

School of Civil and Environmental Engineering

# Global Condition and Exigent Duties

## *water security and beyond*

Water Security Issues in the Himalayan Region and Assessment Tools: APN funded Academy 2022

Dr. André Lindner

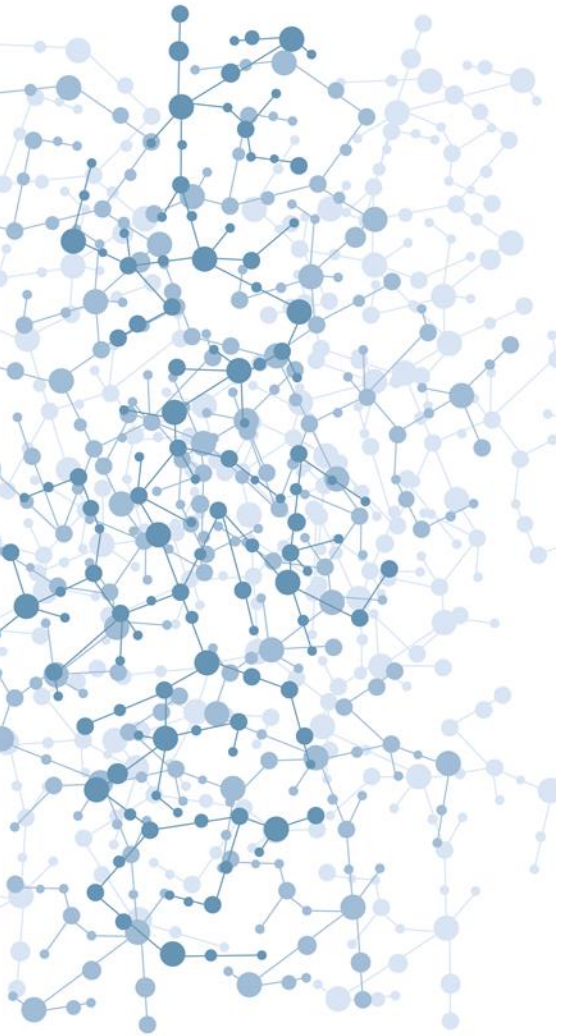
[andre.lindner@tu-dresden.de](mailto:andre.lindner@tu-dresden.de)

[+49 351 463-34899](tel:+4935146334899)

*"See first, think later, then test. But always see first.  
Otherwise, you will only see what you were expecting"*

*Douglas Adams*

*“Climate change is one of the key multidimensional issues that will affect water security throughout the Asian region [...] it is commonly noted that mitigation is largely about “gas,” while adaptation is about “water.”*”



© CTN News, Chiang Rai Times

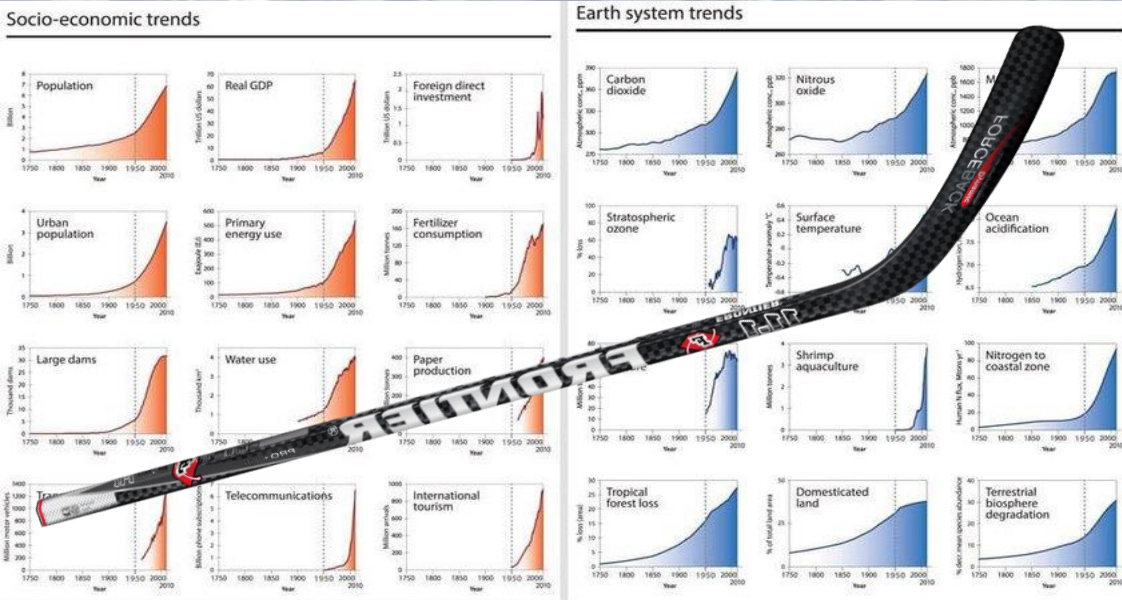


*“Ecosystems transcend political borders, and water is the lifeline for all biological systems [...] attempts to contain water by geographies are bound to have serious consequences on the natural system and also increase economic and political tensions.”*



# Big Planet – Small World

# Small Planet – Big World



Updated Great Acceleration Graphs

Source: Will Steffen et al. "The trajectory of the Anthropocene: The Great Acceleration." The Anthropocene Review, March 2015

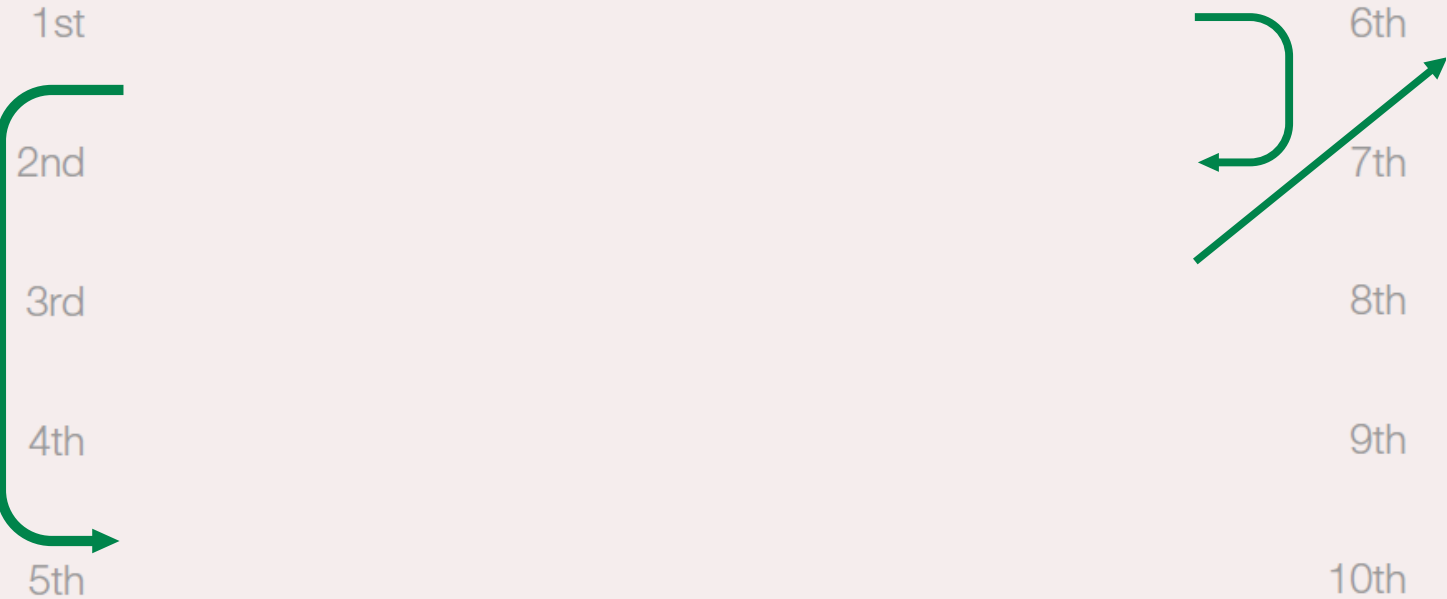


water security

# “Identify the most severe risks on a global scale over the next 10 years”

→ COVID, Ebola, Zika, SARS, HIV – all caused by **zoonoses**  
 → drivers: land-use change, agriculture, trade & consumption  
 → at least **630.000** viruses **with human-pathogenic** potential  
 → **>1 trillion USD** damage vs **30 billion USD** prevention costs

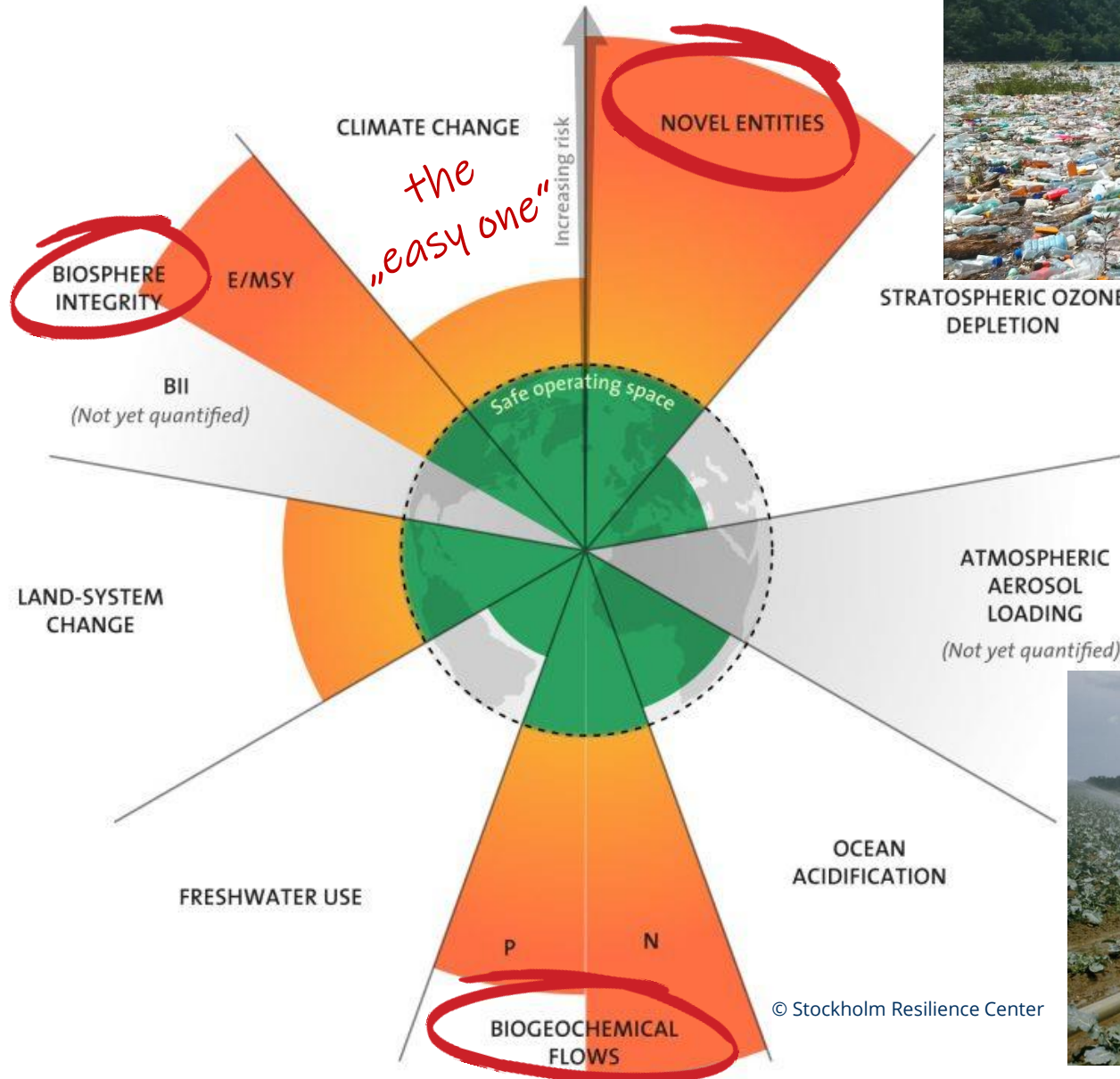
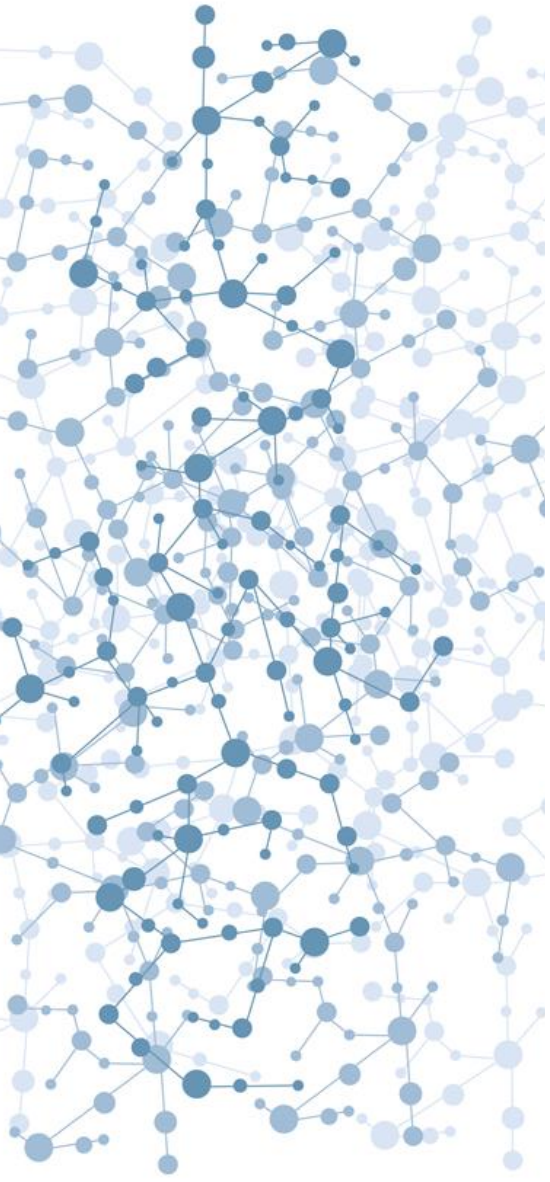
■ Economic  
 ■ Environmental  
 ■ Geopolitical  
 ■ Societal  
 ■ Technological



Source: World Economic Forum Global Risks Perception Survey 2021-2022



# Planetary Boundaries



© Stockholm Resilience Center





# Global Centres

Deutscher Akademischer Austauschdienst  
German Academic Exchange Service



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



1 NO POVERTY



7 AFFORDABLE AND CLEAN ENERGY



11 SUSTAINABLE CITIES AND COMMUNITIES



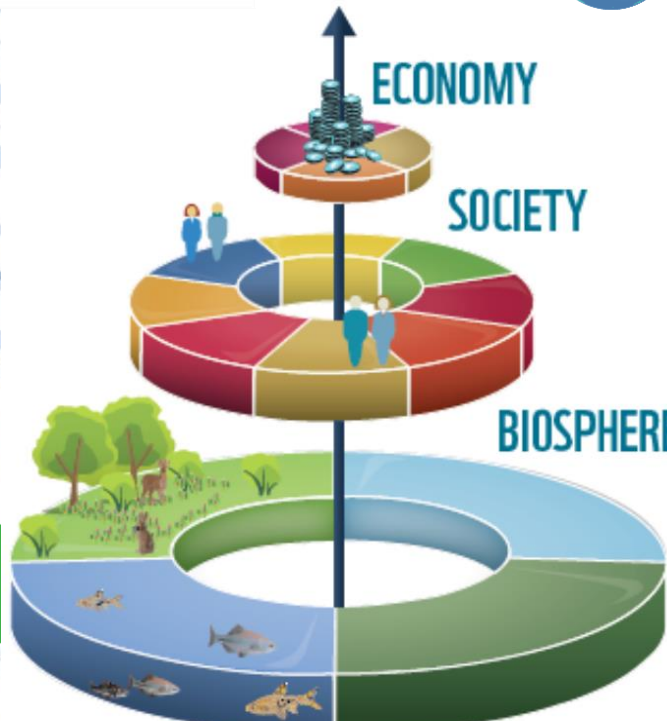
16 PEACE, JUSTICE AND STRONG INSTITUTIONS



14 LIFE BELOW WATER



15 LIFE ON LAND



© Stockholm Resilience Center

# SUSTAINABLE DEVELOPMENT GOALS



10 REDUCED INEQUALITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



2 ZERO HUNGER



5 GENDER EQUALITY



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



13 CLIMATE ACTION



6 CLEAN WATER AND SANITATION



## ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

### BEFORE COVID-19

DESPITE PROGRESS, **BILLIONS STILL LACK** WATER AND SANITATION SERVICES



**2.2 BILLION PEOPLE** LACK SAFELY MANAGED DRINKING WATER [2017]



**4.2 BILLION PEOPLE** LACK SAFELY MANAGED SANITATION [2017]



**TWO IN FIVE** HEALTH CARE FACILITIES WORLDWIDE HAVE **NO** SOAP AND WATER OR ALCOHOL-BASED HAND RUB [2016]



### COVID-19 IMPLICATIONS



**3 BILLION PEOPLE WORLDWIDE** LACK BASIC HANDWASHING FACILITIES AT HOME  
↓ ↓ ↓  
THE MOST EFFECTIVE METHOD FOR COVID-19 PREVENTION



**WATER SCARCITY** COULD DISPLACE **700 MILLION PEOPLE** BY 2030



SOME COUNTRIES EXPERIENCE A FUNDING GAP OF **61%** FOR ACHIEVING WATER AND SANITATION TARGETS

© UN Water

°C

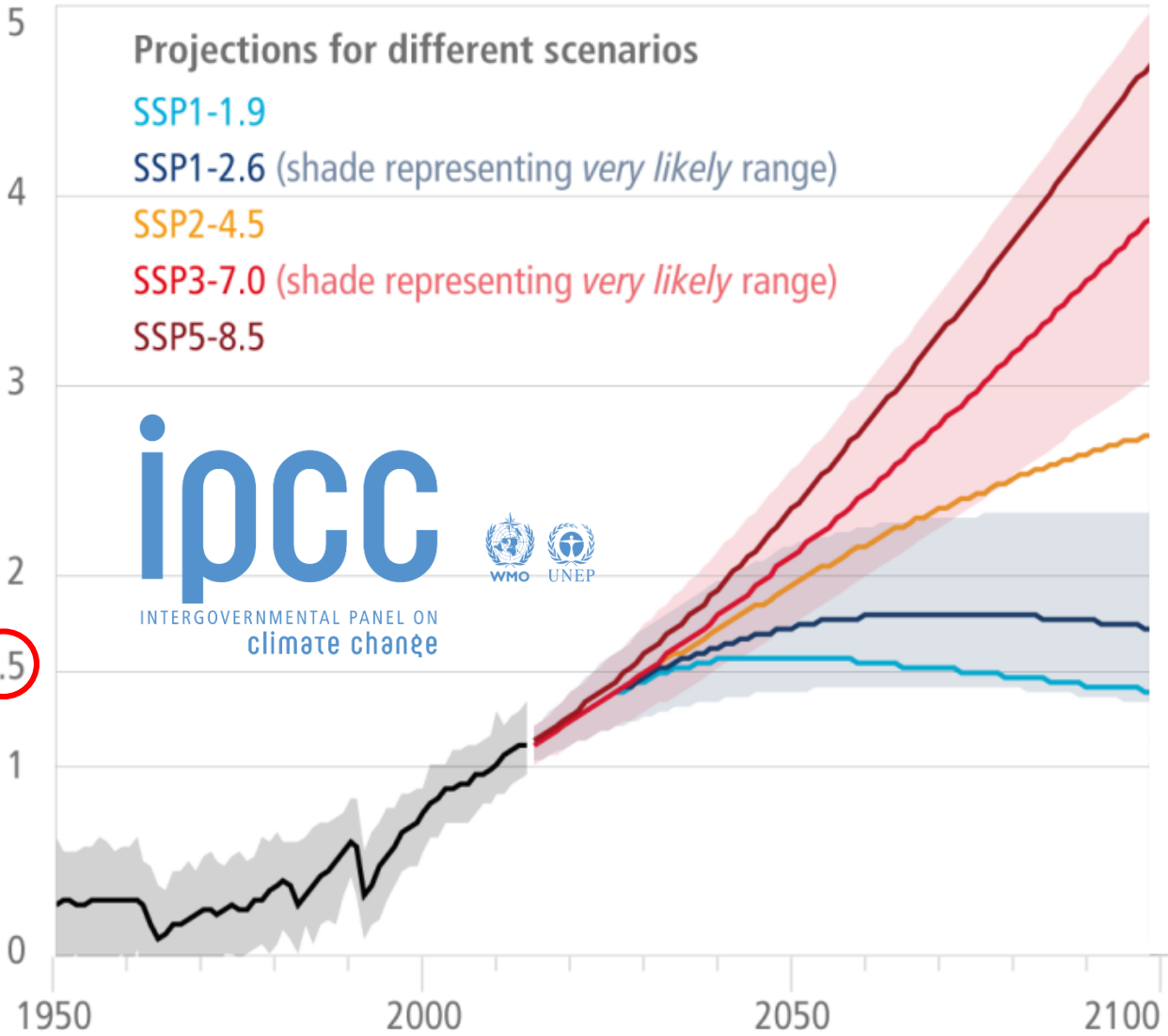
### Projections for different scenarios

- SSP1-1.9
- SSP1-2.6 (shade representing *very likely* range)
- SSP2-4.5
- SSP3-7.0 (shade representing *very likely* range)
- SSP5-8.5

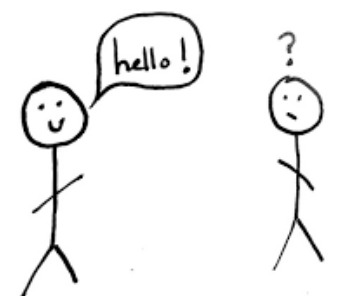
**ipcc**  
 INTERGOVERNMENTAL PANEL ON  
 climate change



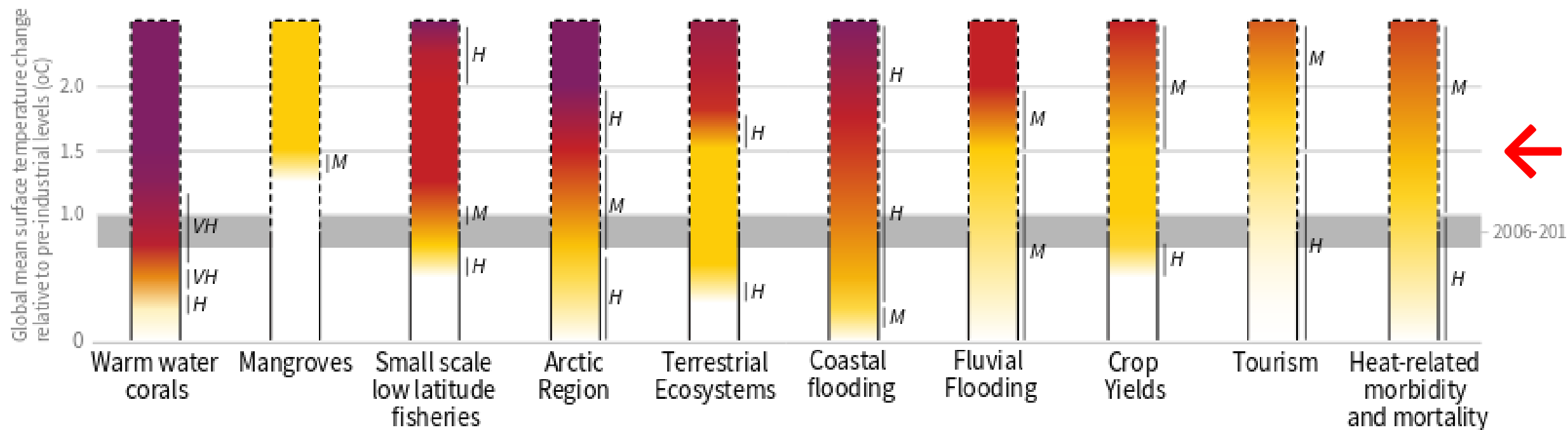
1.5



IPCC 6<sup>th</sup> Assessment Report, Working Group II, 2022



# Impacts and risks for selected natural, managed and human systems



Confidence level for transition: L=Low, M=Medium, H=High and VH=Very high





A working paper for the G20



# Smart, Sustainable and Resilient cities: the Power of Nature-based Solutions



# research oriented and applicable approach



**Water Security & Water Resources Management**

**Ecosystem Resilience and Nature-Based Adaptation**

**Transfer Strategies for Climate Adaptation**



**SUSTAINABLE DEVELOPMENT GOALS**







## 78<sup>th</sup> UNEP/UNESCO/BMU International Short Course on Soil and Land Resources for Sustainable Development



# CIPSEM

[www.tu-dresden.de/cipseu](http://www.tu-dresden.de/cipseu)



since the last 45 years

UNEP/UNESCO/BMUV International Postgraduate Course Programme

## Environmental Management for Developing Countries



1977

2022



United Nations  
Environment Programme



United Nations  
Educational, Scientific and  
Cultural Organization



Federal Ministry  
for the Environment, Nature Conservation,  
Nuclear Safety and Consumer Protection

higher education in sustainable  
management for future decision  
makers & potential change agents



THANKYOU!



Name	WERK
DC Hamburg	HH00
DC Miami	MI00
DC San Diego	SD00
Plant Dallas	HL00
Plant Heidelberg	



**SUSTAINABLE DEVELOPMENT GOALS**

**WELTOFFENE HOCHSCHULEN GEGEN FREMDENFEINDLICHKEIT**

