



SciencesPo.

THE MASTER OF PUBLIC AFFAIRS

117 Blvd Saint Germain, 75007 Paris, Sciences Po, 4th floor,

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Human Security Concentration Overview Course

Wednesday, 31 March 2010

Part 2 (12.30-14.30):

Securitization of Global Environmental Change

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**UNITED NATIONS
UNIVERSITY
UNU-EHS**

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and Human Security

Freie Universität



Berlin

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Plan for Presentation on 31 March 2010 (2)

12.30-14.30: Securitization of Global Environmental Change

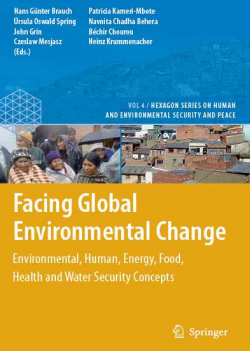
12.30-13.00: Brauch Lecture:

Securitizing Global Environmental Change

■ **13.00-13.30: Discussion: Securitization of GEC**

13.30-14.00: Brauch Lecture: Soil Security Concept

■ **14.00-14.15: Discussion on Soil Security**



Texts for Reading (Part 2)

Hans Günter Brauch: Securitization of Global Environmental Change (31 March 2010)



5. Jon Barnett, Richard A. Matthew and Karen O'Brien, 2008: "Global Environmental Change and Human Security", in: Hans Günter Brauch, Úrsula Oswald Spring, Czeslaw Mesjasz, John Grin, Pal Dunay, Navnita Chadha Behera, Béchir Chourou, Patricia Kameri-Mbote, P.H. Liotta (Eds.): *Globalization and Environmental Challenges: Reconceptualizing Security in the 21 st Century* (Berlin – Heidelberg – New York: Springer-Verlag), chap. 24, pp. 355-362.
6. Hans Günter Brauch, 2009: "Securitizing Global Environmental Change", in: Hans Günter Brauch, Úrsula Oswald Spring, John Grin, Czeslaw Mesjasz, Patricia Kameri-Mbote, Navnita Chadha Behera, Béchir Chourou, Heinz Krumme-nacher (Eds.): *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts* (Berlin – Heidelberg – New York: Springer-Verlag); Chapter 4, pp. 781-790.
7. Brauch, Hans Günter; Oswald Spring, Úrsula, 2009: *Securitizing the Ground - Grounding Security* (Bonn: UNCCD, 2009); To be distributed. Also at: <http://www.unccd.int/knowledge/docs/dldd_eng.pdf>.

Part C: Securitizing Global Environmental Change (Overview)

7. Global Climate Change and Security

- 7.1. Scientization : GEC Scientific Programmes**
- 7.2. Securitization of Global Environmental Change (GEC)**
- 7.3. Global Climate Change: Temperature Increases & Sea Level Rise**
- 7.4. Global & Regional Change in Temperature**
- 7.5. Average Value of Surface Temperature**
- 7.6. Projected Impacts of Climate Change on Water, Food, Ecosystems**
- 7.7. Precipitation Change by 2100**
- 7.8. Water Availability by 2050 (Parry, IPCC, 2005)**
- 7.9. Projected Sealevel Rise**
- 7.10. Change in Hydro-meteorological Hazards**
- 7.11. Impacts of Hazards (1974-2003)**
- 7.12. Natural Hazards in Africa**
- 7.13. Environmental Conflicts: Water and Soil (1980-2006)**
- 7.14. Environmental and Water Hotspots**

8. Addressing Linkages of Global Climate Change & Security

- 8.1. Global Environmental Change & Impacts: PEISOR Model**
-

7. Global Climate Change and Security: Scientization, Politicization, Securitization

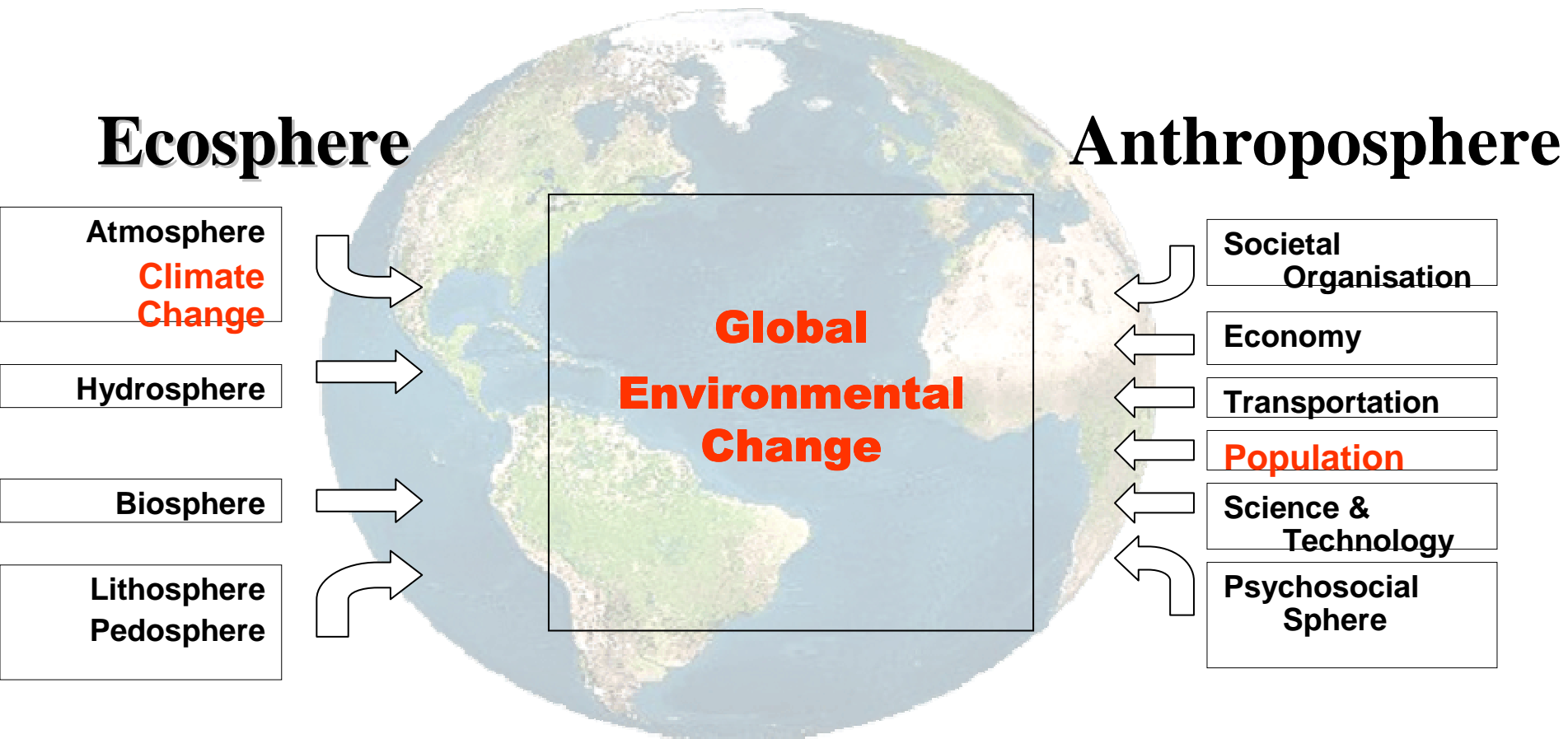
- Since 1970/80s: '*global environmental change*' (GEC) a new topic in natural and social sciences (**scientization**)
- Since late 1980s & 1990s policy efforts on (**politicization**):
 - **Climate Change**: 1988: issue of G7; 1990: UN GA mandate; 1992: Rio summit: **UNFCC (1992)** and **Kyoto Protocol (1997)**
 - **Desertification**: **UNCCD (1994)**, **water (WWF, GWP, WWW)**
- Since 2000: GEC as security issues (securitization)
 - **Since 2002**: climate change seen as a security threat/risk
 - **Valencia: 2003**: NATO Conference: Desertification as a security issue in the Mediterranean
- **Since 2007: two debates on climate change & security**
 - **UN & EU Debates**: climate change and international security
 - **US debate on climate change**: new threats for US national security

7.1 Scientization : GEC Scientific Programmes

- **International Geosphere-Biosphere Programme (IGBP)**. research programme that studies Global Change
- **Goals:**
 - Analyze interactive physical, chemical and biological processes that define Earth System dynamics
 - changes occurring in these dynamics
 - role of human activities on changes
- **DIVERSITAS**: integrates biodiversity science for human well-being:
- By linking biology, ecology & social sciences, it produces socially relevant new knowledge to support sustainable use of biodiversity
- **International Human Dimensions Programme (IHDP)**: international, interdisciplinary science organization: promoting, & coordinating research, capacity building & networking. Social science perspective on global change and works at the interface between science and practice
- **World Climate Research Programme** draws on climate-related systems, facilities & intellectual capabilities of 185 countries to advance understanding of processes that determine our climate.
- Two key objectives of **WCRP** are to determine predictability of climate; and effect of human activities on climate.

In 2001: Amsterdam Declaration on Global Change: IGBP, IHDP, DIVERSITAS, WCRP formed Earth System Science Partnership.

7.2. Securitization of Global Environmental Change (GEC)



GEC poses threats, challenges, vulnerabilities and risks for international, national and human security and survival.

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

Climate Change Impacts: Temperature & Sea level Rise

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

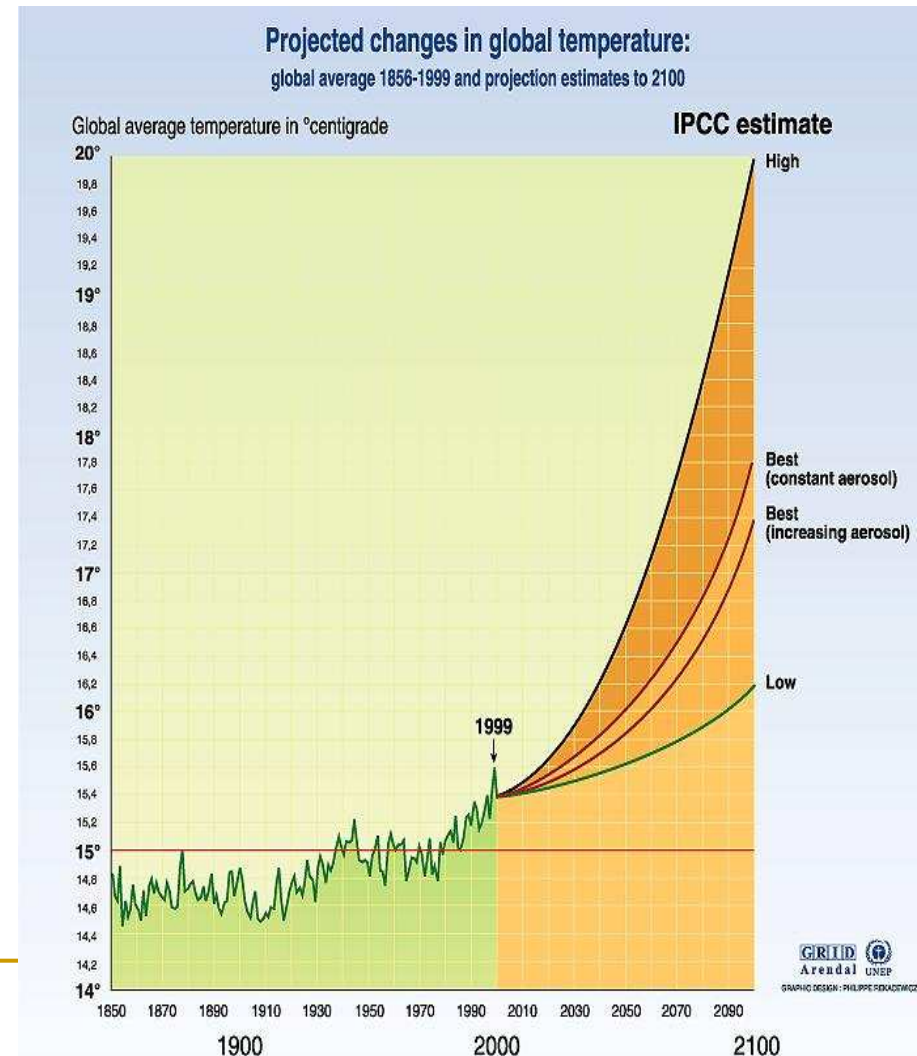
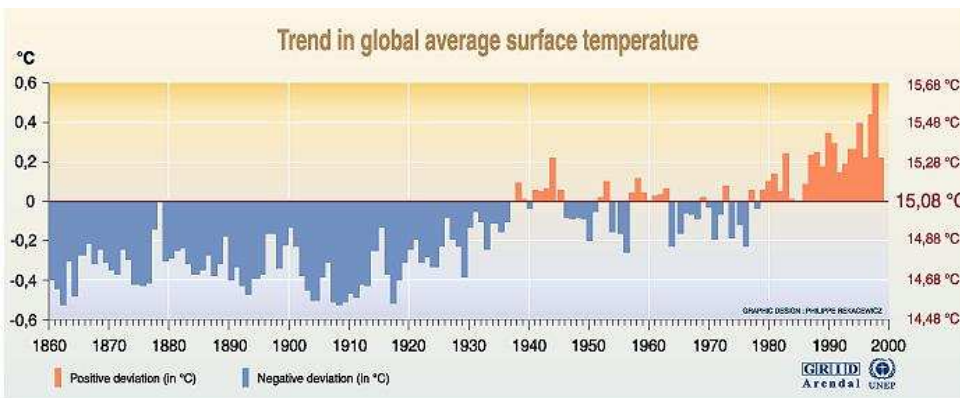
Projected temperature rise:

- ❖ TAR (1990-2100): **+1.4-5. 8°C**
- ❖ AR4 (07): **+1.1-6.4 (1.8-4)°C**

Sources: IPCC 1990,1995,2001,'07

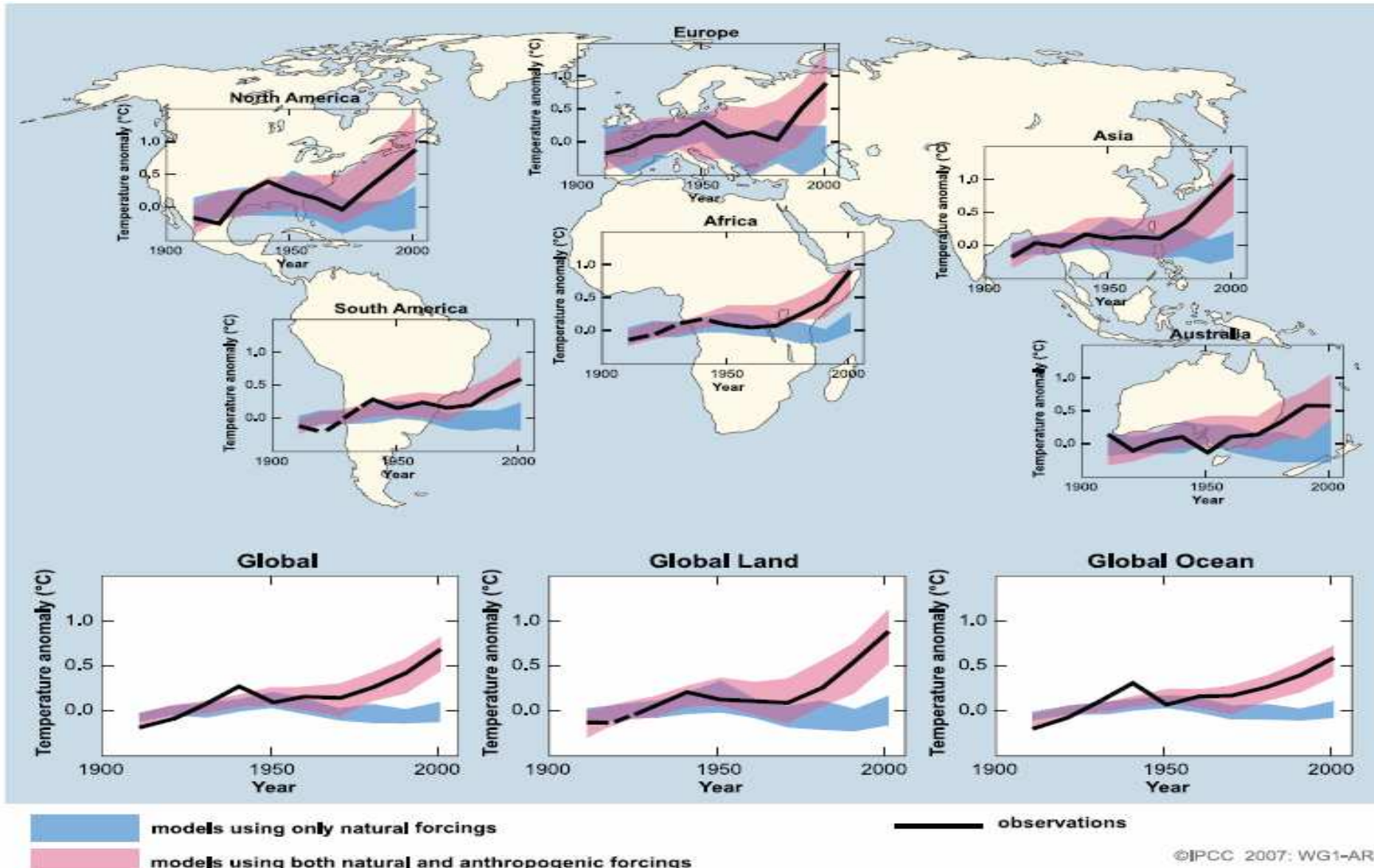
Sea level Rise:

- ❖ 20th cent.: **+0,1-0,2 metres**
- ❖ TAR: 21st century: **9-88 cm**
- ❖ AR4 (2000-2100): **18-59 cm**



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

7.4. Global & Regional Change in Temperature (IPCC 2007, WG 1, AR4, 11)



7.5. Average Value of Surface Temperature (IPCC 2007, WG 1, AR4, p. 14)

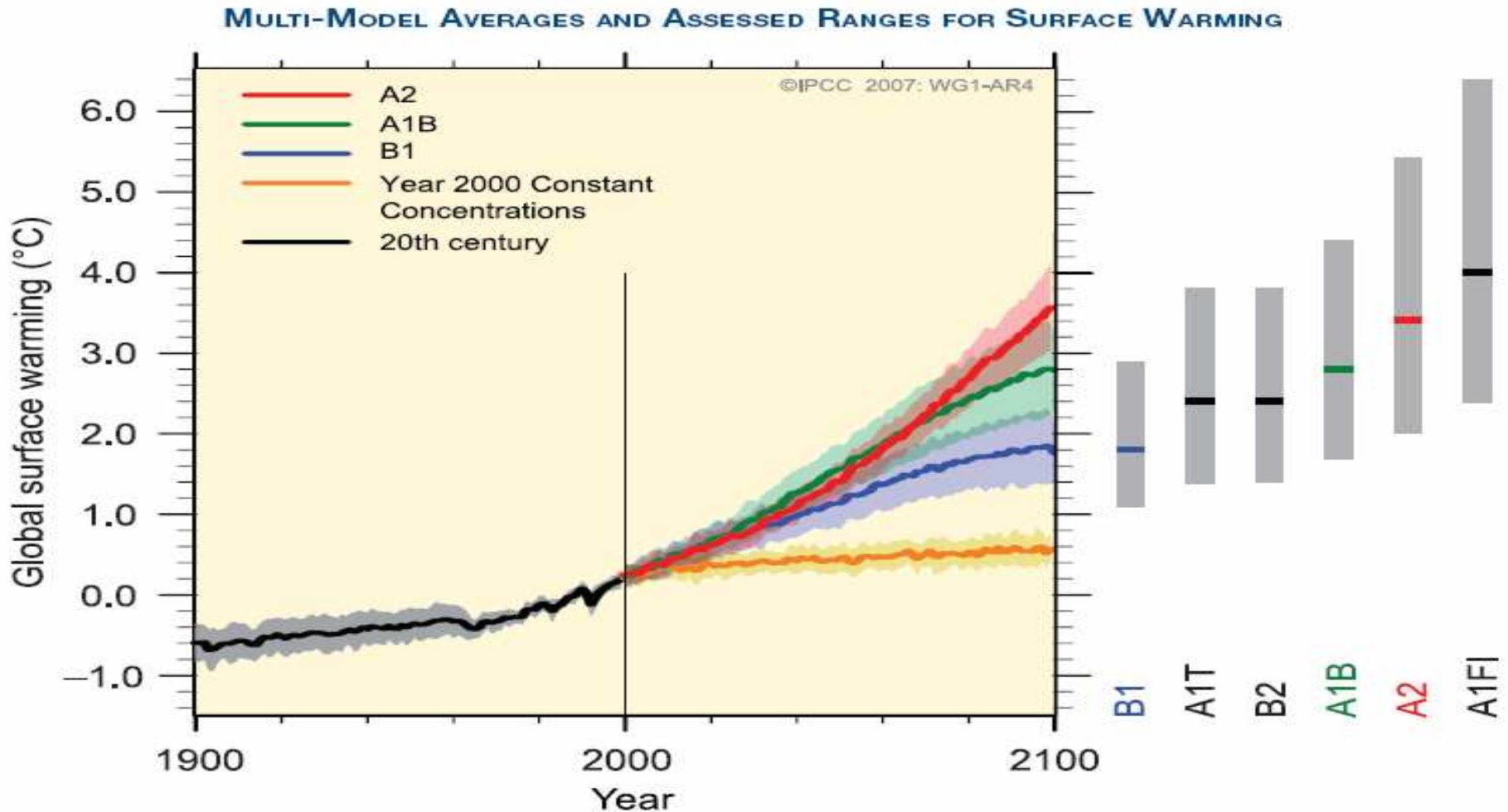


Figure SPM.5. Solid lines are multi-model global averages of surface warming (relative to 1980–1999) for the scenarios A2, A1B and B1, shown as continuations of the 20th century simulations. Shading denotes the ± 1 standard deviation range of individual model annual averages. The orange line is for the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

Projected Impacts of Climate Change

Global temperature change (relative to pre-industrial)

0°C

1°C

2°C

3°C

4°C

5°C

Food

Falling crop yields in many areas, particularly developing regions

Possible rising yields in some high latitude regions

Falling yields in many developed regions

Water

Small mountain glaciers disappear – water supplies threatened in several areas

Significant decreases in water availability in many areas, including Mediterranean and Southern Africa

Sea level rise threatens major cities

Ecosystems

Extensive Damage to Coral Reefs

Rising number of species face extinction

Extreme Weather Events

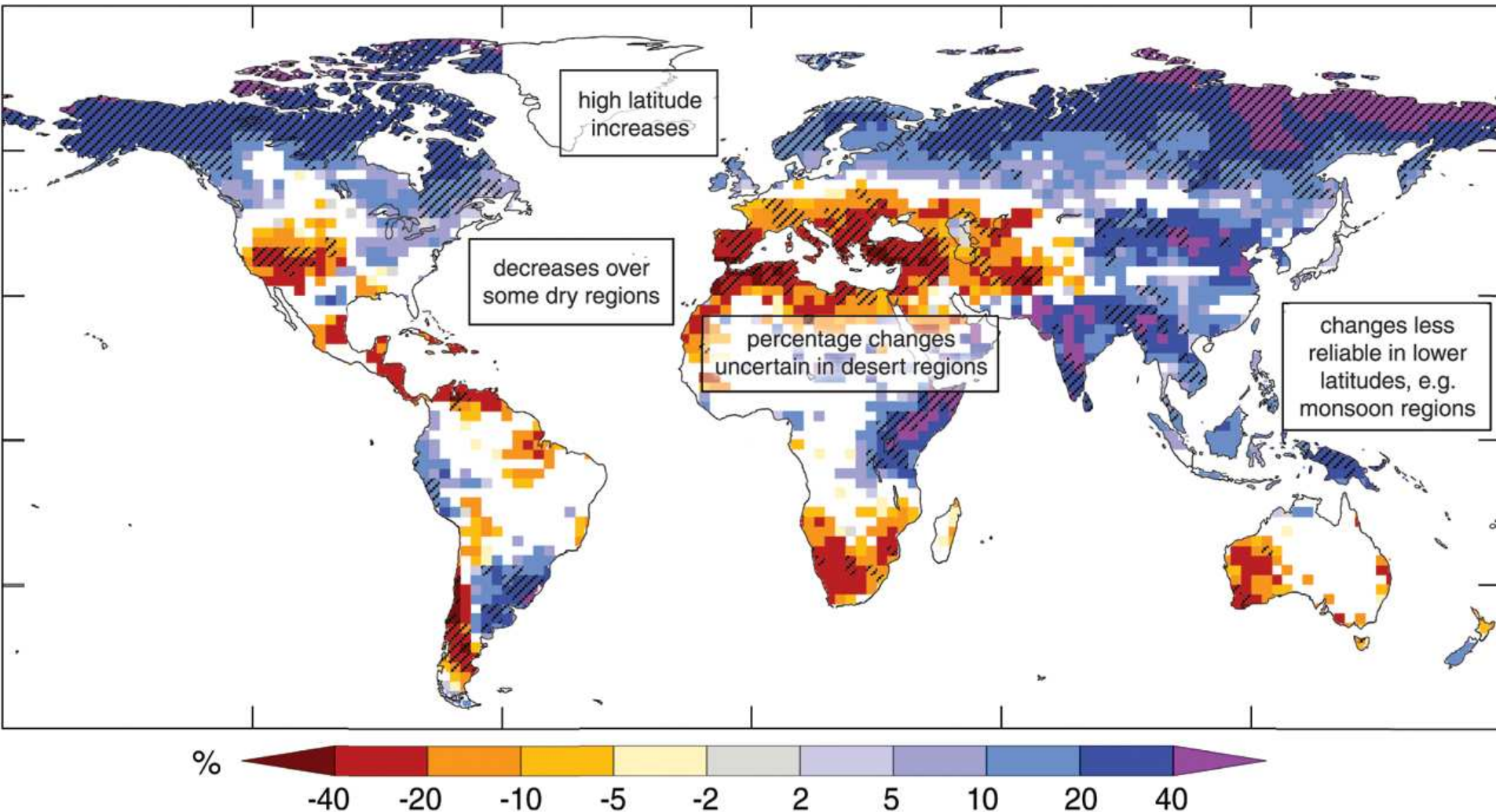
Rising intensity of storms, forest fires, droughts, flooding and heat waves

Risk of Abrupt and Major Irreversible Changes

Increasing risk of dangerous feedbacks and abrupt, large-scale shifts in the climate system

7.7. Precipitation Change by 2100:

Projections and model consistency of relative changes in runoff by the end of the 21st century

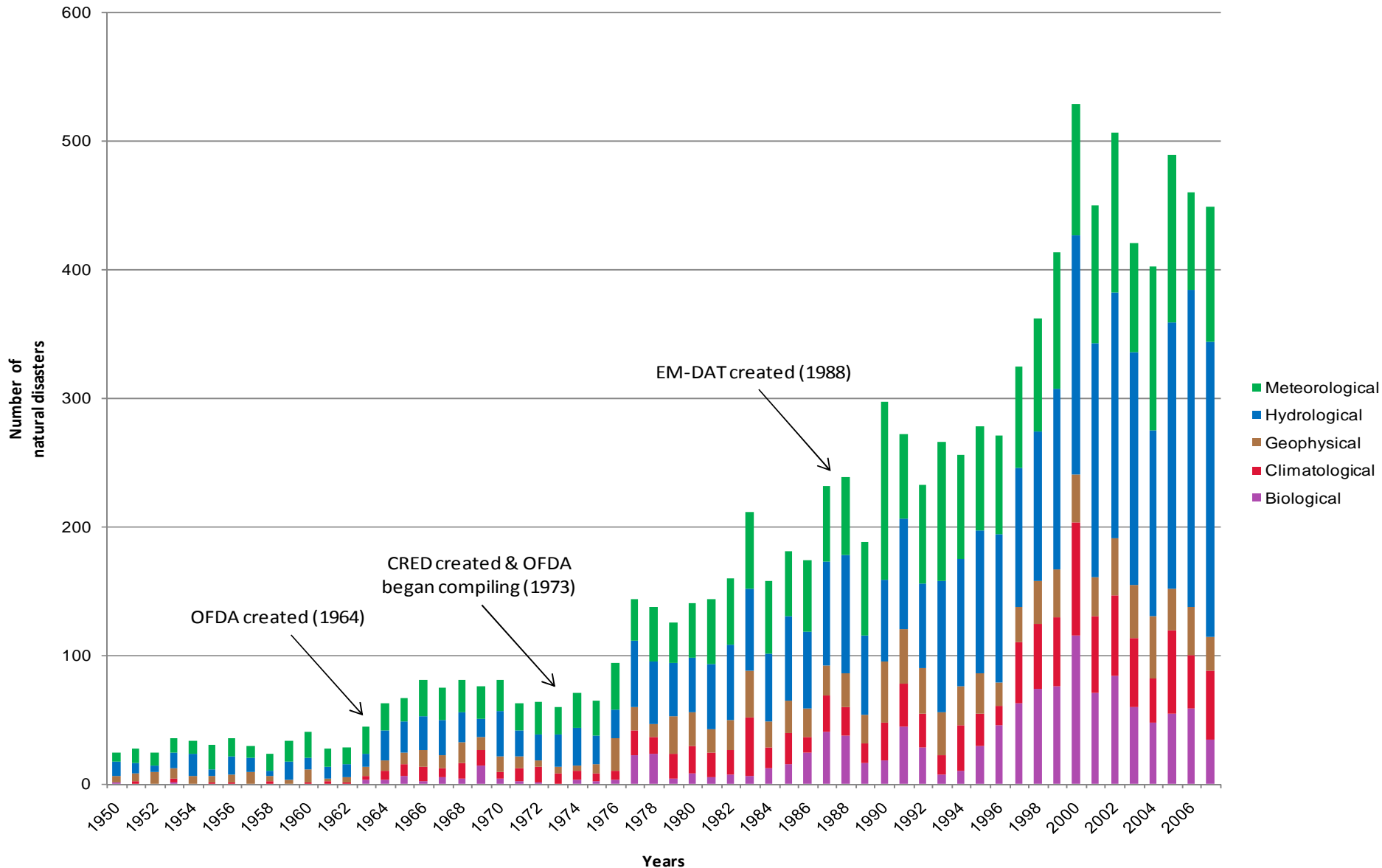


7.8. Projected Sealevel Rise (Pachauri, 2008)

Stabilization level (ppm CO ₂ -eq)	Global mean temp. increase (°C)	Year CO ₂ needs to peak	Global sea level rise above pre- industrial from thermal expansion (m)
445 – 490	2.0 – 2.4	2000 – 2015	0.4 – 1.4
490 – 535	2.4 – 2.8	2000 – 2020	0.5 – 1.7
535 – 590	2.8 – 3.2	2010 – 2030	0.6 – 1.9
590 – 710	3.2 – 4.0	2020 – 2060	0.6 – 2.4

7.9. Change in Hydro-meteorological Hazards.

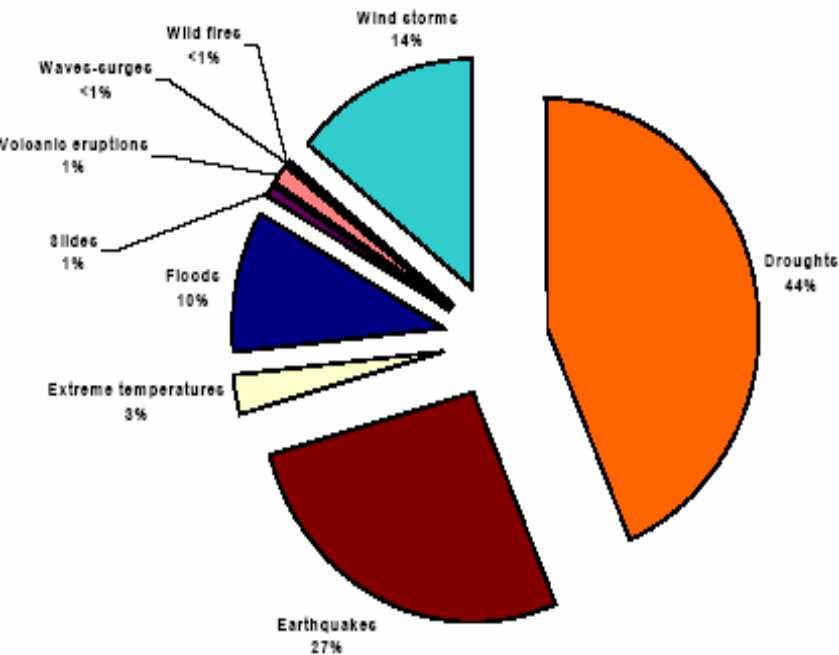
Source: Guha-Sanir (2010)



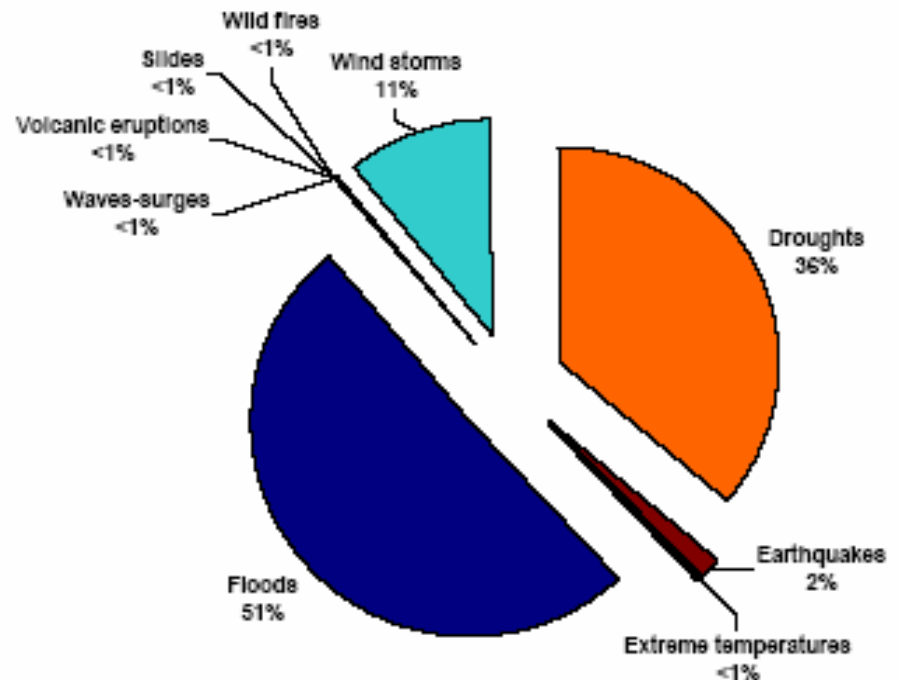
7.10. Impacts of Hazards (1974-2003)

Reported death of natural hazards globally: 2.066.273 persons

- **Affected persons of natural hazards:
5 076 494 541 persons**

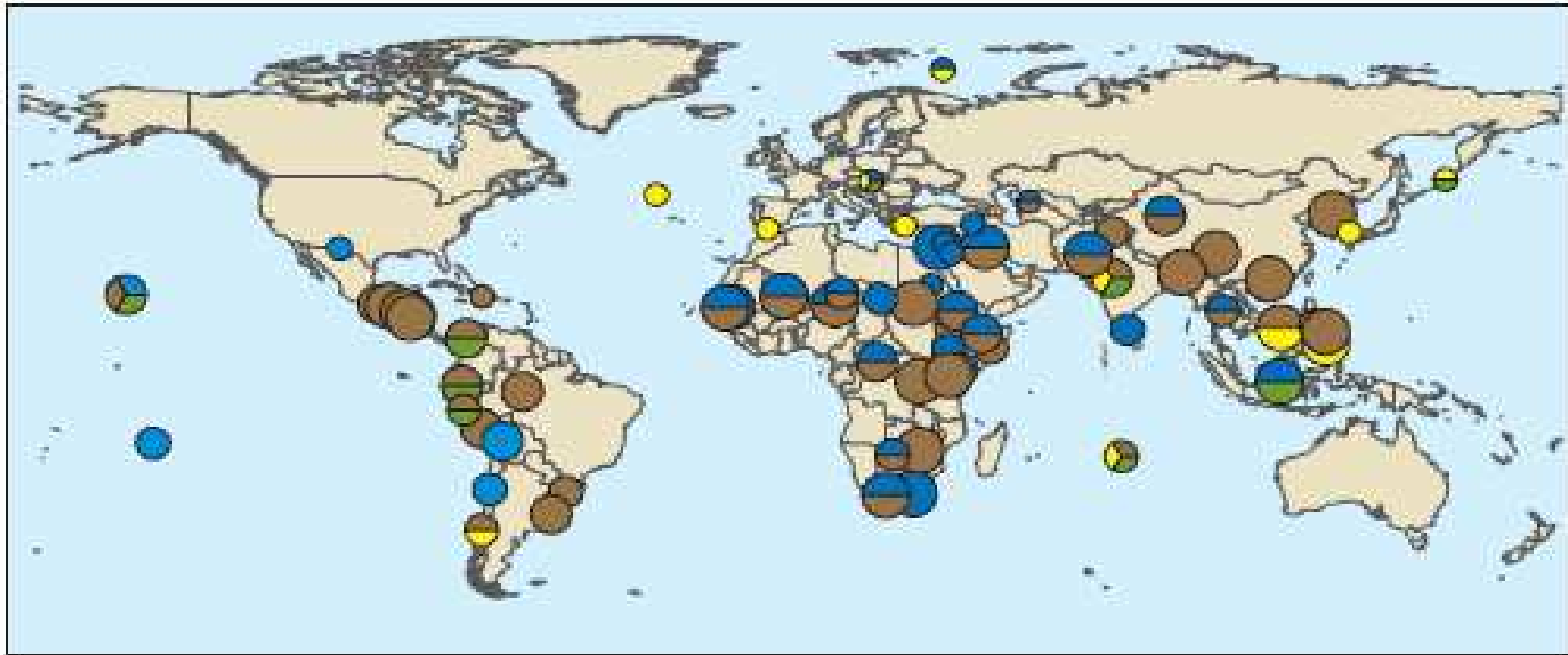


Source: Hoyois/Guha-Sapir (2004)



(f) injured + homeless + affected

7.11. Environmental Conflicts: Water and Soil (1980-2006)



Conflict intensity

- Diplomatic crisis
- Protests (partly violent)
- Use of violence (national scope)
- Systematic/collective violence

Conflict cause

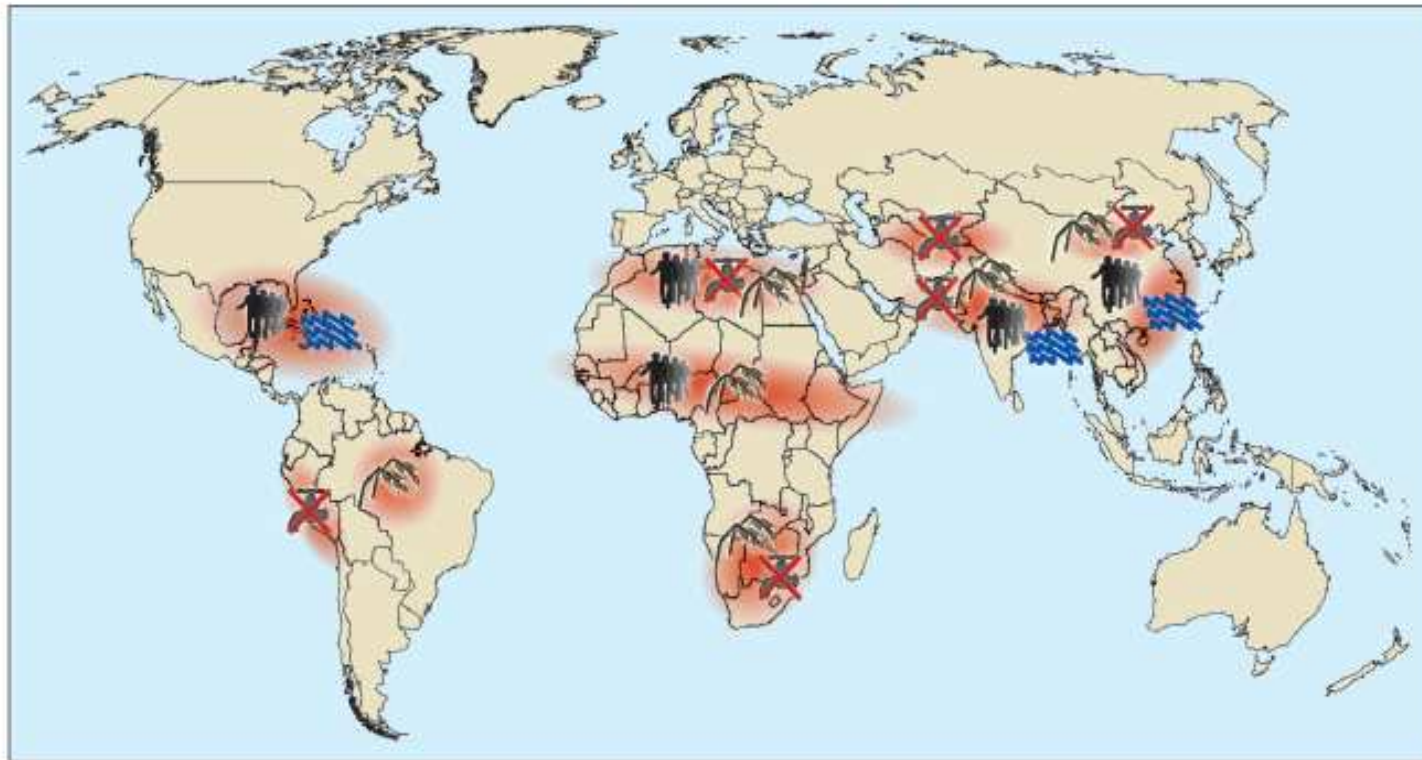


- Water
- Land/soil
- Fish
- Biodiversity

Source: WBGU (2008: 32)

7.12. Environmental and Water Hotspots

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



Conflict constellations in selected hotspots



Climate-induced degradation of freshwater resources



Climate-induced decline in food production



Hotspot



Climate-induced increase in storm and flood disasters



Environmentally-induced migration

Security-related challenges in MENA region: Water scarcity to rise due to demand increase and supply decline

Rising food deficits

Rising environmentally induced migration

8. Addressing Linkages of Global Climate Change and Security



Four Schools

- ❑ Dramatizers: Climate wars
- ❑ Sceptics: lack of research (PRIO)
- ❑ **Empiricists: PEISOR Model & linkages**
- ❑ Trend & future scenarios

Two Approaches

- **Causal analysis**
 - ❑ Natural phenomena -> migration, crises, conflicts (violence)
 - 2nd phase: Homer-Dixon, Bächler
 - 4th phase: Oswald – Brauch - Dalby
- **Discourse analysis: climate change (chapter 4 of this volume)**
 - ❑ International security
 - ❑ National security
 - ❑ Environmental security
 - ❑ Human security

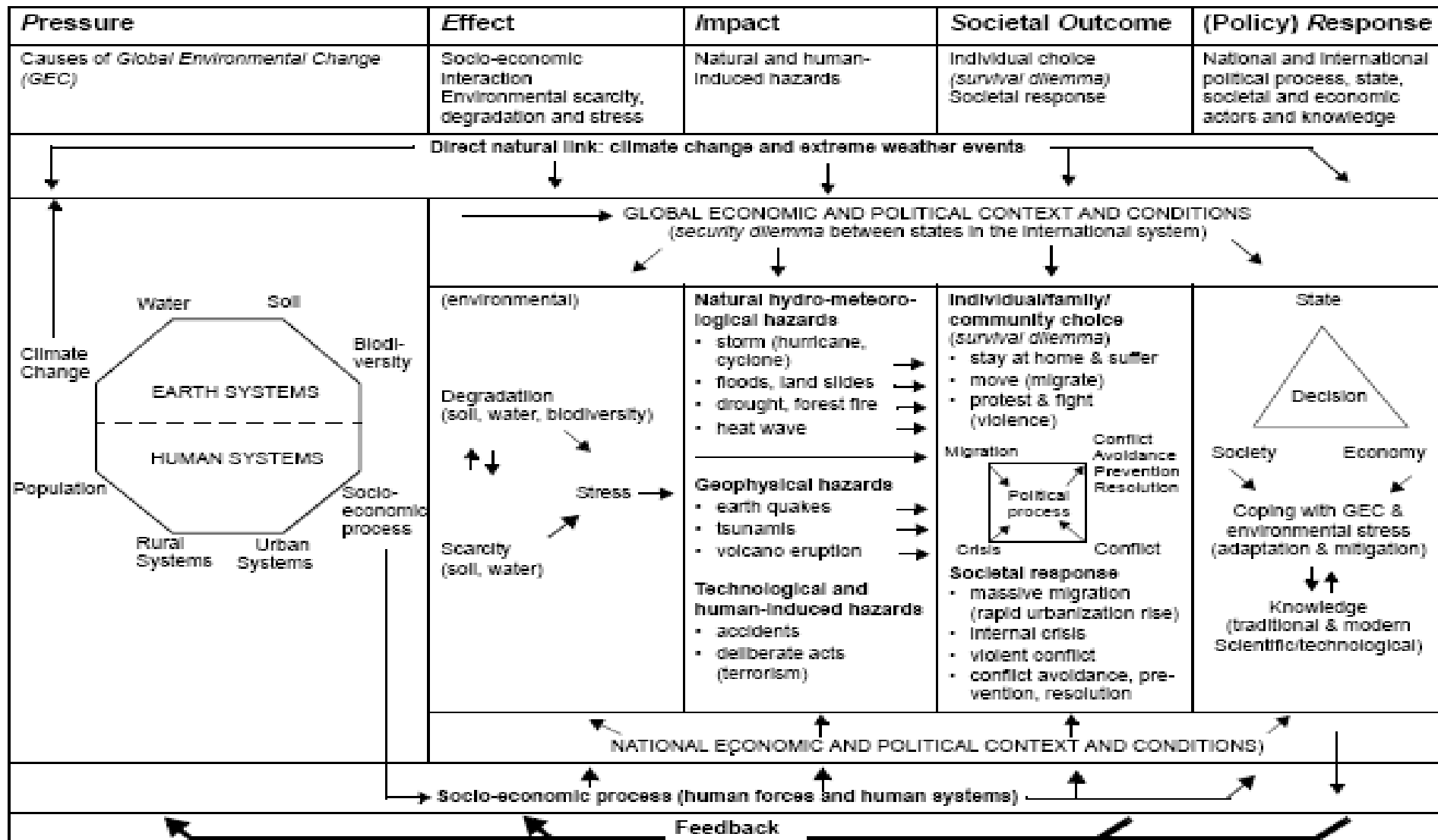
Objects of Security Analysis (Securitization)

- Physical Effects: e.g. temp, rise
- Impacts: Sectors & Regions
- Societal Effects (migration, crises, conflicts)

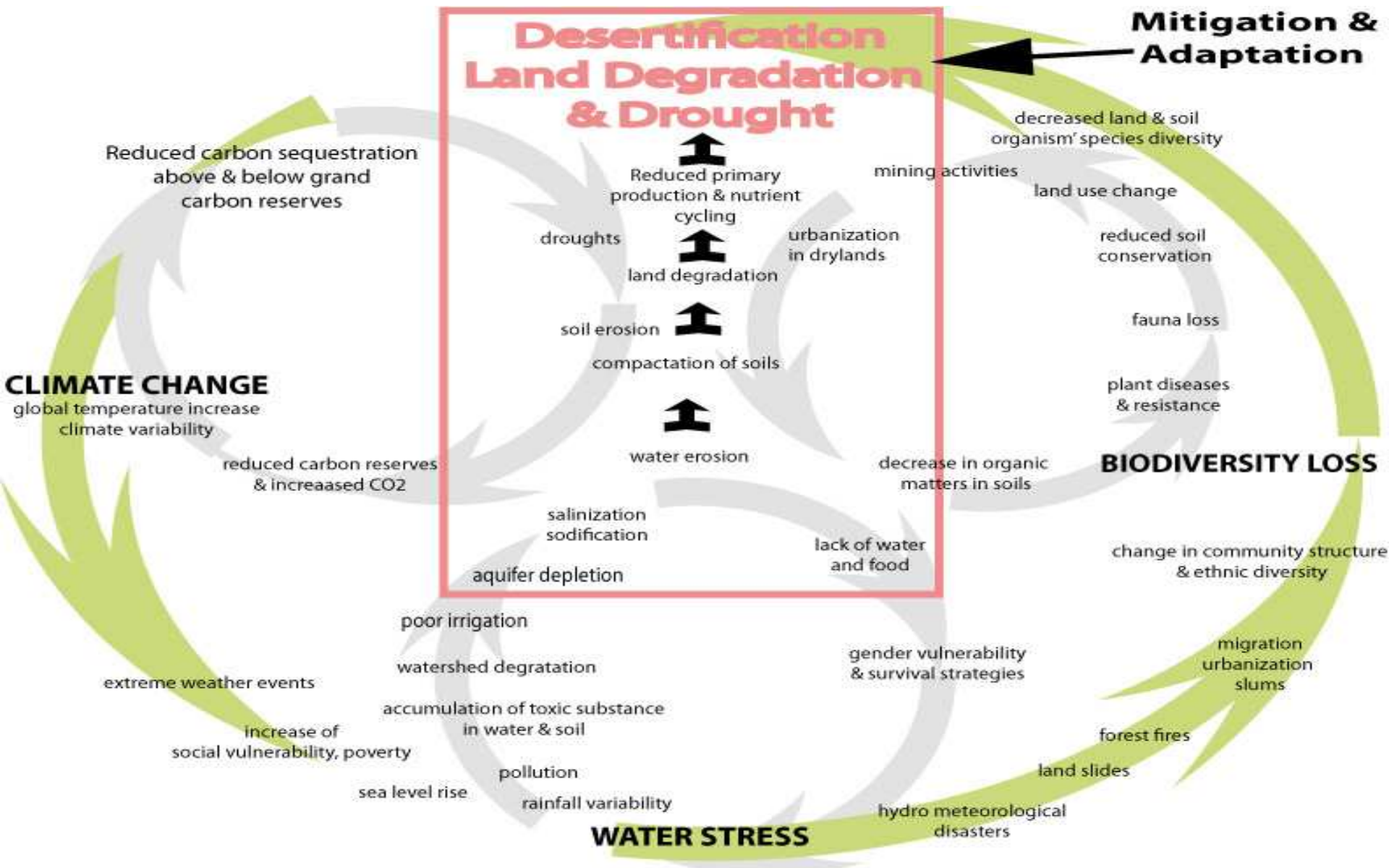
Whether they pose:

- **Objective Security Dangers**
- **Subjective Security Concerns**

8.1 Global Environmental Change & Impacts: PEISOR Model

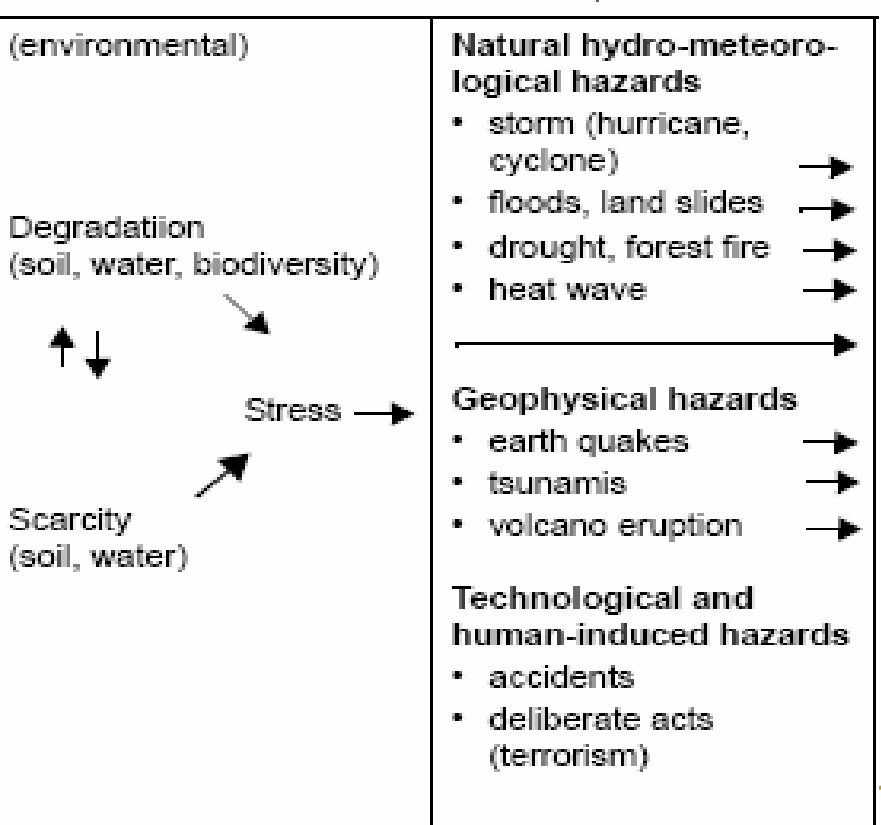


8.2 P: Pressure: Interactions of GEC



Effect	Impact
Socio-economic interaction Environmental scarcity, degradation and stress	Natural and human- induced hazards

Direct natural link: climate change and extreme weather



NATIONAL ECONOMIC AND POLITICAL

8.3. E: Effect & I: Impact

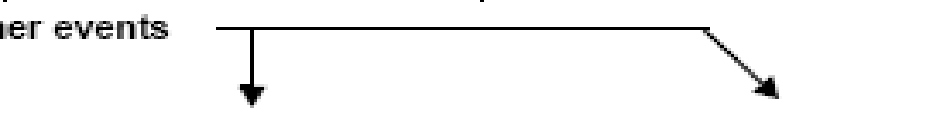
■ E: Environmental security debate of 1990s

- Toronto school
- Swiss school (ENCOP):
- **Soil scarcity > degradation > environmental stress**

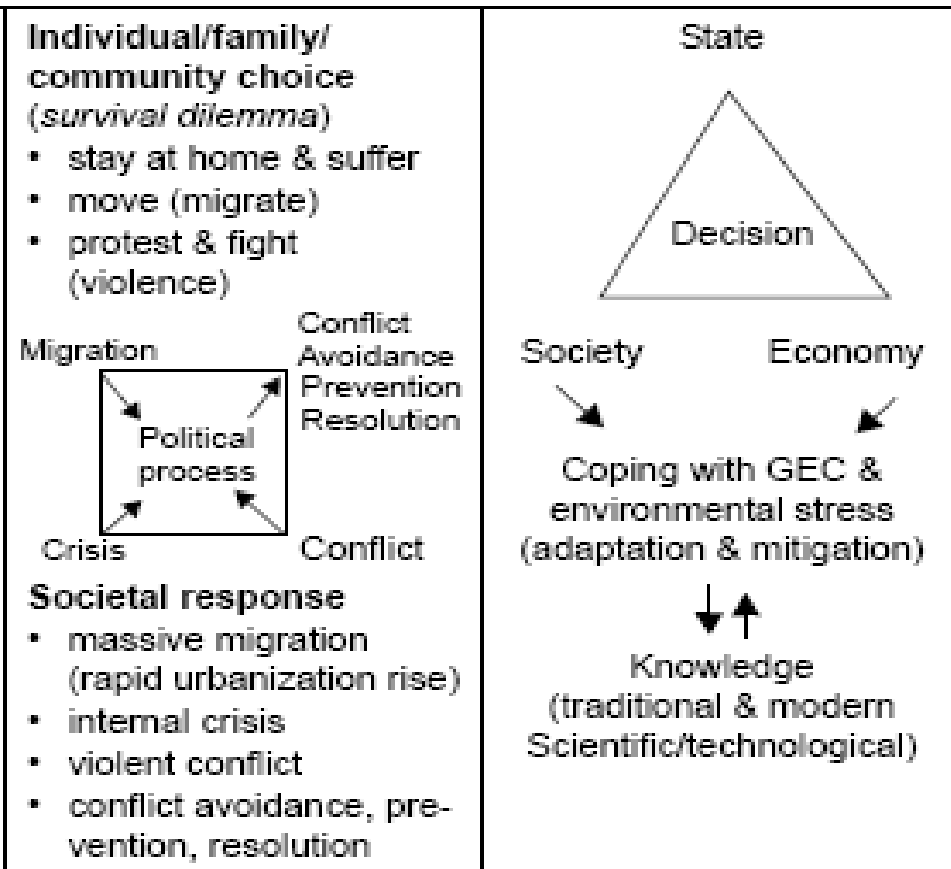
■ I: climate change -> extreme weather events

- Hydrometeorological hazards
 - **Drought (wind erosion)**
 - Heatwaves
 - Forest fires
 - Storms (hurricanes)
 - **Flash floods & landslides (wind & water erosion)**

Societal Outcome	(Policy) Response
Individual choice (<i>survival dilemma</i>) Societal response	National and international political process, state, societal and economic actors and knowledge



POLITICAL CONTEXT AND CONDITIONS
(sites in the international system)



8.4. SO: Societal Outcomes

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

8.5 R Policy Response to Security Dangers posed by Global Environmental Change:

Object

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

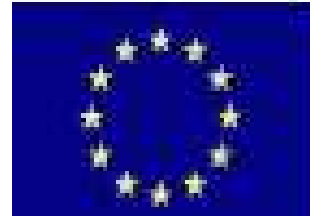
8.6. Chap. 4: Securitization of Global Environmental & Climate Change

- **Not they but „we are the threat“ of global warming**
- **Intersubjective approach: Security: what actors make of it**
 - ❑ **2007 was the turning point for the securitization of climate change**
 - February: IPCC Fourth Assessment Report
 - April: UN Security Council debate
 - June: WBGU-Report: impact on EU debate
 - October: Nobel peace prize for IPCC and al Gore
- **3 fold debate & discourse on climate change:**
 - ❑ **International Security:**
 - Goal: Strategies of conflict prevention by a proactive environmental, economic and development policy
 - ❑ **National Security:**
 - 2007: new military mission for US Department of Defense
 - ❑ **Human Security: HS Network, Greek presidency (5/ 2008)**
 - GECHS Project of IHDP: Social Vulnerability of poor & marginalized population groups

8.7. Discourse 1: Climate Change & International Security

- **BMU-Report 2002: Climate Change and Conflicts**
 - Goal: Agenda setting for IPCC
 - Coalition: Germany, Great Britain, Finland, Mexico
 - Focus: Small Island States, Bangladesh, Mexico, Egypt, MENA
 - OECD-Case studies: Bangladesh, Egypt, Tansania, Nepal, Fiji
- **WBGU-Report 2007-8: Security Risk Climate Change**
 - State-centred security concept
 - Physical effects of GCC may trigger 4 conflict constellations:
 - Climate-induced degradation of drinking water
 - Climate-induced reduction of food production
 - Climate-induced increase of storm and floods, drought and famine
 - Climate-induced migration

8.8. EU Paper: Climate Change & International Security (3/2008)



- ❑ **Climate change ... as a threat multiplier of existing trends, tensions and Instability, that overburdens fragile and conflict prone states and regions**
- ❑ **Seven international security threats from climate change:**
 - 1) Resource conflicts (Water, soil, food);
 - 2) Economic damage and risks for coastal cities;
 - 3) Loss of territory and border conflicts;
 - 4) Environmentally-induced migration;
 - 5) Situations of fragility and radicalization
 - 6) Tensions on energy supply
 - 7) Pressure on international politics
- ❑ **Regions, where these threats become manifest**
 - Africa, Middle East, South Asia; Central Asia, Latin America, Arctic.
- ❑ **Central challenge: Environmental Migration**
- ❑ ~~December 2008: Implementation paper of ESS (2003)~~
- ❑ **Roadmap Process: DG External Relations not DG Environment**



8.9. UN Debates on Climate Change and International Security

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

- <http://www.un.org/News/Press/docs/2007/sc9000.doc.htm>
- <http://www.un.org/News/Press/docs/2007/sqsm10949.doc.htm>

3 June 2009: UN General Assembly Resolution:

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

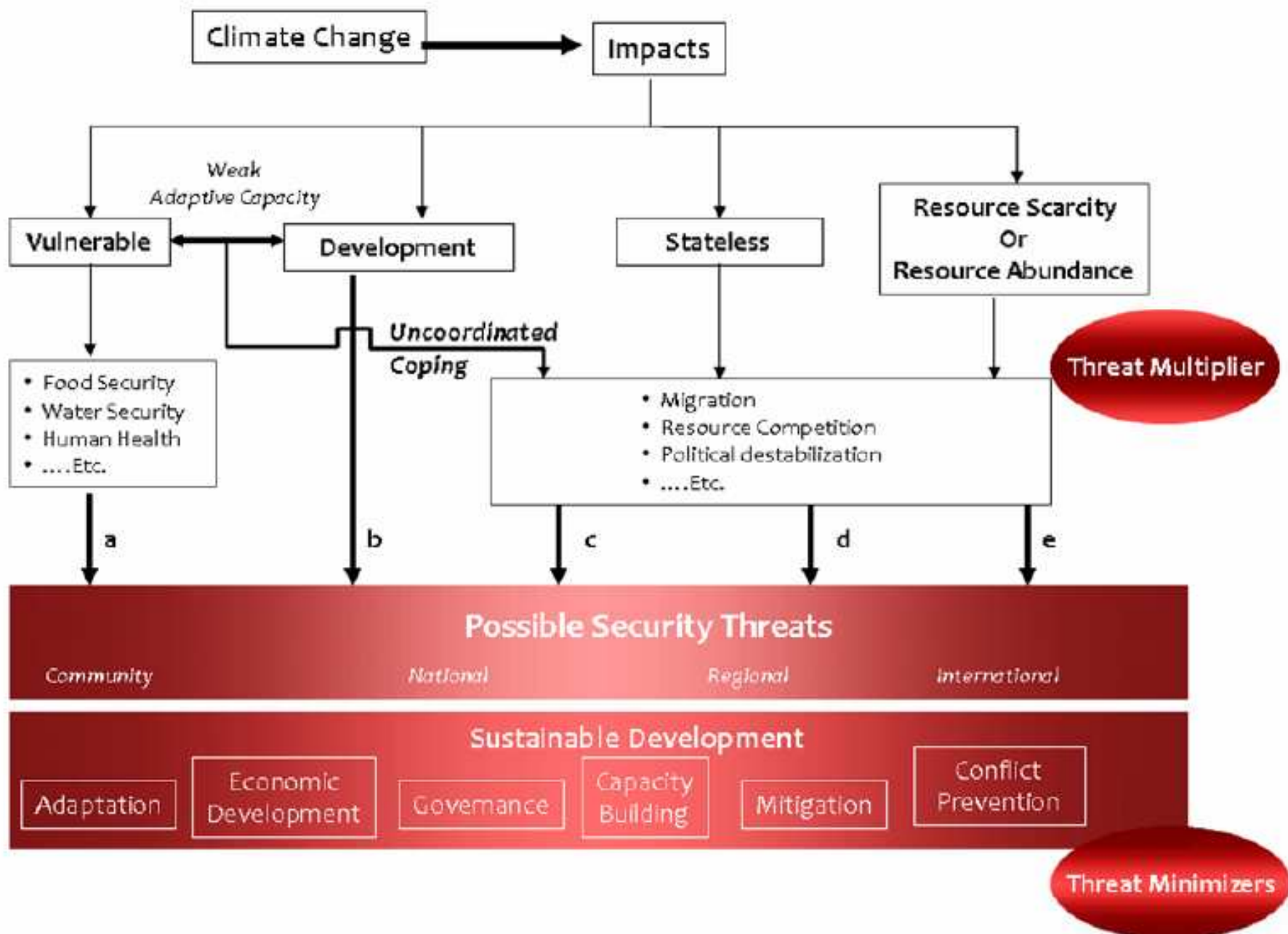
August-September 2009: submission by states (31 replies)

- http://www.un.org/esa/dsd/resources/res_docugaecos_64.shtml

11 September 2009: Report by Ban-Ki Moon

- http://www.un.org/ga/search/view_doc.asp?symbol=A/64/350

Threat multipliers and threat minimizers: the five channels



Source: United Nations Secretariat, based on submissions of Member States and relevant organizations.

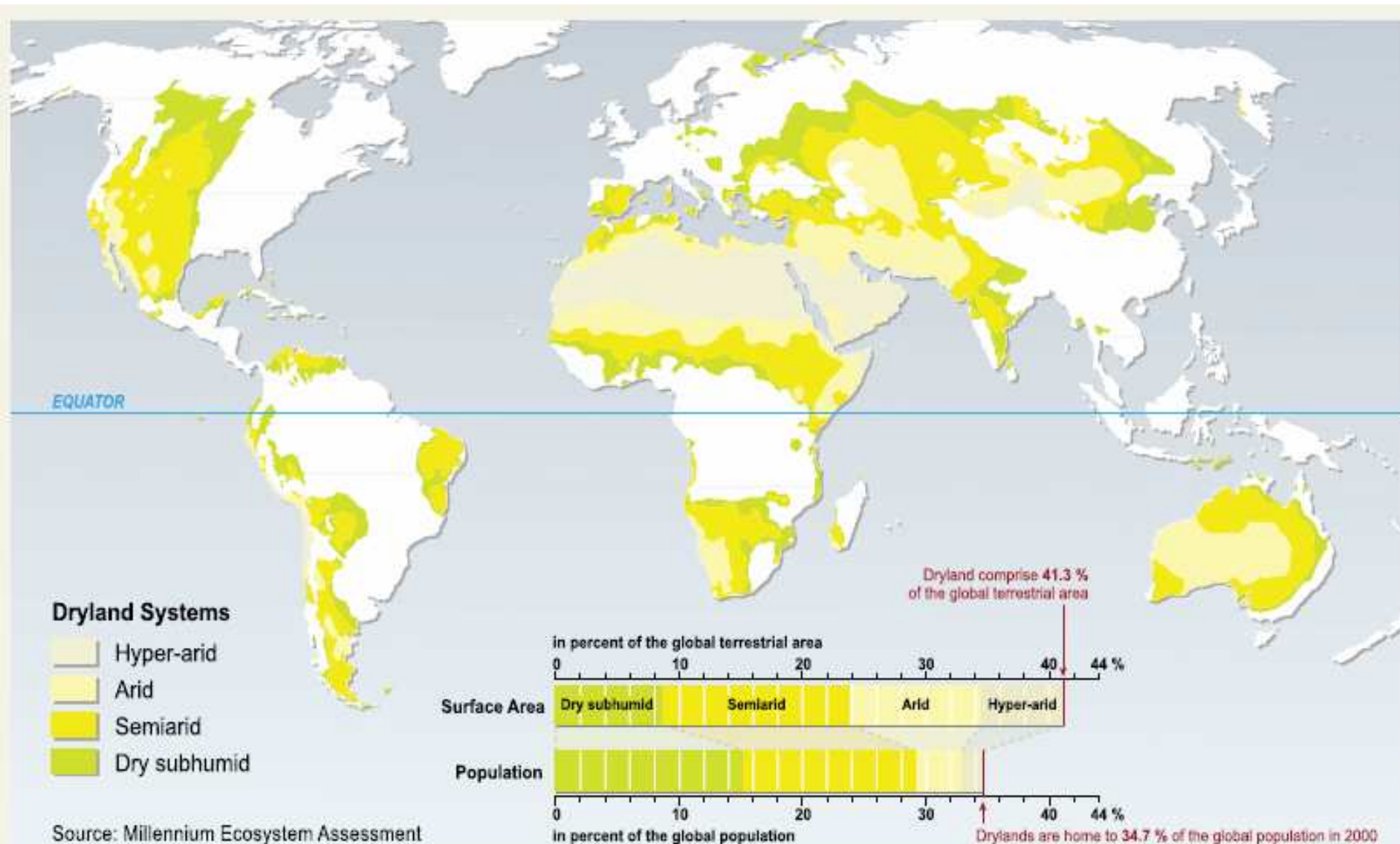
Part D: Securitizing the Ground: The Soil Security Concept (Overview)

- 9. Desertification, Land Degradation & Drought (DLDD)**
 - **Securitization of the Ground (Land and Soil)**
 - Food security, water security, soil security
 - Grounding Security: proactive security policy
 - **DLDD as a Security Danger: PEISOR Model**
 - From Knowledge to Action
 - Implementing Knowledge to Action
 - 10. Proposal for a Euro-Mediterranean Survival Pact
Linking „Virtual Water“ and „Virtual Sun“**
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9. Threefold Challenge: Desertification, Land Degradation and Drought (DLDD)

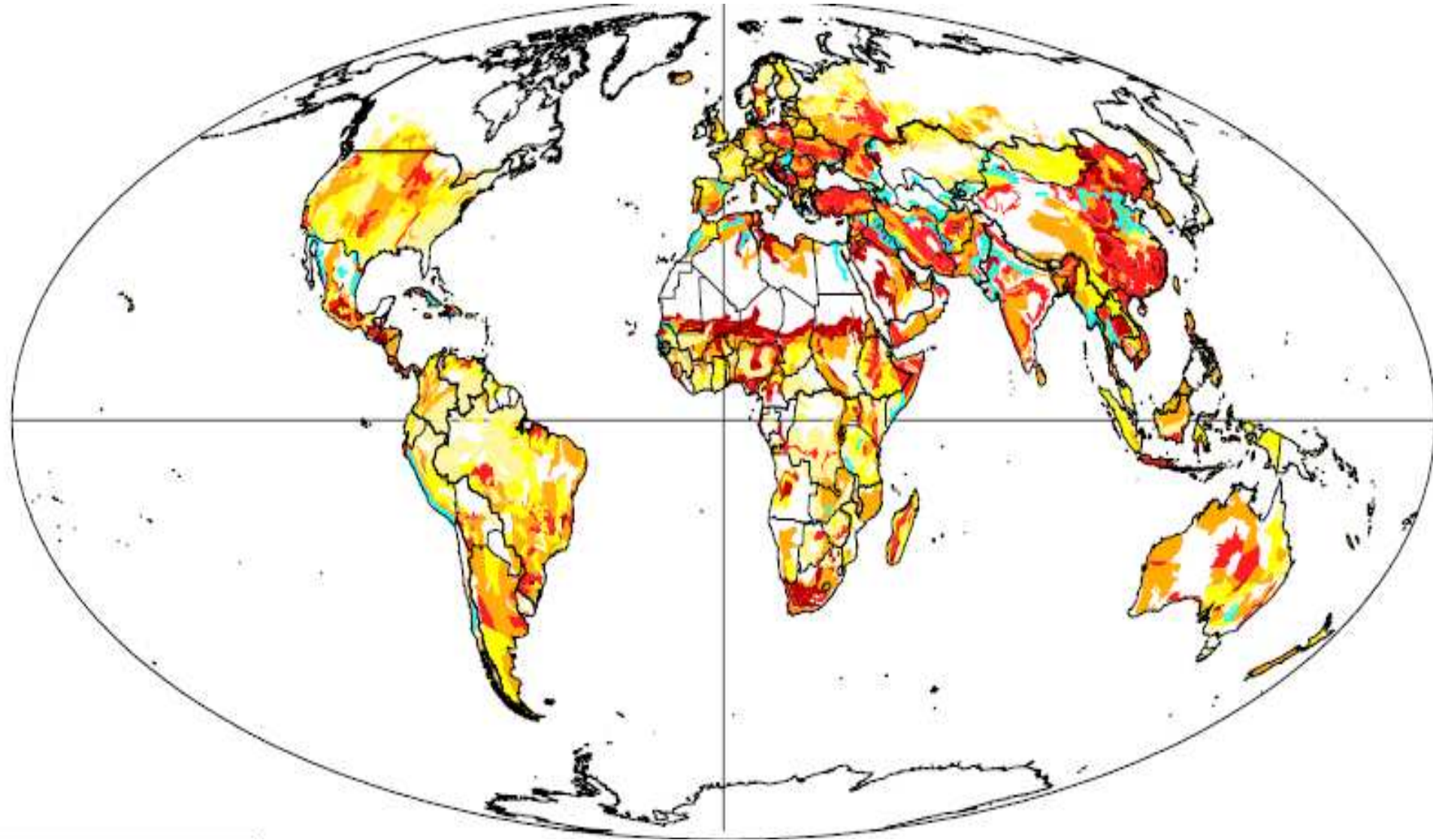
- **UNCCD (1994):** “desertification is caused by complex interactions among physical, biological, political, social, cultural and economic factors.”
- **UNCCD** dual task: (Art. 2) to “combat desertification” and “to mitigate the effects of drought”.
- **Land Degradation:** loss of environmental services or reduction of biological or economic productivity.
- **Land degradation** due to soil, water and wind erosion, fertility and biodiversity loss is prevailing in drylands affecting primarily marginalized people
- **Drought:** outcome of anthropogenic & climatic factors

9.1. Millenium Ecosystem Assessment (2005):



9.2.Global soil degradation (% affected area).

Source: WBGU (2006),GLASOD (1990)



9.3. Securitizing the Ground (Land, Soil) and Grounding Security

- ***Securitizing the ground*** creates wider global political awareness for DLDD and societal consequences.
 - Land as **territory**: classic **territorial security** of **states**
 - Ground as **soil**: new **soil security** concept of **humans**!
- ***Grounding security*** includes reactive and proactive short-, medium- and long-term strategies for mitigation and adaptation to soil insecurity & societal, environmental and economic consequences.
- Addressing both aspects of **soil security** with political process of **securitization of DLDD** and development of effective international strategies, national policies and local measures requires understanding of complex natural and societal interaction.

9.4. New Soil Security Concept:

Soil security that can be analysed from the perspective of state and human, gender and environmental security refers to a

- ❑ loss of soil capacity to regulate & store water
- ❑ the depletion of aquifers for drinking and irrigation that puts in extreme cases the survival of affected people at risk.

Soil security is threatened by

- ❑ the **spatial expansion of existing deserts**,
- ❑ the **severe degradation of soils** and related fertility and biodiversity losses due to processes of geophysical, wind and water erosion and
- ❑ **drought resulting in bad harvests and crop yield declines**. In developing countries DLDD has triggered severe and extended periods of famine affecting several billion people during the 20th century and causing the death of millions of people.

Soil security is achieved when efforts succeed

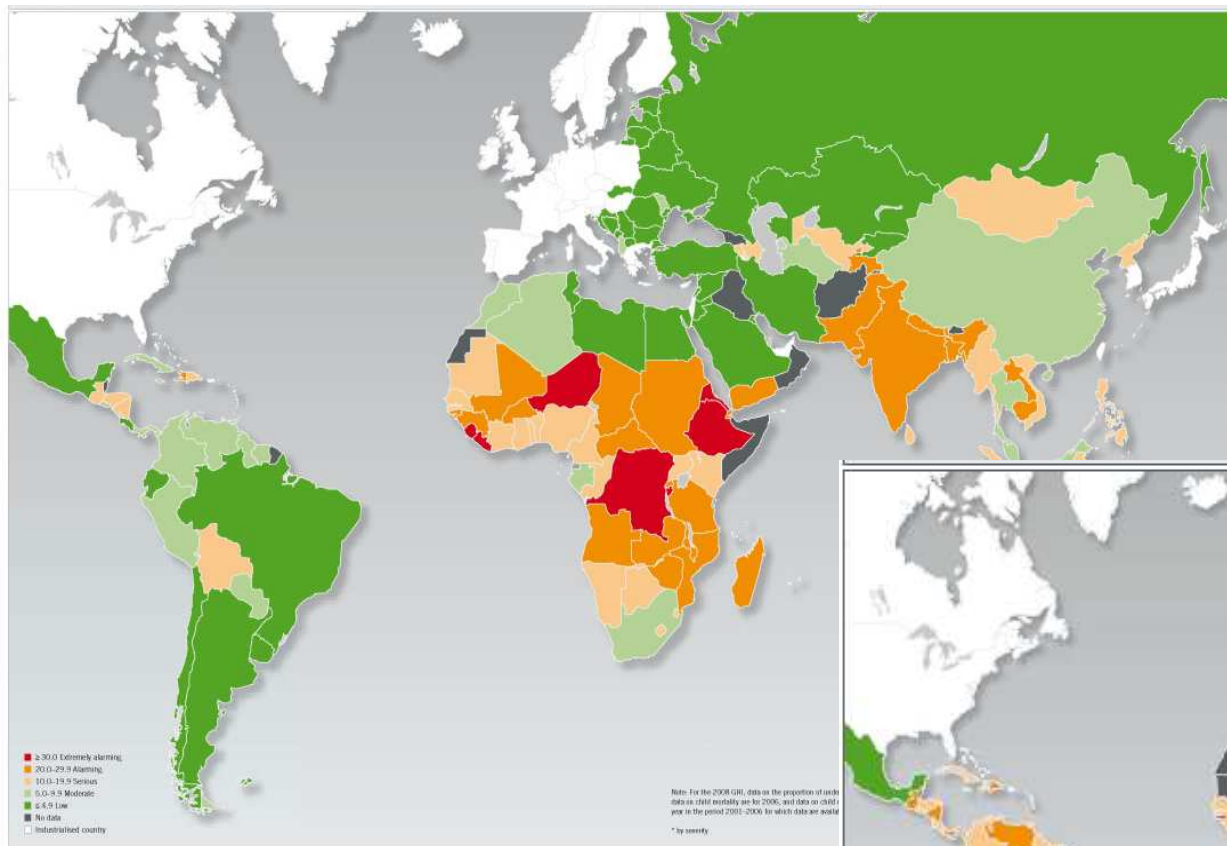
- ❑ **to conserve soil fertility**: contain land degradation and combat desertification and
- ❑ **when the consequences of drought are reduced by improving livelihood and human well-being of the people.**

9.5. Most severe droughts (1900-2008)

By the number of people killed on the country base			By the number of people affected on the country base		
Country	Date	Killed	Country	Date	Affected (million)
China P R.	1928	3,000,000	India	1982	300
Bangladesh	1943	1,900,000	India	2002	300
India	1942	1,500,000	India	1972	200
India	1965	1,500,000	India	1965	100
India	1900	1,250,000	India	Jun 82	100
Sov. Union	1921	1,200,000	China P. R.	Jun 94	82
China P R.	1920	500,000	China P. R.	April 2002	60
Ethiopia	May 83	300,000	India	April 2000	50
Sudan	April 83	150,000	China P. R.	June 1988	49
Ethiopia	Dec 73	100,000	China P. R.	Jan. 2003	48

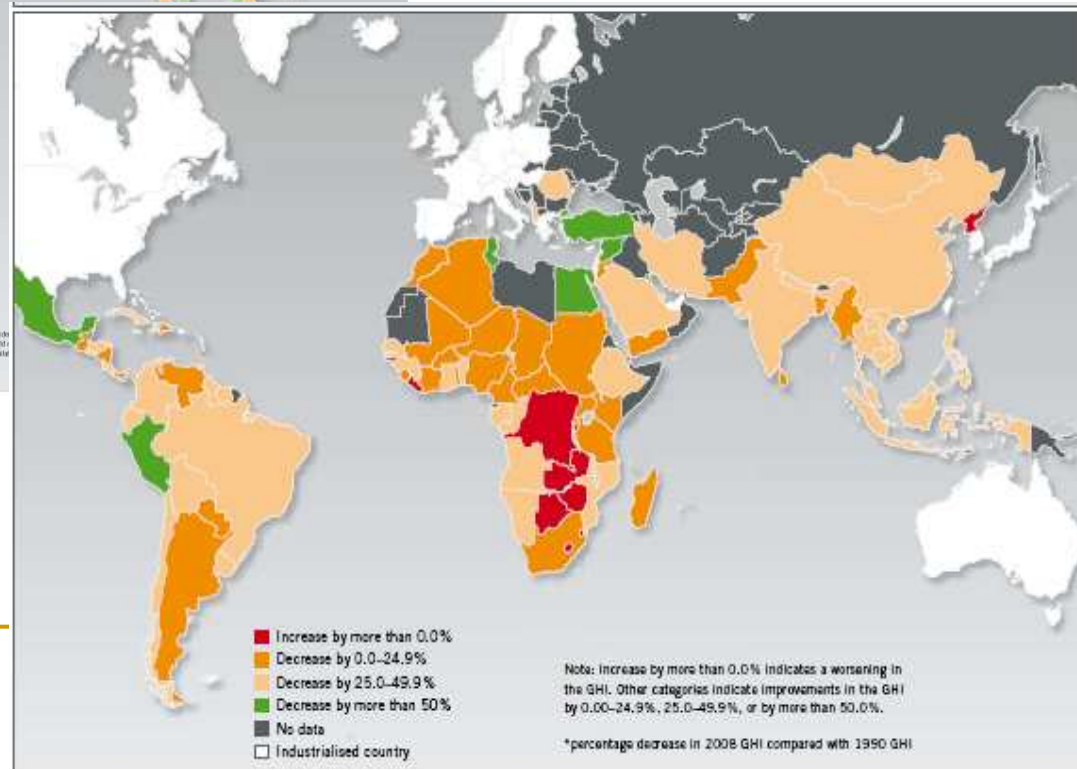
Source: EM-DAT: The OFDA/CRED International Disaster Database,
at: < www.em-dat.net > (created on 5 January 2009)

9.6. Global Hunger Index 1990-2008



← 2008 Global Hunger Index.

Country progress in reducing the Global Hunger Index between 1990 and 2008 ↓



Source: IFPRI, 2008

9.7. Migration currents

Distance no object

Some of the world's more important current migration routes



Sources: National Public Radio;
The Economist **Sou**

Source: <<http://www.economist.com/images/20080105/CSR900.gif>>

9.8. From Knowledge to Action: Addressing Causes & Security Impacts of DLDD

- Requires a political strategy to manage complexity of nature-human interactions where emerging global, regional & local risks are linked to multiple and often simultaneous crises.
- Such a response necessitates the **involvement of the state, the society, the business and academic community**.
- **Adopting proactive response strategies, policies and measures** (best practices, traditional & modern scientific knowledge).
- Good governance, scientific recognition & public awareness call for **anticipatory learning & proactive policies to mitigate societal impacts of complex nature-human interactions to prevent that trends become a reality**.

9.9. From Knowledge to Action

- Soil security concept highlights **multiple causes, effects, impacts and societal outcomes** of soil insecurity & contribute proactive policies.
 - **Emerging security challenges** of DLDD require **extraordinary proactive policy measures** to counter worst case developments in vulnerable hotspots.
 - **Cost of inaction** or late policy response are much higher than acting early by launching proactive strategies, policies and measures.
-

9.10. Implementing Knowledge to Action Requires Extraordinary Policy Measures for Enhancing Soil Security

- ❖ **Supplying More Environmental Services and Food with Less Resources**
 - ❖ **Transition to Alternative Livelihoods and Sustainable Economy**
 - ❖ **Responding to and Coping with Environmentally-Induced Migration**
 - ❖ **Avoiding Environmentally-Induced Conflicts**
-

9.11. Supplying More Environmental Services & Food with Less Resources

- **Optimized territorial governance** of ground water, water harvesting; land & basin managements enhance or restore soil fertility; soil drainage and water-saving irrigation techniques reduces salinity & water-logging problems, maintains crop yield.
- **Produce food for growing population** requires efficiency increase in agriculture: a) change of human diet, b) reduction of animal proteins can feed more people with less resources.
- **Plastic greenhouse technology conserves** residual humidity, uses dew for irrigation and reduces plagues, organic fertilizer.
- **Control of wind & water erosion & of moving sand dunes** involves trees, shrubs and grasses, with improved irrigation and soil management techniques.
- **Improve the quality & quantity of water, energy efficiency and renewables** from solar, wind and waste play a crucial role.
- ~~Tropical deserts have **highest solar radiation**: generate solar energy for desalinization of brackish groundwater or sea water.~~

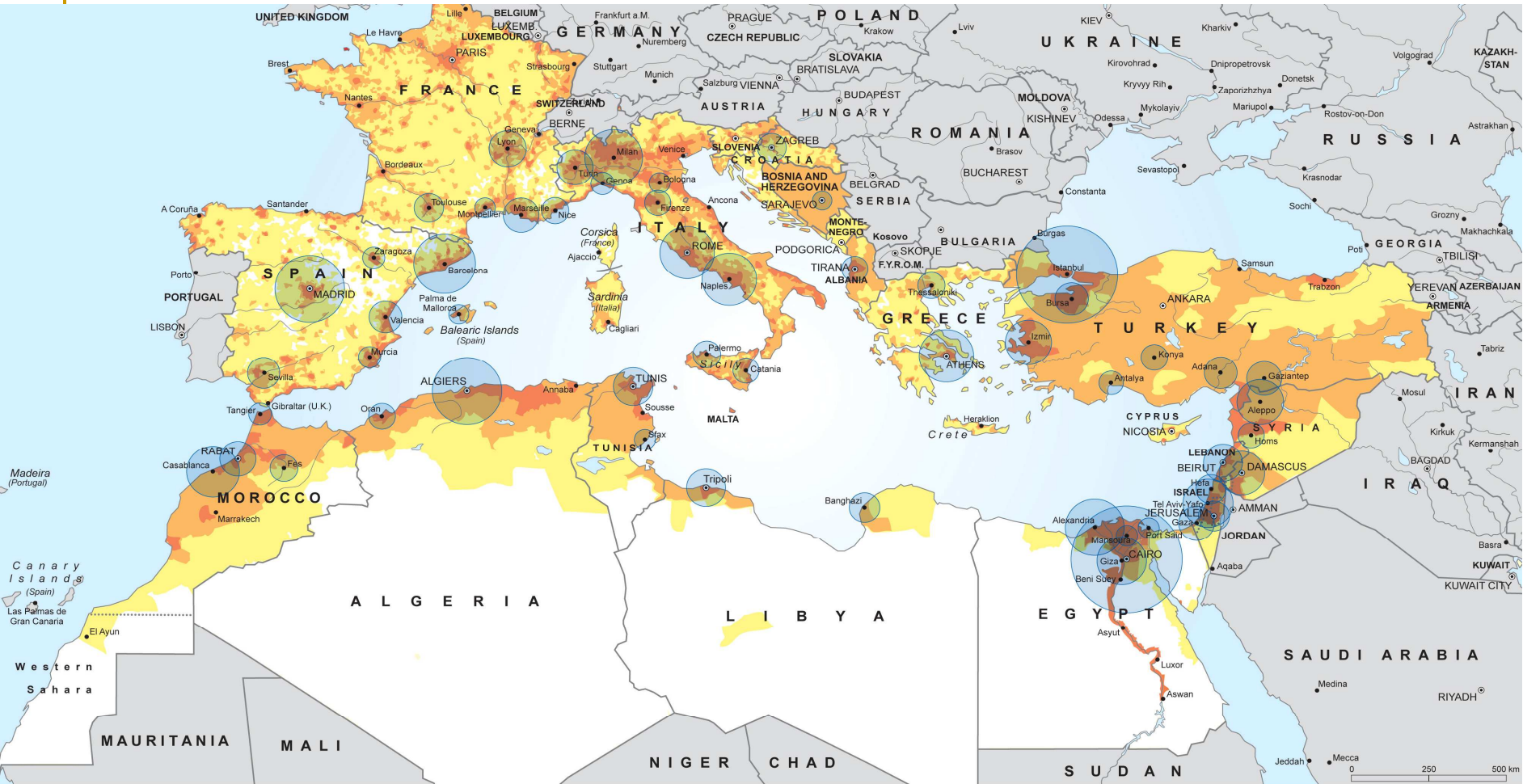
9.12. Responding to & Coping with Environmentally-Induced Migration

- The most cost-effective and humane possible policy responses to environmental migration are to intervene at the earliest possible stage.
- Sustainable development assistance must engage the most vulnerable to strengthen the adaptation capacity of communities affected by DLDD, the more so in the context of climate change.
- Community stabilization through participatory governance should involve diasporas and returning migrants to optimize their financial resources.
- Urban authorities should be prepared to limit negative impacts on the environment due to the influx of population.
- The expected additional flow of environmental migrants requires capacity building to reduce the push factors of population movements and to cope with irregular migration, including human trafficking.

9.13. Avoiding Environmentally-Induced Conflicts

- **Joint North-South anticipatory learning**, peace building, search for action-oriented strategies to cope with root causes & socio-econ. implications.
 - **Survival pact**: linking the *virtual water* through food imports with the *virtual sun* or renewable energy exports through partnership building.->TREC
 - **Functional cooperation against soil erosion**, water scarcity & pollution, employment in rural areas and in intermediary urban networks.
 - **Empowerment of grassroots stakeholders** enhance human and societal security, expand adaptation measures and soil security & reduce costs of coping with consequences.
-

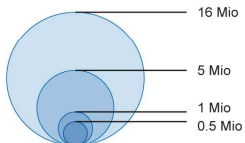
10. Case Study: Desertification in the Mediterranean



Environment and Security in the Mediterranean: Population

Population in urban centre
(Estimation where data not available)

0 5 50 200
Inhabitants per km²



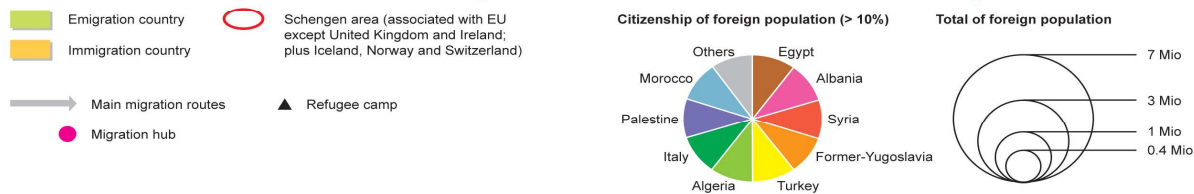
Sources: Center for International Earth Science Information Network (CIESIN),
Columbia University; World Gazetteer



10.1. Migration in the Mediterranean



Environment and Security in the Mediterranean: Migration



Sources: Frontex, Eurostat, Plan Bleu, Migreurop, Philippe Rekacewicz

10.2. Euro-Mediterranean Survival Pact Proactive Policies for Coping with Climate-Induced Migration in the MENA

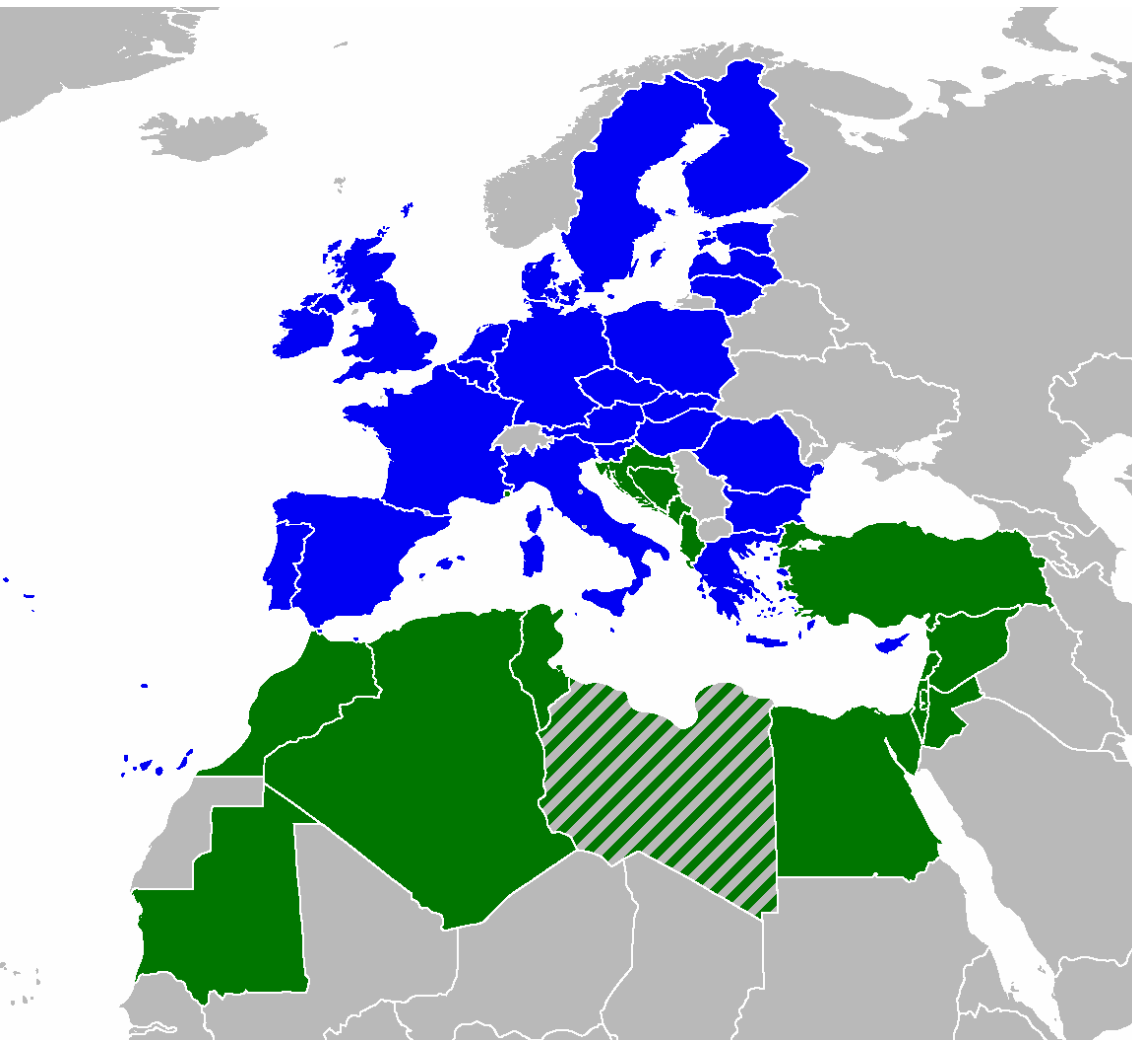
- Trans-Mediterranean migration has been securitized by EU decision-makers: motivation for Barcelona process (1995) & Mediterranean Union (13 July 2008).
 - Two EU policy strategies on migration overlap:
 - **short-term policy response** (FRONTEX, tightening of asylum laws, justice & home affairs [Tampere, Dublin, The Hague])
 - **longer-term proactive development & environmental security strategies** that aim at containing and overcoming causes for future climate-induced migration aiming at a 2°C world by 2100 what requires a major decarbonisation of the European and the world economy by 2050 in the post-2012 regime.
 - **Strategy for development of drylands: Mediterranean Union Solar Initiative & Desertec Industrial Initiative**
-

10.3 Proposed MEH-SEC Initiative within Union for Mediterranean

Model: ENVSEC Init.
(Central Asia, Caucasus, Balkans)

Mediterran. Environmental & Human Security Initiative

- Address longer-term environmental dimension of human security posed by GEC: water, soil & climate change
- Address causes & regional impacts of GEC
- **Framework of the Union for Mediterranean (UfM)**
- Partners: MU (leader), EU, UN, UNEP, UNDP, OSCE, NATO, Arab League, WMO, IPCC



10.4. Tasks of MEH-SEC

- **MEH-SEC** should address soft non-military, environmentally-induced security threats, challenges vulnerabilities and risks for the Mediterranean that are projected to evolve by 2025, 2050 and 2100 and that cannot be solved with military means.
 - They can only be overcome by **forward-looking, proactive, functional cooperation that requires knowledge** (regional climate change scenarios for the Mediterranean: Mediterranean climate impact assessment).
 - **Initiative should coordinate global & regional organizations:**
 - to analyse, assess available research and develop joint cooperative adaptation and mitigation measures
 - to develop cooperative measures dealing with societal consequences, including environmentally-induced forced migration that may lead to hunger & food riots, domestic conflicts & only in the worst case in violent conflicts.
 - **Goal: preventive diplomacy and conflict avoidance by addressing root causes of conflicts**
-

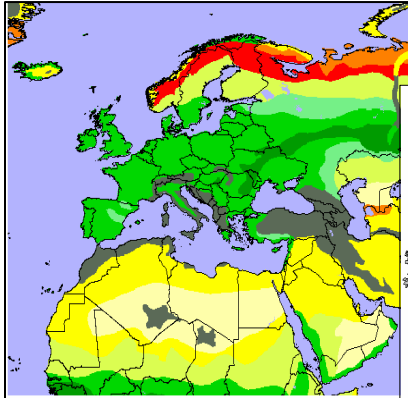
10.5. Solar Electricity Generating System - SEGS, California, USA (354 MW, since 1985) ANDASOL 1, Spain (50 MW, 7 h storage, 2009)



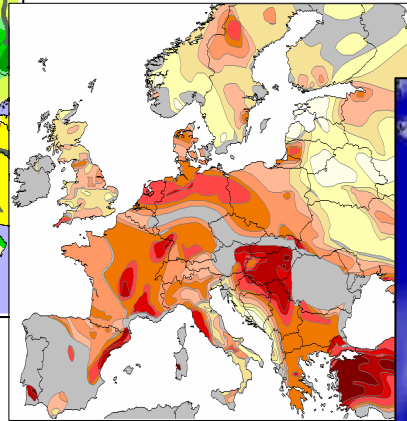
10.6. Renewable Energy Potentials in EU-MENA

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

Biomass (0-1)

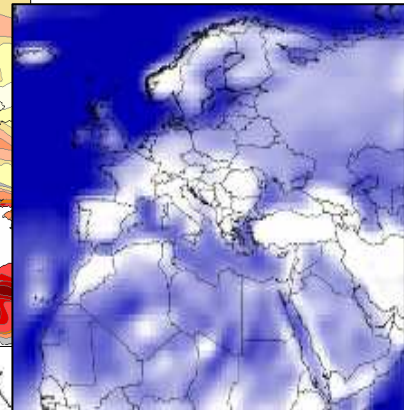


Geothermal (0-1)

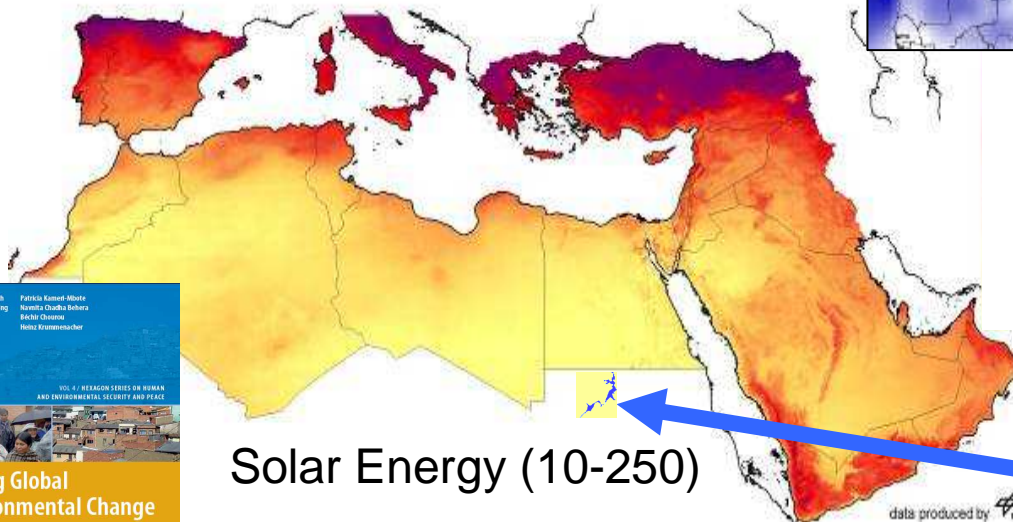
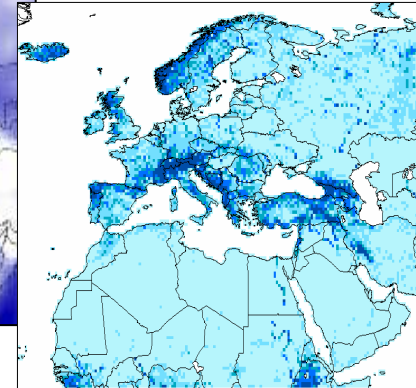


in brackets (Electricity in GWh/km²/a)

Wind Energy (5-50)



Hydropower (0-50)



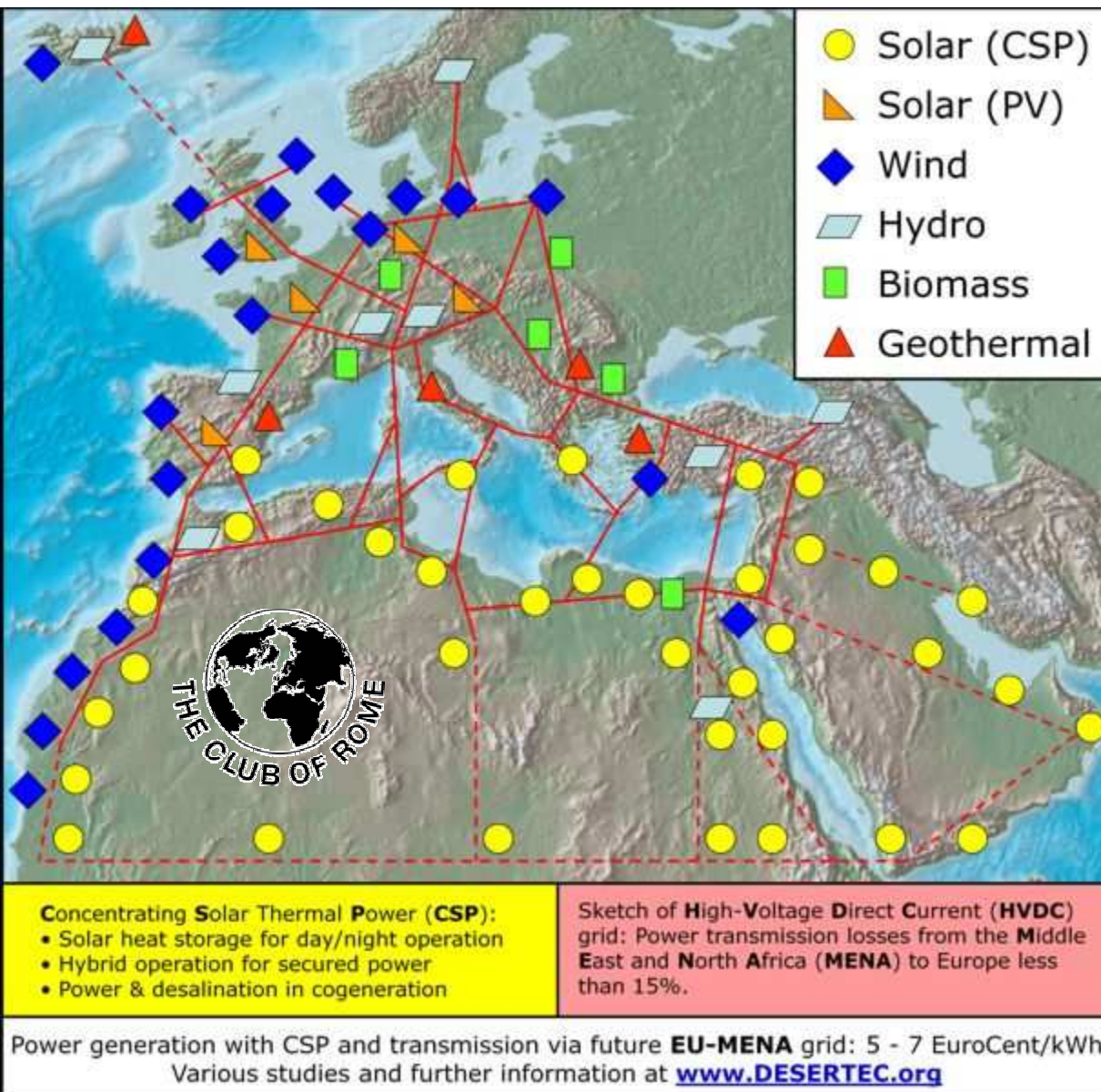
Solar Energy (10-250)

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

data produced by

www.dlr.de/tt/med-csp

10.7. Mediterranean Renewable Energy Potential

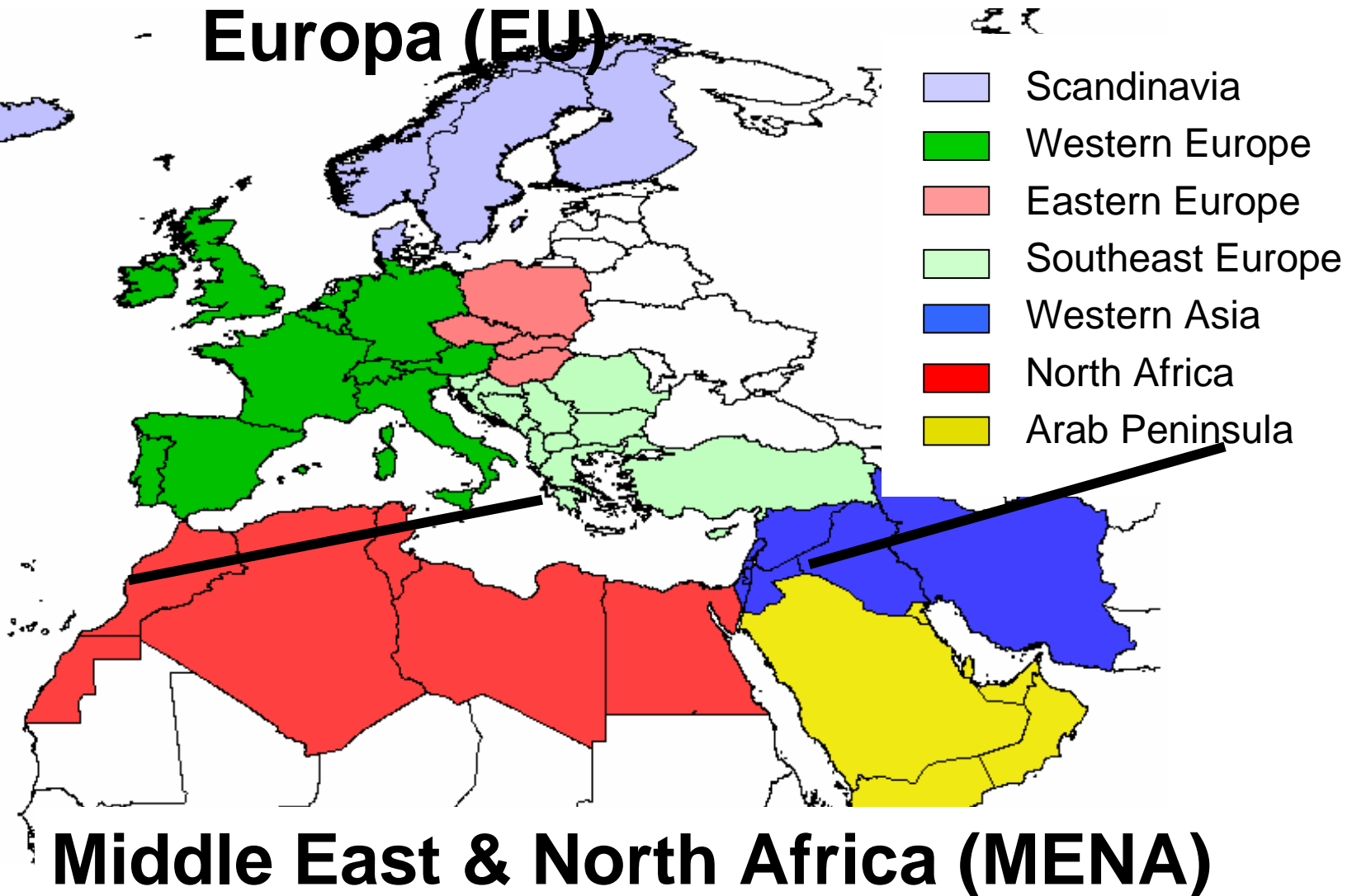


Trans-Mediterranean Renewable Energy Cooperation (**TREC**) is an initiative that campaigns for the transmission of clean power from deserts to Europe.

Since 2003 TREC has developed the **DESERTEC Concept**.

10.8. TREC studied over 50 countries

Europa (EU)



Middle East & North Africa (MENA)

Three studies were commissioned by BMU. MED-CSP and TRANS-CSP studies (2004-2006). AQUA-CSP study: solar desalination was completed by end of 2007.

10.9. DESERTEC Concept & Technology

- **DESERTEC concept:** less than 0.3% of desert of MENA region, **solar thermal power plants** can generate enough electricity and desalinated seawater for current & future demands in EU-MENA.
- **High solar radiation outweighs transmission losses from MENA to Europe. Solar thermal power plants in MENA are more economic than in South Europe.**
- Solar & wind power can be distributed in MENA and transmitted via **High Voltage Direct Current (HVDC)** transmission lines to Europe with transmission losses of 10-15%. **Loss of power during transmission can be limited to 3% per 1000 km.**
- **Solar thermal power plants (Concentrating Solar Thermal Power, CSP).**
- **Use mirrors to concentrate sunlight and create heat to drive steam turbines and electricity generators. Excess heat from additional collectors can be stored in tanks of molten salt & used to power steam turbines during the night or when there is a peak in demand.**

10.10. Desertec Vision: An Intercontinental Mega Project

An Initiative of



TREC
Clean Power from Deserts



10.12. Survival Pact for the Mediterranean: Linking food and renewable energy

Need of political framework for trust & cooperation

Political thinking on co-development based on partnership beyond the fear of a “*food*” & “*energy*” *weapon*.

Financial incentives for linking food and energy.

Renewable energies have a threefold potential:

- for a long-term *sustainable energy policy* in line with climate obligations for both South and North;
 - for creating *sufficient revenue* for other sustainable development projects & imports of *virtual water*;
 - for reducing the competition over scarce oil and gas resources (avoid: *resource control conflicts*).
-

10.13. “Virtual Water” & “Virtual Sun”

- **Tony Allan:** *Virtual water* is water embedded in water intensive commodities (e.g. grain).
- MENA region imported 20% as virtual water by 2000. Proportion will rise to 50% by 2050.
 - Virtual water reduces local water deficits. Problem can be solved by exporting virtual water (cereals, food from Europe to MENA region)
 - MENA countries need foreign income and must overcome the fear that *food as a weapon*.
- “*Virtual sun*” is the sun embedded in forms of renewable energy that can both solve energy demand (including for desalination of drinking water) & can be exported as electricity to the North via long-distance cables and as hydrogen (alternative fuels for transport system of the 21st century with low CO2 emission).
- **Constraint:** Thinking in terms of energy security (supply security) due to oil shocks of the 1970s, 1980s that energy can be used as a weapon against economies of the North.

10.14. Survival Pact: Component of a Global Partnership for Sustainable Development

- Pragmatic perspective: multilateral cooperation can solve security challenges posed by GEC impacts.
- A Euro-Mediterranean Survival Pact to address the long-term challenges of GEC: develop cooperative strategies combining goals for a sustainable development via
 - a sustainable energy policy that contributes to *su-stainable economic development* in South & North
 - a sustainable agricultural policy that counters the *poverty* and market *driven* processes of desertification
- Euro-Mediterranean Survival Pact requires:
 - *Science and knowledge transfer* on renewable energy technologies (e.g. technical training in MENA area)
 - Market incentives (Kyoto mechanisms, CDM)
 - Financial framework: Desertec Industrial Initiative
- Survival Pact: Regional Partnership for Sustainable Development Strategies based on comparative advantages, by linking 2 essential commodities: food (virtual water) and solar energy (virtual sun).

10.15. Achieving Environmental, Human, National. International, **Water**, Food and Energy Security

- Long-term proactive policy responses to climate change impacts are possible and needed.
- Vision of Survival Pact for sustainable codevelopment
- UfM & Solar Plan offer policy framework for developing renewable energy potential in the MENA region.
 - Desertec Industrial Initiative offers a financial, technological and economic framework.
- Linking virtual water & virtual sun achieve these goals:
 - reduce GHG emissions (environmental security)
 - satisfy food import needs (human and food security)
 - Reduce the resource competition over control and access to oil and gas (economic, national & international security).
- Realize a policy of sustainable peace with sustainable development

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SECURITIZING THE GROUND, GROUNDING SECURITY



UNCCD

United Nations Convention to Combat Desertification



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