

Abrupt Climate Change and Conflicts: Security Implications from a European Perspective

Hans Günter Brauch

Free University Berlin & AFES-PRESS

**Talk & Discussion organized by the Washington
Office of the Friedrich Ebert Foundation**

29 March 2004, 12-2pm

Carnegie Endowment for International Peace

The Choate Room

1779 Massachusetts Avenue, NW, Washington, DC

Financial Support & Disclaimer

- ◆ **This presentation was made possible by a partial travel grant of the Deutsche Forschungsgemeinschaft (DFG) and by additional support from a EU-sponsored Network of Excellence on Security: *Global Monitoring for Security and Stability* (GMOSS) for funding a part of my time in preparing these slides.**
- ◆ **The views expressed in this talk do not represent the official political views of the European Commission, nor any policy perspective of the GMOSS Network or of AFES-PRESS. They reflect solely the views and personal assessment of the author. They are made available as a contribution to the international scientific discourse.**

Copyright Notice

- ◆ No part of this talk may be reproduced on any other website without the permission of the author but links to this website are permitted without charge with the written consent of the copyright holder (afes@afes-press.de).
- ◆ This talk contains copyrighted material (tables, figures) from chapters of the speaker, published in: Brauch-Liotta-Marquina-Rogers-Selim (Eds.): *Security and Environment in the Mediterranean* (Berlin – New York – Paris – London – Milan: Springer 2003) with the permission of the author and the publisher.
- ◆ None of these tables and figures may be reproduced in any other publication or website without the permission of the author and publisher and without full credit to the holder of the copyright.
- ◆ The talk also uses material from: Brauch: *Climate Change and Conflicts* (Berlin: BMU 2002) (http://www.bmu.de/en/800/js/download/b_climges/)
- ◆ The talk contains several illustrative slides taken from UNEP and GRIP websites, as well as from IPCC, FAO, UNESCO websites and from J. Alcamo. The copyright for these slides remains with these institutions.

Abrupt Climate Change and Conflicts: Security Implications from a European Perspective Hobbesian vs. A Grotian Analyses

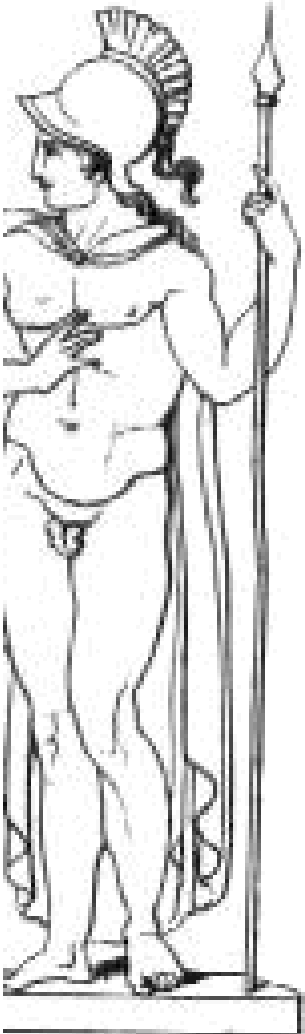
Overview

- ◆ **Kagan Revisited: I am Grotian & neither from Mars or Venus**
- ◆ **Reconceptualising Security since 1989**
- ◆ **Model: Global Environmental Change, Environmental Stress and Fatal Outcomes**
- ◆ **Climate Change and Conflicts**
- ◆ **Global Warming or Chilling: Cause of Change in Gulf Stream**
- ◆ **Climate Change and Conflicts? Hobbesian vs. Grotian Perspectives**
- ◆ **Hobbesian Conclusions on Climate Change & Conflicts**
- ◆ **Grotian Study on Climate Change & Conflicts**
- ◆ **Towards a Fourth Phase of Research on Environmental Security**
- ◆ **Towards a Proactive Environmental and Human Security Policy**

1. Kagan*) Revisited: I am neither from Mars or Venus – I am Grotian

On questions of power
American and European
perspectives are diverging.
Europe lives in a world of laws, paradise
of peace & prosperity
Americans exercise power in an anarchic
Hobbesian world where defence
depends on military might.
← Americans are from Mars
Europeans from Venus →
I am neither from Mars nor Venus
but from the English School

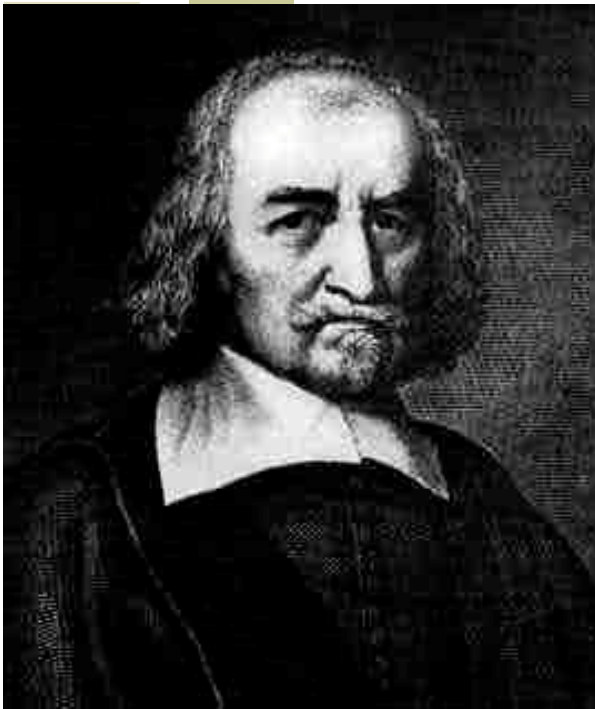
* Of Paradise and Power
(New York: Alfred A. Knopf, 2003)



Encyclopedia Mythica
<http://www.pantheon.org/>



1.1. English School: Hobbes, Grotius & Kant



Hobbes (1588-1679)



Grotius (1583-1645)



Kant (1724-1804)

Security perceptions depend on worldviews or traditions

- ❖ **Hobbesian 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

1.2. Hobbesian vs. Kantian Perception & Agenda for environment & security policy

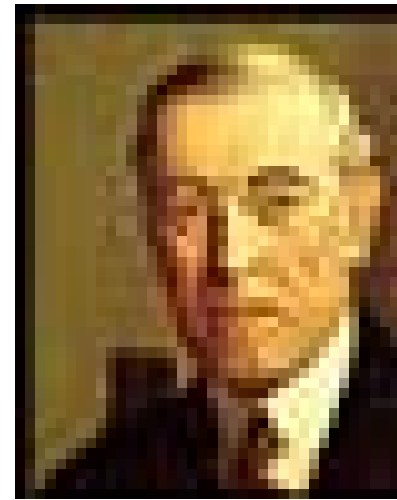


- **Hobbesian diagnosis:** New threats: „rogue states“, „axis of evil“ [Iraq, Iran, Libya, Syria, N. Korea], WMD destruction, terrorism
- **Recipe:** Military build-up, missile defence, use of military power & force to achieve aims, pre-emption, geo-engineering!

Different worldviews: US & Europeans: diagnosis, recipe!

- ❖ **Kantian [Wilsonian] diagnosis:** Violations of international law, nondemocratic regimes
- ❖ **Recipe:** Conditionalised economic aid, support for democratisation efforts & liberation

Both recipes have problems with MENA [Middle East and North African region] and many other Third World regions



1.3. Perspectives on Security & Environment

Ideal type worldviews on security and standpoints on the environment

Worldview/Tradition on security (→) Standpoints on environmental issues (↓)	Machiavelli, Hobbes, Morgenthau, Waltz (pessimist, realist) <i>Power matters</i>	Grotius, (pragmatist) <i>Cooperation is needed, matters</i>	Kant, neoliberal institutionalist (optimist) <i>International law matters and prevails</i> (Democratic peace)
Neomalthusian <i>Resource scarcity</i> (pessimist)	I Perspective of G.W.Bush Admin. MENA states	II ←	III ↙
Reformer, <i>Multilateral cooperation solves chall.</i> (pragmatist)	IV	V UN system most EU states (my position)	VIVVII
Cornucopian <i>Technological ingenuity solves issues</i> (neoliberal optimist)	VII George W. Bush-Administration ?	VIII Bill J. Clinton Administration ?	IX Wilsonian liberal optimism

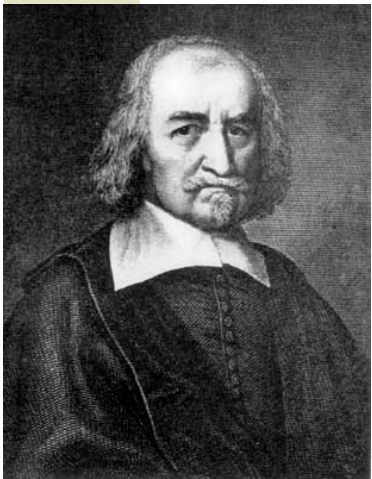
1.4. Hobbesian vs. Grotian Perception of Climate Change as a Security Issue

Climate Change has become a New Security Issue

- **David King:** PM Blair's science adviser: „Climate change is the most severe problem we are facing today, more serious even than the threat of terrorism“ (Independent, 9.1.2004)

2 Studies on Climate Change and Conflicts

- **Peter Schwartz/Doug Randall:** *An Abrupt Climate Change Scenario and Its Implications for US National Security*, Oct 2003, Study for DoD, Net Assessment (I: Hobbesian Neo-Malthusian pessimist & Conucopian)
- **Hans Günter Brauch:** *Climate Change, Environmental Stress and Conflicts*, for the German Federal Ministry of Environment (Nov. 2002)
(V: Grotian reformist, pragmatist & multilateralist)

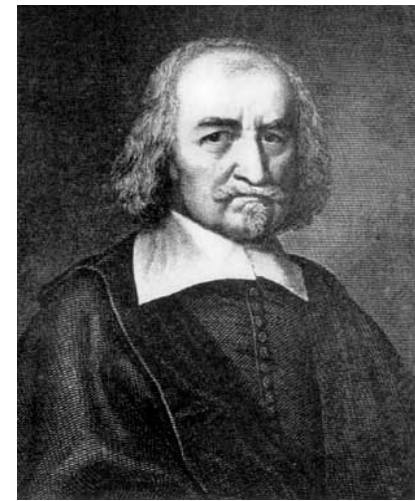
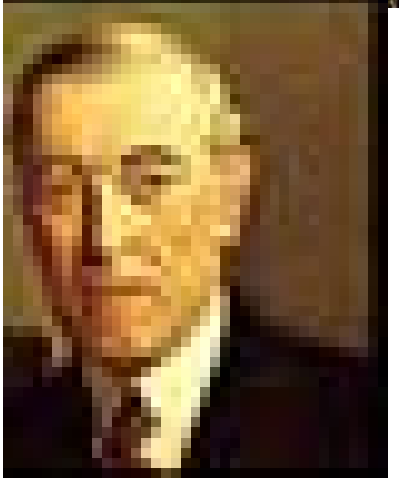


1.5. Grotian Perspective: Basis for a New Transatlantic Security Dialogue

- For Europeans modern Westphalian international order was built on Grotian principles of international law.
- International law and multilateral cooperation in international institutions matter (EU: compromise).
- Europeans pointed to other challenges to survival of humankind, ignored by the Hobbesian mindset.
- **America seems polarised between Wilsonian ideas & Hobbesian strategic interests and goals**

Needed a new bipartisan & transatlantic consensus on the nature of the new security threats & vulnerabilities as well as environmental challenges & risks

Model: NATO CCMS-Study on *Environment & Security* (co-chaired by US DoD (G. Vest) and German BMU (Kurt Lietzmann) March 1999



2. Reconceptualising Security since 1989

- ◆ **4 major changes of international order since 1789**
 - French Revolution and order of Vienna (1815-1914)
 - Versailles Peace Treaty: Wilsonian & Hobbesian Compromise
 - Order of Yalta & San Francisco: Collective Self-Defence
 - 9 September 1989: Fall of the Berlin Wall – not 11 Sept. 2001
- ◆ **1989: Global peaceful change: Reunification of Europe**
- ◆ **11 Sept. 2001: threat of terrorism but no change in int. order**
- ◆ **Since 1989: collective self-defence vs. collective security**
- ◆ **Concept of security:**
 - **Widening:** 5 dimensions: mil., political, econ., societal, envir.
 - **Shrinking:** to the narrow Hobbesian military security concept
 - **Deepening:** global, regional, national, societal, individual
 - **Changes in the referents of security:** state to the individual
 - **Sectorialisation of security:** energy, food, health, water

2.1. Environmental Security Revisited

- ◆ **Environmental Security:** a concept suggested by R. Ullman, 1983; Jessica Tuchman Mathews, 1989, Norman Myers, 1989.
- ◆ **3 phases of research: 1983- present**
 - ❖ **First Phase:** Impacts of wars on the environment (Westing)
Conceptual debate on env. security as a **national security issue**
 - ❖ **Second Phase:** Canadian (Homer-Dixon) and Swiss Phase (Bächler):
empirical case studies
 - ❖ **Third Phase:** methodological diversity
 - ❖ **Fourth Phase:** human and environmental security and peace
- ◆ **Mediterranean space:** highly vulnerable but no debate; goal of our book: *Security and Environment in the Mediterranean*
 - a) bring the debate to the Mediterranean region
 - b) focus on environmental challenges in the MENA

2.2. Back to the Roots: Proposals by Jessica Tuchman Mathews in 1989

- ◆ **J.T. Mathews (1989) & N. Myers (1989)** addressed two key issues: “First there was a **need to redefine security** and to include a **new range of threats**. ... Second, there was an acceptance that the object of **security was no longer simply the state**, but ranges to levels above and below the level of the state” (Lonergan 2002 V: 270-271).
- ◆ **J. T. Mathews (1989)** proposed a “broadening definition of **national security** to include **resource, environmental & demographic issues**”. She warned that global changes “in the **chemical composition of the atmosphere**, in the genetic diversity of species inhabiting the planet, and in the cycling of vital chemicals through the oceans, atmosphere, biosphere and geosphere” could lead to irreversible damage.
- ◆ **N. Myers (1989)** pointed to **soil erosion, ozone layer, climate change** as legitimate causes for international concern that may have repercussions for US security policy.
- ◆ **Resume this debate of 1989 & develop it further in a global framework**

2.3. Dabelko's Assessment of the first phase of Environmental Security Debate in 1996

- ◆ **First phase (Ullman 1983, Mathews 1989, Myers 1989) of debate put “environment” on U.S. national security agenda & created awareness among internat. organisations with a strong normative basis, as Dabelko (1996) correctly noted:**
- ◆ **„Environmental security has emerged as a transnational idea, the core of which holds that environmental degradation and depletion, largely human-induced, pose fundamental threats to the physical security of individuals, groups, societies, states, natural ecosystems & the international system. Security institutions in particular are currently failing to redress these threats. All institutions, according to the central tenets to the idea, must better address these threats. The alternative if these threats are not addressed will likely be economic, social, & ecosystem health and welfare decreases.“**

2.4. Since 1989: Widening, Deepening & Shrinking of Security Concepts

Dimensions & Levels of a Wide Security Concept

Narrow Concept of Bush Adm. vs. Wide European Concept

Security dimension ⇒ ↓ Level of interaction	Military	Political	Economic	Environmental ↓	Societal
Human individual ⇒				victim	
Societal/Community				↓↑	
National	George W. Bush Administration			↓↑	
International/Regional				↓↑	
Global/Planetary ⇒				GEC	

2.5. Environmental & Human Security

Expanded Concepts of Security (B. Møller, 2003)

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	Individ., mankind	Survival	Nature, state, global.
Environmental sec.	Ecosystem	Sustainability	Mankind

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

- ❖ Major challenges: **global environmental change & humankind**,
- ❖ **Focus:** Interactions between ecosystem & humankind, impact of **global environm. change on environm. degradation, of increasing demand on environmental scarcity & environmental stress.**

Human security: Referent: **individuals and humankind**.

- ❖ 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 dual challenge.**

2.6. Human Security: Human Beings as Referents: Protection & Empowerment

- ◆ **Human security: value basis: freedom, equity, justice**
 - 1) level of analysis (Buzan 1998),
 - 2) as a human-centred perspective (Annan 2001),
 - 3) as an encompassing concept (UNDP 1994).
- ◆ **UNDP (1994): complementary to human development**
- ◆ **Human Development Network: formed in 1999: 12 countries**
- ◆ **Human Security Commission: Ogata/Sen: HS Now (2003): Freedom from fear & want: „protection“&„empowerment“**
- ◆ **HS encompasses: food, energy, water, livelihood security**
- ◆ **Hans-Georg Bohle (2002: 2) human security: “a concept that describes not only a desirable state or end-result for individuals and communities, but as an active concept that challenges the inequitable structures that contribute to people’s insecurities and vulnerabilities”.**

2.7. Human Security Network Members

NATO	EU	Third World
Canada		Chile
Greece	Austria	Jordan
Netherlands	Ireland	Mali
		Thailand
Norway	Slovenia	South Africa
	Switzerl.	(observer)

The Network has an inter-regional & multiple agenda perspective, strong links to civil society & academia.

The Network emerged from the land-mines campaign at a Ministerial in Norway, 1999.

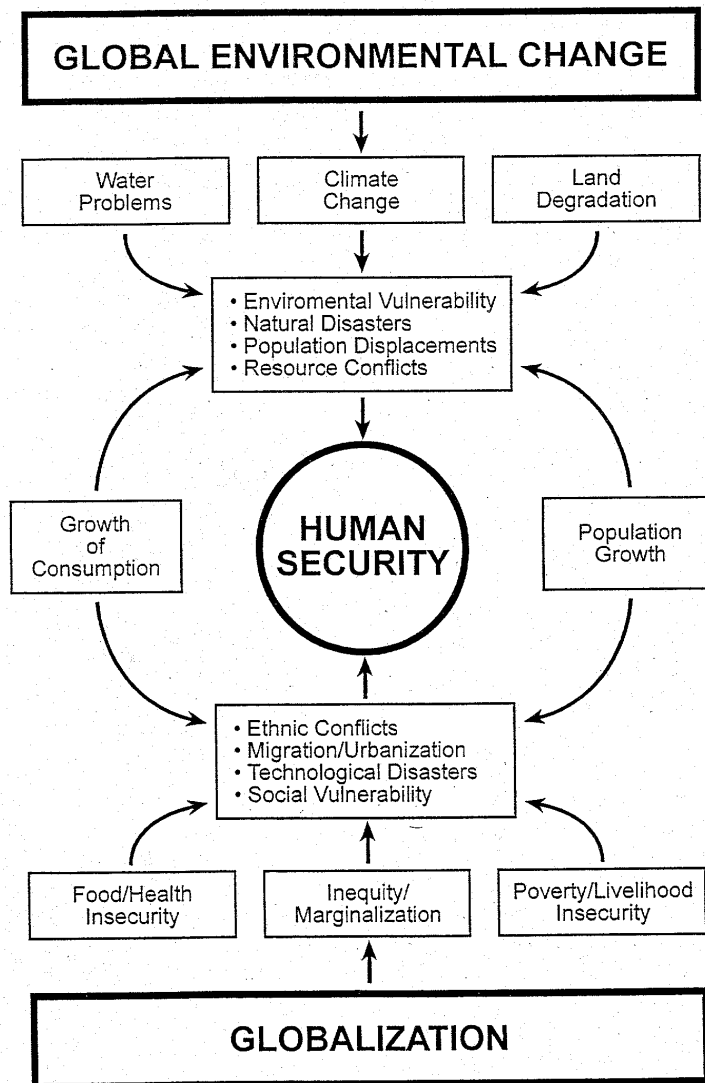
Conferences at Foreign Ministers level in Bergen, Norway (1999), in Lucerne, Switzerland (2000), Petra, Jordan (2001) Santiago de Chile (2002), Graz (2003), Bamako, Mali (May 2004).

Anti-personnel landmines, Intern. Criminal Court, protection of children in armed conflict, control of small arms & light weapons, fight against transnational organized crime, human development, human rights education, HIV/AIDS, implement. of international humanitarian & human rights law, conflict prevention

2.8. Vision of the Human Security Network

- ❖ A humane world where people can live in security & dignity, free from poverty and despair. ... In such a world, every individual would be guaranteed free-dom from fear and freedom from want.... Building human security is essential to achieving this goal.**
- ❖ In essence, human security means freedom from pervasive threats to people's rights, their safety or even their lives.**
- ❖ Human security has become both a new measure of global security and a new agenda for global action. Safety is the hallmark of freedom from fear, while well-being is the target of freedom from want.**

Global Change and Human Security



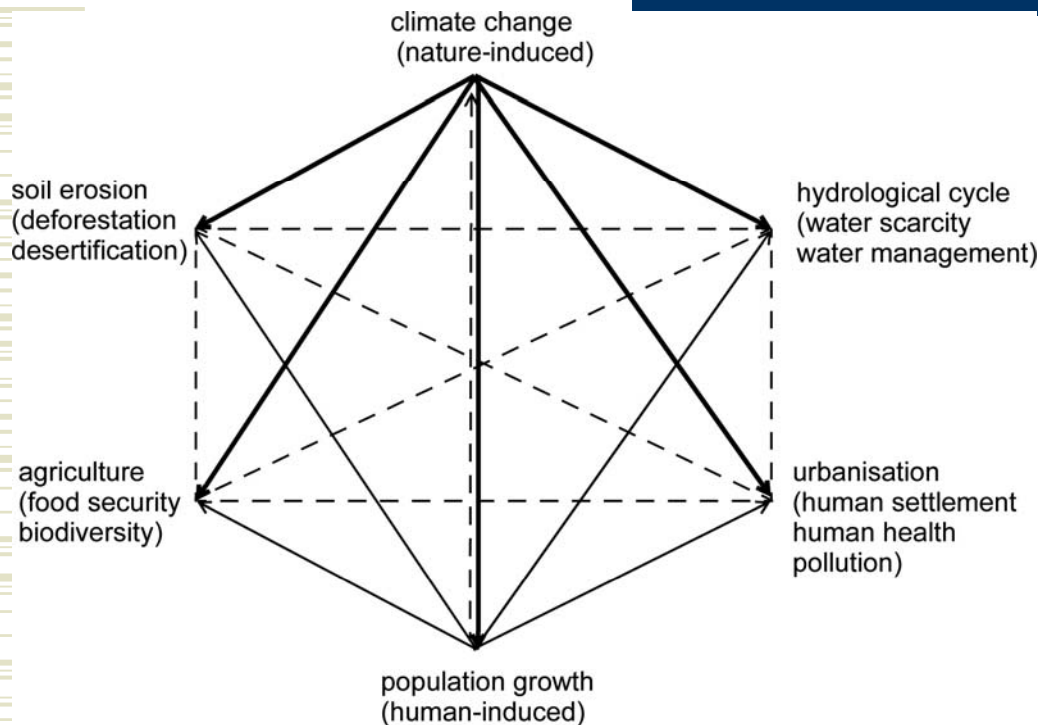
2.9. Global Env. Change & Globalisation as Challenges to Human Security

- ◆ **GEC > environm. vulnerability > disaster > migration > scarcity**
- ◆ **Globalisation > inequity > social or societal vulnerability**
- ◆ **Key security questions:**
 - **How will GEC & globalisation affect the individual, society, countries?**
 - **Is human survival at risk, for whom?**
 - **Can the global environmental security challenges (GEC) be solved by hard security concepts and means?**

3. Model: Global Environmental Change, Environmental Stress and Fatal Outcomes

Causes (Hexagon)	Effect (Interaction)	Environmental Stress	Probable Outcomes
<p>↗ → → → → Extreme Weather Events → → → ↘</p>			
<p>Climate change</p> <p>→ direct impact of nature-induced „root cause“: climate change on five factors → direct impact of human-induced „root cause“: population on four factors - - - complex interaction among four structural factors: urbanisation, water scarcity, soil erosion and desertification and food scarcity and agricultural policy</p>	<p>environmental degradation (soil, water)</p> <p>↕</p> <p>scarcity (water, food, housing)</p>	<p>global cond.</p> <p>↓</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Environmental stress </div> <p>↑</p> <p>nation. cond.</p>	<p>disaster conflict avoidance</p> <p>↗ ↘</p> <p>→ Crisis</p> <p>↙ ↘</p> <p>migration conflict</p>

3.1. Six Major Challenges of Global Environmental Change: Climate Change



→ direct impact of nature-induced „root cause“: climate change on five factors

→ direct impact of human-induced „root cause“: population on four factors

- - → complex interaction among four structural factors: urbanisation, water scarcity, soil erosion and desertification and food scarcity and agricultural policy

Environmental & human security is affected by

Nature & human-induced

- ❖ **Air: Global climate change**
- ❖ **Soil degrad., desertificat.**
- ❖ **Water scarcity, hydro-logical cycle**

Human-induced factors

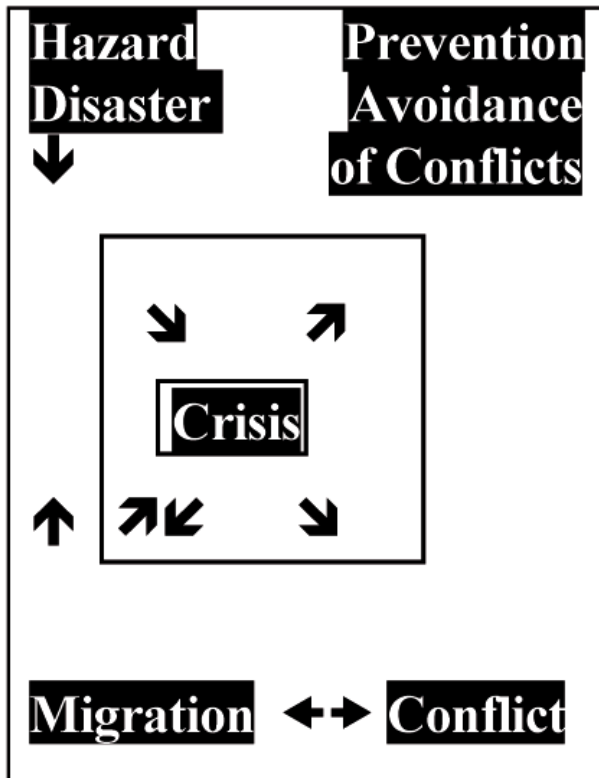
- ❖ **Population growth**
- ❖ **Urbanisation**
- ❖ **Food & Agriculture**

3.2. Extreme Weather Events in 21st Century

Figure: IPCC, TAR 2001, WG II

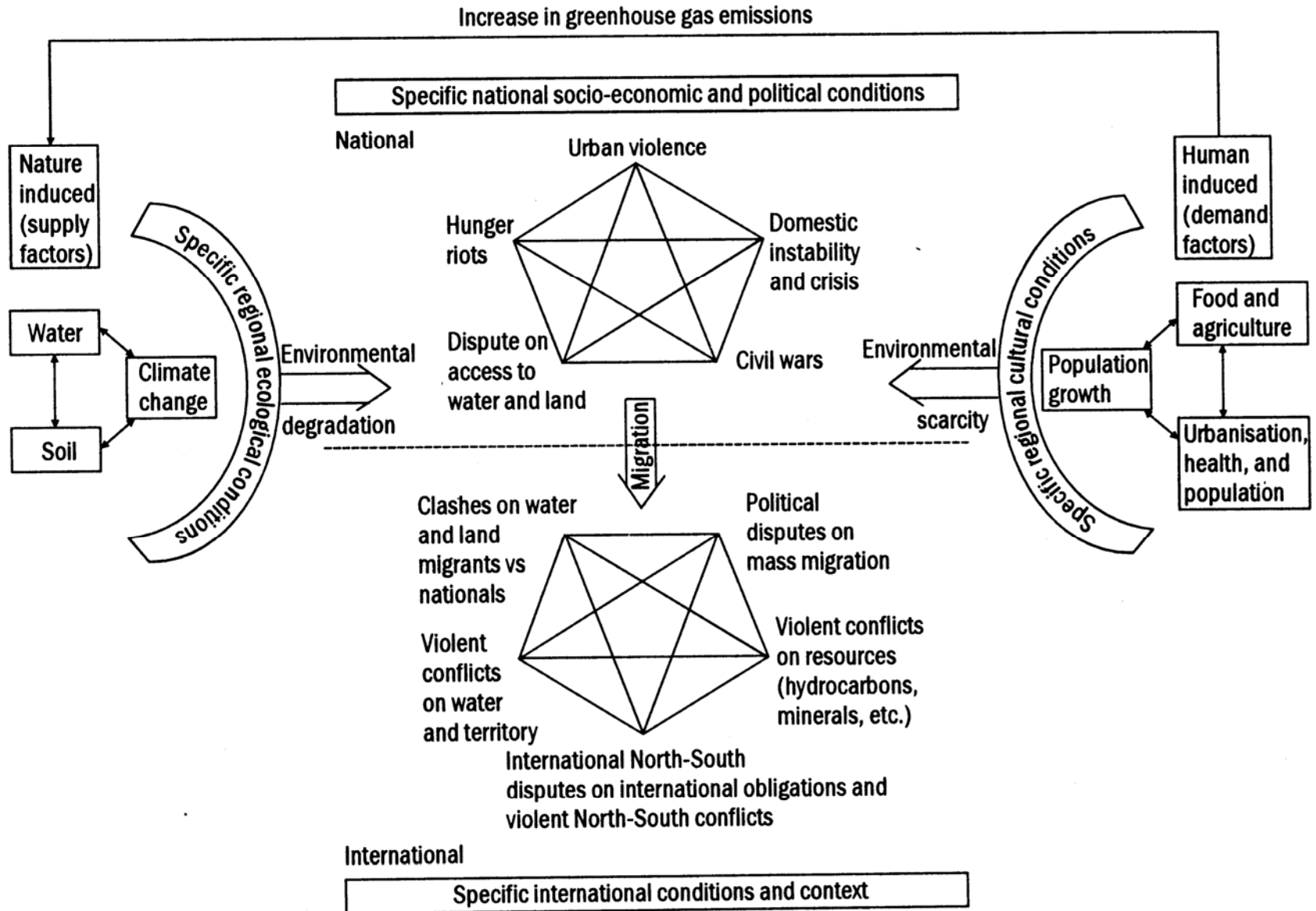
Confidence in observed changes (latter half of the 20th century)	Changes in Phenomenon	Confidence in projected changes (during the 21st century)
Likely ⁷	Higher maximum temperatures and more hot days over nearly all land areas	Very likely ⁷
Very likely ⁷	Higher minimum temperatures, fewer cold days and 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 index¹² 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

3.3. Interactions among Fatal Outcomes: Linking Drought & Famine with Societal Consequences



- Much knowledge on these factors:
- ✓ **Drought, migration, crises, conflicts**
- Lack of knowledge on linkages among **fatal outcomes**
- **Drought & drought-induced migration**
 - **Famine, environmentally-induced migration**
 - **Conflicts & conflict-induced migration**
- Lack of knowledge on **societal consequences**: e.g. **crises & conflicts**
- **Domestic/international crises/conflicts**
 - **Environmentally or war-induced migration as a cause or consequence of crises and conflicts**

3.4. Types of Conflicts



4. Climate Change and Conflicts

Hobbesian: <http://halfgeek.net/weblog/special/gwreport/Pentagon.html>

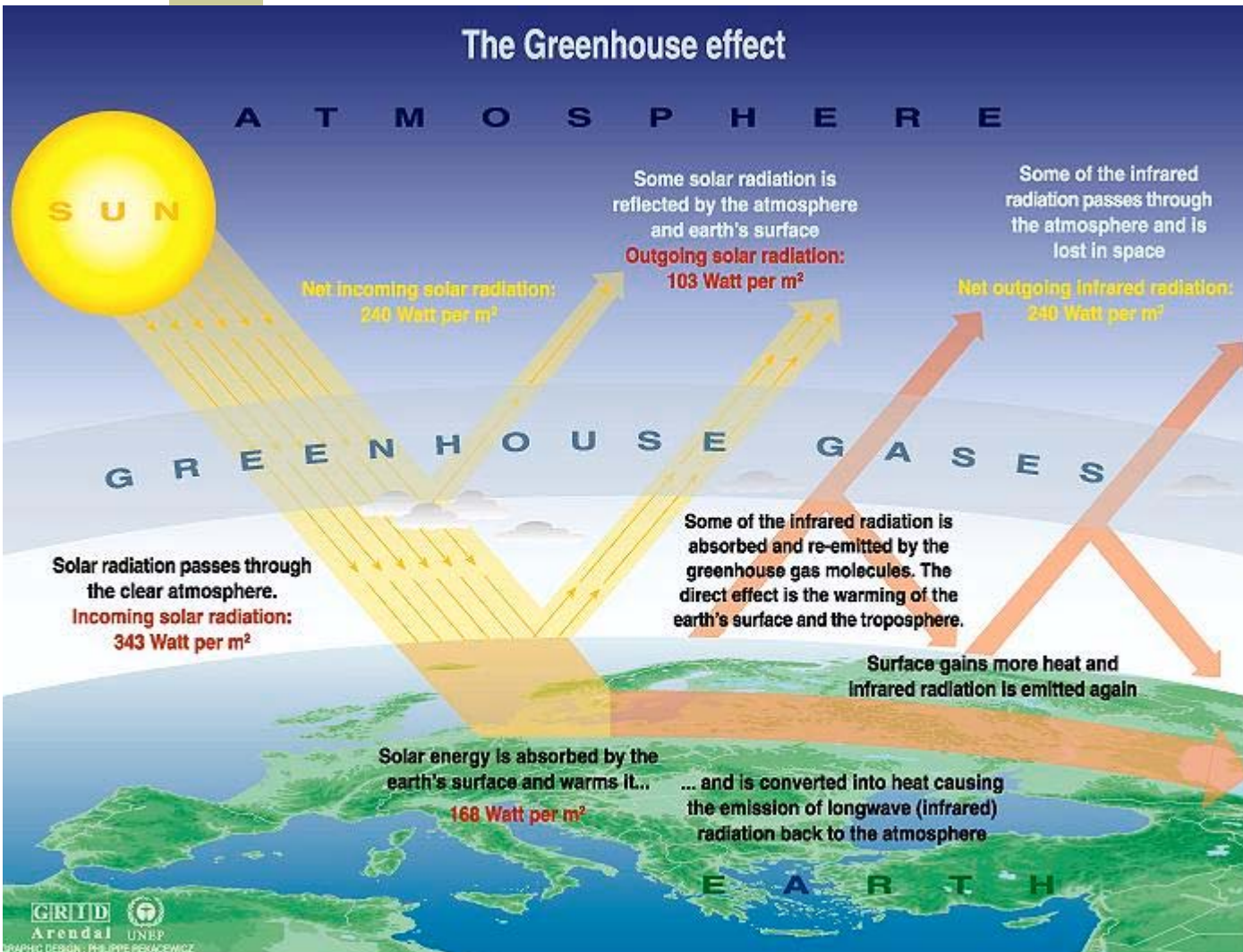
Grotian: <http://www.bmu.de/files/climges.pdf>

- ◆ **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 Günter 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.“**

4.1. Global Warming vs. Cooling: Slow-Onset vs. Abrupt Climate Change

- ◆ **Science Context: Rahmstorf (PIK) hypothesis: on sudden change in the Gulf stream,**
- ◆ **US Nat. Academy of Science: *Abrupt Climate Change: Inevitable Surprises (2002)***
- ◆ **J. Marotzke, Kiel (1990, 2000)**
- ◆ **Mike Hume: Tyndall Centre**
- ◆ **Robert Gagosian, President of Woods Hole Oceanographic Institute (2004)**
- ◆ **Pittinger/Gagosian (10/2003)**
- ◆ **Science Context: 3 IPCC Assessment Reports (1990, 1995 & 2001) & Reports**
- ◆ **Arrhenius Hypothesis of 1896: burning of hydrocarbons contributes to global warming**
- ◆ **Basis of political agenda setting of Reagan Administ. 1988**
- ◆ **Increase in energy consumption contributes to: a) temperature increase. b) sea level rise**
- ◆ **Basis: of UNFCCC & IPCC**

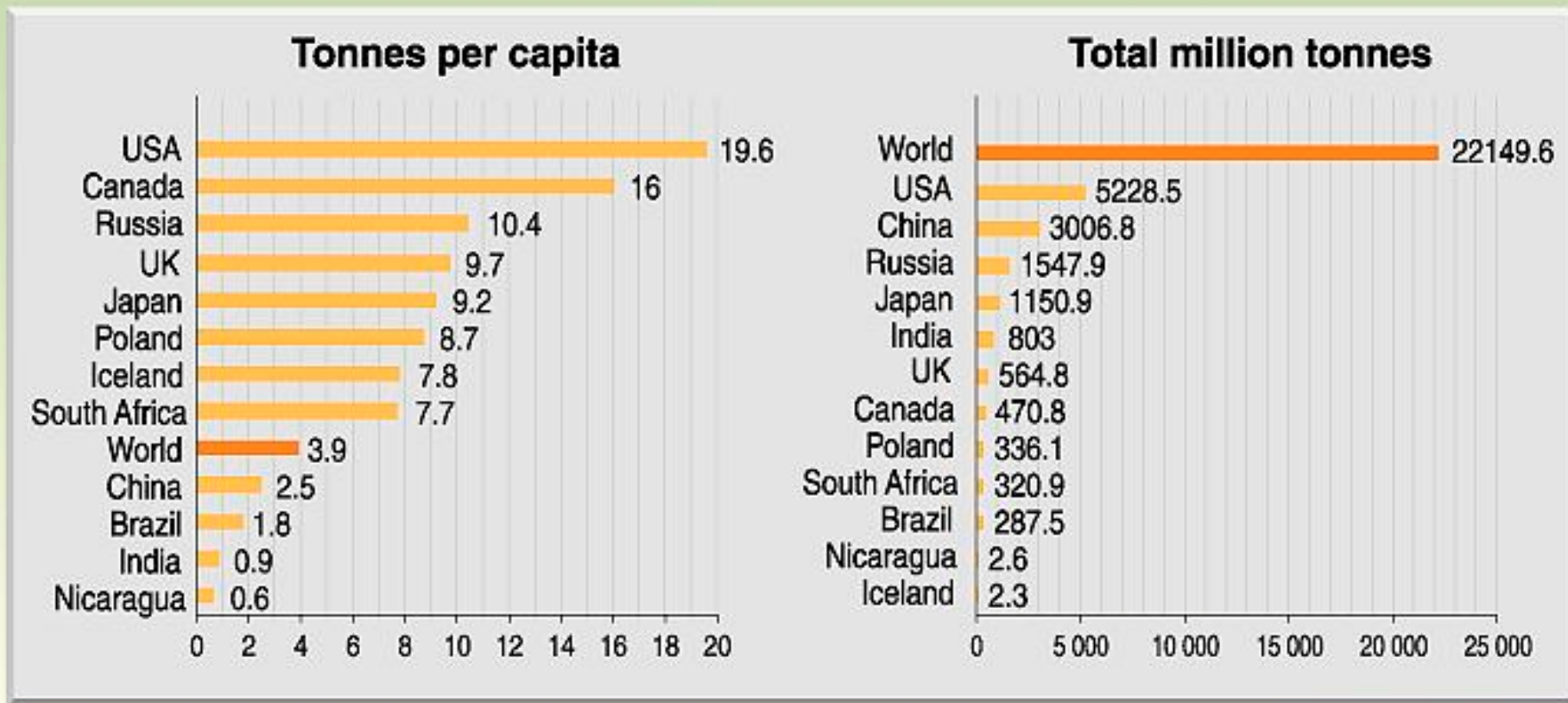
4.2. Greenhouse Hypothesis



- ◆ **Burning of hydrocarbons (coal, oil, gas) increases the concentration of CO₂ in the atmosphere**
- ◆ **Results in a) increasing average temperature & b) rise in sea level.**
- ◆ **Serious impacts: precipitation, desertification & food yields**

4.3. CO₂ Emissions of Selected Countries

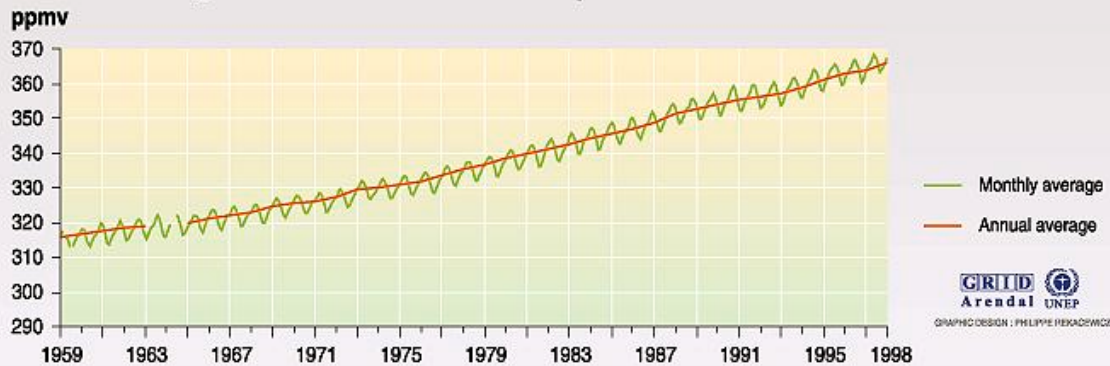
Emissions of CO₂ - selected countries (1995)



GRAPHIC DESIGN : PHILIPPE REKACZEWICZ

4.4. Impact: Concentration of Greenhouse Gases in the Atmosphere

CO₂ concentration in the atmosphere: Mauna Loa curve

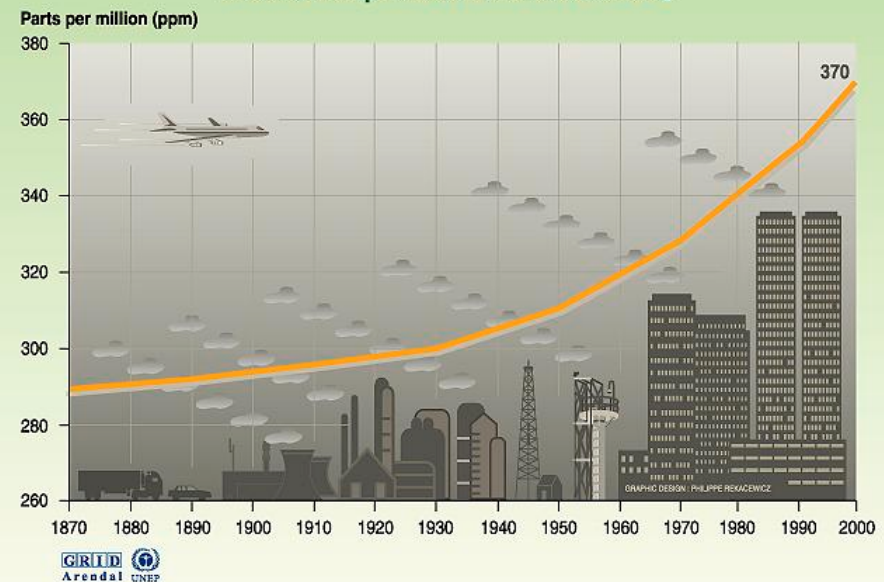


Source : Scripps Institution of oceanography (SIO), University of California, 1998.

CO₂ concentrations in the atmosphere have been measured at an altitude of 4,000 meters on the peak of Mauna Loa mountain in Hawaii since 1958.

Atmospheric CO₂ has increased from a pre-industrial concentration of 280 ppmv to about 367 ppmv in 1998 (ppmv= parts per million by vol.). NOAA: in 2003: increase 3 ppmv to 379 ppmv (NYT, 21 March 2004)

Global atmospheric concentration of CO₂

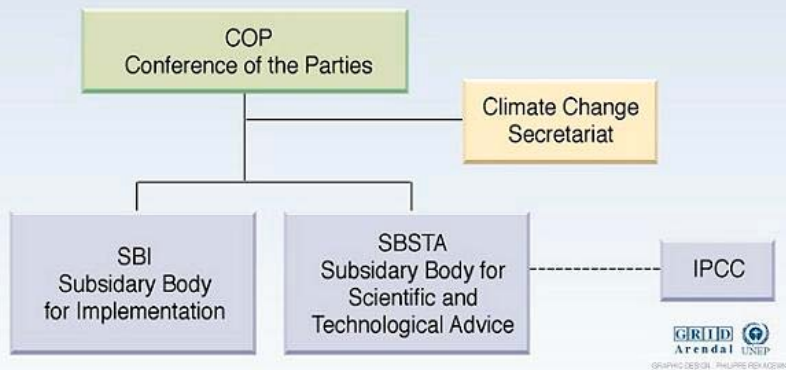


Sources: TP Whorf Scripps, Mauna Loa Observatory, Hawaii, Institution of oceanography (SIO), university of California La Jolla, California, United States, 1999

4.5. Climate Change Policy Institutions

Structure of IPCC: Assessments of 1990, 1995, 2001, 2006/2007 ↓

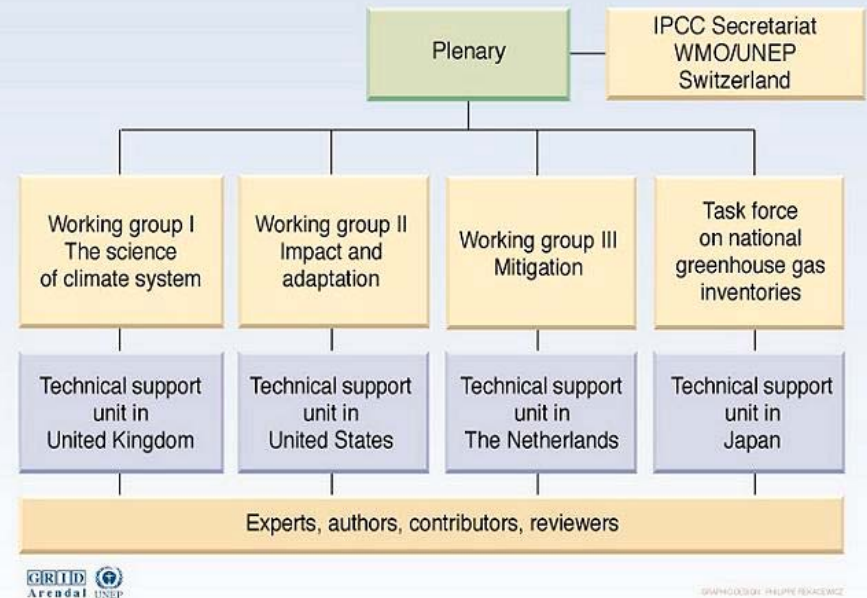
The UN Convention on Climate Change (UNFCCC)



Source: United Nations framework convention on climate change (UNFCCC).

- ◆ Decision-making bodies of UNFCCC ↑
- ◆ Secretariat is in Bonn

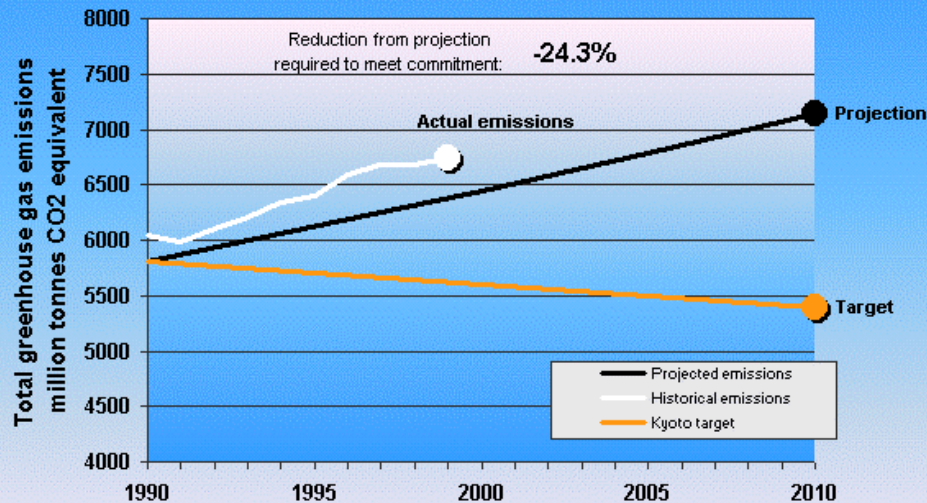
Intergovernmental Panel on Climate Change (IPCC)



Source: United Nations framework convention on climate change (UNFCCC).

4.5. Implementation of Kyoto Climate Goals: United States & Germany

United States



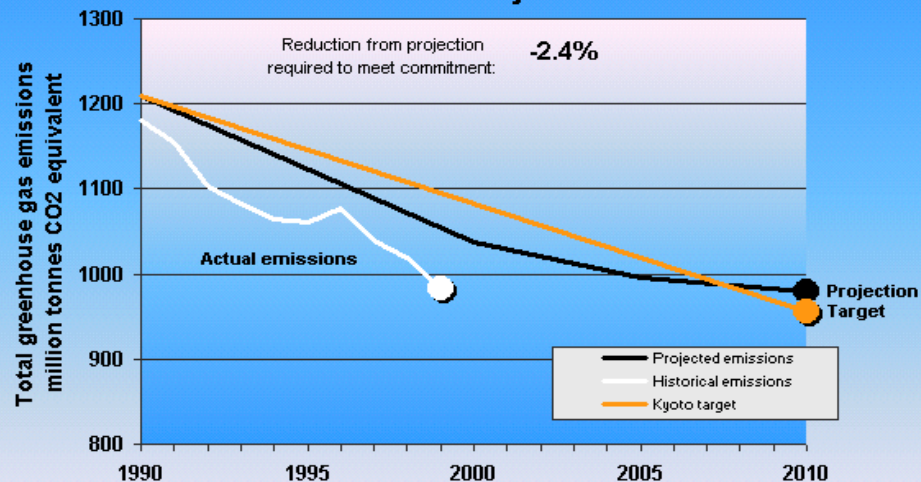
Actual and projected emissions of six greenhouse gases (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆)
 Sources: Actual emissions UNFCCC/SBI/2000/11 Table B.1. Projected emissions UNFCCC/1998/Add.2 Table C.6.

Graphics produced by GRID-Arendal in cooperation with UNFCCC secretariat for the 7th Conference of the Parties (COP-7) to the Convention, held in Marrakesh, Morocco, 29th October to 9th November 2001

Reductions to meet target by 2010

- ◆ **USA: target: -24,3% (far off) ↑**
- ◆ **Germany: target: -2,4% →**

Germany



Actual and projected emissions of six greenhouse gases (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆)
 Sources: Actual emissions UNFCCC/SBI/2000/11 Table B.1. Projected emissions UNFCCC/1998/Add.2 Table C.6.
 Source: Updated 2000 Report of the Federal Republic of Germany

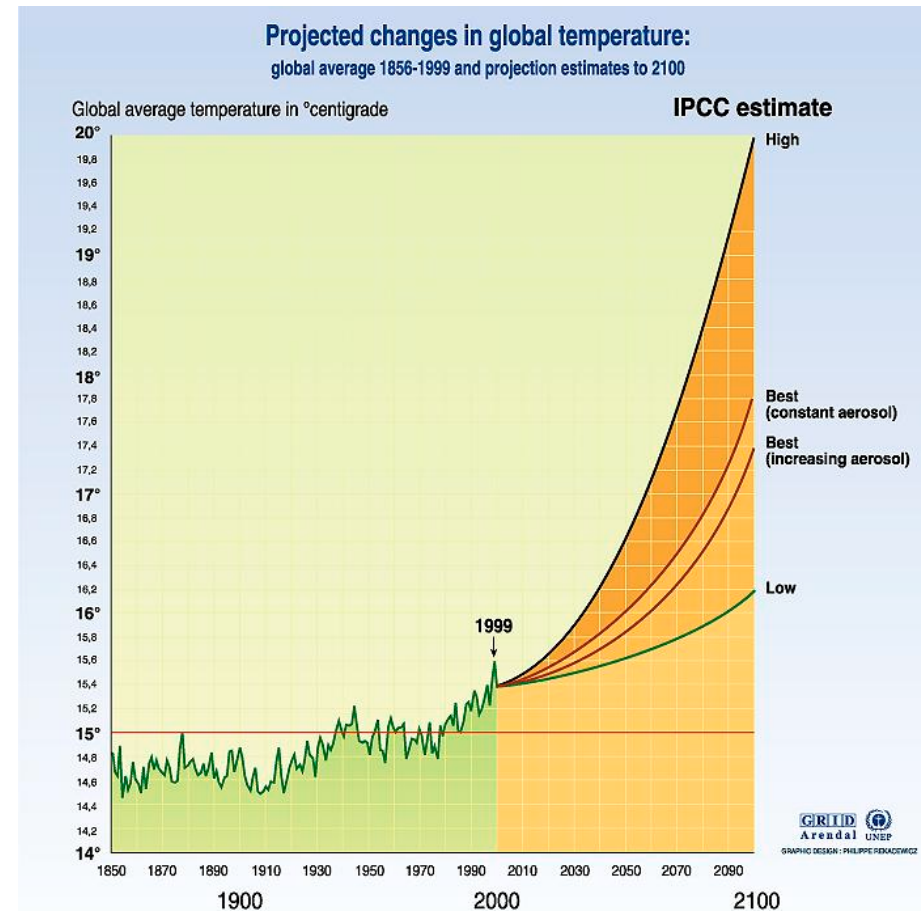
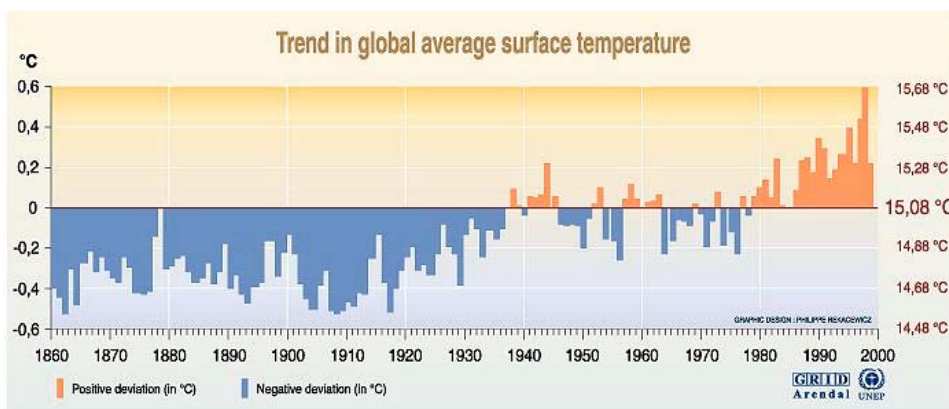
4.6. Global Climate Change: Temperature Increases & Sea Level Rise

2 Climate Change Impacts: Temperature & Sea Level Rise

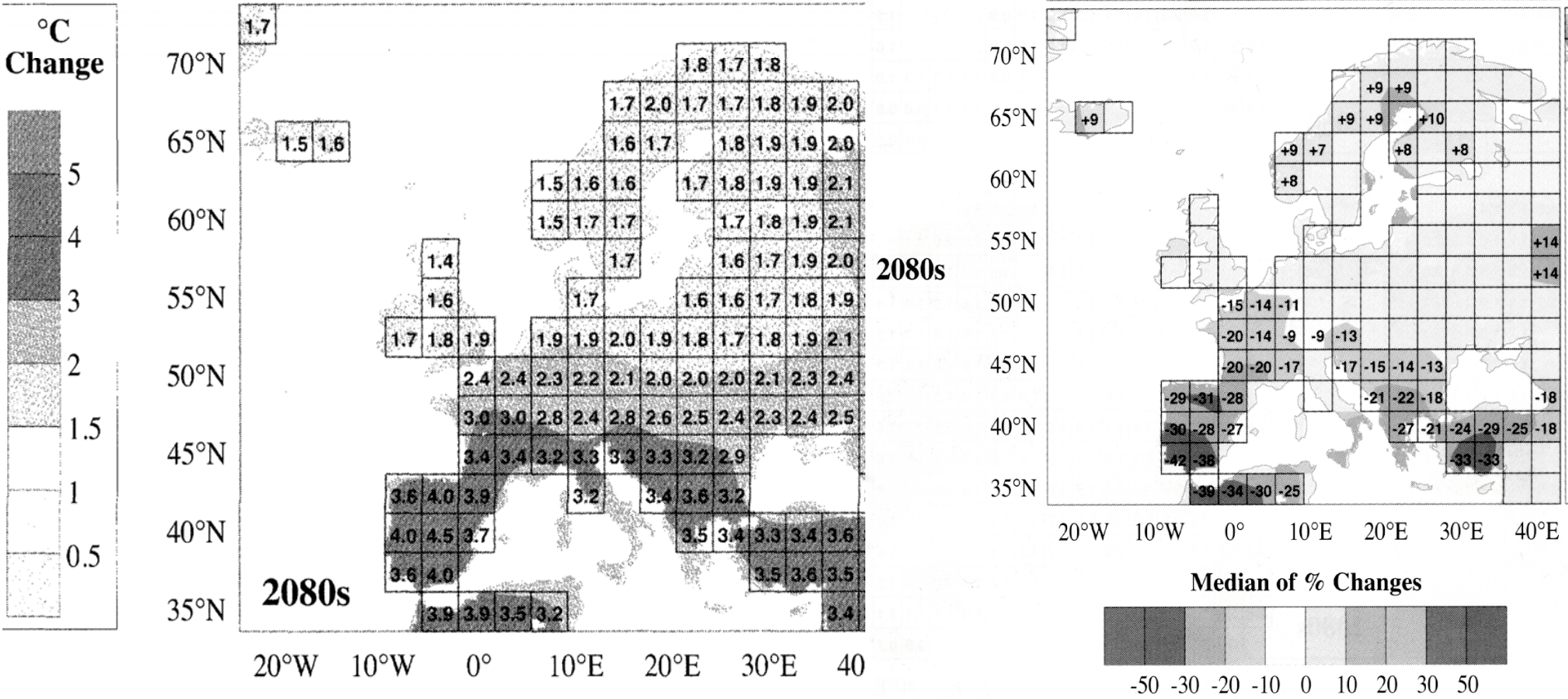
- ❖ Global average temperature rise in 20th century: **+ 0.6°C**

- ❖ Proj. temperature rise: 1990-2100: **+1.4 – 5.8°C**

Sources: IPCC 1990, 1995, 2001



4.7. Climate Change Impacts in Mediterranean



↑ Mean Temperature Change for Summer in 2080s (WG II, p. 651)

Mean Precipitation Change for Summer in 2080s (WG II, p. 652) ↑

Source: IPCC: Climate Change 2001, WG II: Impacts (p. 651-652)

No specific climate change models for South. & East. Mediterranean

4.8. Effects of Climate Change for Egypt & Nile Delta

Population: 3 800 000
Cropland (Km²): 1 800



Population: 6 100 000
Cropland (Km²): 4 500



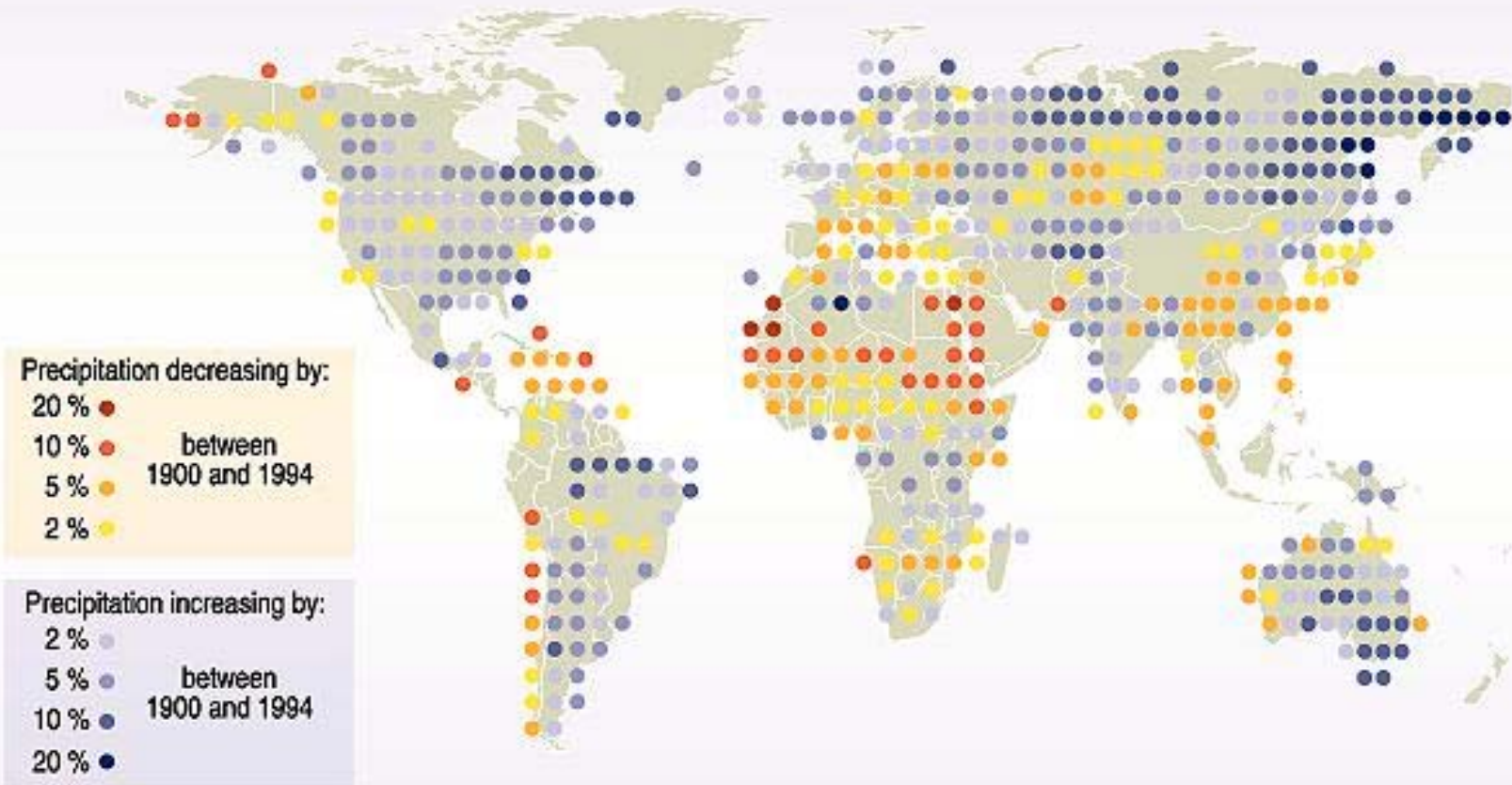
Global Climate Change: Sea level rise:
1860-2100 IPCC, TAR, WG 2 (2001)
Sea level rise 1860-2000: 0.1 – 0.2 m;
Sea level rise: 1990-2100:0.09-0,88 m

Climate Change Impacts: Egypt:

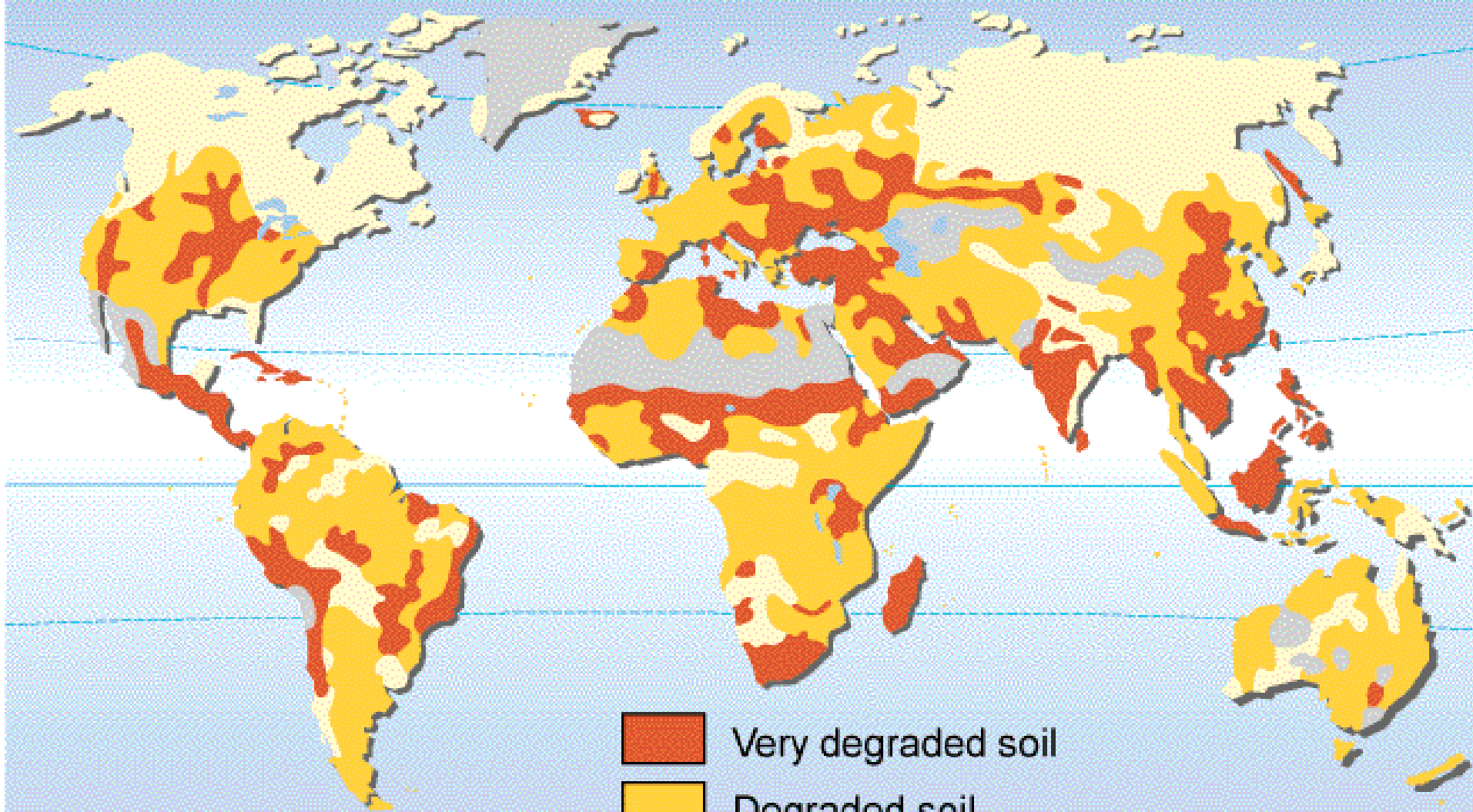
- ◆ Nil Delta: 50cm SLR may affect: 2 million persons, 214.000 jobs
- ◆ Temp. Increase in Cairo: 2060: +4°C
- ◆ SSR (cereals): 1990-2060: 60→10%
- ◆ Yield decline for wheat: 2050: -18%





4.9. Climate Change Impacts on Precipitation

Precipitation changes: trend over land from 1900 to 1994

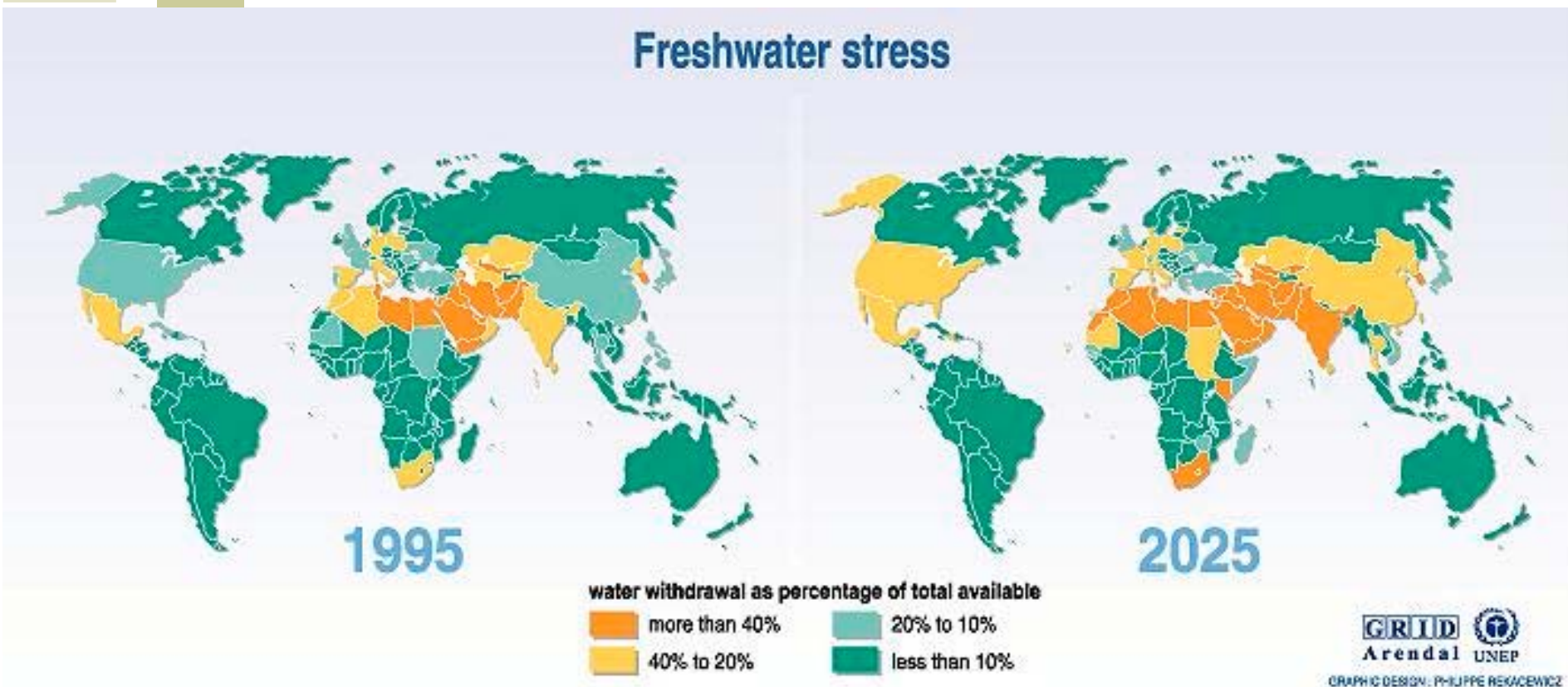


Soil degradation



-  Very degraded soil
-  Degraded soil
-  Stable soil
-  Without vegetation

4.11. Global Fresh Water Stress, 1995-2025 (UNEP)

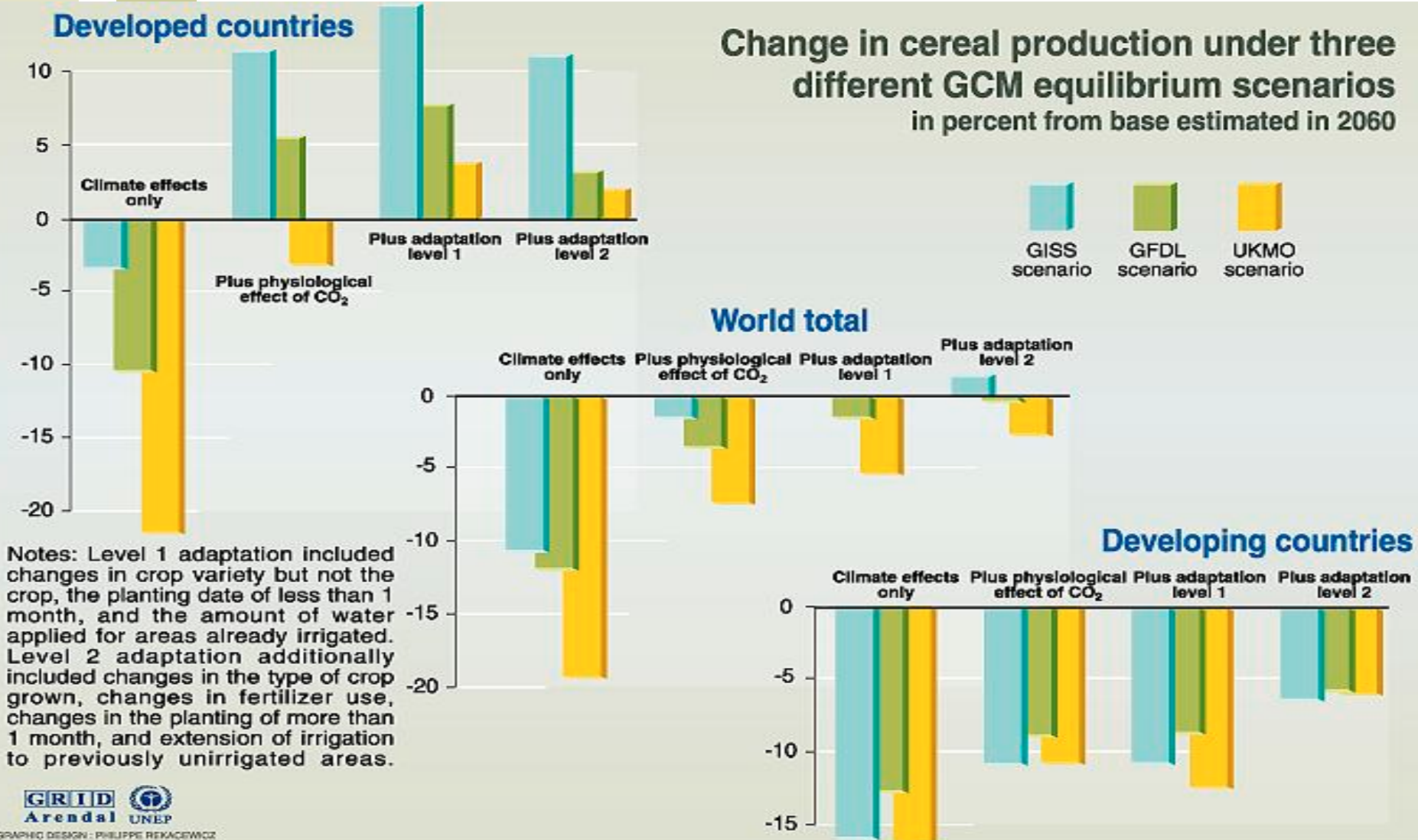


Source: Global environment outlook 2000 (GEO), UNEP, Earthscan, London, 1999.

- ◆ The MENA Region has been and will remain the region with the highest water stress that will become even more severe due to population growth and climate change (temperature rise).

4.12. Climate Change Impacts on Agriculture

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



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



GRAPHIC DESIGN: PHILIPPE REKACEWICZ

← High Potential for Food Crisis (1901-1995)

Alcamo/Endejan 2002: 143



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

4.13. Food Crises

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

Alcamo/Endejan 2002-143

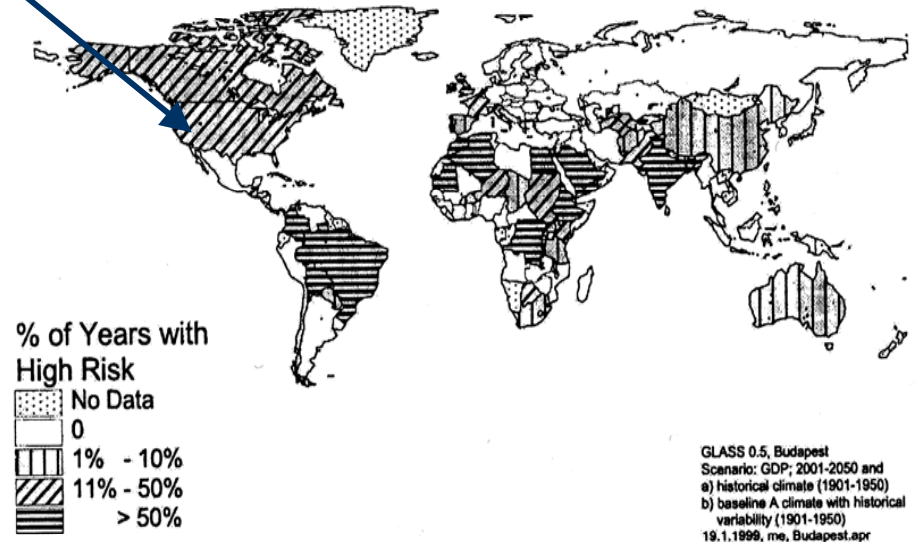


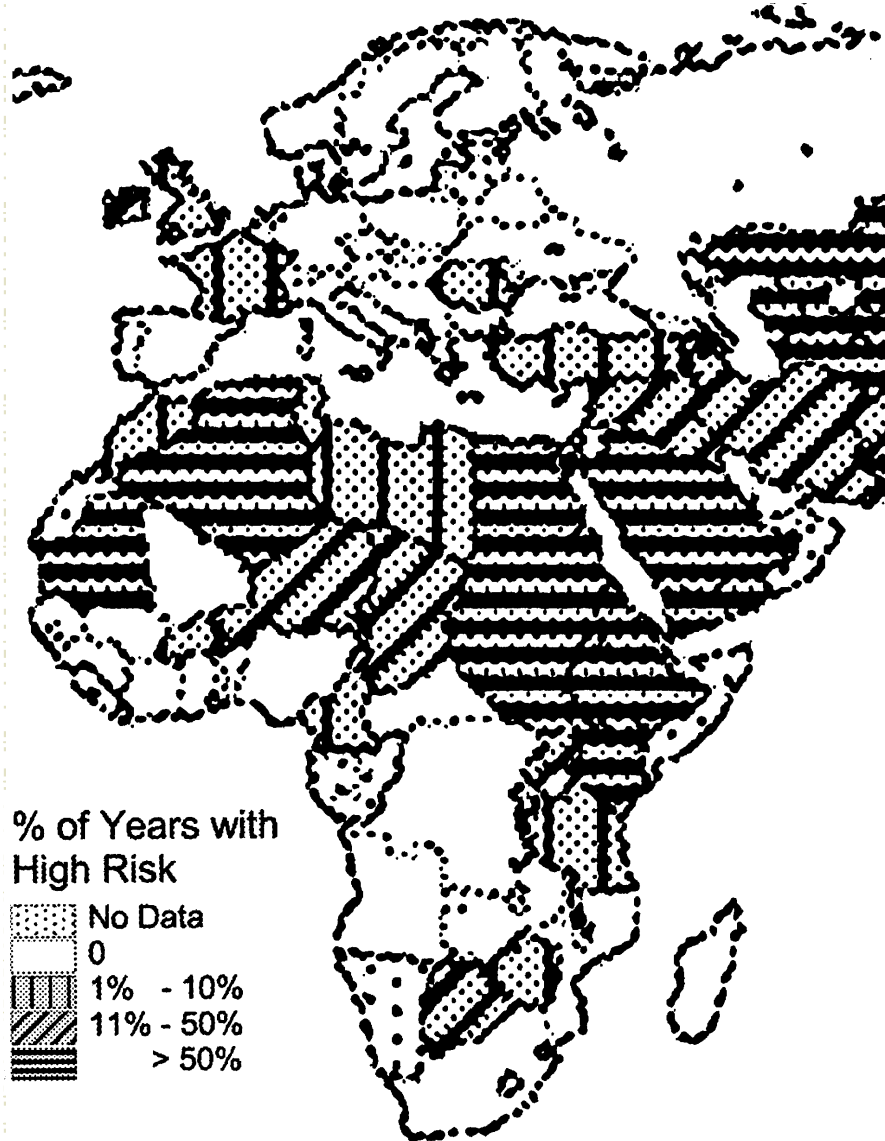
Figure 6. High Potential for Food Crisis 2001-2050 – with GDP Increase and Climate Change.

4.14. High Potential for Food Crisis 1990-2050

← Food Crisis: 1900-1995

Source: Alcamo/Endejan (2002)

High Potential for Food Crisis
2001-2050 with GDP Increase
& Climate Change ↓



4.15. Food Security in the MENA Region

Table: Cereal balance for the MENA, all cereals (1964-2030).

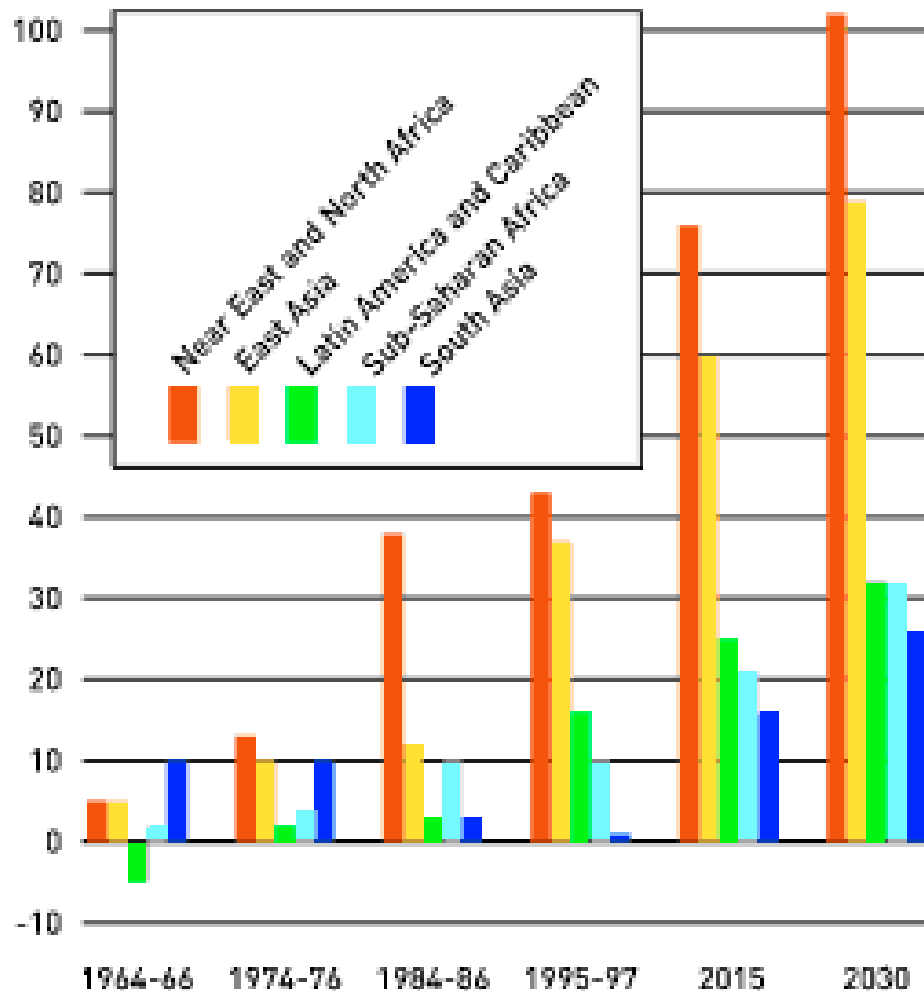
Source: FAO website (report 2000) and FAO book, March 2003

19	Demand				Pro- duc- tion	Net tra- de	Self suf- fic. rate %	Growth rates, % p.a			
	Per caput (kg)		Total (mio.tons)					Time 19... /20..	Dema nd	Pro- duc- tion	Po- pula tion
	food	All uses	food	All uses							
64/66	174	292	28	47	40	- 5	86	67-97	3.6	2.4	2.7
74/76	190	307	40	64	55	- 13	85	77-97	3.1	2.7	2.7
84/86	203	365	56	100	65	-38	65	87-97	2.1	2.0	2.4
95/97	208	357	75	129	84	-43	65	'95- 15	2.0	1.4	1.9
2015	209	359	108	186	110	-85	56	'15- 30	1.5	1.2	1.4
2030	205	367	130	232	131	-116	54	'95-'30	1.8	1.3	1.7

4.16. FAO (2000) Increase in Cereal Imports

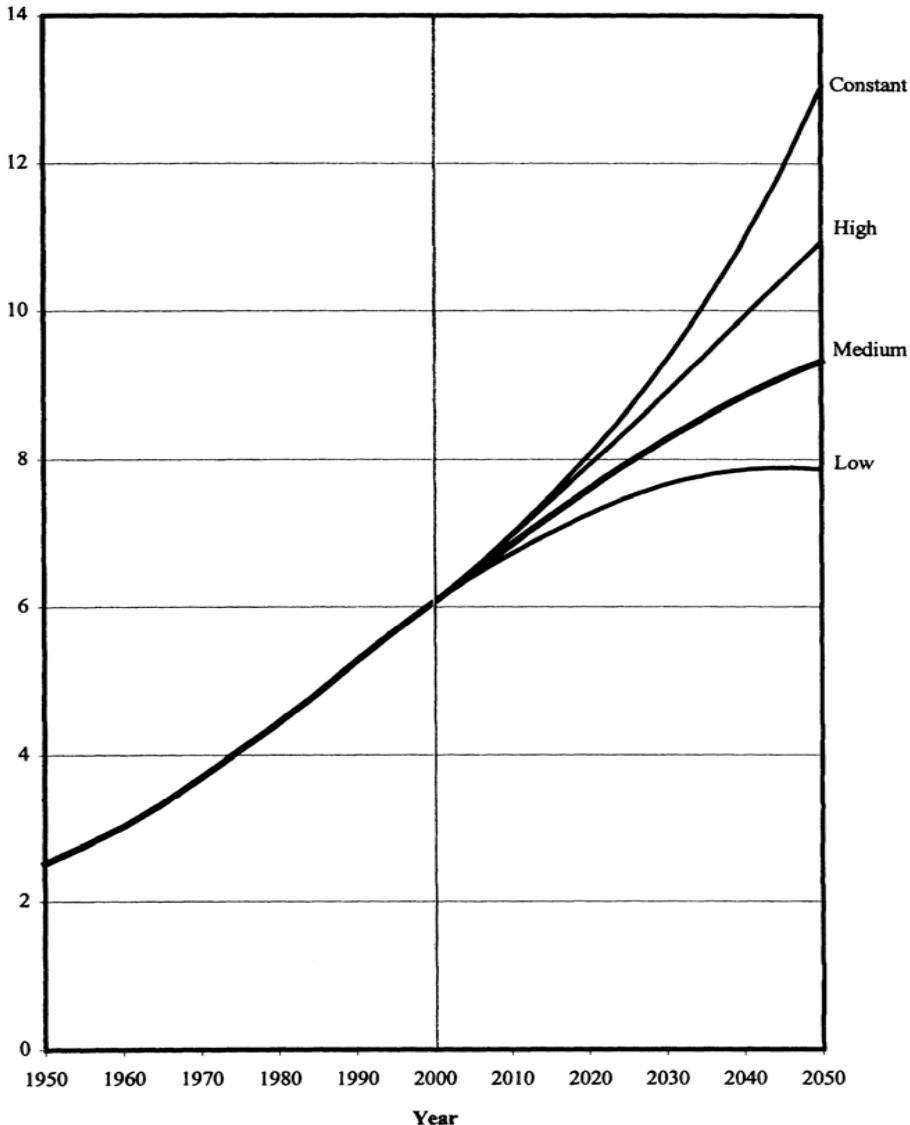
Net cereal imports in developing countries

millions of tonnes



- ◆ **FAO: 4 March 2003, Rome**
World's population will be better fed by 2030, **but hundreds of millions of people in developing countries will remain chronically hungry.**
- ◆ Parts of South Asia may be in a difficult position and **much of sub-Saharan Africa** will not be significantly better off than at present in the absence of concerted action by all concerned.
- ◆ 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.**

4.17. Demand Side: Purely Anthropogenic Factors for Eastern Mediterranean



❖ Population growth:

← World Population, Medium Scenario 2000-2150 (UN, 1998 Rev.)

	2000	2050	2100	2150
Total	6,01	8,91	9,50	9,75

World Population in 2300. Highlights (UN, Dec. 2003), Medium Scenario ↓

	2000	2050	2100	2200	2300
World	6,071	8,919	9,064	8,499	8,972
Developed	1,194	1,220	1,131	1,207	1,278
Less Devel.	4,877	7,699	7,933	7,291	7,694

❖ Food & Agriculture: Demand will grow due to population growth

4.18. Population Growth & Urbanization in the Mediterranean Region (1850- 2050)

Source: Brauch, talk at World Bank, 5 December 2002

http://www.proventionconsortium.org/files/conference_papers/brauch.pdf

Trends in Population Growth (1850-2050) in million

	1850	1900	1950	2000	2050
Southern Europe	83.0	103.5	132.9	177.3	154.1
North Africa	13.1	22.3	44.1	142.8	239.4
Eastern Med. & Turkey	12.45	16.05	29.2	89.5	173.9

Trends in Urbanization (1950-2030) in %, Growth of Urban Centres

	1950	1980	2000	2010	2030
North Africa (5)	24.7	40.4	48.9	53.4	63.3
Western Asia(6)	26.7	51.7	64.7	67.2	72.4

	1950	1960	1975	1990	2000	2010	2015
Istanbul	1.08	1.74	3.60	6.54	8.96	10.72	11.36
Algiers	0.50	0.81	1.57	1.91	2.76	3.74	4.14

4.19. Analysis of Trends in Disasters in Mediterranean. People reported killed & affected by natural disasters, 1975 – 2001

	Total		Earthquake		Flood		Storm	
	E	Killed	E	Killed	E	Killed	E	Killed
S.Europe	249	8,889	33	6,007	71	837	60	469
Balkans	50	562	11	187	12	108	0	0
W. Asia	95	27,613	23	26,087	24	505	8	70
N. Africa	82	6,606	10	3,452	38	2,924	6	69
Total	485	43,729	79	35,735	145	4,374	76	608

Source: CRED database: how representative are reported events?

Role of Earthquakes more important than global trends (Munich Re)

Fatalities of Earthquakes: ca. 50% in 1999 in Izmit (Turkey)

Floods: More events & damages in S.Europe, more fatalities in N.A.

4.20. Fatalities of Disasters in Eastern Med.

Table: Fatalities of Natural Disasters (1975-2001)

Source: Brauch, ch. 49, in: Brauch: *Security & Environment*, 2003

	Total			Drought		Earthquakes		Floods		Storms	
	Ev	Killed	Affect (000)	Kil l.	Aff. 000	Killed	Affect (000)	Kill.	Aff. 000	Kil	Aff.
Israel	11	31	2,029	-	-	-	-	11	1	3	410
Jordan	11	47	349,0	-	330	-	-	17	18,0	11	200
Leban.	4	45	105,6	-	-	-	-	-	1,5	25	104,
OPT	1	-	943	-	-	-	-	-	-	-	-
Syria	5	115	662,2	-	658	-	-	27	172	-	-
Turkey	63	27,375	2,580	-	-	26,087	2,377	450	92,2	31	3
East M.	95	27,613	3,700	0	988	26,087	2,377	505	112,9	70	104,
Total M.	485	43,728	22,15	0	10 m	35,74	35,74	4374	2,153	608	3,697

4.21. Vulnerabilities of Cities to Disasters: Izmit and Algiers

Earthquake in Izmit, Turkey, 17 August 1999

- Turkey 23 (of 63): earthquakes killed: 26,087, affected: 2,377,128
- Izmit: 17,200 died, 321,000 jobs, 600,000 homel., econ. loss (US\$ 12bn),
- ISDR Report (2000) high vulnerability due to: population growth & urbanization; lack of existing building regulations, siting of industry
- Response: 2 WB loans: US\$ 757 million; EIB facil.: € 450 million.

Flash Flood in Algiers: November 2001

- Algeria: 36 events, 4,124 fatalities, 1,154,355 affect.,
earthquakes: 2,881; floods: 1,201; affect.: earthquakes: 1,001,212
- 9-13 Nov. 2001: Flash floods in Algiers: 921 deaths (IFRC 2002), and affect. 50,423, UNICEF: 10,000 families; econ. losses: US\$ 300 mill.
- **High vulnerability → high fatalities** (population density, poor housing in flood-prone areas, admin. errors, lacking building standards, poor area.
- Response: WB loans: US\$ 89 million; EIB loan: € 165 million.

4.22. Increase in Human Disasters and Conflicts Impacting on the Mediterranean

- ◆ Will these fatal outcomes of global environmental change and climate change lead to conflicts?

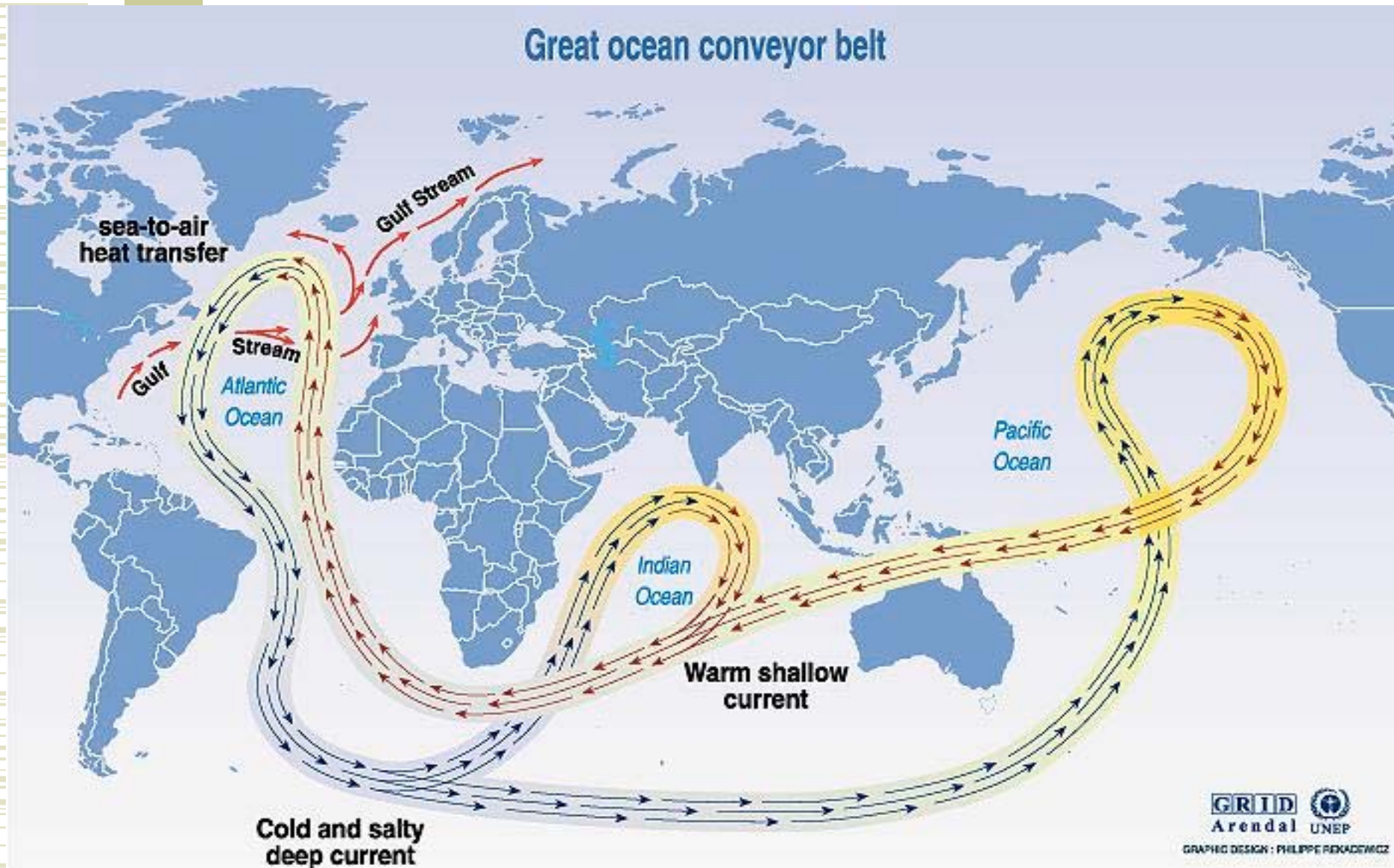
Hypotheses

- ◆ Thesis 1: Population growth, urbanisation & persistent high poverty will increase the societal vulnerability to hazards and disasters.
- ◆ Thesis 2: Extreme weather events will very likely increase an increase in hydro-meteorological hazards (droughts, flash floods and storms).
- ◆ Thesis 3: Environmental stress and hazards may trigger distress migration and low level conflict potentials within societies and among states.

5. Global Warming: Cause of Change in Gulf Stream

- ◆ **Peter Schwartz/Doug Randall: Rahmstorf (PIK) hypothesis: on abrupt change in the Gulf stream: Executive Summary.**
- ◆ **Global warming will occur during the 21st century. ... Recent research suggests that there is a possibility that this gradual global warming could lead to a relatively abrupt slowing of the ocean's thermohaline conveyor**, which could lead to harsher winter weather conditions, sharply reduced soil moisture, and **more intense winds** in certain regions that currently provide a significant fraction of the world's food production. **With inadequate preparation, the result could be a significant drop in the human carrying capacity of the Earth's environment.**
- ◆ **Once temperature rises above some threshold**, adverse weather conditions could develop relatively abruptly, with persistent changes in atmospheric circulation **causing drops in some regions of 5-10 degrees Fahr.** in a single decade. Paleoclimatic evidence suggests that altered climatic patterns could last for as much as a century, as they did when the **ocean conveyor collapsed 8,200 years ago**, or, could last as long as 1,000 years as they did during the Younger Dryas, which began about 12,700 years ago.

5.1. 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.

5.2. Peter Schwartz and Doug Randall Abrupt Climate Change Scenario

- ❖ As an alternative to the scenarios of gradual climatic warming they we outline an abrupt climate change scenario patterned after the 100-year event that occurred about 8,200 years ago. This abrupt change scenario is characterized by the following conditions:
 - Annual average temperatures drop by up to 5 degrees Fahr. over Asia and North America and 6 ° Fahrenheit in Northern Europe
 - Annual average temperatures increase by up to 4 degrees Fahrenheit in key areas throughout Australia, South America, and southern Africa.
 - Drought persists for most of the decade in critical agricultural regions and in the water resource regions for major population centers in Europe and eastern North America.
 - Winter storms and winds intensify, amplifying the impacts of the changes. Western Europe and the North Pacific experience enhanced winds.

5.3. Impact of Abrupt Climate Change Scenario on Geopolitical Environment

- ◆ The report explores how such an abrupt climate change scenario could potentially de-stabilize the geo-political environment, leading to skirmishes, battles, and even war due to resource constraints such as:
 - 1) **Food shortages due to decreases in net global agricultural production**
 - 2) **Decreased availability and quality of fresh water** in key regions due to shifted precipitation patterns, causing more frequent floods and droughts
 - 3) **Disrupted access to energy supplies due to extensive sea ice & storminess**
- ◆ **As global & local carrying capacities are reduced**, tensions could mount around the world, leading to two fundamental strategies: defensive & offensive. Nations with the resources to do so may build virtual fortresses around their countries, preserving resources for themselves. Less fortunate nations especially those with ancient enmities with their neighbors, may initiate in **struggles for access to food, clean water, or energy**. Unlikely alliances could be formed as defense priorities shift and the **goal is resources for survival** rather than religion, ideology, or national honor.

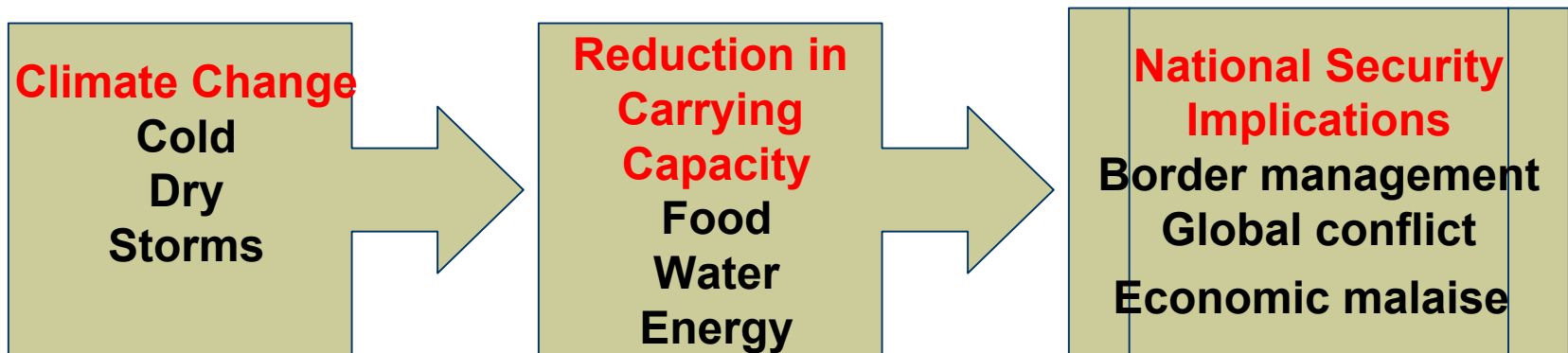
5.4. U.S. National Security Implications

This scenario poses new challenges for the U.S., and suggests several steps to be taken:

- **Improve predictive climate models** to allow investigation of a wider range of scenarios and to anticipate how and where changes could occur
- **Assemble comprehensive predictive models** of the potential impacts of abrupt climate change to improve projections of how climate could influence food, water, and energy
- **Create vulnerability metrics** to anticipate which countries are most vulnerable to climate change and therefore, could contribute materially to an increasingly disorderly and potentially violent world.
- **Identify no-regrets strategies** such as enhancing capabilities for water management
- **Rehearse adaptive responses**
- **Explore local implications**
- **Explore geo-engineering options** that control the climate.

5.5. 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, and 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**



5.6. Assumed Regional Impacts



5.7. Assumed Regional Impacts for Europe & U.S. (Worst Case Analysis)

Europe. Hit hardest by climatic change, average annual temperatures drop by 6 degrees F. in under a decade, with more dramatic shifts along the NW coast. **The climate in NW Europe is colder, drier, and windier, making it more like Siberia.** Southern Europe experiences less of a change but still suffers from sharp intermittent cooling and rapid temperature shifts. **Reduced precipitation causes soil loss to become a problem throughout Europe,** contributing to food supply shortages. **Europe struggles to stem emigration out of Scandinavia and northern European nations in search of warmth as well as immigration from hard-hit countries in Africa and elsewhere.**

United States. Colder, windier, and drier weather makes growing seasons shorter and less productive throughout the northeastern United States, & longer & drier in SW. **Desert areas face increasing windstorms, while agricultural areas suffer from soil loss due to higher wind speeds and reduced soil moisture.** The change toward a drier climate is especially pronounced in the S. states. Coastal areas that remain at risk, as rising ocean levels continues along shores. **The US turns inward, committing its resources to feeding its own population, shoring-up its borders, and managing the increasing global tension.**

5.8. Impact on Natural Resources

- ◆ The changing weather patterns and ocean temperatures affect **agriculture, fish and wildlife, water and energy**. **Crop yields**, affected by temperature and water stress as well as length of growing season **fall by 10-25%** and are less predictable as key regions shift from a warming to a cooling trend.
- ◆ Some agricultural pests die due to temperature changes, other species spread more readily due to **dryness & windiness** – require alternative pesticides.
- ◆ **Commercial fishermen that typically have rights to fish in specific areas will be ill equipped for the massive migration of their prey.**
- ◆ With only **five or six key grain-growing regions** in the world (US, Australia, Argentina, Russia, China, and India), there is **insufficient surplus in global food supplies** to offset severe weather conditions in a few regions at the same time – let alone four or five. **The world's economic interdependence make the US increasingly vulnerable to the economic disruption created by local weather shifts in key agricultural and high population areas around the world. Catastrophic shortages of water and energy supply – both which are stressed around the globe today – cannot be quickly overcome.**

5.9. Impact on U.S. National Security

- ◆ **Violence and disruption** stemming from the stresses created by abrupt changes in the climate pose a different threat to national security than today. **Military confrontation may be triggered by a desperate need for natural resources** such as **energy, food and water** rather than by **conflicts over ideology, religion, or national honor**. The shifting motivation for confrontation would alter which countries are most vulnerable and the existing warning signs for security threats.
- ◆ **Academic debate** over the extent to which **resource constraints & environmental challenges lead to inter-state conflict**. While some believe they alone can lead nations to attack one another, others argue that their primary effect is to act as a trigger of conflict among countries that face pre-existing soc., econ., pol. tension. **Severe environmental problems are likely to escalate degree of global conflict.**
- ◆ **Peter Gleick outlines 3 most fundamental challenges abrupt CC poses for national security:**
 - ◆ 1. **Food shortages due to decreases in agricultural production**
 - ◆ 2. **Decreased availability and quality of fresh water due to flooding and droughts**
 - ◆ 3. **Disrupted access to strategic minerals due to ice and storms**
- ◆ **Abrupt CC, food, water, and energy resource constraints will first be managed through economic, political & diplomatic means such as treaties & trade embargoes. Over time, conflicts over land & water use are likely to become more severe – and more violent.**

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

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

5.11. Worst Case Conflict Scenario due to Climate Change (2020-2030)

Europe	Asia	United States
<p>2020: Increasing: skirmishes over water & immigration</p> <p>2022: Skirmish between France&Germany over commerc.access to Rhine</p> <p>2025: EU nears collapse</p> <p>2027: Increasing migration to Medit. countries such as Algeria, Morocco, Egypt, and Israel</p> <p>2030: Nearly 10% of European pop. moves to a different country</p>	<p>2020: Persistent conflict in South East Asia; Burma, Laos, Vietnam, India, China</p> <p>2025: Internal conditions in China deteriorate dramatically leading to civil war and border wars.</p> <p>2030: Tension growing between China and Japan over Russian energy</p>	<p>2020: Oil prices increase as security of supply is threatened by conflicts in Persian Gulf and Caspian</p> <p>2025: Internal struggle in Saudi Arabia brings Chinese and U.S. naval forces to Gulf in direct confrontation</p>

6. Climate Change and Conflicts? Hobbesian vs. Grotian Perspectives

- ◆ **Hobbesian diagnosis: P.Schwartz, Doug Randall: *An Abrupt Climate Change Scenario and Its Implications for US National Security*, Oct 2003, for DoD, NA (worst case)**
- ◆ **Focus: on one specific possible consequence of Global Warming: Regional Chilling (Gul Stream collapse)**
- ◆ **US: European migration to US,**
- ◆ **Climate Refugees from Northern and Central Europe to the Mediterranean and to North Africa**
- ◆ **Grotian Diagnosis: H.G. Brauch: *Climate Change, Environmental Stress and Conflicts*, Fed. German Min. of Environment (Nov. 2002)**
- ◆ **Focus: Interaction between Global Environmental Change and Fatal Outcomes, case studies: Mexico, Bangladesh, Egypt, Mediterranean**
- ◆ **Distress migration: from Nile Basin, across the Mediterranean, major human disasters, increase in hydro-meteorological hazards in the Mediterranean: storms, droughts, flash floods.**

6.1. Comparing both Studies

- ◆ **Assumptions:** Ramerstorf, & National Academy study
- ◆ **Worldview:** Hobbessian
- ◆ **Concept:** US nat. security
- ◆ **Referent:** U.S. DoD, elite
- ◆ **Method:** Worst case socio-political scenario
- ◆ **Criticism:** events cannot be predicted
- ◆ **Plausibility:** relatively low
- ◆ **Research Needs:** basic research on probability
- ◆ **Assumption:** IPCC hypothesis
- ◆ **Worldview:** Grotian
- ◆ **Concept:** environmental and human security
- ◆ **Referent:** GEC, individual
- ◆ **Method:** socio-economic, qualitative, hermeneutic, projection of trends by IGOs
- ◆ **Plausibility:** higher
- ◆ **Research Needs:** strategies of environmental conflict avoidance

7. Hobbesian Conclusions on Climate Change & Conflicts

- ◆ **Both studies agree: climate change matters & has impacts that may result in conflicts in the 21st century**
- ◆ **DoD-Study:** assumes rapid change of t Gulf Stream (reg. cooling)
- ◆ The report explores how such an abrupt climate change scenario could potentially destabilize the geo-political environment, leading to skirmishes, battles, even war due to resource constraints such as:
 - **Food shortages** due to decreases in net global agricultural production
 - **Decreased availability and quality of fresh water** in key regions due to shifted precipitation patters, causing more frequent **floods and droughts**
 - **Disrupted access to energy supplies** due to extensive sea ice and storminess
- ◆ **Problem of military policy: Nuclear proliferation is inevitable, conflicts over energy resources.** „Managing the military and political tension, occasional skirmishes, and threat of war will be a challenge.”

7.1. Hobbesian Policy Recommendations (DoD Study)

This scenario poses new challenges for the United States, and suggests several steps to be taken:

- **Improve predictive climate models** to allow investigation of a wider range of scenarios and to anticipate how and where changes could occur
- **Assemble comprehensive predictive models** of potential impacts of abrupt climate change to improve projections of how climate could influence food, water & energy
- **Create vulnerability metrics** to anticipate which countries are most vulnerable to climate change and could contribute materially to an increasingly disorderly and potentially violent world.
- **Identify no-regrets strategies** such as enhancing capabilities for water management
- **Rehearse adaptive responses**
- **Explore local implications**
- **Explore geo-engineering options** that control the climate.

8. Grotian Study on Climate Change & Conflicts

- ◆ Report analyses the **conflict dimension of societal & political implications of climate change** in interaction with five primarily **nature-induced** (soil erosion, hydrological cycle & water scarcity) & **human-induced** (population growth, urbanisation, agriculture and food) factors.
- ◆ Nature- & human-induced effects of climate change may lead to **environmental degradation** (soil & agriculture) & **environmental scarcity** (water & food) that may result in **environmental stress**.
- ◆ Given the specific global context & country specific socio-economic, ethnic & religious context & the history of conflict in selected regions, **environmental stress may contribute to five probable outcomes:**
 - ◆ a) **natural and manmade hazards and disasters,**
 - ◆ b) **to distress migration, internally displaced persons and environmental refugees,**
 - ◆ c) **to severe societal, economic and political crises; some of them may either escalate**
 - ◆ d) **to violent conflicts, that may be avoided by efforts for**
 - ◆ e) **conflict resolution, and prevention by the initiation of a process of de-escalation.**

8.1. BMU Study Design

- **Case studies on Mexico, Bangladesh and Egypt and the regional study on the Mediterranean focus on different climate zones, eco-regions or biomes (tropical, sub-tropical, 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 secu-ri-ty*).**
- **The five case studies apply the same criteria & they include the most recent UN data of pro-jections of population growth until 2050, urbanisation until 2030 and for specific cities until 2015.**

8.2. First Case Study on Small Island States

- **Case study on Small Island States in Atlantic, Indian & Pacific Oceans & the Caribbean Sea & in Mediterranean (Malta & Cyprus) summarises the results of the IPCC report on specific vulnerabilities of these countries taking into account population projections until 2050.**
- **Projected sea-level rise by the IPCC & the projected population growth by the UN Population Division offer clear early warning signals for countries that have already been severely affected by extreme weather events, e.g. Dominican Republic, Haiti & Jamaica in Caribbean, Comoros, Maldives, Seychelles & Mauritius in Indian Ocean with high population density.**

8.3. Second Case Study on Mexico

- **Case study on Mexico distinguishes the impacts for the northern, the central and the southern region of Mexico on desertification, on declining precipitation and the increasing demand for water due to population growth and urbanisation.**
- **Included is the projected decline in the areas suitable for the production of maize without irrigation and on the decline in the yield of some agricultural products.**
- **Due to projected trends and impact of severe weather events that have caused severe damages in Central America during 1990s, the pressure for (trans)migration from Central America to Mexico & from there to the United States & Canada will increase in the decades to come.**

8.4. Third Case Study on Bangladesh

- **Case study on Bangladesh focuses on one of the poorest, very densely populated countries of the world that has become the major victim of extreme weather events: of cyclones, floods & drought. A 1m increase in the sea-level could inundate about 17% of Bangladesh, destroy agricultural land due to progressing intrusion of seawater (salination). Based on studies by scientists from Bangladesh & data by International Federation of Red Cross & Red Crescent Societies the vulnerabilities have been analysed:**
- **During the 1980s, each year ca. 22.9 million, during the 1990s, ca. 9 million, & in 2000, close to 3 million people were affected by extreme weather events.**
- **Since 1960, ca. 600,000 persons have died due to cyclones, storm surges, floods & probably 1 million (1945-2001). Human & economic loss for the poorest most severe.**
- **There have been violent events both within Bangladesh & between emigrating Bangladeshi & tribal people clashed in Northern India (Assam) several 1000 people died.**
- **Struggle for survival against the impacts of global environmental change has been real for decades. Without more intensive efforts to address the root causes a major human catastrophe may be possible affecting neighbouring states (India, Myanmar) & OECD.**

8.5. Fourth Case Study on Egypt

- Egypt is affected by temperature increases and sea-level rises
- The first will increase evapotranspiration & water needs of agriculture & is projected to result in declining yields for agricultural food products.
- Climate change may also intensify the process of desertification & make it irreversible in some cases.
- The sea-level rise in the Nile Delta will inundate some of the most fertile agri-cultural land and most densely populated regions.
- At the same time the population growth in Egypt and in the other nine riparian countries of the Nile will increase the demand for scarce water.
- In the framework of the Nile Basin Initiative the international community, with major support from the World Bank, has been active to avoid future water conflicts from arising.
- Egypt has become both a country of emigration (so far primarily to other Arab countries) but also of increasing immigration (of refugees and asylum seekers) from countries in Sub-Saharan Africa.

8.6. Fifth Case Study on Mediterranean

- **Based on IPCC assessments of regional climate models, the Med. region will be severely affected by both increases in temperature & sea level until 2100.**
- **In the MENA countries and Turkey it is estimated that between 2000 and 2050 about 181 million additional persons must be fed.**
- **This is more than presently live in the five South European EU countries (Greece, Italy, France, Spain, Portugal, 2000: 177 million).**
- **The clash between declining supply of water & food & increasing demand will become extremely severe in the Maghreb and in the Mashriq countries, especially in Jordan, Israel, Palestine & Syria where the UN projects a population increase by 40 million between 2000-2050.**
- **The most likely outcome of impact of climate change for Europe will be a dramatic increase of distress migration to Southern Europe.**

8.7. Grotian Conclusions on Climate Change & Conflicts (BMU Study)

Grotian: IPCC Assessments (global warming) focus at interactions among 6 factors of Surv. Hexagon): linkages between climate change impacts, environm. stress & conflict dimensions with the following hypotheses on climate change impacts:

- ◆ **There is no mono-causal linkage between climate change and conflicts.**
- ◆ **do not pose military threat cannot be solved with traditional mindsets nor by milit, means.**
- ◆ **will contribute to environmental stress & become a pot. cause of conflict constellations.**
- ◆ **may challenge the survival of human beings: challenge to human security.**
- ◆ **persuade or force human beings to leave their rural home (urbanisation, migration).**
- ◆ **pose challenges for countries effected by of sea level rise in delta areas but also by complex interactions of increasing temp. & declining precipitation in arid- & semi-arid regions.**
- ◆ **may contribute to an escalation of social, ethnic or religious tension that may erupt in violent temporal riots or result in a long-lasting domestic civil strife or civil war.**
- ◆ **in combination with disputes on scarce water resources may contribute to conflicts.**
- ◆ **may lead to N-S tensions on migration issues, admission of refugees in neighbouring or in industrialised countries and on domestic treatment of immigrant communities.**
- ◆ **posed by the impact of climate change requires bilateral or multilateral international cooperation, support for adaptive capabilities and a massive technology transfer.**

8.8. Grotian Policy Recommendations

- ◆ The main thesis of this study is that cooperative climate *mitigation* strategies are needed that must be linked with policies to assist most affected countries.
- ◆ This requires policies that contain the manifold causes of insecurity & instability & that aim at a regional peace based on equity and strategies of sustainable development that may also be associated with the concept of a “sustainable peace”.
- ◆ These policies should assist these countries to *adapt to* and to *cope with* these projected effects of extreme weather events and long-term climate change impacts

9. Towards a Fourth Phase of Research on Environmental Security

1. Conceptual Phase: Concept Environmental Security

- ❖ Inclusion of environmental factors in US national security agenda
- ❖ Ullmann (1983), Myers (1989), Mathews (1989)
- ❖ Brundtland-Commission (1987), Gorbachev (1987), NATO (1996-)

2. Empirical Phase: Case studies: Scarcity - Conflict

- Toronto: Tad Homer-Dixon: since 1991: 3 Projects
- Zürich/Bern: G. Bächler, K. Spillmann (3 volumes 1996,1997)

3. Phase: Manifold Research without Integration (1995-)

- Resource scarcity or abundance as a cause of conflict

4. Phase: Human & Environm. Security & Peace (HESP)

- ✓ My proposal: focus on linkages between global environm. change and fatal outcomes (hazards, migration, crises and conflicts).
- ✓ Brauch, ch. 2 & 51 of: *Security & Environment in the Mediterran.*

9.1. Goals of a fourth phase of research on human & environmental security & peace

4th phase of research on environmental security aim at:

- ❖ a “**people-centred**” **human security perspective** from the individual to the global level to develop strategies for adaptation and mitigation to reduce both the likelihood and the impact of and the vulnerability to these outcomes by strengthening resilience .
- The **normative orientation** at the dual policy goals of sustainable development and sustainable peace requires the scientific development of complex **knowledge, a societal and political problem awareness, anticipatory learning and “ingenuity” in the framework of a “culture of prevention”**.
- **Practical purpose & policy relevance** of a 4th phase of research is to recognise **early-warning indicators**, to examine both the **environmental consequences of wars and the existing conflicts over scarce resources** that may lead to environmental stress to **prevent that they escalate into violence** and, last but not least, to **develop longer-term priorities for European countries, as well as for international organisations** to avoid environmental outcomes from occurring, to contribute to **regional environmental good governance**.

9.2. Essentials for a 4th Phase of Research on Human & Environmental Security & Peace (HESP)

4th phase of research on human & environmental security & peace (HESP) may aim at ten conceptual and policy goals:

- **Orientation:** Analyst is influenced by worldviews & eco-logical standpoints. An *equity-oriented pragmatic Grotian* perspective may be best suited to support multilateral environmental efforts in framework of **international organisations & regimes with the goal to avoid harmful and conflictual outcomes.**
- **Causes:** Research should broaden scope & include both environmental degradation & scarcity and their impact on environmental stress. This requires a close interaction between social & natural sciences & a multi- & interdisciplinary approach.
- **Policy Process:** Case studies should include respective policy processes, how the state & society have responded to challenges & outcomes, they should emphasise the role the knowledge factor (learning, capacity building) has played in developing adaptive & mitigation strategies to reduce vulnerability & strengthen resilience.
- **Outcomes:** The research should focus not only on environmental conflict but it should include disasters, distress migration and environmental refugees and the complex interactions among these outcomes.

9.3. Essentials for a 4th Phase of Research on HESP

- **Regional Orientation:** A regional perspective both on causes, policy process & on outcomes is needed. This requires a regional resolution for natural science models & comparative social science case studies on the policy processes within the region.
- **Spatial Approach.** The analysis of environmental security issues on a regional level requires a spatial approach. As neither the approaches of *globalisation* & *geopolitics* have included environmental factors & problems of environmental security, a new approach of a *political geo-ecology* has been suggested.
- **Human Security Focus:** Referent for research & policy should be human beings, individual victims & communities of distress migration, disasters, crises & conflicts.
- **Policy Goals on individual level:** Environmental security studies should aim at contributing to strategies for reducing the *impact* of outcomes of environmental stress, decreasing *vulnerability* & strengthening the coping capacities and *resilience*.
- **Policy Goals on national & international level:** Strategies for coping with national & regional outcomes of env. stress by improving disaster response & integrating disaster reduction into national & local development planning. Resolution, prevention & avoidance of violent outcomes from env. stress should become a major policy goal.
- **Sustainable Development & Sustainable Peace:** A human security perspective to analysis of environmental security issues may aim at “sustainable peace”.

9.4. Next Project: Reconceptualising of Security in the 21st Century

Reconceptualisation of Security in 21st Century (2004-6)

- ◆ **Major reference book in Hexagon Series** (Springer-Verlag): Coeditors: **Brauch – Grin – Mesjasz** (AFES-PRESS) – **Chourou** (Mediterr. partner), **Liotta** (US partner) & from Third World regions in Asia & Latin America
- ◆ AFES-PRESS contribution to EU-sponsored network of excellence on security: **GMOSS: Global Monitoring for Stability & Security** in the context of the 6th EU Research Framework Programme
- ❖ **AFES-PRESS: is one of 24 GMOSS partners**

Redefining Security Interests (2006-2008)

- ◆ Possibly second major reference book in the Hexagon Series to be discussed & developed by AFES-PRESS & FOI

9.5. Questions for Reconceptualising Security: Facing Global Env. Change and Globalisation

- ❖ **Our goal: Time to assess & take stock of divergent reconceptualisations of security that have occurred since 1989.**
- ❖ **What does security mean in different cultures & religions and has the understanding changed since 1989?**
- ❖ **What is the spatial context: is security de-spatialised or de-territorialised (OECD perspective) or re-spatialised?**
- ❖ **What are the referents of security in different concepts?**
- ❖ **How have scientific disciplines reconceptualised security?**
- ❖ **Have there been reconceptualisations of security dimensions?**
- ❖ **How has global environmental change and its often fatal outcomes been conceptualised in terms of security concepts?**
- ❖ **How has the sectoral reconceptualisation evolved since 1989?**
- ❖ **How have environmental and human security been (re)conceptualised in different world regions: convergence or divergence?**

9.6. Reconceptualisation of Security in 21st Century

Facing the Challenges of Global Environm. Change & Globalisation

- ◆ **Contribution to 4th Phase of Research on Human & Environmental Security & Peace (HESP)**
- ◆ **Major reference book in the Springer HEXAGON Series**
- ◆ **Details:** http://www.afes-press.de/html/bk_book_of_year.html
- ◆ **Pot. Publisher:** Springer (Berlin-New York-London-Paris-Tokyo)
- ◆ **Content:** about 100-110 chapters, multidisciplinary (philosophy, economics, law, geosciences, political science & international relations)
- ◆ **Authors:** about 100 from all parts of the world
- ◆ **Papers:** peer-reviewed: recommendations, editors & reviewers
- ◆ **Audience:** global and multidisciplinary, with a strong representation of scholars from Asia, Africa and Latin America
- ◆ **Vision:** Bookaid project for Third World University Libraries

10. Towards a Proactive Environmental and Human Security Policy

- ◆ **EU Barcelona process: framework for manifold cooperation EU and all MENA countries (no long-term focus yet!)**
- ◆ **NATO's Mediterranean Dialogue: important framework to involve American & Canadians (awareness, agenda-setting)**
- ◆ **Human Security Network: agenda-setting for humanitarian challenges (Ireland & Netherlands: EU presidency in 2004)**
- ◆ **Grotian multilateralism could & should become the basis for a new transatlantic consensus based on a wide human and environmental security concept & agenda.**
- ◆ **Environmental challenges must be early recognised, this requires joint agenda-setting and anticipatory learning and pro-active countermeasures to enhance coping capacity!**
- ◆ **Pro-active initiatives cheaper than reactive crisis management**

10.1. Proposal for a Transatlantic NATO CCMS Study on Climate Change, Disasters & Conflicts

- ◆ **Model: NATO CCMS-Study: Environment & Security in an International Conflict (1996-1999)**
- ◆ **German-American Initiative: supported by Finnish, Swedish, Foreign and Swiss Defence Ministry**
- ◆ **New NATO CCMS & US-EPA Initiative (Valencia): Desertification as a Security Issue: Dec. 2003**
- ◆ **Grotian Approach: a Middle Ground for a transatlantic compromise on new non-military environmental security challenges.**

10.2. Grotian Goals & Return of Mars to Venus



Encyclopedia Mythica
<http://www.pantheon.org/>

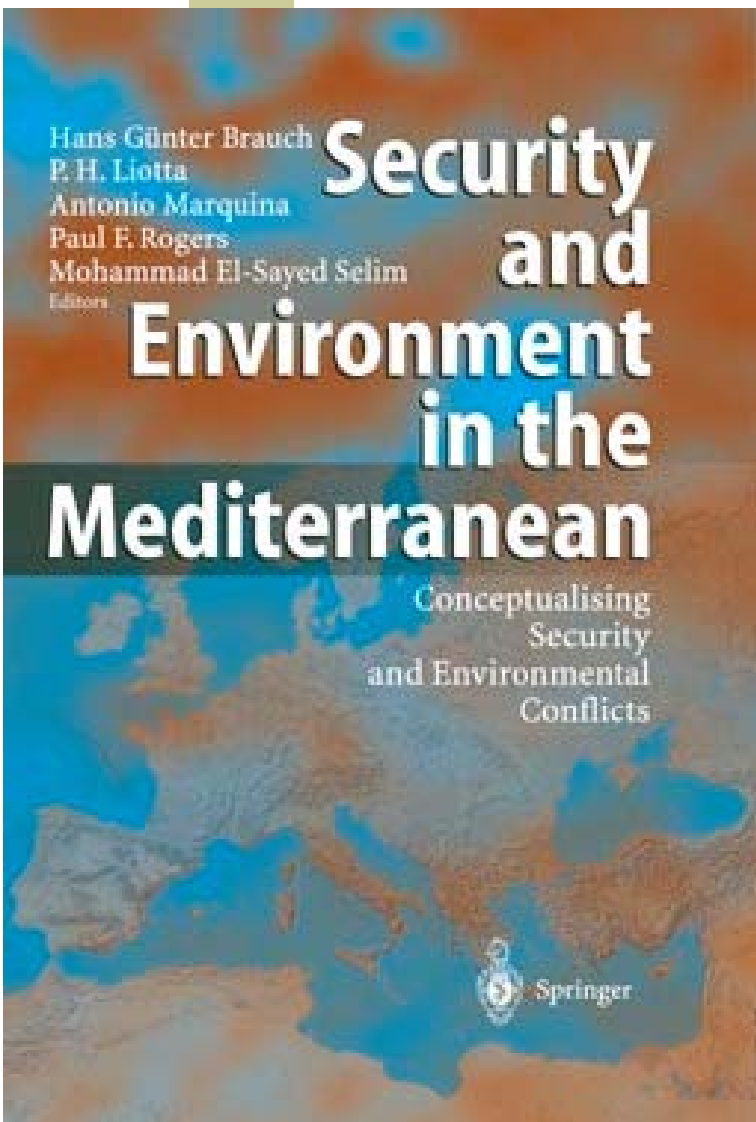


- ◆ In 21st century a Grotian worldview may again reunite Mars & Venus.
 - ◆ Both cannot enjoy life alone.
 - ◆ Neither can survive without the other.
 - ◆ Thus, both need each other!
- Thank you for your attention!**

**Send your comments to:
Brauch@onlinehome.de**

Sources

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



- ◆ **Brauch: *Climate Change and Conflicts* (Berlin: BMU 2002) (http://www.bmu.de/en/800/js/download/b_climges/)**
- ◆ **Brauch – Liotta – Marquina – Rogers - Selim (Eds.): *Security and Environment in the Mediterranean* (Berlin – New York – Paris – London -Milan: Springer 2003) (http://www.afes-press.de/html/bk_book_of_year.html)**
- ◆ **Next workshop: The Hague, 9-11 Sept. 2004: *Reconceptualising Security in an Era of Globalisation (5th Paneuro-pean Conference on Int. Relations)***
(http://www.afes-press.de/html/the_hague.html)