





#### Kursi intensiv: Climate and Green Finance Agenda in EU

Climate Change: Global Impact and Mitigation Policies – Part 1

Jean Monnet Module "Promoting knowledge on EU policy in fiscal administration, climate, and energy topics – PRO-Facts"

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or EACEA. Neither the European Union nor the granting authority can be held responsible for them

#### Content:

- 1. Climate and poverty
- 2. Macroeconomic risk
- 3. Risk perception at individual level



Collapse during Turkey earthquake, 1999



A house slides into the Atlantic Ocean in the aftermath of Hurricane Irma, 2017



Forest fires in Portugal, 2017



Search and rescue operations by the Japan Disaster Relief Rescue Team in 2003 after Algeria Earthquake



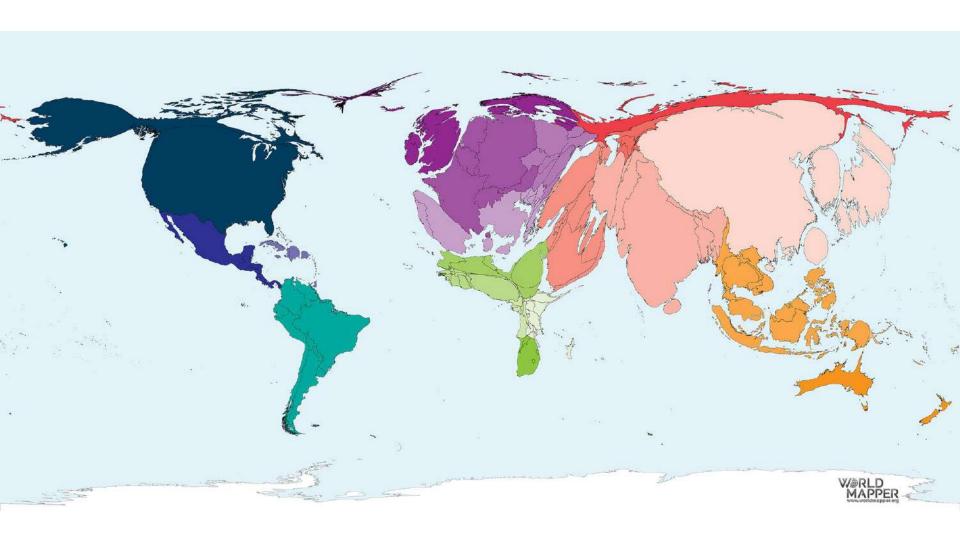
People evacuate using boats in the middle of the city Shkodra flooding, Albania, 2010



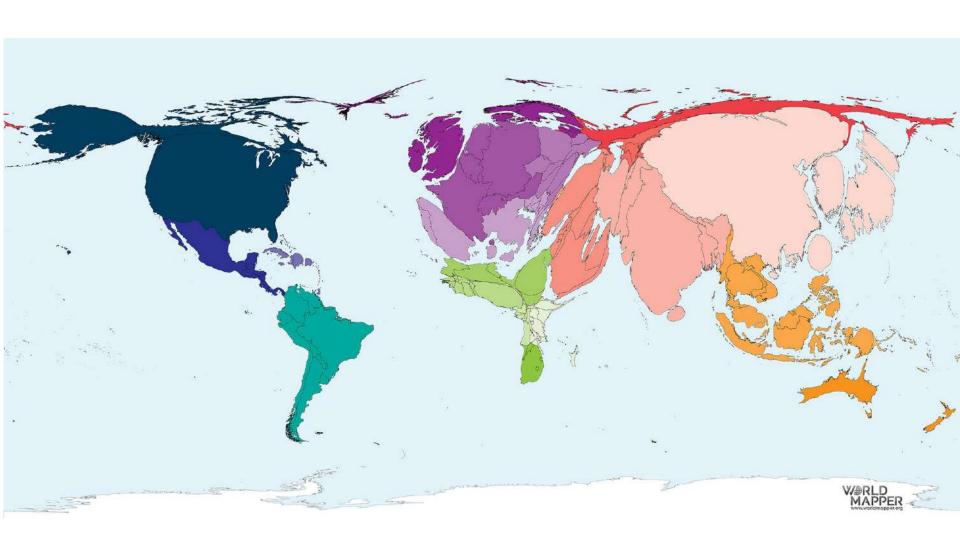
Image from Barbados, Caribbean Islands

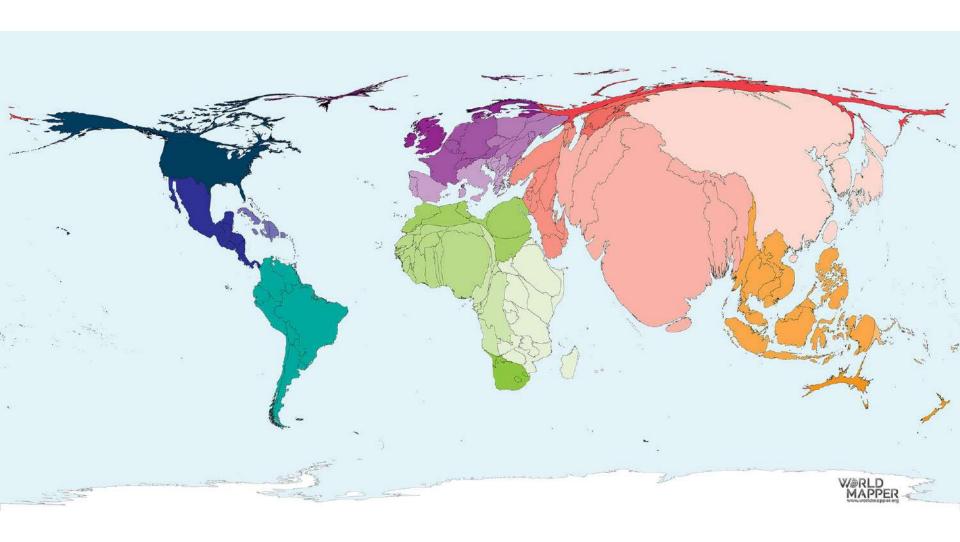




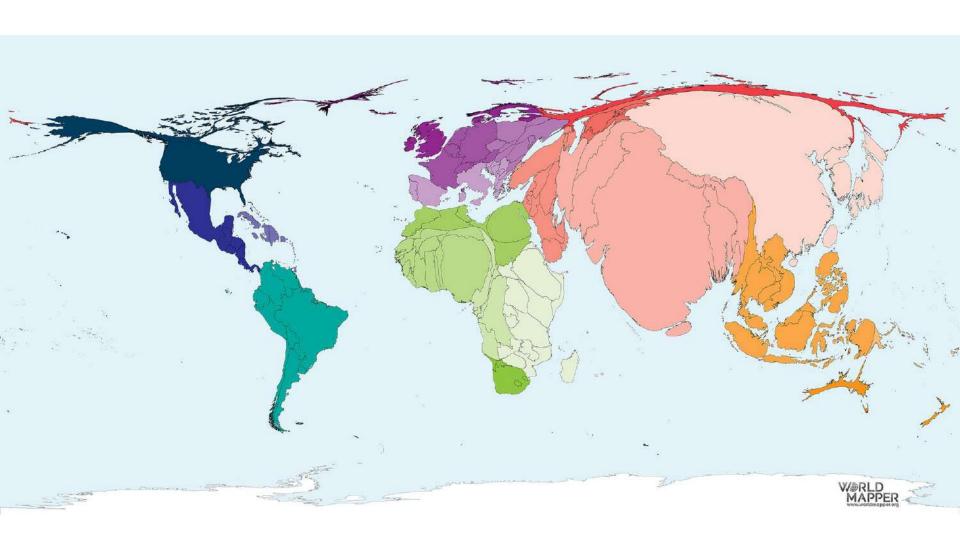


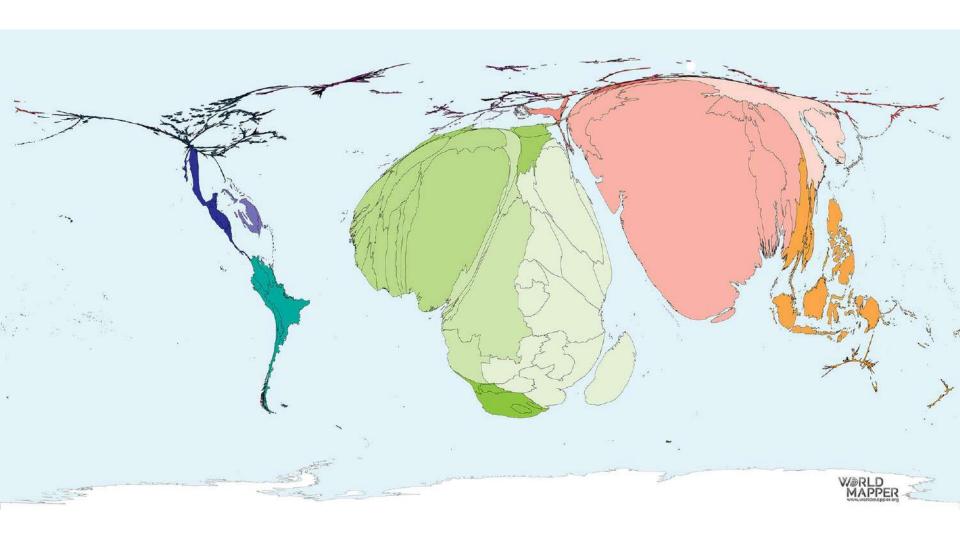
#### World map based on GDP



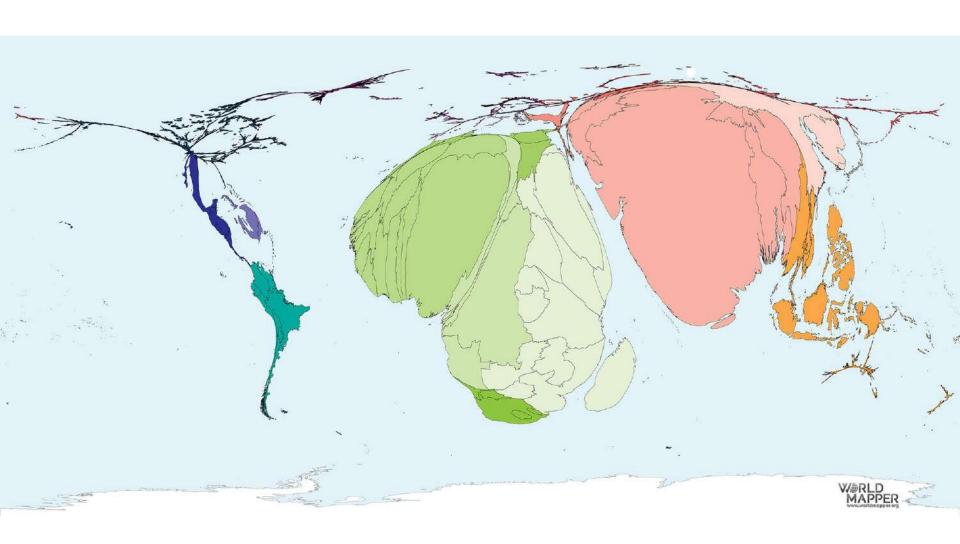


#### World map based on total population

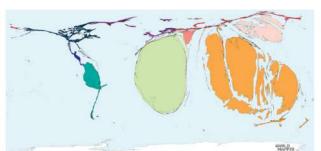




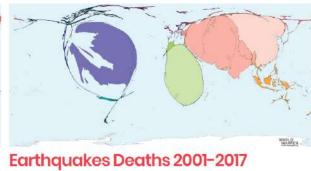
#### World map based on inequality, absolute poverty



## Maps and disasters



Fires Deaths 2000-2017

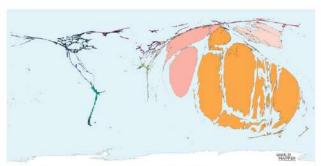


Volcanic Eruptions Deaths 2000-2017

Environment

Environment

Environment







Tsunami Deaths 2001-2017

Environment

Storms 2000-2017

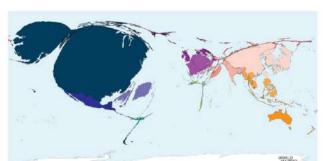
Environment

Tsunamis 2001-2017

Environment

## Maps and disasters







Environment

Environment



Volcanic Eruptions Damages 2000-2017

Environment

Environment

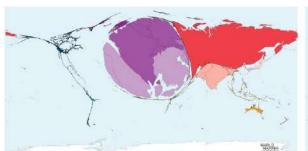


Tsunami Damages 2001-2017

Environment

Environment

## Maps and disasters



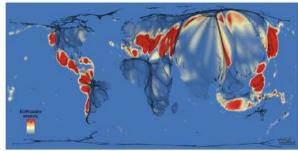
Heatwaves Deaths 2001-2017





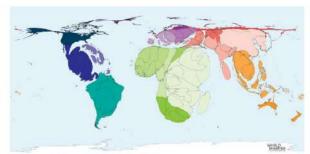
Floods Deaths 2001-2017





Earthquake risk





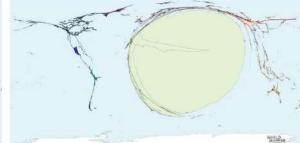
Droughts 2000-2017





Volcanic Eruptions 2000-2017





Drought Deaths 2000-2017

Environment

# | First Part | Disasters and development

## Global challenges

Climate

dilemma

550/450/350

Human growth 20/80 dilemma



Ecosystems 60 % loss dilemma

Surprise 99/1 dilemma

## Disaster and poverty

- Exposure to disasters do not depend on economic development
- Disaster consequences are much higher in developing countries
  - Impact to GDP (relative weight)
  - Number of people killed
  - Damage to infrastructure
  - Resilience
- The level of inequality is even greater because of underreporting





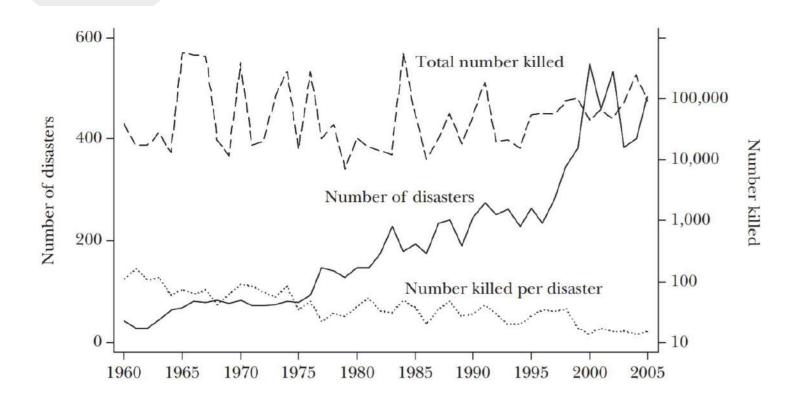
#### Disaster in numbers

- 1900-2015
  - More than \$7 trillion damage
  - 8 million people died
- Damage in absolute terms (1997-2018)
  - USA (US\$ 945 billion from 482)
  - China (US\$ 492 billion from 577)
- Geographic distribution
  - Asia highest number of disasters
  - Africa highest death rate in relation to population
- Type of disasters
  - Floods
  - Storms and hurricanes
  - Earthquakes
  - Tsunamis, Volcanoos





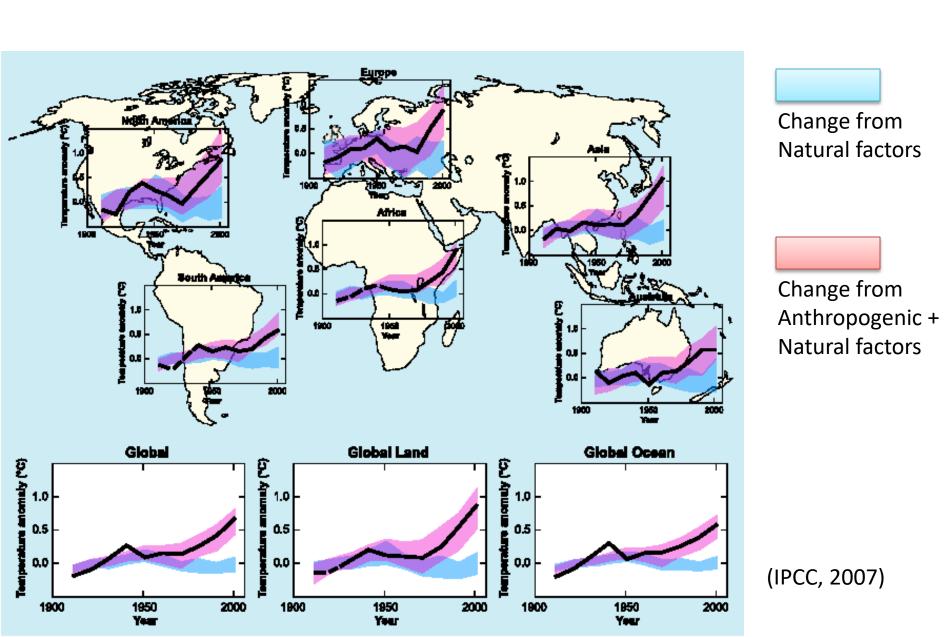
#### Disasters in numbers



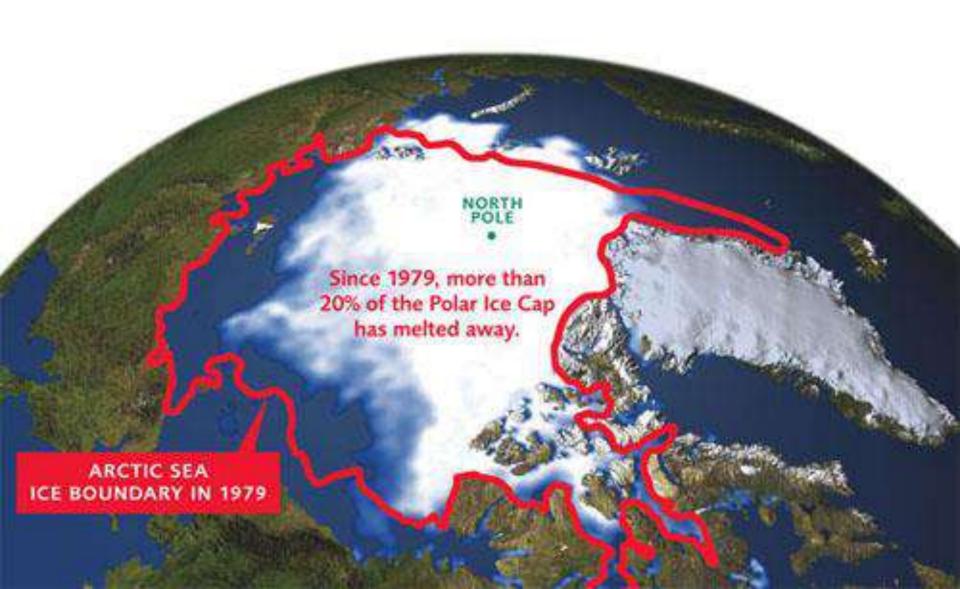




## **Evidence on climate change**



## **Evidence on climate change**

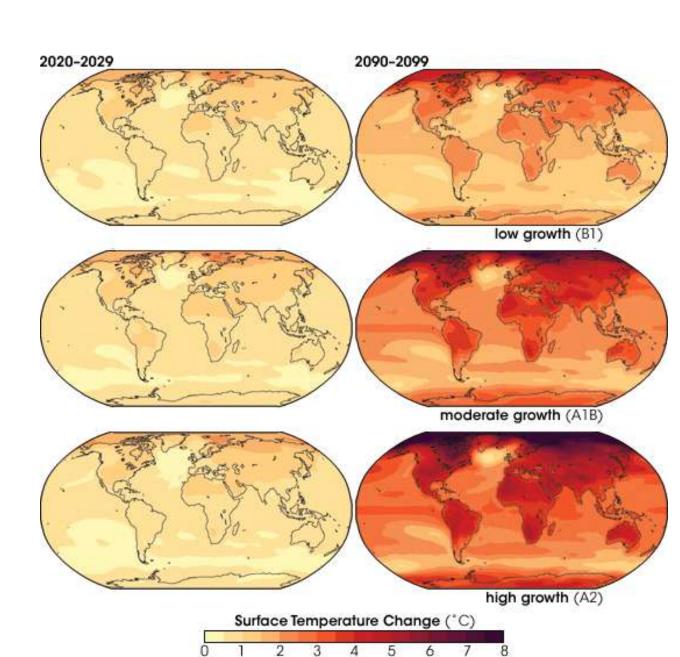


### **Projections of future changes in climate**

Projected warming in 21st century expected to be

greatest over land and at most high northern latitudes

and least over the Southern ocean and parts of the North Atlantic Ocean



## Climate change impacts

- Increase of weather disasters
- Public water supply and drinking water
- Biodiversity loss
- Agricultural production
- Forestry yield
- Energy for heating and cooling
- Tourism and recreation
- Health





## Disasters and climate change

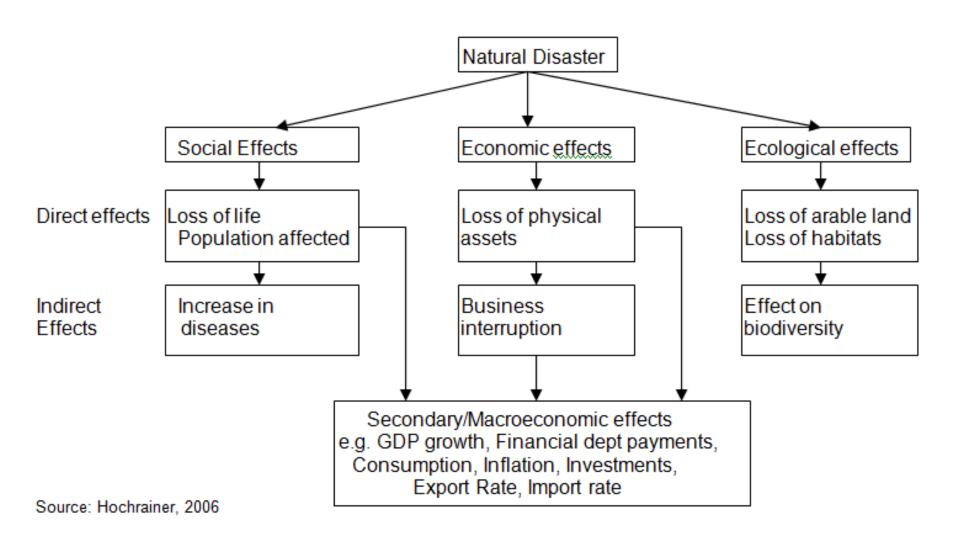
- Climate change affects disaster risk and development in two ways:
  - short-term climate variability and its extremes
  - longer-term variability
- Climate change action and disaster risk management practices not in the same agenda
- Climate change action
  - Mitigation
  - Adaptation





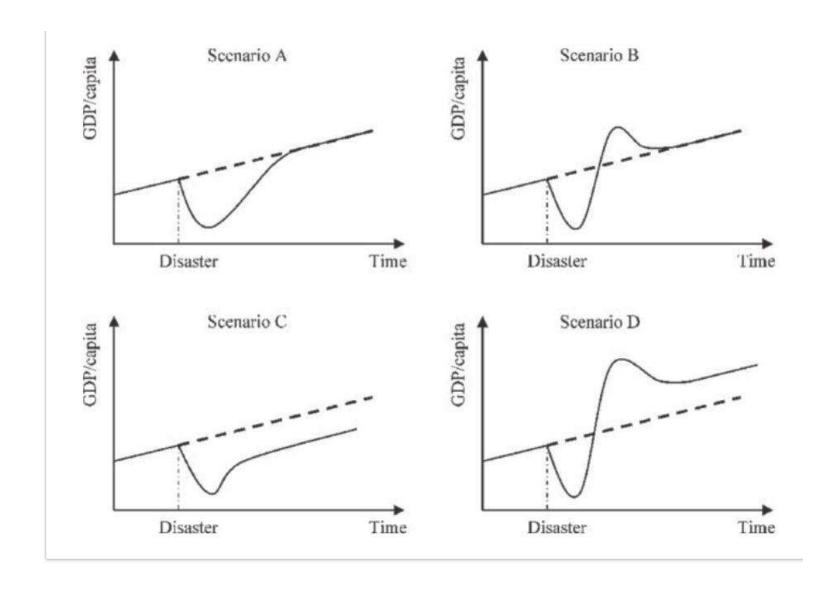
## | Second Part | | Second Part | | Second Part | | Second Part | Second P

### Macroeconomic risk of natural disasters



Macroeconomic Indicator	Expected change
GDP	Immediately drop in GDP growth in the year of the event Rise in GDP growth in the year after the event Slowdown in second and/or third year
Agricultural sector	Significant fall in production
Manufacture Sector	Decrease in activity due to disruption of transportation, reduced production capacities
Service Sector	Decrease in activity due to disruption of transportation and payment system
Exports of goods	Reduction in the rate of growth in the year of the event In the year after return to the previous levels In subsequent years continuation of the year after
Imports of Goods	Considerable increase in the rate of growth in the event year A return to pre-disaster level a year after In subsequent years a further drop, possibly caused by reducing incomes
Gross Formation of Fixed Capital	Sharp increase in the year following the disaster
Inflation rate	Short increase caused by the disruption of production and distribution and increasing transportation costs
Public financing	Worsening of deficit due to a shortfall in tax revenues and increase of public expenditures
Trade balance	Deficit due to decrease in exports and an increase in imports, associated with the decline in production capacities and strong public and private investments for reconstruction

## GDP Scenarios in case of disasters



## | Third Part | Disasters and risk perception

### Overview

Risk communication is a social process by which people are informed of the dangers, their behavior is influenced by information and they are given the opportunity to participate in decision-making about risk issues in an informed manner

Morgan, M., Fischhoff, B., Bostrom, A., & Atman, C. (2001)

Risk perception can be considered as an interpretation or understanding that the individual gives to particular threats that could potentially cause loss of life or property

UNISDR. (May 2009)





## Risk perception and factors related to it

- Risk factors
  - Related to experience with past disaster events
- Information factors
  - Related to public trust and risk communication
- Personal factors
  - Related to demographic factors in line with risk theory
- Context factors
  - Related to household and income conditions





## Risk communication

- Any population exposed to natural dangers wish and should be optimally informed about the risk characteristics, preventive measures and appropriate behaviors during emergencies.
- Authorities should devise appropriate planning, prepare coping strategies, and effectively communicate information to residents, people in the workplace, and communities as a whole.
- Better response to natural disasters requires active involvement of residents, which should have been informed and taught about the dangers they are facing
- Public discussion, stakeholder participation and perhaps joint resolution of conflicts are needed
- Risk communication is perceived as a necessary link between perception of risk and its management.
- Communication programs should be based on a sound understanding of individuals' sociopsychology











Thank you