



**Department of Geography &
Environmental Studies**



14 March, 2011, 1:30-3:00, A220 Loeb (Seminar)

Environmental Change, Security and Migration: Towards Sustainable Transformation

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Chairman, Peace Research and European Security Studies (AFES-PRESS)
Editor, Hexagon Series on Human, Environmental Security and Peace

Global Environmental Change Environmental Hotspots in North Africa and in Mexico Proactive Policies towards a Sustainable Transformation: A DESERTEC Vision for North America & NAFTA



**UNITED NATIONS
UNIVERSITY
UNU-EHS**
Institute for Environment
and Human Security



1. Reconceptualization of Security since 1990

- **Security concept** has been reconceptualised and security goals were redefined globally since 1990 due to
 - a) end of the Cold War in 1989 with fall of the Berlin Wall,
 - b) the process of globalization and
 - c) emerging impacts due to Global Environmental Change.



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



29 August 2005: **Hurricane Katrina**: 1838 deaths (official)
Securitization of 9/11 and nonsecuritization of GEC & climate change impacts

1.1. Changing Security Concepts

This has resulted in a

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

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

1.2. Environmental & Human Security

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

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

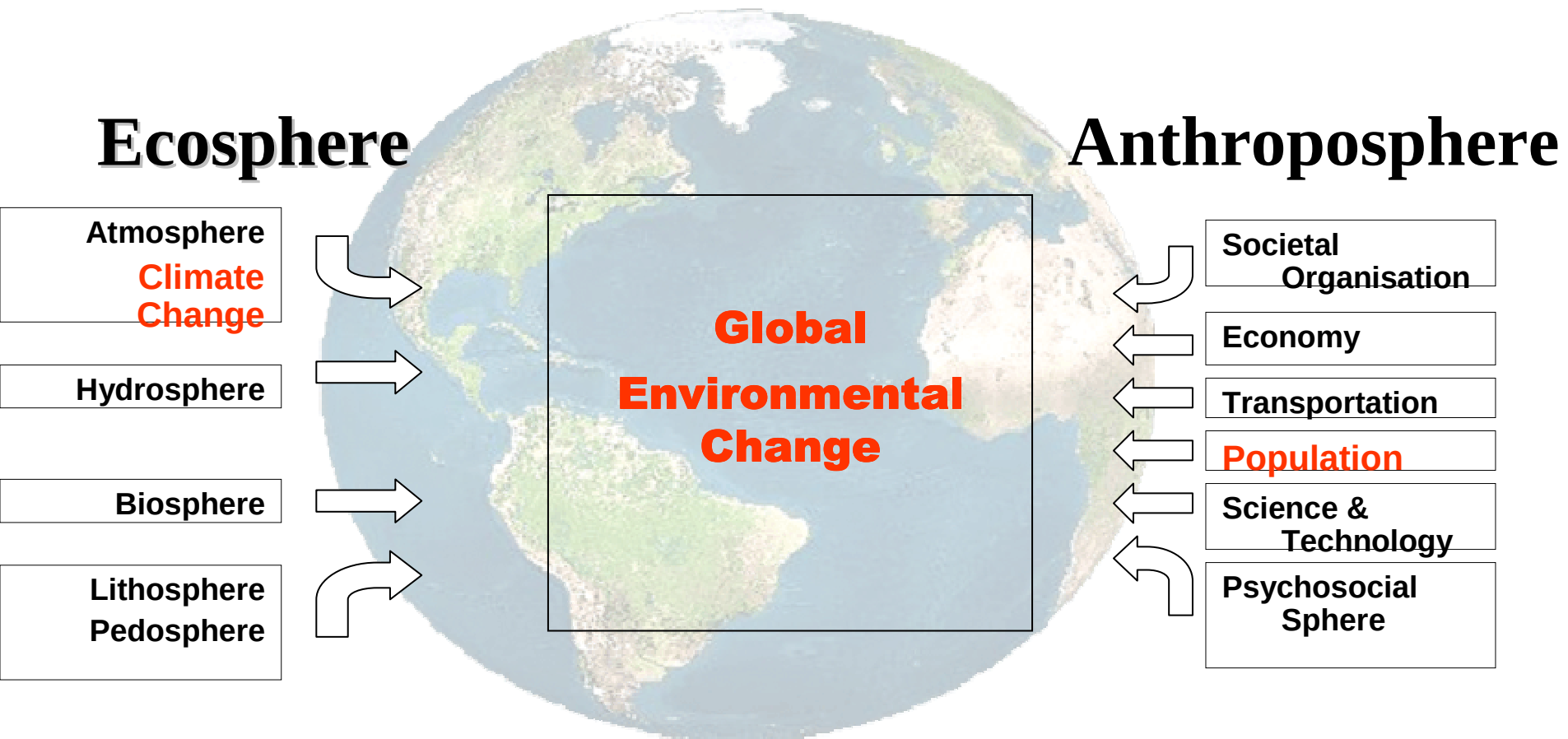
Canadian and British contributions:

Human security: Canada: founding member of Human Security Network, tabled „human security“ & responsibility to protect to UNSC (Axworthy)

Environmental security: Toronto Group, Th. Homer-Dixon (1991-2000)
work of Simon Dalby (ecogeopolitics and political geoecology)

Climate Security: UK, M. Beckett, 17.4.2007: tabled climate change to UNSC

2. Security Challenges of Global Environmental Change



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

3. Security Risk Climate Change:

3 security debate & discourses

Climate change & intern. security debate/discourse

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

Climate change & national security debate/disc.:

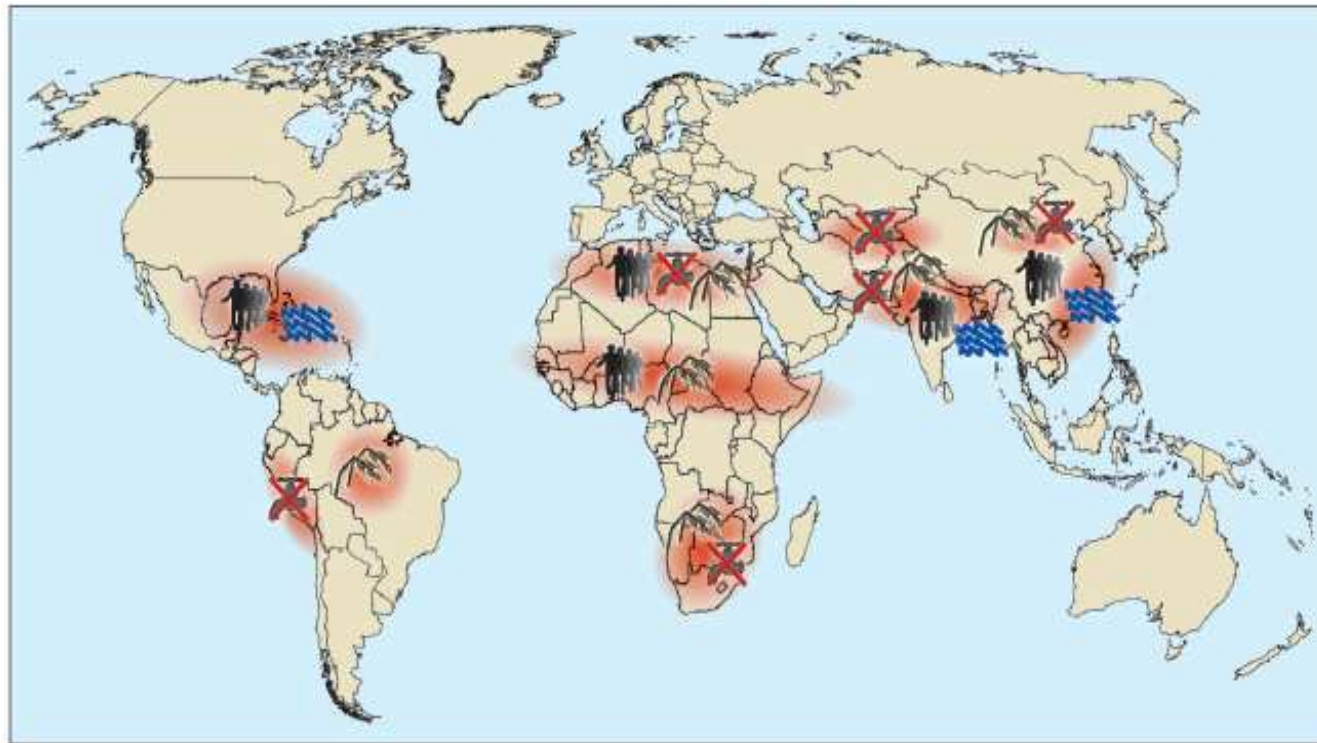
- **US studies:** CNA, CSIS, NIC (CIA), NSS 2010

Climate change & human security debate/discourse

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

4. Regional Environmental Hotspots (WBGU 2007): MENA & Caribbean

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

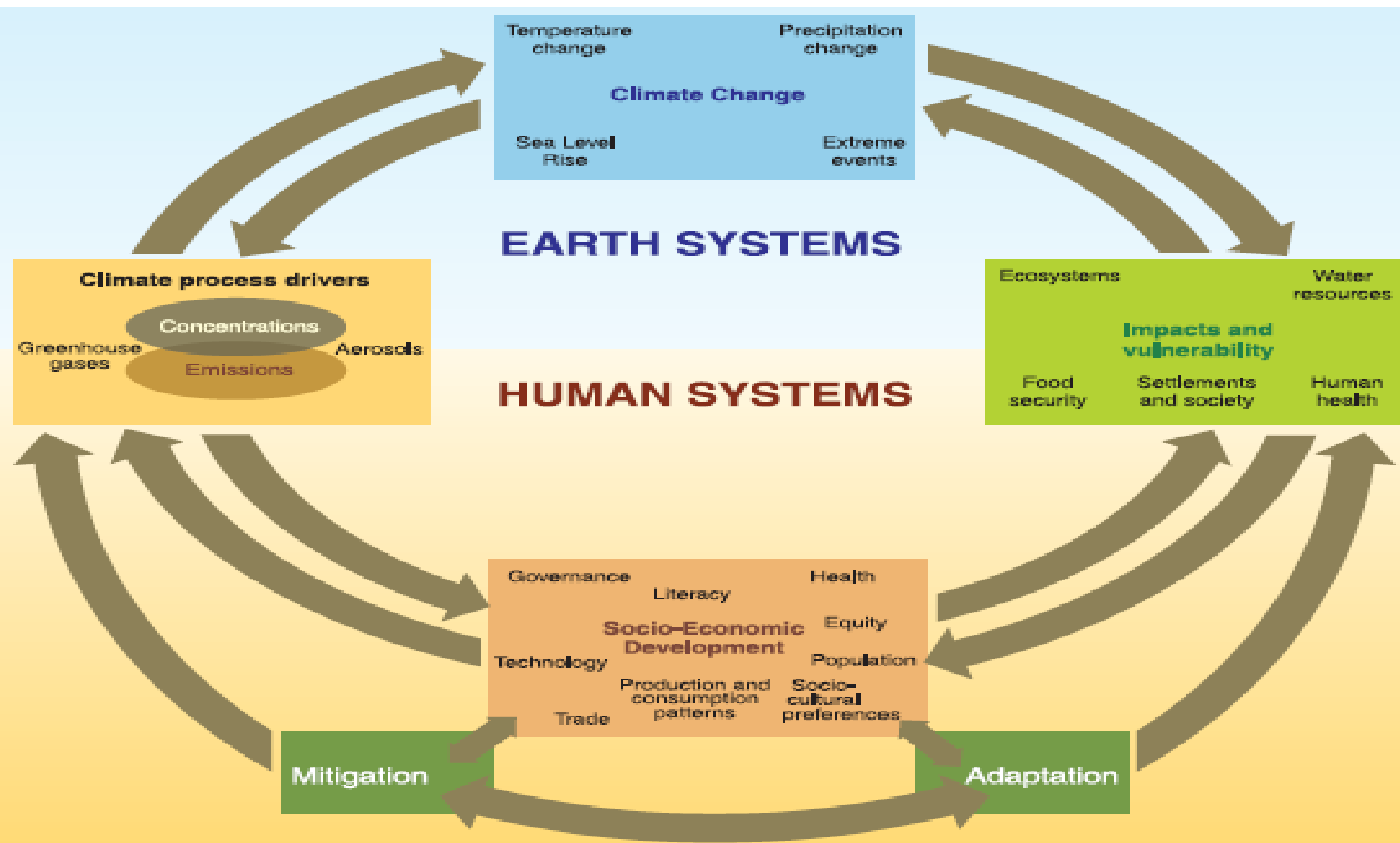
4 conflict constellations

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

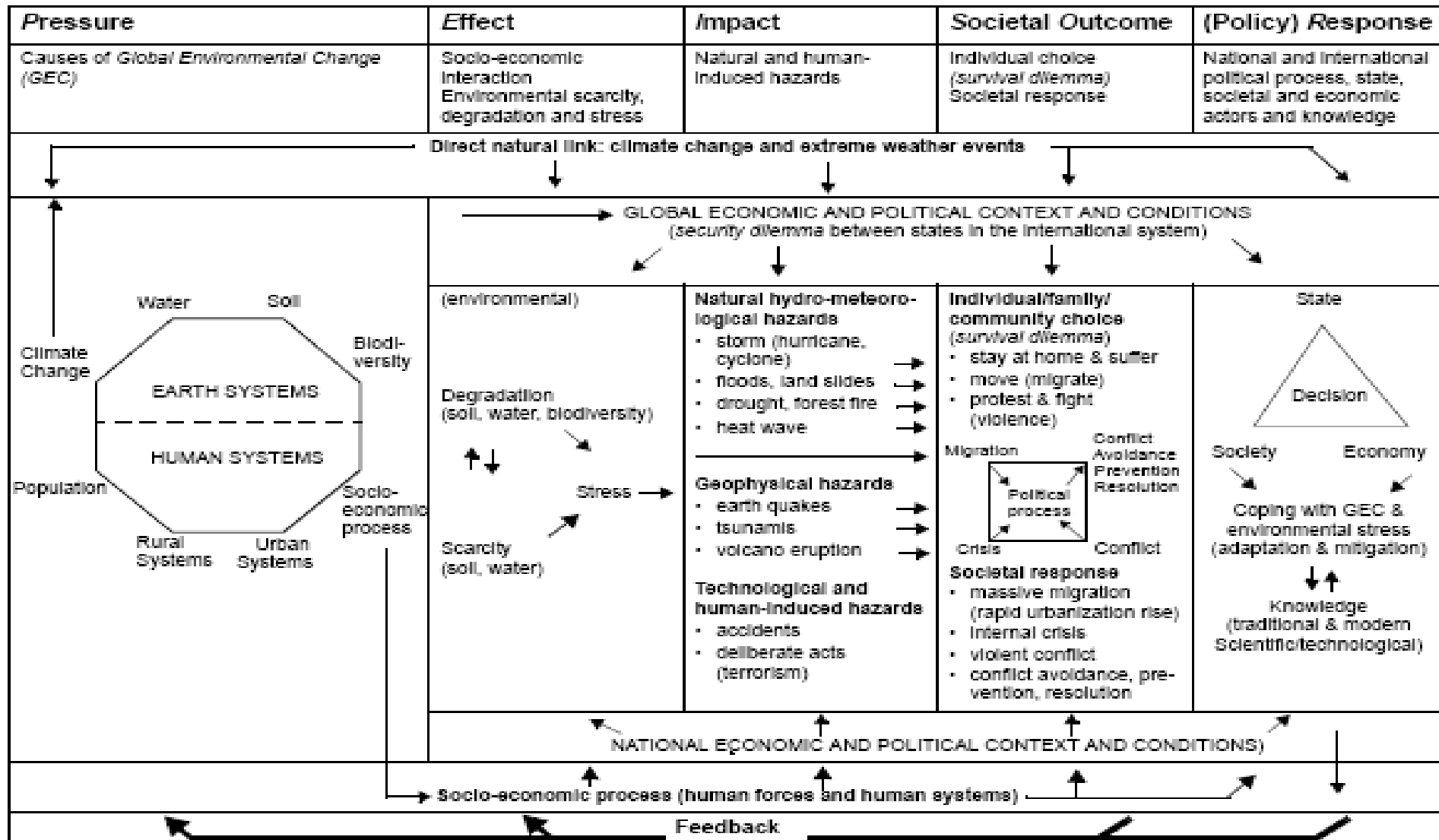
Environmental Hotspots

- **MENA region:**
 - Water
 - Food product.
 - **Migration**
- **Mexico, Caribbean**
 - Water
 - Food product.
 - **Migration**
 - hurricanes

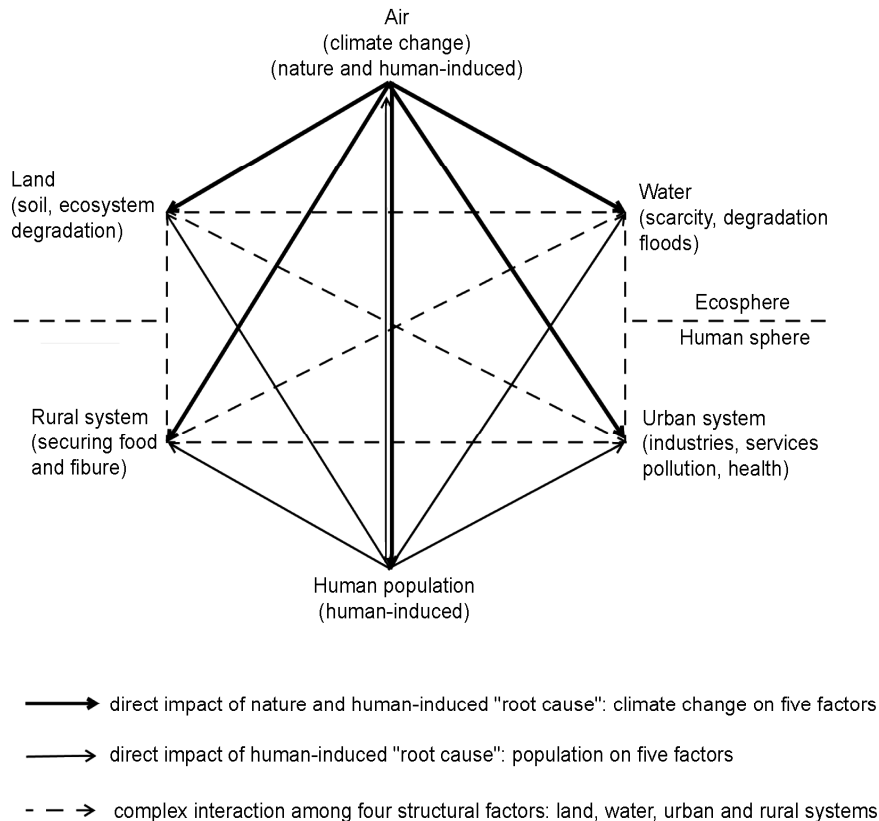
5. IPCC: AR4, 2007 (Synthesis Report)



5.1 Global Environmental Change & Security Impacts: PEISOR Model



5.2. Cause: **P**ressure of Global Environmental Change: Six Determinants: Survival Hexagon



Ecosphere: supply side

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

Anthroposphere: demand

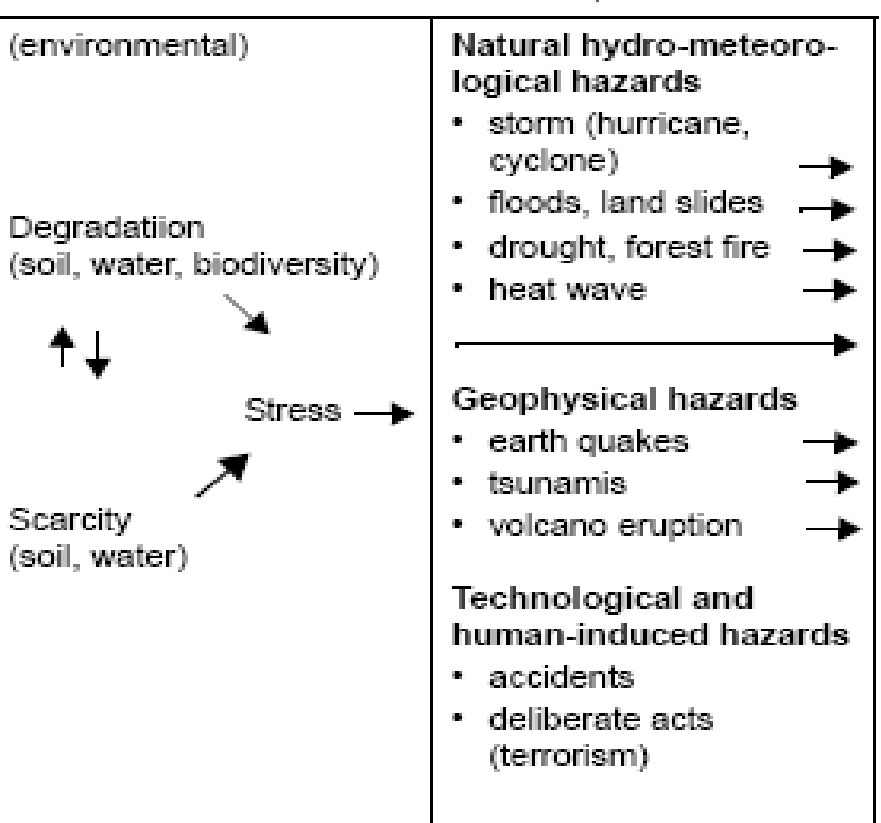
- Population growth/decline
- Rural system: agriculture
- Urban system: pollution etc.
- **Socio-economic processes**

Mode of Interaction

- Linear, Nonlinear
- Exponential
- Chaotic, abrupt

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

5.3. E: Effect & I: Impact

- **E: Environmental security debate of 1990s**
 - Toronto school (Homer-Dixon)
 - Swiss school (ENCOP, Bächler):
 - **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)**

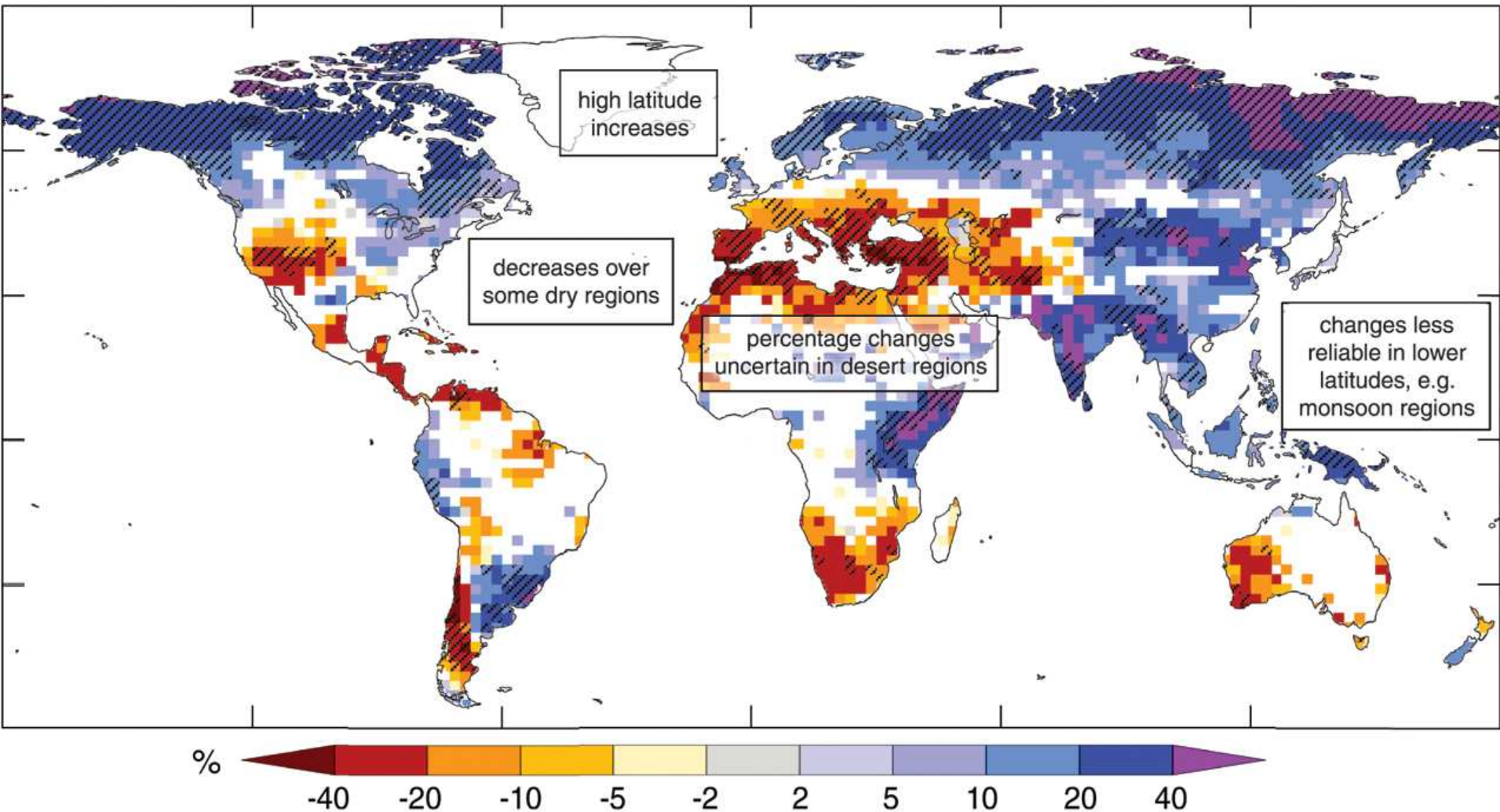
5.5. R: Policy Response to Security Danger Posed by Global Change

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

6. Environmental Hotspot I: North Africa & Middle East (MENA)

- **North African Jasmine revolution of the youth: university graduates without perspective & hope**
 - Democratization: window of opportunity for Europe: long-term partnership of co-development or further militarization against migrants in the Mediterranean Sea (turning point requires new approaches and policies)
- **MENA: Highly environmentally and socially vulnerable region; GEC impacts may become a „threat multiplier“**
 - 3 conflict constellations:
 - water scarcity (blue & green water)
 - food scarcity (crop yield decline)
 - environmentally & climate-induced migration
- **Environmental problems: will rise until 2050/2100**
 - Population growth: +100 million in 5 countries of North Africa
 - Temperature increase & precipitation decline, SLR
 - Declining self-sufficiency rate for food (e.g. for cereals)

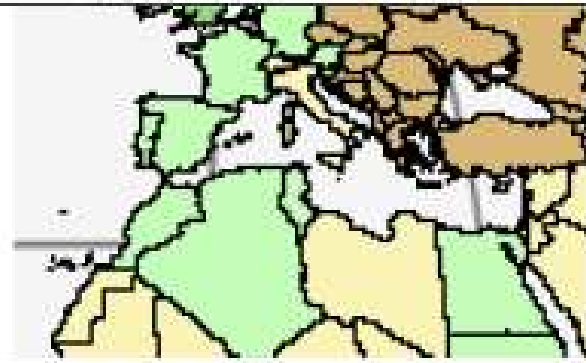
6.1. Projected Changes in Precipitation



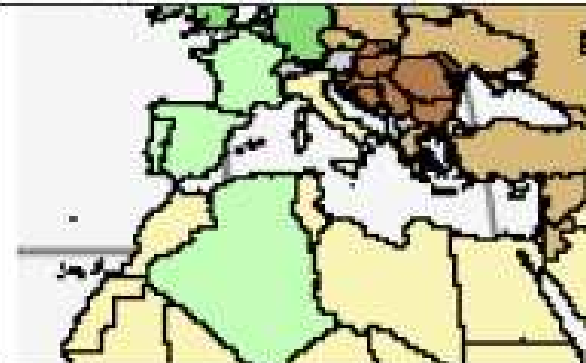
6.2. Climate Change and Food Security

Source: WBGU 2006

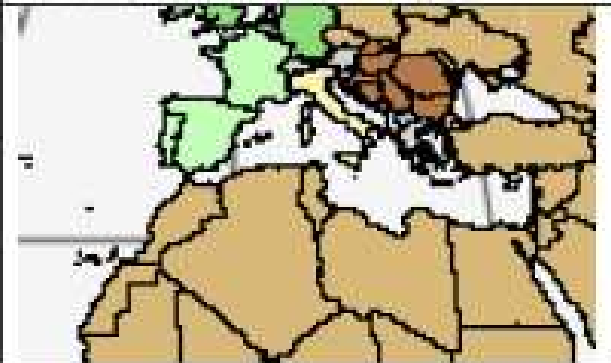
5A: Food security by 2020 (2010-2039) (HADCM3 GGa1)



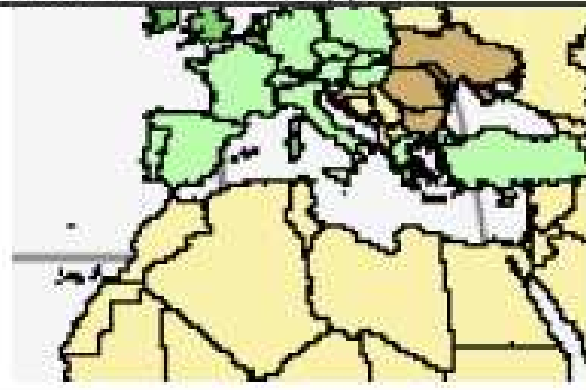
5B: Food security by 2050 2040-2069 (HADCM3 GGa1)



5C: Food security by 2080 2070-2099 (HADCM3 GGa1)



5D: Food security by 2080 2070-2099 (HADCM2), CO₂ Stabilisation at 550ppmv



5E: Food security by 2080: 2070-2099 (HADCM2), CO₂ Stabilisation at 750ppmv



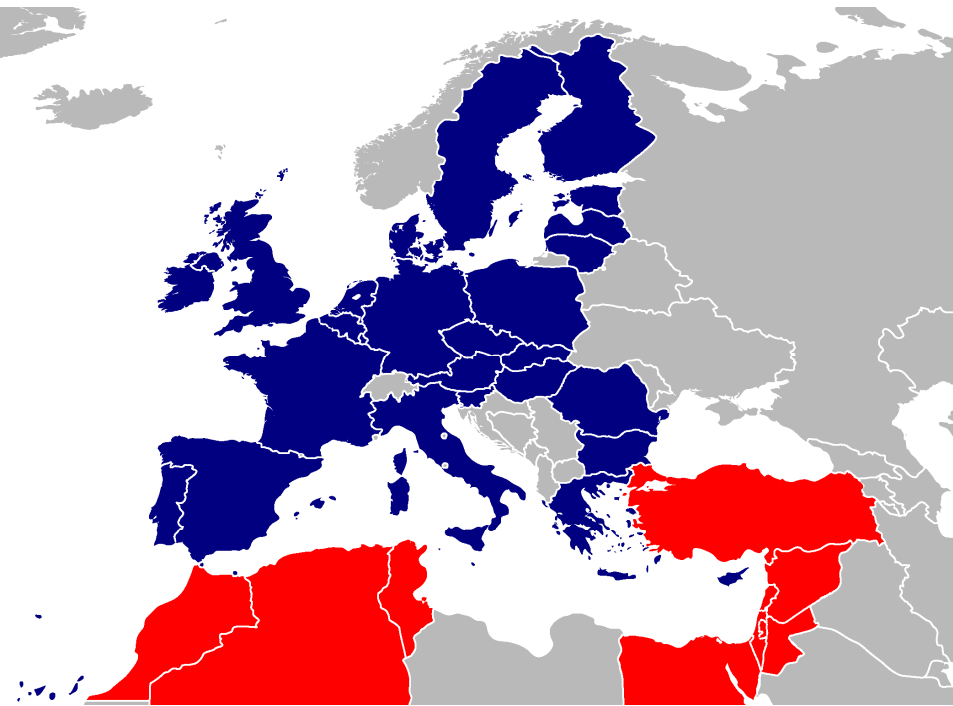
5F: Food security by 2080: 2070-2099 (HADCM2 IS92a), CO₂ unmitigated



potential yield change [%]

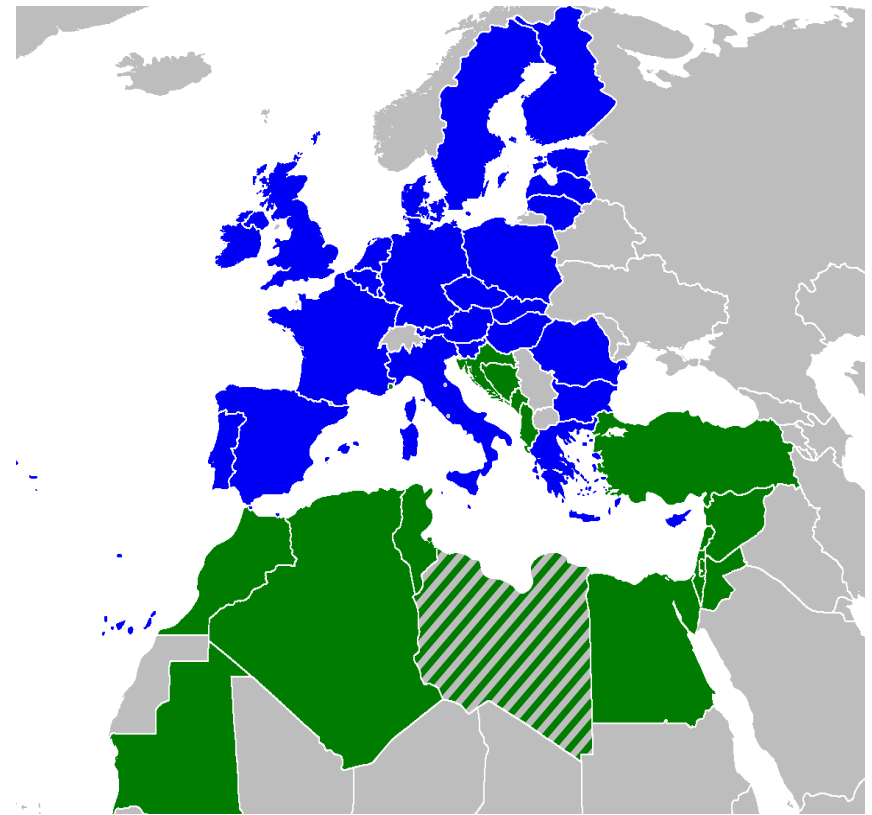


6.3. Geographic & Political Objective of Analysis: Europe-MENA Region

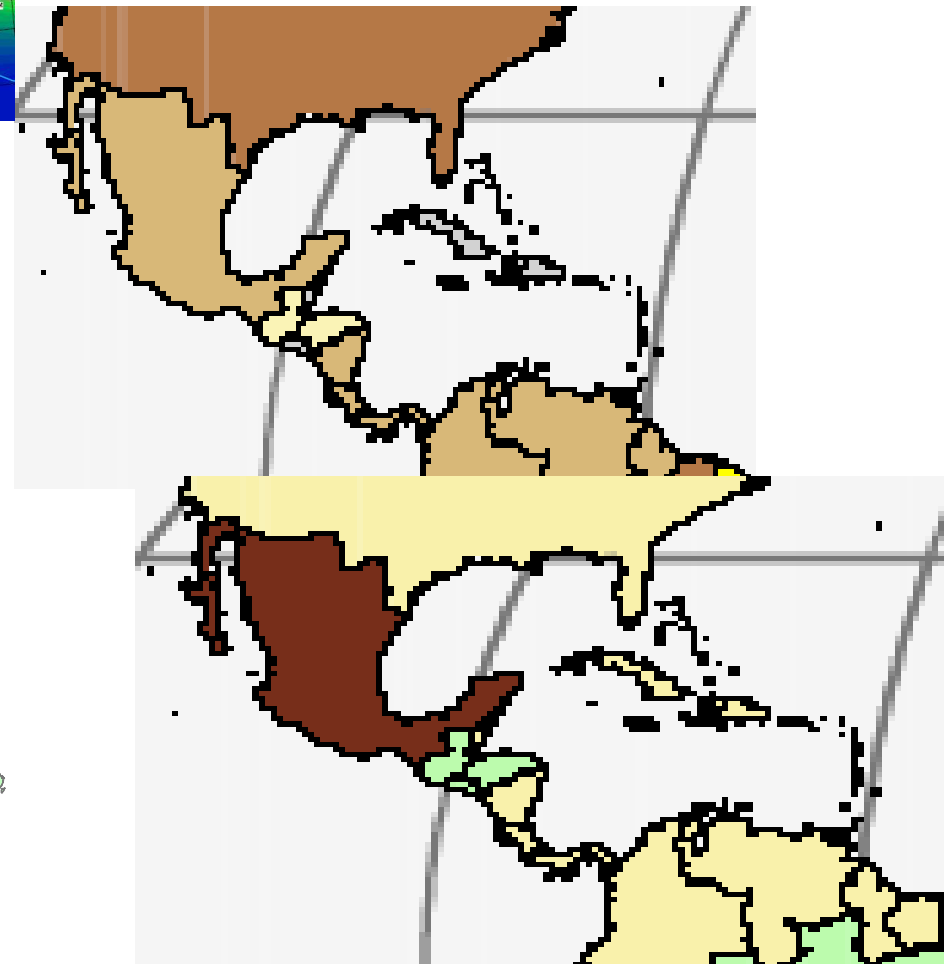
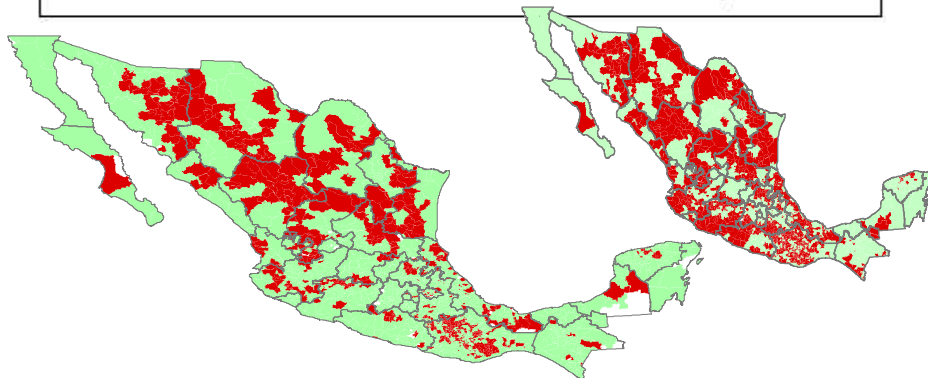
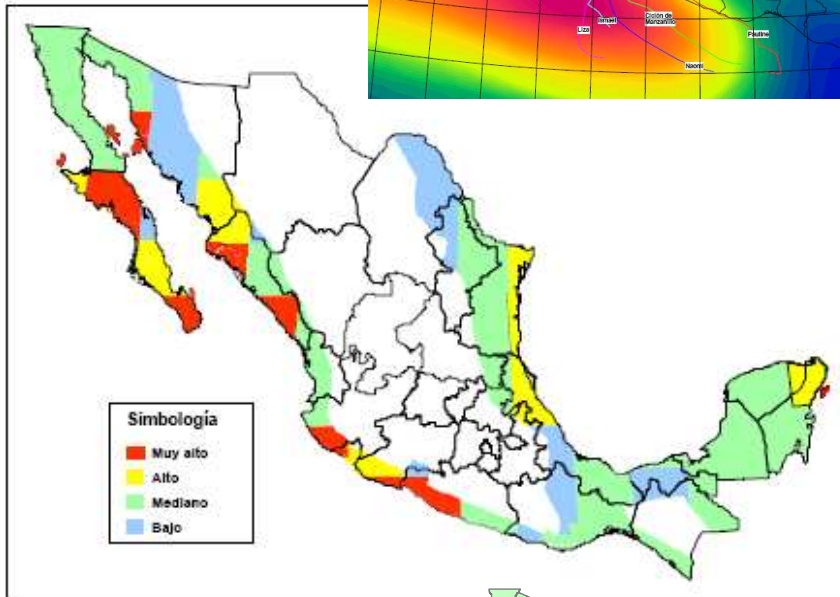
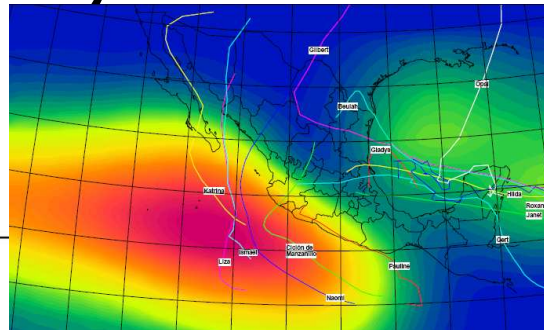


**Member States of the Euro-Mediterranean Partnership
(1995-2008)**

**Member States of the Union for the
Mediterranean (since July 2008)**



7. Environmental Hotspot II: Mexico, Central America, Caribbean



8. Policy Responses: G-8 Commitment

- **We are confronted with a paradox:**
 - Consensus (IPCC 2007) climate change: anthropogenic
 - Consensus: to stabilize temperature increases at 2°C above preindustrial levels (280ppm,1750) by 2100 at 450 ppm.
- **G8 (Britain, Canada, France, Germany, Italy, Japan, Russia, US) agreed in 2007-2010:**
 - 50% reduction of GHG emissions by 2050
 - 80% for industrialized countries
 - US\$ 10 billion/year climate technology & research.
- **But multilateral climate negotiations failed in Copenhagen (2009) and Cancun (2010) to adopt a legally binding Post-Kyoto Strategy**

8.1. Failure of Climate Negotiations to Adopt Post Kyoto Regime

- **Obstacles in major industrialized countries due**
 - Economic opposition of interest groups (lobbies)
 - Short-term interest of policy makers (re-election)
- **Lack of political will of parliaments to adopt policies (USA)**
 - But no legally binding reduction targets for US
 - Obama: proposal -17% (now), -5% (1990) until 2020

Anthropocene Two Ideal Type Future Visions:

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

9. DESERTEC Vision for North Africa: Relevance for North America

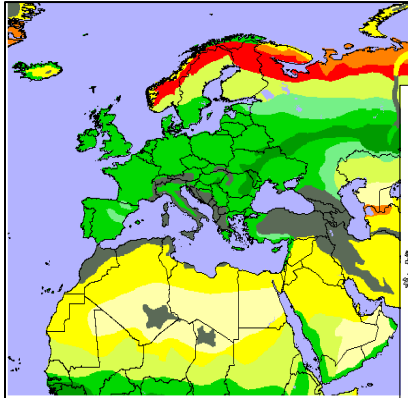
- 1993: **Climate & Energy Partnership** between Europe & North Africa: use technological potential for renewables for development of MENA: help Europe meet its energy goals
- 1999: **Energy Study Group** of German Physical Association: Publication on long-range transmission
- **2002: Survival Pact:** virtual water (food) with virtual sun: interdependence of 2 key commodities (Europe & MENA)
- **2003: Club of Rome endorsed the DESERTEC project**
- **BMU: funded 3 projects on TREC (DLR, Stuttgart)**
- **13 July 2008: EU Solar Plan was launched**
- **July 2009: Desertec Industrial Initiative/Desertec Foundat.**

9.1. Renewable Energy Potentials in EU-MENA

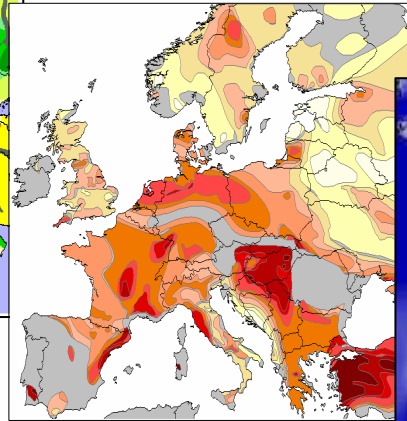
Source: Trieb, Krewitt, May, in: Brauch et al. (2009)

Biomass (0-1)

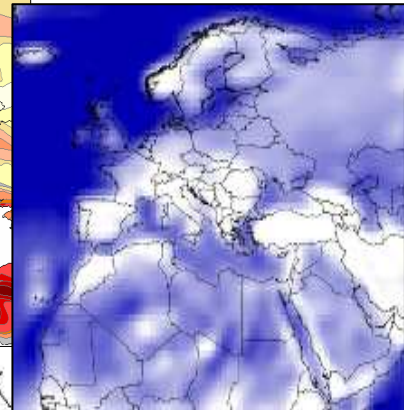
in brackets (Electricity in GWh/km²/a)



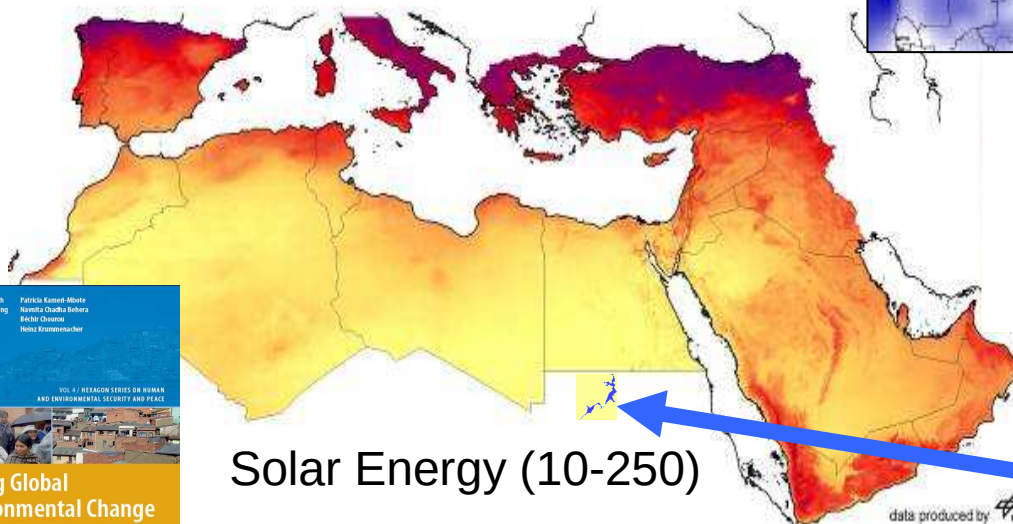
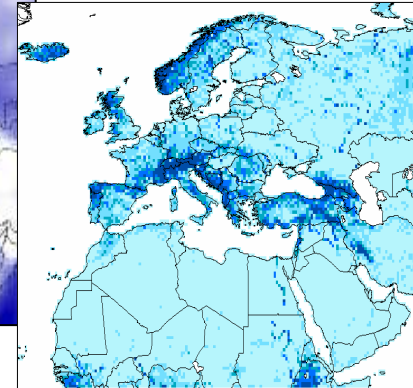
Geothermal (0-1)



Wind Energy (5-50)



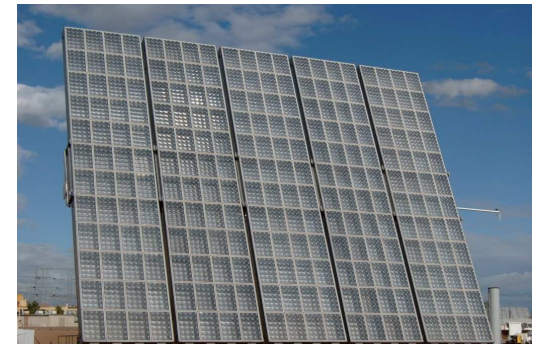
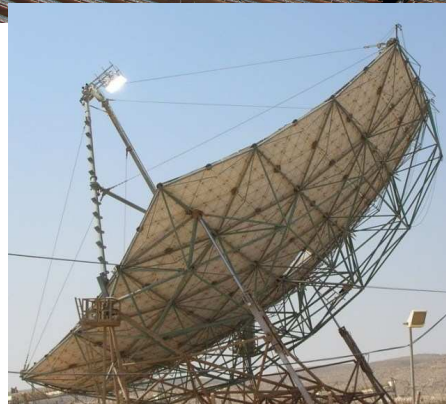
Hydropower (0-50)



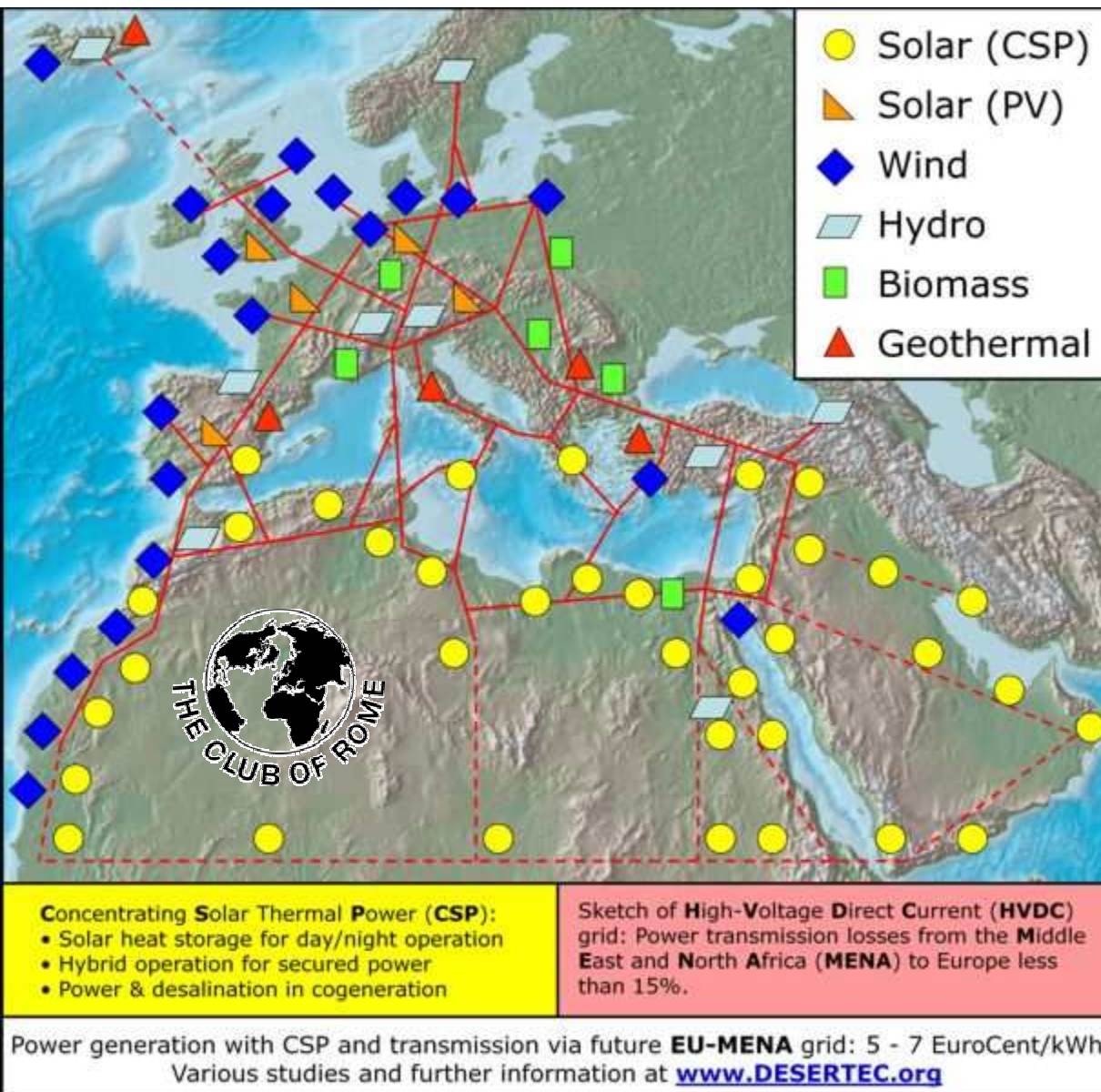
Solar Energy (10-250)

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

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



9.3. Mediterranean Renewable Energy Potential



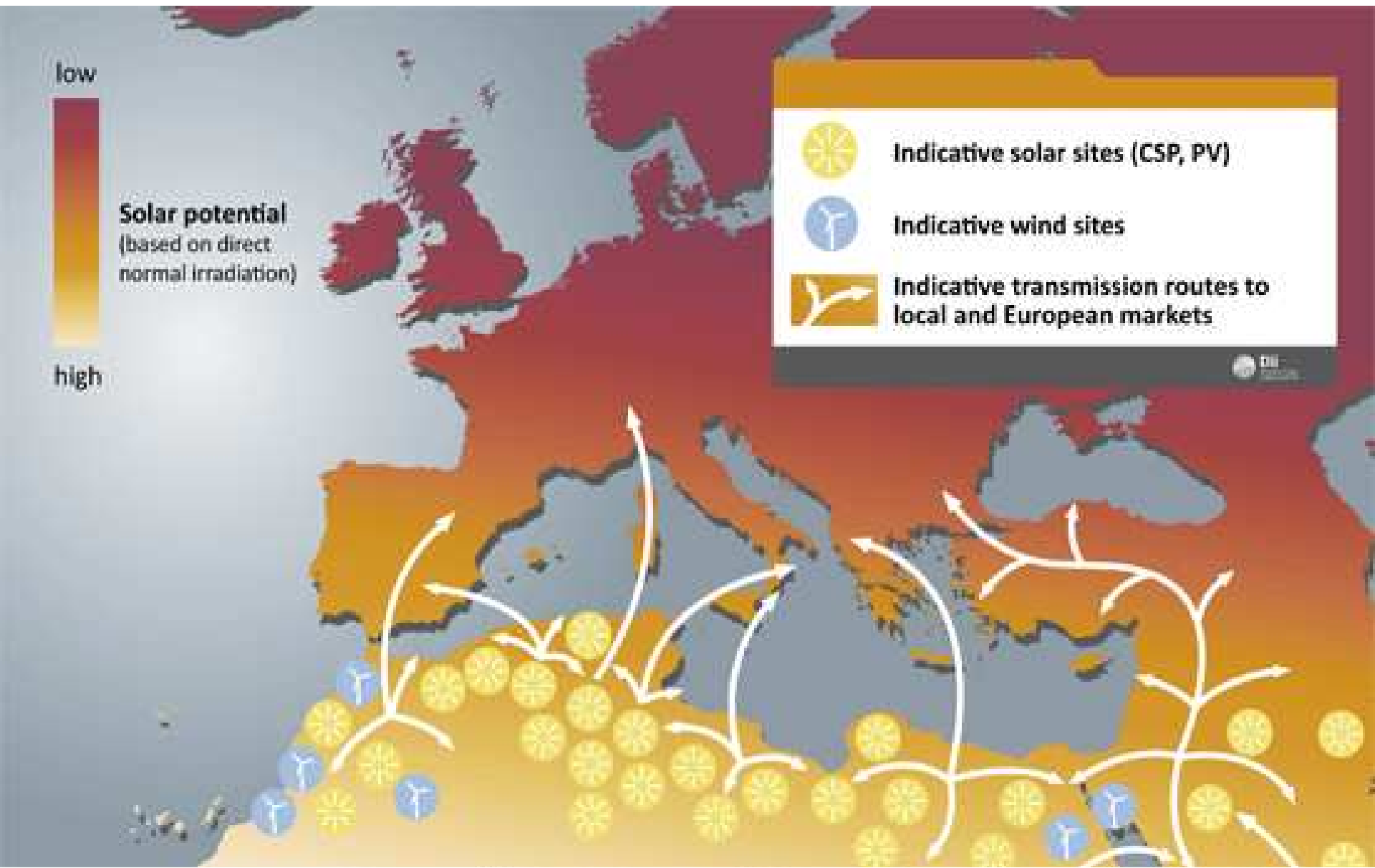
Trans-Mediterranean Renewable Energy Cooperation (**TREC**) is an initiative that campaigns for the transmission of clean power from deserts to Europe.

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

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



9.5. DESERTEC Industrial Concept



9.6. Implementing the G-8 Goals

Key Policy Challenge to Solve the Paradox:

- GHG obligations UNFCCC (stabilization by 2000) & Kyoto Protocol (-5.1% globally; **Canada: -6%; US: -7%; but by 2010: Canada: +26-46% (with LULUCF); US: +16-17%**)
- **80% reduction of GHG emissions (2010-50)**
- Proposals at Copenhagen (2009); US: -7%, EU: -20% (1990)
- EU Parliament called for unilateral 30% reduction of EU-27 GHG by 2020; German goals (Merkel): -40% by 2020.
 - Copenhagen (COP 15): Copenhagen Accord: legally nonbinding
 - Achievement at COP 16 in Cancun: strengthening of UN Process
 - Challenge of COP 17 (Durban): binding post-Kyoto agreement
- Speed up: renewables & energy efficiency
- „Coalition of the willing“: NAFTA energy partnerships
DESERTEC type project for Mexico, USA and Canada

9.7. DESERTEC: Relevance for NAFTA

Technical Potentials and Energy Vision for Mexico

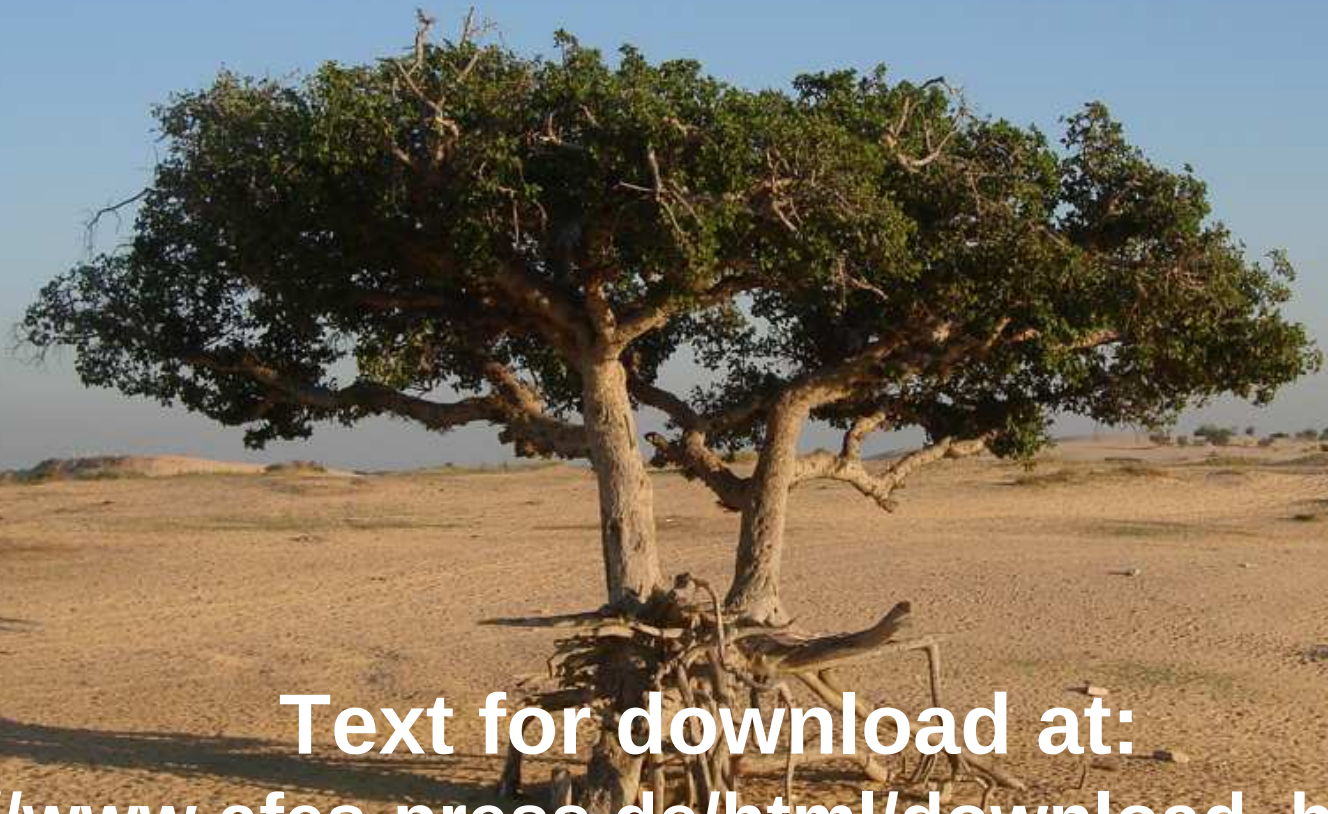
- **Climate Performance (1990-2010) of Canada & USA**
- **Mexico will be severely affected by Global Climate Change**
- **Mexico is threshold country with GHG reduction goals**
- **Mexico has a huge technical potential for renewables**
- **Political and economic challenge: Exploiting renewable potential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

10. Policy Vision & Perspective:

Towards Sustainable Peace & Fourth Sustainable Revolution

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

**Thank you
for your attention
and patience.**



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Global Environmental and Human Security Handbook for the Anthropocene (GEHSHA)

