

M U N I
S C I

ZA311 Environmental geography

Scope of environmental geography

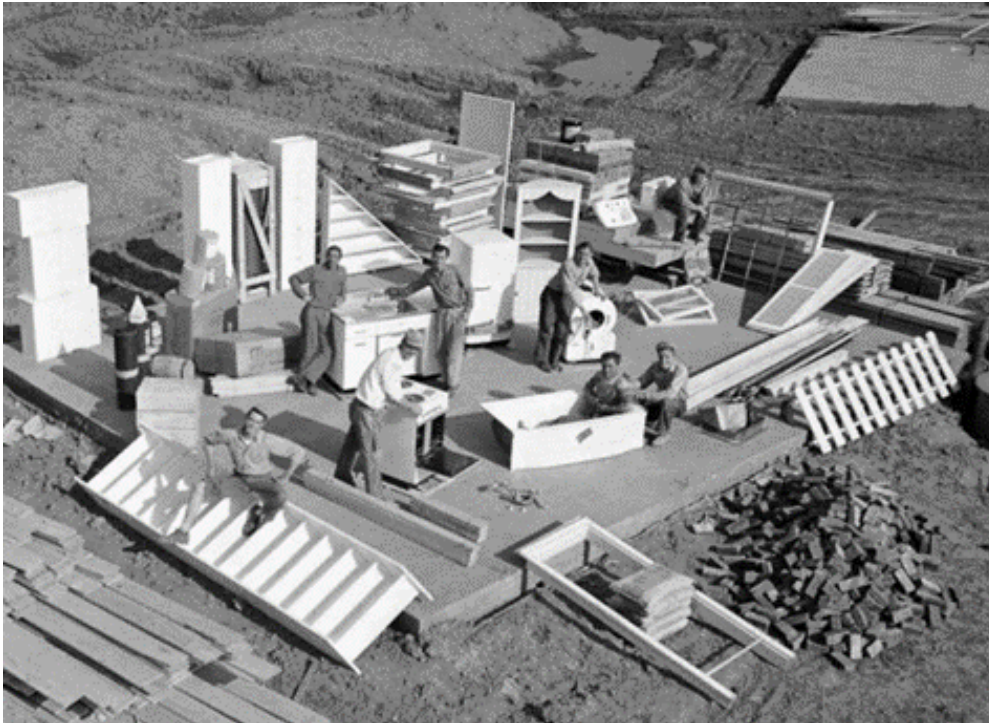
Zdeněk Máčka / Department of Geography

What is the environment?

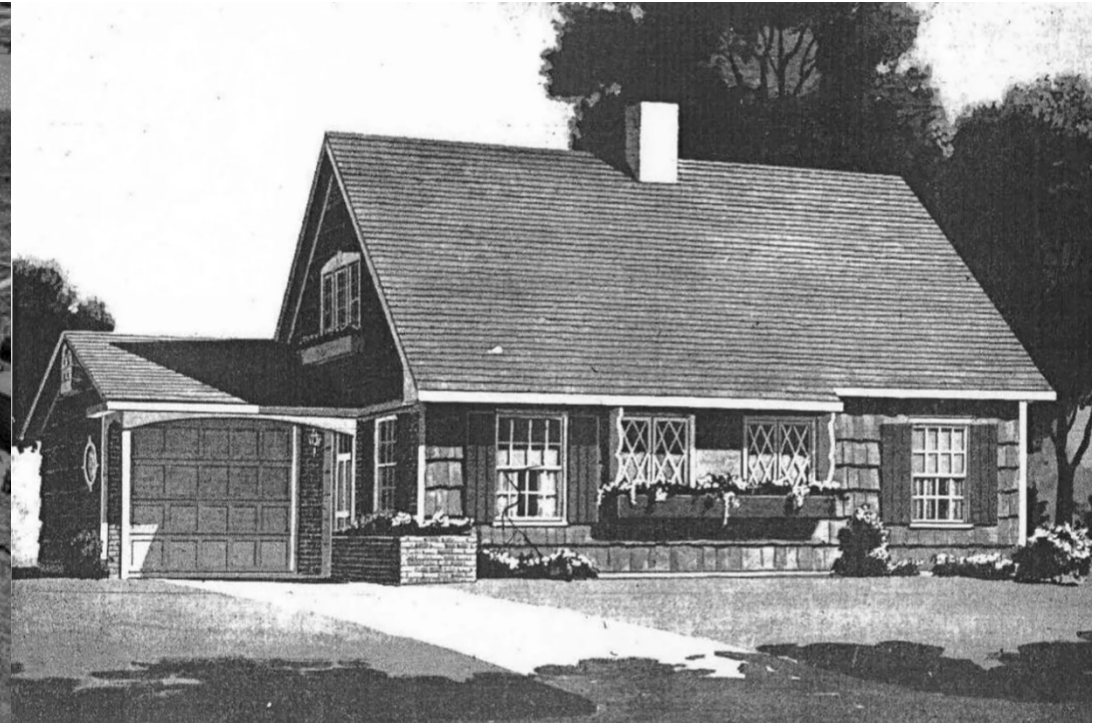
- The word comes from the French “environner”, i.e. to surround
- On a planetary scale, the environment is the multitude of living and nonliving things on Earth that sustain life, including our own
- On an individual scale, the environment is that part of the Earth with which a living organism constantly interacts, that is, which it uses, changes and has to adapt to
- The environment is a collection of systems

What is an (eco)system

- The environment is a collection of systems



This is not a system



This is a (functional) system

“The whole is greater than the sum of its parts”

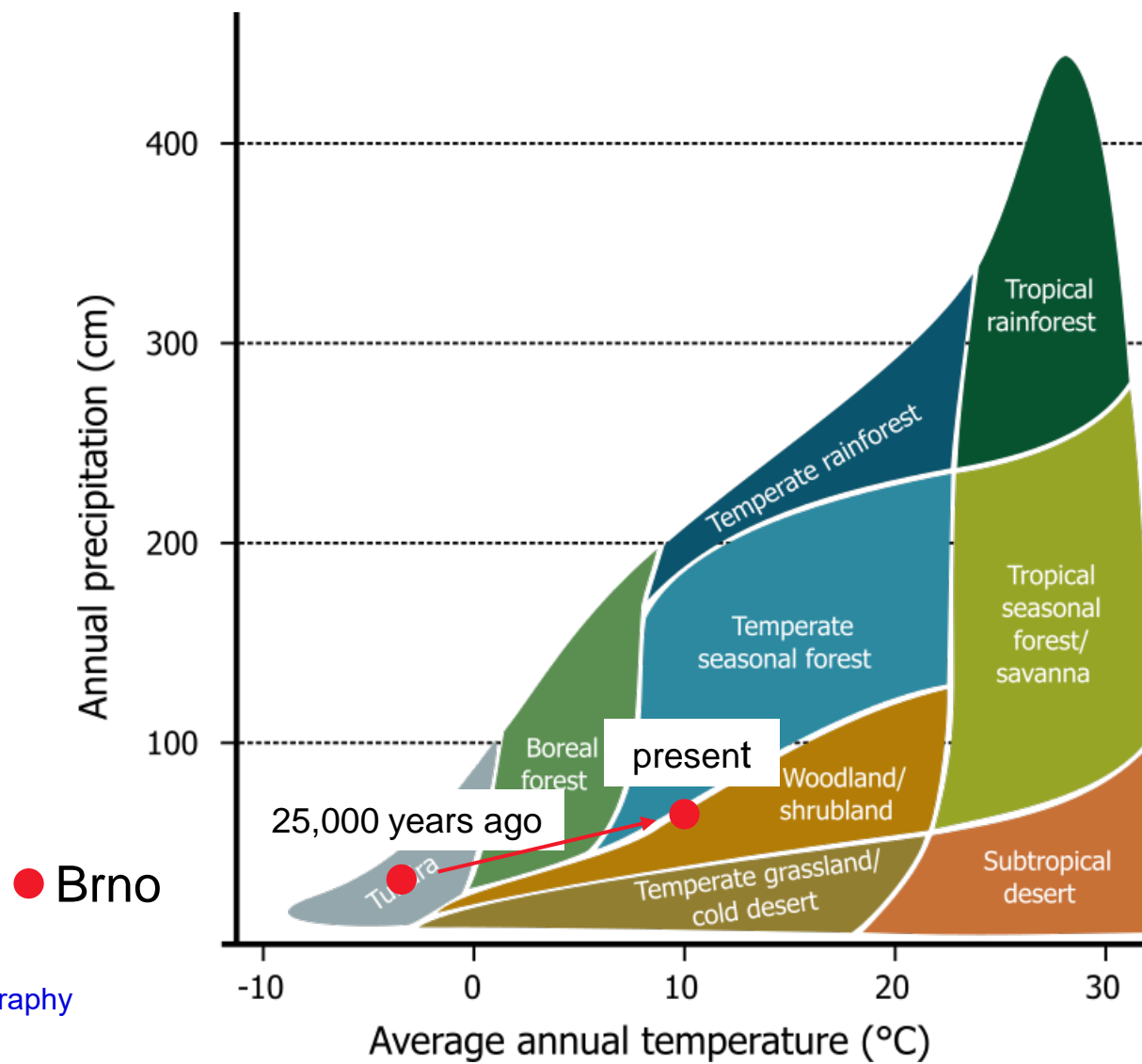
(Eco)system

– System

- A system consists of components that interact to produce patterns of behaviour over a period of time
 - The interactions among the components of a system produce results that each component could not achieve on its own
- Ecosystem = a community of life and the physical environment with which it interacts

Example

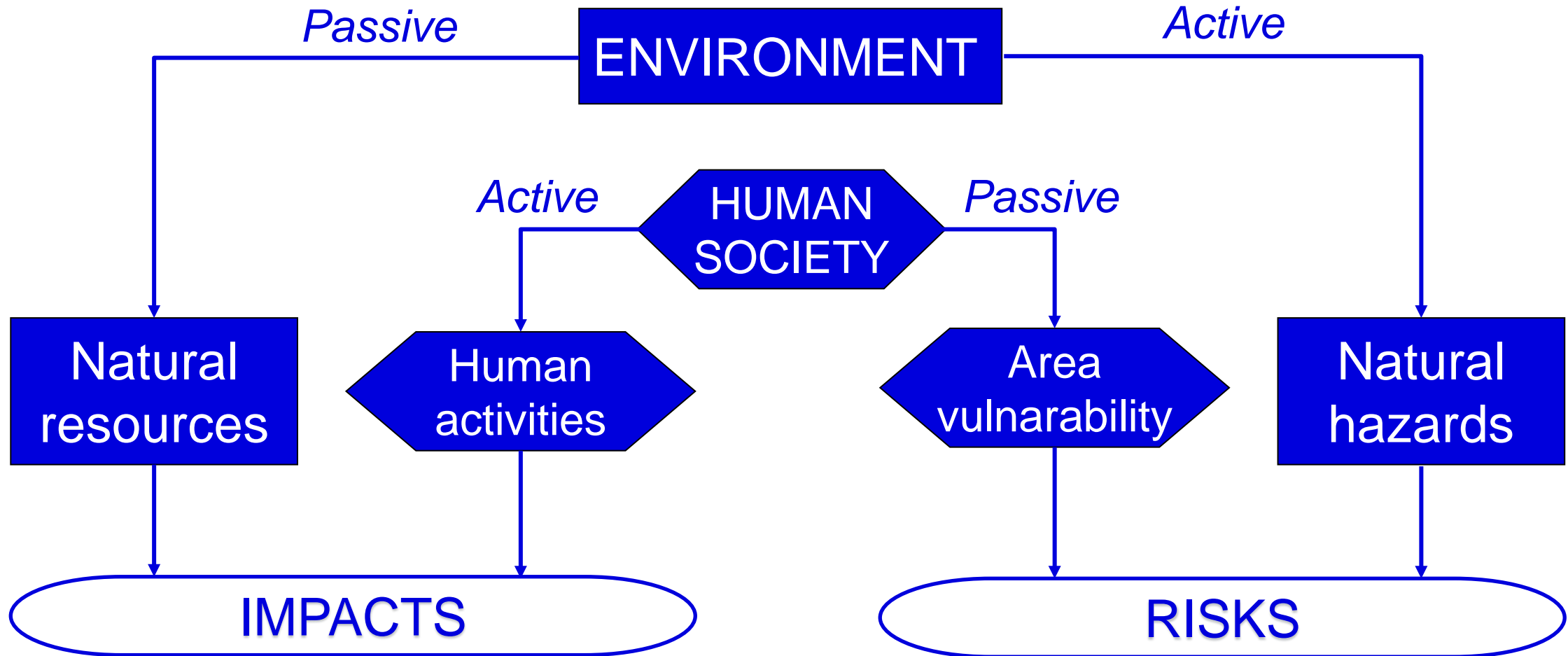
Biomes – ecosystems of continental scale



What is environmental geography?

Environmental geography is a branch of geography that describes the interactions between people and nature from a spatial perspective

Scope of environmental geography



Panizza (1996)

Scope of environmental geography – impact and risk

IMPACT



Natural bridge = resource

Heavy car traffic = human activity (use)

Bridge collapse = impact

RISK



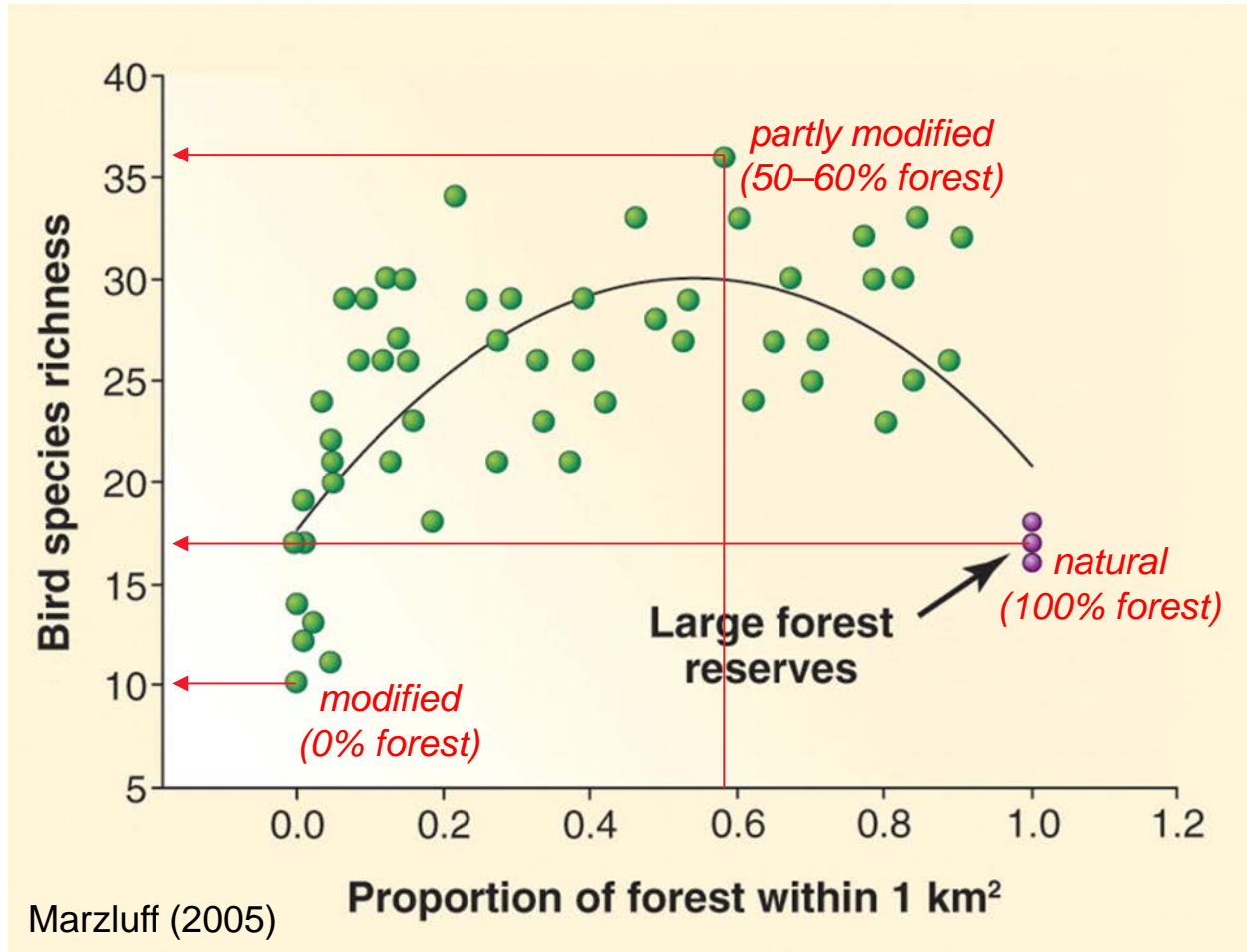
Diablo bridge,
Santander,
Spain

Natural bridge = hazard

A person in a car = vulnerability

Bridge collapse = risk

Example Impact



Changes in the richness of bird species in the human-influenced landscape of the Puget Sound region (Washington, USA) with progressively more forest (i.e., less human settlement)

- Bird richness peaks when 50 to 60% of the land is forested
- The mosaic of forest and non-forest patches supports higher habitat (and species) diversity than forest alone

Example Risk

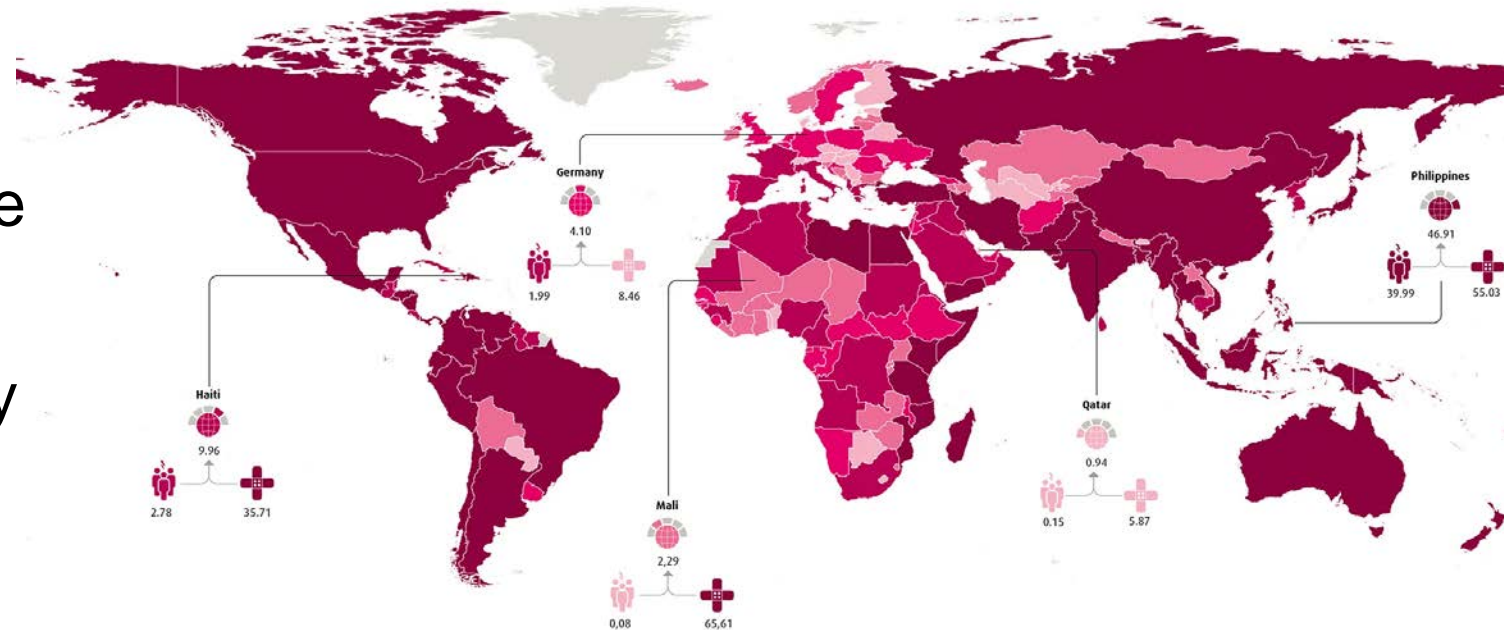
The WorldRiskIndex (WRI) indicates the disaster risk from extreme natural events and negative climate change impacts for 193 countries in the world



WorldRiskIndex 2024



The Americas:
high risk and exposure
Africa:
hotspot of vulnerability



WorldRiskIndex	Exposure	Vulnerability
very low: 0.00 - 1.84	very low: 0.00 - 0.17	very low: 0.00 - 9.90
low: 1.85 - 3.20	low: 0.18 - 0.56	low: 9.91 - 15.87
medium: 3.21 - 5.87	medium: 0.57 - 1.76	medium: 15.88 - 24.43
high: 5.88 - 12.88	high: 1.77 - 7.78	high: 24.44 - 33.01
very high: 12.89 - 100.00	very high: 7.79 - 100.00	very high: 33.02 - 100.00
no data	no data	no data

Top 10 countries with highest risk	
1. Philippines	46.91
2. Indonesia	41.13
3. India	40.06
4. Colombia	37.81
5. Mexico	35.93
6. Myanmar	35.85
7. Mozambique	34.44
8. Russian Federation	28.12
9. Bangladesh	27.73
10. Pakistan	27.02

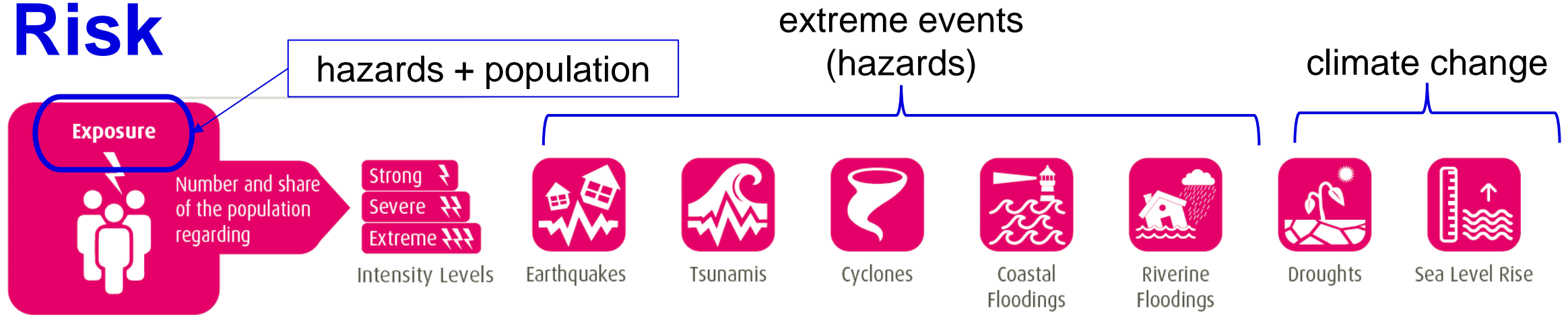
Top 10 countries with highest exposure	
1. China	64.59
2. Mexico	50.08
3. Japan	43.67
4. Philippines	39.99
5. Indonesia	39.89
6. United States of America	39.59
7. India	35.99
8. Colombia	31.54
9. Australia	31.21
10. Russian Federation	28.35

Top 10 countries with highest vulnerability	
1. Central African Republic	73.86
2. South Sudan	72.39
3. Chad	71.82
4. Democratic Republic of Congo	71.04
5. Somalia	71.02
6. Afghanistan	67.77
7. Niger	66.48
8. Nigeria	65.88
9. Ethiopia	65.69
10. Yemen	65.64

Since 2022, the WorldRiskIndex and its elements will use fixed thresholds for the classification of countries to enable medium- and long-term trends analyses. These threshold values for the WorldRiskIndex and each dimension were calculated as the median of the quartiles from the results of the last 20 years. The aggregation of values across all levels of the WorldRiskIndex model is always based on unweighted geometric mean values.
Data sources: IFHV's own calculation based on ChES, EM-DAT FAO, GFDRR, IHME, IDMC, JRC, IMA, ILO, UCDP, UNISQ, UNHCR, UNSDR, WHO, WorldBank, WorldPop, WID, detailed information at www.WorldRiskReport.org.

Example Risk

How is the WorldRiskIndex calculated?



$$\text{WorldRiskIndex} = \text{Exposure} \times \text{Vulnerability}$$

