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Food Security and Sustainable Development

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UN Brundtland Commission: “Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” (1987: 5).

Outcome 6 decades of development; 3 decades of sustainable development:

- 1 billion of the world’s population live in a consumer society
- 5.4 billions are poor
- 1 billion with hunger (100 million people more in 2009), illness and lack of school education and future
- 1 billion without safe water
- 1.5 million children die/year due to water-born illnesses
- 2.4 billion without improved sanitation
- present financial crisis raised unemployment by 250 million
- disasters increased & affected more developing countries

50 Indicators of Sustainability

Theme	Sub-theme	Indicator
Atmosphere (9)	Climate change	Emissions of greenhouse gases
	Ozone layer depletion	Consumption of ozone-depleting substances
	Air quality	Ambient concentration of air pollutants in urban areas
Land (10)	Agriculture (14)	Arable and permanent crop land area
		Use of fertilizers
		Use of agricultural pesticides
	Forests (11)	Forest area as a percent of land area
		Wood harvesting intensity
	Desertification (12)	Land affected by desertification
	Urbanization (7)	Area of urban formal and informal settlements
Oceans, seas and coasts (17)	Coastal zone	Algae concentration in coastal waters
		Percent of total population living in coastal areas
Fresh water (18)	Fisheries	Annual catch by major species
	Water quantity	Annual withdrawal of ground and surface water as a percent of total available water
		Water quality
Biodiversity (15)	Ecosystem	Area of selected key ecosystems
		Protected area as a % of total area
	Species	Abundance of selected key species

Security an object of analysis

- **Security is an ambiguous and highly contested political and scientific concept.**
 - Security is a value, a goal and a legitimizer of policies
 - What are the reasons for the global reconceptualization?
- **Reconceptualization of security occurs due**
 - a) Peace and security: Charter of UNO after WW Two
 - b) End of Cold War: Change of international order
 - c) Globalization: Non-state actors & processes beyond sovereignty
- **Since 1994: major shift from state-centred inter(national) to human security** **Since 2000: Securitization of issues of global environmental change: environmental, climate, water, food, soil security**

Defining security as: term, concept, value, goal and means?

Scientific concept

- **A term: Security (lat.: *securus* and *se cura*)**
- Introduced: **Cicero & Lucretius** referring to a **philosophical & psychological state of mind**
- **Political concept: Pax Romana**
- ‘Security’ as a **political value** has no independent meaning; is related to **individual/societal value systems**
- **UN Charter (1945): 2 referents:**
 - Preamble: “we the peoples of UN”
 - Art. 1: purpose: “maintain international peace and security”.
 - Human vs. international security
- **Social science:** *security* is ambiguous and elastic in its meaning (Art 1993)
- Refers to frameworks, dimensions, issue areas, societal conventions, changing historical conditions and circumstances

Political concept

- **Tool to legitimate** public funding for an accepted purpose: safety, protection (military and police)
- **Political acceptability** (support) **gaining and regaining power**

What is security?

- Arnold Wolfers (1962), realist pointed to two sides of 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 constructivists: “Reality is socially constructed” and is **intersubjective**.

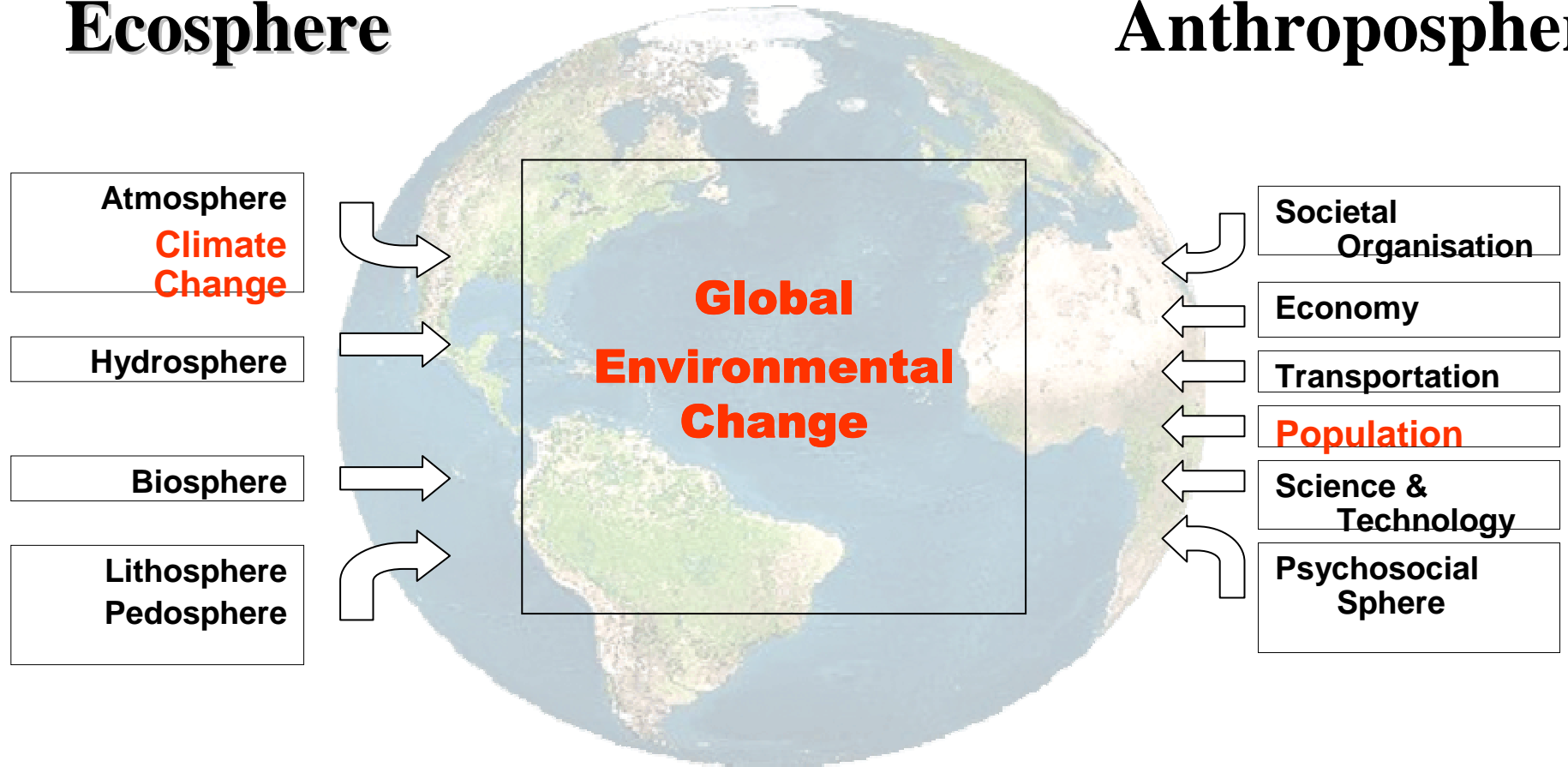
Widening and deepening security concepts

Determination Which security?	Reference object: Security of whom?	Value at risk: Security of what?	Source(s) of threat: Security from whom or what?
National security	The State	Territorial integrity	State, substate actors
Human security	Individual, humankind	Survival of humankind people	Nature, state, globalization
Environmental security	Ecosystems, rural and urban systems, water and food	Sustainability	Humankind, Nature
Gender security	Gender relations, indigenous people, minorities	Equity, identity, social relations, solidarity, tolerance	Patriarchy, totalitarian institutions (élites, governments, religious fundamentalism, dominant cultures), intolerance

Global Environmental Change (GEC)

Ecosphere

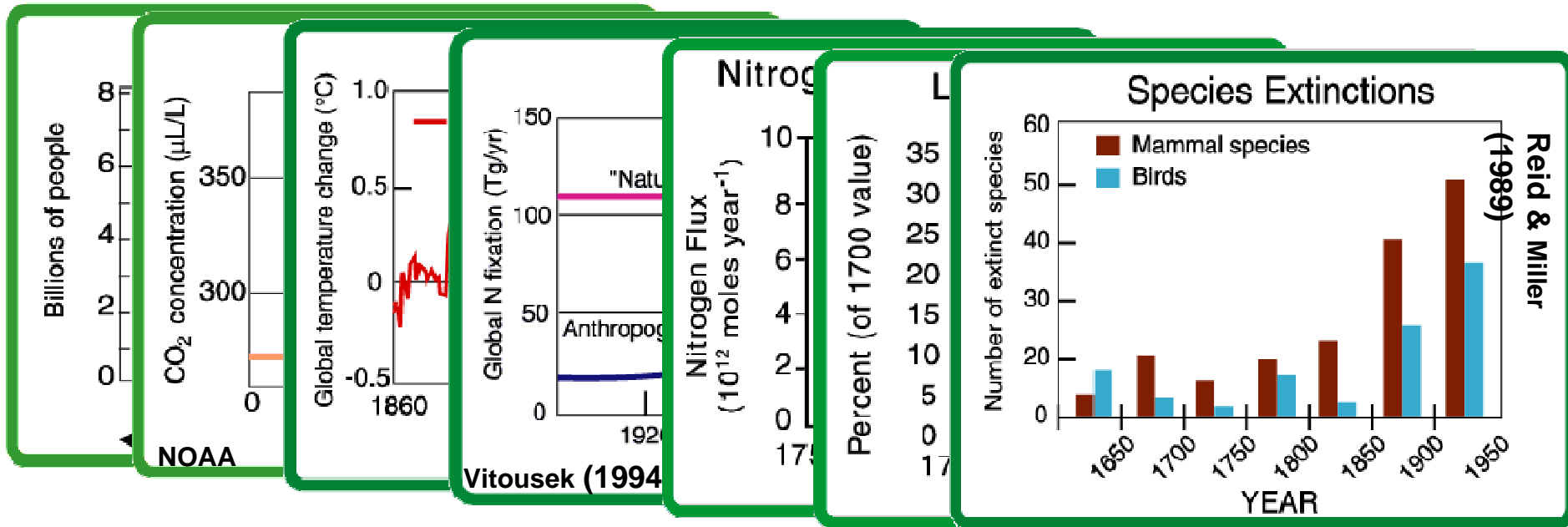
Anthroposphere



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

What is Global Environmental Change:GEC

- GEC is more than climate change
- Includes the natural **plus** the human components
- Represents a constellation and interaction of multiple domains:





World food situation

Some definitions on food security

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.

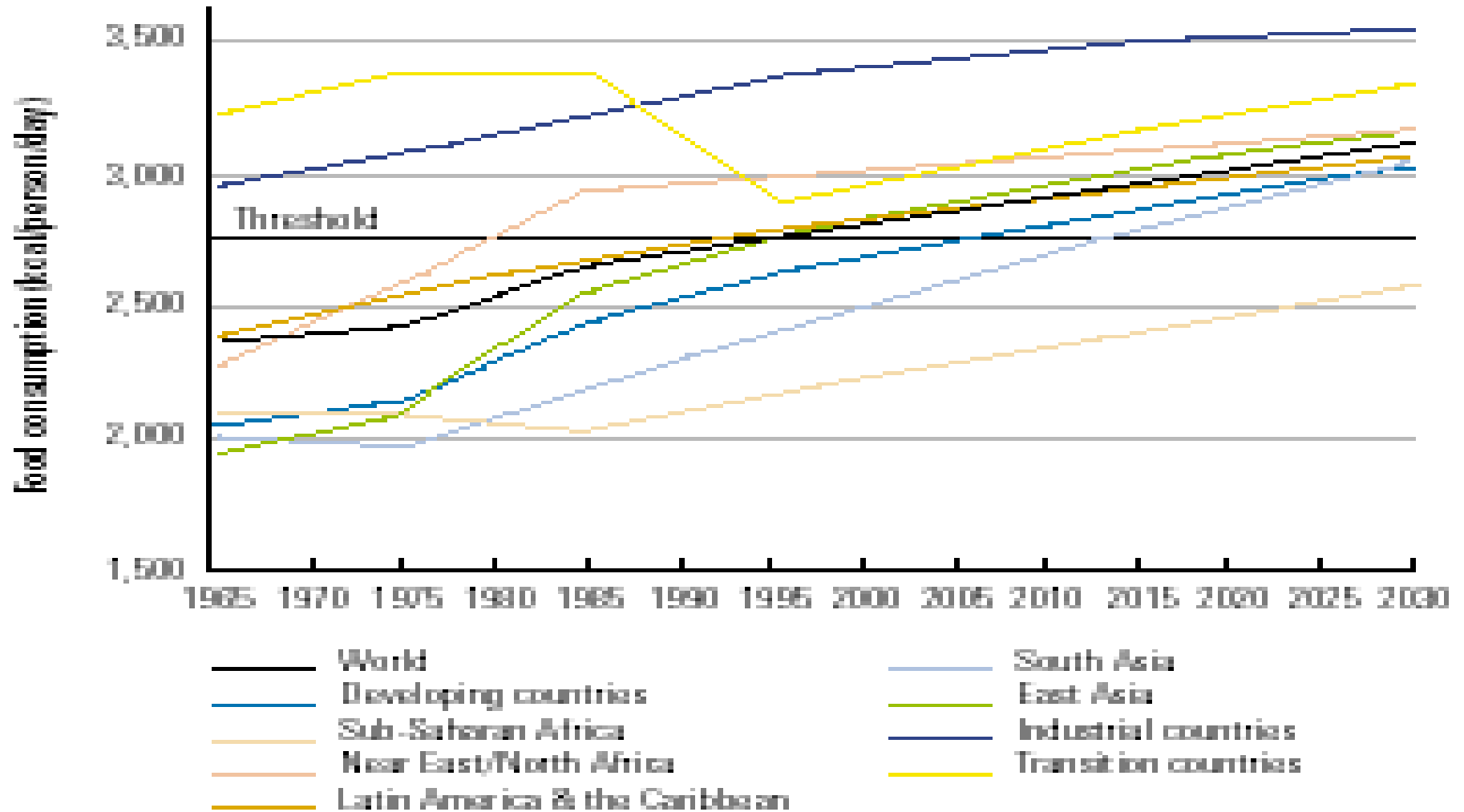
Household food security is the application of this concept to the family level, with individuals within households as the focus of concern.

Vulnerable people are greatly exposed to famine (FAO, 2003)

***Via Campesina's* food sovereignty**

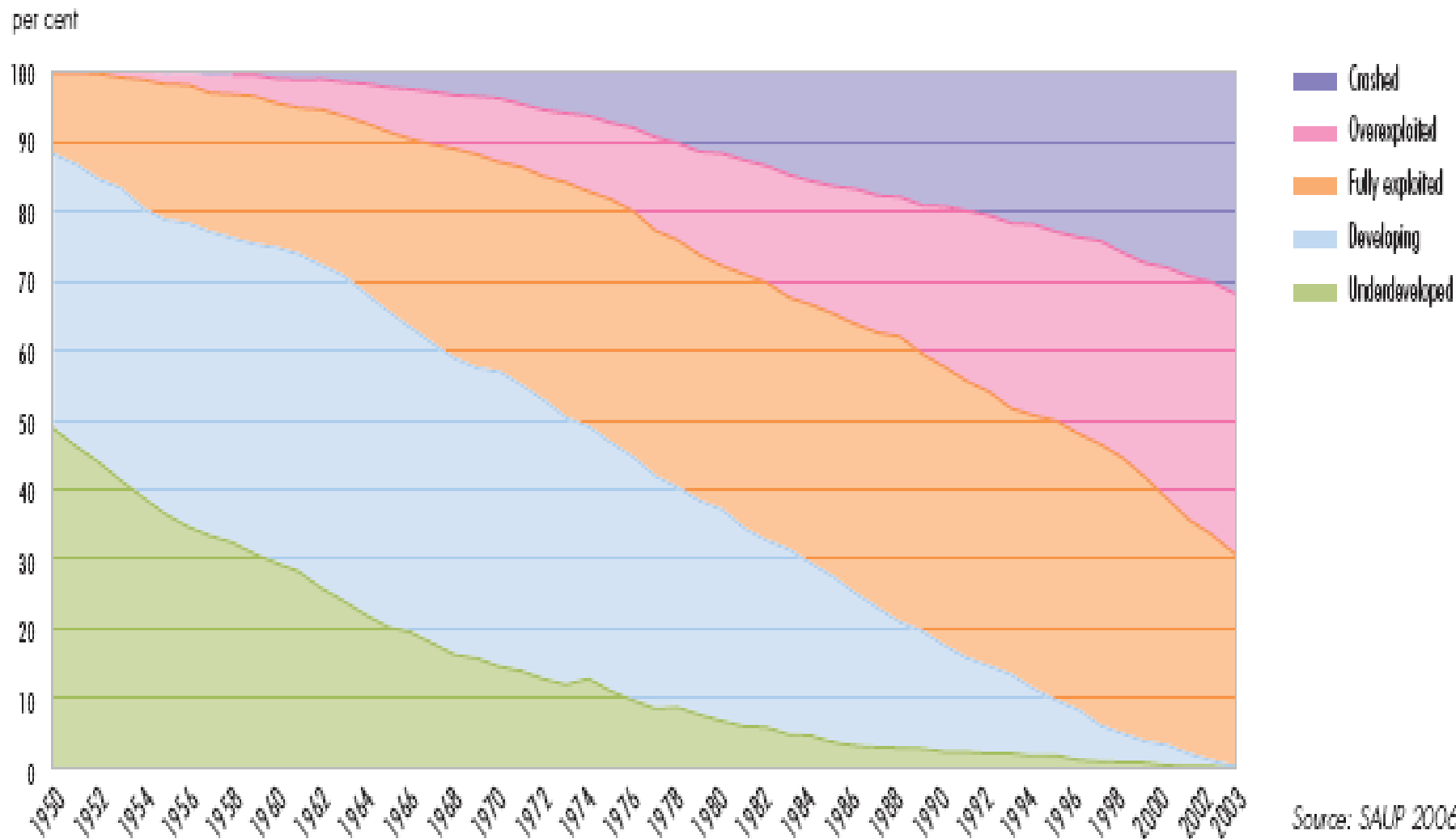
“Food sovereignty is the right of people, communities, and countries to define their own agricultural, pastoral, labour, fishing, food and land policies which are ecologically, socially, economically, and culturally appropriate to their unique circumstances. It includes the right to food and to produce food, which means that all people have the right to safe, nutritious and culturally appropriate food and to food-producing resources and the ability to sustain themselves and their societies” (2004).

Evolution of food situation in the world

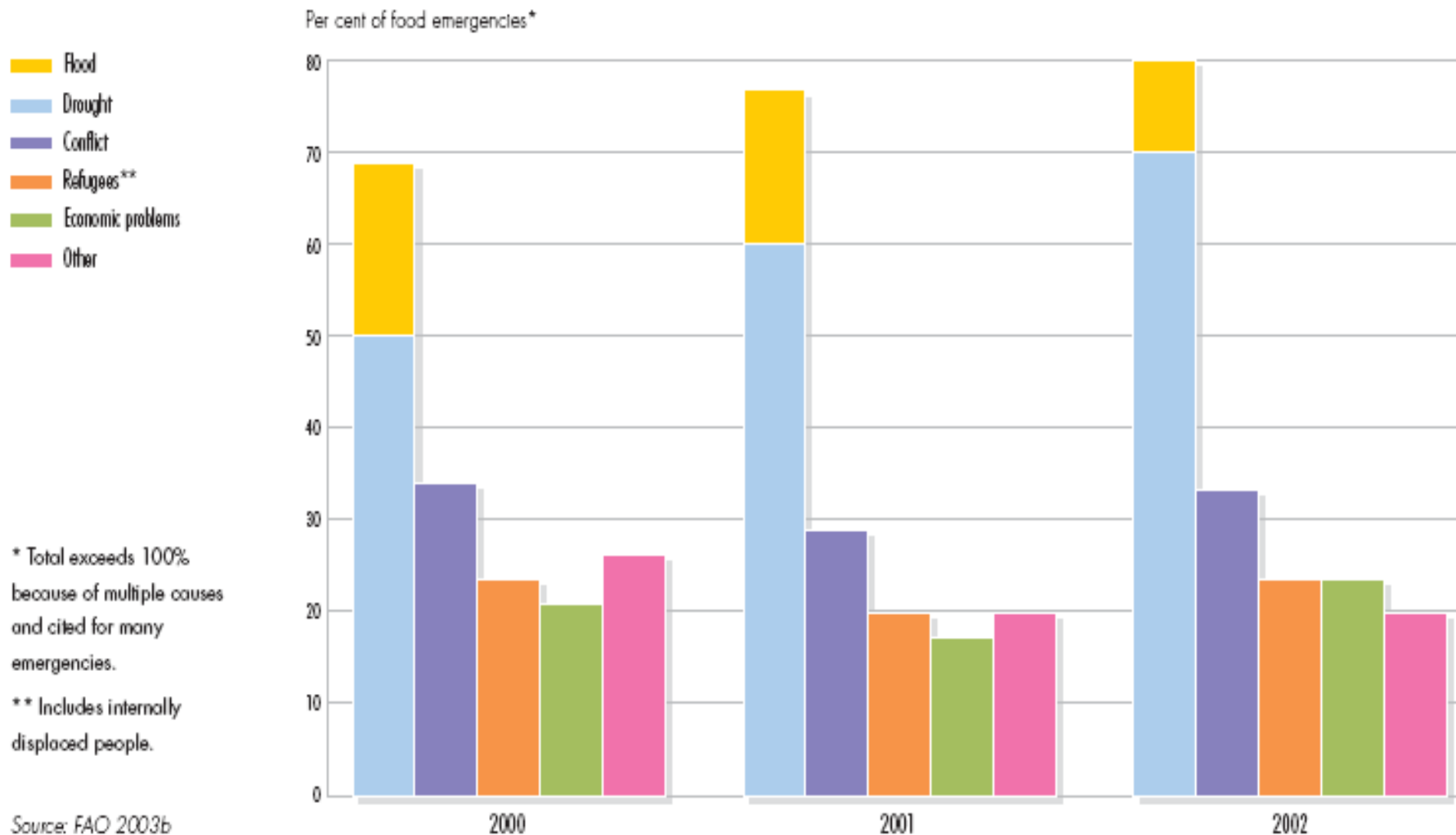


Exploitation of marine fish stocks

Figure 4.13 Exploitation status of marine fish stocks



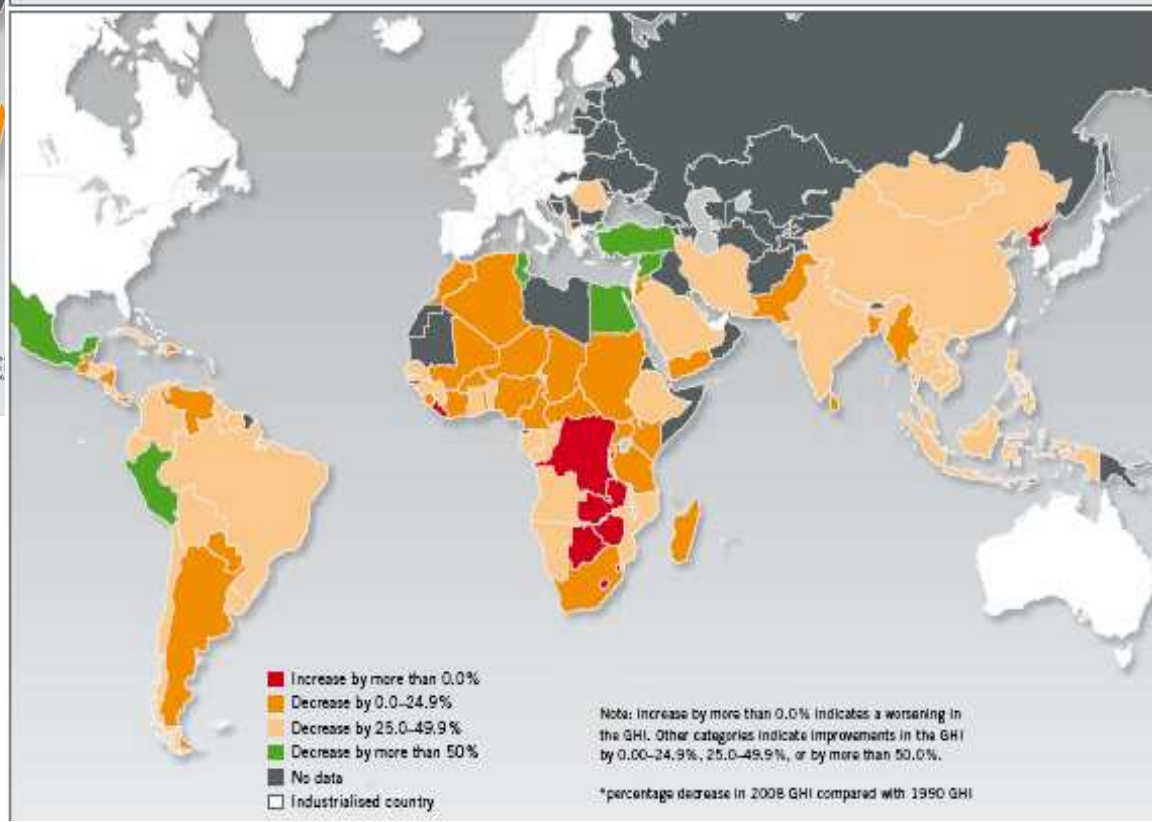
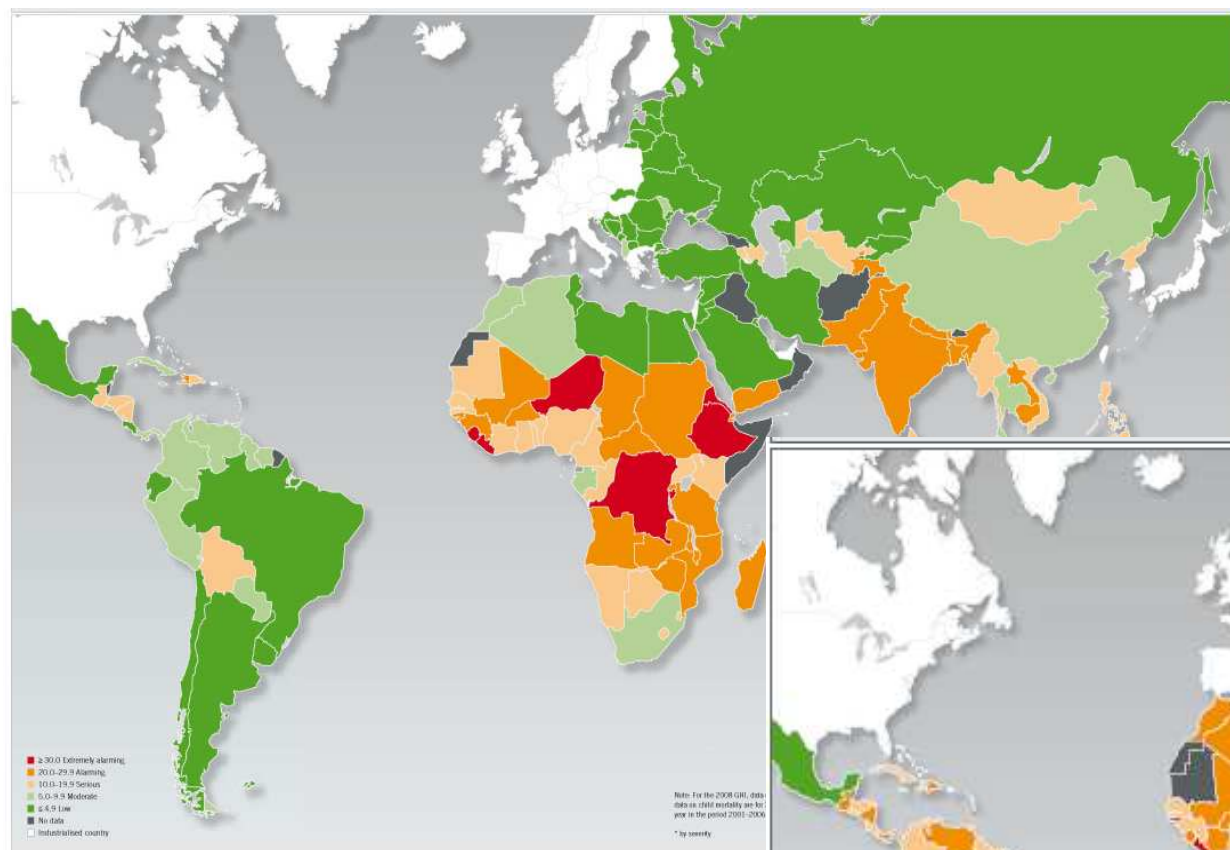
Causes of food emergency



Global Hunger Index 1990 & 2008

← 2008 Global Hunger Index.

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

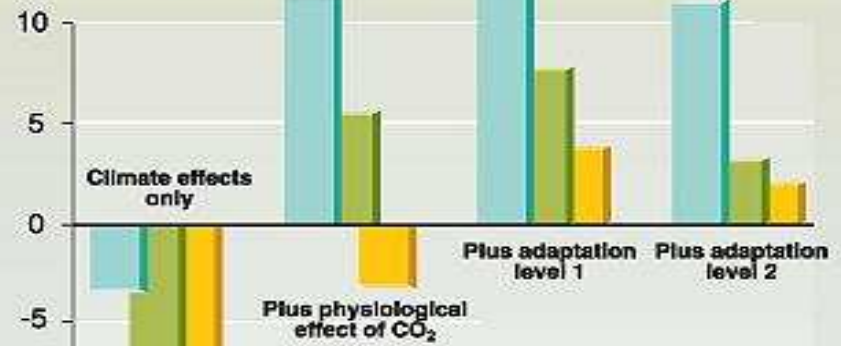


Source: IFPRI, 2008

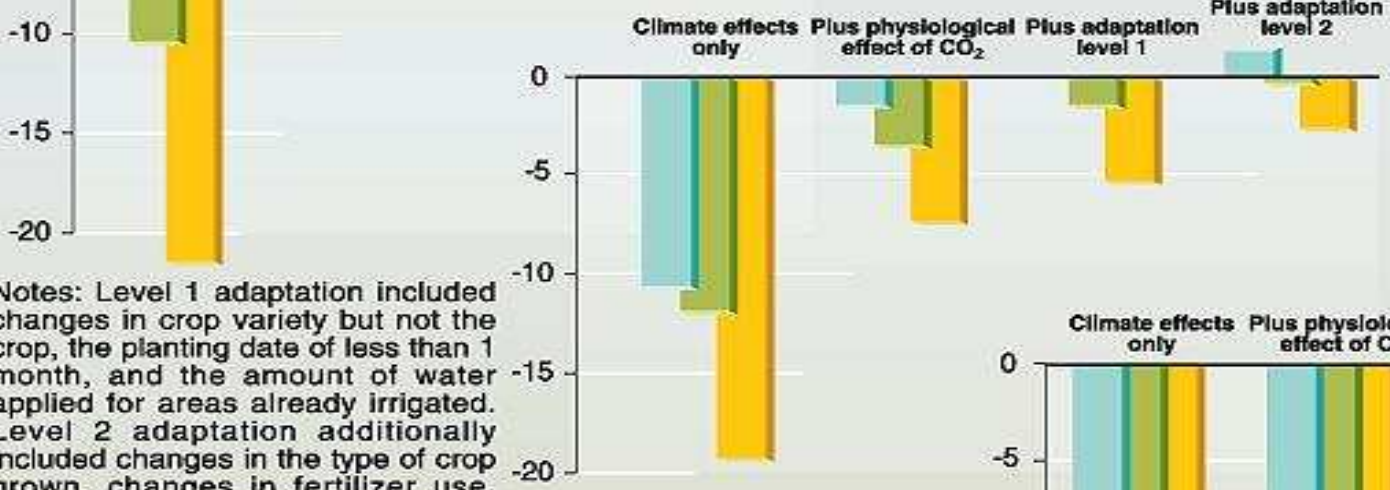
Change in cereal production under three different GCM equilibrium scenarios in percent from base estimated in 2060

■ GISS scenario
■ GFDL scenario
■ UKMO scenario

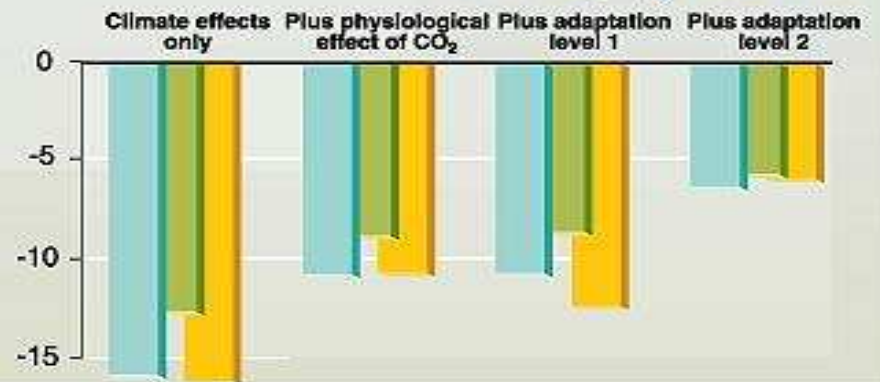
Developed countries



World total



Developing countries



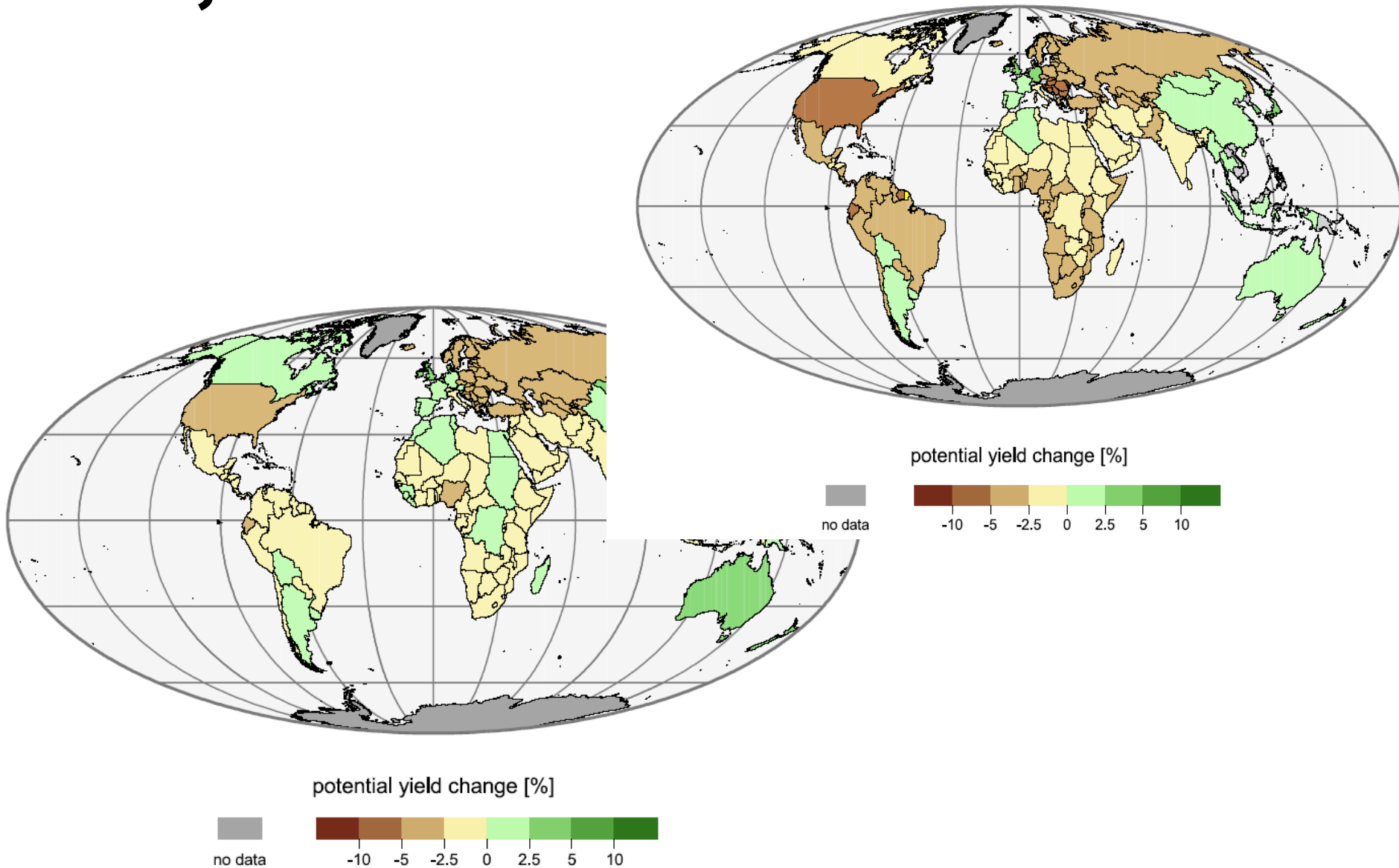
Notes: Level 1 adaptation included changes in crop variety but not the crop, the planting date of less than 1 month, and the amount of water applied for areas already irrigated. Level 2 adaptation additionally included changes in the type of crop grown, changes in fertilizer use, changes in the planting of more than 1 month, and extension of irrigation to previously unirrigated areas.



GRAPHIC DESIGN - PHILIPPE REKACIEWICZ

Food Scenarios: 2020, 2040-2069

Food security 2040 - 2069 (HADCM3 GGA1)



Complex interaction: soil, fertility and vegetation

+ Temperature of soil

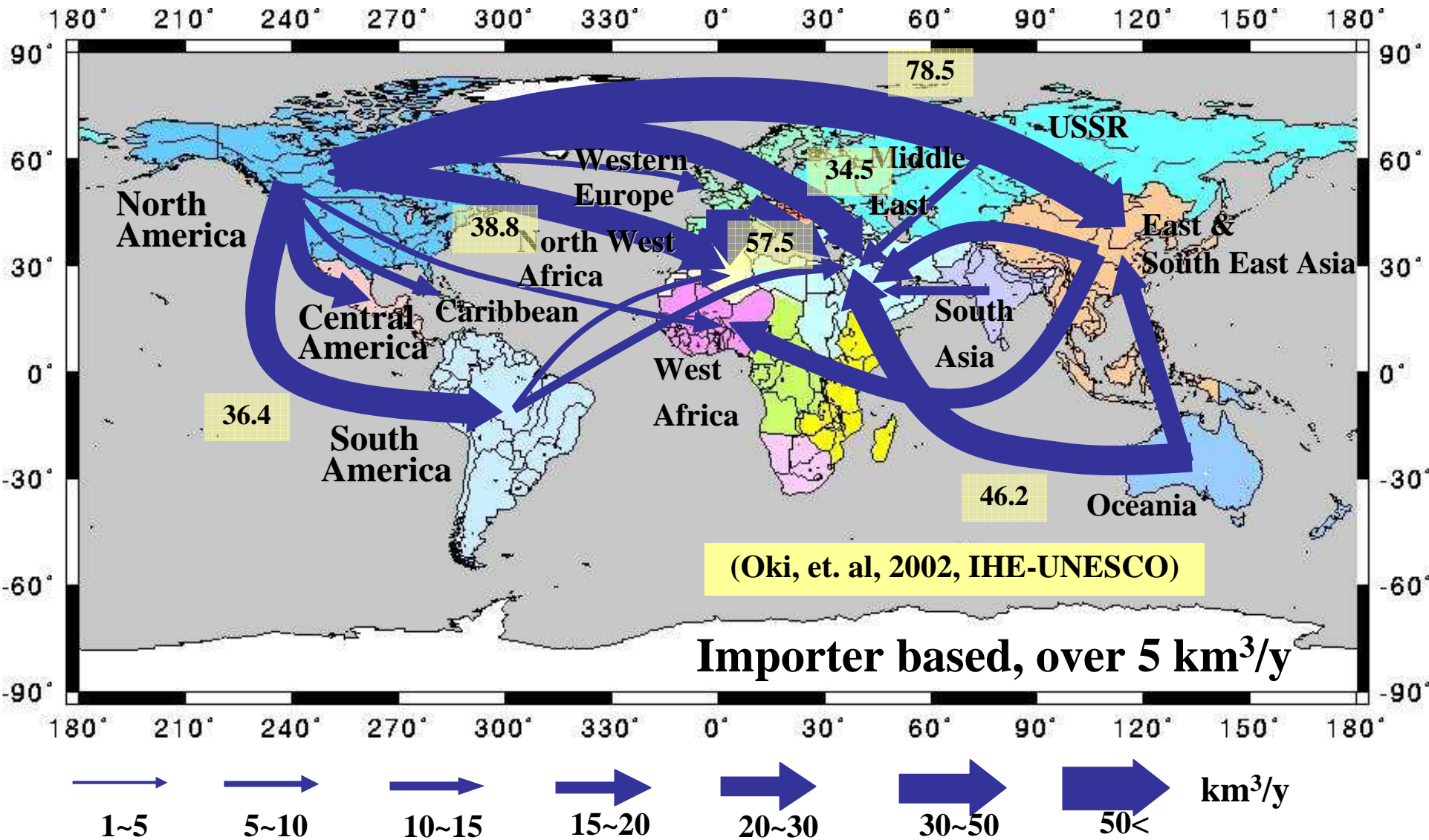
+ Descomposition of loss of OM
+ CO₂ emissions

+ Loss of OM due to erosion



- Recarche of water
- Soil fertility
- Productivity

Food and virtual water in 2000 (only grains)



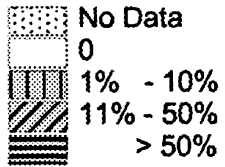
(Oki, et. al, 2002, IHE-UNESCO)

Importer based, over 5 km³/y

(Based on Statistics from FAO etc., for 2000)

Food Insecurity Scenario

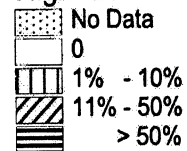
% of Years with High Risk



GLASS 0.5, Budapest Scenario:
 a) GDP and climate 1984
 b) GDP and climate 1901-1995
 19.1.1999, me, Budapest.apr

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

% of Years with High Risk



GLASS 0.5, Budapest Scenario: GDP; 2001-2050 and
 a) historical climate (1901-1950)
 b) baseline A climate with historical variability (1901-1950)
 19.1.1999, me, Budapest.apr

Source: Alcamo, 2002

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

Social, human, gender and food insecurity: a problem of equity

- Drought, Land Degradation and Desertification (DLDD) covers one third of the world land surface and affects around 485 million people; 46% in Africa with 43% of desert.
- In Africa the productivity loss/year is estimated in 0.5-1%
- DLDD poses multiple global, regional and national security issues: food, water, climate, livelihood, health, urban, rural and transportation security.
- DLDD induces large-scale forced migration movements, hunger riots and emerging conflicts on scarce resources.
- One billion of people suffer from hunger and food price rise provoked 65 million more hungry people. MDG can not be reached and affects above all rural and urban poor.

**Threats to food sovereignty:
three models of food production**

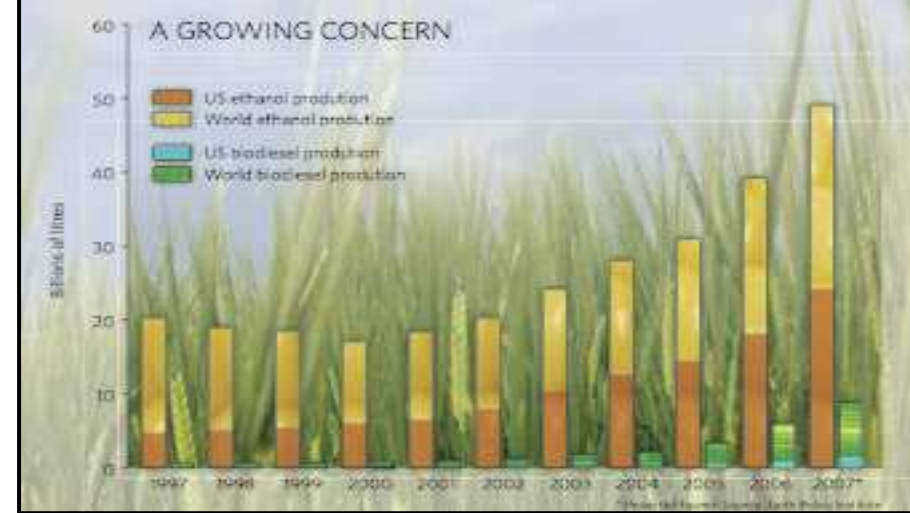


Productivity paradigm

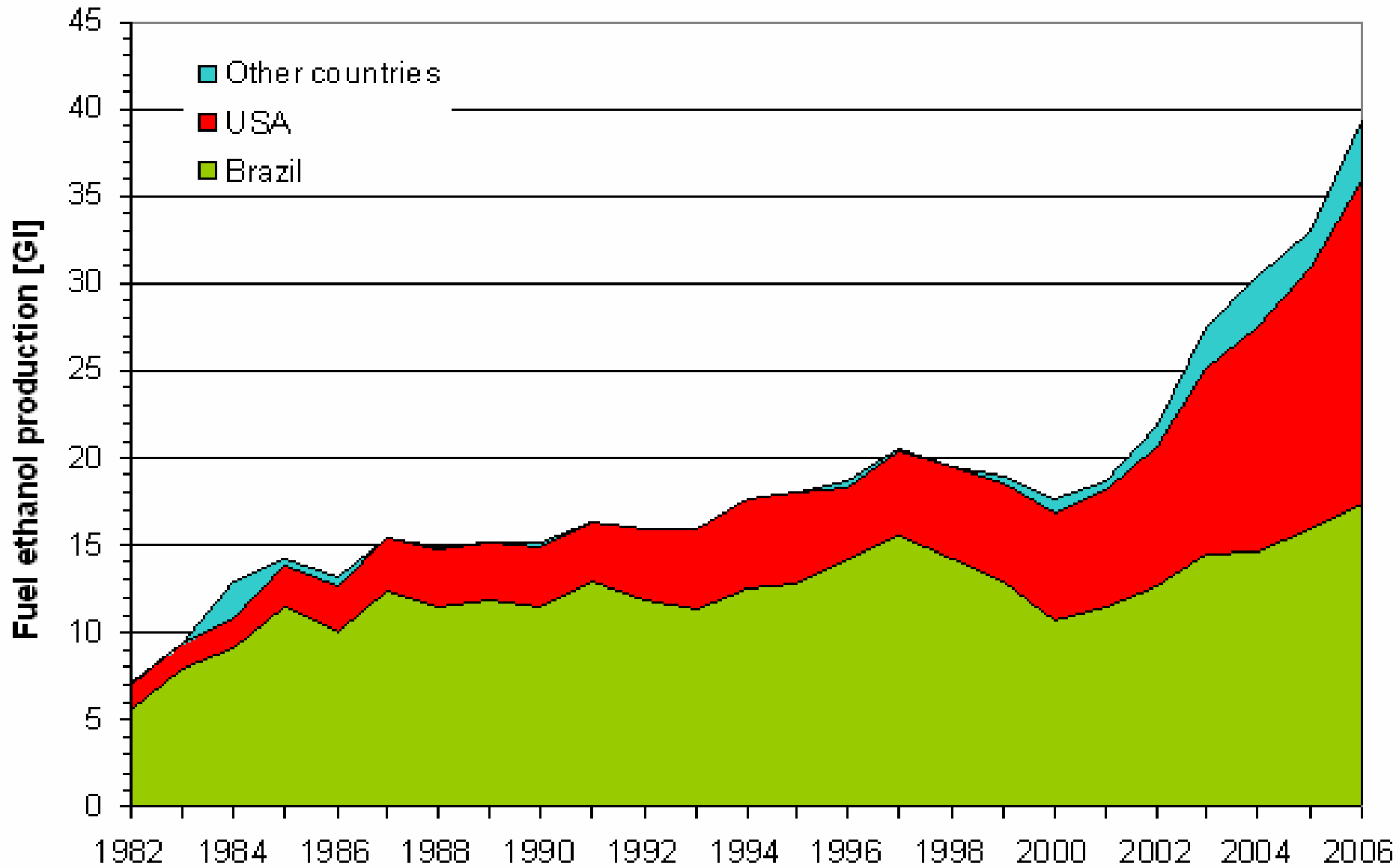
- **Green revolution with intensive use of chemicals, veterinarian drugs, improved seeds, machines, fossil energy, and irrigation systems;**
- **industrialization of agriculture.**
- **cheap and homogenous food for urban areas with government subsidies,**
- **Low food prices leaving poverty in the countryside.**
- **Production controlled by agronomists, veterinarians, and the chemical industry.**
- **Ministry of Agriculture managed natural resources: soils, water, forests, flora, fauna, and fish. Health and environment concerns were marginal.**
- **Limits of this model: negative effects on health, environment (scarcity in water and oil resources) and the destruction of rural livelihood.**

Hunger and bioenergy

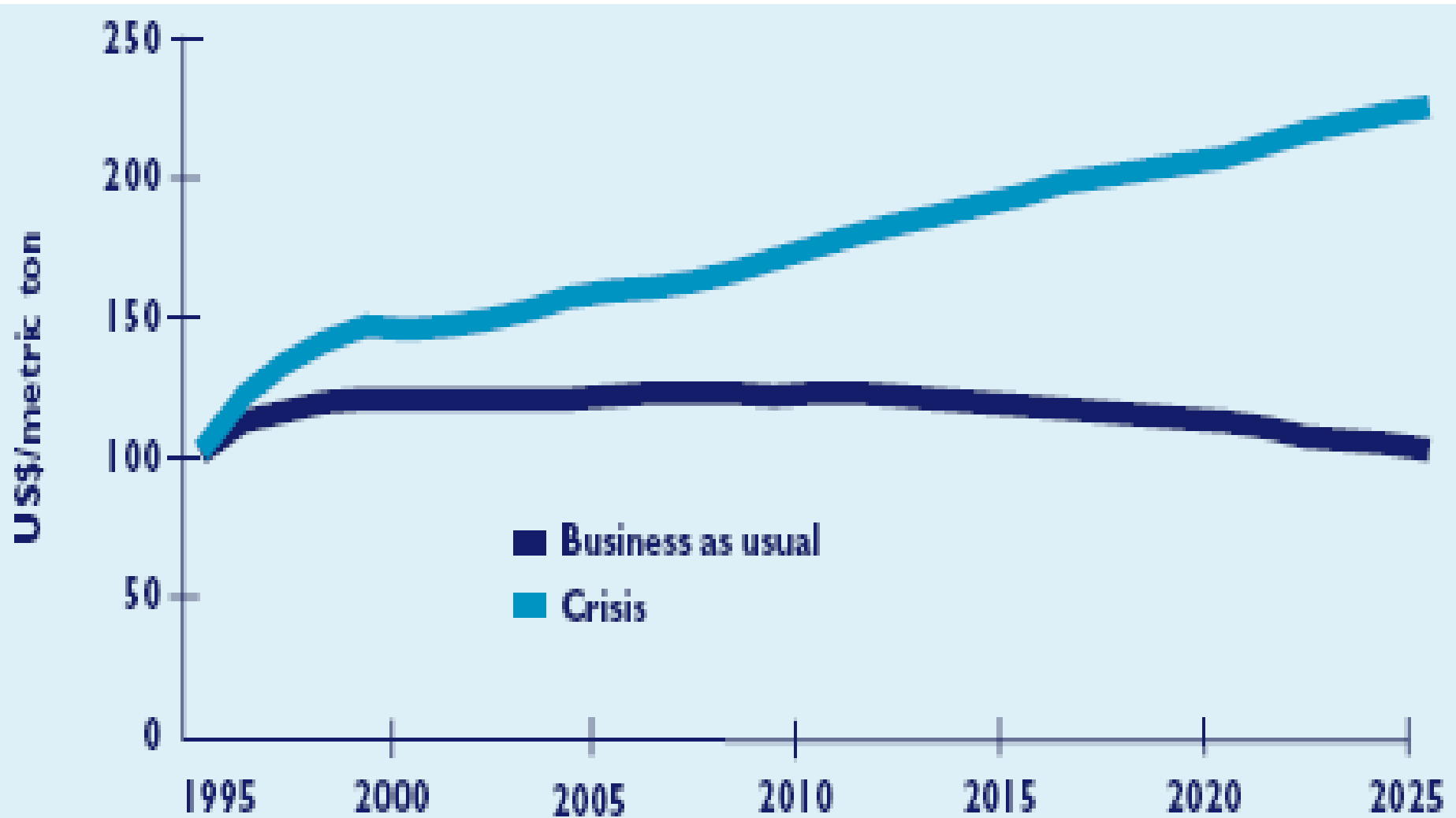
- Cultivation for bioenergy, electricity and heat
 - Crops (grains and agricultural waste)
 - Forest waste
 - Solid municipal waste
- Who produces? OCDE; Brazil
- Why?
 - Energy security
 - Climate change mitigation
 - Rural development
- Required characteristics
 - Native, perennial, rapid growth, resistance to illnesses, no competition to food, not invasive
 - Switchgrass (*Panicum virgatum*)
 - Alamo



Biofuels



International corn prices



source: Rosegrant, Mark W.; Cal, Ximing; Cline, Sarah A., 2002: 20

Food Price Speculation, November 2009

FAO Food Price Index



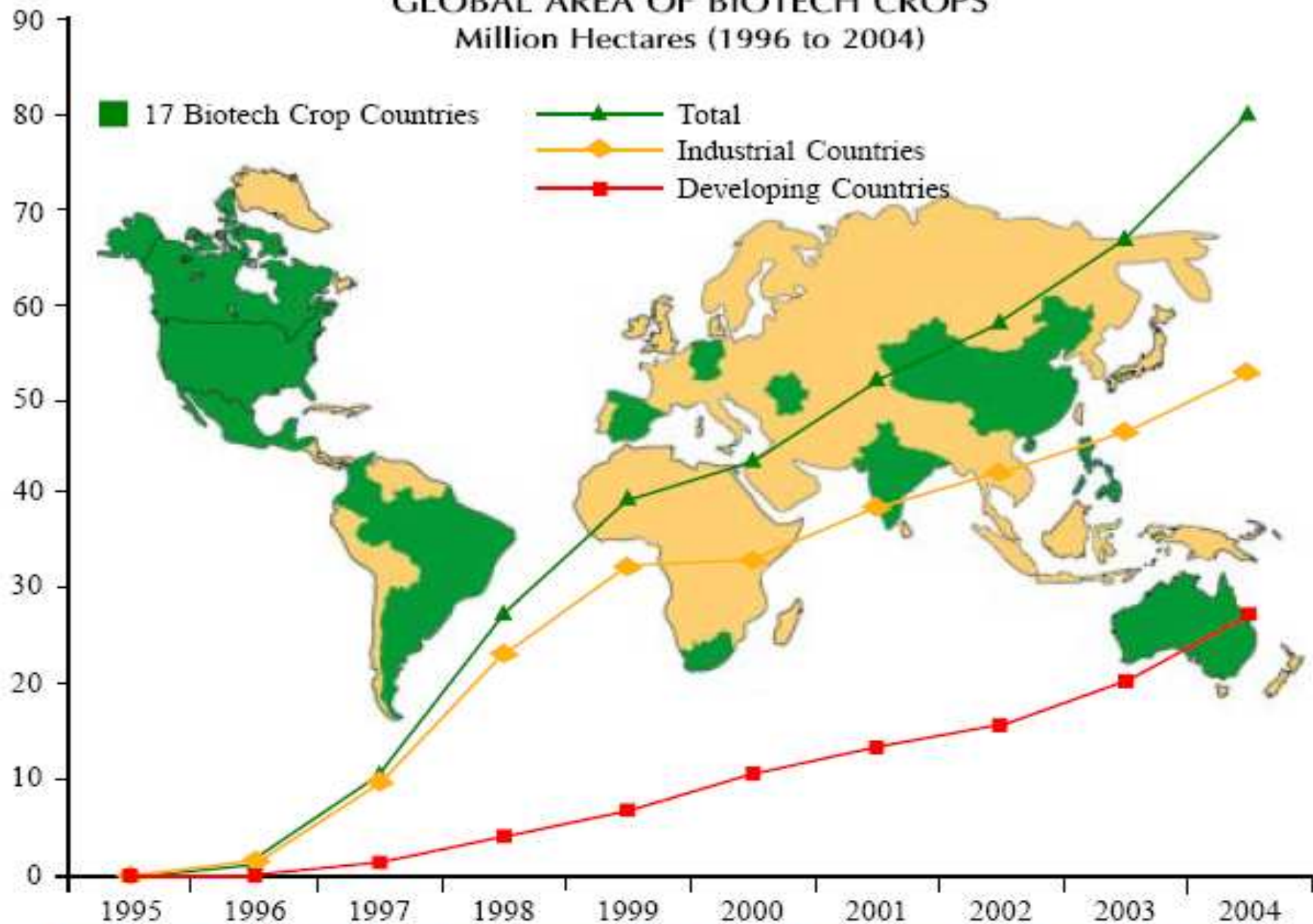
Food Commodity Price Indices



Life science paradigm

- *Life science model* integrates the food chain in form of clusters relating production, transformation & trade of food.
- Combines genetic research with field experiments, biotechnology, engineering, nutrition, pharmacology, health, and mobile field labs controlled by multinational food chains.
- Offers clean, safe, and homogenous products that can stay for weeks on the shelves of supermarkets, thanks to *genetically modified genes and organisms with some undesired social, health and environmental effects.*
- Cornucopian vision of life where MNE resolves environmental, social, and health problems through science and technology.
- Increases costs of production and food prices due to TRIPs, and created monopolies of agro-chemicals and food transformation.
- Food get transformed into medicine (Nestlé, 2002)

GLOBAL AREA OF BIOTECH CROPS Million Hectares (1996 to 2004)



Increase of 20%, 13.3 million hectares or 32.9 million acres between 2003 and 2004.

Source: Clive James, 2004

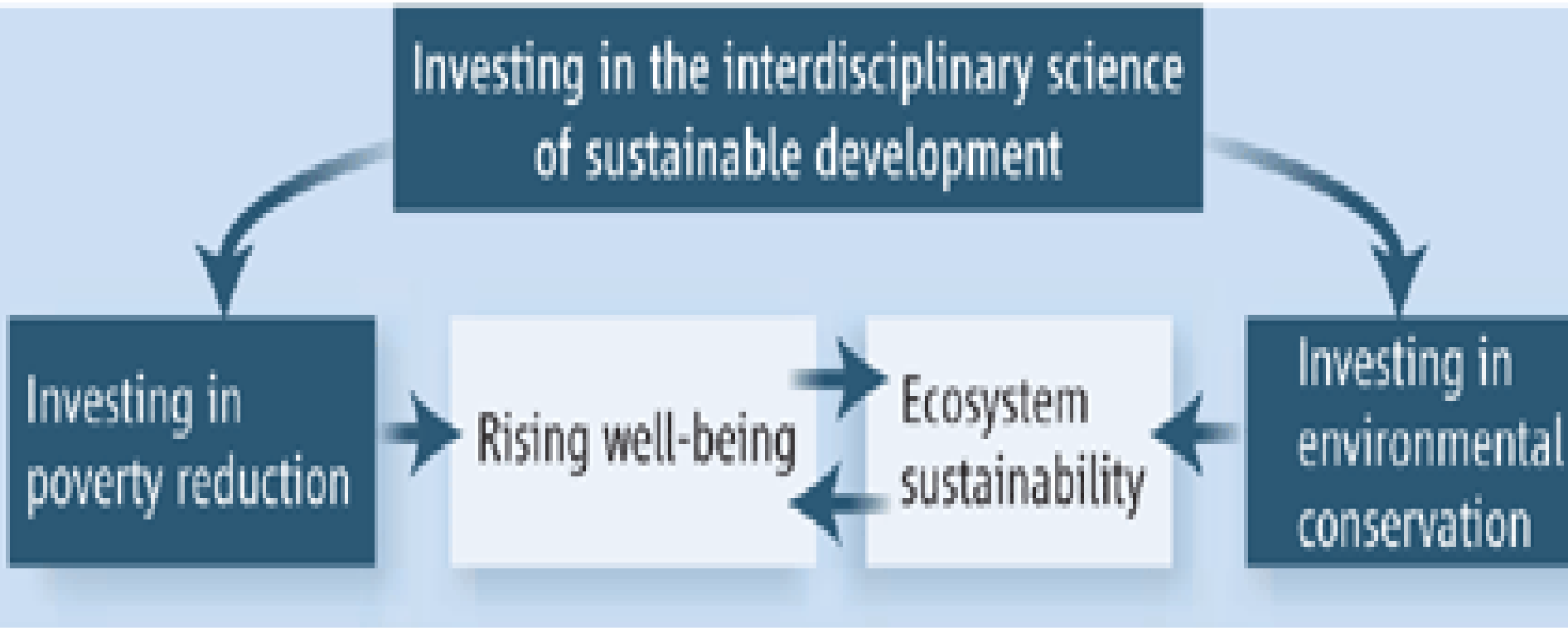
Green agriculture

- Green model generates symbiotic relations and mutual dependence between nature and food production, using soft methods of agriculture.
- Regionally diverse, utilizes polycultivation, association of crops, rotation, mixed agriculture, bio-fertilizers, fixation of nitrogen from air to soil, bio-pesticides, traditional methods of soil conservation and food, inte-gral management of water, plagues, and environmental services.
- Local agricultural production, transformation and trade, with access for peasants to water, seeds, credits
- Women as key producers for food issues, care about vulnerable and consolidate livelihood,
- When livelihood in villages and countries is guaranteed public resources for poverty and hunger alleviation can be reduced and reallocated for other development purposes, creating stable social relations synergies and cooperation.

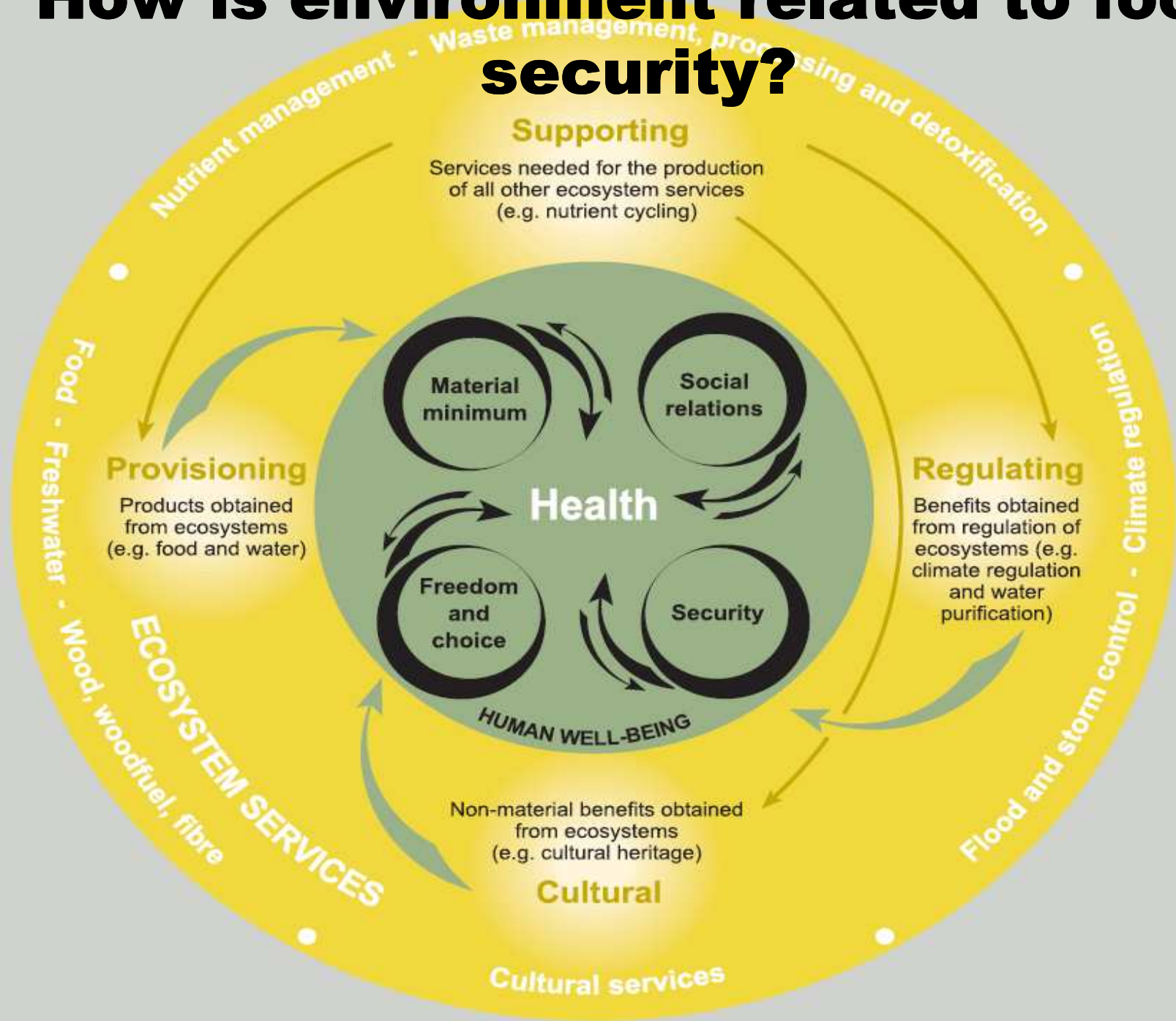
Alternative food integration with livelihood



Integral policy: poverty alleviation and environmental recovery



How is environment related to food security?



Women are key food producers

- Women are in all parts of the world responsible for food and food transformation
- In most countries of Sub-Saharan Africa women represent:
 - 33 % of the rural labour force;
 - 70 % of paid rural daily work;
 - 60-80 % of self-subsistence crops and local sale;
 - 100 % of food transformation;
 - 80% of harvest, transportation from the fields to the community and food storing;
 - 90% of weaving and hooking;
 - 60% of market activities (FAO, 2008)

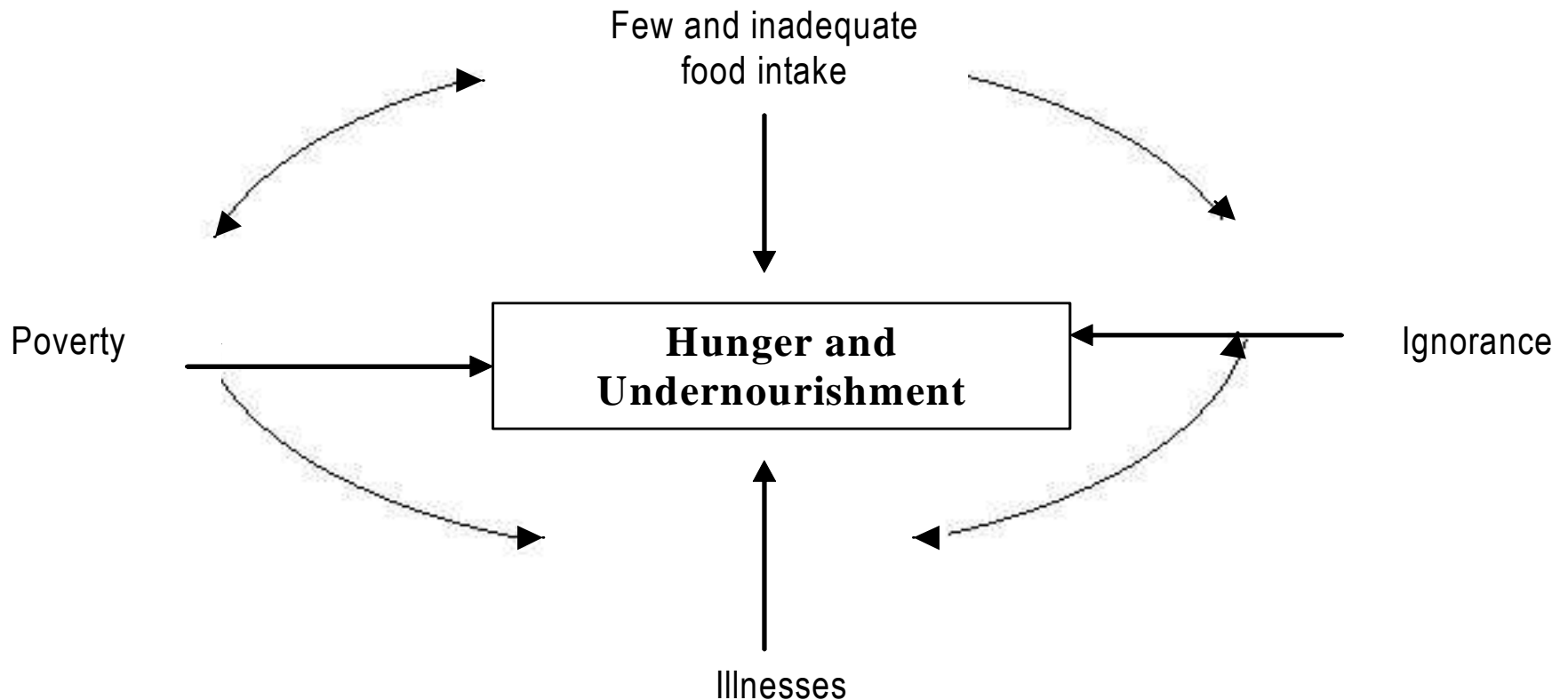


Survival Strategies



Survival strategies, micro business and local food sovereignty

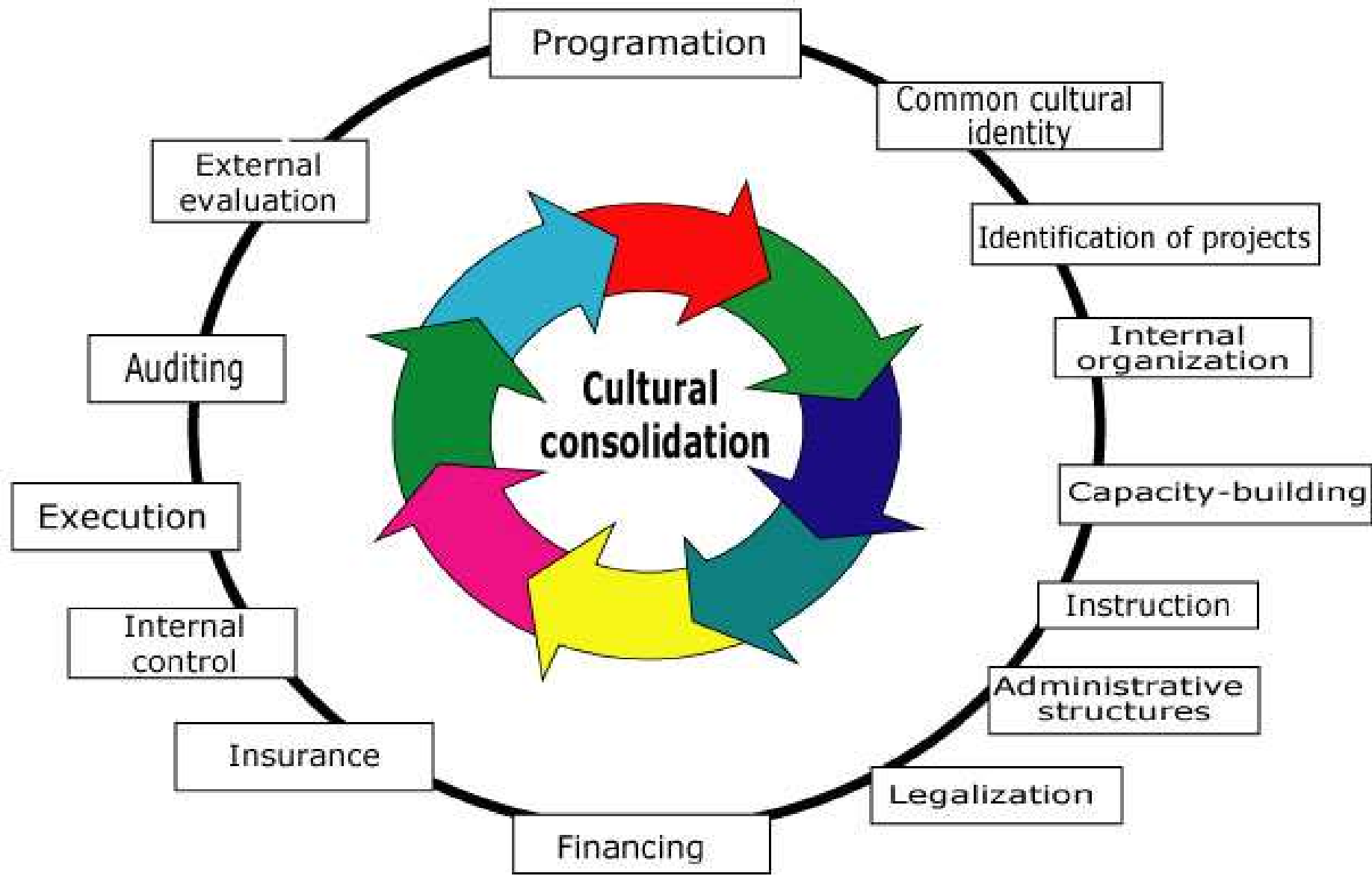
Vicious circle of hunger, undernourishment, poverty, and ignorance. **Source:** Chávez/Ávila/Shamah (2007: 208).



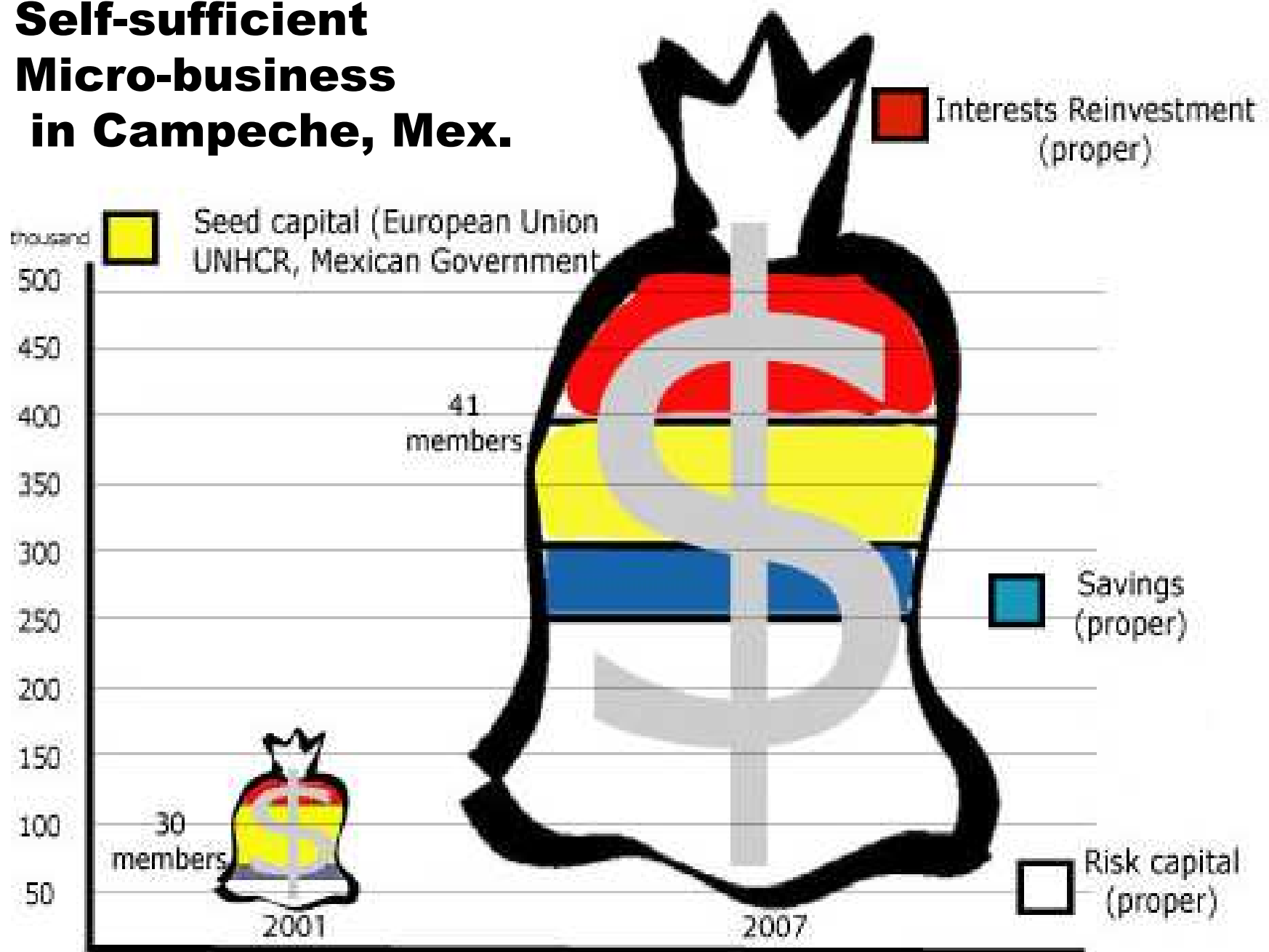
Survival Strategies (Oswald, 1991, 2007)

1. Massive rural migration to urban slums
2. Illegal occupation of marginal and risky land
3. Construction of shelter with precarious materials (waste)
4. Chronic unemployment of men and lack of cash
5. Selling unnecessary goods
6. Credits from family members and neighbors
7. Economic crises increases and lack of food
8. Recollection of perished fruits and vegetables
9. Collective popular kitchen
10. Rotation of women in collective community work (kitchen, child rearing)
11. Common struggle for basic services (electricity, water, access, community center)
12. Communal organization for regularization of land and services
13. Struggle for public subsidies and poverty alleviation programs
14. Temporary paid work
15. Multiple activities: services, handicraft, food, washing, ironing, paid jobs
16. Social organization against organized crime and gangs
17. Empowerment and fight against intra-family violence
18. Social and economic consolidation of colony and families

Fig 1. Model of self-reliant entrepreneurship



Self-sufficient Micro-business in Campeche, Mex.



Transition to Alternative Livelihoods and Sustainable Economy

- **Decentralized governance: traditional knowledge from women, peasants, *grassroots* movements against desertification**
- **Consolidation of leadership (local clergymen, spiritual leaders, doctors, lawyers, schools, teachers) and training (old/young people, migrants)**
- **Off-farm jobs create financial resources to recover degraded land and feed people**
- **Concrete Action Programmes to prevent migration, crises and conflicts.**

**Thank you for
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