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Climate Change and Reconceptualization of Security

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   - Climate Change and International Security

1. Introduction: Focus of the Talk

- What is the linkage between both?
  - A key problem of global environmental change
  - A key area of international relations
- Securitizing climate change:
  - GECHS (1999),
  - Brauch for BMU (2002),
  - U.S. DoD (2004), CAN (15 April 2007)
  - UNSC (17 April 2007),
  - CC as international, national and human security
- UNFCCC & IPCC: epistemic community as a securitizing actor major concern in Europe

2. Reconceptualizing Security: Publication Project

- Basic Assumption & Guiding Question:
  - Did global and regional political contextual changes trigger a reconceptualizing of security?
- What did change? Contextual factors:
  - End of the Cold War: 9 November 1989: Berlin Wall;
  - Events of 11 September 2001;
  - Process of globalization (1945, globalized in 1990)
  - Shift from 'Holocene' to 'Antrhopocene'
- Which were the conceptual innovations?
  - Theoretical: social constructivism & Beck:risk society
  - Widening, deepening & sectorialization of security

2.1. Which conceptual innovations?

- **1989–1991: End of the Cold War (E-W-C)**
  - **Widening**: from 2 to 5 security dimensions
  - **Deepening**: from national to human security
  - **Sectorialization**: energy,food,health,water security
- **11 September 2001: Vulnerability of U.S.**
  - **Shrinking:** weapons of mass destruction, terrorists
- **Transatlantic dispute on security concepts**
  - **Dispute on goals: Terrorism vs. Climate Change**
- **Econ. crises: econ. & social vulnerability**
  - **New wars:** humans as victims: ‚freedom from fear`
  - **Crises, Globalization & Complex Emergencies:** poverty: high economic and **social vulnerability**

2.2. Global Mental Mapping of Rethinking on Security

- **What does security mean globally?**
  - Security debate influenced by North Atlantic debate
  - What are cultural, philosophical, religious influences?
- **How has security been reconceptualized?**
  - ➢ What are obj. security dangers & subj. security concerns: threats, challenges, vulnerabilities and risks?
  - ➢ What are security threats, challenges, vulnerabilities and risks in 5 dimensions, for state and humankind?

GEC & hazards pose new security dangers?
  - Global Environmental Change: pressure & cause
  - Water-related natural hazards: impacts & societal outcome (victims) depend on social vulnerability

2.3. Objective, Subjective, Intersubjective Security

- Wolfers (1962) pointed to two sides of the security concept: "Security, in an *objective* sense, measures the absence of threats to acquired values, in a *subjective* sense, the absence of fear that such values will be attacked".

- **Objective security dangers**: absence of threats

- **Subjective security concerns**: **perception of** absence of fear

- From a constructivist approach in international relations 'security' is the outcome of a process of social & political interaction where social values & norms, collective identities & cultural traditions are essential. Security: **intersubjective** or "what actors make of it".

- **Copenhagen school** security as a "speech act", "where a securitizing actor designates a threat to a specified reference object and declares an existential threat implying a right to use extraordinary means to fend it off".

- Such a process of "securitization" is successful when the construction of an "existential threat" by a policy maker is socially accepted and where "survival'" against existential threats is crucial.
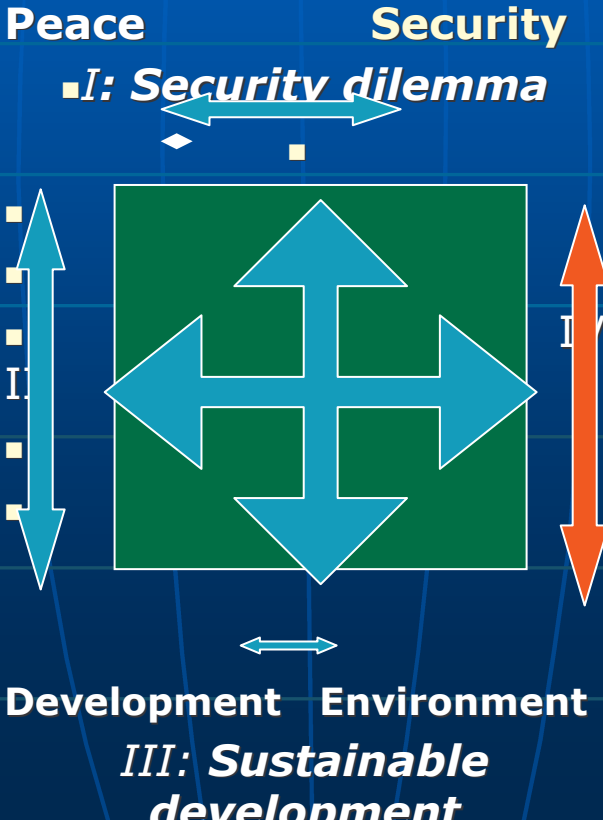
2.4. Copenhagen School: Securitization

- **Securitization**: discursive & political process through which an intersubjective understanding is constructed within a political community to treat something as an existential threat to a valued referent object, and to enable a call for urgent and exceptional measures to deal with the threat.

- '**Referent object**' (that is threatened and holds a general claim on 'having to survive', e.g. the **state, the environment or liberal values**),

- '**Securitizing actor**' (who makes the claim – speech act – of pointing to an existential threat to referent object thereby legitimizing extraordinary measures, often but not necessarily to be carried out by the actor), and

- '**Audience**' (have to be convinced in order for the speech act to be successful in the sense of opening the door to extraordinary measures).

- **It is not up to analysts to settle the 'what is security?'** question – widening or narrowing– but more usefully one can study this as an open, empirical, political and historical question.

- **Who manages to securitize what under what conditions & how?**

- **What are the effects of this?** How does the politics of a given issue change when it shifts from being a normal political issue to becoming ascribed the urgency, priority and drama of '**a matter of security**'.

2.5. Security Perception: Worldviews and Mind-sets

- Perceptions of security dangers (concerns) depend on worldviews of analyst & mind-set of policy-maker.

- Mind-set (Ken Booth): have often distorted perception of new challenges: include ethnocentrism, realism, ideological fundamentalism, strategic reductionism
  - Booth: Mind-sets freeze international relations into crude ima-ges, portray its processes as mechanistic responses of power and characterize other nations as stereotypes.
  - Old Cold War mind-sets have survived global turn of 1989/1990

- 3 worldviews are distinguished by the English school:
  - *Hobbesian* pessimism (realism): power
  - *Kantian* optimism (idealism) *international law* & *human rights*
  - *Grotian* pragmatism: multialteralism, *cooperation* is vital.

- 3 ideal type perspectives in other cultures & traditions:
  - Power matters: Sunzi, Thukydides, Machiavelli, Hobbes,
  - Ideas matter: Kant, W. Wilson
  - Cooperation matters: Confucius, Grotius

2.6. Concepts of security in relation with peace, environment and development

Programmes, pillars & linkage concepts within the quartet

IR research programmes	Conceptual Quartet	Conceptual Linkages
▪ **Peace Research** ▪ **Security Studies** ▪ **Development Stud.** ▪**Environment Studies** **4 conceptual pillars** ▪ **I: *Security dilemma*** ▪ **II:*Survival dilemma*** ▪ **III: *Sust. developm.*** ▪ **IV: *Sustain. peace***	**Peace** **Security** ▪*I: Security dilemma* I IV **Development Environment** *III: Sustainable development*	**Political use of con-cepts & theoretical debates on 6 linkages** ▪ **Peace & security** ▪ **Peace & development** ▪ **Peace & environment** ▪ **Devel. & security** ▪ **Devel. & environment** **Of interest here:** ▪ Security & environment

2.7. From International & National to four Pillars of Human Security

- **International Peace & Security**: League of Nations (1919):"high contracting parties"; UN Charter (1945): "*We the peoples of the United Nations*"
- **National Security:** new U.S. concept World War II, post WW II: National Security Act (1947), before: goal defence, means: Army (War Dep.), & Navy Dept.
- **Alliance Security:** NATO (1949-), WP (1955-2001)
- **Common Security** (Palme Report 1982)
- **Environmental Security** (Brundtland 1987)
- **1990:** Widening, Deepening, Sectorialization
- **2001:** Shrinking: U.S. nat. security agenda **Global Security:** Steinbrunner (2000)
- **Cooperative Security:** Brookings Institution (1990's)
- **Human Security**: UNDP (1994): 4 pillars of HS

2.8. Widening of Security Concepts: Towards Environmental Security

4 trends in reconceptualisation of security since 1990:

- **Widening** (dimensions, sectors), **Deepening** (levels, actors)
- **Sectorialisation** (energy, food, health),
- **Shrinking** (WMD, terrorists)

Dimensions & Levels of a Wide Security Concept

Security dimension⇒ ⇓ Level of interaction	Mili-tary	Political	Economic	Environ-mental ⇓	Societal
Human individual ⇒			Food sec. Health sec.	Cause & Victim	Food sec. Health sec.
Societal/Community				⇓⇑	
National	shrinking		Energy se.	⇓⇑	Food,health
International Regional			Water security	⇓⇑	Water security
Global/Planetary ⇒				GEC	

2.9. Environmental & Human Security

Expanded Security Concepts (Møller, '03; Oswald '01)

Label	Reference object	Value at risk	Source(s) of threat
National security	The State	Territ. integrity	State, substate actors
Societal security	Societal groups	Nation. identity	Nations, migrants
Human security	Individual, mankind	Survival	Nature, state, global.
Environmental sec.	Ecosystem	Sustainability	Humankind
Gender security (Oswald Spring)	Gender relations, indigenous people, minorities	Equality, identity, solidarity	Patriarchy, totalitarian institutions (governments, churches, elites) intoler.

Human security: Referent: **individuals and humankind**. [Human Security Network]

❖**Values at risk**: survival of human beings and their quality of life.

❖**Major source of threat**: nature (global environmental change), globalisation, nation state with its ability to cope with this dual challenge.

Environmental Security: Referent: **Ecosystem**; Value at risk is **sustainability**.

❖ **Major challenges**: global environmental change & humankind,

❖ **Focus**: **Interactions between ecosystem & humankind**, impact of **global environmental change** on **environmental degradation**, of **increasing demand** on **environmental scarcity & environmental stress**. [No Environment Security Network of States, & IGOs & NGOs]

3. Four Pillars of Human Security

- **"Freedom from want"** **human development agenda: poverty** (stimulated by Asian economic crisis of 1990s) by reducing social vulnerability through poverty eradication programmes (UNDP 1994; CHS: Ogata/Sen: Human Security Now, 2003, Human Security Trust Fund, HSU of OCHA), **Japanese approach;**

- **"Freedom from fear"**: **humanitarian agenda: violence, conflicts, weapons** (Canada, Norway, Human Security Network) (UNESCO,HSN), **Canadian approach:**Human Security Rep.(2005)

- **"Freedom to live in dignity"**: **agenda: rule of law, human rights, democratic governance** (**Kofi Annan:** *In Larger Freedom* (March 2005)

- **"Freedom from hazard impact"**: **environmental (GEC) & natural hazard agenda**: Bogardi/Brauch vision, goal: securitize: "environment" (GEC as pressure) and "natural hazards" as impact by reducing environmental & social vulnerability & enhancing coping capabilities of societies confronted with natural & human-induced hazards (Bogardi/Brauch 2005; Brauch 2005a, 2005b).

3.1. First Pillar of HS: "Freedom From Fear"

- **Primary Focus of the Human Security Network**
- **Requirements and objects:**
  - **Rule of Law:** ICC, International Court of Justice and national, regional and local judicial courts and mechanisms
  - **Universal Humanitarian Standards**: initiatives in interna-tional, humanitarian and human rights law, human develop-ment, human rights education,
  - **Good Governance**: capacity building of not only national, but regional and local governments or leadership authorities; fostering democracy; respect for minorities
  - **Conflict Prevention/ Post-Conflict Reconstruc-tion**: land mines, child soldiers, protection of civilian population in armed conflict, small arms and light weapons, trans-national organized crime (Ottawa Convention on Anti-personnel Landmines)
  - **Strong International Institutions**

3.2. Human Security Network Members & Goals

NATO (4)	EU (6)		Third World (6)
Canada			Chile
Greece Nether -lands	Austria Ireland Slovenia		Costa Rica Jordan Mali
Norway	Switzer-land		Thailand (chair) South Africa (observer)

Anti-pers. Landmines, Intern. Criminal Court, pro-tection of children in armed conflict, control of small arms & light weapons, fight against transnat organized crime, human development, human rights educat., HIV/AIDS, implement. of intern. hu-manitarian & human rights law, conflict prevention

Until 2006 no environmental security issues on agenda of this HS-Network.

The Network has an interre-gional & multiple agenda perspective, strong links to civil society & acade-mia.

The Network emerged from landmines campaign at a Ministerial, Norway,1999.

Conferences at Foreign Ministers level in Bergen, Norway (1999), in Lucer-ne, Switzerland (2000), Petra, Jordan (2001) Santiago de Chile (2002), Graz (2003), Bamako, Mali (May 2004), Ottawa (2005) Bangkok (2006), Ljubljana (2007): Greek Presidency

HELLENIC REPUBLIC
EMBASSY OF GREECE

- **18/19 May 2007 in Ljubljana: 10th presid.**
- **Human Security and Climate Change with a focus on the affects on vulnerable children, women and refugees".**
- **Deputy Foreign Minister Evripidis Stylianidis said that among the pro-blems that could ensue from climate change are drought, infectious diseases, illegal migration, poverty and human trafficking, particularly children.**
- **He stated that the Greek presidency will attempt to shed light on all these aspects and contribute to international dialogue.**
- **Greece has chosen an issue that is very high on the agenda of inter-national organisations. Climatic changes preoccupied the UN Security Council and constitute a main priority of the EU's German presidency.**

3.4. "Freedom From Want":
Human Security Commission: Human Security Now

- **Broad:** wider agenda, conceptually more convoluted
- **Goal:** reducing individual/societal vulnerabilities in the economic, health, environment, political, community, and food sphere. Create conditions that can lead to empowerment for individuals,
- **Japanese FM**: HS "comprehensively covers all menaces that threaten human survival, daily life, and dignity…and streng-thens efforts to confront these threats."
- **Threats**:
  - diseases, poverty, financial crises, hunger, unemployment, crime,
  - social conflict, political repression,
  - land degradation, deforestation, emission of GHGs, environm. hazards,
 - population growth, migration, terrorism, drug prod./trafficking

Photo by Osamu Honda 2003

3.5. Human Security Commission Report: Ogata/Sen: Human Security Now (2003)

- *Commission on Human Security* **(CHS)** established in January 2001 at initiative of Japan. The Commission consisted of twelve persons, chaired by Sadako Ogata (former UNHCR) Amartya Sen (1998 Nobel Economics).

- **CHS goals:** a) promote public understanding, engagement and support of human security; b) develop the concept of human security as an operational tool for policy formulation and implementation; c) propose a concrete program of action to address critical and pervasive threats to HS.

- *Human Security Now* (2003) proposes a **people-centered** security framework that focuses "**on shielding people** from critical and pervasive threats and **empowering them to take charge of their lives**. It demands creating genuine opportunities for **people to live in safety and dignity and earn their livelihood**. Its final report highlighted that:

- More than **800,000 people a year lose their lives to violence**. Ca. **2.8 billion suffer from poverty, ill health, illiteracy &** other maladies

in larger freedom

TOWARDS SECURITY, DEVELOPMENT AND HUMAN RIGHTS FOR ALL

Report of the Secretary-General of the United Nations for decision by Heads of State and Government in September 2005

عربى 中文 English Français Русский Español

3.6. "Freedom to Live in Dignity"

- **Kofi Annan** – need for a human centered approach to security "human security can no longer be understood in purely military terms.

- It must encompass economic development, social justice, environmental protection, democratisation, disarmament, and respect for human rights and the rule of law."

- "Embraces far more than the absence of violent conflict"
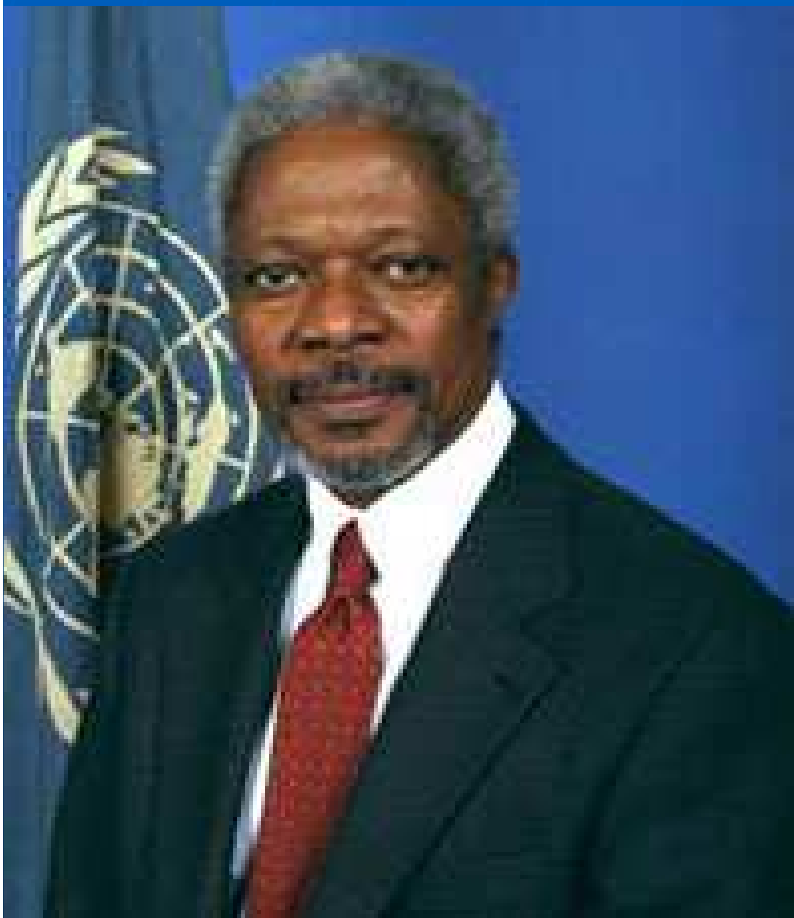
3.7. "Freedom From Hazard Impacts"

- **UNU-EHS**: Bogardi/Brauch (2005), Brauch (2005)
- **Goal:** reduce vulnerabilities/enhance capacity building & coping capabilities of societies faced with nat.hazards
- **Threats/Hazards:**
  - **Environmental:** floods, droughts, and other natural disasters, env. degradation, lack of water or clean water, human-induced climate change, exhaustion of fish resources, depletion of finite resources
  - **Societal:** poverty, improper housing, insufficient food and water, malfunctioning of technical systems, traffic accidents, population explosions, terrorism and organized crime
- **Develop vulnerability indicators and vulnerability mapping** to apply to operational realm by working on solutions
  - **improved early warning systems & capacity-building**
  - **disaster preparedness** (education and training, infrastructure)
  - coordinated rapid **disaster response** by local, regional and national level
  - developing clear guidelines for **post hazard reconstruction**
  - **long term strategies:** e.g. Kyoto, Montreal Protocol
  - **adaptation measures:** e.g. dams, switching to renewable energy
  - **mitigation measures:** restrict housing in hazard areas (coastal areas-flooding, mud slides), charging more for garbage disposal and energy usage, birth control measures

3.8. "Freedom from Hazard Impact":
New Issue for "People-centred Development" for HSN

- During **Thai Presidency** (2005-2006) at 8th Ministerial meeting in Bangkok, 1-2 June 2006, the Thai foreign minister, **Kantathi Suphamongkhon**, suggested in the chairman's conclusions:

- **The network should ... broaden the scope of its focus** into non-traditional threats to human security **by addressing 'freedom from hazard impact' such as threatening diseases and natural disasters** and promoting 'freedom from exclusion' through the involvement of the public in human security dialogue in order to engage all stakeholders.

- (1) *Environment*: prevention of global environmental impact as a result of human activities, with emphasis on the cross-sectional connection between **human security & environmental impact**, the significance of humanitarian assistance, and engagement with the business sector such as the **insurance industry** in time of **natural disasters**; (2) *HIV/AIDS*: integration and measurement of human security in existing HIV/AIDS national programmes;

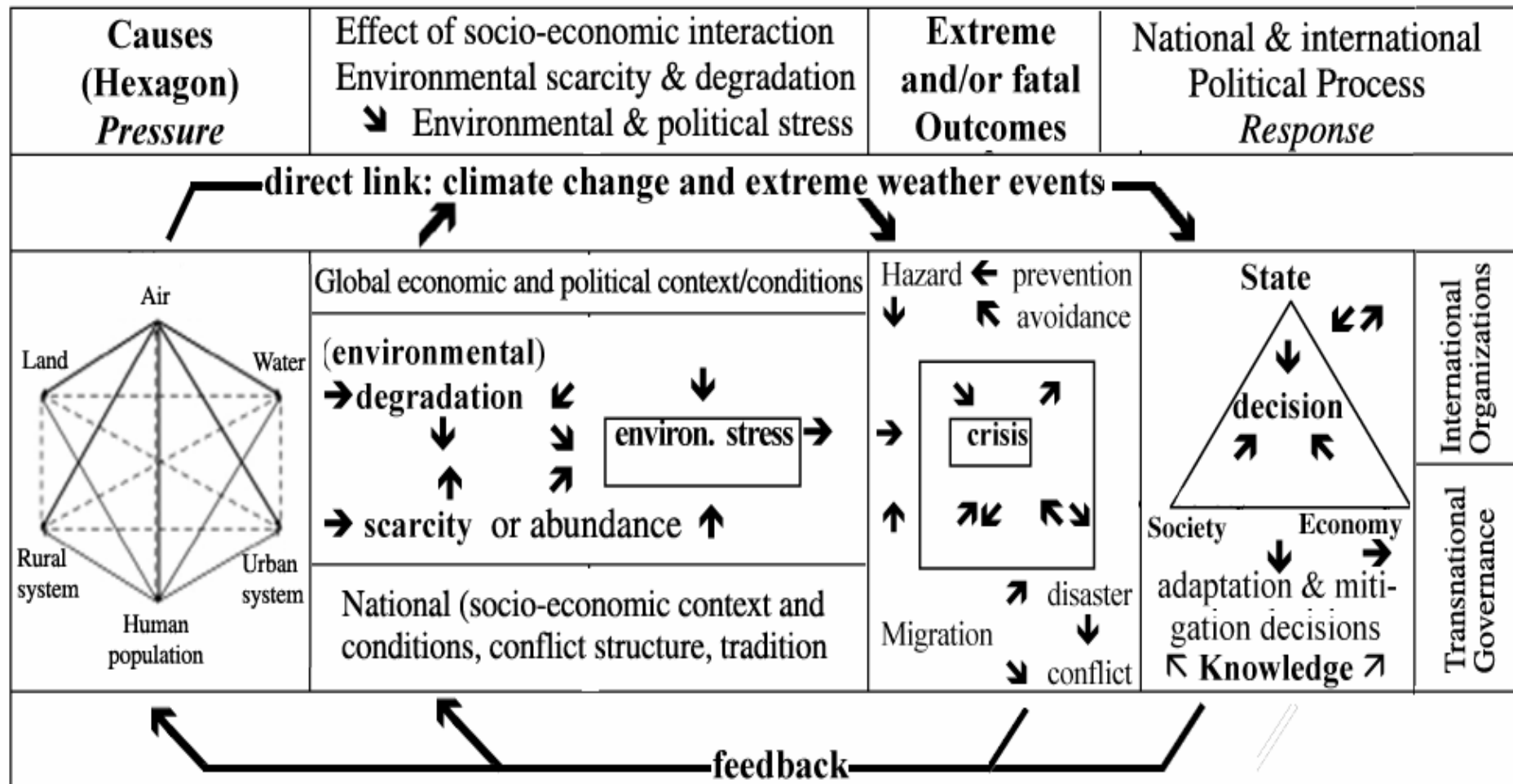# 4. Global Environmental Change: PEISOR Model

- Other Models: Environment – Response
  - OECD: PSR-Model
  - UN-CSD (Committee for Sustainable Development)
  - EEA (European Environment Agency)
- PEISOR Model: Environmental stress and extreme and sometimes fatal outcomes
- Hazards: Nature impacting on humans: victims: poor and highly vulnerable people
- Concept of social vulnerability
- Human security: Freedom from hazard impact

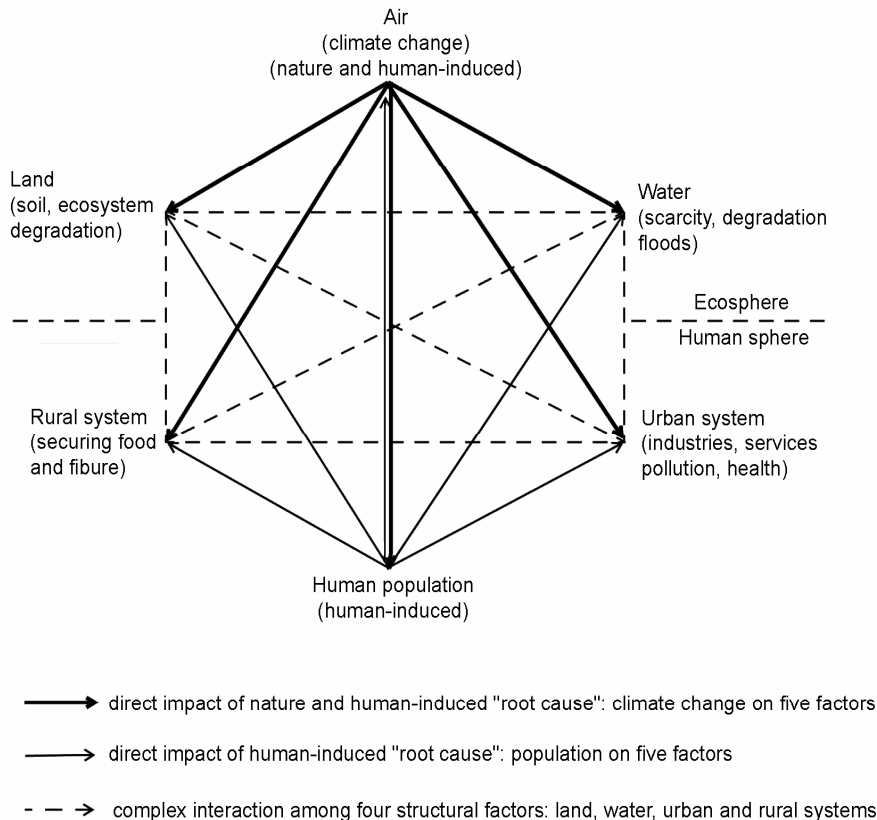# 4.1. PEISOR Model: Global Change, Environmental Stress & Extreme Outcomes

- **The model distinguished 5 stages:**
  - ➤ **P: Pressure: <u>Causes</u> of GEC : Survival hexagon**
  - ➤ **E: <u>Effect</u>: environm. scarcity, degradation & stress**
  - ➤ **I: <u>Im</u>pact: Extreme or fatal outcome: hazards**
  - ➤ **SO: <u>S</u>ocietal <u>O</u>utcomes: disaster, migration, crisis, conflict, state failure etc.**
  - ➤ **R: <u>R</u>esponse by the state, society, the economic sector and by using traditional and modern know-ledge to enhance coping capacity and resilience**

Causes (Hexagon) *Pressure*	**Effect of socio-economic interaction** Environmental scarcity & degradation ↘ Environmental & political stress	**Extreme and/or fatal Outcomes**	**National & international Political Process** *Response*

direct link: climate change and extreme weather events

Air
Land — Water
Rural system — Urban system
Human population

Global economic and political context/conditions

(environmental)
→degradation ↙ ↓
↓ ↘↗
↑ ↗ environ. stress →

→ scarcity or abundance ↑

National (socio-economic context and conditions, conflict structure, tradition)

Hazard ← prevention
↓ ↖ avoidance

→ crisis ↗↙ ↖↘

↑ ↗ disaster
Migration ↓
↘ conflict

State
↙↗
↓
decision
↗ ↖

Society — Economy
↓ →
adaptation & mitigation decisions
↖ Knowledge ↗

International Organizations

Transnational Governance

feedback

4.3. Cause: Pressure of Global Environmental Change: Six Determinants: Survival Hexagon

Air
(climate change)
(nature and human-induced)

Land
(soil, ecosystem
degradation)

Water
(scarcity, degradation
floods)

Ecosphere
Human sphere

Rural system
(securing food
and fibure)

Urban system
(industries, services
pollution, health)

Human population
(human-induced)

→ direct impact of nature and human-induced "root cause": climate change on five factors

→ direct impact of human-induced "root cause": population on five factors

- - → complex interaction among four structural factors: land, water, urban and rural systems

Ecosphere:
- **Air: Climate Change**
- **Soil: Degradation, Desertification**
- **Water: degradat./scarcity**

Anthroposphere:
- **Population growth/decline**
- **Rural system: agriculture**
- **Urban system: pollution etc.**

Mode of Interaction
- **Linear, Nonlinear**
- **Exponential**
- **Chaotic, abrupt**

4.4. **E**ffects: Environmental Scarcity, Degradation & Stress

Four Phases of Env. Sec, Research since 1983 - 2003

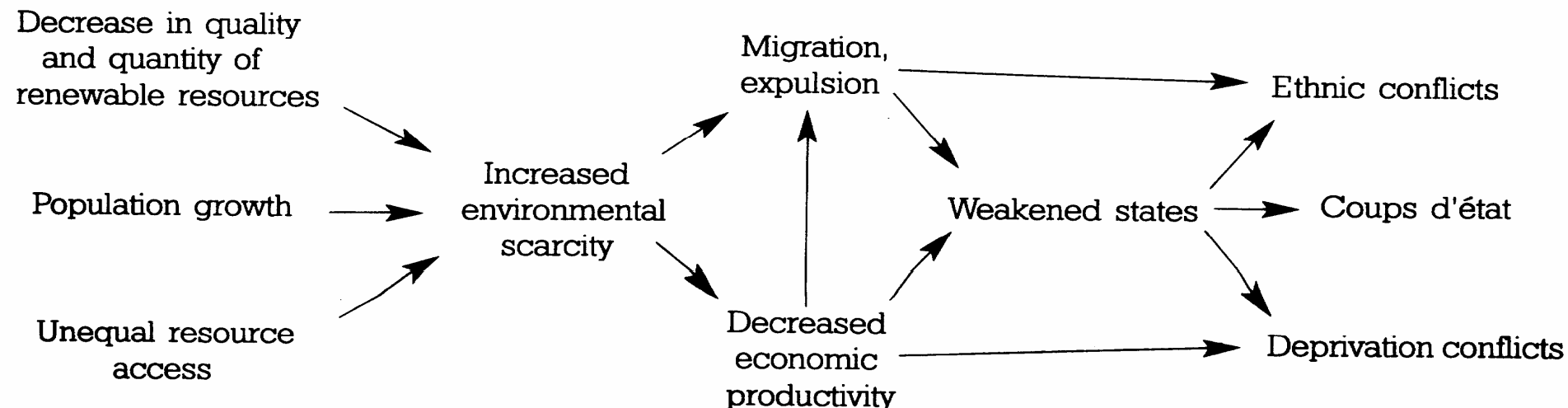**First** Phase: Conceptual Phase: Concept Environmental Security
Second Phase: Empirical Phase: Case studies: Scarcity - Conflict
- **Toronto: Homer-Dixon: since 1991: 3 Projects (figure © Homer-Dixon 1998)**
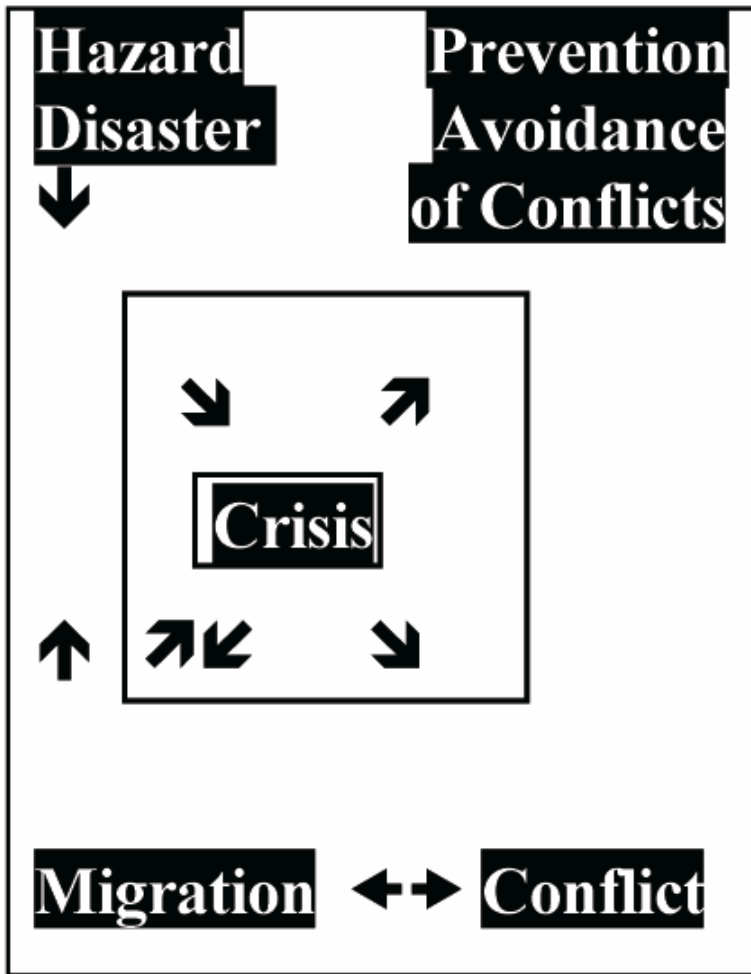- **Zürich/Bern: Günther Bächler, K.Spillmann**

Third Phase: Manifold Research without Integration (1995 - pres.)

Sources of environ-mental scarcity

Social Effects

Decrease in quality and quantity of renewable resources

Population growth

Unequal resource access

Increased environmental scarcity

Migration, expulsion

Decreased economic productivity

Ethnic conflicts

Weakened states

Coups d'état

Deprivation conflicts

4.5. Impact: Human-Induced Natural Hazards Drought, Famine and Societal Outcomes

Much knowledge on these factors:

✓ **Drought, migration, crises, conflicts**

Lack of knowledge on linkages among fatal outcomes

➢ **Drought & drought-ind. migration**

➢ **Famine & environm.-ind. migration**

➢ **Conflicts & conflict-induced migration**

Lack of knowledge on societal consequences: crises/conflicts
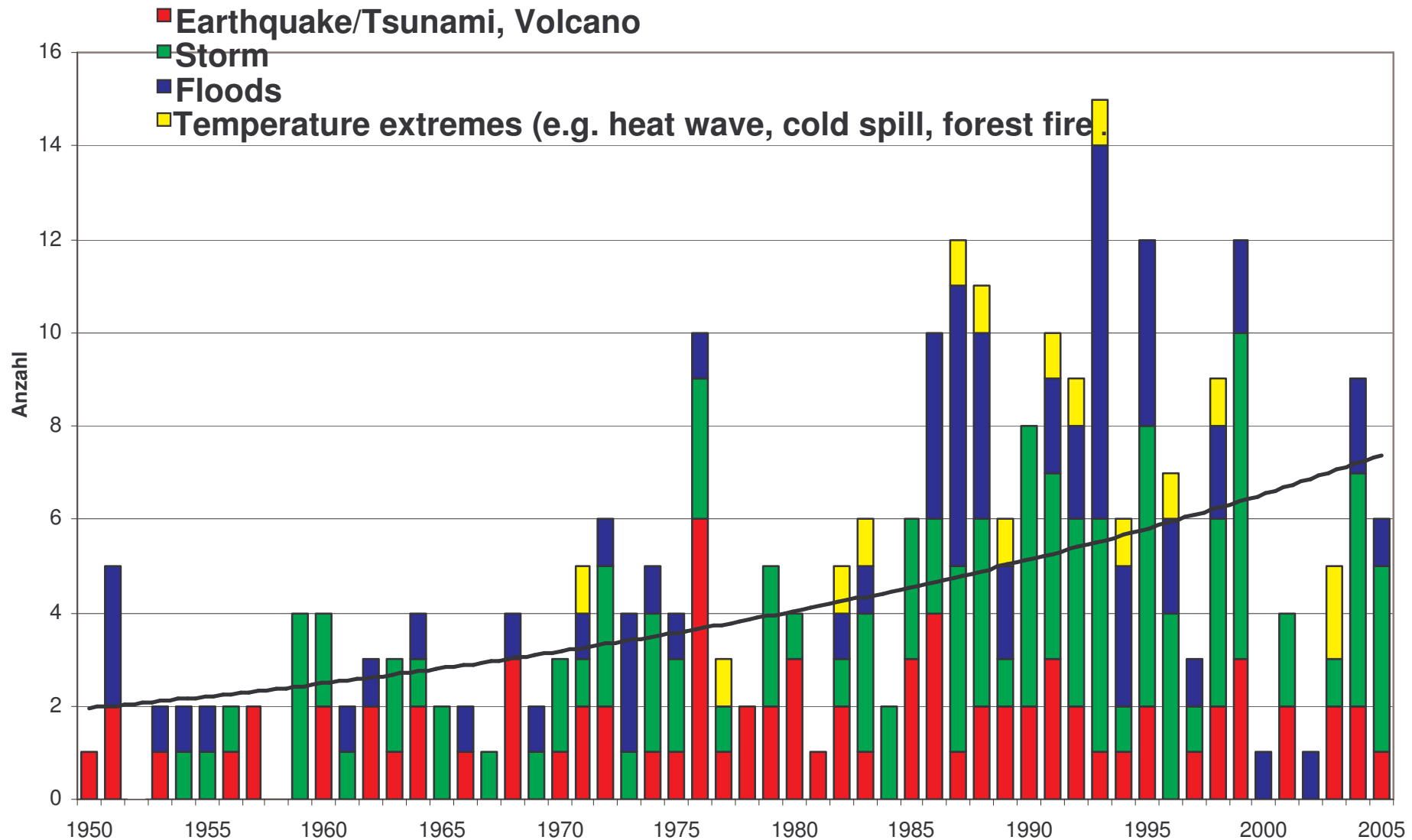
➢ **Domestic/international crises/conflicts**

➢ **Environmentally or war-induced migration as a cause or consequence of crises and conflicts**

4.6. Societal Outcomes: Knowledge on Linkages of Outcomes

- **What are consequences of climate change, desertification and water scarcity for:**
  - Environmental scarcity
  - Envivronmental degradation
  - Environmental stress?
- **What are indirect Societal Outcomes of:**
  - Human-induced hydro-meteorological natural water-related hazards (Storms, floods, landslides, drought) due to natural variability & increase due to climate change?
  - For migration, societal crises and domestic and international conflicts?
  - What role does social vulnerability of victims play?

4.7. Global Impacts: Major Natural Disasters 1950 – 2005. Source: MunichRe, 2006

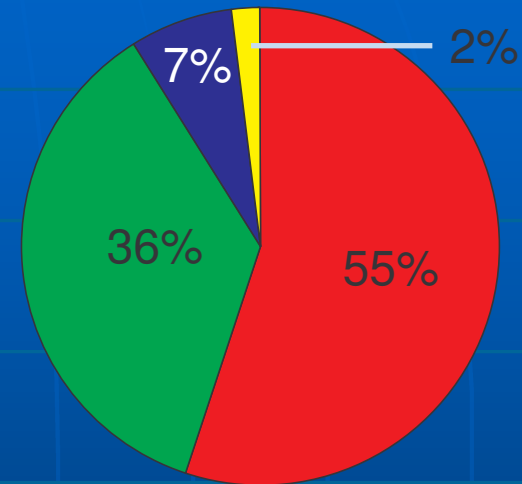© 2006 NatCat*SERVICE*, GeoRisikoForschung, Münchener Rück

Legend:
- ■ Earthquake/Tsunami, Volcano
- ■ Storm
- ■ Floods
- ■ Temperature extremes (e.g. heat wave, cold spill, forest fire.

4.8. Major Natural Hazards (1950-2005). Source: Munich Re Research Div., 2006

267 Events

1,75 Million Dead

Geological events

🟥 **Earthquake/Tsunami, Volcano**

Weather-related events

🟩 **Storm**
🟦 **Floods**
🟨 **Extreme temperatures**

267 Events pie chart:
- 29%
- 40%
- 25%
- 6%

1,75 Million Dead pie chart:
- 55%
- 36%
- 7%
- 2%
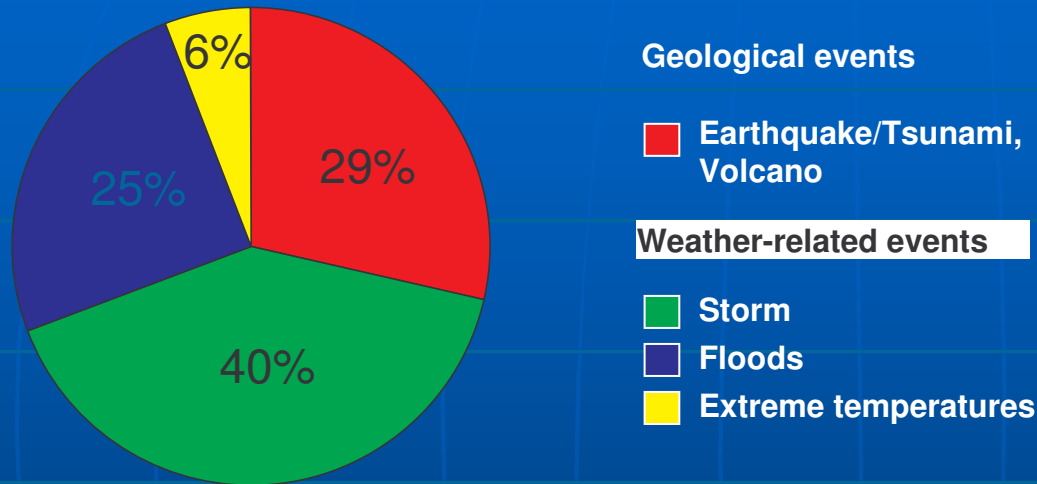
Economic damage: 1.400 billion US$
- 31%
- 38%
- 25%
- 6%
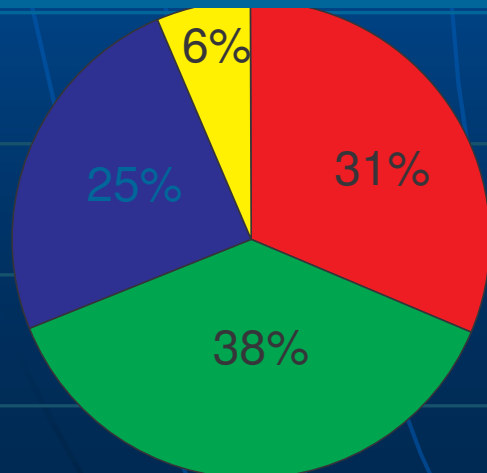
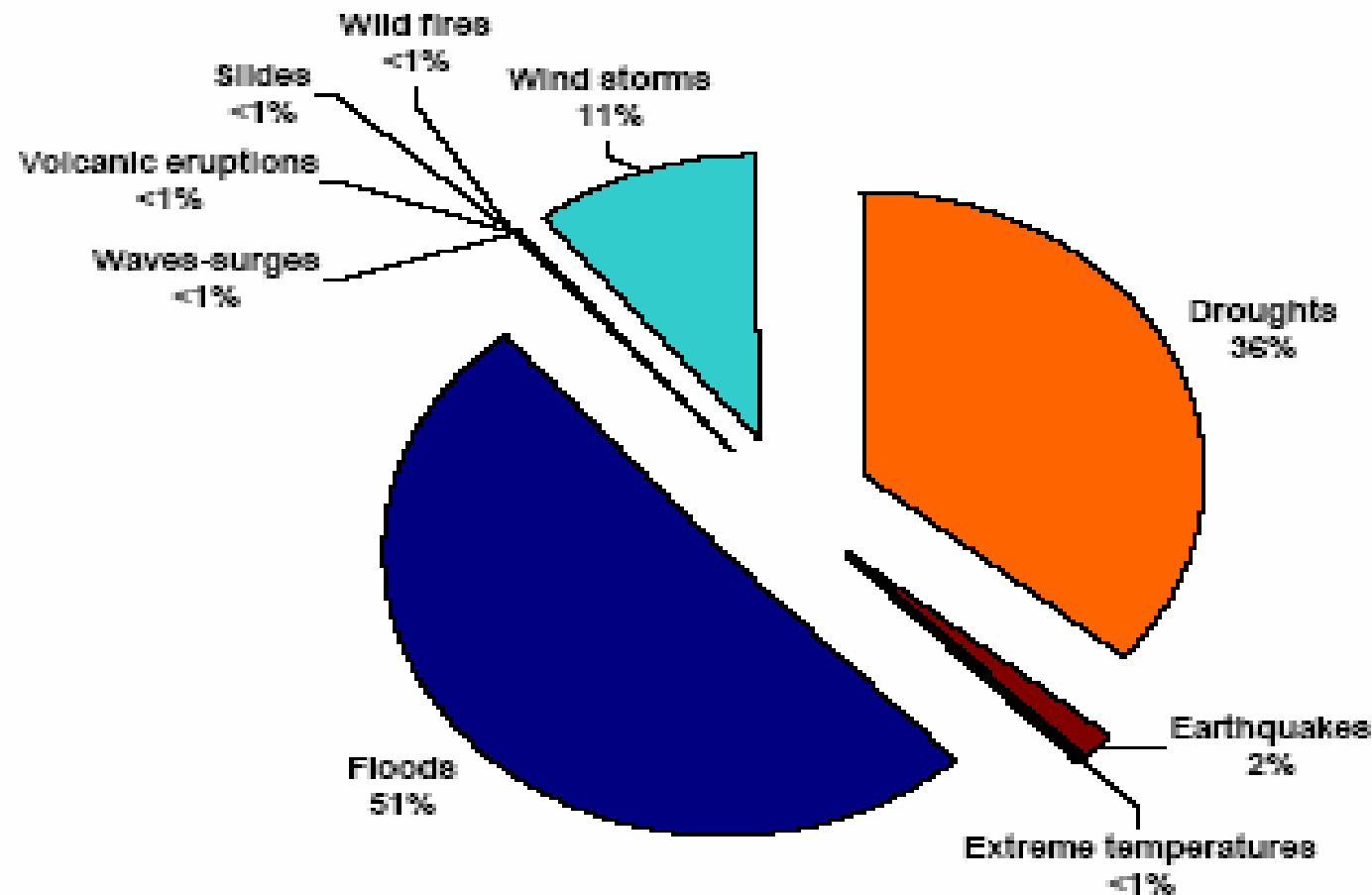**Insured damage: 340 billion US$**
- 11%
- 79%
- 5%
- 5%
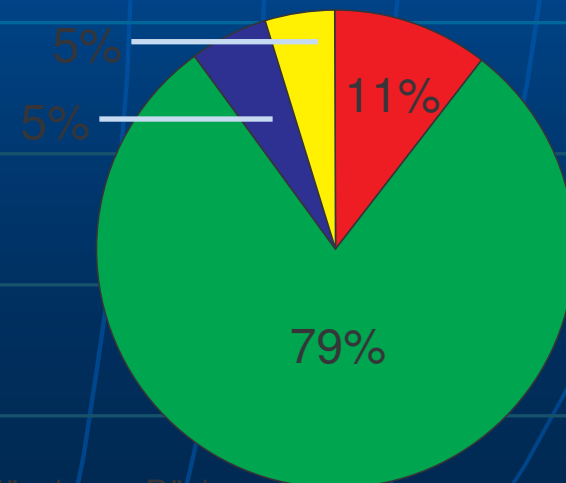
*in Werten von 2005

4.9. Reported Death of Natural Hazards globally (1974-2003): 2.066.273 persons
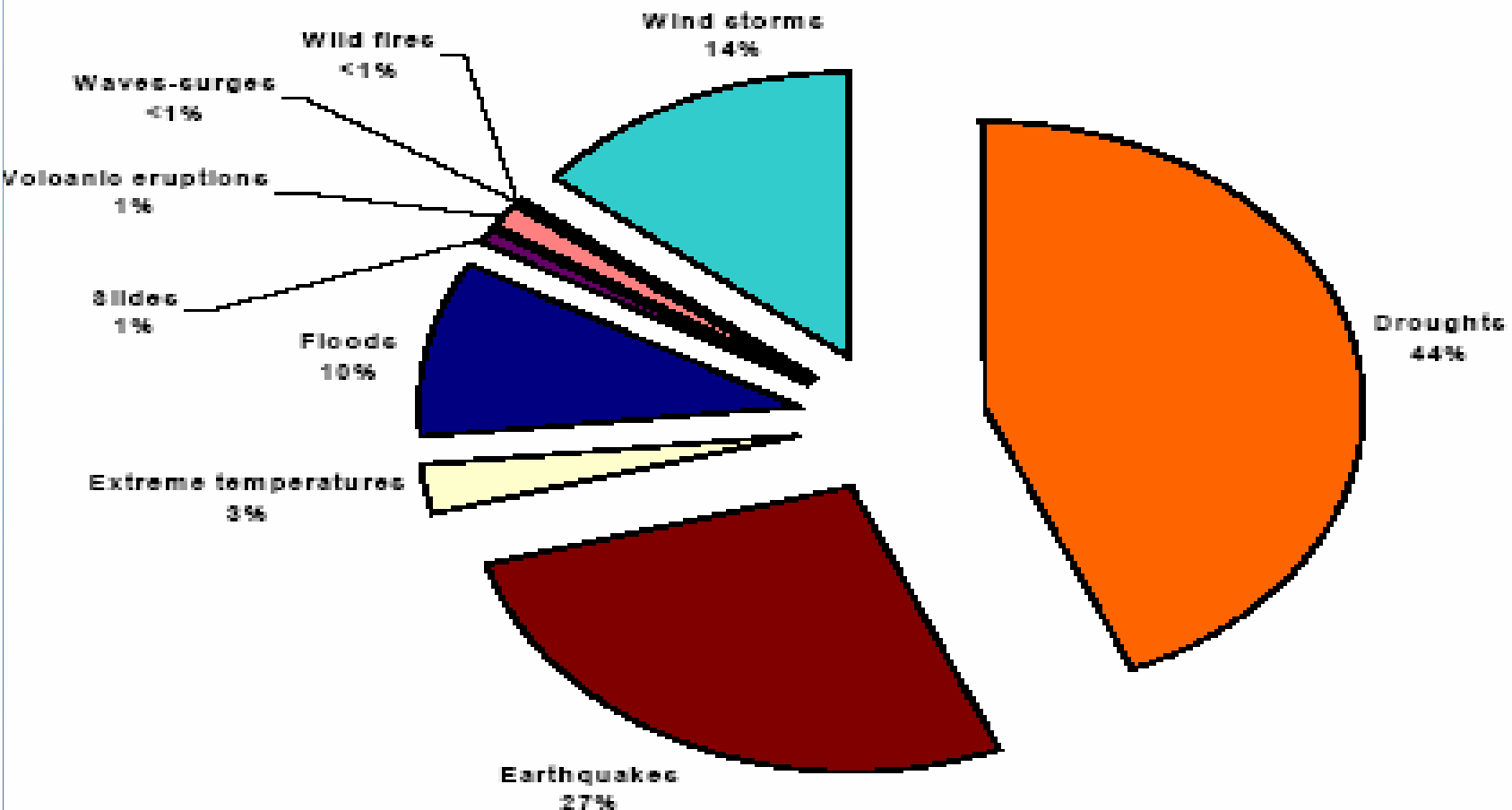
4.10. Affected persons of Natural Hazards globally (1974-2003): 5 076 494 541 persons

Wild fires <1%

Slides <1%

Volcanic eruptions <1%

Waves-surges <1%

Wind storms 11%

Droughts 36%

Floods 51%

Earthquakes 2%

Extreme temperatures <1%

(1) injured + homeless + affected

4.11. Water-related Hazards: Victims of Storms, floods, drought, extreme temperatures

- **MunichRE (1950-2005), major events**
  - **Events:** Storms/floods/extreme temperatures: **71%**
  - **Dead: 45% of 1,75 mio. people**
  - **Economic damage: 69%**
  - **Insured damage: 9%**
- **CRED (1974-2003), all reported events**
  - **Dead:** Storms (14%); floods (10%); extreme temperatures (3%); drought (44%): **71% of a total of 2.066.273** persons
  - **Affected:** Storms (11%); floods (51%); extreme temperatures (>1%); drought (36%): **98% of a total of 5 076 494 541 persons**

4.12. Policy Responses to Natural and Water-Related Hazards

- **Slow onset hazards: GEC**
  - Climate change: temperature increase, sea level rise
  - **Policy response: policy & measures: Reducing greenhouse gas emissions (UNFCCC, Kyoto Protocol)**
  - Soil degradation & erosion: desertification
  - Water scarcity, degradation, water stress

- **Rapid onset hazards:**
  - Storms (winter storms, hurricanes, cyclones)
  - Flash floods, flooding
  - Drought
  - **Policy response:** Early warning, disaster preparedness and response (infrastructure, training, education, foodaid),
  - **Reducing social vulnerability: simultaneous concepts:**
    - **Climate change: adaptation & mitigation**
    - **Poverty eradication**
    - **Protection and empowerment of the people**

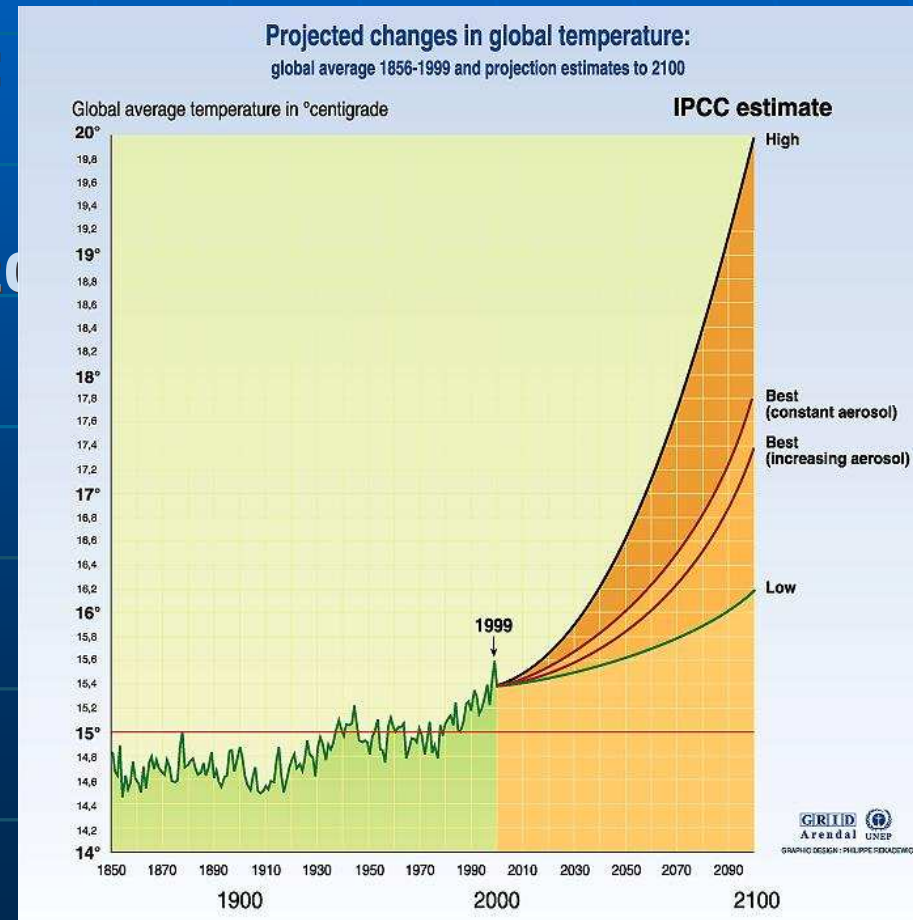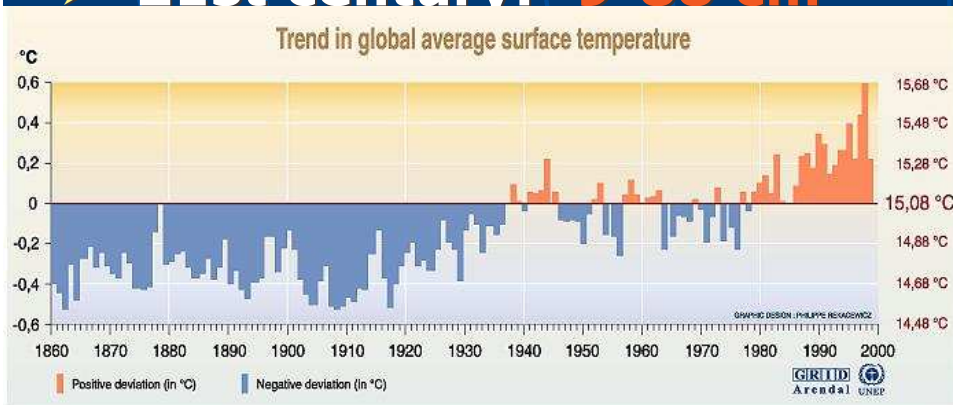# 5. Global Climate Change: Temperature Increases & Sea Level Rise

2 Climate Change Impacts: Temperature & Sea level Rise

- ❖ **Global average temperature rise in 20th century: + 0.6°C**
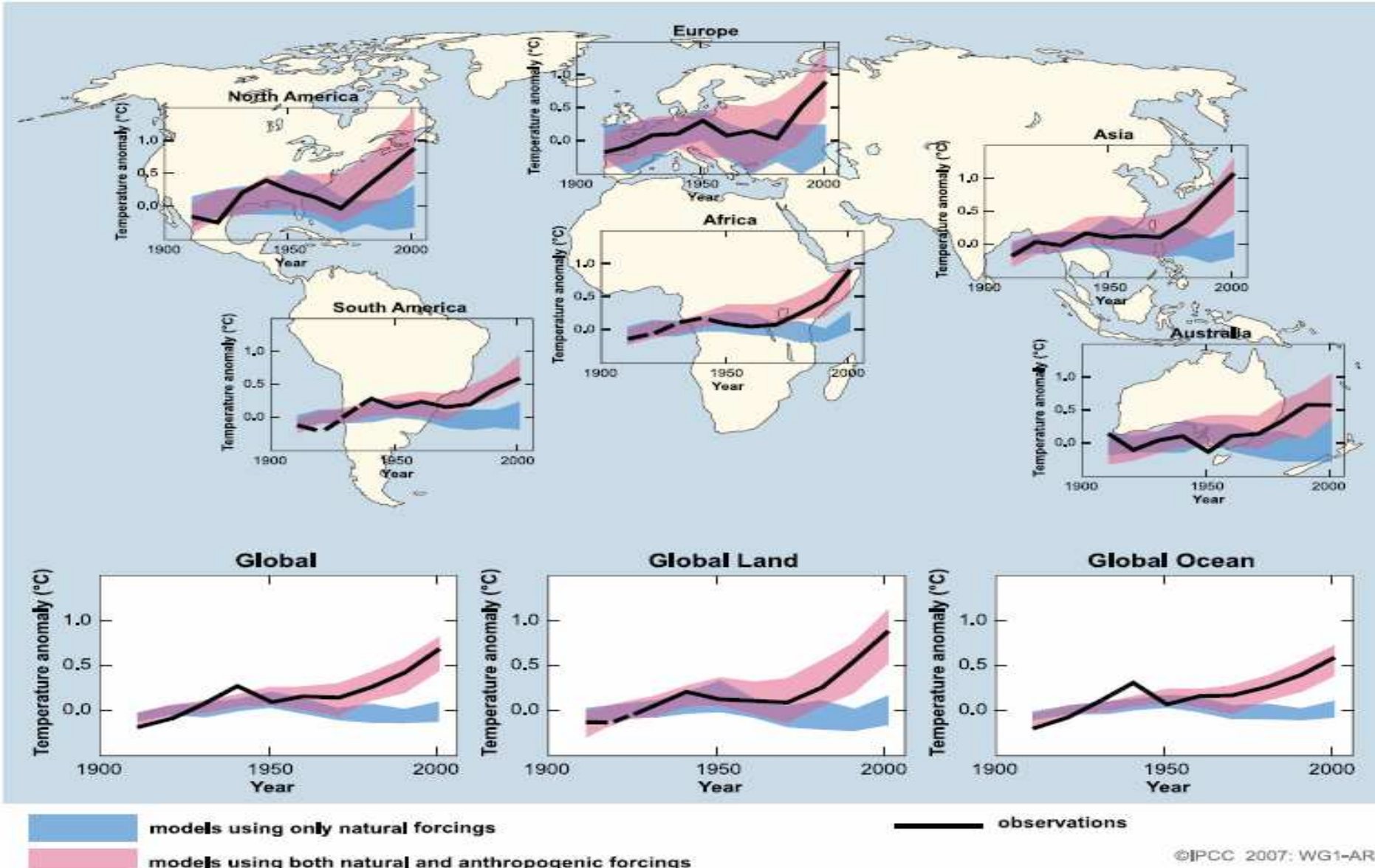- ❖ **Proj. temperature rise: 1990-2100: +1.4 – 5. 8°C**

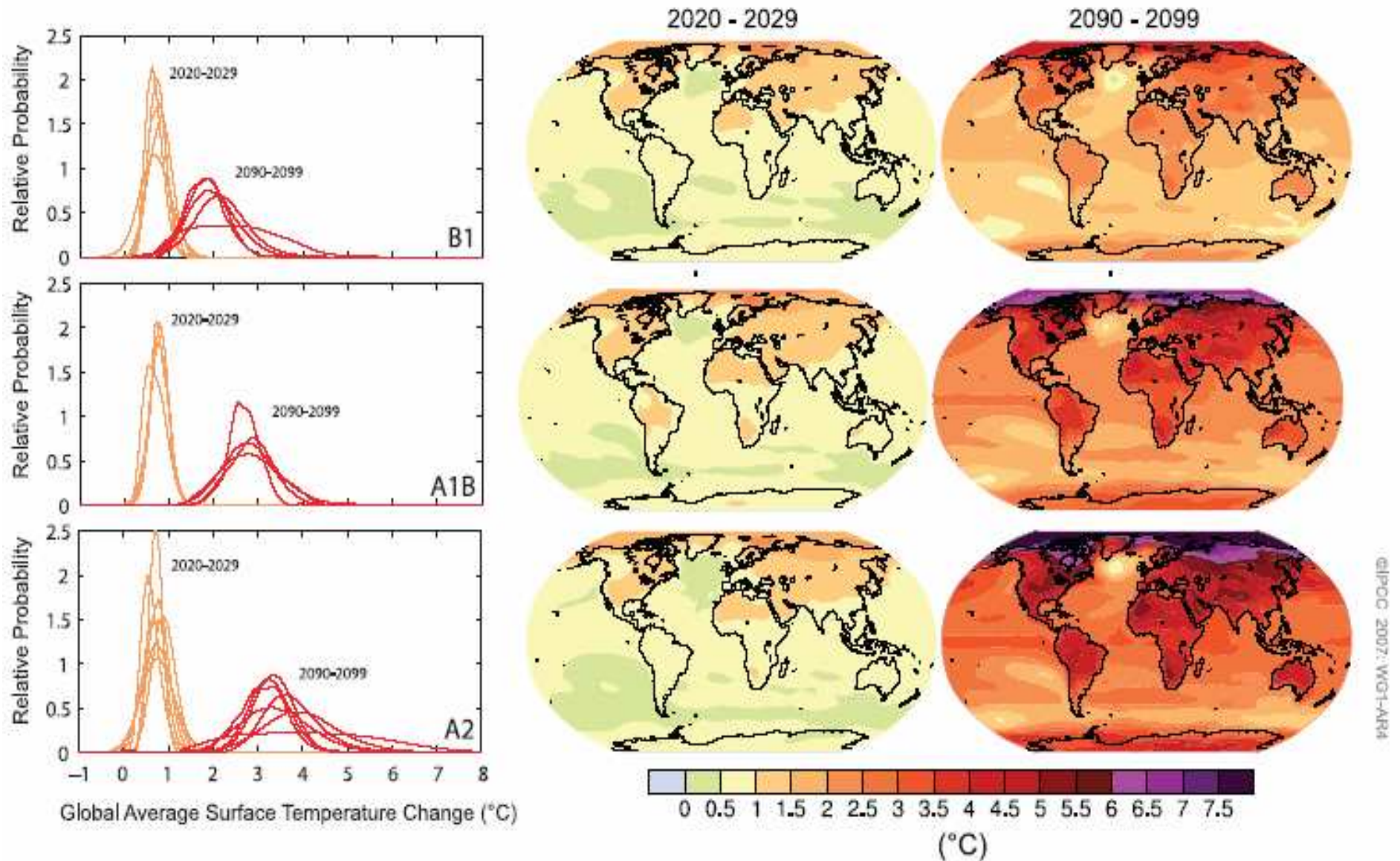**Sources: IPCC 1990, 1995, 20**

Sea level Rise:

- ➢ **20th cent.: +0,1-0,2 m**
- ➢ **21st century: 9-88 cm**

Trend in global average surface temperature

Positive deviation (in °C)   Negative deviation (in °C)

Source: School of environmental sciences, climatic research unit, university of East Anglia, Norwich, United Kingdom, 1999.

Projected changes in global temperature: global average 1856-1999 and projection estimates to 2100

Global average temperature in °centigrade

IPCC estimate

High

Best (constant aerosol)

Best (increasing aerosol)

Low

1999

1900   2000   2100

Source : Temperatures 1856 - 1999: Climatic Research Unit, University at East Anglia, Norwich UK. Projections: IPCC report 95.

©IPCC 2007, WG1-AR4

MULTI-MODEL AVERAGES AND ASSESSED RANGES FOR SURFACE WARMING

©IPCC 2007: WG1-AR4

Legend:
- A2
- A1B
- B1
- Year 2000 Constant Concentrations
- 20th century

Y-axis: Global surface warming (°C) — 6.0, 5.0, 4.0, 3.0, 2.0, 1.0, 0.0, −1.0

X-axis: Year — 1900, 2000, 2100
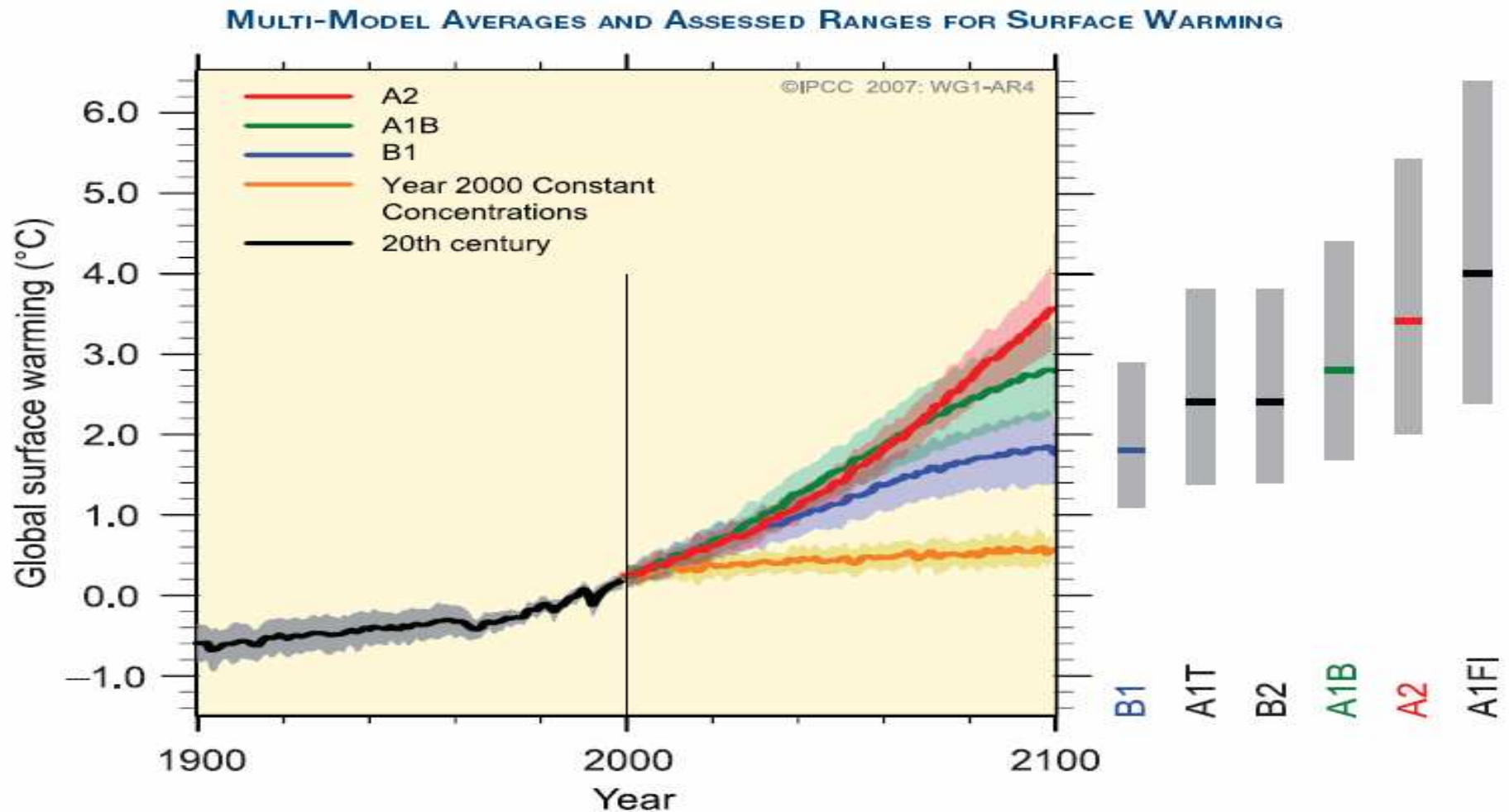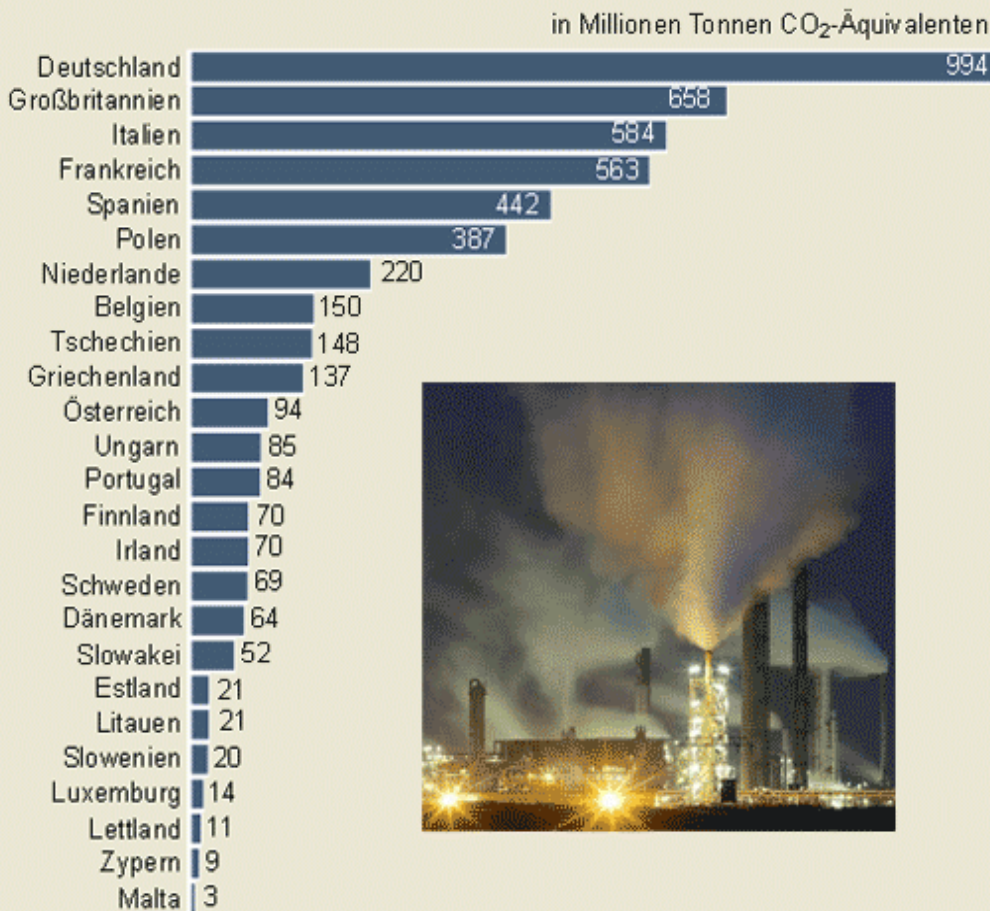
Bars at right: B1, A1T, B2, A1B, A2, A1FI

Figure SPM.5. *Solid lines are multi-model global averages of surface warming (relative to 1980–1999) for the scenarios A2, A1B and B1, shown as continuations of the 20th century simulations. Shading denotes the ±1 standard deviation range of individual model annual averages. The orange line is for the experiment where concentrations were held constant at year 2000 values. The grey bars at right indicate the best estimate (solid line within each bar) and the likely range assessed for the six SRES marker scenarios. The assessment of the best estimate and likely ranges in the grey bars includes the AOGCMs in the left part of the figure, as well as results from a hierarchy of independent models and observational constraints. {Figures 10.4 and 10.29}*
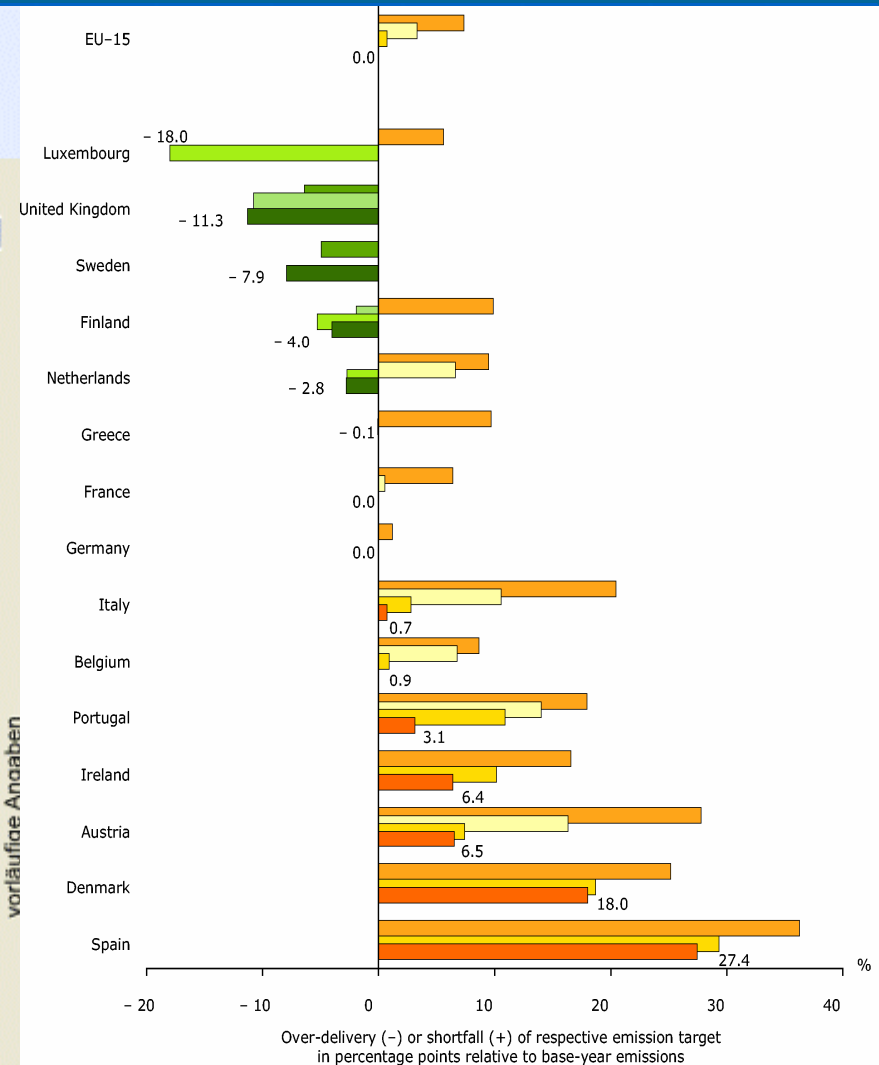
5.4. Greenhouse Gases of EU-Staates

Treibhausgase in der EU
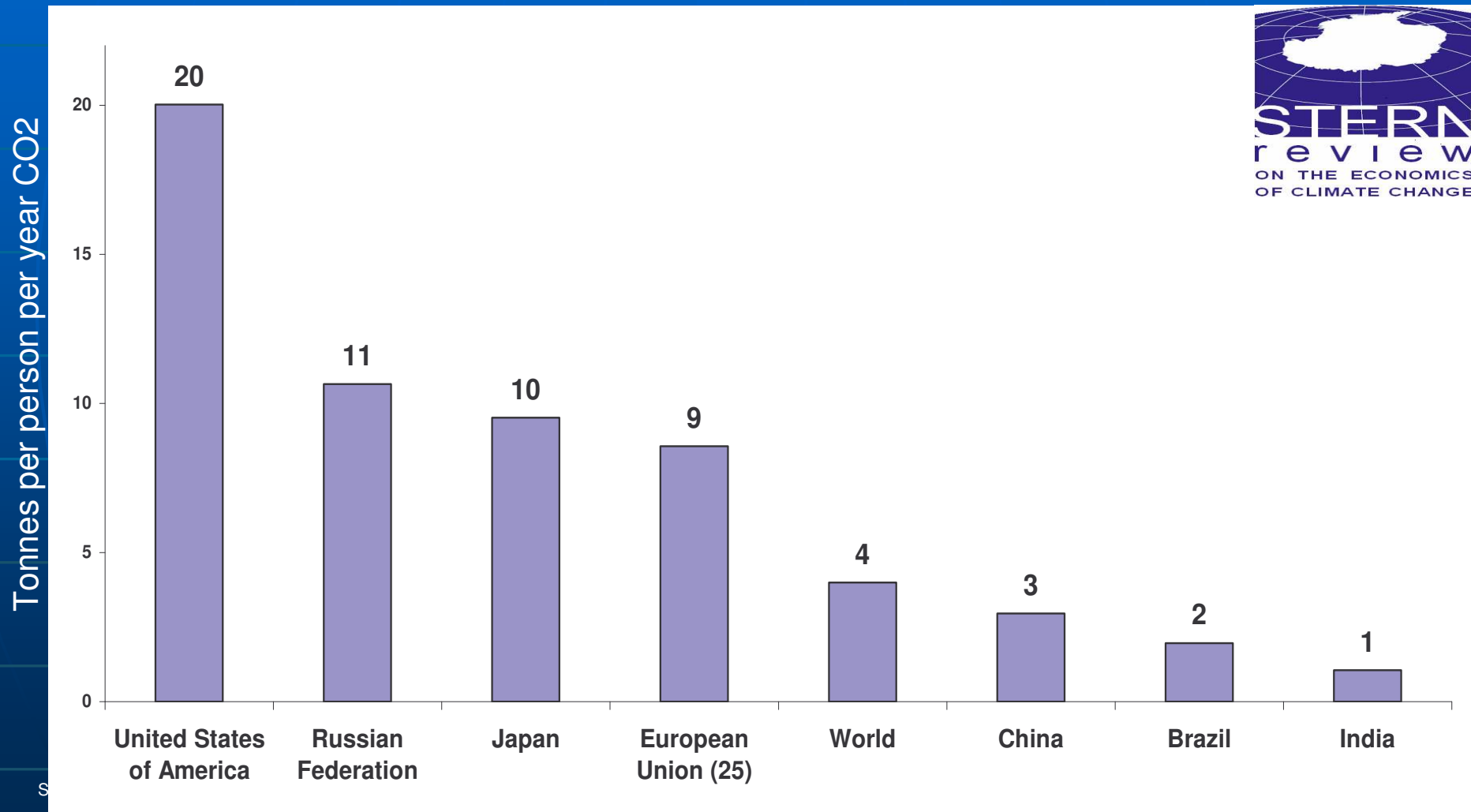Emissionen der sechs wichtigsten vom Menschen verursachten Treibhausgase* im Jahr 2005

in Millionen Tonnen CO_2-Äquivalenten

Land	Wert
Deutschland	994
Großbritannien	658
Italien	584
Frankreich	563
Spanien	442
Polen	387
Niederlande	220
Belgien	150
Tschechien	148
Griechenland	137
Österreich	94
Ungarn	85
Portugal	84
Finnland	70
Irland	70
Schweden	69
Dänemark	64
Slowakei	52
Estland	21
Litauen	21
Slowenien	20
Luxemburg	14
Lettland	11
Zypern	9
Malta	3

Quelle: DIW Berlin   *u. a. Kohlendioxid (CO_2), Methan (CH_4), Lachgas (N_2O)

vorläufige Angaben

EU-15 — 0.0
Luxembourg — 18.0
United Kingdom — 11.3
Sweden — 7.9
Finland — 4.0
Netherlands — 2.8
Greece — 0.1
France — 0.0
Germany — 0.0
Italy — 0.7
Belgium — 0.9
Portugal — 3.1
Ireland — 6.4
Austria — 6.5
Denmark — 18.0
Spain — 27.4

Over-delivery (−) or shortfall (+) of respective emission target in percentage points relative to base-year emissions
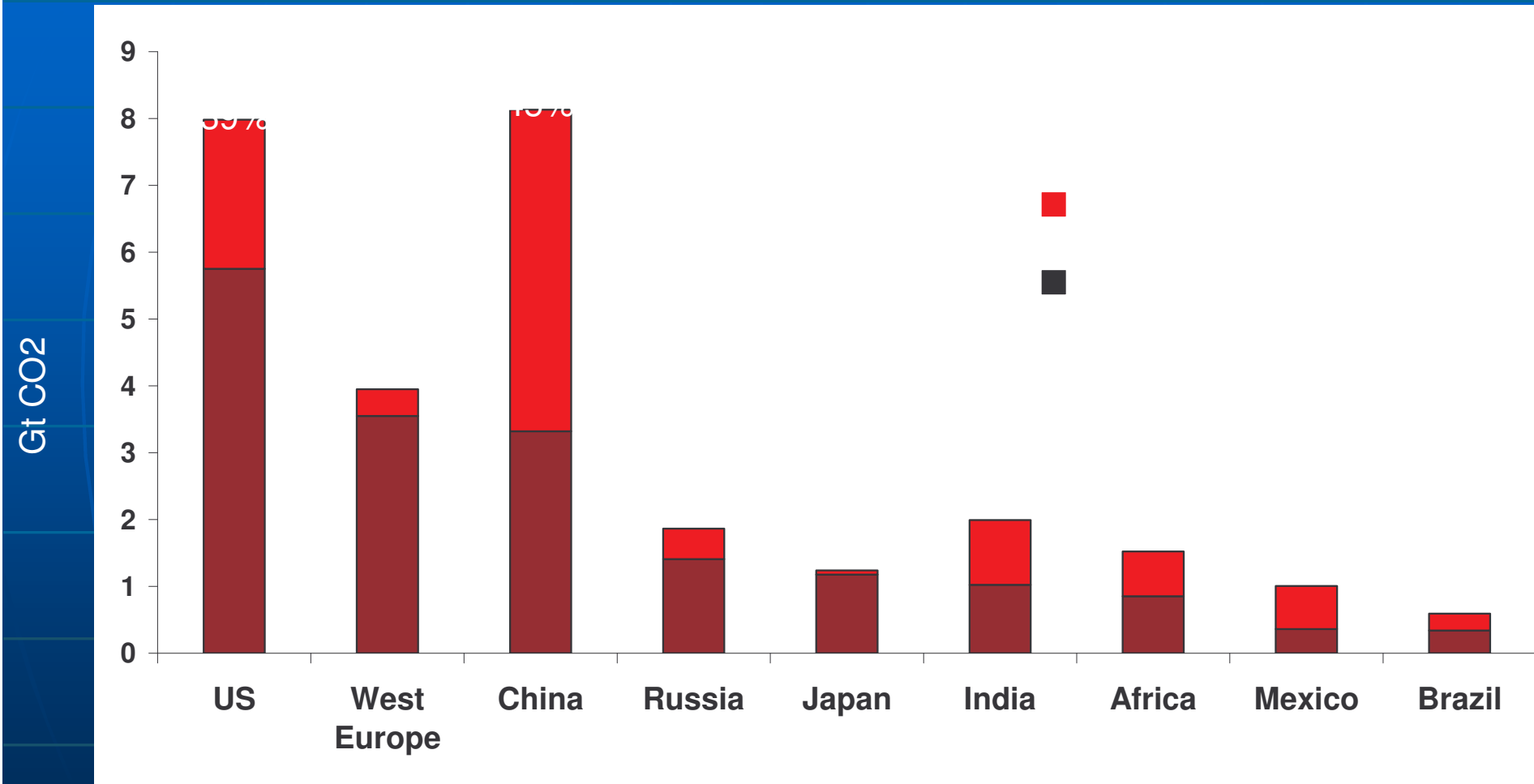
- With existing domestic measures
- With all measures and Kyoto mechanisms
- With additional domestic measures
- With all measures, Kyoto mechanisms and carbon sinks

5.5. Emissions: Responsibility of Industrial States
## (Tons of CO2 Emissions/Capita in Energy Sector only, 2002)

Bar chart showing Tonnes per person per year CO2:
- United States of America: 20
- Russian Federation: 11
- Japan: 10
- European Union (25): 9
- World: 4
- China: 3
- Brazil: 2
- India: 1

STERN review
ON THE ECONOMICS
OF CLIMATE CHANGE

5.6. Projection: Greenhouse Gas Emissions 2025 (only in Energy Sector)

Source: World Resources Institute, CAIT Energy Information Administration Reference Scenario, Energy emissions only

5.7. Projection: Stabilization at 550 ppm
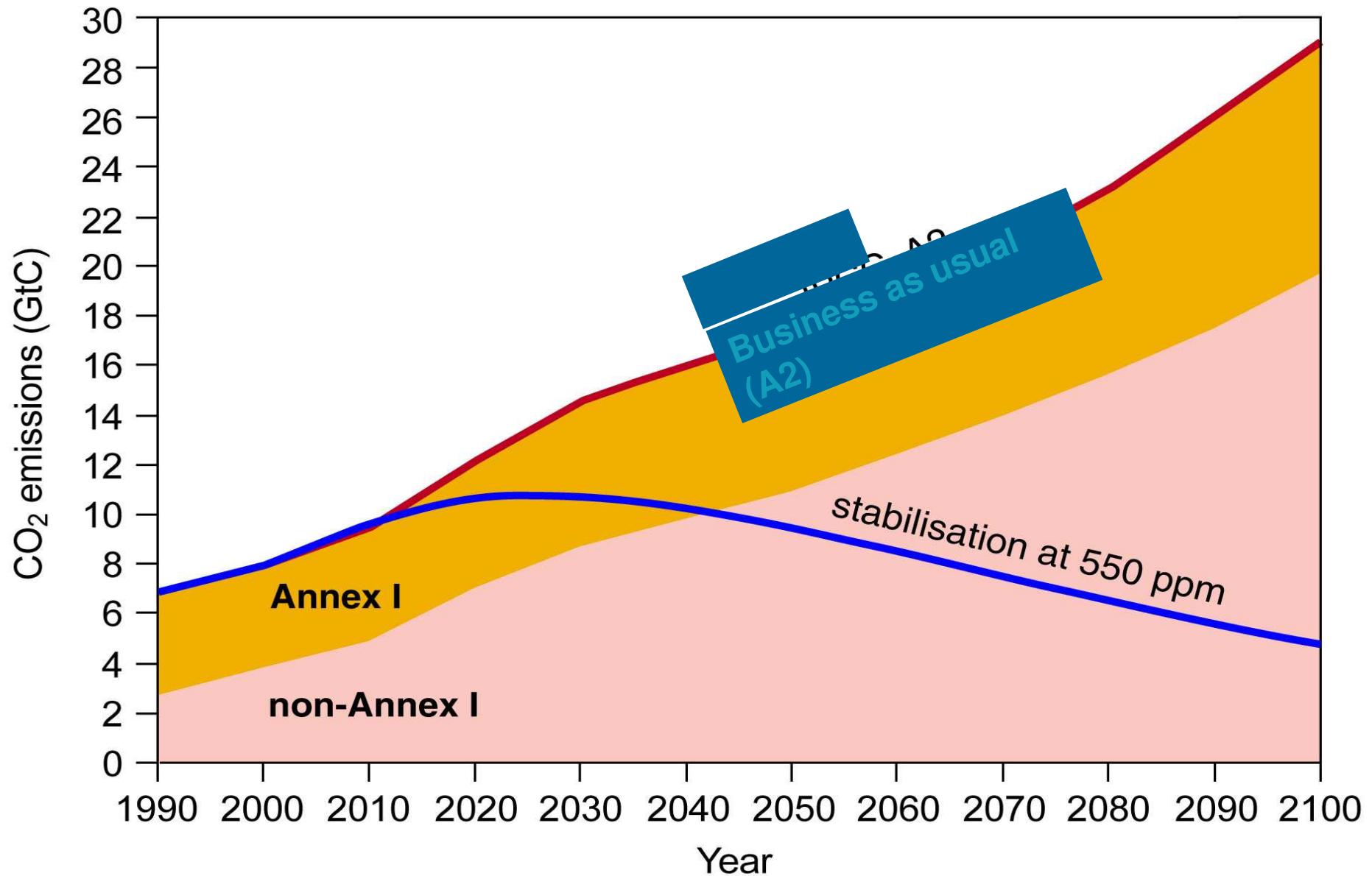
Stabilisation and Commitment to Warming

Eventual temperature change (relative to pre-industrial)
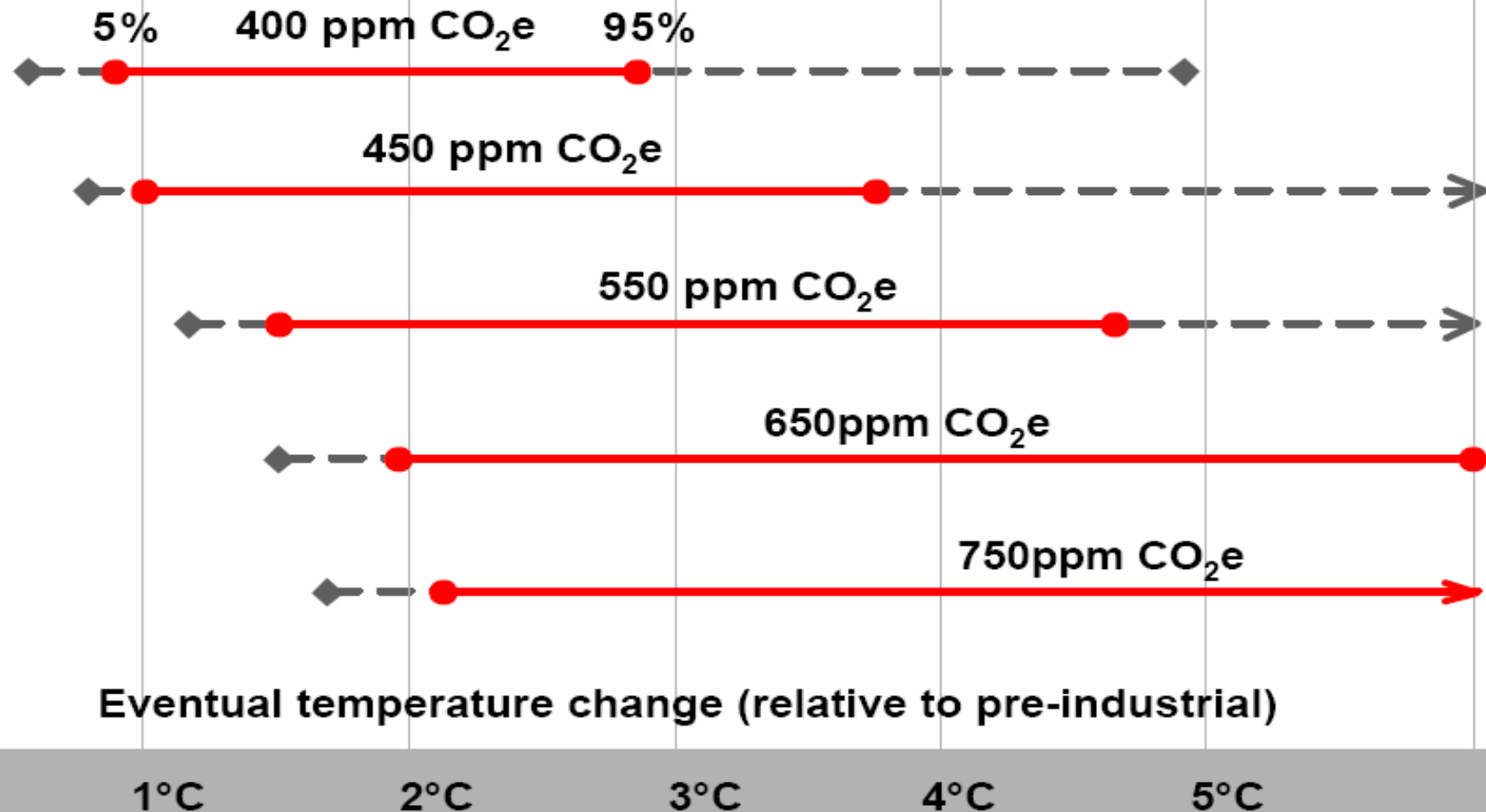
5.9. Projected Impacts of Climate Change

Projected Impacts of Climate Change

Global temperature change (relative to pre-industrial)

| 0°C | 1°C | 2°C | 3°C | 4°C | 5°C |

Food
- Falling crop yields in many areas, particularly developing regions
- Possible rising yields in some high latitude regions
- Falling yields in many developed regions

Water
- Small mountain glaciers disappear – water supplies threatened in several areas
- Significant decreases in water availability in many areas, including Mediterranean and Southern Africa
- Sea level rise threatens major cities

Ecosystems
- Extensive Damage to Coral Reefs
- Rising number of species face extinction

Extreme Weather Events
- Rising intensity of storms, forest fires, droughts, flooding and heat waves

**Risk of Abrupt and Major Irreversible Changes**
- Increasing risk of dangerous feedbacks and abrupt, large-scale shifts in the climate system

# 5.10. Human Influence on Extreme Weather Events (WG I, AR4, Februar 2007: S. 8)

Phenomenon[a] and direction of trend	Likelihood that trend occurred in late 20th century (typically post 1960)	Likelihood of a human contribution to observed trend[b]	Likelihood of future trends based on projections for 21st century using SRES scenarios
Warmer and fewer cold days and nights over most land areas	Very likely[c]	Likely[d]	Virtually certain[d]
Warmer and more frequent hot days and nights over most land areas	Very likely[e]	Likely (nights)[d]	Virtually certain[d]
Warm spells/heat waves. Frequency increases over most land areas	Likely	More likely than not[f]	Very likely
Heavy precipitation events. Frequency (or proportion of total rainfall from heavy falls) increases over most areas	Likely	More likely than not[f]	Very likely
Area affected by droughts increases	Likely in many regions since 1970s	More likely than not	Likely
Intense tropical cyclone activity increases	Likely in some regions since 1970	More likely than not[f]	Likely
Increased incidence of extreme high sea level (excludes tsunamis)[g]	Likely	More likely than not[f,h]	Likely[i]

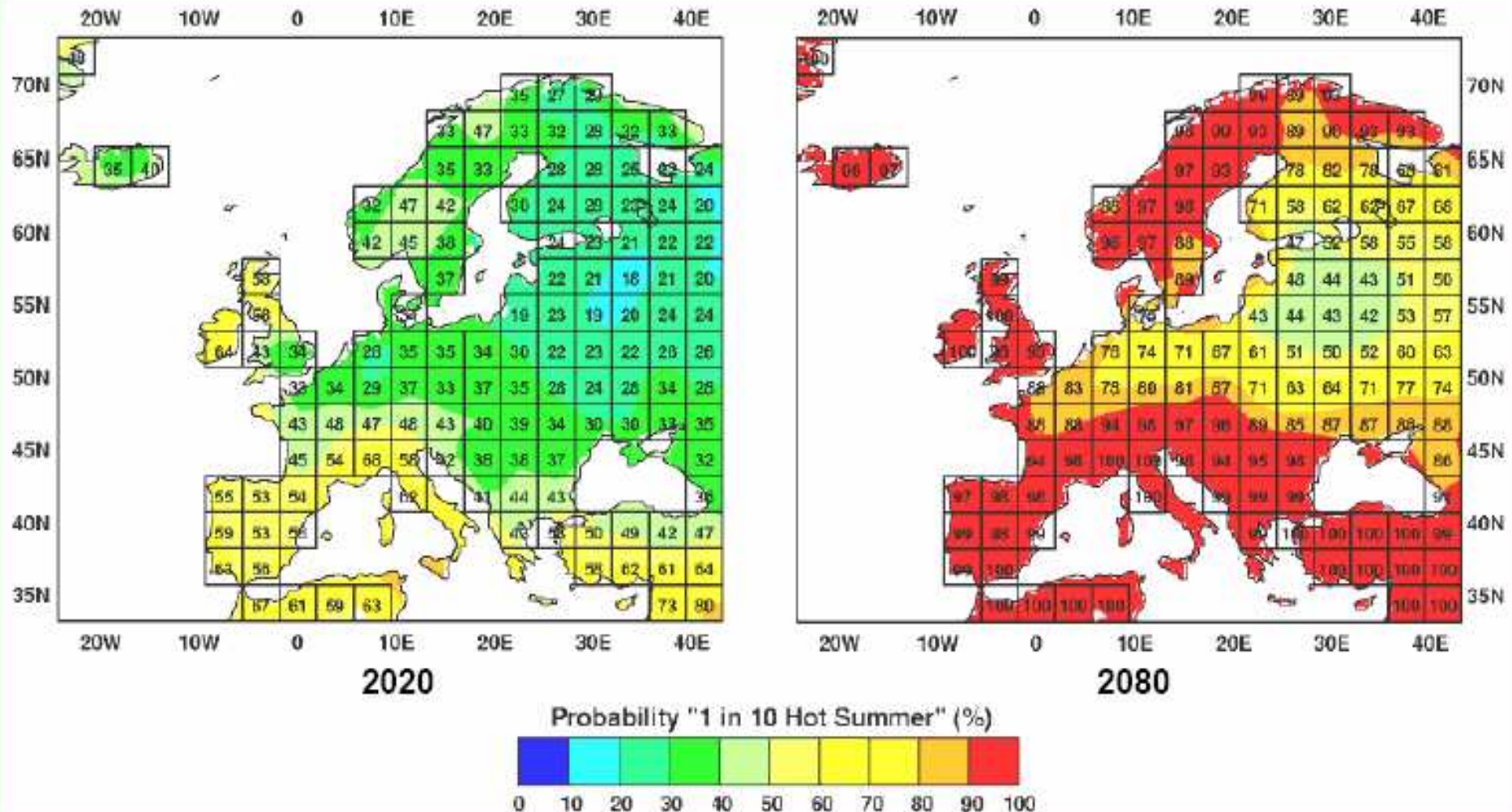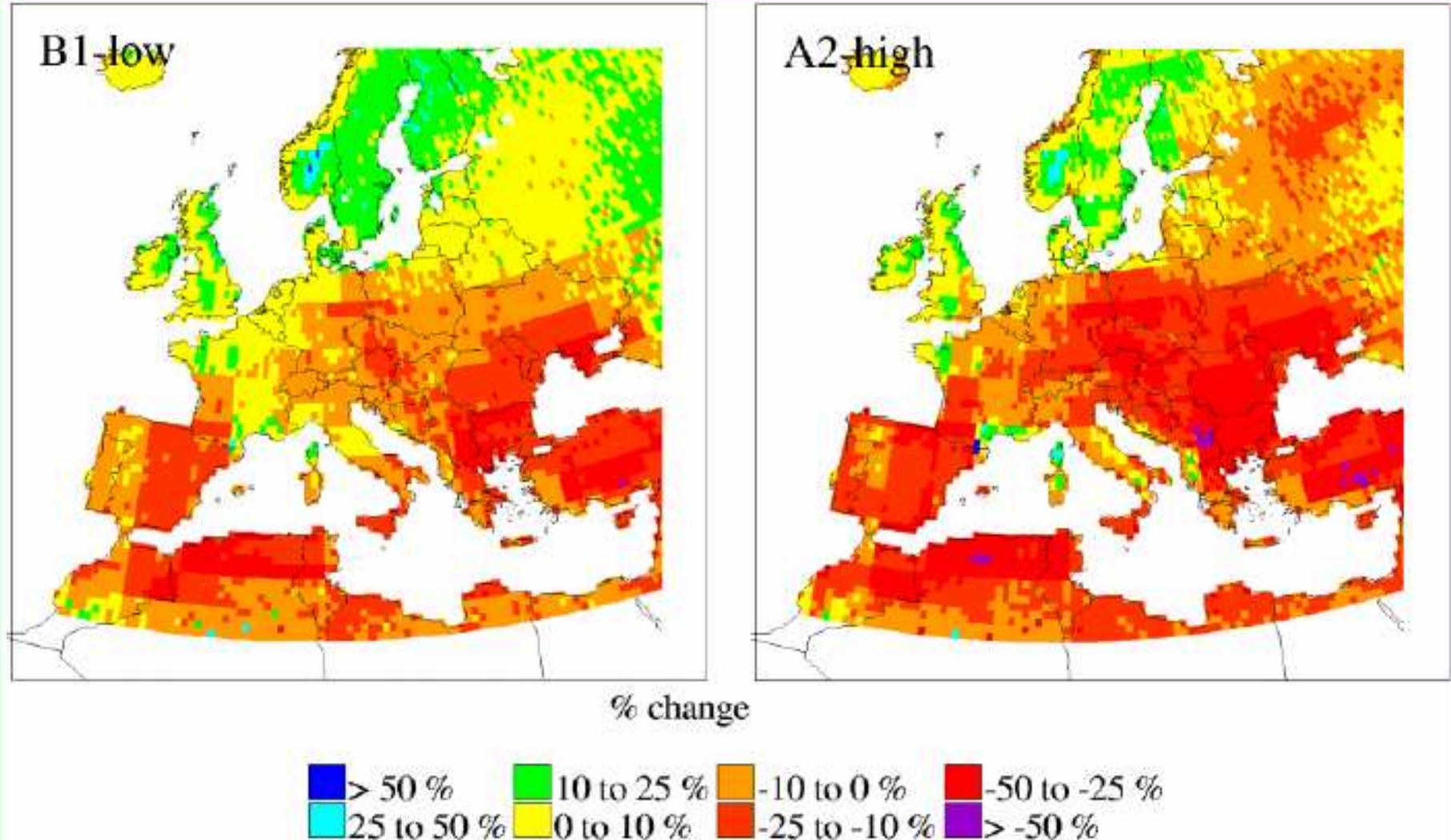# 5.11. Winter Temperature (2020-2080) Winter Precipitation

A2

2020   2080

Probability "1 in 10 Hot Summer" (%)

0 10 20 30 40 50 60 70 80 90 100
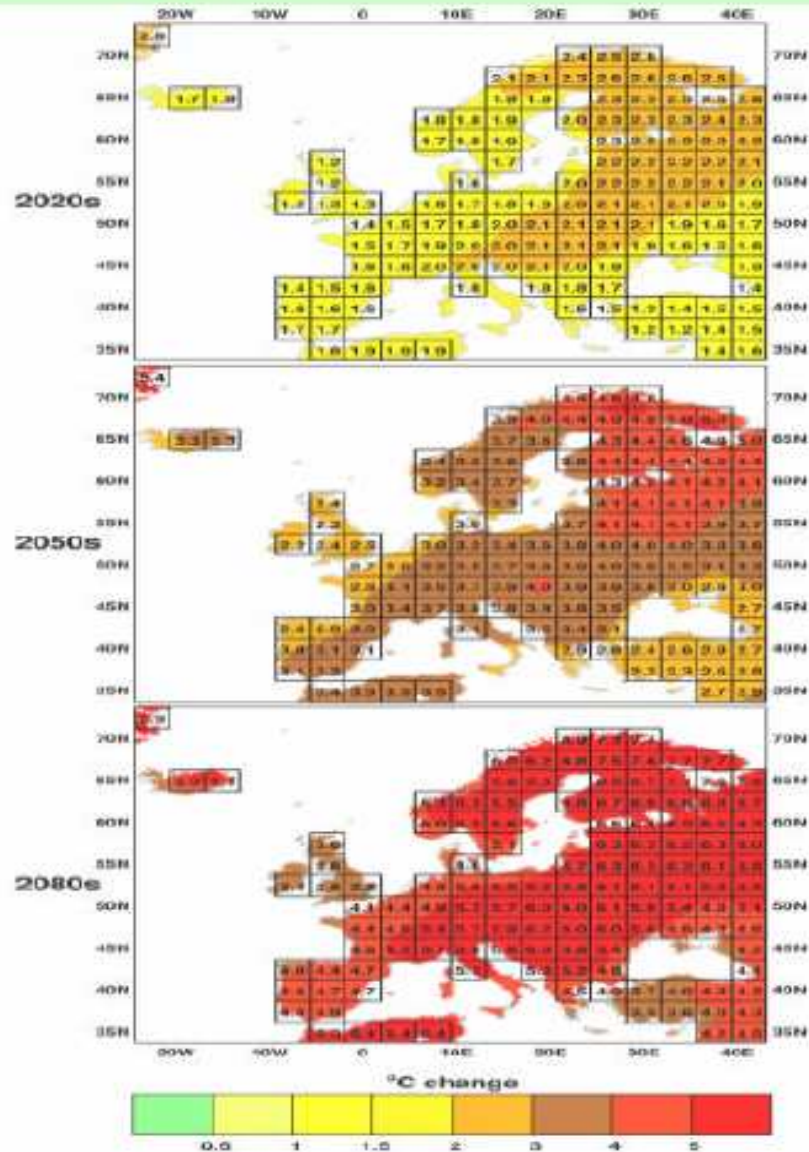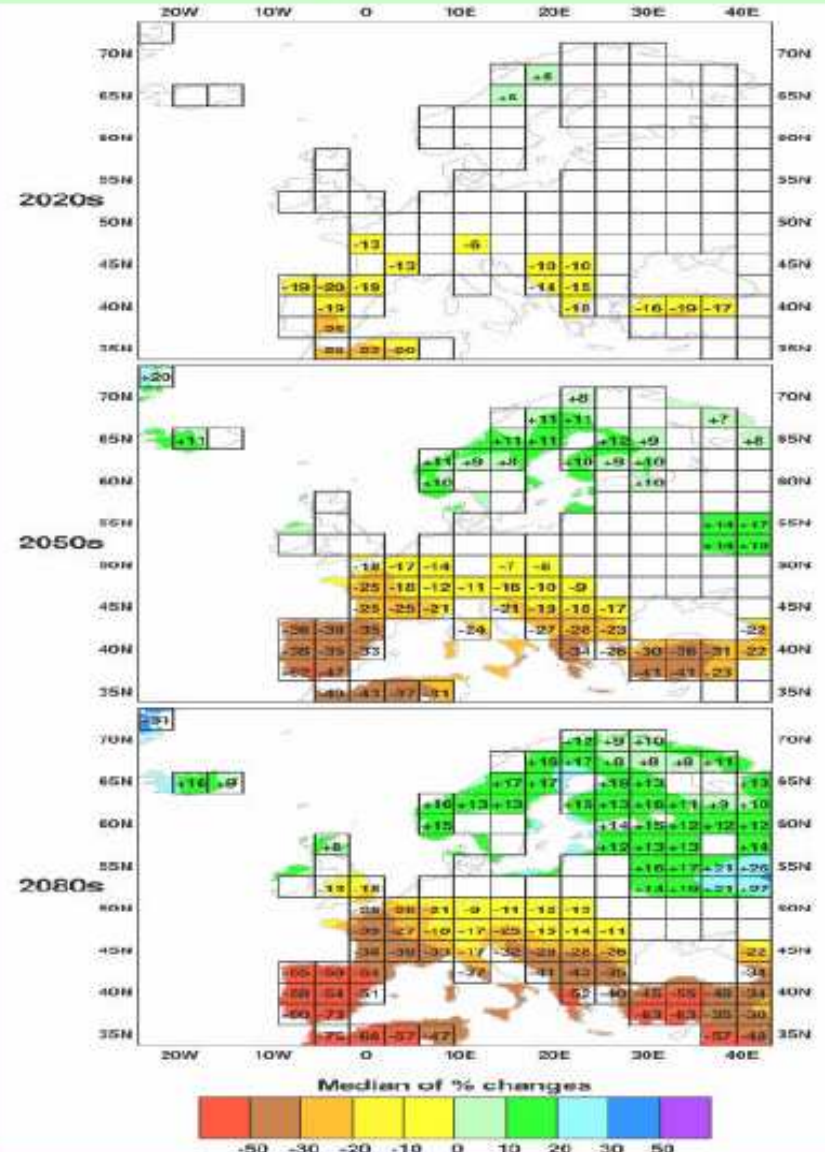
5.13. Water Availability 2050
(M. Parry, IPCC, London, 2005)

5.14. Effects of 2003 summer heat wave on agricultural yield in five EU countries

Effects of 2003 summer heat wave on EU agriculture

Change in cereal production under three different GCM equilibrium scenarios in percent from base estimated in 2060

Developed countries

Climate effects only

Plus physiological effect of CO$_2$

Plus adaptation level 1

Plus adaptation level 2

GISS scenario

GFDL scenario

UKMO scenario

World total

Climate effects only | Plus physiological effect of CO$_2$ | Plus adaptation level 1 | Plus adaptation level 2

Developing countries

Climate effects only | Plus physiological effect of CO$_2$ | Plus adaptation level 1 | Plus adaptation level 2

Notes: Level 1 adaptation included changes in crop variety but not the crop, the planting date of less than 1 month, and the amount of water applied for areas already irrigated. Level 2 adaptation additionally included changes in the type of crop grown, changes in fertilizer use, changes in the planting of more than 1 month, and extension of irrigation to previously unirrigated areas.

GRID Arendal UNEP

GRAPHIC DESIGN : PHILIPPE REKACEWICZ

Source: Climate change 1995, Impacts, adaptations and mitigation of climate change: scientific-technical analyses, contribution of working group 2 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge press university, 1995.

Figure 4. High Potential for Food Crisis 1901-1995.

←High Potential
for Food Crisis
(1901-1995)

© Alcamo/Endejan 2002: 143

5.16. Food Crises

High Potential for
Food Crisis (2001-
2050) with GDP and
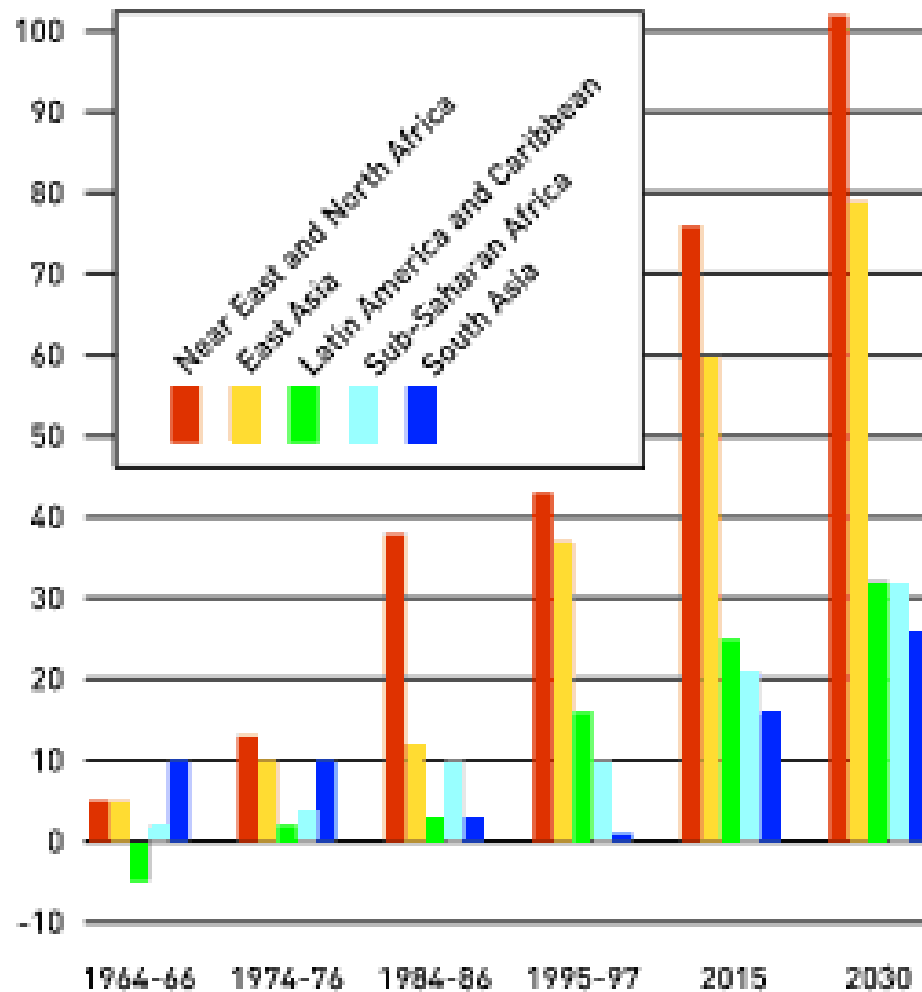Climate Change →

© Alcamo/Endejan 2002-143
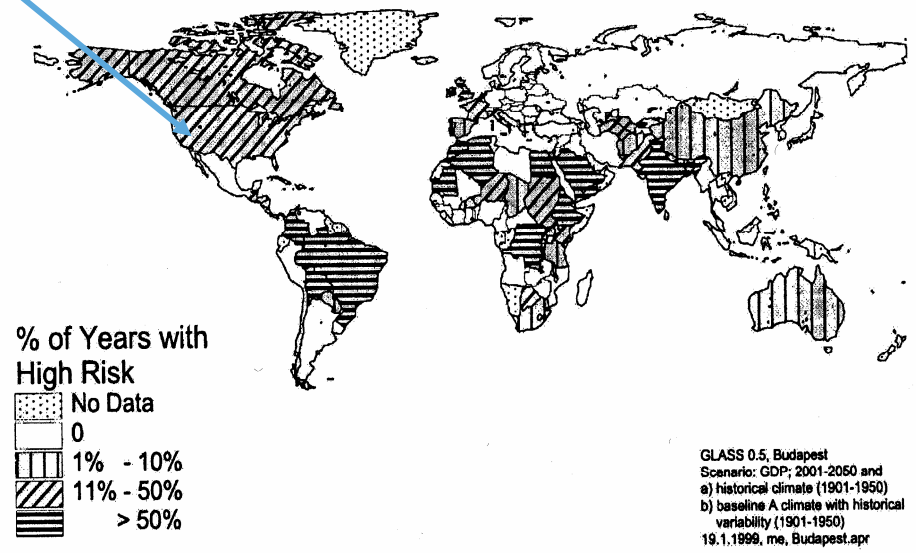
Figure 6. High Potential for Food Crisis 2001-2050
– with GDP Increase and Climate Change.

5.17. FAO (2000) Increase in Cereal Imports

Net cereal imports in developing countries

millions of tonnes

Legend: Near East and North Africa, East Asia, Latin America and Caribbean, Sub-Saharan Africa, South Asia

Years: 1964-66, 1974-76, 1984-86, 1995-97, 2015, 2030

- **FAO: 4 March 2003, Rome** World's population will be better fed by 2030, **but hundreds of millions of people in develo-ping countries will remain chronically hungry**.

- Number of hungry people will decline from 800 million today to 440 million in 2030.

- **The target of the World Food Summit (1996) to reduce the number of hungry by half by 2015, will not be met by 2030.**

6. Climate Change as an Issue of International Politics and Security

Objective: climate change has influnced human history for more than 10.000 years

Subjective: perception of climate change as an issue of security and survival is recent.

1896: Arrhenius hypothesis: energy & climate change

Climate Change became an issue of IR since 1988

1988: Reagan Admin. put CC on agenda of G-7

1990: IPCC set up by UN General Assembly

1992: Rio Earth Summit: UNFCC signed

1997: Kyoto protocol approved (-5.1% by ,08)

- Problem of environmental security (BMU/Brauch 2002)
- Problem of national security (UK, USA, 2004)
- Problem of human security (GECHS,2005)
- Problem of international security: UNSC-Debate on 17.4.2007

6.1. Climate Change Poses Threats, Challenges, Vulnerabilities & Risks for Human, National, Food & Health Security

- **Globally: past trends & future projections**
  - Temperature increase and change in precipitation
  - Increase in both flash floods & droughts
  - Hazard impacts depend also on social vulnerability and resilience
  - Response requires both protection & empowerment of the people

- **Climate Change Impacts on Human Security**
  - Increase in temperature (flash floods & droughts) & sea level rise poses a
  - „survival dilemma" for affected poor people in the South:
     a) to stay at home and to protect property (women, children, old p.)
     b) to leave their home and to move to mega cities (metro poles)
     c) to fight for the access to water (nomads in Sahel countries)

- **Conceptual Response is HUGE (U. Oswald Spring, Mexico)**
  - Human, Gender and Environmental Security (HUGE)
     a) to cope with survival dilemma of the victims of Global Environm. Change
     b) to develop survival strategies by enhancing resilience

6.2. Linking Human & Environmental Security

- **Two separate schools of thought:**
  - **Environmental security**: primarily state-centred (U.S. focus)
  - **Human security**: so far no focus of the Human Security Network (14 states) on enviornment & on natural hazards
  - **HSN 8th Min. meeting in Bangkok (1-2 June 2006):** reference to the need to consider GEC and natural hazards
- **'People-centred' environmental security:**
  - **Jon Barnett (Au/NZ, 2001):** reduce environmental degradation for the vulnerable people. He draws on ecology and hazard theory with the key notions of risk, vulnerability and resilience.
- **Environmental dimension of human security:**
  - **UNDP (1994):** 'environmental security' one of 7 components of an all-encompassing human security concept.
  - **GECHS (1999):** focuses on the pressures and effects of GEC
  - **UNU-EHS (2005):** focuses on the impacts, the societal outcomes but also on policy response, primarily in the UN system.

6.3. Climate Change as a Problem of Environmental Security: BMU-Study (2002)

- **Grotian Diagnosis: H.G. Brauch:** *Climate Change, Environmental Stress and Conflicts, Fed. German Min. of Environment* **(Nov. 2002)**
- **Focus: Interaction between Global Environmental Change and Fatal Outcomes, case studies: Mexico, Bangladesh, Egypt, Mediterranean**
- **Distress migration: from Nile Basin, across the Mediterranean, major human disasters, increase in hydro-meteorological hazards in the Mediterranean: storms, droughts, flash floods.**

- **Assumption:** IPCC hypothesis
- **Worldview:** Grotian
- **Concept:** environmental and human security
- **Referent:** GEC, individual
- **Method:** socio-economic, qualitative, hermeneutic, pro-jection of trends by IGOs
- **Plausibility:** higher
- **Research Needs**: strategies of environmental conflict avoidance

6.4. Climate Change as a Security Problem: Agenda Setting by UK

- **Science Adviser Sir David King of PM: Blair: Climate Change is a bigger trheat than terrorism**

- **February 2006: British Defence Minister John Reid:**
  - „Climate change may spark conflict between nations and British armed forces must be ready to tackle violence.
  - „We see uncertainty growing ... about the geopolitical and human consequence of climate change. .. Impacts such as flooding, melting permafrost & desertification could lead to loss of agricultural land, poisoning of water supplies & destruction of economic infrastructure."
  - "More than 300 million people in Africa currently lack access to safe water; climate change will worsen this dire situation.

- **Report of the Economic Adviser Sir Nicholas Stern (30.10. 06): Costs of Climate Change higher than those of two world wars**

- **John Ashton, UK Foreign special Representative for cliamte Change said at a conference on "Climate Change: The Global Security Impact", on 24.1.2007: "There is every reason to believe that a the 21st century unfolds, the security story will be bound together with climate change."**

- **17.4.2007: Foreign Secretary Beckett: First meeting on Climate Change as a Security issue**

6.5. Climate Change as a Problem of National Security

- **Peter Schwartz/Doug Randall: Contract Study for DoD, Net Assessment, Oct. 2003**
  - *Zweck: "to imagine the unthinkable – to push the boundaries of current research on climate change so we may better under-stand the potential implications on United States nat. security."*

- **Nils Gilman, Doug Randall, Peter Schwartz:**
  - **Impacts of Climate Change: A system Vulnerabiliy Approacjh to Consider the Potential Impacts to 2050 of a Mid-Upper Greenhouse Gas Emissions scenario (Janaur 2007);**

- **CNA Corp: *National Security and the Threat of Climate Change* (April 2007)**
  - **Climate change can act a s a threat multiplier for instability in some of the most volotile regions… presents national security challenge for U.S.**

6.6. Climate Change as a Problem of International Security

- **UK Foreign Minister Margaret Beckett (17.4.2007)**
  - Climate change is a security issue but it is **not a matter of narrow national security** - it has a new dimension," she said. "This is about our **collective security** in a fragile and increasingly interdependent world."

- **52 States particiapted (instead 15 UNSC)**
  - **For the Debate:** UN-SG, Ban Ki-moon, UK, all EU-states, Alliance of samll Island States
  - **Skectical:** Russia, USA
  - **Opposed:** China, Group of 77 (Pakistan)

6.7. Climate Change as a Problem of Human Security

- **GECHS** Science Strategy (1999): Global Environmental Change as a Problem of Human Security

- **GECHS** - Cicero Conference in June 2005: Climate Change and Human Security

- **UNU-EHS:** Floods and drought as a Problem of Human Security

- **UNU-EHS/MunichRe Foundation: Chairs on Social Vulnerability:** impact on natural hazards

- **Politicy Memorandum:** Climate Change and Human Security (15 April 2007) at: <http://www.afes-press.de/html/texte_presse.html>

6.8. Climate Change as a Problem of the Human Security Network (2007-08)

Greek Presidency: Climate Change as a Security Challenge

- **Deputy Greek FM Evripidis Stylianidis outlined Athens' priorities: climate change and their effect on sensitive population groups, such as children.**

- **Among problems that could ensue from climate change are drought, infectious diseases, illegal migration, poverty. human trafficking, particularly children. Greek presidency will address these aspects, contribute to intern. dialogue.**

- **We shall promote specific proposals at international organisations, the UN, the EU and UNICEF and we shall try to give the issue the weight it deserves,"**

- **Main issues being examined by the ministerial "watch" is removal of mines, combatting the trafficking of light arms, the strengthening of multi-partite di-plomacy and of international humanitarian law, support and protection for sen-sitive groups, refugees, women and children and the prevention of conflicts.**

- **Greek presidency hopes to provide a new impetus for the Network, promoting as a priority a leading issue on the agenda of international organisations and inviting to the annual ministerial conference new countries, personalities and organisations and creating an international meeting.**

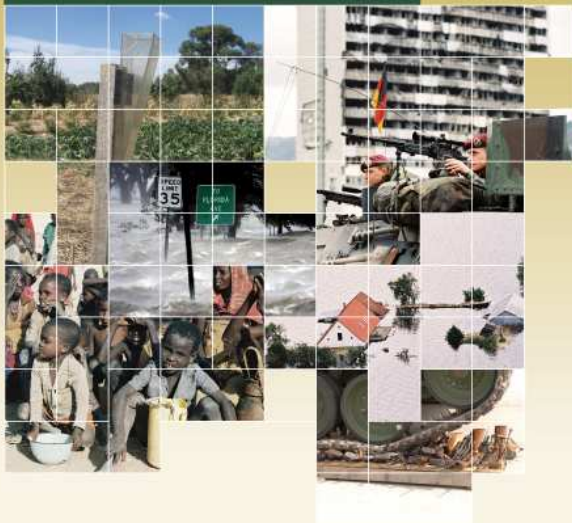# 6.9. World in Transition – Climate Change as a Security Risk
German Advisory Council on Global Change

World in Transition

German Advisory Council on Global Change (WBGU)

Climate Change as a Security Risk

Without resolute counteraction, climate change will overstretch many societies' adaptive capacities within the coming decades. This could result in destabilization and violence, jeopardizing national and international security to a new degree. However, climate change could also unite the international community, provided that it recognizes climate change as a threat to humankind and soon sets the course for the avoidance of dangerous anthropogenic climate change by adopting a dynamic and globally coordinated climate policy. If it fails to do so, climate change will draw ever-deeper lines of division and conflict in international relations, triggering numerous conflicts between and within countries over the distribution of resources, especially water and land, over the management of migration, or over compensation payments between the countries mainly responsible for climate change and those countries most affected by its destructive effects.

6.10. Studies for WBGU-Report

- **Brauch: Regionalexpertise: Destabilisierungs- und Konflikt-potential prognostizierter Umweltveränderungen in der Region Südeuropa und Nordafrika bis 2020/2050 (4,8 MB, 72)**

- **Carius, Tänzler, Winterstein: Weltkarte von Umweltkonflikten: Ansätze zur Typologisierung. (5,9 MB, 115 S.)**

- **Cassel-Gintz: Karten zur Bodendegradation und Versalzung. GIS-II. (8,9 MB, 17 S.)**

- **Clark: Environmentally Induced Migration and Conflict. (1,6 MB, 24 S.)**

- **Giese, Sehring: Regionalexpertise: Destabilisierungs- und Konfliktpotential prognostizierter Umweltveränderungen in der Region Zentralasien bis 2020/2050. (1,7 MB, 46 S.)**

- **Heberer: Regionalexpertise: Destabilisierungs- und Konfliktpotential prognostizierter Umweltveränderungen in China bis 2020/2050 (824 KB, 39 S.)**

- **Swatuk: Regionalexpertise: Southern Africa, Environmental Change and Regional Security: An Assessment (440 KB, 24)**

- **Wolf: A Long Term View of Water and Security: International Waters, National Issues, and Regional Tensions (544 KB, 22 S.)**

6.11. From Research to Action:
Enhancing Environmental & Human Security

Towards Environmental Conflict Avoidance

- **Primary Goal: address fatal outcomes of GEC: hazards and disasters, migration, crises & conflicts that may have been caused, triggered, induced, influenced by: a) environmental stress and b) extreme weather events,**

- **Enhance Environmental Security:** Address human behaviour that contributes to GEC via climate change, soil degradation, water pollution & scarcity: sustainable strategies

- **Enhance Human Security:** address factors of GEC that challenge survival of individuals, families, villages, ethnic groups

- **Avoid Environmentally-induced Conflicts:** address structural or causal factors (of Survival Hexagon), e.g. climate policy, combat desertification, cope with water stress.

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