

# Rising from the Floods: Case Study on Climate Change, Land Tenure Rights, and Resource Management in Kerala, India

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**K**erala, the land of rains and rivers, is used to the monsoon rains that arrive like clockwork every year.

However, the Southwest monsoon of 2018 was particularly severe and caused massive flooding in the bustling Indian State of 33 million people.

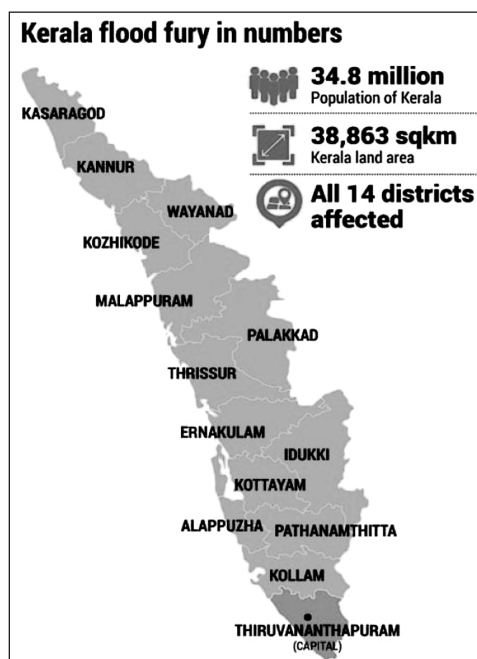
The devastating floods were taken by the locals as evidence of climate change given the extraordinarily heavy volume of rain that fell within a short period.

Kerala is considered vulnerable to natural disasters and climate change as it sits between the Western Ghats to the east and the Arabian Sea to the west.

The extreme rainfall affected Kerala's 14 districts differently although none was spared. The lower areas saw the worst flooding in the State, with floodwaters reaching as high as eight to 15 feet, while those in the hilly areas had to also deal with deadly landslides.

Exacerbating the flooding were deforestation and the loss of vegetation along the riverbanks thus the massive overflow.

Also hit hard were the districts where what used to be marshy places and wetlands were filled up, disturbing the natural ebb and flow of water. Siltation also reduced the ability of the rivers to absorb the extra volume of rainwater that fell that season.



Source: Gulf News, 2018

The torrential rain and the resulting mud flow from the landslides indeed wreaked havoc on many parts of Kerala, which is still feeling the effects years after disaster struck.

### **Natural disaster experienced in the community**

The people of Kerala are used to rains. Every year, the State gets about 3,000 mm of precipitation, 90 percent of which comes during the monsoon season. But in 2018, the heavy volume of rain was completely unexpected which was why preparedness was poor.

It was estimated that Kerala received 2,346.6 mm of rainfall from 1 June 2018 to 19 August 2018, greatly above the expected 1,649.5 mm of rainfall. This rainfall was about 42 percent above the “normal” (Hassan, et al. (Eds.), 2020).

This led to massive overflow of the rivers and tributaries leading to devastating flooding in Kerala.

The following are some of the realities observed in the aftermath of the floods in Kerala (Rajendran, 2018):

- “Over the last several decades, and mostly as a result of the increasing population density, environmental changes have been so pronounced in Kerala as to have magnified the effects of the floods. The rivers, including whole water systems and forests, have been increasingly impacted by dams built for irrigation as well as hydroelectric purposes without respecting the ecological sensitivity of the Western Ghats. Traditional industrial units and their attendant investments have contributed to the pollution of water and air” (Rajendran, 2018).
- “The growth of real estate in Kerala not only forced the conventional agricultural sector to regress, it also led to interfering with vulnerable ecosystems. Unregulated construction, also led to more quarrying and mining of river sand, resulting in land reclamation that caused the wetlands and paddy fields to disappear” (Rajendran, 2018).
- The State has to think seriously about how its water bodies can be saved from further encroachment and pollution. The wetlands are excellent carbon storage centers and help reduce the amount of carbon dioxide in the atmosphere (Rajendran, 2018).
- Kerala has to evolve scientific conservation methods to protect the forests and biodiversity in the Western Ghats, which is subjected to encroachments mostly mediated through political networks. The political parties of Kerala have allowed themselves be manipulated by various business interests in rejecting the Gadgil Committee’s recommendations, which provided a clear and scientific roadmap to preserve the stability of, and promote ecosystem services in, the Western Ghats.
- The State will have to develop more efficient warning and alert systems (Rajendran, 2018).

## Impact on Key Sectors

**On Farmers.** The cataclysmic floods destroyed not just their crops but also their precious assets such as their home, livestock, and farm equipment. The government did provide immediate relief but it was hardly enough. Many had to take out loans that they now have difficulty paying. It is estimated that the Kerala floods caused 27.23 billion INR worth of crop damage, according to the Kerala post disaster needs assessment report of August 2018.

**On Women.** When assessing the impact of disasters, government and aid agencies tend to focus only on livelihoods and assets. The impact on women, many of whom are expected to maintain their homes, is usually overlooked. But with the houses left severely damaged by the floods, women had no choice but to cook in the open, making do with earthen stoves or damaged gas stoves (Das, 2019).

## Issues in community resilience

The devastation caused by the massive flooding and landslides in 2018 brought to the fore the glaring inadequacies in the government response to the disaster. These include the lack of a community-based early warning system that could have prompted residents to seek higher ground, lack of disaster preparedness at the household level, inadequate awareness of local resources for crisis management, and lack of vital communication tools such as mobile phones, satellite radio, and even traditional media such as newspapers and radio that could have been used for effective crisis communication.

The lack of a unified response from both the community and the government authorities was also highlighted, along with the inadequate response capabilities of the frontline government workers needed in times of disasters such as the police, fire marshals, and medical staff. There was also hardly enough shelters and volunteers to handle the humanitarian crisis. It also became obvious that there was not enough knowledge of first aid that could have been useful in the immediate aftermath of the natural disasters.

What these shortcomings prove is that the bottom-up approach to disaster management must be championed so that vulnerable communities can be transformed into resilient communities.

The residents do have intrinsic knowledge of their environment that can be used in drawing up disaster risk reduction policies. Government institutions must also recognize their shortcomings and acknowledge other stakeholders' bodies of knowledge. Together, they can come up with appropriate policies that will incorporate community strengths and embed proper national and local policies so that the socio-economic impacts and vulnerabilities to natural hazards will be greatly reduced or overcome (MSSRF, 2021).

## Effects of natural disasters in the community

Because of where it is situated and its topography, Kerala is vulnerable to flooding, with 14.5 percent of the State's land area considered prone to floods, and up to as high as 50 percent in certain districts. Landslides, meanwhile, are a major hazard in other districts and so are droughts. And because Kerala is one of the most densely populated Indian States, the impact of these natural disasters on the people is magnified.

Many families, for example, lost their primary source of income as some 22,000 hectares of land were inundated and the crops destroyed. Daily laborers were also unable to go to work because of the badly damaged roads. Thousands of houses were likewise either damaged or destroyed.

## Lessons and Insights

Experts from the United Nations and the European Union conducted a study on the impact of the Kerala floods and recommended a four-pronged strategy to rebuild Kerala.

These focused on: a) integrated water resources management (IWRM); b) eco-sensitive and risk-informed approaches to land use and settlements; c) inclusive and people-centered approach; and, d) knowledge, innovation, and technology. The key recommendations for post-flood rehabilitation of the Kerala State Biodiversity Board (KSBB) to the State Government of Kerala are aligned with these pillars.

The major recommendations are:

- ***Institutionalize a structure that will bring out and harmonize multisectoral strategies to conserve biodiversity***

A State-level steering committee of biodiversity must be constituted, for example, to provide guidelines and coordinate actions of all relevant departments, bodies, authorities to achieve conservation and the Sustainable Development Goals.

It was also proposed that a network of trained officials be formed, a "Virtual Biodiversity Cadre" composed of officials who have knowledge to deal with biodiversity and environment in departments that have to do with biodiversity, so that policies and programs will adhere to conservation goals.

- ***Implement urgent policy reforms***

The Kerala State Biodiversity Board (KSBB) had long proposed that the government pass a Land Use Policy that will ensure proper land use for a clean environment as well as adequate

food supply. This can be modified by a Land Use Board and then adopted as an overarching policy for all types of land use in the State.

It is also proposed that the action plans of all sectors, including the one on climate change, incorporate biodiversity conservation.

Also, 18 areas in Kerala have been identified as important coastal and marine biodiversity areas, but so far, only one has been declared a community reserve. It is recommended that the conservation of these areas as community-based marine protected sites be considered top priority.

The invasion of exotic species is also becoming a problem; thus, it is recommended that the State impose strict quarantine and biosecurity measures to ensure ecological balance in the State.

- ***Finance biodiversity conservation***

It is proposed that a certain portion of the Panchayat plan fund be used for biodiversity and environment conservation to ensure sustainability of the efforts.

Related to this, the River Management Fund from sand mining revenues can also be used for the restoration of the river and riverbanks, instead of being funneled to construction projects.

The government is also advised to tap international funding for climate resilience to bankroll local projects.

- ***Restore natural river ecosystems***

The devastating floods and landslides that hit Kerala led to heavy siltation and erosion of riverbanks. To rebuild resilience of the economy, it is necessary to fund the restoration of the degraded riverbanks and buffer zones. This will include the protection of the watersheds and restoration of catchment basins.

Deforestation has made the area even more vulnerable to landslides, especially during high intensity rainfall. Thus, it is necessary to accelerate and finance programs to protect watersheds.

The magnitude of the floods and landslides only underscored the dire need to enhance the people's knowledge on the consequences of damaging human activities such as deforestation, quarrying, narrowing, and blocking of draining channels.

■ ***Reduce vulnerability and improve resilience***

Rebuilding Kerala after the disastrous floods and landslides will be challenging, to say the least. But as it goes through the process, the focus should not just be on the engineering part, but also from the view of reducing the State's vulnerability to disasters, such as by repairing damaged riverbanks and protecting watersheds.

Rebuilding should also mean closer and more frequent consultations with the people who are the most vulnerable to natural disasters enhanced by climate change.

T. Nanda Kumar, a former Secretary, Government of India and former member of the National Disaster Management Authority as well as a resident of Kerala, offers additional recommendations. Among these is to build on the people's knowledge. Build on volunteer strength to build future rescue teams, he added.

Kumar likewise enjoined everyone to learn the harsh lessons of the disaster. There can be no debate anymore on climate change and the shifts in the environment caused by global warming. Accept the fact that development that runs counter to the environment cannot be sustainable. Thus, it is time to use the new awareness to develop a more sound plan for ecologically fragile regions such as Kerala. The floodplains should be kept free of obstructions to mitigate the effects of another flooding due to heavy rains.

Kerala's finances will not be enough to fund its rehabilitation, thus the national government should step in. Kerala can also rally support from both within and outside India to help. There are many well-wishers in and out of Kerala who can make small but significant contributions toward Kerala's sustainable reconstruction.

Kumar also suggested that in the light of the disaster, the State and the higher government should revisit district disaster management plans. These must incorporate inputs from the public. Also, rebuilding should take into consideration proper design and planning of roads and bridges, and even schools, hospitals, and public buildings given the experience from the floods and landslides (FE Bureau, 2018).

***Postscript: Update on the recent effects of and responses to COVID-19***

The devastating Kerala floods of 2018 as well as the Nipah virus outbreak in 2019 led to investments in emergency preparedness and outbreak response that then helped the government and the people respond well to the COVID-19 pandemic (WHO, 2020).

Innovated approaches were adopted and the experience in disaster management came into play following the outbreak, allowing the government to quickly deploy resources and implement a timely and comprehensive response in collaboration with key stakeholders including the people.

The government, for example, set up district control rooms for monitoring, capacity-building of frontline workers, and risk communication. Strong community engagement was also apparent and there were actions to address the psychosocial needs of the vulnerable populations.

Technical guidelines on contact tracing, quarantine, isolation, hospitalization, and infection prevention and control were released early to the frontliners and other departments at the frontlines of the public health crisis.

All these actions helped keep the devastating pandemic under control. ■

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