

**EVENT REPORT ON  
"EXTREME RAINFALL OVER KERALA"  
OCTOBER 2021**



PREPARED BY

**KERALA STATE DISASTER MANAGEMENT AUTHORITY**



## Table of Contents

1.0 Introduction .....	3
2.0 Extreme Rainfall Event in Kerala from October 11 <sup>th</sup> to 26 <sup>th</sup> 2021 .....	4
2.1. Alerts.....	4
2.2. Average district rainfall measured during the days: .....	5
2.3. Major Events:.....	7
2.4 Damages caused.....	17
3.0 Actions taken (Mitigation and Preparedness measures).....	19
4.0 Weather Forecast based Early Warnings and Disaster Preparedness:.....	20
5.0 Co-ordination with DDMA's and line departments .....	22
6.0 Role of Dams/Reservoirs in controlling floods .....	22
6.1. Significance of Rule curve in Reservoir water level Monitoring .....	23
7.0 CONCLUSION: .....	23
ANNEXURE 1: G.O.( ) No.676/2021/DMD dated 07/10/2021 .....	26
ANNEXURE 2: Details of camps, houses damaged (fully and partially), deaths and missing cases and forces deployed as on 26.10.2021 .....	29
ANNEXURE 3: Sample data dissemination done by SEOC for the day 16-10-2021 using different social media platforms.....	30
ANNEXURE 4: Action Taken Report - KSEOC.....	49
ANNEXURE 5: G.O.(Rt)No.453/2021/DMD .....	69
ANNEXURE 6: RULE CURVE MEETINGS AND PROCEEDINGS.....	71

## List of Tables

Table 1: Average rainfall(mm) received in each district.....	5
Table 2: List of reported landslide events occurred between 11/10/2021 and 26/10/2021 .....	11
Table 3: Fatalities and missing reported.....	17
Table 4: No of houses damaged (fully and partially) in each districts .....	19
Table 5: Actual measured rainfall and predictions .....	21
Table 6:List of Major Reservoirs under KSEBL.....	22
Table 7:List of Major Reservoirs under Irrigation .....	23

## List of Figures

Figure 1: Rainfall departure map of Kerala in the month of October 2021 .....	6
Figure 2 Arial view of the Kootickal landslide location. Source: Press Trust of India.....	7
Figure 3 Photograph showing a destroyed house at Kootickal. Source: Manorama.....	8
Figure 4: Rescue operations carried out at the landslide location near Mackochi in Kokkayar village. Source: TOI .....	8
Figure 5: Landslide location at Kokkayar where rescue operations are carried out. Source: The News Minute.....	9
Figure 6: Major Landslide locations in Kerala between 11 <sup>th</sup> October and 26 <sup>th</sup> October 2021 .....	12
Figure 7: Flood inundation map of Kerala between 11 <sup>th</sup> October and 26 <sup>th</sup> October 2021 .....	13
Figure 8: Map showing most affected villages of Kottayam district .....	14
Figure 9: Map showing the most affected villages of Pathanamthitta District .....	14
Figure 10: Map showing the most affected villages of Idukki District.....	15
Figure 11: Map showing the most affected villages of Alappuzha District .....	16
Figure 12: The wall collapse that resulted in the death of siblings in Karipur, Malappuram Source: The Hindu .....	18

# **EVENT REPORT ON EXTREME RAINFALL OVER KERALA**

## **DURING THE MONTH OF OCTOBER**

### **12.10.2021 - 26.10.2021**

#### **1.0 INTRODUCTION**

The first part of the Sixth Assessment Report released by The Intergovernmental Panel on Climate Change (IPCC) in August 2021 confirms that events like extreme heat, extreme rainfall and tropical cyclones are manifestations of climate change. IPCC Special Report on ‘Oceans and Cryosphere in a Changing Climate’ (2019) states that even though the cyclones did not make landfall, they produced heavy rainfall on western Indian coasts. With a rapidly warming Indian Ocean and in particular over Arabian Sea, such severe cyclones are projected to increase in number and the possibility of them making landfall over the west coast of India cannot be overlooked.

Kerala witnessed the most devastating series of floods and landslides in the years 2018 and 2019 which affected millions of people with huge numbers of casualties and incurred heavy economic, social and infrastructural damages. In October 2021, once again the state of Kerala was hit by torrential rain causing flooding and triggered a series of landslides.

On 11<sup>th</sup> October 2021, Kerala state received widespread heavy rainfall. The cyclonic storm ‘KOMPASU’ in the West Pacific along with the cyclonic circulation in the North Andaman Sea and the neighbourhood strengthened the monsoon westerlies and has caused widespread very heavy rainfall over the Kerala state. Kunnamangalam, Thikkodi, and Kanjirapuzha in North Kerala experienced extremely heavy rainfall of more than 20 cm on the particular day. Brimore, Valayinkil, Malappuram, Pulingome, Parambikulam, Ayoor, Parappanagadi, Vellachal, Boothathankettu, Keerampara, Payyavoor, Pazhassi, Vannapuram, Olayampadi, Cheruthazham, Pandikkad, Karikkadavu, Ponmudi, Anakkayam, Peringalkuthu, Pilicode, Thodupuzha and Mattannur also experienced very heavy rainfall. Rainfall of more than 10 cm was recorded over Thrithala, Thunakadavu, Perinthalmanna, Nilambur, Kulathupuzha, Cheruvanchery, Pazhayannur, Mangattuparambu, Vellarikundu, Cheruthazham, Vyanthala and Kulamavu. By the weakening of cyclonic storm ‘KOMPASU’, monsoon westerlies weakened and the State experienced light to moderate rainfall during 12-15<sup>th</sup> October. An average rainfall of about 30.5 mm, 14.4 mm, 7.9 mm and 15.1 mm received respectively on 12, 13, 14 and 15<sup>th</sup> October 2021.

A cyclonic circulation formed over Arabian Sea on 13<sup>th</sup> October which intensified into a low-pressure system over the east-central and the adjoining south-east Arabian Sea off the Lakshadweep coast on

14<sup>th</sup> October 2021. It moved east-south-eastwards as a low-pressure system towards the Kerala coast. Under its influence, widespread heavy rainfall and isolated extremely heavy rainfall was experienced in various parts of the State on 16<sup>th</sup> October in a short span of time which caused devastating floods and landslides. Rainfall of about 347 mm received at Mundakayam in Kottayam district was the highest value recorded and Peermade in Idukki district received about 304.5 mm of rainfall on that day. Chinnar, Kulamavu, Kanjirappally, Teekoy, Nilackal, Perunthenaruvi, Ponmudi, Keerapara and Thodupuzha regions received more than 20 cm rainfall. Rainfall of above 10 cm was recorded over Poonjar, Cheruthoni, Chalakudy, Seethathode, Panniyoor, Muvattupuzha, Neeleswaram (EKM), Thenmala, Konni and Kakkayam.

Even though the low pressure over the South-East Arabian Sea and adjoining Kerala coast became less marked on 17<sup>th</sup> October, isolated heavy rainfall was experienced over Kerala. Kunnankulam, Tripayar, Vynthala, Varantharappilly, Amalanagar, Mathilakam, Vettilappara, Moozhiyar, Keerampara, Bhoothathankettu, Peringalkuthu, Neeleswaram and Chalakudy received more than 10 cm of rainfall.

## **2.0 EXTREME RAINFALL EVENT IN KERALA FROM OCTOBER 11<sup>TH</sup> TO 26<sup>TH</sup> 2021**

### **2.1. ALERTS**

- i. **Rainfall alerts** (Nowcasts and forecasts) were received from the Indian Meteorological Department (IMD). Nowcasts were received daily in 3 hourly intervals (01am, 04am, 07am, 10am, 01pm, 04pm, and 10pm). Rainfall forecasts for upcoming 5 days were received 3 times a day (10am, 01pm and 04pm).
- ii. **Dam water levels** of both KSEB and Irrigation departments were monitored initially on a daily basis. At the peak rainfall days, dam water levels were updated every 3 hours. Dam water level alerts (blue, orange and red) were given on a timely basis.
- iii. **Lightning and heavy wind alerts:** Alerts were given daily evening for lightning and heavy wind as received from IMD
- iv. **Fishermen warning and high wave alerts:** Fishermen were advised not to venture into the sea area because of rough sea conditions. And the alerts were given on a daily basis.
- v. **Ocean state forecast:** Ocean tidal forecast were issued on a daily basis from INCOIS which used for opening of dams and efficient river drainage systems

## 2.2. AVERAGE DISTRICT RAINFALL MEASURED DURING THE DAYS:

District wise rainfall(mm)	11-Oct	12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct
Kerala & Mahe	13.8	78.7	30.5	14.4	7.9	15.1	80.3	32.7	8.6	1.6	29.1	8.1	14	17.4	5	13.2
Alapuzha	34.7	43.7	12	28.8	3.2	24.6	44.8	4.2	2.6	3.2	34.2	0.2	10.4	6.7	0	16.1
Ernakulam	8.6	51	27.9	22.8	3.7	11.4	97.4	44.3	23.5	0	35.1	2.5	25.9	4.5	1	10.2
Idukki	8.8	75.5	13.1	19.2	16.7	4	147.2	40	17.6	3.3	41.4	29.7	8.7	31.7	9.3	25.2
Kannur	10.8	104.6	81.6	3.8	0.3	0.2	94.1	26.2	6.1	0	11.2	0.1	0.3	0	20.2	3.1
Kasargod	6.2	88.7	87.5	1.7	2.7	12.5	37.4	19.4	3.1	0	18.9	3.2	0	0	0	24.9
Kollam	31.8	80.9	4.9	37.7	5.1	51.8	89	27.9	1.1	1.9	17.2	5.2	11.9	32.7	0.2	10
Kottayam	22.6	47.4	19.8	16.2	10.5	20.4	118.7	12.9	6.3	2.5	18.7	15.4	6.5	15.2	0	17.2
Kozhikode	26	164.9	71.6	1.3	0.6	0	63.9	31.4	7.1	0	14.3	0.1	4.9	14.6	0.5	0
Mahe	16.8	152.8	43.4	1.2	0	0	153.8	38.8	25.6	0	4.8	0	0	0	8.6	0
Malapuram	6.8	129.3	32.5	5.1	5.6	0.3	43.8	20.4	1.7	1.7	27	5	8.1	4.1	9.5	4.4
Palakkad	5.4	93.8	19.1	11	7.8	1.4	67.7	37.3	17.2	4.6	40.4	14.6	40.2	4.7	8.4	12.5
Pathanamthitta	10.4	59.1	16.1	16.8	23.1	59.3	111.8	36.3	0.4	0.4	42	5.6	4.1	76.9	0	35.3
Thiruvananthapuram	33	29.4	2.2	32	3.7	60.6	48	12.8	1.2	0	2.2	2.9	0.2	24	0	22.8
Thrissur	7.4	66.3	37.3	10.8	15.3	0.8	64.1	79.9	11.1	1.3	41.7	5.4	37.1	7.8	2.4	4.2
Wayanad	7.2	12	12.4	1.4	2.3	0.1	42.1	29.2	2.1	0	41.4	1	12.3	21.7	4.7	0.3

*Table 1: Average rainfall(mm) received in each district*

\*Source:IMD,Thiruvananthapuram

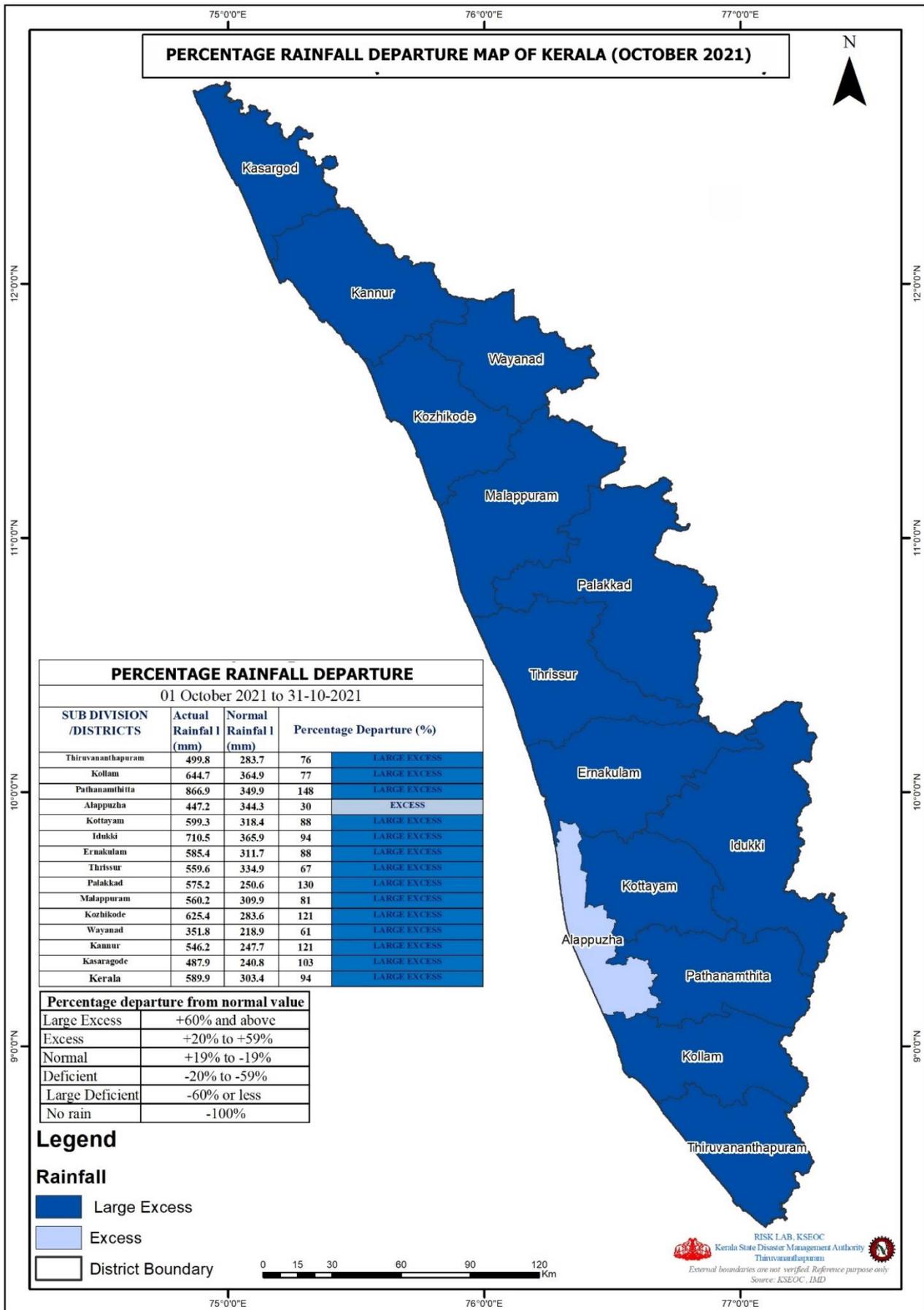


Figure 1: Rainfall departure map of Kerala in the month of October 2021

### 2.3. MAJOR EVENTS:

#### **Kottayam**

On 16<sup>th</sup> October, in Kanjirappally Taluk of Kottayam district alone about 23 landslide events were reported in villages viz., Kootickal, Edakunnam, Mundakkayam, Erumely North and Koruthodu. Landslide events were also reported from multiple locations in Meenachil Taluk of Kottayam district on the same day. Amongst, Kootickal village was the most affected. The bodies of all the 13 persons reported missing following the landslides in Kootickal have been recovered.



*Figure 2* Aerial view of the Kootickal landslide location. Source: Press Trust of India



*Figure 3 Photograph showing a destroyed house at Kootickal. Source: Manorama*

## **Idukki**

Idukki district also reported about 23 landslides in Peerumedu Taluk alone on 16<sup>th</sup> October. The major landslide occurred at Mackochi of Kokkayar village of Peerumedu taluk at about 11 am. The devastating landslide caused huge damage and took the lives of 7 people amongst 5 were children.



*Figure 4: Rescue operations carried out at the landslide location near Mackochi in Kokkayar village. Source: TOI*



*Figure 5: Landslide location at Kokkayar where rescue operations are carried out. Source: The News Minute*

**REPORTED LANDSLIDE EVENTS IN KERALA BETWEEN 11-10-2021 to 25-10-2021**

<b>SL No</b>	<b>DISTRICT</b>	<b>TALUK</b>	<b>VILLAGE</b>	<b>INCIDENT LOCATION</b>	<b>DATE</b>
1	Palakkad	Mannarkadu	Attapadi road	Attapadi road	12-10-2021
2	Kollam	Pathanapuram	Piravanthoor	Karavoor	16-10-2021
3	Kottayam	Meenachil	Poonjar Thekkekara	Kuzhimbully	16-10-2021
4	Kottayam	Meenachil	Poonjar Thekkekara	Cholathadam	16-10-2021
5	Kottayam	Meenachil	Poonjar Thekkekara	Kaipally	16-10-2021
6	Kottayam	Meenachil	Poonjar Thekkekara	Adivaram	16-10-2021
7	Kottayam	Meenachil	Poonjar Thekkekara	Eethumpally	16-10-2021
8	Kottayam	Meenachil	Teekoy	Mangalagiri bhagam	16-10-2021
9	Kottayam	Meenachil	Teekoy	Marmala Aruvi Bhagam	16-10-2021
10	Kottayam	Meenachil	Moonilavu	Anjukudiyar	16-10-2021
11	Kottayam	Meenachil	Moonilavu	Mankombu	16-10-2021
12	Kottayam	Meenachil	Moonilavu	Anjumala	16-10-2021
13	Kottayam	Kanjirappally	Koottickal	Kodunga	16-10-2021
14	Kottayam	Kanjirappally	Koottickal	Plappally	16-10-2021
15	Kottayam	Kanjirappally	Koottickal	Thalunkal	16-10-2021
16	Kottayam	Kanjirappally	Koottickal	Kavaali	16-10-2021
17	Kottayam	Kanjirappally	Koottickal	Valiyentha	16-10-2021
18	Kottayam	Kanjirappally	Koottickal	Mlakkara	16-10-2021
19	Kottayam	Kanjirappally	Koottickal	Mooppanmala	16-10-2021
20	Kottayam	Kanjirappally	Koottickal	Mundappally	16-10-2021
21	Kottayam	Kanjirappally	Koottickal	Elamkadu	16-10-2021
22	Kottayam	Kanjirappally	Koottickal	Njarkadu	16-10-2021
23	Kottayam	Kanjirappally	Koottickal	Chanthanplappally	16-10-2021
24	Kottayam	Kanjirappally	Koottickal	Koonad	16-10-2021
25	Kottayam	Kanjirappally	Edakkunnam	Cherumala	16-10-2021
26	Kottayam	Kanjirappally	Edakkunnam	Azhamala	16-10-2021
27	Kottayam	Kanjirappally	Edakkunnam	Vattakkavu	16-10-2021
28	Kottayam	Kanjirappally	Mundakkayam	Karadimala	16-10-2021
29	Kottayam	Kanjirappally	Mundakkayam	Parathanam	16-10-2021
30	Kottayam	Kanjirappally	Mundakkayam	Vettukulamkuzhi	16-10-2021
31	Kottayam	Kanjirappally	Erumely North	Assambani	16-10-2021
32	Kottayam	Kanjirappally	Koruthodu	Mundakkayam Block	16-10-2021
33	Kottayam	Kanjirappally	Koruthodu	Kombukutty	16-10-2021
34	Kottayam	Kanjirappally	Koruthodu	Madukka	16-10-2021
35	Kottayam	Kanjirappally	Koruthodu	Chakirimedu	16-10-2021
36	Kottayam	Kanjirappally	Koruthodu	Pulinthanam Padi	16-10-2021
37	Idukki	Peerumadu	Peruvandhanam	Cheruvallikulam	16-10-2021

38	Idukki	Peerumadu	Peruvandhanam	Aanachari	16-10-2021
39	Idukki	Peerumadu	Peruvandhanam	Nediyoram	16-10-2021
40	Idukki	Peerumadu	Peruvandhanam	Puzhap	16-10-2021
41	Idukki	Peerumadu	Peruvandhanam	Amalagiri	16-10-2021
42	Idukki	Peerumadu	Peruvandhanam	Thekkemala	16-10-2021
43	Idukki	Peerumadu	Peruvandhanam	Paloorkavu	16-10-2021
44	Idukki	Peerumadu	Peruvandhanam	Kombanpara	16-10-2021
45	Idukki	Peerumadu	Peruvandhanam	Madamba	16-10-2021
46	Idukki	Peerumadu	Peruvandhanam	Vagamala	16-10-2021
47	Idukki	Peerumadu	Peruvandhanam	Karainkkad	16-10-2021
48	Idukki	Peerumadu	Kokkayar	Mackochi	16-10-2021
49	Idukki	Peerumadu	Kokkayar	Kanakapuram	16-10-2021
50	Idukki	Peerumadu	Kokkayar	Mukkulam	16-10-2021
51	Idukki	Peerumadu	Kokkayar	Vembil	16-10-2021
52	Idukki	Peerumadu	Kokkayar	Enthayar	16-10-2021
53	Idukki	Peerumadu	Kokkayar	Poovanchi	16-10-2021
54	Idukki	Peerumadu	Kokkayar	Kuttiplangad	16-10-2021
55	Idukki	Peerumadu	Kokkayar	Urumbikkara	16-10-2021
56	Idukki	Peerumadu	Kokkayar	Vadakkemala	16-10-2021
57	Idukki	Peerumadu	Kokkayar	Meloram	16-10-2021
58	Idukki	Peerumadu	Kokkayar	Meppuzha	16-10-2021
59	Idukki	Peerumadu	Kokkayar	Kochupalam	16-10-2021
60	Palakkad	Ottapalam	vellinezhi		17-10-2021
61	Palakkad	Chittoor		B/W Parambikulam & Thoonkadavu	18-10-2021
62	Palakkad	Alathur	Kizhakancheri	odathodu- padagithodu road	20-10-2021
63	Kottayam	Meenachil	Teekoy	magalagiri 36 acre	20-10-2021
64	Malappuram	Peruthalmanna	Araku prambu	mattarakal	20-10-2021
65	Idukki	Devikuilam	Manakandam	Ancham mile	20-10-2021
66	Wayanad	Vythiri	Kalpetta	Chena Mala	20-10-2021
67	Pathanamthitta	Konni	Seethathode	Kottaman para	23-10-2021
68	Pathanamthitta	Ranni	Narani puram	Kurumban muzhi	23-10-2021
69	Pathanamthitta	Ranni	Narani puram	Kurumban muzhi	25-10-2021

\*Source: District Emergency Operations Centres

Table 2: List of reported landslide events occurred between 11/10/2021 and 26/10/2021



Figure 6: Major Landslide locations in Kerala between 11<sup>th</sup> October and 26<sup>th</sup> October 2021

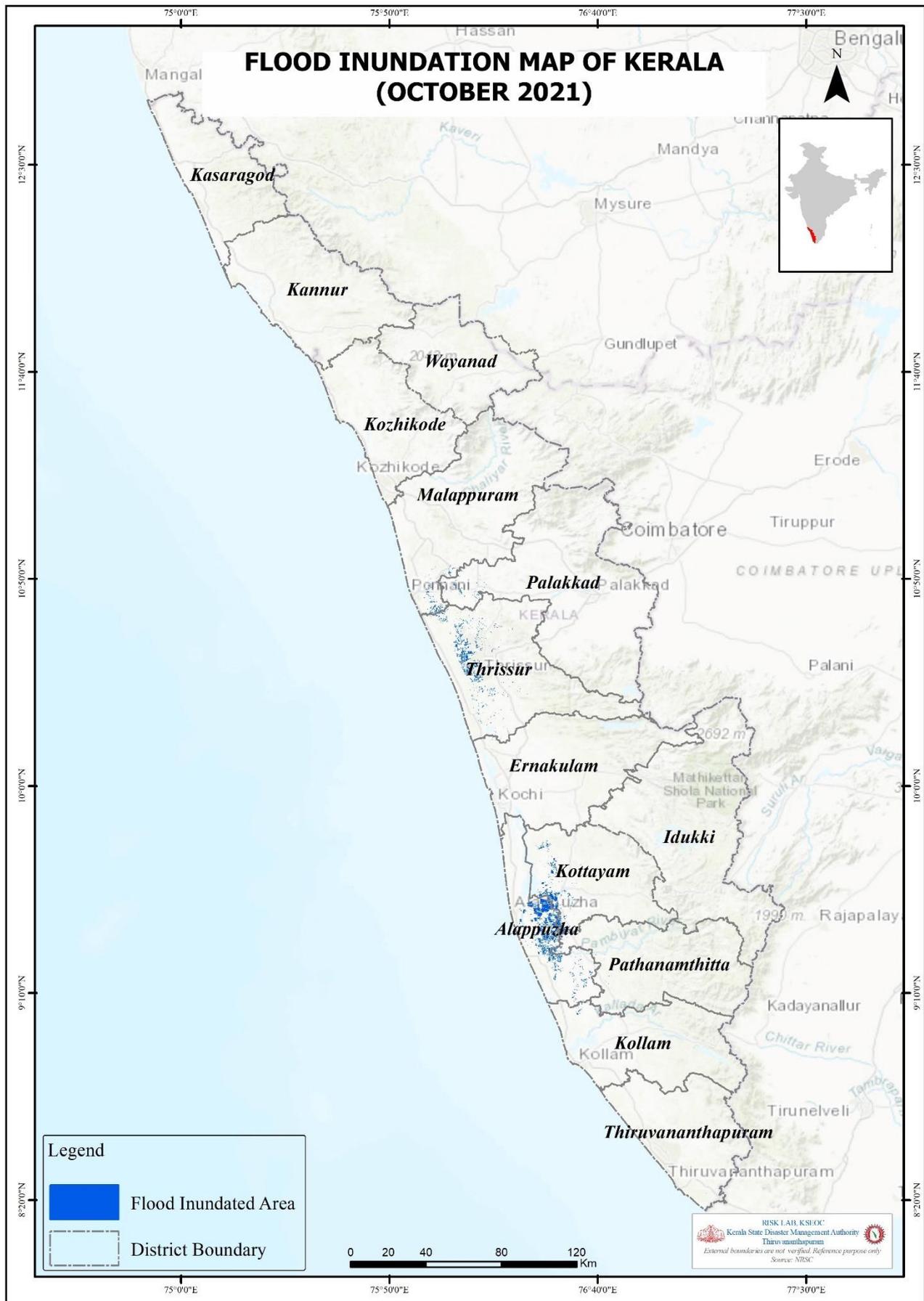


Figure 7: Flood inundation map of Kerala between 11<sup>th</sup> October and 26<sup>th</sup> October 2021

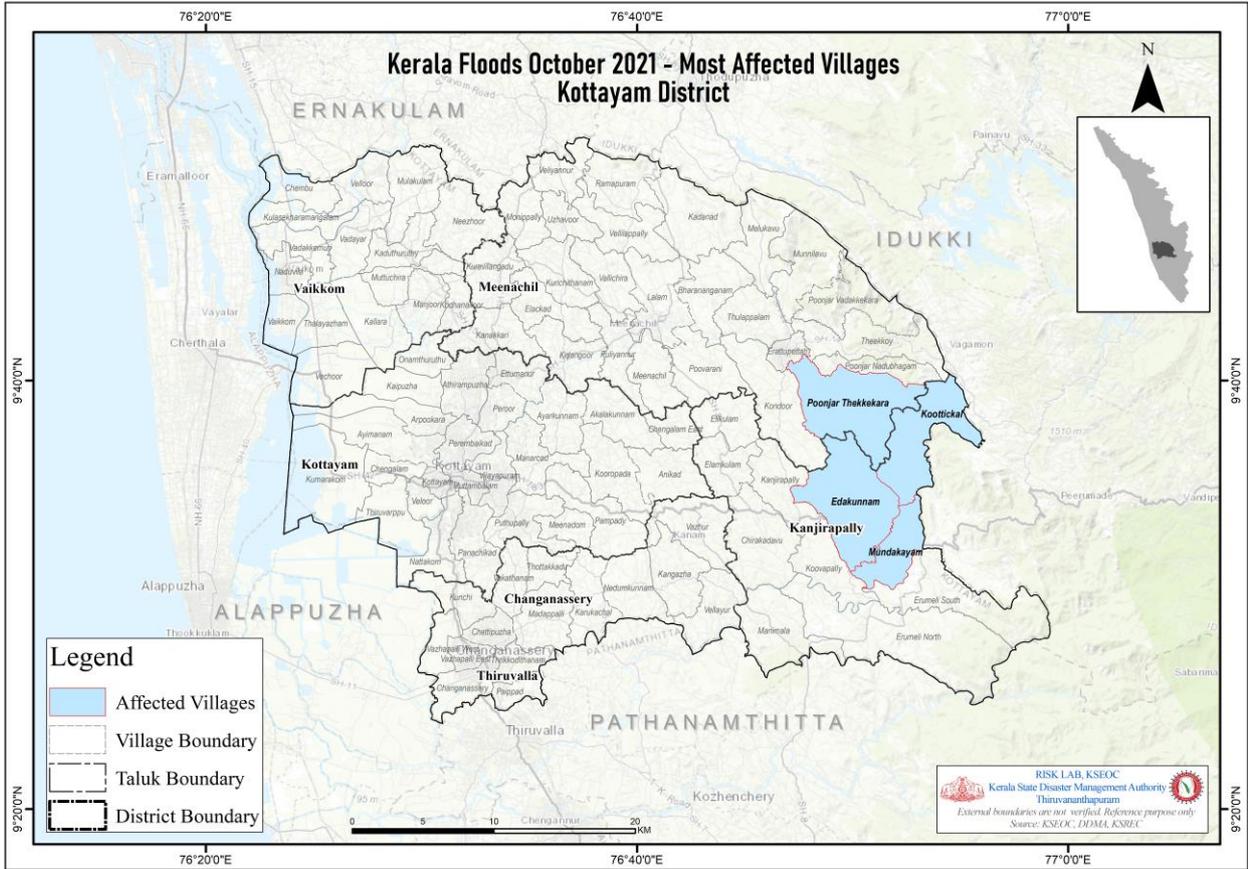


Figure 8: Map showing most affected villages of Kottayam district

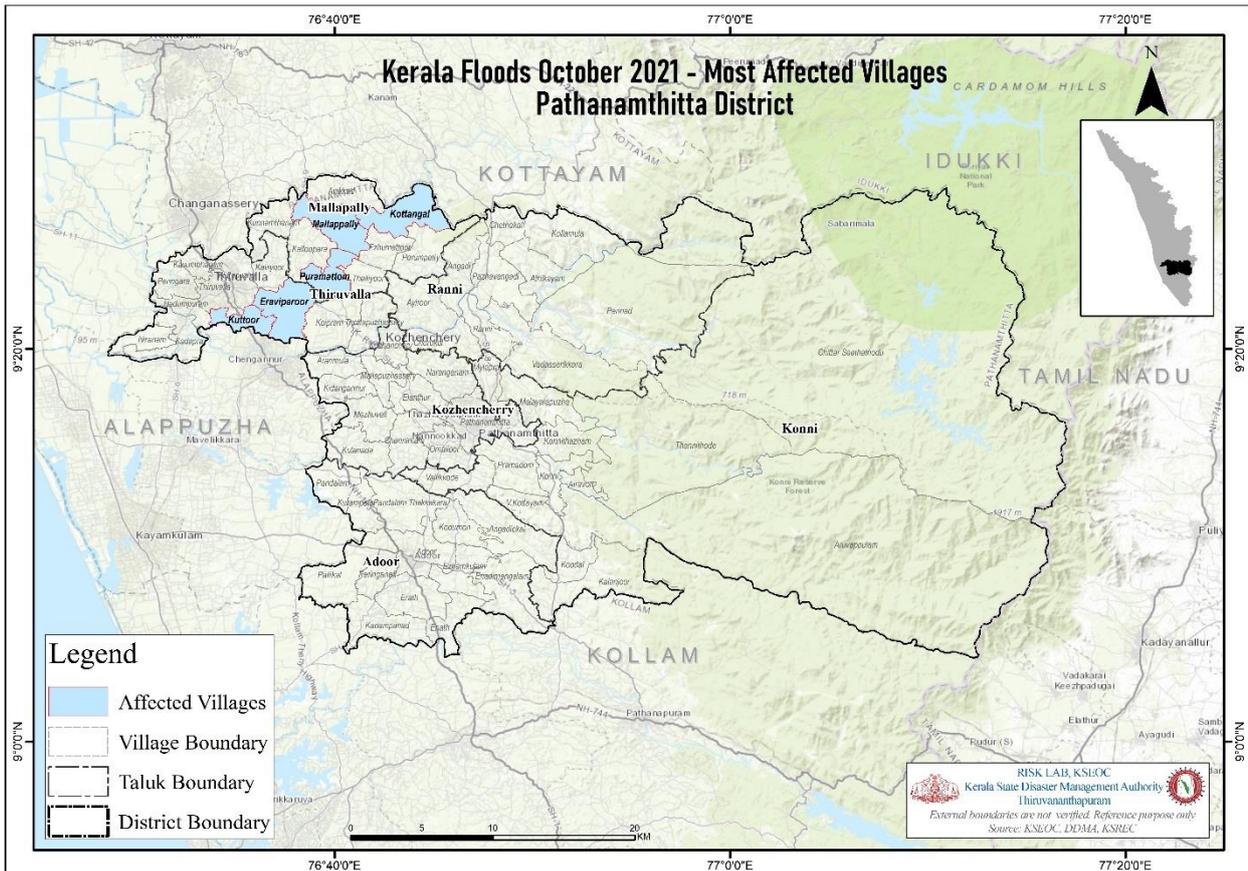


Figure 9: Map showing the most affected villages of Pathanamthitta District

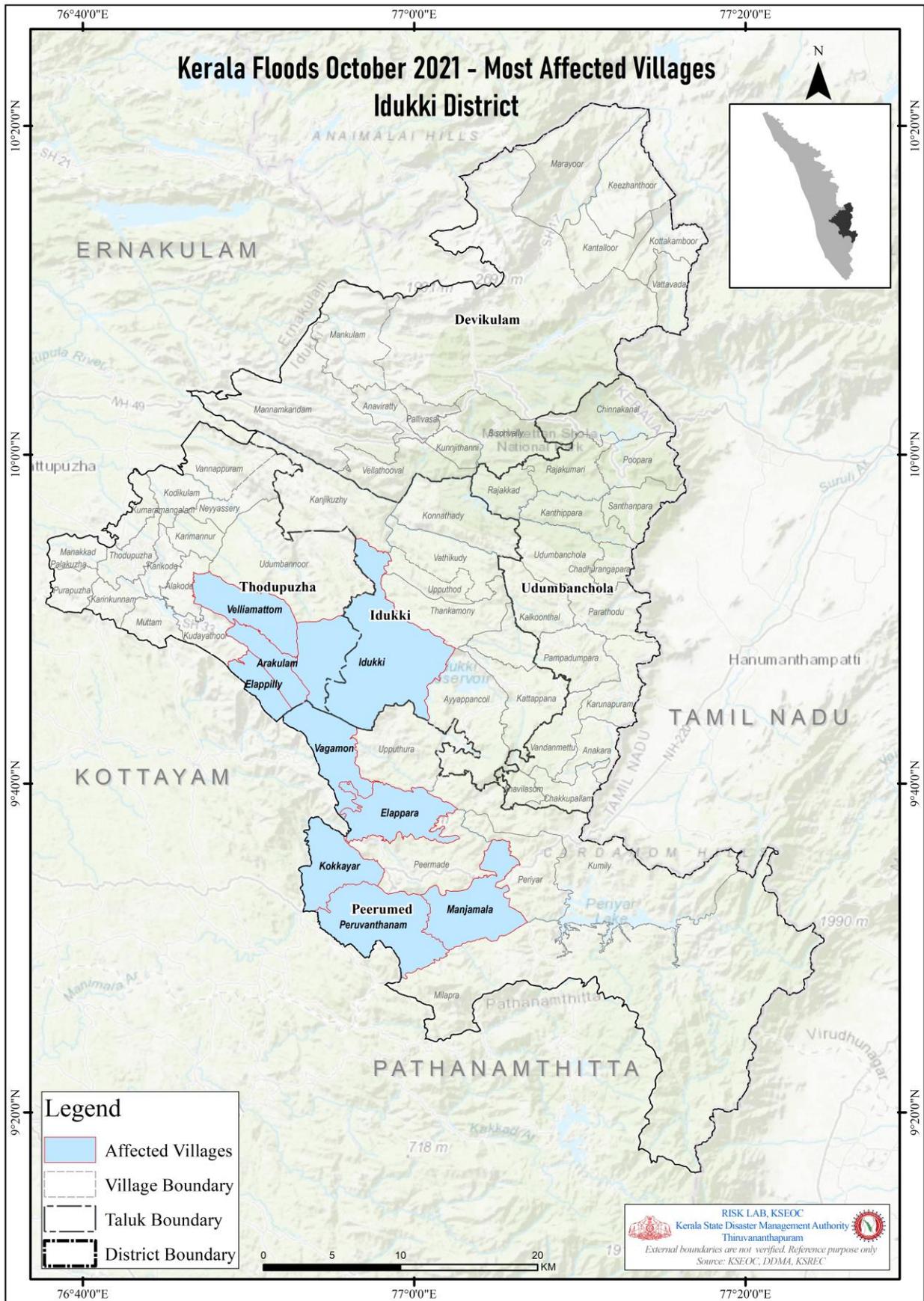


Figure 10: Map showing the most affected villages of Idukki District



Figure 11: Map showing the most affected villages of Alappuzha District

## 2.4 DAMAGES CAUSED

A total of 57 people (see Table 3) lost their lives due to the impact of rains. The causes of the deaths of people were drowning, collapse of walls etc. that occurred during the rains. In addition, 2 people were missing as of 26th October 2021.

Sl. No.	District	No. of Human Fatalities	No. of Persons Missing
1	Thiruvananthapuram	4	0
2	Kollam	3	0
3	Pathanamthitta	2	0
4	Alappuzha	2	0
5	Kottayam	17	0
6	Idukki	12	0
7	Ernakulam	0	0
8	Thrissur	3	0
9	Palakkad	2	0
10	Malappuram	8	2
11	Kozhikode	1	0
12	Wayanad	0	0
13	Kannur	3	0
14	Kasaragod	0	0
<b>Total</b>		<b>57</b>	<b>2</b>

*Table 3: Fatalities and missing reported*



*Figure 12: The wall collapse that resulted in the death of siblings in Karipur, Malappuram Source: The Hindu*

The damages occurred in the housing sector have been given in Table 4. The number of fully damaged houses as well as the number of partially damaged houses was highest in Kottayam district. The detailed list of damages, deceased and missing persons, details of camps, deployment of NDRF and rescue teams as on 26<sup>th</sup> October 2021 is attached as Annexure 2.

Sl. No.	District	No. of Houses Fully Damaged	No. of Houses Partially Damaged
1	Thiruvananthapuram	5	215
2	Kollam	6	151
3	Pathanamthitta	4	11
4	Alappuzha	7	59
5	Kottayam	190	1083
6	Idukki	119	391
7	Ernakulam	0	0
8	Thrissur	6	18
9	Palakkad	2	54
10	Malappuram	2	93
11	Kozhikode	3	28
12	Wayanad	0	0
13	Kannur	2	60
14	Kasaragod	0	33
<b>Total</b>		<b>346</b>	<b>2196</b>

*Table 4: No of houses damaged (fully and partially) in each districts*

### **3.0 ACTIONS TAKEN (MITIGATION AND PREPAREDNESS MEASURES)**

During the first week of October itself, IMD had forecasted widespread heavy rainfall and isolated very heavy rainfall over Kerala due to the prevailing South west monsoon. Foreseeing the dangers that could happen due to the heavy rainfall, Kerala State Disaster Management Authority had advised Disaster Management Department (DMD) to issue orders regarding steps to be taken by District Collectors, Line Departments and Public vide GO No 676/2021/DMD dated 07/10/2021 (Annexure 1). An online meeting was called by the Honourable Revenue Minister on 13<sup>th</sup> October with all the district collectors and the line departments to update about the heavy rainfall warning. In the meeting the Minister informed that NDRF units has been stationed at the most hazard prone districts and advised everyone to be vigilant and to take all the necessary actions as a part of the preparedness

activity as mentioned in the Orange Book of Disaster Management – Standard Operations Procedures (SOP) & Emergency Supports Functions Plan ([https://sdma.kerala.gov.in/wp-content/uploads/2021/05/orangebook\\_2021.pdf](https://sdma.kerala.gov.in/wp-content/uploads/2021/05/orangebook_2021.pdf)). Meetings were conducted on a regular basis with all District collectors and officials of all line departments (water authority, KSEB, Irrigation, etc). Forces were deployed in each district. NDRF, Army, Airforce and Navy helicopters, Defence service corps, ETF, Aapda Mitra volunteers, Inter Agency Group members, Civil Defence and Sannadha Sena volunteers were arranged as per the needs of each district. (Detailed Action taken report on daily basis by SEOC is attached in Annexure 4)

#### **4.0 WEATHER FORECAST BASED EARLY WARNINGS AND DISASTER PREPAREDNESS:**

Kerala, however, is highly vulnerable to natural disasters and the changing climatic dynamics given its location along the sea coast and with a steep gradient along the slopes of the Western Ghats and considering this fact, the weather forecasting and prediction has always been complicated for Kerala. The State Disaster Management Authority is completely dependent on the IMD for forecasts and warnings for its preparedness and mitigation measures. As per the NDMA guidelines and DM Act 2005, State governments and State Disaster Management Authorities shall officially depend on IMD's weather forecast. As per the National Disaster Management Plan, page numbers 114, 118 all the weather forecasts and early warnings regarding flood shall be official the responsibility of IMD and CWC. As per the page number 104 of NDMP, any forecasts or early warnings related to cyclones shall be the responsibility of IMD and according to page numbers 161 & 162, early warnings related to landslides shall be the responsibility of Geological Survey of India and IMD.

The Standard Operating Procedure as listed in the Orange Book by KSDMA is based on the red, orange and yellow alerts issued by the IMD, according to which the line departments and the response teams are mobilised to the disaster-prone locations. The colour coded forecast issued at 1 pm every day by the IMD is taken into consideration by KSDMA and shall issue necessary warnings based on it as per the SOP. As per the forecast from IMD, KSDMA translates the same into local language and sign language and forwards the same to all the line departments, officials, media and shall also update the same through the various social media handles of KSDMA for public information. Apart from this, KSDMA also issues Nowcast for 3 hours, live data from AWS, received rainfall details, water levels in all major reservoirs etc,

It is an undisputed fact that the early warnings and preparations during the 2018-19 Floods, Okhi & Burevi cyclones and also the landslide and flood in October 2021 was hindered due to the errors in the forecast by IMD. As per the IMD Thiruvananthapuram centre's weather forecast issued on

October 15<sup>th</sup> 1 pm and 4 pm, Kottayam, Alappuzha, Pathanamthitta, Kollam and Thiruvananthapuram shall receive normal rainfall and was given green alert, whereas Idukki was issued with a yellow alert suggesting Isolated Heavy rainfall for October 16<sup>th</sup>. But that day witnessed extremely heavy rainfall of about 305.5 mm rainfall in Peerumedu, 266 mm in Kanjirapally and about 204 mm rainfall in Thodupuzha in just 24 hours.

District	Alert	15-10-2021	Alert	16-10-2021	Alert	17-10-2021
KSGD	Yellow	0	Green	33	Yellow	28.8
KNR	Yellow	0	Yellow	117.6	Yellow	38.4
KKD	Green	1.2	Orange	70.4	Green	67
WYND	Green	8	Orange	103.4	Green	60
MLP	Orange	9.6	Yellow	105.2	Yellow	63
TSR	Yellow	36.1	Yellow	101.2	Green	105.7
PKD	Orange	12.3	Yellow	123.7	Green	64
ERN	Yellow	7.4	Yellow	88.4	Green	95
KTY	Yellow	42.2	Green	266	Yellow	26
IDK	Yellow	6.4	Yellow	305.5	Yellow	56.3
ALP	Yellow	33.7	Green	48.8	Yellow	8.6
PTN	Yellow	97	Green	102	Yellow	40
KLM	Yellow	69.4	Green	165.4	Green	55.4
TVM	Yellow	44.4	Green	45.5	Green	48.6

*Table 5: Actual measured rainfall and predictions*

Disaster management, especially preparedness is based on the early warnings and weather forecasts received at least 24 hours in advance to any incident. Any errors in this forecast and early warnings shall hamper the deployment of NDRF and other forces for the rescue and evacuation of the vulnerable community from the disaster affected locations. On 16<sup>th</sup> October Kottayam and Pathanamthitta had no prior warning alerts and Idukki had only yellow alert from IMD, extremely heavy rainfall was reported in these districts in a very short span of time. The devastating floods and landslides wrecked these districts with heavy damages to life and property.

By October 18<sup>th</sup> most of the KSEB dams and reservoirs were on red alert and most of the irrigation reservoirs and barrages were on yellow alert. As a preparatory measure since IMD had forecasted heavy downpour in the upcoming days and also after considering downward flooding of the low-lying areas especially in Alappuzha district; shutters were opened for the release of water from reservoirs. In the following days, flood waters affected Alappuzha district and relief camps were opened in all the four districts namely Alappuzha, Kottayam, Pathanamthitta and Idukki. As on 26<sup>th</sup> October 2021, 57 lives were lost including 9 children, two are missing, more than 340 houses were fully damaged, and more than 2100 houses were partially damaged.

More than 400 relief camps were opened with 9200 families and more than 30,000 inmates out of which 4967 are children. Alappuzha and Pathanamthitta districts have the highest number of camps with highest number of inmates and children.

The State Government, along with the support of Army, IAF, NDRF and civilians rescued stranded people from the affected districts.

### **5.0 CO-ORDINATION WITH DDMA'S AND LINE DEPARTMENTS**

Drafted as per Section 22 (2) (f) of the Disaster Management Act, 2005, The Orange Book published by KSDMA spells out the roles and responsibilities of individual departments. Edition 3 of the Orange Book contains the Incident Response System structure to be followed at the State, District, and Taluk level. It also provides details of Emergency Operations Centres at the State and District Level and the Standard Operating Procedures to be followed during various hazards. In addition, the handbook also contains the emergency support functions plan, indicating the Suo-moto responsibilities of various departments in the event of emergencies.

The Orange Book takes cognizance of the LSG DMPs, especially with regard to the identification of camps in LSG's and the prioritisation of vulnerable people during warning dissemination and relocation.

### **6.0 ROLE OF DAMS/RESERVOIRS IN CONTROLLING FLOODS**

Dams play a major role in controlling and mitigating floods in Kerala State. The reservoirs under Kerala State Electricity Board Limited (KSEBL) and Irrigation Department have to be closely and continuously monitored for analysing the changes in the water levels, live storage and the inflow rate. Based on these parameters, the quantity of water that can be spilled or discharged can be decided. The dams can be primarily classified as major dams and minor dams based on their storage capacity at Full Reservoir Level (FRL). If the storage capacity of the reservoir is greater than 200 MCM, then it is termed as a major reservoir while that which is less than 200MCM, it is termed as minor reservoir.

<b>SL NO.</b>	<b>NAME OF THE RESERVOIR</b>	<b>STORAGE CAPACITY(MCM)</b>
1	IDUKKI	1460
2	IDAMALAYAR	1017.8
3	KAKKI	446.51
4	BANASURA SAGAR	201

*Table 6:List of Major Reservoirs under KSEBL*

SL NO.	NAME OF THE RESERVOIR	STORAGE CAPACITY (MCM)
1	MALAMPUZHA	226
2	KALLADA	504.92

*Table 7: List of Major Reservoirs under Irrigation*

#### 6.1. SIGNIFICANCE OF RULE CURVE IN RESERVOIR WATER LEVEL MONITORING

A rule curve or rule level in a reservoir specifies the storage of water which can be maintained in the reservoir for a specified period, to fill the reservoir in stages during monsoon considering the conservation and flood control aspects. The rule curve of a reservoir helps in the efficient monitoring and maintaining the safe water level in a reservoir without disregarding the conservation practice of the same.

As a part of Disaster Management-South-West Monsoon Preparedness, a State Rule Curve Monitoring Committee for all dams in the state was formed (G.O (Rt) No. 453/2021/DMD dated 03.06.2021) (Annexure 5). Under this technical committee, rule curves of all major dams in the state were formulated. The objective of such a technical committee is to evolve a structured and systematic preparedness strategy for tackling the adverse impacts of a monsoon. The compliance committee meeting is carried out on a monthly basis, except for any instances of emergency. A total number of twenty-one meetings have been conducted till date, out of which sixteen meetings have been conducted during the onset of moderate to heavy rainfall received from October 11 towards the end of the month. The detailed minutes of meeting till 25<sup>th</sup> October is attached as Annexure 6.

#### 7.0 CONCLUSION:

Kerala witnessed one of the heaviest rainfalls recorded ever in the month of October this year. The extremely heavy downpour in a very short span of time created havoc in Kerala especially in the districts of Kottayam, Idukki, Pathanamthitta and Alappuzha triggering flooding and landslides. It was very unfortunate that about 57 lives were lost, 2 were missing, more than 340 houses were fully damaged, and more than 2100 houses were partially damaged in these multiple incidents which took place from 11<sup>th</sup> October to 26<sup>th</sup> October. But the early warnings and preparedness activity of KSDMA, DDMA's and the line departments as per the Standard Operating Procedures (SoP) laid down in the Orange Book and the LSG level Disaster Management plans helped the state in implementing the preparedness and mitigation measures effectively. About 400 relief camps were opened with 9200 families and more than 30,000 inmates out of which 4967 were children. These preparedness and mitigation measures helped the state to reduce casualties. In a nutshell, while the Orange Book helps

in managing disasters at the state level by assigning roles and responsibilities to lower levels, the LSG DM Plans bring more attention to the idea of community-based disaster risk reduction.

It is a fact that every year, the number of disaster events like extreme rainfall events and landslides are increasing in Kerala. In order to make the preparedness and mitigation activity much more efficient, we need to strengthen our resources. KSDMA suggests that we need to establish an efficient network of AWS and ARG's throughout the state on LSG level at the earliest. This will help the us to provide more accurate weather forecasts and nowcasts, rather than depending alone on the IMD's weather forecast details. This will definitely improve our early warning systems and effectively reduce the number of casualties in the future.



### **Authors**

1. Mr. Vignesh R, Environmental Planner, KSDMA
2. Indu V, Architect, KSDMA
3. Dr. Alfred Johny, Hazard Analyst (Oceanography), KSDMA
4. Mrs. Lekshmi Vijayachandran, Hydrologist, KSDMA
5. Dr. Shinu Sheela Wilson, Meteorologist, KSDMA
6. Ms. Remya R, Meteorologist, KSDMA
7. Mr. Pradeep G S, Hazard and Risk Analyst, Head SEOC (i/c), KSDMA

# **ANNEXURES**

**ANNEXURE 1: G.O.(O) NO.676/2021/DMD DATED 07/10/2021**

"ഭരണഭാഷ- മാതൃഭാഷ"



**കേരള സർക്കാർ**

**സംഗ്രഹം**



ദുരന്ത നിവാരണ വകുപ്പ്- സംസ്ഥാനത്ത് അതിശക്തമായ മഴയ്ക്ക് സാധ്യതയുള്ളതിനാൽ വിവിധ വകുപ്പുകളും ജില്ലാ കളക്ടർമാരും പൊതുജനങ്ങളും സ്വീകരിക്കേണ്ട നടപടികൾ സംബന്ധിച്ചുള്ള നിർദ്ദേശങ്ങൾ ഉൾക്കൊള്ളിച്ച് ഉത്തരവ് പുറപ്പെടുവിക്കുന്നു.

**ദുരന്ത നിവാരണ (എ) വകുപ്പ്**

സ.ഉ.(സാധാ) നം.676/2021/DMD

തീയതി 07/10/2021, തിരുവനന്തപുരം

**ഉത്തരവ്**

സംസ്ഥാനത്ത് അതിശക്തമായ മഴയ്ക്കുള്ള സാധ്യതയുള്ളതായി കേന്ദ്ര കാലാവസ്ഥാ വകുപ്പ് അറിയിച്ചിരിക്കുന്നതിന്റെ പശ്ചാത്തലത്തിൽ താഴെപ്പറയുന്ന നിർദ്ദേശങ്ങൾ കർശനമായി പാലിക്കേണ്ടതാണ്.

**പൊതുജനങ്ങൾക്കുള്ള പ്രത്യേക നിർദ്ദേശങ്ങൾ**

- താഴെ പ്രദേശങ്ങൾ, നദീതീരങ്ങൾ, ഉരുൾപൊട്ടൽ-മണ്ണിടിച്ചിൽ സാധ്യതയുള്ള മലയോര പ്രദേശങ്ങൾ തുടങ്ങിയ ഇടങ്ങളിലുള്ളവർ അതീവ ജാഗ്രത പാലിക്കണം.
- അതിശക്തമായ മഴ മുന്നറിയിപ്പുള്ള സാഹചര്യത്തിൽ അധികൃതരുടെ നിർദ്ദേശങ്ങൾ അനുസരിച്ച് മാറിത്താമസിക്കേണ്ട ഇടങ്ങളിൽ അതിനോട് സഹകരിക്കേണ്ടതാണ്.
- വിവിധ തീരങ്ങളിൽ കടലാക്രമണം ശക്തമാകാൻ സാധ്യതയുള്ളതിനാൽ അപകട മേഖലകളിൽ താമസിക്കുന്നവർ ജാഗ്രത പാലിക്കണം. ആവശ്യമായ ഘട്ടത്തിൽ മാറി താമസിക്കണം. മൽസ്യബന്ധനോപധികൾ സുരക്ഷിതമാക്കി വെക്കണം.
- അടച്ചുറപ്പില്ലാത്ത വീടുകളിൽ താമസിക്കുന്നവരും മേൽക്കൂര ശക്തമല്ലാത്ത വീടുകളിൽ താമസിക്കുന്നവരും വരും ദിവസങ്ങളിലെ മുന്നറിയിപ്പുകളുടെ അടിസ്ഥാനത്തിൽ സുരക്ഷയെ മുൻകരുതി മാറി താമസിക്കാൻ തയ്യാറാവേണ്ടതാണ്.
- സ്വകാര്യ-പൊതു ഇടങ്ങളിൽ അപകടവസ്ഥയിൽ നിൽക്കുന്ന മരങ്ങൾ/പോസ്റ്റുകൾ/ബോർഡുകൾ തുടങ്ങിയവ സുരക്ഷിതമാക്കേണ്ടതും മരങ്ങൾ കോതി ഒതുക്കുകയും ചെയ്യേണ്ടതാണ്. അപകടാവസ്ഥകൾ അധികൃതരുടെ ശ്രദ്ധയിൽ പെടുത്തേണ്ടതാണ്.
- ദുരിതാശ്വാസ ക്യാമ്പുകളിലേക്ക് മാറേണ്ടുന്ന ഘട്ടങ്ങളിൽ പൂർണ്ണമായും കോവിഡ് മാനദണ്ഡങ്ങൾ പാലിക്കാൻ തയ്യാറാവണം.

- ദുരന്ത സാധ്യത മേഖലയിലുള്ളവർ ഒരു എമർജൻസി കീറ്റ് അടിയന്തരമായി തയ്യാറാക്കി വെക്കേണ്ടതാണ്.
- ശക്തമായ മഴ പെയ്യുന്ന സാഹചര്യത്തിൽ ഒരു കാരണവശാലും നദികൾ മുറിച്ചു കടക്കാനോ, നദികളിലോ മറ്റ് ജലാശയങ്ങളിലോ കളിക്കാനോ മീൻപിടിക്കാനോ മറ്റ് ആവശ്യങ്ങൾക്കോ ഇറങ്ങാൻ പാടുള്ളതല്ല.
- ജലാശയങ്ങൾക്ക് മുകളിലെ മേൽപ്പാലങ്ങളിൽ കയറി കാഴ്ച കാണുകയോ സെല്ലിയെടുക്കുകയോ കൂട്ടം കൂടി നിൽക്കുകയോ ചെയ്യാൻ പാടുള്ളതല്ല.
- അണക്കെട്ടുകളുടെ താഴെ താമസിക്കുന്നവർ അണക്കെട്ടുകളിൽ നിന്ന് വെള്ളം പുറത്തേക്ക് ഒഴുക്കി വിടാനുള്ള സാധ്യത മുൻകൂട്ടി കണ്ട് കൊണ്ടുള്ള തയ്യാറെടുപ്പുകൾ നടത്തുകയും അധികൃതരുടെ നിർദ്ദേശങ്ങൾക്ക് അനുസരിച്ച് ആവശ്യമെങ്കിൽ മാറിത്താമസിക്കുകയും വേണം.
- മലയോര മേഖലയിലേക്കുള്ള രാത്രി സഞ്ചാരം പൂർണ്ണമായി ഒഴിവാക്കുക.
- കാറ്റിൽ മരങ്ങൾ കടപ്പഴുക്കി വീണം പോസ്റ്റുകൾ തകർന്നു വീണം ഉണ്ടാകാനിടയുള്ള അപകടങ്ങളെയും ശ്രദ്ധിക്കേണ്ടതാണ്.

പ്രസ്തുത നിർദ്ദേശങ്ങൾ പൊതുജനങ്ങളിലെത്തിക്കാനുള്ള നടപടികൾ അതാത് ജില്ലാ കളക്ടർമാർ സ്വീകരിക്കേണ്ടതാണ്. കൂടാതെ, കോവിഡ് 19 ന്റെ പശ്ചാത്തലത്തിൽ ദുരിതാശ്വാസ ക്യാമ്പുകൾ നടത്താൻ സംസ്ഥാന ദുരന്ത നിവാരണ അതോറിറ്റി ഓറഞ്ച് ബുക്ക് 2021 ലൂടെ നിർദ്ദേശിച്ച തരത്തിലുള്ള തയ്യാറെടുപ്പുകൾ ജില്ലാ കളക്ടർമാർ പൂർത്തീകരിക്കേണ്ടതാണ്.

**റവന്യൂ, ആഭ്യന്തര, തദ്ദേശസ്വയംഭരണ വകുപ്പ്, അഗ്നിരക്ഷാ സേന, ഫിഷറീസ് വകുപ്പ്, തീരദേശ പോലീസ്, ജലസേചന വകുപ്പ്, വൈദ്യുതി വകുപ്പ് എന്നീ വകുപ്പുകൾക്കുമുള്ള പ്രത്യേക നിർദ്ദേശങ്ങൾ**

- ജില്ലാ ദുരന്ത നിവാരണ അതോറിറ്റി അടിയന്തരമായി ബന്ധപ്പെട്ട വകുപ്പുകൾ ഓറഞ്ച് ബുക്ക് 2021 അടിസ്ഥാനമാക്കിയുള്ള തയ്യാറെടുപ്പുകൾ പൂർത്തീകരിച്ചിട്ടുണ്ടോ എന്ന് പരിശോധിക്കുകയും വിവിധ വകുപ്പുകളുടെ ഏകോപനം ഉറപ്പാക്കുകയും ചെയ്യേണ്ടതാണ്.
- ദുരന്ത സാധ്യത മുന്നിൽ കണ്ടുകൊണ്ട് ദുരന്ത പ്രതികരണത്തിനായി ആവശ്യമായ റിസോഴ്സുകൾ സജ്ജമാക്കി വെക്കേണ്ടതാണ്.
- സംസ്ഥാന ദുരന്ത നിവാരണ അതോറിറ്റിയുടെ ഓറഞ്ച് ബുക്ക് 2021 ലെ മാർഗ്ഗനിർദ്ദേശങ്ങൾക്ക് അനുസൃതമായി ആവശ്യമായ എല്ലാ തയ്യാറെടുപ്പുകളും പൂർത്തീകരിക്കാൻ കർശനമായി നിർദ്ദേശിക്കുന്നു.
- ഉരുൾപൊട്ടൽ/മണ്ണിടിച്ചിൽ, വെള്ളപ്പൊക്ക ദുരന്ത സാധ്യത മേഖലകളിൽ അടിയന്തരമായി ദുരിതാശ്വാസ ക്യാമ്പുകൾ സജ്ജമാക്കി വെക്കേണ്ടതാണ്.
- മുന്നറിയിപ്പിൻറെ പശ്ചാത്തലത്തിൽ ഓറഞ്ച് ബുക്ക് 2021 ൽ വശനംബർ ഗ്രൂപ്പ് എന്ന് അടയാളപ്പെടുത്തിയിരിക്കുന്ന വിഭാഗങ്ങൾക്കായി ക്യാമ്പുകൾ തയ്യാറാക്കി ആവശ്യമായ ഘട്ടങ്ങളിൽ ആളുകളെ മുൻകൂട്ടി തന്നെ മാറ്റി താമസിപ്പിക്കേണ്ടതാണ്.
- ജിയോളജിക്കൽ സർവ്വേ ഓഫ് ഇന്ത്യ, സംസ്ഥാന ദുരന്ത നിവാരണ അതോറിറ്റിയുടെ വിദഗ്ധ സമിതി എന്നിവർ ഉരുൾപൊട്ടൽ/മണ്ണിടിച്ചിൽ സാധ്യതയുണ്ടെന്ന് കണ്ടെത്തിയ പ്രദേശങ്ങളിൽ

അടിയന്തരമായി ക്യാമ്പുകൾ സജ്ജമാക്കി ജനങ്ങൾക്ക് 'അനൗൺസ്മെന്റ്' വഴി വിവരം നൽകുകയും ജനങ്ങളെ മുൻകരുതലിന്റെ ഭാഗമായി മാറ്റി താമസിപ്പിക്കുകയും ചെയ്യേണ്ടതാണ്. അപകട സാഹചര്യത്തിൻറെ ഗൗരവം ഉൾക്കൊണ്ടു കൊണ്ട് പൊതുജനങ്ങളെ മാറിത്താമസിപ്പിക്കാൻ നിർബന്ധിതമായ ഇടപെടൽ ഉണ്ടാകേണ്ടതാണ്.

- വെള്ളപ്പൊക്ക സാധ്യതയുള്ള താഴ്ന്ന പ്രദേശങ്ങളിൽ മുൻകൂട്ടി ക്യാമ്പുകൾ സജ്ജമാക്കുകയും മഴ തുടങ്ങുന്ന ഉടനെ തന്നെ ആളുകളെ ക്യാമ്പുകളിലേക്ക് മാറ്റിത്താമസിപ്പിക്കുകയും ചെയ്യേണ്ടതാണ്.
- ക്യാമ്പുകൾ സജ്ജമാക്കേണ്ടത് കോവിഡ് പ്രോട്ടോക്കോൾ പാലിച്ചു കൊണ്ടായിരിക്കണം.
- പശ്ചിമഘട്ട മലയോര മേഖലയിലേക്കുള്ള ഗതാഗതം വൈകിട്ട് 7 മണി മുതൽ രാവിലെ 7 മണി വരെ നിരോധിച്ചു കൊണ്ടുള്ള ഉത്തരവ് പുറപ്പെടുവിക്കേണ്ടതാണ്.
- ജില്ലാ, താലൂക്ക് കൺട്രോൾ റൂമുകൾ 24\*7 മണിക്കൂറും ജാഗ്രത കരായി പ്രവർത്തിക്കേണ്ടതാണ്.
- പോലീസും അഗ്നിരക്ഷാ സേനയും അതീവ ജാഗ്രതയോടെ ആക്ഷന്റുകൾക്ക് തയ്യാറായി ഇരിക്കാൻ നിർദ്ദേശം നൽകേണ്ടതാണ്.
- ശക്തമായ കാറ്റ് വീശുന്നതിനാൽ അപകടാവസ്ഥയിലുള്ള മരങ്ങൾ, പോസ്റ്റുകൾ, പരസ്യ ബോർഡുകൾ തുടങ്ങിയവ മുഖമുണ്ടാക്കാൻ സാധ്യതയുള്ള അപകടങ്ങൾ പ്രതിരോധിക്കുന്നതിനായി അടിയന്തര നടപടി സ്വീകരിക്കേണ്ടതാണ്.
- ഫയർ ആൻഡ് റെസ്ക്യൂ സേനയും സിവിൽ ഡിഫെൻസും രക്ഷാപ്രവർത്തനങ്ങൾക്ക് സജ്ജരായി ഇരിക്കാനുള്ള നിർദ്ദേശം നൽകണം.
- കടലാക്രമണം രൂക്ഷമായ മേഖലയിലും ക്യാമ്പുകൾ സജ്ജീകരിച്ച് ആളുകളെ മാറ്റേണ്ടതാണ്.
- മൽസ്യ തൊഴിലാളികൾ യാതൊരു കാരണവശാലും കടലിൽ പോകുന്നില്ലെന്ന് ഫിഷറീസ് വകുപ്പും കോസ്റ്റൽ പോലീസും ഉറപ്പാക്കേണ്ടതാണ്. ഇത് സംബന്ധിച്ചുള്ള മുന്നറിയിപ്പ് മൽസ്യ തൊഴിലാളി ഗ്രാമങ്ങളിൽ ഉച്ചഭാഷിണികൾ ഉപയോഗിച്ച് വിളിച്ചു പറയേണ്ടതാണ്.
- നദികളിലെ ജലനിരപ്പ് സൂക്ഷ്മമായി നിരീക്ഷിക്കുകയും സംസ്ഥാന ദുരന്ത നിവാരണ അതോറിറ്റിയെ യഥാസമയം അറിയിക്കുകയും ചെയ്യേണ്ടതാണ്.

**വൈദ്യുതി വകുപ്പിനുള്ള പ്രത്യേക നിർദ്ദേശം**

- ശക്തമായ കാറ്റിൽ മരങ്ങൾ കടപ്പഴകി വീണും, ചില്ലുകൾ ഒടിഞ്ഞു വീണും, പോസ്റ്റുകൾ തകർന്നും വൈദ്യുത കമ്പികൾ പൊട്ടാനും ഷോക്കേറ്റ് ആളുകൾക്ക് അപകടം സംഭവിക്കാനുള്ള സാധ്യതയുണ്ട്. ഇത്തരം അപകടങ്ങൾ ലഘൂകരിക്കാൻ വേണ്ട മുൻകരുതലുകൾ അടിയന്തരമായി സ്വീകരിക്കണം.
- കൺട്രോൾ റൂം 24 മണിക്കൂറും പ്രവർത്തിപ്പിക്കേണ്ടതാണ്.
- ലൈനുകളുടേയും ട്രാൻസ്ഫോമറുകളുടേയും അപകട സാധ്യതകൾ പരിശോധിച്ച് മുൻകൂർ നടപടികൾ ആവശ്യമുള്ളയിടത്ത് അത് പൂർത്തീകരിക്കേണ്ടതാണ്.
- താഴ്ന്ന പ്രദേശങ്ങളിൽ സ്ഥിതി ചെയ്യുന്ന വൈദ്യുത പവർ ഹൗസുകളിലും മറ്റ് പ്രധാന സ്ഥാപനങ്ങളും വെള്ളം കയറാനുള്ള സാധ്യത മുന്നിൽ കണ്ടുള്ള മുൻകരുതൽ നടപടി സ്വീകരിക്കണം.
- അണക്കെട്ടുകളിൽ ജലനിരപ്പ് സൂക്ഷ്മമായി നിരീക്ഷിക്കുകയും സ്ഥിതിഗതികൾ ജില്ലാ-സംസ്ഥാന ദുരന്ത നിവാരണ അതോറിറ്റികളെ യഥാസമയം അറിയിക്കുകയും ചെയ്യുക.



**ANNEXURE 2: DETAILS OF CAMPS, HOUSES DAMAGED (FULLY AND PARTIALLY), DEATHS AND MISSING CASES AND FORCES DEPLOYED AS ON 26.10.2021**

DISTRICT WISE CAMP DETAILS AS ON 26.10.2021, 5.00 PM											
District	Total No of Camps	No.of families	Total no of inmates	Male	Female	Children	House damages- Fully(12.10.21 to 26.10.21)	House damages- Partially (12.10.21 to 26.10.21)	Death(12.10.21 to 26.10.21)	Missing (12.10.21 to 26.10.21)	Forces deployment
Thiruvananthapuram	12	106	439	157	261	21	5	215	4	0	Nil
Kollam	1	4	19	8	6	5	6	151	3	0	1 team NDRF
Pathanamthitta	15	161	530	199	225	106	4	11	2	0	1 team NDRF
Alappuzha	55	1893	6286	2536	2797	953	7	59	2	0	2 teams NDRF
Kottayam	24	930	3334	1356	1410	568	190	1083	17	0	Nil
Idukki	27	589	1864	728	785	351	119	391	12	0	2 teams NDRF
Ernakulam	4	24	79	30	31	18	0	0	0	0	2 teams NDRF
Thirissur	18	217	688	259	314	115	6	18	3	0	1 team NDRF
Palakkad	8	162	436	141	166	129	2	54	2	0	1 team NDRF
Malappuram	5	63	246	88	90	68	2	93	8	2	1 team NDRF
Kozhikode	0	0	0	0	0	0	3	28	1	0	Nil
Wayanad	7	77	308	100	102	106	0	0	0	0	Nil
Kannur	0	0	0	0	0	0	2	60	3	0	1 NDRF team
Kasaragod	0	0	0	0	0	0	0	33	0	0	Nil
<b>TOTAL</b>	<b>176</b>	<b>4226</b>	<b>14229</b>	<b>5602</b>	<b>6187</b>	<b>2440</b>	<b>346</b>	<b>2196</b>	<b>57</b>	<b>2</b>	<b>12 team NDRF</b>

*One Chopper from Air Force and One chopper from Navy kept stand by at EAM and Cochin Naval Base*

*Source: Respective DEOCs*

**ANNEXURE 3: SAMPLE DATA DISSEMINATION DONE BY SEOC FOR THE DAY 16-10-2021 USING DIFFERENT SOCIAL MEDIA PLATFORMS**

**● KSEBL Alert on Dam Water**

The daily water levels details of main power generation dams with alert in Kerala are provided by KSEB. This warning is issued in all the official whatsapp groups of KSDMA, IAS, IPS Officers, Private Secretary of Ministers, all Medias, Emergency Response Group, Landslide Team, Central and State Forces, LSGD nodal officers, Volunteers, Virtual Cadre, Department of Telecommunication – Telecom Service Providers, and DEOCs of Kerala. The same warning is issued in the social media Facebook and Twitter. This was also issued on the website of KSDMA.

**Facebook**

**Kerala State Disaster Management Authority - KSDMA**

Published by Pradeep Gopinathan Nair · October 16 at 11:13 AM ·

കേരളത്തിലെ പ്രധാന അണക്കെട്ടുകളിലെ (KSEB) ദിവസേനയുള്ള ജലനിരപ്പ് സംബന്ധിച്ചുള്ള വിവരം Daily Water Level Details of Main Power Generation Dams (KSEB) in Kerala (16/10/2021)

അണക്കെട്ടിലെ പരമാവധി ജലനിരപ്പ്, പൂർണ്ണ സംരംഭന ശേഷി, Rule Level തുടങ്ങിയ വിശദവിവരങ്ങളുടെ പട്ടിക <https://sdma.kerala.gov.in/dam-water-level/> എന്ന ലിങ്കിൽ ലഭ്യമാണ്.

പ്രസ്തുത പട്ടിക മനസ്സിലാക്കേണ്ട വിധം എങ്ങനെയെന്നുള്ള വിശദീകരണം ദുരന്ത നിവാരണ അതോറിറ്റിയുടെ വെബ്സൈറ്റിൽ <https://sdma.kerala.gov.in/wp-content/> See More

See Translation

കേരളത്തിലെ പ്രധാന അണക്കെട്ടുകളിലെ (KSEB) ദിവസേനയുള്ള ജലനിരപ്പ് സംബന്ധിച്ചുള്ള വിവരം Daily Water Levels Details of Main Power Generation Dams (KSEB) in Kerala					
No. no.	Reservoir അണക്കെട്ട്	District ജില്ല	Water Level as on date (m)	Colour Code (Today's Alert)	പുറംതടം വിട്ടുപോകാനുള്ള അളവ് (cumecs)
1	ഇടമലയാർ Edamaleyar	എറണാകുളം Ernakulam	164.27	No warning	0.0
2	ബാണാസുര Banasura	വയനാട് Wayanad	772.80	No warning	0.0
3	അനന്തനദി Ananthangadi	ഇടുക്കി Idukki	1204.50	No warning	0.0
4	കുറ്റിയാടി Kuttyadi	കോഴിക്കോട് Kozhikode	749.26	No warning	0.0
5	പമ്പ Pamba	പത്തനംതിട്ട Pathanamthitta	986.45	No warning	0.0
6	ഇരട്ടയാർ ERATTAYAR	ഇടുക്കി Idukki	747.80	No warning	NA
7	ലോവർ പെരിയാർ Lower Periyar	ഇടുക്കി Idukki	256.76	No warning	0.0
8	കല്ലാർ Kallar	ഇടുക്കി Idukki	820.60	No warning	NA

Daily Water Levels Details of Main Power Generation Dams with Alert (KSEB) in Kerala					
No. no.	Reservoir അണക്കെട്ട്	District ജില്ല	Water Level as on date (m)	Colour Code (Today's Alert)	പുറംതടം വിട്ടുപോകാനുള്ള അളവ് (cumecs)
1	കല്ലാർകുട്ടി Kallarukutti	ഇടുക്കി Idukki	456.00	Red	23.25
2	കുണ്ടള Kundala	ഇടുക്കി Idukki	1757.80	Red	0.58
3	ടേഴ്സാർ Seelayar	തൃശൂർ Thrissur	2661.50 ft	Red	0.00
4	കക്കി(ആനത്തോട്) Kakkil (Ananthodu)	പത്തനംതിട്ട Pathanamthitta	978.40	Red	0.00
5	പൊരിങ്ങൽകുത്ത് Poringalkuthu	തൃശൂർ Thrissur	418.05	Orange	67.99
6	മാട്ടുപെട്ടി Mattupetti	ഇടുക്കി Idukki	1597.650	Orange	0.48
7	പൊന്മുടി Ponnudi	ഇടുക്കി Idukki	704.65	Blue	0.0

24,499  
People reached

1,175  
Engagements

Boost Unavailable

Twitter

**Kerala State Disaster Management Authority @KeralaSD... · Oct 16**

കേരളത്തിലെ പ്രധാന അണക്കെട്ടുകളിലെ (KSEB) ദിവസേനയുള്ള ജലനിരപ്പ് സംബന്ധിച്ചുള്ള വിവരം Daily Water Level Details of Main Power Generation Dams (KSEB) in Kerala (16/10/2021)

Reservoir Name	Water Level as on date (m)	Alert Status	Color Code
Edamalyar	164.27	Red	Red
Banasura	772.80	Red	Red
Aanaranga	1204.50	Red	Red
Kethiyadi	749.26	Orange	Orange
Pamba	958.45	Orange	Orange
BRATTAYAR	747.00	Blue	Blue
Lower Periyar	258.78	Yellow	Yellow
Kallar	820.60	Yellow	Yellow

**Colour Code**

- No Alerts
- Blue - 1st Stage of alert
- Orange - 2nd Stage of alert
- Red - 3rd Stage of alert
- Yellow - 4th Stage of alert

● Irrigation Reservoirs

The daily water levels details of major dams in Kerala are provided by Irrigation department. This warning is issued in all the official whatsapp groups of KSDMA, IAS, IPS Officers, Private Secretary of Ministers, all Medias, Emergency Response Group, Landslide Team, Central and State Forces, LSGD nodal officers, Volunteers, Virtual Cadre, Department of Telecommunication – Telecom Service Providers, and DEOCs of Kerala. The same warning is issued in the social media Facebook and Twitter. This was also issued in website of KSDMA.



**Kerala State Disaster Management Authority - KSDMA**

Published by Pradeep Gopinathan Nair ·  
October 16 at 11:13 AM ·

കേരളത്തിലെ പ്രധാന അണക്കെട്ടുകളിലെ (ജലസേചന വകുപ്പ്) ദിവസേനയുള്ള ജലനിരപ്പ് സംബന്ധിച്ചുള്ള വിവരം - Daily Water Level Details of Major Dams (Irrigation) in Kerala (16/10/2021)

അണക്കെട്ടിലെ പരമാവധി ജലനിരപ്പ്, പൂർണ്ണ സംഭരണ ശേഷി തുടങ്ങിയ വിശദവിവരങ്ങളടങ്ങിയ പട്ടിക <https://sdma.kerala.gov.in/dam-water-level/> എന്ന ലിങ്കിൽ ലഭ്യമാണ്.

പ്രസ്തുത പട്ടിക മനസ്സിലാക്കേണ്ട വിധം എങ്ങനെയെന്നുള്ള വിശദീകരണം ദുരന്ത നിവാരണ അതോറിറ്റിയുടെ വെബ്സൈറ്റിൽ <https://sdma.kerala.gov.in/wp-content/uploads/...> See More

See Translation

**ജലസേചന അണക്കെട്ടുകളിലെ തൽസ്ഥിതി**  
**IRRIGATION RESERVOIRS STATISTICS AS ON 16/10/2021, 11:00 AM**

reservoir നാമം	District ജില്ല	നിലവിലെ ജലനിരപ്പ് Water Level as on date (m)	ഇന്നത്തെ മുന്നറിയിപ്പ് നില Colour Code (Today's Alert)
പാലക്കാട്	Palakkad പാലക്കാട്	200.72	No Warning

**Colour Code**

നീല	1st Stage of alert ഒന്നാംഘട്ട മുന്നറിയിപ്പ്
ഓറഞ്ച്	2nd Stage of alert രണ്ടാംഘട്ട മുന്നറിയിപ്പ്
ചുവപ്പ്	3rd Stage of alert മൂന്നാംഘട്ട മുന്നറിയിപ്പ്

ക്രമ നമ്പർ	അണക്കെട്ട്	ജില്ല	Water Level as on date (m)	Colour Code (Today's Alert)	Spill (cumecs)
1	Chattiar എലിയാർ	Palakkad പാലക്കാട്	63.72	Red	0.00
2	Heechി എലി	Palakkad പാലക്കാട്	38.80	Red	0.75
3	Mangalam കുന്ന്	Palakkad പാലക്കാട്	77.26	Orange	0.00
4	Kumari കുമാരി	Palakkad പാലക്കാട്	81.72	Orange	0.48
5	Chinnar ചിന്നാർ	Palakkad പാലക്കാട്	75.43	Orange	0.00
6	Mekkara മേക്കര	Palakkad പാലക്കാട്	86.88	Orange	0.00
7	Mulanpuzha മൂലപ്പുഴ	Palakkad പാലക്കാട്	79.00	Orange	0.00
8	Neeyar നെയ്യാർ	Thiruvananthapuram തിരുവനന്തപുരം	69.07	Blue	0.00
9	Pothandy പാത്തണ്ടി	Palakkad പാലക്കാട്	87.8	Blue	0.00
10	Shavara (for TM use) ശവാര (എം.ടി. ഉപയോഗത്തിന്)	Palakkad പാലക്കാട്	87.27	Yellow	0.00
11	Mankara മങ്കര	Kozhikode കോഴിക്കോട്	33.0	Yellow	0.00
12	Kuttiyadi കുട്ടിയാടി	Kozhikode കോഴിക്കോട്	38.05	Yellow	0.00

11,917  
People reached

442  
Engagements

Boost Unavailable

30

7 Shares

Like

Comment

Share





Kerala State Disaster Management Authority - KSDMA

Published by Pradeep Gopinathan Nair · October 16 at 4:42 PM ·

Nowcast - അടുത്ത മൂന്ന് മണിക്കൂറിൽ പ്രതീക്ഷിക്കാവുന്ന ദിനാന്തരീക്ഷാവസ്ഥ (weather)

പുറപ്പെടുവിച്ച സമയം: 04.00 PM 16.10.2021

അടുത്ത 3 മണിക്കൂറിൽ കേരളത്തിലെ തിരുവനന്തപുരം, കൊല്ലം, പത്തനംതിട്ട, ആലപ്പുഴ, കോട്ടയം, ഇടുക്കി, എറണാകുളം, തൃശ്ശൂർ, പാലക്കാട് എന്നീ ജില്ലകളിൽ ഒറ്റപ്പെട്ടയിടങ്ങളിൽ മണിക്കൂറിൽ 40 കി. മീ. വരെ വേഗതയിൽ വീശിയടിച്ചേക്കാവുന്ന കാറ്റിനും ഇടിമിന്നലോടു കൂടിയ മഴയ്ക്കും സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

Nowcast dated 16.10.2021

Time of issue 1600 hrs IST (Valid for next 3 hours)

Thunderstorm with moderate rainfall & gusty winds speed reaching 40 Kmph is likely at one or two places in Thiruvananthapuram, Kollam, Alappuzha, Kottayam, Pathanamthitta, Idukki, Ernakulam, Palakkad, and Thrissur districts of Kerala

IMD-KSEOC-KSDMA

See Translation

7,221

People reached

348

Engagements

+1.4x Higher

Distribution Score

Boost Unavailable

27

1 Comment 6 Shares

Like

Comment

Share

Most Relevant



Kerala State Disaster Management Authority - KSDMA

Published by Pradeep Gopinathan Nair · October 16 at 7:26 AM ·

Nowcast - അടുത്ത മൂന്ന് മണിക്കൂറിൽ പ്രതീക്ഷിക്കാവുന്ന ദിനാന്തരീക്ഷാവസ്ഥ (weather)

പുറപ്പെടുവിച്ച സമയം: 07.00 AM 16.10.2021

അടുത്ത 3 മണിക്കൂറിൽ കേരളത്തിൽ തിരുവനന്തപുരം, കൊല്ലം, പത്തനംതിട്ട, ആലപ്പുഴ, കോട്ടയം, എറണാകുളം എന്നീ ജില്ലകളിലെ ഒറ്റപ്പെട്ടയിടങ്ങളിൽ ഇടിയോട് കൂടിയായ മഴയ്ക്കും മണിക്കൂറിൽ 40 കിലോമീറ്റർ വരെ വേഗതയിൽ വീശിയടിച്ചേക്കാവുന്ന കാറ്റിനും സാധ്യത ഉണ്ടെന്ന് സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

Nowcast dated 16.10.2021:

Time of issue 0700 hrs IST (Valid for next 3 hours):

Thunderstorm with moderate rainfall & gusty winds speed reaching 40 Kmph is likely at one or two places in Thiruvananthapuram, Kollam, Alappuzha, Kottayam, Pathanamthitta and Ernakulam districts of Kerala.

IMD-KSEOC-KSDMA

See Translation

7,097

People reached

455

Engagements

+1.4x Higher

Distribution Score

Boost Unavailable

41

5 Comments 2 Shares

Like

Comment

Share



**Kerala State Disaster Management Authority - KSDMA**

Published by Pradeep Gopinathan Nair · October 16 at 10:19 AM

Nowcast - അടുത്ത മൂന്ന് മണിക്കൂറിൽ പ്രതീക്ഷിക്കാവുന്ന ദിനാന്തരീക്ഷാവസ്ഥ (weather)

പുറപ്പെടുവിച്ച സമയം: 10.00 AM 16.10.2021

അടുത്ത 3 മണിക്കൂറിൽ കേരളത്തിൽ തിരുവനന്തപുരം, കൊല്ലം, പത്തനംതിട്ട, ഇടുക്കി, ആലപ്പുഴ, കോട്ടയം, എറണാകുളം, തൃശൂർ എന്നീ ജില്ലകളിലെ ഒറ്റപ്പെട്ടയിടങ്ങളിൽ ഇടിയോട് കൂടിയായ മഴക്കും മണിക്കൂറിൽ 40 കിലോമീറ്റർ വരെ വേഗതയിൽ വീശിയടിച്ചേക്കാവുന്ന കാറ്റിനും സാധ്യത ഉണ്ടെന്ന് സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

Nowcast dated 16.10.2021

Time of issue 0100 hrs IST (Valid for next 3 hours)

Thunderstorm with moderate rainfall & gusty winds speed reaching 40 Kmph is likely at one or two places in Thiruvananthapuram, Kollam, Alappuzha, Kottayam, Pathanamthitta, Idukki, Ernakulam, and Thrissur districts of Kerala.

IMD-KSEOC-KSDMA

See Translation

7,122

People reached

283

Engagements

+1.4x Higher

Distribution Score

Boost Unavailable

28

6 Shares

Like

Comment

Share



**Kerala State Disaster Management Authority - KSDMA**

Published by Pradeep Gopinathan Nair · October 16 at 4:51 PM

Nowcast - അടുത്ത മൂന്ന് മണിക്കൂറിൽ പ്രതീക്ഷിക്കാവുന്ന പുതുക്കിയ ദിനാന്തരീക്ഷാവസ്ഥ (weather)

പുറപ്പെടുവിച്ച സമയം: 04.18 PM 16.10.2021

അടുത്ത 3 മണിക്കൂറിൽ കേരളത്തിൽ എല്ലാ ജില്ലകളിലും ഇടിയോട് കൂടിയ അതിശക്തമായ മഴക്കും മണിക്കൂറിൽ 40 മുതൽ 60 കിലോമീറ്റർ വരെ വേഗതയിൽ വീശിയടിച്ചേക്കാവുന്ന കാറ്റിനും സാധ്യത ഉണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

Nowcast dated 16.10.2021

Time of issue 1618 hrs IST (Valid for next 3 hours)

Thunderstorm with heavy rainfall & gusty winds speed reaching 40 - 60 Kmph is likely to occur in all districts of Kerala

IMD-KSEOC-KSDMA

See Translation

7,085

People reached

150

Engagements

+1.4x Higher

Distribution Score

Boost Unavailable

34

6 Shares

Like

Comment

Share



### Kerala State Disaster Management Authority - KSDMA

Published by Pradeep Gopinathan Nair · October 16 at 3:35 PM ·

Nowcast - അടുത്ത മൂന്ന് മണിക്കൂറിൽ പ്രതീക്ഷിക്കാവുന്ന ദിനാന്തരീക്ഷാവസ്ഥ (weather)

പുറപ്പെടുവിച്ച സമയം: 01.00 PM 16.10.2021

അടുത്ത 3 മണിക്കൂറിൽ കേരളത്തിൽ ഇടുക്കി, കോട്ടയം, എറണാകുളം, തൃശൂർ എന്നീ ജില്ലകളിൽ ഇടിയോട് കൂടിയ അതിതീവ്ര മഴക്കും മണിക്കൂറിൽ 40 കി.മീ വേഗതയിൽ വീശിയടിച്ചേക്കാവുന്ന കാറ്റിനും സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു. കൂടാതെ മലപ്പുറം, പാലക്കാട്, ആലപ്പുഴ, പത്തനംതിട്ട, കൊല്ലം, തിരുവനന്തപുരം എന്നീ ജില്ലകളിൽ ഇടിയോട് കൂടിയായ അതിശക്തമായ മഴക്കും മണിക്കൂറിൽ 40 കിലോമീറ്റർ വരെ വേഗതയിൽ വീശിയടിച്ചേക്കാവുന്ന കാറ്റിനും സാധ്യത ഉണ്ടെന്നും കാസർഗോഡ്, കണ്ണൂർ, വയനാട്, കോഴിക്കോട് ജില്ലകളിൽ ശക്തമായ മഴക്കും സാധ്യതയുണ്ടെന്നും കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

Nowcast dated 16.10.2021

Time of issue 1300 hrs IST (Valid for next 3 hours)

Thunderstorm with very heavy rainfall & gusty winds speed reaching 40 Kmph is likely to occur in Idukki, Kottayam, Ernakulam, Thrissur districts and thunderstorm with heavy rainfall & gusty winds speed reaching 40 Kmph is likely to occur in Malappuram, Palakkad, Thiruvananthapuram, Kollam, Alappuzha and Pathanamthitta, and moderate rainfall is likely to occur in Kasargode, Kannur, Kozhikode and Wayanad districts of Kerala

IMD-KSEOC-KSDMA

See Translation

26,028

People reached

1,894

Engagements

↑ +5.2x Higher

Distribution Score

Boost Unavailable

96

6 Comments 30 Shares

Like

Comment

Share



### Kerala State Disaster Management Authority - KSDMA

Published by Pradeep Gopinathan Nair · October 16 at 7:41 PM ·

Nowcast - അടുത്ത മൂന്ന് മണിക്കൂറിൽ പ്രതീക്ഷിക്കാവുന്ന പുതുക്കിയ ദിനാന്തരീക്ഷാവസ്ഥ (weather)

പുറപ്പെടുവിച്ച സമയം: 07.16 PM 16.10.2021

അടുത്ത 3 മണിക്കൂറിൽ കേരളത്തിൽ തിരുവനന്തപുരം, കൊല്ലം, ആലപ്പുഴ, പത്തനംതിട്ട, മലപ്പുറം, കോഴിക്കോട്, വയനാട്, കണ്ണൂർ, കാസർഗോഡ് എന്നീ ജില്ലകളിൽ ഇടിയോട് കൂടിയ അതിശക്തമായ മഴക്കും മണിക്കൂറിൽ 40 മുതൽ 60 കിലോമീറ്റർ വരെ വേഗതയിൽ വീശിയടിച്ചേക്കാവുന്ന കാറ്റിനും സാധ്യത ഉണ്ടെന്നും കോട്ടയം, ഇടുക്കി, എറണാകുളം, തൃശ്ശൂർ, പാലക്കാട് എന്നീ ജില്ലകളിൽ ശക്തമായ മഴക്കും സാധ്യതയുണ്ടെന്നും കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

Nowcast dated 16.10.2021

Time of issue 1916 hrs IST (Valid for next 3 hours)

Thunderstorm with heavy rainfall & gusty winds speed reaching 40 - 60 Kmph is likely to occur in Thiruvananthapuram, Kollam, Alappuzha, Pathanamthitta, Malappuram, Kozhikode, Wayanad, Kannur, and Kasaragod districts of Kerala. Moderate rainfall is likely to occur in Kottayam, Idukki, Ernakulam, Thrissur, and Palakkad districts of Kerala.

IMD-KSEOC-KSDMA

See Translation

16,061

People reached

539

Engagements

↑ +3.1x Higher

Distribution Score

Boost Unavailable



### Kerala State Disaster Management Authority - KSDMA



Published by Pradeep Gopinathan Nair · October 16 at 4:21 AM

Nowcast - അടുത്ത മൂന്ന് മണിക്കൂറിൽ പ്രതീക്ഷിക്കാവുന്ന ദിനാന്തരീക്ഷാവസ്ഥ (weather)

പുറപ്പെടുവിച്ച സമയം: 04.00 AM 16.10.2021

അടുത്ത 3 മണിക്കൂറിൽ കേരളത്തിൽ എറണാകുളം, തൃശ്ശൂർ, തിരുവനന്തപുരം, കൊല്ലം, ആലപ്പുഴ എന്നീ ജില്ലകളിലെ ഒറ്റപ്പെട്ടയിടങ്ങളിൽ മഴയ്ക്ക് സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

Nowcast dated 16.10.2021:

Time of issue 0400 hrs IST (Valid for next 3 hours):

Light rainfall is likely at one or two places in Thiruvananthapuram, Kollam, Alapuzha, Ernakulam, and Thrissur districts of Kerala.

IMD-KSEOC-KSDMA

See Translation

5,394

People reached

306

Engagements

+1.0x Average

Distribution Score

Boost Unavailable

15

1 Share

Like

Comment

Share



Comment as Kerala State Disaster Manage...



### Kerala State Disaster Management Authority - KSDMA



Published by Pradeep Gopinathan Nair · October 16 at 1:20 AM

Nowcast - അടുത്ത മൂന്ന് മണിക്കൂറിൽ പ്രതീക്ഷിക്കാവുന്ന ദിനാന്തരീക്ഷാവസ്ഥ (weather)

പുറപ്പെടുവിച്ച സമയം: 01.00 AM 16.10.2021

അടുത്ത 3 മണിക്കൂറിൽ കേരളത്തിലെ എല്ലാ ജില്ലകളിലും മഴയ്ക്ക് സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

Nowcast dated 16.10.2021:

Time of issue 0100 hrs IST (Valid for next 3 hours):

Light rainfall is likely at one or two places in all districts of Kerala.

IMD-KSEOC-KSDMA

See Translation

3,630

People reached

163

Engagements

-1.4x Lower

Distribution Score

Boost Unavailable



Kerala State Disaster Management Authority - KSDMA



Published by Pradeep Gopinathan Nair · October 16 at 5:45 PM ·



മഴയും ശക്തമാകുമ്പോൾ വൈദ്യുതി കമ്പികളും പേരിടാത്ത സാധ്യത കൂടുതലാണ്. ഇത്തരത്തിൽ ഏതെങ്കിലും പട്ടണത്തിൽ പെട്ടാൽ ഉടൻ തന്നെ 1912 എന്ന നമ്പറിൽ കെഎസ് ഇടാൽ നൂമ്പിലോ 1077 നമ്പറിൽ ജില്ലാ ഭൂമി നിവാസ അടാൽ നൂമ്പിലോ വിവരം അറിയിക്കുക. കെഎസ് ഇംഗി ജീവനപ്പലങ്ങൾ കഴിയോടെ സഹകരിക്കുക. പൊതുജനങ്ങൾ റിപ്പോർട്ട് ചെയ്യാതിരിക്കുക.

മഴയും ഉണ്ടാകുമ്പോൾ ഒരു കാണവശാലും മരങ്ങളുടെ പാടുകളിലൂടെ മെച്ചപ്പെട്ട് വാഹനങ്ങളും പാർക്ക് ചെയ്തുള്ളിലെ മരങ്ങളുടെ അപകടകരമായ ഗിരിയിലുള്ള പാതകളും അപകടകരമായ അവസ്ഥയിലുള്ള മരങ്ങൾ ശ്രദ്ധയിൽ പെട്ടാൽ ബന്ധപ്പെട്ട തദ്ദേശ സ്ഥാപനം അറിയിക്കുക.

പാൽ വിതരണക്കാർ പോലെയുള്ള അതിരാവിലെ ഉണക്ക പ്രത്യേക ജാഗ്രത പാലിക്കണം. വഴികളിലെ വെള്ളപ്പൊക്കം വെല്ലുവിളി ചെയ്യുന്നതിനായി ഉറപ്പാക്കാൻ ശ്രമിക്കണം.

പ്രധാന പാതകളിലൂടെയും ഇലക്ട്രിക് പോസ്റ്റുകൾ, കെട്ടിട കെട്ടിടങ്ങൾ വിഴിവാൻ സാധ്യതയുള്ളതിനാൽ കാറ്റും മഴയും തടയാൻ ശ്രദ്ധിക്കുക. ശ്രദ്ധിക്കുക. ശ്രദ്ധിക്കുക.

മരങ്ങളിൽ കൂടി കടന്നു പോകുന്ന വൈദ്യുതി ശ്രദ്ധിക്കണം. ഉറപ്പ് വരുത്തുക.

കാറ്റും മഴയും വെച്ചിട്ടുള്ള കോണി പോലെയുള്ള പാതകൾ സാധ്യതയുള്ള ഉപകരണങ്ങളും മറ്റ് വസ്തുക്കളും കെട്ടി വെക്കേണ്ടതാണ്.

മരങ്ങളിൽ കൂടി കടന്നു പോകുന്ന വൈദ്യുതി ശ്രദ്ധിക്കണം. ഉറപ്പ് വരുത്തുക.

35,362 People reached      476 Engagements      Boost Unavailable

65 Likes      39 Shares

Like      Comment      Share

- Lightning warning posters were posted in facebook and twitter



**Kerala State Disaster Management Authority - KSDMA**

Published by Pradeep Gopinathan Nair · October 16 at 10:15 AM



**ഇടിമിന്നൽ ജാഗ്രത നിർദ്ദേശങ്ങൾ**

ഇടിമിന്നലുള്ള സമയത്ത് യാത്രകൾ പരമാവധി ഒഴിവാക്കാൻ ശ്രമിക്കുക. അഥവാ യാത്രയിലാണെങ്കിൽ വാഹനത്തിനകത്ത് തന്നെ തുടരുക. കൈകാര്യങ്ങൾ പുറത്തിടാനിടിക്കുക. വാഹനത്തിനകത്ത് നിങ്ങൾ സ്വരക്കിതരായിരിക്കൂ.

മൈക്കിൾ, മൈക്ക്, ട്രാക്ക്സ് തുടങ്ങിയ വാഹനങ്ങളിലുള്ള യാത്ര ഇടിമിന്നൽ സമയത്ത് ഒഴിവാക്കുകയും ഇടിമിന്നൽ അനുസാനിക്കുന്നത് വരെ സ്വരക്കിതരായ ഒരു കെട്ടിടത്തിൽ അഭയം തേടുകയും വേണം.

വൃക്ഷങ്ങളുടെ ചുവട്ടിൽ നിൽക്കരുത്. വാഹനങ്ങൾ മരച്ചുവട്ടിൽ പാർക്ക് ചെയ്യുകയരുത്.

കുടുംബശ്രീ സഹായകരമായ വിവരങ്ങൾ അന്വേഷിക്കാൻ കേരള സംസ്ഥാന ദുരന്ത നിവാരണ അതോറിറ്റി ടെലിസർവ്വൈസ് ഫീൽഡ്, റിക്വസ്റ്റ് അന്വേഷിച്ച് ടി ടി എസ് നമ്പർ - 895033

ടാൾ ഫ്രീ നമ്പർ : 1077

keraladma@gmail.com | www.adma.kerala.gov.in



13,715 People reached      334 Engagements      Boost Unavailable

You and 55 others      1 Comment 24 Shares

Like      Comment      Share

## Fishermen Warning by IMD

IMD issues weather warning for fishermen for Karnataka, Kerala and Lakshadweep area; warning for other coasts and open sea; and high-wave warning issued by INCOIS. This fishermen warning was issued in all the official whatsapp groups of KSDMA, IAS, IPS Officers, Private Secretary of Ministers, all Medias, Emergency Response Group, Landslide Team, Central and State Forces, LSGD nodal officers, Volunteers, Virtual Cadre, Department of Telecommunication – Telecom Service Providers, and DEOCs of Kerala. The same warning is issued in the social media Facebook and Twitter. This was also issued in website of KSDMA.

 Kerala State Disaster Management Authority - KSDMA  
Published by Pradeep Gopinathan Nair · October 16 at 1:50 PM ·

**മത്സ്യത്തൊഴിലാളി ജാഗ്രത നിർദ്ദേശം**  
കേരള- ലക്ഷദ്വീപ് തീരങ്ങളിൽ 16-10-2021 മുതൽ 17-10-2021 വരെ മത്സ്യബന്ധനത്തിന് പോകാൻ പാടുള്ളതല്ല എന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

16-10-2021 മുതൽ 17-10-2021 വരെ: കേരള- ലക്ഷദ്വീപ് തീരങ്ങളിൽ മണിക്കൂറിൽ 40 മുതൽ 50 കി.മീ വരെ വേഗതയിലും ചില അവസരങ്ങളിൽ 60 കി.മീ വരെ വേഗതയിലും വീശിയടിച്ചേക്കാവുന്ന ശക്തമായ കാറ്റിനും മോശം കാലാവസ്ഥയ്ക്കും സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

**പ്രത്യേക ജാഗ്രത നിർദ്ദേശം**  
16-10-2021 മുതൽ 17-10-2021 വരെ: തെക്കൻ - കിഴക്കൻ അറബിക്കടലിലും, മാലദ്വീപ് തീരങ്ങളിലും മണിക്കൂറിൽ 40 മുതൽ 50 കി.മീ വരെ വേഗതയിലും ചില അവസരങ്ങളിൽ 60 കി.മീ വരെ വേഗതയിലും വീശിയടിച്ചേക്കാവുന്ന ശക്തമായ കാറ്റിനും മോശം കാലാവസ്ഥയ്ക്കും സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

16-10-2021: വടക്കൻ ആന്ധ്രതീരങ്ങളിൽ മണിക്കൂറിൽ 40 മുതൽ 50 കി.മീ വരെ വേഗതയിൽ വീശിയടിച്ചേക്കാവുന്ന ശക്തമായ കാറ്റിനും മോശം കാലാവസ്ഥയ്ക്കും സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

16-10-2021 മുതൽ 17-10-2021 വരെ: ഗൾഫ് ഓഫ് മാനാർ കന്യാകുമാരി തീരങ്ങൾ എന്നിവിടങ്ങളിൽ മണിക്കൂറിൽ 40 മുതൽ 50 കി.മീ വരെ വേഗതയിലും ചില അവസരങ്ങളിൽ 60 കി.മീ വരെ വേഗതയിലും വീശിയടിച്ചേക്കാവുന്ന ശക്തമായ കാറ്റിന് സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

മേൽ പറഞ്ഞ ദിവസങ്ങളിൽ പ്രസ്തുത പ്രദേശങ്ങളിൽ മത്സ്യബന്ധനത്തിന് പോകാൻ പാടുള്ളല്ല.

മുന്നറിയിപ്പുള്ള സമുദ്രമേഖലകളുടെ വ്യക്തതയ്ക്കായി ഇതിനോടൊപ്പം നൽകിയിരിക്കുന്ന ഭൂപടം പരിശോധിക്കുക

പുറപ്പെടുവിച്ച സമയം 16/10/2021, 01.00 PM  
IMD-KSEOC-KSDMA

[See Translation](#)





Kerala State Disaster Management Authority @KeralaSD... · Oct 16

മത്സ്യത്തൊഴിലാളി ജാഗ്രത നിർദ്ദേശം

കേരള- ലക്ഷദ്വീപ് തീരങ്ങളിൽ 16-10-2021 മുതൽ 17-10-2021 വരെ മത്സ്യബന്ധനത്തിന് പോകാൻ പാടുള്ളതല്ല എന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു



7 19 7



Kerala State Disaster Management Authority @KeralaSD... · Oct 16

ഉയർന്ന തിരമാല ജാഗ്രത നിർദ്ദേശം

കേരള തീരത്ത് (പൊഴിയൂർ മുതൽ കാസർഗോഡ് വരെ) ഒക്ടോബർ 16 രാത്രി 11.30 വരെ 2.5 മുതൽ 3.1 മീറ്റർ വരെ ഉയരത്തിൽ തിരമാലകും കടലാക്രമണത്തിനും സാധ്യതയുണ്ടെന്ന് ദേശീയ സമുദ്ര സ്ഥിതി പഠന ഗവേഷണ കേന്ദ്രം (INCOIS) അറിയിച്ചു.

പുറപ്പെടുവിച്ച സമയം 16/10/2021,09.00 PM

29 89 7

## High Wave Warning



**Kerala State Disaster Management Authority - KSDMA**

Published by Pradeep Gopinathan Nair · October 16 at 10:04 PM ·

**\*ഉയർന്ന തിരമാല ജാഗ്രത നിർദ്ദേശം\***

**\*കേരള തീരത്ത് (പൊഴിയൂർ മുതൽ കാസർഗോഡ് വരെ) ഒക്ടോബർ 16 രാത്രി 11.30 വരെ 2.5 മുതൽ 3.1 മീറ്റർ വരെ ഉയരത്തിൽ തിരമാലക്കും കടലാക്രമണത്തിനും സാധ്യതയുണ്ടെന്ന് ദേശീയ സമുദ്ര സ്ഥിതി പഠന ഗവേഷണ കേന്ദ്രം (INCOIS) അറിയിച്ചു.\***

**\*മൽസ്യത്തൊഴിലാളികളും തീരദേശവാസികളും ജാഗ്രത തുടരുക.\***

1. കടൽകേഴാടം രൂക്ഷമാകാൻ സാധ്യതയുള്ളതിനാൽ അപകട മേഖലകളിൽ നിന്ന് അധികൃതരുടെ നിർദ്ദേശാനുസരണം മാറി താമസിക്കണം.
2. മൽസ്യബന്ധന യാനങ്ങൾ (ബോട്ട്, വള്ളം, etc.) ഹാർബറിൽ സുരക്ഷിതമായി കെട്ടിയിട്ട് സൂക്ഷിക്കുക. വള്ളങ്ങൾ തമ്മിൽ സുരക്ഷിത അകലം പാലിക്കുന്നത് കുട്ടിയിടിച്ചുള്ള അപകട സാധ്യത ഒഴിവാക്കാം. മൽസ്യബന്ധന ഉപകരണങ്ങളുടെ സുരക്ഷ ഉറപ്പാക്കണം.
3. ബീച്ചിലേക്കുള്ള യാത്രകളും കടലിൽ ഇറങ്ങിയുള്ള വിനോദങ്ങളും പൂർണ്ണമായും ഒഴിവാക്കുക.

**\*പുറപ്പെടുവിച്ച സമയം 16/10/2021, 09.00 PM\***

**\*INCOIS-KSEOC-KSDMA\***

See Translation

9,824 People reached   208 Engagements   ↑ +1.9x Higher Distribution Score   Boost Unavailable

You and 50 others   1 Comment   12 Shares

Like   Comment   Share

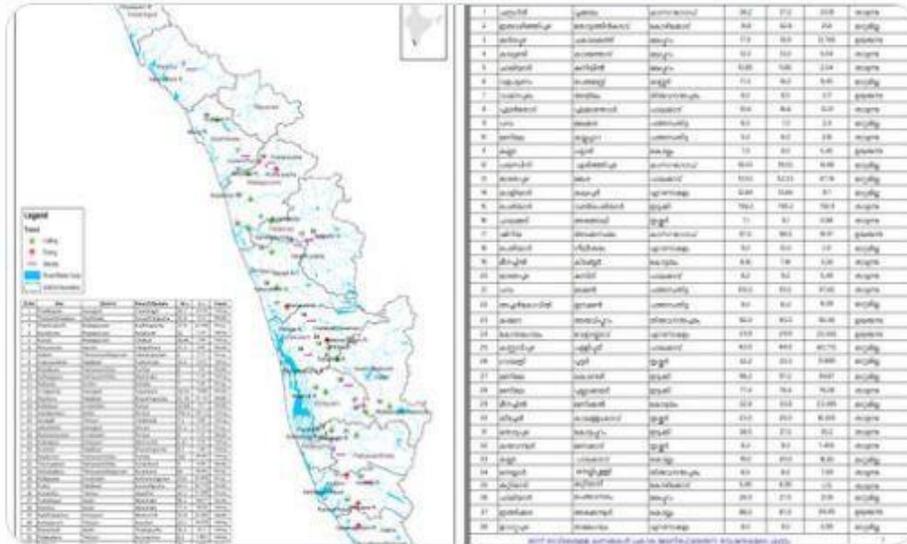
- **River Water-level Alert by CWC**

The CWC on daily basis issues the water-level of 38 rivers that flows in Kerala. This alert was issued in all the official whatsapp groups of KSDMA, IAS, IPS Officers, Private Secretary of Ministers, all Medias, Emergency Response Group, Landslide Team, Central and State Forces, LSGD nodal officers, Volunteers, Virtual Cadre, Department of Telecommunication – Telecom Service Providers, and DEOCs of Kerala. The same warning is issued in the social media Facebook and Twitter. This was also issued in website of KSDMA.



Kerala State Disaster Management Authority @KeralaSD... · Oct 16

കേരള ജല കമ്മീഷൻ (CWC) പ്രളയ മുന്നറിയിപ്പ് സംവിധാനം CWC-KSEOC-KSDMA (16/10/2021)



8 10

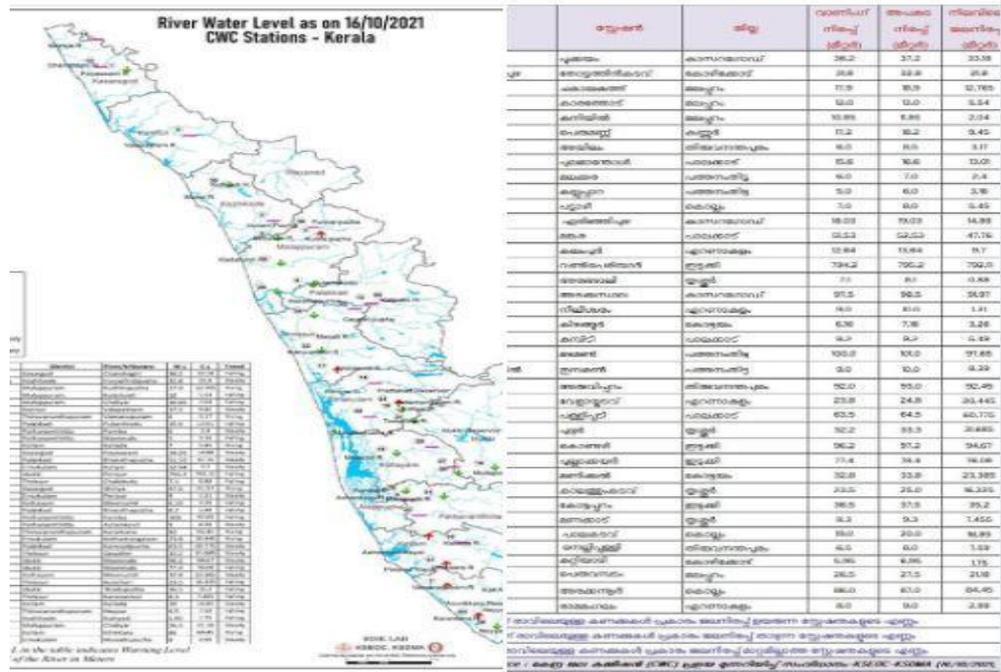


Kerala State Disaster Management Authority - KSDMA

Published by Pradeep Gopinathan Nair · October 16 at 12:10 PM

കേരള ജല കമ്മീഷൻ (CWC) പ്രളയ മുന്നറിയിപ്പ് സംവിധാനം CWC-KSEOC-KSDMA (16/10/2021)

See Translation



10,591 People reached 555 Engagements Boost Unavailable

49 3 Comments 13 Shares Like Comment Share

- **Rainfall Forecast by IMD**

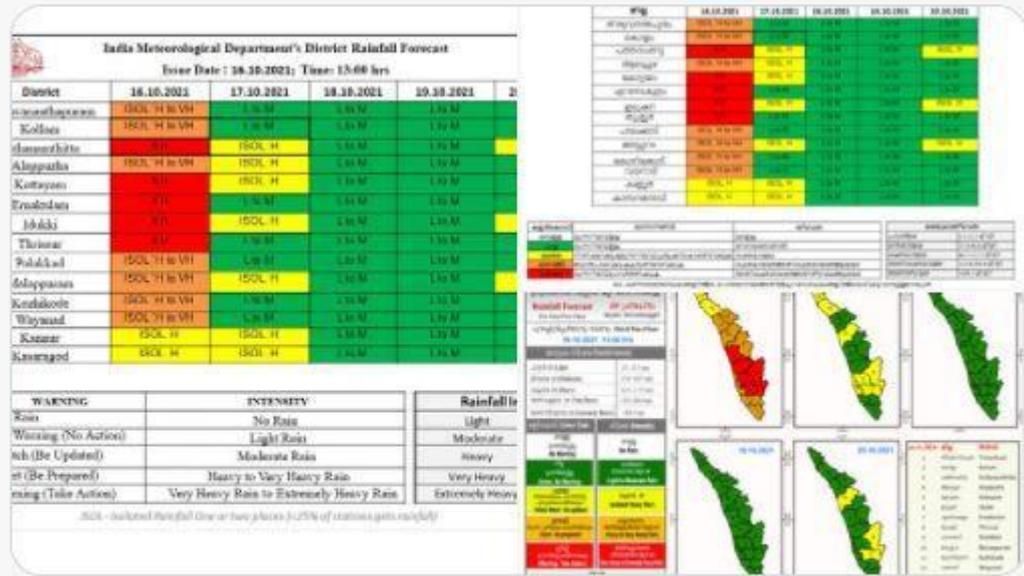
IMD issues district-wise rainfall forecast for the current day to the preceding four days. This rainfall forecast was issued in all the official whatsapp groups of KSDMA, IAS, IPS Officers, Private Secretary of Ministers, all Medias, Emergency Response Group, Landslide Team, Central and State Forces, LSGD nodal officers, Volunteers, Virtual Cadre, Department of Telecommunication – Telecom Service Providers, and DEOCs of Kerala. The same warning is issued in the social media Facebook and Twitter. This was also issued in website of KSDMA As some of the district had orange alert, so all District Collectors, all DDMAAs, were alerted through mail informing the above with precautionary measures that to be taken. This warning was also conveyed through mail to all nodal departments like Revenue, Police, LSGD, Fire & Rescue, Fisheries, Coastal Police, KSEB, and Irrigation.





**Kerala State Disaster Management Authority @KeralaSD...** · Oct 16 ...

കേന്ദ്ര കാലാവസ്ഥാവകുപ്പിന്റെ അടുത്ത 5 ദിവസത്തേക്കുള്ള പുതുക്കിയ മഴ സാധ്യത പ്രവചനം കേരളത്തിൽ അതിതീവ്രമായ മഴയ്ക്ക് (Extremely Heavy Rainfall) സാധ്യത - വിവിധ ജില്ലകളിൽ ഇന്ന് (16-10-2021) റെഡ് അലേർട്ട് പ്രഖ്യാപിച്ചു.  
16-10-2021: പത്തനംതിട്ട, കോട്ടയം, എറണാകുളം, ഇടുക്കി, തൃശ്ശൂർ.



11 58 114



**Kerala State Disaster Management Authority @KeralaSD...** · Oct 16 ...

ഒക്ടോബർ 16 മുതൽ 17 വരെ കേരളത്തിൽ ശക്തമായ കാറ്റിന് സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

31 95



dileep fans & supporters  
15K members • 6 posts a day

Join



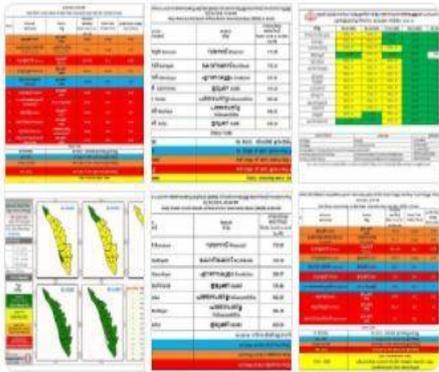
ജനരംഗവേദി  
837 members • 6 posts a month

Join

See All

Photos

See All



Videos

See All



മഴ സാധ്യത (പ്രവചനത്തെക്കു...

You and 18 others

701 Views • 3 days ago

Page Transparency

See All

Facebook is showing information to help you better understand the purpose of a Page. See actions taken by the people who manage and

നടത്തേണ്ടതെന്നും ഏത തരത്തിലാണ അലൈർട്ടുകൾ മനസ്സിലാക്കേണ്ടത് എന്നും സംസ്ഥാന ദുരന്ത നിവാരണ അതോറിറ്റിയുടെ ഓറഞ്ച് പുസ്തകം 2021 ൽ വിശദീകരിക്കുന്നുണ്ട്. അത് [https://sdma.kerala.gov.in/.../2021/05/orangebook\\_2021.pdf](https://sdma.kerala.gov.in/.../2021/05/orangebook_2021.pdf) ൽ ലിങ്കിൽ ലഭ്യമാണ്.

കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് മുന്നറിയിപ്പിൽ മാറ്റങ്ങൾ വരുത്തുന്നതുസരിച്ച് അലൈർട്ടുകളിൽ മാറ്റം വരാവുന്നതാണ്. ദുരന്ത നിവാരണ അതോറിറ്റിയുടെ ഫേസ്ബുക്ക്, ട്വിറ്റർ പേജുകളും പരിശോധിക്കുക.

പുറപ്പെടുവിച്ച സമയം-04 PM, 16/10/2021

IMD-KSEOC-KSDMA

See Translation

India Meteorological Department's District Rainfall Forecast  
Issue Date : 16.10.2021; Time: 16:00 hrs

District	16.10.2021	17.10.2021	18.10.2021	19.10.2021	20.10.2021
Thiruvananthapuram	ISOL H to VH	1.50 M	1.50 M	1.50 M	1.50 M
Kollam	ISOL H to VH	1.50 M	1.50 M	1.50 M	1.50 M
Palakkad	ISOL H	ISOL H	1.50 M	1.50 M	ISOL H
Alappuzha	ISOL H to VH	ISOL H	1.50 M	1.50 M	1.50 M
Kottayam	ISOL H	ISOL H	1.50 M	1.50 M	1.50 M
Ernakulam	ISOL H	1.50 M	1.50 M	1.50 M	1.50 M
Idukki	ISOL H	ISOL H	1.50 M	1.50 M	ISOL H
Thiruv	ISOL H	1.50 M	1.50 M	1.50 M	1.50 M
Palakkad	ISOL H	1.50 M	1.50 M	1.50 M	1.50 M
Malappuram	ISOL H to VH	ISOL H	1.50 M	1.50 M	ISOL H
Kozhikode	ISOL H to VH	1.50 M	1.50 M	1.50 M	1.50 M
Waynad	ISOL H to VH	1.50 M	1.50 M	1.50 M	1.50 M
Kannur	ISOL H	ISOL H	1.50 M	1.50 M	1.50 M
Kasaragod	ISOL H	ISOL H	1.50 M	1.50 M	1.50 M

കേരള കാലാവസ്ഥ വകുപ്പിന്റെ മഴ പ്രവചനത്തിനുള്ള മഴ സാധ്യത

മഴ	16.10.2021	17.10.2021	18.10.2021	19.10.2021	20.10.2021
തിരുവനന്തപുരം	ISOL H to VH	1.50 M	1.50 M	1.50 M	1.50 M
കൊല്ലം	ISOL H to VH	1.50 M	1.50 M	1.50 M	1.50 M
പാലക്കാട്	ISOL H	ISOL H	1.50 M	1.50 M	ISOL H
ആലപ്പുഴ	ISOL H to VH	ISOL H	1.50 M	1.50 M	1.50 M
കോട്ടയം	ISOL H	ISOL H	1.50 M	1.50 M	1.50 M
എറണാകുളം	ISOL H	1.50 M	1.50 M	1.50 M	1.50 M
ഇടുക്കി	ISOL H	ISOL H	1.50 M	1.50 M	ISOL H
തൃശ്ശൂർ	ISOL H	1.50 M	1.50 M	1.50 M	1.50 M
പാലക്കാട്	ISOL H	1.50 M	1.50 M	1.50 M	1.50 M
മലപ്പുറം	ISOL H to VH	ISOL H	1.50 M	1.50 M	ISOL H
കോഴിക്കോട്	ISOL H to VH	1.50 M	1.50 M	1.50 M	1.50 M
വയനാട്	ISOL H to VH	1.50 M	1.50 M	1.50 M	1.50 M
കന്നൂർ	ISOL H	ISOL H	1.50 M	1.50 M	1.50 M
കാസർഗോഡ്	ISOL H	ISOL H	1.50 M	1.50 M	1.50 M

22,450

People reached

1,060

Engagements

Boost Unavailable

77

37 Shares

Like

Comment

Share



Kerala State Disaster Management Authority - KSDMA

Published by Pradeep Gopinathan Nair · October 16 at 4:27 PM ·

ഒക്ടോബർ 16 മുതൽ 17 വരെ കേരളത്തിൽ ഒറ്റപ്പെട്ടയിടങ്ങളിൽ ഇടിമിന്നലോട് കൂടിയ മഴയ്ക്ക് സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

ഇടിമിന്നൽ - ജാഗ്രത നിർദ്ദേശങ്ങൾ

ഉച്ചക്ക് 2 മണി മുതൽ രാത്രി 10 മണിവരെയുള്ള സമയത്ത് ഇടിമിന്നലിനുള്ള സാധ്യത കൂടുതലാണ്. ഇടിമിന്നൽ അപകടകാരികൾ ആണ്. അവ മനുഷ്യൻറെയും മൃഗങ്ങളുടെയും ജീവനും വൈദ്യുത-ആശയവിനിമയ ശൃംഖലകൾക്കും വൈദ്യുത ചാലകങ്ങളുമായി ബന്ധിപ്പിച്ചിട്ടുള്ള വീട്ടുപകരണങ്ങൾക്കും വലിയ നാശനഷ്ടം സൃഷ്ടിക്കുന്നുണ്ട്. ആയതിനാൽ പൊതുജനങ്ങൾ താഴെപ്പറയുന്ന മുൻകരുതൽ കാര്യങ്ങൾ കണ്ട് തുടങ്ങുന്ന സമയം മുതൽ തന്നെ സ്വീകരിക്കേണ്ടതാണ്. ഇടിമിന്നൽ ദൃശ്യമല്ല എന്നതിനാൽ ഇത്തരം മുൻകരുതൽ സ്വീകരിക്കുന്നതിൽ നിന്നും വിട്ടുനിൽക്കരുത്.

- ഇടിമിന്നലിൻറെ ആദ്യ ലക്ഷണം കണ്ടുകഴിഞ്ഞാൽ ഉടൻ തന്നെ സുരക്ഷിതമായ കെട്ടിടത്തിനുള്ളിലേക്ക് മാറുക. തുറസ്സായ സ്ഥലങ്ങളിൽ തുടരുന്നത് ഇടിമിന്നലേൽക്കാനുള്ള സാധ്യത വർദ്ധിപ്പിക്കും.
- ഇടിമിന്നലുള്ള സമയത്ത് ജനലും വാതിലും അടച്ചിടുക, വാതിലിനും ജനലിനും അടുത്ത് നിൽക്കാതെയിരിക്കുക. കെട്ടിടത്തിനകത്ത് തന്നെ ഇരിക്കുകയും പരമാവധി ഭിത്തിയിലോ തറയിലോ സ്റ്റർശിക്കാതിരിക്കാൻ ശ്രമിക്കുകയും ചെയ്യുക.
- ഗൃഹോപകരണങ്ങളുടെ വൈദ്യുതി ബന്ധം വിച്ഛേദിക്കുക. വൈദ്യുതി ഉപകരണങ്ങളുടെ സാമീപ്യവും ഇടിമിന്നലുള്ള സമയത്ത് ഒഴിവാക്കുക.
- ഇടിമിന്നലുള്ള സമയത്ത് ടെലിഫോൺ ഉപയോഗിക്കുന്നത് ഒഴിവാക്കണം. മൊബൈൽ ഫോൺ ഉപയോഗിക്കുന്നത് കൊണ്ട് കുഴപ്പമില്ല.
- കുട്ടികൾ ഉച്ചക്ക് 2 മണി മുതൽ രാത്രി 10 മണി വരെ അന്തരീക്ഷം മേലാവൃതമാണെങ്കിൽ, തുറസായ സ്ഥലത്തും, ടെറസ്സിലും കളിക്കുന്നത് ഒഴിവാക്കുക.
- ഇടിമിന്നലുള്ള സമയത്ത് വൃക്ഷങ്ങളുടെ ചുവട്ടിൽ നിൽക്കരുത്. വാഹനങ്ങൾ മരച്ചുവട്ടിൽ പാർക്ക് ചെയ്യുകയുമരുത്.
- ഇടിമിന്നലുള്ള സമയത്ത് വാഹനത്തിനകത്ത് തന്നെ തുടരുക. കൈകാലുകൾ പുറത്തിടാതിരിക്കുക. വാഹനത്തിനകത്ത് നിങ്ങൾ സുരക്ഷിതരായിരിക്കാം.



Kerala State Disaster Management Authority - KSDMA

Published by Pradeep Gopinathan Nair · October 16 at 4:31 PM ·

ഒക്ടോബർ 16 മുതൽ 17 വരെ കേരളത്തിൽ ശക്തമായ കാറ്റിന് സാധ്യതയുണ്ടെന്ന് കേന്ദ്ര കാലാവസ്ഥ വകുപ്പ് അറിയിച്ചു.

ശക്തമായ കാറ്റിനെ നേരിടാനുള്ള പൊതുജാഗ്രത നിർദ്ദേശങ്ങൾ

കേരളത്തിൽ ഏറ്റവും കൂടുതൽ നാശനഷ്ടവും ജീവഹാനിയും ഉണ്ടാക്കുന്ന സംസ്ഥാന സവിശേഷ ദുരന്തമാണ് ശക്തമായ കാറ്റ്. ശക്തമായ കാറ്റിൽ മരങ്ങൾ കടപുഴകി വീണും ചില്ലുകൾ ഒടിഞ്ഞു വീണും അപകടങ്ങൾ ഉണ്ടാകാനുള്ള സാധ്യതയുണ്ട്. കാറ്റും മഴയും ഉണ്ടാകുമ്പോൾ ഒരു കാരണവശാലും മരങ്ങളുടെ ചുവട്ടിൽ നിൽക്കാൻ പാടുള്ളതല്ല. മരച്ചുവട്ടിൽ വാഹനങ്ങളും പാർക്ക് ചെയ്യരുത്... See More

See Translation



MAUSAM.IMD.GOV.IN  
Kerala

4,891 People reached    82 Engagements    ↓ -1.0x Average Distribution Score    Boost Unavailable

16    1 Share

Like    Comment    Share



Kerala State Disaster Management Authority - KSDMA

Published by Joe Lois · October 16 at 4:45 PM

അടിയന്തിര സാഹചര്യങ്ങളിൽ എമർജൻസി കിറ്റ് കിട്ടാതെ കാനൂകളിലെക്കോ സുരക്ഷിത സ്ഥാനത്തേക്കോ മാറുക കിട്ടില്ല ഉണ്ടായിരിക്കേണ്ടവയെ കുറിച്ച് ഈ ചിത്രത്തിൽ നൽകിയിട്ടുണ്ട്.

See Translation

**Is your emergency kit ready?**

**ഉണ്ടെങ്കിൽ എമർജൻസി കിറ്റ് തയ്യാറാക്കുക**

**ഈ എമർജൻസി കിറ്റ് തിരുത്തലുണ്ടെങ്കിൽ ജീവൻ രക്ഷിക്കുക**

**എമർജൻസി കിറ്റ് തയ്യാറാക്കുക**

**An emergency kit can save your life during a Disaster**

**Prepare an emergency kit today**

**പൊതുജന അറിവ് വ്യാപിപ്പിക്കൽ :**

**കേരള സംസ്ഥാന ദുരന്ത നിവാരണ അതോറിറ്റി**

അതിരപ്പള്ളി ഹിൽസ്, വികാസ് ഭവൻ പി.ഒ, തിരുവനന്തപുരം 695032

Tel : 0471- 2331345, 2331645 Fax : 0471- 2364424, Toll free - 107

Website : www.sdma.kerala.gov.in, Email : keralasdma@gmail.com

**Issued In Public Interest By**

**Kerala State Disaster Management Authority**

Vatory Hills, Vikas Bhavan PO, Thiruvananthapuram, K

2331345 | Toll Free 1070 | www.sdma.kerala.gov.in | keralasdma@g

7,365 People reached

190 Engagements

Boost Unavailable

You and 55 others

16 Shares

Like

Comment

Share

## **ANNEXURE 4: ACTION TAKEN REPORT - KSEOC**

### **11-10-2021**

- Foreseeing the dangers that could happen due to the heavy rainfall, Kerala State Disaster Management Authority had advised Disaster Management Department (DMD) to issue orders regarding steps to be taken by District Collectors, Line Departments and Public vide GO No 676/2021/DMD dated 07/10/2021.
- The daily rainfall forecast of the India Meteorological Department predicted heavy rainfall in the southern districts of the state. Orange alert was declared in 7 districts, including Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha, Kottayam, Ernakulam, and Idukki. On 12-10-2021 6 districts including Kollam, Pathanamthitta, Alappuzha, Kottayam, Ernakulam and Idukki were declared with Orange alert. Orange alert was declared on 13-10-2021 also for 6 districts including Alappuzha, Kottayam, Ernakulam, Idukki, Thrissur, Palakkad and Malappuram.
- A review meeting was convened by the Revenue Principal Secretary to analyse the rule curve level of dams in the state. KSEB and the Irrigation department were instructed to closely monitor the dam's water levels and to open control rooms functioning round the clock.
- KSEB and the Irrigation department started functioning control rooms and they were working in coordination with the State Emergency Operations Centre and District Emergency Operations Centre.
- A meeting was conducted with all the district collectors to analyse the situation in each district. The meeting concluded that all the districts on Orange Alert are well equipped to face any adversity.
- 6 teams of NDRF were deployed. One team in Pathanamthitta, Idukki, Alappuzha, Ernakulam, Kottayam, and Thrissur. The Army and DSC were also asked to make 2 teams available in case of an emergency.
- Concerned departments were instructed to inform the Aapda Mitra volunteers, Inter Agency Group members Civil Defence and Sannadha Sena volunteers to be prepared for action.

### **12-10-2021**

- The water level in the Chalakkudy river was found to be increasing rapidly. The water level of 0.93m recorded at 2am rose up to 6.10m by 8.30am.
- The NDRF team prepositioned for Kollam district was redirected to Chalakkudy with immediate effect.

- Even though a yellow alert was declared for the Thrissur district, Poringalkkuthu received 170.5mm of rainfall and Vayanthala received 110.5mm of rainfall.
- 73 families were shifted to relief camps and 6 families were relocated to relatives' houses in Thrissur district.
- At 11.30am, the Revenue minister convened a meeting with the District Collector, Thrissur and elected representatives of the district to analyse the situation and give necessary instructions.
- Weather stations of IMD in Kannur, Kasaragod, Ernakulam, Thirssur, Kollam, Palakkad and Malappuram districts recorded more than 100mm of rainfall in the last 24 hours.
- At 3.30pm, Revenue Minister as per the instructions of the Chief Minister convened an online meeting at the Headquarters of KSDMA with District Collectors of all districts to analyse the situation as IMD had predicted intense rainfall in the coming days. The meeting gave importance to the Chalakkudy river scenario.
- KSEB and Irrigation department were instructed to closely monitor the dam water levels.
- Police and Fire and Rescue departments were informed to be on alert.
- Instructions were given to District collectors to relocate people from landslide prone areas.
- Instructions were given to prohibit night travel in hilly areas.
- 2 houses were destroyed completely and 94 houses were partially damaged
- 19 relief camps were opened throughout the state housing 688 members from 178 families. The camps were occupied by 265 males, 272 females and 151 children
- 3 deaths were reported from the state

### **13-10-2021**

- State Emergency Operations Centre and District Emergency Operations Centre are closely monitoring the rain situation.
- The daily rainfall forecast of India Meteorological Department predicted heavy rainfall in the northern districts of the state in the coming days.
- In the above circumstances the NDRF team positioned at Kottayam was redirected to Malappuram district.
- 36 camps were operational across the state having 815 inmates. 7 deaths reported and one person is missing from Kannur district.

## 14-10-2021 (Depression in the Arabian Sea and Bay of Bengal)

- IMD issued the District Rainfall Forecast with Orange alerts for 6 districts on 14-10-2021 and for 7 districts on 15-10-2021.
- In connection with the Low-pressure formation and isolated heavy - very heavy rainfall forecasts (Orange alerts) issued by the IMD, the Commissioner, Disaster Management, convened a meeting with the Hazard Analysts working with the District EOCs and technical and non-technical staff of the KSEOC and KSDMA to discuss the preparedness measures.
- A Low-Pressure Area has formed over northern parts of the Central Bay of Bengal & neighbourhood. It is likely to move west- northwestwards and reach south Odisha-north Andhra Pradesh coasts during next 24 hours. Another Low-Pressure Area has formed over East-central & adjoining Southeast Arabian Sea off Lakshadweep area. It is likely to move east southeastwards as a Low-Pressure Area towards Kerala coast during next 48 hours. Under the influence of the above, widespread rainfall with isolated heavy to very heavy rainfall is expected over Kerala during 14- 16th October 2021. Hence, the State Relief Commissioner has decided to formally activate the SEOC in Emergency (24x7) mode. Informed the Chairman, KSEBL, and Chief Engineer, Irrigation (I & A) to depute staff to the SEOC to work 24x7 to monitor the status of water levels in reservoirs belonging to the KSEB Dam Safety and Irrigation departments.
- As per the direction from the Commissioner, Disaster Management informed all Chairpersons, DDMAAs to active full-fledged DEOCs with staff from the Irrigation Department, KSEBL, and KWA. These staff should create a system in the DEOC (with Irrigation and KSEBL) to plot and monitor –
  - Rainfall data (in dammed and undammed areas),
  - Hourly/half hourly reservoir levels
  - Half hourly reservoir inflow (to also assess rainfall intensity in the catchment of the reservoir)
  - River gauge data (CWC and Irrigation), during the next 4 - 5 days (KSEOC will assist with this)
- As per the direction from the CDM, informed the Head of all Departments through E-mail to ensure that there is enough manpower to man and supervise control rooms and dashboards. Ensure that there are enough staff and volunteers in the field to meet emergencies.
- Low Pressure Area over Eastcentral & adjoining Southeast Arabian Sea off Lakshadweep area and the associated cyclonic circulation extends up to mid tropospheric level persists. IMD

informed that this is likely to move east southeastwards as a Low-Pressure Area towards the Kerala coast during the next 48 hours.

- IMD issued the Fisherman warning for the Kerala, Karnataka, and Lakshadweep coasts. As per the bulletin, fishermen are advised not to venture into these areas and those out in the Eastcentral & adjoining Southeast Arabian Sea from 14-10-2021 to 16-10-2021.
- Informed all Chairpersons of the Coastal DDMA's, Coastal DEOCs, the Fisheries Control Room, the Coast Guard, and Coastal Police control rooms, and SPMR through hotlines, and email.
- IMD issued the District Rainfall forecast at 1 PM and withdrawn "Orange" alerts for October 14<sup>th</sup>, 2021.
- Ensured that 2 teams of the Army (Pangode) and 2 teams of the Defence Security Corps (DSC) (Kannur) are kept on standby for deployment.
- IMD issued a modified Fisherman warning with advice to fishermen to return to the coast by this evening.
- Informed all the Chairpersons of the Coastal DDMA's, coastal DEOCs, the Fisheries Control Room, the Coast Guard, and Coastal Police control rooms, and SPMR through hotlines, and email to ensure that all fishermen engaged in fishing reached the nearest coast by this evening.
- Informed the Media through Official WhatsApp group to scroll the message in the news channels.
- IMD issued heavy wind alerts from October 14, 2021, to October 18, 2021.
- IMD issued lightning alerts from Oct. 14 – 18.
- 34 camps were operational across the state having 953 inmates. Two deaths reported (one from Malappuram and Idukki) due to drowning, and two persons are missing from Malappuram district. 1 house was fully damaged and 6 were partially damaged.

#### **15-10-2021 (Depression in the Arabian Sea and Bay of Bengal)**

- IMD issued the District Rainfall Forecast with Orange alerts for 2 districts on 16-10-2021. Informed the concerned DEOCs through hotline, and sent Email warnings to district collectors.
- Informed the nodal departments through email.
- IMD issued the Fisherman warning for the Kerala, Karnataka, and Lakshadweep coasts. As per the bulletin, fishermen are advised not to venture into these areas from 15-10-2021 to 16-10-2021.

- Informed all Chairpersons of the Coastal DDMA's, Coastal DEOCs, the Fisheries Control Room, the Coast Guard, and Coastal Police control rooms, and SPMR through hotlines, and email.
- IMD issued the Modified District Rainfall Forecast with Orange alerts for 2 districts on 16-10-2021. Informed the concerned DEOCs through hotline, and sent Email warnings to district collectors.
- Informed the nodal departments through email.
- IMD issued heavy wind alerts from October 15, 2021, to October 17, 2021.
- IMD issued lightning alerts from Oct. 15 – 17.
- 21 camps were operational across the state having 531 inmates. Two deaths were reported (one from Kannur and Palakkad) due to drowning. 23 houses were partially damaged.
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared with CDM.
- Various IEC materials were designed and disseminated through KSDMA's fb, whatsapp groups & website for wider public awareness. New posters were designed on 'strong winds', 'back to home' etc.

\*In addition to this, the warnings were shared through official WhatsApp groups of KSDMA.

### **16-10-2021 (Depression in the Arabian Sea and Bay of Bengal)**

- IMD issued the District Rainfall Forecast (10 AM) with orange alerts for 11 districts and yellow alerts for 2 districts on 16-10-2021. Informed the concerned DEOCs through hotline, and sent Email warnings to district collectors.
- Informed the nodal departments through email.
- Vide Email No. MTO IV/840/2021/SEOC-KSDMA dated 16-10-2021, requested Station Commander, Pangode Military Camp, Thiruvananthapuram and Station Commander, Defence Security Corps, Kannur to deploy one team of Army to Kottayam and Thiruvananthapuram districts, and one team of DSC to Kannur and Kozhikode districts considering the district rainfall forecast.
- IMD issued the District Rainfall Forecast (1 PM) with red alerts for 5 districts, orange alerts for 7 districts and yellow alerts for 2 districts on 16-10-2021. Informed the concerned DEOCs through hotline, and sent Email warnings to district collectors.

- Informed the nodal departments through email.
- Debris flow incidences were reported at the Elangad area in Koottikkal village (Kottayam district), Theekkekara village (Kottayam), and a landslide incidence was reported at Edakunnam village. Around 50 people were stranded in the Koottikkal village.
- Civil defence members, trained Aapda Mitra Volunteers and Inter Agency group Members were the first responders to the disaster.
- Vide ltr. No. DM1-2763/2021/DC KTM dated 16-10-2021 the District Collector & Chairman, Kottayam DDMA requested the service of the Air Force for airlifting the people stranded in Koottikkal Village. Vide E-mail No. MTO IV/840/2021/SEOC-KSDMA, informed the Air Officer, Commanding-in-Chief, Southern Air Command, Thiruvananthapuram. In response, they informed that it is difficult to use choppers for rescue operations due to bad weather and suggested contacting Southern Naval Command.
- Vide E-mail No. MTO IV/840/2021/SEOC-KSDMA, information was shared with the Flag Officer, Commanding in Chief Southern Naval Command about the stranded people. Later it was informed by the Kottayam Hazard Analyst that the local people rescued the people stranded there.
- The Kottayam Hazard Analyst shared the details of people (15 people) stranded in a three storied building at Chirakadavu. Spoke to one of the stranded people (9446924652). He informed that they were not able to go out as the surrounding region was inundated by 10 ft floodwater. Shared the details with Commander Ryan (Southern Naval Command). Later the HA of Kottayam informed that the people were rescued by local people.
- IMD issued the Fisherman warning for the Kerala, Karnataka, and Lakshadweep coasts. As per the bulletin, fishermen are advised not to venture into these areas from 16-10-2021 to 17-10-2021.
- Informed all Chairpersons of the Coastal DDMA's, Coastal DEOCs, the Fisheries Control Room, the Coast Guard, and Coastal Police control rooms, and SPMR through hotlines, and email.
- Informed the nodal departments through email.
- IMD issued heavy wind alerts from October 16, 2021, to October 17, 2021.
- IMD issued lightning alerts from Oct. 16 – 17.
- IMD issued the District Rainfall Forecast (4 PM) with red alerts for 6 districts, orange alerts for 6 districts and yellow alerts for 2 districts on 16-10-2021. Informed the concerned DEOCs through hotline, and sent Email warnings to district collectors.
- Informed the nodal departments through email.

- Vide E-mail No. MTO IV/840/2021/SEOC-KSDMA, requested the General Officer Commanding, Karnataka & Kerala Sub Area, Bangalore and Station Commander, Pangode Military Camp, Thiruvananthapuram for deploying one ETF team to Kottayam.
- Vide E-mail No. MTO IV/840/2021/SEOC-KSDMA, requested the Director-General, NDRF, New Delhi, and The Sr. Commandant, NDRF, 4th Btl, Arakkonam for deploying 3 additional teams (one in Idukki, Kottayam, and Kollam districts).
- 65 camps were operational across the state having 1242 inmates. 6 deaths reported today.
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared with CDM.
- Emergency Messages were disseminated through sign language videos under the 'disability inclusive DRR' project, with the support of NISH, mainly to help the persons with disabilities.
- Various IEC materials were designed and disseminated through KSDMA's fb, whatsapp groups & website for wider public awareness. New posters were designed on 'strong winds', 'back to home' etc.

\*In addition to this, the warnings were shared through official WhatsApp groups of KSDMA.

### **17-10-2021 (Depression in the Arabian Sea and Bay of Bengal)**

- Vide Email No. MTO IV/840/2021/SEOC-KSDMA dated 17-10-2021, requested the service of two helicopters of Air Force (Air Officer in Command, Southern Air Command, Thiruvananthapuram) for reconnaissance, rescue, and relief in the landslide affected locations including airdropping of food packets in the Koottickal village of Kottayam district. One helicopter airdropped food packets in the landslide affected areas in Koottickal village.
- IMD issued the District Rainfall Forecast (10 AM) with yellow alerts for 11 districts and on 17-10-2021.
- Submitted the preliminary report on landslide incidences to NERC (MHA) and NDMA control room.
- INCOIS issued high wave alert for Kerala coast till 18-10-2021 and IMD issued fisherman warning for Kerala coast on 17-10-2021.
- IMD issued the District Rainfall Forecast (1 PM) with yellow alerts for 11 districts and on 17-10-2021.
- IMD issued lightning alerts from Oct. 17 – 21.

- Vide email NERC (MHA) shared the IMD bulletin stating - *Low pressure area over southeast Arabian Sea & adjoining Kerala has become less marked and now seen as a trough from south Interior Karnataka to south Tamil Nadu at lower levels. Under its influence, isolated heavy rainfall very likely over Kerala on 17th October 2021 and significant reduction thereafter. A fresh spell of easterly wave is likely to affect south Peninsular India from 20th October and cause fairly widespread rainfall with isolated heavy falls likely over Kerala from 20th October and likely to continue for subsequent 3-4 days.*
- Redeployed the NDRF team in Kottayam district to Alappuzha (Upper Kuttanad area) considering the possibility of inundation of this area in connection with the Kakki Dam shutter opening scheduled on 18<sup>th</sup> October 2021.
- IMD issued Heavy wind alert from October 17 – 21, 2021.
- KSDMA organized a coordination meeting with the Inter Agency Groups (IAGs) for severely affected districts, viz. Kottayam, Pathanamthitta, Idukki & Alappuzha. The meeting was held to request the support of NGOs to the respective DDMA's. Around 80 people participated representing various NGOs, DDMA's. Other stakeholders were UNICEF & Sphere India.
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared with CDM.
- 163 camps were operational across the state having 5223 inmates. 23 deaths reported (22 due to landslides and one due to drowning). 4 houses were fully damaged, 111 houses were partially damaged.
- KSDMA & KILA conducted an online training for the Emergency Response Team (ERT) Members of the Local Self Government Institutions. The objective was to help the volunteers to be prepared for any eventualities.
- Various IEC materials were designed and disseminated through KSDMA's fb, whatsapp groups & website for wider public awareness. New posters were designed on 'strong winds', 'back to home' etc.
- Civil defence members, trained Aapda Mitra Volunteers and Inter Agency group Members were actively involved in the rescue operations.

\*As there is no orange or red alerts for the districts, the warnings were shared only through official WhatsApp groups.

## 18-10-2021 (Depression in the Arabian Sea and Bay of Bengal)

- Submitted the preliminary report on landslide incidences to NERC (MHA) and NDMA control room.
- Hon'ble Chief Minister of Kerala chaired an online meeting regarding the overall situation assessment meeting with District Collectors and line department officials via online platform at 10.00 AM. An assessment also made about dam water levels, smooth functioning of relief camps, dam opening, etc
- INCOIS issued high wave alert for Kerala coast till midnight of 18-10-2021 and IMD issued fisherman warning for Kerala coast from 20/10/2021 to 22/10/2021.
- IMD issued the District Rainfall Forecast (1 PM) with green alerts for all districts on 18-10-2021.
- IMD issued lightning alerts from Oct. 20 – 22.
- Revenue Secretary called meeting via Google meet platform at 2PM on Idukki and Idamalayar reservoir storage and rule curve monitoring, and fixed the timing of release. Peechi, Kerala Sholayar and Chimmoni dams operations were also discussed.
- IMD issued Heavy wind alert from October 18 – 21, 2021.
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared with CDM.
- 240 camps were operational across the state having 9081 inmates. 37 deaths reported (20 due to landslides). 80 houses were fully damaged, 342 houses were partially damaged.
- Civil defense members, trained Aapda Mitra Volunteers and Inter Agency group Members were actively involved in the rescue operations.
- Requested NDRF team at Palakkad district to move to Ernakulam district due to opening of dams in Idukki and Idamalayar. And a new team is requested to position at Palakkad.
- Various IEC materials were designed and disseminated through KSDMA's fb, whatsapp groups & website for wider public awareness. New posters were designed on 'strong winds', 'back to home' etc.

\*As there is no orange or red alert for the districts, the warnings were shared only through official WhatsApp groups.

## **19-10-2021 (Depression in the Arabian Sea and Bay of Bengal)**

- 2 shutters of Pamba dam were opened by 30 cm at 6 AM. It increased by 45 cm at 11 AM.
- 2 shutters of Idamalayar dam were opened by 50 cm at 6 AM. This was increased to 80 cm by 9:45 AM.
- 3 shutters of Idukki dam were opened by 35 cm. First shutter was opened at 11 AM, second at 12 PM and the third at 12:30 PM.
- IMD issued the District Rainfall Forecast (10 AM) with green alerts for all 14 districts on 19-10-2021.
- IMD issued the District Rainfall Forecast (1 PM) with yellow alerts for 8 districts on 19-10-2021 and orange alerts for 11 districts on 20-10-2021 and orange alerts for 12 districts on 21-10-2021. Informed the concerned DEOCs through hotline, and sent Email warnings and specific precautionary measures to be taken to district collectors.
- Contacted District Collectors/ADMs/HA (district) and informed them of the upcoming orange alert and advised them to move people away from vulnerable areas as the alert can be changed to red in the coming days.
- Informed the nodal departments through email.
- Informed various media outlets about the upcoming orange alert.
- IMD issued the Fisherman warning for the Kerala, Karnataka, and Lakshadweep coasts. As per the bulletin, fishermen are advised not to venture into these areas from 20-10-2021 to 22-10-2021.
- Informed all Chairpersons of the Coastal DDMA's, Coastal DEOCs, the Fisheries Control Room, the Coast Guard, and Coastal Police control rooms and SPMR through hotlines, and email.
- Informed the nodal departments through email.
- IMD issued lightning alerts from Oct. 19 – 23.
- IMD issued heavy wind alerts from October 19, 2021 to October 23, 2021.
- Inquired to NDRF Arakkonam about the status of the requested NDRF team for Palakkad District. Ensured the same.
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared with CDM.
- Ninth meeting for rule curve of major dams under KSEB and Irrigation was conducted at 6 PM. On account of the current situations in the state, extreme rainfall events are anticipated for the coming days, hence the necessary precautionary measures are to be taken by the respective District Administrative Authorities. These includes proper and timely evacuation

of the residents of the vulnerable areas, close monitoring of the water-levels in the reservoirs, shutter operations & regulations of the major reservoirs, and smoothening of the course of rivers for the efficient discharge of outflow from the reservoirs. Close monitoring of Kuttanad region has to be carried out by the Alappuzha District Administration. Necessary actions are to be taken for clearing courses of every river for the smooth flow of water without any hindrance of debris, mud, and other obstacles, especially Manimala river, by Irrigation Department. The Department should also closely monitor its reservoirs and essential actions have to be undertaken accordingly. Both KSEBL and Irrigation department shall coordinate and analyse the data regarding the subsequent working conditions of the reservoirs. Besides, based on the discussions and decisions undertaken by the respective departments, necessary information shall be conveyed.

- Tenth meeting for rule curve of major dams under KSEB and Irrigation was conducted at 10:30 PM. The meeting basically factored the discussions regarding the operations of the shutters of the reservoirs which are already opened under KSEBL. Idukki reservoir operation shall be closely monitored and if the trend indicates that the inflow would be more than 500 cumecs, KSEB should increase the spill from present 100 cumecs. Once the inflow cross this threshold, the decisions shall be taken on a real time basis by KSEBL. Early evacuation operations and other necessary actions have to be undertaken at the earliest. Real time operations have to be maintained in the Idamalayar reservoir, if the rainfall intensity increases for the coming days. Regarding the Mullaperiyar reservoir, real time monitoring has to be done continuously. The time for the outflow spill and the level at which the release from the reservoir will be initiated are the main parameters to be ensured and properly conveyed by the Tamil Nadu Government. Regarding the reservoirs under Irrigation Department, the shutters of Chimoni, Vazhani, Peechi in the Trichur district shall be remained opened and for the reservoirs Neyyar, Malampuzha and Kallada, sufficient flood cushion space are maintained as stated by Irrigation Department. It was noted that the operation of the Kallada reservoir has to be closely monitored as this reservoir has a tendency of exhibiting critical behavior.
- Honourable Revenue Minister came to KSDMA to analyse the present situation of the state.

**20-10-2021**

- Organized Review of Preparedness Meeting (Heavy Rainfall Forecast from 20.10.2021) with Chief Minister at 11. AM. The information about the meeting passed to all district collectors, principal secretaries and line departmental heads. The following directions were issued by chief minister in the meeting :
- Ensure Covid protocols & hygiene in relief camps
- Necessary action shall be taken to ensure treatment and protection of the COVID 19 affected in the camps.
- Necessary actions to be taken to release the relief assistance to the affected people at the earliest.
- Eleventh Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State at 10.30 AM to 10.50 AM. The following discussions were held in the meeting:
- The meeting basically discussed the current scenario of the state. As of the present status is concerned, the reservoir operations shall continue with the current spill from the shutters.
- The weather forecast has to be regularly monitored and updated so as to decide the further actions to be taken by the respective departments.
- According to the IMD forecast for the day 20-1-2021, orange alert is forecasted for the districts Pathanamthitta, Idukki and Kottayam while the rest of the districts come under yellow and green alerts.
- A slight increase in the level of the Periyar River is seen while a falling trend is seen in the Pamba river at the Malakkara station.
- Regular monitoring of the water level in the rivers as well as in the reservoirs has to be carried out.
- Informed DEOC Kannur to arrange three vehicles to transport Defence Security Corps from Kannur to Kasargode as per the request of Kasargode DEOC
- IMD issued the District Rainfall Forecast (10 AM) with orange alert in three districts (Pathanamthitta, Kottayam and Idukki), yellow alerts in Thiruvananthapuram, Kollam, Alapuzha, Ernakulam, Thrissur, Palakkad, Malappuram, Wayanad and Kozhikode and green alerts in Kannur and Kasargode districts on 20/10/2021
- Emailed consolidated death details to NERC MHA, DDG Police as per their request.
- Regularly updated (Website, Social Media) and informed all concerned officers regarding Dam Water level Warnings issued by KSEB and Irrigation departments in 3 hours intervals.

- IMD issued the District Rainfall Forecast at 1pm. They withdrew orange alerts for today and they issued yellow alert for 11 Districts except Kasragod, Kannur and Alappuzha where they have issued Green Alert.
- IMD issued the District Rainfall Forecast with orange alert in three districts (Pathanamthitta, Kottayam and Idukki), yellow alerts in Thiruvananthapuram, Kollam, Ernakulam, Thrissur, Malappuram and green alerts in Alappuzha, Palakkad, Kozhikode, Wayanad, Kannur and Kasargode on 21/10/2021.
- Informed the concerned DEOCs through hotline, and sent Email warnings and specific precautionary measures to be taken to district collectors.
- Informed the nodal departments through email.
- Informed various media outlets about the upcoming orange alert.
- IMD issued lightning alert from Oct. 20 – 24 and the message passed to all DEOCs
- IMD issued heavy wind alerts from Oct. 20 – 24 and the message passed to all DEOCs
- Contacted all DEOCs and collected updates about rain status in each district.
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared with CDM.
- Prepared and issued GIS maps such as rainfall, temperature and river water level.
- IMD issued the Fisherman warning for the Kerala, Karnataka, and Lakshadweep coasts. As per the bulletin, fishermen are advised not to venture into these areas from 20-10-2021 to 21-10-2021.
- Informed all Chairpersons of the Coastal DDMA's, Coastal DEOCs, the Fisheries Control Room, the Coast Guard, and Coastal Police control rooms and SPMR through hotlines, and email.
- Informed the nodal departments through email.
- Honourable Revenue Minister came to KSDMA to analyse the present situation of the state.

#### **21-10-2021**

- IMD issued the District Rainfall Forecast (10 AM) with orange alert in three districts (Pathanamthitta, Kottayam and Idukki), yellow alerts in Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Thrissur, Palakkad and Malappuram, and green alerts in Wayanad, Kozhikode Kannur and Kasargod districts on 21/10/2021.
- Regularly updated (Website, Social Media) and informed all concerned officers regarding Dam Water level Warnings issued by KSEB and Irrigation departments in 3 hours intervals.
- Updated River Status and map as per the data received from Central Water Commission.

- IMD issued the Fisherman warning for the Kerala, Karnataka, and Lakshadweep coasts and for South East Arabian Sea As per the bulletin, fishermen are advised not to venture into these areas for 21-10-2021.
- Informed all Chairpersons of the Coastal DDMA's, Coastal DEOCs, the Fisheries Control Room, the Coast Guard, and Coastal Police control rooms and SPMR through hotlines, and email.
- Informed the nodal departments through email.
- IMD issued the District Rainfall Forecast with orange alert in Eight districts (Pathanamthitta, Kottayam, Idukki, Palakkad, Malappuram, Kozhikode, Wayanad, Kannur ), yellow alerts in Thiruvananthapuram, Kollam, Alappuzha, Thrissur and Kasargod.
- Informed the concerned DEOCs through hotline, and sent Email warnings and specific precautionary measures to be taken to district collectors.
- Informed the nodal departments through email.
- Informed various media outlets about the upcoming orange alert.
- IMD issued lightning alert from Oct. 21 – 25 and the message passed to all DEOCs
- IMD issued heavy wind alerts from Oct. 21 – 25 and the message passed to all DEOCs
- Vide MTO IV/840/2021/SEOC-KSDMA dated 21-10-2021, the CDM directed the Chairman, DDMA's to convene a meeting with the officers from Mining & Geology, Soil Conservation and Groundwater departments to identify landslide vulnerable areas close to the settlements.
- Contacted all DEOCs and collected updates about rain status in each district.
- Updated all alerts in Website and in Social Media

## **22-10-2021**

- Regularly updated (Website, Social Media) and informed all concerned officers regarding Dam Water level Warnings issued by KSEB and Irrigation departments in 3 hours intervals.
- Thirteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State at 11.30 AM to 12:00 PM. The following discussions were held in the meeting;
  - It was decided that the spill from Idukki reservoir should be reduced from 100cumecs to 50cumecs. (Maximum of 500cumecs). Early notice has to be given to the District Collector, Idukki and District Collector, Ernakulam in case of increased spill.
  - Regarding the Idamalayar reservoir, it was decided that the spill from the Idamalayar reservoir can be stopped as sufficient flood cushion was available in the reservoir.

- Regarding the Pamba dam, the spill can be stopped for the present condition as permitted by the District Collector, Pathanamthitta. Early notice has to be given to the District Collector, Pathanamthitta in case of increased spill.
- In case of Kakki reservoir, the shutters need not be closed but can be reduced to a minimum value. [ a maximum value of 200cumecs]
- Shutters of Pamba dam and Idamalayar dam were closed at 1:00 pm.
- 2 shutters of Idukki dam were closed at 1:10 pm. 1 shutter is still kept open by 35 cm with spill reduced from 105 cumsecs from 50 cumsecs.
- Shutters of Kakki dam are lowered, reducing the spill to 48 cumsecs.
- IMD issued the District Rainfall Forecast (10 AM) with green alerts for 4 districts (Thiruvananthapuram, Alappuzha, Kannur, Kasaragod) and yellow alerts for rest of the districts (Kollam, Pathanamthitta, Kottayam, Ernakulam, Idukki, Thrissur, Palakkad, Malappuram, Kozhikode and Wayanad) on 22-10-2021.
- IMD issued the District Rainfall Forecast (1 PM) with yellow alerts for 7 districts (Pathanamthitta, Kottayam, Idukki, Palakkad, Malappuram, Kozhikode and Wayanad) and green alert for rest of the districts (Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Thrissur, Kannur and Kasaragod) on 22-10- 2021. On 25-10-2021, orange alerts for 4 districts (Idukki, Kottayam, Palakkad and Malappuram) were issued. Email sent to concerned district collectors informing warnings and specific precautionary measures to be taken.
- Informed the nodal departments through email.
- Informed various media outlets about the upcoming orange alert.
- 1 Air force helicopter which was on standby at Cochin was sent back to Sullur, as the rainfall intensity got reduced in many districts over Kerala.
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared them with CDM.
- Disaster Management Department vide GO(Rt) No. 705/2021/DMD dated 22/10/2021 gave permission to District Collectors for releasing an amount of Rs 25000/- to each village officer as advance for making immediate arrangements for relief camps, providing refreshments to emergency workers, removing fallen trees or such other emergencies.

**23-10-2021**

- Contacted DEOC Ernakulam and DEOC Thrissur and collected updates about rain status in each district.
- Noted news of landslide at athirapally. Contacted DEOC Thrissur and they reported that they haven't obtained any information of the landslide and that they shifted 7 families in Ward 4,5,6 of Pariyaram Village due to flooding inside the home. They expect that this was due to the continuous rainfall that happened for more than 2 and a half hours in the region.
- Closely monitored the water levels in the reservoirs (especially Mullaperiyar Reservoir), and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared them with CDM.
- Regularly updated (Website, Social Media) and informed all concerned officers regarding Dam Water level Warnings issued by KSEB and Irrigation departments in 3 hours intervals.
- Updated River Status and map as per the data received from Central Water Commission and IDRB.
- IMD issued the District Rainfall Forecast (10 AM) with green alerts for 9 districts (Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha, Kottayam, Kannur, Kozhikode, Wayanad and Kasaragod) and yellow alerts for 5 districts (Ernakulam, Idukki, Thrissur, Palakkad, Malappuram) on 23-10-2021.
- IMD issued the Fisherman warning for the Kerala and Lakshadweep coasts. As per the bulletin, fishermen are advised not to venture into these areas for 23rd and 24th of October. Special warning declared on the 26th and 27th of October.
- Informed all Chairpersons of the Coastal DDMA's, Coastal DEOCs, the Fisheries Control Room, the Coast Guard, and Coastal Police control rooms and SPMR through hotlines, and email.
- Informed the nodal departments through email.
- IMD issued the District Rainfall Forecast (1 PM) with orange alerts for 2 districts (Ernakulam, Idukki) and yellow alerts for 8 districts (Thiruvananthapuram, Kollam, Alappuzha, Pathanamthitta, Kottayam, Thrissur, Palakkad and Malappuram) and green alert for 4 districts (Kozhikode, Wayanad, Kannur and Kasaragod) on 23-10-2021. On 26-10-2021, orange alerts for 4 districts (Pathanamthitta, Idukki, Kottayam and Wayanad) were issued. Email sent to concerned district collectors informing warnings and specific precautionary measures to be taken.
- Informed the nodal departments through email.
- Informed various media outlets about the upcoming orange alert.

- IMD issued lightning alert from Oct. 23 – 27 and the message passed to all DEOCs
- Fourteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State at 3.30 PM to 4:30 PM. The following discussions were held in the meeting;
  - The status of the reservoirs-Idukki, Idamalayar, Kakki reservoirs were discussed in detail. The spill from Idukki reservoir shall be continued at the same rate as that of 45 cumecs, if necessary with advanced notice to District Administration the spill can be increased to maximum 500 cumecs based on inflow and weather conditions. The current status (no spill) of the Idamalayar reservoir shall be continued for the time being. In the case of Kakki reservoir, the present status of the reservoir shall continue with no further changes in its shutters.
  - The water level in the Mullaperiyar reservoir has reached 135.95 feet, if reached at 136 feet then the spill from it will be initiated.
  - Evacuation efforts shall be done along the Periyar river and the downstream areas of the Mullaperiyar reservoir in Kerala.
  - Regular monitoring of water level in the river and the intensity of rainfall must be recorded in the vulnerable areas for any emergency action.
- Updated rainfall status from Kottayam, Idukki and Pathanamthitta
- Reported Minor landslides at Seethathode, Angamoozhy area in Pathanamthitta district
- Enquired about the status of landslides occurred in Pathanamthitta and DEOC reported that this is minor landslides with no other casualties reported.
- Informed Thiruvananthapuram, Kottayam, Idukki and Pathanamthitta to be alerted due to heavy rainfall occurring in the various locations in the districts and evacuated people from Kattakada area due to flood situation by district administration as per the warning of Meteorological team from KSEOC.
- Fifteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State at 9.30 PM to 10:30 PM. The following discussions were held in the meeting;
  - It was decided that the spill from Idukki reservoir shall be continued at present. Advance notice has to be given to the District Collector, Idukki, if spill is to be increased. Close monitoring of the reservoir should be done.
  - Regarding the Mullaperiyar reservoir, first intimation has been given by the Tamil Nadu Government at 136 feet. It was reported that there will be enough time to moderate the spill from the reservoir. Regular monitoring of the inflow rate as well as early notice must be provided to the District Administration.

- Commissioner, Disaster Management explained the intensity of rainfall recorded in the rain-gauge stations of Idukki and Ernakulam Districts.
- It was also decided that no spill from the Idukki and Kakki reservoirs shall be initiated during the night hours.
- It was decided to convene a meeting at 6:30 am on 24-10-2021 to discuss the further scenario.
- CDM directed to closely monitor Idukki, Mullaperiyar and Kakki reservoirs water level and Update timely.
- Updated Reservoir status

#### **24-10-2021**

- Sixteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State at 6.30 AM to 7 AM. The following discussions were held in the meeting;
  - It was decided that the spill from Idukki reservoir shall be continued at the same rate (45cumecs) for the present. Continuous monitoring of the Idukki reservoir has to be done and the required measures have to be undertaken.
  - Regarding the Kakki reservoir, the present status of the reservoir shall continue. The reservoir currently shows a decreasing trend.
  - Regarding the Mullaperiyar reservoir, the water level is currently at 136.80feet. Regular monitoring of water level and inflow rate in the reservoir, river and the intensity of rainfall must be recorded and due actions shall be taken correspondingly.
  - It was decided to convene a meeting at 3:30pm (24.10.2021)with regard to the current situation in Kerala. Early notice has to be given to the District Administration before the spill from the reservoir.
- Regularly updated (Website, Social Media) and informed all concerned officers regarding Dam Water level Warnings issued by KSEB and Irrigation departments in 3 hours intervals.
- IMD issued the District Rainfall Forecast (10 AM) with yellow alerts for 5 districts (Pathanamthitta, Kottayam, Idukki, Kozhikode and Wayanad) and green alerts for rest of the districts (Thiruvananthapuram, Kollam, Ernakulam, Alappuzha, Thrissur, Palakkad, Malappuram, Kannur, and Kasaragod) on 24-10-2021. On 26-10-2021, orange alerts for 4 districts (Pathanamthitta, Idukki, Kottayam, and Wayanad) were issued.

- IMD issued the District Rainfall Forecast (1 PM) with yellow alerts for 7 districts (Pathanamthitta, Kottayam, Idukki, Palakkad, Malappuram, Kozhikode and Wayanad) and green alert for rest of the districts (Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Thrissur, Kannur and Kasaragod) on 24-10- 2021. On 26-10-2021, orange alerts for 4 districts (Pathanamthitta, Idukki, Kottayam, and Wayanad) were issued. Email sent to concerned district collectors informing warnings and specific precautionary measures to be taken.
- Informed the nodal departments through email.
- Informed various media outlets about the upcoming orange alert.
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared them with CDM.
- Seventeenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State at 4PM to 5PM. The following discussions were held in the meeting;
  - ❖ It was decided that the spill from Idukki reservoir (42cumecs) shall be continued for the present. Continuous monitoring of the Idukki reservoir has to be done and further actions can be undertaken depending on the weather conditions as well as the inflow rate in the Mullaperiyar reservoir in the coming days. Advance notice should be given to the District Administration for any changes in the operations of reservoir.
  - ❖ Regarding the Kakki reservoir, the spill has to be reduced to 45cumecs from 94cumecs for the present, as the inflow is less. Further decisions shall be taken in accordance with the weather conditions in the District. Advance notice should be given to the District Administration for any changes in the operations of reservoir.
  - ❖ Regarding the Mullaperiyar reservoir, the current water level is currently at 136.85feet. Regular monitoring of water level and inflow rate in the reservoir, river levels and the intensity of rainfall must be recorded and due actions shall be taken correspondingly.
  - ❖ Idamalayar and Pamba reservoirs are shut already. No need to spill now.

#### **25-10-2021**

- Regularly updated (Website, Social Media) and informed all concerned officers regarding Dam Water level Warnings issued by KSEB and Irrigation departments in 3 hours intervals.
- IMD issued the District Rainfall Forecast (10 AM) with yellow alerts for 11 districts (Thiruvananthapuram, Kollam, Pathanamthitta, Kottayam, Idukki, Ernakulam, Thrissur, Palakkad, Malappuram, Kozhikode and Wayanad) and green alerts for rest of the districts

(Alappuzha, Kannur, and Kasaragod) on 25-10-2021. On 26-10-2021, orange alerts for 4 districts (Kollam, Pathanamthitta, Idukki, Kottayam) were issued.

- IMD issued the District Rainfall Forecast (1 PM) with yellow alerts for 11 districts (Thiruvananthapuram, Kollam, Pathanamthitta, Kottayam, Idukki, Ernakulam, Thrissur, Palakkad, Malappuram, Kozhikode and Wayanad) and green alerts for rest of the districts (Alappuzha, Kannur, and Kasaragod) on 25-10-2021. On 26-10-2021, yellow alerts for 12 districts (Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha, Kottayam, Idukki, Ernakulam, Thrissur, Palakkad, Malappuram, Kozhikode and Wayanad) and green alerts for rest of the districts (Kannur, and Kasaragod) on 25-10-2021.
- Informed various media outlets
- Closely monitored the water levels in the reservoirs, and prepared the graphs and tables representing water levels in reservoirs of Irrigation and KSEB and shared them with CDM.
- IMD issued lightning alert from Oct. 25 – 28 and the message passed to all DEOCs
- IMD issued heavy wind alerts from Oct. 25 – 28 and the message passed to all DEOCs
- Eighteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State at 4.45 PM to 5:30 PM. The following discussions were held in the meeting;
  - It was decided that the lowest possible spill from Idukki reservoir shall continue which is done at present (about 42cumecs-status quo).
  - Regarding the Kakki reservoir, one shutter shall be closed and the other shall be kept open(30cm) with a spill of approximately 25 cumecs.
  - Regarding the Mullaperiyar reservoir, it was decided that the KSDMA shall request the Forest Department to provide the data recorded in the rain gauge stations of the forest areas on an hourly basis. The proposal for installation of Automatic Raingauge stations in the catchments of the forest region shall also be put forward.

**ANNEXURE 5: G.O.(RT)NO.453/2021/DMD**

**File No.DMA1/131/2019-DMD**



**GOVERNMENT OF KERALA**

**Abstract**

Disaster Management Department - South West Monsoon preparedness - Committee for monitoring the operations as per Rule Curve of all major dams in the state - Constituted -orders issued

**DISASTER MANAGEMENT (A) DEPARTMENT**

**G.O.(Rt)No.453/2021/DMD Dated,Thiruvananthapuram, 03/06/2021**

Read 1 Minutes of the virtual conference on monsoon preparedness held on 19.05.2021 chaired by Chief Secretary  
2 Letter no- MTO V/880/2021/Admin dated 01.06.2021 from Commissioner, Disaster Management

**ORDER**

As per the reference read (1) above, it has been decided that a committee shall be constituted for monitoring the operations of rule curve prepared for all major dams in the State during the period of South West Monsoon. Commissioner Disaster Management as per the reference read (2) above, also suggested the structure of the committee to be formed.

Government have examined the proposal in detail and are pleased to accord sanction for constituting a committee for monitoring the operations as per rule curve of all major dams in the state consisting of the following members

1. Additional Chief Secretary, Disaster Management -  
Chairperson
2. Additional Chief Secretary, Water Resources - Member
3. Principal Secretary, Power - Member
4. Chairman, KSEB - Member
5. Commissioner, Disaster Management - Member
6. Managing Director, Kerala Water Authority- Member
7. Chief Engineer, Dam Safety, KSEB - Member
8. Chief Engineer, IDRB, Irrigation Department (Member Secretary, Dam Safety Authority) - Member
9. Chief Engineer, ISW, Irrigation Department - Member
10. District Collectors of Districts with reservoirs -  
Members

File No.DMA1/131/2019-DMD

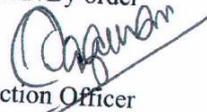
- 11.Mr. James Wilson, Assistant Executive Engineer & Member Expert Advisor Group, KSEB - Member
- 12.Director, Met Centre, IMD, Thiruvananthapuram - Member
- 13.Representative of Tamil Nadu Water Resources Department invited by Chief Engineer, ISW
- 14.Member Secretary, KSDMA - Convener

The committee shall meet once in 10 days from June to December . In case of Orange and Red Alerts in districts with dams and/or when water levels of major reservoirs cross the orange alert levels, the frequency of meetings shall be increased.

(By order of the Governor)  
Dr. A Jayathilak Ias  
Additional Chief Secretary

To:  
Additional Chief Secretary, Water Resources  
Principal Secretary, Power  
Chairman, KSEB  
Commissioner, Disaster Management  
Managing Director, Kerala Water Authority  
Chief Engineer, Dam Safety, KSEB  
Chief Engineer, IDR, Irrigation Department (Member Secretary, Dam Safety Authority)  
Chief Engineer, ISW, Irrigation Department  
District Collectors of Districts with reservoirs  
Mr. James Wilson, Assistant Executive Engineer & Member Expert Advisor Group, KSEB  
Director, Met Centre, IMD, Thiruvananthapuram  
Representative of Tamil Nadu Water Resources Department invited by Chief Engineer, ISW  
Member Secretary, KSDMA  
PS to Chief Minister  
PS to Minister, Revenue & Disaster Management  
PS to Minister, Water Resources  
PS to Minister, Power  
Special Secretary to Chief Secretary  
PA to Additional Chief Secretary, Disaster Management  
Stock/File

Forwarded /By order

  
Section Officer

# ANNEXURE 6: RULE CURVE MEETINGS AND PROCEEDINGS

## 1. Rule Curve Meeting-11.10.2021,Time-5:30pm-7:30pm

### Disaster Management - SW Monsoon preparedness Minutes of the Sixth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State

11-10-2021 Via Google meet

Time-5:30pm-7:30pm

The meeting was conducted to analyze and discuss the water levels under KSEBL, Irrigation and KWA reservoirs.

Commissioner, Disaster Management stated that the meeting was scheduled in accordance with the Indian Meteorological Department's forecast of orange alert in a few districts in the Kerala State for the next five days consecutively.

India Meteorological Department's District Rainfall Forecast					
Issue Date 11.10.2021, Time: 12:00 hrs.					
District	11.10.2021	12.10.2021	13.10.2021	14.10.2021	15.10.2021
Thiruvananthapuram	ISCL, H to VH	H to VH	H to VH	H to VH	H to VH
Kollam	ISCL, H to VH	ISCL, H to VH	H to VH	H to VH	H to VH
Pathanamthitta	ISCL, H to VH	ISCL, H to VH	H to VH	H to VH	H to VH
Alappuzha	ISCL, H to VH	ISCL, H to VH	H to VH	H to VH	H to VH
Kottayam	ISCL, H to VH	ISCL, H to VH	H to VH	H to VH	H to VH
Eranakulam	ISCL, H to VH	ISCL, H			
Idukki	ISCL, H to VH	ISCL, H			
Thiruv	ISCL, H	ISCL, H	ISCL, H to VH	ISCL, H to VH	H to VH
Palakkad	ISCL, H	ISCL, H	ISCL, H to VH	ISCL, H	ISCL, H to VH
Malappuram	ISCL, H	ISCL, H	ISCL, H to VH	ISCL, H to VH	ISCL, H to VH
Kozhikode	H to VH	ISCL, H	ISCL, H	ISCL, H	ISCL, H to VH
Wayanad	H to VH	ISCL, H	ISCL, H	ISCL, H	ISCL, H to VH
Kannur	H to VH	ISCL, H	ISCL, H	ISCL, H	ISCL, H
Kasaragod	H to VH	ISCL, H	ISCL, H	ISCL, H	H to VH

COLOR CODE	WARNING	INTENSITY	Rainfall Intensity (mm)
White	No Rain	No Rain	Light (2.5 - 15.5 mm)
Green	No Warning (No Action)	Light Rain	Moderate (15.6 - 64.4 mm)
Yellow	Watch (Be Updated)	Moderate Rain	Heavy (64.5 - 115.5 mm)
Orange	Alert (Be Prepared)	Heavy to Very Heavy Rain	Very Heavy (115.6 - 204.4 mm)
Red	Warning (Take Action)	Very Heavy Rain to Extremely Heavy Rain	Extremely Heavy (> 204.5 mm)

ISCL - Issued Rainfall (Low to Very Heavy) (129% of station gauge range)

He stated that IMD has declared the rainfall of the months, June –September (16%), as normal and added that the major reservoirs were judiciously following the rule curve norms along with the minor reservoirs following the alert system.

It was also observed that from October 1<sup>st</sup> to October 10<sup>th</sup>, there was large excess of rainfall (71% from the normal), which resulted in the considerable saturation of the soil and soil moisture content. In such a scenario, landslides can be invariably anticipated in the State.

भारत सरकार भारत मौसम विज्ञान विभाग (पूर्वी विभाग प्रभाग) मौसम केन्द्र थिरोवनन्थपुरम - 695 033				GOVERNMENT OF INDIA INDIA METEOROLOGICAL DEPARTMENT (Ministry of Earth Sciences) METEOROLOGICAL CENTRE VikasBhavan P.O Thiruvananthapuram - 695033	
<b>SEASON'S RAINFALL</b>					
<b>01 October 2021 to 10 October 2021</b>					
SUB DIVISION /DISTRICTS	Actual Rainfall (mm)	Normal Rainfall (mm)	Percentage Departure (%)		
<b>KERALA</b>	169.7	99.4	71	LARGE EXCESS	
<b>LAKSHADWEEP</b>	47.2	50.5	-7	NORMAL	
ALAPPUZHA	136.5	114.9	19	NORMAL	
KANNUR	145	85	71	LARGE EXCESS	
ERNAKULAM	166.5	101.9	63	LARGE EXCESS	
IDUKKI	179.7	130.1	38	EXCESS	
KASARAGODE	169.2	91.5	85	LARGE EXCESS	
KOLLAM	160.8	107.4	50	EXCESS	
KOTTAYAM	180	104.7	72	LARGE EXCESS	
KOZHIKODE	186.8	98.2	90	LARGE EXCESS	
MALAPPURAM	186.5	96.6	93	LARGE EXCESS	
PALAKKAD	155.7	73.5	112	LARGE EXCESS	
PATHANAMTHITTA	287.4	104	176	LARGE EXCESS	
THIRUVANANTHAPURAM	126.3	84.7	49	EXCESS	
THIRISSUR	127.8	121.8	5	NORMAL	
WAYANAD	150.7	71.4	111	LARGE EXCESS	
MAHE	175.6	87.2	101	LARGE EXCESS	

Percentage departure from normal value			
Large Excess : +60% and above	Excess: +20% to +59%	Normal : +19% to -19%	No rain : >100%
Deficient : -20% to -59%	Large Deficient: -60% or less		

The intensity of rainfall has been increasing from Southern Kerala to Northern Kerala. Besides, there is a cyclonic circulation in the Bay of Bengal, which may consequently trigger larger amount of rainfall in the consecutive days in the State.

Commissioner also stated that the DDMA's shall note that two NDRF teams have been assigned to Thrissur district. Due to the presence of high rainfall, four more teams have been assigned in the Kerala State (in the districts-Pathanamthitta, Kollam, Kottayam, Idukki, Alappuzha and Ernakulam) (Total number of NDRF teams-six). If needed, more number of teams can be deployed in the other districts.

Secretary (Revenue & Disaster Management) initiated the review of all Districts and major reservoirs.

Sri. James Wilson, Assistant Executive Engineer & Member Expert Advisor Group, KSEBL, gave the status of the water storage level in the reservoirs under KSEBL. He stated that the current situations in the reservoirs Idukki, Idamalayar, Banasura Sagar were under control while the case of that the Kakki reservoir in Pathanamthitta district has to be seriously monitored and evaluated. He affirmed that there was a storage capacity of 60MCM present in the reservoir, where 33MCM shall be utilized for power generation for 10 days (3.3MCM will be utilized per day). He mentioned that an amount of 30MCM storage (approximately) can be accommodated in the reservoir. Besides, he said that a 20MCM is available between the FRL and the current reservoir level. He also affirmed that there was considerable storage capacity between the rule level and the current water level to meet any kind of drastic circumstances. He stated that regular monitoring was done at the reservoir site and any kind of outflow discharge action from the Kakki reservoir should be invariably checked, depending on the situation at the downstream catchment area (Kuttanad region). He said that the close monitoring is to be done at the Kakki

reservoir for every three hours, particularly during the next five days. He affirmed that, if there is no situation of threatening inflow in the area and if the water level crosses the upper rule level, there is no need for the opening of the Kakki reservoir towards the downstream catchment.

For the case of Sholayar reservoir, Thrissur district, regular monitoring was conducted. The Tamil Nadu Government was requested to stop the inflow to the Kerala Sholayar in accordance with the current scenario. For the remaining minor dams, continuous monitoring is done and simultaneously shutters were opened to discharge the excess inflow.

Chief Engineer, Civil Dam Safety and DRIP, also affirmed that regular monitoring of the reservoirs shall be done properly, along with the efficient communication with the DDMA's as well as the District collectors (regarding the opening of shutters of the reservoirs during emergency).

Sri. Priyesh R, Director, IDRBI informed the status of the water levels in the reservoirs under Irrigation, that the water levels of the Kallada and Malampuzha reservoirs (>200MCM) were under control and that there is considerable storage capacity in the reservoirs with respect to FRL to meet any increased inflow. In addition, it was also stated that the rainfall intensities in both of the catchment areas were considerably lower. Regarding the details of the other minor reservoirs Peechi, Vazhani and Mangalam come under red alert category, while the Pothundy, Chulliyar, Neyyar and Meenkara dams come under the orange alert category. Except for the reservoirs Neyyar and Malamkara, all other reservoirs pose no issue of concern. At the Neyyar reservoir, there is heavy inflow, which has to be closely monitored. He informed that the shutter of the Neyyar dam has already been opened up to a level of 30cm, which will be further increased by 10cm within half an hour.

In this regard, the Additional Chief Secretary, Revenue and Disaster Management intervened and enquired about the safety of the downstream catchment (Trivandrum city and nearby

places).Consequently, Sri. James Wilson also discussed and affirmed that regular monitoring should be done at the site. Besides, Commissioner, Disaster Management stated the importance of Emergency Action Plan(EAP),which have to be reviewed by the district collectors, in order to evaluate and assess the emergency operation of reservoirs and its related aspects, that have to be considered at the downstream.

Deputy Collector, Trivandrum District, informed that there has been a change in data presented by IDRIB with respect to the level of water discharged at the outlet of Neyyar reservoir(from 10 to 20cm which was approved by the District Collector, Trivandrum).

With reference to the further explanations given by Assistant Executive Engineer, Channel Sub-division and the Director, IDRIB, Sri.T.K.Jose, Additional Chief Secretary, Home, Vigilance, Water Resources & Coastal Shipping explained the necessity of knowing the downstream discharge values as well as the importance of data collection invariably from all potential sources. He explained the geographical aspects of the Neyyar basin, significance of efficient planning& coordination along with the proper routing of data collected from the rain gauge stations at Neyyar.

Sri.James Wilson suggested a method for the efficient monitoring of the water levels in the Neyyar reservoir, where a fifteen minute interval reading has to taken regularly, which has to be incorporated to obtain a moving average value. Based on this value, the water levels can be compared and the essential alerts can be furnished.

Executive Engineer, Irrigation Division was asked about the vulnerable points in the Neyyar basin by Sri.T.K.Jose, IAS. He stated that Amaravila and Peringakadavu were the major vulnerable regions of the same. In response to the explanation, Additional Chief Secretary ,Revenue and Disaster Management enquired the District Collector, Trivandrum, whether the outflow rates were in accordance with the respective EAP.

Deputy Collector, Trivandrum explained the status of water levels at Amaravila as follows- current water level, warning level and the danger water level as 4.15m, 5.85m and 6.85m respectively.

Following the discussions and explanations during the meeting, Sri.T.K.Jose, Additional Chief Secretary (ACS), WRD, stated that a regular half an hour monitoring should be carried out in the Neyyar river along with the proper monitoring and recording of water levels, which need to be properly informed to the Disaster management authorities for the subsequent actions.

District Collector, Trivandrum informed that regular monitoring of the Neyyar river is done. She also explained that the carrying capacity of the Neyyar river channel is large enough to accommodate higher inflows. It was also confirmed that proper communication was done at the LSG levels.

Following the discussions regarding the water level monitoring at the Neyyar catchment basin, Sri.T.K.Jose, ACS, WRD stated that regular half hour monitoring should be done at the river gauge stations, specifically at Amaravila and Ottaseksharamangalam. In addition, necessary communication and information have to be provided by the Irrigation Department to the DDMA and KSDMA.

Managing Director, Kerala Water Authority, stated that there was considerable runoff at Peppara and Aruvikkara regions (comes under Karamana river). There was heavy precipitation in the region as well and hence there was a request from DDMA to increase the shutter height from 30cm to 50cm. District Collector, Trivandrum informed that permission shall be given for the increase of shutter height from 30cm to 50cm.

Sri.James Wilson explained the status of power generation at the Idukki and informed that for the current scenario, maximum power generation has to be done at the Moolamattom power house. In addition, the discharging capacity at the downstream of Malankara reservoir has also to be addressed. The release from the Malankara reservoir has to be controlled efficiently.

District Collector, Idukki affirmed that the rainfall intensity at the catchment of the Malankara was controllable and the release from the Malankara reservoir was done in a controlled and regulated manner.

Executive Engineer, Kallada explained that the current water level at Kallada was 111.35m. The FRL was 115.84m and the rainfall at Kallada was 18mm .

District Collector, Pathanamthitta informed that the water level at Kakki reservoir was 1.31m below upper rule level. Even if the URL is crossed, there will be 15% capacity left in the reservoir. She raised the concern that if the level raises to orange alert, more precautionary measures have to be undertaken. Regarding the case of Maniyar and Moozhiyar(which are opened most of the times),the water level at Maniyar was 34.1m and the FRL was 34.62m. There are 5 shutters ,out of which one shutter is opened 30cm and the remaining shutters are opened 5cm each. There was a request from Assistant Executive Engineer to raise the shutter to 300cm(700cumecs).

Assistant Executive Engineer, PIP stated that Maniyar, being a barrage, is unable to retain the water and its two shutters are hand operated and others are mechanically operated. Due to this condition, these mechanically operated shutters should be raised to 300cm (as the other two are hand operated).Sri.James Wilson clarified the doubts that flood regulation is only possible through Kakki reservoir. Sri.T.K.Jose informed that the shutters of Maniyar barrage should be opened in a gradual incremental manner(5cm each) and not in drastic manner.

He added that regular and close monitoring is essential at Pamba, Achankovil (Pathanamthitta district), in order to prevent the flooding at the downstream areas (Kuttanad region).

Chief Engineer, ISW explained the status of water levels at the Kuttanad region. The water level at the Kavalam region was 1.2m and the warning level was 1.44m. Sri.T.K.Jose, ACS, WRD, informed that proper alert and monitoring shall be carried out the Kuttanad region. Chief Engineer, ISW explained the status of water levels of the eight inter-state reservoirs. Almost all the reservoirs have more than 95% storage. The Tamil Nadu Government was asked to monitor and maintain the flood cushion in the reservoirs. The water levels at the reservoirs are under control. Regarding the Mullaperiyar reservoir, the water level is 128.60m. Not much concern is observed at the Mullaperiyar reservoir.

The status of water level at the Challiyar basin was under control as informed by Shajahan Kabeer, Assistant Engineer.

District Collector, Kannur, informed that the current water level at the Pazhassi was about 16.99m and that the FRL is 26.52m. There is no issue of concern.

District Collector, Malappuram informed that the water level at the Malampuzha reservoir was under control. The current situation was also under control at the Nilambur region. The alert system was also well maintained.

District Collector, Wayanad, informed that the rainfall depth is manageable and that the situation was under control.

District Collector, Ernakulam, stated that the current water level at Idamalayar reservoir was 163.3m (blue alert is at 165m) and the FRL was 169m. There was no issue of concern. (83% storage). The Bhoothathankettu shutters are already open and the water levels are safe. The camp and other reservoir operations are already started according to the EAP and orange book guidelines. A team of 22 members of NDRF will reach shortly at Ernakulam. A meeting with the DDMA will be conducted the next day.

Deputy Collector, Kozhikode stated that the percentage of gross storage was about 42.32% for the Kakkayam dam and the current water level is 747.23m. The blue alert level is 755m and there was no issue of concern. For the Pervannamuzhi reservoir, the storage capacity is 71.7MCM and inflow is 14.98m<sup>3</sup>/second. The total outflow is 24.863m<sup>3</sup>/second. The present water level is 42.7m and the 4 spillway shutters are open along with the sluices closed. No issue of concern.

ADM, Palakkad, stated that FRL is 77.88m for Mangalam reservoir and the present water level is 77.63m. For the Pothundy reservoir, the FRL is 108.2m and the present water level is 107.25m. For Chulliyar reservoir, the FRL is 154.08m and the present water level is 153.44m. The Siruvani reservoir has the FRL as 878.50m and the present water level is 876.66m.

For Meenkara reservoir, the FRL is 156.36m and the present water level is 155.96m. The Kanjirapuzha reservoir has FRL of 97.50m and the present water level is 95.60m. For Malampuzha reservoir, the FRL is 115.06m and the present water level is 113.03m. For Walayarreservoir, the FRL is 203.00m and the present water level is 202m. The Moolathara regulator has FRL 184.73m and the current water level is 184.20m. No issues of concern. The control rooms and camp operations (covid and non- covid ) have been started. ADM stated that they are watchful.

District Collector, Thrissur stated that there was a meeting including all the Panchayats and the alert information are being regularly passed on. The conditions at Peechi and Chimony are in control and pose no issue of concern.

District Collector, Idukki stated that for the Kallarkutty reservoir, the present water level is 455mand is under red alert. The order has been issued for spilling 500 cumecs and the NDRF team has reached the district.

District Collector, Pathanamthitta ensured that all the rescue shelters have been identified and the control rooms are opened. Meeting will be arranged with the local self government bodies to discuss the conditions at Maniyar and Kakki.

District Collector, Kollam informed that three shutters are opened 30cm and the release is 20.38cumecs. The coordination meeting has been conducted and the NDRF team will also reach the district by next day. No issue of concern in the district. Regarding Munroethuruth, tidal alerts are important and no major concern is observed.

District Collector, Alappuzha informed that at Thottapally, 25shutters are opened and remaining 15 shutters are under technical issues. District Collector stated that steps are on to rectify issues and that more shutters will be opened in the coming days. For the Thaneermukham, all 90 shutters are opened. Proper alert system and communication have been maintained at the LSG level. The NDRF team is expected to reach the next day. He suggested that Kuttanad region should be under strict supervision and monitoring to avoid potential chances of flooding. The rain gauge stations of Alappuzha district are Pallathuruthy, Kavalam, Nedumudy, Karumadi and Thottapally.

Additional Secretary, Revenue and Disaster Management stated that in order to assess the chances of landslide at the districts Wayanad, Idukki, Malappuram, the respective District Collectors should closely monitor and assess the situation in these districts regularly. Other districts also have to monitor vigilantly.

After taking stock of the situation in all districts, the Committee decided as follows.

#### **Decisions**

1. All the District Collectors shall coordinate and keep in touch with the KWA, KSEBL and Irrigation for smooth dam operation..(Action; District Collectors)
2. The Irrigation Department & KSEBL should constantly monitor and regularly update information on reservoir status and inflow to the DDMA's to enable coordinated action. (Action: Irrigation Department)

**The meeting ended at 7:30pm**

\*\*\*\*\*

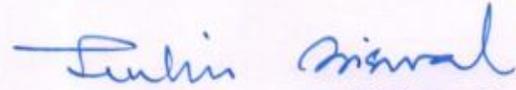
#### **Participants**

1. Sri.T.K.Jose, Additional Chief Secretary, Home, Vigilance, Water Resources & Coastal Shipping
2. Tinku Biswal, Additional Chief Secretary, Revenue and Disaster Management
3. Dr. A Kowsigan, Commissioner, Disaster Management
4. Chief Engineer, Civil Dam Safety and DRIP
5. Alex Varghese, Chief Engineer, ISW
6. Sri. James Wilson, Assistant Executive Engineer & Member Expert Advisor Group, KSEBL

7. Sri. Priyesh R, Joint Director, Dam Safety &Hydrology, IDRB, Director, IDRB
8. District Collector, Pathanamthitta
9. District Collector, Alappuzha
10. District Collector, Trivandrum
11. Deputy Collector, Trivandrum
12. District Collector, Idukki
13. District Collector, Wayanad
14. District Collector, Ernakulam
15. District Collector, Malappuram
16. District Collector, Kannur
17. District Collector, Kollam
18. District Collector, Kozhikode
19. District Collector, Thrissur
20. District Collector, Palakkad
21. Assistant Executive Engineer, Channel Sub-division
22. Executive Engineer, Irrigation Division
23. Managing Director, Kerala Water Authority
24. Assistant Executive Engineer, PIP Sub-division
25. Assistant Executive Engineer, Chittur
26. Executive Engineer, Ernakulam
27. DDMA, Ernakulam
28. Executive Engineer, Chittur
29. Executive Engineer, KRIP Division, Kanjirapuzha
30. Shajahan Kabeer, Assistant Engineer
31. Ezhuverikkara, Kerala Water Authority
32. Executive Engineer, Malampuzha

33. KyIP, O&M sub-division
34. Deputy Chief Engineer, Electrical Circle, Palakkad
35. Executive Engineer(PWD/WRD), Parambikulam Division
36. Chief Engineer, PI
37. Executive Engineer, PyIP
38. Executive Engineer, R&DS, Idamalayar
39. Executive Engineer, RDS, KSEBL, Vazhathope
40. Deputy Chief Engineer, Research and Dam Safety Organisation, Pallom
41. Sri.Fahad Marzook, Hazard Analyst, Kozhikode
42. Athira, Hazard Analyst, Malappuram
43. John Richard Thomas, Hazard Analyst, Pathanamthitta
44. Susmy Sunny, Hazard Analyst, Thrissur
45. Pradeep G.S, Hazard and Risk Analyst, KSDMA
46. Lekshmi Vijayachandran, Hydrologist, KSDMA

list



**Chairman &**

**Secretary(Revenue & Disaster Management)**

## **2. Rule Curve Meeting-17.10.2021, Time-6:30pm-7:30pm**

### **Disaster Management - SW Monsoon preparedness**

#### **Minutes of the Seventh Meeting of the Committee for monitoring the operation-**

#### **Kakki Reservoir Monitoring**

**17-10-2021 Via Google meet**

**Time 6:30pm-7:30pm**

The meeting was convened to analyze the Kakki reservoir's status and the necessary actions to be undertaken.

The meeting started at 6.30 PM.

Discussions factored the weather forecast, red alert status of the dam, inflow levels, live storage levels in the reservoir, rainfall details, preparatory measures in the downstream catchment areas of Alappuzha district, Upper rule levels details of the reservoirs and the amount of rainfall in the downstream catchment areas.

Based on these discussions, the following decisions were taken by the committee:

- Decided to raise the shutters of Kakki Dam on 18-10-2021 at 11:00 am, as the water level is rising above the upper rule level (978.83m), which may rise to/near the FRL within 15 hours or so.
- One or two shutters may be raised depending on the situation in the downstream catchment area.
- As stated by District Collector, Pathanamthitta, considering -
  1. Forecast of light to moderate rainfall in the Pathanamthitta district from 20<sup>th</sup> October for 3 to 5 days.
  2. Heavy rainfall at Nilakkal and Perunthenaruvi areas (more than 20cm rainfall) on 16<sup>th</sup> October and possibilities of landslide occurrence.
  3. Possible spill and release of water from the Kakki reservoir.
  4. Need for evacuation efforts in Ranni and Thiruvalla.
  5. Pilgrim safety - Especially of pilgrims coming from other states who might not be aware of alerts and seriousness.

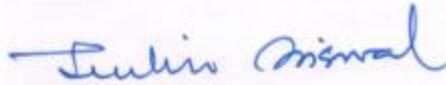
6.Risk of bunching of pilgrims of cancelled days on 3<sup>rd</sup>,4<sup>th</sup> and 5<sup>th</sup> days of pilgrimage and non-adherence of covid protocol.

- The Committee decided to recommend to the Government to cancel the Sabarimala pilgrimage(days 3<sup>rd</sup>,4<sup>th</sup> and 5<sup>th</sup> of the pilgrimage also, as was done in case of days 1 and 2).

The meeting ended at 7:30pm

**Attendees**

1. Shri.T.K.Jose IAS, Additional Chief Secretary,Home,Vigilance,Water Resources & Coastal Shipping
2. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
3. Dr. A.Kowsigan IAS, Commissioner, Disaster Management
4. Dr.DivyaS.Iyer IAS, District Collector, Pathanamthitta
5. Shri.A. Alexandar IAS, District Collector,Alappuzha
6. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
7. Smt. Lekshmi Vijayachandran,Hydrologist,KSDMA



**Chairman &**

**Secretary(Revenue & Disaster Management)**



### **3.Rule Curve Meeting-18.10.2021,Time-2:00pm-4:00pm**

#### **Disaster Management - SW Monsoon preparedness**

#### **Minutes of the Eighth Meeting of the Committee for monitoring the operations of reservoirs-(ABOVE RED ALERT LEVEL)**

**18-10-2021 Via Google meet**

**Time-2:00pm-4:00pm**

The meeting was convened to analyze the status of reservoirs Pamba,Idukki,Idamalayar,Peechi,Chimoni,Kerala Sholayar and Mullaperiyar.

The meeting started at 2:00 PM.

Since the water levels in the reservoirs namely Pamba, Idukki,Idamalayar,Peechi,Chimoni, Kerala Sholayar and Mullaperiyar are constantly rising and some of them are above the red alert level, the following decisions were taken -

- The Pamba dam shall be opened on 19.10.2021 morning 6AM depending upon the rainfall situation existing in the catchment area.The opening of the shutters shall be in accordance with the rainfall received, inflow rate and the Kakki reservoir spill status. Sufficient early alert and warning must be provided to the public before the release.Early evacuation should be carried in the downstream regions as necessary.(Action:DDMA,Pathanamthitta)
- It was noted that more mobile squads should be engaged by the Irrigation Department in the Kuttanad region,Alappuzha District,for the proper monitoring and clearance of pathway of the flow of water from the dams to the downstream areas.This will inturn increase the discharge of water through the Thottapally spillway to the sea,thereby reducing flooding of the region.
- The public should be alerted and the mobile teams/squads' contact numbers should also be provided.
- Both the Idukki and Idamalayar reservoirs' shutters shall be opened on 19.10.2021.

-Idukki reservoir -11:00am,19-10-2021

-Idamalayar reservoir-6:00am,19-10-2021

The amount of spill from the reservoirs shall be only 100 cumecs each.

11. Sri.Priyesh,Director, IDR B

12. Smt. LekshmiVijayachandran,Hydrologist,KSDMA

*si fr*

*Jubin Prasad*  
Chairman &

Secretary(Revenue & Disaster Management)

#### 4.Rule Curve Meeting-19.10.2021,Time-6:00pm-7:15pm

### **Disaster Management - SW Monsoon preparedness Minutes of the Ninth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State**

**19-10-2021 Via Google meet**

**Time-6:00pm-7:15pm**

- The Committee assessed the operations of the reservoirs and the implications of the weather forecast.
- In the Idukki reservoir, spill was lesser than 100cumecs.
- Regarding the reservoirs Kallada, Malampuzha, Chimoni, Vazhani and Peechi,it was stated that sufficient storage was available in these reservoirs and that there is no issue of concern.

After deliberations, the following decisions were taken:

#### **Decisions**

- It was stated that the orange alert has to be considered as red alert for all practical purposes and close monitoring is needed.
- Accordingly, early evacuation works have to be carried out. The rivers Periyar and Bharathapuzha are under heavy rainfall alert.
- Regular and efficient monitoring of water level has to be done in Kuttanad region in the coming days. In addition, landslide prone areas have to be constantly monitored and effective evacuation procedures have to be carried out.
- The water levels of the Mullaperiyar reservoir have to be constantly monitored and the water level at which the spill shall be initiated and the time of spill ,both factors should be duly considered and should be conveyed early from the Tamil Nadu Government.
- The water course of the Manimala reservoir has to be closely monitored and the course should be cleared by the removal of debris and waste.[Action: Irrigation Department]

## **Attendees**

1. Sri.T.K.Jose, Additional Chief Secretary,Home,Vigilance,Water Resources & Coastal Shipping
2. Tinku Biswal, Additional Chief Secretary, Revenue and Disaster Management
3. Dr. A Kowsigan, Commissioner, Disaster Management
4. Dr.DivyaS.Iyer, District Collector, Pathanamthitta
5. Sri.A Alexandar, District Collector,Alappuzha
6. District Collector, Trivandrum
7. Smt.Sheeba George , DistrictCollector, Idukki
8. Smt.Geetha A, District Collector,Wayanad
9. Sri.JafarMalik,DistrictCollector,Ernakulam
10. Sri.PremkumarV.R.,DistrictCollector,Malappuram
11. Sri.Chandrasekhar S,District Collector,Kannur
12. Smt. AfsanaParveen,DistrictCollector,Kollam
13. Sri.Narasimmughari T.L Reddy,District Collector,Kozhikode
14. Smt.Haritha.V.Kumar, District Collector, Thrissur
15. District Collector, Palakkad
16. Chief Engineer, Civil Dam Safety and DRIP
17. Sri. James Wilson, Assistant Executive Engineer & Member Expert Advisor Group, KSEBL
18. Sri. Priyesh R, Joint Director, Dam Safety &Hydrology, IDRB, Director, IDRB
19. Assistant Executive Engineer, Channel Sub-division
20. Executive Engineer, Irrigation Division
21. Managing Director, Kerala Water Authority
22. Assistant Executive Engineer,PIP Sub-division
23. Alex Varghese,ChiefEngineer,ISW
24. Assistant Executive Engineer,Chittur
25. Executive Engineer,Ernakulam
26. DDMA,Ernakulam
27. Executive Engineer,Chittur
28. Executive Engineer, KRIP Division,Kanjirapuzha
29. ShajahanKabeer,Assistant Engineer,

30. Ezhuverikkara, Kerala Water Authority
31. Executive Engineer, Malampuzha
32. KyIP, O&M sub-division
33. Deputy Chief Engineer, Electrical Circle, Palakkad
34. Smt. Lekshmi Vijayachandran, Hydrologist, KSDMA

*Justin Primal*

**Chairman &**

**Secretary (Revenue & Disaster Management)**

*WS*

**5.Rule Curve Meeting-19.10.2021,Time-10:30pm-11:15pm**

**Disaster Management - SW Monsoon preparedness  
Minutes of the Tenth Meeting of the Committee for monitoring the  
operations as per Rule Curve of all Major Dams in the State**

**19-10-2021 Via Google meet**

**Time-10:30pm-11:15pm**

- The operations of the shutters of the reservoirs which are already open under KSEBL -Idukki, Pamba, Kakki and Idamalayar(KSEBL),Chimoni, Peechi, Vazhani, Neyyar, Malampuzha and Kallada(Irrigation Department) were discussed.

Date	IDUKKI			IDAMALAYAR			KAKKI		
	Gross Inflow	Spill	PH Discharge + Losses	Gross Inflow	Spill	PH Discharge + Losses	Gross Inflow	Spill	PH Discharge + Losses
15-Oct-21	9.99		5.36	5.47		4.61	5.29		3.28
16-Oct-21	75.96		5.77	13.86		4.93	15.08		3.28
17-Oct-21	34.71		9.22	26.82		5.22	15.46		2.93
18-Oct-21	28.53		9.99	15.96		5.31	11.99	7.00	3.07
19-Oct-21	1.99	2.33	4.51	4.84	5.01	2.63	5.55	5.44	1.57

- Based on the current situation,as extreme rainfall events were anticipated in the coming days, the outflow discharge from the Idukki reservoir can be allowed upto 500cumecs for the next day. Further decisions can be taken in accordance with the inflow rate, downstream catchment impact and the amount of rainfall received.
- Idukki reservoir operation shall be closely monitored and if the trend indicates that the inflow would be more than 500 cumecs, we should increase the spill from present 100 cumecs (to a maximum of 500cumecs).
- Early evacuation operations and other necessary actions have to be undertaken at the earliest at the downstream areas.
- The outflow from the Idamalayar reservoir can be managed(blue alert level)for the next 2 days, depending on the downstream catchment characteristics, amount of rainfall received etc. Real time operations have to be maintained in the reservoir, if the rainfall intensity increases in the coming days.

- Regarding the Mullaperiyar reservoir, real time monitoring has to be done continuously. The time for the outflow spill and the level at which the release from the reservoir will be initiated are the main parameters to be ensured and properly conveyed by the Tamil Nadu Government.

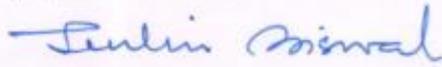
### DECISIONS

- Regarding the reservoirs under Irrigation Department, the shutters of Chimoni, Vazhani, Peechi in the Trichur district shall remain open and for the reservoirs Neyyar, Malampuzha and Kallada, sufficient flood cushion space are to be created by Irrigation Department. It was noted that the operation of the Kallada reservoir has to be closely monitored as this reservoir has a tendency to go critical.
- KSEBL Major Reservoirs

RESERVOIR	Water level at 8 pm on 19.10.2021	Rule level on 20.10.2021	Rule level from 21.10.2021 to 31.10.2021	Spill	Reduction /hr	Decision of Rule Curve Committee
IDUKKI	2398.06 ft	2398.96 ft	2399.31 ft	100 cumecs	6 mm	Bring down the reservoir level to the orange alert for the rule level from 21.10.2021 to 31.10.21 ( 2397.31 ft) by maintaining all the 3 shutters at the present opening @35 cm and then maintain one gate at 40 cm till the orange alert by the IMD is withdrawn. How ever reservoir operation shall be as per real time inflow (dukki) reservoir operation shall be closely monitored and if the trend indicates that the inflow would be more than 500 cumecs, we should increase the spill from present 100 cumecs. Once we cross this threshold, the decisions shall be taken on a real time basis.
IDAMALAYAR	165.6 m	166.8 m	167 m	100 cumecs	10mm	Bring down the reservoir level to the blue alert level (165.3 m) by maintaining the 2 shutters at the present opening @80 cm and then closing the gates. How ever reservoir operation shall be as per real time inflow.
KAKKI	979.86 m	979.83 m	979.94 m	150 cumecs	10 mm	Bring down the reservoir level to <b>979.45</b> m as on 21.10.2021 by maintaining all the 2 shutters at the present opening @90 cm and then maintain one gate at 30 cm till the orange alert declared by the IMD is withdrawn. How ever reservoir operation shall be as per real time inflow.
BANAGURASAGAR	773.2 m	775.6 mm	775.6 mm	no spill		Can be decided on real time as sufficient dynamic flood cushion is available.
PAMBA	984.5 m	no rule level but on red alert		25 cumecs	100 mm	Bring down the reservoir level to 982 m (blue alert level) by maintaining all the 2 shutters at the present opening @ 45 cm and then reservoir operation shall be as per real time inflow.

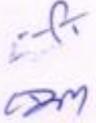
**Attendees**

1. Shri.T.K.Jose IAS, Additional Chief Secretary, Home, Vigilance, Water Resources & Coastal Shipping
2. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
3. Dr. A. Kowsigan IAS, Commissioner, Disaster Management
4. Dr. B. Ashok IAS, Chairman, KSEB
5. Alex Varghese, Chief Engineer, ISW
6. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
7. Smt. Lekshmi Vijayachandran, Hydrologist, KSDMA



**Chairman**

**& Secretary (Revenue & Disaster Management)**



## 6.Rule Curve Meeting-20.10.2021,Time-10:30am-10:50am

### Disaster Management - SW Monsoon preparedness

#### Minutes of the Eleventh Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State

20-10-2021 Via Google meet

Time-10:30am-10:50 am

- The meeting discussed the current scenario of reservoirs and rain forecast in the state.

#### Decisions

- For the present, the reservoir operations shall continue with the current spill from the shutters.
- The weather forecast has to be regularly monitored and updated so as to decide the further actions to be taken by the respective departments.
- According to the IMD forecast for the day 20-1-2021, orange alert is forecasted for the districts Pathanamthitta, Idukki and Kottayam while the rest of the districts come under yellow and green alerts.
- A slight increase in the level of the Periyar river is seen while a falling trend is seen in the Pamba river at the Malakkara station.
- Regular monitoring of the water levels in the rivers as well as in the reservoirs have to be carried out.

#### Attendees

1. Shri.T.K.Jose IAS, Additional Chief Secretary,Home,Vigilance,Water Resources & Coastal Shipping
2. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
3. Dr. A.Kowsigan IAS, Commissioner, Disaster Management
4. Alex Varghese, Chief Engineer, ISW
5. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
6. Smt. LekshmiVijayachandran, Hydrologist, KSDMA

  
Chairman &

Secretary (Revenue & Disaster Management)



## **7.Rule Curve Meeting-20.10.2021,Time-3:00pm-3:45pm**

### **Disaster Management - SW Monsoon preparedness**

#### **Minutes of the Twelfth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State**

**21-10-2021 Via Google meet**

**Time-3:00pm-3:45pm**

- The meeting discussed the current scenario of reservoirs and rain forecast in the state.
- The status of the reservoirs-Idukki, Idamalayar, Kakki, Parambikulam, Poringalkuthu and Mullaperiyar were discussed.
- Executive Engineer,Idukki Reservoir, suggested if the shutters can be downed to release 40cumecs only.
- Sri.James Wilson explained his view point, explaining that the Idukki reservoir spill need not be reduced from 100cumecs now.[Note attached]
- Commisioner, Disaster Management explained the following-  
A cyclonic circulation lies over south Tamil Nadu coast & neighbourhood and it is likely to persist during next 2 days. Under its influence, fairly widespread to wide spread rainfall with isolated heavy falls with thunderstorm & lightning very likely over Kerala during 21st-24th October. Isolated very heavy falls also very likely over Kerala on 21st October.(According to the report given by IMD,21.10.2021,07:45am)
- Commisioner, Disaster Management shared the alert details and instances of heavy rainfall in the last 24hours as follows and explained that the release of 100 to 500cumecs may be maintained without reduction in the Idukki reservoir.

 <b>കേരള കാലാവസ്ഥാ വകുപ്പിന്റെ ജില്ലാ അടിസ്ഥാനത്തിലുള്ള മഴ പ്രവചനം</b> 					
പുറപ്പെടുവിച്ച തീയതി: 21.10.2021; സമയം: 13:00 hrs					
ജില്ല	21.10.2021	22.10.2021	23.10.2021	24.10.2021	25.10.2021
തിരുവനന്തപുരം	ISOL H	L to M	L to M	L to M	L to M
കൊല്ലം	ISOL H	ISOL H	L to M	ISOL H	ISOL H
പത്തനംതിട്ട	ISOL H to VH	ISOL H	ISOL H	ISOL H	ISOL H
തൃശ്ശൂർ	ISOL H	L to M	L to M	L to M	L to M
മലപ്പുറം	ISOL H to VH	ISOL H	ISOL H	ISOL H	ISOL H
എറണാകുളം	ISOL H	ISOL H	ISOL H	L to M	ISOL H
ഇടുക്കി	ISOL H to VH	ISOL H	ISOL H	ISOL H	ISOL H
തൃശ്ശൂർ	ISOL H	ISOL H	ISOL H	L to M	L to M
പാലക്കാട്	ISOL H to VH	ISOL H	ISOL H	ISOL H	ISOL H
മലപ്പുറം	ISOL H to VH	ISOL H	ISOL H	L to M	ISOL H
കോഴിക്കോട്	ISOL H to VH	ISOL H	ISOL H	L to M	ISOL H
വയനാട്	ISOL H to VH	ISOL H	ISOL H	ISOL H	ISOL H
കണ്ണൂർ	ISOL H to VH	L to M	L to M	L to M	L to M
കാസർഗോഡ്	ISOL H	L to M	L to M	L to M	L to M

കളക്ടറേറ്റ്	മുനമ്പിള്ളി	തീവ്രത	അളവ്
വെള്ള	മുനമ്പിള്ളി	മഴ	1.5-11.3 മിമി
പാലക്കാട്	മുനമ്പിള്ളി	മഴ	17.6-44.4 മിമി
തൃശ്ശൂർ	തിരുവല്ല, തൃശ്ശൂർ, തിരുവനന്തപുരം, തിരുവനന്തപുരം	മഴ	44.5-111.7 മിമി
കൊല്ലം	കൊല്ലം, തിരുവനന്തപുരം	മഴ	111.6-204.4 മിമി
പത്തനംതിട്ട	മുനമ്പിള്ളി, പത്തനംതിട്ട	മഴ	>204.4 മിമി

ISL, മഴക്കാലാവസ്ഥാവിനിയമം; Z, മഴക്കാലാവസ്ഥാവിനിയമം; L, ശരാശരി മഴ; M, ശരാശരി മഴ; VH, ശരാശരി മഴ; M, ശരാശരി മഴ; M, ശരാശരി മഴ

- The operations of the rest of the reservoirs are dependent upon the weather conditions in the coming days.
- The last 24 hr rainfall (mm) recorded in rain gauges (IDRB) rainfall data is given below-(21.10.2021 at 8.30 am).

Edakkara	147.8
Parambikulam	145
Mangalam dam	115
Teekoy	109
Kottiyoor	104.4
Kalladi	97.6
Enamakkal	93
Arookutty	82.4
Kalpetta	76
Thunakadavu	72
Mathilakam	71.8
Chittady	70.8
Vaniampara	70
Bhoothathankettu	65.9
Nedumkandam	65.4
Nedumpoyil	65
Chinmony Dam	64.4
Amala Nagar	64
Ollukkara	63
Vettilappara	62.3
Peechi	58.4
Triprayar	57
Pathanmathitta	56.8
Vadasherikkara	51.3
Kalliyot	50.6

- The last 24 hour heavy rainfall (mm) recorded in few of the IMD AWS/ARG is given below- (21.10.2021 at 8.30 am).

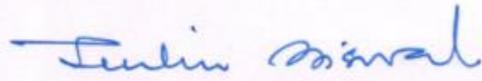
Palluruthy	115.5
Konni	81
Kayamkulam	75
Peringalkuthu	59.5
Ambalavayal	59
Kanjirapuzha	45.5
Kakkayam	38
Thodupuzha	37.5

### Decisions

- For the present weather condition, the Idukki reservoir operations shall continue with the current spill from the shutters, till any further changes in the weather happens. This implies that the outflow of 100cumecs shall be continued (to a maximum of 500cumecs) without reduction.
- Regarding the Idamalayar reservoir, the spill of the shutters of the reservoir can be reduced, but not stopped. Further decisions shall be taken in accordance with the weather conditions in the coming days.

### **Attendees**

1. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
2. Dr. A.Kowsigan IAS, Commissioner, Disaster Management
3. Sri.Jafar Malik, District Collector, Ernakulam
4. District Collector,Idukki
5. Dr. B. Ashok IAS, Chairman, KSEBL
6. Alex Varghese, Chief Engineer, ISW
7. Chief Engineer,IDRB
8. Chief Engineer, Dam Safety
9. Chief Engineer,Irrigation&Adminisration
10. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
11. Sri.Priyesh,Director, IDRB
12. Smt. LekshmiVijayachandran,Hydrologist,KSDMA



**Chairman &**

**Secretary(Revenue & Disaster Management)**

25/2  
GPM

## 8.Rule Curve Meeting-22.10.2021,Time-11:30am-12:00pm

### Disaster Management - SW Monsoon preparedness

#### Minutes of the Thirteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State

22-10-2021 Via Google meet

Time-11:30am-12:00pm

- The meeting discussed the current scenario of reservoirs and rain forecast in the state.
- The status of the reservoirs-Idukki, Idamalayar, Kakki and Pamba reservoirs were discussed in particular in detail.

#### KSEBL PROPOSAL FOR THE MEETING

KSEBL PROPOSAL FOR THE MEETING				
RESERVOIR	Water level at 9 am on 22.10.2021	Rule level from 21.10.2021 to 31.10.2021	Present spill	Suggestions before the Rule Level Committee
IDUKKI	2398.26 ft	2399.31 ft	105 cumecs	Permit Dam Safety Organisation to reduce the spill from 105 cumecs to 40 cumecs by keeping one shutter open @ 40 cm as inflow is not as expected for Orange Alert in Idukki district. The reservoir level is to be within the rule level upto October 31 st. However reservoir operation shall be as per real time inflow. The reservoir will be closely monitored and if there is sudden rise in the inflow KSEBL may increase the discharge progressively. Noted that release upto 500 cumecs will be required if intense rainfall occurs with advance notice to DC/DDMA/SDMA. Kallar observations to be strengthened by DSO.
IDAMALAYAR	165.17 m	167 m	75 cumecs	As the blue alert level is reached at 9.00 PM on 20/10/2021. However discharge through spillway gates reduced from 5 pm on 21.10.2021 as decided in the RCB meeting on 21.10.2021 3 pm. As the water level is much below the rule level (1.83 m) and there is enough dynamic flood cushion the gates may be closed. However reservoir operation shall be as per real time inflow. The reservoir will be closely monitored and if there is sudden rise in the inflow KSEBL may increase the discharge progressively.
KAKKI	979.37 m	979.84 m	95 cumecs	Reduce the spill from 95 cumecs to 40 cumecs by keeping two shutters open @ 30 cm as the reservoir level is within the rule level upto October 31st and there is no significant inflow. However reservoir operation shall be as per real time inflow with flexibility to 200 cumecs. The reservoir will be closely monitored and if there is sudden rise in the inflow KSEBL may increase the discharge progressively to the minimum possible level.
BANASURASAGAR	773.15 m	775.6 mm	no spill	Can be decided on real time as sufficient dynamic flood cushion is available. No flood rule as of now.
PAMBA	982.20 m		3.35 cumecs	As the reservoir level is in the blue alert level the gates may be closed. However reservoir operation shall be as per real time inflow. The reservoir will be closely monitored and if there is sudden rise in the inflow we may increase the discharge progressively with advance notice to DC/DDMA/SDMA.

- The rainfall forecast of IMD 10hours (22.10.2021) was discussed.

भारत सरकारपृथ्वी विज्ञान मंत्रालय  
भारत मौसम विज्ञान विभाग  
मौसम केन्द्र  
तिरुवनंतपुरम - 695 033



Government of India  
Ministry of Earth Sciences  
India Meteorological Department  
Meteorological Centre  
Thiruvananthapuram-695 033

### District Rainfall Forecast For Kerala and Lakshadweep

22 October 2021

Issue Time 1000 hours IST

District		22-Oct	23-Oct	24-Oct	25-Oct	26-Oct
Thiruvananthapuram	Intensity:	L to M				
	Probability:	Very Likely				
Kollam	Intensity:	ISOL H	L to M	ISOL H	ISOL H	L to M
	Probability:	Very Likely				
Pathanamthitta	Intensity:	ISOL H	ISOL H	ISOL H	ISOL H	L to M
	Probability:	Very Likely				
Alappuzha	Intensity:	L to M				
	Probability:	Very Likely				
Kottayam	Intensity:	ISOL H	ISOL H	ISOL H	ISOL H	L to M
	Probability:	Very Likely				
Ernakulam	Intensity:	ISOL H	ISOL H	L to M	ISOL H	L to M
	Probability:	Very Likely				
Idukki	Intensity:	ISOL H	ISOL H	ISOL H	ISOL H	L to M
	Probability:	Very Likely				
Thrissur	Intensity:	ISOL H	ISOL H	L to M	L to M	L to M
	Probability:	Very Likely				
Palakkad	Intensity:	ISOL H	ISOL H	ISOL H	ISOL H	L to M
	Probability:	Very Likely				
Malappuram	Intensity:	ISOL H	ISOL H	L to M	ISOL H	L to M
	Probability:	Very Likely				
Kozhikode	Intensity:	ISOL H	ISOL H	L to M	ISOL H	L to M
	Probability:	Very Likely				
Wayanad	Intensity:	ISOL H	ISOL H	ISOL H	ISOL H	L to M
	Probability:	Very Likely				
Kannur	Intensity:	L to M				
	Probability:	Very Likely				
Kasaragode	Intensity:	L to M				
	Probability:	Very Likely				
Lakshadweep	Intensity:	L to M				
	Probability:	Very Likely				

Intensity of Rainfall	
V.L	Very Light Rainfall (0.1 to 2.4 mm)
L	Light rainfall (2.5-15.5 mm)
M	Moderate (15.6-30.4 mm)
H	Heavy Rainfall (30.5-115.5 mm)
VH	Very Heavy Rainfall (115.6-204.4 mm)
EH	Extremely Heavy Rainfall (>204.4mm)

Distribution of Heavy Rainfall	
Category	% of stations
ISOL	1-25
SCT	26-50

Probability of Occurrence (%)	
Likely	25-50
Very Likely	51-75
Most Likely	>75

Warning Colour Codes	
Red	Warning (Be Prepared)
Yellow	Alert (Be Prepared)
Green	No Warning (No Action)

Phone: 0471-2322894/2330025 Fax: 2332330

E-mail: mc.trv@imd.gov.in, mctrivandrum@gmail.com

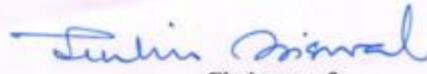
- After deliberations, the following decisions were taken.

**Decisions**

- It was decided that the spill from Idukki reservoir may be reduced from 100cumecs to 50cumecs. Advance notice has to be given to District Collectors, Idukki and Ernakulam, if spill is to be increased. The spill should not be beyond 500cumecs unless reviewed by this Committee.
- Regarding the Idamalayar reservoir, it was decided that the spill from the Idamalayar reservoir can be stopped as sufficient flood cushion has reportedly been created in the reservoir.
- Regarding the Pamba dam, the spill can be stopped for the present. Advance notice has to be given to District Collector, Pathanamthitta in case of resumption of spill.
- In case of Kakki reservoir, the shutters need not be closed and spill can be reduced to a minimum value. The spill may be increased when needed (maximum 200cumecs) only with advance notice to District Collector, Pathanamthitta.

**Attendees**

1. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
2. Shri.T.K.Jose IAS, Additional Chief Secretary,Home,Vigilance,Water Resources & Coastal Shipping
3. Dr. A.Kowsigan IAS, Commissioner, Disaster Management
4. Sri.Jafar Malik, District Collector, Ernakulam
5. District Collector,Idukki
6. District Collector,Pathanamthitta
7. Dr. B. Ashok IAS, Chairman, KSEBL
8. Alex Varghese, Chief Engineer, ISW
9. Chief Engineer,IDRB
10. Chief Engineer, Dam Safety
11. DDMA,Ernakulam
12. Executive Engineer,Ernakulam
13. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
14. Sri.Priyesh,Director, IDRB
15. Smt. LekshmiVijayachandran,Hydrologist,KSDMA

  
**Chairman &**

**Secretary(Revenue & Disaster Management)**

*m/s*  
*CDM*

**9.Rule Curve Meeting-23.10.2021,Time-3:30pm-5:00pm**

**Disaster Management - SW Monsoon preparedness**

**Minutes of the Fourteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State**

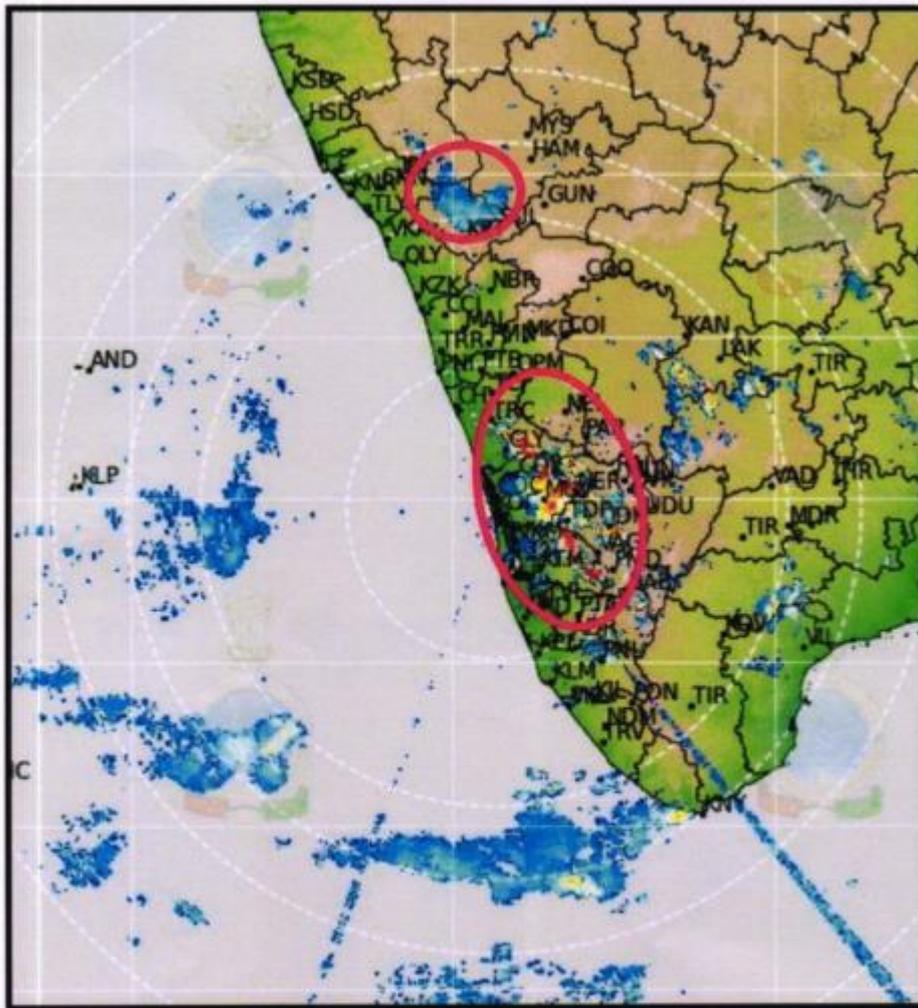
**23-10-2021 Via Google meet**

**Time-3:30pm-5:00pm**

- The meeting was convened on account of the orange alerts issued for Idukki and Ernakulam at 1:00pm on 23.10.2021 by IMD.
- The status of the reservoirs-Idukki, Idamalayar, Kakki reservoirs were discussed in detail.
- The rainfall forecast of IMD 13:00hours (23.10.2021) was discussed.

 <b>India Meteorological Department's District Rainfall Forecast</b> 					
Issue Date : 23.10.2021; Time: 13:00 hrs					
District	23.10.2021	24.10.2021	25.10.2021	26.10.2021	27.10.2021
Thiruvananthapuram	ISOL H	ISOL M	ISOL H	ISOL H	ISOL M
Kollam	ISOL H	ISOL M	ISOL H	ISOL H	ISOL M
Pathanamthitta	ISOL H	ISOL H	ISOL H	ISOL H to VH	ISOL M
Alappuzha	ISOL H	ISOL M	ISOL M	ISOL H	ISOL M
Kottayam	ISOL H	ISOL H	ISOL H	ISOL H to VH	ISOL H
Ernakulam	ISOL H to VH	ISOL M	ISOL H	ISOL H	ISOL M
Idukki	ISOL H to VH	ISOL H	ISOL H	ISOL H to VH	ISOL H
Thrissur	ISOL H	ISOL M	ISOL H	ISOL H	ISOL M
Palakkad	ISOL H	ISOL M	ISOL H	ISOL H	ISOL M
Malappuram	ISOL H	ISOL M	ISOL H	ISOL H	ISOL M
Kozhikode	ISOL M	ISOL H	ISOL H	ISOL H	ISOL M
Wyanad	ISOL M	ISOL H	ISOL H	ISOL H to VH	ISOL H
Kannur	ISOL M	ISOL M	ISOL M	ISOL M	ISOL H
Kasaragod	ISOL M	ISOL M	ISOL M	ISOL M	ISOL H

- The IMD radar at 3.30 pm(23.10.2021) hints heavy rainfall alert at Ernakulam, Thrissur, Idukki and Kottayam districts.



- After deliberations, the following decisions were taken.

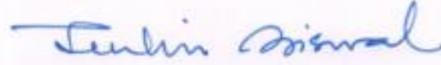
**Decisions**

- It was decided that the spill from Idukki reservoir shall be continued at the same rate (45cumecs) for the present. But if the inflow increases, the spill can be increased to maximum 500cumecs based on inflow and weather conditions. Advance notice must be given to the District Administration before increasing the spill.

- Regarding the Idamalayar reservoir, it has been reported that there is enough storage space in the reservoir for any flexible operation in the reservoir. The current status (no spill) of the reservoir shall be continued for the present.
- Regarding the Kakki reservoir, the present status of the reservoir shall continue with no further changes in its operations of shutters.
- It was noted that the water level in the Mullaperiyar reservoir has reached 135.95feet. Additional Chief Secretary, Home, Vigilance, Water Resources & Coastal Shipping stated that Tamil Nadu will be requested to initiate the spill from the reservoir at 136feet. Adequate early evacuation efforts shall be done along the Periyar river and the downstream areas of the Mullaperiyar reservoir in Kerala. Advance notice must be given to the District Administration.
- Regular monitoring of water level in the river and the intensity of rainfall must be recorded in the vulnerable areas for any emergency action.
- It was decided to convene a meeting at 9:00pm (23.10.2021) with regard to the current weather situation in Kerala.

**Attendees**

1. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
2. Shri.T.K.Jose IAS, Additional Chief Secretary,Home,Vigilance,Water Resources & Coastal Shipping
3. Dr. A.Kowsigan IAS, Commissioner, Disaster Management
4. District Collector,Idukki
5. District Collector,Pathanamthitta
6. Dr. B. Ashok IAS, Chairman, KSEBL
7. Dr.Anand S.R.,Chief Engineer,KSEBL
8. Chief Engineer, Dam Safety
9. Sreedevi.R., Executive Engineer, KSEBL
10. DDMA,Ernakulam
11. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
12. Sri.Priyesh,Director, IDRB
13. Smt. LekshmiVijayachandran,Hydrologist,KSDMA



**Chairman &**

**Secretary(Revenue & Disaster Management)**



## 10. Rule Curve Meeting-23.10.2021,Time-9:00pm-5:00pm

### Disaster Management - SW Monsoon preparedness

#### Minutes of the Fifteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State

23-10-2021 Via Google meet

Time-9:00pm-10:00pm

- The meeting discussed the current scenario of reservoirs and rain forecast in the state.
- The status of the reservoirs-Idukki, Kakki and Mullaperiyar reservoirs were discussed in particular in detail.
- District Collector, Idukki stated that the water level is 136.40feet at the Mullaperiyar reservoir. Tamil Nadu had issued first intimation at 136feet.
- Chairman, KSEBL stated that 19MCM would be needed to reach Upper Rule Level in Idukki reservoir and that enough space is available as flood cushion in the normal course. Alex Varghese, Chief Engineer, IDR B stated that in case of Mullaperiyar reservoir- First Intimation -136feet  
Second Intimation-138feet  
First Warning-140feet
- Commissioner, Disaster Management explained the intensity of rainfall recorded in the rain gauge stations of Idukki and Ernakulam Districts.

➤ Rainfall (mm) (8.30 am to 8.30 pm)

#### Idukki

1. Idukki -	20.4 mm
2. Alady -	20.8 mm
3. Kulamavu -	28.2 mm
4. Meenmutty-	11 mm
5. Thattathikkudy-	32 mm
6. Udumbanchola-	17.2 mm
7. Anavilasam -	2.8 mm
8. Kadumakuzhy	-8.2 mm
9. Kattappana-	1.4 mm
10. Cheruthoni-	24.5 mm
11. Peerumade-	23 mm

#### Kakki

1. Seethathode-	60.5 mm
2. Kakki	0.5 mm

#### Mullaperiyar

1. Thekkady -21.8 mm
2. Periyar -0 mm
3. Konni -130.5 mm
4. Kottarakkara -46 mm

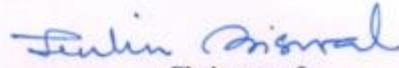
After deliberations, the following decisions were taken.

#### Decisions

- It was decided that the spill from Idukki reservoir as in done at present will continue (about 42cumecs-status quo). Advance notice has to be given to District Collector, Idukki, if spill is to be increased. Close monitoring of the reservoir should be done overnight.
- Regarding the Mullaperiyar reservoir, first intimation has been given by the Tamil Nadu Government at 136 feet. Regular monitoring of the inflow rate on hourly basis is important and the data should be shared with KSEBL by Chief Engineer, Irrigation.
- Chief Engineer, ISW assured that data regarding the Mullaperiyar reservoir (inflow rate, discharge, water level) shall be provided on hourly basis for the purpose of close monitoring.
- Pamba dam will continue to be shut (status quo).
- Kakki spill at the rate of 45cumecs to continue (status quo).
- It was decided to convene a meeting at 6:30am to discuss the morning scenario.

#### Attendees

1. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
2. Dr. B. Ashok IAS, Chairman, KSEBL
3. Dr. A.Kowsigan IAS, Commissioner, Disaster Management
4. District Collector, Idukki
5. District Collector, Pathanamthitta
6. Alex Varghese, Chief Engineer, ISW
7. Chief Engineer, Dam Safety
8. Executive Engineer, RDS, KSEBL, Vazhathope
9. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
10. Sri. Priyesh, Director, IDRIB
11. Assistant Executive Engineer, KSEBL, Pathanamthitta
12. Smt. Lekshmi Vijayachandran, Hydrologist, KSDMA

  
Chairman &

Secretary (Revenue & Disaster Management)



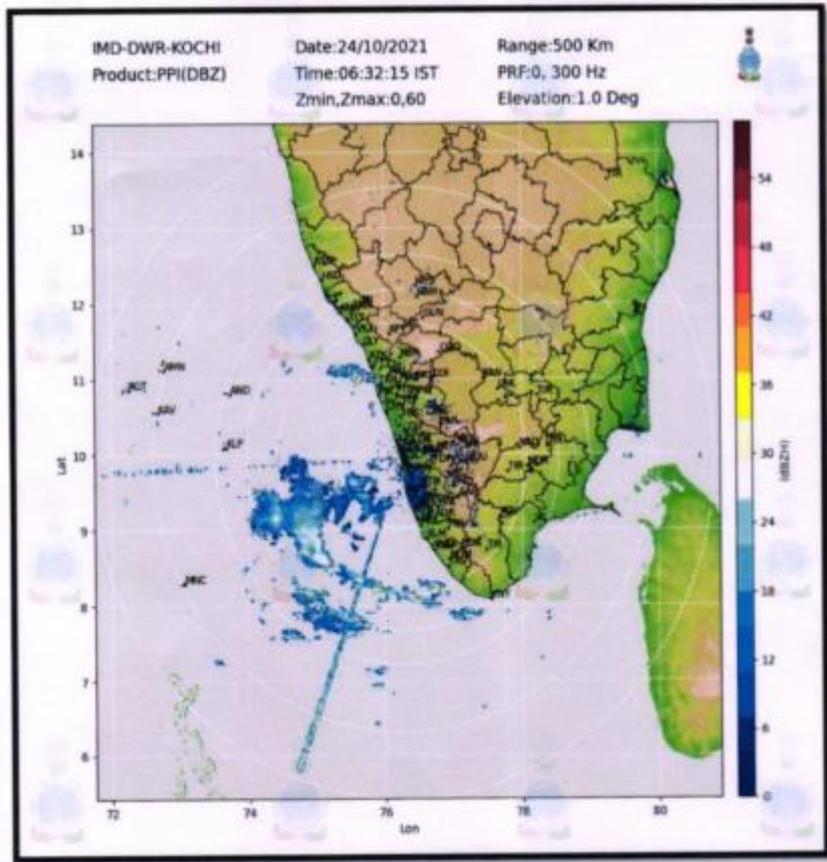
## 11.Rule Curve Meeting-24.10.2021,Time-6:30am-7:00am

### Disaster Management - SW Monsoon preparedness Minutes of the Sixteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State

24-10-2021 Via Google meet

Time-6:30am-7:00am

- The meeting was convened to assess the status of the reservoirs-Idukki, Kakki, Pamba and Mullaperiyar reservoirs.
- The IMD radar at 6.30 am (24.10.2021) hinted light rainfall in Alappuzha district.



- The Idukki, Kakki and Pamba reservoir water levels were examined.

- The details regarding the Idukki reservoir at 06:00am on 24.10.2021

Full Reservoir Level- 2403.00feet

Maximum Water Level:- 2408.50feet

Water Level -2398.26 feet

Live Storage: 1378.433 MCM (94.44%)

Gross Inflow /1 hrs :0.231MCM

Net Inflow/hr: -0.331MCM

Spill /1 hrs: 0.152 MCM ( for 1 gate)

PH Discharge/ 1hrs :0.410MCM

Generation / 1 hrs : 0.622 MU

Rainfall : Nil

Status : Gate No. 3 in open condition (40cm)
- The details regarding the Kakki reservoir at 06:00am on 24.10.2021

Full Reservoir Level : 981.46 m

Water Level : 979.37m

Live Storage : 409.19Mcm (91.64 %).

Inflow in 01 hr : 0.310Mcm. (86Cumeecs).

PH Discharge in 1 hr : 0.1380 Mcm.

Spill in 1 hr : 0.172Mcm

Alert status : Red

Weather Status : No rain

Gate opening status:48 cumeecs (No. 2 @ 30 cm and No. 3 @ 30 cm)
- The details regarding the Pamba reservoir at 06:00am on 24.10.2021

Full Reservoir Level : 986.33 m

Water Level : 982.10m

Live Storage : 23.10Mcm (74.16%)

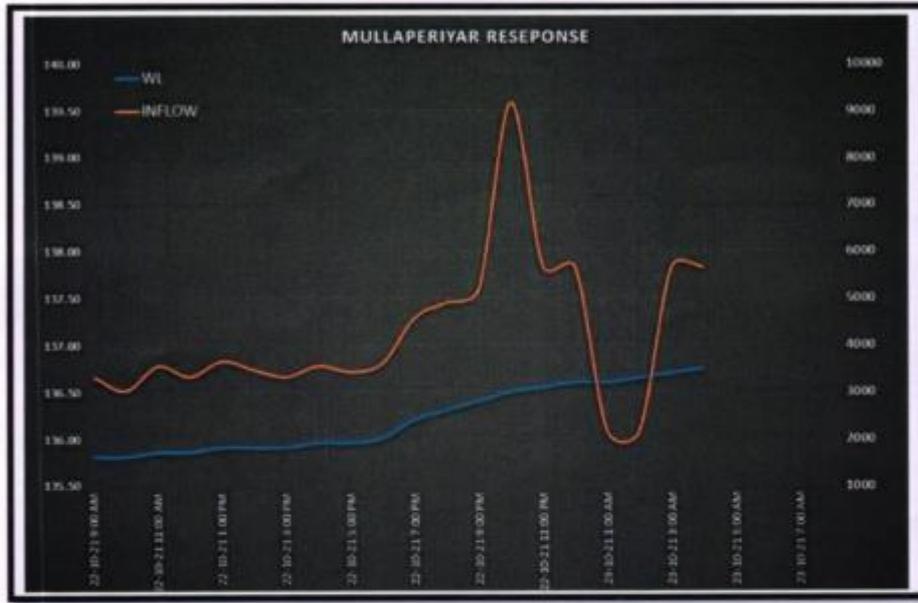
Spill in 1 hr : No spill

Alert status : Blue

Weather Status : No rain

Gate opening status: All Gates are in closed condition

- The water level, inflow rate and discharge of the Mullaperiyar reservoir at 06.00 am (24.10.2021) are 136.80feet,5650cusecs, 2150cusecs respectively. The graphical representations showing the variation of water level(feet) and inflow rate verses time are depicted as follows-was examined.



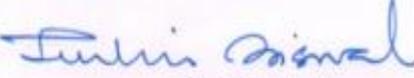
- After deliberations, the following decisions were taken.

#### Decisions

- It was decided that the spill from Idukki reservoir shall be continued at the same rate (45cumeecs) for the present. Continuous monitoring of the Idukki reservoir has to be done and the required measures have to be undertaken.
- Regarding the Kakki reservoir, the present status of the reservoir spill shall continue. The reservoir currently shows a decreasing trend in storage.
- Regarding the Mullaperiyar reservoir, the water level is currently at 136.80feet. Regular monitoring of water level and inflow rate in the reservoir, river trends and the intensity of rainfall must be recorded and due actions shall be taken correspondingly.
- It was decided to convene a meeting after 3:00pm (24.10.2021) for the next assessment.

### **Attendees**

1. Shri.T.K.Jose IAS, Additional Chief Secretary ,Home, Vigilance, Water Resources & Coastal Shipping
2. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
3. Dr. B. Ashok IAS, Chairman, KSEBL
4. Dr. A. Kowsigan IAS, Commissioner, Disaster Management
5. District Collector, Idukki
6. Chief Engineer, Dam Safety
7. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
8. Smt. Lekshmi Vijayachandran, Hydrologist, KSDMA

  
**Chairman &**

**Secretary (Revenue & Disaster Management)**

*sfr*

## 12.Rule Curve Meeting-24.10.2021,Time-4:00pm-5:00pm

### Disaster Management - SW Monsoon preparedness

#### Minutes of the Seventeenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State

24-10-2021 Via Google meet

Time-4:00pm-5:00pm

- The meeting was convened to take stock of the status of the status of the reservoirs- Idukki, Kakki and Mullaperiyar reservoirs.
- The rainfall forecast of IMD (24.10.2021) was discussed.

India Meteorological Department's District Rainfall Forecast					
Issue Date : 24.10.2021; Time: 13:00 hrs					
District	24.10.2021	25.10.2021	26.10.2021	27.10.2021	28.10.2021
Thiruvananthapuram	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Kollam	ISOL H	ISOL H	ISOL H to VH	ISOL H	ISOL H
Pathanamthitta	ISOL H	ISOL H	ISOL H to VH	ISOL H	ISOL H
Alappuzha	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Kottayam	ISOL H	ISOL H	ISOL H to VH	ISOL H	ISOL H
Eranakulam	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Idukki	ISOL H	ISOL H	ISOL H to VH	ISOL H	ISOL H
Thrissur	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Palakkad	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Malappuram	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Kozhikode	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Wayanad	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Kannur	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H
Kasaragod	ISOL H	ISOL H	ISOL H	ISOL H	ISOL H

COLOUR CODE	WARNING	INTENSITY	Rainfall intensity (mm)	
White	No Rain	No Rain	Light	(2.5 - 15.5 mm)
Green	No Warning (No Action)	Light Rain	Moderate	(15.6 - 64.4 mm)
Yellow	Watch (Be Updated)	Moderate Rain	Heavy	(64.5 - 115.5 mm)
Orange	Alert (Be Prepared)	Heavy to Very Heavy Rain	Very Heavy	(115.6 - 204.4 mm)
Red	Warning (Take Action)	Very Heavy Rain to Extremely Heavy Rain	Extremely Heavy	(> 204.5 mm)

ISOL - Isolated Rainfall One or two places (<25% of stations gets rain/fall)

- Idukki reservoir has a space of 17MCM below Upper Rule Level.
- The water level, inflow rate and discharge of the Mullaperiyar reservoir at 4:00 pm (24.10.2021) are 136.85ft, 2200cusecs, 2200 cusecs respectively.
- District Collector, Pathanamthitta wanted in Kakki reservoir to be brought to Blue alert level from Orange alert level.

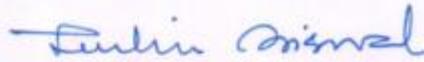
- After deliberations, the following decisions were taken.

**Decisions**

- It was decided that the spill from Idukki reservoir (42cumecs) shall be continued for the present. Continuous monitoring of the Idukki reservoir has to be done and further actions can be undertaken depending on the weather conditions as well as the inflow rate in the Mullaperiyar reservoir in the coming days. Advance notice should be given to the District Administration for any changes in the operations of reservoir.
- Regarding the Kakki reservoir, the spill has to be reduced to 45cumecs from 94cumecs for the present, as the inflow is less. Further decisions shall be taken in accordance with the weather conditions in the District. Advance notice should be given to the District Administration for any changes in the operations of reservoir.
- Regarding the Mullaperiyar reservoir, the current water level is currently at 136.85feet. Regular monitoring of water level and inflow rate in the reservoir, river levels and the intensity of rainfall must be recorded and due actions shall be taken correspondingly.
- Idamalayar and Pamba reservoirs are shut already. No need to spill now.

**Attendees**

1. Shri.T.K.Jose IAS, Additional Chief Secretary ,Home, Vigilance, Water Resources & Coastal Shipping
2. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
3. Dr. B. Ashok IAS, Chairman, KSEBL
4. Dr. A. Kowsigan IAS, Commissioner, Disaster Management
5. District Collector, Idukki
6. District Collector,Pathanamthitta
7. Chief Engineer, Dam Safety
8. Executive Engineer,RDS,KSEBL,Vazhathope
9. Sri.Priyesh,Director,IDRB
10. Assistant Executive Engineer,KSEBL,Pathanamthitta
11. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
12. Smt. Lekshmi Vijayachandran, Hydrologist, KSDMA



**Chairman &**

**Secretary (Revenue & Disaster Management)**



### 13.Rule Curve Meeting-25.10.2021,Time-4:45pm-5:30pm

#### Disaster Management - SW Monsoon preparedness

#### Minutes of the Eighteenth Meeting of the Committee for monitoring the operations as per Rule Curve of all Major Dams in the State

25-10-2021 Via Google meet

Time-4:45pm-5:30pm

- The meeting discussed the current scenario of reservoirs and rain forecast in the state.
- The status of the reservoirs-Idukki, Kakki and Mullaperiyar reservoirs were discussed in particular in detail.
- In Idukki reservoir, it was reported that there was 19.69MCM to reach Upper Rule Level(URL) and 83.78MCM needed to reach Full Reservoir Level(FRL).
- The rainfall forecast of IMD 13:00hours (25.10.2021) was discussed.

India Meteorological Department's District Rainfall Forecast					
Issue Date : 25.10.2021; Time: 13:00 hrs					
District	25.10.2021	26.10.2021	27.10.2021	28.10.2021	29.10.2021
Thiruvananthapuram	ISOL H	ISOL H	L to M	L to M	L to M
Kollam	ISOL H	ISOL H	L to M	L to M	L to M
Pathanamthitta	ISOL H	ISOL H	ISOL H	L to M	L to M
Alappuzha	L to M	ISOL H	L to M	L to M	No rain
Kottayam	ISOL H	ISOL H	ISOL H	L to M	L to M
Ernakulam	ISOL H	ISOL H	ISOL H	L to M	L to M
Idukki	ISOL H	ISOL H	ISOL H	L to M	L to M
Thrissur	ISOL H	ISOL H	ISOL H	L to M	L to M
Palakkad	ISOL H	ISOL H	ISOL H	L to M	L to M
Malappuram	ISOL H	ISOL H	ISOL H	L to M	L to M
Kozhikode	ISOL H	ISOL H	ISOL H	L to M	L to M
Wayanad	ISOL H	ISOL H	ISOL H	L to M	L to M
Kannur	ISOL H	L to M	ISOL H	L to M	L to M
Kasaragod	L to M	L to M	ISOL H	L to M	L to M

COLOUR CODE	WARNING	INTENSITY	Rainfall Intensity (mm)	
White	No Rain	No Rain	Light	(2.5 - 15.5 mm)
Green	No Warning (No Action)	Light Rain	Moderate	(15.6 - 64.4 mm)
Yellow	Watch (Be Updated)	Moderate Rain	Heavy	(64.5 - 115.5 mm)
Orange	Alert (Be Prepared)	Heavy to Very Heavy Rain	Very Heavy	(115.6 - 204.4 mm)
Red	Warning (Take Action)	Very Heavy Rain to Extremely Heavy Rain	Extremely Heavy	(> 204.5 mm)

*ISOL - Isolated Rainfall One or two places (<25% of stations gets rainfall)*

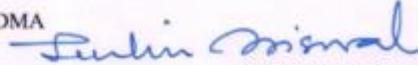
After deliberations, the following decisions were taken.

**Decisions**

- It was decided that the lowest possible spill from Idukki reservoir shall continue which is done at present (about 42cumecs-status quo).
- Regarding the Kakki reservoir, one shutter shall be closed and the other shall be kept open(30cm) with a spill of approximately 25cumecs.
- Regarding the Mullaperiyar reservoir, it was decided that the KSDMA shall request the Forest Department to provide the data recorded in the rain gauge stations of the forest areas on an hourly basis. The proposal for installation of Automatic Raingauge stations in the catchments of the forest region shall also be put forward.

**Attendees**

1. Shri.T.K.Jose IAS, Additional Chief Secretary ,Home, Vigilance, Water Resources & Coastal Shipping
- 2. Smt. Tinku Biswal IAS, Secretary, Revenue and Disaster Management
3. Dr. B. Ashok IAS, Chairman, KSEBL
4. Dr. A.Kowsigan IAS, Commissioner, Disaster Management
5. District Collector,Idukki
6. District Collector,Pathanamthitta
7. Alex Varghese, Chief Engineer, ISW
8. Chief Engineer, Dam Safety
9. Executive Engineer,RDS,KSEBL,Vazhathope
10. Shri. James Wilson, Assistant Executive Engineer & Member Expert Advisory Group, KSEBL
11. Sri.Priyesh,Director, IDRB
12. Smt. LekshmiVijayachandran,Hydrologist,KSDMA

  
**Chairman &**

**Secretary(Revenue & Disaster Management)**

