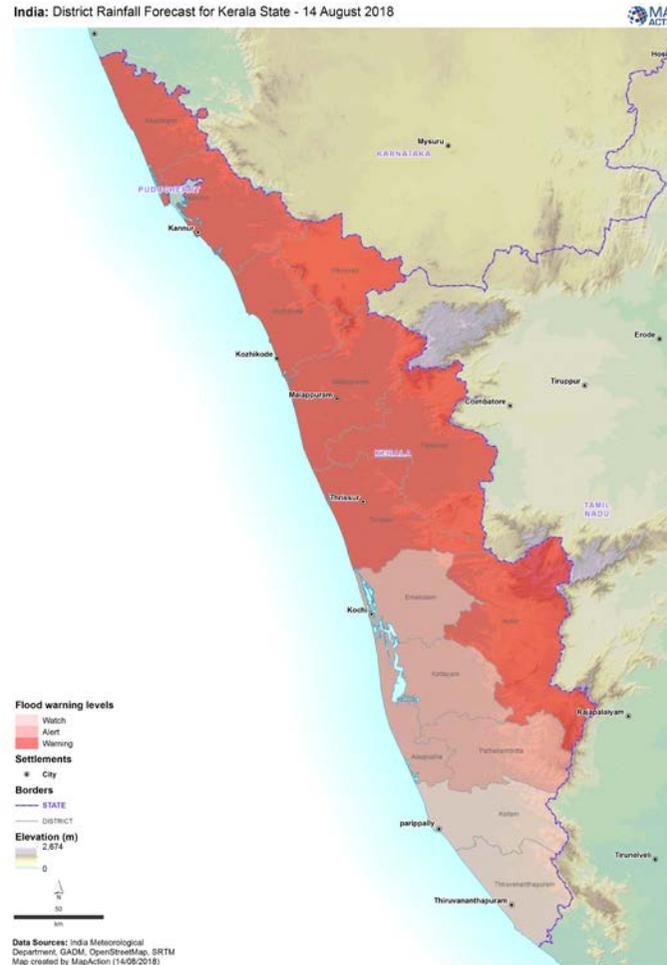


# INDIA

## Floods in Kerala

The southwestern state of Kerala has been facing the worst monsoon season since 1924, causing severe flooding and landslides especially in the northern part of the state, where eight districts remain on red alert. As of 14 August, over 60,000 people have been evacuated to some 500 relief camps across the state, and 39 deaths have been reported. Beginning 8 August and as of 14 August, this is the second major flood in Kerala this monsoon season, and the impact is greater than in July, when over 34,000 people were displaced in 265 relief camps. The affected population is in need of food, shelter, NFI, WASH, and health assistance. Emergency national and international response has been prompt and coordinated; however, longer-term assistance is likely to be needed in the aftermath of the floods.



Source: MAP Action

### NEED FOR INTERNATIONAL ASSISTANCE



### IMPACT



### Limitations

Needs assessments are ongoing, and specific sectoral needs are still unclear. There is limited information on populations that were affected by floods but have not moved to relief camps.

## Anticipated scope and scale

Rainfall is expected to continue on 15 August but decrease from 16 to 18 August, which will most likely lead to floods beginning to recede. **The monsoon season is expected to continue until September**, and further adverse weather can be expected. However, the impact of flooding will continue to be felt, most notably on agriculture and livelihoods. **Crop damage** has been significant and many agricultural workers will likely be in need of long-term **livelihoods assistance**.

## Key priorities



**+60,000**  
displaced in **+500** relief camps



**+20,000**  
homes damaged



**WASH needs**  
to be expected



**Livelihoods**  
impacted in the long-term

## Humanitarian Constraints



Flooding and landslides have caused significant damage to roads and infrastructure across the state. Some affected populations live in remote and isolated areas that are difficult to reach.

## Crisis impact

Heavy rainfall between 8 and 14 August has caused flooding and landslides in Kerala state, in southwest India. Every year the region is affected by the monsoon (from June until September), and regularly causes damage to agriculture, impacting livelihoods in particular. (The Guardian 12/08/2018)

Kerala state is currently facing the worst flooding and landslides on record since 1924. (The Indian Express 13/08/2018) 39 people have reportedly died and over 60,000 people have been evacuated to 500 relief camps across the state. (DG ECHO 13/08/2018, SPHERE India 11/08/2018, DD News 13/08/2018)

As of 14 August, eight out of 14 districts in Kerala are on high alert (Idukki, Thrissur, Palakkad, Malappuram, Kozhikode, Wayanad, Kannur, Kasaragod). (India Meteorological Department 14/08/2018) Idukki and Wayanad in particular been affected by landslides, due to the presence of many hills. (Act Alliance 11/08/2018)

Heavy rainfall is expected to continue in Kerala on 15 August (12-20 cm in 24 hours), but will then decrease from 16 to 18 August. (India Meteorological Department 14/08/2018)

**Shelter & NFI:** The flooding and landslides have led to significant shelter destruction: nearly 20,000 houses have reportedly been damaged. (DG ECHO 13/08/2018) In the relief camps, populations are in need of shelter items (tarpaulin sheets, mosquito nets), and NFI items (cooking utensils, solar lanterns, bed sheets, cloths). (SPHERE India 11/08/2018)

**Agriculture & Livelihoods:** Around half of the population (47.7%) in Kerala live in rural areas and depend on rural livelihoods. (Census 2011) Due to flooding, the plantation industry in Kerala is at risk of losing between EUR 62 million and 88 million, and around 40% of the current crops, impacting the livelihoods of many farmers in the region. Coffee plantations are heavily impacted, but the floods also affected tea, rubber, cardamom, and black pepper plantations. An estimated 500 acres of plantations have been destroyed by landslides in Nilambur, Kalikavu and Malappuram districts, and according to estimates, the damage caused by monsoon rains lead to a decrease of up to 50% in cardamom crops. (The Times of India 14/08/2018)

**Food:** Need for food assistance has been reported in the relief camps. (SPHERE India 11/08/2018)

**Health:** In the context of flooding, contaminated water sources and stagnating flood water increase the risk of waterborne diseases outbreaks. Health teams have been deployed to camps to monitor the health conditions of the newly displaced populations and check the spread of communicable diseases. (Deccan Chronicle 10/08/2018) In camps, important needs for medicine have been reported. (SPHERE India 11/08/2018)

**WASH:** WASH needs can be expected due to the destruction of shelters and potential contamination of water sources. Only 57% of urban households and 30% of rural households in Kerala have access to an improved source of drinking water, and the majority of the population (62%) depends on wells, which are sometimes unprotected, and therefore susceptible to contamination from flood water. The floods are likely to lead to a drinking water crisis, aggravated by the fact that many areas are still left without any drinking water supplies. (Act Alliance 11/08/2018, Hindustan Times 12/08/2018, Government of India 2012)

**Education:** Access to education is usually hampered during the monsoon. The closure of some schools and colleges has been reported in eight districts in Kerala. (DD News 13/08/2018)

## Impact on critical infrastructure

Landslides and floods have caused damage to at least 10,000km of roads, hampering humanitarian access. (DG ECHO 13/08/2018)

The power has been shut down in some of the affected areas. Destruction of infrastructure was also reported, most notably a concrete bridge was completely destroyed, leaving almost 3,500 people completely isolated and impossible to access. The Indian Army was quick to intervene, and built a bridge from trunks and branches of a fallen tree. (The Times of India 14/08/2018, Act Alliance 11/08/2018)

## Vulnerable groups affected

Kerala state has a Scheduled Tribe population of 364,189, mostly concentrated in flood-affected Wayanad district (over 136,000 people). Scheduled Tribes (ST) are among the most disadvantaged socio-economic groups in India. (Census 2011, United Nations in India accessed on 15/08/2018) A lot of tribes live in remote and isolated forest areas, making them more vulnerable to natural hazards. (Wayanad.net accessed on 14/08/2018)

Elderly people are disproportionately affected by natural disasters. Although Kerala has the highest life expectancy at birth in the country (71.8 years), it is also the state with the highest number of elderly people, with 12.6% of its population aged 60 years old or above. It also has the highest old-age dependency ration with almost 20%. (Government of India 2016)

Floods disproportionally affect the poor, who generally live in more vulnerable areas in housing that is susceptible to damage by floods. (ACAPS 01/2012)

## Humanitarian and operational constraints

Damage caused by flooding and landslides to roads and infrastructure (bridges in particular) is likely to hinder humanitarian assistance. Some populations in Kerala live in isolated and difficult to reach areas. Access to these areas is further complicated by the impact of the monsoon. (Wayanad.net accessed on 14/08/2018)

## Aggravating factors

### Continuing monsoon season

This flooding episode is the second one to have occurred in Kerala since the beginning of the monsoon season in June. Heavy rains that began around 9 July forced 34,693 people to seek refuge in 265 relief camps, and killed at least 12 people. Kottayam, Alappuzha and Ernakulam districts were the worst affected areas. (Act Alliance 11/08/2018, DG ECHO 18/07/2018)

Although the rainfall is expected to be less heavy over the coming days, the monsoon is expected to continue until September. The monsoon usually lasts between June and September. In India, the rains have had a particularly severe impact in 2018, causing 774 deaths since May. (Le Monde 12/08/2018, The Times of India 13/08/2018)

### Population density

Kerala state is 38,852km<sup>2</sup>, and its population density is around 860 people per square kilometre, which is three times the national average of 324 people per square kilometre, making it one of the most densely populated states in the country. (Census 2011)

Kerala is also one of the most touristic areas in India. (The Guardian 12/08/2018)

### Location and type of housing/infrastructure

Roughly half of the population lives in urban areas, and the other half in rural areas. Housing in Kerala is for the most part resistant to floods: about 87% of the population lives in 'pucca' housing (solid and permanent buildings), and 11.4% in 'semi-pucca' housing (semi-permanent). However, an estimated 6,500 people are living in slums or squatter settlements in urban areas in Kerala. (Government of India 2012)

### Agriculture & Livelihoods

Flooding can have a long-term negative impact on agriculture and rural livelihoods. Each year vast areas of agricultural land are lost or damaged during the monsoon. In Kerala state, during the 2017 monsoon, coffee crops already suffered a drop of 40% compared to 2016. Rubber plantations in the central part of the state have been negatively impacted by continuous rain over the last five months. This significantly affects the livelihoods of the population dependent on agriculture for their income. (The Times of India 14/08/2018)

### Other factors of vulnerability

Local authorities were forced to open 27 reservoirs to absorb excess water caused by flooding. One of the reservoirs had not been opened for 26 years. (Le Monde 12/08/2018) The release of water from the dams exacerbated the flooding, especially in Idukki and

Ernakulam districts. (Act Alliance 11/08/2018) As of 14 August, the cumulative water released was 237,872 million cubic metres. (The Times of India 14/08/2018)

There are concerns in Kerala state that a dam in Mullaperiyar located further upstream could break due to the pressure of the high water level. Overflowing of the Mullaperiyar dam would affect the Idukki dam area, further aggravating the damages caused by floods (The Times of India 14/08/2018).

## Key characteristics (Kerala state)

- **Demographic profile:** Population of Kerala: 33,406,061; 48% male, 52% female ; religion : 54.73% Hindu, 26.56% Muslim, 18.38% Christian (Census 2011) 7.05% of the population in Kerala lives below the poverty line (countrywide: 21.92%) (Government of India 07/2013) Population growth: 4.91%. 2.76% of the total population of India lives in Kerala. (Census 2011)
- **Food security and livelihoods:** In Kerala state, 52.30% of the population lives in urban areas and 47.70% in rural areas. (Census 2011)
- **WASH statistics:** 29.5% of rural households and 56.8% of urban households have access to an 'improved source' of drinking water. (Government of India 2012)
- **Lighting and cooking sources:** Firewood/chips 36.3%, LPG 30.8% (Government of India 2012)
- **Literacy levels:** 94% (Census 2011)

## Response capacity

### Local and national response capacity

The Central Government of India has released EUR 10 million under the State Disaster Response Fund (SDRF), as well as immediate relief funding of EUR 12.6 million from the National Disaster Response Fund (NDRF) in order to respond to the emergency. (DG ECHO 13/08/2018, Government of India 14/08/2018)

The Indian Army (ten columns of the Army, a unit of Madras Regiment, the Navy, the Air Force and NDRF) has been mobilised for rescue and evacuation in all districts affected by flooding and landslides. The State Government is providing food and shelter assistance, and offering approximately EUR 5,000 to families of deceased victims, and over EUR 24,000 to families having lost their home and land. (DG ECHO 13/08/2018) The

State Government is planning on providing additional teams if needed. (DD News 13/08/2018, Government of India 14/08/2018)

National NGO CASA is operating in some of the flood affected areas, and is supporting the civil society group CARD in assisting people affected by the floods. (Act Alliance 11/08/2018)

## International response capacity

A Unified Response Strategy (URS) and coordination mechanism between various organisations has been put in place by SPHERE India. Needs assessments are currently being conducted in affected districts by various humanitarian organisations including Caritas India, Oxfam India, CARE, Save the Children, World Vision India, Habitat for Humanity. (SPHERE India 11/08/2018, SPHERE India 12/08/2018)

All the international organisations on the ground are already implementing WASH, shelter, NFI, food, livelihoods, and health response. (SPHERE India 12/08/2018)

preparedness measures have helped to reduce the number of lives lost and impact on livelihoods. (WFP 19/20/2014, JNA ACAPS 04/2014)

Indirect losses, such as livelihood impact, are often much higher than direct damage. (ECLAC 2003)

Drills should be regularly organised to inform people what to do if an alert is issued: lock up their homes, keep their cattle in a safe place, and take few clothes and important documents with them. (First Post 14/10/2013)

Different means of communication have proved essential in reaching a large population: constant news coverage before and throughout the event (emails, fax, telephone, print media, online news networks, loudspeakers) to communicate warnings and alerts, as well as distribution of satellite phones to representatives of the most vulnerable districts, to ensure that communications continue during the storm. (UNEP 11/2013)

## Information gaps and needs

- Needs assessments are ongoing. It is difficult to assess precise humanitarian needs, although priority sectors are known.
- The number of people injured is unknown, thus making it challenging to know the extent of health needs.
- There is no information on the situation of people who have been affected by floods but have not been moved to evacuation centres.
- The extent of damage to people's homes is unknown (how many houses were completely destroyed as opposed to damaged).

## Lessons learned

Water, sanitation and health are major issues in the aftermath of cyclones and floods, and a speedy response is crucial to prevent the spread of diseases: floods are often followed by epidemics. An increased amount of stagnant water increases the risk of mosquito- and waterborne diseases. (ACAPS 07/2011)

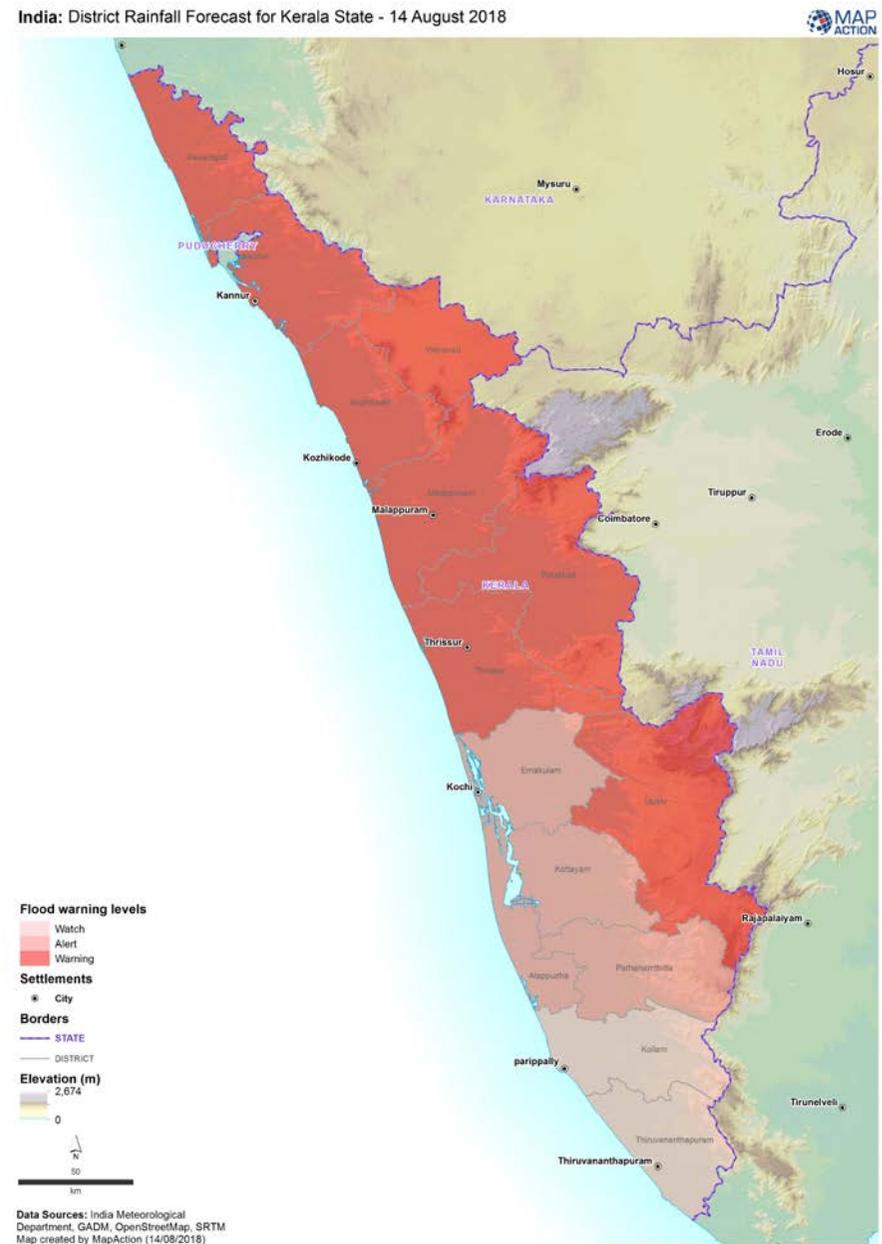
Implementing an improved real-time flood and drought control warning system can reduce the damage caused by floods. Improved forecasting, early warning, and

### District Map of Kerala



Source: Maps of India

### District Rainfall Forecast for Kerala State – 14 August 2018



Source: Map Action