Centro Regional de Investigaciones Multidisciplinarias
de la UNAM (CRIM), Cuernavaca, Morelos, México

Lunes, 6 de marzo de 2006:
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Conferencia magistral
Global Environmental Change
and Extreme Outcomes:
Implications for Human and
Environmental Security

Contents

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

Ecosphere

Antrophosphere

Atmosphere
Climate
Change

Hydrosphere

Biosphere

Lithosphere
Pedosphere

Global Change

Societal
Organisation

Economy

Transportation

Population

Science &
Technology

Psychosocial
Sphere

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

1.2. Global Environmental Change: Concepts & Research Programmes

❖ **Since 1970s, 1980s GEC focused on human-induced perturbations in environment encompassing many globally significant issues on natural & human-induced changes in environment, & socio-econ. drivers**

  ➢ **IGBP or International Geosphere-Biosphere Programme;**
  ➢ **IHDP or International Human Dimensions Programme;**
  ➢ **World Climate Research Program (WCRP),**
  ➢ **DIVERSITAS on biodiversity**

❖ **IHDP: contribution & adaptation of societies to changes, social, cult., econ., ethical, spiritual issues, our role & responsibility for the environ.**

❖ **GEC deals with changes in nature & society that affect humankind as a whole and human beings both a cause and victim, however those who have caused it and are most vulnerable to are often not identical.**

❖ **GEC affects & combines ecosphere & anthroposphere.**

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

2. **Global Environmental Change** and **Security Concepts**

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

2.1. A Classical Definition in Political Science & International Relations

- Arnold Wolfers (1962), US of Swiss origin, realist pointed to two sides of the security concept:

- "Security, in an objective sense, measures the absence of threats to acquired values, in a subjective sense, the absence of fear that such values will be attacked".

- Absence of "threats": interest of policy-makers

- Absence of "fears": interest of social scientists, especially of contructivists: "Reality is socially constructed"

- Iraq case: WMD: "subject. fear" vs. "lack of obj. threat"

- According to Møller (2003) Wolfer's definition ignores: Whose values might be threatened? Which are these values? Who might threaten them? By which means? Whose fears should count? How might one distinguish between sincere fears and faked ones?

2.2. Security Perception: Worldviews/Mind-sets

- **Perceptions of security threats, challenges, vulnerabilities, risks depend** on **worldviews** of analyst & **mind-se**t of policy-maker.

- **Mind-set** (Ken Booth): have often distorted perception of new challenges: include ethnocentrism, realism, ideological fundamentalism, strategic reductionism

- **Booth: Mind-sets freeze international relations** into crude images, portray its processes as mechanistic responses of power and characterise other nations as stereotypes.

- Old Cold War mind-sets have survived global turn of 1989/1990

- **3 worldviews** are distinguished by the English school:
  - *Hobbesian* pessimism (**realism**)
  - *Kantian* optimism (idealism) where *international law* and *human rights* are crucial; and
  - *Grotian* pragmatism where *cooperation* is vital

2.3. English School: Hobbes, Grotius & Kant

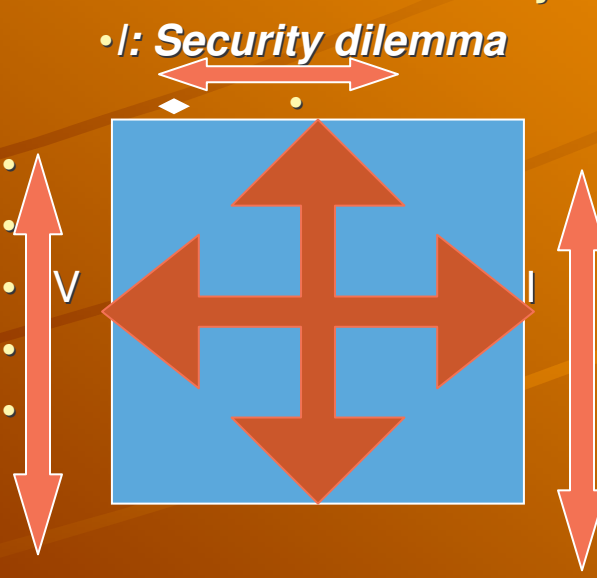Hobbes (1588-1679)   Grotius (1583-1645)   Kant (1724-1804)

Security perceptions depend on worldviews or traditions

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

2.4. Conceptual Quartet: Security Concepts in relation with peace, environment & development

Pillars & linkage concepts within the quartet

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

2.5. Why do we Observe & Analyse a Reconceptualiation of Security?

Political context: Cold War and since 1990

Which change is crucial and long-lasting?

- **9 November 1989:** unification of Germany & **Europe:** triggered integration
- **11 September 2001:** vulnerability of US to terrorism **USA:** triggered revival of **Cold War mindset,** military build-up, and constraints on civil liberty: impact of laws on homeland security
- **Latin America: Third wave of democratisation, economic crisis?**

Did the contextual change of 1989 or the impact of 11 September trigger a global "reconceptualisation" of security?

Political science context: realism➔constructivism

- **Kuhn:** Scientific revolutions lead to paradigm shifts
- **Ideas matter**: emergence of constructivist approaches, security is socially constructed (speech acts), constructivism shift, but no scientific revolution.
- **Threats matter:** evolution of the new worldview of the neo-conservative ideologues in the US & impact on IR.

2.6. Political contextual change Cold War and since 1990

	Cold War (1947-89)	Post Cold War (1990-)
Concept	Narrow	Wide (EU, OECD world)
		Narrow: non-OECD world Since 11.9. 2001 in USA
Dimensions	military, political	+ economic, societal,
Referent	nation state, alliance	+ global env. change
Threat (from)	Soviet(West), imperialist (East)	individual to global
Challenge	manifold: 5 dimensions	USA: WMD, terrorism
Vulnerability	weapons systems,cities, ICBMs, infrastructure	EU: wider spectrum, climate change
Risk	military, ideological	5 dimensions of sec.

2.7. Widening, Deepening and Sectorialisation of Security

Since 1990 3 changes of Security Concept in Science & Policy Practice

- **Widening:** Extended security concepts, e.g. in the German Defence White Paper (1994), from military & political dimension to econ., societal, environmental

- **Deepening:** Shift in the referent from the state (national security) to the individual (human security)

- **Sectorialisation:** many international organisations use security: energy security (IEA), health security (WHO), food security (FAO, WFP), water security (UNEP, UNU), livelihood security (OECD) etc.

2.8. Widening of Security Concepts: Towards Environmental Security

4 trends in reconceptualisation of security since 1990:

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

Dimensions & Levels of a Wide Security Concept

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

2.9. Environmental & Human Security

Expanded Concepts of Security (Møller, Oswald)

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	Humankind
Gender security	Gender relations, indigenous people, minorities	Equality, identity, solidarity	Patriarchy, totalitarian institutions (governm., churches,elites) intoler.

Human security: Referent: individuals and humankind. [Human Security Network]

❖Values at risk: survival of human beings and their quality of life.

❖Major source of threat: nature (global environmental change), globalisation, nation state with its ability to cope with this dual challenge.

Environmental Security: Referent: Ecosystem; Value at risk is sustainability.

❖ Major challenges: global environmental change & humankind,

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

2.10. Compilation of Environmental 'Threats', 'Challenges', 'Vulnerabilities' and 'Risks'

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

3. **Environmental and Human Security**

- **Environmental Security: a dimension of a widened security concept:**
  - Conceptual proposals: to make environmental security a new task of US nation. security
  - 3 research phases of & proposal for a 4th ph.
  - Policy debate & Implementation: ENVSEC
- **Human Security: Shift from nation state to human beings/humankind**
  - Four Pillars: a) Freedom from fear, b) want, c) hazard impact, d) to live a life in dignity
  - Policy Debate: UNDP (1994); Human Security Network; Human Security Commission

3.1. Changing Referents of Security:
National or State Security vs. Human Security

- In World War II, "national security" emerged in U.S. "to explain America's relation-ship to the rest of the world".
- "National security" a guiding principle for U.S. policy.
- During Cold War: concepts of internal, national, allian-ce & international security were used for a bipolar international order where deterrence played a key role to prevent a nuclear war.
- "National" and "alliance security" focused on military and political threats posed by the rival system.
- National security legitimated the allocation of major resources and constraints on civil liberties.
- Human security is a new concept that has been used since by social scientists and international organis.(UNDP 1994):
  - Man scientific definitions
  - Four pillars:
  - Different policy goals

3.2. What is Human Security?

- **<u>Human Security:</u>** puts individual, his or her environment and livelihood at the centre as the main referent. The individual is regarded as most important and to protect his/her security, an analysis is employed that involves many interrelated variables such as economic, social, political, environmental, technological factors.

- HS recognizes that "lasting stability cannot be achieved if people are not protected from a wide variety of threats to their lives and livelihoods". (FA of Canada)

- Human security concept emerged in 1990s: change of intern. pol. order

- Decline in traditional security threats – emergence of intra-state conflicts

- Recognition of unrelenting cost of human lives in violent conflict.

- New Security Agenda: intra-state violent conflict, economic security, energy, water, human rights, epidemic diseases, poverty, inequality, enviro. degradation etc.

- UN Security Councit extended meaning of "international peace and security" to cover conflicts that are more domestic

- Move towards international humanitarian interventions through Peace-keeping: Somalia, Sierra Leonne, East Timor, Haiti, Ivory Coast, etc.

3.3. Four Pillars of Human Security Concept

- **"Freedom from fear"** by reducing the probability that hazards may pose a survival dilemma for most affec-ted people of extreme weather events (UNESCO, HSN), **Canadian approach:** Human Security Report (2005)

- **"Freedom from want"** by reducing societal vulnerabili-ty through poverty eradication programs (UNDP '94; CHS 2003: **Ogata/Sen**: Human Security Now), **Japanese approach**;

- **"Freedom to live in dignity"** (**Kofi Annan** in his report: *In Larger Freedom* (March 2005)

- **"Freedom from hazard impact"** by reducing vulnerabi-lity & enhancing coping capabilities of societies confron-ted with natural & human-induced hazards (**UNU-EHS** 2004; Bogardi/Brauch 2005; Brauch 2005a, 2005b).

3.4. First Pillar of HS: Freedom From Fear

- **Narrow:** pragmatic, conceptually precise, **Goal**: "to provide security that individuals can pursue their lives in peace" (Krause)
- "lasting security cannot be achieved until people are protected from violent threats to their rights, safety or lives" (**FA Canada**)
- **Threats**: inter-state wars, intra-state conflicts, criminality, dome-stic violence, terrorism, small arms, inhumane weapons, land-mines, "to provide security so individuals can pursue their lives in peace" (Krause 2004).
- <u>**Requirements and objects:**</u>
  - ➢ **Rule of Law:** ICC, International Court of Justice and national, regional and local judicial courts and mechanisms
  - ➢ **Universal Humanitarian Standards**: initiatives in inter. humanitarian and human rights law, human development, human rights education,
  - ➢ **Good Governance**: capacity building of not only national, but regional and local governments or leadership authorities; fostering democracy; respect for minorities
  - ➢ **Conflict Prevention/ Post-Conflict Reconstruction**: land mines, child soldiers, protection of civilian population in armed conflict, small arms and light weapons, trans-national organized crime (Ottawa Convention on Anti-personnel Landmines)
  - ➢ **Strong intern. institutions** that can support & enforce above

3.5. Human Security Network Members

NATO	EU	Third World
Canada		Chile
Greece Nether-lands Slovenia	Austria Ireland	Jordan Mali Thailand South Africa (observer)
Norway	Switzer-land	

Anti-pers. Landmines, Intern. Criminal Court, pro-tection of children in armed conflict, control of small arms & light weapons, fight against transnat organized crime, human development, human rights educat., HIV/AIDS, implement. of intern. hu-manitarian & human rights law, conflict prevention

So far no environmental security issues on the agenda of this HS-Network.

The Network has an interre-gional & multiple agenda perspective, strong links to civil society & acade-mia.

The Network emerged from landmines campaign at a Ministerial, Norway,1999.

Conferences at Foreign Ministers level in Bergen, Norway (1999), in Lucer-ne, Switzerland (2000), Petra, Jordan (2001) Santiago de Chile (2002), Graz (2003), Bamako, Mali (May 2004),Canada (2005), Thailand (2006)

3.6. Second Pillar of HS: Freedom From Want

- **Broad:** wider agenda, conceptually more convoluted
- **Goal:** reducing individual/societal vulnerabilities in the economic, health, environment, political, community, and food sphere. To create conditions that can lead to empowerment for individuals,
- **Japanese FM**: HS "comprehensively covers all menaces that threaten human survival, daily life, and dignity...and strengthens efforts to confront these threats"
- **Threats**: diseases, poverty, financial crises, hunger, unemployment, crime, social conflict, political repression, land degradation, deforestation, emission of GHGs, environmental hazards, population growth, migration, terrorism, drug production and drug trafficking
- **Ogata/Sen (CHS 2003): 2 Approaches**: Protection & Empowernment
Protection:
  - protection in violent conflict
  - proliferation of arms
  - protection and funds for post-conflict situations
  - strengthening the rule of law
  - developing norms and institutions to address insecurities
Empowernment:
  - achieve UN Millenium Development Goals, poverty eradication encouraging fair trade and markets
  - sustainable development
  - universal access to basic health care
  - universal education
- Protection and Empowernment are Mutually Reinfocring!

Photo by Osamu Honda 2003

3.7. Human Security Commission Report: Ogata/Sen: Human Security Now (2003)

- *Commission on Human Security* **(CHS)** established in January 2001 at initiative of Japan. The Commission consisted of twelve persons, chaired by Sadako Ogata (former UNHCR) Amartya Sen (1998 Nobel Economics).

- **CHS goals:** a) promote public understanding, engagement and support of human security; b) develop the concept of human security as an opera-tional tool for policy formulation and implementation; c) propose a concre-te program of action to address critical and pervasive threats to HS.

- *Human Security Now* (2003) proposes a **people-centered** security fra-mework that focuses "**on shielding people** from critical and pervasive threats and **empowering them to take charge of their lives**. It demands creating genuine opportunities for **people to live in safety and dignity and earn their livelihood**. Its final report highlighted that:

- More than **800,000 people a year lose their lives to violence**. Ca. **2.8 billion suffer from poverty, ill health, illiteracy &** other maladies

in larger freedom

TOWARDS SECURITY, DEVELOPMENT AND HUMAN RIGHTS FOR ALL

Report of the Secretary-General of the United Nations for decision by Heads of State and Government in September 2005

عربي 中文 English Français Русский Español

- **In Larger freedom: development, security and human rights:** In Millennium Report, Annan drew on UN Charter preamble "We the peoples" (A/54/2000.

- Framers of Charter understood that this could not be narrowly based. They created UN to ensure respect for fundamental human rights, establish conditions for justice & rule of law, "promote social progress, better standards of life in larger freedom".

- **Development, security & human rights** reinforce each other. **Poverty & denial of human rights** may not "cause" civil war, **terrorism or organized crime**, all greatly increase the risk of instability and violence.

- No **development without security, no security without development**, we will not enjoy either **without respect for human rights**.

- In **Millennium Declaration**, Member States stated to promote democracy, rule of law, respect for human rights and fundamental freedoms. They recognized that freedom from want and fear are essential but not enough.

- **All human beings have the right to be treated with dignity and respect.**

- Promotion of universal values of rule of law, human rights & democracy are ends in themselves, essential for a world of justice, opportunity & stability. No security agenda & drive for development will be successful unless based on human dignity.

3.9. 4th Pillar of HS: Freedom From Hazard Impacts

- **UNU-EHS**: Bogardi/Brauch (2005), Brauch (2005)
- **Goal:** reduce vulnerabilities & enhance the capacity building & coping capabilities of societies faced with natural & human hazards
- Threats/Hazards:
  - <u>Environmental</u>: floods, droughts, and other natural disasters, environmental degradation, lack of water or clean water, human-induced climate change, exhaustion of fish resources, depletion of finite resources (e.g. oil, gas)
  - <u>Societal</u>: poverty, improper housing, insufficient food and water, malfunctioning of technical systems, traffic accidents, population explosions, terrorism and organized crime
- **Develop vulnerability indicators and vulnerability mapping** to apply to operational realm by working on solutions
  - improved early warning systems capacity-building for early warning
  - disaster preparedness (education and training, infrastructure)
  - coordinated rapid disaster response by local, regional and national level
  - developing clear guidelines for post hazard reconstruction
  - <u>long term strategies</u>: e.g. Kyoto, Montreal Protocol
  - <u>adaptation measures</u>: e.g. dams, switching to renewable energy
  - <u>mitigation measures</u>: restrict housing in hazard areas (coastal areas-flooding, mud slides), charging more for garbage disposal and energy usage, birth control measures
- **Begin or continue to find sustainable ways of development**

3.10. Broaden Research Stakeholders: Integrate Human & Environmental Security Concerns into a Peace Research Agenda

Environmental Security

- First phase: (Ullman, Matthew & Myers): make environ-mental security primarily as a national security concern.
- Fourth Phase: make environmental security challenges also a human security concern.

Human Security

- Environmental security challenges so far hardly a human security concern (missing on agenda of Human Se- curity Network, but also in HSC: Human Security Now).

Peace Research

- Authors from peace research have contributed to both debates and could rather build conceptual bridges than authors with an Hobessian outlook in Security Studies

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

- „Pressure-State-Response" (PSR) of OECD (1993, 1997, 1999): P: pressure; S. state of env., R: policy response;

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

- EU (EEA): DPSR-Model
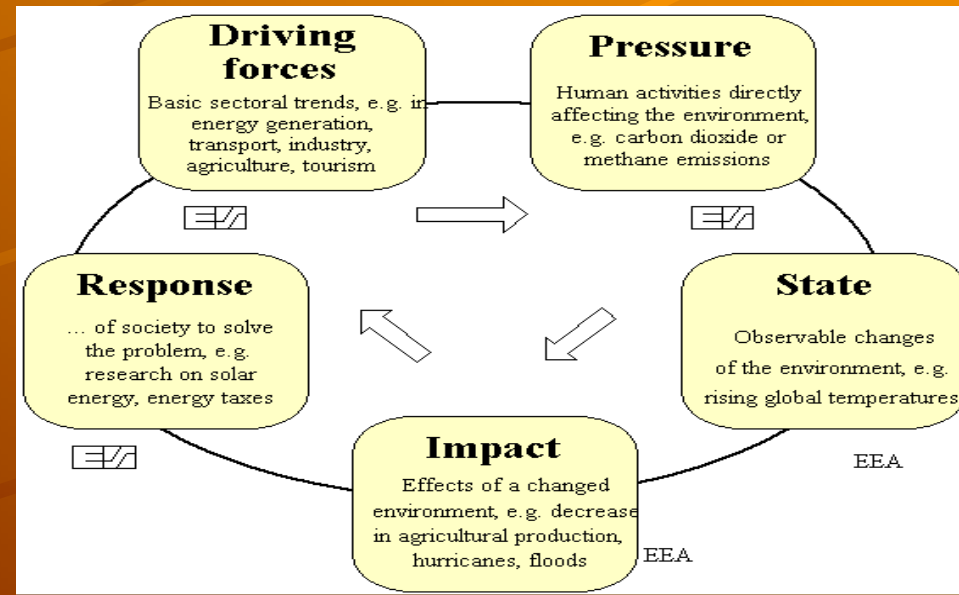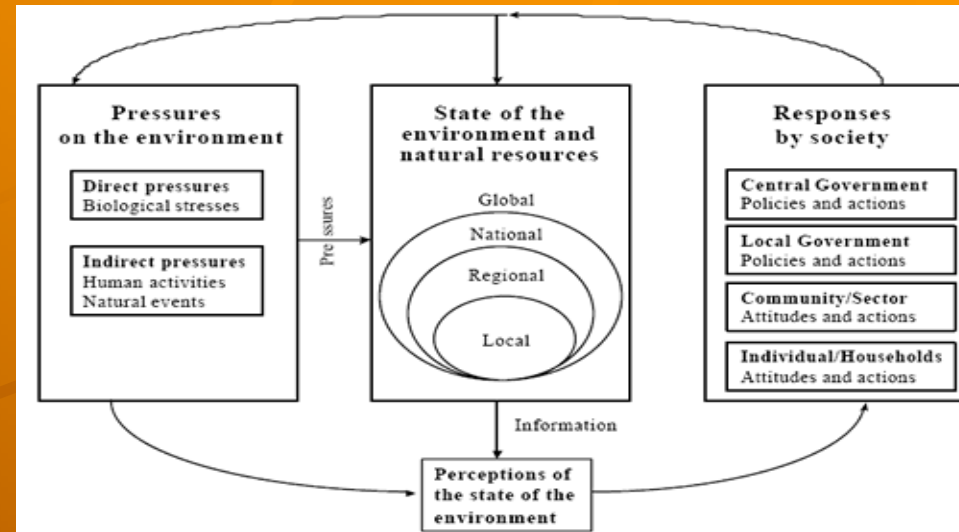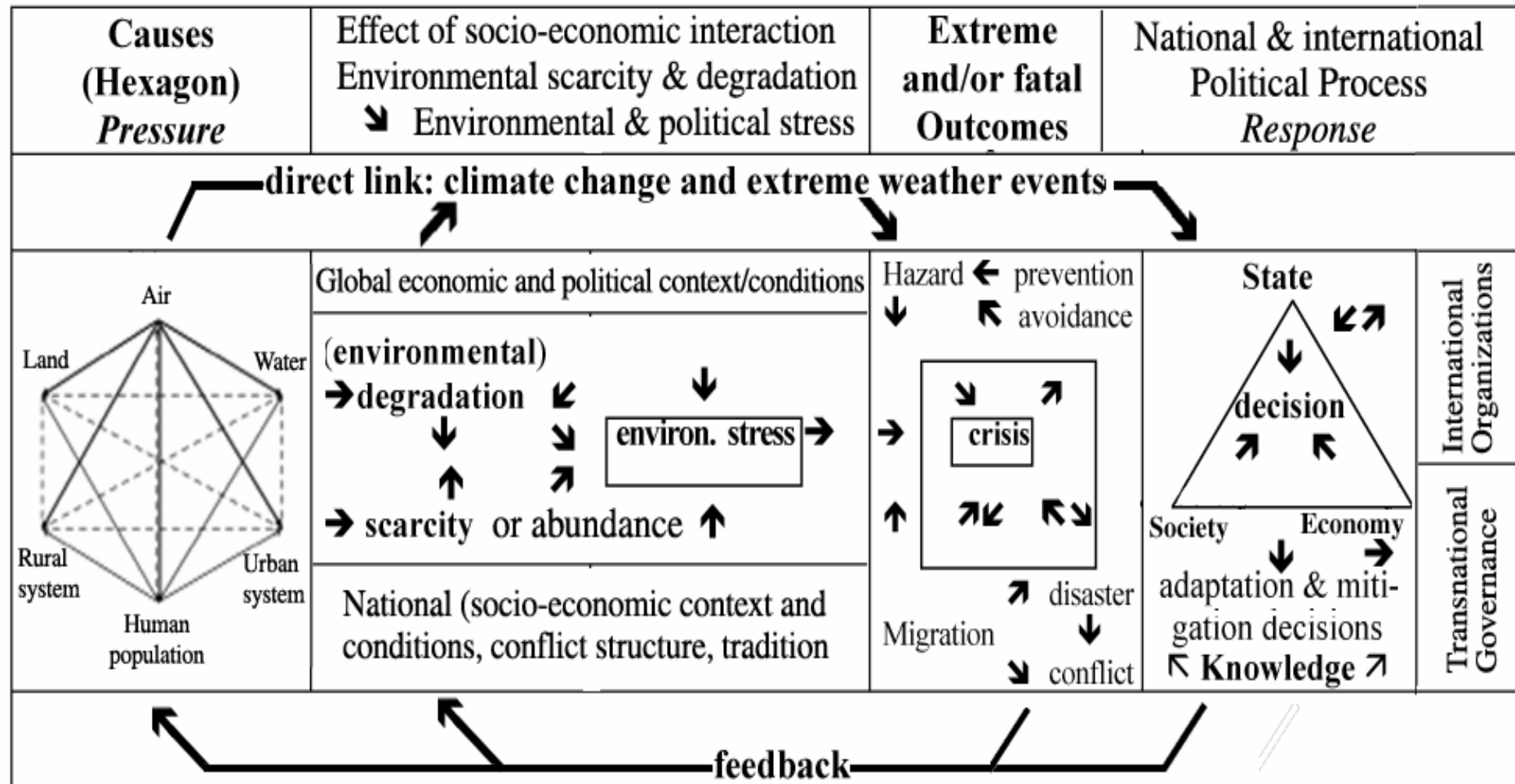
4.2. Securitisation of Causes, Impacts and Socio-economic Impacts of GEC:

- **The model distinguished 5 stages:**
  - **P: Causes** of GEC („pressure"): Survival hexagon
    - **Effects:** environmental scarcity, degradation and stress, influenced by national and global context
  - **E: Effect:** environm. scarcity, degradation & stress
  - **I:** Extreme or fatal ourcome („**impact**"): hazards
  - **S: Societal Outcomes:** disaster, migration, crisis, conflict, state failure etc.
  - **R: Response** by the state, society, the economic sector and by using traditional and modern know-ledge to enhance coping capacity 6 resilience

5. Pressure: Six Causal Determinants: Survival Hexagon

Air
(climate change)
(nature and human-induced)

Land
(soil, ecosystem
degradation)

Water
(scarcity, degradation
floods)

Ecosphere
Human sphere

Rural system
(securing food
and fibure)

Urban system
(industries, services
pollution, health)

Human population
(human-induced)

→ direct impact of nature and human-induced "root cause": climate change on five factors

→ direct impact of human-induced "root cause": population on five factors

- — → complex interaction among four structural factors: land, water, urban and rural systems

Ecosphere:

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

Anthroposphere:

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

Mode of Interaction

- **Linear**
- **Exponential**
- **Chaotic, abrupt**

6. <u>E</u>ffects: Environmental Scarcity, Degradation & Stress

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

First Phase: Conceptual Phase: Concept Environmental Security

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

➢ **Toronto: Homer-Dixon: since 1991: 3 Projects (figure © Homer-Dixon 1998)**

➢ **Zürich/Bern: Günther Bächler, K.Spillmann**

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

Sources of environ-
mental scarcity

Social Effects

Decrease in quality and quantity of renewable resources

Population growth

Unequal resource access

Increased environmental scarcity

Migration, expulsion

Decreased economic productivity

Weakened states

Ethnic conflicts

Coups d'état

Deprivation conflicts
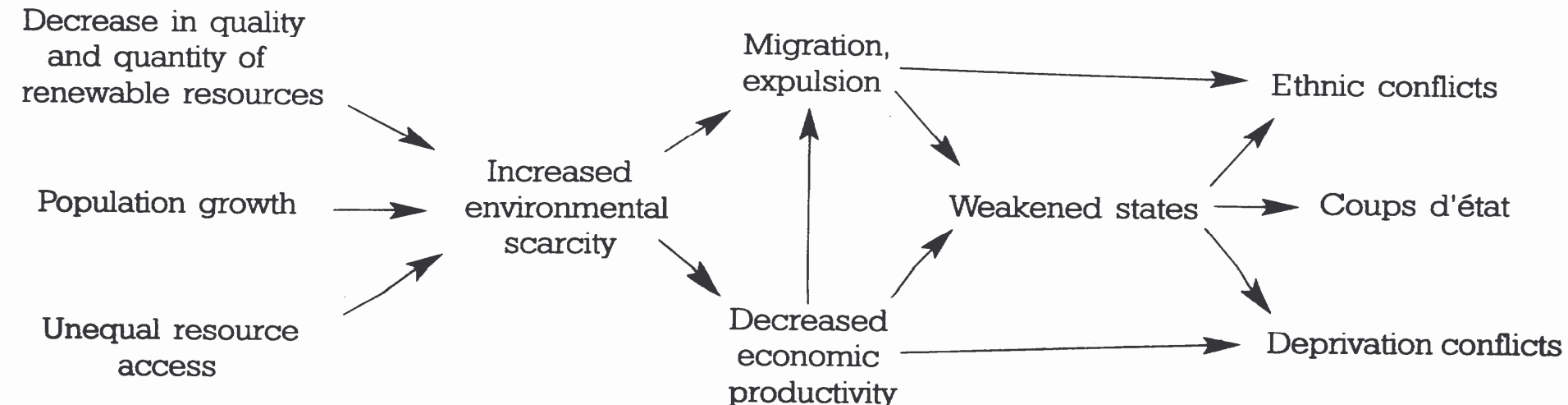
7. Impact: Human-Induced Natural Hazards Drought, Famine and Societal Consequences
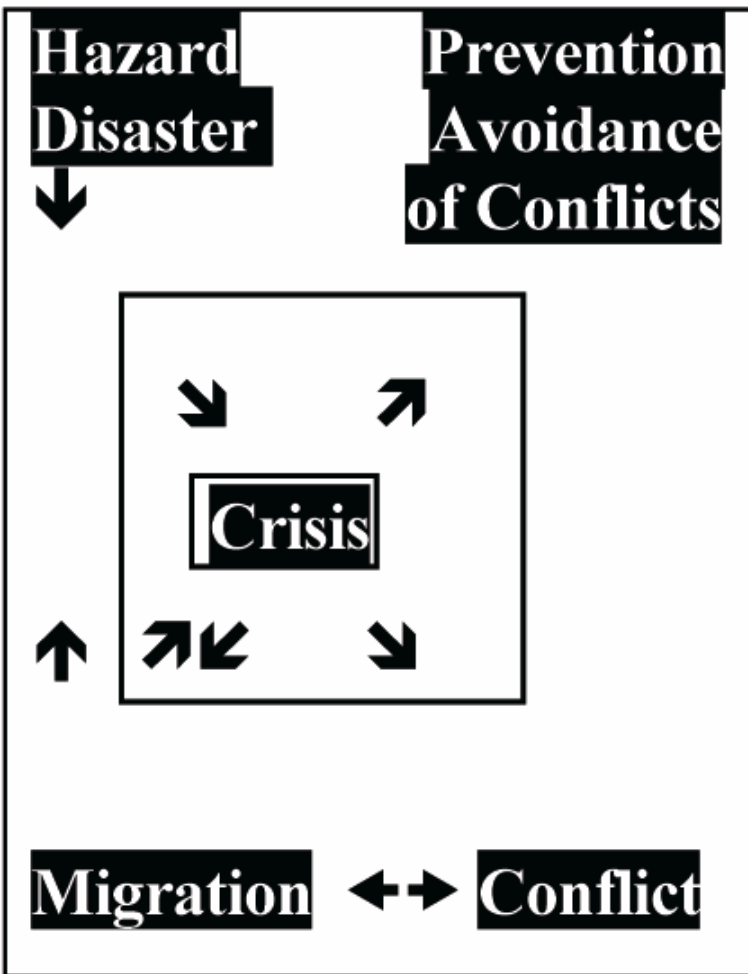
Much knowledge on these factors:

✓ **Drought, migration, crises, conflicts**

Lack of knowledge on linkages among fatal outcomes

➢ **Drought & drought-ind. migration**

➢ **Famine & environm.-ind. migration**

➢ **Conflicts & conflict-induced migration**

Lack of knowledge on societal consequences: crises/conflicts

➢ **Domestic/international crises/conflicts**

➢ **Environmentally or war-induced migration as a cause or consequence of crises and conflicts**

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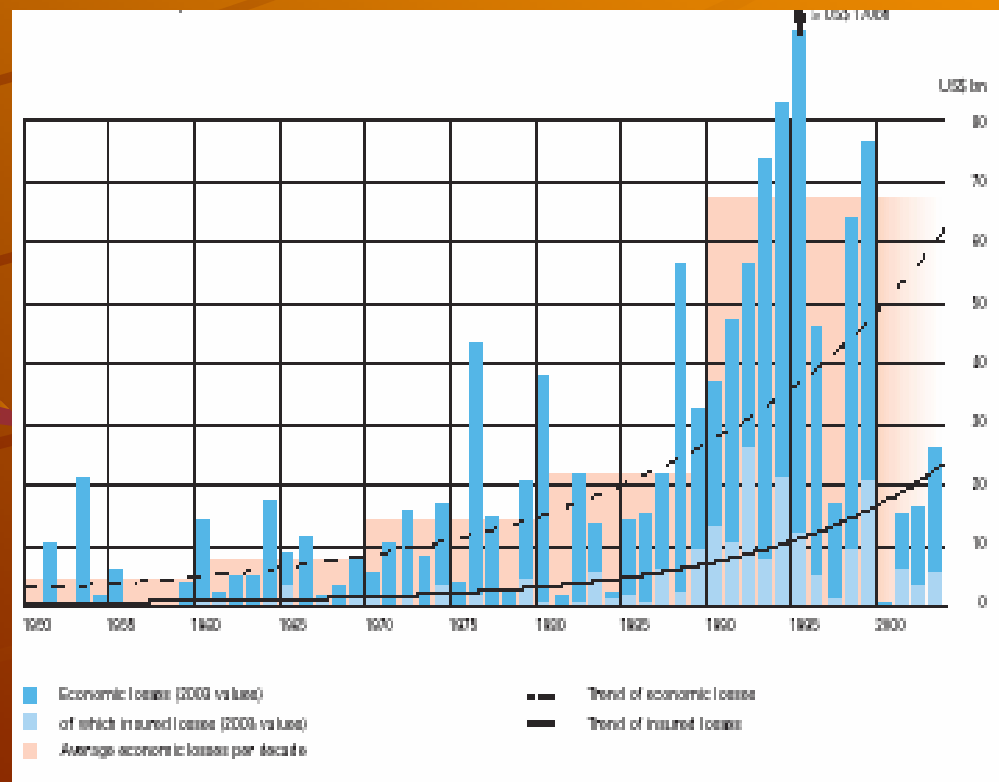(1900-2003, by decades*)

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

650   990   2000   2800   4700

7.1. Global Impacts of Natural Hazards

Economic losses (2003 values)
of which insured losses (2003 values)
Average economic losses per decade

Trend of economic losses
Trend of insured losses

7.2. Major Natural Hazards (1950-2005), Number of Events

Legend:
- Earthquake/Tsunami, Volcano
- Storm
- Floods
- Temperature extremes e.g. heat waves, cold spell, forest fire)
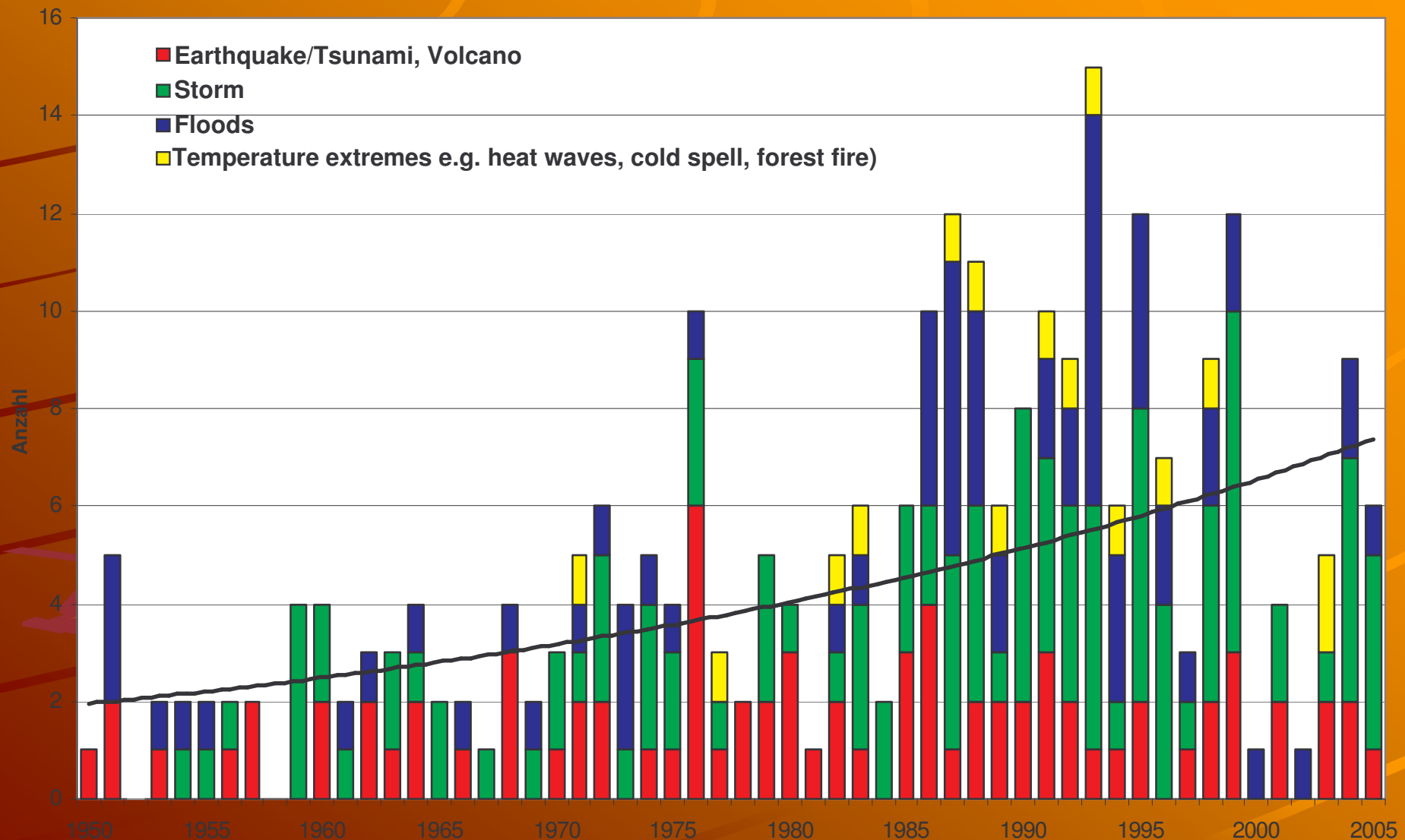
7.3. Major Natural Hazards (1950-2005), Economic and Insured Losses

Mrd. US$

- Economic damages in values of 2005
- Insured damages in values of 2005
- Economic trend
- Trend of insured damage

© 2006 NatCat*SERVICE*, GeoRisikoForschung, Münchener Rück
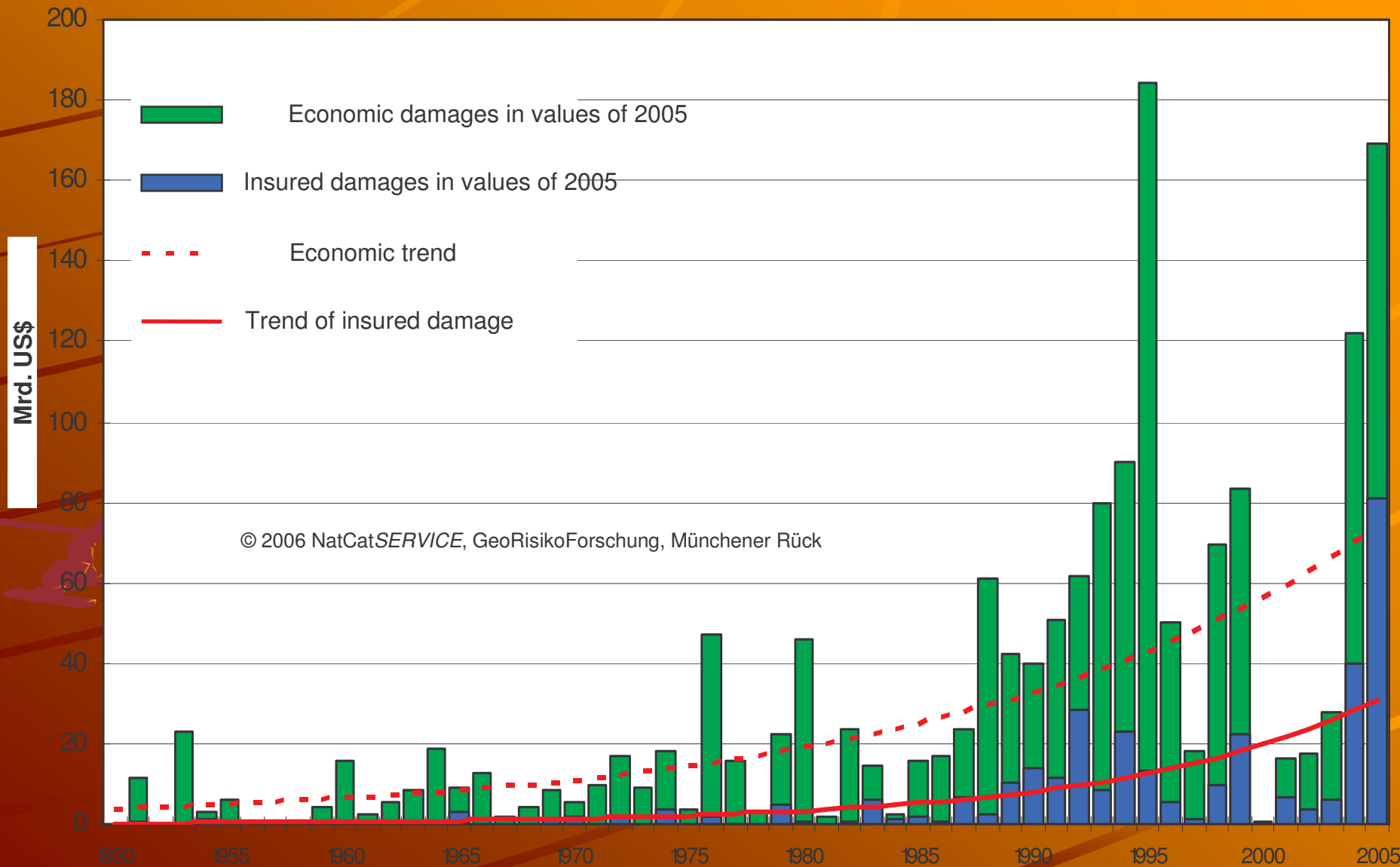
7.4. Major Natural Hazards (1950-2005),

267 Events
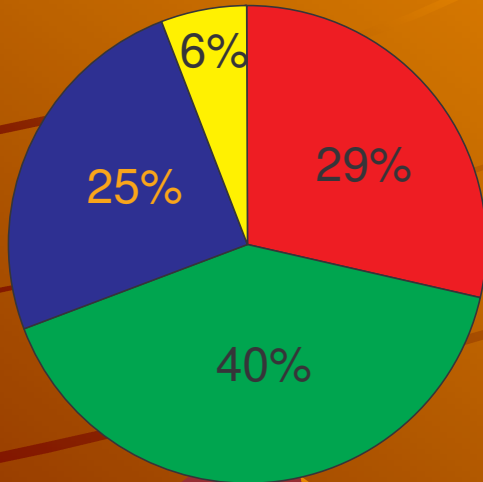
1,75 Million Dead

Geologisch bedingte Ereignisse

■ Earthquake/Tsunami, Volcano

Wetterbedingte Ereignisse

■ Storm
■ Flood
■ Extreme temperatures
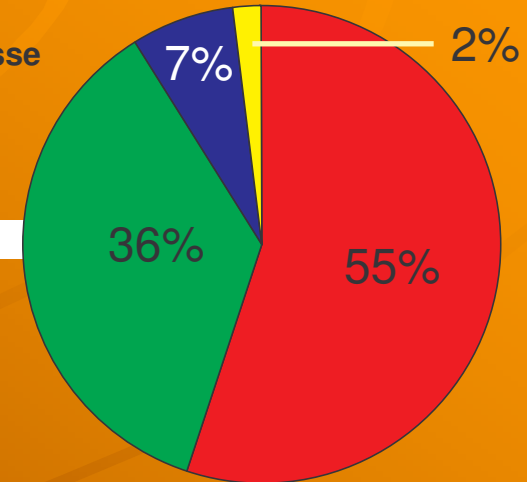
Economic damage: 1.400 billion US$
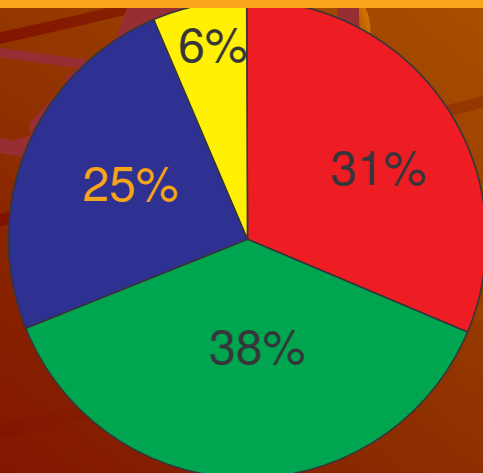
Insured damage: 340 billion US$
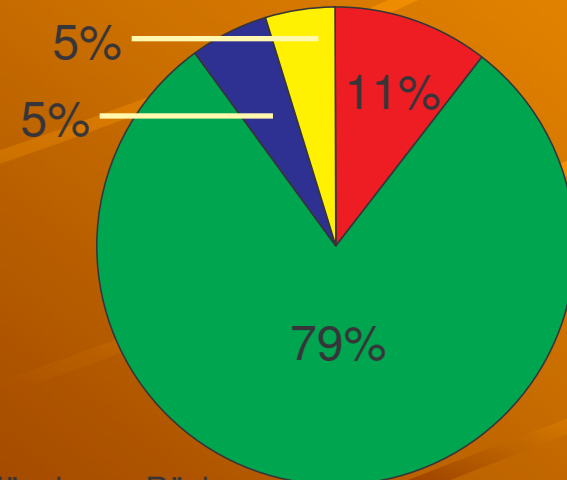
*in Werten von 2005

© 2006 GeoRisikoForschung, Münchener Rück

7.5. Reported Death of Natural Hazards globally (1974-2003): 2.066.273 persons
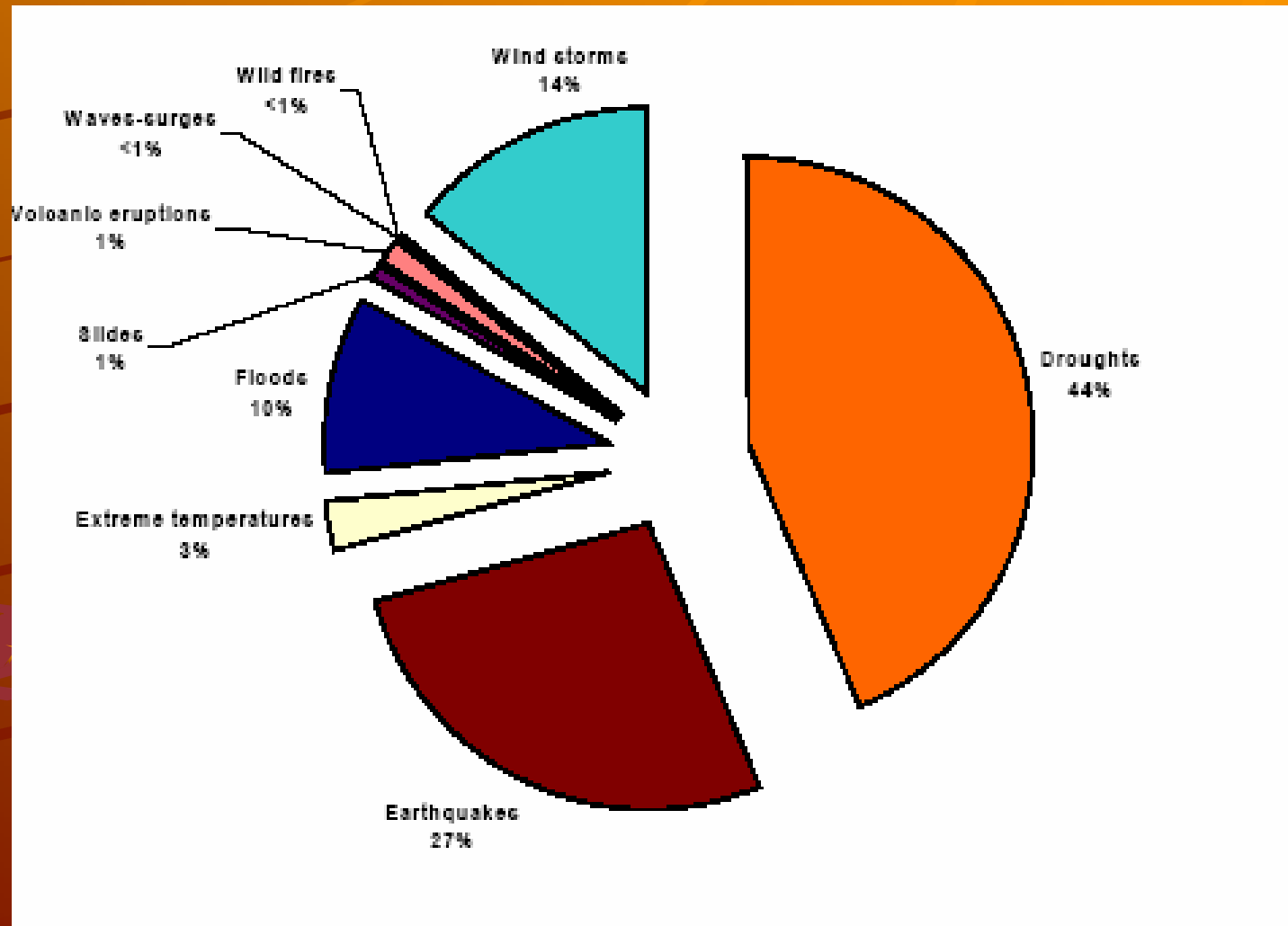
Source: Hoyois und Guha-Sapir (2004)

7.6. Affected persons of Natural Hazards globally (1974-2003): 5 076 494 541 persons

Source: Hoyois und Guha-Sapir (2004)

7.7. Natural Hazards in Mexico

(Source: CRED: number of people killed)

Disaster	Date	Killed
Earthquake	19-Sep-1985	9,500
Flood	1959	2,000
Volcano	1949	1,000
Wind Storm	27-Oct-1959	960
Flood	12-Sep-1999	636
Wind Storm	1-Oct-1976	600
Wind Storm	28-Sep-1955	500
Earthquake	28-Aug-1973	500
Wind Storm	12-Nov-1961	436
Extreme Temperature	30-Apr-1990	380

7.8. Natural Hazards in Mexico
(Source CRED: number of people affected)

Disaster	Date	Total Affected
Earthquake	19-Sep-1985	2,130,204
Wind Storm	1-Oct-2005	1,954,571
Wind Storm	19-Oct-2005	1,000,000
Wind Storm	8-Oct-1997	800,200
Flood	12-Sep-1999	616,060
Wind Storm	15-Jul-1976	300,000
Wind Storm	1-Oct-1976	276,400
Wind Storm	Aug-1967	271,000
Wind Storm	Dec-1983	257,500
Flood	16-Sep-1993	231,290

7.9. Natural Hazards in Mexico
(Source CRED: economic damage costs)

Disaster	Date	Damage US$ (000's)
Earthquake	19-Sep-1985	4,104,000
Wind Storm	22-Jun-1993	1,670,000
Drought	May-1996	1,200,000
Flood	3-Sep-1998	602,700
Flood	12-Sep-1999	451,300
Wind Storm	8-Oct-1997	447,800
Wind Storm	24-Sep-2001	400,000
Wind Storm	17-Jan-1988	250,000
Wind Storm	10-Oct-1995	241,000
Earthquake	15-Jun-1999	226,800

7.10. Summarized Table of Natural Disasters in Mexico (1929-2005)

	# of Events	Killed	Injured	Homeless	Affected	Total Affected	DamageUS (000's)
Drought	8	0	0	0	65,000	65,000	1,729,500
ave. per event		0	0	0	8,125	8,125	216,188
Earthquake	27	10,677	33,287	112,275	2,411,015	2,556,577	4,691,000
ave. per event		395	1,233	4,158	89,297	94,688	173,741
Epidemic	2	68	0	0	11,525	11,525	0
ave. per event		34	0	0	5,763	5,763	0
Extreme Temperature	16	1,207	0	16,000	0	16,000	82,600
ave. per event		75	0	1,000	0	1,000	5,163
Flood	45	4,083	659	165,990	1,336,695	1,503,344	1,491,900
ave. per event		91	15	3,689	29,704	33,408	33,153
Slides	6	202	0	120	200	320	0
ave. per event		34	0	20	33	53	0
Volcano	10	1,120	500	15,000	146,408	161,908	117,000
ave. per event		112	50	1,500	14,641	16,191	11,700
Wild Fires	3	83	0	0	0	0	83,200
ave. per event		28	0	0	0	0	27,733
Wind Storm	61	4,972	1,803	616,250	4,927,386	5,545,439	3,943,345
ave. per event		82	30	10,103	80,777	90,909	64,645

8. Societal Outcomes: Knowledge on Linkages of Outcomes

- **What are consequences of climate change, desertification and water scarcity for:**
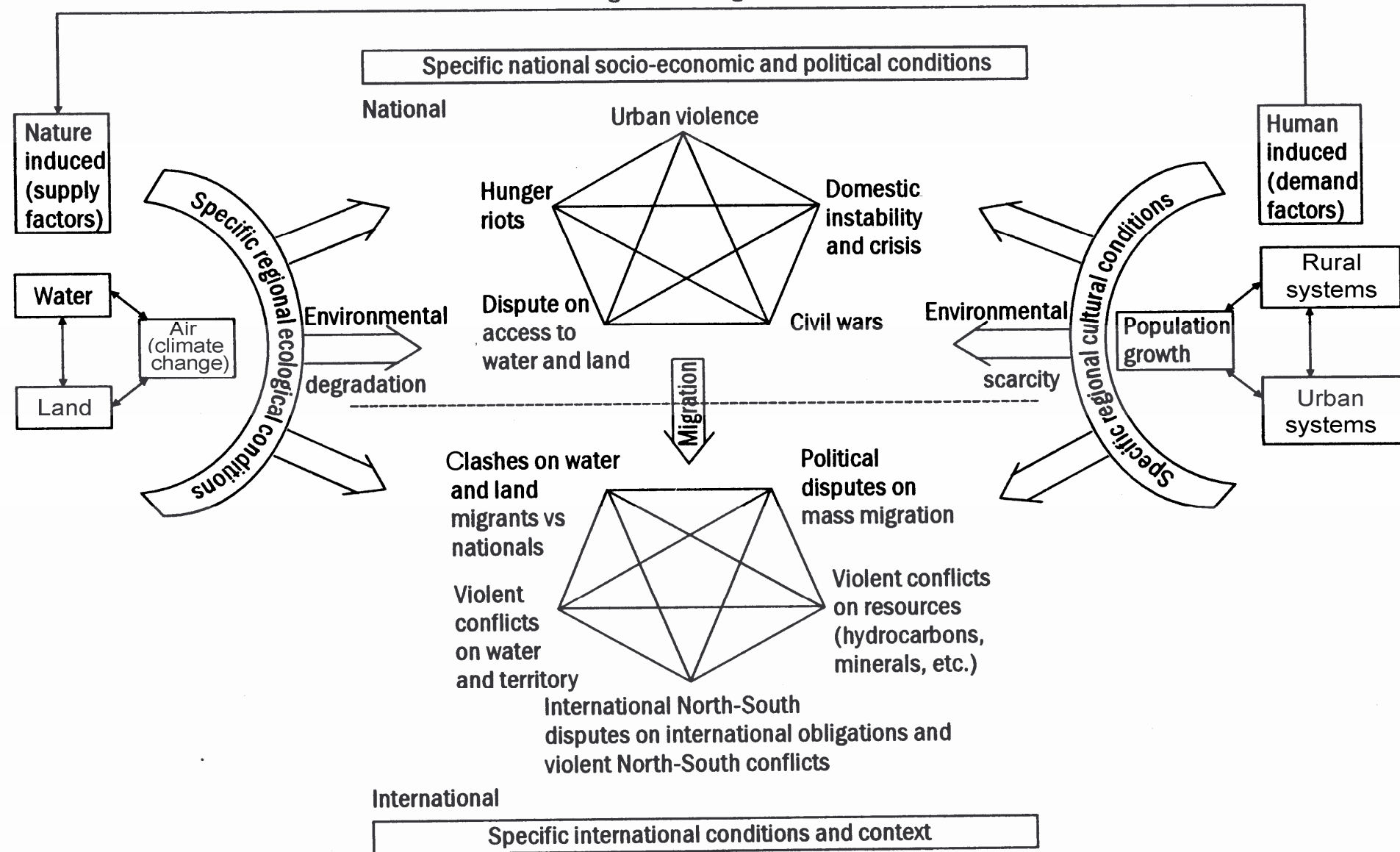 - Environmental scarcity
  - Envivironmental degradation
  - Environmental stress?
- **What are indirect Societal Outcomes of:**
  - Human-induced hydro-meteorological natural hazards (Storms, floods, landslides, drought) due to natural variability & increase due to climate change?
  - For migration, societal crises and domestic and international conflicts?

Increase in greenhouse gas emissions

Specific national socio-economic and political conditions

National

Nature induced (supply factors)

Water

Air (climate change)

Land

Specific regional ecological conditions

Environmental degradation

Urban violence

Hunger riots

Domestic instability and crisis

Dispute on access to water and land

Civil wars

Migration

Environmental scarcity

Specific regional cultural conditions

Human induced (demand factors)

Population growth

Rural systems

Urban systems

Clashes on water and land migrants vs nationals

Political disputes on mass migration

Violent conflicts on water and territory

Violent conflicts on resources (hydrocarbons, minerals, etc.)

International North-South disputes on international obligations and violent North-South conflicts

International

Specific international conditions and context
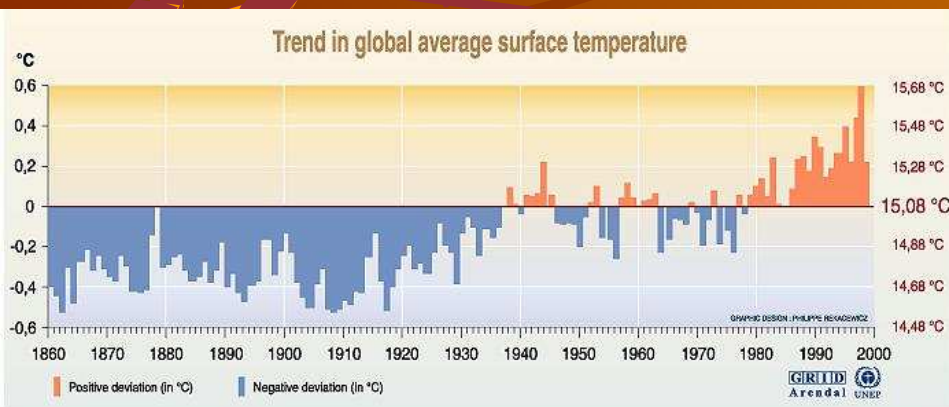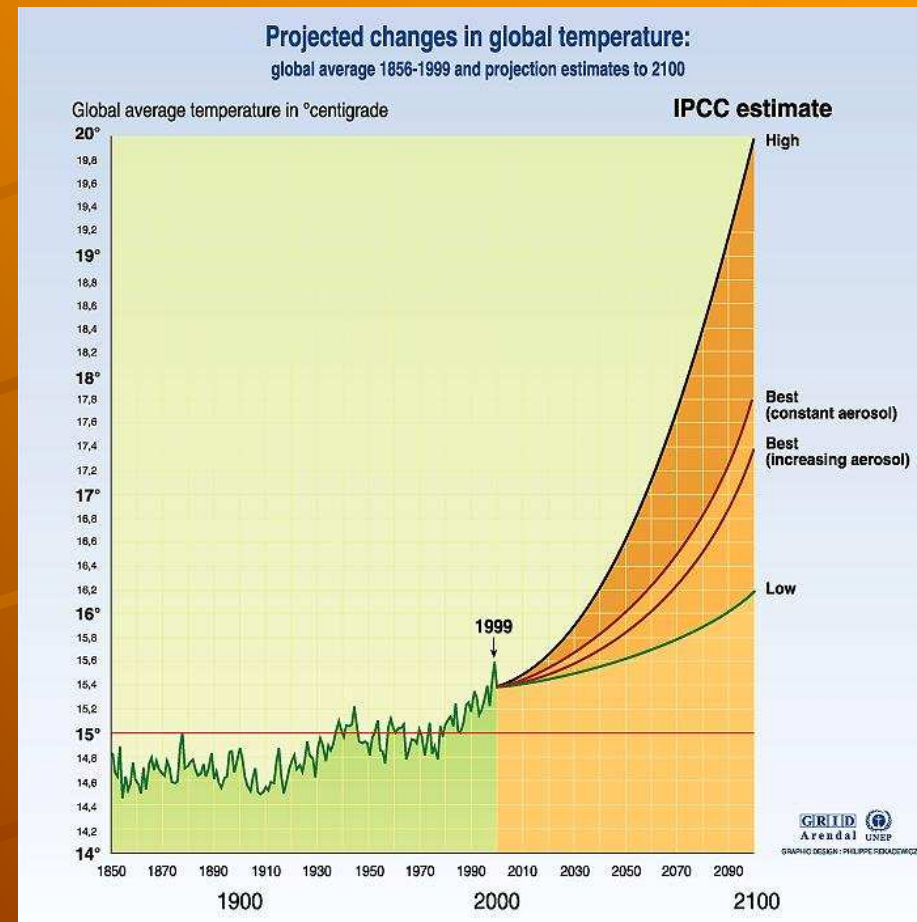
8.2. Global Climate Change: Temperature Increases & Sea Level Rise

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

Trend in global average surface temperature

Positive deviation (in °C) Negative deviation (in °C)

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

Projected changes in global temperature:
global average 1856-1999 and projection estimates to 2100

Global average temperature in °centigrade

IPCC estimate

High

Best (constant aerosol)

Best (increasing aerosol)

Low

1999

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

Precipitation changes: trend over land from 1900 to 1994

Precipitation decreasing by:
20 % (between 1900 and 1994)
10 %
5 %
2 %

Precipitation increasing by:
2 % (between 1900 and 1994)
5 %
10 %
20 %

GRID Arendal UNEP
GRAPHIC DESIGN: PHILIPPE REKACEWICZ

Sources: Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge press university, 1996; Hulme et al., 1991 and 1994; Global Historical Climate Network (GHCN), Vose et al., 1995 and Eischeid et al., 1995)

Developed countries

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

GISS scenario
GFDL scenario
UKMO scenario

Climate effects only

Plus physiological effect of CO_2

Plus adaptation level 1

Plus adaptation level 2

World total

Climate effects only

Plus physiological effect of CO_2

Plus adaptation level 1

Plus adaptation level 2

Developing countries

Climate effects only

Plus physiological effect of CO_2

Plus adaptation level 1

Plus adaptation level 2

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.
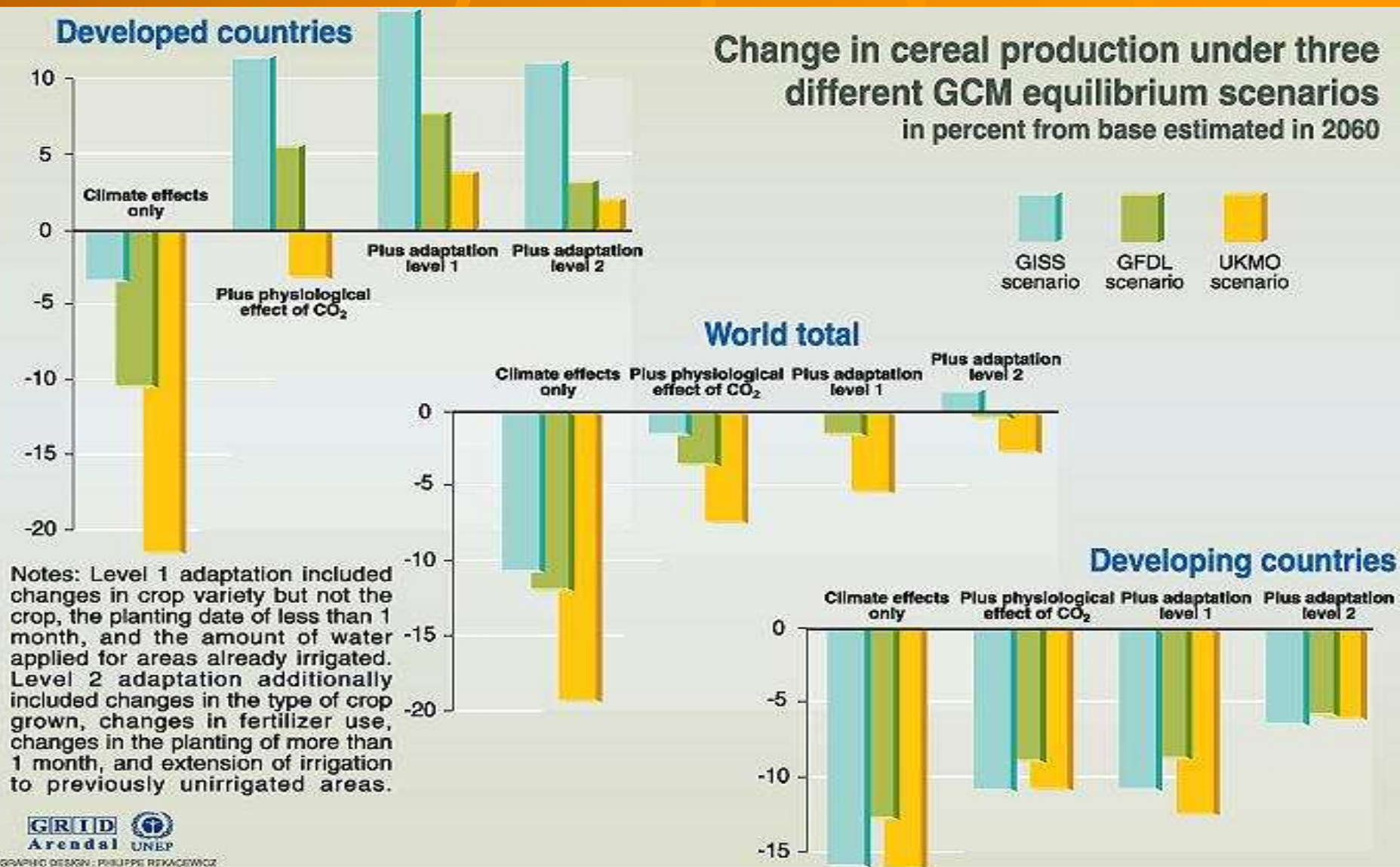
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Arendal   UNEP
GRAPHIC DESIGN : PHILIPPE REKACEWICZ

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

←High Potential for Food Crisis (1901-1995)

Alcamo/Endejan 2002: 143

8.5. Food Crises

High Potential for Food Crisis (2001-2050) with GDP and Climate Change →
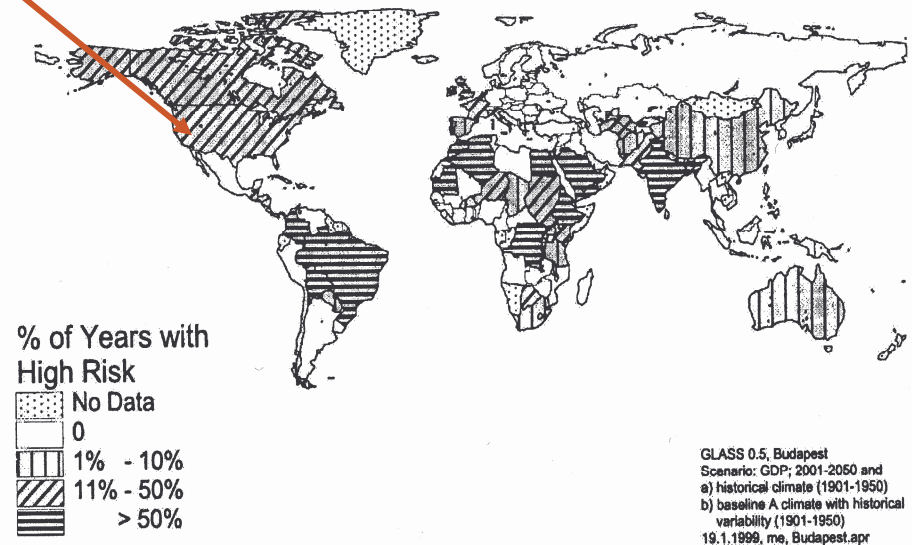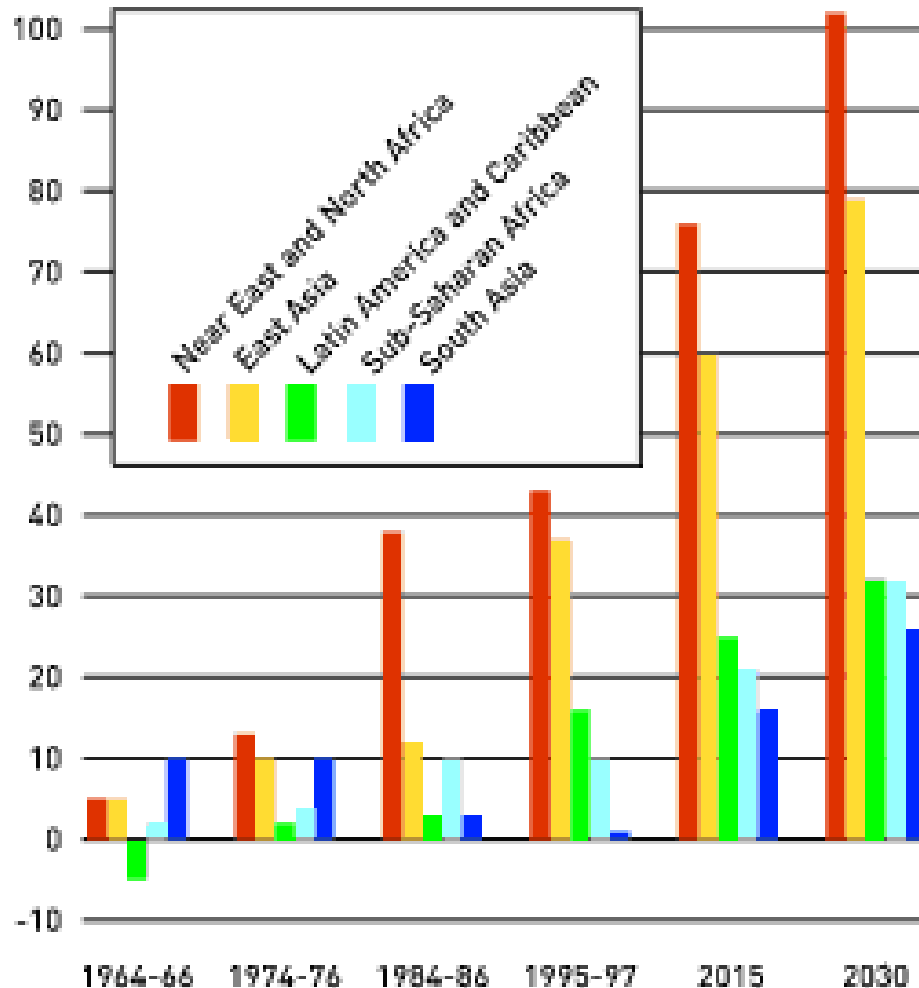
Alcamo/Endejan 2002-143

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

8.6. FAO (2000) Increase in Cereal Imports

Net cereal imports in developing countries

millions of tonnes

Legend (left to right):
- Near East and North Africa
- East Asia
- Latin America and Caribbean
- Sub-Saharan Africa
- South Asia

Years: 1964-66, 1974-76, 1984-86, 1995-97, 2015, 2030

- **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.**

8.7. Climate Change and Conflicts

Hobbesian: http://halfgeek.net/weblog/special/gwreport/Pentagon.htm I
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
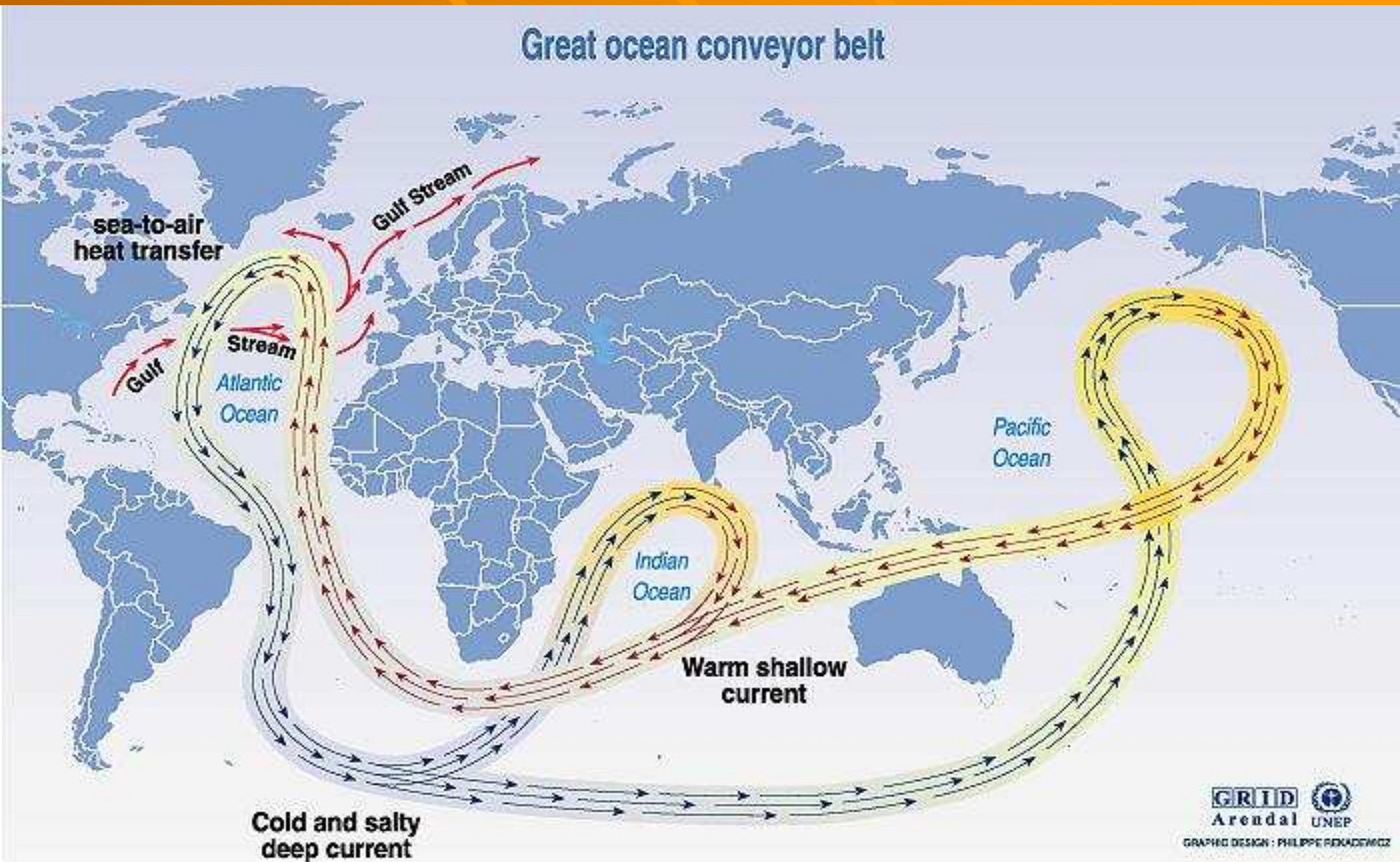- Neo-Malthusian pessimist & Cornucopian optimist
- Pentagon, US national

- **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."

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

- **Science Context: 3 IPCC Assessment Reports (10990, 1995 & 2001) & Reports**
- **Arhennius Hypothesis of 1896: burning of hydrocarbons con-tributes to global warning**
- **Basis of political agenda setting of Reagan Administ. 1988**
- **Increase in energy consumption contributes to: a) temper ature increase. b) sea level rise**
- **Basis: of UNFCCC & IPCC**

- **Scíence 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 Oceanogra-phic Institute (2004)**
- **Pittinger/Gagosian (10/2003)**

Great ocean conveyor belt

sea-to-air heat transfer

Gulf Stream

Gulf Stream

Atlantic Ocean

Pacific Ocean

Indian Ocean

Warm shallow current

Cold and salty deep current

GRID Arendal UNEP

GRAPHIC DESIGN : PHILIPPE REKACEWICZ

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.

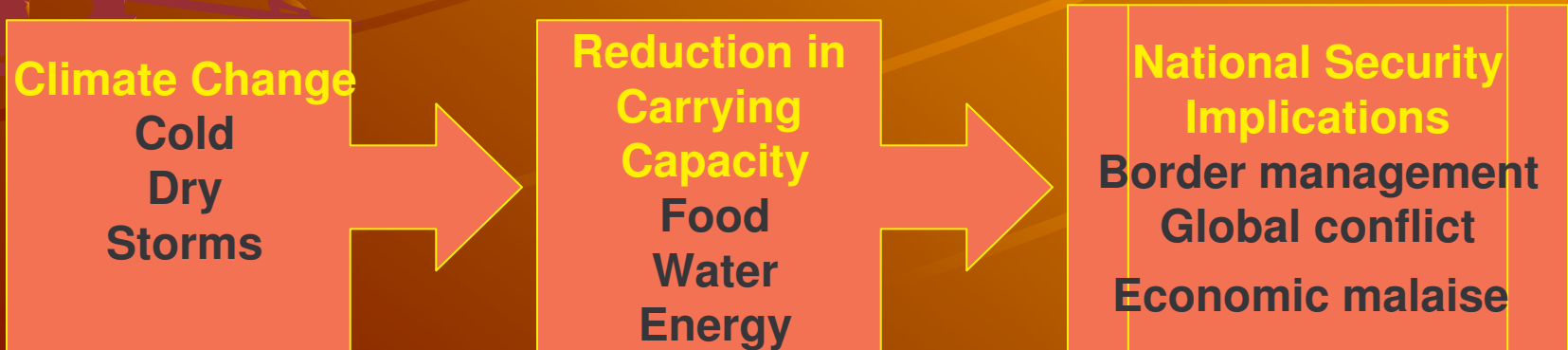# 8.10. Peter Schwartz and Doug Randall Abrupt Climate Change Scenario

❖ **As an alternative to gradual climatic warming they 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 these conditions:**

➢ Annual average temperatures drop by up to 5 degrees Fahr. over Asia and North America and 6 degrees Fahre. 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 chan-ges. Western Europe and the North Pacific experience enhanced winds.

8.11. Impact of Abrupt Climate Change Scenario on Geopolitical Environment

- The report explores how such an abrupt climate change scenario could potentially destabilize 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 patters, causing more frequent floods and droughts
    3) Disrupted access to energy supplies due to extens. sea ice and 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 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.

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

- Indications today that global warming has reached the threshold where the thermohaline circulation could start to be significantly impacted.

- These indications include observations documenting that North Atlantic is increasingly being freshened by melting glaciers, increased precipitation, & fresh water runoff making it substantially less salty over the past 40 years.

- **Report suggests that, due to pot. dire consequences, the risk of abrupt climate change, although uncertain & quite possibly small, should be elevated beyond a scientific debate to a U.S. national security concern**

-

Climate Change	Reduction in Carrying Capacity	National Security Implications
Cold	Food	Border management
Dry	Water	Global conflict
Storms	Energy	Economic malaise

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

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

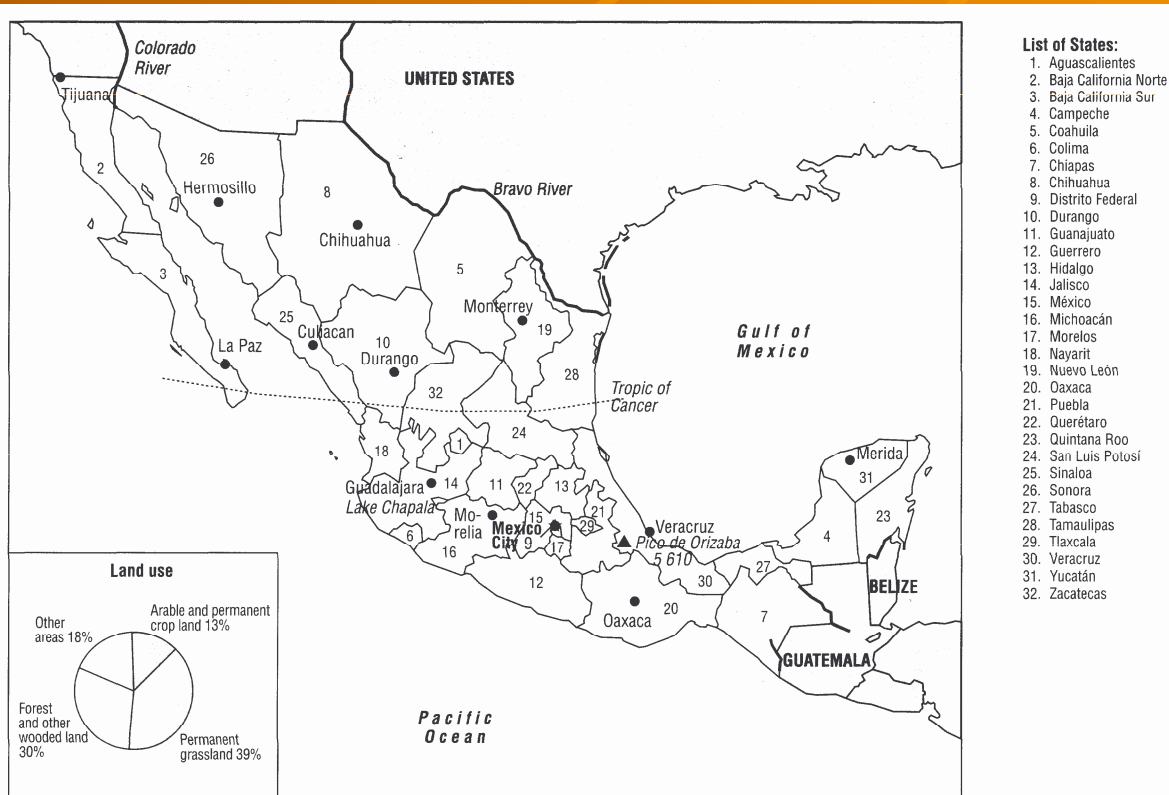# 8.15. BMU Study Design

➢ **Case studies on** Mexico, Bangladesh and Egypt and the regional study on the Mediterranean **focus on different climate zones, eco-regions (tropical, subtropical, semi-arid & arid).**

➢ **They are affected by different impacts of sea-level rise, tempe-rature 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 projections of population growth until 2050, urbanisation until 2030 and for specific cities until 2015.**

8.14. 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 (population growth &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, t**

  ➢ **he pressure for (trans)migration from Central America to Mexico & from there to the United States & Canada will increase in the decades to come.**

8.16. Second Case Study on Mexico

List of States:
1. Aguascalientes
2. Baja California Norte
3. Baja California Sur
4. Campeche
5. Coahuila
6. Colima
7. Chiapas
8. Chihuahua
9. Distrito Federal
10. Durango
11. Guanajuato
12. Guerrero
13. Hidalgo
14. Jalisco
15. México
16. Michoacán
17. Morelos
18. Nayarit
19. Nuevo León
20. Oaxaca
21. Puebla
22. Querétaro
23. Quintana Roo
24. San Luis Potosí
25. Sinaloa
26. Sonora
27. Tabasco
28. Tamaulipas
29. Tlaxcala
30. Veracruz
31. Yucatán
32. Zacatecas

- **Climate change & popula-tions growth matter**
- First Nat. Comm. (97): **59.6% - 75%** of land would become **unsuitable for maize production** due to climate change
- Climate change directly affects mortality rate through **heat-waves** or **floods** or indirectly through infectious illnesses (**malaria, dengue, cholera, typhus**).
- The growing urban centres imply a growth in **demand for water**, and those in arid & semi-arid areas will be affected by **water shortage**

8.17. Desertification-induced Drought, Migration & Famine and Conflicts

- **Desertification is a slow-onset environmental challenge to security and survival, especially for the poor.**
  - ➢ Affects the individual, family, village, region and their security
  - ➢ Affects survival of rural population: contributes to rapid urbanisation
  - ➢ Vicious circle: Poverty contributes to desertification and desertification often intensifies poverty.(dual cause and effect relationship)

- Drought, migration and famine are situational challen-ges to security and survival, especially for the poor.
  - ➢ **Drought as a hydro-meteorological hazard (partly caused by Climate change and its interaction with desertification) has forced people to leave their home and livelihood**
  - ➢ **Drought has often resulted in famine and/or food price increases that often led to strikes, hunger revolts, domestic crises and conflicts.**

8.18. Impacts of Desertification: Migration, Urbanisation and Internal Displacement

1994 Almería Symposium on Desertification and Migration

The Almería Statement, 1994:

Socio-political dimensions

- of 50 conflicts: 20 env. dimension
- Major factor of geopolitical instability
- Urbanisation: accelerates impoverishment of land, resources & people

Policy priorities

- IDP in arid, semi-arid lands > impose severe pressure on scarce natural land
- Prevention of involuntary desertif.-induced migration: stustainable agriculture
- Regional planning: harmonise agricultural production with development of medium-scale towns in rural areas

© Sebastiao Salgado: Refugee child

8.19. Desertification, Migration and Conflict – Case of Mexico: Annual Aridity & Precipitation


Index of Aridity

	< 0.15
	0.15 -> 0.19
	0.20 -> 0.24
	0.25 -> 0.49
	> 0.50
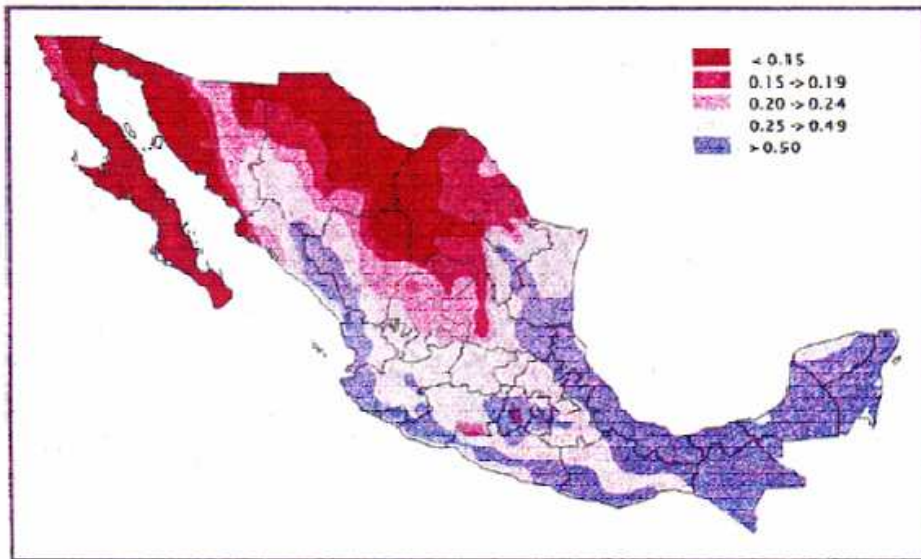
Ratio between annual precipitation
and average evaporation

< 0.15	very arid area (desert)
0.15 - 0.20	arid area
0.20 - 0.25	semi arid area
0.25 - 0.50	dry and subhumid area
> 0.50	humid area

Sources:
Atlas Nacional del Medio Fisico de Mexico de INEGI
Mapas temáticos de INEGI
Atlas Nacional de Mexico de UNAM

Annual Precipitation

	< 125
	125-400
	400-600
	600-800
	800-1500
	> 1500
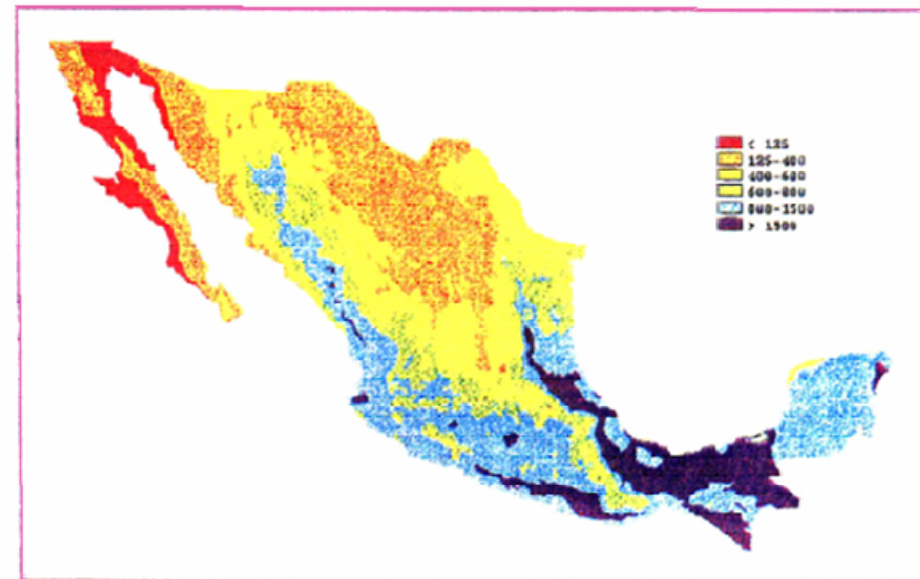
0 - 125 mm	0 - 5 inches
125 - 400 mm	5 - 16 inches
400 - 600 mm	16 - 24 inches
600 - 800 mm	24 - 31 inches
800 - 1500 mm	31 - 59 inches
> 1500 mm	> 59 inches

Sources:
Atlas Nacional del Medio Fisico de Mexico de INEGI
Mapas temáticos de INEGI
Atlas Nacional de Mexico de UNAM

# 8.20. Desertification, Migration and Conflict – Case of Mexico

Average Number of Dry Months Per Year

Legend:
- 12
- 10–11
- 7–9
- 4–6
- < 3
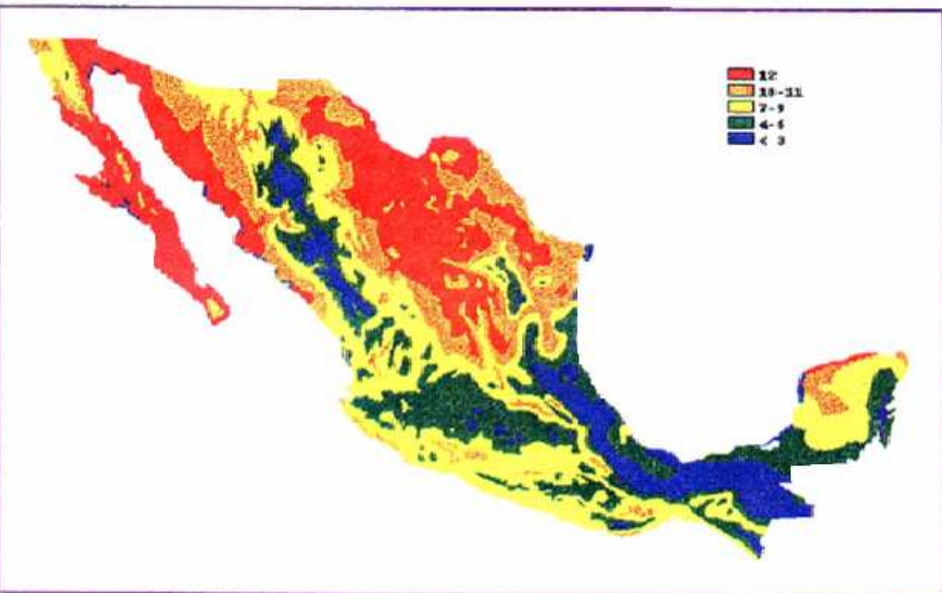
Months:
- 12 — arid area
- 10 - 11 — semi-arid area
- 7 - 9 — dry and subhumid areas
- 4 - 6 — humid area
- < 3 — very humid area

Sources:
Atlas Nacional del Medio Físico de México de INEGI
Mapas temáticos de INEGI
Atlas Nacional de México de UNAM

Average Annual Evaporation

Legend:
- > 2200 mm
- 2000–2200 mm
- 1600–2000 mm
- < 1600 mm
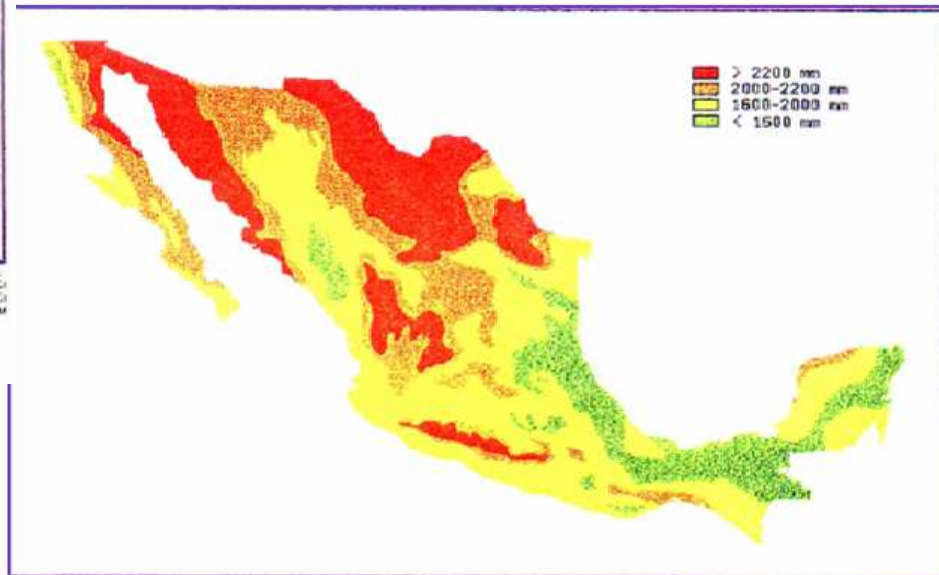
mm	inches
> 2200 mm	> 83.6 inches
2200 - 2000 mm	78.7 - 86.5 inches
2000 - 1600 mm	62.9 - 78.6 inches
< 1600 mm	< 62.8 inches

Sources:
Atlas Nacional del Medio Físico de México de INEGI
Mapas temáticos de INEGI
Atlas Nacional de México de UNAM

Number of Dry Months and Migration

Legend (circle sizes):
- 39177
- 29407
- 19638
- 9869
- 100

Legend (dry months):
- 12
- 10–11
- 7–9
- 4–6
- < 3
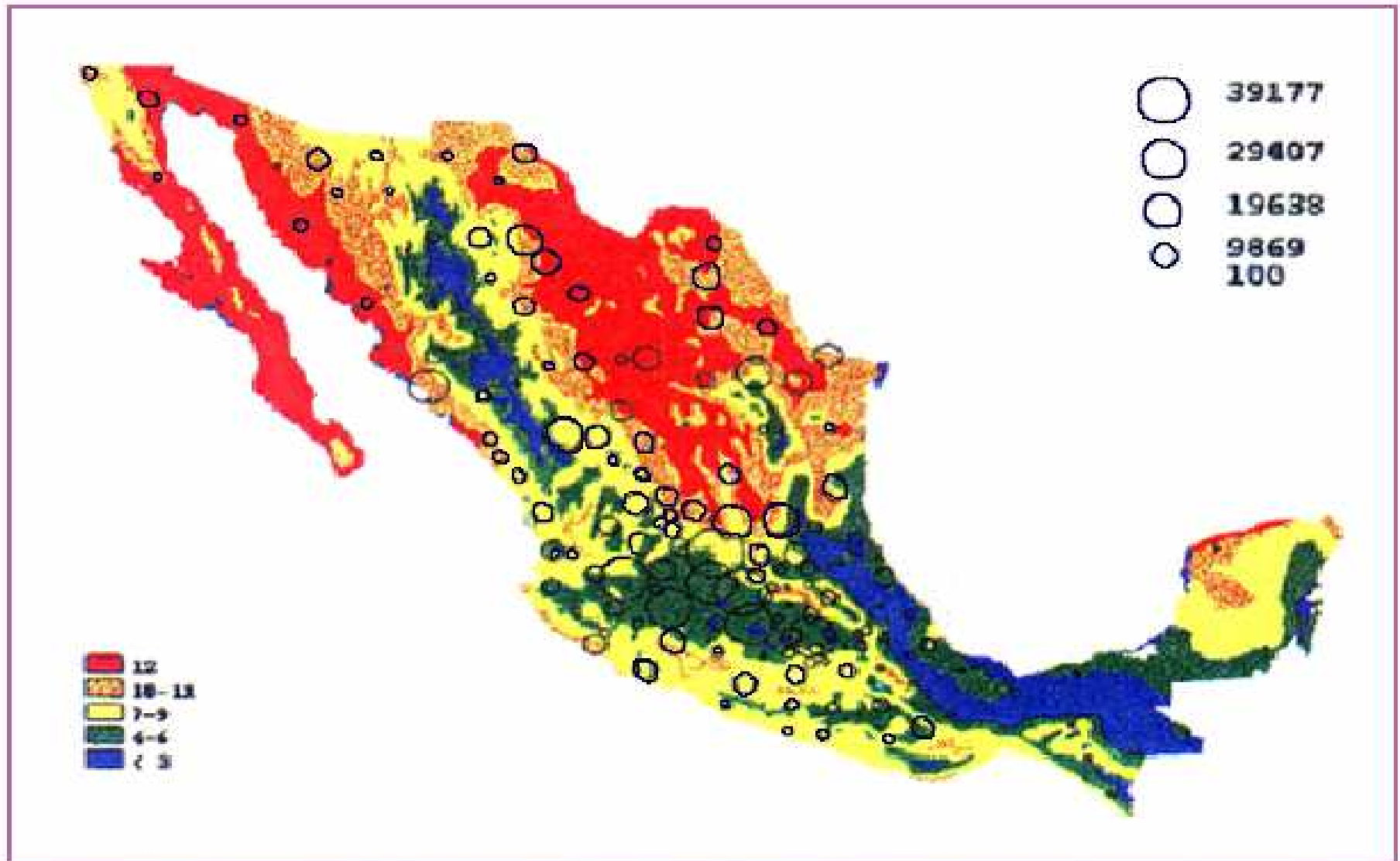
Number of dry months and flow (estimation for 1993) of Mexican migrants living and working in the US, surveyed on the border on their return to Mexico (spatial distribution according to their region of birth in Mexico, rural and urban localities).

8.22. Desertification, Migration and Conflict – Case of Mexico

Rural Migration and Aridity

< 0.50
> 0.50

18587
14100
9700
5300
1000
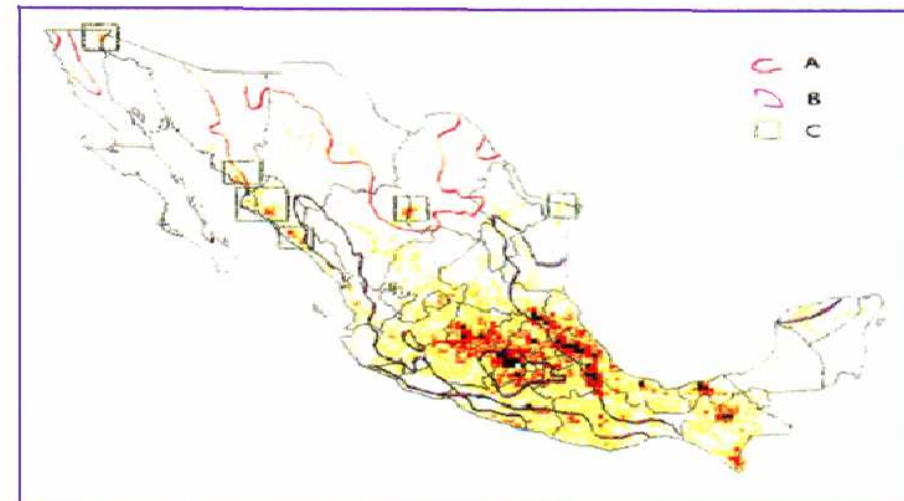
- Arid and dry areas (< 0.50)
- Humid area (> 0.50)
- Flow of Mexican migrants in 1993, living and working in the US, surveyed on the border on their return to Mexico (spatial distribution according to the region of last residence in rural localities of Mexico.
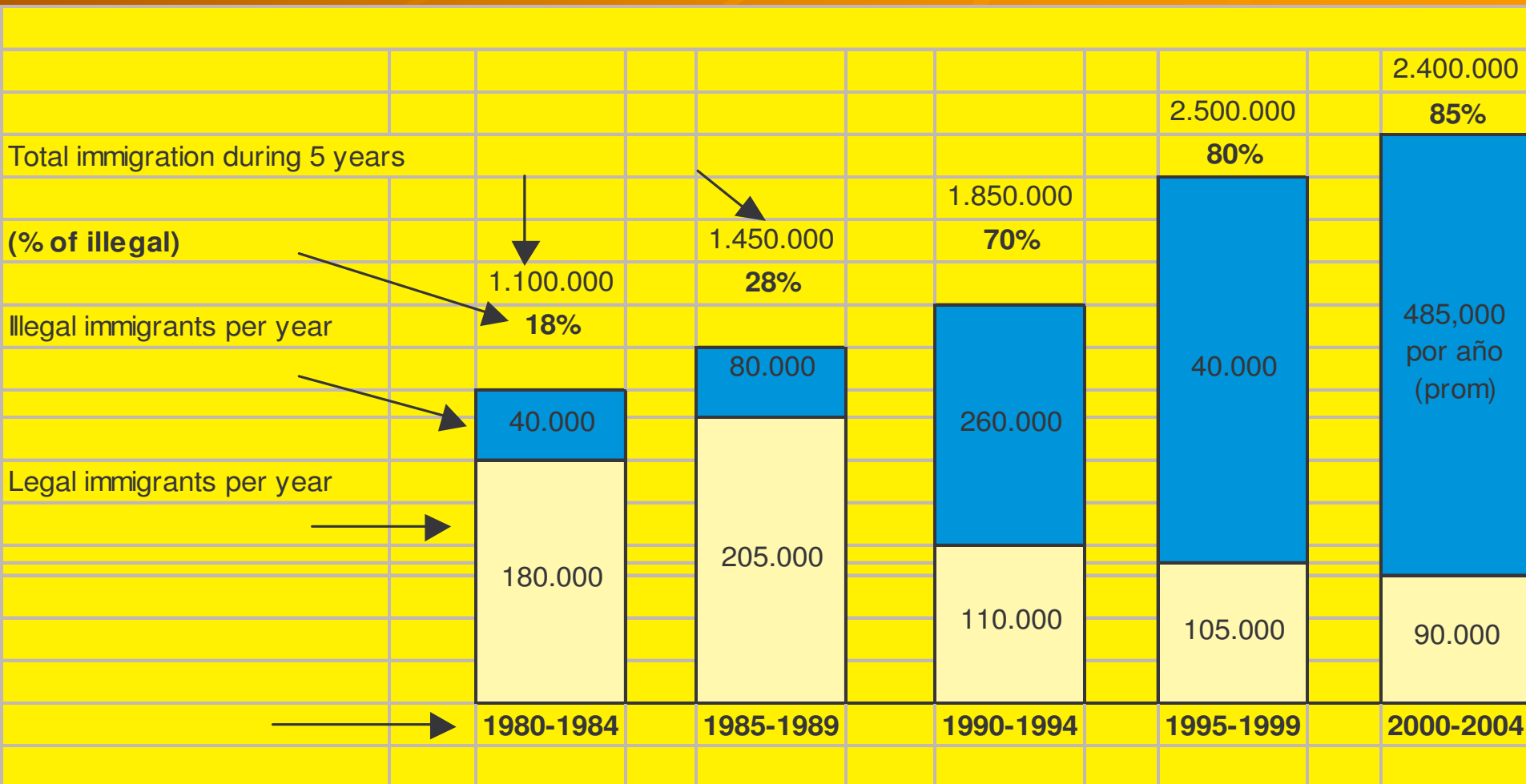
Aridity and Density of Rural Population

A
B
C

A. Transition from arid to dry area
B. Transition from dry to humid area
C. Arid area with irrigation
Density of rural population (living in localities of less than 2500 inhabitants) in 1990 (X Mexican Census).
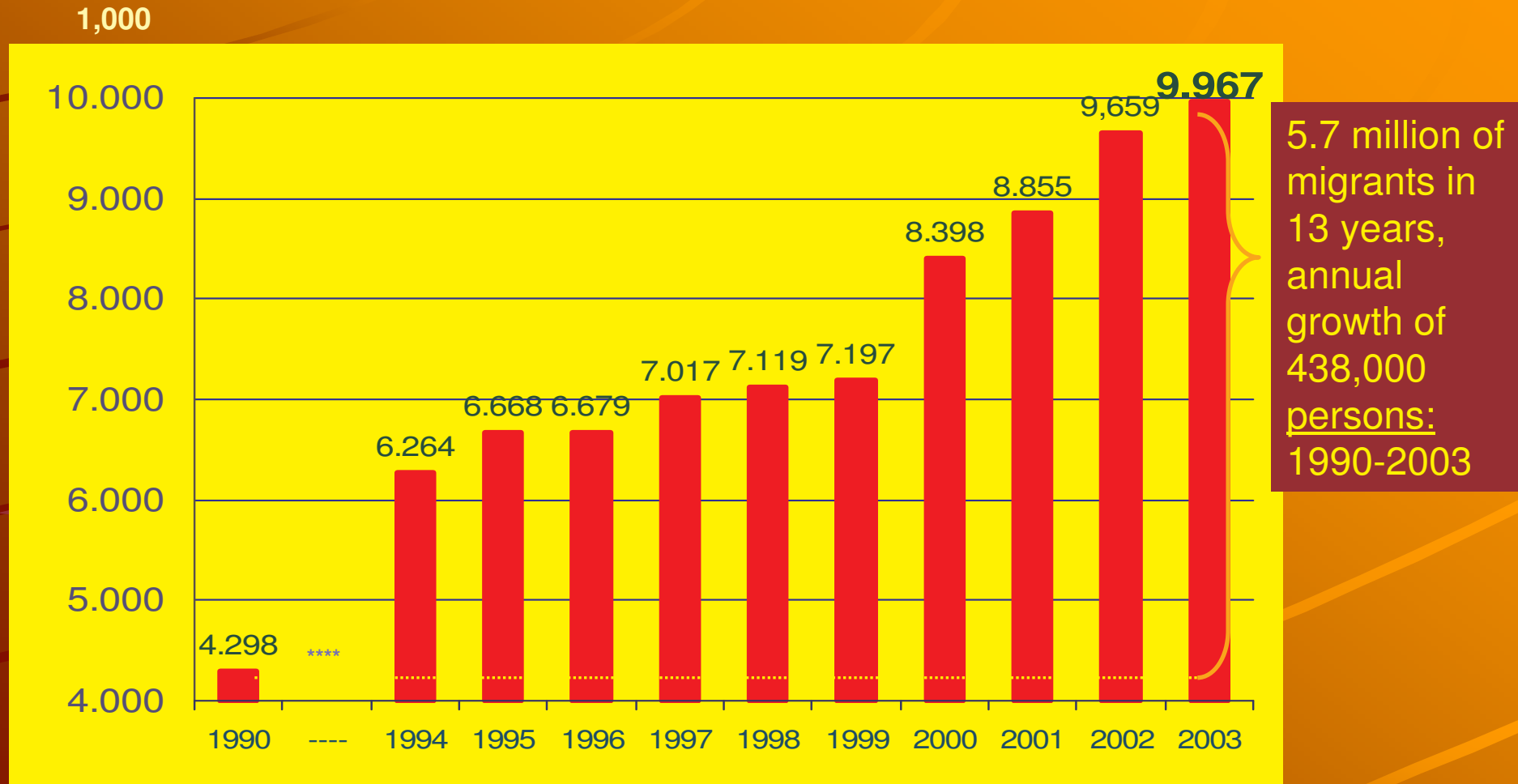
8.23. Migrants to USA from Mexico by Legal Status

	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Total immigration during 5 years	1.100.000	1.450.000	1.850.000	2.500.000	2.400.000
(% of illegal)	18%	28%	70%	80%	85%
Illegal immigrants per year	40.000	80.000	260.000	40.000	485,000 por año (prom)
Legal immigrants per year	180.000	205.000	110.000	105.000	90.000

8.24. Mexican Migrants to USA 1990–2003 (1000 Persons)

1,000

Year	Value
1990	4.298
----	****
1994	6.264
1995	6.668
1996	6.679
1997	7.017
1998	7.119
1999	7.197
2000	8.398
2001	8.855
2002	9,659
2003	9.967

5.7 million of migrants in 13 years, annual growth of 438,000 persons: 1990-2003

9. <u>R</u>esponse: Policy Goal:
Early Warning & Reducing Social Vulnerability By Empowerment & Resilience Building

- **To environmental scarcity, degradation & stress:**
  - **Proactive climate policy:** reduce greenhouse gases by shifting to nonfossil energy resources, especially renwables
  - **Combat desertification and soil erosion**:
  - Cope with water scarcity & degradation by demand-side mana-gement and alternative supply (desalination with renewables)
  - Cope with population growth, rural emigration and urbanisation
- **To extreme outcomes of GEC, hydro-meteoro-logical hazards & severe societal consequences:**
  - **Reducing the hazard imapct by enhanced early warning against multiple hazards and reducing social vulnerabi-lity by improved resilience**
  - **Improved policy of conflict resolution, prevention and adaptation and mitigatioin against challegnes of GEC that may lead to conflicts (anticipatory learning & conflict avoidance)**

9.1. Instruments and Actors for Dealing with Desertification as a Security Issue

Reactive Security Policy: Dealing with the Consequences

➢ Rapid disaster response: humanitarian community dealing with drought & famine & migration & conflicts

➢ Coping with domestic & trans-border violence: police & armed forces

Proactive Security Policy: Addressing the Causes

✦ Global environmental policy and combined efforts of

➢ Desertification: UNCCD regime (Secretariat in Bonn)

➢ Climate Change: UNFCCC regime (Secretariat in Bonn), Kyoto Protocol

➢ Reproductive Health: UNPF (slowing down demand)

➢ Improved Water Conservation, Harvesting and Management

➢ Sustainable Agriculture: FAO, WFP

➢ Dealing with urbanisation: Habitat

Task: Reduce costs & impact of drought and societal conse-quences by early warning of famine, migration & conflict!

10. Policy Implications for Human & Environmental Security

- **Conclusion:**
  - Environmental Security: Widening of scope & actors
  - Human Security: shifting from state to humankind
- **Task for Research:**
  - Development the environmental dimension of human security
  - Introduce human security concerns into environmental security
  - Develop the fourth phase of research on HESP
- **Task for Policy:**
  - Mainstream early warning of hazards & conflics
  - Develop anticipatory learning and proactive policies to mitigate against impacts of GEC (climate change)
  - Empower people by building resilience and recucing social vulnerability by poverty eradication policies

10.1. Broaden Policy Constituency: Climate Change, Disaster & Early Warning (disaster & conflict) & Conflict Prevention Community)

Four constituencies without scientific & policy interaction

❖ **Early Warning communities (global, regional)**
  ➢ of natural hazards and disasters (UNISDR, EWC)
  ➢ of crises and conflicts

❖ **Adaptation and Mitigation efforts**
  ➢ Against climate change (IPCC community)
  ➢ Against natural hazards and disasters (UNISDR, GDIN, etc.)
  ➢ 2 conferences in June 2002: by Dutch (Actor specific) & German (research specific) Foreign Minístries

❖ **Mainstreaming of these efforts is needed**
  ➢ early warning of hazards, crises & conflicts (IPCC community)
  ➢ Against natural hazards and disasters (UNISDR, GDIN, etc.)

❖ **Major Clients: EU-ECHO: funder & UN-OCHA: coordination**

10.2. From Research to Action: Enhancing Environmental & Human Security

- **Primary Goal:** address fatal outcomes of GEC: hazards and disasters, migration, crises & conflicts that may have been caused, triggered, induced, influenced by: a) environmental stress and b) extreme weather events,

- **Enhance Environmental Security:** Address human behaviour that contributes to GEC via climate change, soil degradation, water pollution & scarcity: sustainable strategies

- **Enhance Human Security:** address factors of GEC that challenge survival of individuals, families, villages, ethnic groups

- **Avoid Environmentally-induced Conflicts:** address structural or causal factors (of Survival Hexagon), e.g. climate policy, combat desertification, cope with water stress.

10.3. Environmental Conflict Avoidance: Addressing Causes & Fatal Outcomes

- Environmental and human security strategies: address the two values at risk a) **sustainability** (environmental security); and b) **survival** (human security);

- Deal with the different referent objects of security: a) **ecosystem** (environmental security); and b) individual & mankind (human security);

- Address the different causes of threat, challenge, vulenrability adn risk: a) **mankind** (environm. security); and b) **nature, state, globalisation** (human securirty);

- We need **sustainable development strategies** (development, environment policies addressing 6 GWC-factors).

- We need **survival strategies** (protection & empowerment).

Thank you
for inviting me and giving me an opportunity to share with you our emerging conceptual ideas.

Thank you
for your attention
and patience.

Send your comments to:
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