# Disaster: Manmade and Gradual Process

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Be it on the aftermath of sudden ground shaking as in the Bhuj Earthquake of 2001, or the occurrence of some unheard-of phenomenon like the sudden swelling of waves as with the Indian Ocean Tsunami of 2004, or unexpectedly heavy rainfall and ensuing floods as in Kedarnath in 2013 or prolonged creep of ground silently unfolding into a disaster as in Joshimath in 2023 – every single human tragedy, small or big, triggers a debate over increasing magnitude and frequency of natural disasters.

Despite lacking hard facts and data to supplement the claim, many - especially with a scientific bend of mind - are quick to attribute all this to climate change. They at the same time manage to rearrange and even manipulate available data and statistics to strengthen their viewpoint.

Those unable to comprehend the reasons behind the devastation attribute the same to a divine curse and this is commonplace amongst the elderly and uneducated. Moreover, often dubbing disasters as “Daiveey Apda”, the administration reinforces this belief of the masses.

## Nature: The villain

In most cases of human tragedy nature is often portrayed as being the villain.

Is nature really to be blamed every now and then, and for each and every devastating incidence, or else this blame game is the product of our skewed understanding of natural processes and their interrelationship with disasters?

## Natural processes

Many disasters are no doubt caused by routinely occurring natural processes – atmospheric circulation, continuing movement of geographical entities made up of near-surface layers of earth called Plates by geologists, simple precipitation and temperature variation, as also routine aggradation and denudation.

These processes are no new to our planet but then, their intensity or pace has not always remained the same. Fluctuations in these have influenced the

environment and the earth has consequently witnessed extremes – ice sheets extending to the equatorial region and forcing sea level to go down by as much as 130 meters during the Last Glacial Maximum (LGM), about 20000 years ago, as also abnormally high temperatures - 10-18$^{o}$ more than 19$^{th}$ Century during Eocene times – some 56 – 34 million years before present.

Nature or its underlying processes have never operated according to a standard menu, and nature with wardrobe full of variety is sure to keep surprising us.

But then, despite introducing variability and even extremes, nature does not design disasters.

## Disasters: Whose responsibility?

Variability in natural processes is a rule rather than exception.

If that is right, are we justified in portraying nature as being the villain for every disaster that takes place on this planet?

**Do we humans have no role in these?**

**Kedarnath – June 2013:** South-west monsoonal front collided with the Westerlies in the higher reaches of Kumaun – Garhwal Himalaya and this interaction caused abnormally high rainfall on 16 – 17 June 2013 which resulted in sudden rise in discharge and water level of most rivers that include Yamuna, Alaknanda, Mandakini, Bhagirathi, Dhauliganga, Pinder and Kali.

Despite all these rivers crossing the danger level major loss of human lives occurred in the Mandakini valley alone where large number of people were present in the proximity of active channel of Mandakini river at Kedarnath, Rambara and Gaurikund.

**What then caused this disaster?**

Presence of people in large numbers or the precipitation?

Who according to you was responsible for this large a human congregation in Mandakini valley?

Whatever the answer, you are sure to spare the nature.

**Joshimath – 2023:** Joshimath is presently hotspot of disaster managers. Continuing distress of Joshimath and the surroundings is however well documented.

People, administration, and authorities – everyone knew for quite some time that the ground below was creeping, and the same was evident from cracks on the roads and houses, as also fissures in agricultural fields.

Deciphering the slowly unfolding disaster was therefore no rocket science.

The warning signs were however ignored, by both masses and authorities, and Joshimath was allowed to grow recklessly with no regard to bearing or carrying capacity, solid waste management and drainage measures.

And there we stand – helpless spectators to what nature is doing and fully unaware as to how the situation is to unfold in days to come.

So, would you call Joshimath a natural disaster?

Nature is doing just what it does, and has been doing since millennia. Denudation and aggradation are continuing and ongoing processes armed with which nature reshapes the landscape.

This calls review of our understanding - what we call a disaster and how we relate it to nature.

## Disaster

Though defined differently by organisations and legislations - disaster is an incidence wherein the affected community or individuals require outside assistance for coping. Something happens that harms people. The affected people are unable to deal with the situation. They require outside help for coping.

This simple definition of disaster suffices from individual to the level of community and state.

Moreover, disaster as defined and understood unanimously, results from the interplay of hazard and vulnerability.

## Hazard

Hazard refers to devastation causing potential of any event, process or material – earthquake, atmospheric circulation or toxic chemicals. This is attributed both to nature and humans.

So we have natural hazards such as earthquake, cyclone, flood, landslide and the like. As put forth earlier in the context of nature – hazard refers to routinely occurring natural processes – atmospheric circulation, Plate tectonics, precipitation, temperature fluctuations, aggradation, denudation and the like.

We do at the same time have anthropogenic hazards that include accidents of various kind, fire, building collapse, leakage of toxic chemicals and the like.

It is however the vulnerability that invariably decides the impact.

## Vulnerability

Vulnerability refers to the proneness of individuals or community to be affected by hazards. Put alternatively, vulnerability refers to societal factors that make it difficult for people or community to evade the consequences of natural processes.

It is the vulnerability and certainly not hazard that makes the difference and decides if the disaster is to take place or not. Moreover vulnerability is not created by nature.

Vulnerability, in most cases, emanates from our actions, values, beliefs, customs, behaviour, attitude, choices and decisions. And most times, decisions relating to vulnerability reduction are taken by a chosen few commanding power and authority, but these have wider and lasting implications for the masses.

**Spatial vulnerability**: Vulnerability could be a function of where one is geographically located – and the vulnerability would vary depending on that.

If close to the river, lake, sea or ocean – one is vulnerable to flood, inundation, storm or wave action. If in mountains – one is vulnerable to landslide or avalanche and sometimes an earthquake.

But then nature does not decide as to who resides where.

These choices are made by humans, and often driven by socio-economic considerations.

**Structural vulnerability**: This refers to proneness to harm due to the quality of buildings or resilience of the built environment.

If a community routinely builds using cyclone or earthquake resistant technology and ensures quality and craftsmanship,
its vulnerability to cyclone or earthquake is low.

Nature however does neither decide quality nor technology to be utilized in construction. These are all decided by human choices and decisions, often manipulated by economic considerations.

**Socio-economic vulnerability**: Going deeper one realizes that various socio-economic factors create vulnerability or add to it. People deprived of education, healthcare, resources, economic opportunitiesand civic amenities together with those attached to gender roles are often more vulnerable.

But then illiteracy, inequality and discrimination are all a function of social dynamics and not created by nature.

## Vulnerability and not nature causes disaster

In fact it is human choices, policies, practices, beliefs and decisions that influence and create vulnerability. And it is the vulnerability that decides if the community or region is to face a disaster.

Review of a few previous earthquakes would illustrate this difference.

**San Simon Earthquake**: On 22 December 2003 central California was jolted by magnitude 6.6 San Simon Earthquake whose hypocenter was 16 km below the surface.

Though causing economic losses to the tune of US$ 250-300 million this earthquake killed just 02 persons and injured 40.

**Bam Earthquake**: Just four days after San Simon Earthquake on 26 December 2003 Iran was devastated by magnitude 6.6 Bam
Earthquake whose hypocenter was 15 km deep.

Bam Earthquake killed 26271 and injured 22628 persons while 45000 were displaced.

Around 90% infrastructure around Bam was damaged with 70% houses completely destroyed.

Same is the case with Turkiye – Syria Earthquake.

**Turkiye – Syria Earthquake**: Hypocenter of 7.8 magnitude Turkiye – Syria Earthquake of 6 February 2023 was 17.9 km below the surface.

This earthquake razed large geographical area in both Turkiye and Syria and while bodies are still being recovered the death toll has already crossed 35000.

**Tokachi Earthquake**: Compare Turkiye – Syria Earthquake to Tokachi Earthquake of 26 September 2003. Six times more energy was released in this 8.3 magnitude earthquake that had hypocenter at a depth of 27 km.

Despite causing losses worth US$ 1.9 billion Tokachi Earthquake killed only one person while 02 went missing and 849 were injured.

## Disaster: A continuing process

Both San Simon and Bam earthquakes had similar physical parameters – same amount of energy was released at around similar depth below the earth's surface – but the affects were poles apart.

As against this, despite being almost six times stronger human losses in Tokachi Earthquake were insignificant as compared to Turkiye – Syria Earthquake.

Really speaking these differences were no creation of nature.

Neither did nature or earthquake spare people in California or Japan, nor was there some vengeance against those living in Turkiye or Syria or Iran.

In fact people in California and Japan had learned to live with earthquakes and the governments in those countries had devised and implemented a regime that promoted and ensured high quality construction abiding to earthquake safe construction practices. At the same time human
decisions, attitude and choices ensured that masses are aware and know how to cope up in an earthquake situation.

All this ensured safety of the people.

On the other hand the people and governments in Turkiye, Syria and Iran failed to do so and the results are for us to see and analyse.

But nothing was done or achieved overnight.

Neither did California or Japan became earthquake safe overnight nor were Turkiye,  or Syria or Iran rendered vulnerable overnight.

Both ways it has been a slow process driven by well thought of and deliberate human actions backed by decisions, choices, beliefs and attitude.

## Address vulnerability to manage disasters

Hope you are convinced by now that disasters are the result of our actions, values, beliefs, customs, behaviour, attitude, choices and decisions and these attributes alone make a society resilient or vulnerable.

Worded alternatively, we can say that most disasters are manmade and not created by nature.

Moreover, we experience most disasters as events but in reality disasters are caused by build-up of vulnerability over a long time that might run into decades. Societal processes acting for long time accentuate vulnerability that ultimately culminates in a disaster. This is actually what happened in Joshimath or for that matter in Turkiye, Syria and Iran.

So we can safely deduce that rather than an event disaster is a slow process.

Alternatively we can assert that accruing vulnerability surpassing the threshold manifests itself in a disaster and the problem of disaster risk reduction efforts is rooted in missed focus on vulnerability reduction, and considering hazard forecasting and warning dissemination as being the ultimate solution for reducing the disaster toll.

In the process disaster managers, often mesmerised by technology, projected outcomes and jargon of consultants, fail to realise that even a precise and accurate warning communicated well in advance is to be of no use if social attributes of the recipient community inhibit appropriate action - the message could not be deciphered meaningfully, knowhow on what to do could be missing, resources, faith and belief could prohibit evacuation and so on.

So, if aiming at disaster resilience of the society rather than just communicating warnings, the sole focus of all disaster risk reduction initiatives should necessarily be on identifying vulnerabilities and proactively eliminating these

with active involvement of all stakeholders and ensuring that the new ones do not crop up.