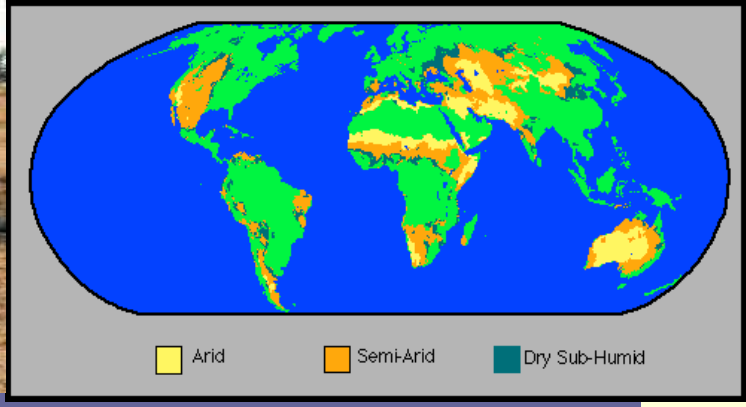

Prof. Dr. Úrsula Oswald Spring,
CRIM-UNAM, Mexico
PD Dr. Hans Günter Brauch, Germany

Third Session of the Committee for the Review of the Implementation of the Convention (CRIC 3)

Bonn, 10 May 2005

UNCCD

UNITED NATIONS
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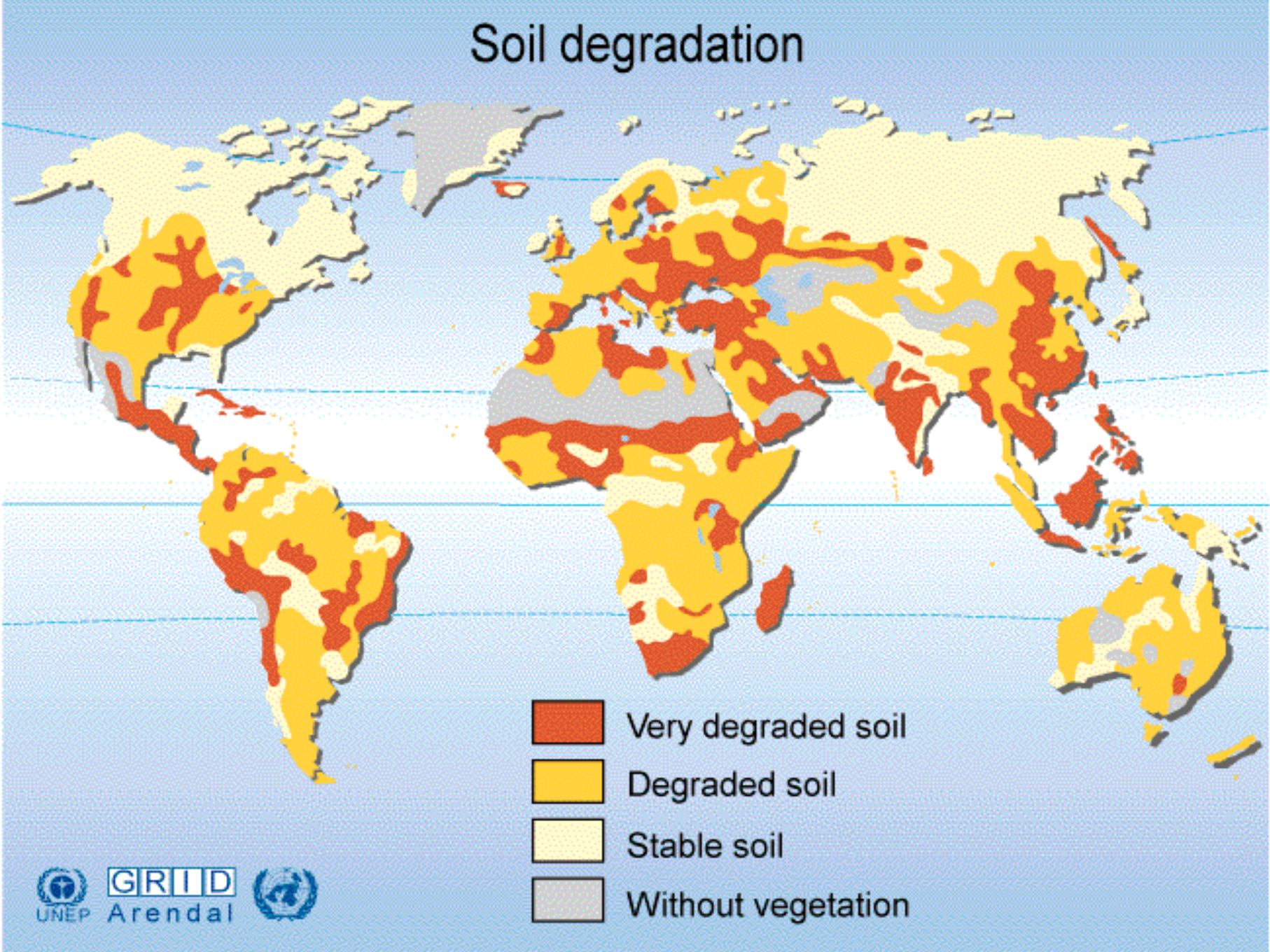
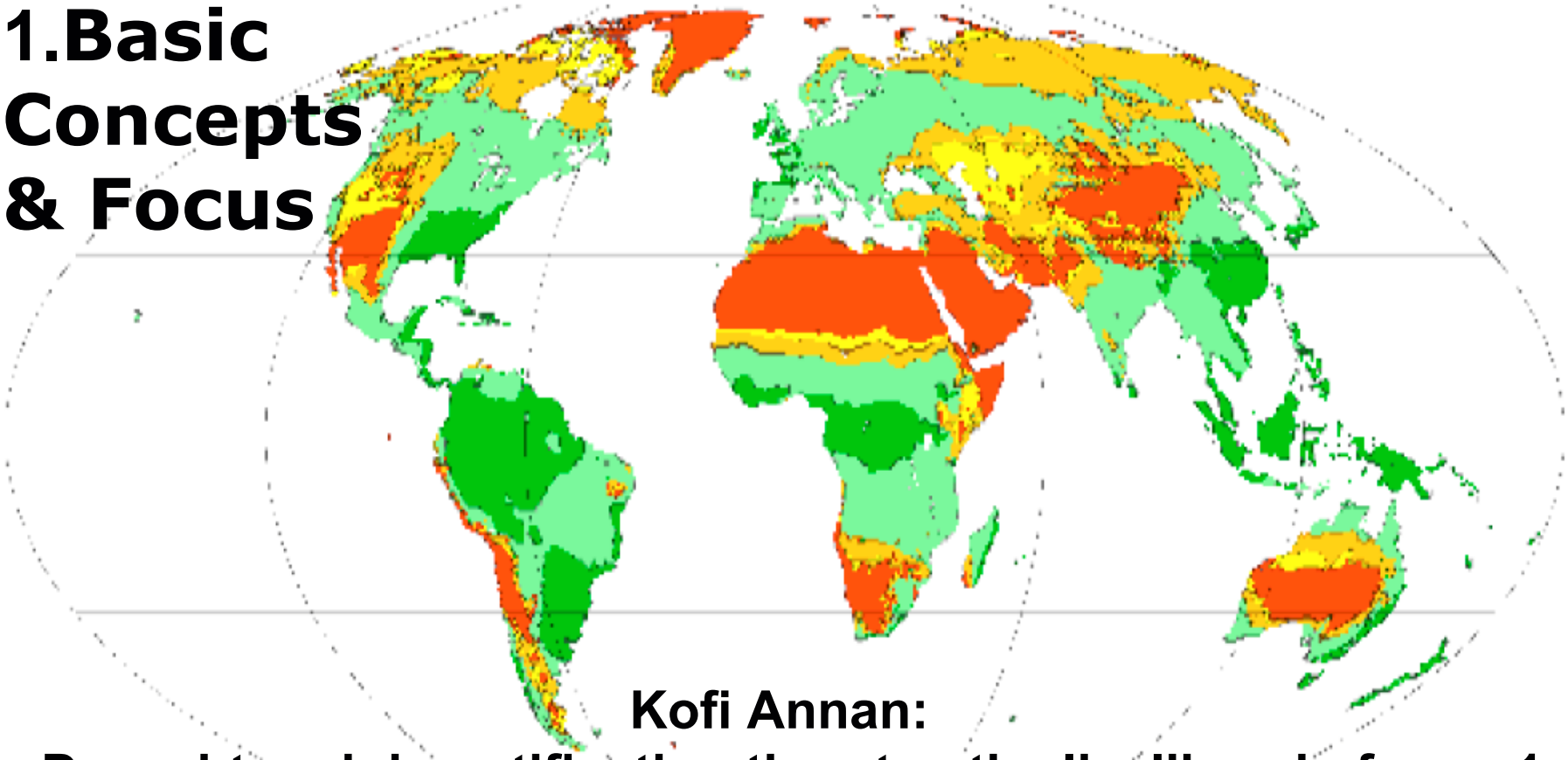
GLOBAL INTERACTIVE DIALOGUE ON MIGRATIONS AND CONFLICTS

Contents

Soil degradation



1.Basic Concepts & Focus



Kofi Annan:

„Drought and desertification threaten the livelihood of over 1 billion people in more than 110 countries around the world.“

AREA OF DRYLANDS

Area of drylands by length of growing period zone and region

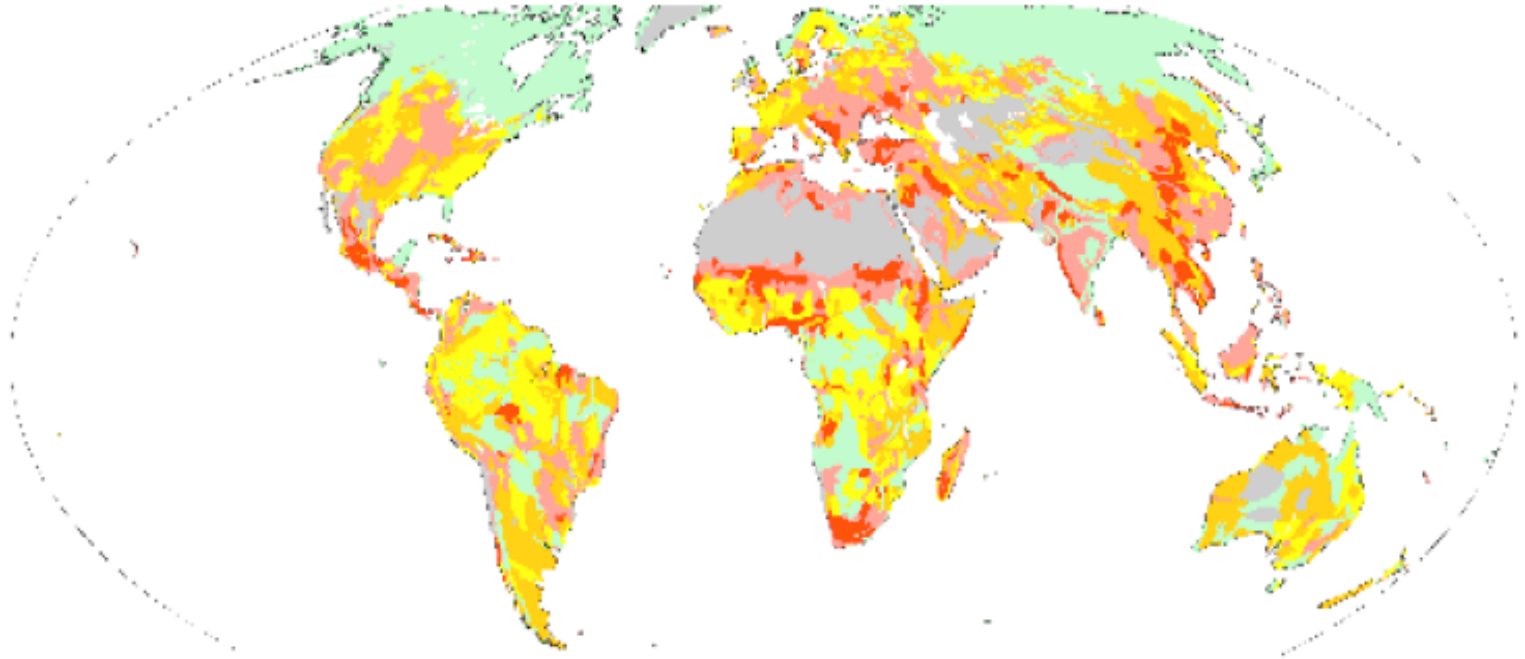
	Hyperarid	Arid	Semi-arid	Dry subhumid	Drylands (total)
	% of total area	% of total area	% of total area	% of total area	% of total area
Sub-Saharan Africa	24	6	13	19	38
North Africa & Near East	78	4	11	5	20
North Asia, east of Urals	1	11	51	33	95
Asia and Pacific	24	6	15	17	38
South & Central America	9	11	6	10	45
North America	7	12	28	23	63
Europe	0	<0.5	13	16	29
World	19	7	20	18	45

Nachtergaele and Young 2000, 10

Severity of Land Degradation

according to

The GLASOD Study (UNEP - ISRIC)



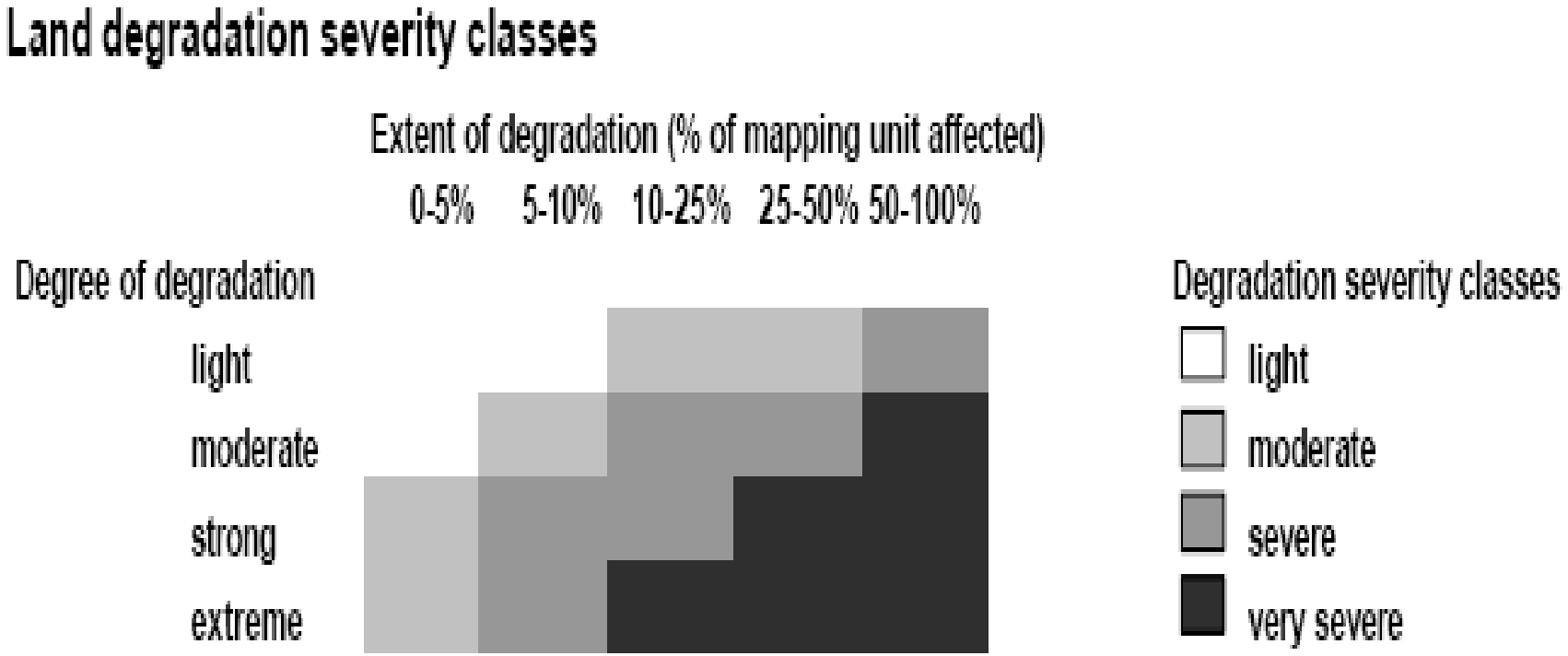
light | medium | high | very high | stable terrain | non-used wasteland

Mollweide Projection

FAO -GIS. March 2000

SEVERITY OF LAND DEGRATION WORLDWIDE

Nachtergaele and Young 2000, 27



LAND DEGRADATION BY REGION

Land degradation severity by region (% of area by severity class)

	None	Light	Moderate	Severe	Very Severe	Total degrada-tion: Light – Very Severe	Degradation: Moderate – Very Severe
Sub-Saharan Africa	33	24	18	15	10	65	42
North Africa & Near East	30	17	19	28	7	70	52
Asia and Pacific	28	12	32	22	7	72	61
North Asia. east of Urals	53	14	12	17	4	47	33
South & Central America	23	27	23	22	5	77	50
Europe	9	21	22	36	12	90	70
North America	51	16	16	16	0	44	29
World	35	18	21	20	6	65	47

Nachtergaele and Young 2000, 29

AREA OF DRYLANDS

Area of drylands by length of growing period zone and region

	Hyperarid	Arid	Semi-arid	Dry subhumid	Drylands (total)
	% of total area	% of total area	% of total area	% of total area	% of total area
Sub-Saharan Africa	24	6	13	19	38
North Africa & Near East	78	4	11	5	20
North Asia, east of Urals	1	11	51	33	95
Asia and Pacific	24	6	15	17	38
South & Central America	9	11	6	10	45
North America	7	12	28	23	63
Europe	0	<0.5	13	16	29
World	19	7	20	18	45

Nachtergaele and Young 2000, 10

Human-induced severe and very severe land degradation due to agricultural activities

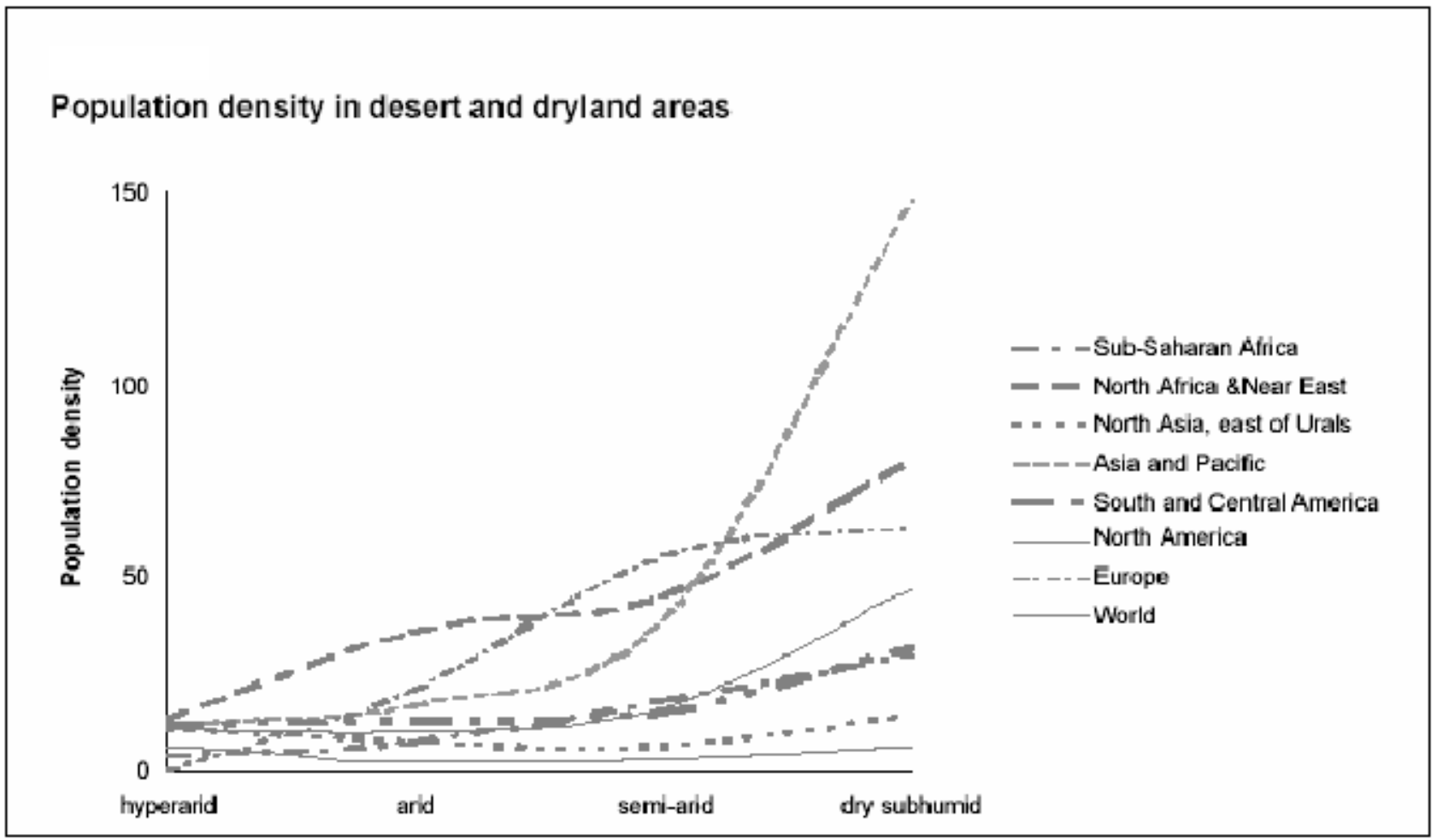
Region	Area extent ('000 km²)	% of total area	% of severely degraded land
Sub-Saharan Africa	1996	8	34
North Africa and Near East	759	6	18
North Asia, east of Urals	1180	6	27
Asia and Pacific	3506	12	42
South and Central America	1795	9	32
North America	2427	13	77
Europe	727	11	22
World	12391	9	35

Land degradation severity and population density by region. (Population density in number of inhabitants per km^2)

	None	Light	Moderate	Severe	Very Severe
Sub-Saharan Africa	8	20	29	34	50
North Africa & Near East	2	22	34	15	22
North Asia, east of Urals	4	11	10	19	20
Asia & Pacific	19	5	13	26	8
South & Central America	10	13	15	28	58
Europe	31	74	108	101	86
North America	5	23	25	21	NA
World	17	25	34	55	67

NA = not applicable

POPULATION DENSITY IN DESERT AND DRYLAND AREAS



Nachtergaele and Young 2000, 20

DESERTIFICATION, RISKS AND POPULATION

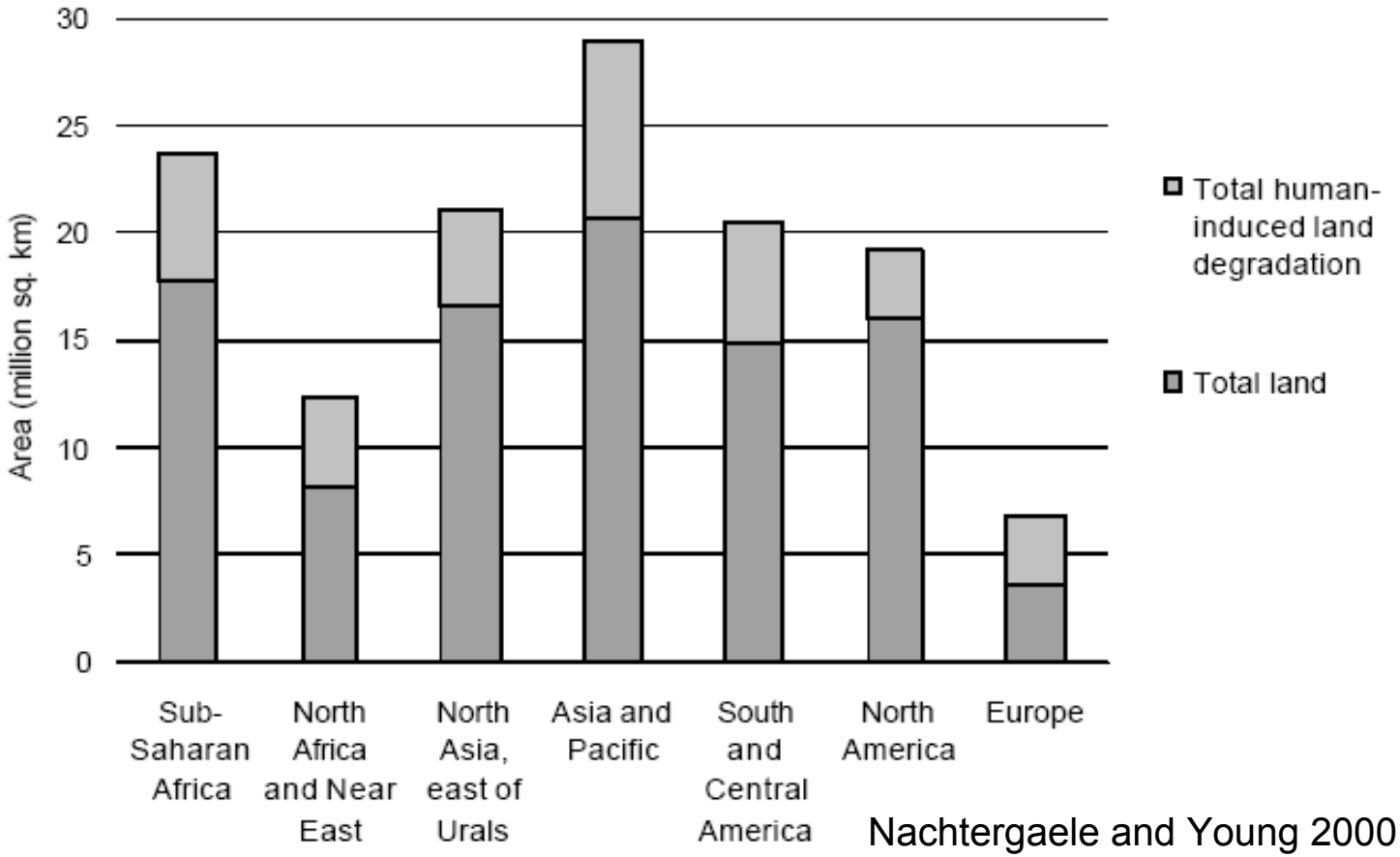
Desertification risk and population level by region

	Desertification risk (UNSO, 1997)		
	Population in drylands (%)	Based on area of drylands (%)	Based on population on drylands (%)
Sub-Saharan Africa	36	50	37
North Africa & Near East	44	91	79
North Asia, east of Urals	89	96	89
Asia and Pacific	44	50	46
South & Central America	24	19	25
North America	19	68	19
Europe	18	29	19
World	38	57	41

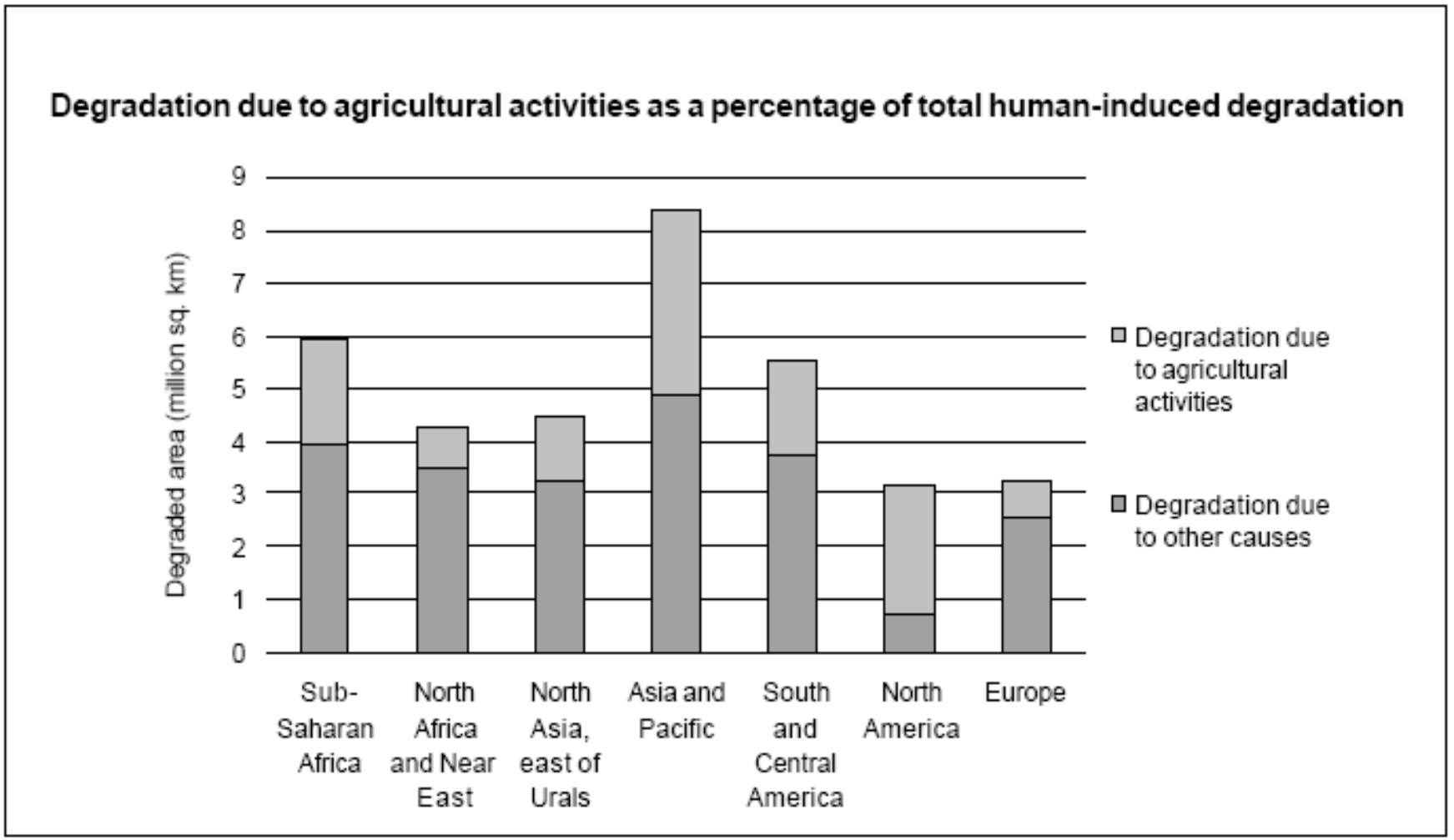
SOURCE:Nachtergaele and Young 2000, 21

PEOPLE AND LAND DEGRADATION

Human-induced land degradation (severe and very severe) as percentage of total land area



Nachtergaele and Young 2000, 29



Nachtergaele and Young 2000, 31

Area of major soil constraints by region

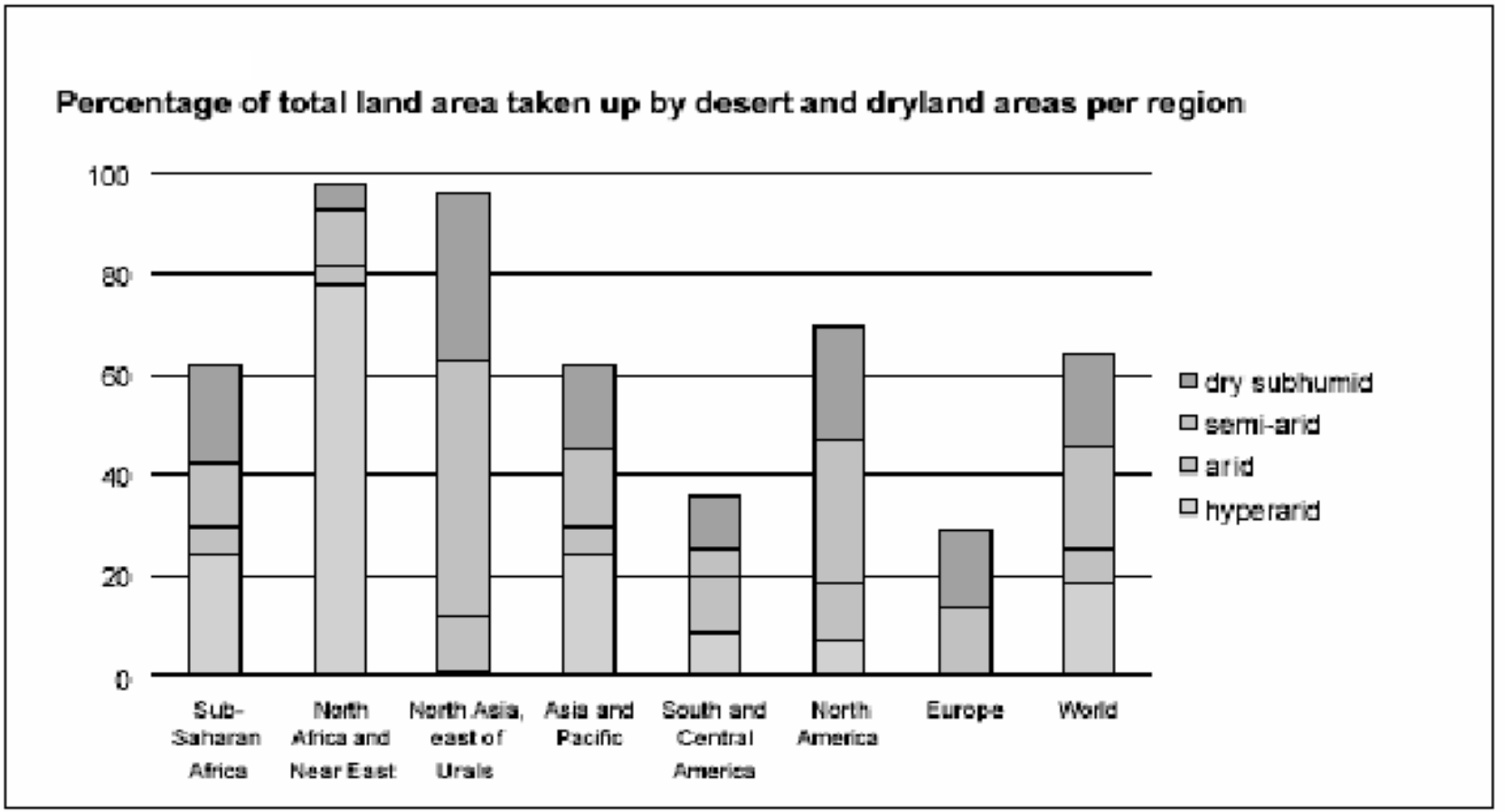
	Total area	Soil Constraint: Hydromorphy		Low cation exchange capacity		Aluminium toxicity		High phosphorus fixation	
	('000) km^2	('000) km^2	%	('000) km^2	%	('000) km^2	%	('000) km^2	%
Sub-Saharan Africa	23755	1903	8	3716	16	4371	18	1009	4
North Africa and Near East	12379	79	1	292	2	1	0	0	0
Asia and Pacific	28989	3083	11	1105	4	3906	14	1395	5
North Asia, east of Urals	21033	5702	27	11	0	783	4	0	0
South and Central America	20498	2086	10	982	5	8019	39	3016	15
North America	21410	3388	16	0	0	2219	10	1	0
Europe	6843	1142	17	44	1	569	8	0	0
World	134907	17382	13	6151	5	19867	15	5421	4

	Total Area	Soil Constraint: Vertic properties		Salinity and sodicity		Shallowness		Erosion hazard	
	('000) km^2	('000) km^2	%	('000) km^2	%	('000) km^2	%	('000) km^2	%
Sub-Saharan Africa	23755	1072	5	884	4	3007	13	3627	15
North Africa and Near East	12379	69	1	780	6	2854	23	1185	10
Asia and Pacific	28989	1455	5	3043	11	4892	17	4655	16
North Asia, east of Urals	21033	0	0	2137	10	2796	13	3349	16
South and Central America	20498	439	2	1115	5	2313	11	3923	19
North America	21410	106	1	191	1	2491	12	3851	18
Europe	6843	87	1	219	3	780	12	1386	20
World	134907	3228	2	8369	6	19133	14	21975	16

For definitions of regions, see Appendix 1.

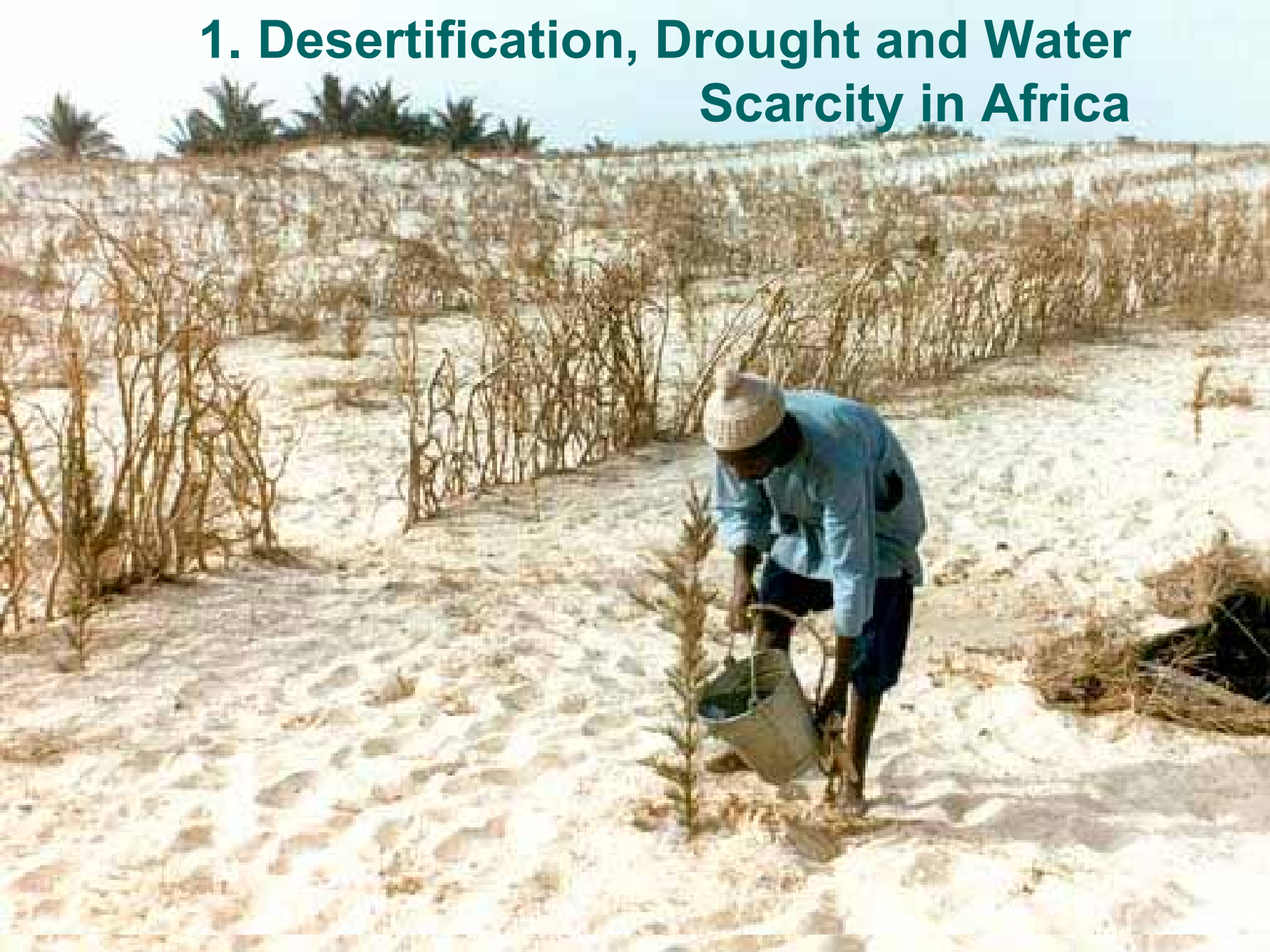
Nachtergaele and Young 2000, 4

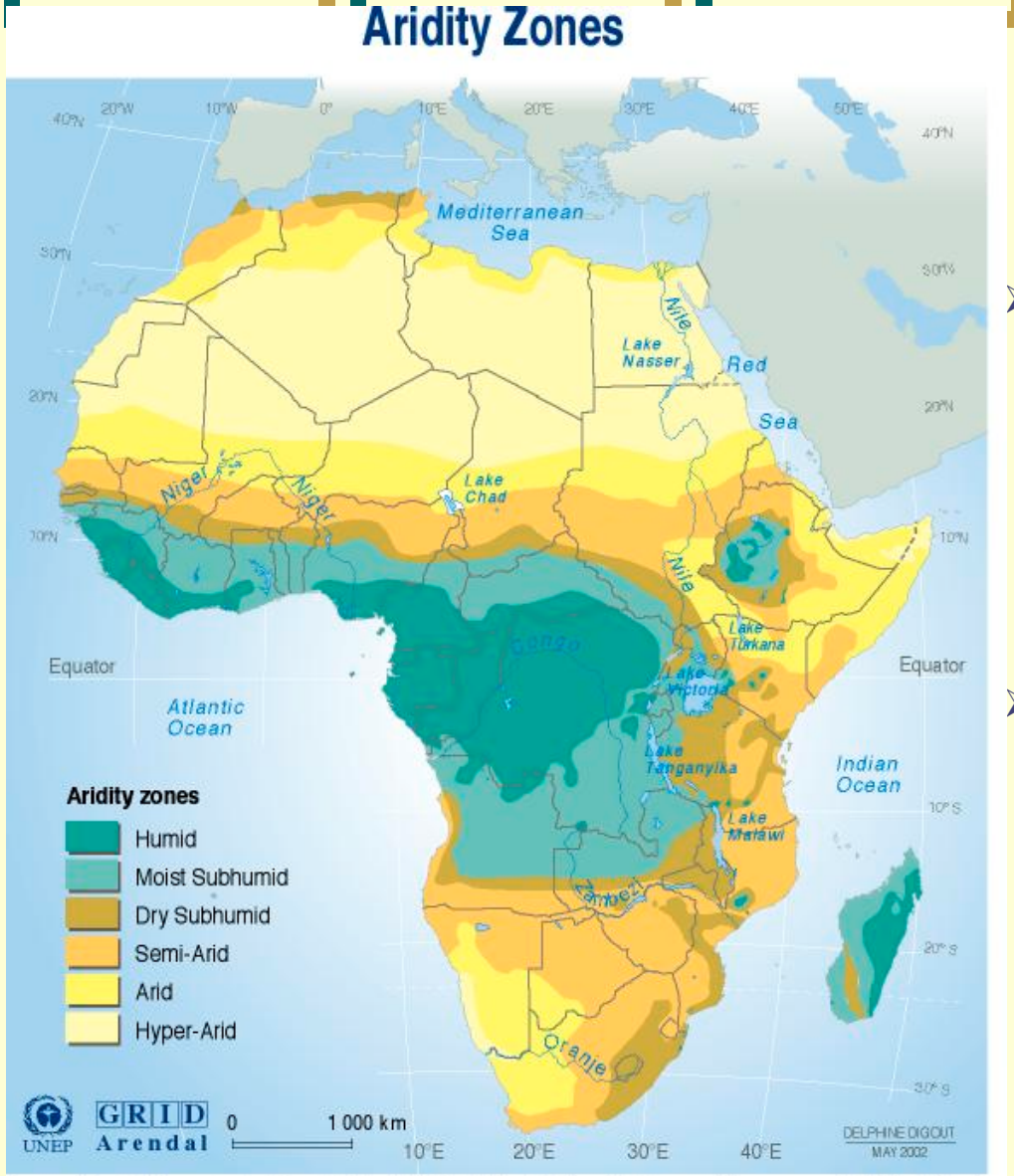
PERCENTAGE OF TOTAL LAND AREA TAKEN UP BY DESERT AND DRYLAND AREAS PER REGION



Nachtergaele and Young 2000, 9

1. Desertification, Drought and Water Scarcity in Africa



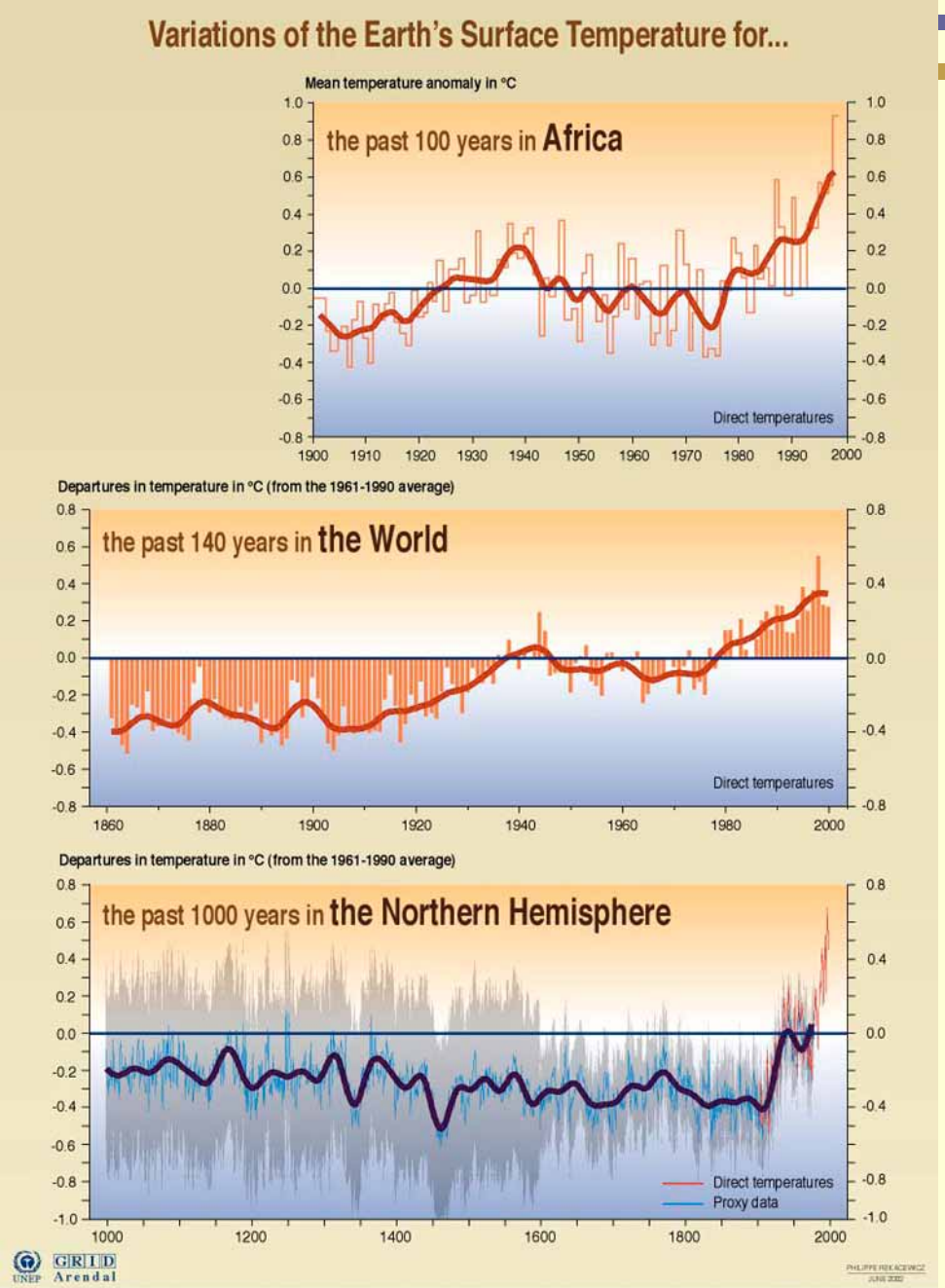


Source: World Meteorological Organization (WMO), United Nations Environment Programme (UNEP), *Climate Change 2001: Impacts, Adaptation, and Vulnerability*, Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

1. Basic Questions

Desertification Concept

- 1990 UNEP *ad hoc* group for the "Global Evaluation of Desert.": "***Desertification is land degradation in arid, half-arid and dry sub-humid areas resulting from opposite human impact***".
- UNCED in Rio de Janeiro in 1992 adopted this definition: "Desertification is land degradation in arid, half-arid and dry sub-humid areas, resulting from various factors, including climatic variations and human activities."



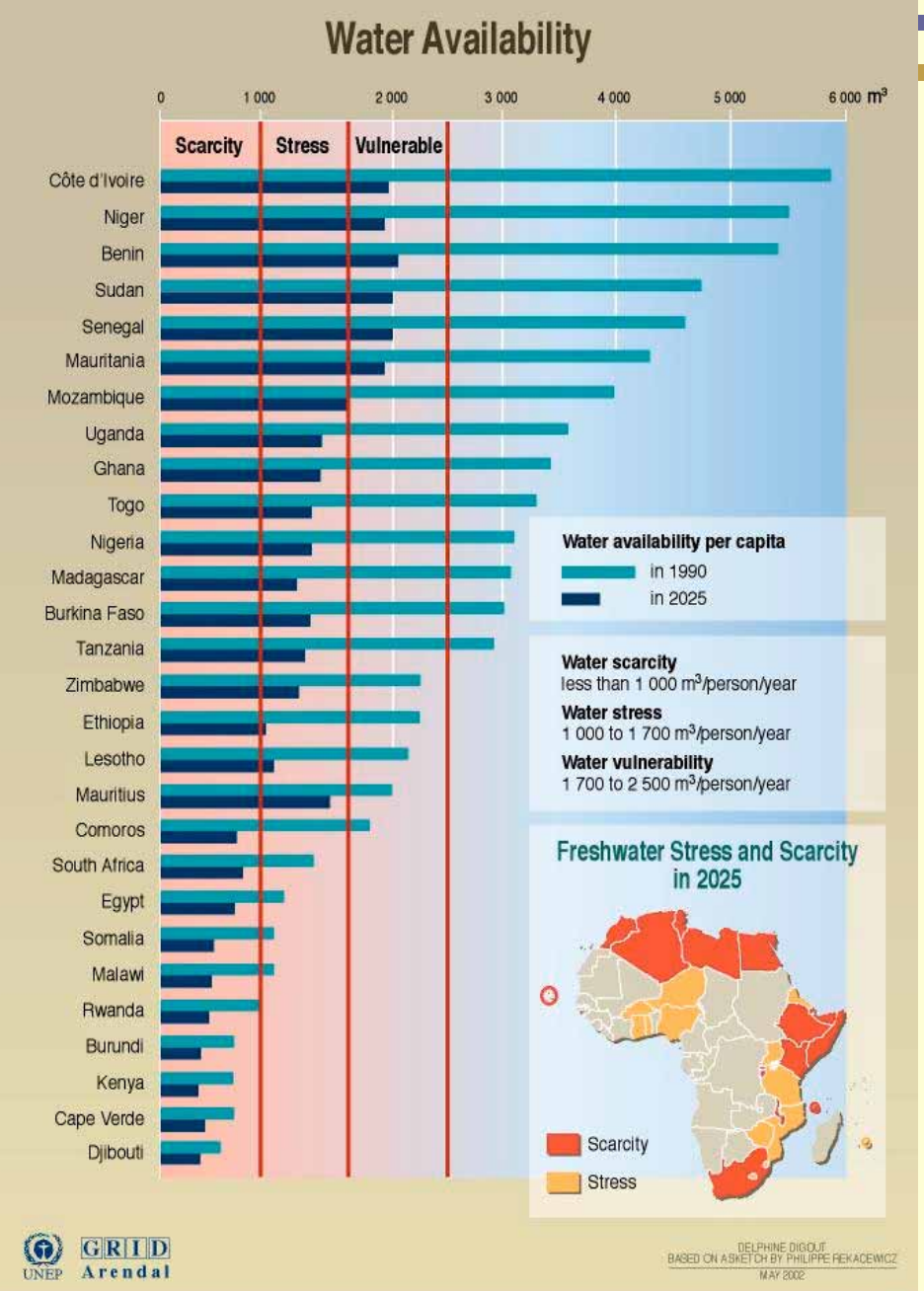
1.1. Temperature Change in Africa

Interactions: desertification & climate change: IPCC, TAR (2001):

WG II (IPCC 1996): Most deserts are likely to become more extreme.

- **Most desert regions: become hotter & most not become wetter.**
- **Few Opportunities to mitigate greenhouse gas emis. in desert regions**
- **Human-induced desertification may counteract any ameliorating effect of CC on most deserts unless appropriate management actions are taken.**

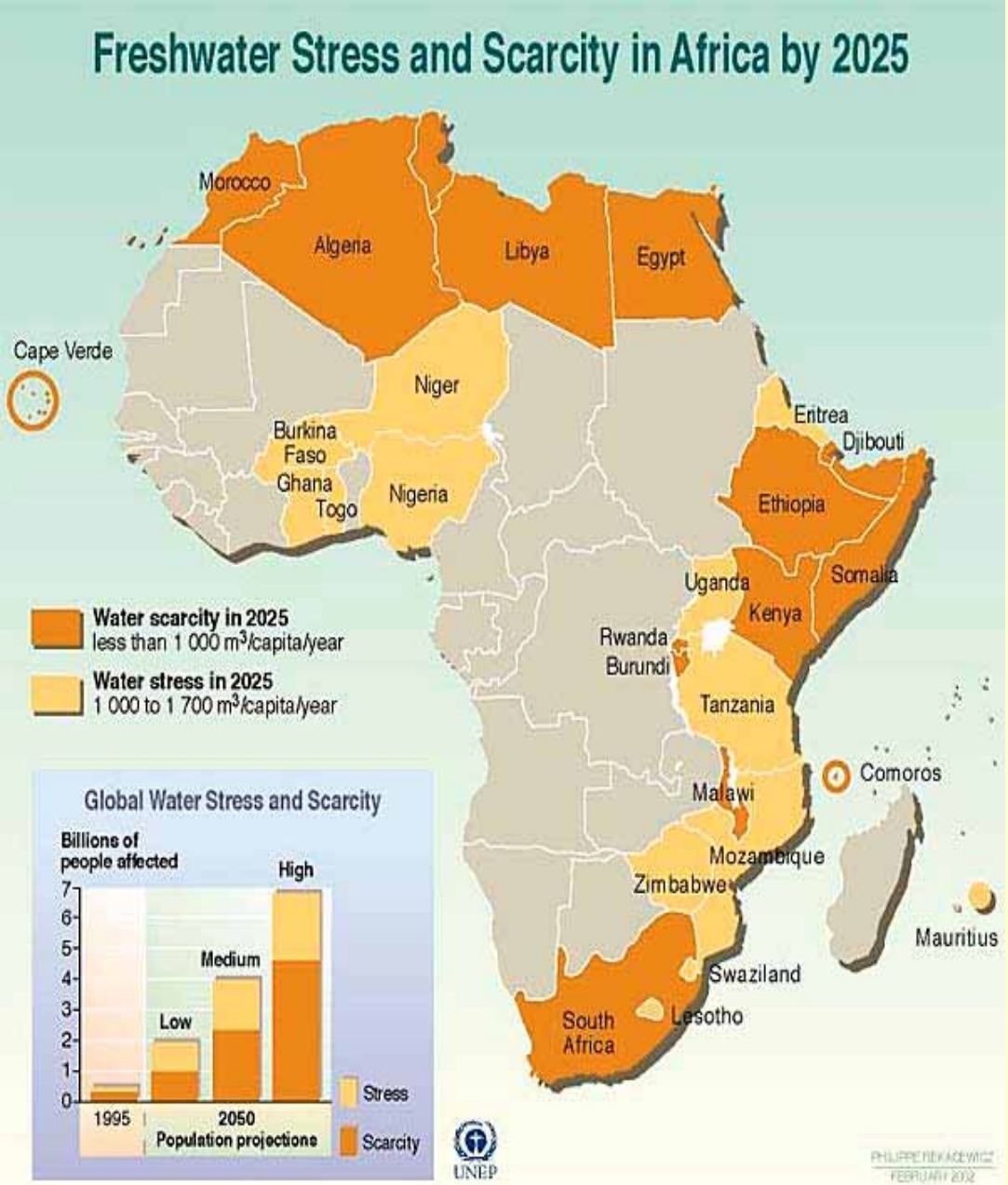
➢ **Human-induced factors: (population growth, urbanisation & agricul ture/food) contribute to processes of soil erosion and desertification.**



Source: United Nations Economic Commission for Africa (UNECA), Addis Ababa ; Global Environment Outlook 2000 (GEO), UNEP, Earthscan, London, 1999.

1.2. Water Scarcity in Africa

- Water scarcity, stress and vulnerability has been severe in many parts of Africa in 2000
- **Water scarcity, stress & vulnera-bility will become extreme in parts of Africa by 2025**



Source: United Nations Economic Commission for Africa (UNECA), Addis Ababa; Global Environment Outlook 2000 (GEO), UNEP, Earthscan, London, 1999; Population Action International.

1.3. Water Stress in Africa in 2025

- **Water scarcity, water stress & vulnerability will become extreme in North, East and South Africa by 2025**
- **This will have severe impacts on food security.**

2. Desertification, Drought and Famine a Security Issues

2.1. Food, Health and Livelihood Security

Food Security (FAO, WFP)

- FAO: access for all people to enough food for active, healthy life.
- (1) the adequacy of food availability (effective supply); (2) the adequacy of food access (effective demand); and (3) the reliability of both.
- Desertification and drought affect the supply side of food security.

Health Security (WHO)

- WHO: guarantee of accessible and affordable health care to all
- WHO: *Global Health Security* (Epidemic Alert & Response) global partnership: a) contain known risks, b) respond to unexpected, c) improve preparedness

Livelihood Security (OECD, Third World countries)

- Livelihood security: used by NGOs, humanitarian aid organisations
- "Missing link" between poverty, environmental degradation & conflict.

2.2. Desertification as a Security Issue

Desertification as a Food Security Issue

- Desertification (cause) & drought (impact: hydro-meteorologic. hazard) > famine > migration: force people to leave their home (livelihood);
- Major actors & concept users: FAO, WFP, OCHA, ECHO, human. NGOs
- Solution: short-term: food aid & long-term: sustainable agriculture

Desertification as a Health Security Issue

- Famine: undernourishment, malnutrition, high vulnerability to disease, higher rate of death among children> becomes as health security issue
- Major actors & concept users: WHO, OCHA, ECHO , humanit. NGOs
- Solution: short-term: medical aid & long-term: sustainable developm.

Desertification as a Livelihood Security Issue

- Desertification, drought & famine: force people to leave their livelihoods, homes, villages, provinces, in search for indiv. & group survival
- Major actors & concept users: in South Asia, UK, US: disaster managers, OCHA, ECHO, humanit. NGOs
- Solution: enhancement of resilience & sustainable development

2.3. Desertification and Security Linkages

Desertification as a new security challenge?

- Objective security: no military threats but environmental challenges, vulnerabilities and risks to the well-being, survival of individuals & national stability.
- Subjective security: perception of an absence of fear of hunger and survival.

Desertification as a manifold security issue

- Human Security Issue: referent: individual; value at risk: home, group survival
- Env. Security Issue: referent: ecosystem; value at risk: sustainability of soils
- Food Security issue: referent: social groups; value at risk: home,survival

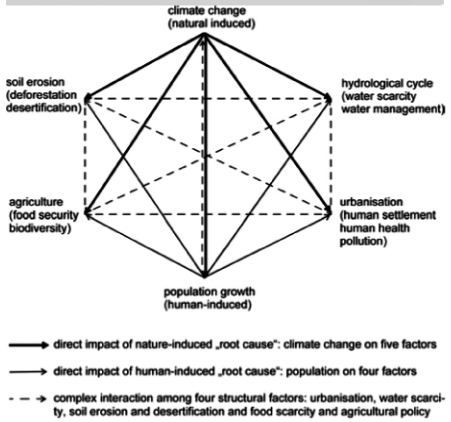
If desertification forces people to leave their home, village & country, results in

- Social Security Issue; referent: soc. group; value at risk: nat. identity, perceived threat: immigrants and scarce resources: water, soil & food.
- National (political, economic, military) security issue: hunger riots; referent: soc. group; value at risk: regime stability, survival of governments
- International security Issue: in Sahel (Africa) between nomadic tribes and resident farmers in periods of severe drought & famine: contributes to mass transboundary environm. induced migration & often trigger ethnic clashes

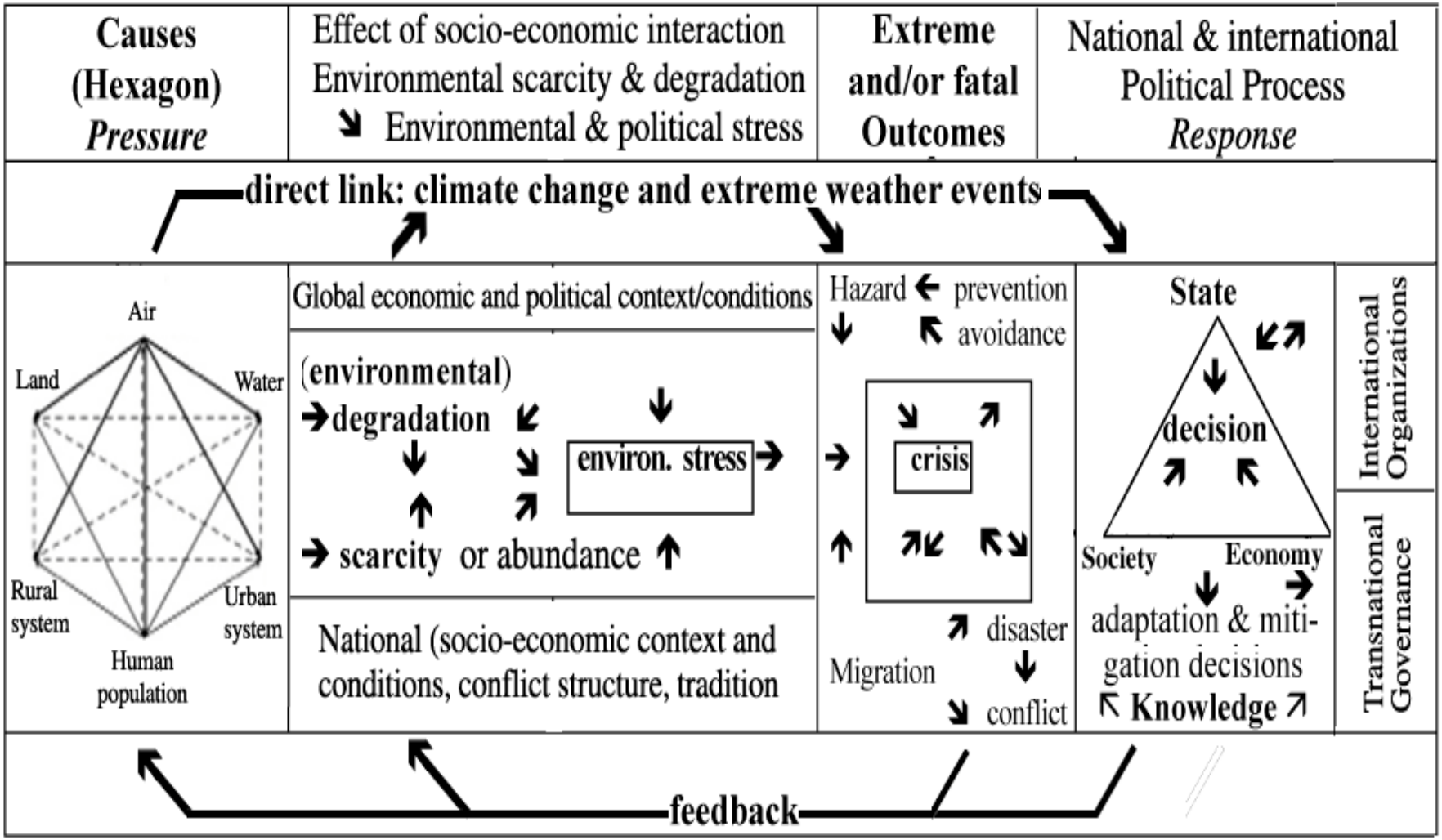
3. Model: Global Environmental Change, Environmental Stress and Extreme Outcomes

3.1. Model: Desertification and Drought

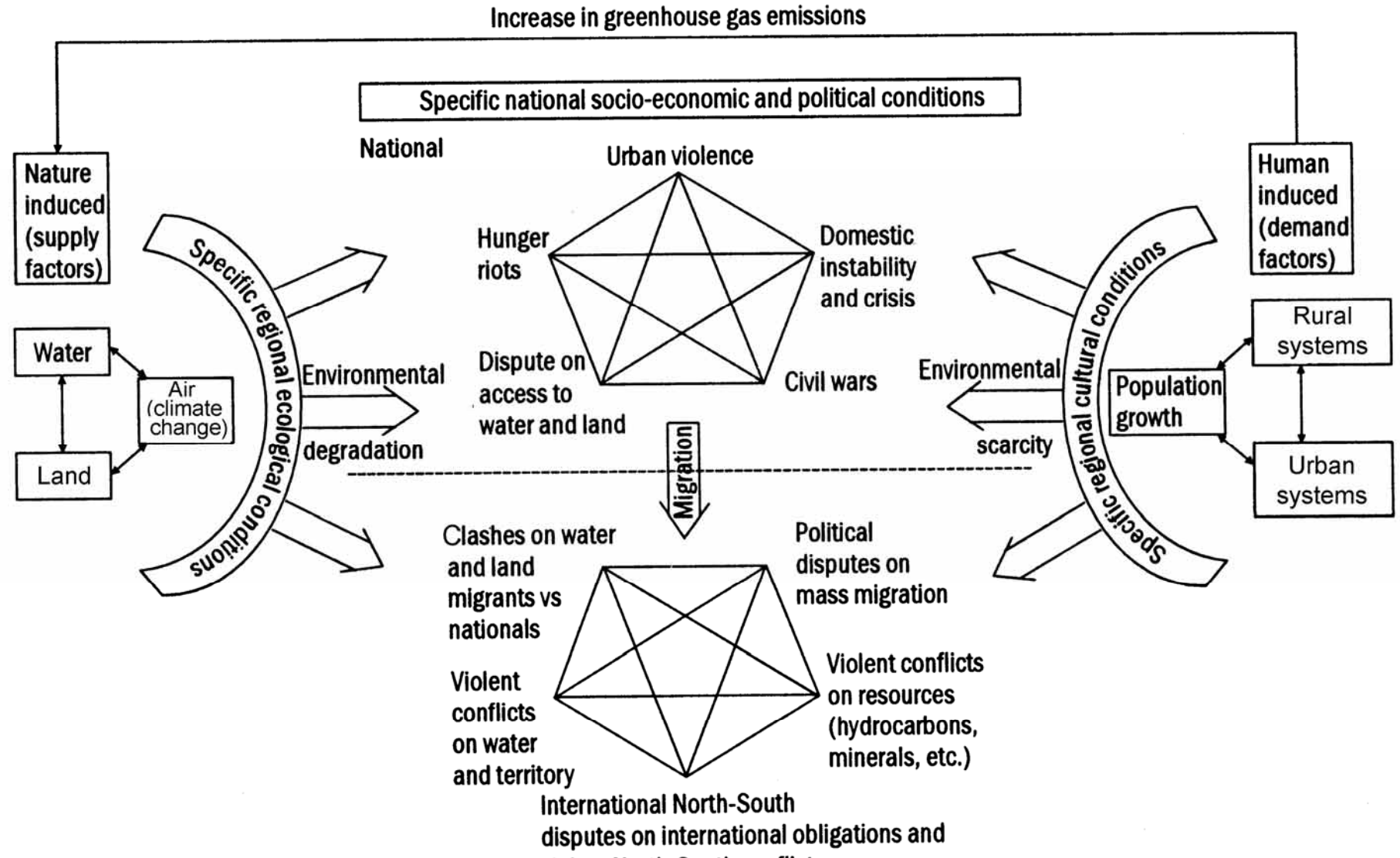
Climate Change <> Desertification → Extreme Weather Events
> Hydro-meteorolog. hazards/disasters (drought & famine)

Causes (Hexagon)	Effect (Interaction)	Environmen-tal Stress	Probable Outcomes
↗→→→→ Extreme Weather Events →→→↘			
Desertification 	**environmental** → **degradation** (soil, water) ↓↑→ → **scarcity** (water, food, housing)	global cond. ↓ Environ-mental stress ↑ nation. cond.	**drought & famine** conflict avoidance ↗↗ → **Crisis** ↘↘ **migration** **conflict**

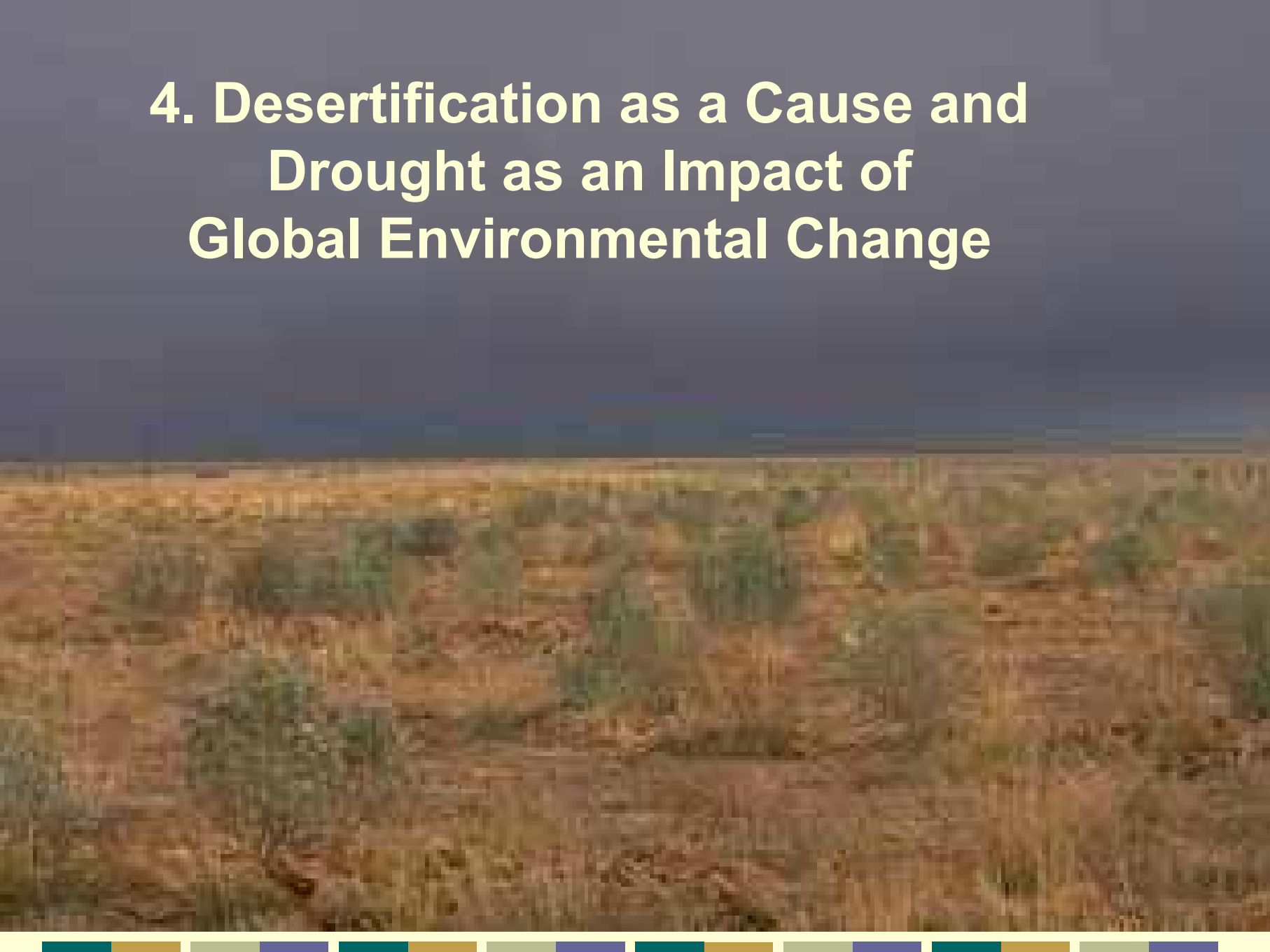
3.2. Modified Pressure & Response Model:



3.3. Potential Violent Outcomes of Environm. Stress



4. Desertification as a Cause and Drought as an Impact of Global Environmental Change



4. Desertification as a Cause and Drought as an Impact of Global Environmental Change

- Desertification: nature (natural variability) & human-induced (anthropogenic) concept
- Six Factors of Global Environmental Change: Complex Causal Interaction within the Hexagon
- Linkages between desertification and other factors: e.g. climate change & population growth, urbanisation and agriculture & food needs
- Desertification: is a contributor to environmental degradation, scarcity and stress
- Drought: is a cause of famine, migration, hunger revolts, domestic crises and violent conflicts

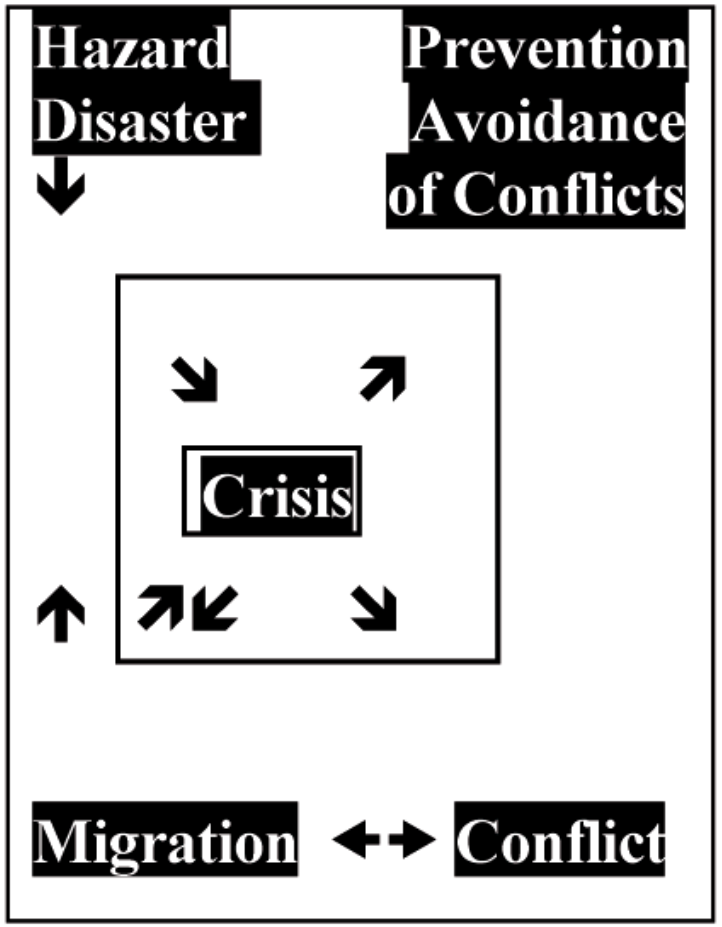
4.1. Linkages: Climate Change & Desertification

Interactions between desertification and climate change were analysed by Williams and Ballings (1996) for WMO/UNEP & assessed by IPCC.

- **IPCC, SAR (1995) & TAR (2001): Climate Change and Desertification**
  - **WG II (IPCC 1996): Most deserts are likely to become even more extreme.**
  - **Most desert regions: become hotter & most will probably not become wetter.**
  - **Changes in frequency or intensity of rainfall events are likely to cause changes in the flora and fauna. … Any reduction in the intensity of rainfall could also be detrimental to this set of organisms due to false starts in their life cycles.**
  - **Opportunities to mitigate greenhouse gas emissions in desert regions are few.**
  - **Human-induced desertification may counteract any ameliorating effect of CC on most deserts unless appropriate management actions are taken.**
- **Impact of CC on Desertification in the Mediterranean and MENA Region**
  - **These projected effects are relevant for all MENA countries, especially for Egypt & will be affected most by effects for coastal zones due to sea-level rise.**
- **Human-induced factors: (population growth, urbanisation & agricul ture/food) contribute to processes of soil erosion and desertification.**

5. Interactions among Fatal Outcomes: Drought and Societal Consequences

5. Interactions among Fatal Outcome:
Linking Drought & Famine with Societal Consequences



Much knowledge on these factors:

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

Lack of knowledge on linkages among fatal outcomes

- ➢ **Drought** & drought-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

5.1. Basic Questions on Linkages

Are there causal linkages among:

- drought and violent societal consequences?
- drought & disaster-induced migration?
- drought, food insecurity (famine), migration & conflicts?

Illustrative cases on linkages:

- Lack of precipitation > drought > bad harvests > famine > disaster-induced migration > clashes migrants/farmers > or hunger riots > police & armed forces restore order
- Conflicts > war refugees > famine > enhanced societal & environmental vulnerability of war refugees to hazards and disasters (to drought, floods & epidemics)

If there are linkages, then mainstreaming of early warning of hazards and conflicts makes sense!

5.2. Knowledge on Linkages among Fatal Outcomes

Thesis 1: **There is a linkage** between **Global Environmental Change** & **hazards** leading to **disasters** (IPCC 01; ISDR 02).

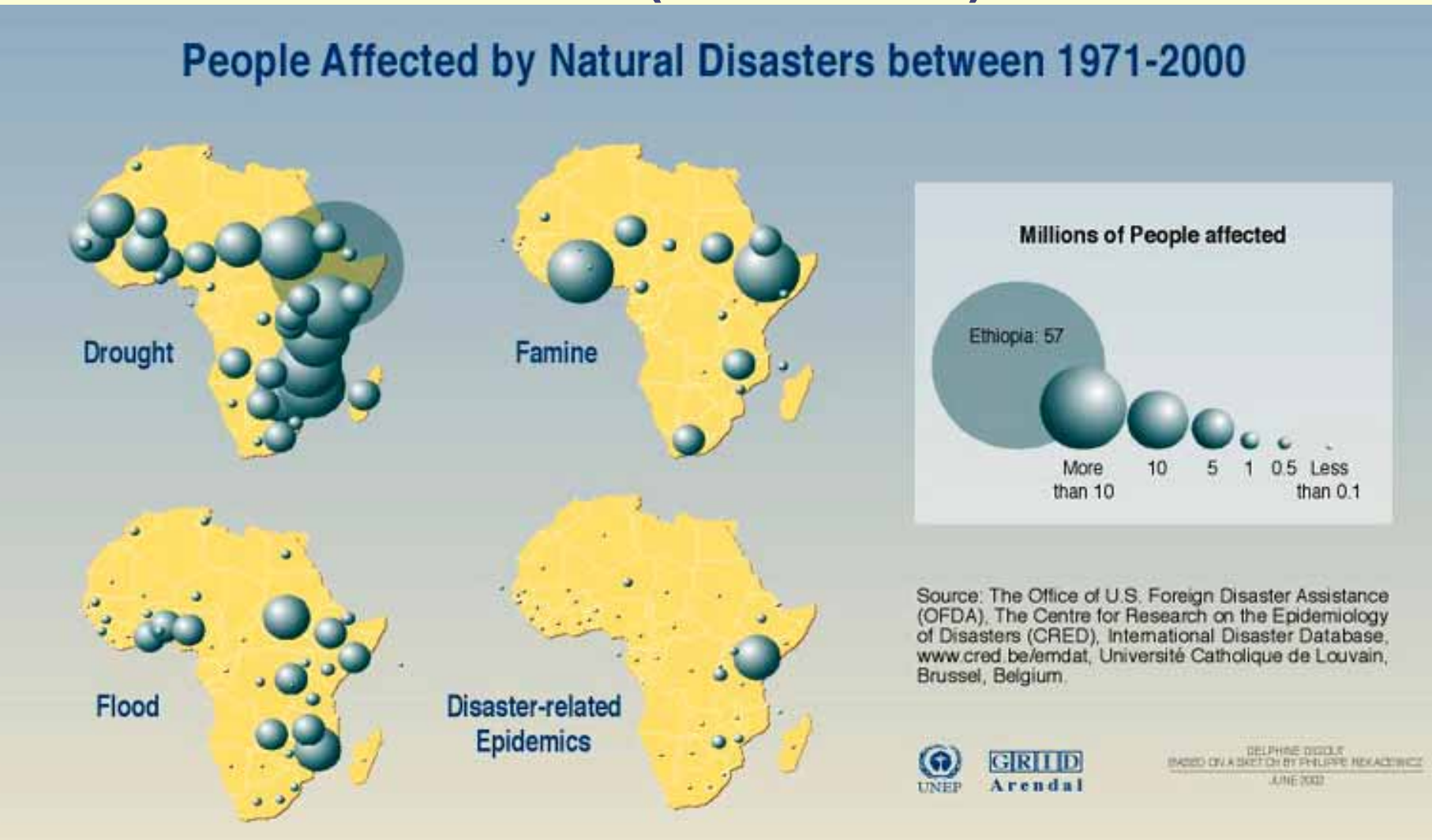
Thesis 2: **IPCC** observed & projected a linkage between **climate change** & **increase in extreme weather events** resulting in increase in number & intensity of **hydro-meteorological** events.

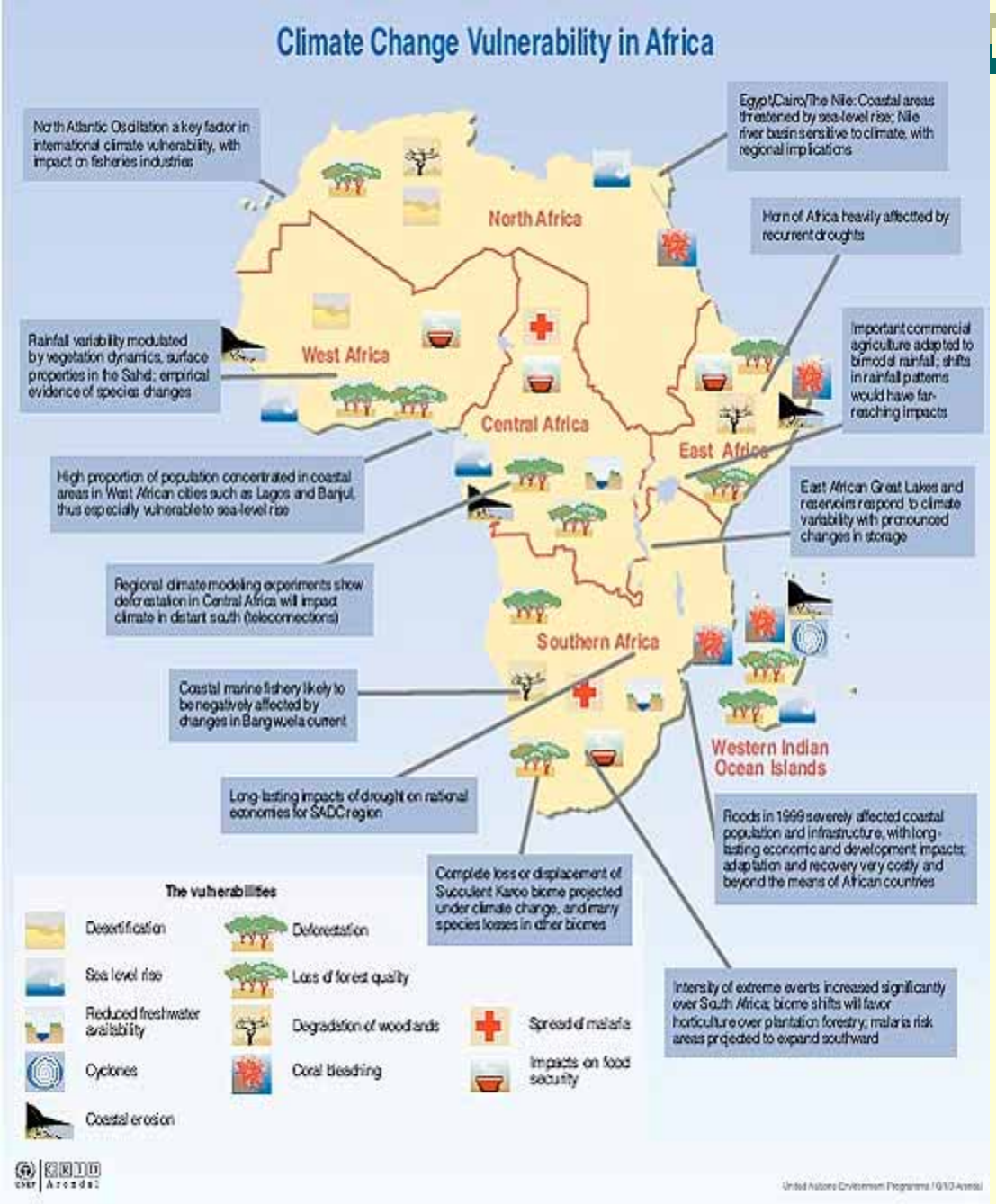
Thesis 3: **Munich Re** observed an increase in **economic damage** from **hydro-meteorol. disasters** for 1950-95 (IPCC 2001).

Thesis 4: There exists a **complex interaction** between **drought** and **environmentally-induced, disaster-triggered migration**.

Thesis 5: In some cases **hazards/disasters** and **environmentally-induced migration may cause, trigger** or **contribute** to domestic and international **crises** that may under certain conditions **escalate to violent conflicts** that should be **avoided, prevented or resolved internally and (inter)nationally.**

5.3. People Affected by Drought & Famine in Africa (1971-2000)

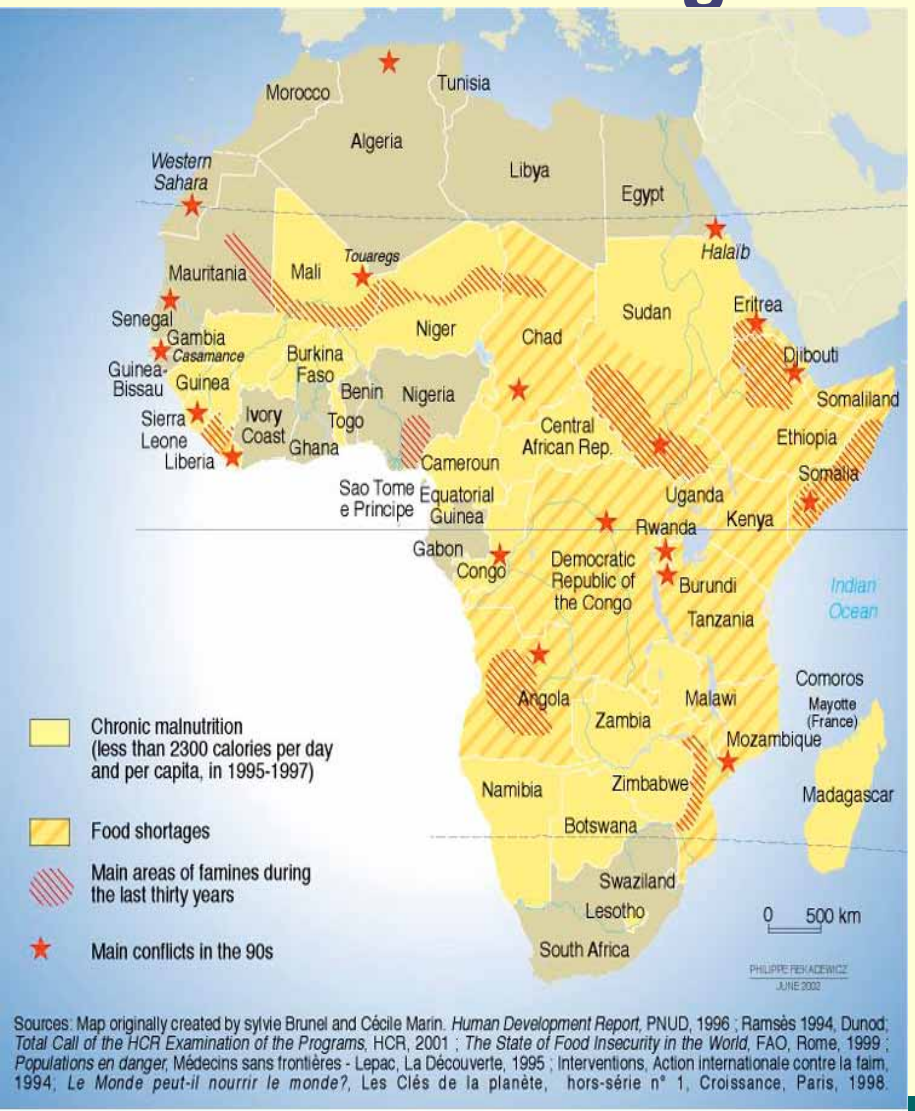




5.4.Vulnerability to Climate Change nd Desertification

- **WG II (IPCC 1996): Most deserts will be-come more extreme.**
- **Most desert regions will become hotter**
- **Human-induced de-sertification may counteract any ameliorating effect of CC on most deserts unless appropriate management actions are taken.**

5.5. Need for Research: Potential Linkages Between Hunger & Conflicts in Africa?



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

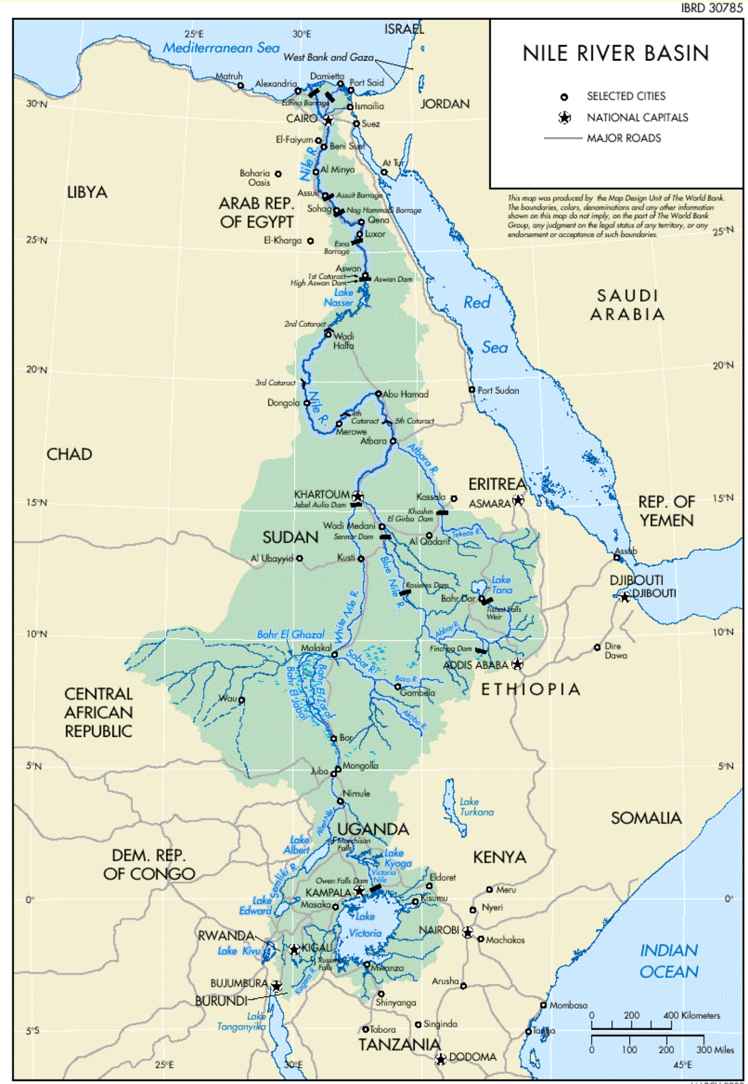
- **Coincidence between famine areas & major wars in 1980s?**
- **Famines, political unrest, and civil wars occur simultaneously in the same countries and regions.**
- ❖ **Migration: rapid spread of diseases, especially AIDS.**
- ➢ **Research is needed on the links among outcomes: drought, famine, migration, crises, and conflicts.**

5.6. Diagnosis: Interactions among Outcomes

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

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

5.7. Case of 4 vulnerable Nile basin countries



4 of 9 countries are in Nile Basin

High: **drought**, famine. migration, conflicts

Today: major recipients of **food aid**.

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

Long-term indicator population growth

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

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

© Sebastiao Salgado: Rwanda

6. 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 challenges 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.**

6.1 Impacts of Desertification: Migration, Urbanisation and Internal Displacement


© Sebastiao Salgado: Refugee child

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

6.2 Impacts of Desertification: Drought, Famine, Crises & Conflicts

Figure 8.6. Famine areas and location of major wars in Africa. Source: Griffiths and Binns, 1988:49.

- **Coincidence between famine areas & major wars in Africa in 1980s?**

M. Garenne: „Mortality in Sub-Saharan Africa:Trends & Prospects“

I.L. Griffith: „Famine and war in Africa“, in: Geography, 73,1:59-61:

- „Famines, political unrest, and civil wars occur simultaneously in the same countries and regions.
- Rapid urbanisation rates
- Migration: rapid spread of diseases, especially also AIDS

➢ **Empirical research is needed on the relations among the outcomes: drought, famine, migration, crises & conflicts.**

6.3 Hunger Riots in North African countries

Drought > increase in basic food prices, IMF proposal to cut food subsidies > general strikes > violent hunger riots > intervention of police and armed forces > casualties & imprisonment of rioters, cases in court.

E, MONDAY, DECEMBER 17, 1990 *

Morocco on Edge After 2 Days of Riots

Compiled by Our Staff From Dispatches

RABAT, Morocco — Security forces patrolled major Moroccan cities Sunday following two days of rioting, and government opponents insisted the death toll was higher than the official figure of five.

Varying and unconfirmed assertions by doctors, union officials and others gave figures on the number of deaths in the north-central city of Fez that ranged from a minimum of 25 to more than 100.

Medical sources in Fez said that at least 33 people were killed in the violence Friday and Saturday.

A doctor who did not want be identified told Reuters, "The death toll is heavy. On the basis of hospital and morgue registers, there must have been 100 dead and 200 wounded, including both civilians and military."

Registers at a hospital and the city morgue showed that 13 died on Friday and 20 on Saturday. Most of the dead brought in on Saturday were soldiers, medical sources said.

The government said rioting Friday in Fez, a city of 450,000, killed five people, including a policeman, and injured 127 people, mostly policemen. Scores of people were reported injured Friday in other cities during a nationwide, one-day general strike for higher wages.

The violence continued in Fez on Saturday with arson attacks on vehicles and a police station.

The major cities were reported calm but uneasy Sunday, with security forces deployed at intersections and guarding public buildings. A few spontaneous demonstrations were reported in Rabat, the capital, late Saturday and early Sunday.

The union federations that organized the general strike vowed to combat "government terrorism." They said the violence occurred because security forces "resorted to intimidation, provocation and repression."

But the government said the police in Fez suffered heavy casualties because they exercised restraint, using warning shots, tear gas and clubs to disperse rioters.

Authorities said a policeman was fatally stabbed when his unit was surrounded by rioters, and a civilian was crushed to death by stampeding protesters during a police charge.

Fez, the religious and intellectual center of Morocco, suffered extensive damage from looting and arson. The official press agency, WMA, said looters armed with chains and iron bars ransacked jewelry stores, banks and public buildings.

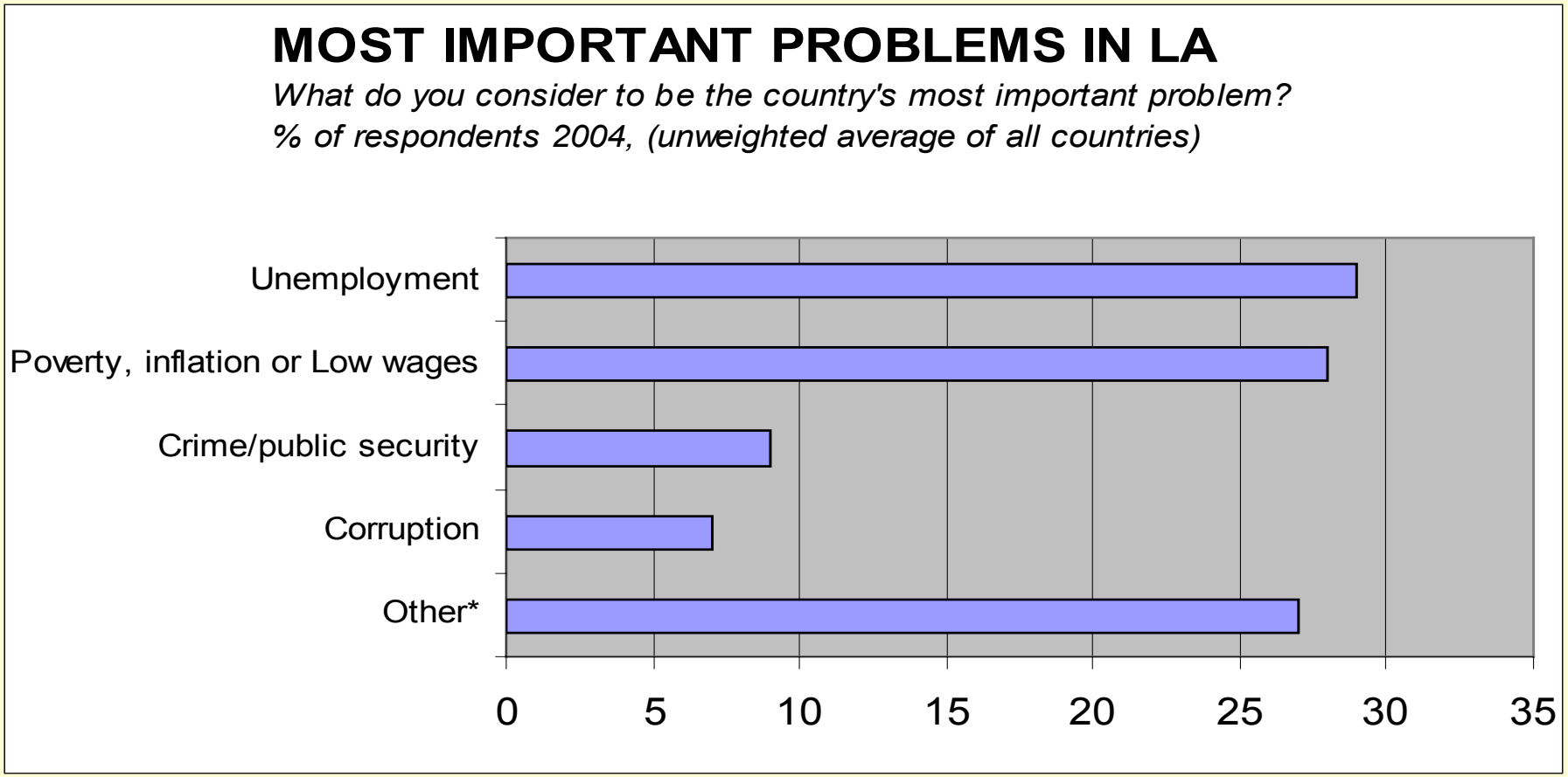
The rioters set about 50 buses and cars on fire and burned a luxury hotel, the Merindes, the agency said. About 210 people were arrested, including a group carrying away a safe containing more than $70,000 in cash, WMA reported.

The unions said 80 percent of workers observed the strike call. The government said only a handful of businesses and factories were affected.

But authorities confirmed that the strike was widely observed on university campuses, where at least 40 percent of classes were canceled.

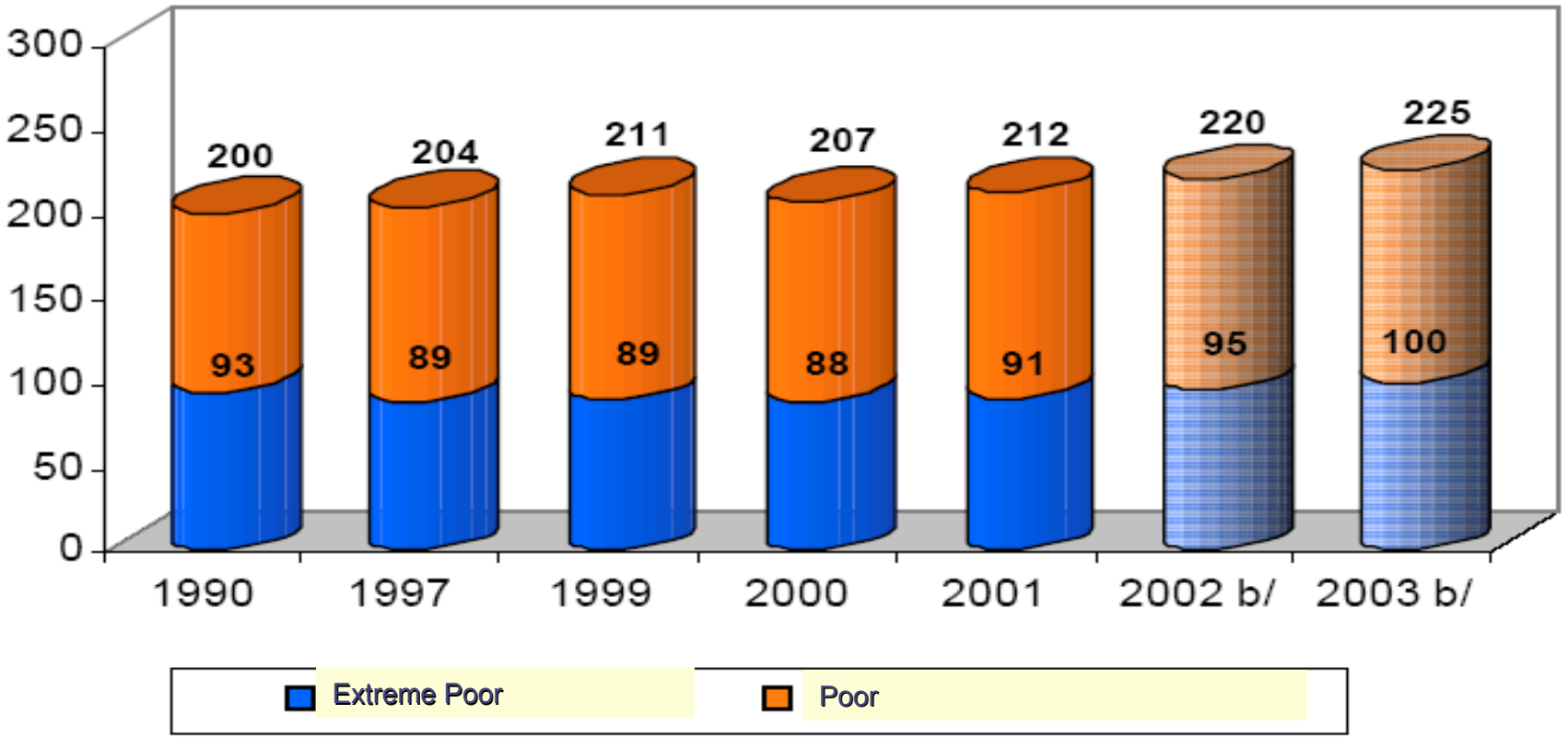
(AP, Reuters)

7. Most Important Problems in Latin America



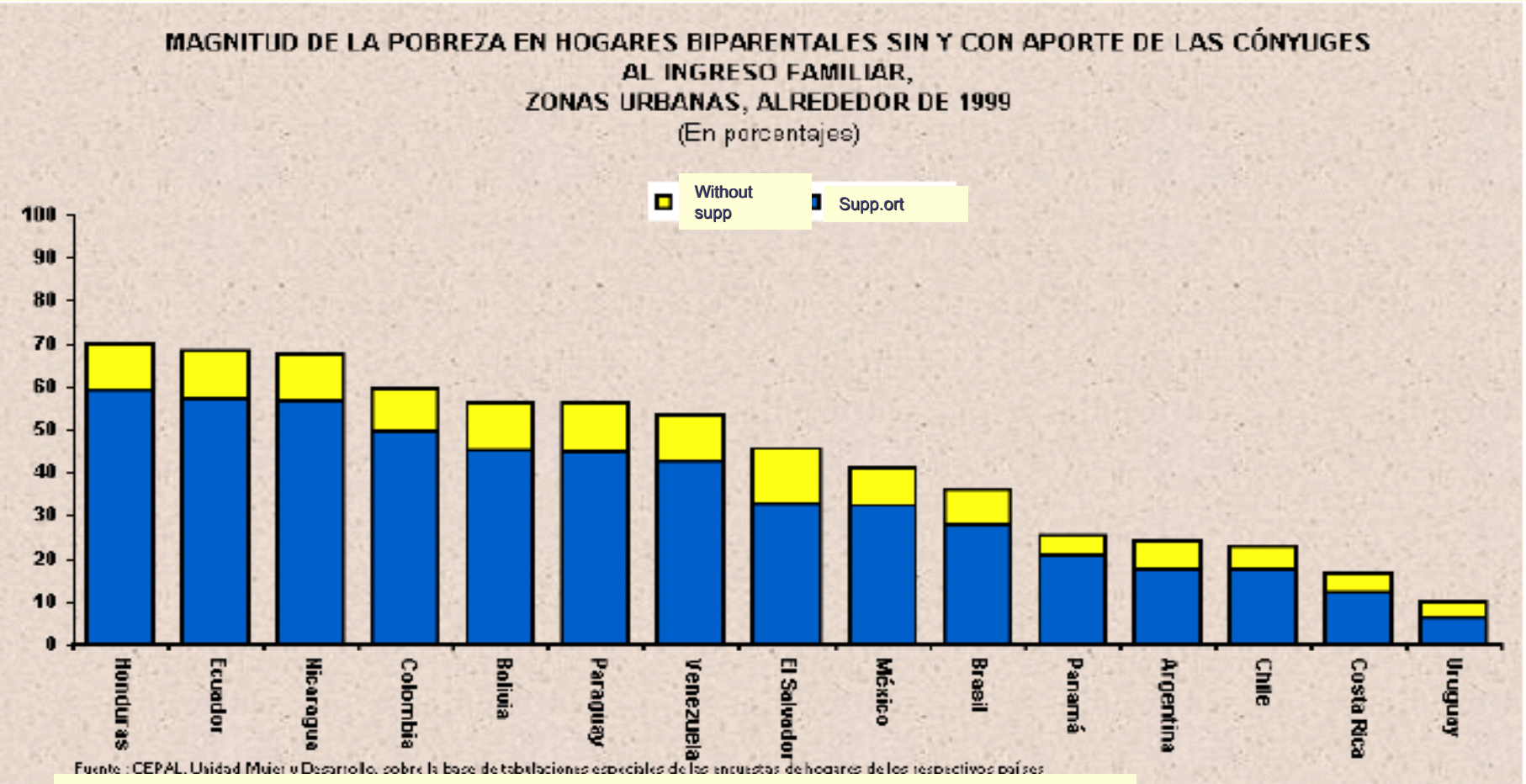
Source: Latinobarómetro, 2004, *Includes political problems, terrorism, education, health and others

7.1. Evolution of Poverty in Latin America and Mexico (Million of persons)



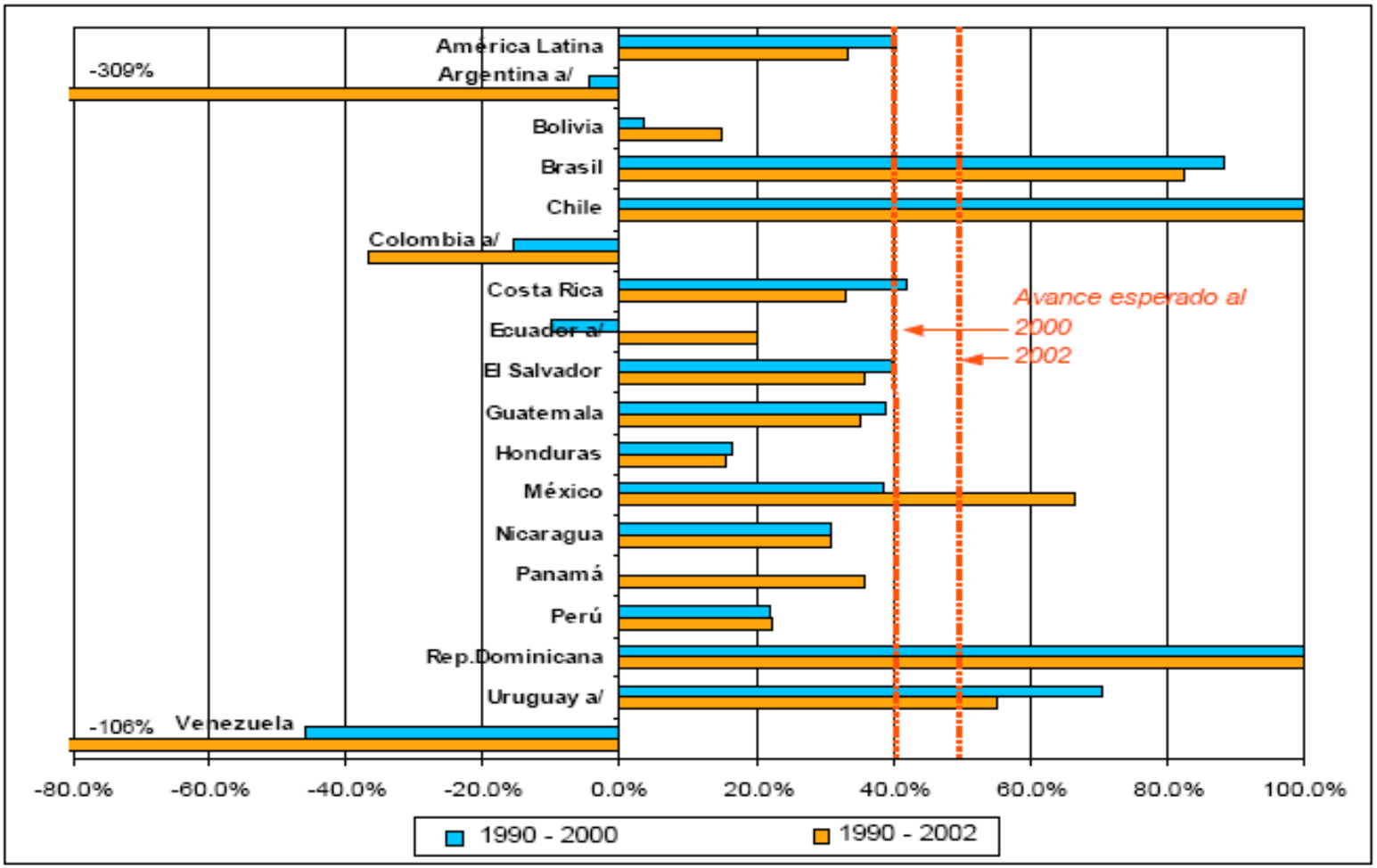
Source: CEPAL, 2004,
b) Data for 2002 and 2003 are projections

7.2. Poverty in Households with both Husbands and with Economic Support of Women (%)



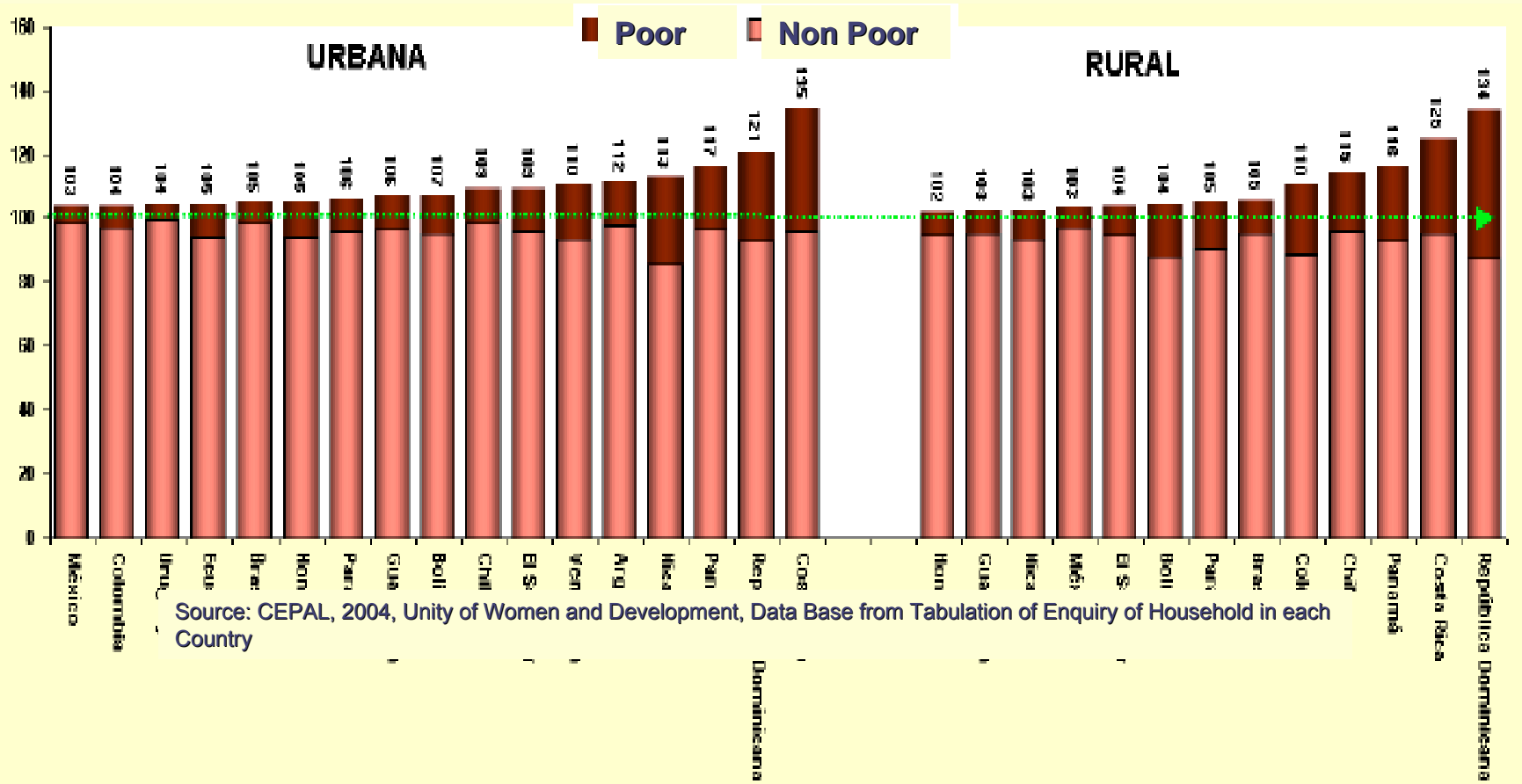
Source. CEPAL, 2004, Unity or Women and Development

7.3. PROGRESS IN POVERTY ALLEVIATION



Source: CEPAL, 2004,
a) Urban areas

7.4. Index of Women's Poverty in Urban and Rural Areas



Source: CEPAL, 2004, Unity of Women and Development, Data Base from Tabulation of Enquiry of Household in each Country

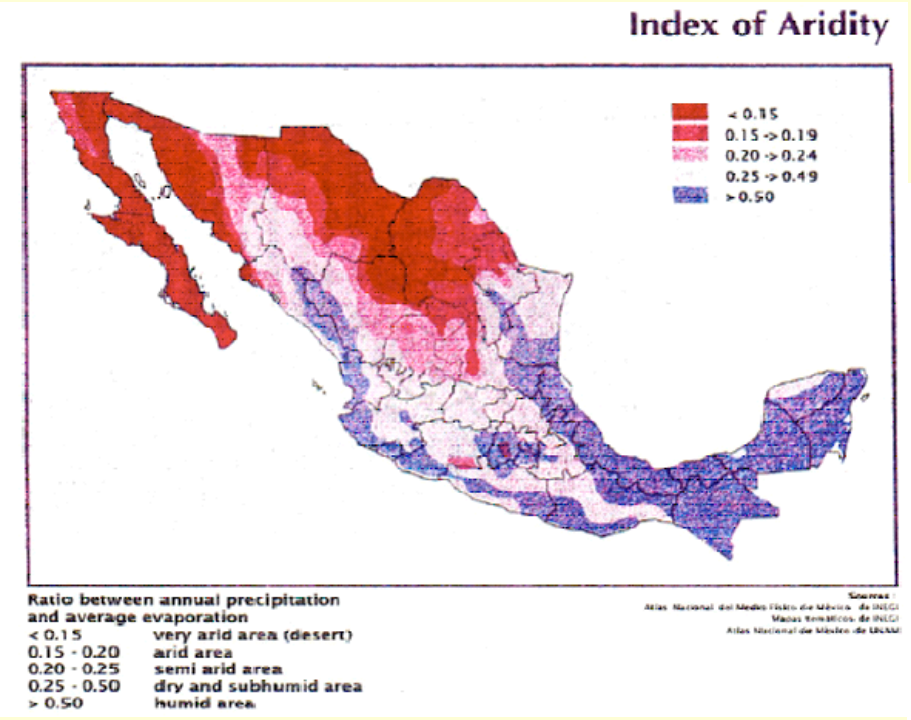
Nota : El índice se presenta corregido según la estructura poblacional

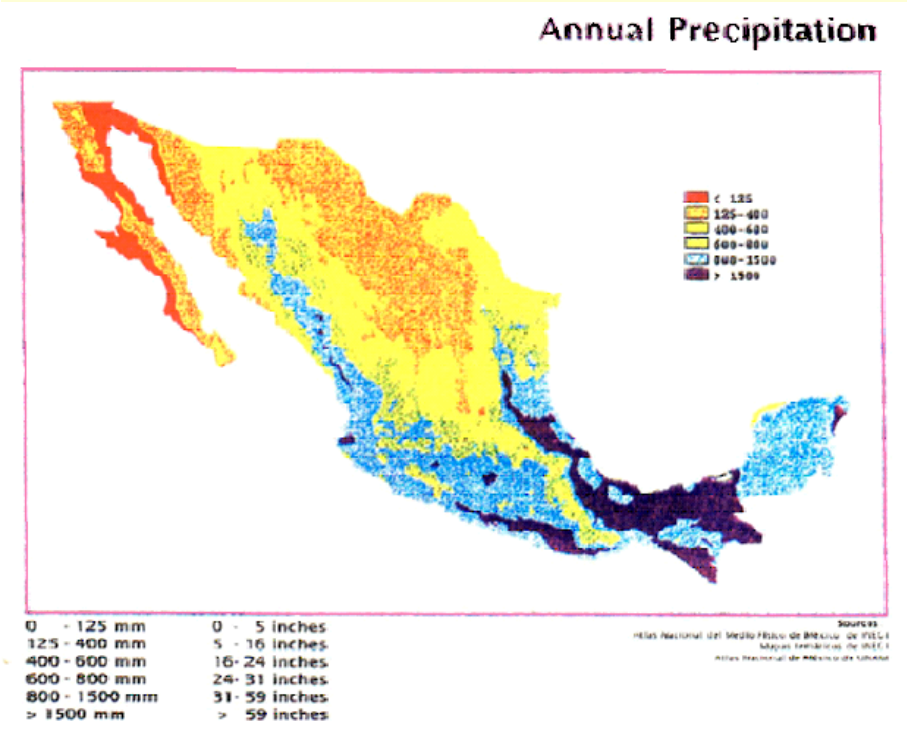
Fuente: CEPAL, Unidad Mujer y Desarrollo, sobre la base de tabulaciones especiales de las encuestas de hogares de los respectivos países

7.5. Poverty in Mexico

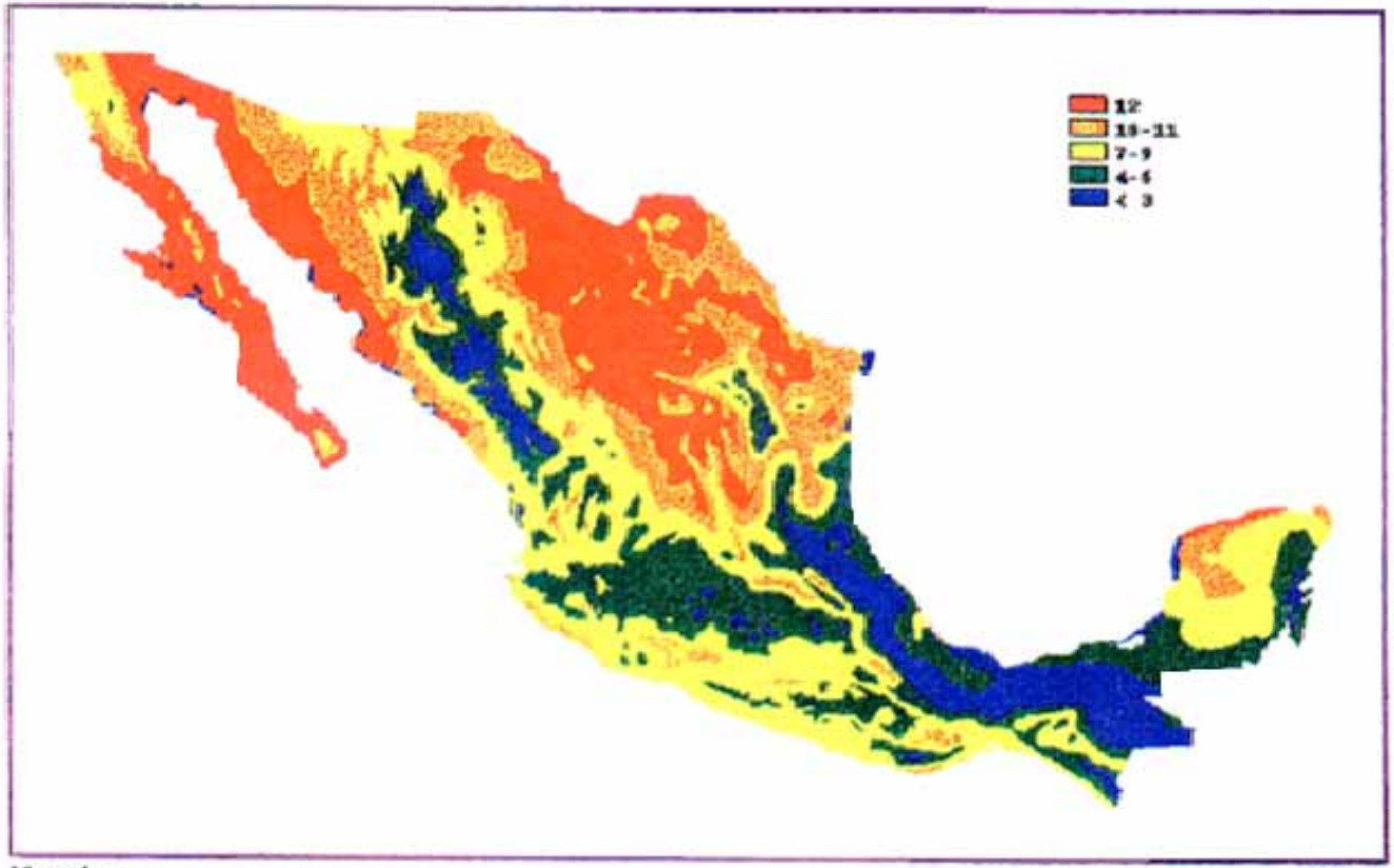
- 28% of Mexican children are poor (UNICEF, 2005)
- Infant poverty: place 80 (behind South Africa: 76; World Bank –WB- 2005*)*
- Income *per capita*: place 80 (WB, 2005)
- National Income 637,200 million dollars; place 10, WB, 2005)
- 20% of rich concentrate 43% of consumption: structural induced scarcity (Homer-Dixon, 1998:351-353)
- Minimal requirement to live 70 pesos (6.2 US$)
- Economic Active Population: 43 million: 12.5 million in formal sector
- Occupied population: 26 million: 7% less than 1 minimal salary (MS: 42 MN or 3.7US$); 20.7%: 1-2 MS; 46.2%: 2-5 MS; 26.1: more than 5 MS (INEGI, 2005)

8. Desertification, Migration and Conflict – Case Study on Mexico: Annual Aridity & Precipitation





Average Number of Dry Months Per Year

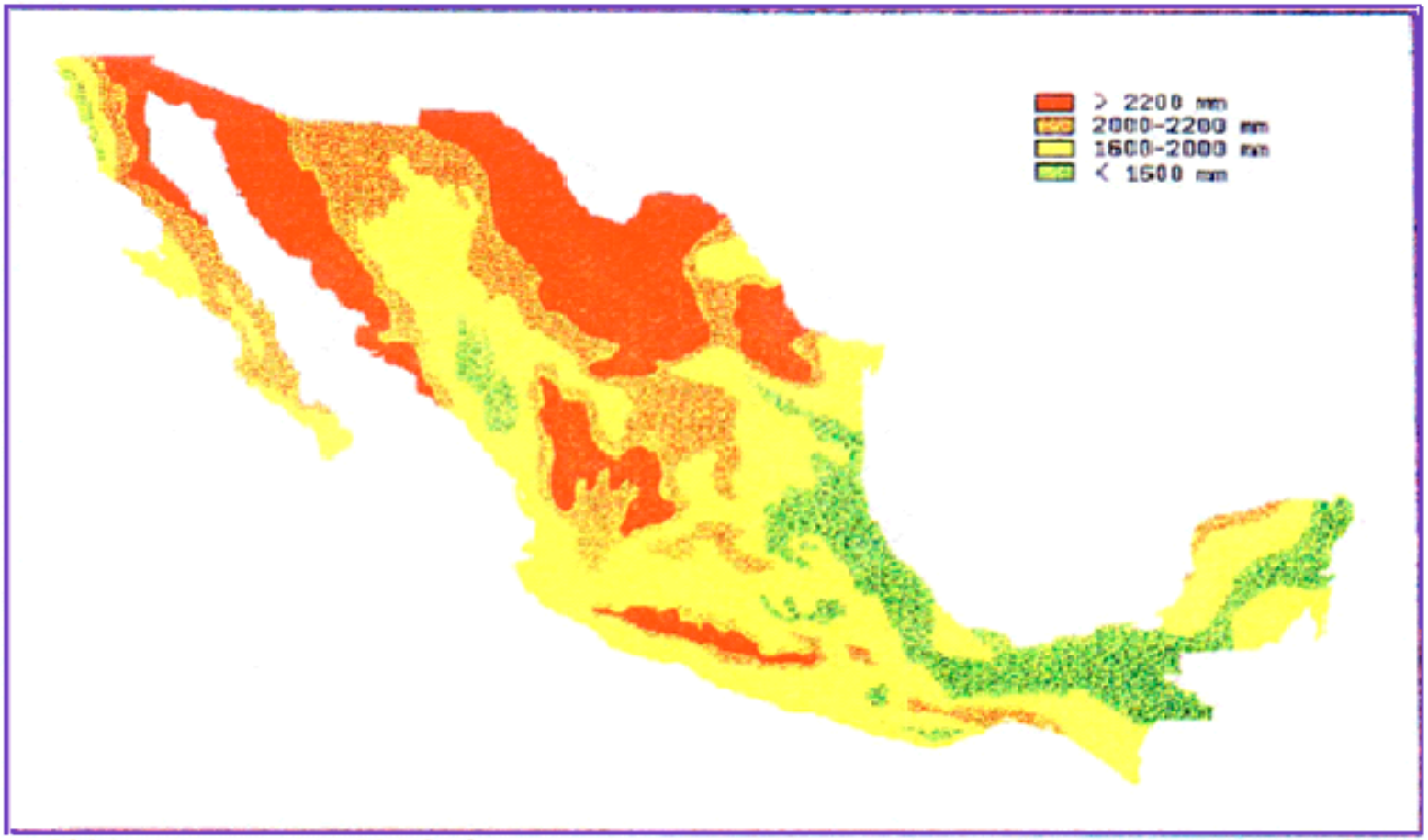


Months:

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

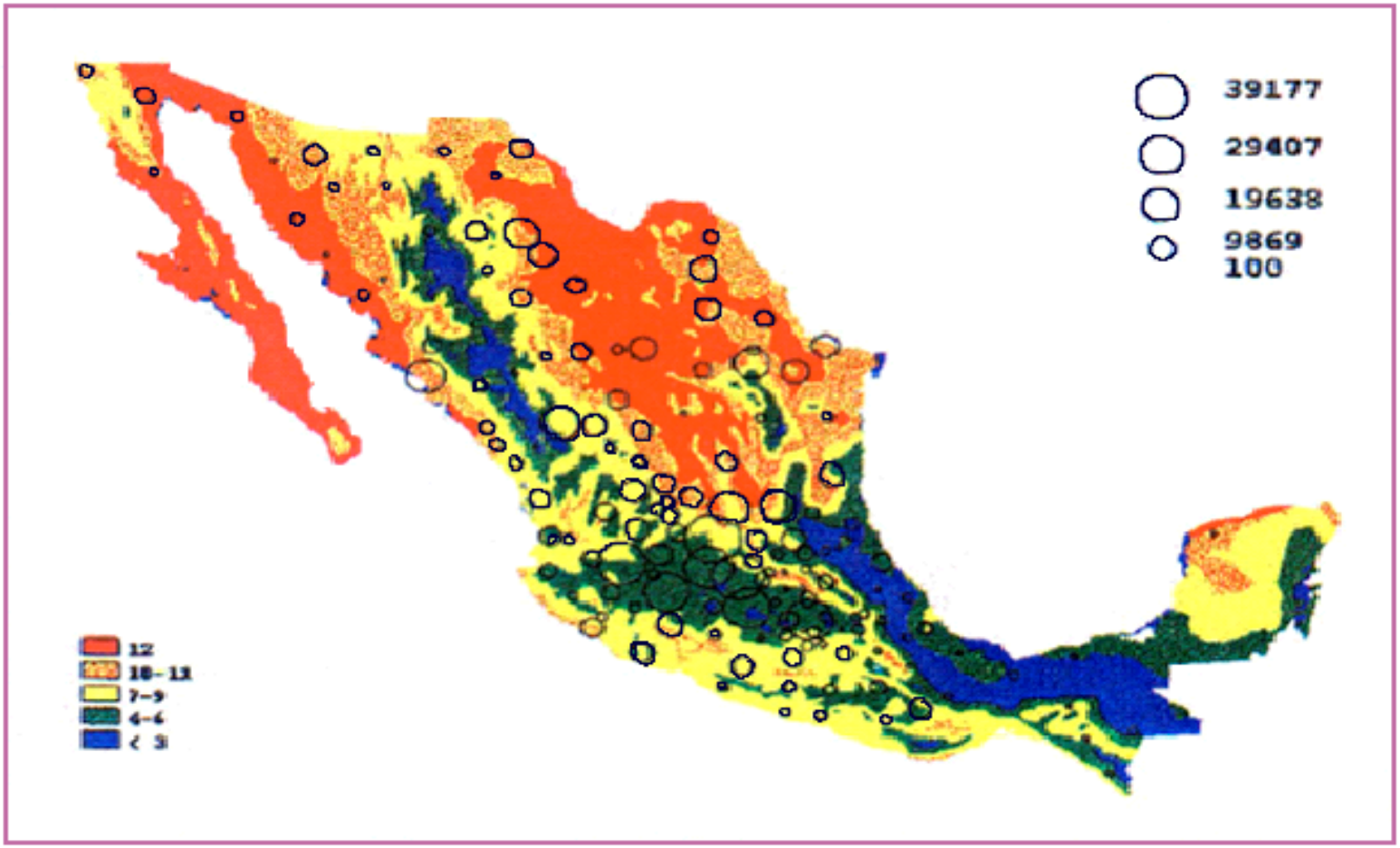
Average Annual Evaporation



> 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



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).

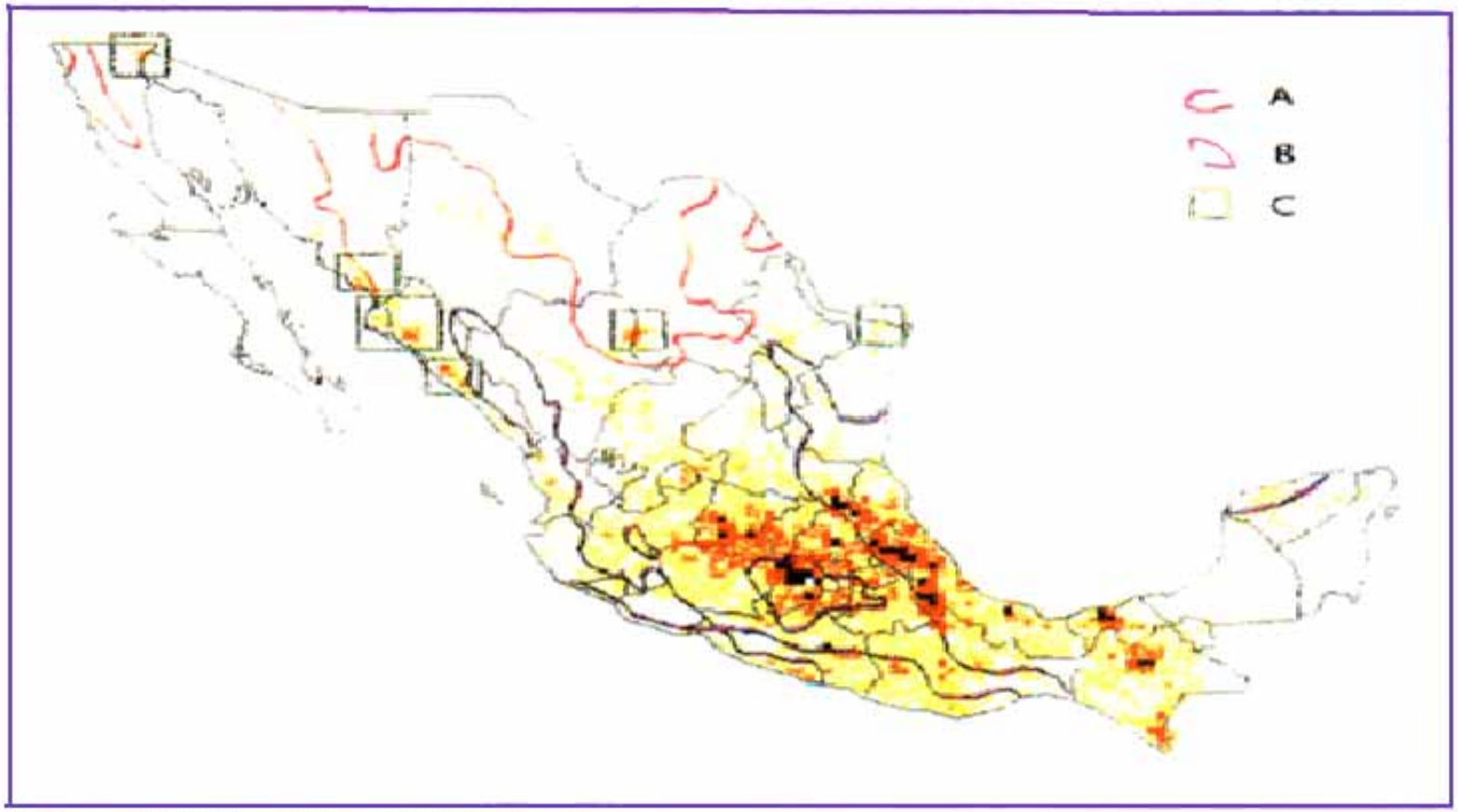
Sources:
Survey on Mexican-US migratory flow (COLEF)
Atlas Nacional de México de UNAM
Sistema de Información Geográfica y Estadística de la
Frontera Norte (COLEF-CRIT/OME)

Rural Migration and Aridity

- Arid and dry areas (< 0.50)
- Humid area (> 0.50)
- Flow of Mexican migrants in 1995, 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.

Sources

Aridity and Density of Rural Population

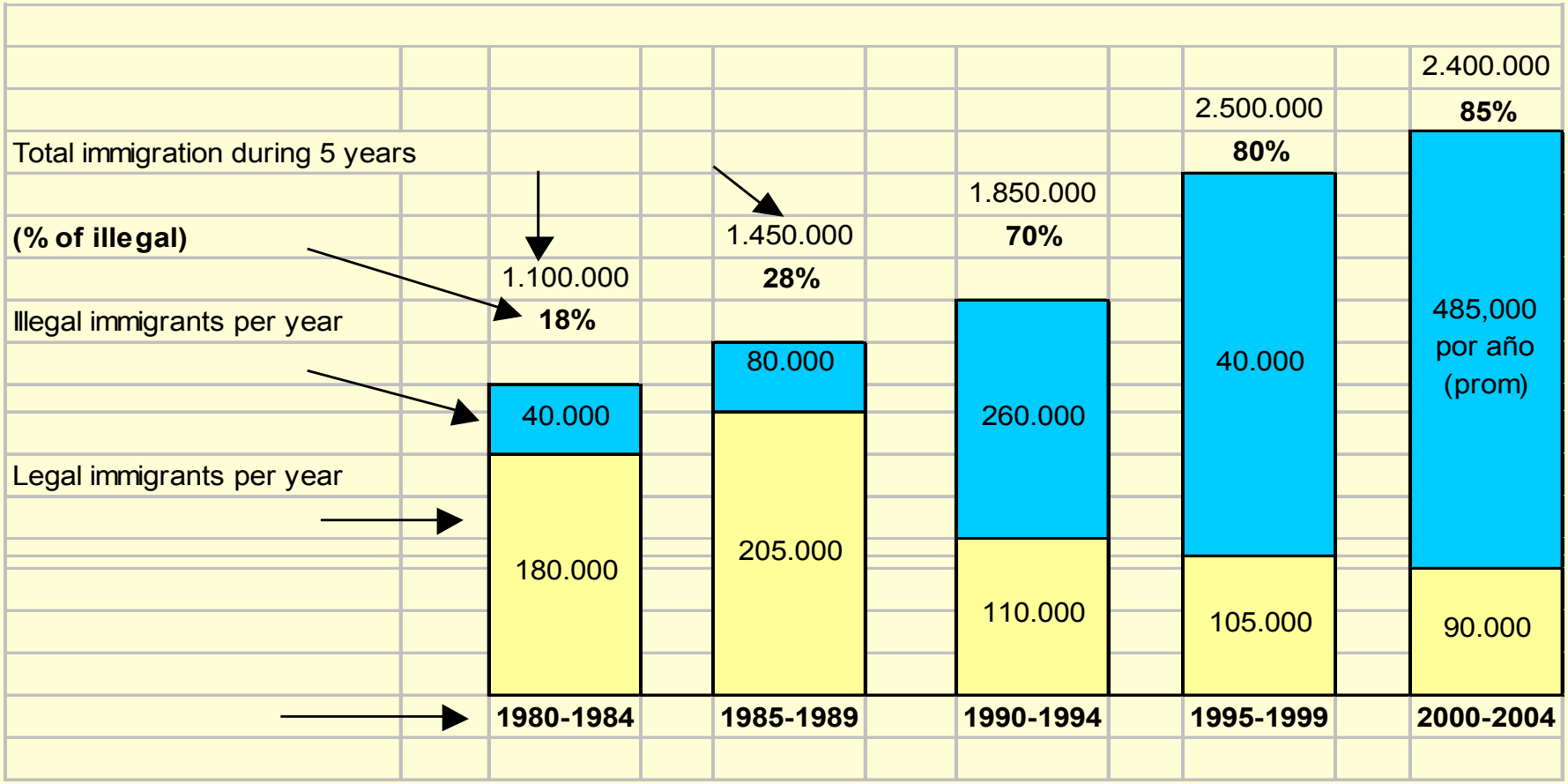


A- Transition from arid to dry area
B- Transition from dry to humid area
C- Arid area with irrigation

Density of rural population (living in localities of less than 2500 inhabitants) in 1990 (X Mexican Census).

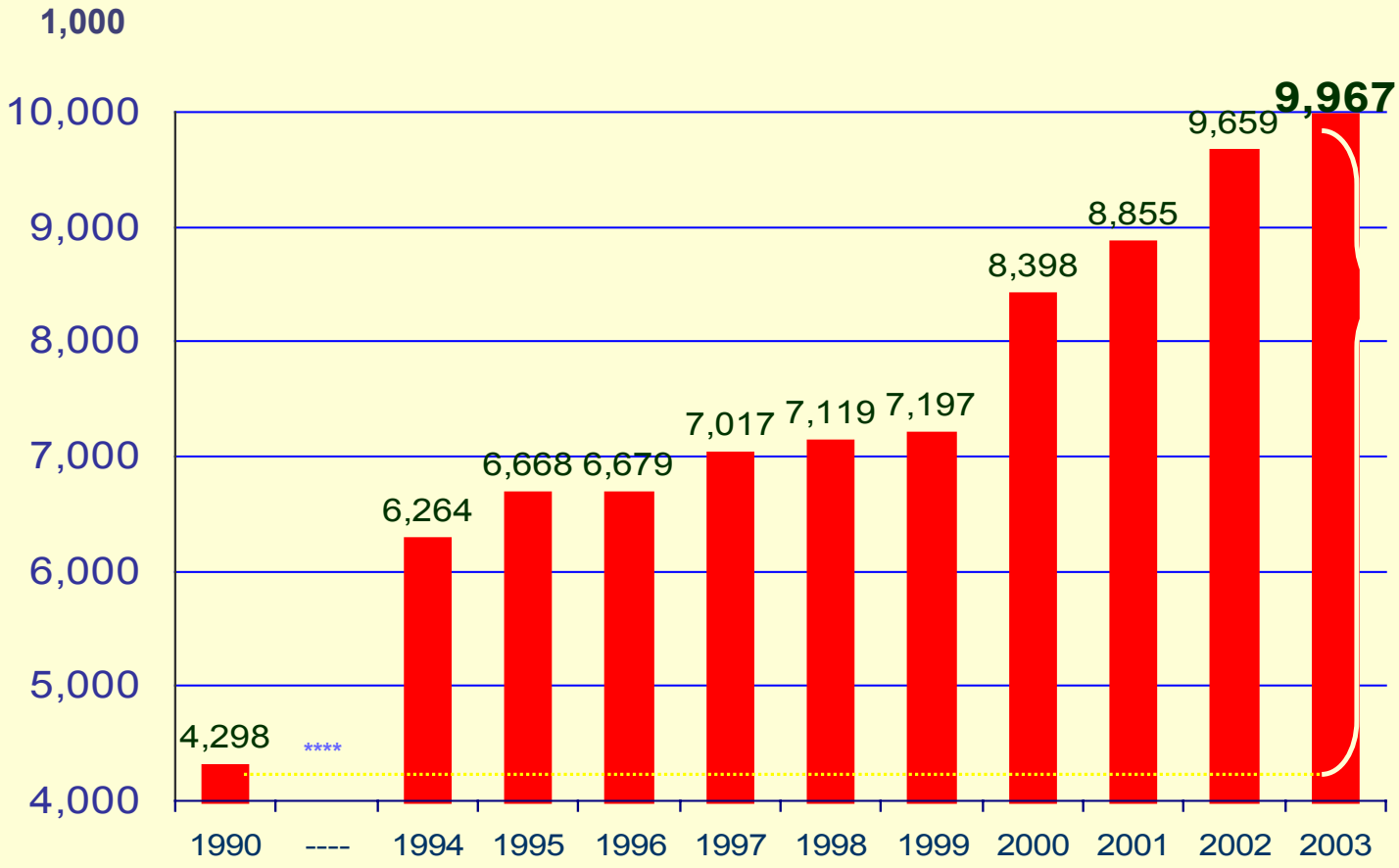
Sources:

8.6. Migrants to USA from Mexico by Legal Status



Source: Pew Hispanic Center, Estimation of the Amount and Characteristics of Undocumnetated Population Living in USA

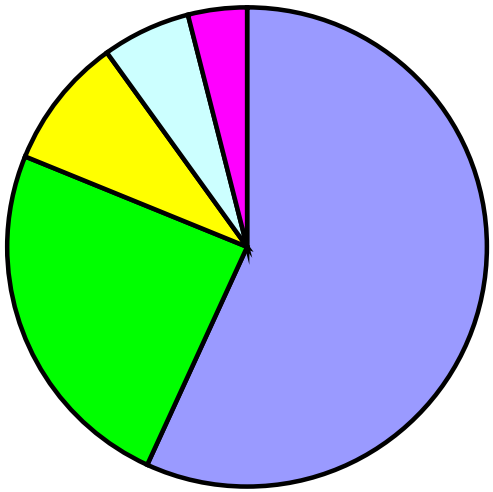
8.7. Mexican Migrants to USA 1990- 2003 (1000 Persons)



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

SOURCE: Public-use files from the US Census Bureau, Current Population Survey, March Supplement, elaborated by Fernando Lozano, 2005

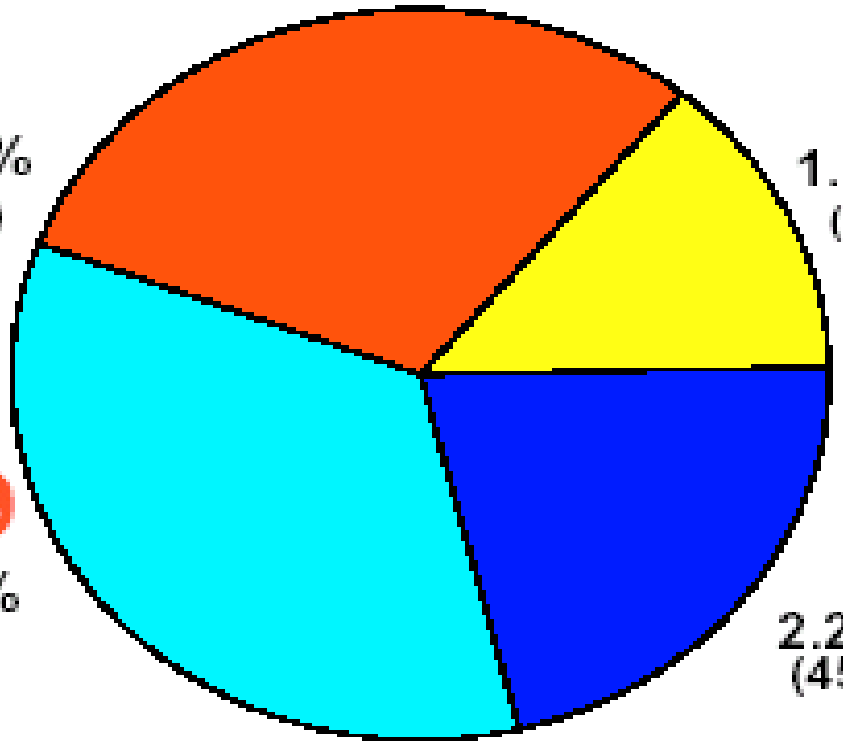
8.8. Undocumented Immigrants by Origin (Total 10.3 million, March, 2004)



- Mexico (5.9 millones)
- Latin America (2.5 millones) without Mexico
- Asia (1 millon)
- Europe and Canada (0.6 millones)
- Africa and others (0.4 millones)

Source: Pew Hispanic Center, Estimation of the Amount and Characteristics of Undocumnetated Population Living in USA

8.9. Years of Arrival of Undocumented Migrants



2000-04
3.1 million – 30%
(700,000 per year)

1980s
1.3 million -- 14%
(130,000 per year)

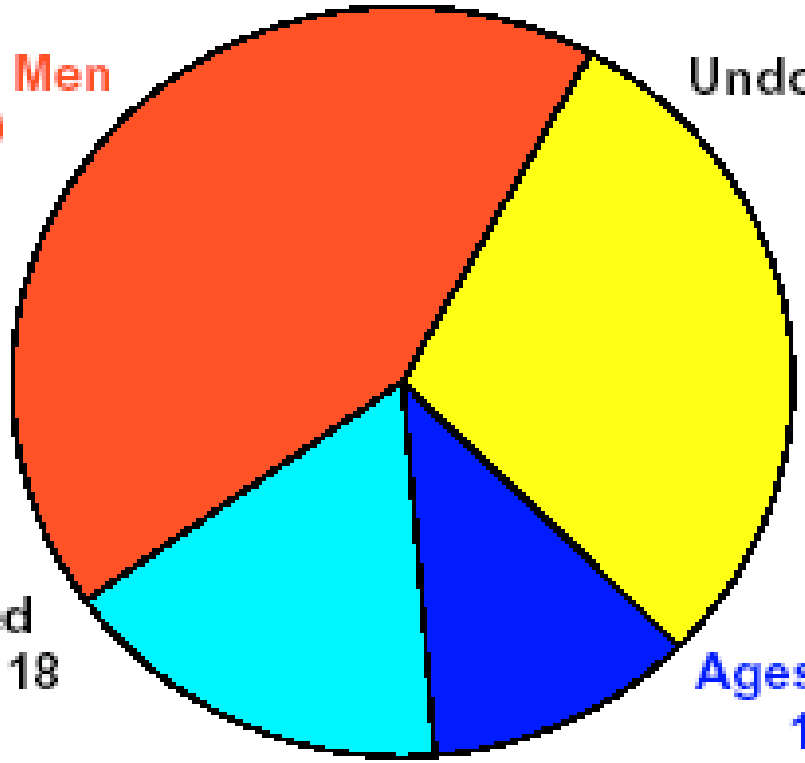
1995-1999
3.6 million -- 35%
(750,000 per year)

1990-94
2.2 million -- 21%
(450,000 per year)

10.3 Million in March 2004

Source: Pew Hispanic Center, Estimation of the Amount and Characteristics of Undocumetated Population Living in USA

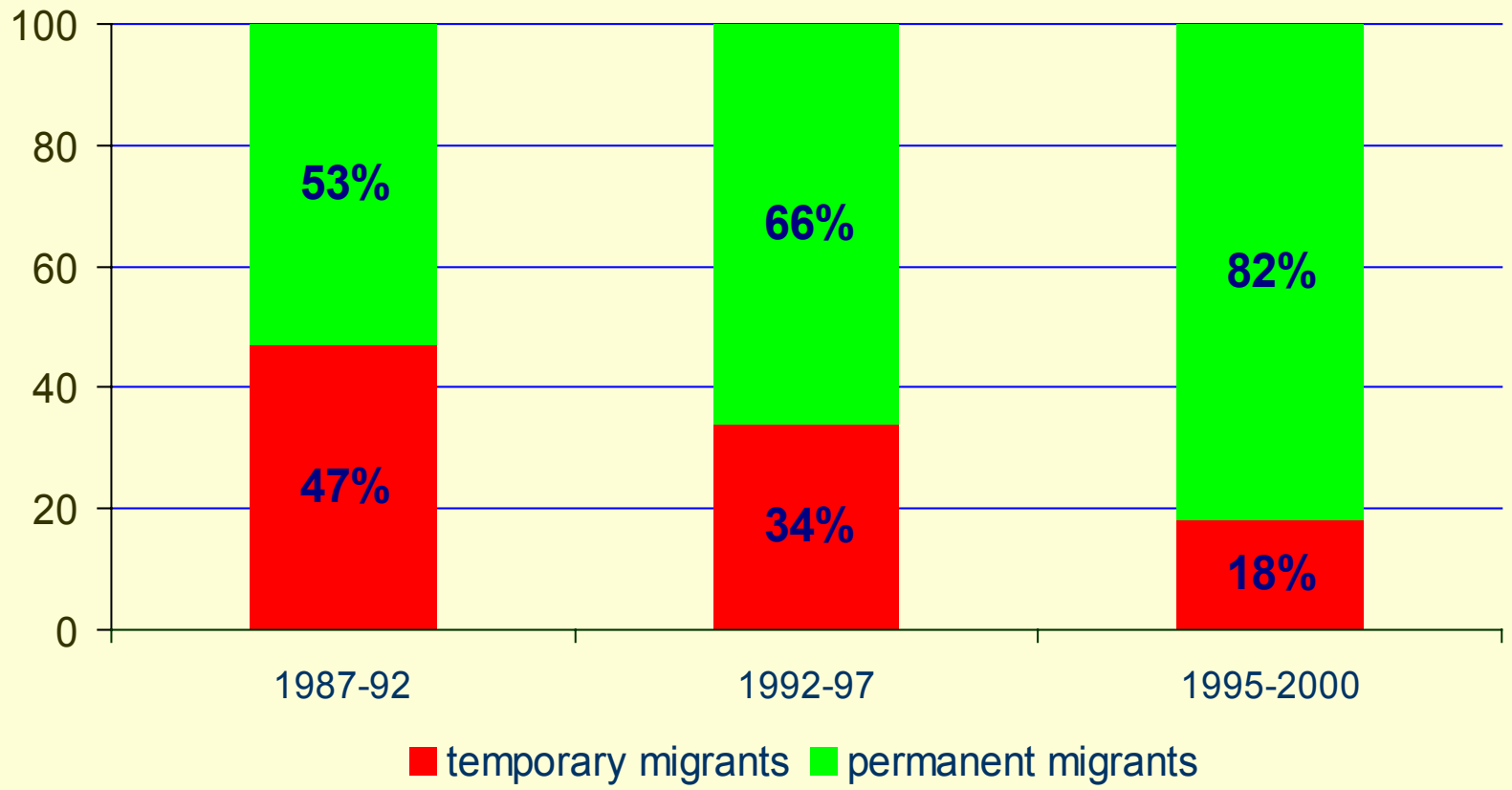
Undocumented are Children and Younger Adults



10.3 Million in March 2004

Source: Pew Hispanic Center, Estimation of the Amount and Characteristics of Undocumetated Population Living in USA

8.11. TEMPORARY AND PERMANENT MIGRANTS

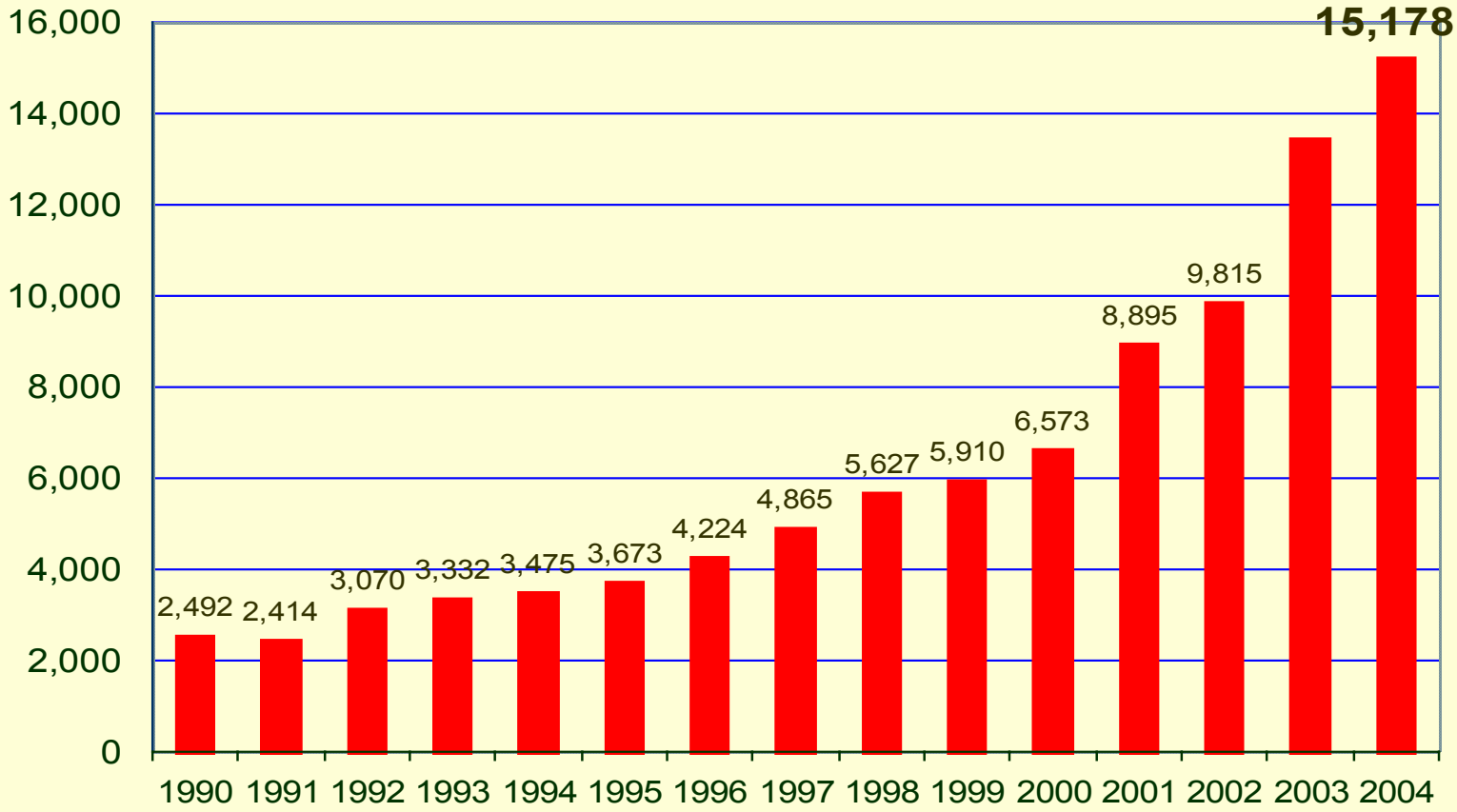


SOURCE: ENADID92, ENADID97 and Censo 2000

8.12. ILLEGAL MIGRATION TO USA

- Growth of migration: 1970: 760,000 persons; 2004: 11.2 million; growth rate 8%/ year or 15 times in 35 years.
- 47% legal migration; 53% illegal
- Till 1980 migration was basically legal (80%), and from 1990 due to partial closing of border it turns increasingly illegal.
- 32% of non native population in USA, only higher by German and Irish immigrants in XIX century.

8.13. Remittance From Migrants Sent to Mexico, 1990-2004 (1'000,000 US $)



January-Nov., 2004

Average 2004: **1.380 billion dollars**

SOURCE: Informes Anuales Banco de México, varios años. www.banxico.org.mx, elaborated by Fernando Lozano, CRIM, 2005

9. Early Recognition, Long-term Monitoring of Desertification & Drought & Early Warning of Conflicts: A Security Task

© Sebastiao Salgado: Spain, Gibraltar

9. 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 consequences by early warning of famine, migration & conflict!

9.1. Drought Early Warning System

- Famine Early Warning Systems Net (FEWS)

✓ Normalized Difference Vegetation Index (NDVI), (11/11-20, 2003 Dekad 32) from the US Geological Survey (USGS)

✓ Current Rainfall Estimate (11/11-20, 03) Dekad 32 from the National Oceanic and Atmospheric Administration (NOAA).

✓ Current NDVI Long-Term Avg (1982-1999)

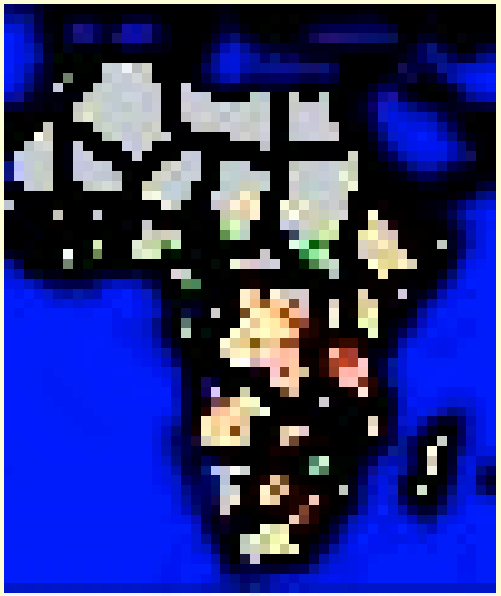
- Early Warning Systems

Of hazards/disasters:

- GIEWS (FAO),
- HEWS, IRIN.

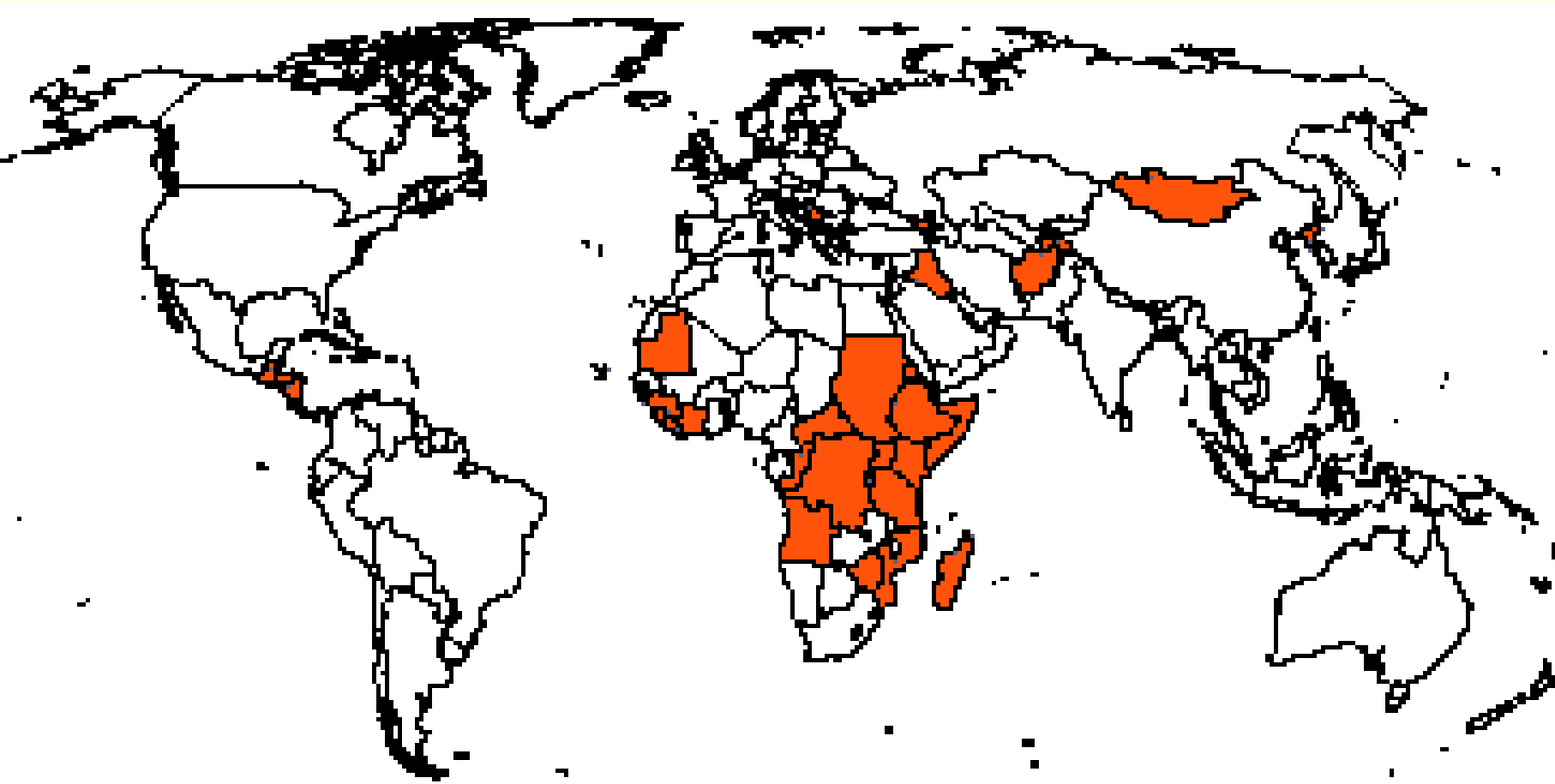
Of conflicts:

- FEWER, FAST (Swisspeace)



9.2. FAO: Global Information and Early Warning System on Food and Agriculture (GIEWS)

Countries Experiencing Food Emergencies in October 2003



10. Combating Desertification & Drought and Resolving, Preventing & Avoiding Violence: A Long-term Task for the United Nations

© Sebastiao Salgado: Kabul

10. Combating Desertification & Drought - Resolving, Preventing & Avoiding Violence: A Long-term Task

- Desertification, drought, famine & hunger riots must be analysed as part of : Global Environmental Change & fatal outcomes
- Desertification & drought are no hard security threats!
  - They require long-term cooperation among scientists & policy makers using traditionaland advanced technological knowledge.
  - They require a long-term, pro-active local capacity-building.
- Desertification & drought are emerging soft security challenges, they cause environmental and social vulnerabilities and they may trigger under specific global, national, regional & local conditions violent societal consequences: e.g. general strikes and hunger revolts that may challenge regime stability and the survival of governments!

10.1 Desertitication & Drought: A Security Issue?

- Desertification & drought pose environmental security challenges, vulnerabilities and risks.
- Desertification & drought are human security challenges.
  - Referent: individual, family, village, province
  - Value at risk: human survival & livelihood of the poor with low resilience
  - Cause of the challenge: nature (GEC), nation states & globalisation processes
- Desertification & drought is a food security challenge.
- Drought & famine poses a health security challenge.
- Drought, famine and drought & famine-induced migration: poses livelihood security challenges, vulnerabilities & risks
- Drought, famine & migration: may trigger violent social consequences and thus become: social, national & international security challenges, risks and only in very extreme cases military threats.

10.2. Desertification > Drought > Famine > Migration > Violent Events: Research Needs

- Much knowledge on individual factors of GEC and individual fatal outcomes but little on interactions and linkages between global environmental change & fatal outcomes (Disciplinary constraints)
- Lack of multi-, trans- and interdisciplinary research integration.
  - Within global change community: between desertification & climate change specialists: among specialists of six factors of my survival hexagon.
  - Within the fatal outcome communities: on nature & human-induced hazards/ disasters, environmentally-induced or triggered migration, crises and conflicts
  - Between the climate change (desertification) and disaster community
    - ✓ June 2002: Foreign Ministries of Germany & Netherlands & IFRC-RCS
    - ✓ UNISDR project: adaptation & mitigation to climate change & disaster
  - Between early warning communities on disasters and conflicts.
- Need for a broad *Earth Systems Analysis*: Natural & Social Scientists
  - Schellnhuber/Wenzel: (1998)Potsdam (PIK): to Hadley Centre in UK: ESA
  - Manifold methods: quantitative modelling and qualitative comp. case studies

10.3. Desertification & Drought Mitigation: Some Policy Conclusions

- **Combating Desertification & Drought**: A non-military human & environmental, food, health and livelihood security task for agricultural and environment policy
- **Coping with Drought & Famine**: OCHA, ECHO, WFP et al.
- **Coping with environment.-induced migration**: UNHCR, IOM
- **Avoiding violent conflicts**: A joint task of international institutions: **NATO & EU** cooperating in the Mediterranean
- **Combating desertification** is a major environmental, development and a security task for the EU in Mediterranean
- **Need pro-active policies** by states & int. org. in the Mediterranean on causes of desertif.: **population growth** (South), **market forces** (North) and **climate change impacts** (N & S).

10.4. P.L.G.Vlek: UNU-EHS: InterSecTions 1 International Panel on Land Degradation

- **Proposal: UNU & UNEP to establish a IPLD (IPCC):**
- **Task: „to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-econ. information relevant to udnerstanding gehe scientific basis of risk of human-induced land degradation, its potential impacts and options for adaptation and mitigation.“**
- **Assessment based on peer-reviewed & published scien-tific/technical literature**

➢ **WG I: scientific aspects**

➢ **WG II: vulnerability of socio-economic, food & natural systems to land degradation, consequences of land degradation & options adapting to it**

➢ **WG III: assesses options for limiting land degradation and resulting land cover change.**

10.5. H.G.Brauch: UNU-EHS: InterSecTions 2:
4th Phase of Environmental Security Research

- After 2 decades of research environmental security to a fourth stage of **synthesis & reconceptualisation**
- New phase of research on Human and Environmental Security and Peace (HESP) combine: structural factors from the natural and human dimensions of GEC based on expertise from the natural & social sciences
- Social science research on extreme or fatal outcomes: hazards, migration, crises and conflict constellations.
- Fourth phase of social science research on HESP may aim at ten conceptual and policy goals:

10.6. H.G.Brauch: UNU-EHS: InterSecTions 2:
4th Phase of Environmental Security Research (2)

Scientific Orientation and Approach

1. ***Orientation***: An equity-oriented **Grotian** perspective may support multilateral environmental efforts in international organisations & regimes to avoid conflictual outcomes of global environmental change, environmental scarcity, degradation and stress..
2. ***Spatial Approach.*** The analysis of environmental security issues on a regional level requires a spatial approach which may be called a ***political geo-ecology***
3. ***Human Security Focus***: The reference for research and policy should be human beings, individual victims & communities of distress migration, disasters, crises and conflicts.
4. ***Sustainable Development and Sustainable Peace***: A hu-man security perspective to the analysis of environmental secu-rity issues may aim at an enduring “sustainable peace”

10.7. H.G.Brauch: UNU-EHS: InterSecTions 2:
4th Phase of Environmental Security Research (3)

Scientific Focus on Causes, Impacts and Extreme Outcomes of Global Environmental Change

5. ***Causes*: Research should be broadened to include environm. degradation &scarcity, impact on environm. stress and on hazards..**

6. ***Outcomes*: Research on hazards, distress migration & env. refugees** which may lead to **disasters, crises and conflicts.**

7. ***Policy Process*: Case studies on how state & society responded to challenges & outcomes**, emphasise role knowledge factor played for adaptive & mitigation strategies to reduce vulnerability & strengthen resilience. Use international environmental regimes and governance as a **tool for conflict prevention**.

8. ***Regional Orientation***: on the **causes, the policy process & its outcomes**. Regional natural science models (climate, soil, water), comparative social science case studies on policy processes at regional scale.

10.8. H.G.Brauch: UNU-EHS: InterSecTions 2:
4th Phase of Environmental Security Research (4)

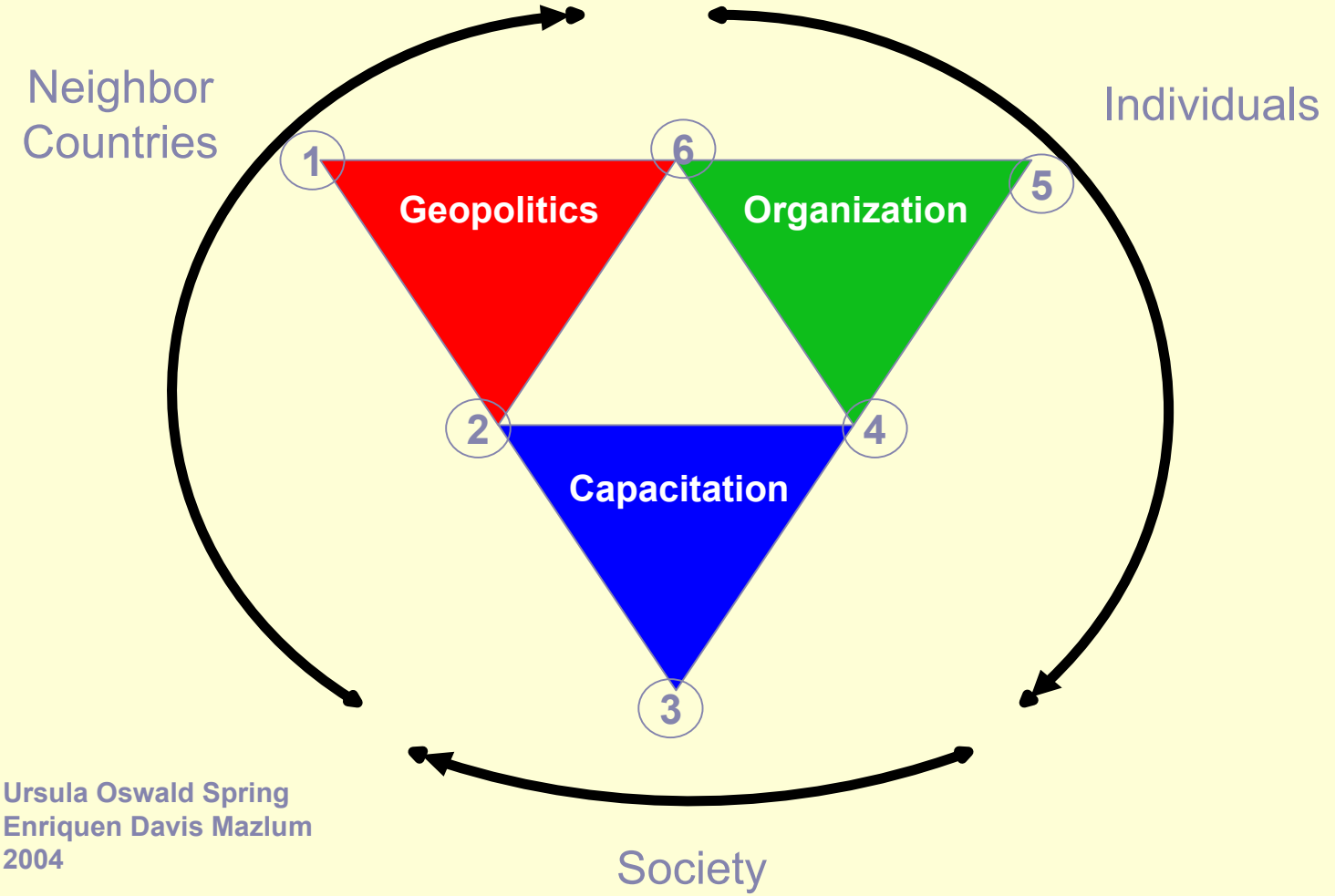
Policy Goals

9. ***Policy Goals on the Societal and Individual Level***: Environmental security studies should contribute to **strategies for reducing the *impact* of environmental stress, decreasing the *vulnerability* & strengthening the coping capacities and *resilience*.**

10. ***Policy Goals on the Communal, Sub-national, National and International Level***: Strategies for **coping with outcomes of environmental stress** should be developed by **improving disaster preparedness and response & by integrating disaster reduction into development planning.**

The resolution, prevention and avoidance of resulting violence should become a major policy goal.

10.9. Resolution of Conflicts



Ursula Oswald Spring
Enriquen Davis Mazlum
2004

Thank you

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

Thank you

for your attention and patience.

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