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Coping with Global Environmental Change, Disasters and Security

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http://www.afes-press.de/html/download_hgb.html

Coping with Global Environmental Change, Disasters and Security

When & Where?

- **20.11.2006, 18-20 Uhr, Raum Osteuropa-Institut, 20.11. (Introduction) and**
- **Block I:** First Weekend: 26./27.1.2007
  - 26.1.2007: 14.00-20.00, **Ihnestraße 22/UG 2**
  - and 27.1.2007: 9.00-17.00. **Rost-/Silberlaube K 23/27**
- **Block II:** Second Weekend: 9./10.2.2006
  - 9.2.2007: 14.00-20.00¸ **Ihnestraße 22/UG 2**
  - and 10.2.2007: 9.00-17.00, **Rost-/Silberlaube K 23/27**
- **This graduate seminar takes place in English.**

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8. National, Environmental & Human Security
9. International Policy Relevance
10. Free Source Material, Background Information

1. Focus of the Seminar

- First general question: Do global environmental change, hazards and disasters pose security dangers and concerns?
- This implies: Do global environmental issues & policies pose threats, challenges, vulnerabilities and risks for international, national, environmental and human security?
- Second key question: What do we mean with security?
  - Security of whom?
  - Against what?
  - By which means?
- Third key question: Which reactive and proactive policies and meaures are needed to cope with „global environmental change and disasters" to prevent and avoid that they become objective security dangers?
- Fourth questions: What does this imply for the study of security issues in the social and political sciences?

2. Seminar Structure: 15 Sessions

1. Introduction: Contextual global political change and reconceptualisation of security
2. Narrow vs. wide security concepts: military vs. environmental and human security
3. Environmental security as a theoretical construct: four phases of the conceptual debates
4. Environmental security as a political goal: UN,UNEP,UNDP,UNU,OSCE, NATO,EU
5. Referents of securitisation: State security vs. human security
6. Global environmental change: conceptual evolution since the 1980s
7. Global environmental change as new research progr.: IGBP, IHDP, WCRP, Diversitas
8. Models linking: Global environm. change & policy response: OECD,UN-CSD,EEA
9. Models linking: Global environmental change & policy response: PEISOR and others
10. Impacts of GEC: hydro-meteorological hazards & disasters: storms, floods, drought
11. Environmental & hazard induced popul. movements through urbanisation/migration
12. Environmentally and hazard induced societal, economic and political crises
13. Environmentally and hazard induced societal, economic and political conflicts
14. National policy responses in Germany
15. International policy responses at the EU (EU-ECHO) and UN (UN-OCHA) level.

3. Criteria of participation & deadlines

- **Web:** http://www.afes-press.de/html/fu_berlin.html
- **Download: material & questionnaire**
  - Fill in the questionnaire and return it by Email to: brauch@onlinehome and thus formally register:
  - Give three options for a seminar paper (Referat)
  - **Registration is possible by Email until: 15 December 2006**
- **Seminar Criteria:**
  - Regular participation (presence 85% or all but 2 sessions)
  - Oral presentation also for „Teilnahmeschein“ (no free riders)
  - Seminar paper (c. 20 pages): on topic of oral talk
- **Withdrawal is possible until 15 December 2006**
- **Final seminar plan will be on the web at 20 Dec. 2006**
  - All rules of modular BA, MA. MA IB apply
  - Deadline for paper submission: 30 April 2006
  - Nonmodular & other: submission dates: 30 April & 1 Oct.

4.Research & Dialogue Context of the Seminar

- 4th Phase of Environmental Security Research:
  - **Research project**: funded by Berghof Foundation for Conflict Research
  - **Dialogue project:** International conferences with a focus on the Mediterranean sponsored by NATO
    - Canterbury (2001), The Hague (2004), Istanbul (2005)
    - Talks at international conferences: agenda-setting
  - **Publication project:** volumes in Hexagon series
  - **Teaching project:** Graduate seminars at OSI:
    - See: old bibliographies: WS 2003/4 – WS 2005/2006
    - See: Brauch: Security & Environment in the Mediterranean (Berlin: Springer, 2003).

4.1. Research Context

- **1st Phase of Research on Environmental Security**
  - Westing: Impacts of wars on Environment in Vietnam
  - Ullman, Myers, Matthews: GEC as threats for US national security
- **2nd Phase of Research on Environmental Security**
  - Homer-Dixon, Toronto group: population growth, environmental scarcity as a course of environmental stress that pose security dangers
  - G. Bächler, Zürich/Bern: ENCOP: environmental scarcity and degradation pose security dangers
- **3rd Phase of Research on Environmental Security: No consensus**
  - Collier/Handler: resource abundance as a security danger
- **Goal of 4th Phase of Research on Environmental Security**
  - Oswald 2001; Dalby 2002; Brauch 2003; Dalby/Brauch/Oswald 2007 (2 articles)
  - 3 disciplines: anthropology, geography and political science
  - **Combine national and human security**
    - Change in Earth History: **From Holocene to Anthropocene (Crutzen/Schellnhuber)**
    - Wide concept of **human, gender & environmental security** (Oswald: **HUGE concept)**
    - **Human and Environmental Security and Peace** (Brauch: **HESP Project**)
  - **Hexagon-Series with Springer-Verlag**

4.2. Past: Reconceptualizing Security: Global Mental Mapping

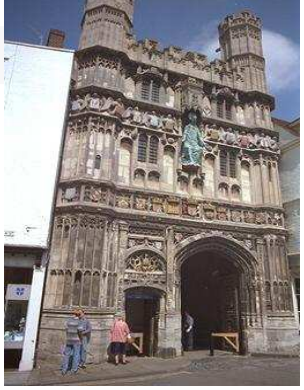
- **Basic Assumption & Guiding Question:**
  - Did global and regional political contextual changes trigger a reconceptualizing of security?
- **What did change?**
  - End of the Cold War: 9 November 1989: Berlin Wall;
  - Events of 11 September 2001;
  - Others: Death of Mao in China, economic crises in Latin America, 1980s, Southeast & East Asia, 1990s.
- **Which were the conceptual innovations?**
  - Theoretical: social constructivism & Beck:risk society
  - Widening, deepening & sectorialization of security

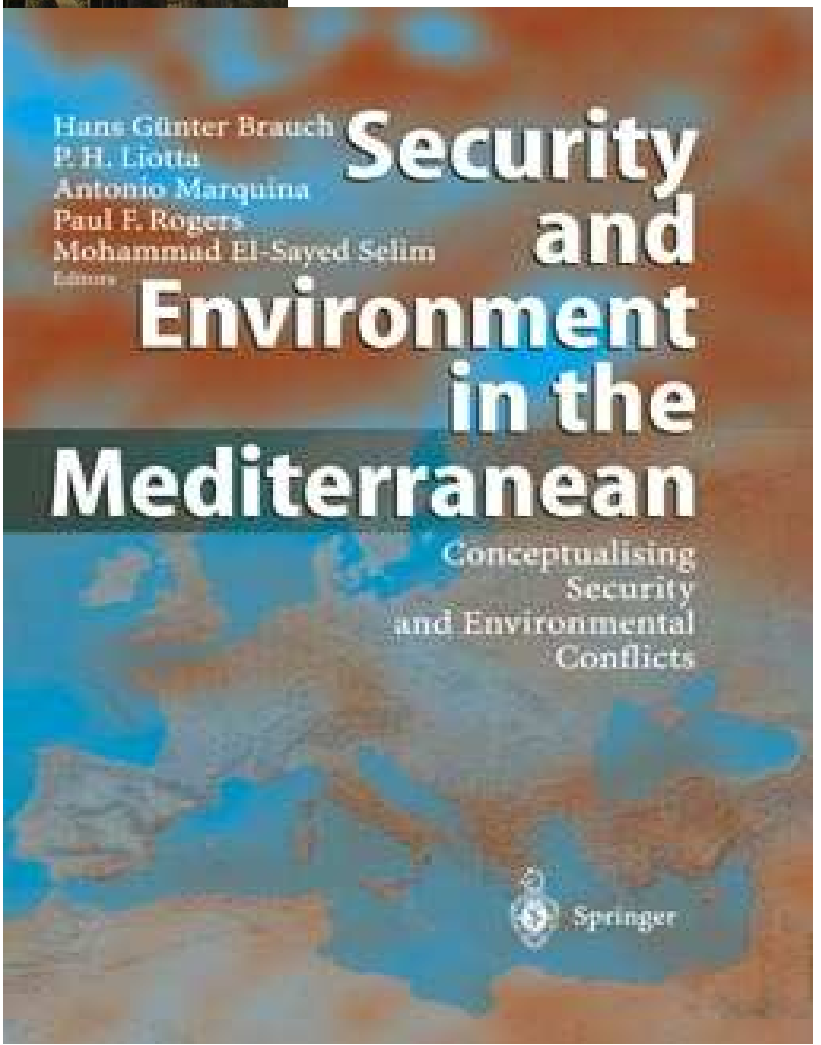
4.3. Future: From Holocene to Anthropocene?

- **Is a fundamental change in earth history under way from the Holocene to an Anthropocene?** (Crutzen, nobel prize in chemistry; Schellnhuber PIK)
- **What is the cause?** Human behaviour: burning of fossil fuels ➡ greenhouse gases ➡ climate change ➡ hazards (hurricane Katrina?) ➡migration ➡conflicts?
- **Stern Review** (30.10.2006): cost of not acting in 21st century: higher than costs of 1st and 2nd world wars!
- **Whose security is at stake**? Of nations? Societies? Human beings or humankind?
- Which are instruments of a proactive security policy?

4.4. Canterbury, 2001: Conceptualizing Security and Environmental Conflict

(Basic reading: published in 2003)





- **Focus: Mediterranean**
  - Environmental security research
  - Conceptualizing security in Europe, Maghreb/Mashreq, Israel & Turkey: narrow concept
  - Environmental Conflict
  - Six factors of GEC (hexagon)
  - Natural disasters & prevention
- **First Book in Springer Hexagon Series on HESP** (Human, environ-mental security & peace)

4.5. Montreal, Sopron, The Hague, 2004: Reconceptualising Security


The Hague, Peace Palace, Sep. 2004


Editorial meeting, 11.9.2004

H.G. Brauch, J. Grin, C. Mesjasz, P. Dunay, N. Behera, B. Chourou, U. Oswald, P. H. Liotta, P. Kameri-Mbote (Eds.): Globalisation and Environmental Challenges: Reconceptualising Security in the 21st Century (Berlin –New York : Springer-Verlag, 2007)

H.G. Brauch, J. Grin, C. Mesjasz, H. Krummenacher, N. Behera, B. Chourou, U. Oswald, P. Kameri-Mbote (Eds.): Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts (Berlin – New York : Springer-Verlag, 2007/2008)

4.6. Istanbul & Bonn, 2005: Security Threats, Challenges, Vulnerabilities, Risks

- **WISC, 24.-27.8.2005: Istanbul**
- **IHDP, 9.-13.10.2005: Bonn**

Third book:

- H.G. Brauch, U. Oswald Spring, P. Kameri-Mbote, C. Mesjasz, J. Grin, B. Chourou, J. Birkmann (Eds.):
- ***Coping with Global Change, Disasters and Security - Threats, Challenges, Vulnerabilities and Risks*** **(theme of this Seminar)**
- (Berlin et al.: Springer, 2008).

4.7. Volumes of HEXAGON-Series

1: Brauch – Liotta - Marquina – Rogers - Selim (Eds.): ***Security and Environment in the Mediterranean. Conceptualising Security and Environmental Conflicts*** *(2003).*

2. Shuval - Dweik (Eds.): ***Israel-Palestinian Water Issues – from Conflict to Cooperation*** (2007).

3. Brauch – Grin – Mesjasz – Dunay- Chadha Behera – Chourou - Oswald Spring - Liotta - Kameri-Mbote (Eds.): ***Globalisation and Environmental Challenges: Reconceptualising Security in the 21st Century*** (2007).

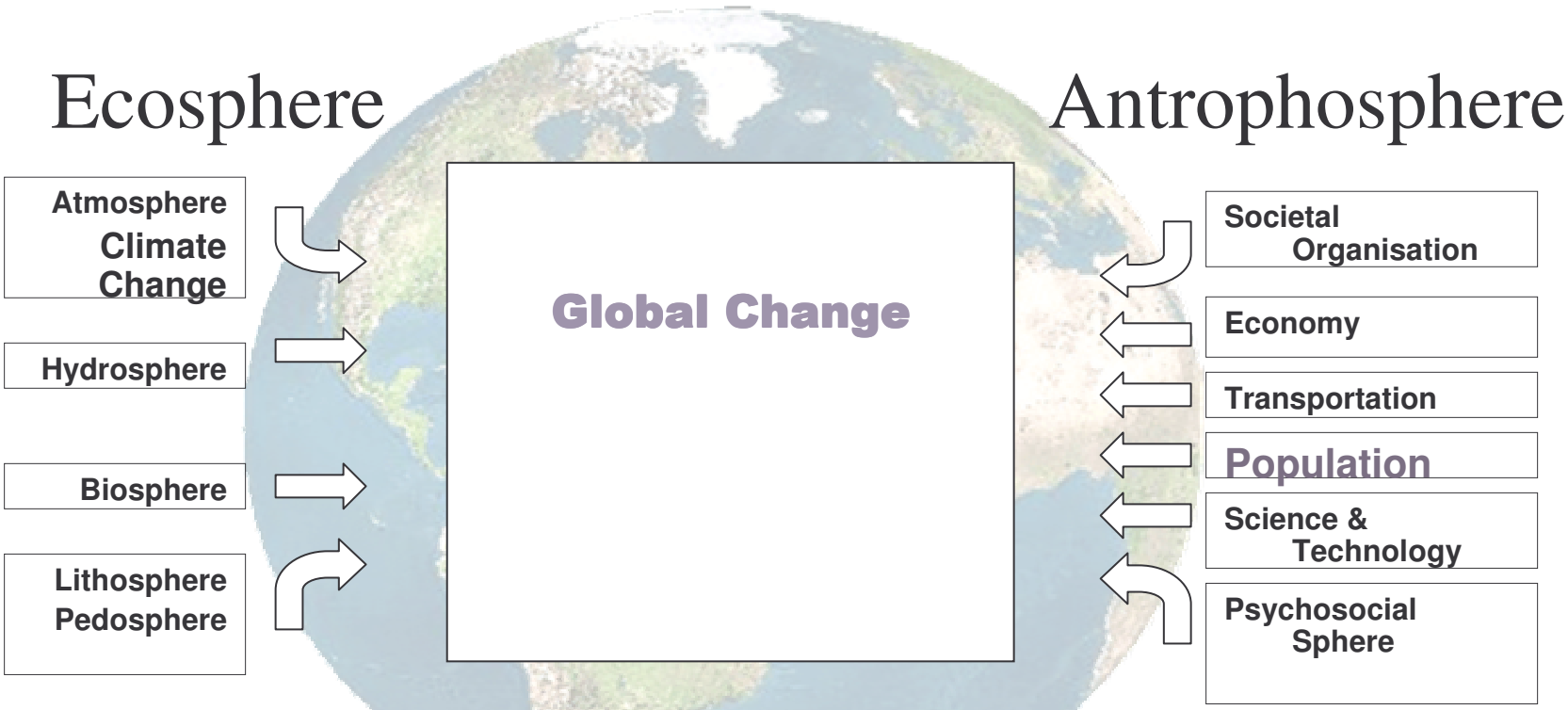
4. Brauch - Grin – Mesjasz – Krummenacher - Chadha Behera – Chourou - Oswald Spring - Kameri-Mbote, Patricia (Eds.): ***Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts*** (2007/2008).

5. Brauch - Oswald Spring - Kameri-Mbote – Mesjasz – Grin – Chourou – Birkmann (Eds.): ***Coping with Global Environmental Change, Disasters and Security – Threats, Challenges, Vulnerabilities and Risks*** (2008).

5. Global Environmental Change: Concepts & Research Programmes

- During Cold War **ecology was no security concern**.
- **Global (environmental) change** (GEC): changes in nature & society that affected humankind & will affect human beings who are both a cause of this change and often also a victim.
- Those who caused it & are most vulnerable are not identical (**equity**?).
- GEC affects & combines the **ecosphere & anthroposphere**.
- **Human dimension of GEC** covers contribution & adaptation of societies to these changes. These processes pose que-stions for social, cultural, economic, ethical, & spiritual is-sues, for saving, but also our responsibility for environm.
- **Ecosphere**: atmosphere (climate syst.), hydrosph. (water), lithosph. (earth crust, fossil fuels), pedosph. (soil), biosph.
- **Anthroposphere:** populations, social organis., knowledge, culture, economy & transport & other human-rel. systems.

5.1. Global Environmental Change (GEC): Environment & Security Linkages



GEC poses a threat, challenge, vulnerabilities and risks for human security and survival.

5.2. Global Environmental Change: Concepts & Research Programmes

- Since 1970s, 1980s GEC focused on human-induced perturbations in environment encompassing many globally significant issues on natural & human-induced changes in environment, & socio-econ. drivers
  - IGBP or International Geosphere-Biosphere Programme;
  - IHDP or International Human Dimensions Programme;
  - World Climate Research Program (WCRP),
  - DIVERSITAS
- IHDP: contribution & adaptation of societies to changes, social, cult., econ., ethical, spiritual issues, our role & responsibility for the environ.
- GEC deals with changes in nature & society that affect humankind as a whole and human beings both a cause and victim, however those who have caused it and are most vulnerable to are often not identical.
- GEC affects & combines ecosphere & anthroposphere.

  Ecosphere: *atmosphere* (climate system), *hydrosphere* (water), *litho-sphere* (earth crust, fossil fuels), *pedosphere* (soil), *biosphere* (life). *Anthroposphere*: populations, social organisations, knowledge, culture, economy & transport

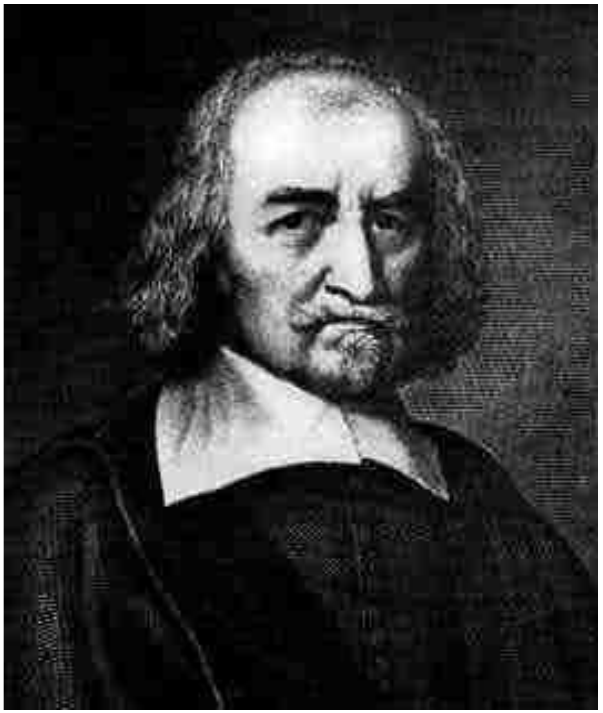
5.3. Global Environmental Change and Security Concepts

- Does GEC pose security dangers, i.e. threats, challenges, vulnerability & risks?
- Which security concept are we using & is relevant?
  - Narrow: national military security?
  - Widened & deepended security concept?
- Hypothesis: Thinking on security changed since1989.
  - Global, regional contextual change since when?
  - Scientific revoulation or new theoretical approaches?
- Book Project: Global mental mapping of reconceptua-lization of security
  - Widening, deepening, shrinking, sectorialisation?

5.4. A Classical Definition in Political Science & in International Relations

- Arnold Wolfers (1962), US of Swiss origin, realist 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".
- Absence of "threats": interest of policy-makers
- Absence of "fears": interest of social scientists, (contructivists): "Reality is socially constructed"
- Iraq case: WMD: "subjective fear" vs. "lack of objective threat"

5.5. English School: Hobbes, Grotius & Kant



Hobbes (1588-1679)

Grotius (1583-1645)

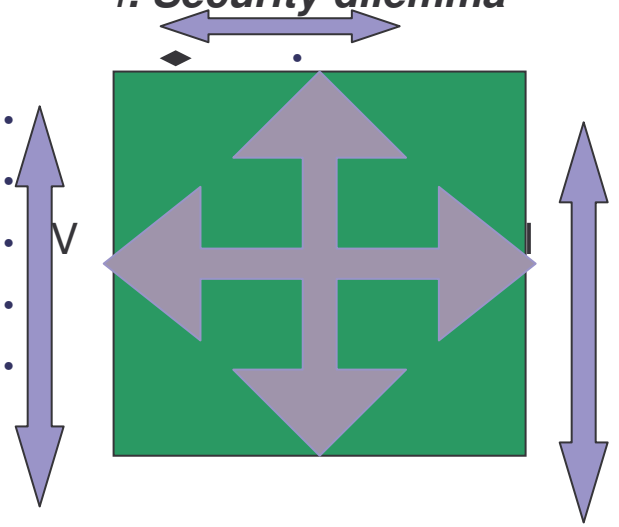
Kant (1724-1804)

Security perceptions depend on worldviews or traditions

- Hobbessian pessimist: *power* is the key category (narrow concept)
- Grotian pragmatist: *cooperation* is vital (wide security concept)
- Kantian optimist: *international law* and *human rights* are crucial

5.6. Conceptual Quartet: Security Concepts in Relation with Peace, Environment & Development

Pillars & linkage concepts within the quartet

IR research programs	Conceptual Quartet	Conceptual Linkages
■Peace Research ■Security Studies ■Development Studies ■Environment Studies 4 conceptual pillars ■ I: *Security dilemma* ■ II:*Survival dilemma* ■ III: *Sust. developm.* ■ IV: *Sustain. peace*	Peace Security •*I: Security dilemma*  Developm. ⟷ Environm. *III: Sustainable development*	•Policy use of concepts & Theoretical debates on six dyadic linkages •L1: Peace & security •L 2: Peace & development •L 3: Peace & environment •L 4: Developm. & security •L 5: Devel. & environment •L 6: Security & environm. [six chapters reviewing & assessing the debates]

5.7. Widening of Security Concepts: Towards Environmental Security

4 trends in reconceptualisation of security since 1990:

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

Dimensions & Levels of a Wide Security Concept

Security dimension⇒ ⇓ Level of interaction	Mili-tary	Politi-cal	Economic	Environ-mental ⇓	Societal
Human individual ⇒			Food/health & water sec.	**Cause & Victim**	Food/health & water sec.
Societal/Community				↓↑	
National	In Cold War, US since 2001: Shrinking		Energy security (1973 oil cr.)	↓↑	
Internat./Regional				↓↑	
Global/Planetary ⇒				GEC	

6. Models of Nature & Human Interactions

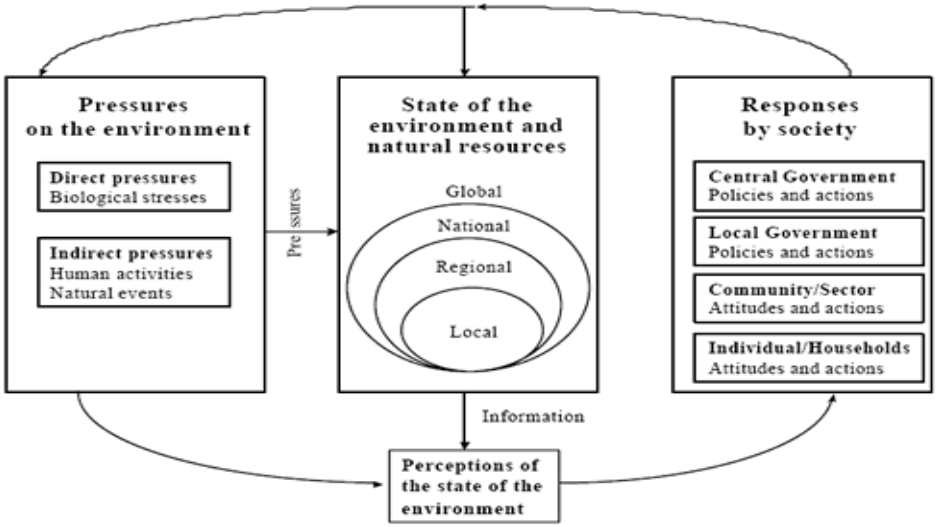
- Models: Environment as Cause – Policy Response
  - OECD: PSR-Model
  - UN-CSD (Committee for Sustainable Development)
  - EEA (European Environment Agency)
- PEISOR Model: Environmental stress and extreme and sometimes fatal outcomes
  - Hazards: Nature impacting on humans: victims: poor and highly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

6.1. Models on Linkage of Cause & Impact: GEC and Policy Responses

- „Pressure-State-Response“ (PSR) of OECD (1993-1999): ---->
  - P: pressure;
  - S. state of environment,
  - R: policy response;

EU: (DPSIR, EEA 1998)
  - D: Driving Force
  - P: Pressure
  - S: State
  - I: Impact
  - R: Response“ ---------->

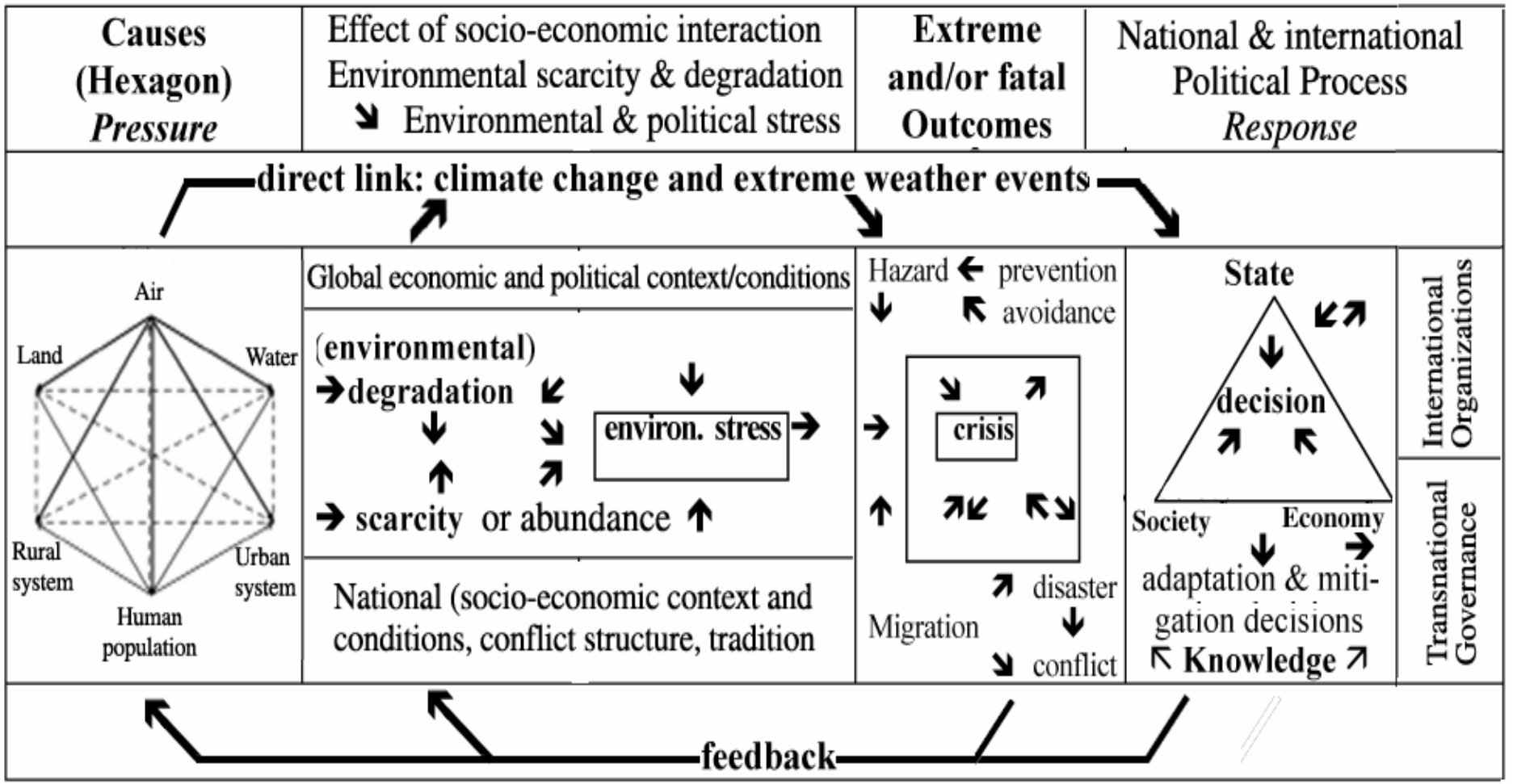
- UN-CSD. Driving Force-State-Response (DSR)
  - D: Determinants of human activities;
  - S: State of sustainable development;
  - R: Responses.



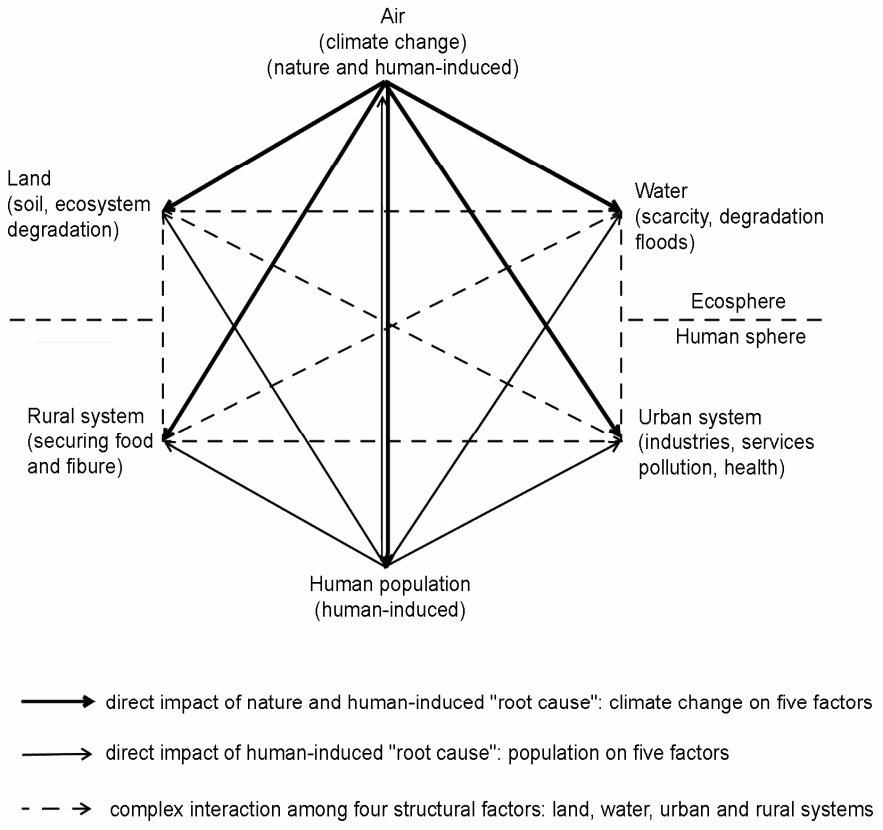
6.2. PEISOR Model: Global Change, Environmental Stress & Extreme Outcomes

- **The model distinguished 5 stages:**
  - **P: Pressure: Causes of GEC : Survival hexagon**
  - **E: Effect: environm. scarcity, degradation & stress**
  - **I: Impact: Extreme or fatal outcome: hazards**
  - **SO: Societal Outcomes: disaster, migration, crisis, conflict, state failure etc.**
  - **R: Response by the state, society, the economic sector and by using traditional and modern know-ledge to enhance coping capacity and resilience**

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



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



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

6.5. Effects: Environmental Scarcity, Degradation & Stress

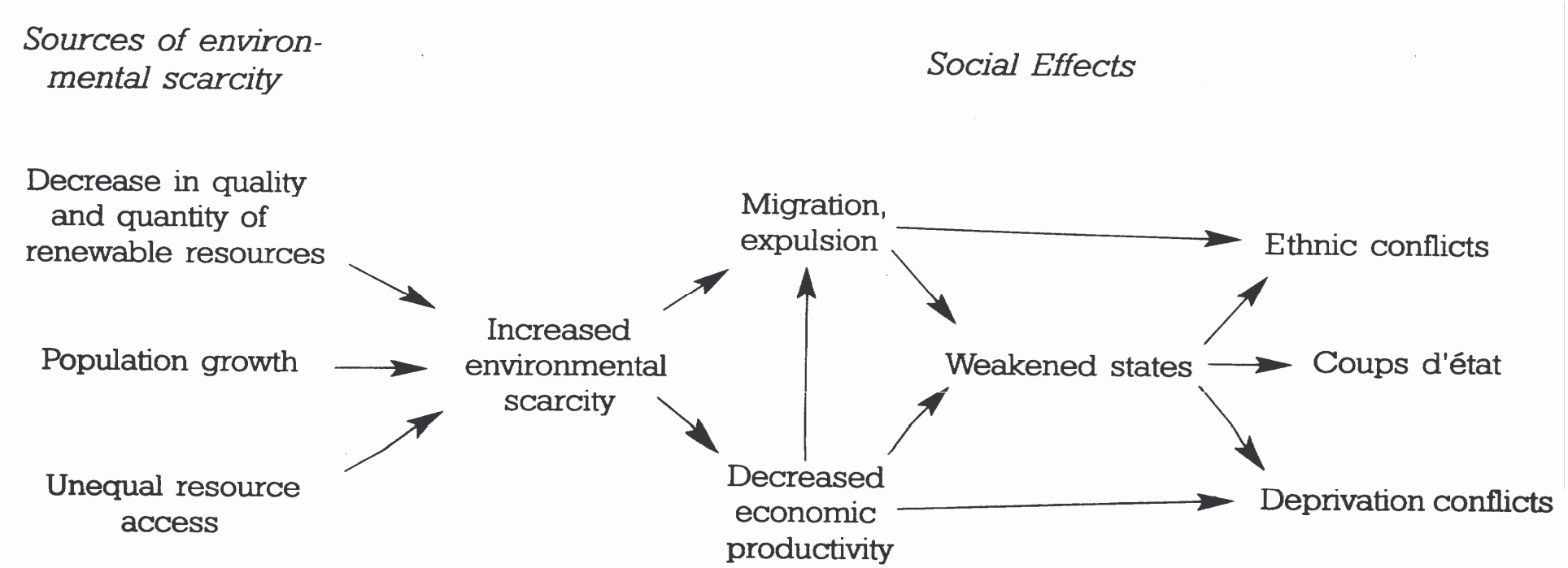
Four Phases of Env. Sec, Research since 1983 - 2003

First Phase: Conceptual Phase: Concept Environmental Security

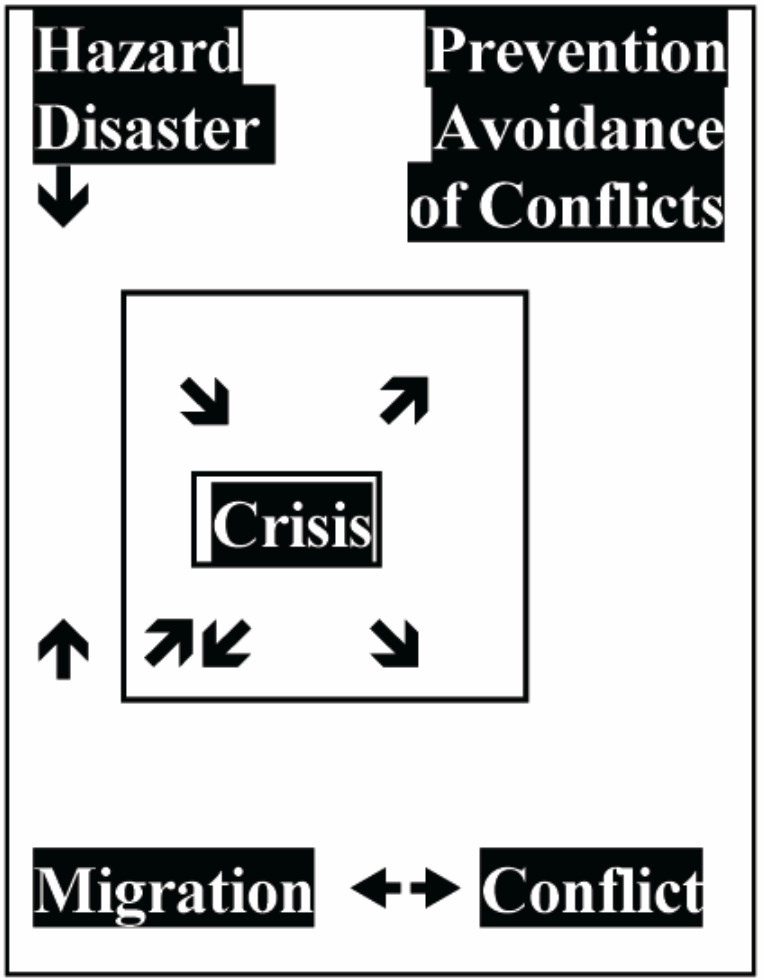
Second Phase: Empirical Phase: Case studies: Scarcity - Conflict

- **Toronto: Homer-Dixon: since 1991: 3 Projects (figure © Homer-Dixon 1998)**
- **Zürich/Bern: Günther Bächler, K.Spillmann (1996)**

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



6.6. 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

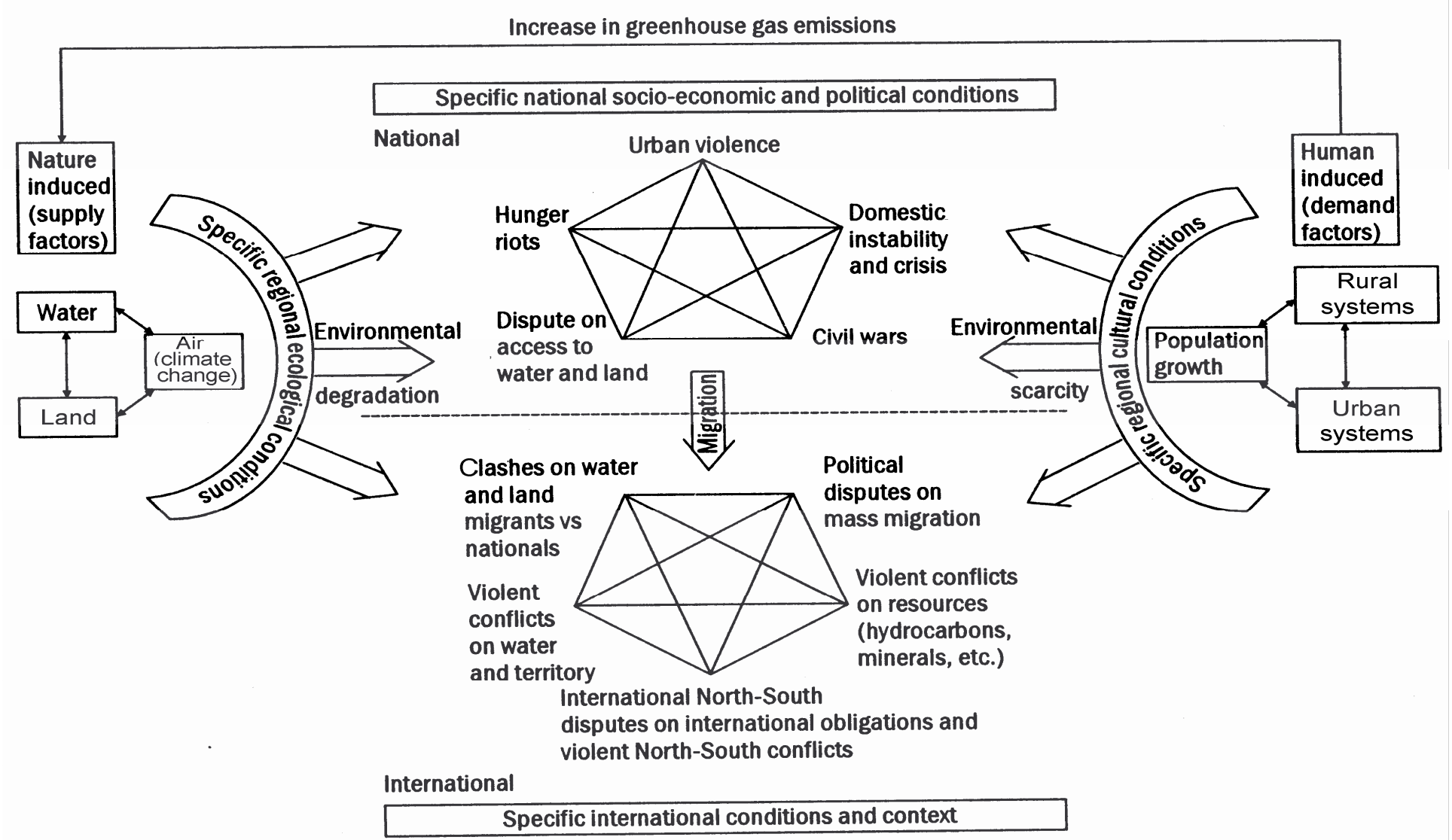
Lack of knowledge on societal consequences: crises/conflicts

- ➢ Domestic/international crises/conflicts
- ➢ Environmentally or war-induced migration as a cause or consequence of crises and conflicts

6.7. Societal Outcomes: Knowledge on Linkages of Outcomes

- **What are consequences of climate change, desertification and water scarcity for:**
  - Environmental scarcity
  - Envivironmental 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?

6.8. Pentagon of Extreme Outcomes



7. Climate Change, Natural Hazards and Disasters

- **Climate Change**: Natural variability during past millenia and anthropogenic change since Industrial Revolution (1750)
- **During 21st Century**: Climate change may have manifold impacts on security & survival
- Climate & Weather-related **natural hazards** have increased during 20th century and will increase significantly during 21st century
- This will have **serious impacts** on international relations **pose manifold security dangers.**

7.1. Global Climate Change: Temperature Increases & Sea Level Rise

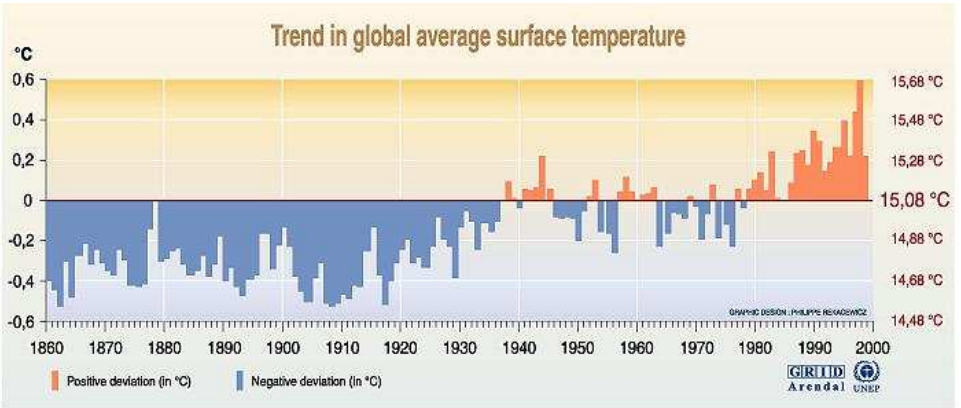
2 Climate Change Impacts: Temperature & Sea level Rise

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

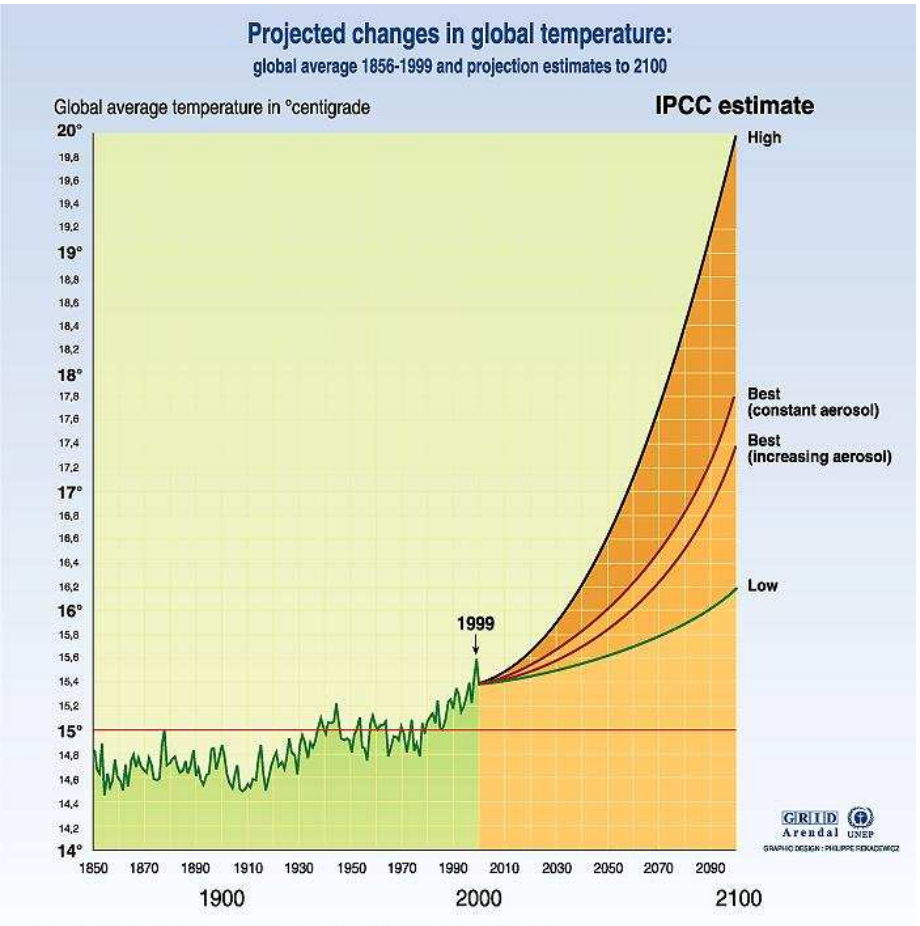
Sources: IPCC 1990, 1995, 2001

Sea level Rise:

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



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



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

7.2. Report of Sir Nicholas Stern (30.10.2006)

STERN review ON THE ECONOMICS OF CLIMATE CHANGE

Summary of Conclusions

There is still time to avoid the worst impacts of climate change, if we take strong action now.

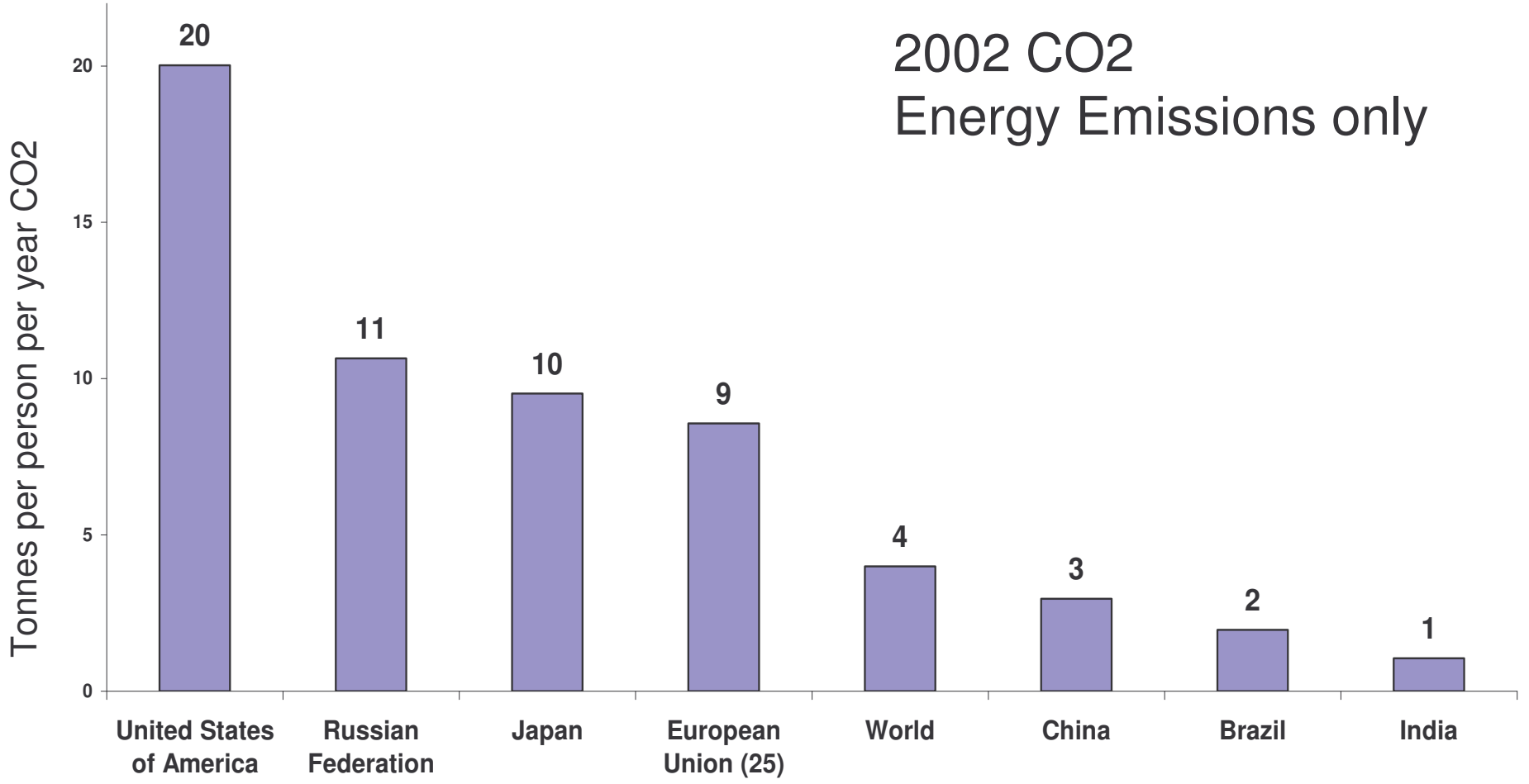
The scientific evidence is now overwhelming: climate change is a serious global threat, and it demands an urgent global response.

This Review has assessed a wide range of evidence on the impacts of climate change and on the economic costs, and has used a number of different techniques to assess costs and risks. From all of these perspectives, the evidence gathered by the Review leads to a simple conclusion: the benefits of strong and early action far outweigh the economic costs of not acting.

Climate change will affect the basic elements of life for people around the world – access to water, food production, health, and the environment. Hundreds of millions of people could suffer hunger, water shortages and coastal flooding as the world warms.

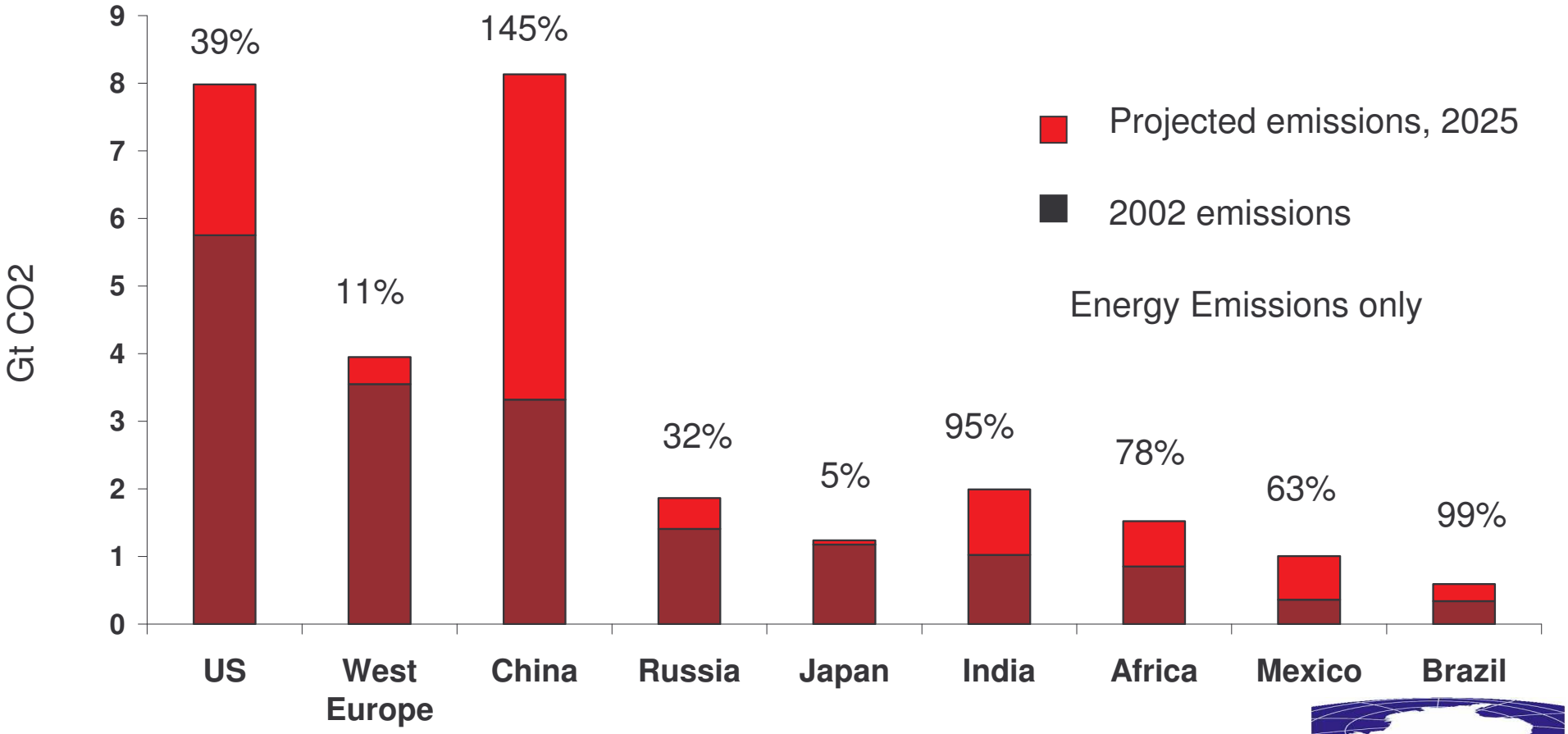
Using the results from formal economic models, the Review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more.

7.3. Current emissions per capita are higher in developed countries



Source: World Resources Institute, CAIT

7.4. Larger developing countries account for much of the forecast rise in emissions



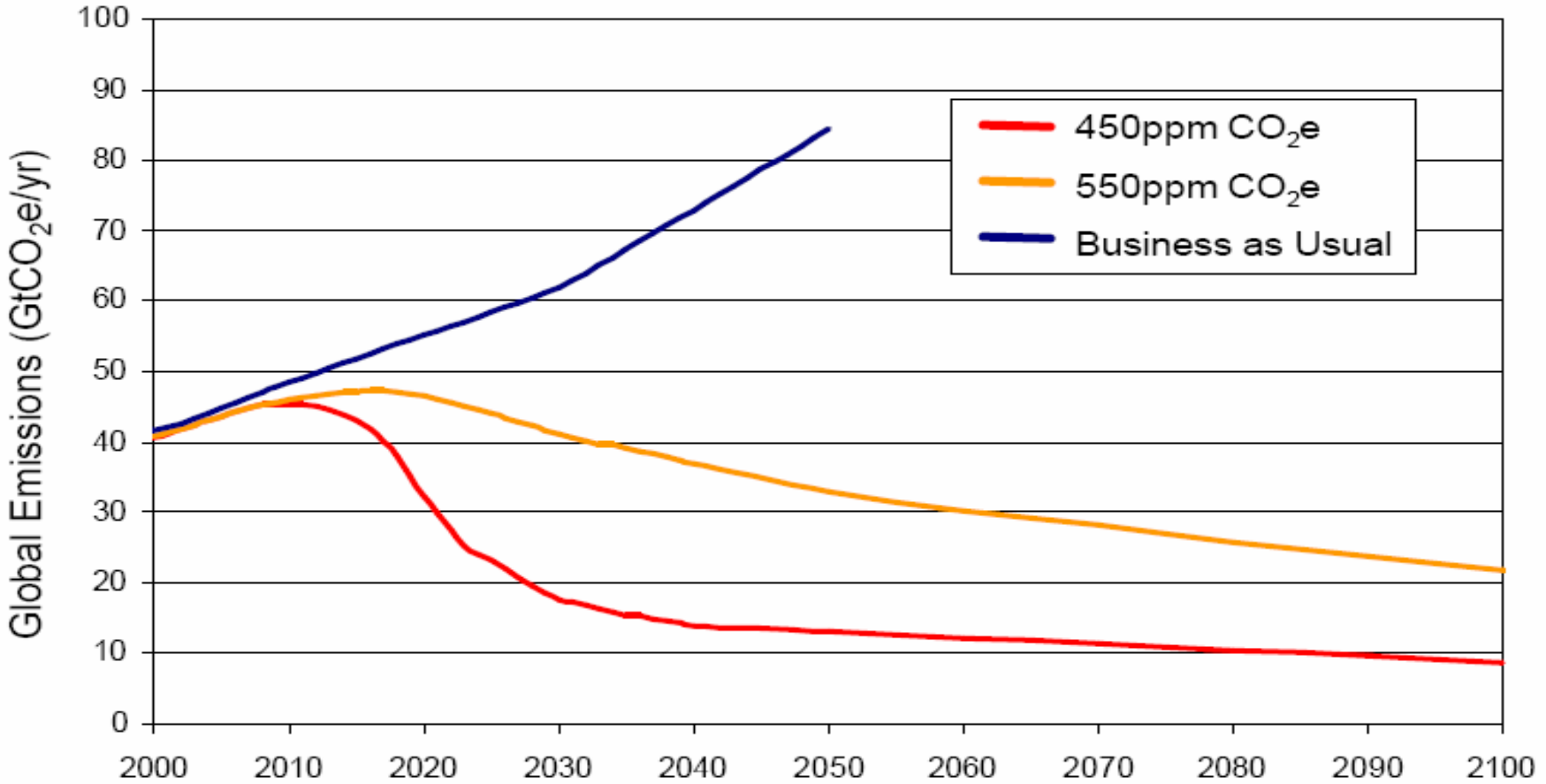
Source: World Resources Institute, CAIT Energy Information Administration Reference Scenario, Energy emissions only

STERN review ON THE ECONOMICS OF CLIMATE CHANGE

7.5. Nich. Stern Report,Oct. 2006

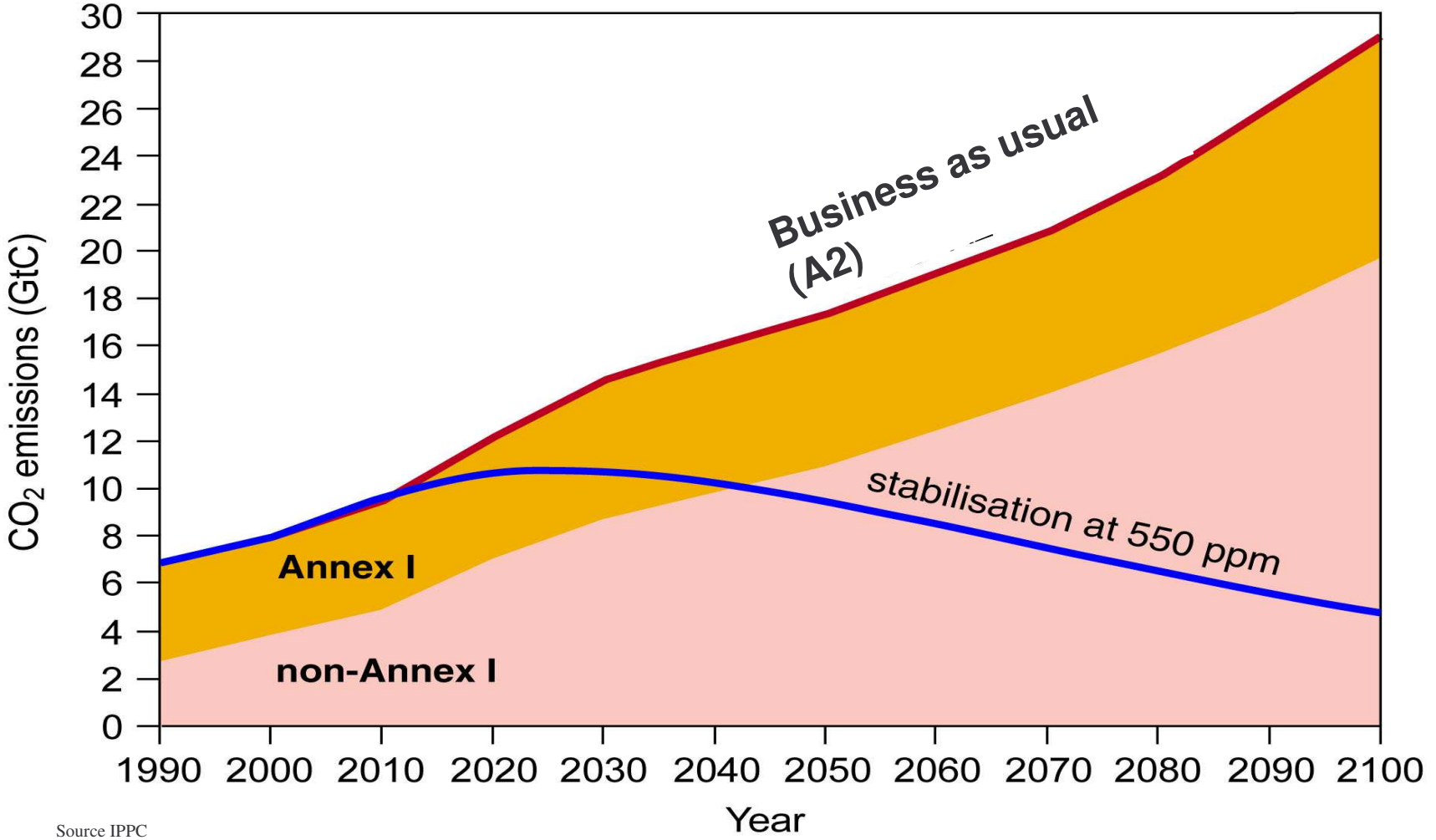
STERN review ON THE ECONOMICS OF CLIMATE CHANGE

Emissions Paths to Stabilisation



7.6. To stabilise at below 550 ppm, emissions must start to fall soon & developing countries must be part of the solution

STERN review ON THE ECONOMICS OF CLIMATE CHANGE

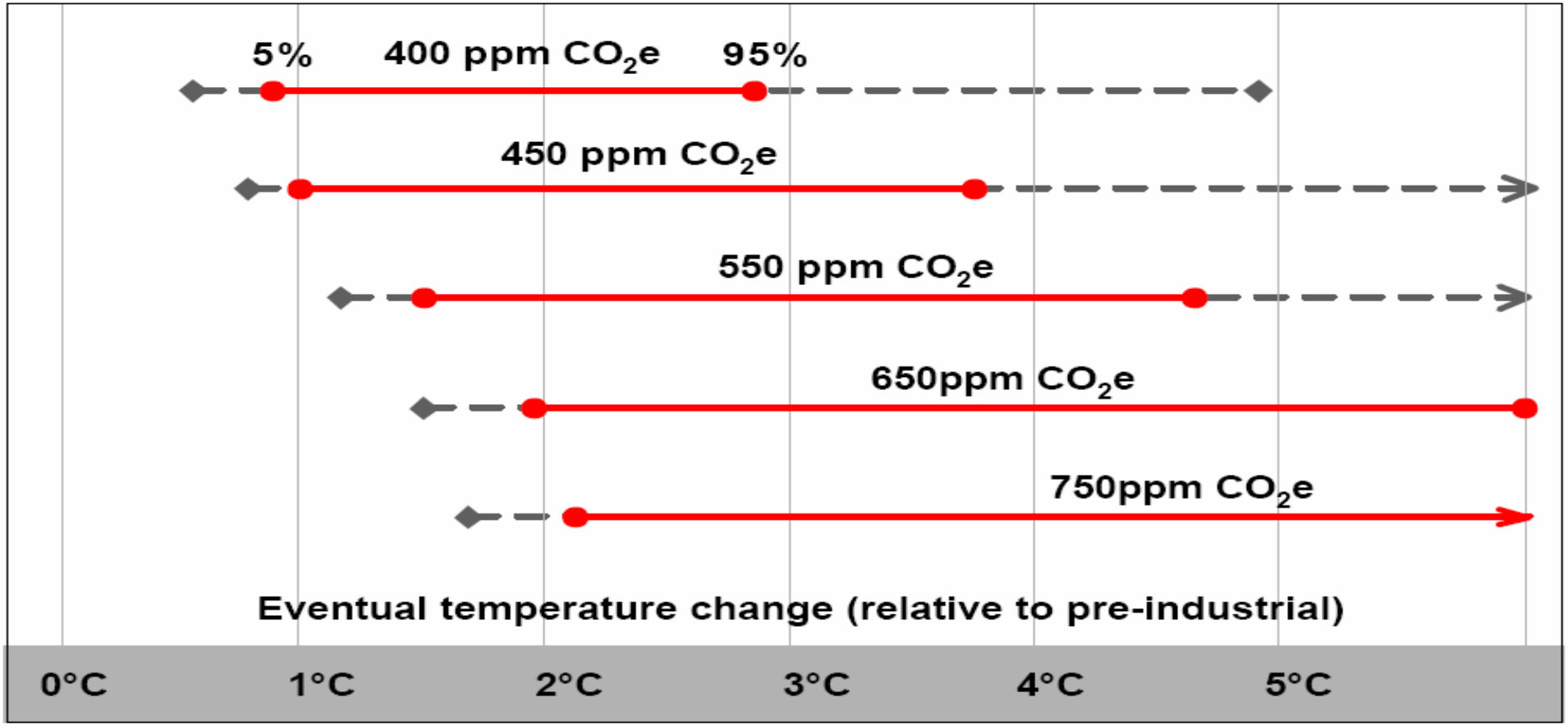


Source IPPC

7.7. Nich. Stern Report,Oct. 2006

STERN review
ON THE ECONOMICS OF CLIMATE CHANGE

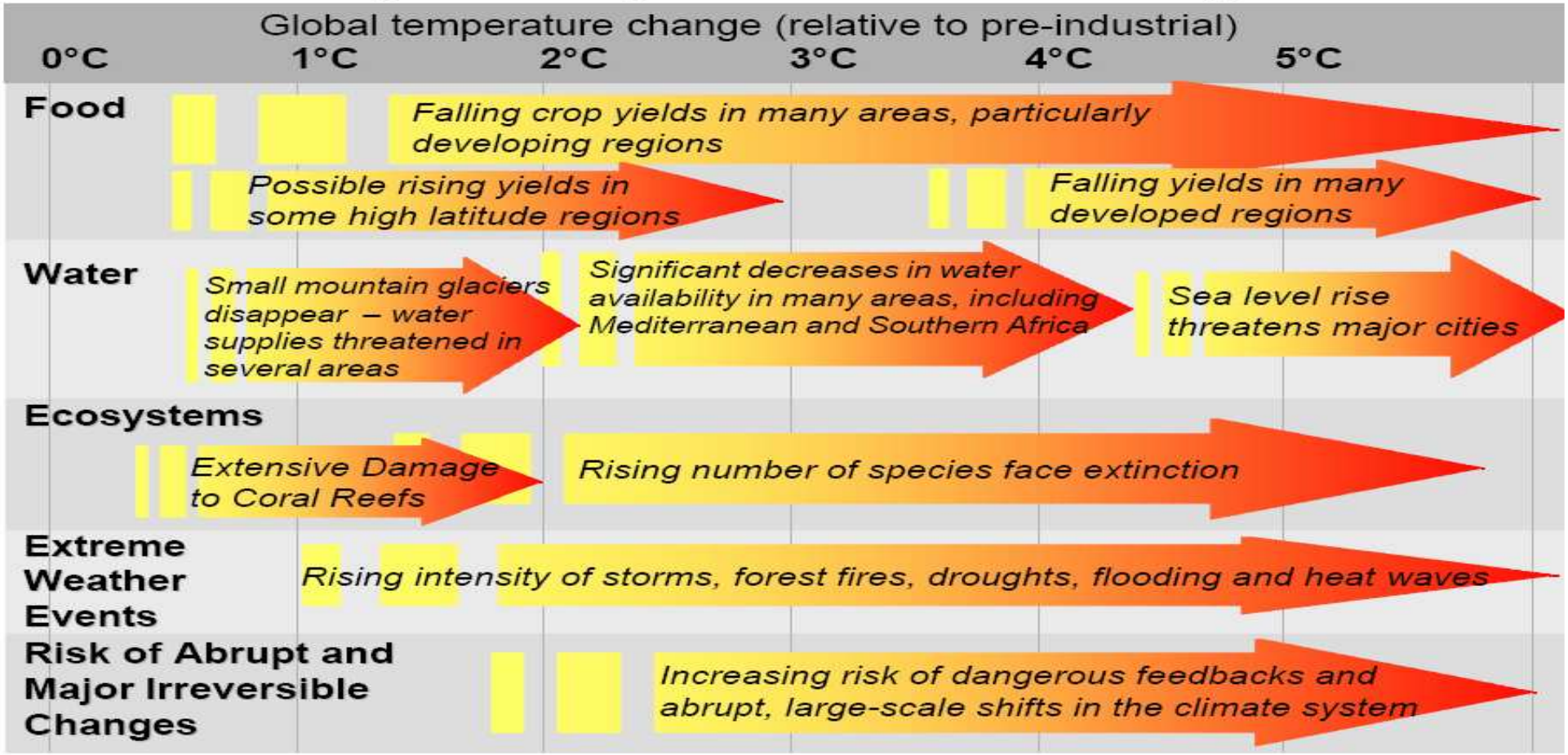
Stabilisation and Commitment to Warming



7.8.Nich. Stern Report, Oct. 2006

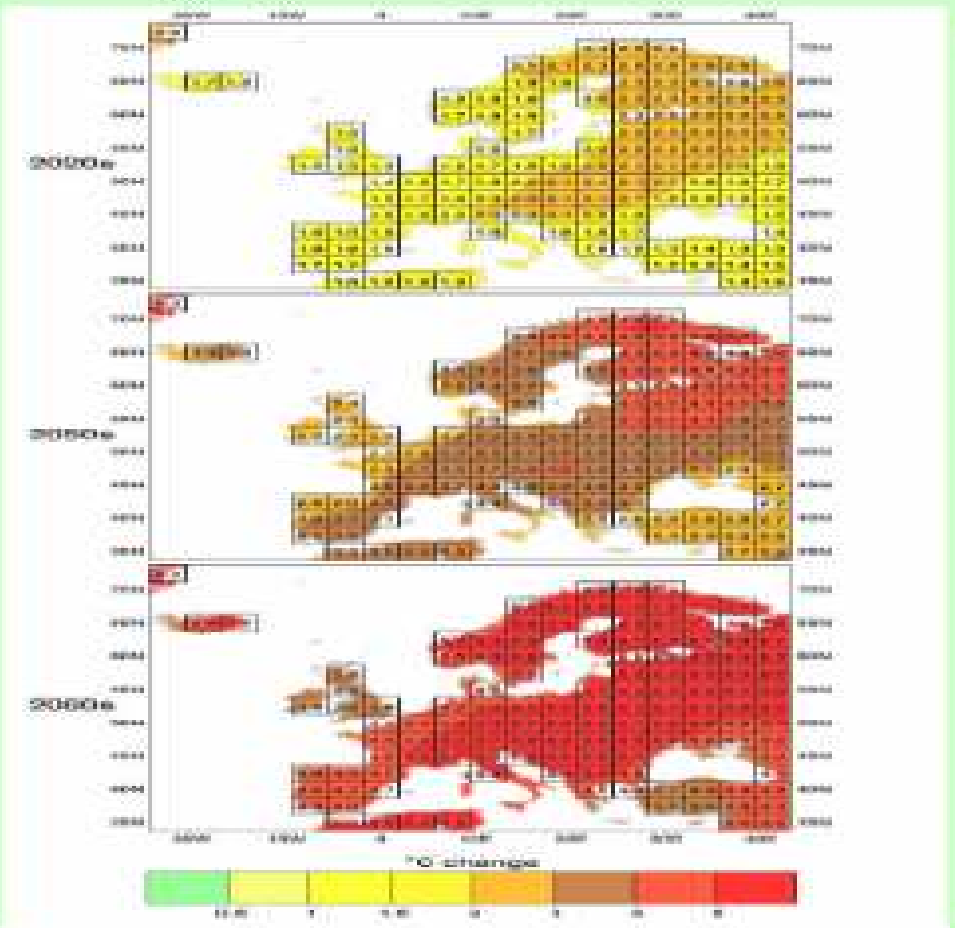
STERN review ON THE ECONOMICS OF CLIMATE CHANGE

Projected Impacts of Climate Change



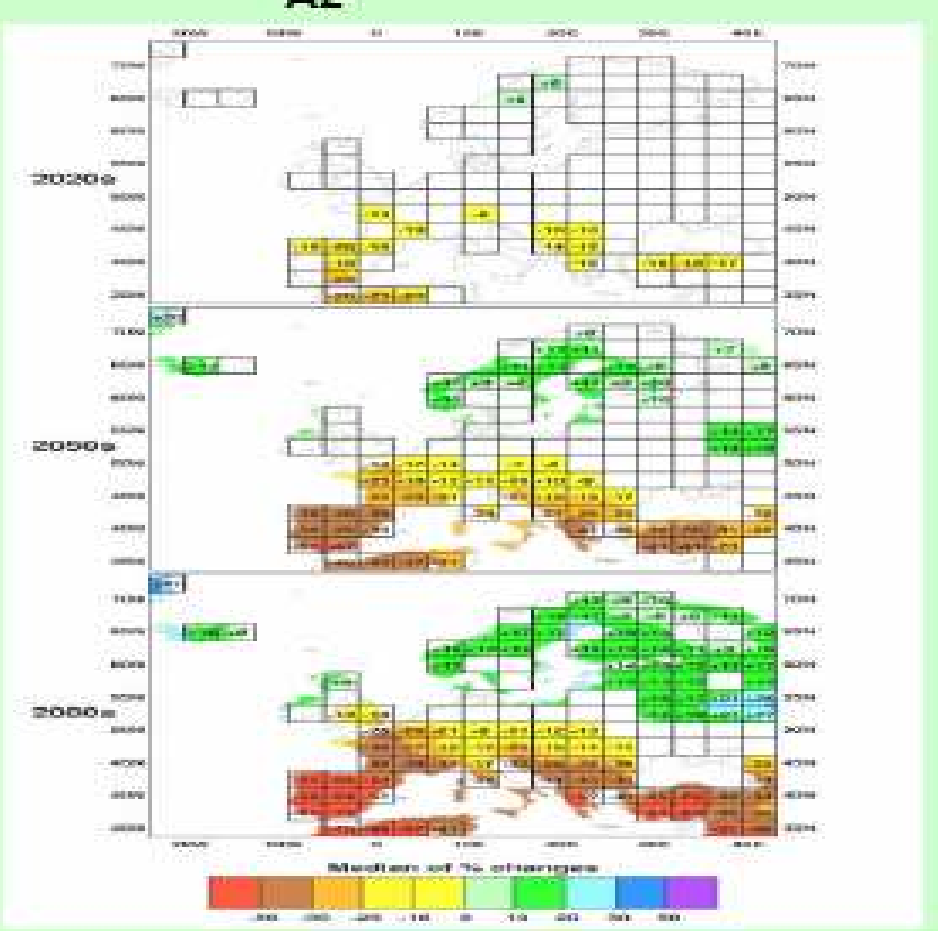
7.9. Projected Changes for Winter Temperatures & Summer Precipitation in Europe (2020/2050/2080)

Winter Temperatures



Summer Precipitation

(only significant changes shown)



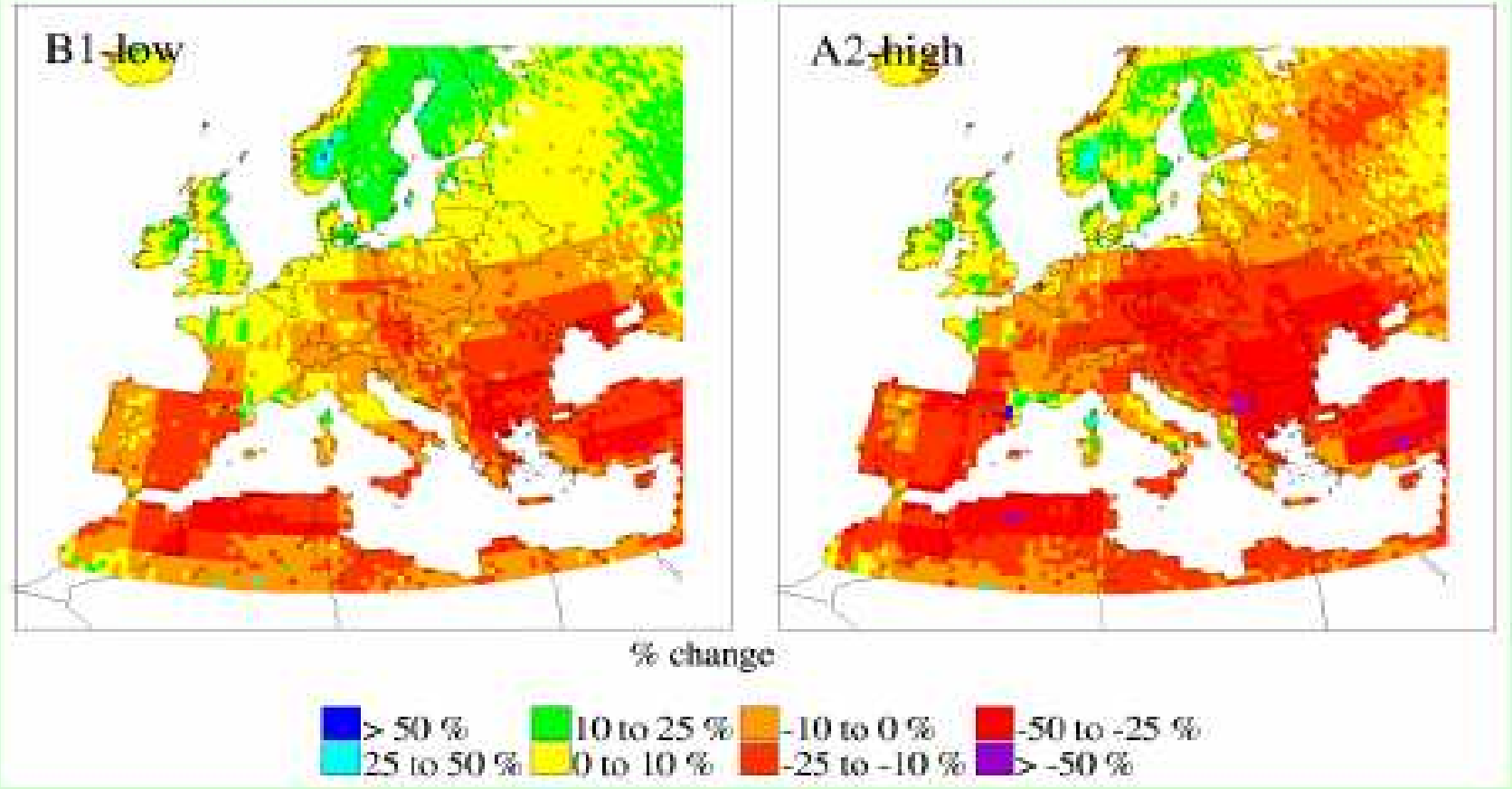
7.10. Water Availability in Europe, 2050‘s

© M. Parry, Meeting of EU Agriculture/ Environment Ministers, 11.9.2005, London

WATER AVAILABILITY, 2050s

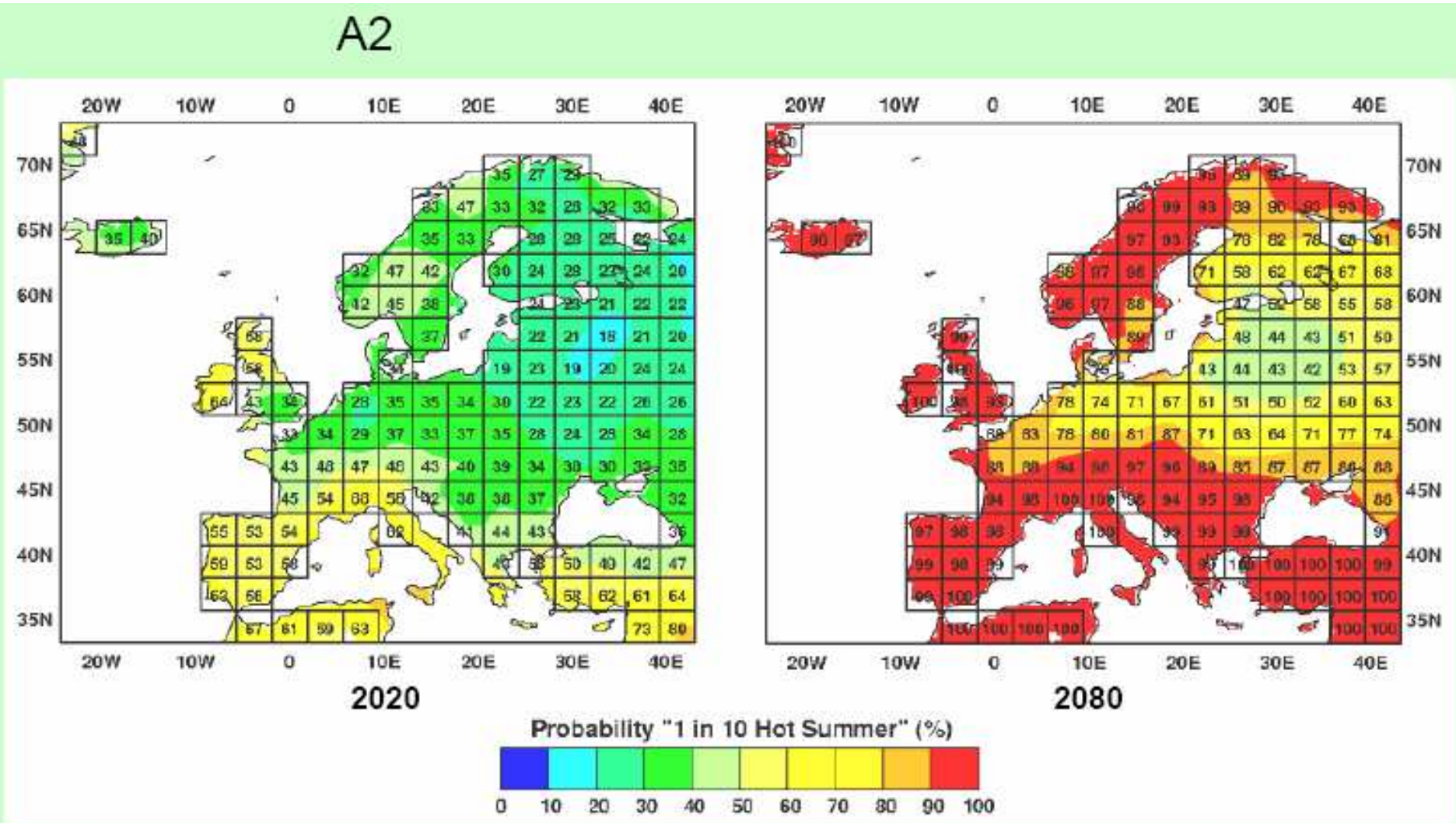
(CHANGE IN ANNUAL RUNOFF)

Acacia Project



7.11. Probability of 1 in 10 Hot Summers (%) by 2020 and 2080

© M. Parry, Meeting of EU Agriculture/ Environment Ministers, 11.9.2005, London

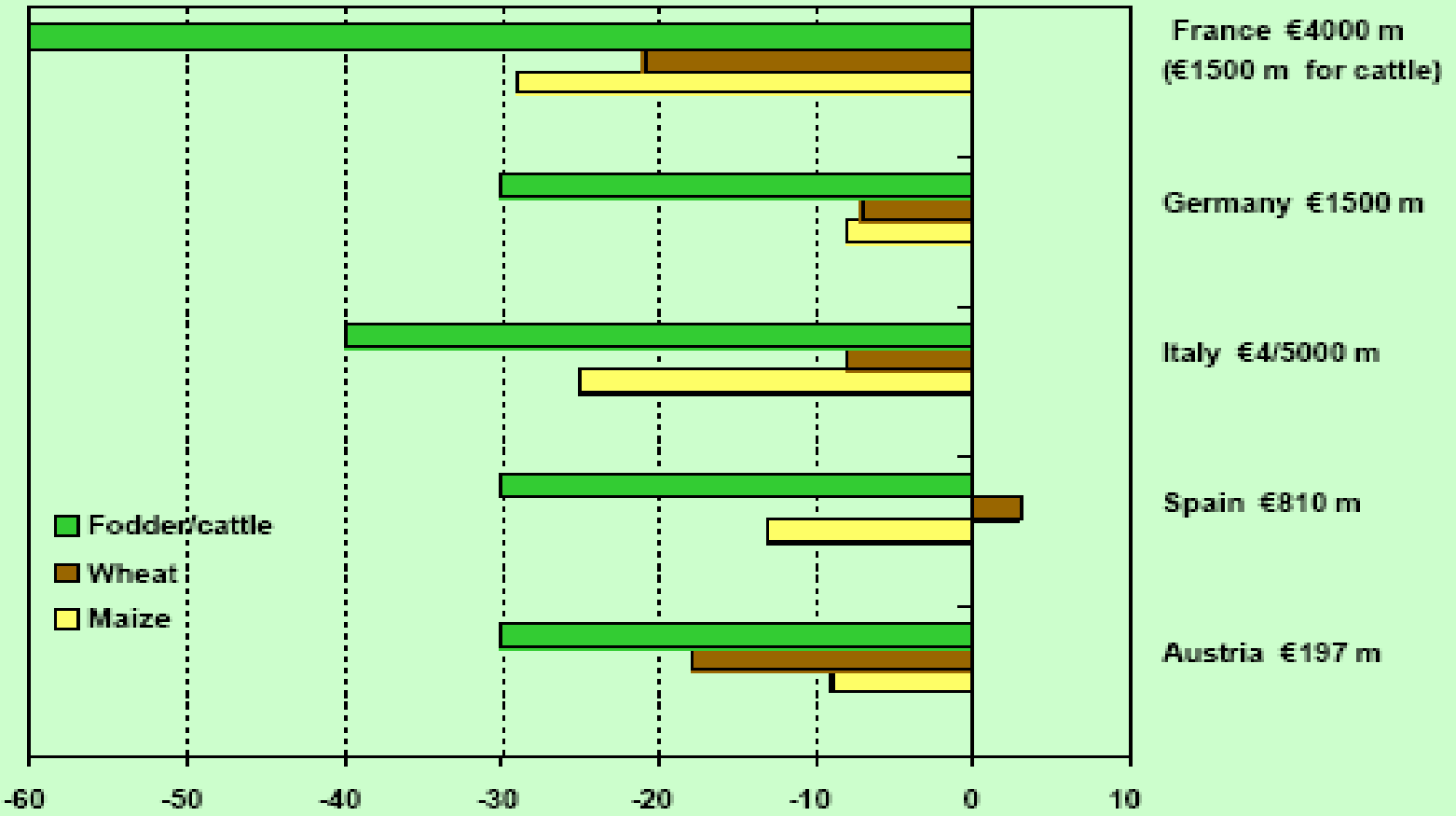


7.12. Effects of 2003 summer heat wave on agricultural yield in five EU countries

© M. Parry, Meeting of EU Agriculture/ Environment Ministers, 11.9.2005, London

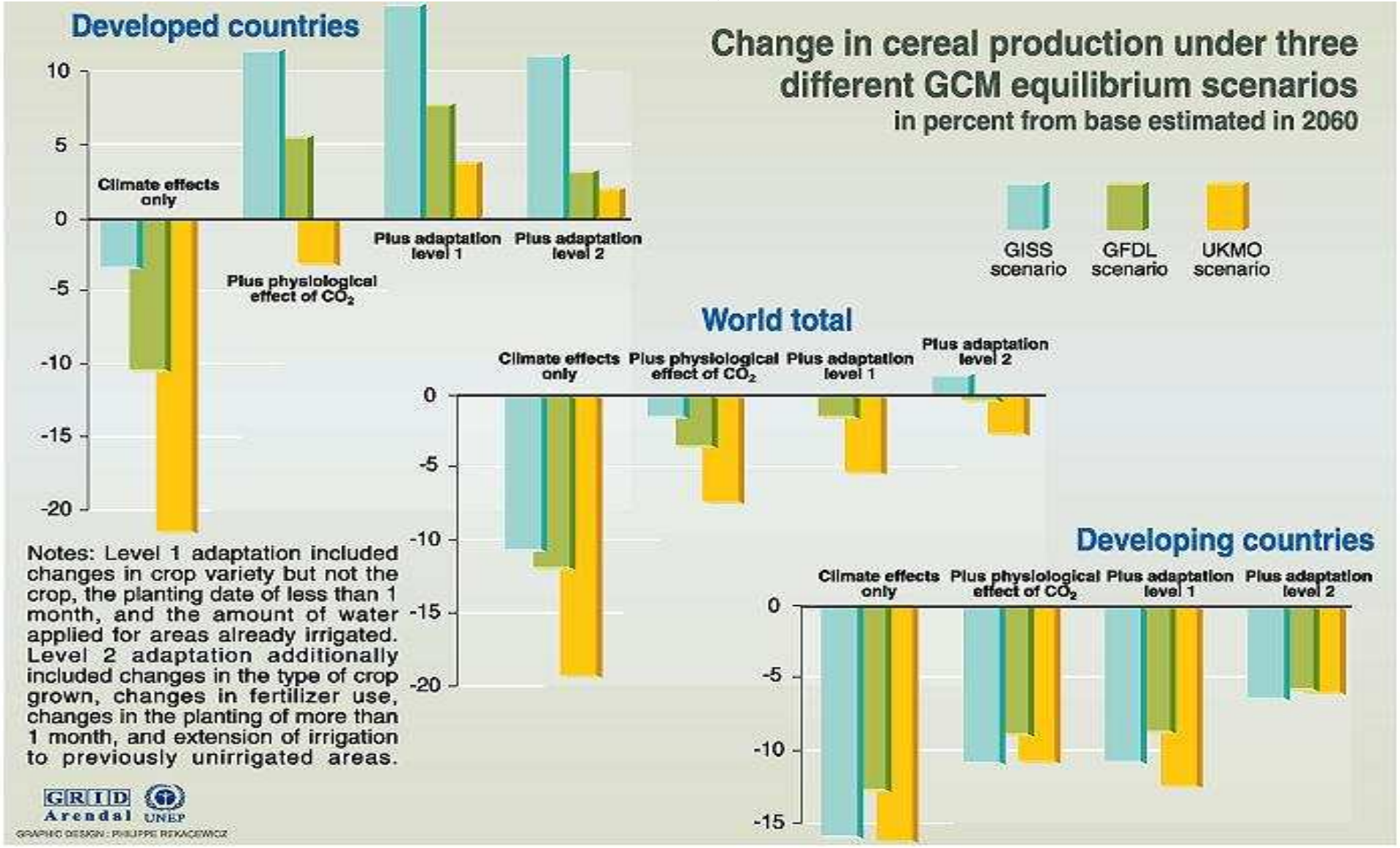
COPA

Effects of 2003 summer heat wave on EU agriculture



7.13. Climate Change Impacts on Agriculture

Source: © UNEP; GRID Arendal



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

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

←High Potential for Food Crisis (1901-1995)

7.14. Food Crises

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

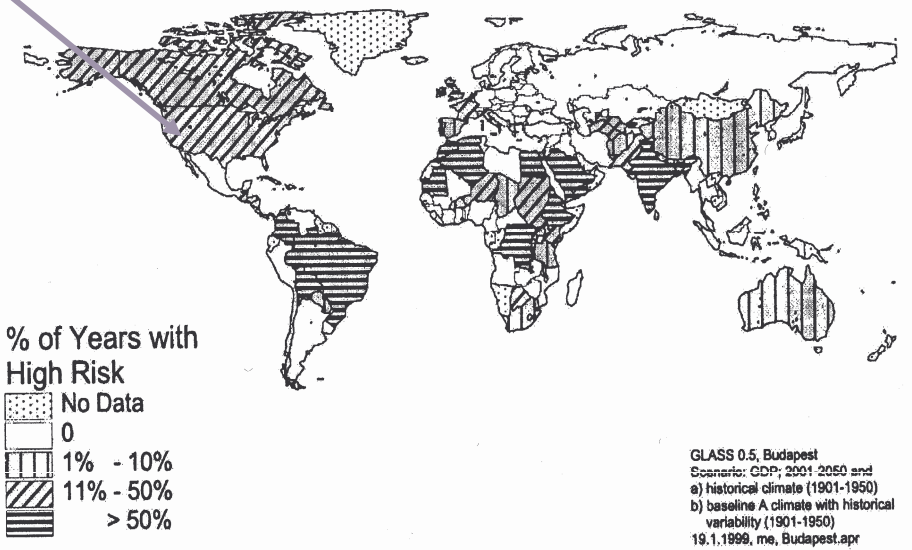
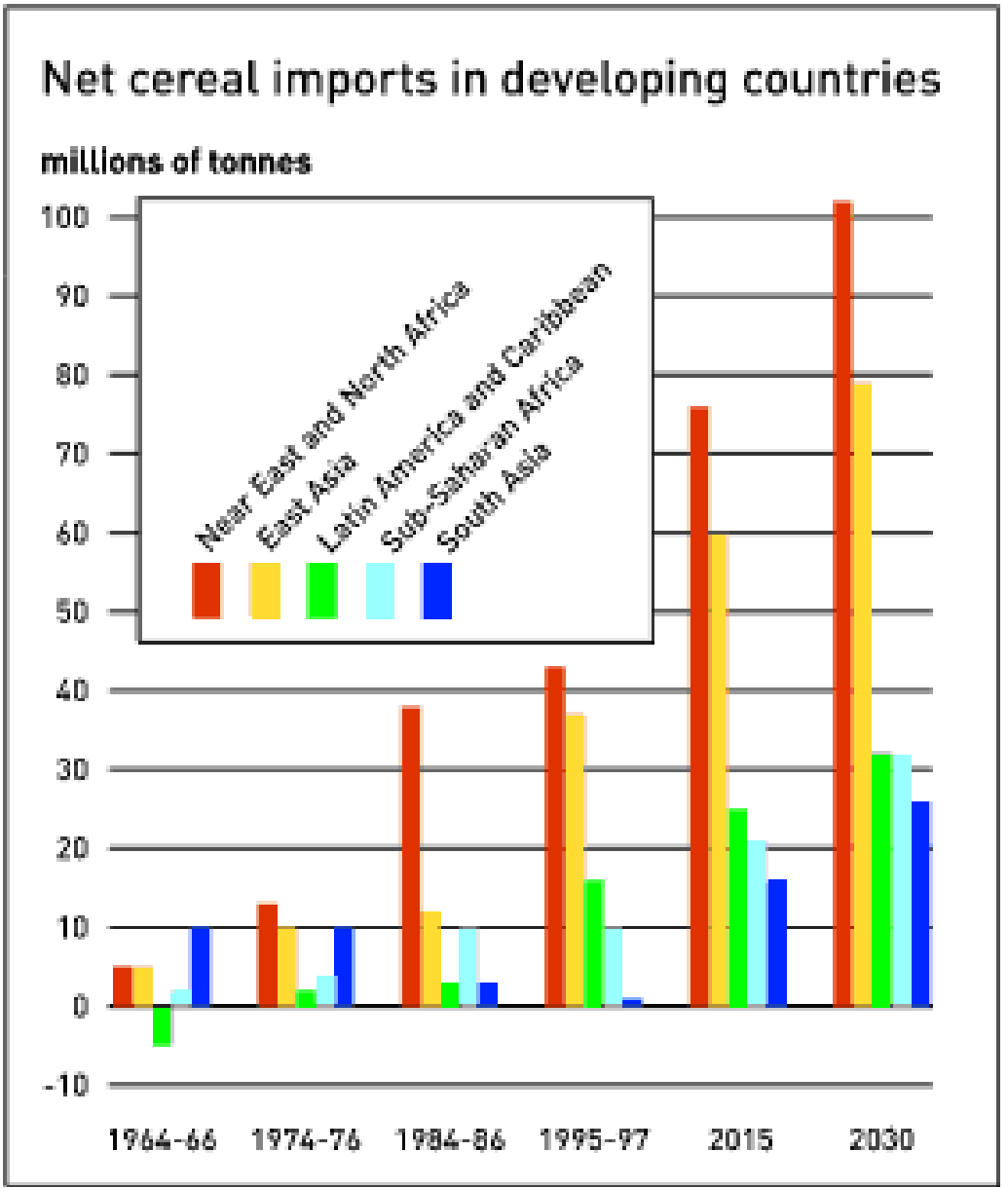


Figure 6. High Potential for Food Crisis 2001-2050 – with GDP Increase and Climate Change.

7.15. FAO (2000) Increase in Cereal Imports



- **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.**

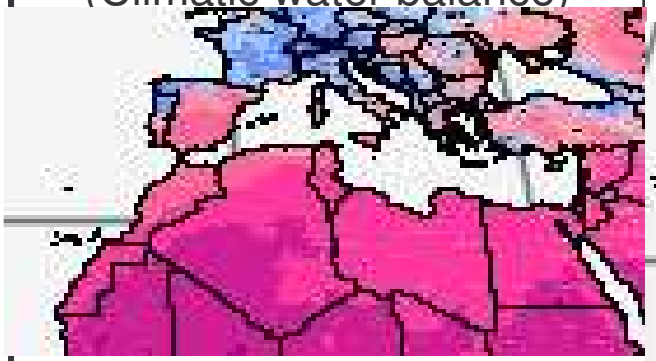
7.16. Extreme Weather Events in the 20th & 21st Century (IPCC, TAR 2001, WG II)

Confidence in observed changes (latter half of the 20th century)	Changes in Phenomenon	Confidence in projected changes (during the 21st century)
Likely[7]	**Higher maximum temperatures and more hot days over nearly all land areas**	Very likely[7]
Very likely[7]	**Higher minimum temperatures, fewer cold days and frost days over nearly all land areas**	Very likely[7]
Very likely[7]	**Reduced diurnal temperature range over most land areas**	Very likely[7]
Likely[7], over many areas	**Increase of heat index[12] over land areas**	Very likely[7], over most areas
Likely[7], over many Northern Hemisphere mid- to high latitude land areas	**More intense precipitation events[b]**	Very likely[7], over many areas
Likely[7], in a few areas	**Increased summer continental drying and associated risk of drought**	Likely[7], over most mid-latitude continental interiors. (Lack of consistent projections in other areas)
Not observed in the few analyses available	**Increase in tropical cyclone peak wind intensities[c]**	Likely[7], over some areas
Insufficient data for assessment	**Increase in tropical cyclone mean and peak precipitation intensities[c]**	Likely[7], over some areas

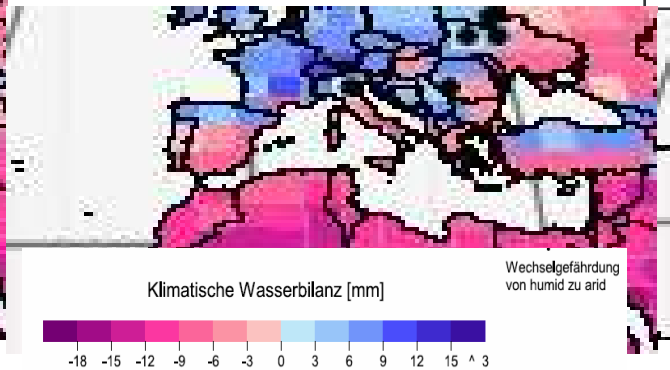
7.17. Potential Dangers of Drought

Source: **AFES-PRESS for WBGU, 2006, slides by PIK for WBGU**

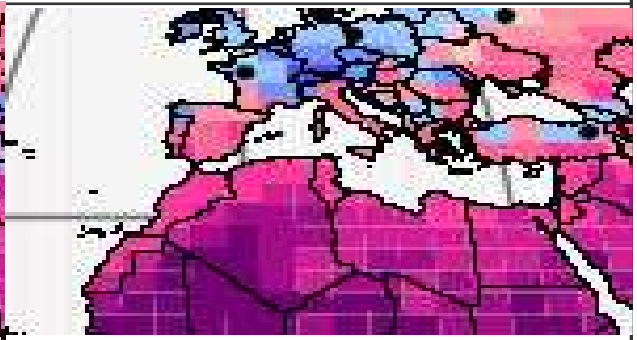
For 1975-2004
(Climatic water balance)



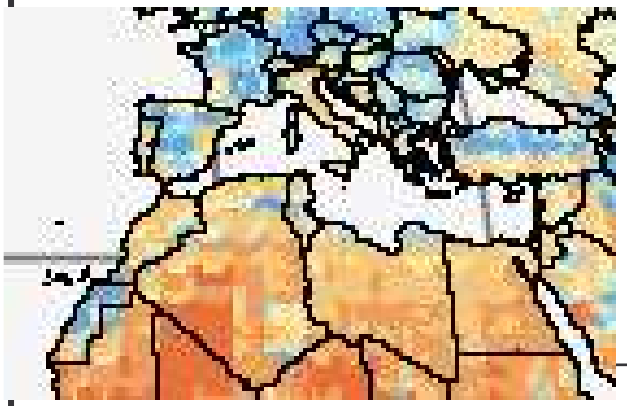
For 2050 (2040-2069)
(Climatic water balance)



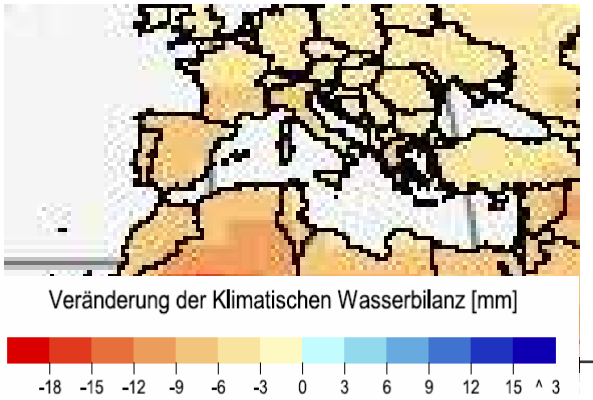
For 2080 (2070-2099)
(Climatic water balance)



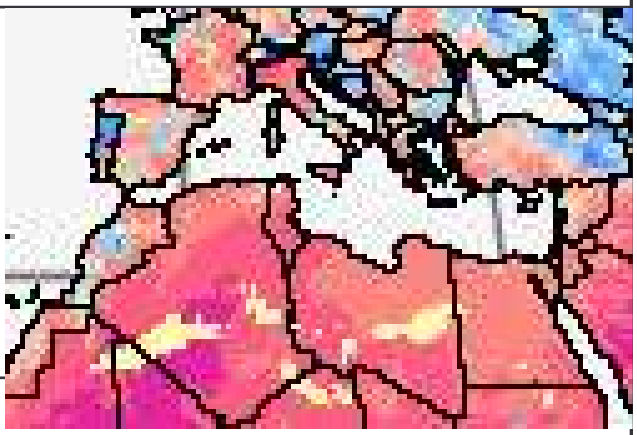
Difference 2040/2069-1975/2004,
change of climatic water balance.



Difference 2070/ 2099-2040/69,
change of climatic water balance.



Trends of climatic water balance.
1975-2004



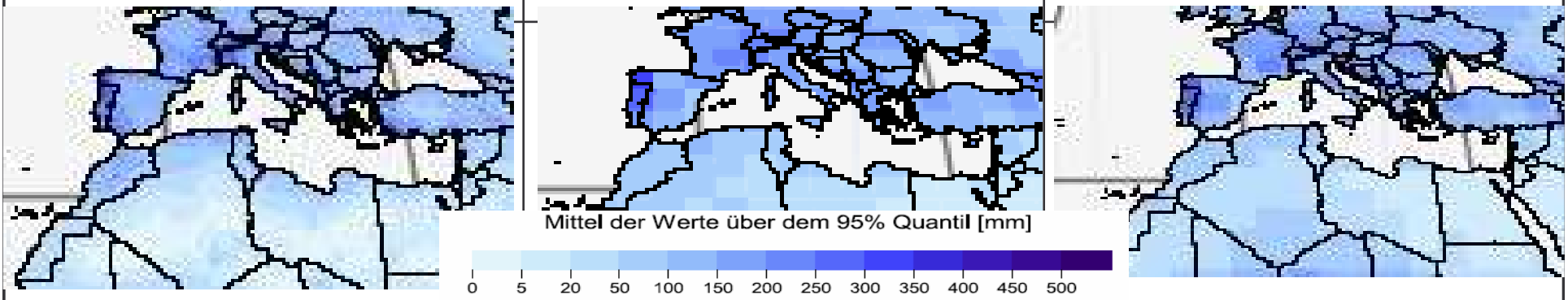
7.18. Potential for Flash Floods

Source: **AFES-PRESS for WBGU, 2006, slides by PIK for WBGU**

Potential danger of flash floods by country, 1975-2004

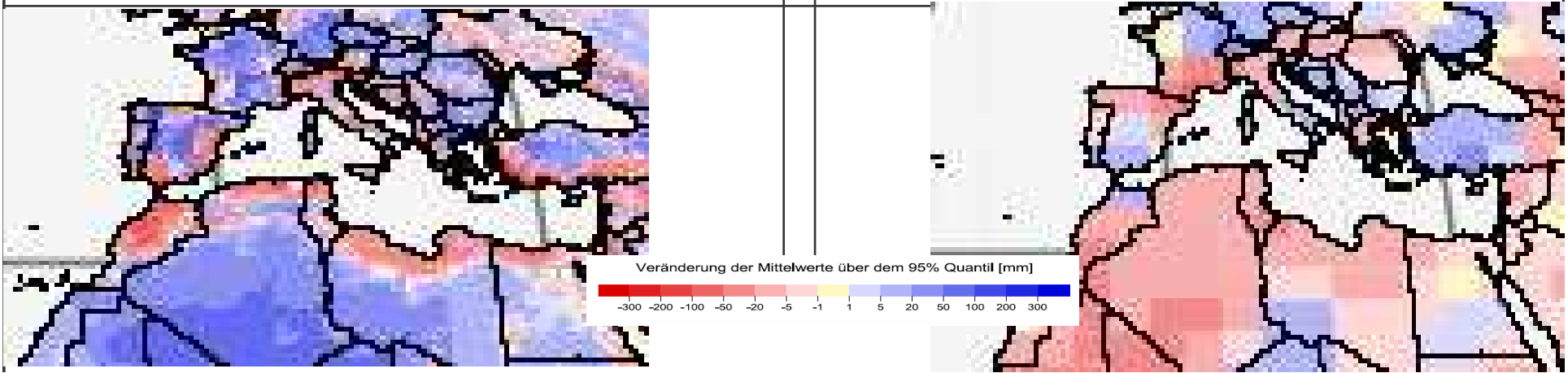
Potential danger of flash floods by 2050 (2040-2069)

Potential danger of flash floods by 2080 (2070-2099)



Potential danger of flash floods by country Difference 1990-2050 (2040-2069 -1975/2004)

Potential danger of flash floods by country Difference 2050-2080 (2070/2099 -2040/2069)

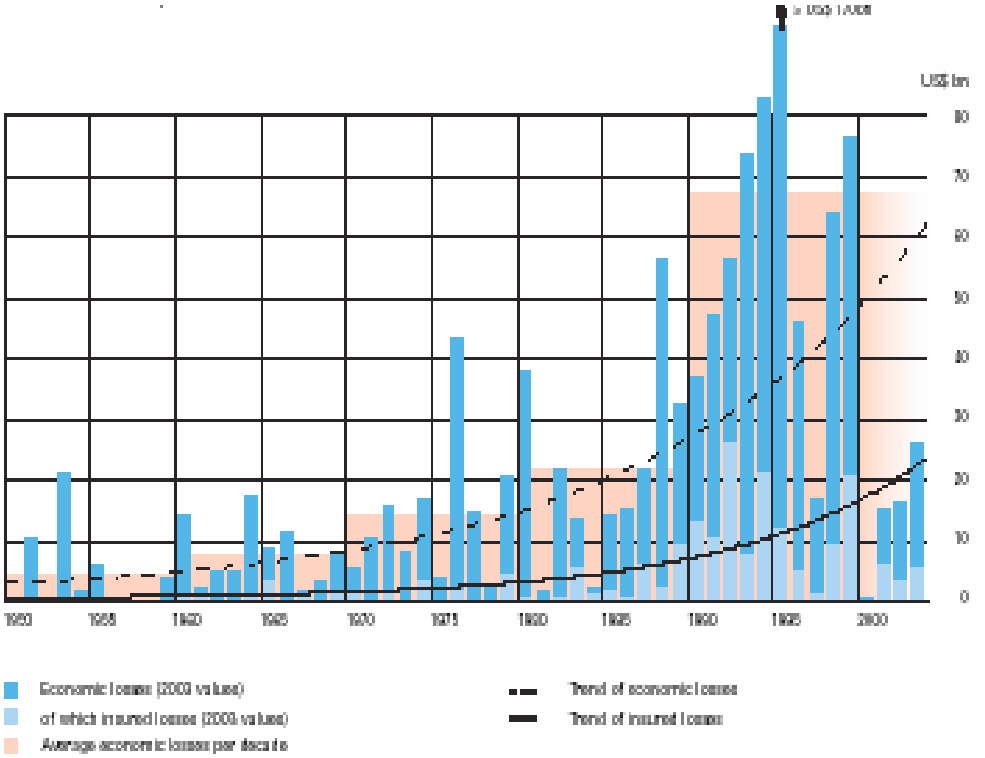


650 990 2000 2800 4700

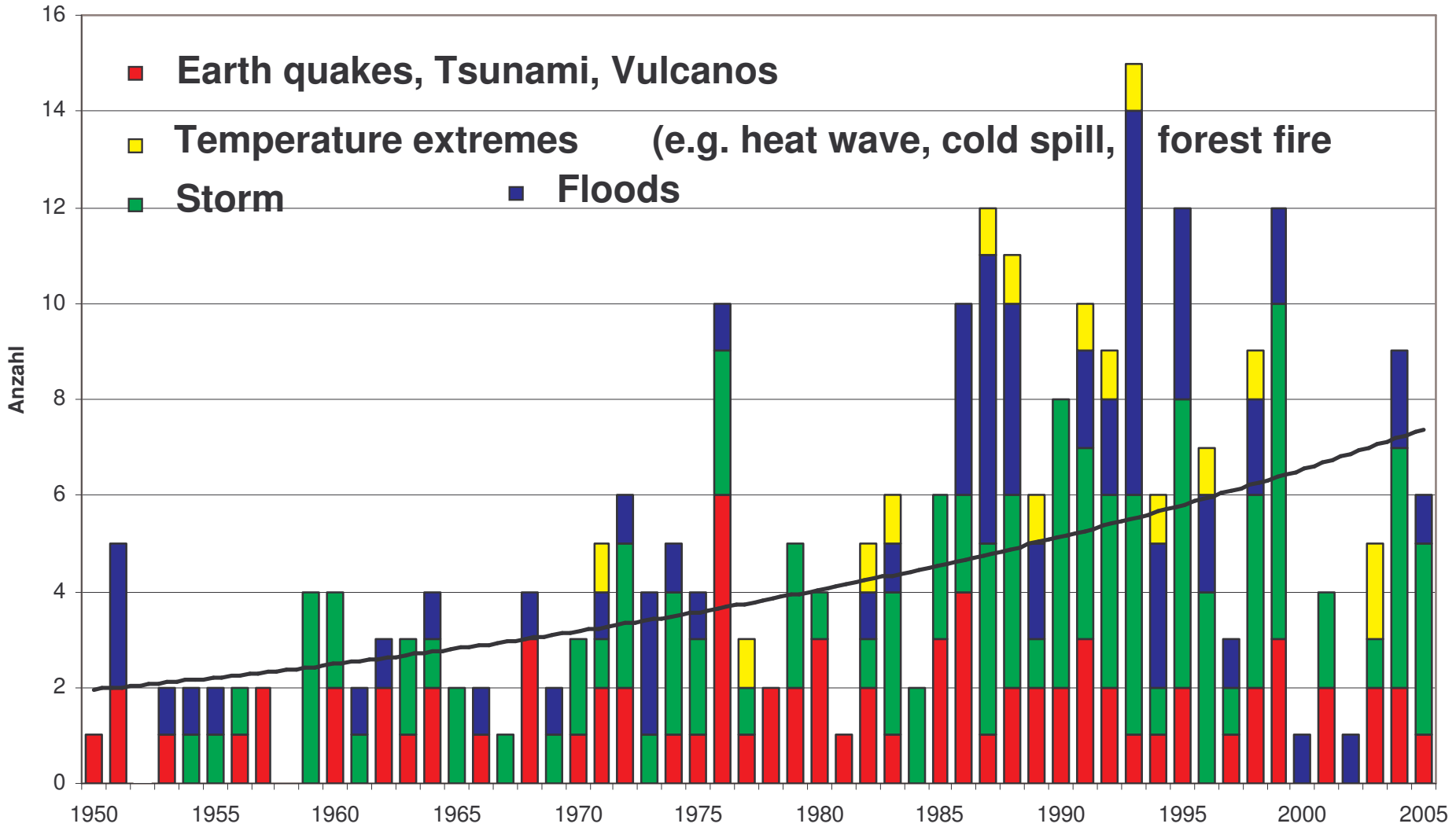
Distribution of natural disasters: by origin
(1900-2003, by decades*)

	1900-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2003	Total
Hydrometeorological	28	75	56	74	128	280	511	795	1575	2139	1444	7105
Geological	36	26	32	38	53	58	94	128	234	283	152	1134
Biological	5	12	10	3	3	3	40	65	167	351	297	956
Total	69	113	98	115	184	341	645	988	1976	2773	1893	9195

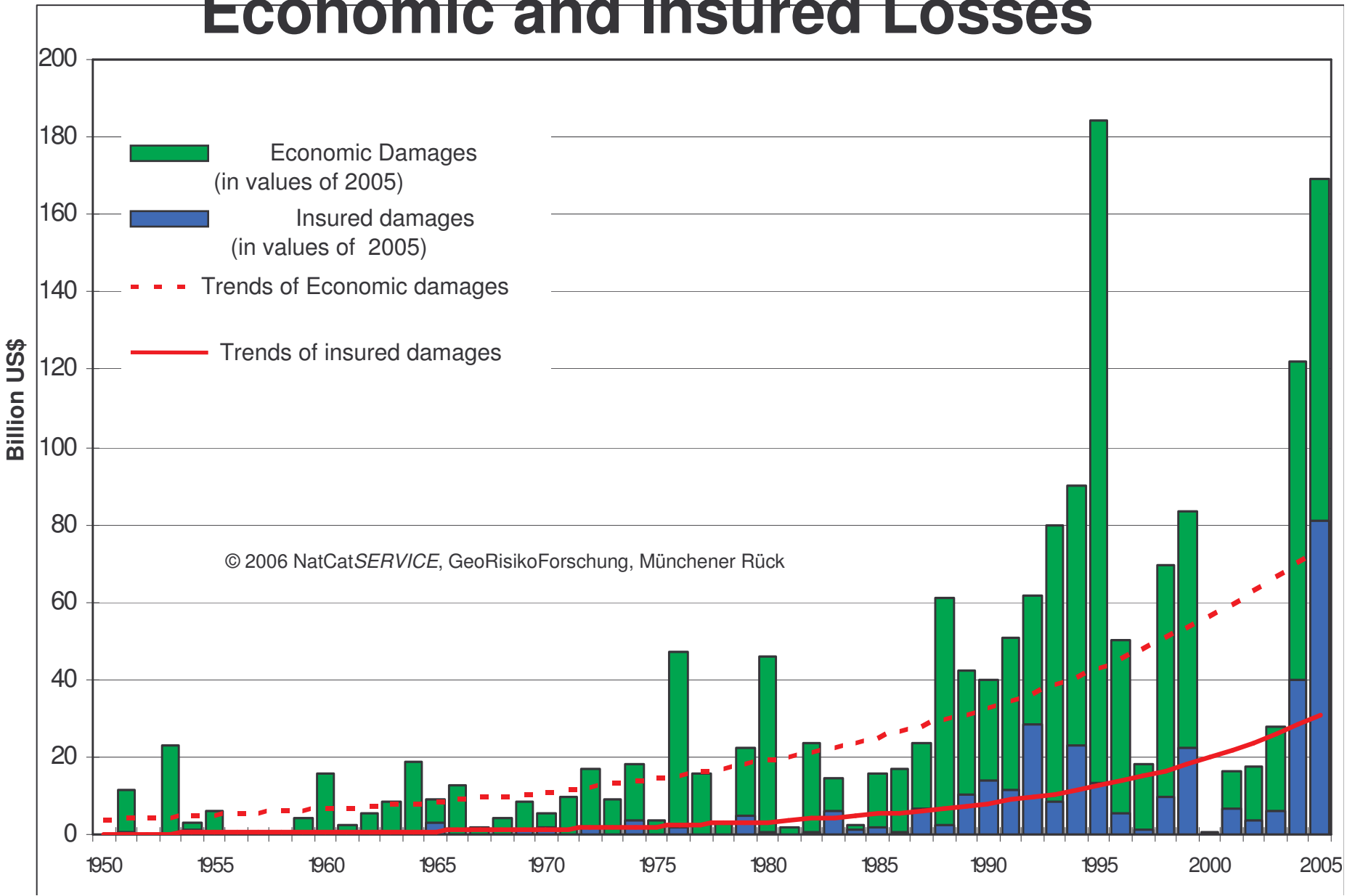
7.19. Global Impacts of Natural Hazards



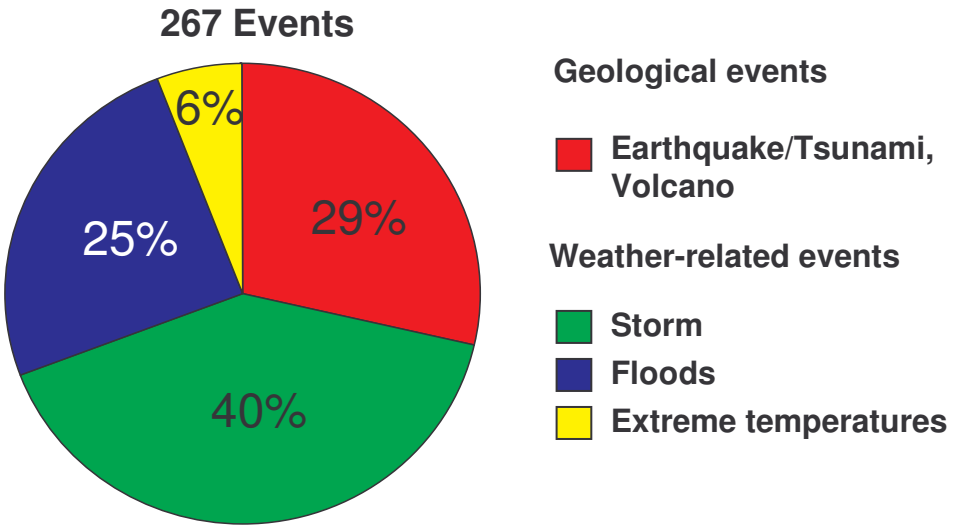
7.20. Major Natural Hazards (1950 – 2005)

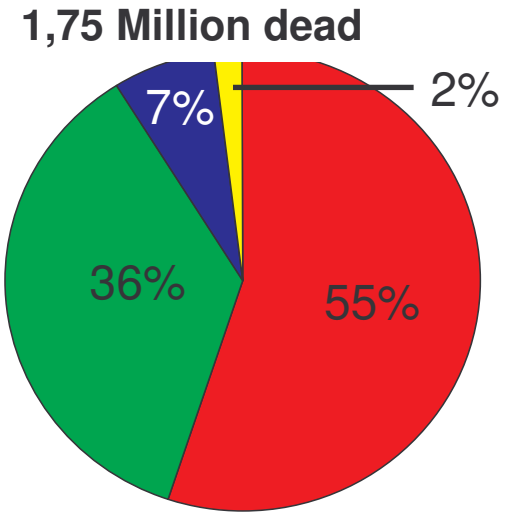


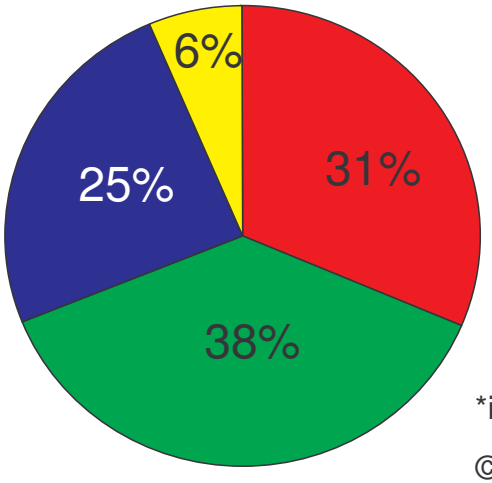
7.21. Major Natural Hazards (1950-2005), Economic and Insured Losses

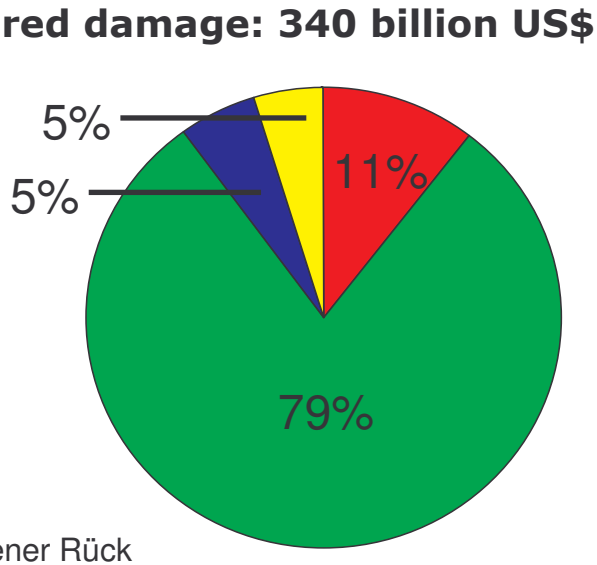


7.22. Major Natural Hazards (1950-2005). Source: Munich Re Research Div., 2006



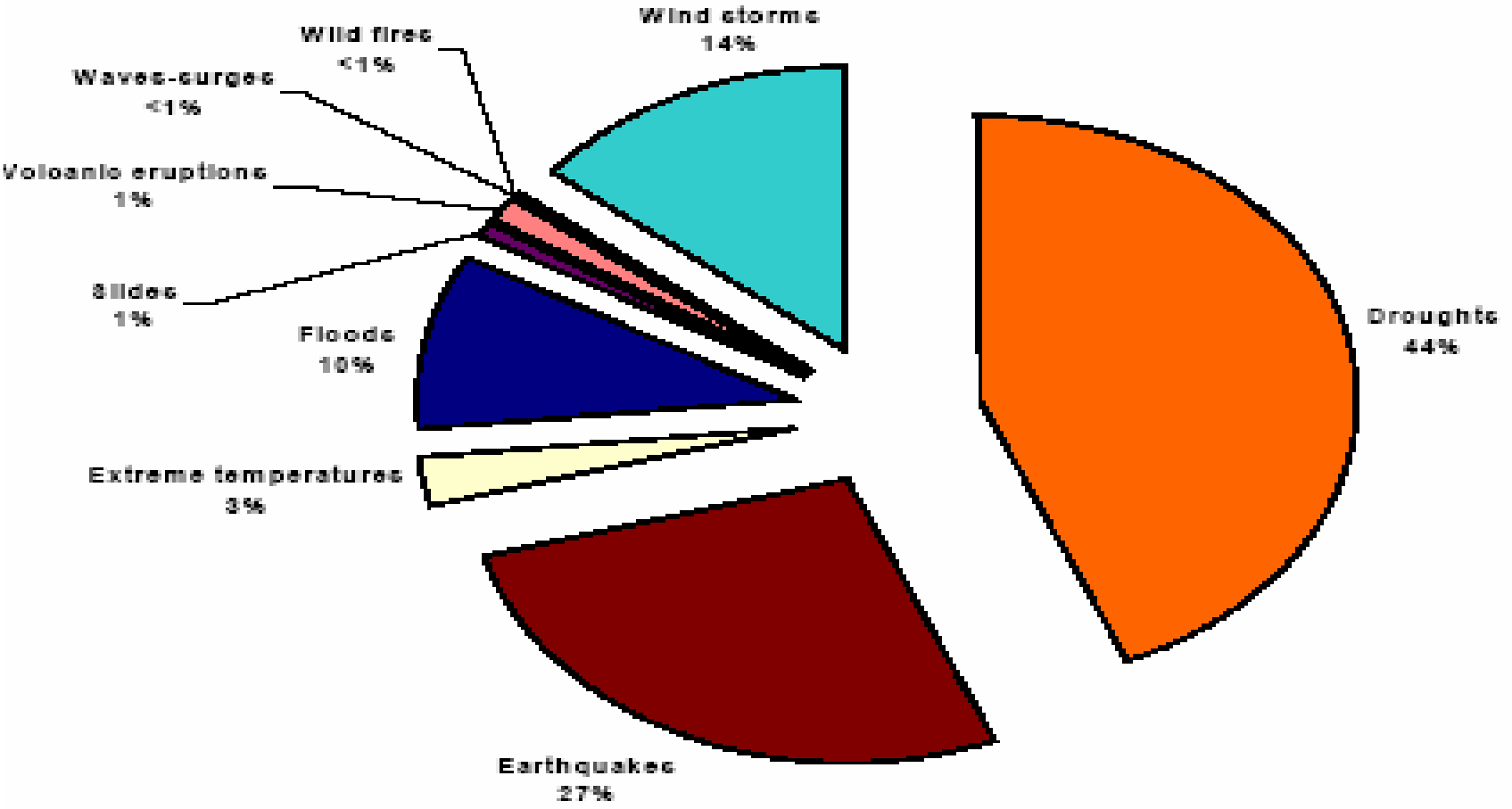






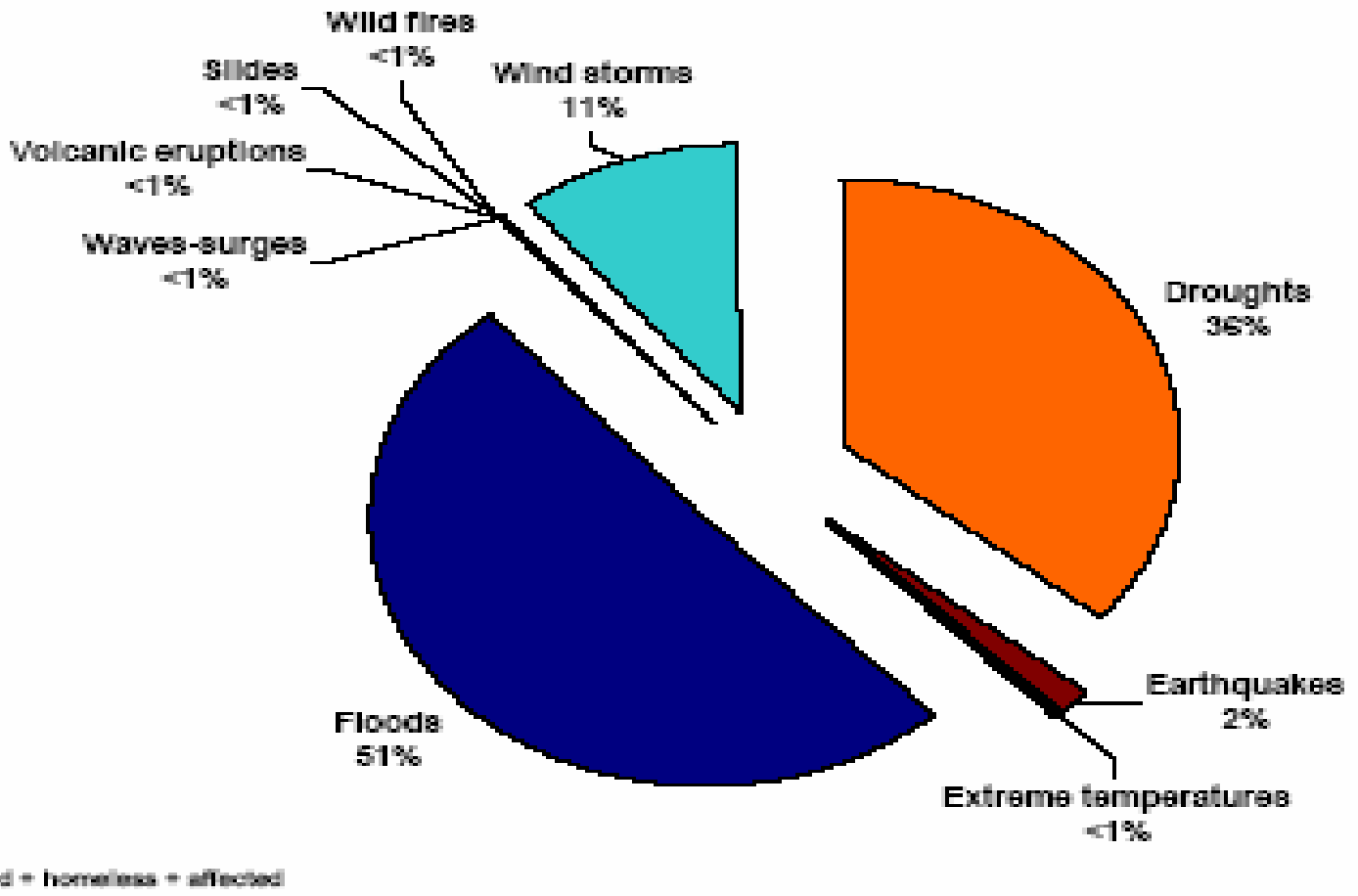
*in Werten von 2005

7.23. Reported Death of Natural Hazards globally (1974-2003): 2.066.273 persons



Source: © Hoyois und Guha-Sapir (2004)

7.24. Affected Persons of Natural Hazards Globally (1974-2003): 5 076 494 541 Persons



Source: © Hoyois und Guha-Sapir (2004)

7.25. Climate Change Poses Environmental 'Threats', 'Challenges', 'Vulnerabilities' and 'Risks' for National and Human Security

Environmental causes, stressors, effects &natural hazards pose	Natural and economic factors		Societal impact factors (exposure)	
	Substantial threats for	Challenges affecting	Vulnerabilities for	Risks for
	Security objects (for what or whom?)			
Climate change - temperature increase (creeping, long-term)	- Human health - agriculture (yield decline) - biodiversity - desertification	- tourism - food security - fisheries - government action - econ. action	- infect. disease - damage to crops - natural systems - water scarcity - forest fire	- human populations - the poor, old people and children due to heat waves
Climate change - sea level rise (creeping, long-term)	- Small island states - marine eco-system, - indigenous communities, - industry, energy	- deltas - coastal zones - marine, freshwater ecosystems	- coastal cities, habitats, infrastructure, jobs - cities, homes, jobs	- livelihood - poor people, - insurance, - financial services

7.26. Climate Change and Conflicts

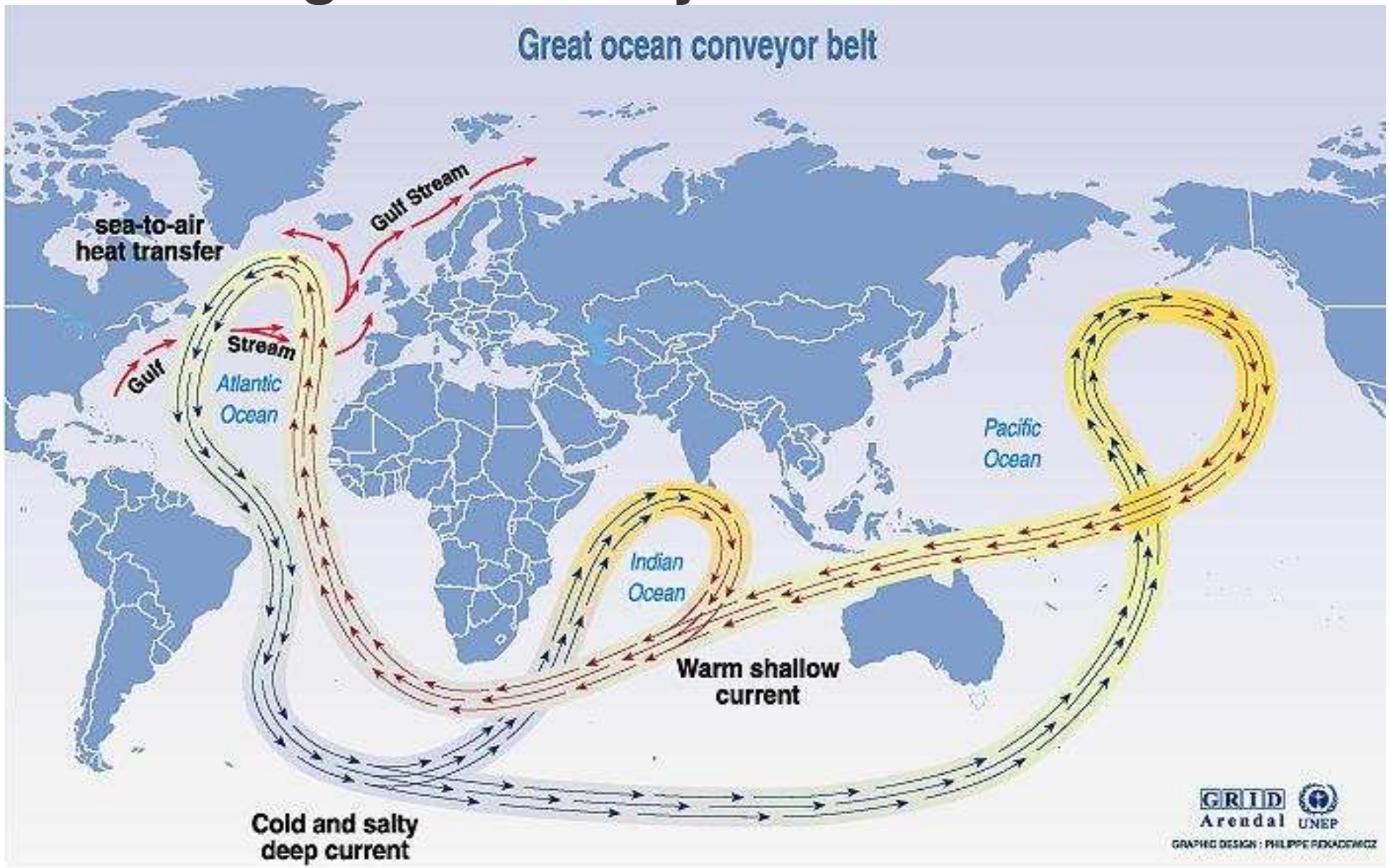
Hobbesian: http://halfgeek.net/weblog/special/gwreport/Pentagon.htm l

Grotian: http://www.bmu.de/files/climges.pdf

- Peter Schwartz/Doug Randall
- Contract Study for DoD, Net Assessment, Oct. 2003
- *The purpose of this report is to imagine the unthinkable – to push the boundaries of current research on climate change so we may better understand the potential implications on United States national security.*
- Vantage point: Hobbesian
- Neo-Malthusian pessimist & Cornucopian optimist
- Pentagon, US national security

- Hans G. Brauch (AFES-PRESS)
- Contract Study for German Environment Ministry, Nov. 2002
- *The purpose is to provide empirical evidence on climate change and conflicts and to contribute to the national and international debate on climate protection.*
- Contribute to crisis prevention & crisis management & provide additional supportive arguments for precautionary & ambitious climate protection policy.“

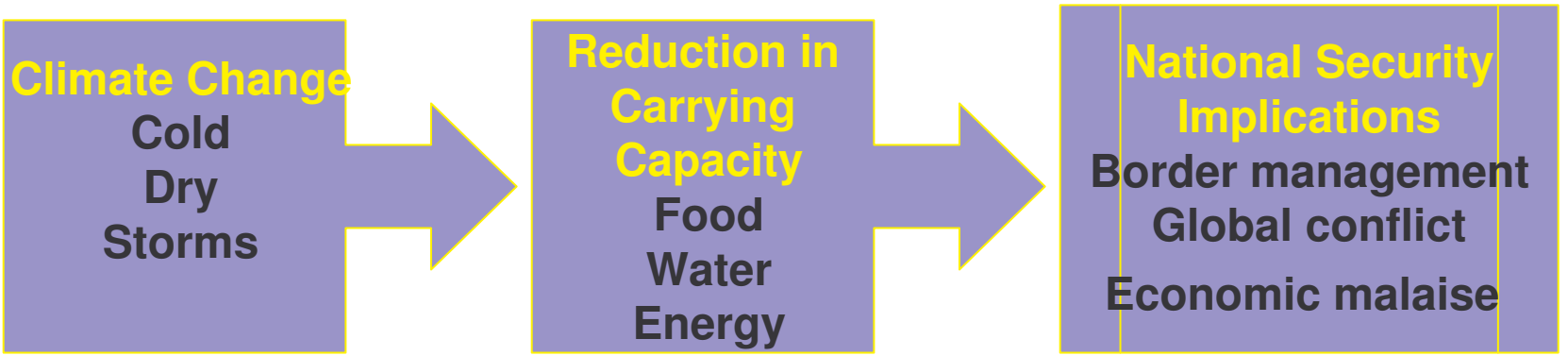
7.27. Change in Conveyer Belt & Gulf Stream



Source: Broecker, 1991, in 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, 1996.

7.28. Peter Schwartz and Doug Randall: Climate Change as a U.S. Security Concern

- Indications today that global warming has reached the threshold where the thermohaline circulation could start to be significantly impacted.
- These indications include observations documenting that North Atlantic is increasingly being freshened by melting glaciers, increased precipitation, & fresh water runoff making it substantially less salty over the past 40 years.
- **Report suggests that, due to pot. dire consequences, the risk of abrupt climate change, although uncertain & quite possibly small, should be elevated beyond a scientific debate to a U.S. national security concern**



7.29. Worst Case Conflict Scenario due to Climate Change (2010-2020)

Europe	Asia	United States
2012: Severe drought and cold push Scandinavian populations southward, push back from EU **2015:** Conflict within the EU over food and water supply leads to skirmishes and strained diplomatic relations **2018:** Russia joins EU, providing energy resources **2020:** Migration from northern countries such as Holland and Germany toward Spain and Italy	**2010:** Border skirmishes & conflict in Bangladesh, India, and China, as mass migration occurs toward Burma **2012:** Regional instability leads Japan to develop force projection capability **2015:** Strategic agreement between Japan & Russia for Siberia & Sakhalin energy resources **2018:** China intervenes in Kazakhstan to protect pipelines regularly disrupted by rebels & criminals	**2010:** Disagreements with Canada & Mexico over water increase tension **2012:** Flood of refugees to southeast U.S. & Mexico from Caribbean islands **2015:** European migration to United States (mostly wealthy) **2016:** Conflict with Europeans over fishing rights **2018:** Securing North America, U.S. forms integrated security alliance with Canada & Mexico **2020:** DoD manages borders & refugees from Caribbean & Europe.

7.30. BMU Study Design

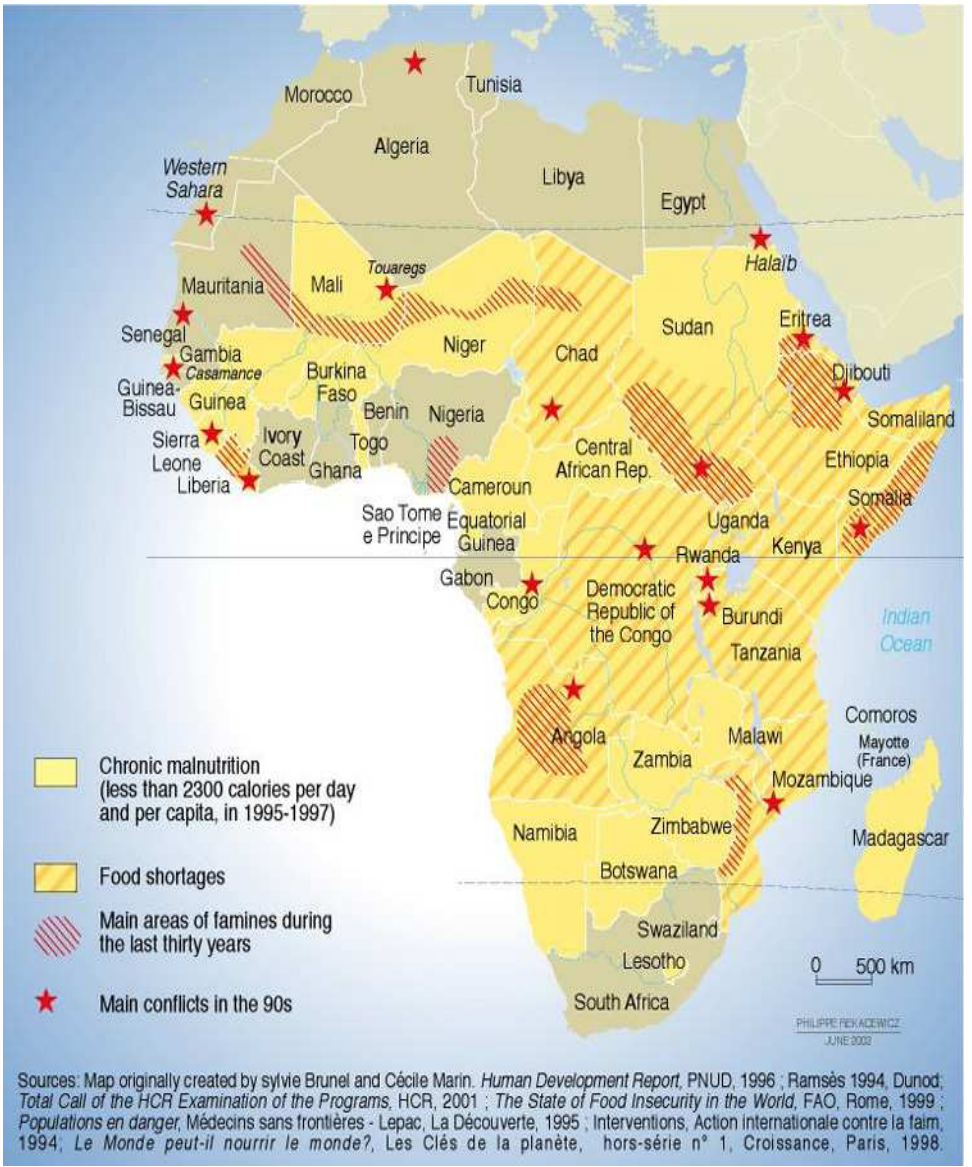
- Case studies on **Mexico, Bangladesh and Egypt and the regional study on the Mediterranean** focus on different climate zones, eco-regions (tropical, subtropical, semi-arid & arid).
- They are affected by different impacts of sea-level rise, temperature increases & extreme weather events, storms, flooding, forest fires & drought.
- The probable consequences of the environmental impacts on the conflict dimension may affect different levels from the global, international, and regional to national, societal and to the human level (*human security*).
- The five case studies apply the same criteria & include the most recent UN data of projections of population growth until 2050, urbanisation until 2030 and cities until 2015.

7.31. Diagnosis: Coexistence of Outcomes

Decision Tool Based: ECHO-Human Needs Index (2002)

	Country Ranking		I		II		III		IV	
	Priority List of Humanitarian Needs	ODA Aver.	HDI	HPI	Natur disast	Con-flicts	Refu gees	IDP	Food need	Under 5
1	Burundi (Nile Basin)	2,857	3	x	2	3	3	3	3	3
2	Somalia	2,833	x	x	3	3	2	3	3	3
3	Ethiopia (Nile Basin)	2,625	3	3	3	2	3	1	3	3
4	Sudan (Nile Basin)	2,625	3	2	3	3	3	3	2	2
5	Angola	2,571	3	x	1	3	2	3	3	3
6	Afghanistan	2,500	x	x	3	3	1	2	3	3
7	Liberia	2,500	x	x	1	3	3	2	3	3
8	Rwanda (Nile Basin)	2,500	3	3	2	3	3	0	3	3
9	Bangladesh	2,375	3	3	3	2	2	2	2	2

7.32. Hazards as a Cause of Conflict



Sources: Map originally created by sylvie Brunel and Cécile Marin. *Human Development Report*, PNUD, 1996 ; Ramsès 1994, Dunod; *Total Call of the HCR Examination of the Programs*, HCR, 2001 ; *The State of Food Insecurity in the World*, FAO, Rome, 1999 ; *Populations en danger*, Médecins sans frontières - Lepac, La Découverte, 1995 ; Interventions, Action internationale contre la faim, 1994; *Le Monde peut-il nourrir le monde?*, Les Clés de la planète, hors-série n° 1, Croissance, Paris, 1998.

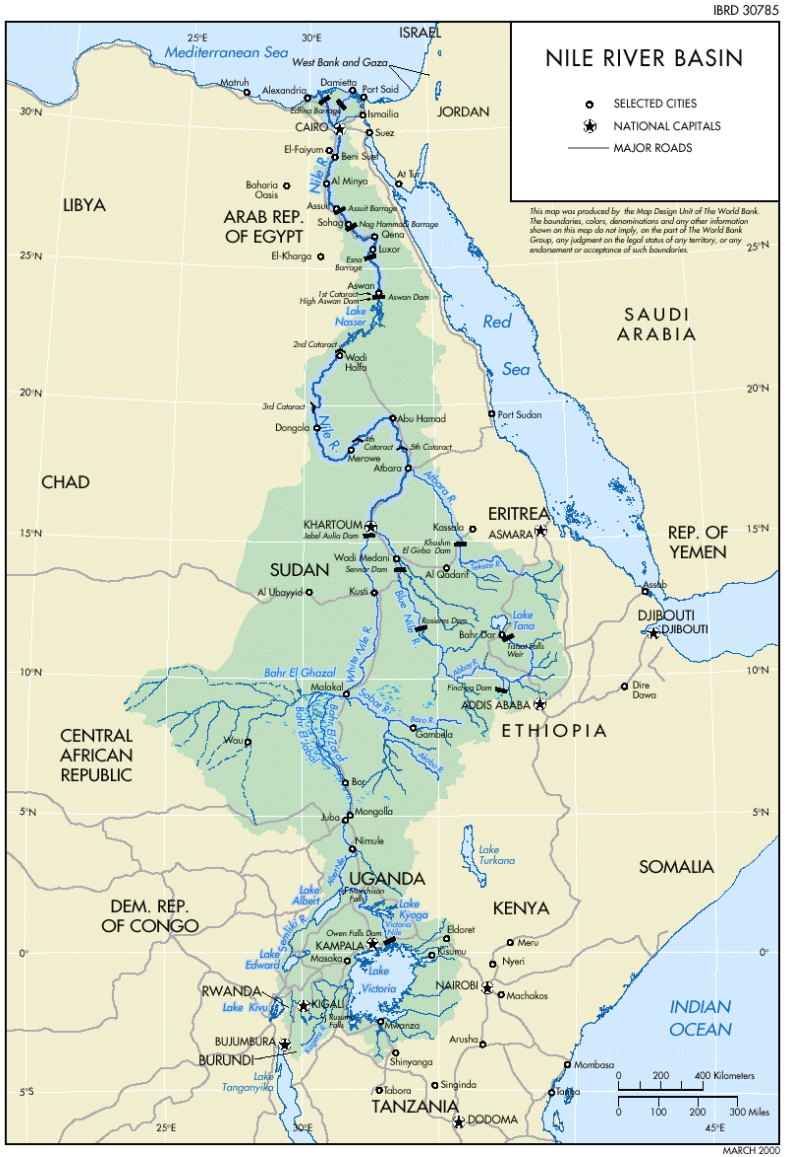
Coincidence: famine areas & conflicts

Sudan: coexistence of: disastes, internal displacement, refugees, conflict

- **Famines, political unrest, and civil wars occur simultaneously in same countries & regions**
- **Migration: rapid spread of diseases, especially AIDS.**

➢ **Social science research is needed on links among extreme & fatal outcomes: drought, famine, migration, crises & conflicts.**

7.33. Case of Vulnerable Nile Basin Countries



4 of 9 countries are in Nile Basin

High: drought, famine. migration, conflicts

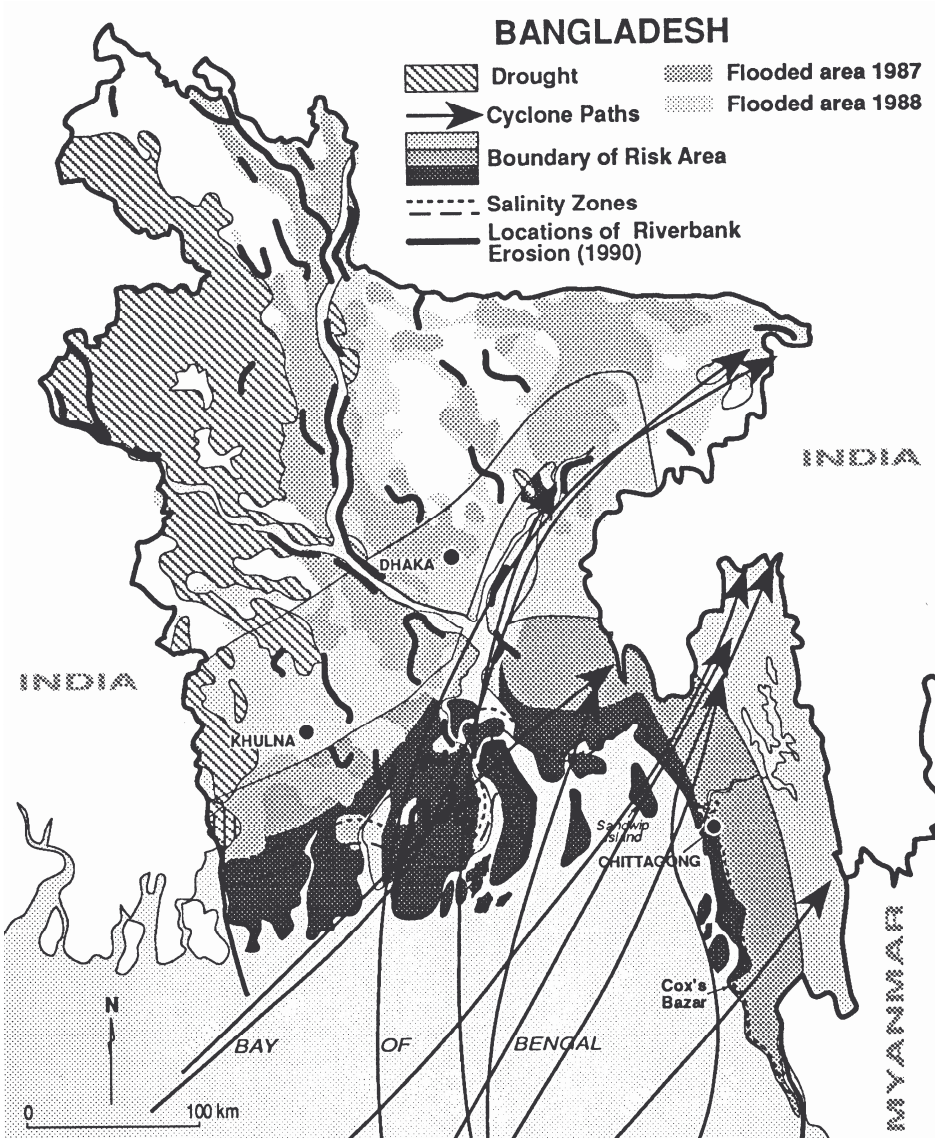
Today: major recipients of food aid.

Early warning systems: GIEWS (FAO), FEWS (USAID) HEWS, IRIN. FEWER, FAST

Long-term indicator population growth

	1950	2000	2050	2000-50
Sudan	9,2	31,1	63,5	32,435
Ethiopia	18,4	62,9	186,5	123,544
Ruanda	2,1	7,6	18,5	10,914
Burundi	2,5	6,4	20,2	13,862
Sum (1-4)	32,2	108,0	288,7	+180,755
Sum (1-9)	86,7	280,8	855,8	574,967

7.34. Bangladesh: Disaster & Conflicts



Multiple hazards: floods, cyclones, droughts and sea-level rise.

- Since 1945: 1 million deaths
- Extreme weather forced people to migrate: IDPs & emigration
- Conflicts: migrants - tribal people in Chittagong Hills & in Assam

Long-term Warning Indicators

- 1 m SLR rise will inundate 17%
- Temp. Increase 2 - 5℃ to 2100. ⇨ more severe droughts
- More intense cyclones & floods
- Health: water pathogens, dengue

Population	1950	2000	2050
Bangladesh	29.0	137.4	265.4

8. National, Environm. & Human Security

- These impacts of global environmental change have killed and affected míllions of people.
- They pose threats, challenges, vulnerabilities and risks for the environment and for people.
- They affect environmental and human security and they may affect also national and international security.
- The shift to the anthropocene requires a new thinking and strategy on security that focuses on the survival dilemma of people as well as the security dilemma of nations.

8.1. 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]**

8.2. Five Security Dimensions and Four Security Dangers & Concerns

Security Dimensions➡ ⬇ Security Dangers	Military	Political	Econo-mic	Socie-tal	Environ mental security	Human security perspect.
Threat	Hobbesian perspective: national/alliance security during Cold War			Grotian perspective: wider security concept in post Cold War era		
Challenges	Narrow `hard´security concept			Wider `soft´ security concepts		
Vulnerabilities - Environmental - Social	Old and new security agenda: change in actors & meaning prior and after the Cold War				New agenda: GEC, Global warming, water-related hazard & disasters	
Risks	multiple applications in scientific and political communities prior and after the Cold War					

8.3. Four Pillars of Human Security

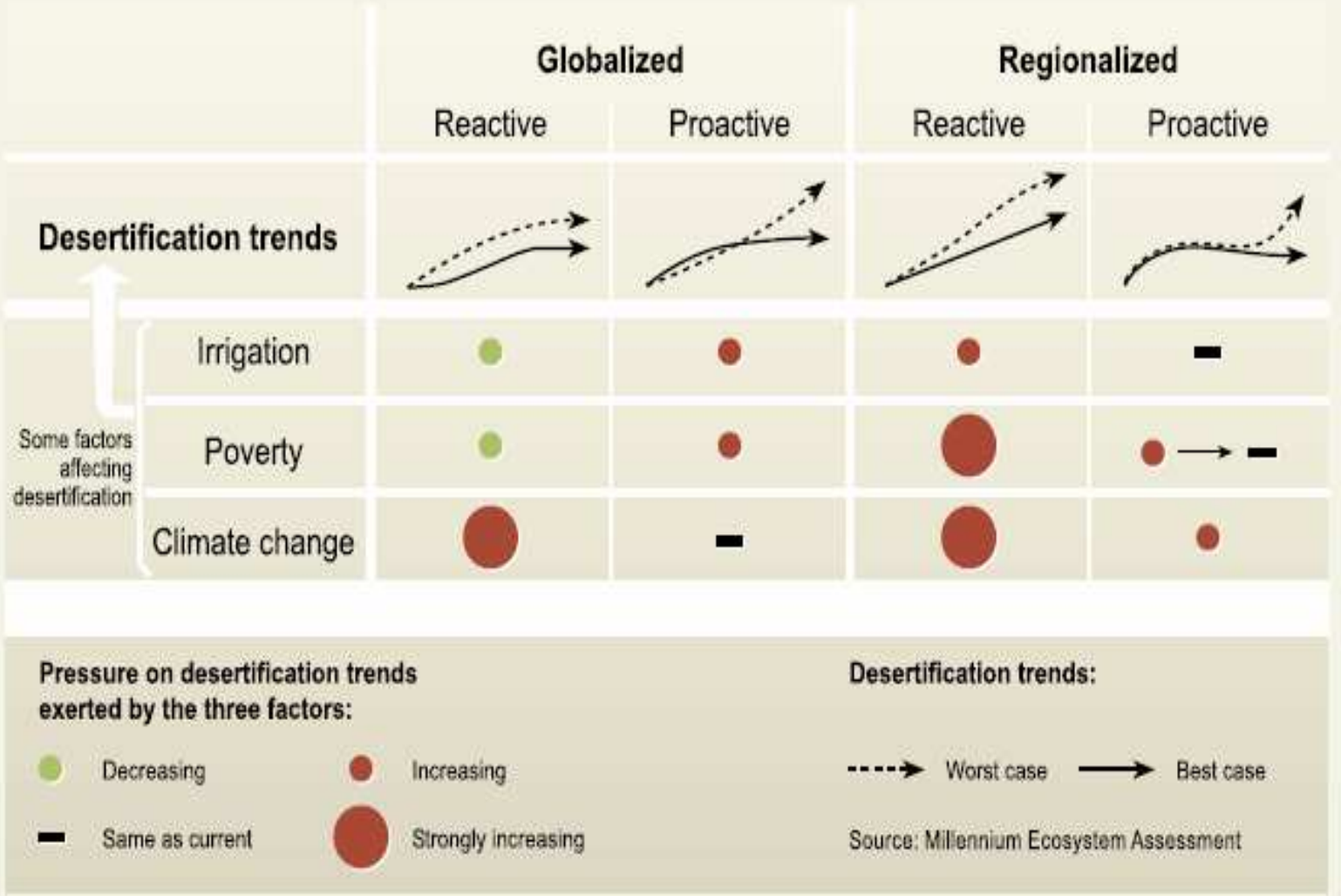
- **"Freedom from want" human development agenda: poverty** (stimulated by Asian economic crisis of 1990s) by reducing social vulnerability through poverty eradication programmes (UNDP 1994; CHS: Ogata/Sen: Human Security Now, 2003, Human Security Trust Fund, HSU of OCHA), **Japanese approach;**
- **"Freedom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

9. International Policy Relevance: From a Reactive to a Proactive Security Policy

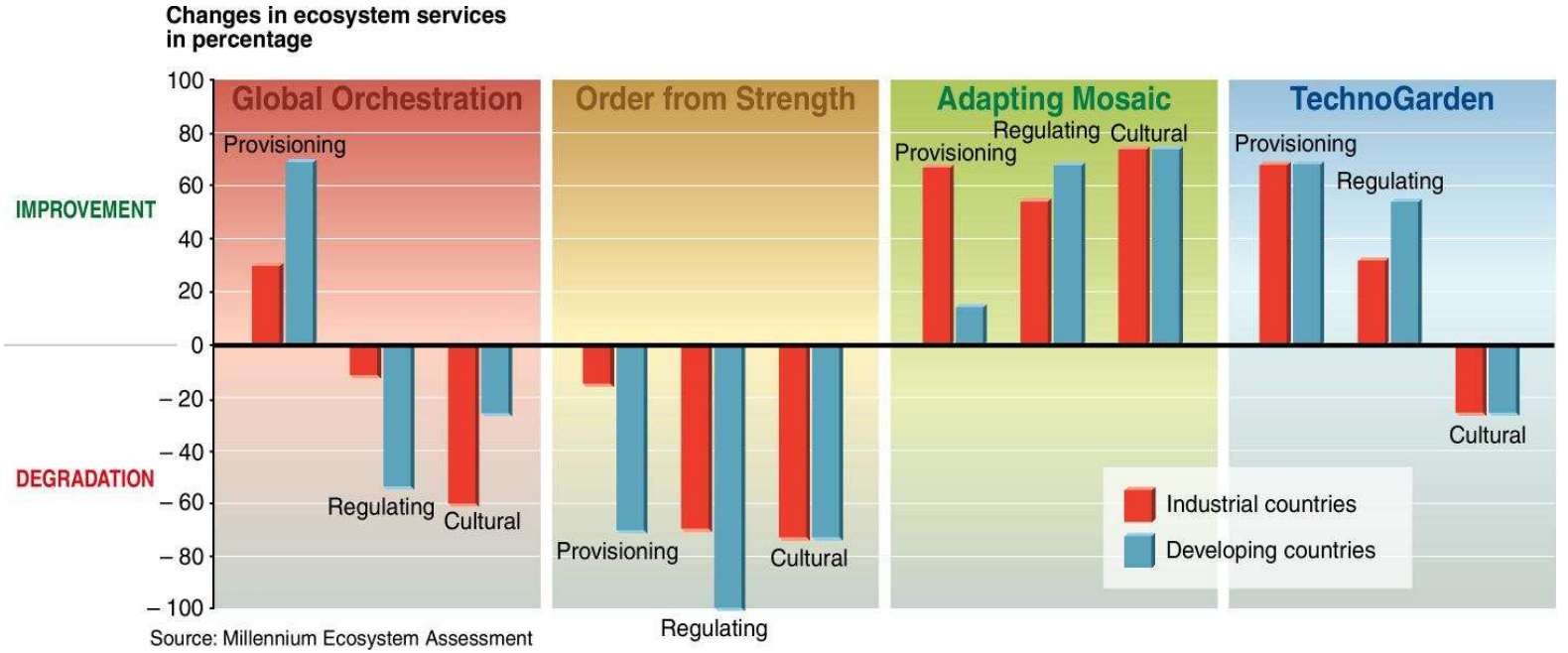
- **Past Change of Security Concepts: Impact of the global contectual change of 1989 & 1990**
  - From national to environmental and human security
  - Shift of focus from security dilemma of States to the survival dilemma of groups and people
  - From military factors: WMD & Terrorism to environmental factors that affect human beings and humankind
- **Change of Earth History from Holocene to Anthropocene** (anthtropogenic Climate changes vs. natural variability of climat history of past 20.000 years)
  - This human caused (anthropogenic) change requires a new proactive security policy primarily with non-military means of economic, foreign, development and environment policy.

9.1. Millenium Ecosystem Assessment (2005):

Rates of change in the extent of desertified areas in the drylands: Solid lines indicate the best case; dashed lines indicate the worst case for desertification in each of the MA scenarios.



9.2. Improvements are possible by 2050



- **Three of four scenarios show that significant changes of policy are possible that may partly counter the negative consequences of a growing pressure on ecosystems, even though the needed changes are major and have not yet been launched.**
- **Proactive Scenarios are advantageous.**

10. Free Source Material and Background Information

- My English reports on:
  - Climate Change and Conflicts (2002)
  - Environment and Human Security. Towards Freedom from Hazard Impacts (2005)
  - Threats, Challenges, Vulnerabilites and Risks in Environmental and Human Security (2005)
- My English keynote speeches at:
  - <http://www.afes-press.de/html/download_hgb.html>
- My German talks at:
  - <http://www.afes-press.de/html/texte_hgb.html>