Jueves 28 de Abril 2011, 11:00 horas
UNAM, Facultad de Ciencias Políticas y Sociales
Sala Fernando Benítez

Coping with Global Environmental Change, Disasters and Security

Threats, Challenges, Vulnerabilities and Risks

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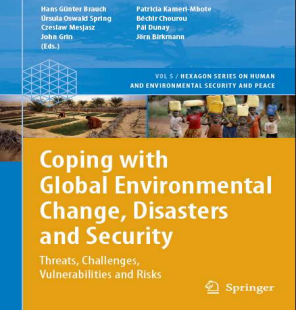

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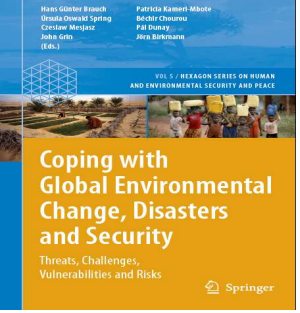
1. Key Questions & Goals of Presentation

- **Key Questions:**
  - What were the reasons for this project?
  - What are the reasons for the reconceptualization of security?
  - What are the impacts of this reconceptualization of security?
  - What is the focus of this volume?
  - What are key scientific insights and policy conclusions?
- **Goals of this Presentation:**
  - **Global Environmental and Human Security Handbook for the Anthropocene:**
    - **270 peer reviewed chapters, 300 authors, 100 countries;**
    - **Result: 3 huge English books, translations in Spanish, Turkish, Greek**
  - **Present today: 3rd volume of this English Handbook:**
    Coping with Global Environmental Change, Disasters & Security - Threats, Challenges, Vulenrabilities, Risks

2. Reasons for Reconceptualization of Security and its Impacts

- **Security concept has been reconceptualised and security interests & goals were redefined globally since 1990 due to**
  - end of the Cold War in 1989 with fall of the Berlin Wall,
  - the process of globalization and its impacts (9/11, fin. crisis)
  - emerging impacts due to Global Environmental Change
- **This reconceptualization of Security has resulted in a**
  - ***widening*** from the narrow military and political dimensions to economic, societal and environmental dimensions;
  - ***deepening*** from the 'state-centred' to 'human centred' concepts of human security both upward from national to regional, international and global security and downward to community and people's or human security;
  - ***sectorialization*** to energy, food, water, health, soil, livelihood, climate and other security concepts that have been used by international organizations and scientists to upgrade the urgency of their respective activities or fields.
- **New theories:**
  - **Political Science: Copenhagen School: Theory of Securitization (O.Waever)**
  - **Sociology: Beck's: (Global) Risk Society (U. Beck)**
  - **Geology, Geography: Shift from Holocene to Anthropocene (P. Crutzen)**
- **New approach:**
  - **Political Geoecology for the Anthropocene (Brauch/Dalby/Oswald Spring)**
- **New strategy: Fourth Sustainability Revolution (Oswald Spring/Brauch)**

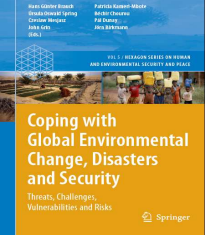


2.1. Reasons for Reconceptualization of Security and Project Goals

- **Security concept has been reconceptualised and security interests & goals were redefined globally since 1990 due to**
- **Goal of the project: offer a global conceptual mapping of the reconceptualization of security**

Reunification of Germany
Enlargement of the EU
9/11/2011: 2752 people died: „war on terror“ ➔

Mexico: last 10 years 5 major natural hazards:6 million people were affected; they caused economic damage of 16.4 billion US$;



2.2. Processes of Changing Security Concepts

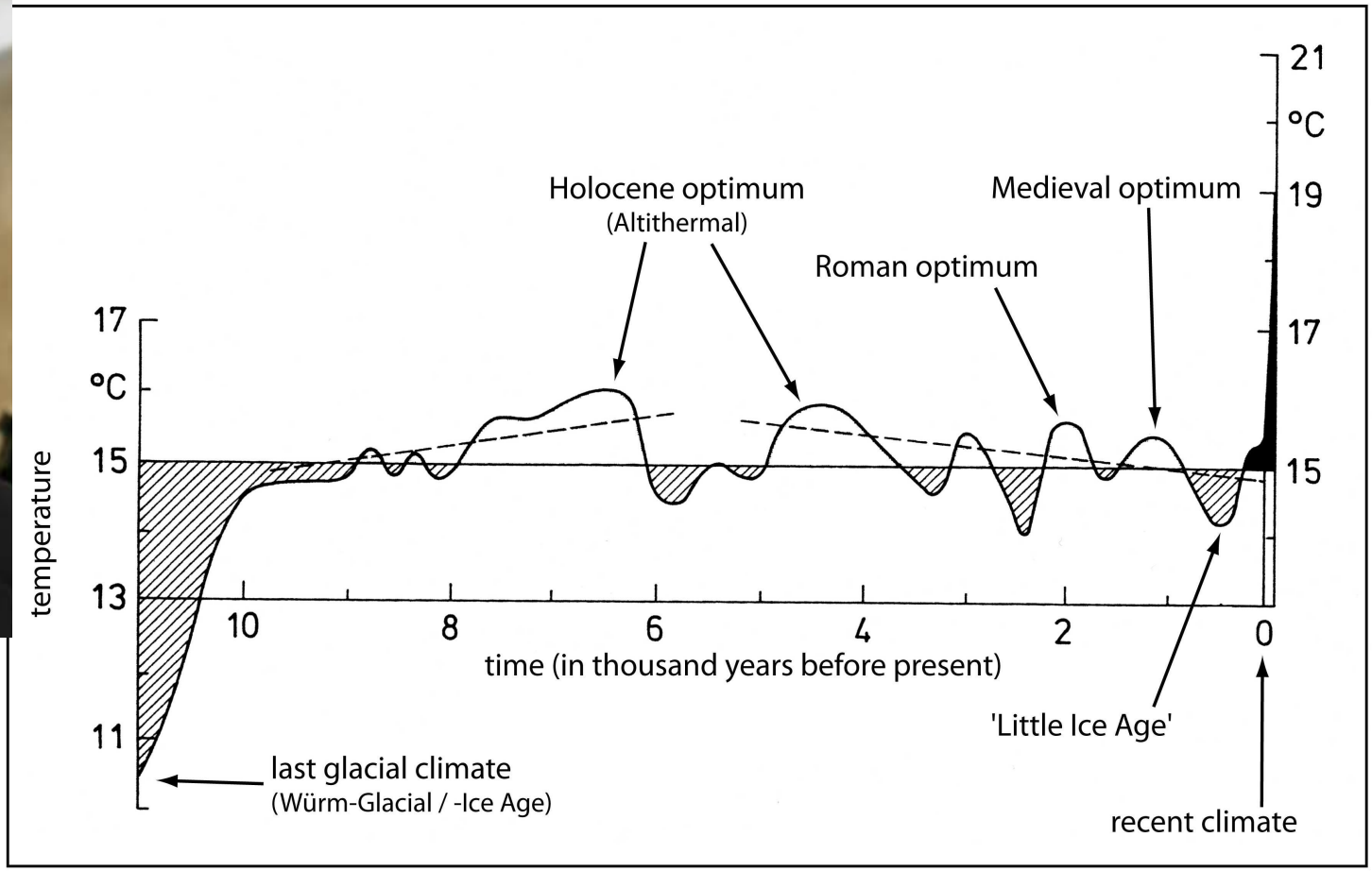
This reconceptualization of Security has resulted in a

- ***widening*** from the narrow military and political dimensions to economic, societal and environmental dimensions;
- ***deepening*** from the 'state-centred' to 'human centred' concepts of human security both upward from national to regional, international and global security and downward to community and people's or human security;
- ***sectorialization*** to energy, food, water, health, soil, livelihood, climate and other security concepts that have been used by international organizations and scientists to upgrade the urgency of their respective activities or fields.

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**	

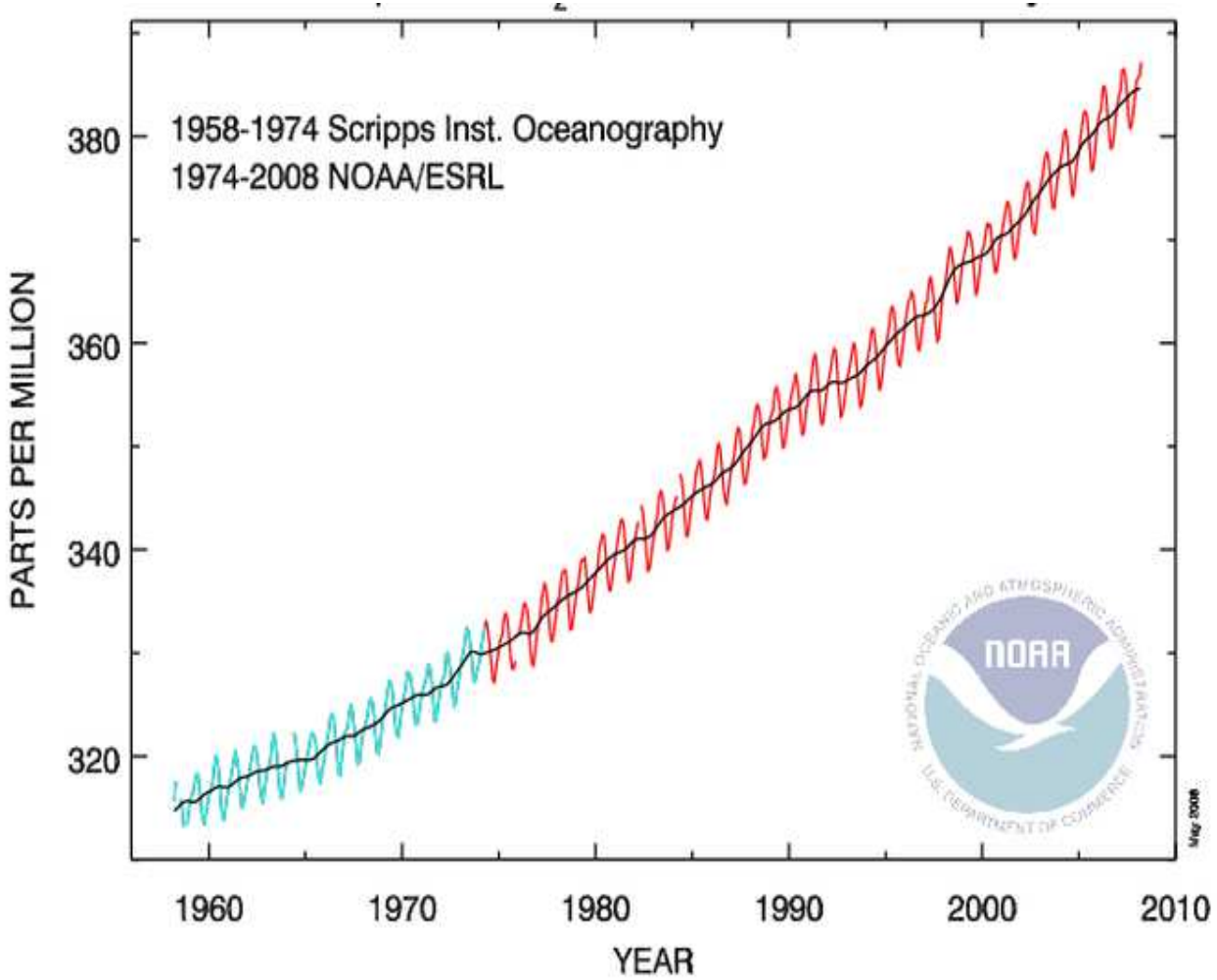
3. The Anthropocene: Security Challenges of Global Environmental Change

Paul Crutzen, Nobel Laureate for Chemistry (1995)



Holocene era of earth history since end of glacial period (10-12.000 years ago)
Anthropocene, since industrial revolution: burning of coal.oil,gasn➔GHG increase

3.1. Anthropogenic Climate Change in the Anthropocene Era (1750 to present)



- GHG concentration in the atmosphere
- 1750: 279 ppm, 1987: 387 ppm
- 1/3: 1750-1958: 279 to 315 ppm
- 2/3: 1958-1987: 315 to 387 ppm

3.2. Security Policy in the Anthropocene

- **From climate variability (Holocene) to anthropogenic climate change (Anthropocene)**
- This emerging contextual change in earth history requires a **fundamental rethinking** of the **conceptual quartet:** security, peace, environment & development:
- Clark/Crutzen/Schellnhuber (2004): A **New Copernican Revolution: New Sustainability Paradigm**
- **In the Anthropocene era of earth history: humankind is living in a global risk society (Beck)**
  - Threats are global and do not respect national boundaries
  - Difference in hazard impacts due to social vulnerability
  - Industrialized countries are not immune:
  - Tipping points of the climate system
  - Military means will not be able to solve this challenge!

3.3. Security Risk Climate Change: 3 security debate & discourses

Climate change & intern. security debate/discourse

- **UN (17 April 2007):** FM M. Beckett, UK presidency (UNSC)
- **EU (2008-):** EC & Council Study & roadmap process
- **UN GA** (June 2009-) Res., Report by Sec. General

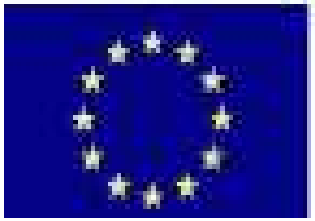
Climate change & national security debate/discourse

- **US studies:** CNA, CSIS, NIC (CIA), NSS 2010

Climate change & human security debate/discourse

- IHDP (GECHS): Lonergan & Brklacich (chairmen)
  - 2005: conference in Norway on climate change and human security
- HSN (Canada was a co-founder & a major sponsor)
- 2007/2008: Greek HSN presidency (May 2008, Athens)
- **2011-2014: IPCC, WG II, chapter on human security**

3.4. EU Paper: Climate Change & International Security (March 2008)



- **Climate change … as a threat multiplier of existing trends, tensions and Instability, that overburdens fragil and conflict prone states and regions**
- **Seven intern. Security threats from climate change**:
  - 1) Resource conflicts (Water, soil, food);
  - 2) Economic damage and Risks for coastal cities;
  - 3) Loss of Territory and border conflicts;
  - 4) en viuronmentally-induced migration;
  - 5) Situations of Fragility and radicalization
  - 6) Tensions on energy supply
  - 7) Pressure on international politics
- **Regions, where these threatds become manifest**
  - Africa, Middle East, South Asia; Central Asia, Latin America, Arctic.
- **Central challenge: Environmental Migration**

3.5. UN: Climate Change and Security (UNSC, UNGA, UN-SG)

17 April 2007: UN Security Council: tabled by Ms.Beckett (UK)

3 June 2009: UN General Assembly Resolution:

- 1. *Invites* the relevant organs of the United Nations, as appropriate and within their respective mandates, to intensify their efforts in **considering and addressing** climate change, including its possible security implications;
- 2. *Requests* the Secretary-General to submit a **comprehensive report** to the General Assembly at its sixty-fourth session on the **possible security implications of climate change**, based on the views of the Member States and relevant regional and international organizations.

August-September 2009: submission by states (31 replies)

2 Reports by UN Secretary-General Report by Ban-Ki Moon

- **11 September 2009 on: *Climate change and its possible security implications* (A/64/350)**
- **8 March 2010 on: *Human Security* (A/64/701)**

3.6. Climate Change & National Security: USA

Climate changes as a threat for US national security Search for military answers & new DoD missions

- **Pentagon study** of Schwartz/Randall: (2003, 2004)
- **April 2007: CNA:** *National Security & the Threat of Climate Change* (April 2007): climate change as a threat multiplier in vulnerable regions for US security
- **November 2007,** *Center for Strategic and Intern. Studies* (CSIS); *Centre for a New American Security* (CNAS): *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change*

US National Security Strategy 2010

- **The danger from climate change is real, urgent, and severe**. The change wrought by a warming planet will lead to new conflicts over refugees and resources; **new suffering from drought and famine; catastrophic natural disasters**; and the **degradation of land across the globe**. The United States will therefore confront climate change based upon clear guidance from the science, and in cooperation with all **nations—for there is no effective solution to climate change that does not depend upon all nations taking responsibility for their own actions and for the planet we will leave behind.**

3.7. Climate Change & Human Security

- **IHDP-GECHS (1999-2009):** conference: climate change and human security (2005)
- **Red de Seguridad Humana**
- (Austria, Chile, Costa Rica, Eslovenia, Grecia, Irlanda, Jordania, Mali, Noruega, Súiza, Taílandia y Africa del (observador)
- **10a Conferencia Ministerial, Atenas**
  - Cambio climático (CC) y países en desarrollo
  - Cambio climático y Mujeres
  - **Cambio climático (CC) y Niños**
  - **Cambio climático y Emigrantes**

- **Friends of Human Security (Japan & Mexico, co-chairs)**
- **Discussed climate change as one of 5 issues since second meeting in 2007**
- **UN-Secretary General: Report on Human Security (March 2010): referred to climate change & natural disasters**
- **UNGA, informal meeting, 14 April 2011**

4. We are the Threat and we are the Victims!

- **3 policy debates: climate change (2002-today)**
  - referent: international (EU, UN), national security (USA)
- **Different threat analysis: They are the threat**
  - They are the threat: victims of GEC and climate change
  - Legitimation of new military missions: Obamas: QDR, NSS
- **Shift of focus: We are the threat and the victims**
  - **Threat:** consumption, burning of fossil fuels (CO2 -> GHG)
  - **Victims:** human beings, humankind: poses equity issues
  - Solution: Reduction of GHG by 50% by 2050
  - Requires: new knowledge, innovation, transformation
- **Goal is not militarization of the environment (as pursued by some & critisized by others) but demilitarization of security**
- **Coping with this threat requires: human security approach**

4.1. Merge two parallel debates

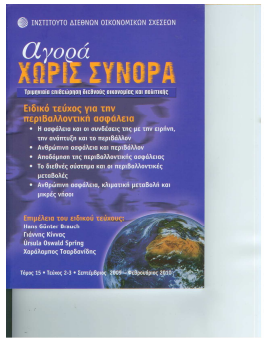
- **Two paralell debates on environmental and human security in the UN General Assembly, the UN Security Council.**
- **UN-Secretary General has responded with two reports:**
  - **Climate change and its possible security implications** (2009)
  - **Human Security** (March 2010) where he referred to “the threats posed by natural disasters” for human security and **suggested to apply this concept to climate change** and the increase in **frequency and intensi-ty of climate-related hazard events**.
- **Proposal to UNGA on 14 April 2011: add fourth pillar of HS:**
  - **Freedom from Fear (peacekeeping, humanitarian law, disarmament)**
  - **Freedom from Want (human and sustainable development agenda;**
  - **Freedom to live in Dignity (human rights, governance, rule of law)**
  - **Freedom from Hazard Impacts (policy agendas on global environ-mental change, natural hazards,disasters (early warning, disaster response & preparedness, resilience building, reduction of social vulnerability).**

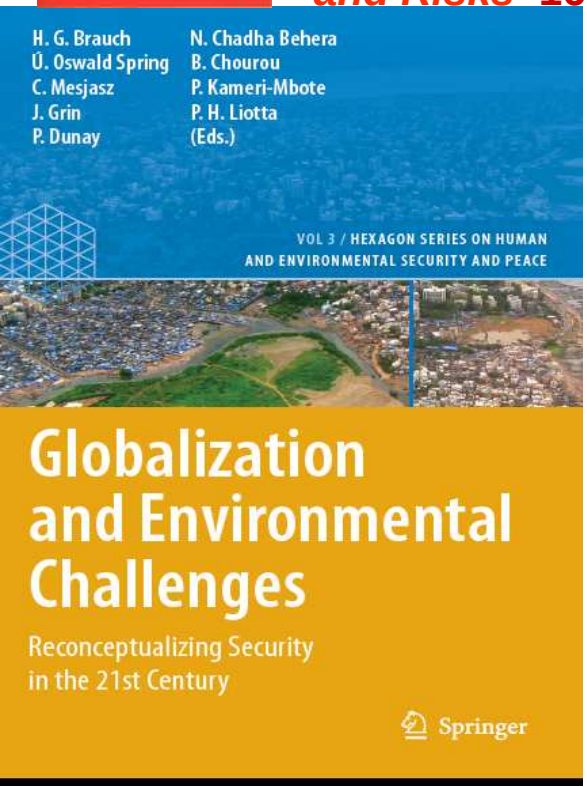
5. Global Environmental and Human Security Handbook for the Anthropocene

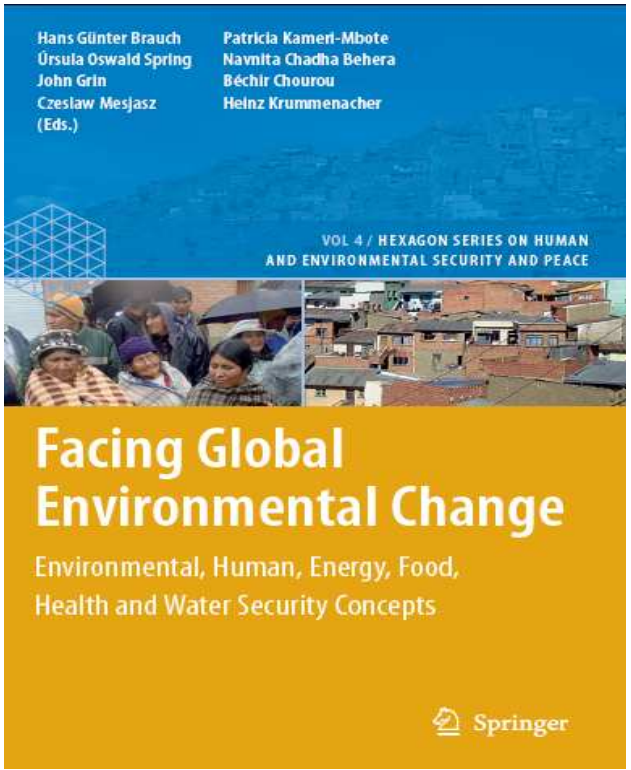
Vol. 3 (1): Globalization and Environmental Challenges: 92 authors, 36 countries, 16 disciplines, (2008)

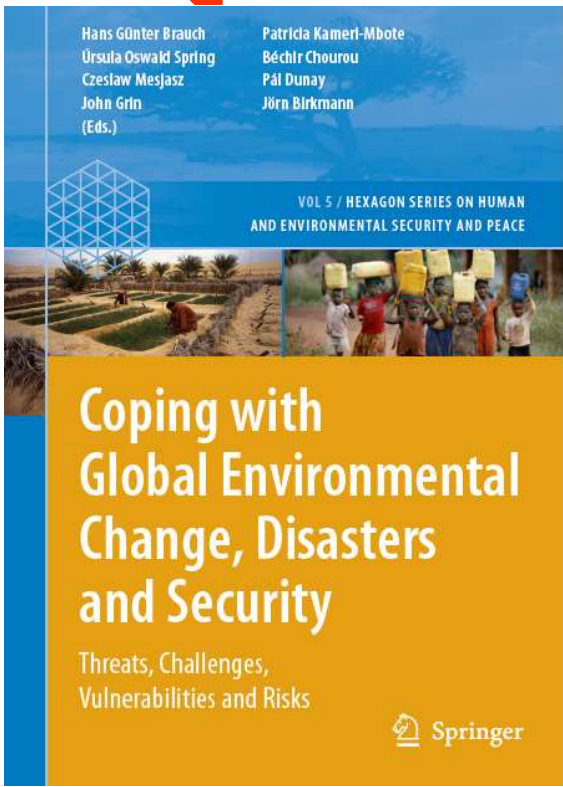
Vol. 4 (2): Facing Global Environmental Change: 132 authors, 49 countries on global debate and problems of environmental, human, energy, food, health, water security (2009)

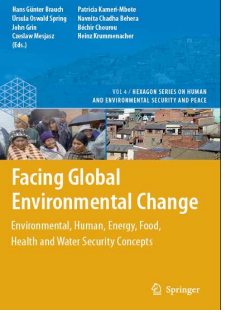
➔**Vol. 5 (3): Coping with Global Environmental Change:** ***Disasters and Security – Threats, Challenges, Vulnerabilities and Risks*** **164 authors, 48 countries (2011).**











5.1. Structure & Themes of this Book: Concepts, Coping Strategies & Tools

I: Introduction (chap. 1-5)

II: Regional Political and Military Security Dangers and Concerns (ch. 6-19)

III: Economic, Social, Environmental and Human Security Dangers in the Near East, Africa and Asia (ch. 20-28)

IV: Threats, Challenges, Vulnerabilities and Risks for Urban Centres in Hazards and Disasters (ch. 29-39)

V: Coping with Climate Change, Soil and Desertification, Water Management, Food and Health (ch. 40-67)

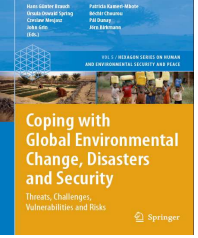
VI: Coping with Hazards, Social Vulnerability and Resilience Building (ch. 68-72)

VII: Coping with Global Env. Change: Scientific, International and National Political Strategies, Policies and Measures (ch. 73-89)

VIII: Remote Sensing, Vulnerability Mapping and Indicators of Env. Security Challenges (ch. 90-91)

IX: Towards an Improved Early Warning of Conflicts and Hazards (ch. 92-93)

X: Summary and Conclusions: (ch. 94-95)



5.2. Latin America & Mexico

Ursula Oswald Spring (Mexico): coed. of 3 vol. (author of 2 ch., co-auth. 4 ch.):

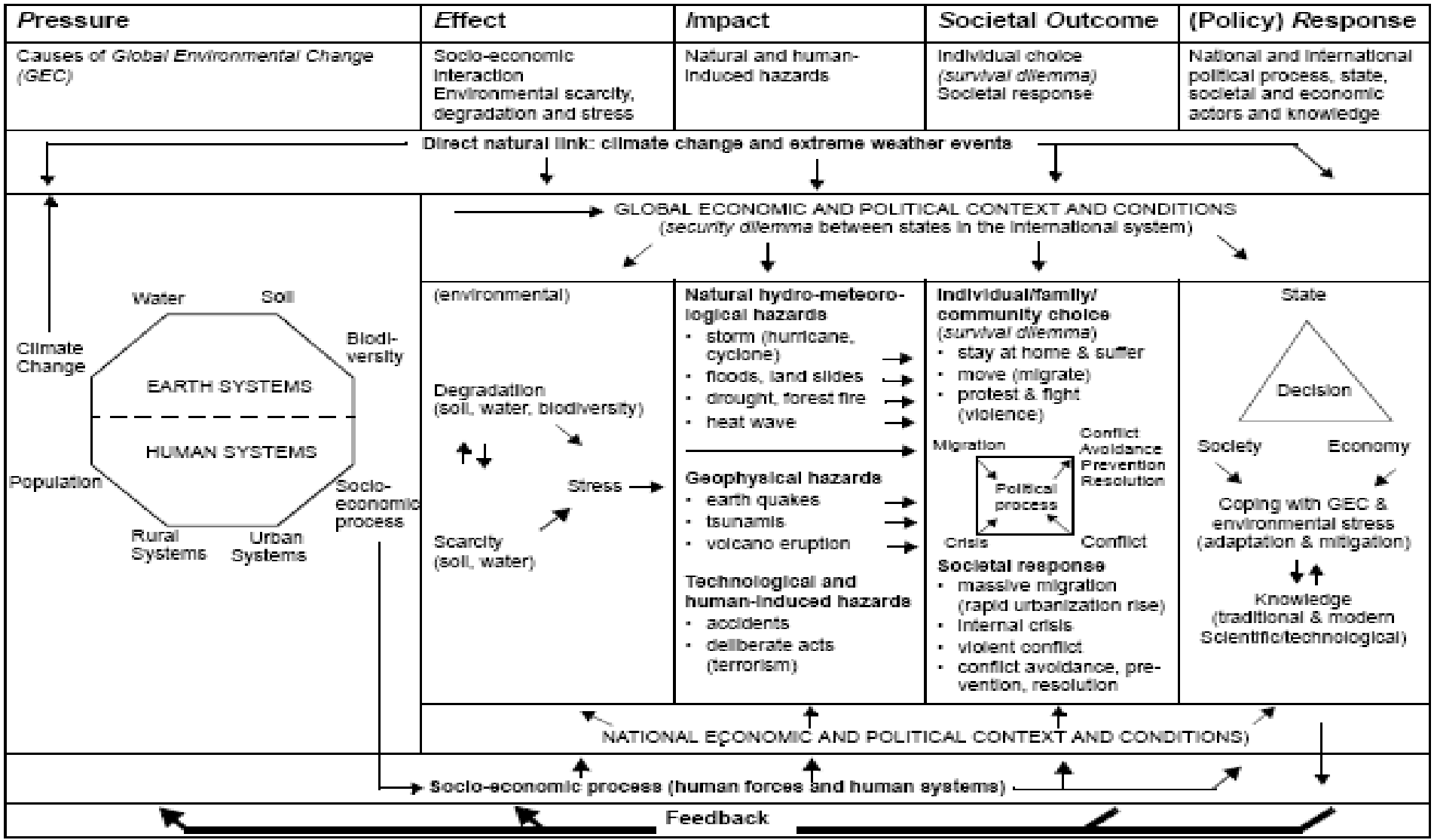
- Genetically Modified Organisms: A Threat for Food Security and Risk
- for Food Sovereignty and SurvivalSocial Vulnerability, Discrimination, and Resilience-building inDisaster Risk Reduction

- ***Omar D. Cardona (Columbia):*** Disaster Risk and Vulnerability: Concepts and Measurement of Human and Environmental Insecurity
- ***Omar Serrano (Mexico):*** Promoting Democracy as a Security Goal. The 'inward-outward' Paradox of the EU's Foreign Policy
- ***Mabel C. Marulanda, Omar D. Cardona and Alex H. Barbat* (Colombia)*:*** Revealing the Impact of Small Disasters to the Economic and Social Development
- ***Carmen Lacambra and Kaveh Zahedi* (Colombia)*:*** *Climate Change, Natural Hazards and Coastal Ecosystems in Latin-America: A Framework for Analysis*
- ***Tulio Arredondo Moreno (Mexico; Elisabeth Huber-Sannwald: (Austria):*** Impacts of Drought on Agriculture in Northern Mexico
- ***Cecilia Conde (Mexico):*** Coping with Climate Change Impacts on Coffee and Maize for Peasants in Mexico
- ***Fátima Flores (Mexico), Wolfgang Wagner (Austria)****:* The Impact of AIDS on Women's Social Life in a Mexican Rural Community
- ***Juan Carlos Villagrán de León (Guatemala):*** *Risks in Central America: Bringing Them Under Control*
- ***Ricardo Zapata-Martí (Mexico/Chile):*** Strategies for Coping with Climate Change in Latin America: Perspective beyond 2012
- ***Juan Carlos Villagrán de León (Guatemala):*** Vulnerability Assessment in Sri Lanka in the Context of Tsunami Early Warning

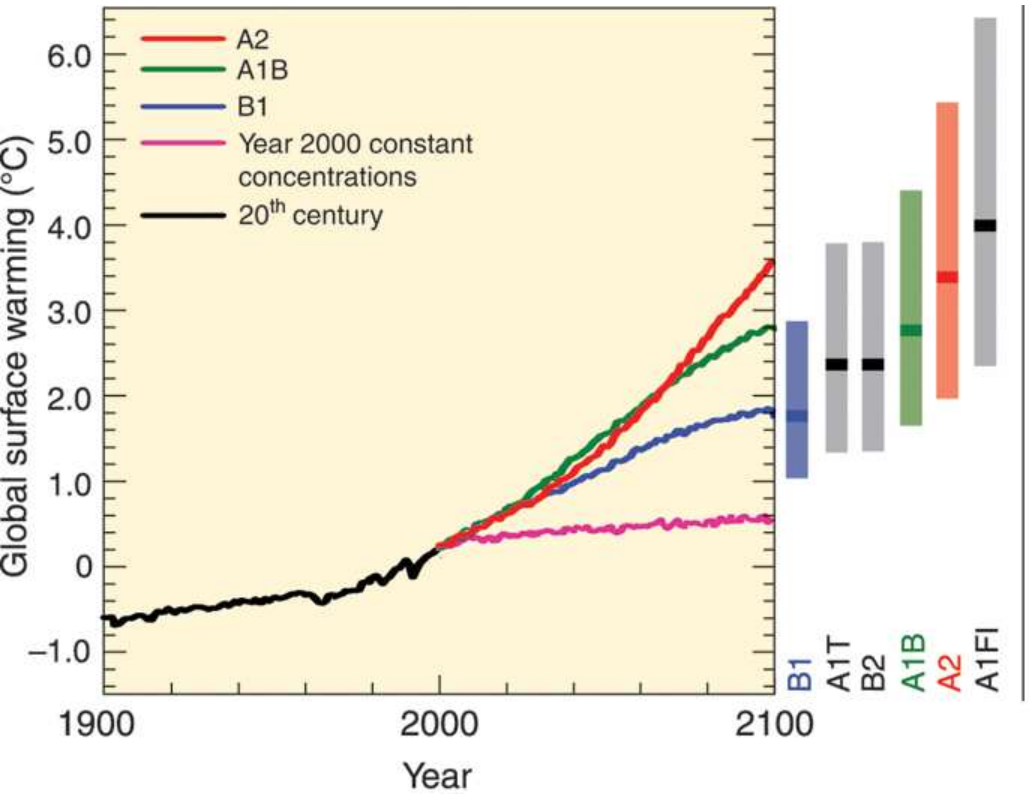
6. Analysing Security Impacts of Climate Change in the Anthropocene

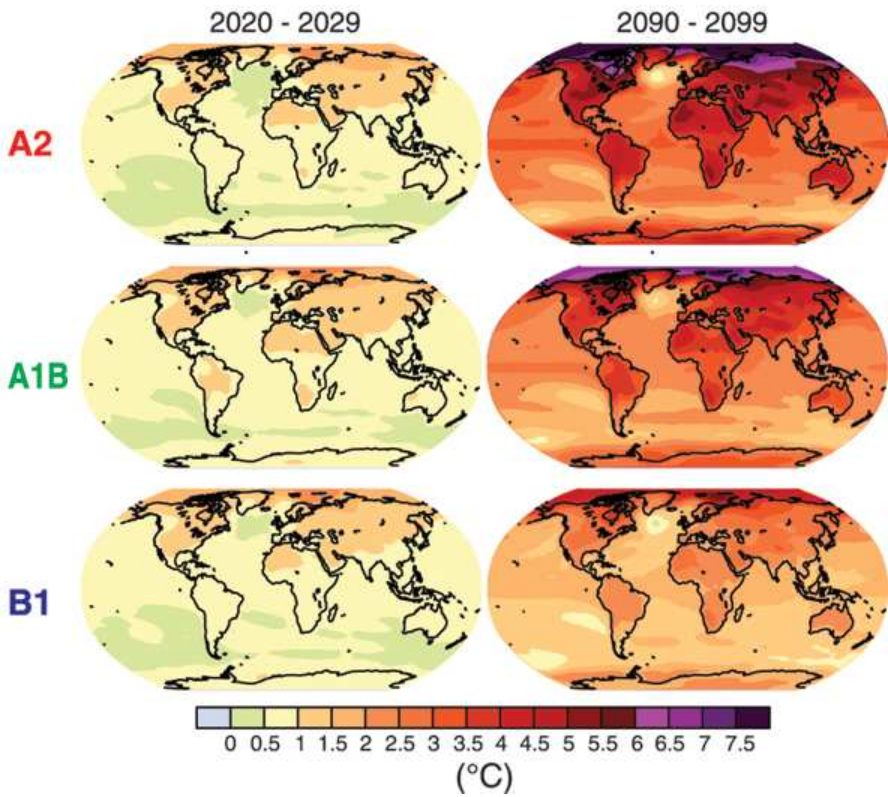
- Addressing the new challenges to human, national and international security requires a multi-, inter- and transdisciplinary approach focusing on both the
  - Earth system & its interactions (environmental quartet)
  - Human system & its interactions (societal quartet)
  - Linear, non-linear, chaotic itnereactions among both
- Due to turn from Holocene to Anthropocene:
  - No anologies from massive migration, conflicts and collpase of civilizations (e.g. Mayan) are possible
- Different political science approaches are possible:
  - Discourse, causal, scenario analyses

6.1 Global Environmental Change & Security Impacts: PEISOR Model



6.2. Anthropogenic Climate Change in the Anthropocene (1900-2100)



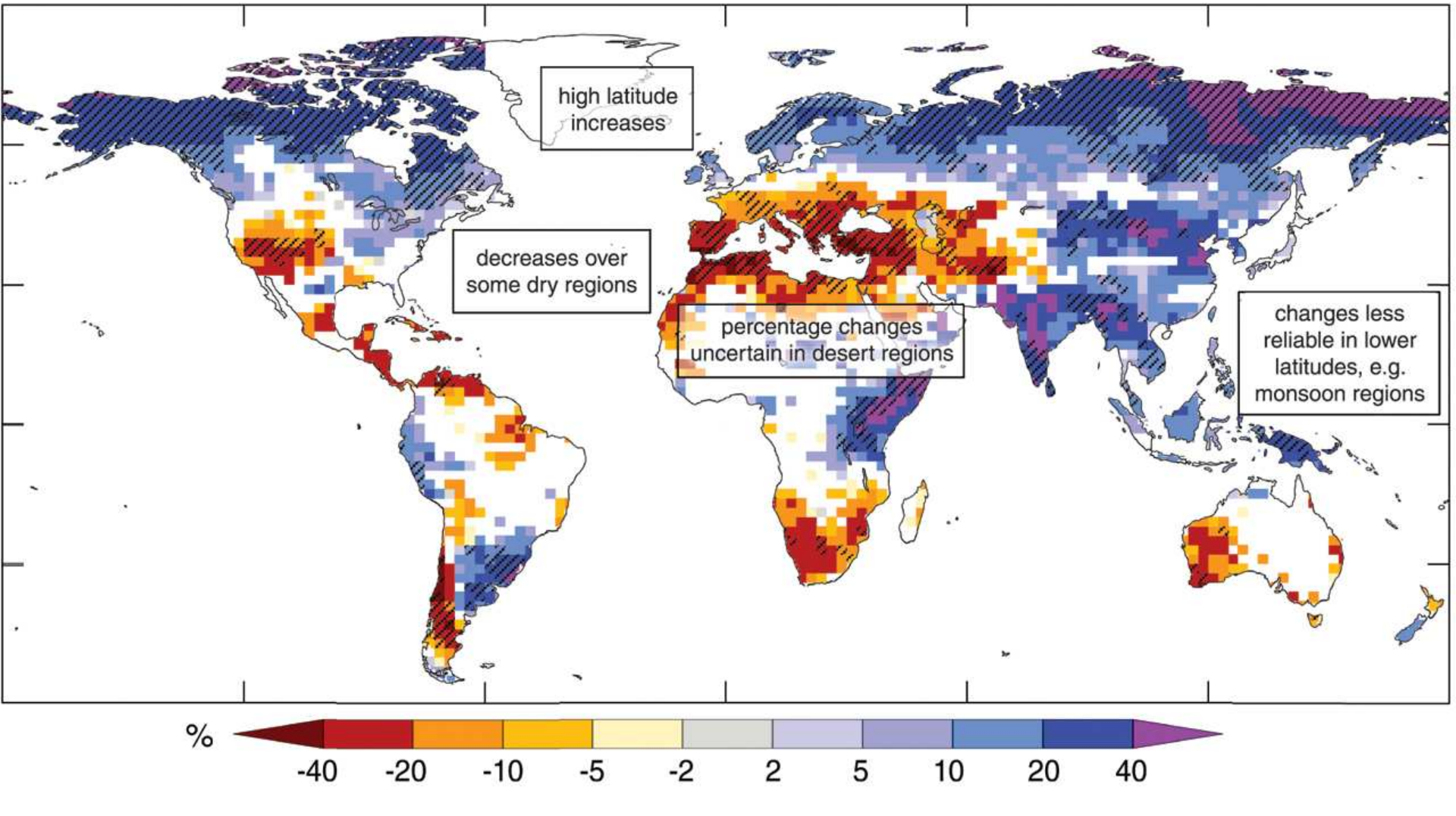


- **Three Regimes for Temperature Increase**
  - +2℃: **certain**: EU Stablization goal (**decision in Copenhagen COP 15)**
  - +4℃: **probable, without immediate Stabilizartion Measures**
  - +6℃: **possible** (business as usual) **(catastrophe scenario)**

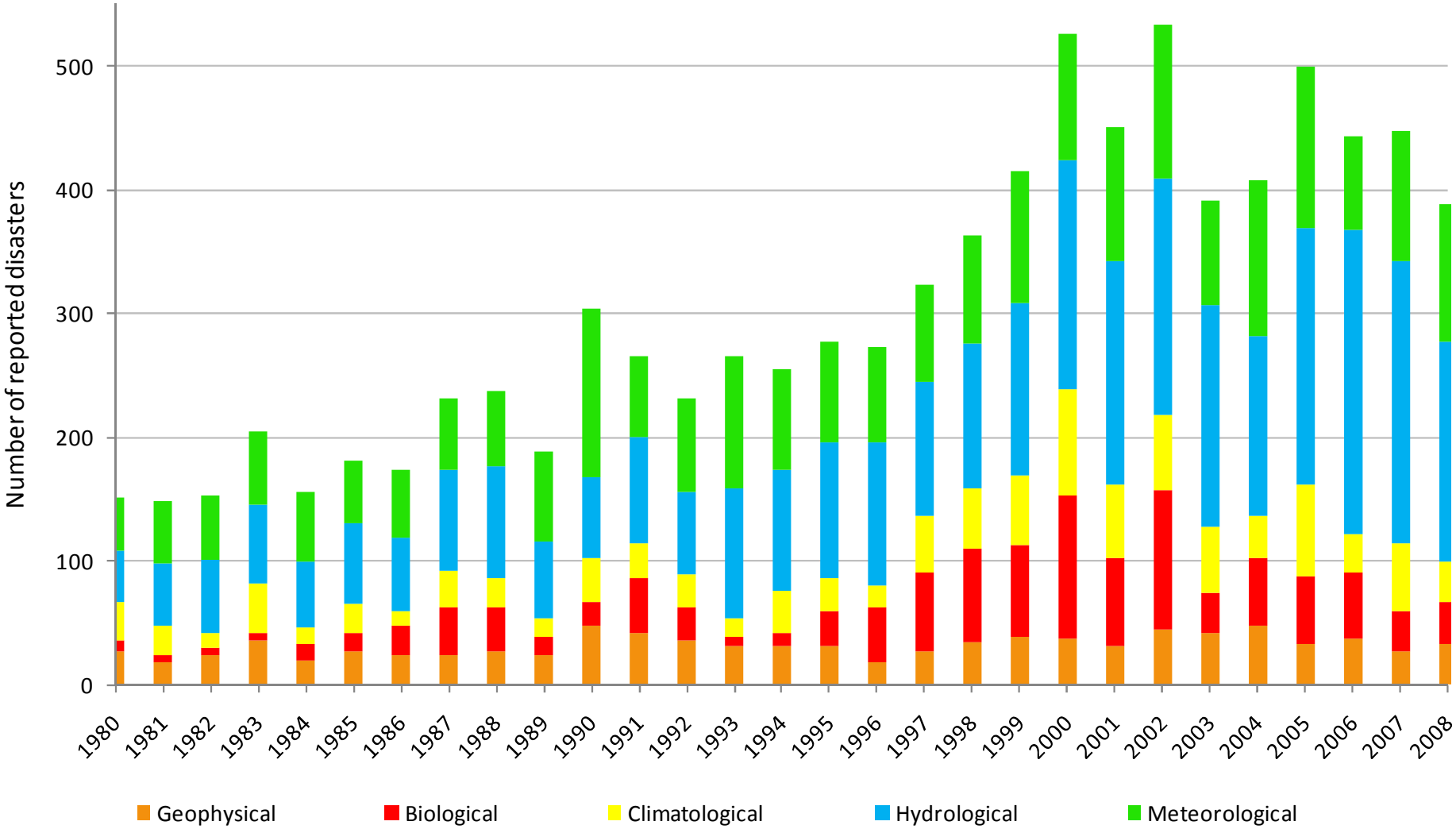
6.3. Projected Increase of Sea Level Rise (IPCC chair, Pachauri, 2008)

Stabilization level (ppm CO_2-eq)	Global mean temp. increase (°C)	Year CO_2 needs to peak	Global sea level rise above pre-industrial from thermal expansion (m)
445 – 490	2.0 – 2.4	2000 – 2015	0.4 – 1.4
490 – 535	2.4 – 2.8	2000 – 2020	0.5 – 1.7
535 – 590	2.8 – 3.2	2010 – 2030	0.6 – 1.9
590 – 710	3.2 – 4.0	2020 – 2060	0.6 – 2.4

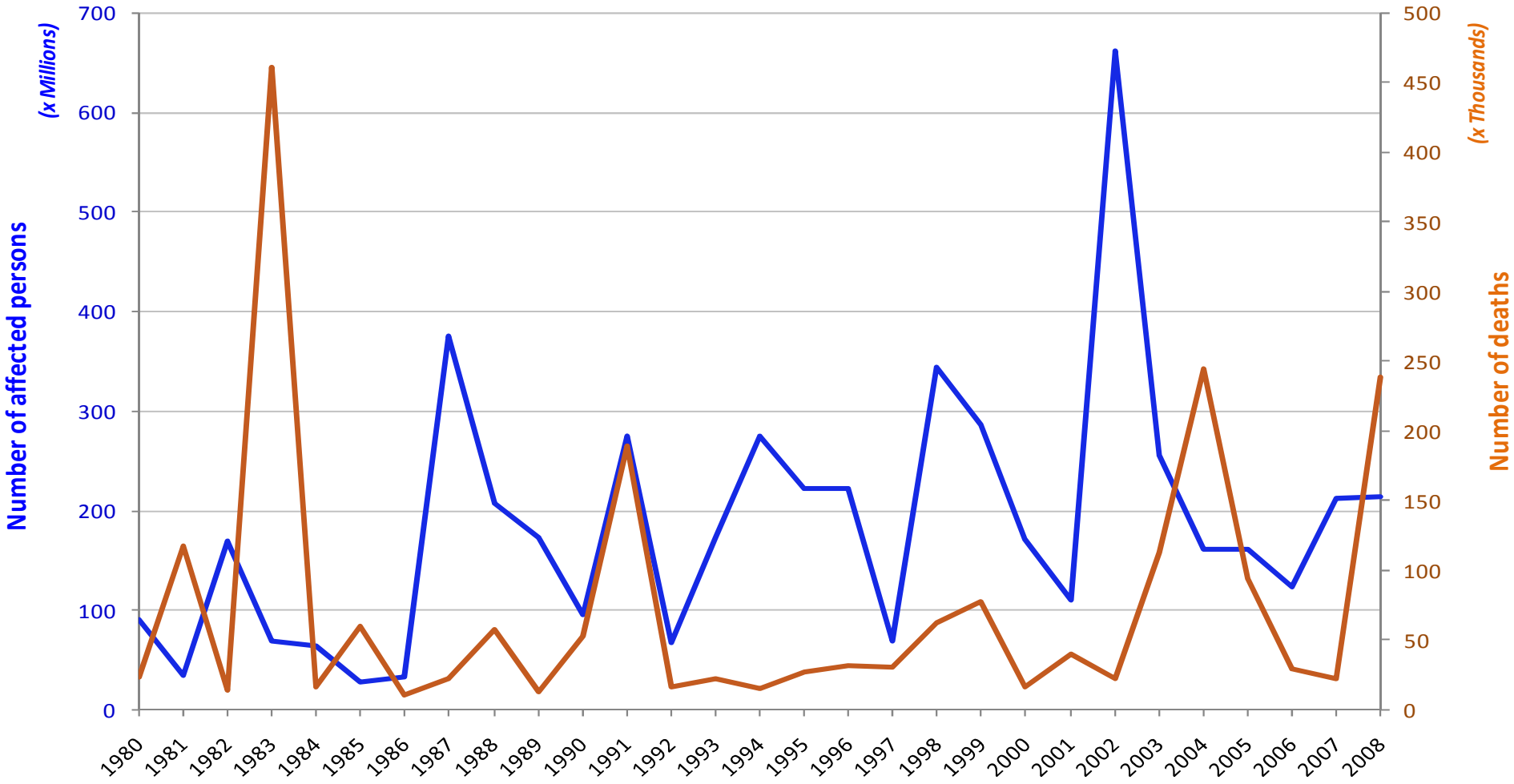
6.4. Projected Changes in Precipitation

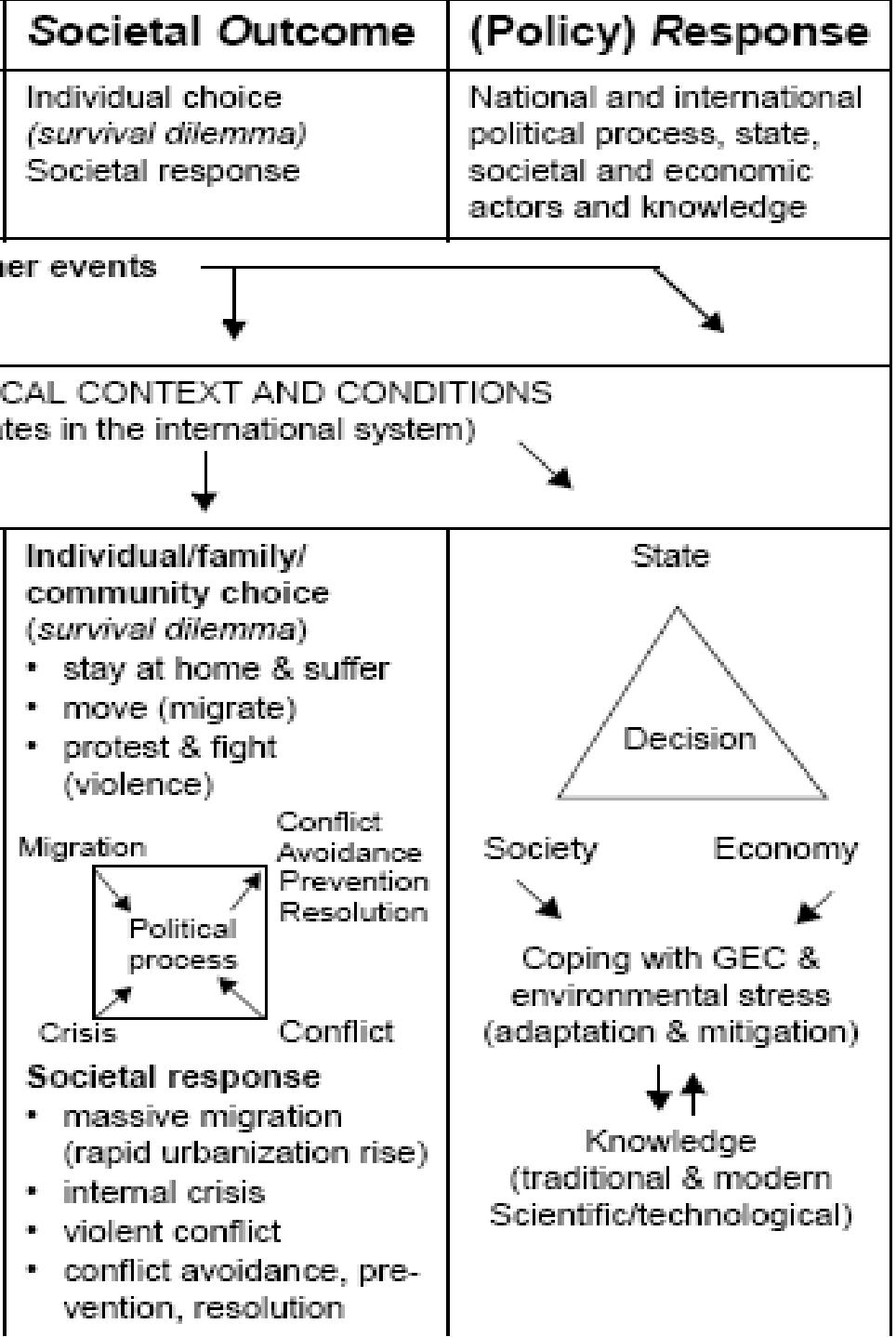


6.5. Increase in natural hazards (1980-2008)



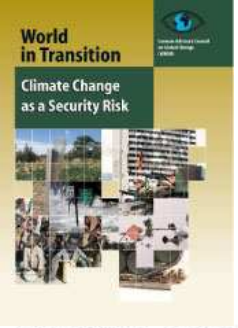
6.6. Trend in number of persons reported affected and killed by natural disasters





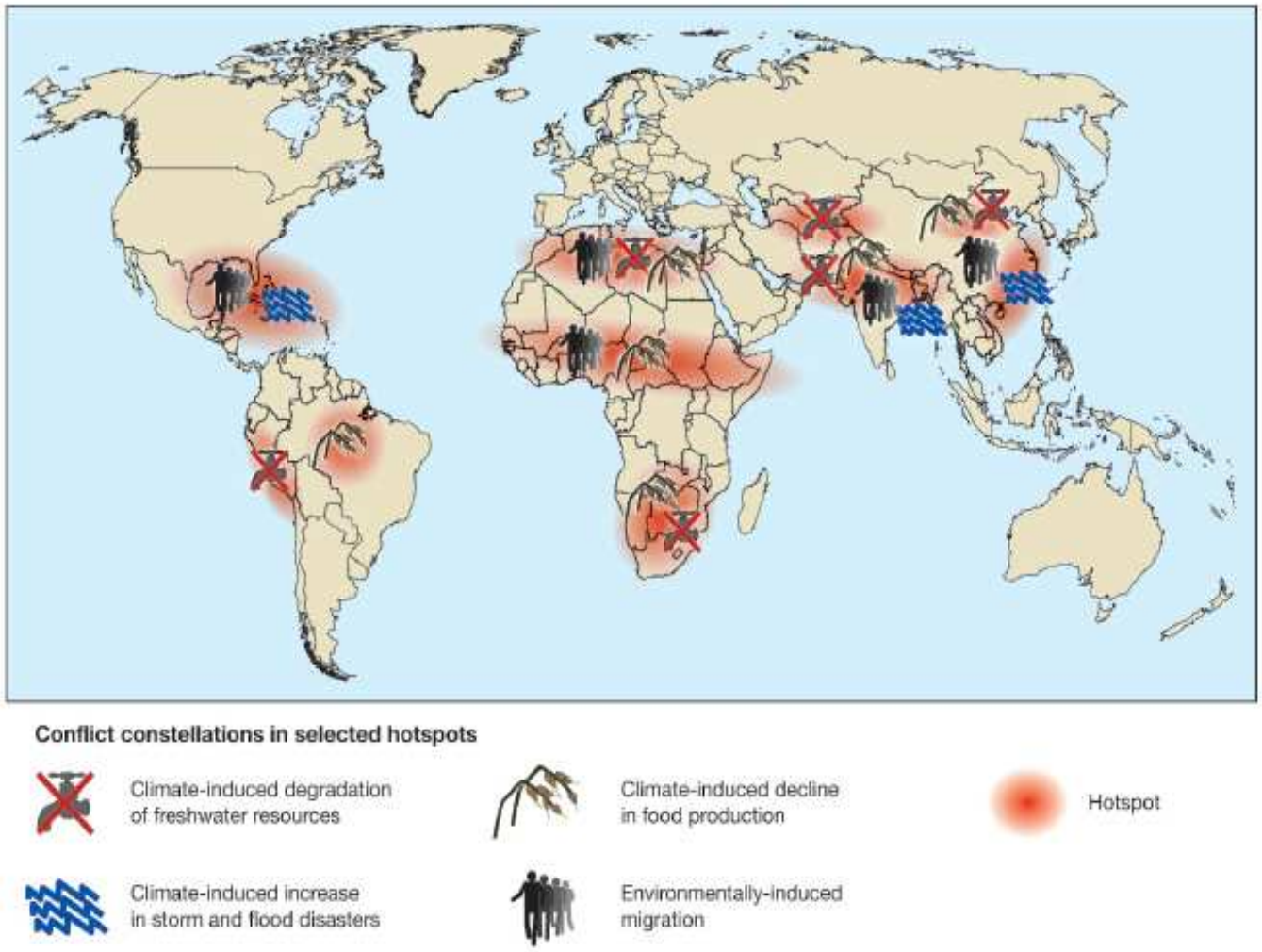
6.7. SO: Societal Outcomes

- Individual level (choice)
  - Human security perspective
  - Survival dilemma of humans
- State/society level
  - Hunger, famine
  - Migration to urban slums
  - Rural-rural migration
  - Transborder migration
    - Seasonal (labour,nomads)
    - Permanent
  - Crises: domestic (food riots)
  - Conflicts:
    - Peaceful protests
    - Violent clashes
  - Complex emergencies



6.8. Regional Environmental Hotspots Mexico, Caribbean (WBGU 2007)

Figure 4.7: Regional hotspots and security risks associated with climate change. **Source**: WBGU (2008: 4). Reprinted with permission.



4 conflict constellations

- **Water scarcity: demand increase & supply decline**
- **Rising food deficits**
- **Natural hazards**
- **Environmentally induced migration**

Environmental Hotspots

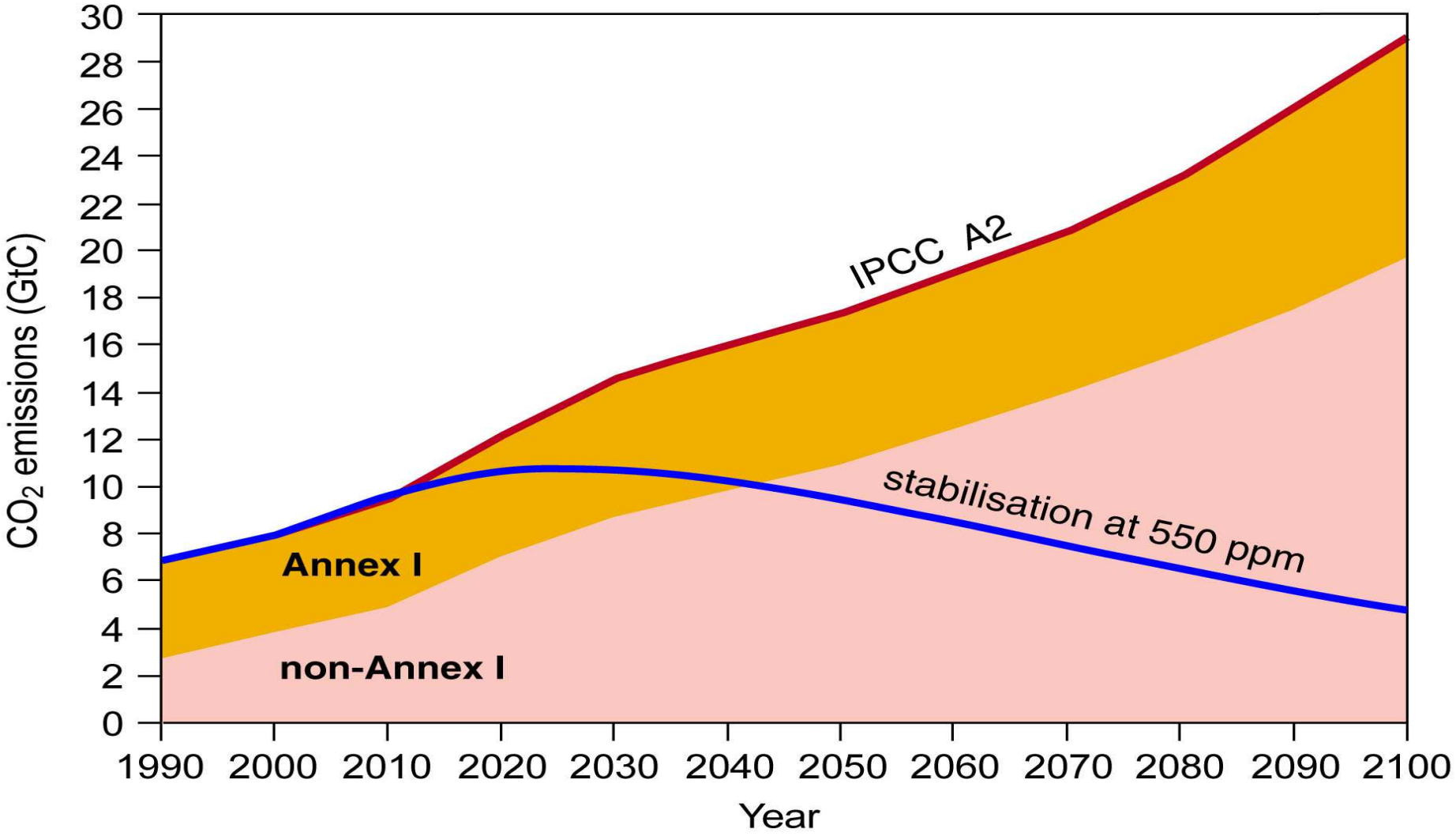
- **Mexico, Caribbean**
  - Water
  - Food product.
  - hurricanes
  - **Migration**

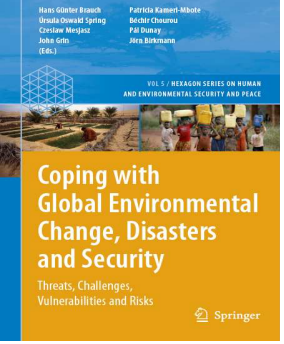
6.9. R: Policy Response to Security Danger Posed by Global Environmental Change

- **How? Responsive vs. proactive action**
  - **Reponse:** cost of non-action (Stern Report)
  - **Proactive:** anticipatory knowledge, learning, action
- **What? Addressing causes (Pressure)**
  - **Earth system:** environmental quartett
  - **Human:** productive/consumptive behaviour
- **Responding to Effects & Impacts**
  - **Environmental stress**
  - **Climate-related natural hazards**
- **Addressing Societal Outcomes:** Migration/Conflicts

7. Coping with Global Environmental Change, Disasters and Security Dangers

IPCC Projection (Model A2): Policy Goal: GHG Stabilization at 550 ppm





7.1. The Climate Paradox: Policy Implementation Gap

- **We are confronted with a climate paradox:**
  - Global consensus climate change is largely anthropogenic
  - Policy consensus to stabilize temperature increases due to GHG emissions at 2℃ above preindustrial levels
- **G8 (Canada, France, Germany, Italy, Japan, Russia, UK, US) agreed in 2007 – 2010:**
  - 50% reduction of GHG emissions by 2050
  - **80% for industrialized countries (G-8)**
- **No agreement on legally binding targets & reference year**
- **But climate negotiations failed in Copenhagen (2009) and Cancun (2010) to adopt a Post-Kyoto Strategy**

7.2. Implementing the G-8 Goals

Key Policy Challenge to Solve the Paradox:

- 80% reduction of GHG emissions (2010-2050)
- GHG reduction obligations under UNFCCC (stabilization by 2000) & Kyoto Protocol (-5.1% globally;
  - Canada: -6%; but by 2010: +38,3%, (target difference: +43,3%)
  - USA goal in Kyoto Prot.: 7% (not rat.); US: +16-17%,Obama proposal:-7% by 2020 based on year 1990 (or- 17% based on base year 2005), (target difference: + 23%)
  - Italy:-6,5; real: +13.1% (target difference: + 19,6%)
  - Japan:- 6%, but by 2010: +6,0% (target difference: +12%)
  - France: 0%, - 0,3% (target difference: -0,3%)
  - Germany: -21%, - 21.3% (target difference: -0,3%)
  - UK:-12,5%; real: -19,5% (target difference: -7%)
  - Russia: 0%, -21.3% (target difference: -21,3%)
- Proposals at Copenhagen (2009); US: -7%, EU: -20% (1990)
- EU Parliament called for unilateral 30% reduction of EU-27 GHG by 2020;
- German goals (Merkel, 2008, renewable energy package): -40% by 2020.
- Copenhagen (COP 15): Copenhagen Accord: legally nonbinding
  - Achievement at COP 16 in Cancun (Mexican Presidency): strengthening of the UN Process
  - Challenge of COP 17 (Durban): legally binding post-Kyoto agreement
- Speed up: renewables & energy efficiency

7.3. Policy consensus to stabilize temperature rise 2℃ above preindustrial levels by 2100

Copenhagen Accord agreed (COP 15, 2009)

„…we shall, recognizing the scientific view that the **increase in global temperature should be below 2 degrees Celsius**, on the basis of equity and in the context of sustainable development, enhance our long-term cooperative action to combat climate change.“

Cancun Agreements (COP 16, 12.12.2010):

- Industrialised country targets are officially recognised and these countries are to develop low-carbon development plans and strategies …..
- **Clean Development Mechanisms** has been strengthened ...
- A total of $30 billion in fast start finance from industrialised countries to support climate action in the developing world up to 2012 and the intention to raise $100 billion in long-term funds by 2020 is included in the decisions.

7.4. Failure of Climate Negotiations to Adopt Post Kyoto Regime

- Obstacles in major industrialized countries due
  - Economic opposition of interest groups (lobbies)
  - Short-term interest of policy makers (re-election)
  - Lack of public awareness partly due to manipulation of media
- Lack of political will of some parliaments to adopt policies (in USA)
  - Bush Administration adopted 50-80% reduction goals
  - But no legally binding reduction targets for US
  - Obama: proposal -17% (now), -5% (1990)until 2020

8. Two Opposite Visions: Business-as-usual vs. sustainability revolution

Anthropocene Two Ideal Type Future Visions:

- ***Business-as-usual*** where economic and strategic interests and behaviour prevail leading to a major crisis of humankind, in inter-state relations and destroying the Earth ('security' and 'market first' scenarios, UNEP 2007)
- The need for a ***transformation*** of global cultural, environmental, economic (productive and consumptive patterns) and political (with regard to human and interstate) relations ('sustainability first' scenario, UNEP 2007).

8.1. Security Relevance of 2 Visions

- **Policy perspective matters:**
  - national security: Hobbesian obsession: new military missions
  - international security: threat multipliers to threat minimizers: sustainable development is the solution
  - human security: human being, community, humankind in the focus

- **Solutions differ: 2 alternative strategies**
  - **Business as usual: Neomalthusian & Cornucopian solutions**
    - **Neomalthusian:** resource scarcity leads to wars, **military means crucial**
    - **Cornucopian:** technical fixes, geo-engineering, **technological superiority**
    - **Security implication: Hobbesian obsession: military & economic power**
  - **Alternative paradigm: Sustainability Revolution&Sustainable Peace**
    - **Third alternative is needed: cooperation & economic transformation**
    - **Sustainability revolution: economic transformation**
    - **Sustainable peace: Move from state-centred to human-centred security: develop fourth pillar of freedom from hazard impact**

8.2. Copernican Revolution in Thinking
Fourth Sustainable Revolution in Action

We face two alternative strategies & visions

- **Hobbesian obsession & business as usual (1990-2010)**
- **A revolution in thinking and action for sustainability**
  - **Clark/Crutzen/Schellnhuber (2004/2005). Copernican revolution towards sustainabilitý: fundamental paradigm shift (Kuhn 1962)**
  - **Action Goals: A fourth sustainable revolution**
  - **Strategy: Transition towards Sustainability**

Transition to fourth peaceful revolution (Anthropocene)

- **First Revolution: Agricultural: collectors to farmers**
- **Second Revolution: Industrial (1750)**
- **Third Revolution: Communication (after WW II)**
- **Fourth Revolution: Sustainability Revolution (2000 ff.)**

8.3. Paradigm for Global Sustainability

- **Alternative vision** refers to a “new paradigm for global sustainability” (Clark/Crutzen/Schellnhuber 2004)
  - **Changes in technology and management systems alone will not be sufficient**, but “**significant changes in governance, institutions and value systems**” are needed, resulting in a fourth major transformation after “the stone age, early civilization and the modern era”.
  - These alternative strategies should be **“more integrated, more long-term in outlook, more attuned to the natural dynamics of the Earth System and more visionary**”
  - These many changes suggested above by natural scientists require a **‘Fourth Green Sustainability Revolution’.**

9. Fourth Sustainable Revolution Sustainable Development with Sustainable Peace

Revolutions

1. ***Agricultural:*** 7,000-10,000 years ago: human settlements and Holocene
2. ***Industrial:*** from 1750: urbanization with massive use of fossil energy
3. ***Technological-Communicative:*** 1950: Globalization, GEC in the Anthropocene
4. ***Sustainability Revolution:*** 2020-2050: Decarbonization, Dematerialization and HUGE

Elements of a Fourth Sustainability Revolution

1. **Worldview**
2. **Mindset**
3. **Culture**
4. **Governance**

9.1. Elements of a 4th Sustainable Revolution

Worldview **refers to a world perception, ideas and beliefs through which people interpret and interacts with the world.**

Mindset includes fixed mental attitudes of policy-makers: determining person's or group's responses to interpretations of situations

Culture: is a based on values, norms, beliefs, institutions and productive processes including the development of science and technology

Governance: participative governance combining processes of policy initiation and adoption (**bottom-up**) and implementation of the required fundamental transformations (**top down**).

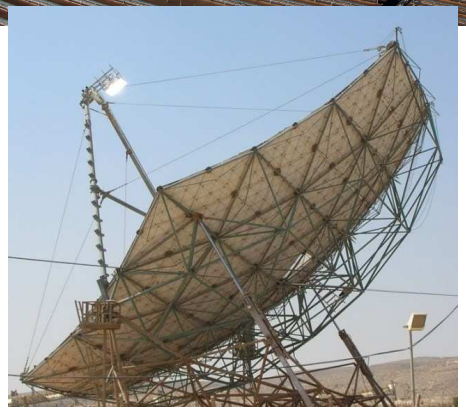
9.2. Decarbonization of the Economy

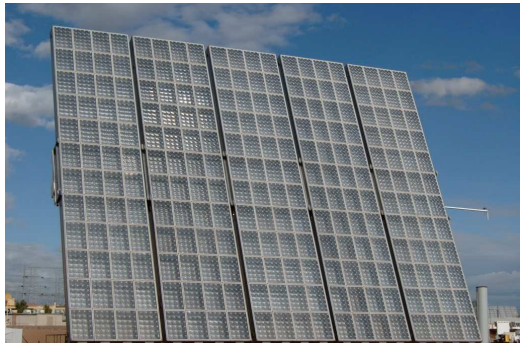
Sustainability Revolution in Energy Sector

- **To achieve the goals of a 80% reduction of GHG emissions in 40 years requires:**
  - Changing mindsets of policy makers and worldviews of scientists and opinion leaders and governance structures
  - Implementing commitments (difficulties in many industria-lized countries, e.g. in the US, Canada, Australia)
  - Develop binding national policies and their implementation
  - Initiating bold scientific research programmes with a goal:
    - Enhance energy efficiency
    - Shift from carbon to renewable energy sources
- **This must lead to a decarbonization of the economy (especially of the energy sector)**
- **For many natural and political & social scientists:**

  This requires a fourth sustainability revolution!

9.3. Solar Electricity Generating System (since 1985 in California & 2006 in Spain, SCS)



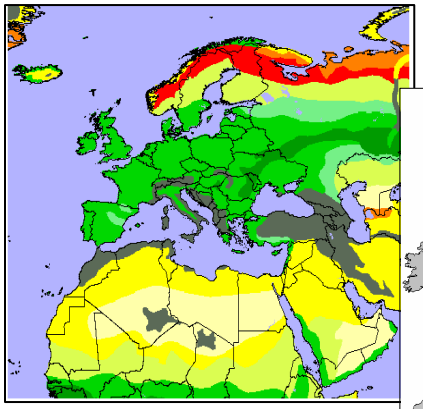


9.4. Renewable Energy Potentials EU-MENA

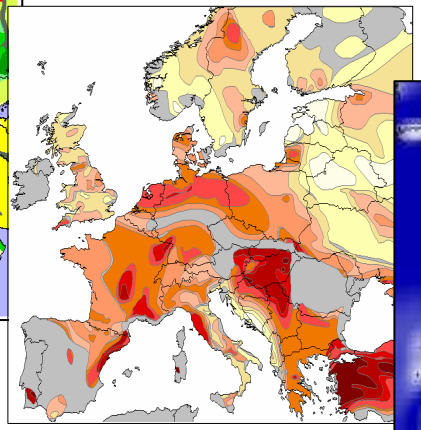
Source: Trieb, Krewitt, May, in: Brauch et al. (2009)

Biomass (0-1)

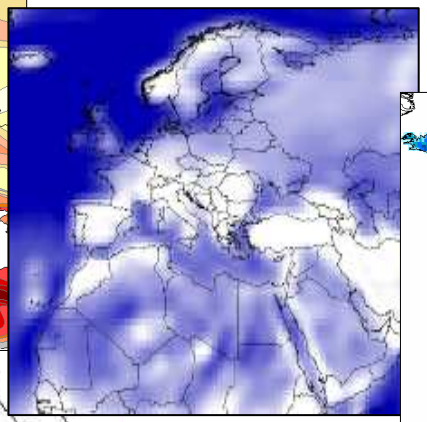
in brackets (Electricity in GWh/km²/a)



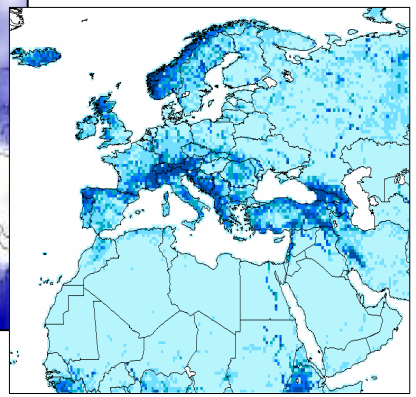
Geothermal (0-1)

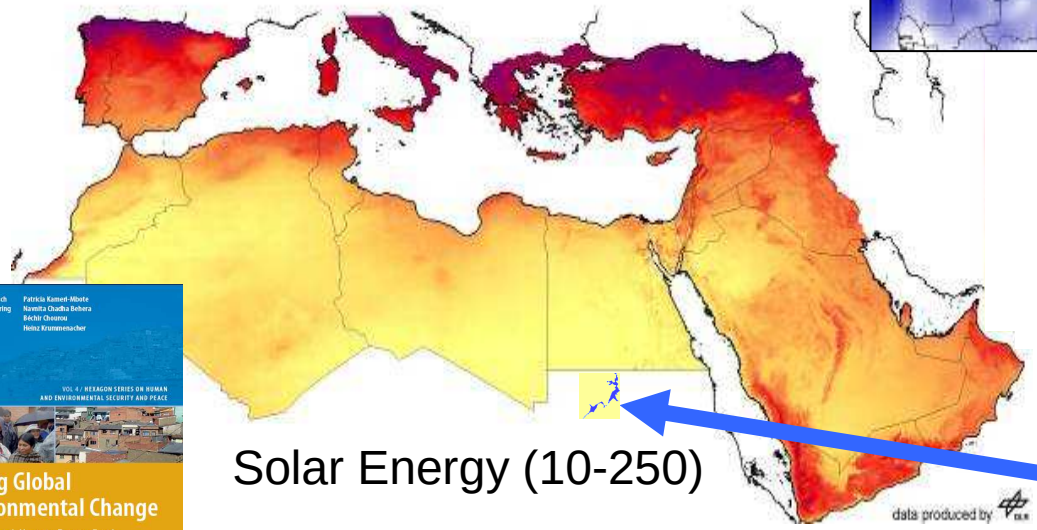


Wind Energy (5-50)



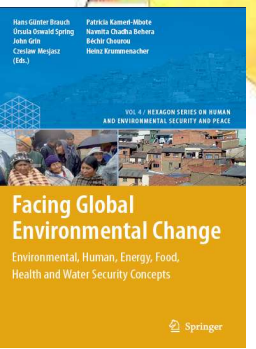
Hydropower (0-50)





Solar Energy (10-250)

A solar thermal power plant of the size of the Assuan Dam would produce 120 times as much energy, i.e. about 30% of the total European energy demand.



www.dlr.de/tt/med-csp

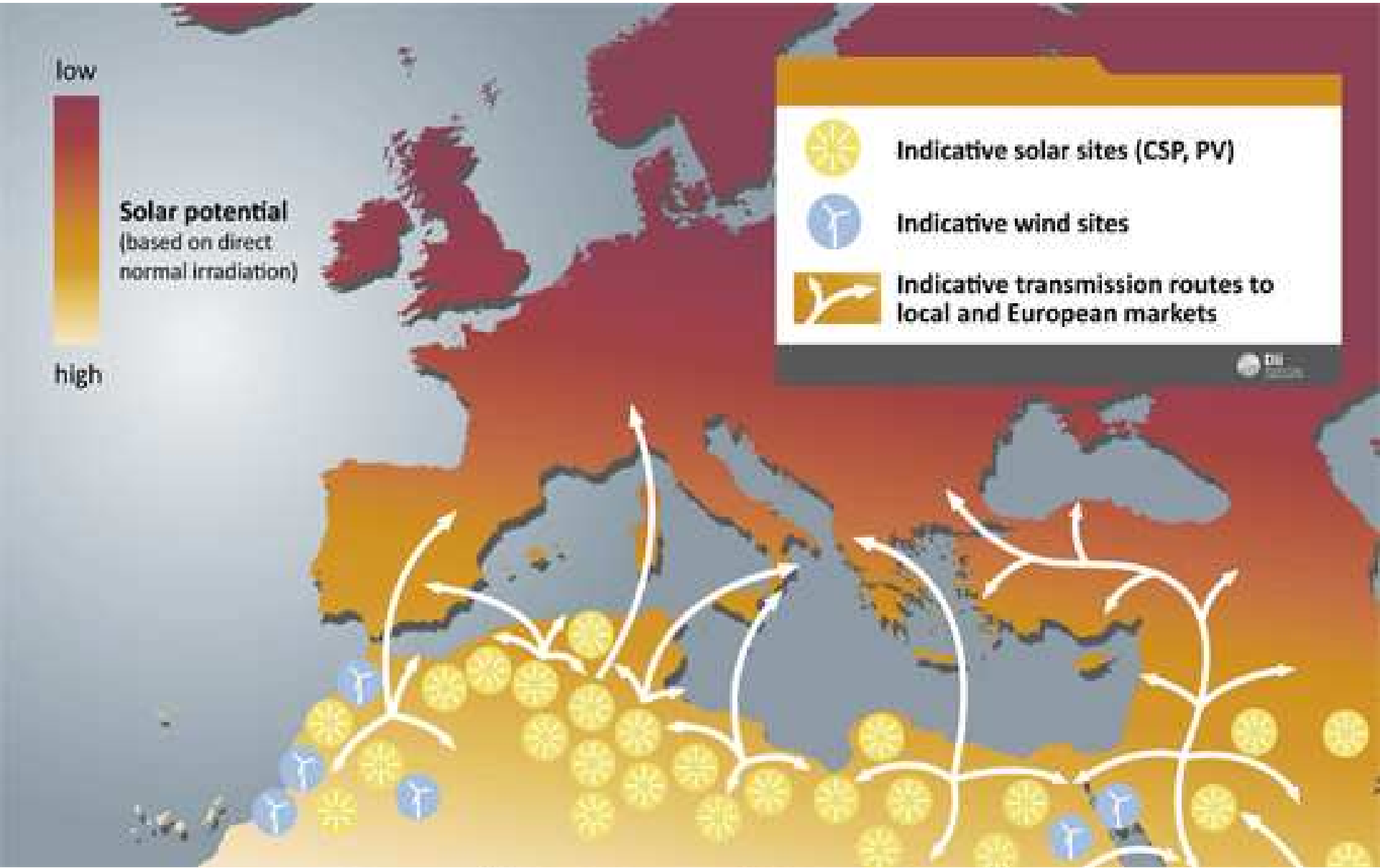
DESERTEC FOUNDATION

An initiative of

TREC Clean Power from Deserts

9.5. Desertec Vision: An Intercontinental Mega Project (2009)

9.6. DESERTEC Industrial Concept



9.7. DESERTEC: Relevance for NAFTA

Technical Potentials and Energy Vision for Mexico

- **Climate Performance (1990-2010) of Canada & USA**
- **Mexico is severely affected by Global Climate Change**
- **Mexico has national GHG reduction goals**
- **Mexico has a huge technical potential for renewables**
- **Political and economic challenge: Exploiting renewable potential and move towards decarbonization of the economy & creating new jobs**
- **Develop a NAFTA Scheme for Electricity from Deserts of Mexico, US, Canada replacing coal, gas, oil, biofuel**
- **Help Canada & US to meet their climate reduction goals by using Joint Implementation (JI) and Clean Development Mechanism (CDM projects)**

9.8. Policy Proposal

- Critically assess the shortcomings, potential and relevance of the DESERTEC conceptual proposal and the Desertec Industrial Initiative!
- Outline a longer-term conceptual master plan for developing Mexico‘s energy strategy further in light of Mexico‘s adopted climate change policies!
- Enter a research partnership with research institutes in the US, Canada and in Europe to develop policy relevant research schemes and on their investment needs until 2020!

9.9. Policy Vision & Perspective:

Towards Sustainable Peace & Fourth Sustainable Revolution

- **Goal: stabilization of temperature increase at 2℃ in global average temperature by 2100:**
  - -50% global reduction of GHG, -80% for OECD countries (2050)
  - Major transfomation and decarbinzation of the economy
- **Combination of sustainable development strategy & peace policy: sustainable peace to prevent that GEC issues pose a threat to international peace.**
- **Fundamental transformation & demilitarization of security is needed not a militarization of the environment, as we are the threat & solution.**

10. Towards a Political Geoecology for the Anthropocene

- During the Anthropocene our thinking on peace and security must change due to human interventions into the earth system.
- If ‘we’ are the threat it is impossible to fight a war against ourselves. To cope with this threat to human well-being, survival and security a radical change in our thinking on international relations and security is needed. This new threat is global in nature and does not respect national borders or political systems, nor does it discriminate between the ‘good’ and ‘bad’.
- **Thesis: Fundamental change in earth history requires a rethinking of the relationship between humankind and nature, including the political realm and international relations, that makes geopolitical approaches in the Hobbesian tradition obsolete.**

10.1. Bringing the Environment into the Geopolitical Discourse

- **Debate on GEC & climate change triggered new proposals for a spatialization of environmental issues: *ecological geopolitics & political geoecology*.**
- New geopolitical context of the Anthropocene requires a **forward looking, anticipatory understanding of security**, not the old one that emphasizes monitoring borders, providing insurance or cleaning up after a disaster.
- Both **geoecology & Anthropocene** suggest that old assumptions of environment determining human fate are no longer tenable, because carbon fuel use has already changed environmental conditions.
- **Old geopolitics diverts attention from new circumstances, refers to an inappropriate geography to suggest inevitability of conflict when large scale cooperation is needed to deal with the changes that are in motion due to use of carbon fuels & numerous other changes.**

10.2. Political Geoecology vs. Traditional Geopolitics

- **Political geoecology** suggests a more explicit focus on ecology and also a clear indication that **human choices** are shaping the future world.
- Recognition of **significance of our actions** as the debate about climate change suggests to people the profound **choices our predecessors & we** made in **shaping the future condition of the biosphere**.
- The most important theme for all concerned about security in the 21st century, the **inapplicability of traditional geopolitical notions of an external environment for discussions of human security**.

10.3. New Spatial Approaches in the Anthropocene: Geoecology & Earth Systems Analysis or Science

Combining Human, Social, and Geoecology:

- **Analysis of security impacts of GEC in the Anthropocene requires knowledge produced by *geoecology* in physical geography, earth system science and by *social* and *human ecology* approaches.**
- **A proactive security policy in the Anthropocene must be knowledge-based, and requires a different knowledge from what intelligence agencies offer policy-makers, and traditional security experts trained in the Hobbesian tradition of security studies can offer.**
- **A new security policy in and for the Anthropocene necessitates for the new security dangers posed by GEC a new policy framework that integrates experience of past nature-human interactions as well as the scenario- and model-based projections of the probable societal outcomes of future trends.**
- **New security policy requires a new peace policy in the 21st century that combines 'sustainable development' with 'sustainable peace'.**

10.4. From „Ecological“ Geopolitics to Political Geoecology

- **Both discourses on spatialization of IR and security** & on the nature-human interactions **have 2 major deficits**:
  - the discourse on **geopolitics, geostrategy and geoeconomics in the social sciences has been dominated by the Hobbesian pessimism** and ignoring environmental concerns and issues of global environmental change as dangers for security and survival;
  - the newly emerging research in the natural sciences on Lovelock's Gaia hypothesis, geoecology in geography, and *Earth Systems Analysis* (ESA) or ***Earth Systems Science*** **(ESS)** has ignored the political dimension of transforming this new systemic knowledge into proactive policy initiatives
- **Bringing the Environment into the Security Discourse**
- **Introducing the Political Dimension into the Research on Nature-Human Interactions in ESS** .

10.5. Towards an Integrative Concept of a Political Geoecology

- *Political geoecology* should, by bringing the environment into spatializations of international politics and security & by introducing a political and economic dimension into the discourses on geoecology and earth systems analyses (ESA) or science (ESS), overcome these dangers.
- **Thus, *political geoecology* combines three components:**
  - '***political*' dimension of the transformation of complex knowledge into innovative and proactive action;**
  - spatial of '***geo*' contextualization** of this new knowledge and action;
  - ***ecological* focus on the human-nature interface** during Anthropocene that combines approaches of geo-, social, human and political ecology.
- **A *political geoecology* will be used in a wider sense than the narrow approach of geoecologists in phys. geography**.

10.6. Towards a Sustainable Peace in the Anthropocene

For the transition to the Anthropocene Era of Earth History we need for the 21st century

- **A Copernican Revolution in thinking for sustainability**
- **A Fourth Sustainable Revolution**
- **A Strategy for a sustainability transition**
- **A New Nonmilitary Security Agenda**
- **New realistic conceptual visions as guidelines for action**
  - **Vision of a sustainability transition (John Grin/Rotmans/Schot 2010)**
  - **Vision of a decarbonization of the economy**
  - **Vision of efficiency revolution: Ernst Ulrich von Weizsäcker: Factor 4**
  - **Vision of an energetic imperative: Hermann Scheer (2010)**

Political Geoecology for the Anthropocene: A scientific agenda to bring security into Earth Systems Science

10.7. Policy Vision & Perspective:

Towards Sustainable Peace & Fourth Sustainable Revolution

- **Goal: stabilization of temperature increase at 2℃ in global average temperature by 2100:**
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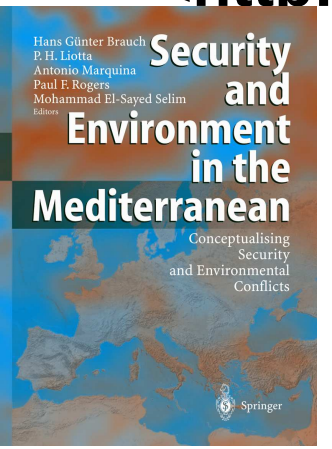
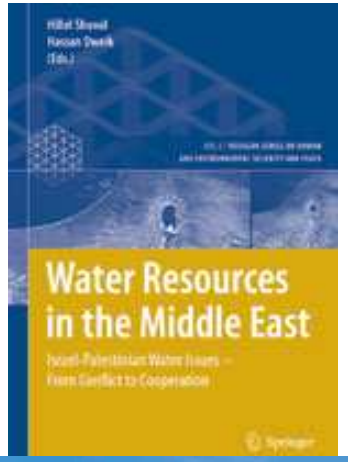
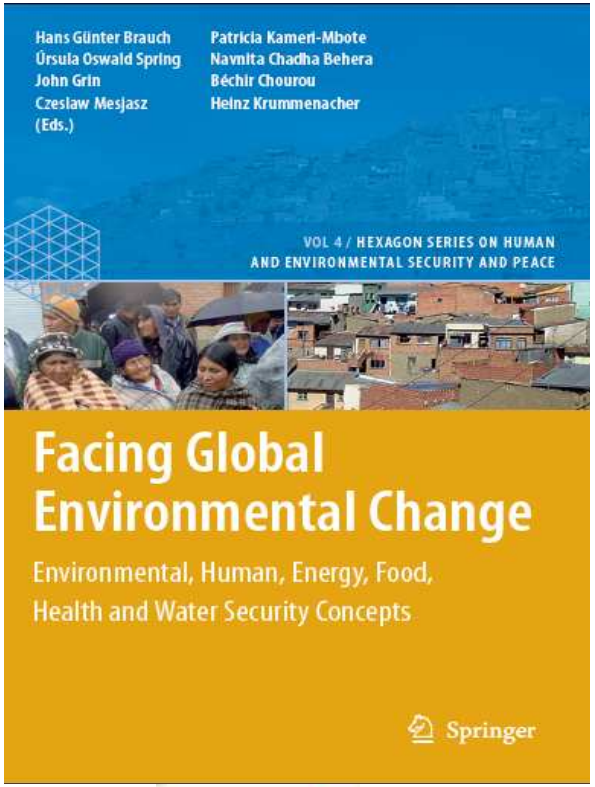
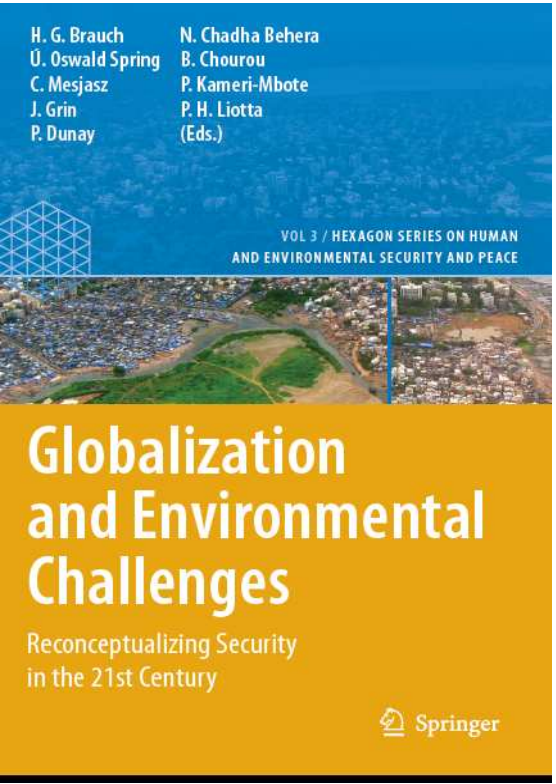
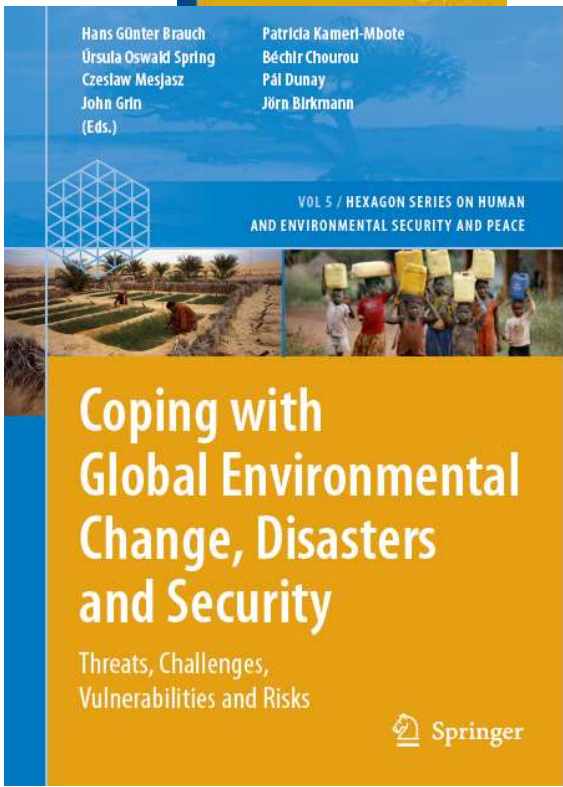
Global Environmental and Human Security Handbook for the Anthropocene (GEHSHA)



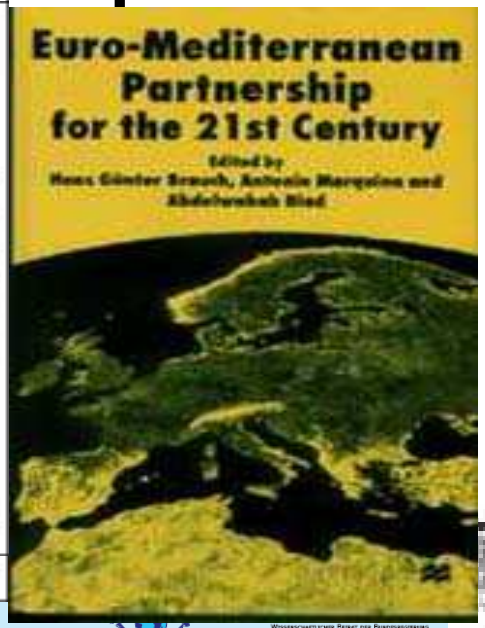


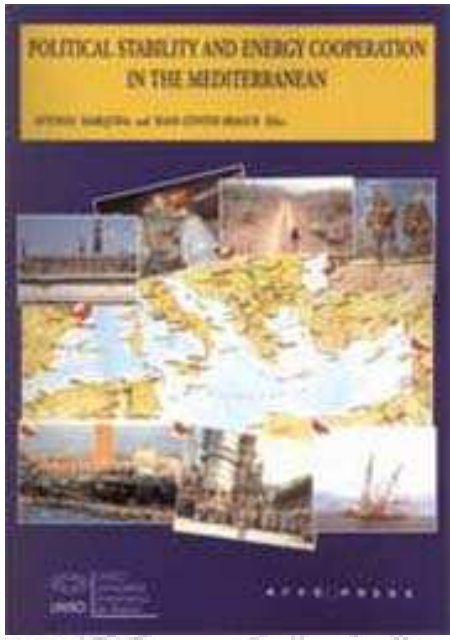


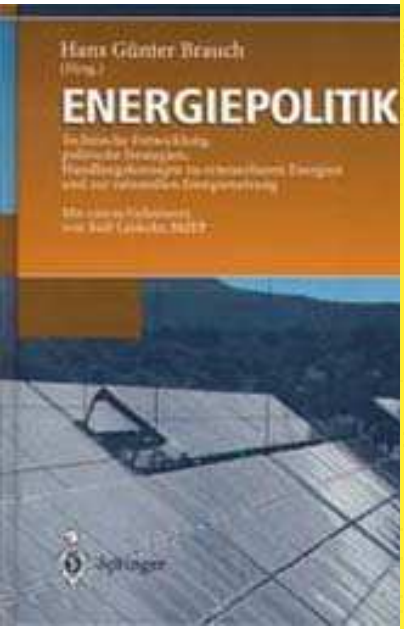


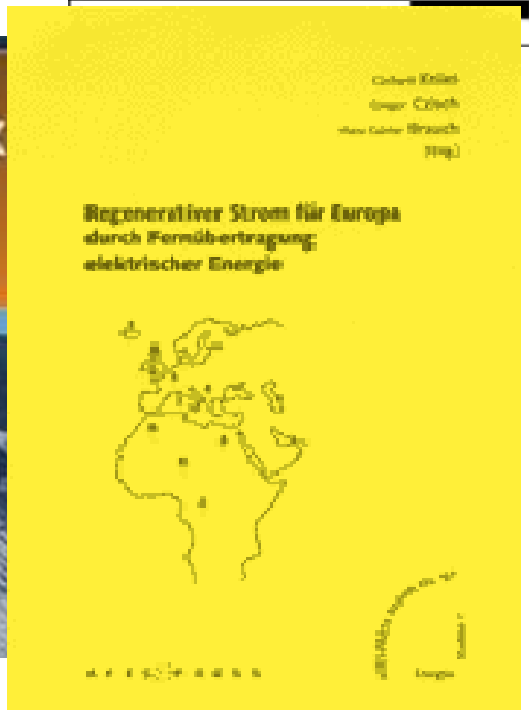


Own texts on DESERTEC related topics









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Berlin 2007