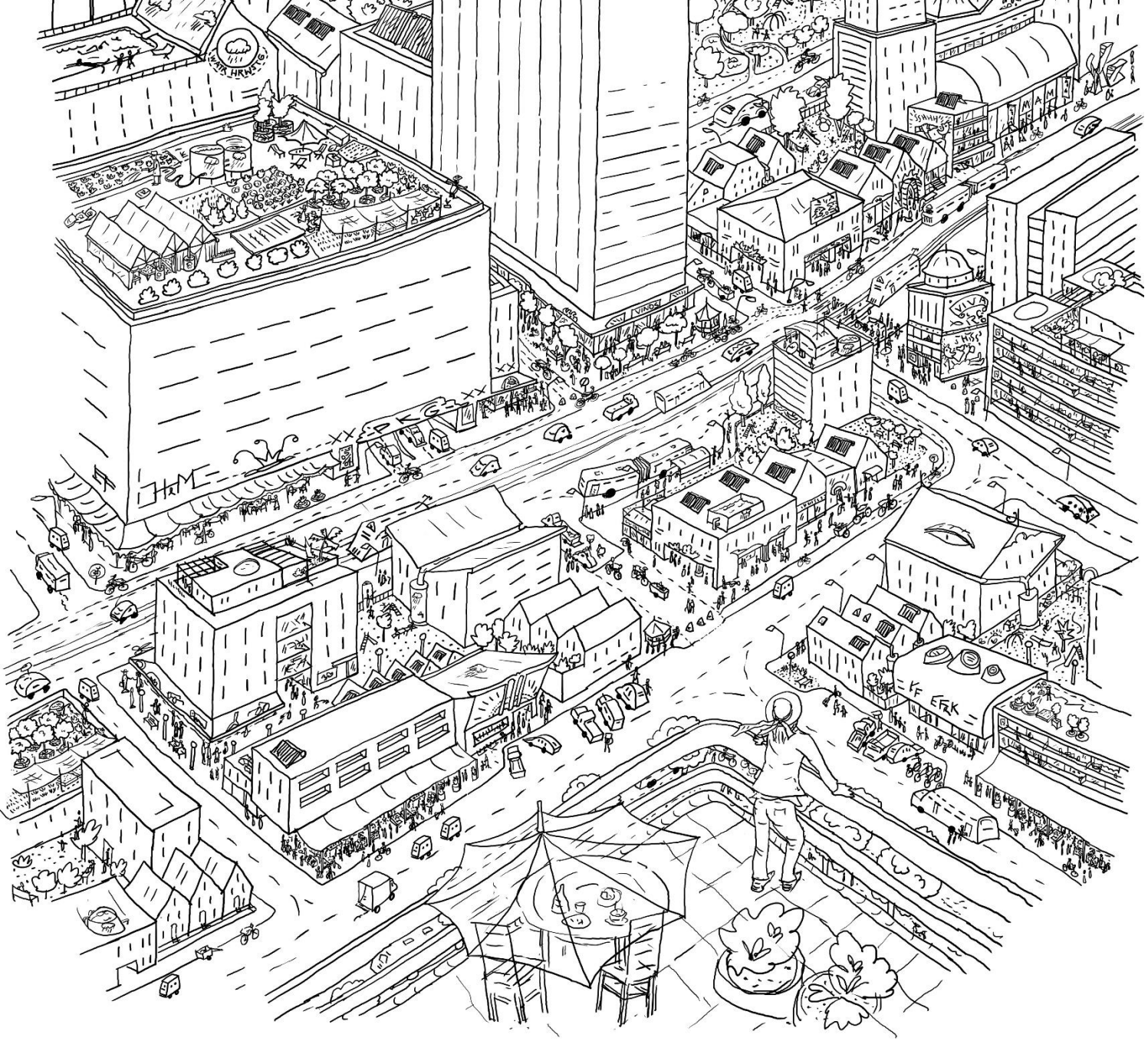


CITY RESILIENCE ACTION PLANNING TOOL

CityRAP Tool

Understanding Disaster Risk and Urban Resilience

www.dimsur.org
www.unhabitat.org

UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

URBAN RESILIENCE

refers to the ability of any urban system, with its inhabitants,…

UN HABITAT
FOR A BETTER URBAN FUTURE

DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience

…to maintain continuity through all **shocks**…

UN HABITAT
FOR A BETTER URBAN FUTURE

DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience

…and **stresses**,…

UN HABITAT
FOR A BETTER URBAN FUTURE

DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience

…while positively adapting and transforming toward sustainability.

UN HABITAT
FOR A BETTER URBAN FUTURE

DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience

How has this city transformed?

What is **URBAN RESILIENCE?**

> The ability of any urban system, with its inhabitants, to maintain continuity through all **shocks and stresses**, while positively adapting and transforming toward sustainability" (UN-Habitat)

What is the difference between shocks and stresses? Some examples?

SHOCKS

SHOCKS:

Sudden acute events that threaten a city

Earthquakes, floods, volcanic eruption, tornado, hurricanes, diseases outbreaks, terrorist attacks and conflicts

UN HABITAT
FOR A BETTER URBAN FUTURE

DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience

STRESSES

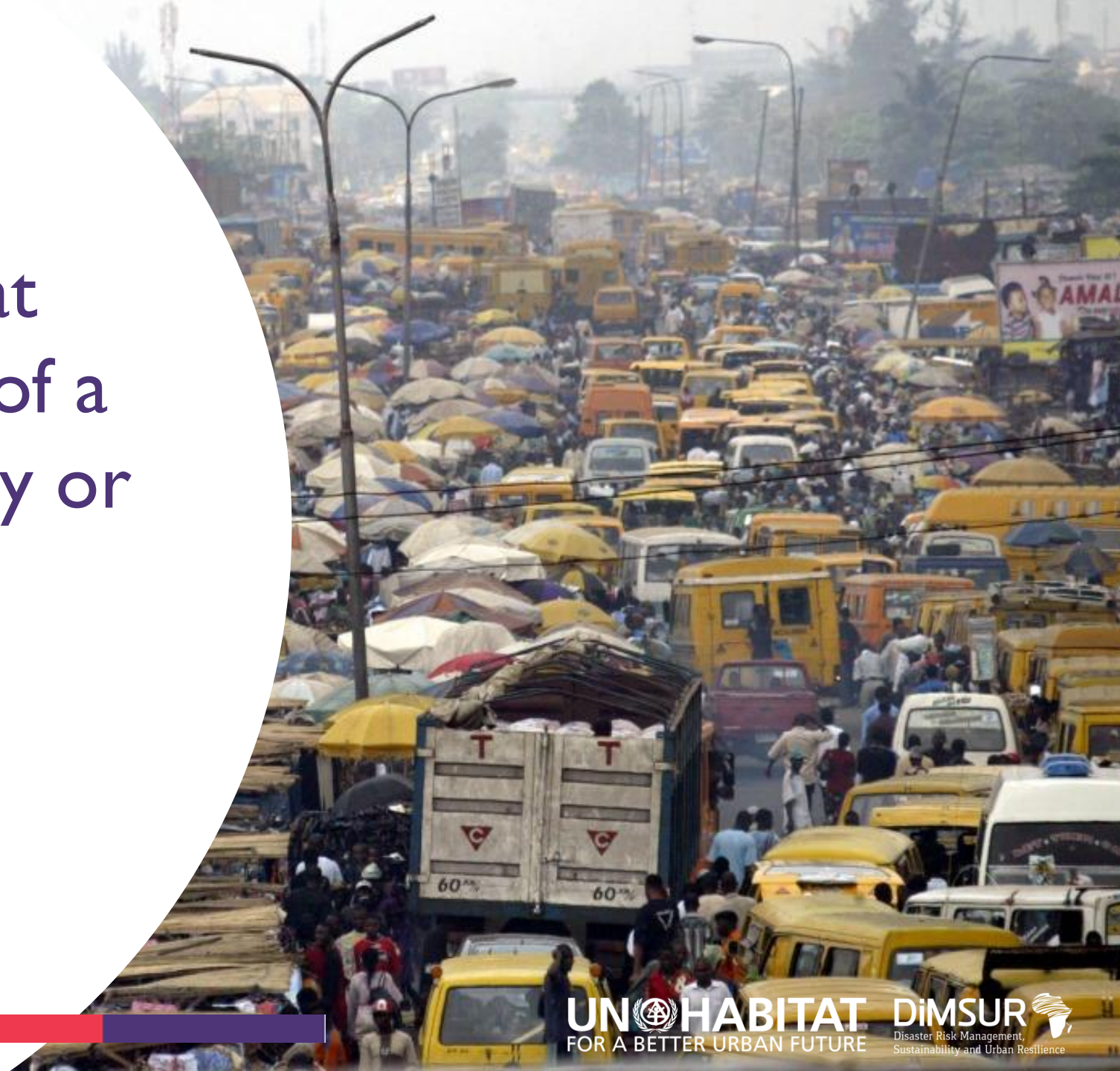
UN HABITAT
FOR A BETTER URBAN FUTURE

DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience

STRESSES:

Chronic events that weaken the fabric of a city on a day-to-day or cyclical basis

High unemployment, inefficient public transportation system, endemic violence/insecurity, food or water shortages



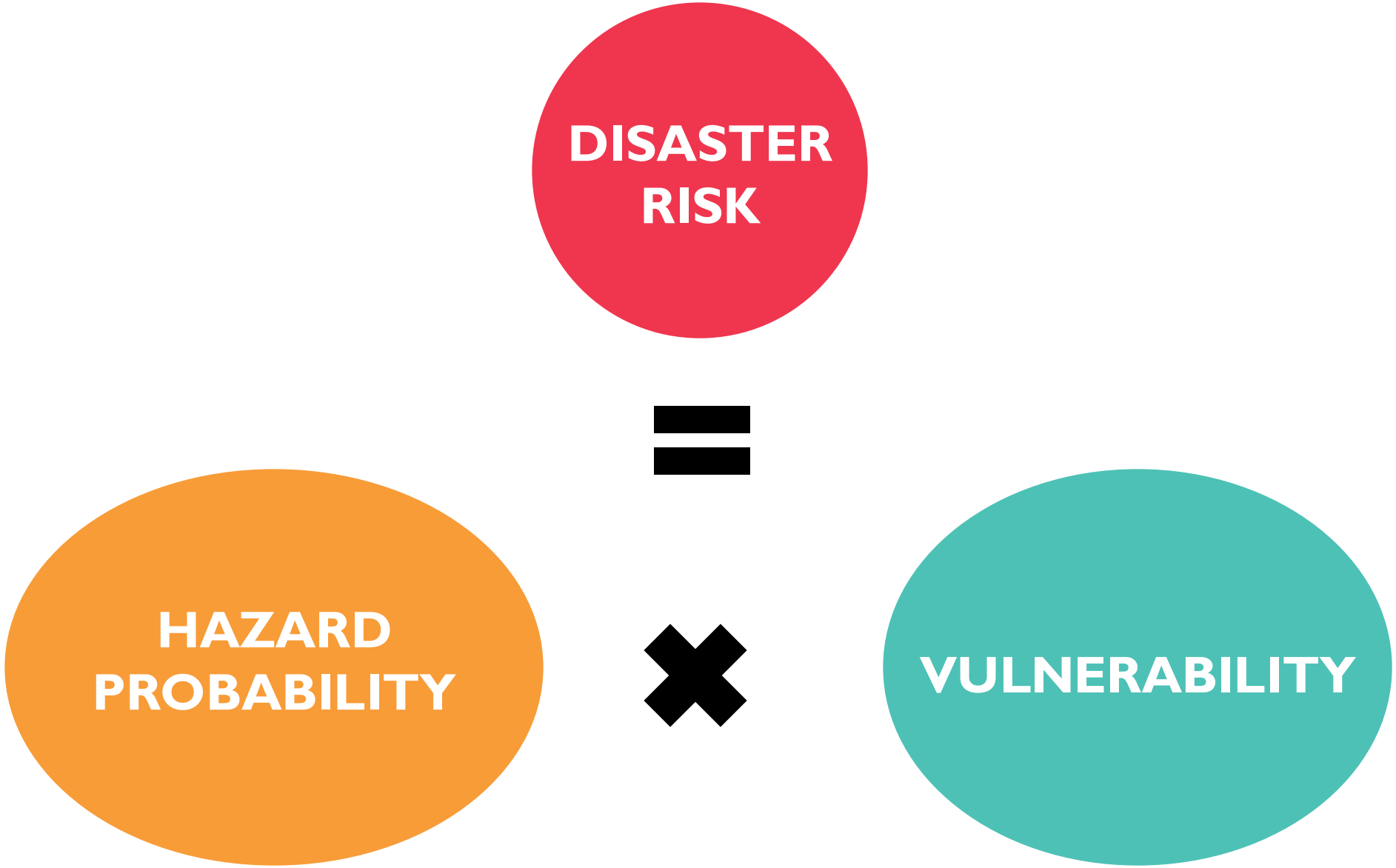
UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

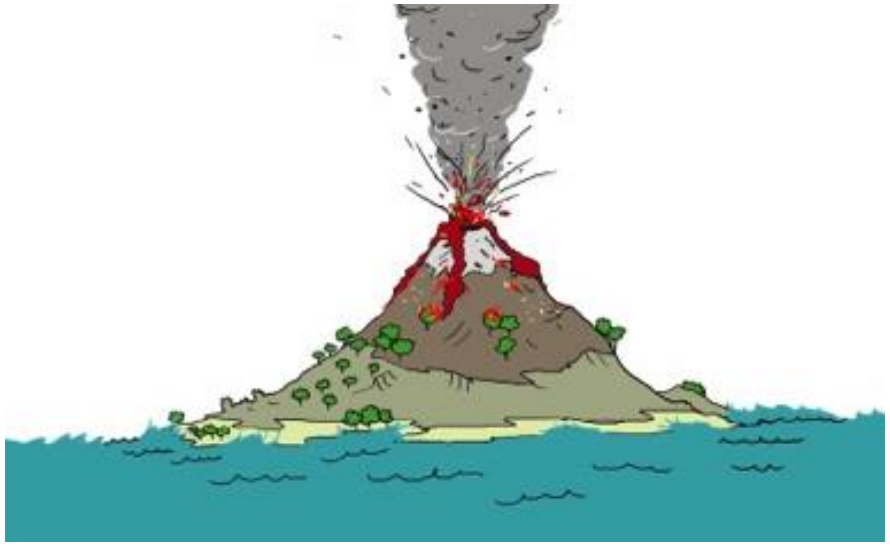
What is **DISASTER RISK?**

UN HABITAT
FOR A BETTER URBAN FUTURE

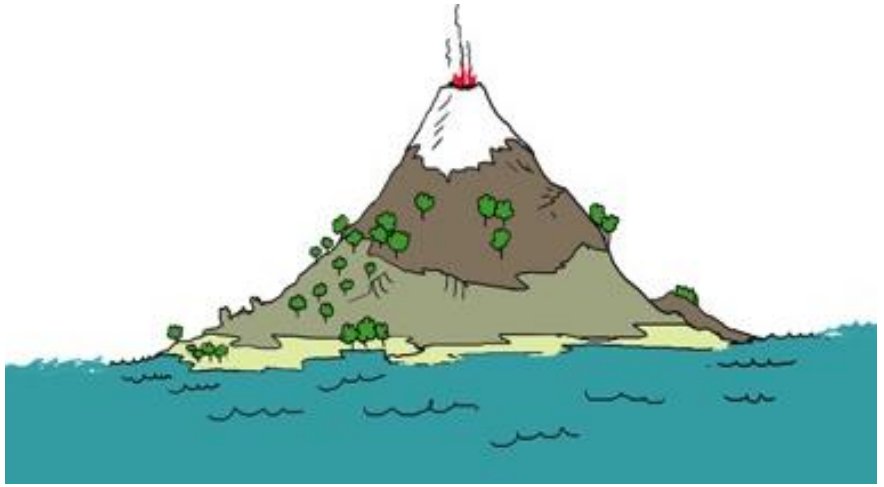
DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience


DISASTER RISK
=
HAZARD PROBABILITY
×
VULNERABILITY

A **hazard** (natural or man-made) does not necessary trigger a **disaster**.
This will depend on the level of **vulnerability.**



HAZARD PROBABILITY = 3

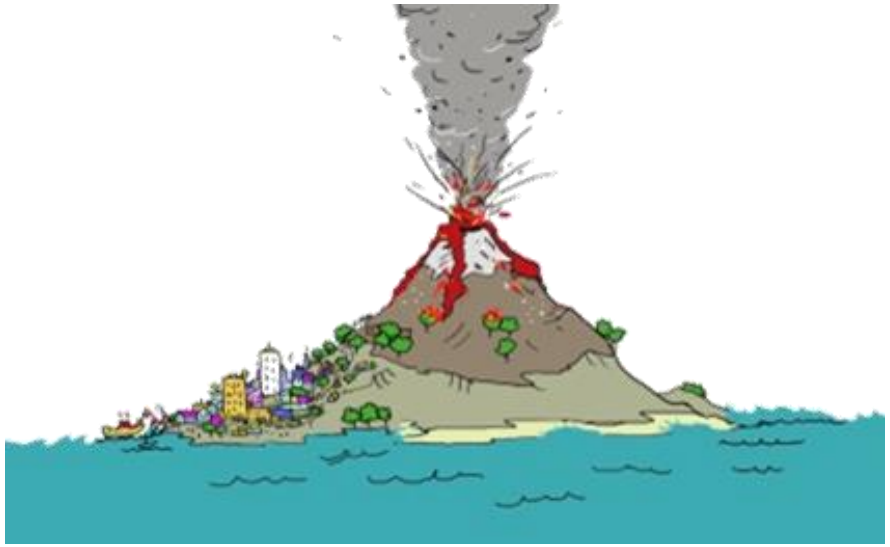


VULNERABILITY = 0

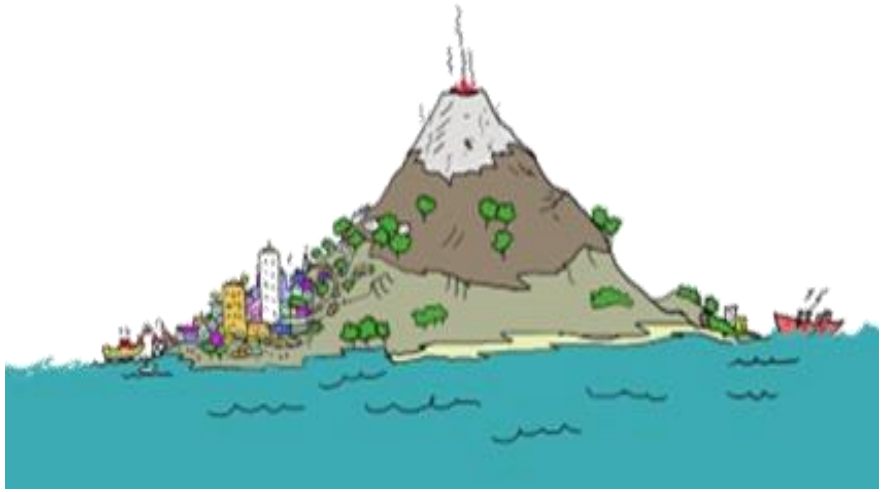
A volcanic eruption on an isolated uninhabited island for example will not result in a disaster:

DISASTER RISK = 3 x 0 = 0

Disasters occur when people are exposed to the hazards and when they are **unable to cope** with it.



HAZARD PROBABILITY = 3



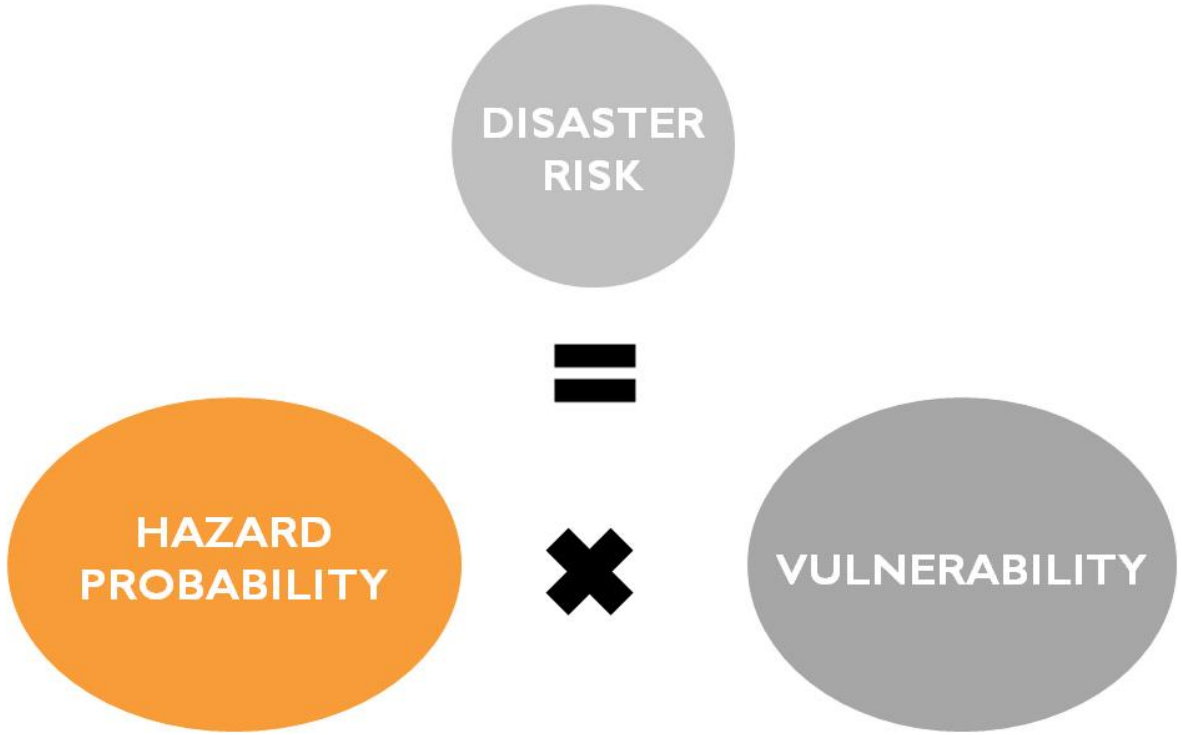
VULNERABILITY = 3

If the island is inhabited and the inhabitants are unable to cope with the volcanic eruption then the risk of disaster is very high:

DISASTER RISK = 3 x 3 = 9

Hazard probability:

- the probability that a particular hazard will occur
- depends on the frequency of the hazard and on predictions about its magnitude



What are different types of hazards? Some examples?

Natural hazards

Geology-related hazards

Earthquakes, volcanic eruptions, tsunami, landslides

Climate-related hazards

Tropical cyclones, tornadoes, droughts, thunderstorms, lightning, floods

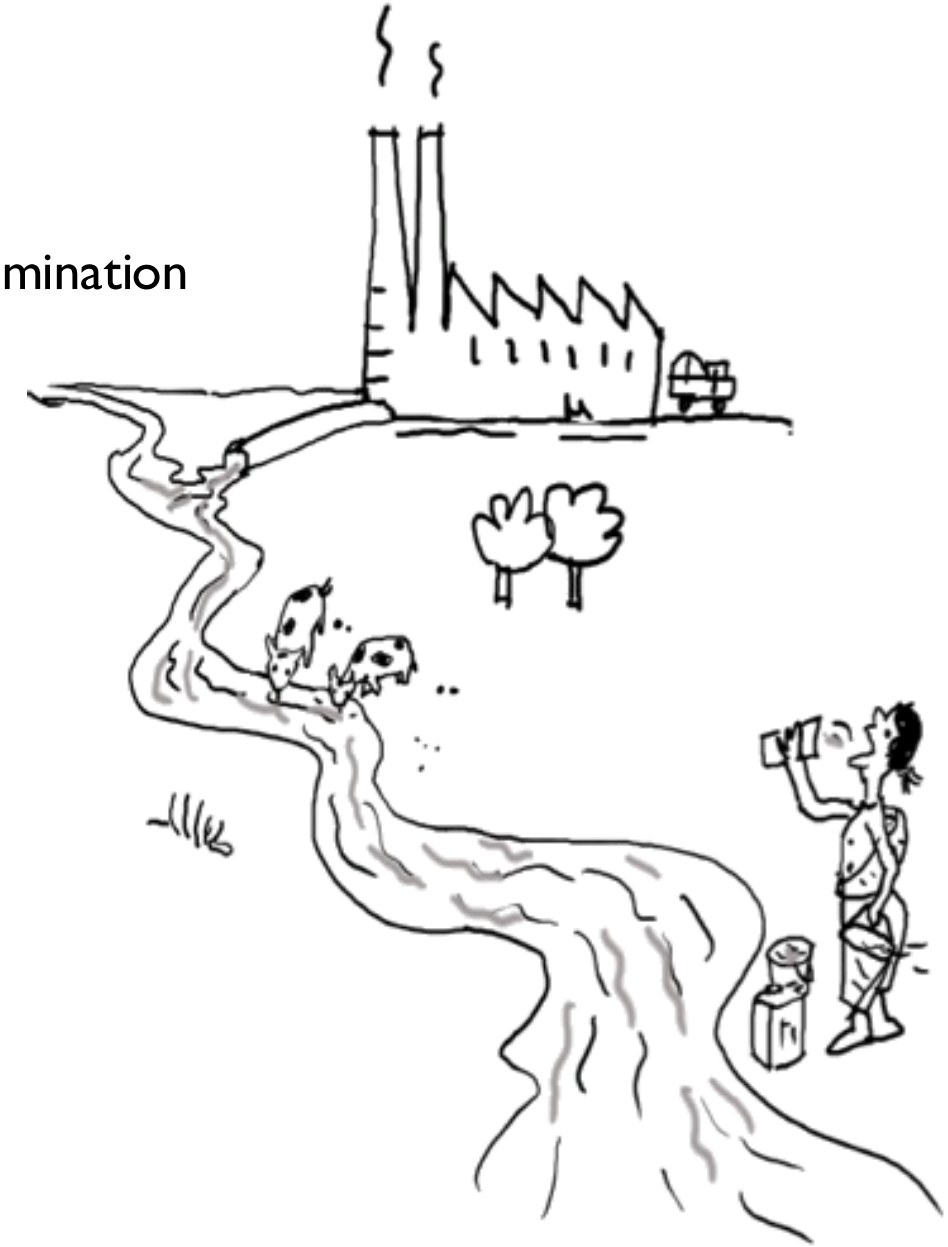
Other natural hazards

Insect infestations, disease epidemics, wildfires

Man-made Hazards

Consequences of human action on environment and society:

- Acid rain
- Atmospheric, water or land contamination
- Exposure to harmful substances
- Destruction of the ozone layer
- Global warming
- Forest fires/market fires
- Conflicts/violence
- Terrorist attacks
- … etc.!



Climate Change

"A change in the climate that persists for decades or longer, arising from either natural causes or human activity"

What will happen in your city, if nothing is done globally to mitigate climate change?

Climate change induced natural hazards

- **Increase of frequency and intensity of natural hazards**
- **Increase in hazard probability**
- **Increase in disaster risk**

Exposure X Sensitivity

Capacity

Vulnerability

The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

Exposure:

Being present in a hazard zone

E.g: building a city or a house near the sea, on a river bank, on the slope of a mountain, in the desert…

$$\text{Vulnerability} = \frac{\text{Exposure} \times \text{Sensitivity}}{\text{Capacity}}$$

UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

Sensitivity:

The likelihood of being at risk when exposed to a hazard

E.g.: not knowing how to swim, living in an informal settlement or in an area very densely populated with poor water and sanitation systems…

$$\text{Vulnerability} = \frac{\text{Exposure} \times \text{Sensitivity}}{\text{Capacity}}$$

UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

Capacity:

The combination of all the strengths, attributes and resources available within a community or society that can be used to withstand and recover quickly from any disturbances (current or future)

- Infrastructure and physical means
- Institutions (legal, policy framework)
- Knowledge and awareness
- Skills and collective attributes
- Social relationships
- Leadership and management

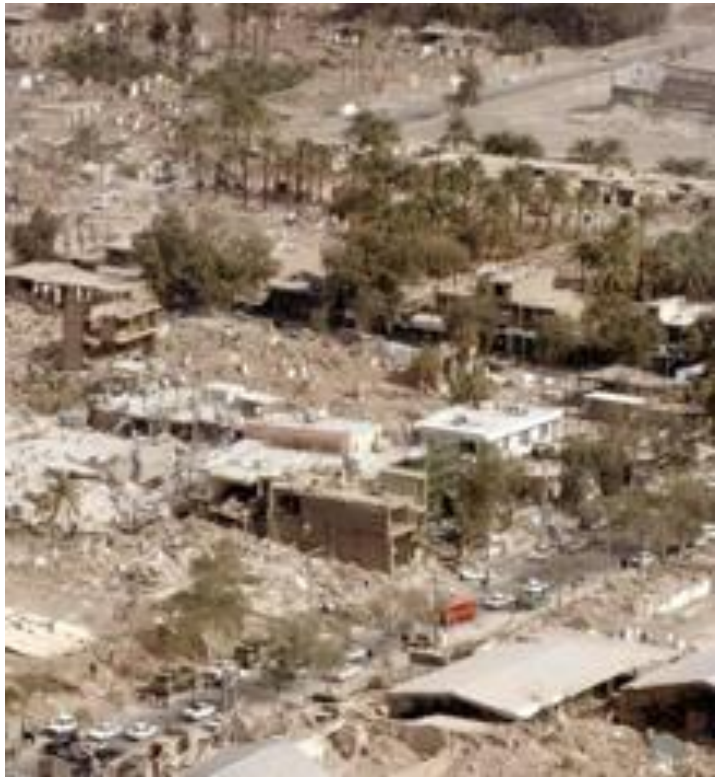
$$\text{Vulnerability} = \frac{\text{Exposure} \times \text{Sensitivity}}{\text{Capacity}}$$

Hazard or disaster?

2003 – 3 earthquakes between 6.3-6.6 on Richter Scale

Taiwan: 0 damage, 0 victim

California: 0 damage, 1 victim



Bam, Iran: 80% of the city destroyed, 38 000 victims

Why has Bam, Iran, been more impacted by the earthquake?

BAM, IRAN:

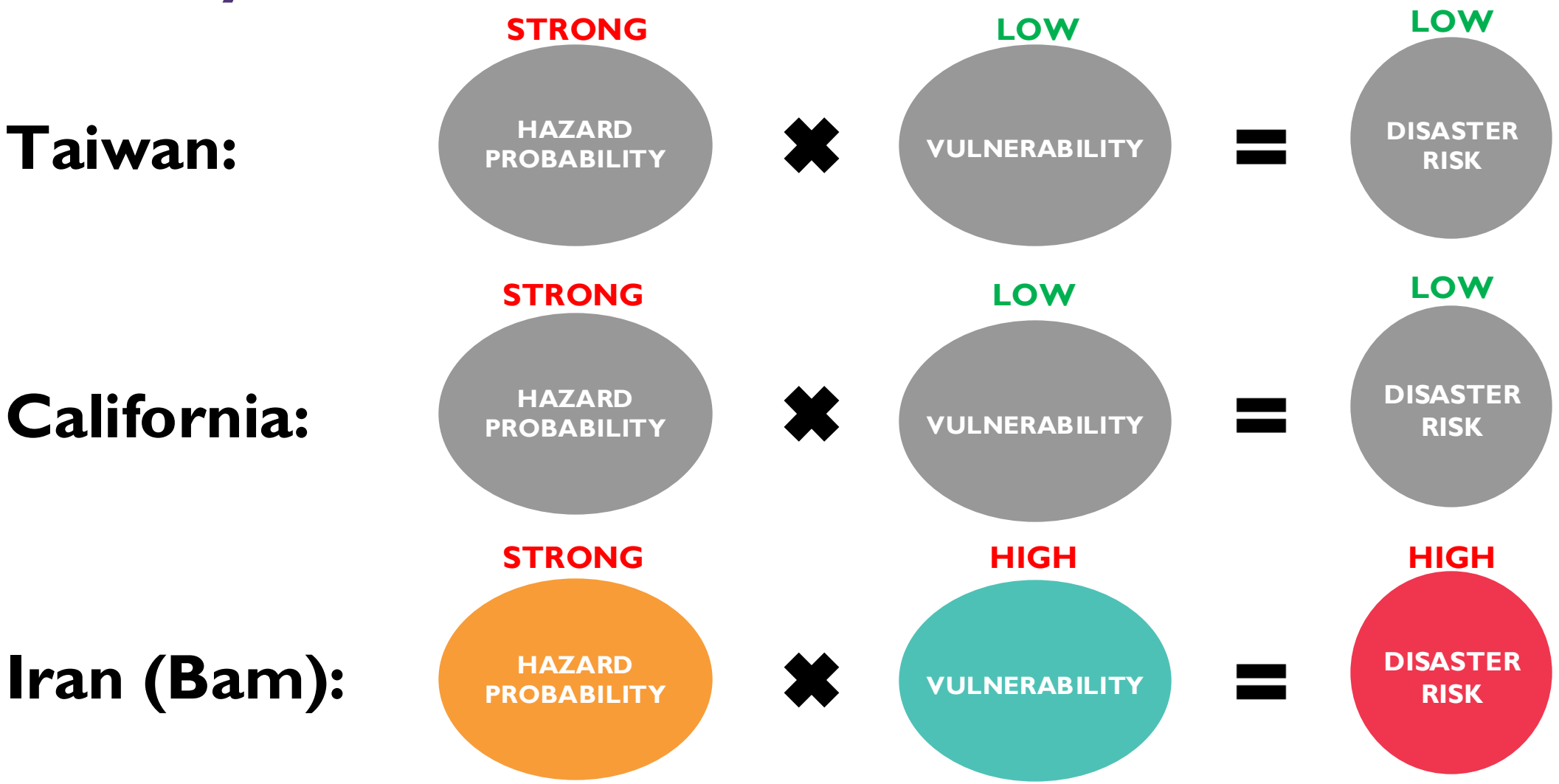
More vulnerable than cities in California or Japan

- 2,000 years without earthquake
- An active fault within the area
- Adequate earthquake-resistant regulations but limited implementation
- Information and training of local authorities on DRM nearly non-existent
- No contingency plan

UN-HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

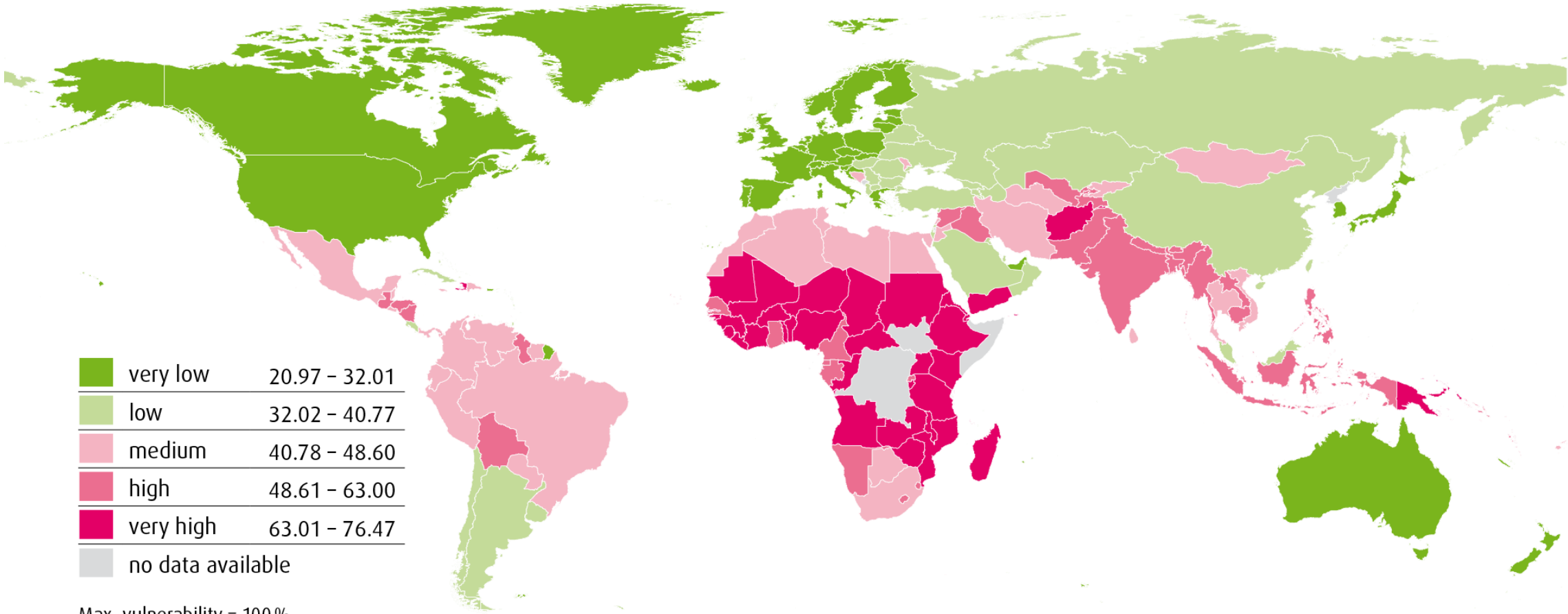
Similar natural hazard but different levels of disaster impacts – why?



UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

Vulnerability



Source The WorldRiskReport 2018

UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

The disaster risk equation

$$\frac{\text{Exposure} \times \text{Sensitivity}}{\text{Capacity}}$$

The Change

"THE CHANGE" is an educational video to raise awareness on adaptation to climate change at the community level and sustainable human settlements.

https://vimeo.com/75911282

Questions

- What does the “machine” represent?
- What is the state of hazard probability and exposure in the movie?
- What is the state of sensitivity to natural hazard of the city and of the community (at the beginning and at the end of the movie)?
- What examples of coping and adaptive capacities is the movie giving?
- What key message does the movie convey?

UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

Urban vulnerability

UN HABITAT
FOR A BETTER URBAN FUTURE

DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience

What makes cities vulnerable?

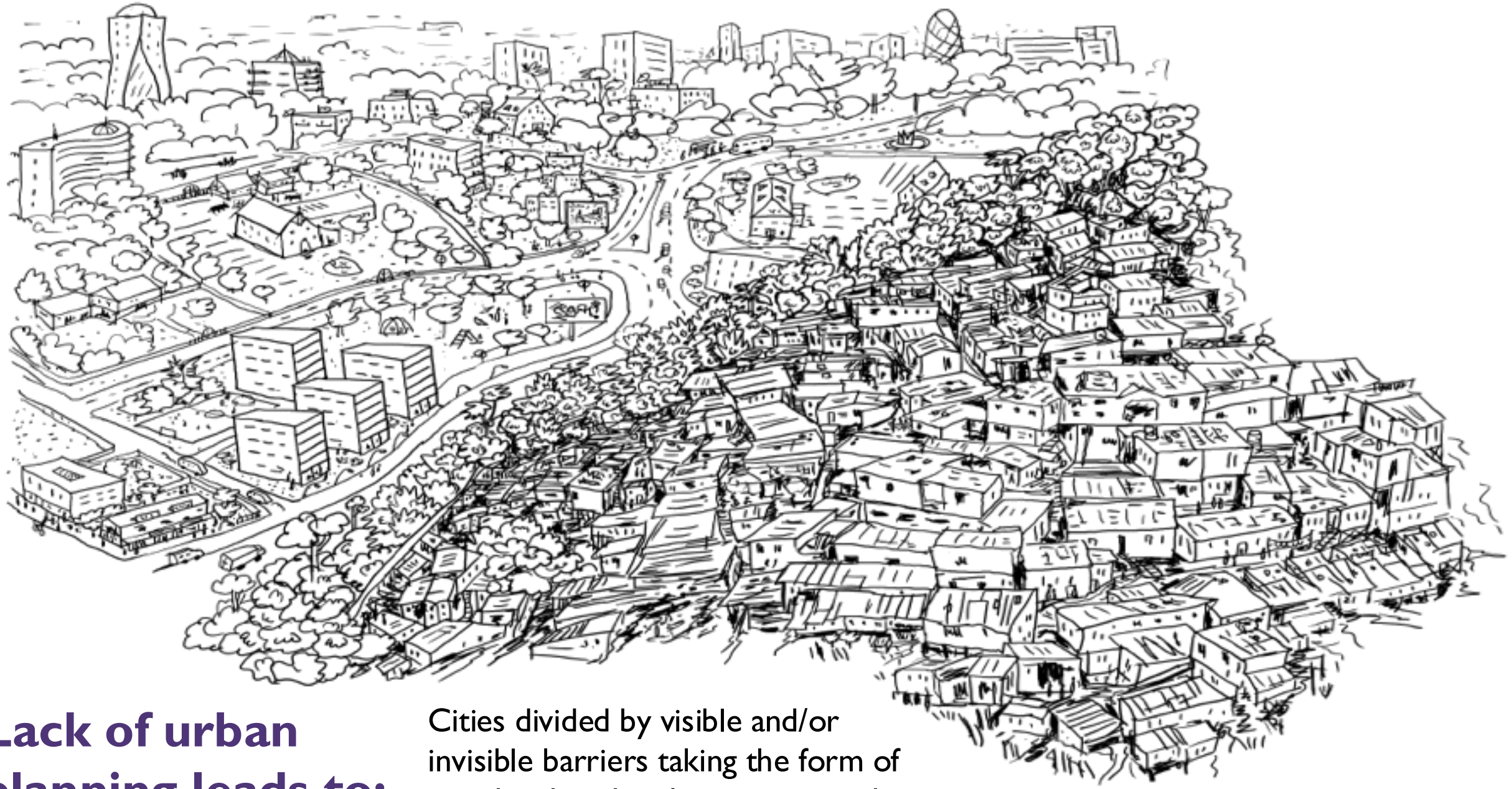
- High concentration of assets, infrastructure and people
- large number of stakeholders - complex governance and coordination aspects
  → When disasters occur in urban areas, the magnitude is much more extreme than in rural areas
- Urban areas are growing around the globe - there is a need to take risks into account in urban planning

UN HABITAT
FOR A BETTER URBAN FUTURE

DiMSUR
Disaster Risk Management, Sustainability and Urban Resilience

Complexity is even higher in urban areas of developing countries:

- the fastest growing urban agglomerations are intermediate size cities in Asia and Africa
- oftentimes lack of financial resources, technical capacity, experience and data to manage this rapid growth
- a lack of efficient enforcement capacity of laws on urban planning (land use zoning, building codes, etc.)



Lack of urban planning leads to:

Cities divided by visible and/or invisible barriers taking the form of social, cultural and economic exclusion.

UN-HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

Unplanned urbanisation and vulnerability

Physical characteristics that make informal settlements especially vulnerable to natural hazards:

- Often situated in high-risk areas (shores, river banks, hillsides, flood plains…)
- High density of population
- Lack of infrastructure and services (roads, water pipes, drainage systems, toilets, waste collection, schools, dispensaries)

UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

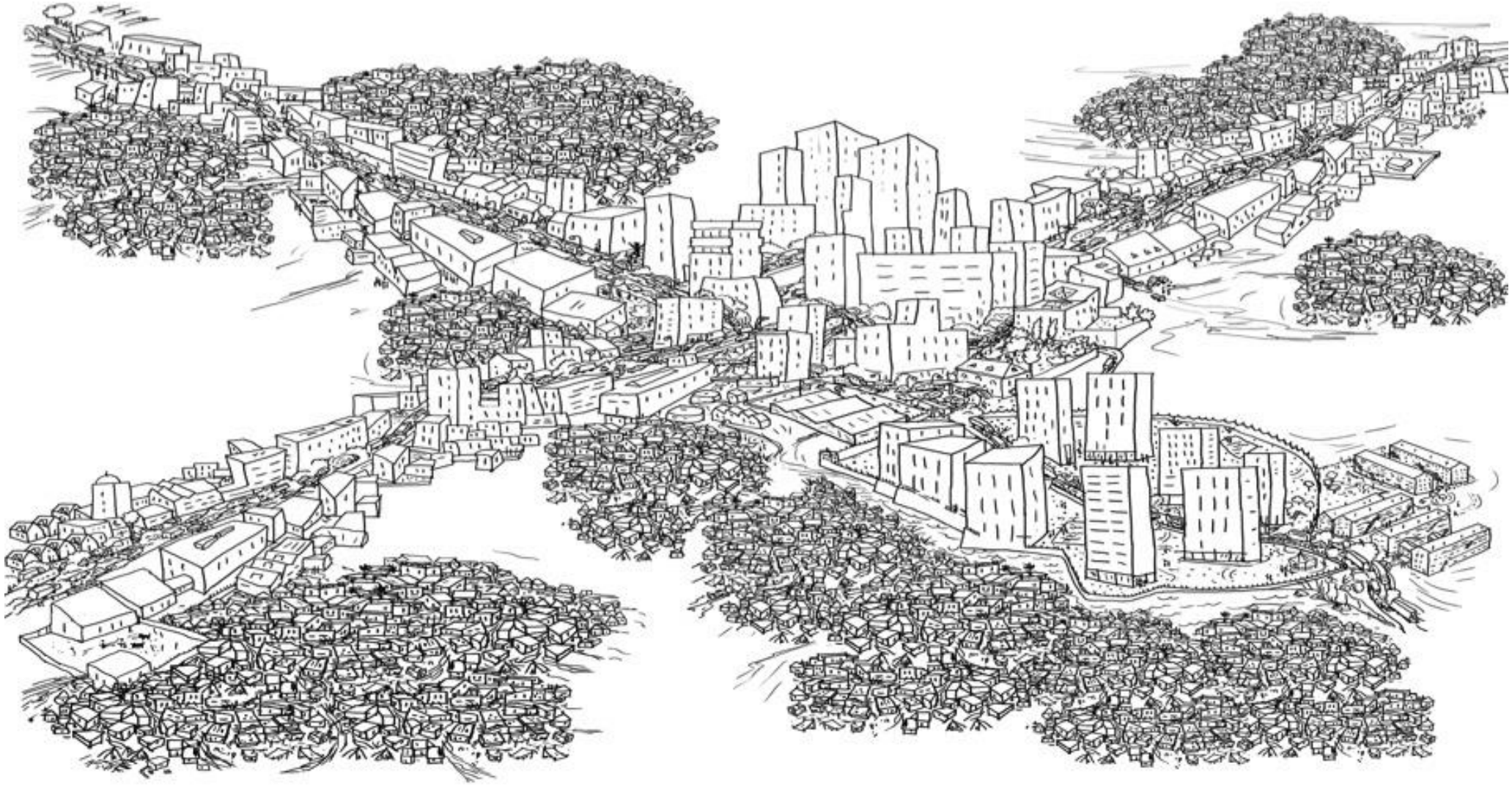
Unplanned urbanisation and vulnerability

Socio-economic characteristics of informal settlements that make their inhabitants especially vulnerable to natural hazards:

- Insecurity of land tenure
- Low level of income, resources and assets
- High unemployment
- Low level of education
- Weak political power
- High violence/crime rates

UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience



Some other results of lack of urban planning

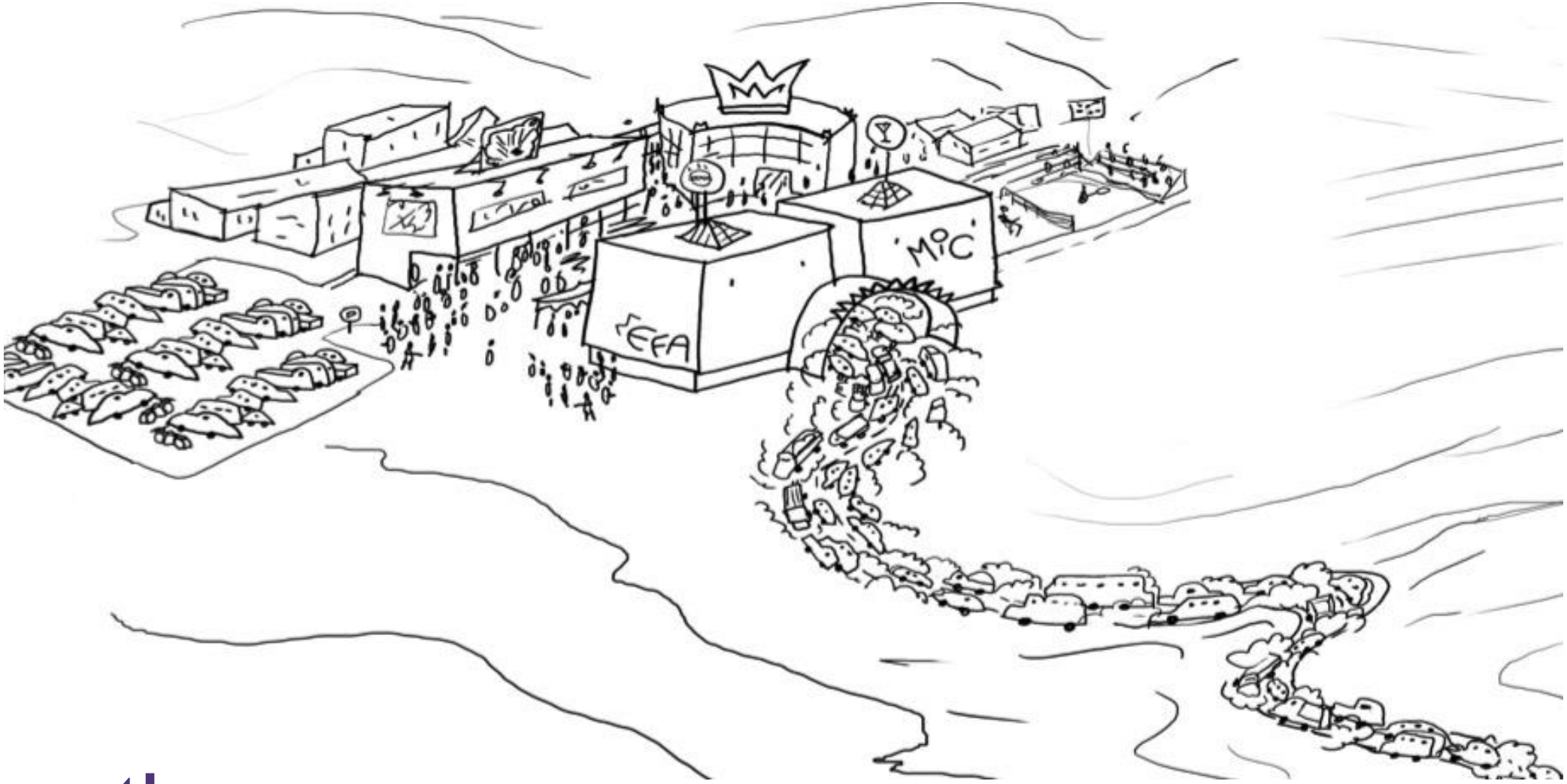
- Marginal settlements appear and multiply around the city centre and the production areas following existing infrastructures
- Everyone going to the city need to cross the centre

UN HABITAT FOR A BETTER URBAN FUTURE

DiMSUR Disaster Risk Management, Sustainability and Urban Resilience

Some other results of lack of urban planning

The city centre becomes a highly congested area with high traffic density



Some other results of lack of urban planning

- Waste of fuel and time to go from one point to an other in the city
- Creation of traffic jam and increasing of pollution

QUESTIONS FOR DISCUSSION

How can we **equip fast growing cities and towns** in the developing world to plan for facing the increasing challenge of shocks and stresses?

How can **planning processes and outputs better** contribute for building resilience and improving people's lives?