



## KERALA FLOOD 2018

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**Abstract:** In this paper the case study is about describing the severe Floods affected the South Indian state Kerala, due to unusually high rainfall during the monsoon season May-August 2018.

In August 2018, harsh flooding affected the Kerala due to heavy high rainfall during the monsoon season. About one sixth of population of Kerala is affected by flood and its related incident. Landslides are reported in different parts of the state.

The incessant rain accompanied with the rise of water level in rivers and other waterbodies have resulted in flooding in many parts of Kerala. Government of Kerala is doing his best for the flood affected areas. The state government requires INR 31000 Crore for recovery and reconstruction. People across the country and abroad were co-operated and support the government's building and rehabilitation duties. Situation is regularly monitored by the Prime Minister, Chief Minister and National Crisis Management Committee.

The main objective of this paper is to analyse the causes, impacts and various measures adopted by the government in order to tackle the problem of flood in Kerala in 2018.

### Kerala Flood 2018

Beginning on August 15<sup>th</sup> 2018, severe floods were affected in Kerala due to unusually high rain fall during the monsoon season. It was the worst flooding in Kerala nearly a century. Almost 370 people died and 33000 peoples are rescued. According to Kerala Govt. one sixth of the total population of Kerala had been directly affected by flood. All 14 districts were placed on red alert. Almost all dams have been opened since the water level increased rapidly and close to over flow level. The Indian government had declared it a level 3 calamity, or "calamity of a severe nature". It is the worst flood in Kerala after the great flood of 99 that happened in 1924.

### Objectives of the Study

1. To examine the reasons behind the 2018 flood in Kerala and bring out its effects
2. To find out the various measures introduced in Kerala to tackle it effectively

### Causes of the Flood 2018

The main reason for floods has been asse high intensity rainfall in short duration, poor or inadequate drainage capacity, unplanned reservoir regulation and failure of flood control structures.

The causes may be of two types

1. Natural causes
2. Human causes

#### 1. Natural causes

a. Incessant rainfall: Kerala received 2346 mm of rainfall against a normal of 1649mm since the beginning of June. Such heavy rainfall in a short period of time caused the flood and triggered landslides that killed many people.

b. The Unusual rainfall pattern may be attributed to the global climate change: The Arabian sea is becoming warmer that cause a surge in moisture level in the sea and the westerly winds that move over the sea carry that moisture with them as they move into the subcontinent. This may have caused the torrential rain fall.

c. Large expense of low-lying areas: About 10% of its geographical area is below the sea level.

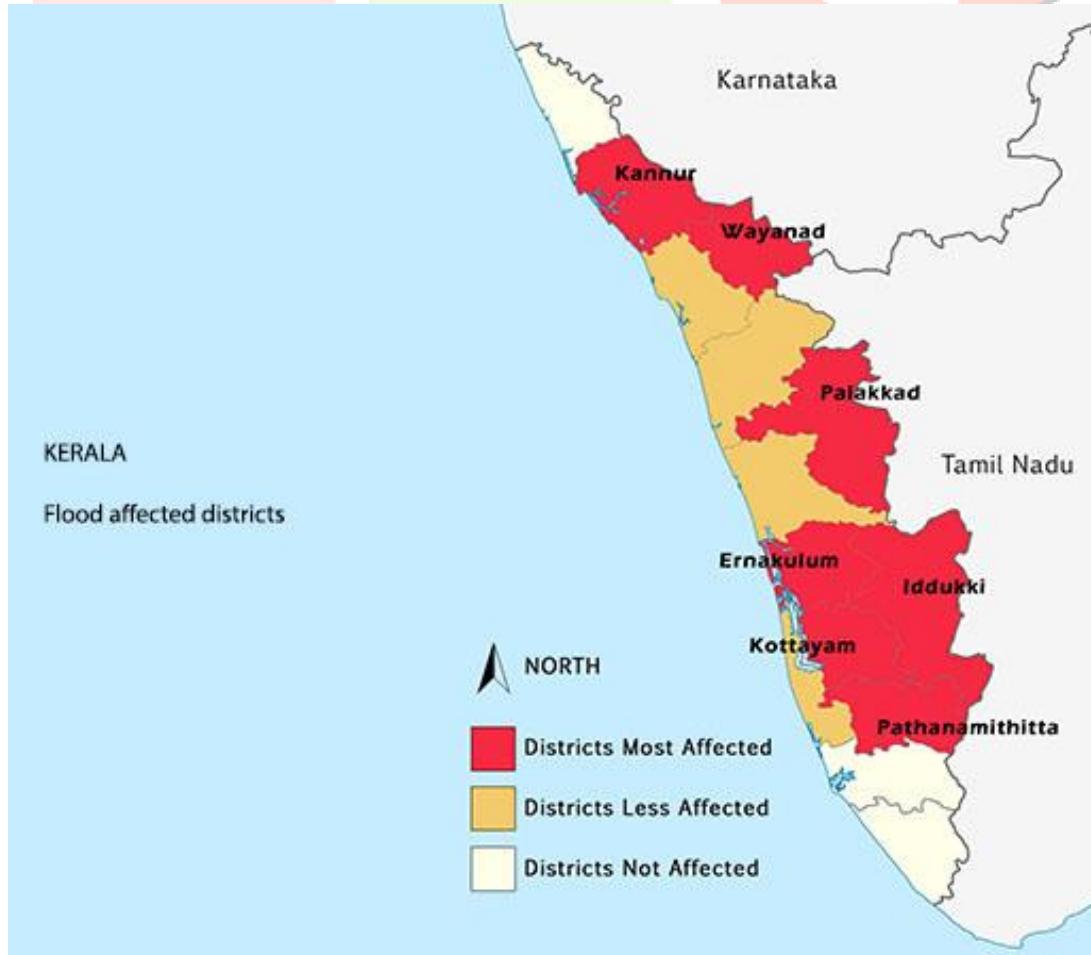
## 2.Human causes

- a. Dam mismanagement: Here was an instant release of water from Dam due to heavy rain, as dam reservoirs were not emptied before the onset of rain, flooding the nearby regions, at a much faster rate than expected. Kerala govt. claimed that the sudden releases of water from the Mullaperiyar Dam ( Located in Kerala but operated in Tamil Nadu) was a cause for the floods in the state.
- b. Stone quarrying: There were approximately 6000 big, medium and small quarries in the state. Mud slides and landslides were reported in many places across the state which is attributed to increasing the stone quarrying activity and large scale deforestation.
- c. Wet lands and lakes that acted as natural barriers have disappeared due to rampant urbanization and construction of infrastructure
- d. Cities were built and expanded on leveled farmlands, blocking the normal water ways.
- e. Other factors are deforestation drive for development purpose, uncontrolled sand mining has constrained river flows, while the rapid spread of high rise buildings on unstable hills slopes has weakened the soil. The unplanned development has left the area susceptible to flash floods and landslides.

## Effects of the devastating Flood

Kerala experienced a record level rainfall. A huge 310 mm of rainfall in just 24 hours, resulted in devastating flooding, causing significant damage to infrastructure, agricultural systems and human life.

1. Roughly half of the population in Kerala live in rural areas and are dependent on rural livelihoods such as farming. Due to the flooding, major crop systems in the state were worst hit that is rice, paddy with 26106 hectares of farmlands are damaged.
2. Local plantations were inundated by water, endangering the local rubber, tea, coffee and spice industries, with an estimated 500 acres of plantations. Land have been destroyed due to landslides in Nilambur, Malappuram and Kalakaua areas. "The floods may have damaged the rural economy to such an extent that it may lead to an agrarian crisis.
3. The flood killing at least 480, displacing 78000 and causing 50000 crore worth of damage in state. Over 3274 relief camps have been opened at various locations to accommodate the flood victims. It is estimated that 1247496 people have found shelter in such camps
4. All schools throughout the state except Sainik school Kazhakootam have been closed, and tourists have been dissuaded or banned from some districts due to safety concerns. The Govt. cancelled Onam celebrations, and the allocated funds have been reallocated to relief efforts.
5. Official have estimated more than 83000 km of roads will need to be repaired and that the total recover cost will be between 2.2 billion and \$ 2.7 billion. Besides a number of water treatment plants were forced to cease pumping water, resulting in poor access to clean water especially in northern districts of the state.
6. On 12 August Cochin International Airport, India's fourth busiest in terms of international traffic, and the busiest in the state suspending all operations until 29 August, following runway flooding. Kochi Metro was closed briefly on 16<sup>th</sup> August and later offered free service to aid those affected by the flooding. Due to heavy rain and raising water levels the southern railway had suspended train services on the Thiruvananthapuram, Kottayam Ernakulam and Ernakulam – Shornoor – Palakkad sections.



### Immediate drought after the Flood.

A few days after receiving one of the highest rainfalls in a century, Kerala was caught under the threat of severe water level in wells, ponds and rivers have recorded lowest levels and some wells even collapsed.

The heavy run-off of the top soil in the upland areas and the siltation in the rivers were the reason for the falling water level. The top soil in the hills and upland areas had been removed in the flash floods to a depth of up to two meters in many places the caused ecological destruction caused by deforestation, harmful land use in the upland areas and sand mining in the stream and rivers as having contributed to the top soil run-off and siltation. This was exacerbated by the impact of climate change at the macro level.

### Measures taken to control Flood in Kerala

The state government has taken all measures in the matter of preparedness and response to meet the flood disaster in accordance with National Disaster Management plan and Kerala Disaster Management plan. All preparedness measures were supported with the allocation of responsibilities, budgetary provisions and the guidelines, covering both the structural and nonstructural measures for risk reduction in the state.

### Rescue operations.

The center launched massive rescue and relief operations One of the largest rescue operation 40 helicopters, 31 aircraft, 182 teams for rescue, 18 medical teams of defense forces, 90 teams of NDRF and 7 companies of central armed police forces were pressed into service along with over 500 boats and necessary rescue equipments.

The fisherman from across Kerala were engaged in flood rescue missions. A good majority of the population were involved in arranging supplies and help material in various ways. According to the Govt. estimate, a total of 4537 from the fisherman community participated in rescue operation with 669 fishing boats. They managed to rescue more than 65000 people from various districts

### Relief and Monetary Aid

1. The government of Kerala started a donation website for flood victims. As of 30 August 2018 Rs. 24067 million (US 350 million) was collected from the public including organizations, corporate firms and famous personalities.
2. The Prime Minister of India, Narendra Modi announced a sum of Rs. 5 billion (US 72 million) as interim relief for Kerala on 18 August 2018.
3. Mata Amritanandamayi Math donated rs.100 million (US 1.4 million) to the Kerala Chief Minister's Distress Relief Fund, in addition to providing relief materials and helping in rescue operations.
4. Many members of Parliament, members of state legislative assemblies and councils, civil servants and government employees across the country have also donated their one month's salary and allowances towards Kerala Chief Minister's Distress Relief Fund.
5. Chief Ministers of all the states (and Delhi) have pledged monetary aid from their respective state funds in addition to dispatch of various relief materials such as potable water, blankets, packed food, rice, water purifying machines, daily – use and health care products etc. are some of the measures.

### Corporate and Individuals

1. UAE based Indian businesses have donated Rs. 188.5 million (US 2.7 million) so far to Khalifa Bin Zayed Al Nahyan Foundations relief fund. Among those to donate were Indian businessmen Yusef Ali M.A. Chairman and Managing director of Lulu group International and Dr. B.R. Shetty, founder and chairman of NMC health.
2. Canara bank, a leading nationalized public sector bank, donated Rs. 50.1 million (US 720000) towards Chief Minister's Distress Relief Fund. Besides this, 10 tons of rice packets were also donated under CSR.
3. Major oil companies of India such as BPCL, HPCL, 10CL and others have collectively donated rs.250 million (US 3.6 million) to the Kerala Chief Ministers Distress Relief Fund, in addition to providing relief materials and helping in rescue operations etc. are some other relief measures.

### Flood Precautions

The following actions should be taken, in any potential flooding or flooding event

#### Protecting your home

- If susceptible to flooding, elevate the furnace, water heater, and electric panel
- To prevent floodwater from backing up into your home, Install check valves in sewer traps
- Seal walls in basements with waterproofing compounds to avoid seepage.
- Keep an adequate supply of food, drinking water and candle in case you are trapped inside your home.

#### When a flood is imminent

- Listen to designated radio/TV emergency alert systems for emergency instructions.
- Secure/bring in outdoor furniture or other items that might float away and become a potential hazard.
- Transfer or move valuable items and papers/documents to upper floors.

## During a flood

- Always seek higher ground. Do not wait for instructions.
- Be aware of flash flood areas such as canals, streams, drainage channels.
- Be ready to evacuate.
- If instructed, turn off utilities at main switches and unplug appliances - do not touch electrical equipment if wet.
- If you must leave your home, do not walk-through moving water. Six inches of moving water can knock you off your feet. Use a stick to test depth.
- Do not try to drive over a flooded road. If your car stalls, abandon it immediately and seek an alternate route.

## After a flood

- Stay away from flood water - do not attempt to swim, walk or drive through the area
- Be aware of areas where water has receded. Roadways may have weakened and could collapse.
- Avoid downed power lines and muddy waters where power lines may have fallen.
- Do not drink tap water until advised by the Health Unit that the water is safe to drink.
- Once flood waters have receded you must not live in your home until the water supply has been declared safe for use, all flood-contaminated rooms have been thoroughly cleaned and disinfected, adequate toilet facilities are available, all electrical appliances and heating/cooling systems have been inspected, food, utensils and dishes have been examined, cleaned or disposed of, and floor drains and sumps have been cleaned and disinfected.

## Conclusion

The 2018 Kerala flood is the worst flood to hit the state in nearly 100 years. And while each disaster is different, the lessons to be learned from communities, governments and voluntary agencies that have dealt with similar floods and disasters will be invaluable for Kerala. Progressive social development, literacy, vibrant media and active community are Kerala's key assets to tackle this disaster – and will help rebuild a more resilient, effective and efficient community. These lessons, arrived at by listening to people and working with government and voluntary agencies across the world, could set an example to the rest of the world.

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