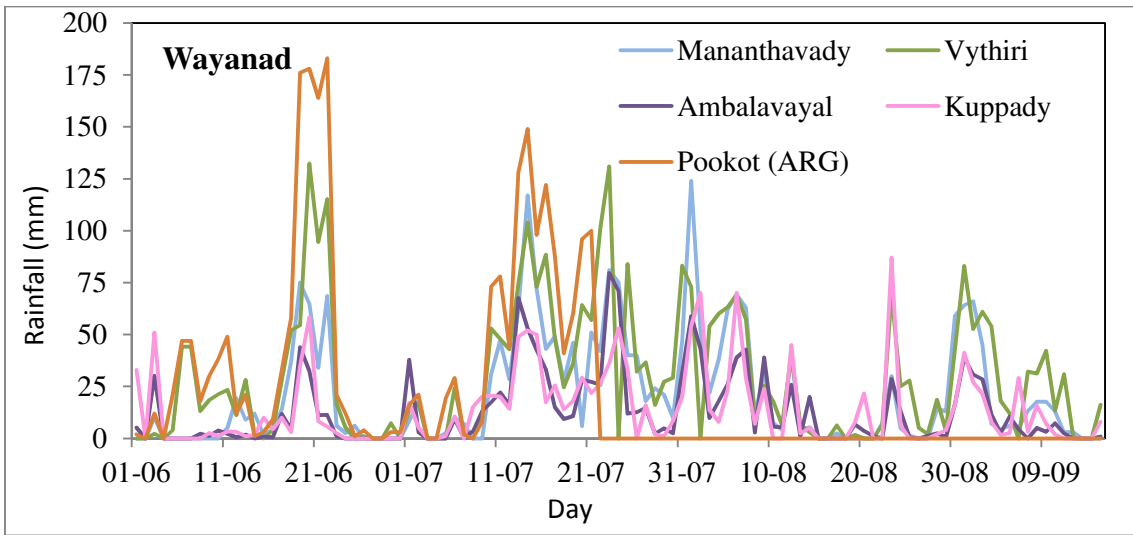
Figure 2: Station wise actual and expected rainfall of 2014 (1st June to 17th September) (Data source: IMD)
 Note the peak rainfall events that occurred in each station as compared to the normal

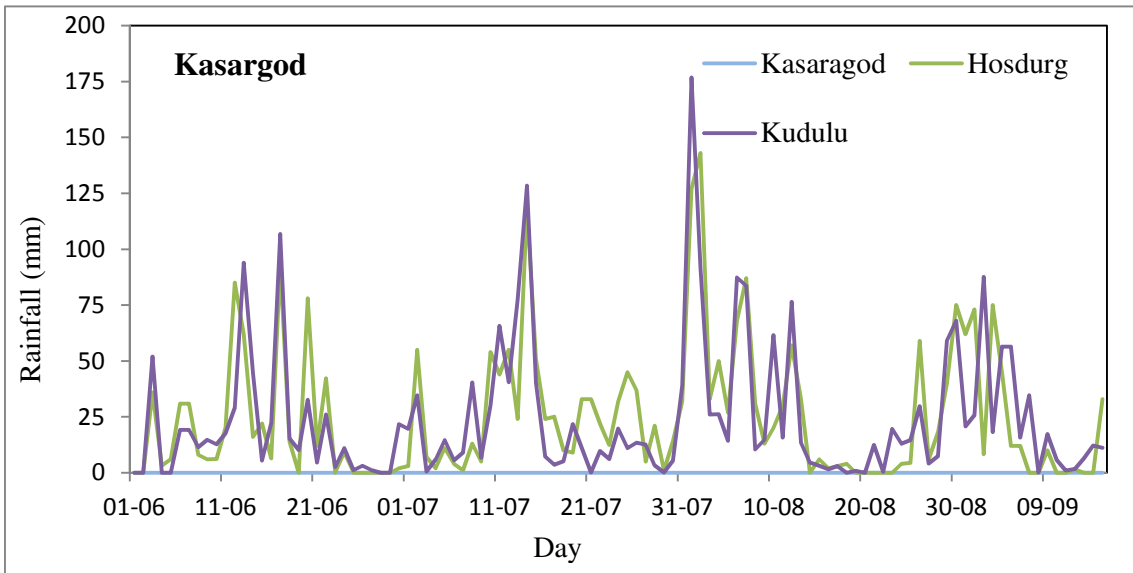












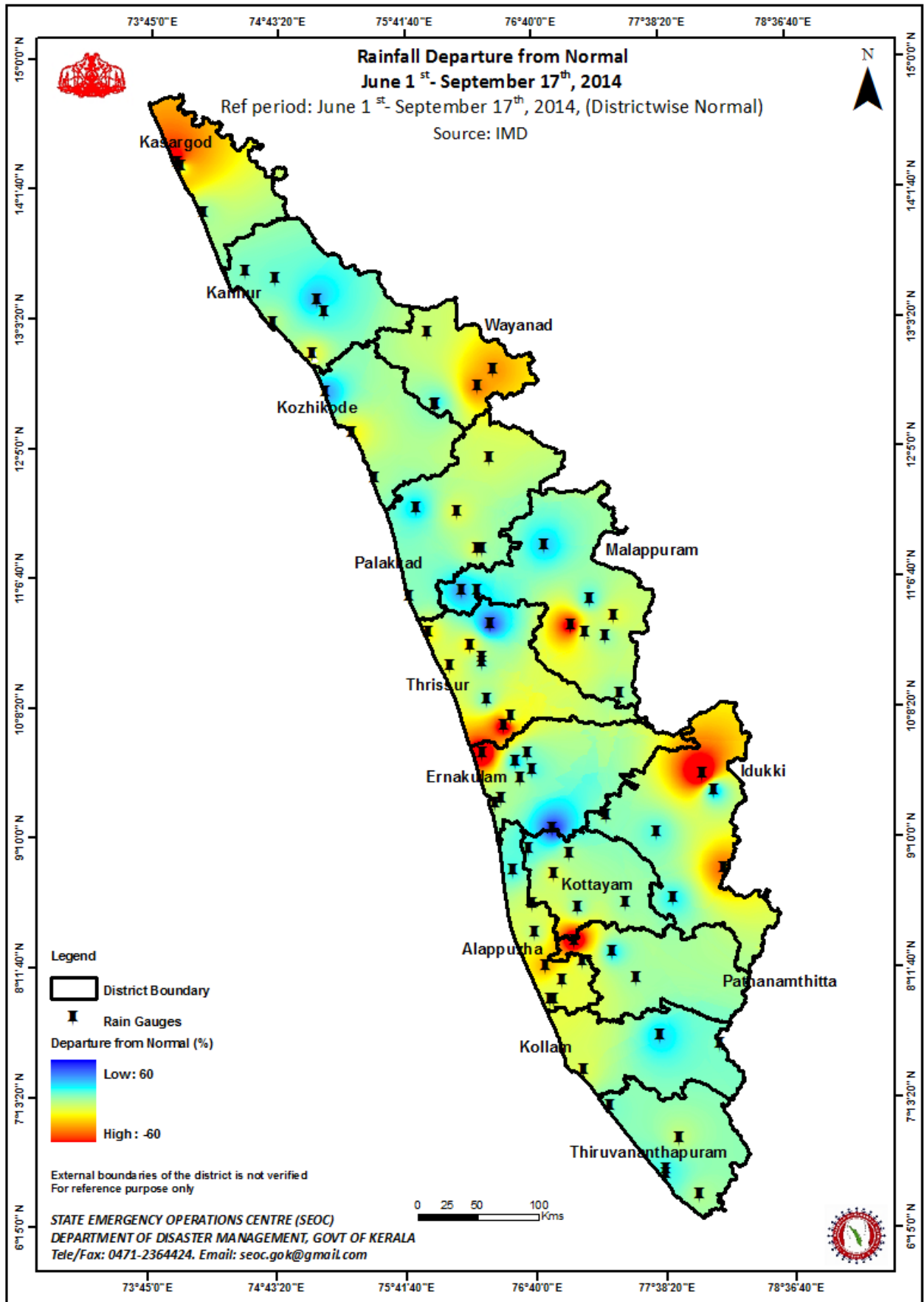


Figure 3: Rainfall departure 2014 (1st June to 17th September) (Data source: IMD)

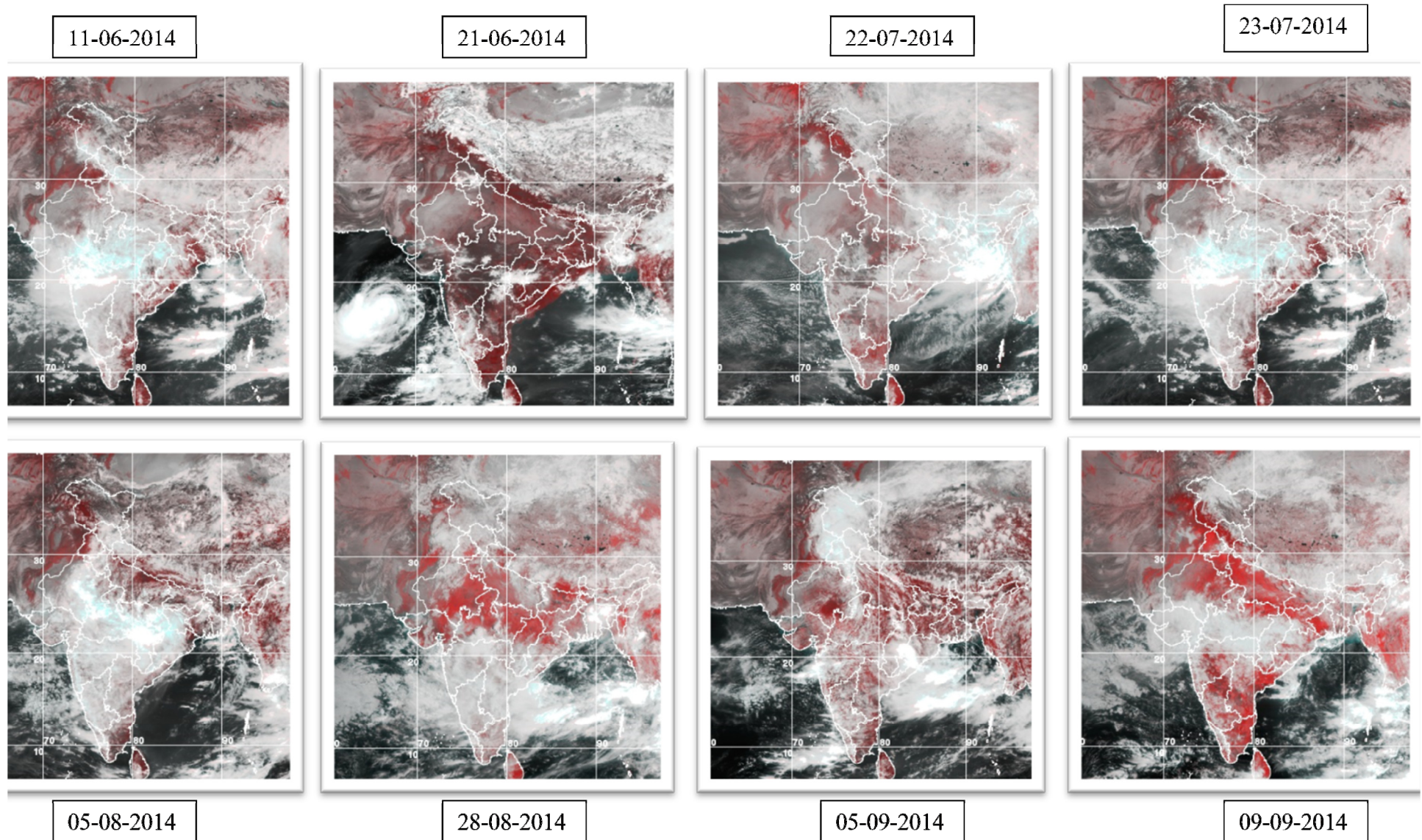


Figure 4: INSAT pictures from 1st June to 17th September 2014 (Source: IMD)

Table 1: Actual and expected rainfall (mm) in the rain gauges across Kerala – 1st June to 17th September 2014 (Source: IMD)

Sl. No.	Station	District	Actual RF	Normal RF	Departure %
1	Kannur	Kannur	2573	2567.5	0
2	Taliparamba	Kannur	2906.4	2567.5	13
3	Thalasserry	Kannur	2196.8	2567.5	-14
4	Irikkur	Kannur	3407	2567.5	33
5	Mattanur	Kannur	2981.1	2567.5	16
6	Cheruthazham	Kannur	2842	2567.5	11
7	Kasargod	Kasargod	0	2576.7	-100
8	Hosdurg	Kasaragod	2676	2576.7	4
9	Kudulu	Kasaragod	2598.9	2576.7	1
10	Kozhikode	Kozhikode	2520.9	2476.7	2
11	Vadakara	Kozhikode	3323	2476.7	34
12	Quilandy	Kozhikode	1990.2	2476.7	-20
13	Mananthavady	Wayanad	2337.2	2456.7	-5
14	Vythiri	Wayanad	3195.4	2456.7	30
15	Ambalavayal	Wayanad	1390.6	2456.7	-43
16	Kuppady	Wayanad	1494.4	2456.7	-39
17	Pookot	Wayanad	2318	2456.7	-6
18	Nilambur	Malappuram	1814.8	1955.3	-7
19	Manjeri	Malappuram	1733	1955.3	-11
20	Perinthalmanna	Malappuram	2228.8	1955.3	14
21	Ponnani	Malappuram	2124.4	1955.3	9
22	Angadippuram	Malappuram	1556	1955.3	-20
23	Karipur AP	Malappuram	2414.8	1955.3	24
24	Palakkad	Palakkad	1761.1	1480.8	19
25	Mannarkad	Palakkad	1875	1480.8	27
26	Ottappalam	Palakkad	2249.2	1480.8	52
27	Alathur	Palakkad	1461.6	1480.8	-1
28	Chittur	Palakkad	1278.1	1480.8	-14
29	Kollengode	Palakkad	1574.4	1480.8	6
30	Pattambi	Palakkad	1802.5	1480.8	22
31	Thrithala	Palakkad	2025.3	1480.8	37
32	Parambikulam	Palakkad	1563.3	1480.8	6
33	Erimayur	Palakkad	396.1	1480.8	-73
34	Thrissur	Thrissur	2346	2057	14
35	Kodungallur	Thrissur	2063.9	2057	0
36	Irinjalakuda	Thrissur	2310.2	2057	12
37	Vadakkancherry	Thrissur	1548.4	2057	-25
38	Kunnamkulam	Thrissur	1623.6	2057	-21
39	Chalakydy	Thrissur	1931.5	2057	-6
40	Enamackel	Thrissur	1755.2	2057	-15
41	Vellanikkara	Thrissur	1953.2	2057	-5
42	Vynthala	Thrissur	362.3	2057	-82
43	Kochi AP	Ernakulam	1889.5	1917	-1

44	Aluva	Ernakulam	2438.5	1917	27
45	Paravur	Ernakulam	0	1917	-100
46	Piravom	Ernakulam	3013.8	1917	57
47	Perumbavur	Ernakulam	2252	1917	17
48	CIAL Kochi	Ernakulam	2140.8	1917	12
49	Ernakulam South	Ernakulam	1977.9	1917	3
50	Alappuzha	Alappuzha	1478.6	1611.1	-8
51	Kayamkulam	Alappuzha	1531.3	1611.1	-5
52	Mavelikkara	Alappuzha	1455.9	1611.1	-10
53	Cherthala	Alappuzha	1896.7	1611.1	18
54	Mancompu	Alappuzha	1595.1	1611.1	-1
55	Haripad	Alappuzha	1044.3	1611.1	-35
56	Chengannur	Alappuzha	1551.8	1611.1	-4
57	Kayamkulam	Alappuzha	1338.3	1611.1	-17
58	Kottayam	Kottayam	1917	1764.6	9
59	Vaikom	Kottayam	2041.5	1764.6	16
60	Kumarakom	Kottayam	1549.4	1764.6	-12
61	Kozha	Kottayam	1771	1764.6	0
62	Kanjirappally	Kottayam	1865.4	1764.6	6
63	Peermade	Idukki	2538.6	2117.8	20
64	Thodupuzha	Idukki	2247.6	2117.8	6
65	Devikulam	Idukki	0	2117.8	-100
66	Munnar	Idukki	2708	2117.8	28
67	Idukki	Idukki	2449.4	2117.8	16
68	Myladumpara	Idukki	1137	2117.8	-46
69	Thiruvalla	Pathanamthitta	17	1580.3	-99
70	Konni	Pathanamthitta	1639.4	1580.3	4
71	Kurudamannil	Pathanamthitta	1928.8	1580.3	22
72	Kollam	Kollam	1094.3	1212.4	-10
73	Aryankavu	Kollam	1337	1212.4	10
74	Punalur	Kollam	1514.8	1212.4	25
75	Trv City	Thiruvananthapuram	923.2	777.6	19
76	Trv AP	Thiruvananthapuram	902.3	777.6	16
77	Nedumangad	Thiruvananthapuram	750.6	777.6	-3
78	Neyyattinkara	Thiruvananthapuram	786.4	777.6	1
79	Varkala	Thiruvananthapuram	860.7	777.6	11

2. Agriculture

The total geographic area of the State is 3,88,6287 Ha. Geographical area in Kerala has been classified according to thirteen different uses of land such as forest, land put to non-agricultural use, net area sown, barren and uncultivable land, and pastures and grazing land. The net area under cultivation during the year 2012-13 was 20,48,109 Ha, which occupies 52.70% of the total area in the State. The total cropped area is 25,91,734 Ha during the year 2012-13.

Agricultural crops in the state are broadly classified as food crops and non-food crops. Food crops are cereals, millets, sugar crops, spices, & condiments, fresh fruits, vegetables, etc. The major non-food crops are rubber, betel leaves, lemon grass, etc. Another classification of crop is seasonal crops, annual crops and perennial crops which are based on their life time.

- a) Seasonal crops: Paddy, pulses, tapioca, vegetables, sweet potato, tubers, groundnut, ginger, turmeric, cotton, tobacco, onion, tur etc.
- b) Annual crops: Sugarcane, banana, plantain, pineapple, betel leaves, etc.
- c) Perennial crops: Coconut, arecanut, cashew, mango, jack, tamarind, pepper, rubber, tea, coffee, cardamom, cloves, nutmeg, cinnamon, cocoa, papaya, etc.

3.1. Agricultural scenario in the State (2012-13)

- Total cropped area - 25,91,734 Ha
- Net area sown - 20,48,109 Ha
- Area sown more than once - 5,43,625 Ha
- Net area irrigated (source wise) - 3,95,868 Ha
- Net area irrigated (source wise) to net area sown - 19.33%
- Irrigated paddy area to total paddy area - 74.48%
- Cropping intensity - 126.54%

3.2. Important crops of Kerala

Figure 2 - The important crops of the State are depicted in the map given below.

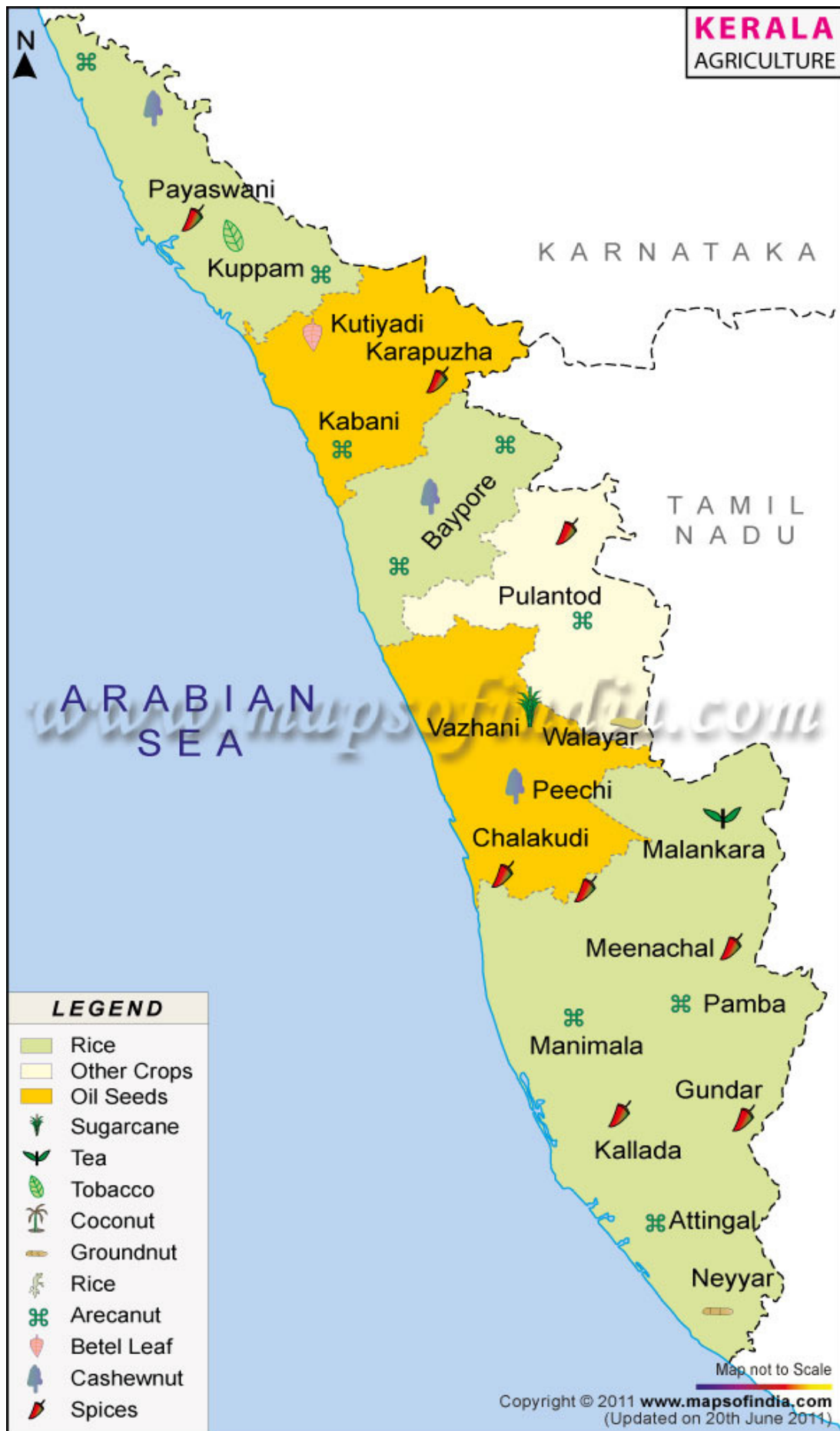


Figure 2: Crops of Kerala

3.3. Crop wise cumulative area under cultivation (2013-14)

• Rice	-	199611 ha
• Tapioca	-	74907 ha
• Banana	-	33323 ha
• Plantain	-	48612 ha
• Coconut	-	815035 ha
• Arecanut	-	102085 ha
• Pepper	-	84877 ha
• Ginger	-	4436 ha
• Cashew	-	47260 ha
• Turmeric	-	2567 ha
• Coffee	-	84571 ha

3. Losses

4.1. Human Fatalities

One hundred and twenty three (123) lives were lost during the period from 1st June to 15th September 2014. Table 2 shows the district wise human fatalities and injuries reported.

Table 2: District wise human fatalities and injuries (Details: Annexure 1a & 1b)

District	Fatalities		Injuries		Total
	No	Amount (Lakhs)	No	Amount (Lakhs)	
Thiruvananthapuram	8	12.000	1	0.435	12.435
Kollam	3	4.500	0	0	4.500
Pathanamthitta	7	10.500	0	0	10.500
Alappuzha	12	18.000	0	0	18.000
Kottayam	3	4.500	0	0	4.500
Idukki	2	3.000	0	0	3.000
Ernakulam	10	15.000	1	0.435	15.435
Thrissur	9	13.500	7	3.045	16.545
Palakkad	8	12.000	7	3.045	15.045
Malappuram	16	24.000	0	0	24.000
Kozhikode	9	13.500	0	0	13.500
Wayanad	6	9.000	0	0	9.000
Kannur	15	22.500	4	1.74	24.240
Kasargode	15	22.500	4	1.74	24.240
Total	123	184.500	24	10.44	194.940

4.2. Houses damages

A large number of houses were completely or severely damaged. The actual loss to housing sector due to this is inestimable. Figure 5 shows some photographs of the calamity damages incurred in the state. District wise details of number of houses damaged (fully, severely and partially) with estimated loss is given in Table 3, 4 and 5:

Table 3: District wise house damage estimates – Pucca

District	Pucca houses						Total (in lakhs)
	FD		SD		PD		
	No	Amount	No	Amount	No	Amount	
Thiruvananthapuram	30	58	325	231	344	43	332

Kollam	20	14	264	33	595	23	70
Pathanamthitta	7	10	48	8	278	38	56
Alappuzha	17	31	113	34	633	42	106
Kottayam	8	20	-	0.00	598	53	74
Idukki	50	96	-	0	1280	250	346
Ernakulam	6	6	147	17	374	15	38
Thrissur	19	15	116	16	329	20	50
Palakkad	14	15	236	39	530	22	75
Malappuram	46	84	180	41	617	75	200
Kozhikode	15	27	-	0	1166	57	84
Wayanad	5	3	8	1	138	9	13
Kannur	24	30	539	81	329	28	138
Kasargode	21	25	115	22	380	18	65
Total	282.0	432.5	2091.0	522.6	7591.0	692.7	1647.8

Table 4: District wise house damage estimates – Kutcha

District	Kutcha houses						Total (in lakhs)
	FD		SD		PD		
	No	Amount	No	Amount	No	Amount	
Thiruvananthapuram	64.0	64.5	220.0	35.5	826.0	195.8	295.7
Kollam	11.0	1.9	306.0	11.6	503.0	11.6	25.1
Pathanamthitta	2.0	1.1	11.0	2.4	155.0	7.1	10.6
Alappuzha	4.0	0.0	27.0	0.0	101.0	0.0	-
Kottayam	0.0	0.0	0.0	0.0	0.0	0.0	-
Idukki	0.0	0.0	0.0	0.0	0.0	0.0	-
Ernakulam	1.0	0.2	60.0	1.4	210.0	3.2	4.8
Thrissur	0.0	0.0	21.0	1.9	40.0	1.5	3.4
Palakkad	2.0	0.5	1.0	0.1	58.0	3.1	3.7
Malappuram	3.0	0.6	9.0	0.5	7.0	0.2	1.2
Kozhikode	3.0	1.4	0.0	0.0	48.0	3.8	5.2
Wayanad	1.0	0.5	0.0	0.0	26.0	1.7	2.2
Kannur	8.0	10.7	158.0	14.5	51.0	5.0	30.2
Kasargode	0.0	0.0	0.0	0.0	5.0	0.1	0.1
Total	99.0	81.3	813.0	67.9	2030.0	233.2	382.4

Table 5: District wise house damage estimates – Huts

District	Number	Amount
Thiruvananthapuram	133	33.4
Kollam	33	1.0
Pathanamthitta	2	0.1
Alappuzha	3	0.1
Kottayam	-	0.0
Idukki	-	0.0
Ernakulam	2	0.0
Thrissur	2	0.1
Palakkad	-	0.0
Malappuram	-	0.0
Kozhikode	-	0.0
Wayanad	-	0.0
Kannur	-	0.0
Kasargode	-	0.0
Total	175	34.6

Table 6: District wise house damage estimates – Total

District	Total loss
Thiruvananthapuram	661.4
Kollam	96.0
Pathanamthitta	66.4
Alappuzha	105.6
Kottayam	73.6
Idukki	346.0
Ernakulam	43.0
Thrissur	53.8
Palakkad	79.0
Malappuram	201.2
Kozhikode	89.2
Wayanad	15.5
Kannur	168.7
Kasargode	65.4
Total	2064.8

4.3. Damages to fisheries

The cyclonic storms, wind and rainfall have caused severe damages to the fisheries sector of the state. The details of district wise damages are given in Table 7 & Table 8:

Table 7: District wise damages to boats and nets (Losses in lakhs)

District	Fully Damaged Boat	Partially Damage Boat	Fully Damaged Net	Partially damaged Net	Total
Thiruvananthapuram	0.21				0.21
Kollam	0.21	0.03		0.015	0.255
Pathanamthitta	0	0	0	0	0
Alappuzha			0.1		0.1
Thrissur	0.07	0.12	0.0185	0.03	0.2385
Malappuram	7.9	0	0	0	7.9
Kozhikode	17		1.5		18.5
Kannur	0.07	0	0.0185	0	0.0885
Kasargode	0	0.2	0.21	0	0.41
Total	25.46	0.35	1.847	0.045	27.702

Table 8: De-silting/repair/restoration of fish farms

District	Area (ha)	Cost (in lakhs)
Kollam	1310	106.11
Pathanamthitta	2504	202.824
Alappuzha	1500	121.5
Kottayam	1038	84.078
Idukki	1000	81
Ernakulam	85	6.885
Thrissur	130	10.53
Palakkad	227	18.387
Malappuram	84	6.804
Kozhikode	145	11.745
Wayanad	129	10.449
Kannur	14	1.134
Kasargode	247	20.007
Total	8413	681.453

4.4. Agriculture damages

The floods, windfall, heavy rainfall and cyclonic thunder storms have caused severe damages to crops in the affected areas. The details of district wise crop losses are given in Table 9. *It may be noted that in Kerala, majority of the farmers are SMALL AND MARGINAL FARMERS. It is only the SMF who claim for damages via NDRF/SDRF. Hence, loss estimation and claim is made only for the SMF sector. Details of losses incurred by 'other than small and marginal farmers' are not routinely collected.*

**Table 9: District wise agricultural damages – Small and Marginal Farmers only
(Details: Annexure 3)**

District	>50% crop loss extent (ha)	Loss (in lakhs) as per norms
Thiruvananthapuram	995.1	81.5
Kollam	675.8	45.5
Pathanamthitta	66.8	5.5
Alappuzha	7926.1	706.6
Kottayam	1404.8	125.0
Idukki	113.4	10.4
Ernakulam	106.5	9.0
Thrissur	258.1	23.0
Palakkad	548.4	48.9
Malappuram	397.3	33.1
Kozhikode	177.9	16.3
Wayanad	976.2	77.6
Kannur	196.5	17.4
Kasargode	170.1	17.2
Total	14013.0	1216.9

Table 10 shows the cost incurred for temporary repair of bunds. Many polder walls (bunds) that protect below mean sea level farm lands of Alappuzha breached. Permanent repair of polder walls can only be undertaken after the monsoon season. Until then, as a temporary measure, the breached bunds have been repaired using sand bags. Sand bags were also required to protect houses from intense onshore wash of sea due to cyclonic storm like situation. One sand bag in Alappuzha costs about Rs. 200, depending on the location of requirement and the transportation cost. Labour cost is Rs. 750/day for lying the sand bags given the fact that in general labour cost is high in Kerala and because this work involves drowning risk.

Table 10: District wise cost of bund protection & sand casting of agricultural lands

District	No of breeches	Area affected (ha)	No of sand bags used (@Rs. 200/bag)	No. of labour (@Rs. 750/day)	Total (in lakhs)
Alappuzha	60	3152.09	2000	400	7
Total	60	3152.09	2000	685	11.7575

Table 11 shows the cost incurred for debris clearance of agricultural, particularly in the Alappuzha due to bund breach and in the hilly districts of Kottayam, Idukki, Thrissur and Kozhikode.

Table 11: District wise cost of debris clearance from agricultural land

District	Area (ha)	Costs (in lakhs)
Alappuzha	4000	32.4
Kottayam	500	4.05
Idukki	19.03	0.15414
Thrissur	3.75	0.03038
Kozhikode	12.5	0.10125
Total	4535.28	36.7358

4.5. Damages to animal husbandry and dairy sector

The intense rainfall and wind have caused severe damages to animal husbandry and dairy development sector of the state. The details of item wise damages are given in Table 12.

Table 12: District wise damages to animal husbandry and dairy development sector

Item	Loss in lakhs
Animal & poultry fatality	26
Totally damaged cattle sheds	13
Provision for feed and concentrate	56
Transportation of fodder	10
Total	105

2.6 Repair/restoration of damaged infrastructure

Losses were incurred to roads, irrigation canals, water supply schemes and community owned open wells. Many 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 13 shows the district wise irrigation sector damages and water supply scheme damages (Details are provided as annexure). Table 14 shows the district wise details of power sector losses (details are provided as annexure). Table 15 shows the length of PWD roads that were damaged and the cost that had to be incurred for repairing them. Table 16 shows the number of bridges that got damaged and the cost of replacing them. Table 17 shows the community owned assets such as length of village roads, number of damaged water tanks and the number of open wells that had to be repaired in each district.

**Table 13: Cost (in lakhs) incurred/committed for repair of irrigation and water supply schemes
(Details: Annexure 5)**

District	Irrigation sector - Cost (in lakhs)	Water Supply sector – Cost (in lakhs)
Thiruvananthapuram	24	0
Kollam	0	23.4
Pathanamthitta	0	36.5
Alappuzha	0	254.875
Kottayam	0	0.8
Idukki	0	43
Ernakulam	7	200
Thrissur	0	1.38
Palakkad	0	0
Malappuram	0	0
Kozhikode	0	0
Wayanad	0	0
Kannur	0	38.23
Kasargode	0	0
Total	31	598

Table 14: Cost (in lakhs) incurred/committed for repair of power sector (Details: Annexure 6)

District	Cost (in lakhs)
Thiruvananthapuram	27.28
Kollam	102.818
Pathanamthitta	-
Alappuzha	113.232
Kottayam	97.94
Idukki	18.2452
Ernakulam	136.508
Thrissur	76.2145
Palakkad	144.693
Malappuram	163.128
Wayanad	18.2475
Kannur	123.914
Kasargode	65.8541
Total	1088.0743

Table 15: Loss to PWD roads in Lakhs (Details: Annexure 7)

District	Length (Km)	Cost (in lakhs)
Thiruvananthapuram	234.305	1140.5
Kollam	293.884	1580.6
Pathanamthitta	-	1048
Alappuzha	140.915	733
Idukki	129	4794.5
Ernakulam	393.9	1540

Thrissur	25.2	284
Palakkad	112.29	300.7
Malappuram	727.084	5544.5
Kozhikode	343.89	596.23
Wayanad	109.05	578.25
Kannur	41.475	480
Kasargode	199.332	769.2
Total	2750.325	19389.48

Table 16: Loss to bridges in Lakhs (Details: Annexure 8)

Table 12: Loss to Bridges (in lakhs)	
District	Cost (Rs)
Thiruvananthapuram	40.00
Kollam	146.00
Pathanamthitta	0.00
Alappuzha	3.00
Kottayam	0.00
Idukki	89.00
Ernakulam	0.00
Thrissur	20.00
Palakkad	160.00
Malappuram	0.00
Kozhikode	30.00
Wayanad	2.50
Kannur	0.00
Kasargode	0.00
Total	490.50

Table 17: Cost incurred for immediate restoration of community owned infrastructure

District	Number of open wells	Cost	No. of damaged pumps	Cost	No. of damaged water supply tanks	Cost	Length of damaged village roads (Km)	Cost	Total (in lakhs)
Thiruvananthapuram	-	-	-	-	-	-	-	-	-
Kollam	35	12.3	5	1	3	7.5	106	-	21
Pathanamthitta	-	-	-	-	-	-	-	-	-
Alappuzha	-	-	-	-	-	-	-	-	-
Kottayam	-	-	-	-	-	-	-	-	-
Idukki	-	-	-	-	-	-	100	250	250
Ernakulam	-	-	-	-	-	-	-	-	-
Thrissur	-	-	-	-	-	-	-	-	-
Palakkad	-	-	-	-	-	-	-	-	-
Malappuram	6	0.3	-	-	-	-	-	7.5	7.8
Kozhikode	-	-	-	-	-	-	-	-	-
Wayanad	35	1.75	-	-	-	-	-	-	-
Kannur	-	-	-	-	-	-	-	1	1
Kasargode	-	-	-	-	-	-	-	-	-
Total	76	14.3	5	1.3	3	7.5	206	258.5	279.85

Annexures are given as a separate volume attached to this memorandum.

Figure 5: Photographs of damages due to the monsoon rainfall



മിടുങ്ങിപ്പോയ വീട്. മോടി പാൽക്കു ചുറ്റും വെള്ളം കടന്നുപോയിട്ടുണ്ട്. മോടി പാൽക്കു ചുറ്റും വെള്ളം കടന്നുപോയിട്ടുണ്ട്. മോടി പാൽക്കു ചുറ്റും വെള്ളം കടന്നുപോയിട്ടുണ്ട്.

Flooded house at Alappuzha 24.08.2014



Building collapse due to heavy rain at Aluva, Ernakulam 07.08.2014



ചിലവനൂരിൽ അമലവനം റോഡിൽ തകർന്ന വീട്.

Uprooted tree damaged house at Chilavanoor, Ernakulam 17.07.2014



മാർ റോഡ്-ന്പു. മാർവിലെ റോഡിൽ പാലത്തോടൊപ്പം വീട് തകർന്നുപോയി.

House damage due to heavy rain at Maradu, Ernakulam 26.06.2014



ബാഗലിറപ്പുത്ത്: കനത്ത മഴയിൽ അങ്കമാലി വ്യാപക പഞ്ചായത്ത് ഓഫീസിന്റെ മതിൽ തൂങ്ങിപ്പരിഞ്ഞു തകർന്ന കാര്യം.

Wall breakage due to heavy rain damaged car at Angamali, Ernakulam 2.08.2014



എട്ടാംകൈലിൽ വ്യാഴാഴ്ച വെളുപ്പിന് ഉണ്ടായ മണ്ണിടിച്ചിലിനെത്തുടർന്ന് തകർന്ന കട

Shop collapsed due to landslide at Munnar, Idukki 18.07.2014



കനത്ത മഴയിൽ ഉദ്യാമയിലെ കെ.വി. ജാനകിയുടെ വീട് മരം വീണു തകർന്ന നിലയിൽ.

Uprooted tree damages house at Uduma, Kasaragod 3.08.2014



കടലാക്രമണം രൂക്ഷമായ ചിത്താരി കടപ്പുറം ധീരസേന സംസ്ഥാന വൈസ് പ്രസിഡന്റ് യു.എസ്. ബാലന്റെ നേതൃത്വത്തിലുള്ള സംഘം സന്ദർശിച്ചു.

Uprooted tree due to Rough sea at Chithari beach at Kasaragod 21.07.2014



Flooded house due heavy rain at Kanhangad, Kasaragod
02.08.2014



House damaged at Valakam colony Kottarakkara,
Kollam 20.06.2014



House damages at Valakam-Puliyam colony
Kottarakkara, Kollam 20.06.2014



Agricultural loss at Oyoor ,Kollam 24.08.2014



Flooded Bridge at Peringalloor, Kollam 24.08.2014



Flooded S.N. Pooram road, Kollam 24.08.2014



House damage at Kadakkal Aattupuram, Kollam 24.08.2014



Flooded house at S.N. puram, Kollam 24.08.2014



ചെറുപൊയ്ക പുഴയിൽ ഭാഗത്തു കല്ലടയാർ കരകവിഞ്ഞൊഴുകി കൃഷിയിടത്തിലേക്കു കയറിയിട്ടുണ്ട്.

Agricultural loss due to overflow of Kalladavar at Cherupoyka, Kollam 24.08.2014



റിട്ടിൽ കാടങ്ങിയ മലനട മാറാൻ റിട്ടിൽ കാഞ്ഞുപെണ്ണിനെ

Rescue officers shifting people from their flooded house using life boats at Maranadu, Kollam 24.08.2014



ചടമംഗലം കല്ലുമാലയിൽ ഉരുൾപൊട്ടലിൽ റിട്ടിലേക്ക് പിഴുത് റിന്ന മരം.

Trees uprooted out of debris flow damaged house, Chadamangalam, Kollam 24.08.2014



മലയ്ക്കുളം മഠത്തിൽകാവ് ക്ഷേത്രത്തിനു സമീപം മേട്ടിൽ ലക്ഷംവീട് കോളനിയിൽ പുഴണയായു വെള്ളത്തിൽ മുങ്ങിയ വീടുകളിലൊന്ന്

Flooded house at Lakshamveedu colony, Manjaloor ,Kollam 24.08.2014



കനത്ത മഴയെ തുടർന്ന് പിതൃക്കാട് സന്തക്കുന്ന് റോഡിൽ മണ്ണിടിഞ്ഞപ്പോൾ

Landslide at Pithrukkad,Wayanad at 25.07.2014



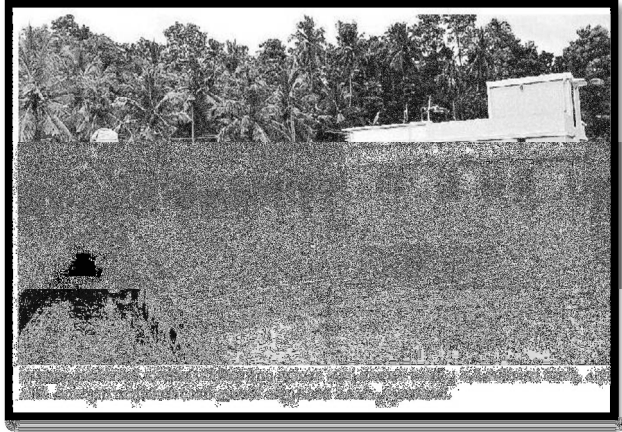
ചങ്ങനാശേരി തലശ്ശേരി 14-ാം വാർഡിൽ തെടുപറമ്പിൽ സൈനബ ബീവിയുടെ വീട് പൂർണ്ണമായും തകർന്നിരിക്കുന്നു

Completely damaged house at Changanassery,Kottayam 24.08.2014.



തിരുവല്ല പൊതുതൂങ്ങിയിലെ ഓളമുക്കത്ത് മൂലം എസി റോഡിൽ ഉണ്ടായ ഗതാഗതക്കുരുക്ക്.

Traffic disruption due water ponding at Thiruvalla,Pathanamthitta 24.06.14.



Flooded house at Malayamkkeezi, Trivandrum
24.08.2014.



Building collapsed due to heavy rain, Thiroor,
Malappuram 03.08.2014



Building collapsed at Ponnani,
Malappuram,03.08.2014.



Completely damaged house at Kannannur,
Palakkad 03.09.2014

Abstract

Code No.	Item	Loss as per SDRF norms (lakhs)
1	2	3
1	Gratuitous Relief	
a	Ex-gratia payment to families of deceased persons (123 individuals)	184.5
b	Ex-gratia payment for loss of a limb or eyes	0
c.i	Grievous injury requiring hospitalization for more than a week	10.44
c.ii	Grievous injury requiring hospitalization for less than a week	0
d	Clothing and Utensils	0
e	Gratuitous Relief for families in dire need (Free Ration)	0
2	Search and Rescue	0
3	Relief Measures	
a	Provision for temporary accommodation, food, clothing, medical care etc. for people affected/evacuated and sheltered in relief camps	0
b	Air dropping	0
c	Provision of emergency supply of drinking water in rural areas and urban areas	0
4	Clearance of affected areas	
a	Clearance of debris in households and public area	0
b	Draining of flood waters in affected areas	0
c	Funeral and burial of dead bodies	1.23
5	Agriculture	
i	Assistance to small and marginal farmers only	
A	Assistance for land and other loss	
a	Removal of debris on agricultural land	36.7358
b	De-silting/restoration/repair of fish farms	681.453
c	Loss of substantial portion of land caused by landslide & change of course of rivers	0
d	Repair of bunds of agricultural land	11.7575
B	Input subsidy (where crop loss is >50%)	
a	For agricultural crops – rain-fed, irrigated and perennial (only small and marginal farmers; no claims for other than SMF received and hence not included herein)	1216.9
6	Animal husbandry & dairy	
i	Replacement of milch animals & poultry	26
ii	Provision of fodder/feed concentrate in cattle camps including transportation	66
iii	Additional cost of medicines and vaccines	0
iv	Damage to straw	0
7	Fishery	
i	Assistance to Fishermen for repair/replacement of boats, net – damaged or lost	27.702

9	Housing	
a	Fully damaged/Destroyed houses	
I	Pucca Houses	432.5
ii	Kutcha Houses	81.3
b	Severely Damaged Houses	
i	Pucca Houses	522.6
ii	Kutcha Houses	67.9
c	Partially damaged houses	
i	Pucca Houses	692.7
ii	Kutcha Houses	233.2
d	Damaged/Destroyed huts	
e	Cattle shed adjoining house	
		13
10	Infrastructure - Repair/restoration (of immediate nature) of damaged infrastructure	
i)	Road & bridges	19879.98
ii)	Community owned assets	279.85
Iii)	Drinking water supply works (Kerala Water Authority and District Administration)	209.86
iv)	Irrigation (Dept. of Irrigation)	34.5
v)	Power (KSEB)	1088.0743
Grand Total		25832.7826
Estimated loss as per norms: Two hundred and fifty eight crore thirty two lakh seventy eight thousand two hundred and sixty only		

Sd/-
State Relief Commissioner &
Principal Secretary, Revenue and Disaster Management
Govt. Secretariat, Thiruvananthapuram – 695001
Tel/Fax: 0471-2518549
Email: revenueedmdk@gmail.com; seoc.gok@gmail.com