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Kerala Flood Of 2018 Less Intense Than Deluge Of 1924: So Why Was Damage As Great?

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Kerala's once-in-a-lifetime rainfall was 2,378 mm over 88 days, four times more than normal—but 30 percent less and spread over 61 days more than the deluge of 1924, the most intense flood in the state's [recorded history](#), submerging as it did almost the entire coastline.

So why was the flood of 2018 as devastating as the 3,368 mm rainfall that Kerala received 94 years ago (locally called the “deluge of 99”, since it occurred in the year 1099 of the Malayalam calendar)?

That's because Kerala has reduced its capacity to deal with such extreme floods by allowing illegal stone quarrying, cutting down forests and grasslands, changing drainage patterns and sand mining on river beds, said experts.

“Rampant stone quarrying and digging of pits is the reason behind the landslides and landslips, which worsened the situation in the Kerala floods,” Madhav Gadgil, ecologist and founder of the [Centre for Ecological Sciences](#) at the [Indian Institute of Science](#), Bengaluru, told IndiaSpend.

“These quarries cause deforestation and block the natural streams, which help in reducing the intensity of the floods.”

Most of the 373 casualties in Kerala were caused by [landslides](#) in the northern districts of Malappuram and Wayanad, and the central district of Idukki.

Gadgil is the lead author of a 2011 government-commissioned [study](#) written by the [Western Ghats Ecology Expert Panel](#) (WGEEP)—commonly called the Gadgil committee report—which he headed. The report recommended that development be restricted in the Western Ghats, which sprawls across six states, including Kerala.

The change in land use came at a time of increasingly uncertain weather—uncharacteristic dry spells interspersed with intense rain.

“Our vulnerability to extreme rainfall is increasing as land development is changing drainage patterns,” Roxy Mathew Koll, climate scientist at the [Indian Institute of Tropical Meteorology](#), Pune, told IndiaSpend.

When there is more rain than the soil can absorb, water will quickly run-off, overwhelming streams, drains and rivers, causing mudslides and flash floods, said Koll.



Most of the regions overwhelmed by the recent floods were classified as “ecologically sensitive zones”—where there should be limited or no construction or deforestation—by the Gadgil committee.

In 2011, the central government and the Western-Ghats states, including Kerala, [refused to accept](#) the Gadgil committee report.

The Western Ghats: Super Sponge

Spread across 1.6 lakh sq km, more than three times the size of Haryana, the Western Ghats extend over six states—Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra and Gujarat—along



India's western coast.

The rain and tropical forests of the Ghats are one of the world's 10 “[biodiversity hotspots](#)”, home to the most diverse range of life in the subcontinent: 7,402 species of flowering plants, 1,814 species of non-flowering plants, 139 mammal species, 508 bird species, 179 amphibian species, 6,000 insects species and 290 freshwater fish species.

The Ghats are a source of about 20 rivers and tributaries watering the Indian peninsula, and its forests and grasslands act as a super sponge, soaking up excess rain.

With the biodiversity, water security and retention characteristics in mind, the Gadgil committee [suggested](#) classification of the Ghats into three zones: Ecologically highest sensitive zones (ESZ1), where certain types of areas would be “no-go”, including water courses, water bodies, special habitats, biodiversity rich areas, and sacred groves; ecologically high sensitive zones (ESZ2), where construction of new railway lines and major roads would not be allowed, except when “highly essential”; and ecologically moderately sensitive zones (ESZ3), where new energy projects and infrastructure such as roads may be allowed but with “strict environmental regulations”.

The committee's [recommendations](#) included restrictions on mining and quarrying, use of land for non-forest purposes and no construction of high-rises.

“We had given sector-specific recommendations to be taken up with consultation of all the local-government bodies, but our report was rejected,” said Gadgil.

[Sector-Wise Recommendation For The Western Ghats](#) by [IndiaSpend](#) on Scribd



13. Proposed guidelines/summary recommendations for sector-wise activities

WGEEP advocates a graded or layered approach, with regulatory as well as promotional measures appropriately fine-tuned to local ecological and social contexts within the broad framework of (1) Regions of highest sensitivity or Ecologically Sensitive Zone 1 (ESZ1), (2) Regions of high sensitivity or ESZ2, and the (3) Regions of moderate sensitivity or ESZ3. While we advocate this fine-tuning through a participatory process going down to gram

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“A study in the southern region, comprising the states of Karnataka, Kerala and Tamil Nadu, showed that between 1920-1990 about 40 percent of the original forest cover was lost or converted to another form of land use,” said Gadgil committee [report](#).

“Change in land use of forests exposes the region to such (Kerala-like) calamities,” said Gadgil, whose point has been that the scale of the disaster could have been reduced.

Also Read: [Kerala Floods: Putting Centre’s Rs 600-Crore Aid In Context](#)

Loosening The Soil, And The Government’s Confusion

Like other experts, VS Vijayan, a member of the Gadgil committee and former chairman of Kerala State Biodiversity Board, told IndiaSpend that cutting trees in the catchment areas of dams, illegal construction and farming on slopes exceeding 30 degrees were among the reasons for flood devastation.



“Many of these activities end up loosening the soil making it susceptible to landslides,” said Vijayan. “We had recommended against all of these practices in the Gadgil committee report, but no one listened.”

One of the main reasons for the rejection of the Gadgil committee report was the government’s confusion between the definition of ecologically sensitive zones and ecologically fragile areas, according to Vijayan.

Kerala has a 15-year-old law called the [Ecologically Fragile Lands Act](#), which says people can be evicted from protected areas, such as wildlife sanctuaries and national parks. The government thought that the ecologically sensitive zones were essentially the same, “which was not the case”, said Vijayan.

“We clearly divided the entire Ghats into three zones based on their ecology and needs of protection,” said Vijayan. “It never meant that humans were to be evicted from sensitive areas.”

Extreme rainfall events cannot be stopped, but the the impact of floods can be reduced if forests and natural landscapes are used as shields, he said.

Climate Change Is Exacerbating Heavy Rainfall

When winds from the west slam against the Western Ghats, clouds form and rain falls. In general, stronger winds lead to more intense rain, D Shivanand Pai, head of the climatic prediction group at the India Meteorological Department, Pune, told IndiaSpend.

In the monsoon of 2018, the “pressure gradient”—which determines pressure changes and, in turn, rainfall—between land and the Arabian sea was “very strong”, said Pai, causing heavy rain. “A low pressure developed in the Bay of Bengal and moving inland contributed to the heavy rain by making the winds stronger.”

What Kerala witnessed was an event of high intensity rainfall over a short span of time.

The intensity of such heavy rainfall events have been rising across India. Over 110 years to 2010, heavy rainfall events in India show an [increasing trend](#) of 6 percent per decade, said a November 2017 [study](#) co-authored by Pai, who said high-intensity rainfall results from rising temperatures caused by climate change.

These events have also been deemed responsible for floods.



India accounts for a fifth of deaths globally due to floods and heavy rain, with over one lakh people dying nationwide over 64 years between 1953 and 2017, according to Central Water Commission [data](#) presented to the Rajya Sabha (Parliament's upper house) on March 19. Damage to crops, houses and public utilities was reported to be Rs 365,860 crore—or as much as [3 percent](#) of India's current gross domestic product—the data show.

On average, more than 1,600 people die every year in floods, which disrupt the lives of nearly 32 million people, the [data](#) show. More than 92,000 cattle are lost every year, seven million hectares of land—or nearly twice the size of Kerala—is affected and damage estimated at about Rs 5,600 crore, [IndiaSpend reported](#) on July 17, 2018.

As India's climate warms, extreme weather, such as intense rain and floods, is [predicted](#) to worsen.

India could see a six-fold increase in population exposed to the risk of severe floods by 2040—to 25 million people from 3.7 million facing this risk between 1971 and 2004—[IndiaSpend reported](#) in February 2018, quoting a 2018 [study](#) published in *Science Advances*, a peer-reviewed journal.

*(**Bhasker Tripathi** is a principal correspondent with IndiaSpend.)*

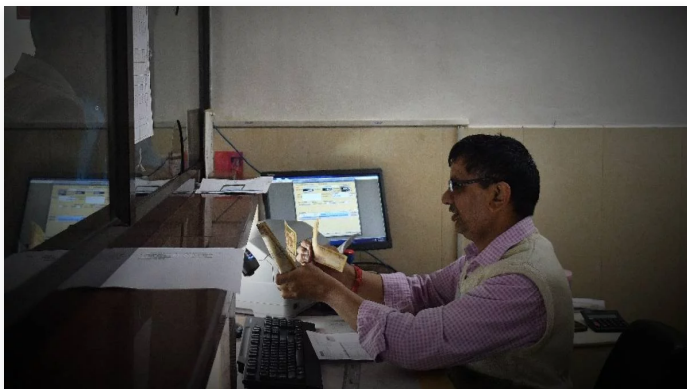
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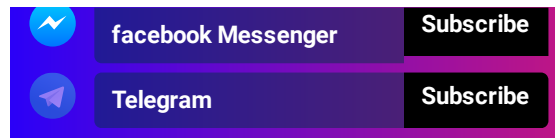
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