

# Hazard or Resource? People's Behaviour in the Face of Lahar Onslaughts and Implications for Disaster Risk Reduction

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## Problem

There are two ways for looking at people's behaviour in the face volcanic threats. The first is known as the hazard paradigm and dominates amongst scientists and policy makers. The second, called vulnerability paradigm, is gaining ground amongst practitioners, especially NGOs. The present contribution explores both hypotheses through the particular lens of people's behaviour in facing lahar onslaughts.

### The hazard paradigm

- It emphasizes rare and extreme volcanic hazards
- People behave in accordance with their perception of the risk associated with these hazards
- The better the risk perception the more likely are people to take protective measures
- Risk perception depends on hazard-related factors, i.e. magnitude, duration, frequency and temporal spacing, plus the recentness, frequency and intensity of past personal experiences with hazards.
- Disasters identified with volcanic hazards are thus considered out of the regular social fabric

### The vulnerability paradigm

- Vulnerability in facing volcanic hazards reflects people's ability to access means of protection
- People's behavior depends on the most pressing need they face to sustain their livelihoods
- The stronger and more diverse the livelihoods the more likely are people to access means of protection
- Access to livelihoods and means of protection is rooted in hazard-independent structural social, cultural, economic and political constraints
- Disasters identified with volcanic hazards amplify people's daily hardship and everyday emergencies

## Four case studies

Fogo volcano

### Fogo volcano study - Cape Verde



- A lahar killed 3 people in 2003
- Quarrying lahar materials is constant resource which does not depend on scarce rainfall as agriculture does
- Furthermore it does not require any skill, particular knowledge and specific instruments
- Those who collect sand and stones are the poorest with limited livelihoods
- To have enough to feed their family on a daily basis they consciously risk their life in time of strong rain

### Mt Karthala case study - Comoros

- Hundreds of houses and thousands of people have been affected by lahars since 2005
- Eventually, extracting sand has provided a significant addition to local livelihoods which are based on farming and fishing
- There is also a huge demand for construction materials in Comoros and hollow blocks made of sand are much cheaper than materials built with lava
- To control the source of sand some people channeled lahar-prone rivers towards their home, thus consciously increasing their exposure



Mt Karthala

### Mt Pinatubo case study

- Mt Pinatubo lahars killed hundreds of people from 1991 to 1997
- Lahar materials have become a major resource for both large-scale sand quarry companies and small-scale gathering of pumice stones by poor families
- Quarry companies make huge benefits from selling sand to the construction industry without much risk
- On the other hand, poor families struggle to make a living from selling small stones for laundries. These people live very close to lahar channels and expect sandy flows as they bring more stones



Mt Pinatubo

### Mt Merapi case study

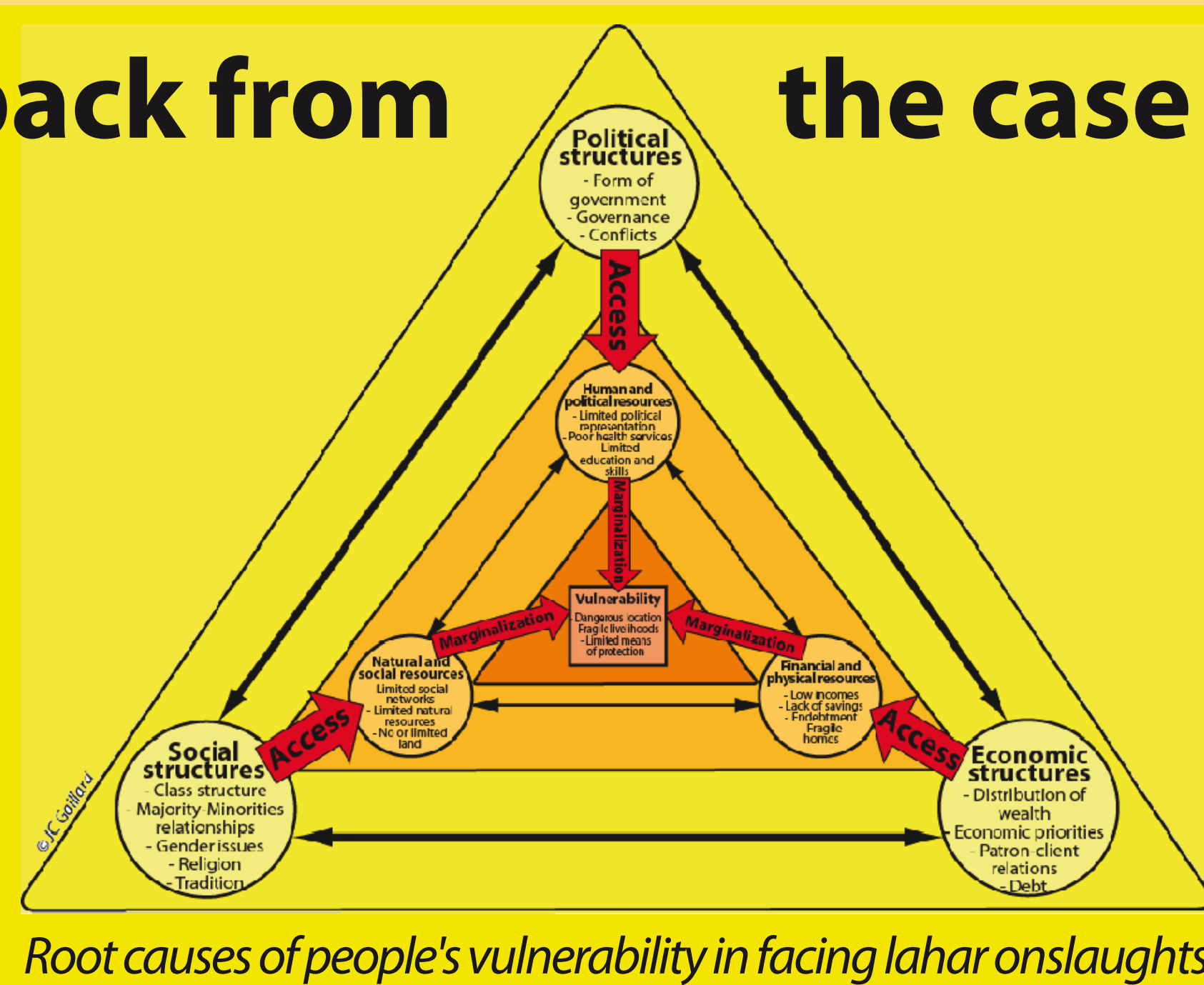
- Large-scale quarry activities involve 1,000 people in the sole Gandol river valley where up to 500 trucks are observed daily
- Sand is used for people personal consumption, sculpture making and industrial purposes
- Miners face lahar, landslide and health hazards
- Sand quarry has severe environmental impacts



Mt Merapi

## Feedback from the case studies

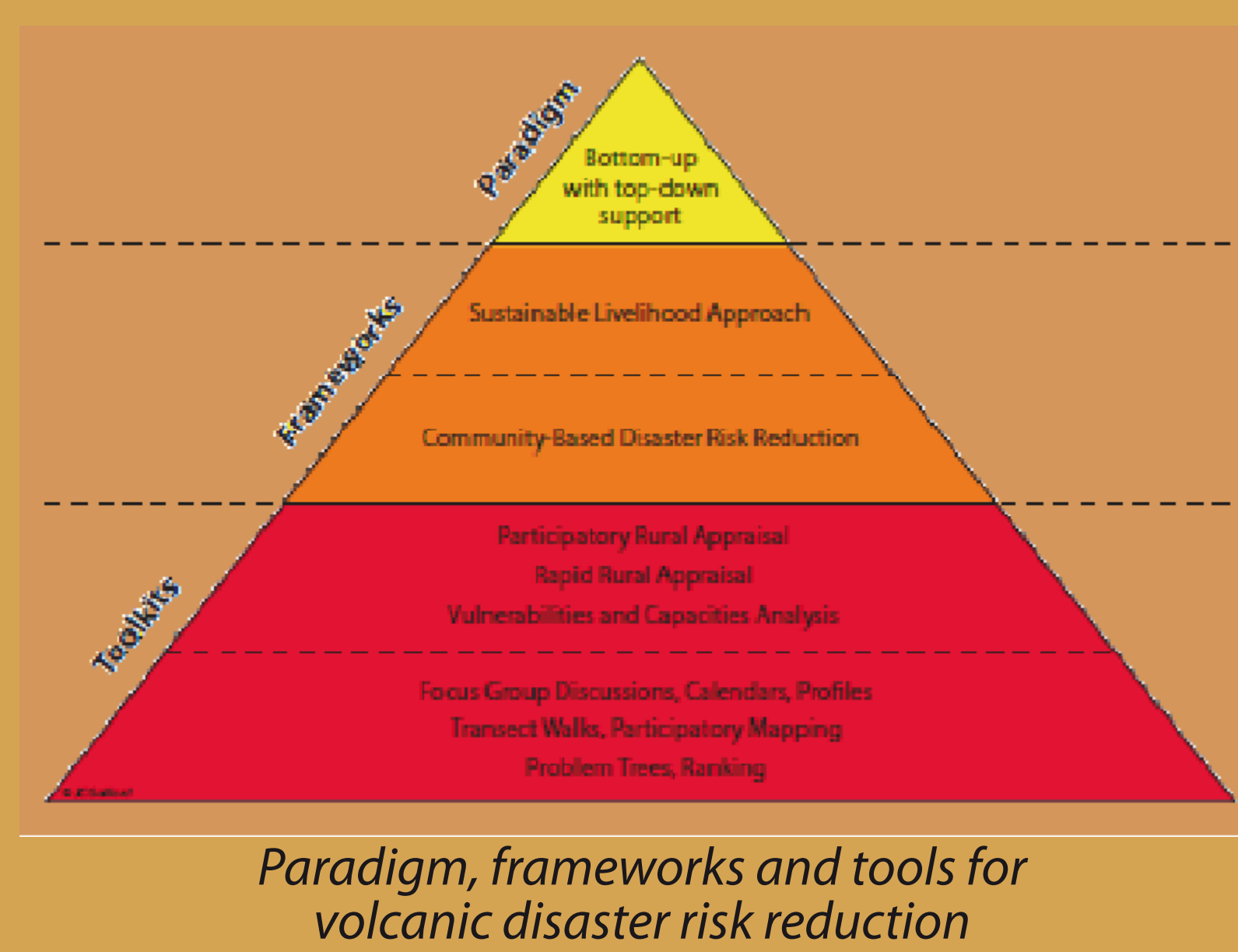
- In all four case studies, people experienced recent lahars and other volcanic hazards
- People display a high perception of the risk associated with these threats
- However they are forced to live in hazard-prone areas and make a living from quarrying lahar materials to sustain their daily needs
- They further lack access to means of protection



- In all cases, perception of risk related to daily poverty is actually higher than perception of risk linked to rare volcanic hazards
- Their exposure and vulnerability in the face of lahar hazards therefore mirrors poor and unsustainable livelihoods
- The failure of access to protection and livelihoods does not mean that these resources are unavailable locally
- It rather reflect an unequal distribution of available resources and the chronic daily marginalisation of those who face lahar hazards

## Volcanic disaster risk reduction

- Volcanic disaster risk reduction should be community-based
- It should empower communities with self-developed and culturally, socially and economically acceptable ways of coping with and avoiding crises related to volcanic hazards
- It should emphasize endogenous resources which prevent people from resorting to exogenous means which are often hard to access and which often create a cycle of dependency
- It should aim at strengthening people's livelihoods
- It should integrate both bottom-up and top-down actions as well as local and scientific knowledge
- It should involve a large array of stakeholders, including local communities, NGOs, local and national governments, scientists, school communities, faith groups, private institutions, etc.



Watch tower equipped with a traditional gong used as warning device in facing Mt Merapi in Turgo, Indonesia, July 2009

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Members of the local community, volcanologist and local officials discussing Mt Bulusan volcanic risk reduction in Irosin, Philippines, Jan. 2010

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