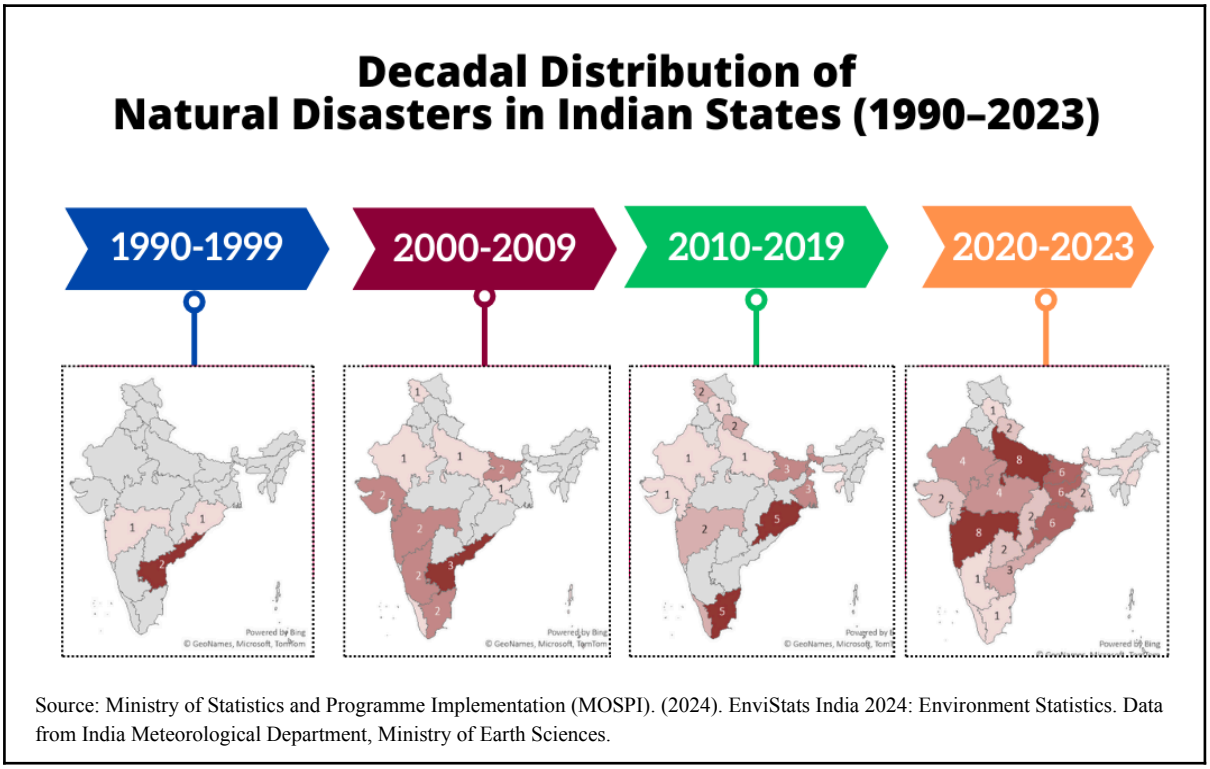
The Escalating Crisis of Natural Disasters in India

- Sneha Mariam Thomas

India is facing a growing crisis of natural disasters, with both the frequency and intensity of such events on the rise. As climate change accelerates, the country's vulnerability to extreme weather conditions, including cyclones, floods, heatwaves, and more, has significantly increased. This crisis strains resources—infrastructure, people, and budgets—requiring significant investment in disaster response and recovery. Hence, it is crucial for India to assess these trends, not only to understand the evolving risks but also to develop more effective disaster management strategies.

1. Uncovering the Escalating Distribution and Evolving Nature of Natural Disasters in India

The data on the decadal distribution of natural disasters in India from 1990 to 2024 reveals a troubling trend of increasing vulnerability. The rapid increase in disasters—from 4 in the 1990s to 63 in the 2020-2023 period—highlights a staggering acceleration in natural disaster events. This sharp spike, particularly in the last two decades, indicates a growing national crisis, with both frequency and intensity of events escalating in an unprecedented manner.

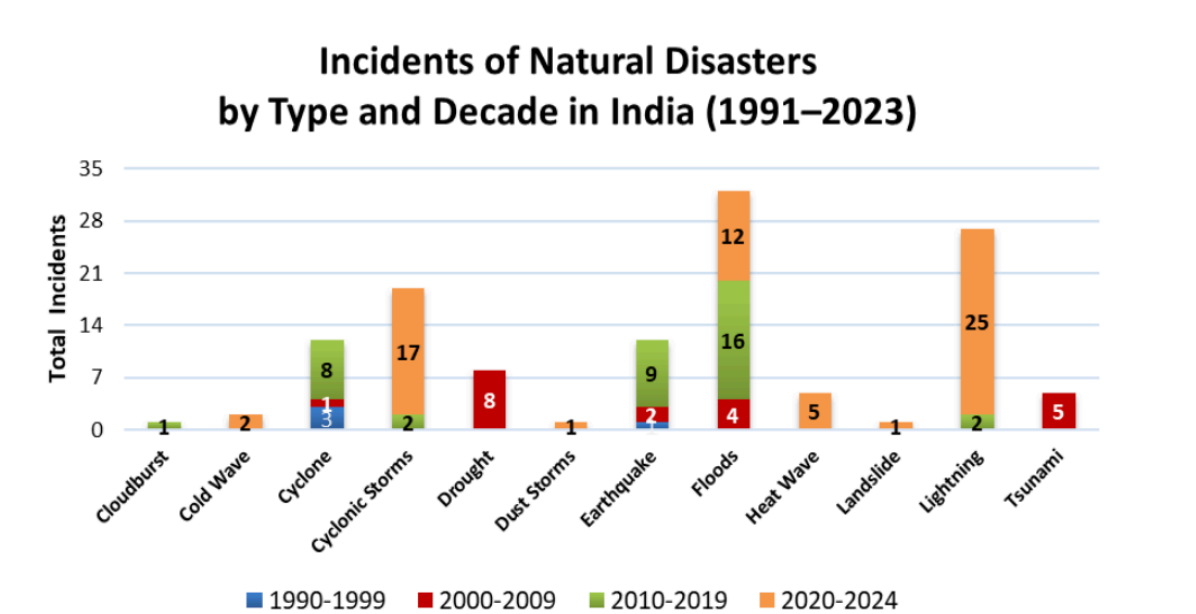


Source: Ministry of Statistics and Programme Implementation (MOSPI). (2024). EnviStats India 2024: Environment Statistics. Data from India Meteorological Department, Ministry of Earth Sciences.

Also, in the past, certain regions, such as coastal areas or flood-prone states, were more frequently affected by disasters. However, the data now shows that regions which previously had a record of disasters are experiencing an increase in their frequency. At the same time, areas that were once not

prone to such events, like Jharkhand, Madhya Pradesh, and Telangana, are now emerging as new hotspots for natural calamities. This shift is likely driven by deforestation, rapid urbanization, and the growing impacts of climate change, making regions that were previously low-risk more vulnerable to natural calamities.

While the increase in disaster frequency is concerning, it is equally important to analyze the evolving types of calamities to understand their broader and more complex impact. Over the decades, certain disasters, particularly extreme weather events, have become more frequent, reflecting the growing influence of climate change, rapid urbanization, and regional vulnerabilities.



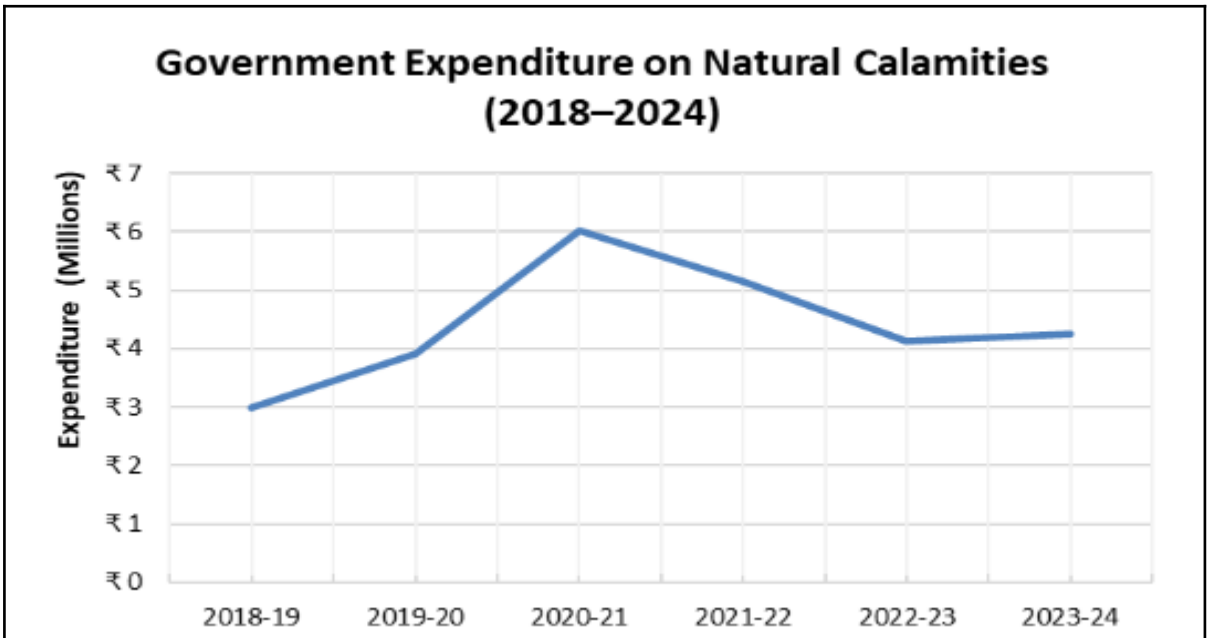
Source: Ministry of Statistics and Programme Implementation (MOSPI). (2024). EnviStats India 2024: Environment Statistics. Data from India Meteorological Department, Ministry of Earth Sciences.

Cyclones and cyclonic storms have seen a sharp rise in frequency, particularly in the 2020-2024 period, where the number of cyclonic storms surged from 2 in the 2010-2019 period to 17. This increase can be attributed to rising sea surface temperatures, a key driver of more powerful storms in coastal areas due to global warming. Similarly, floods have remained a significant threat, reflecting a combination of erratic monsoon patterns, changing rainfall distribution, and poor water management practices exacerbated by rapid urbanization. Urbanization, especially in flood-prone and coastal areas, has led to increased vulnerability, making these regions more susceptible to the devastating effects of cyclones and floods.

The intensifying impacts of climate change are introducing new and unprecedented disaster risks, compounding the existing vulnerabilities faced by India. Heatwaves, previously unrecorded until the

2010-2019 period, have become more prominent in the 2020-2024 period. This rise is closely linked to global temperature increases and the urban heat island effect, especially in densely populated cities. Also, the sharp rise in lightning strikes—from just 2 incidents in 2010-2019 to 25 in 2020-2024—signals increasing atmospheric instability. As global temperatures rise, conditions become more favorable for thunderstorms, resulting in a higher frequency of lightning events.The 2020-2024 period also marks the first appearance of cold waves, suggesting shifts in atmospheric patterns, particularly in northern India. This emergence of extreme cold weather events highlights the potential for a wider range of weather extremes as climate patterns shift.

2. Government Response



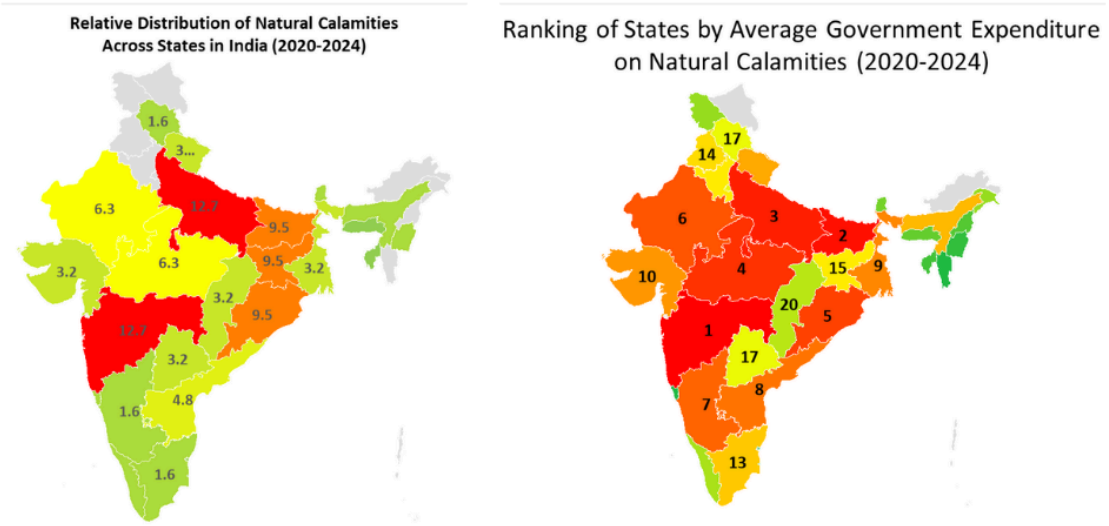
Source: Ministry of Statistics and Programme Implementation (MOSPI). (2024). EnviStats India 2024: Environment Statistics. Data from Reserve Bank of India, State Finances: A Study of Budgets.

Government expenditure on natural calamities has seen a modest increase from ₹2.98 billion in 2018-19 to an estimated ₹4.25 billion in 2023-24. However, despite the growing frequency and intensity of natural disasters, there has been a period of decline in the allocation in recent years, particularly in 2021-22 and 2022-23. This disconnect between rising disaster events and dip in fundings is concerning, as it highlights a potential shortfall in resources needed for effective disaster management, preparedness, and recovery. With the growing scale of disasters, there is an urgent need for a more substantial and consistent financial commitment to better respond to the increasing vulnerabilities and ensure resilience against future calamities.

In light of the increasing frequency and severity of natural disasters, it is essential to evaluate the allocation of resources at the state level. Despite the growing scale of devastation, many states face

significant challenges in securing adequate funding for disaster management and recovery efforts. A critical analysis of funding trends across various states in relation to the scale of disasters they experience can help identify gaps, inefficiencies, and opportunities for better resource distribution.

State-Level Analysis of Government Expenditure and Natural Calamities (2020-2024)



Source: Ministry of Statistics and Programme Implementation (MOSPI). (2024). EnviStats India 2024: Environment Statistics. Data from Reserve Bank of India, State Finances: A Study of Budgets.

The two maps provide a detailed comparison of the distribution of natural calamities across states in India from 2020 to 2024, alongside a ranking of states based on their average government expenditure on disaster relief during the same period. Both maps utilize a shared color-coding system: red indicates the highest incidence of natural calamities and government expenditure, while green represents states with a lower share in both calamities and funding.

States such as Maharashtra, Uttar Pradesh, and Bihar, which represent 12.7%, 12.7%, and 9.5% of the national share in natural disasters, respectively, receive proportionally higher government funding for disaster relief, in recognition of their increased vulnerability. This pattern generally aligns disaster risk with resource allocation, ensuring that the most affected states have the financial means to manage and respond to calamities. However, this correlation is not always consistent. Jharkhand, for instance, shares a similar disaster incidence with Bihar and Odisha but ranks much lower in funding (15th), indicating a potential gap in financial support for states with comparable disaster risks. Furthermore, states like Andhra Pradesh, Telangana, Himachal Pradesh, and Karnataka, which have historically faced frequent natural disasters, continue to receive higher funding despite low frequency

of calamities in 2020-2024. This highlights the ongoing influence of past disaster trends on funding decisions. On the other hand, states such as Puducherry, Meghalaya, and Tripura, with little to no recent disaster incidents, rank lower in funding, which raises concerns about their readiness for potential future events.

In conclusion, the rising frequency and intensity of natural disasters in India, including new threats such as heatwaves, lightning strikes, and cold waves, underscore the urgency of reevaluating the country's disaster management strategy. The data reveals a concerning mismatch between the increasing scale of disasters and stagnating government funding, particularly in states like Jharkhand and newer hotspots, which remain underfunded despite facing rising risks. This analysis suggests that disaster management should prioritize long-term resilience through preventive measures and infrastructure investment, rather than focusing primarily on post-disaster relief. Moreover, a more equitable distribution of funding, reflecting emerging threats and the evolving geography of disaster risk, is essential to ensure that all vulnerable regions can build the capacity to withstand future calamities.