WATER AND ITS SECURITY IN SEMI-ARID ENVIRONMENTS

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WATER IS LIFE

- Satisfy the thirst
- Produce food
- Sustain ecosystems
- Embellish landscape
- Support productive processes
- Generate a human cosmovision
- Is necessary for any life and life support processes

WORLD'S DISPOSAL OF WATER

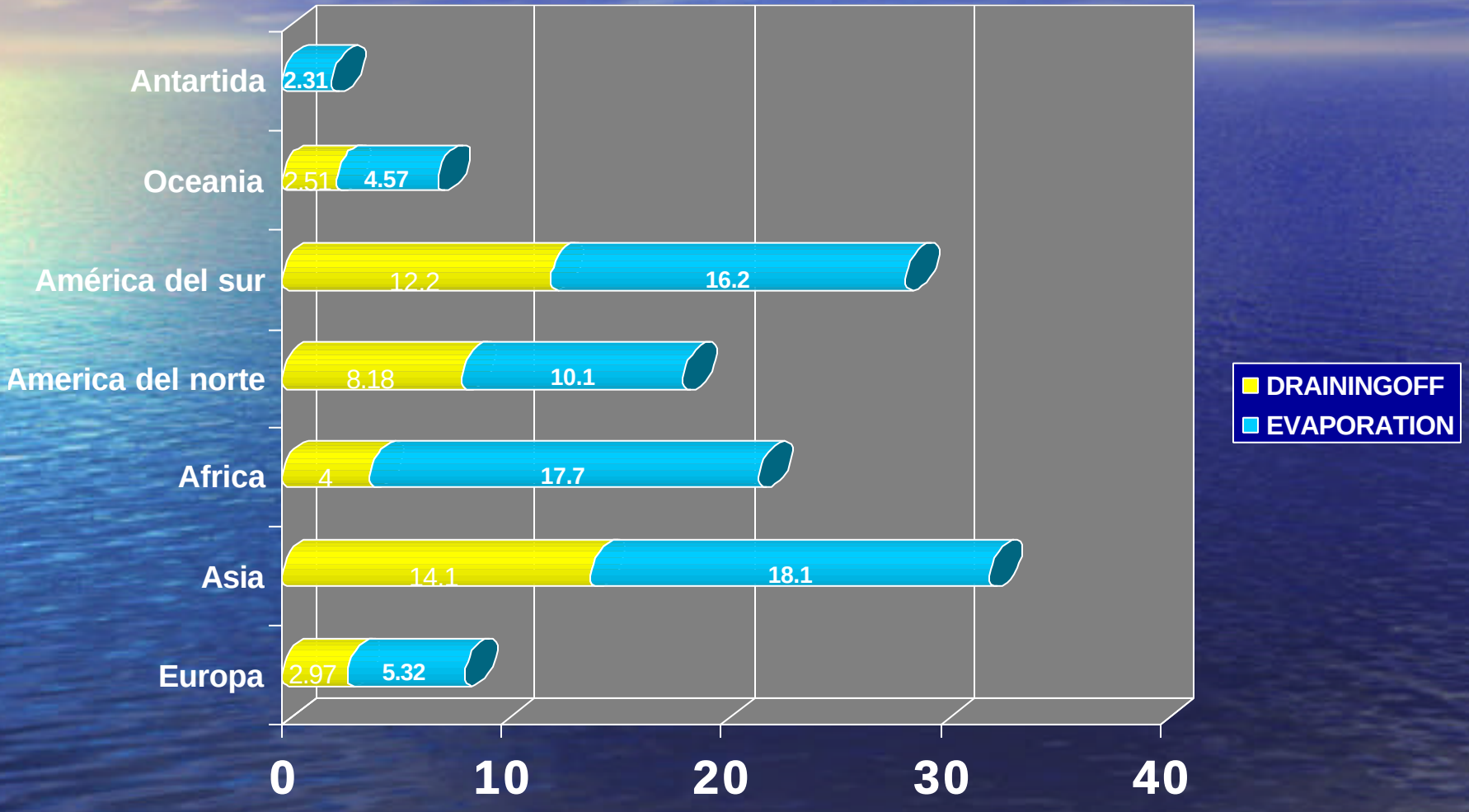
Blue Water: 40 mil km^3: aquifers

- 70% agriculture
- 20% industry
- 10% domestic use

Green Water: Drain of naturally inside ecosystems

- 60% of production of food
- 40% of fishes in sweet water
- 25% of molluscs

Figura 4. Precipitation, Evaporation and Raining of by Regions



Source: GEO-3, 2002

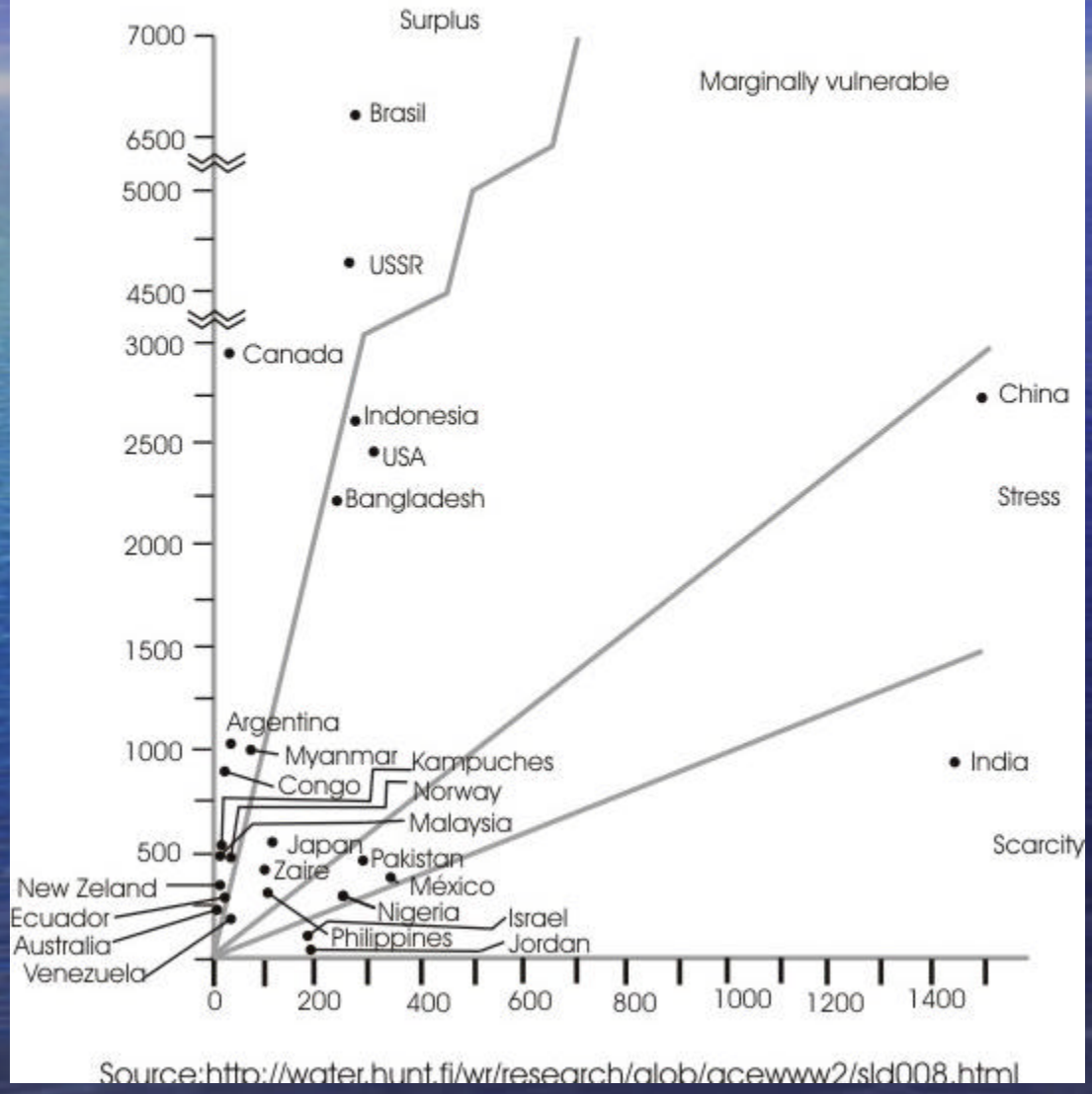
WORLD'S WATER DEMAND

During the XX century, world population increased three times and water demand six times. More than half of the population lives within hydric stress conditions. Every year 3 to 4 millions of personas -2 millions are children- die because of water born illnesses.

- *physical stress: without access to the resource*
- *economic stress: lack of money to create infrastructure for safe water supply and services*

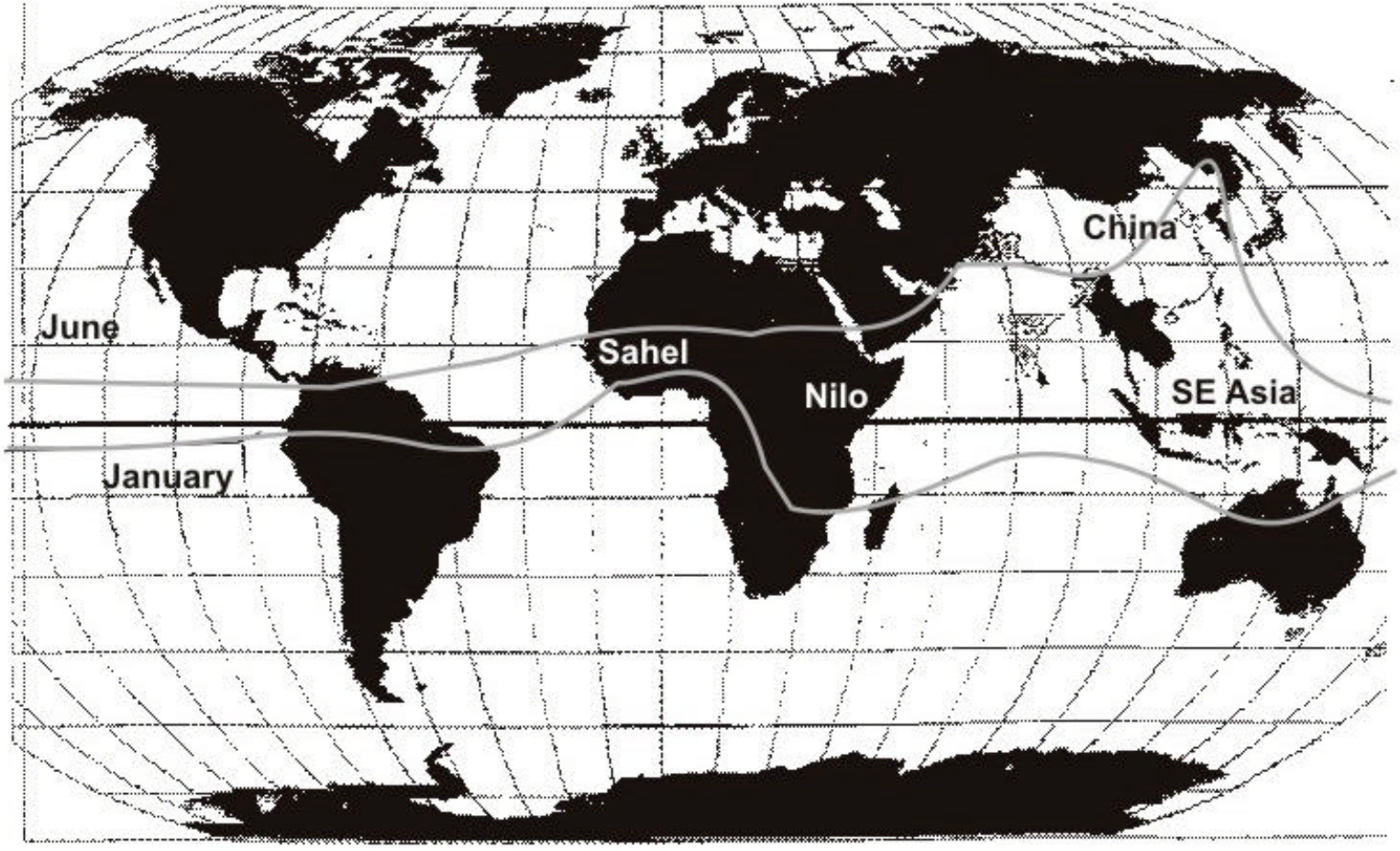
Figure 6

Water scarcity evaluation model Kulshreshtha



Source:http://water.hunt.fi/wr/research/glob/acewww2/sld008.html

Climate Change
the High Vulnerable Tropic



Source: http//.water.hut.fi/wr/research/glob/acewwwl/sld010.html

Figure 8

Proyection of population and urbanization

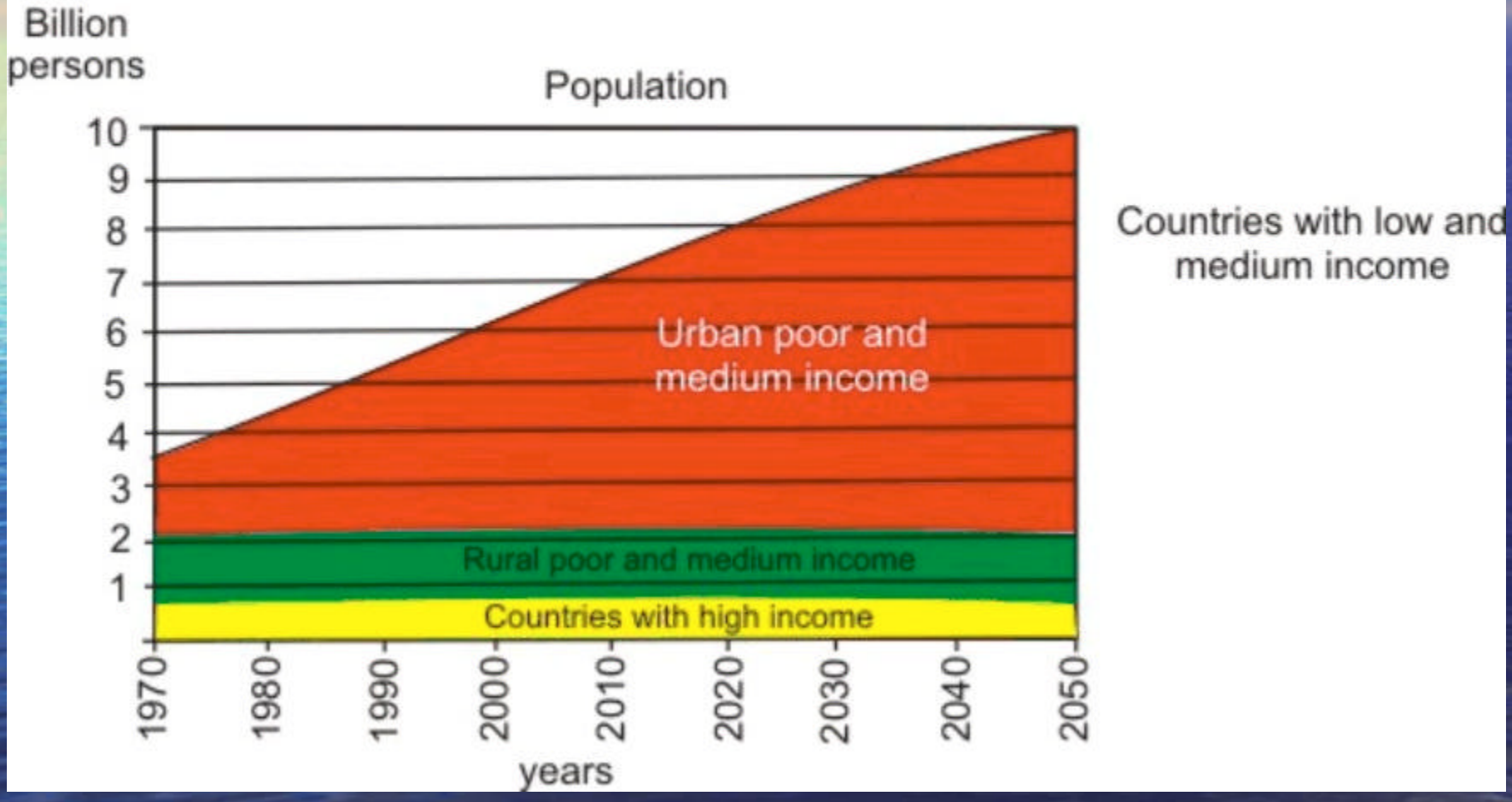
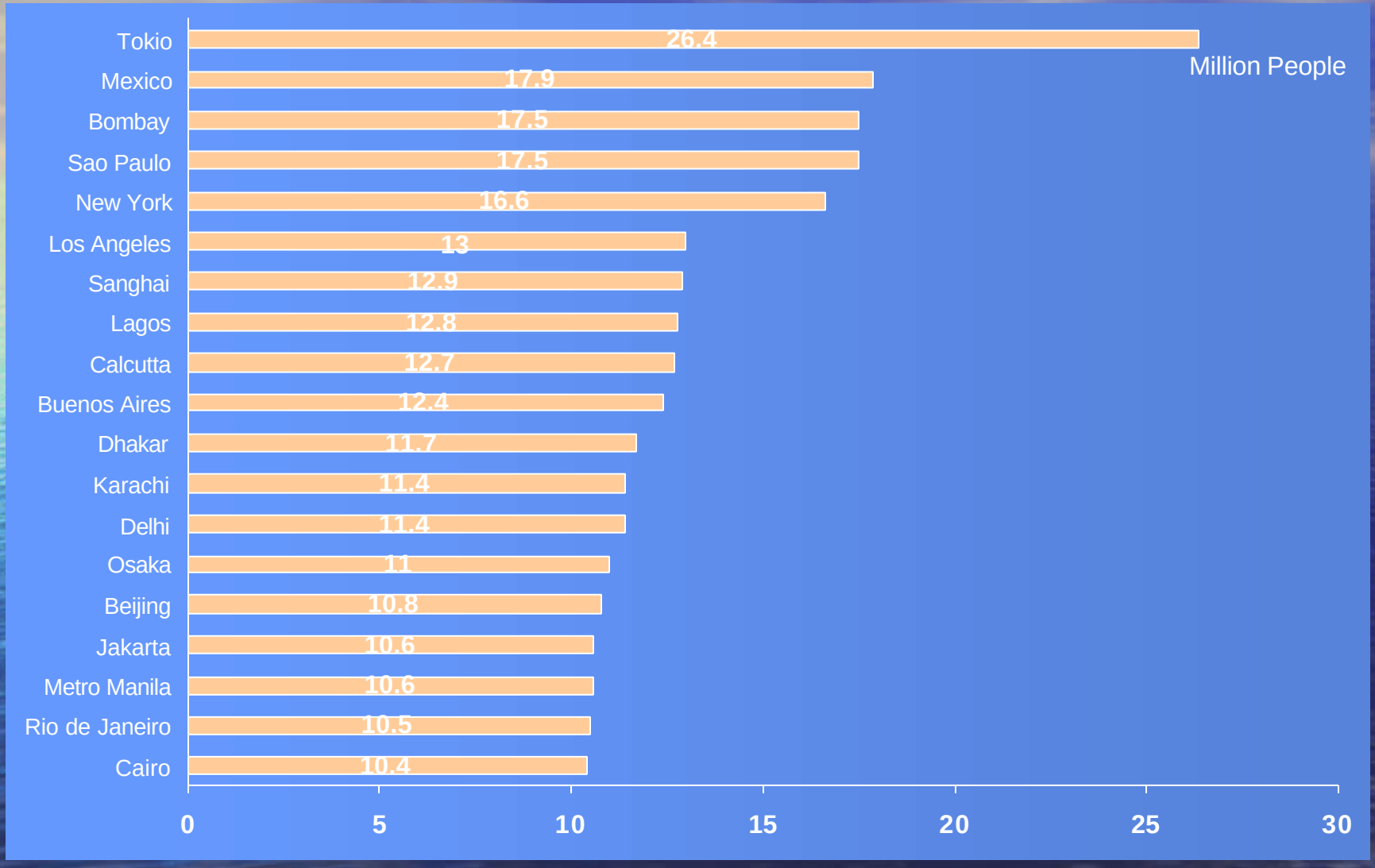


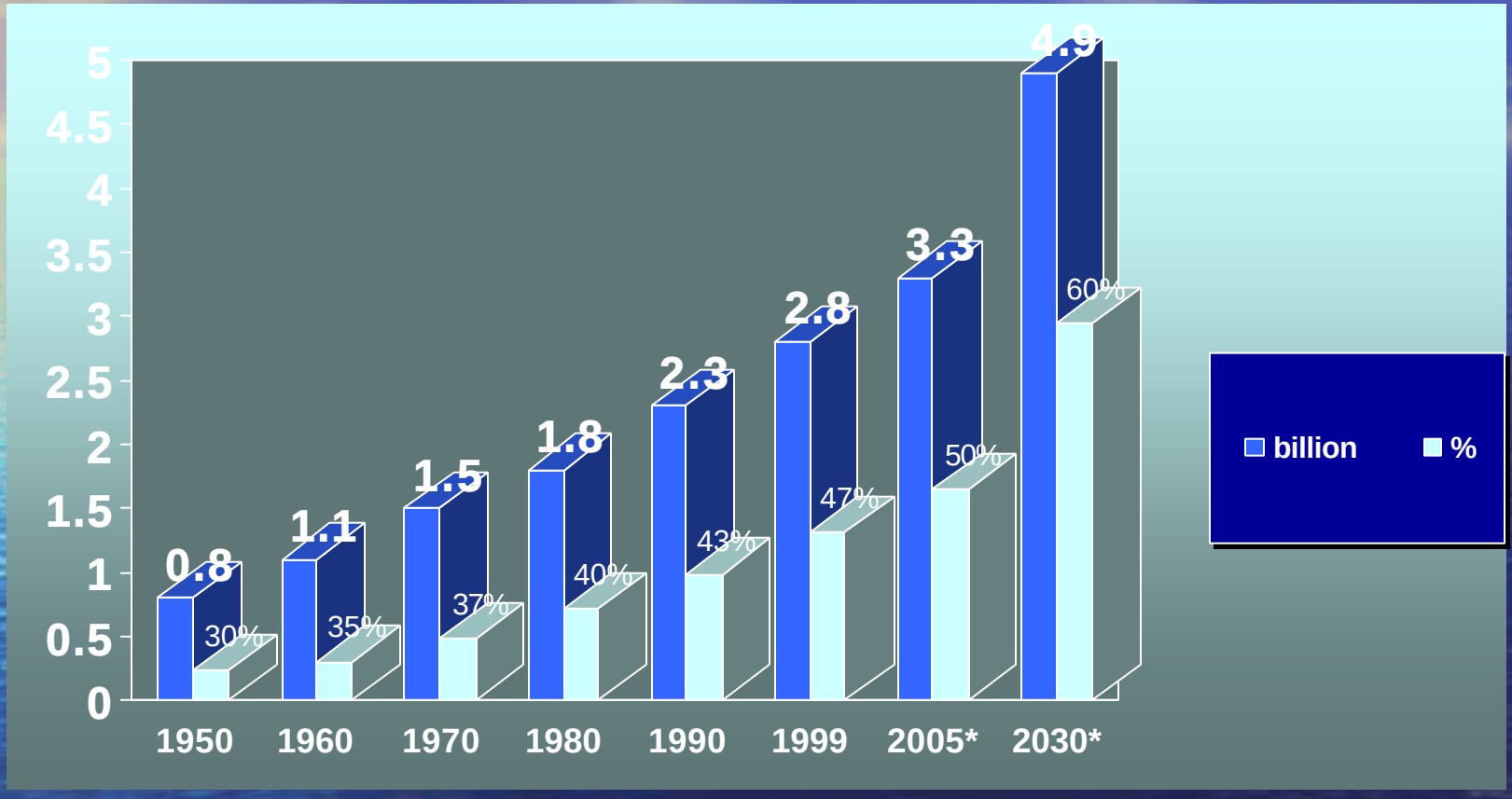
Figure9

MAIN URBAN AGGLOMERATIONS



Source: UNO, 1999, World Urbanization Prospects

Growing Urban Population

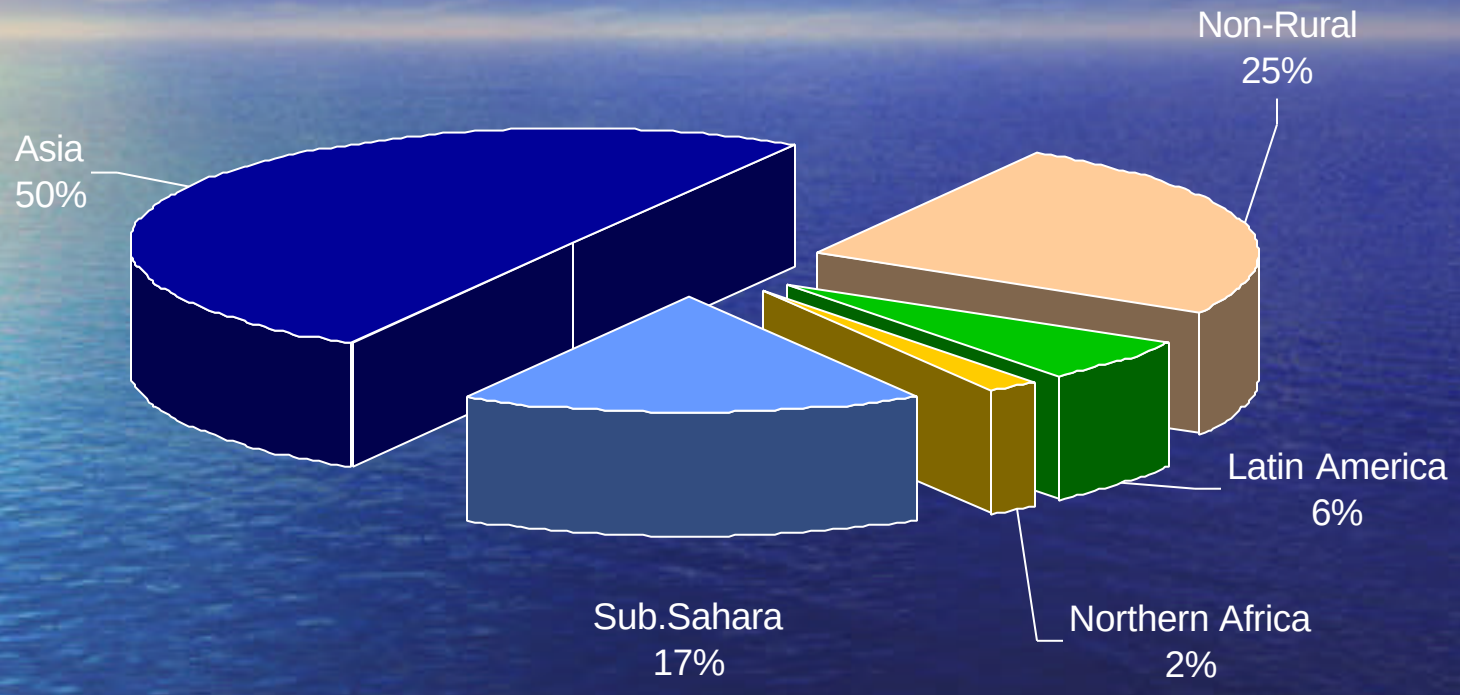


* estimate

Source: UN 1999, World Perspectives of Urbanization

Figure 11

Poors in the World

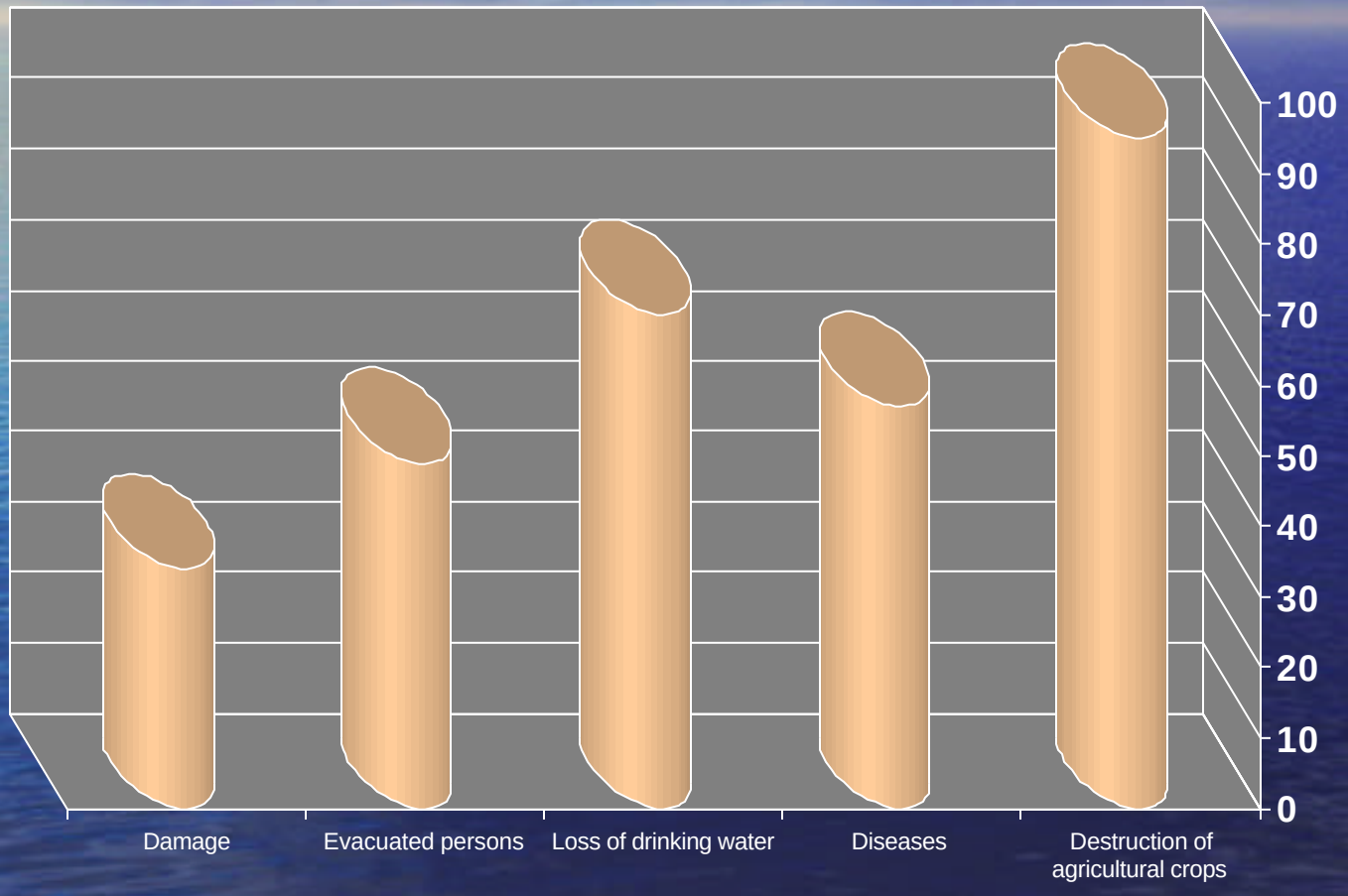


Total poor: 1.2 billion
Rural Poor: 900 millon
Urban Poor: 300 millon

Source: UNDP, 2002

Figure 12

Effects of Hurricane Mitch in Honduras



Source: Goverment of Honduras (2002)

WORLD'S CATASTROPHES

1973-1993:

-66 millions of affected persons

- 19 millions of dead

1994-1997:

-113 millions of dead

1998 (Niño Year): Mitch Honduras

-30 thousand dead

-1/3 of GNP of Honduras in damages

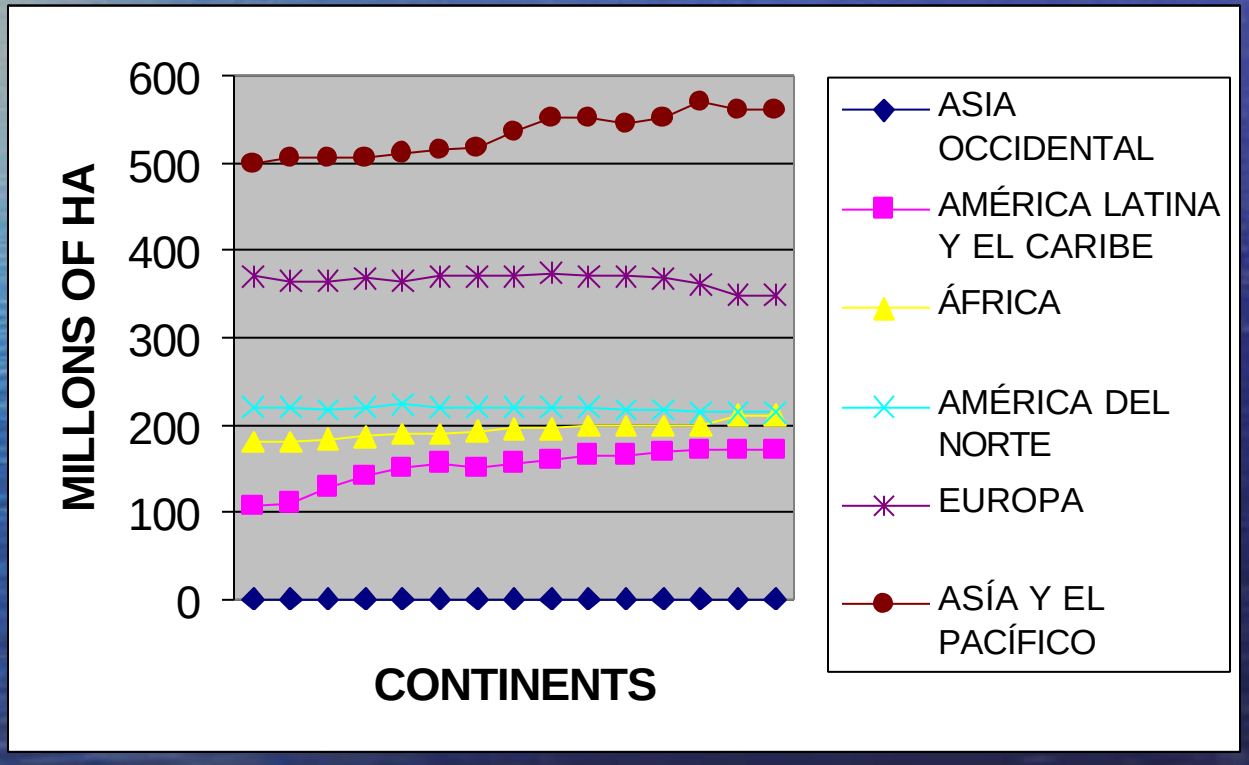
-85% of agriculture destroyed, hunger

1990-2000: ten times more damages than a decade before

-70 billions of economic loss

LAND AND SUSTAINABILITY

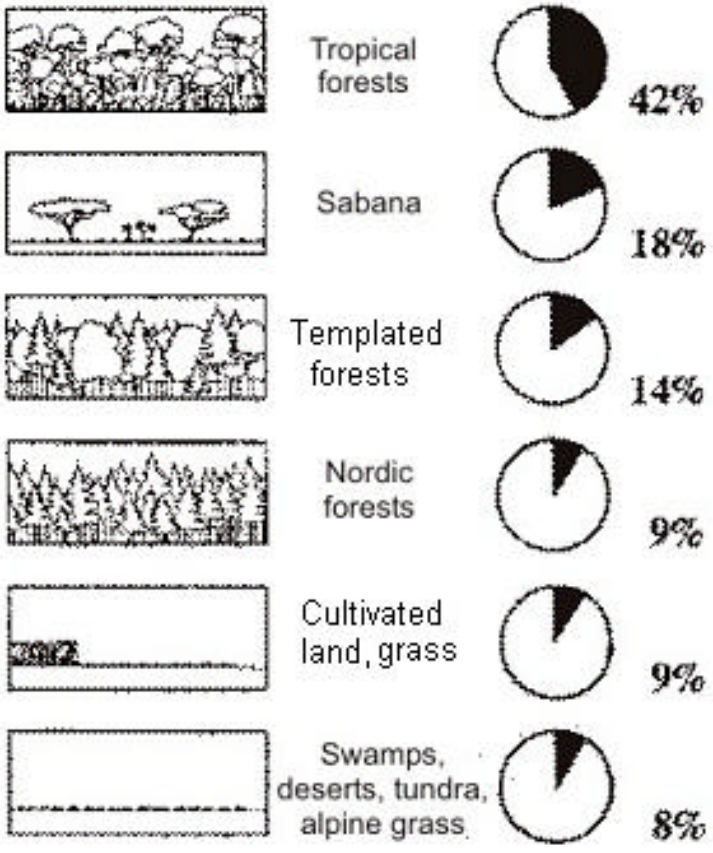
Use of land for agiruclture and permanent crops



Fuente: GEO-3, 2002

Tropical forest are the best generators of oxigene

Production of vegetal biomass and oxygene on surface of earth

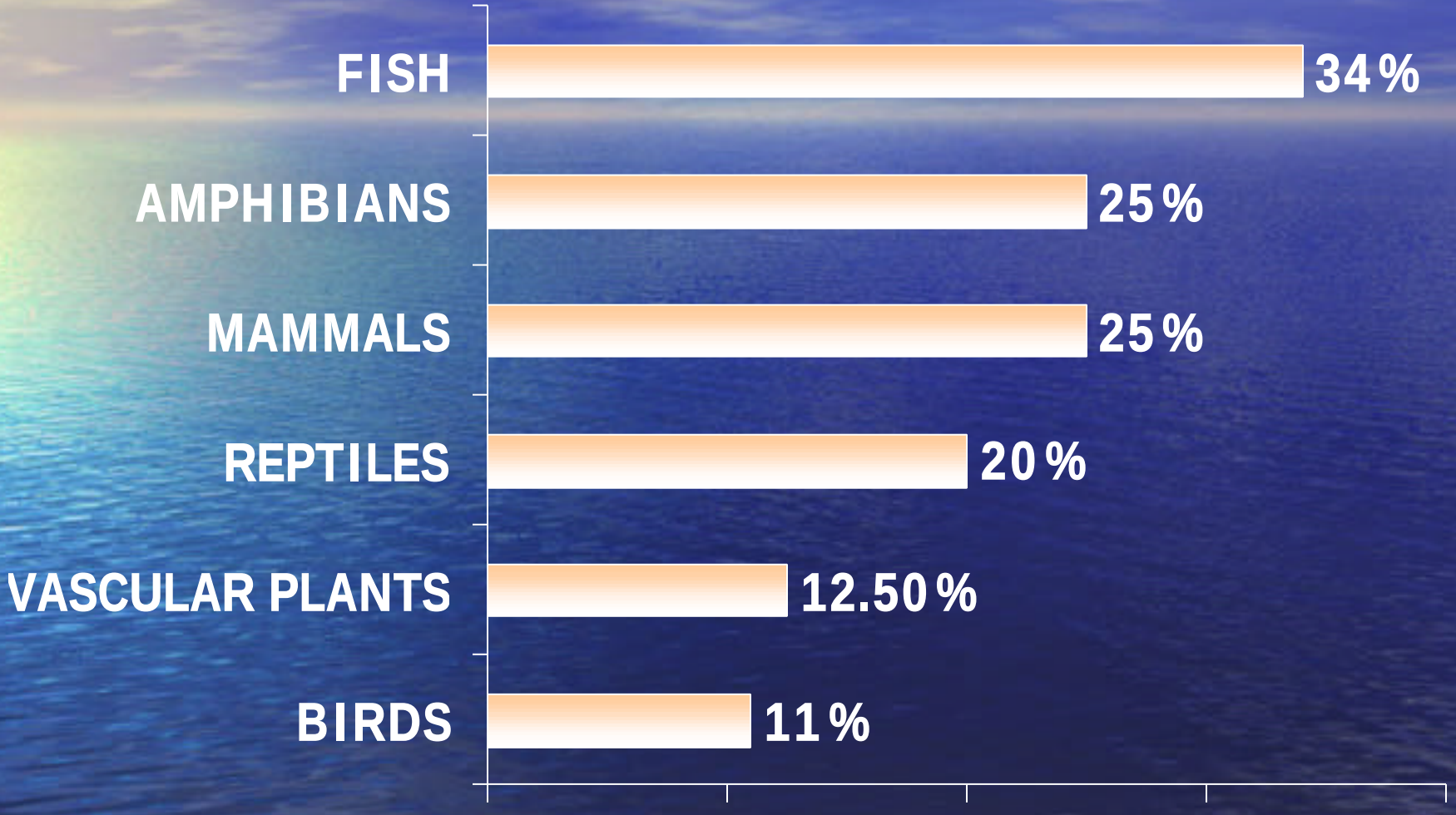


Source Strahm and Oswald, 1991

)EFORESTATION PROCESS

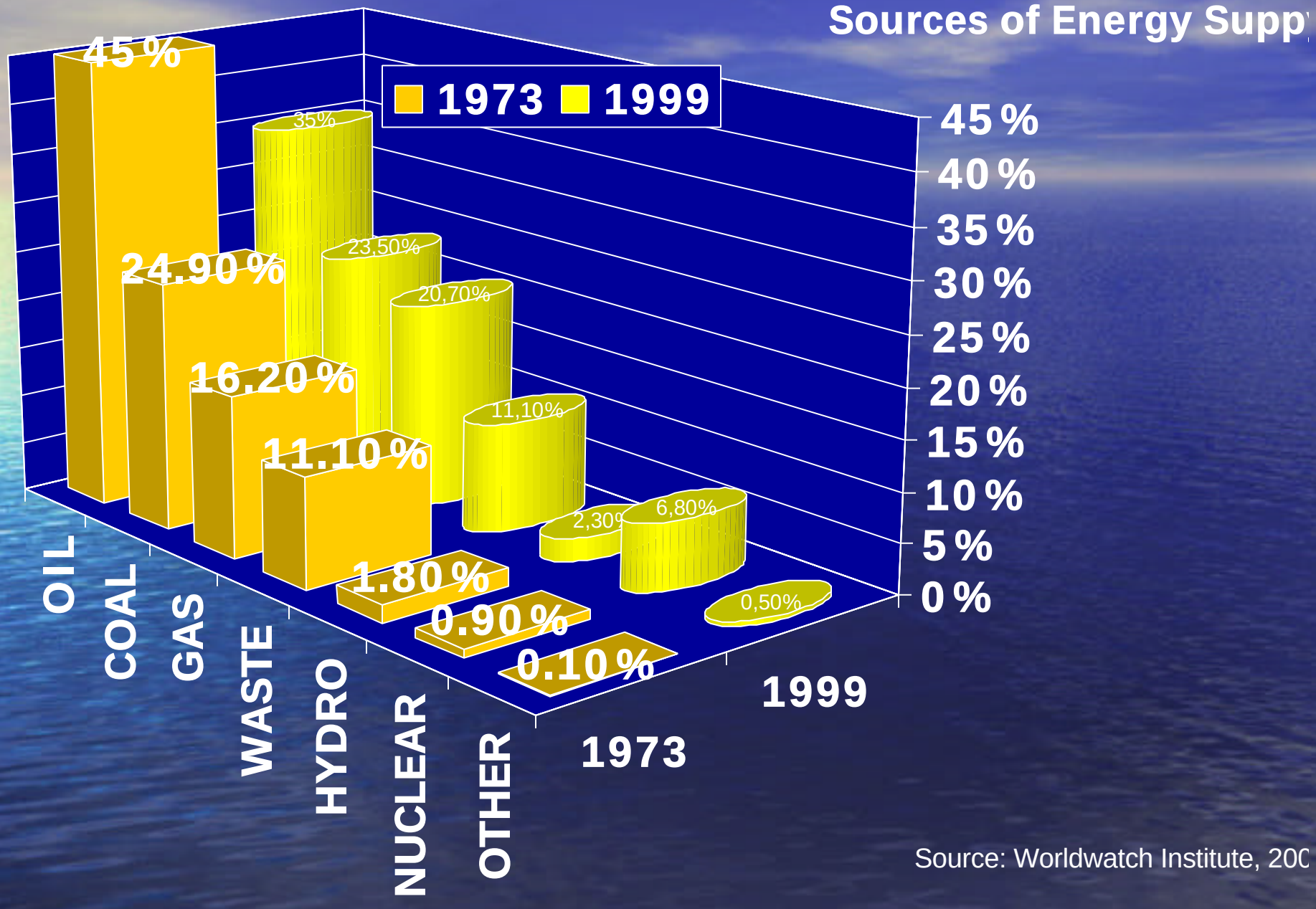
ource: FAO and GEO-3, 2003

UNSUSTAINABLE WILDLIFE MANAGEMENT



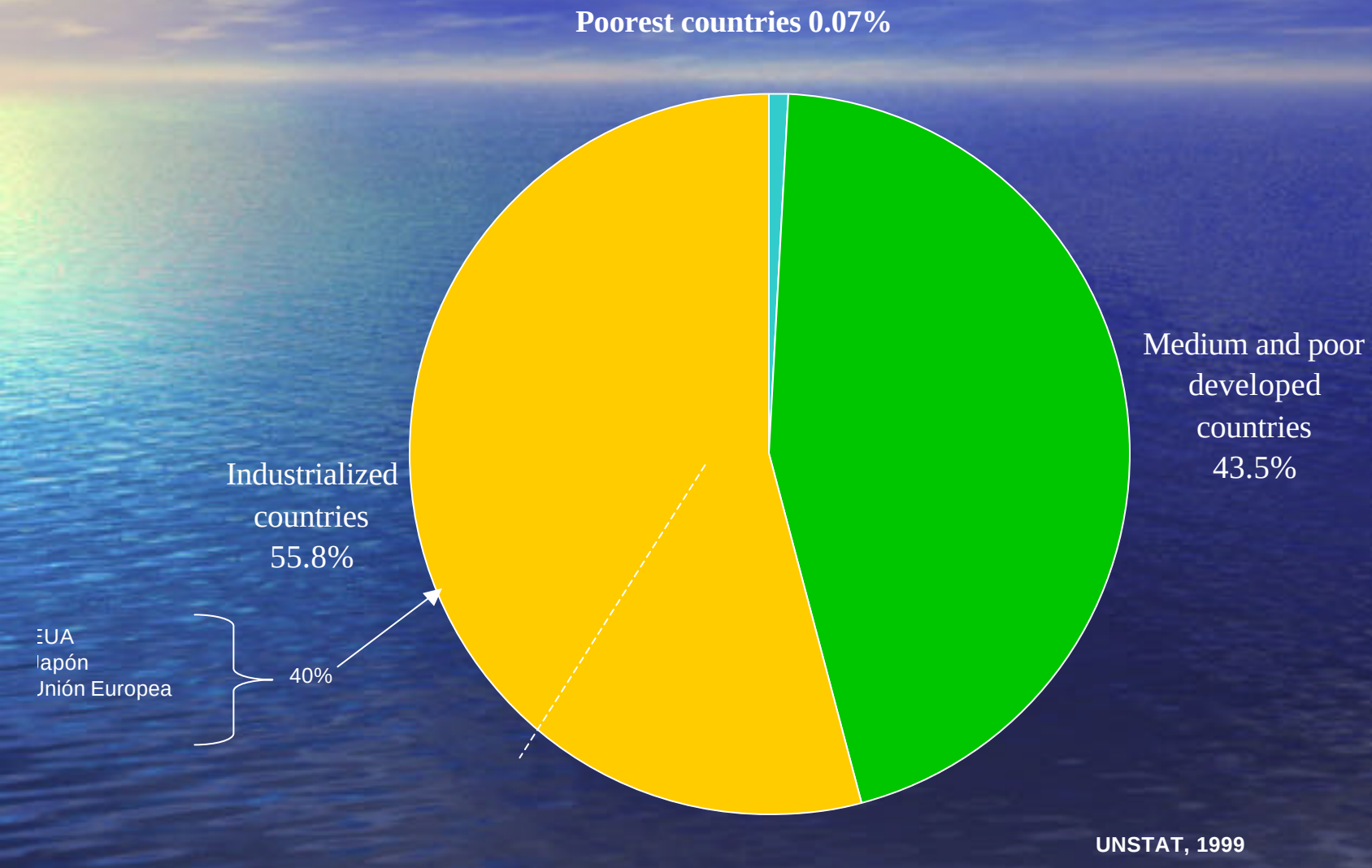
Source: FAO, IUCN/World Conservation Union, 2000

Figure 18



Source: Worldwatch Institute, 200

EMISSION OF CARBON BIOXYDE IN THE WORLD



UNSTAT, 1999

Figure 20

FOUR CONFLICTIVE PROCESSES

The mortgage of an economic model of late capitalism concentrates income and wealth through unemployment, and expulses youth and elders from the labor market. It is managed by a superpower who bases its force on military superiority, and promotes a homogenizing culture through consumerism and mass media. This increases world instability through four main processes:

1. **Poverty,** misery and inequality generates human insecurity.

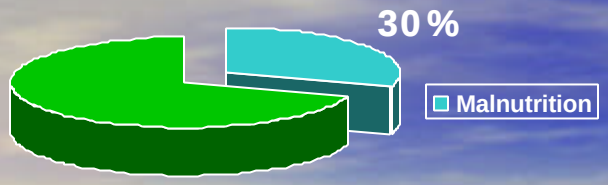
2.**Physical violence**, wars, armed conflicts, genocide, ethnocide drug and arm traffic, illegal migrants, refugees and creates public insecurity.

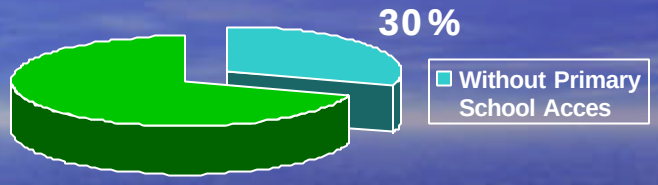
3. **Discrimination of gender,** women, youth, elders, indigenous religious, ideological and other minorities produces gender insecurity.

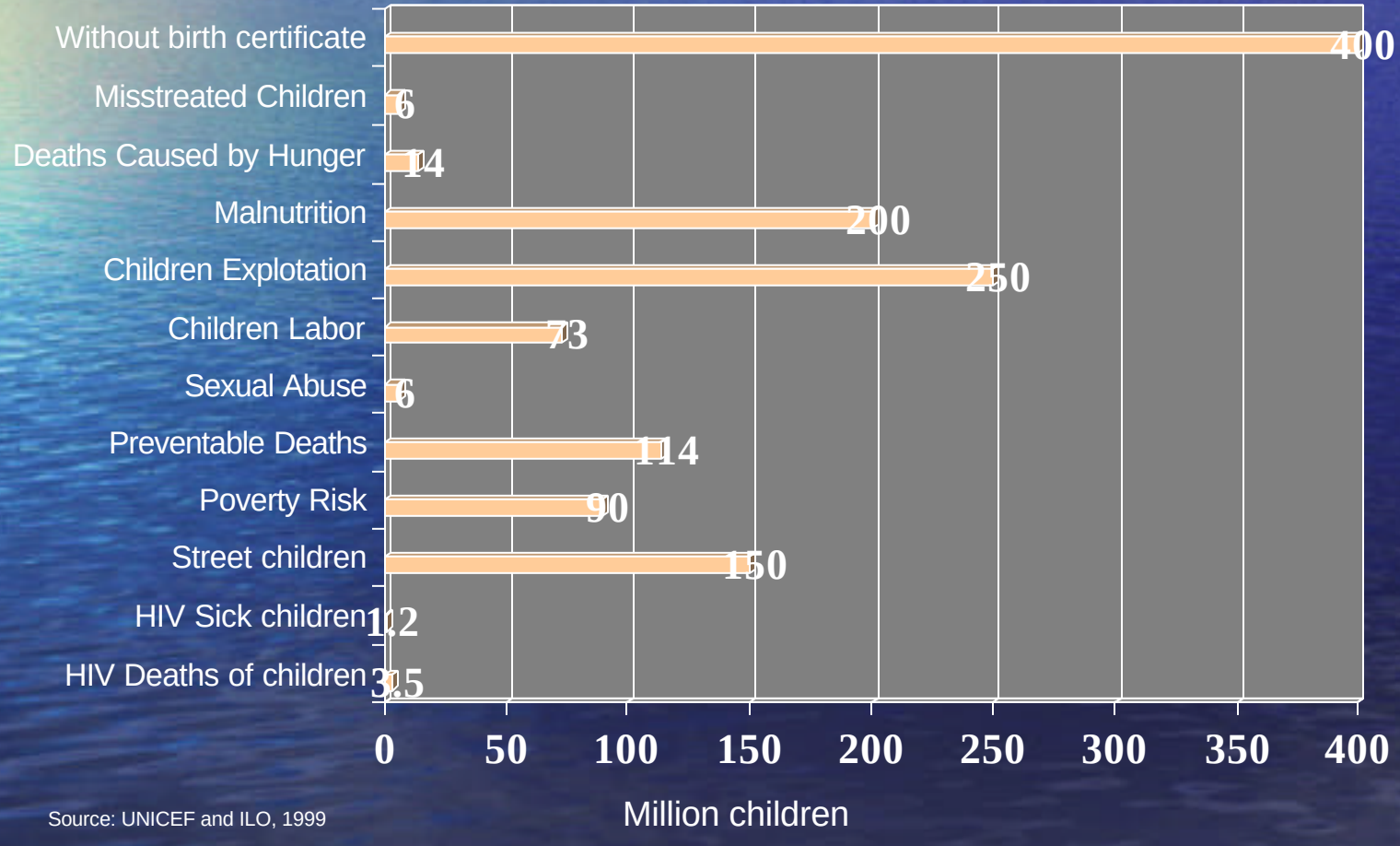
4. **Environmental destruction**, loss of biodiversity, urbanization hazardous waste increase, irrational management of natural resources, climatic changes and urbanization create

Figure 21

Life Conditions of Children and Youth in the World







Source: UNICEF and ILO, 1999

Figure 22

CHILDREN'S POVERTY IN MEXICO

- Children suffer more from poverty, because from 10.5 millions of kids in México:
- 2 millions have low stature
- 800 thousands low weight
- 214 thousands severe malnutrition
- 28% of children are malnourished (only 2% in USA) and 44% of indigenous children
- 32.2% of children malnourished lives in rural areas
- Source: ENN, 1999

Figure 23

WATER AND POPULATION IN MEXICO

- 84% of Mexico has a semi-arid clima and receive 28% of precipitation, but 77% of population lives there, produces 84% of GDP and disposes of 92% of irrigated land.
- South-East receive 78% of precipitation, has 23% of population and only 8% of irrigated land. The highest levels of poverty is located in this area.
- Irrigation uses between 78 to 82% of water and produce between 5-7% of GDP of Mexico.

Figure 24

TROPICAL AND TEMPLATE FORESTS

- Only 55 millions of hectares of forests are left in Mexico
- 1.1 million hectares are disappearing per year due to fire, illegal exploitation, irrational management and pests
- 80% of the forest is in hand of ejidatarios, only 0.2% shows a certified sustainable exploitation
- There is no integration of mixed agriculture, forests, environmental services and ecotourism
- The Mexican government impulse an agribusiness model of agriculture, destroying resources and creating poverty within the peasantry.

Figure 25

FOOD SOVEREIGNITY IN MEXICO

- Importation of corn before NAFTA: 2.5 million tons (mt); in 2002: 6.148 mt
- Importation of basic grains: before 8.7 mt today more than 18.7 mt
- Subsidies per farmer in USA 21,000US$, in Mexico 700 US$
- 25 million of peasants and its families lives from agriculture, only 5 millions can compete within the rules of NAFTA. ¿Where are going 20 millions of peasants? Basically to the USA
- 3.9 million ejidatarios produce basic grains at all for their self-sufficiency

Figure 26

ENVIRONMENTAL COSTS IN MEXICO

- Average of environmental destruction: 10% GDP (INGEI-SNCEYE, 1988-1999); 11.8% in 2003 and only 6% of redemption
- 12 years of free-market : only 3% of environmental costs were internalized (Villamar, 2002)
- 9.2 years of GDP of the country are required in order to mitigate environmental damages and irrational resource exploitation (INEGI, 1999)

igure 27 WOMEN'S SITUATION IN MEXICO

- Labor market: 2 millions of women work (5x more in 60 years) and 1.9 millions are responsible of a household (each third household)
- Work per week: 5-11 hours more than a man
- Analphabets: man 8.4%; women 12.7%
- Women in labor market show 1.3 years more of education, work 118% more than men and receive 10.14 pesos (75.3%) compared with 13.46 pesos given to men.
- 85.3% of women and children suffer from intrafamilia violence, in families where a man is the chief and 14.7%, when a women is in front of a household.
- Work hours of women: 74.9% household; 18.3%

TERRITORIAL REGULATIONS IN MEXICO FOR THE XXI CENTURY

- General Law of Human Communities
- General Law of Population
- General Law of Planning
- General Law of Environmental Development and Protection
- General Law of Information, Statistics y Geography
- General Law of National Waters
- General Law of Ways of Communication
- Federal Law of Housing
- Forestry Law
- Law of Wildlife

Territorial, socioeconomic-cultural and environmental integral regulations

Regional development, sustainable, prospective, environmental diverse, with equity and care about the vulnerables

Socio-political management

- Regional
- Social
- Economic
- Environmental
- Legal
- Population
- Cultural
- Urban
- Rural
- Housing
- Communications
- Science and technology
- Participative democracy

Physical and Natural Space

Resources

Commodities: water, air, land,subsoil, energetic, flora, fauna,food

Services: Photosynthesis, Biomass, Cycle of Carbon and Sulfur, Biologic Redemption

Informática: Genes, Proteins

Risks and Dangers

Foods, drought

Pollution

Land slice

Volcanic eruption

Frost, Hailstorm, Water Ice

Global warming

Desertification

Earthquake

Natural Ecosystems

Rate of Conservation

Capacity of Resiliency

Diversity of Resources

Rate of Sustainable Management of Natural Resources

Environmental Services

Rate of Waste and Wastewater Recycling

Progress in Environmental Culture

Urban Ecosystems

Degree of Urbanization

Rate of Marginalization and Violence

Brut Rate of Economic Activities

Coefficient of Economic Dependency

Density of Paved Roads

Food and Resource Dependency

Degree of Pollution

Rate of Dignified Employment and Social Security

Rural Ecosystems

Rate of Marginality

Rate of Technology in Agriculture

Regional Integration

Food Sovereignty

Sustainable Integrated Agriculture

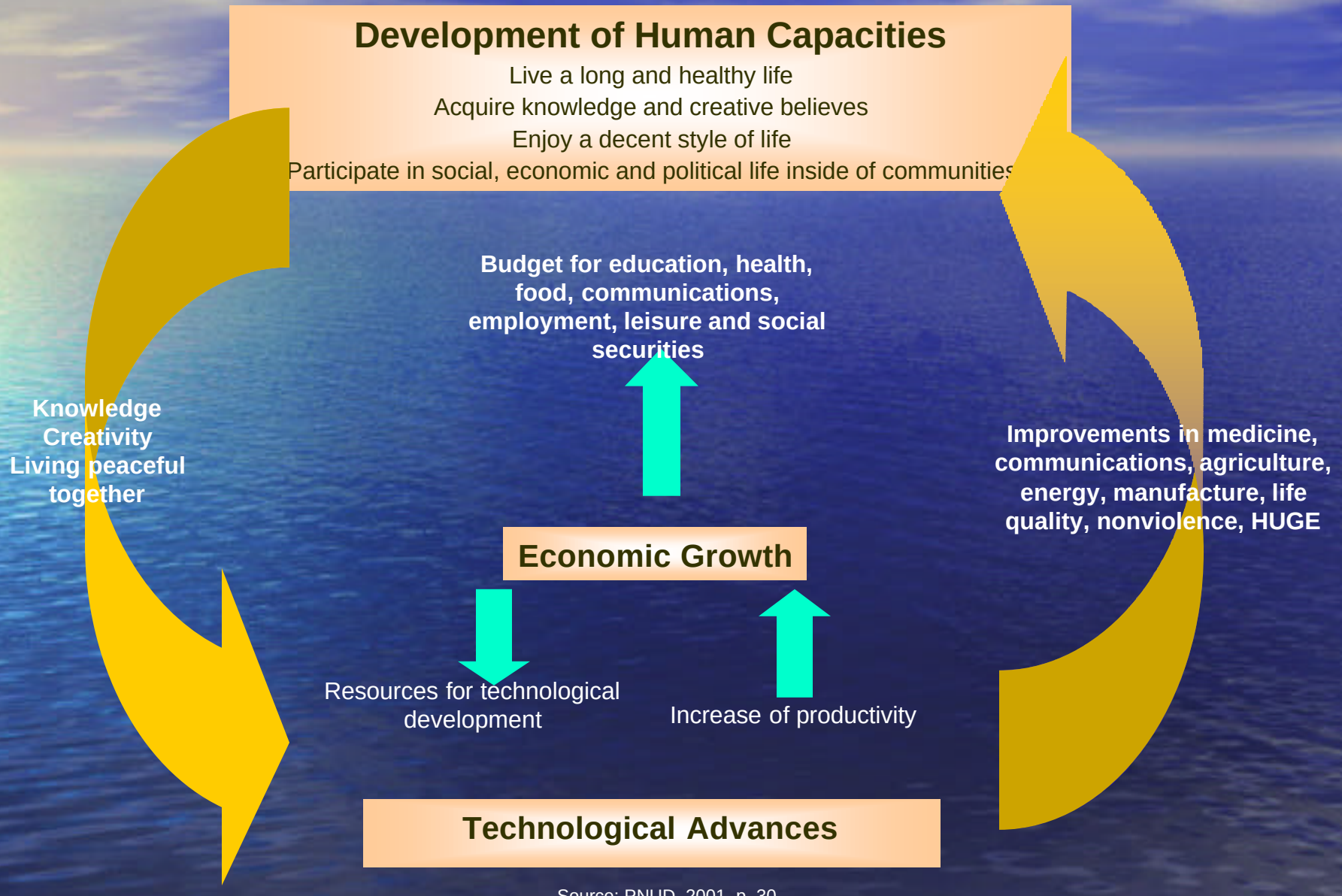
Holistic Management of Environmental Services

Rate of Rururbanization

CRITERIAS FOR A NEW CULTURE OF WATER

- Environmental
- Social
- Regional
- Cultural
- Legal
- Humanized and nonviolent living together with nature and other human beings

RELATIONS BETWEEN TECHNOLOGY AND HUMAN DEVELOPMENT



Source: PNUD, 2001, p. 30

SUSTAINABLE ALTERNATIVES OF WATER MANAGEMENT AT LOCAL LEVEL:

- Decentralization of water and wastewater services through a concession systems to municipal, social or private organizations, but regulated by local laws
- Decentralization of functions for operation and control of water and sewage systems to organized and trained citizens
- Training of local technicians for administrating water and sewage systems at municipal level
- Training of public functionaries and honest professionals for local management of water and sewage systems, including sensibility for public demands, conciliation processes and honest administration of public funds.

ALTERNATIVES: Water *Saving*

- Repair damages in tubes and system, and optimize use of drinking water; avoid excess in creation of infrastructure and imported, expensive technology with difficult repairing
- Little sewage plants reduce costs of collectors and avoid pollution during the transportation of sewage water
- Separation *in situ* of grey and sewage water, treatment at home and recycling in sanitary system and gardens gives optimum water management results
- Periodical maintenance of the local and regional systems
- Mexican technology has a good level and reach norms: NOM
- Water saving disposals reduce sewage water
- Recollection of raining water and building of ferro-cement cistern for conservation increase local water supply
- Holistic management of water is necessary together with a new water culture of reduce-recycle and reuse the water.

FINANCING

- Integral budgeting, including drinking water and sewage systems: avoids water born illnesses, dead, loss of labor hours, and creates healthy population
- Priorities in investments to improve life quality for marginal, instead of external and internal debt payment: water is a basic human right
- Reduction of private subsidies for banks and enterprises (FOBAPROA/IBAP); savings in public administration; honest governmental administration increase budget for public investments in basic services.
- Decentralization and citizen's watching reduces corruption in public services and buildings and reorient the investment to the popular necesities.

Financial Alternatives

- Establishment of public-private associations for creating and maintaining infrastructure of drinking water, sewage, conservation and recycling of water (in the Morelos state i.e. CECOMOC and not World Bank's Private Public Partnerships).
- Collaboration with universities and research centers to create adapted technology in a cheaper way, but fully award of norms and water quality requirements.
- Guarantee to dispose of spare parts at cheap prices for immediate reparations
- Campaign to save water and to do investments for green water management in each house

DEMOCRATIZATION OF WATER MANAGEMENT

- Diagnostics together with citizens
- Establishment of social priorities for communities
- Sustainable management of the resource
- Rational investment with further possibilities of amplification
- Water saving techniques
- Sewage *in situ*
- Decentralization of water management controlled by a law and citizens

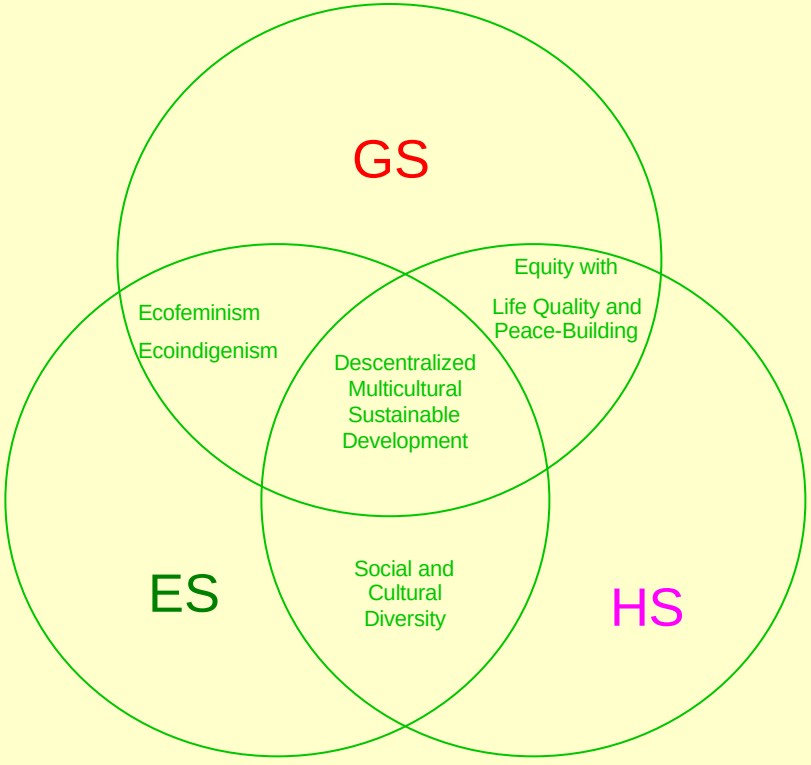
ALTERNATIVES: WOMEN MAIN GUARDIANS OF SUSTAINABILITY AND SOLIDARITY ECONOMOMY

- Socialization of values at home
- Guardians of local knowledge
- Users of tradition medicine and health practices
- Planner of survival strategies
- Care about biodiversity
- Reminder of cultural memory, traditional believes and transmitter of myths

System of Sustainable Cultures of Peace

UGE: HUMAN, GENDER AND
NVIRONMENTAL SECURITY
S – Gender Security

S – Environmental Security
S – Human Security



Multiculturalism
Self-Organized Dissipate System
Technological Diversity
Joy of Creative Efforts
Agathos & Kalos
Local Self-Sufficiency

Civilizatorian Processes
Multiplicity
Relationess
Ethics of Care
Plurality
Politically Transversal

Democratic Practices from Below
Bio-Socio Cultural Colaboration
Protection of Vulnerables
Permanent Evaluation
Regional Peacebuilding
Sustainable Food Sovereignty