RESEARCH REVIEW JOURNALS
Volume-04
Issue-02
February -2019

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com [UGC Listed Journal]

Lethal interplay of severe weather with persistent environment neglect: Kerala floods

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ARTICLE DETAILS

Article History
Published Online: 20 February 2019

Keywords
Flood, Weather, Madhav Gadgil Committee, Sustainable Solutions, Disaster Management, Vulnerability

ABSTRACT

Devastating impact of severe weather got exacerbated when the harsh weather conditions and environment neglect met at the crossroads (as mentioned in the report given by a committee chaired by ecologist Madhav Gadgil) in the state of Kerala. Flash floods during monsoons are very common in the coastal states like Kerala- a state with unique geographical variations. The main reasons attributed for such cataclysmic floods in the state are high-intensity rainfall, unplanned reservoir regulation and failure of flood control structures. The incidence of floods in India has been going up in the past three to four decades amounting to huge loss of life and property and such rise in extreme weather events raises concern over climate change impact. This paper examines the underlying causes behind the fury of nature in the state, its impact and the lessons Indians need to learn for reducing flood risk and building resilience as this is not the first and the last time the country got hit by floods. Kerala floods depict that Indians need to rethink their living with water as the nation is highly vulnerable owing to its diverse geographical variations. A fresh approach needs to be adopted to address flood risk by making use of more sustainable solutions that work in harmony with environment on one hand and provides benefits to the local community as well as economy on the other. Such tragedies could be avoided or mitigated through better preparedness to deal with unforeseen situation, which is to be ensured by the disaster management authority.

1. Introduction

The fury of flood has become a very recurrent phenomenon, depicting the vulnerability of different parts of India today. Is human interference with nature making India more prone to floods? The recent flood in Kerala seems to have proved the point. Building habitations in flood prone areas, unregulated tourism, construction of big dams, roads, townships and unfettered mining, anywhere and everywhere in the fragile areas- all have served flash floods on Kerala's platter. According to Rashtriya Barh Ayog (RBA) 8.70 lakh hectares out of the total geographical area of 38.90 lakh hectares in Kerala is a flood prone area- which indicates that 22 percent of the state is prone to flooding[1]. Kerala is situated along the Western Ghats and most of the towns and cities are located on the foothills. The state has many small rivers which get swelled up quickly as they have small catchment areas.

This paper examines how a catastrophe induced by climate change and continuous environment neglect became an apocalyptic fury triggered by local environmental degradation and lack of proper disaster management infrastructure. A proactive approach is very much required in order to mitigate such disasters and resilience building with proper flood governance is of utmost importance so as to bring about sustainable change in the situation.

In India the deadly interplay between the extreme weather events and the continuous environment neglect is a cause of concern. It is this neglect which has almost devastated a state- Kerala- which now after the water is receding is rising by leaps and bounds, rebuilding itself by pulling off an impossible herculean task of rehabilitating its people. This was an ominous reminder by nature to us that everytime humans will interfere with it, for each time it will take a revenge on us. Rapid and unprecedented urbanization, environmental degradation resulting in depletion of resources and administrative inefficiency and indifference all point towards the development paradigm and thus effective management of floods should be incorporated with every developmental activity undertaken so as to alter the course of development.

2. Antecedent factors responsible for inundation

It would be totally wrong on our part to attribute every calamity to climate change, at the face of it. For example, Chennai floods were a result of unsustainable land use policies undertaken and it would be a fallacy to attribute them to climate change alone. There are a multiple of causes which needs a mention if the recent floods in Kerala are to be discussed.

• The forgotten Madhav Gadgil Committee's recommendations

The deluge Kerala is battling with takes us back to the almost buried report of 2011 submitted by Western Ghats Ecology Expert Panel (Gadgil Committee) by the state. Keeping the ecological and environmental sensitivity in mind intertwined with the complex geographical nature of the region the committee defined the boundaries of Western Ghats and the area came to be running about 1,29,037 square km[2]. The entire area was proposed to be demarcated as ecologically sensitive area (ESA) and small zones (in total 3) were designated as ecologically sensitive zones depending on their significance and hazard vulnerability. It recommended strongly

that human interference with the nature should be stopped in certain areas so as to avoid a calamity. Mining, quarrying, deforestation and uncontrolled diversion of forest land into non-forest land were strictly prohibited in Zone 1[3].But the report was rejected by the state government and no recommendations were adopted by it. The effects of this fury could have been minimized if not averted had the Kerala government learnt lessons from such tragedies that have occurred in the past and implemented atleast some of the panel's recommendations as most of the areas which bore the brunt of the calamity are the ones which were declared ecologically sensitive by the committee[4][5].

- **Was Kerala waiting for its inundation?**

After repeated reminders by Central Water Commission in 2006 and National Committee on Dam Safety in 2011 to the state governments to come up for each of its large dam with an Emergency Action Plan, no need was paid to these guidelines put forth by central authorities. It is a sad truth that five long years went in vain but no action was taken on preparing the plan[6].According to 2017 Comptroller and Auditor General audit report out of 61 dams not even a single one had an Emergency Action Plan to deal with such disaster in Kerala. No analysis was done on dam breakage, prescribed quality checks and no mock drill was organized in the state. Such poor dam safety and management makes us only conclude that the state's ill-preparedness caused huge loss which we will take years to recoup from[6,7].

- **Absence of Forecasting Station**

Using the information provided by the forecasting stations about the vulnerable areas which can get flooded, effective management of the floods can be undertaken. Once we become aware of the upstream situation appropriate measures can be taken. But this is what exactly which didn't happen in Kerala as there was no flood forecasting station in Kerala run by Central Water Commission which is the nodal agency of flood forecasting in India despite it having proposed the setting up of 2 such stations in the state during the 12th Five Year Plan(2012-2017)[6,7].

- **Administrative inefficiency and indifference**

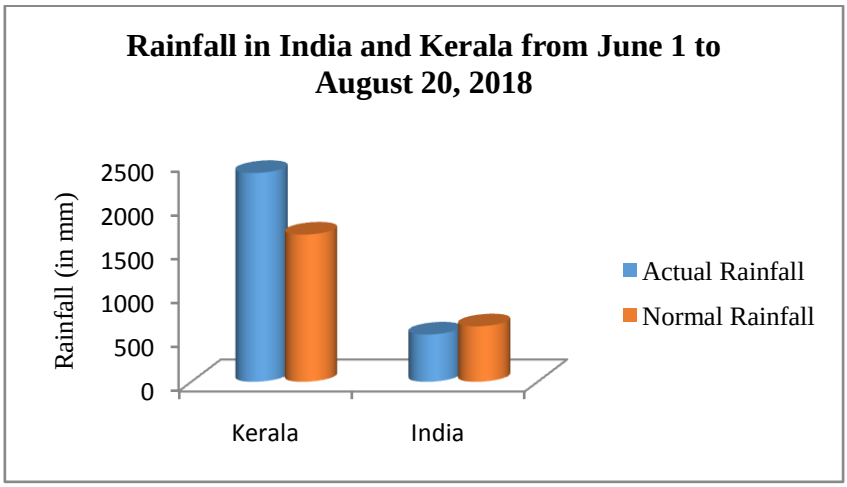
The floods in the region could have been avoided or atleast mitigated. Kerala State Electricity Board operating most of the dams in the region firstly shouldn't have allowed the dams to be fully filled up before the end of the monsoon as they are kept empty so that they can store water incase of such unusual rain[8]. But since most of the dams got filled upto their full capacity including Idukki which is Kerala's biggest dam by July (the rain being normal during that period) the operators could have released the water earlier. As a result of excessive rain on August 9 they were left with no option than to release water resulting in inundation of the region. All five shutters were opened first time in the history which increased the flow of Periyar river flowing through Idukki and Ernakulam districts. It discharged nearly 700,000 litres of water per second into the river. Even Tamil Nadu operating four dams in Kerala didn't release the water from the Mullaperiyar dam earlier and eventually releasing it in Idukki lead to the disaster in the downstream area[9].Thus, another issue which the floods have brought up is inter-state dam management and is to be looked upon with much seriousness.

- **Anthropogenic causes**

Certain anthropogenic activities like mining, quarrying and unprecedented urban development including alarming rise in conversion of public land into private, construction of dams in ecologically sensitive zones are too responsible for creating such havoc in Kerala. Many illegal stone quarrying activities and construction work end up loosening the soil, making the region susceptible to landslides which worsened the situation in Kozhikode, Malappuram, Wayanad and Idukki district of Kerala[10].

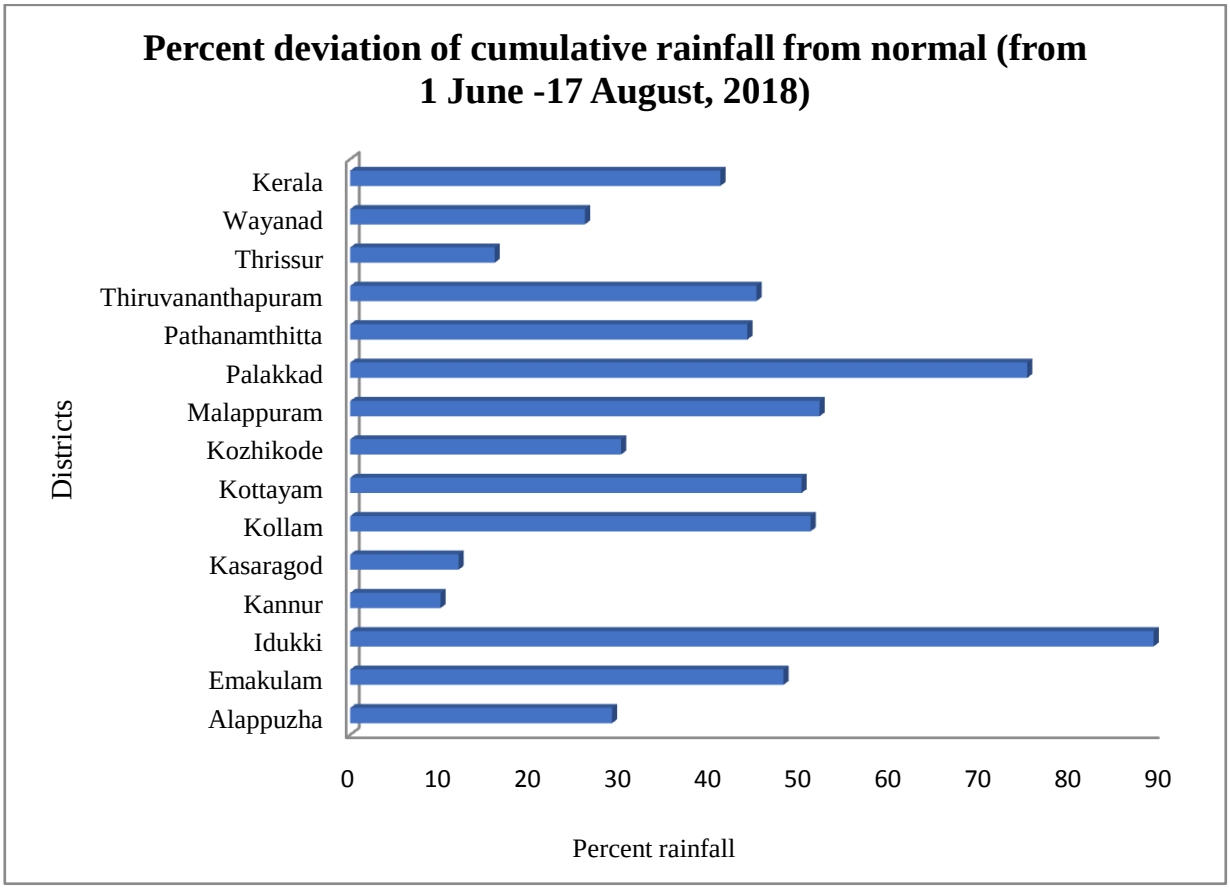
- **Torrential Rain**

Kerala no doubt received high intensity rainfall which defied the trends in previous years. No break in the rain was observed this year. According to India Meteorological Department (IMD) the state received torrential rains of 2,378 millimetres (mm) against 1,676 millimetres over 81 days between 1st June and 20th August, 2018 which is an excess of 42 percent or three times more than the Indian average for that period. Excessive downpour is evident from the fact that 255 percent above-normal rainfall i.e. 98.4 millimetres was received in the state between 9th August and 15th August, 2018 which is five times more than India's average for that period [11,12].



Source: India Meteorological Department.

According to IMD Idukki recorded the highest rainfall in Kerala i.e. 93 percent above normal and second-highest rainfall (3,521 millimetres) of any Indian district over these 81 days. Consecutively developed two low pressure system over northern Bay of Bengal have been held responsible for the heavy spell in too short a duration [11,12].



Source: India Meteorological Department.

3. Aftermath

According to Kerala government one-sixth of the total population has been affected by floods wherein over 400 lives have been lost and over a million displaced. The power and transport sector as well as telecom connectivity has come to a halt. Trains have been suspended and electricity grids have been switched off so as to avoid any mishap. Around 100,000 buildings including the residential ones too, over 10,000 kilometres of district, state and national highways and around **9.06 lakh** hectares worth of crops have been washed away[13].

Kerala's GDP is expected to fall to 6.5-7% from the budgeted 7.6% for the financial year 2019 as per Care Ratings[13,14]. Kerala accounts for 85% of India's rubber production. Various tyre companies are severely affected due to floods estimating a loss of 4.2 billion. Tourism industry employing around 1.4 million people and generating Rs 30,000 crore is in wreck today. The automobile industry has suffered a loss of around Rs 1,000 crores. The overall economic loss in the state have been estimated upto Rs 21,000 crore [13,14]. The relief and rehabilitation work has already started and there is hope that the state will soon bounce back to normalcy. The rebuilding process will surely help the state in rising through leaps and bounds.

4. Learning from The Apocalyptic Fury-Kerala Floods

The cataclysmic floods in Kerala have exposed India's ill-preparedness to handle such severe weather events. Scientists for years have been predicting now that the frequency of such events would rise as an impact of global warming. We need to be prepared to deal with such unforeseen weather events to reduce the risk and some of the solutions to the recurrent floods in the region lies in effective mitigation and rehabilitation measures.

Firstly, the early forecasting, warning and prediction systems in India should be strengthened enough so that they can prepare flood hazard zonation maps which can reduce the vulnerability in the risk region. Its high time that the nation should start using effectively the information available from its rich modern technologies like weather forecasting systems, remote sensing and weather and earth observation satellites, in collaboration with ground data from dams as well as reservoirs to issue flood forecast and warnings in the region. It needs to use the historical records pertaining to flood inundation areas in the country to identify the area of future risk so that zoning regulations can be applied by local governments so as to minimize the damage.

Secondly, after this, timely warnings are to be issued of these events to the people and relocation, if necessary, is undertaken. The coordination, involvement and action of diverse players of both central and state governments with clear responsibilities is required for the exercise to be a success which was seen to be missing in the case of Kerala.

For example, there was no flood forecasting station in the state.

Thirdly, to tame the untamed waters dams are constructed, so they should be kept relatively empty before the rainy season but in Kerala such was not the case reflecting poor dam management. Dams are built to control floods as they can help in minimizing the damage by storing river water and managing them by adjusting their flows. The flood in the state can largely be attributed to the callous attitude of the dam operators who could have handled the situation pretty well by releasing the water earlier rather than waiting for them to get swelled up to the brim resulting into the inundation of the entire state.

Fourthly, need of the hour is to establish a specialized agency solely for the purpose of tackling floods. Since various agencies involved in flood management in India have enough on their plates and have proved ineffective in drawing an effective disaster management plan and forecasting. The focus of this agency should be to collect hydrological data and make an assessment of the same so that effective air borne terrain mapping might help in adopting measures to relocate people to better or elevated sites who have already settled in low lying areas. It should come up with proper warning dissemination strategies, embedding early warning in national policy and making people aware by involving them in drill exercises.

Fifthly, it can be taken care of that no major developmental activities like mining, quarrying and construction is undertaken in areas which are ecologically sensitive. Urban infrastructure involving buildings such as airports, hospitals, schools and other important ones should be built in safe areas and not near the flood plains. For instance houses can be built on stilts. Ponds, lakes etc. should be created to hold water in urban places.

Lastly, incorporating traditional knowledge in the disaster risk reduction strategies and policies by involving the participation of the local communities and functionaries of panchayati raj institutions on one hand and coordination with national and international bodies on the other hand.

5. Conclusion

It is the need of the hour that the country should adopt sustainable land use practices. Local people should be involved in decision making at the grass root level so that the course of development can be directed accordingly. Human interference with the nature has to be stopped immediately so as to prevent such potential catastrophe from occurring again. The process of conservation and development should be undertaken simultaneously and not at the cost of one another. Empowerment of local government to decide which kind of activities are to be regulated in each zone should also be focused upon. Unprecedented urban development involving construction works, mining and quarrying should be immediately prohibited in ecologically sensitive areas so as to save the nation from such havoc. Its urgently required to increase the resilience of calamity struck areas through sustainable development without much intervention with the nature.

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