

Climate Change, Social Stress and Violent Conflict
State of the Art and Research Needs
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AND ENVIRONMENTAL SECURITY



Facing Global Environmental Change

Environmental, Human, Energy, Food,
Health and Water Security Concepts



Food Security and Sovereignty

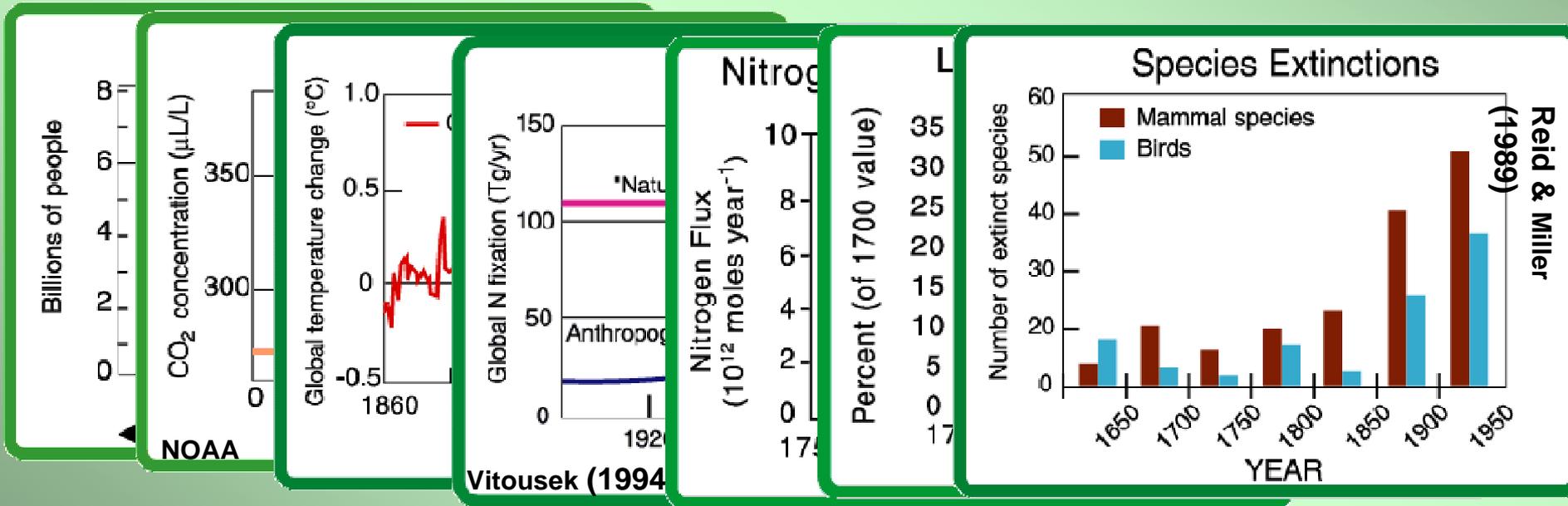
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Index

1. How is Global Environmental Change (GEC) related to food security?
2. Definitions on food security and food sovereignty
3. World food situation
4. Social and food insecurity: a problem of equity
5. Threats to food sovereignty: three models of food production
6. Conclusions: food sovereignty as resilience-building from top-down to bottom-up for improving human, gender and environmental (HUGE) security

1. How is Global Environmental Change related to Food Security?

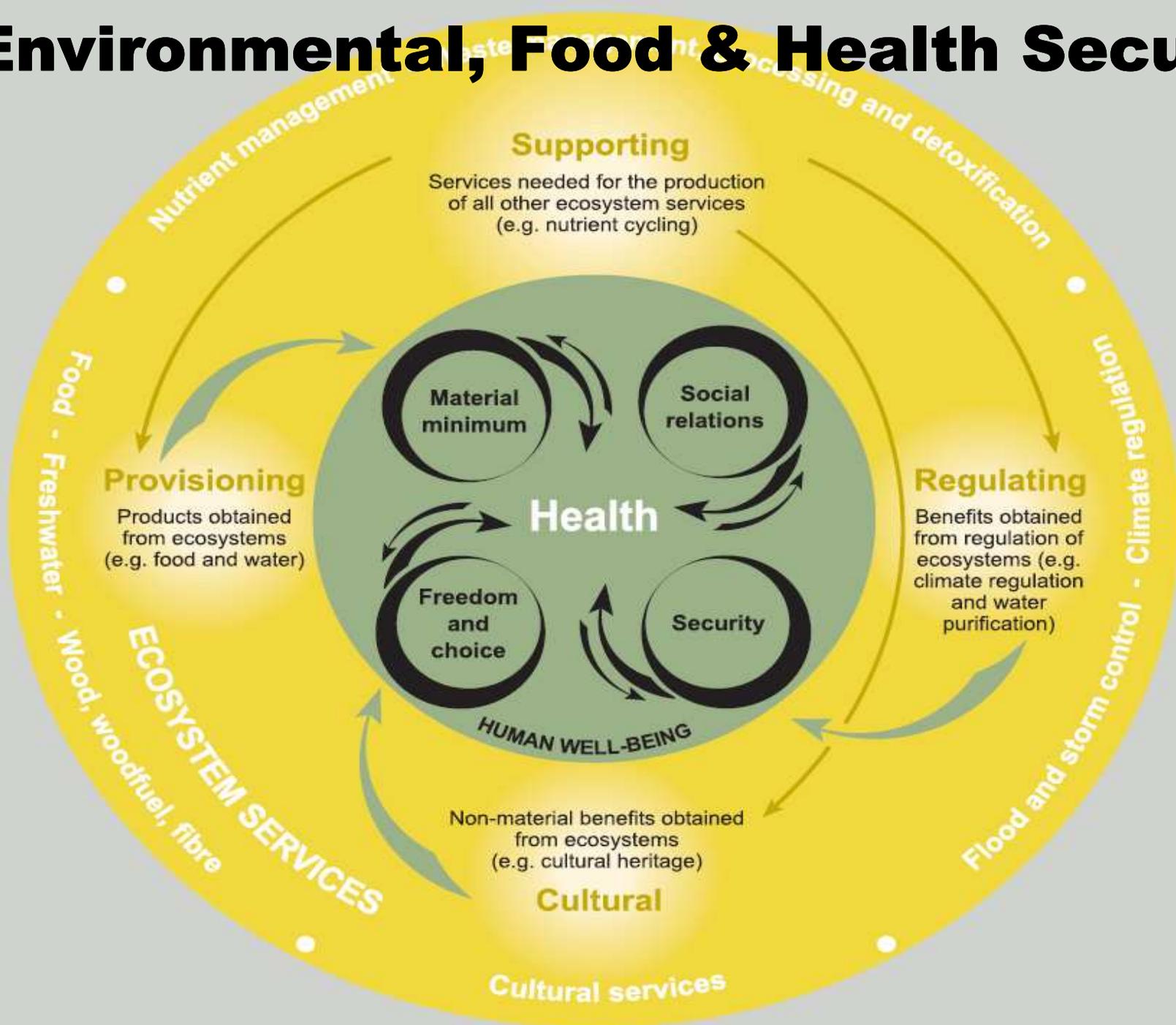
- GEC is more than climate change
- Includes natural **plus** human components
- It is a constellation of changes in different spheres, such as:



Ecosystem Services as Foodprovider

- **15 out of 24 ecosystem services** are degraded or used unsustainably
- **Soil nutrient** depletion, erosion, desertification
- Depletion of **freshwater reserves** and pollution of groundwater
- **Overfishing** is pressuring fragile soils
- **Loss of tropical forest** and of biodiversity reduces food availability
- **Urbanization** is diminishing the availability of land for food production.

Environmental, Food & Health Security



Widening, Deepening and Sectorialization of Security Threats, Challenges, Vulnerabilities & Risks

Security dimension ⇒ ↓ Level of interaction	Military	Political	Economic	Environmental ↓	Societal
Human individual Human security ⇒	Land mines	Failed state	Food & Health security	Cause & victim	Food & Health security
Societal, community security	Border control	Public security	Water, Food & Health sec.		↓↑
National security	During Cold War shrinking (in USA since 2001 ↑ & since 2009 ↓)		Energy security	↓↑	Energy Food, Water & Health security
International and Regional security			Water security	↓↑	Water security
Global and planetary security ⇒	Terrorism	Intern. migration	Financial crisis	CC; GEC; biodiversity loss	Health security

2. Some definitions: 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.

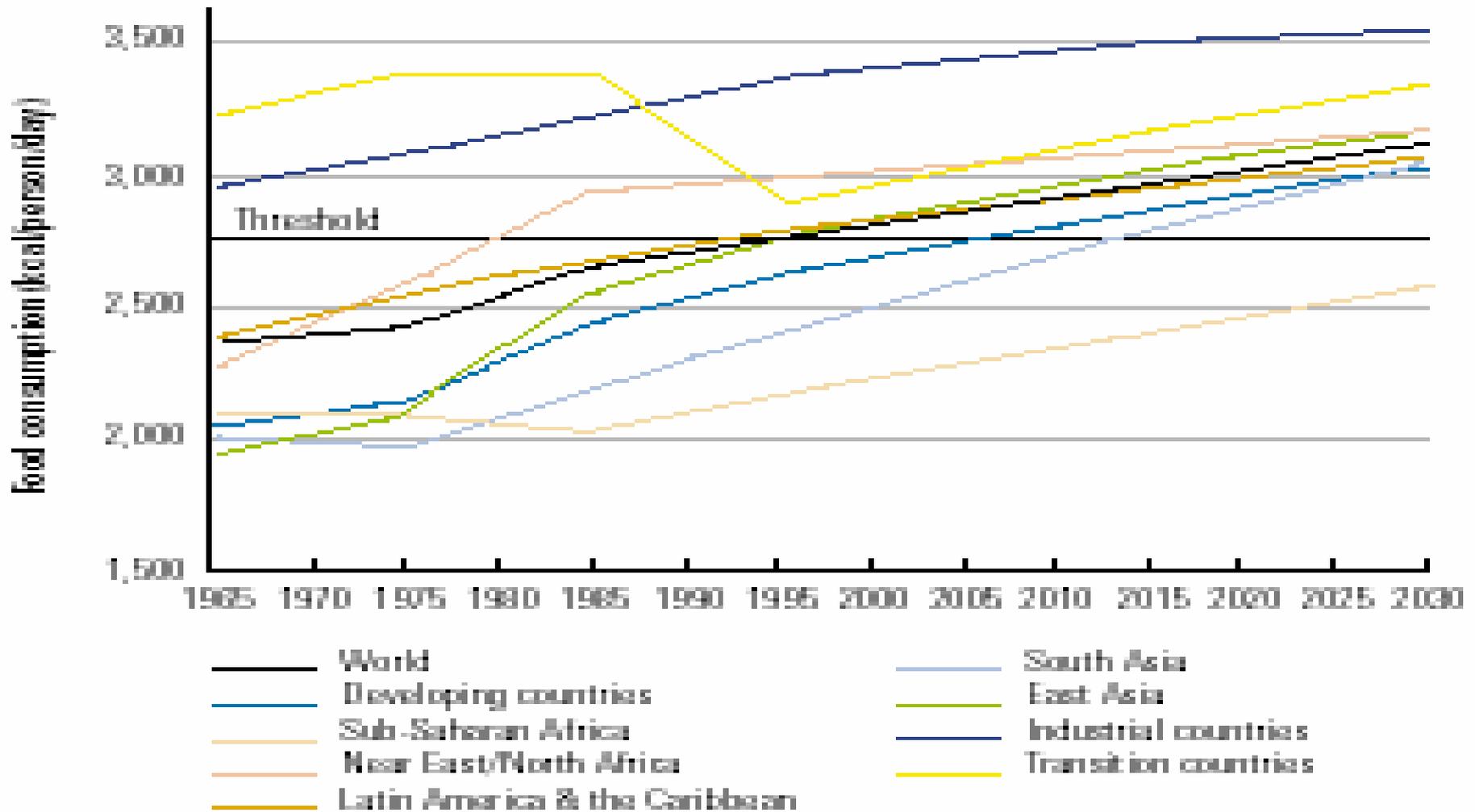
Household food security is the application of this concept to the family level, with individuals within households as the focus of concern.

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

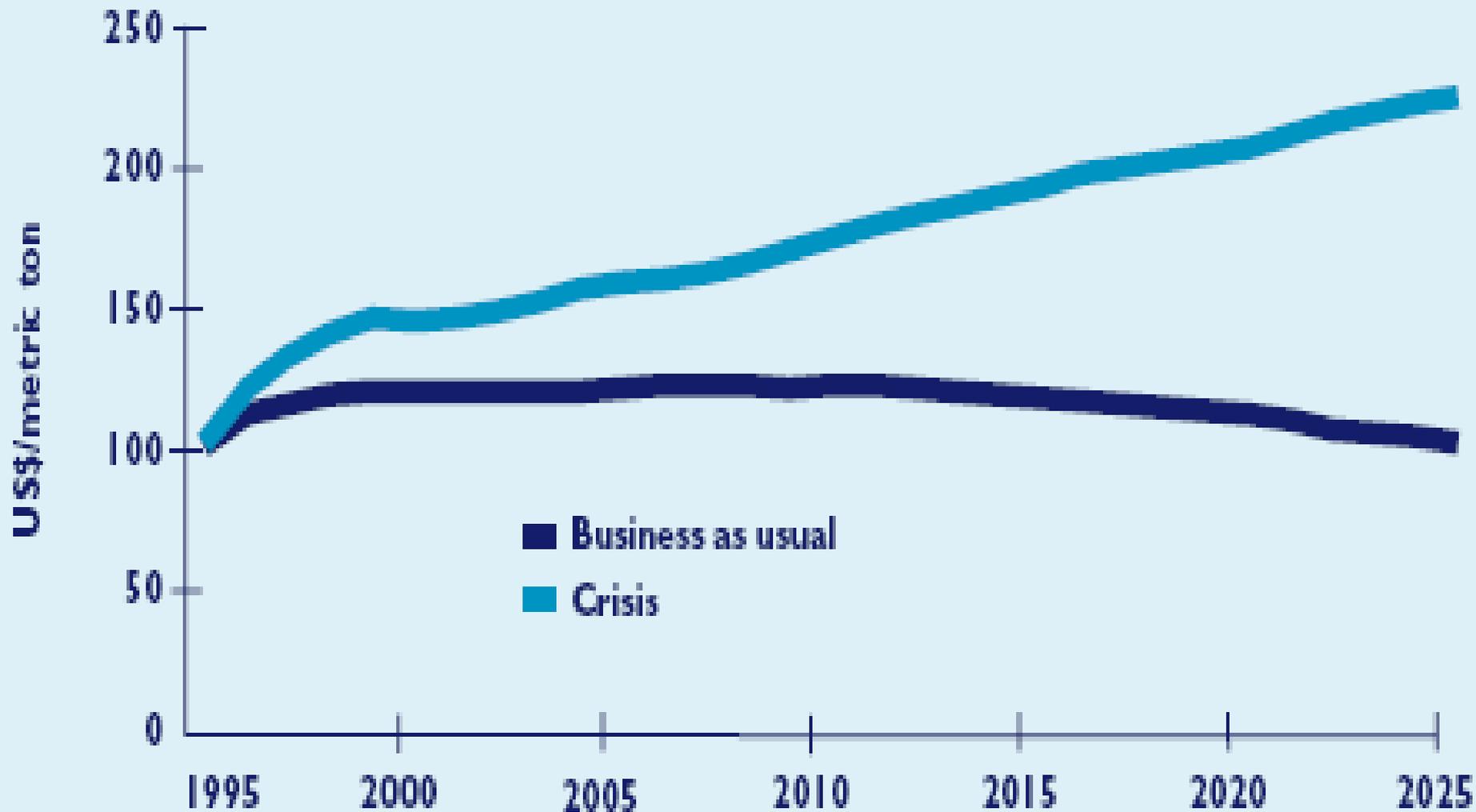
***Via Campesina's* food sovereignty**

“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).

3. World Food Situation

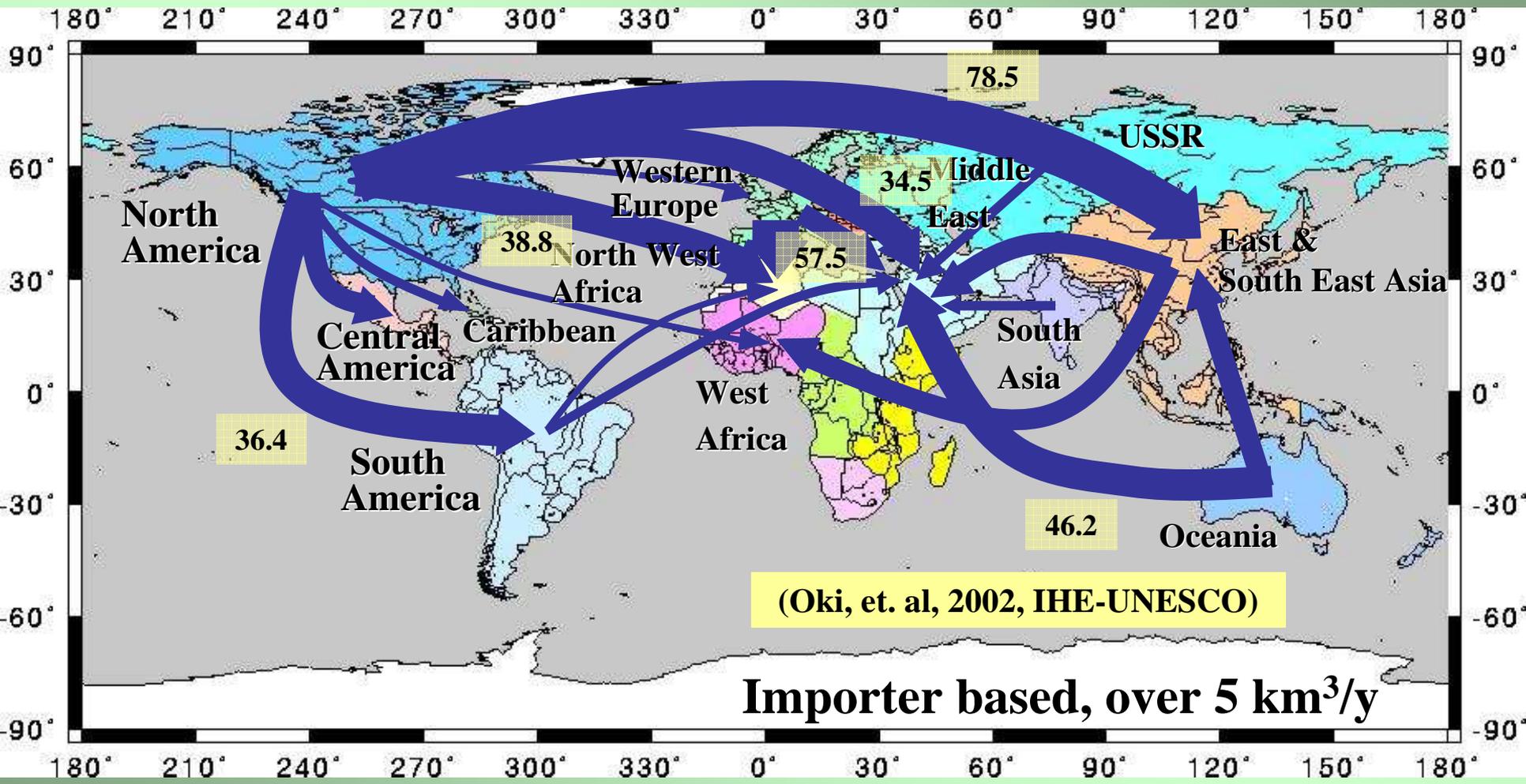


International Corn Prices



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

Food and virtual water in 2000 (only grains)



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

Importer based, over $5 \text{ km}^3/\text{y}$



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

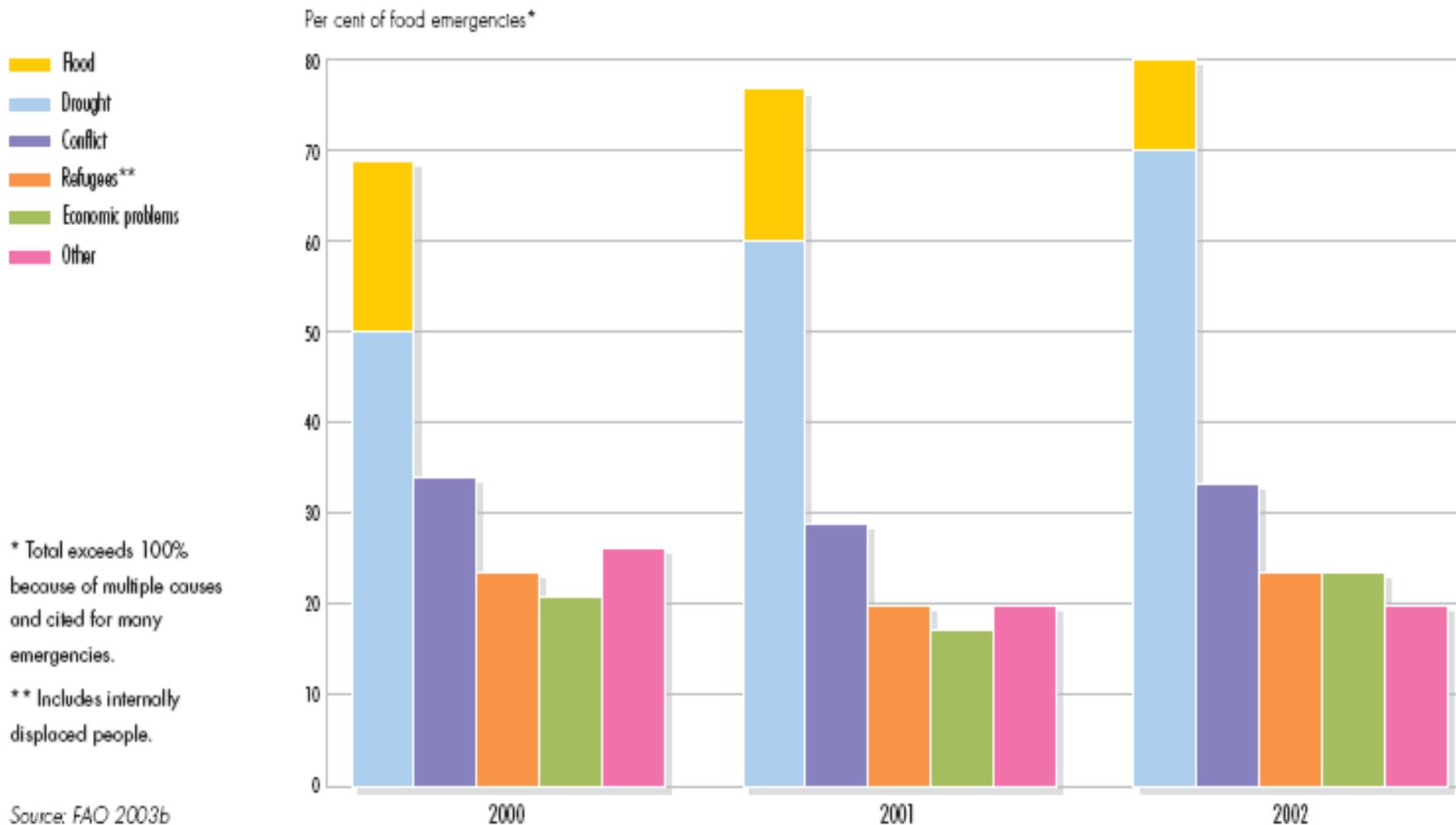


4. Social and Food Insecurity

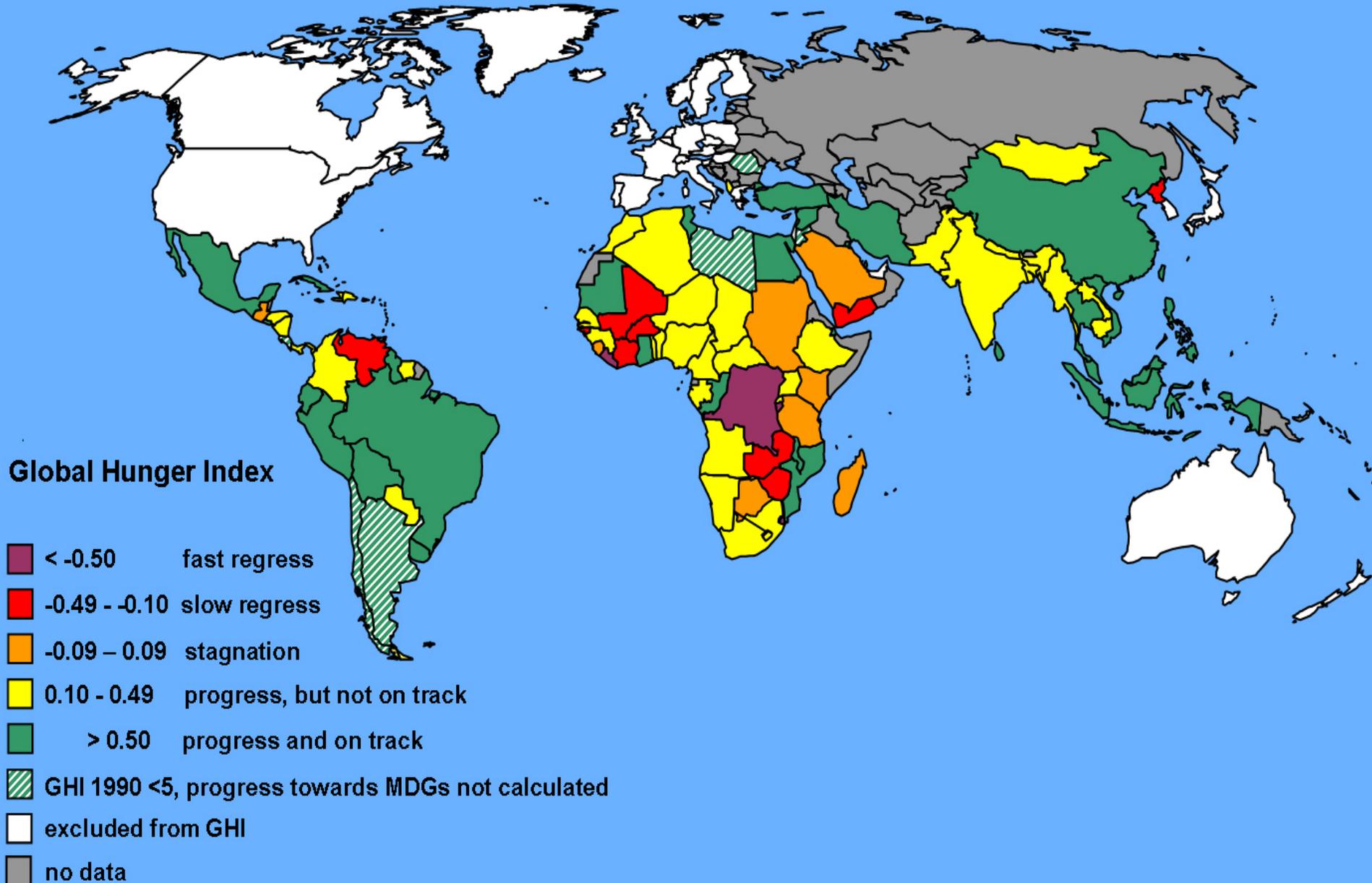
A Problem of Equity

- Each **sixth person** in the globe is hungry: **1.06 billion** are undernourished, have not enough food or money to pay for it. Food price rise **provoked 65 million more hungry people** in 2008. MDG can not be reached and affects above all rural and urban poor.
- 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.

Causes of Food Emergency



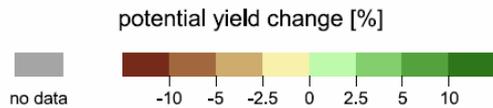
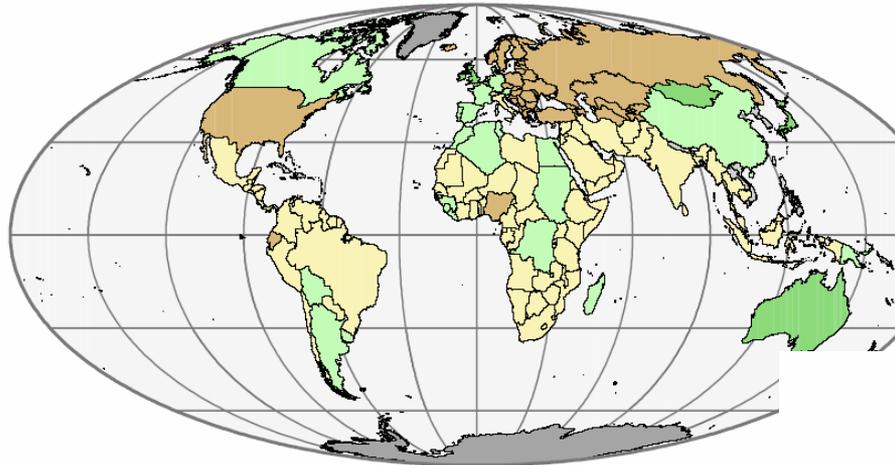
Global Hunger Index



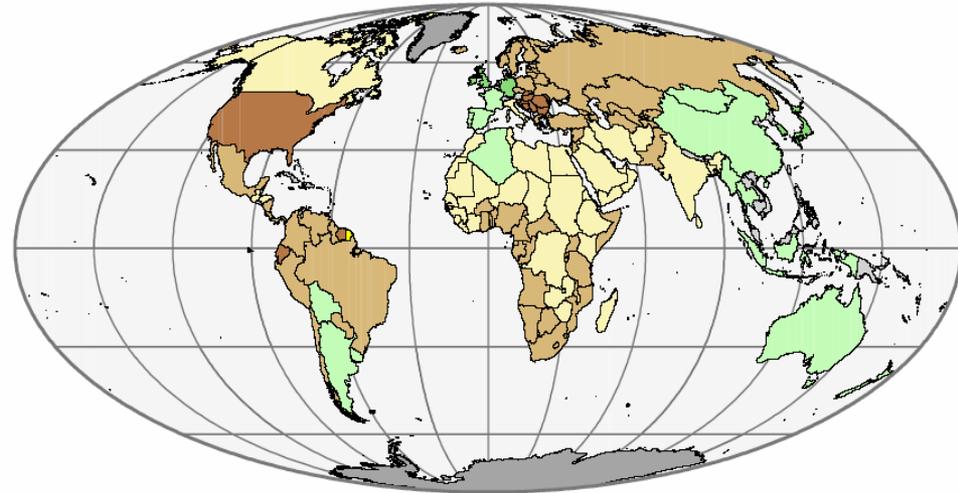
Women are Key Food Producers

- Women are in all parts of the world **responsible for food and food transformation**
- **Sub-Saharan Africa** countries 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)

Food Scenarios: 2020, 2050, 2090



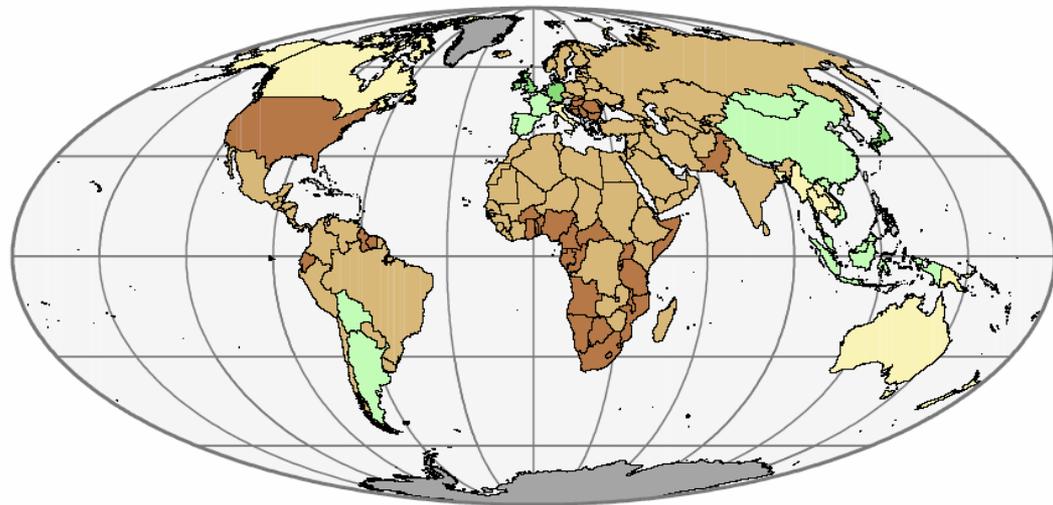
Food security 2040 - 2069 (HADCM3 GGA1)



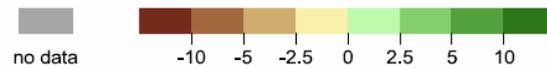
potential yield change [%]



Food security 2070 - 2099 (HADCM3 GGA1)



potential yield change [%]





5. Threats to Food Sovereignty: 3 Models of Food Production

- Productivity paradigm**
- Life science paradigm**
- Green agriculture paradigm**

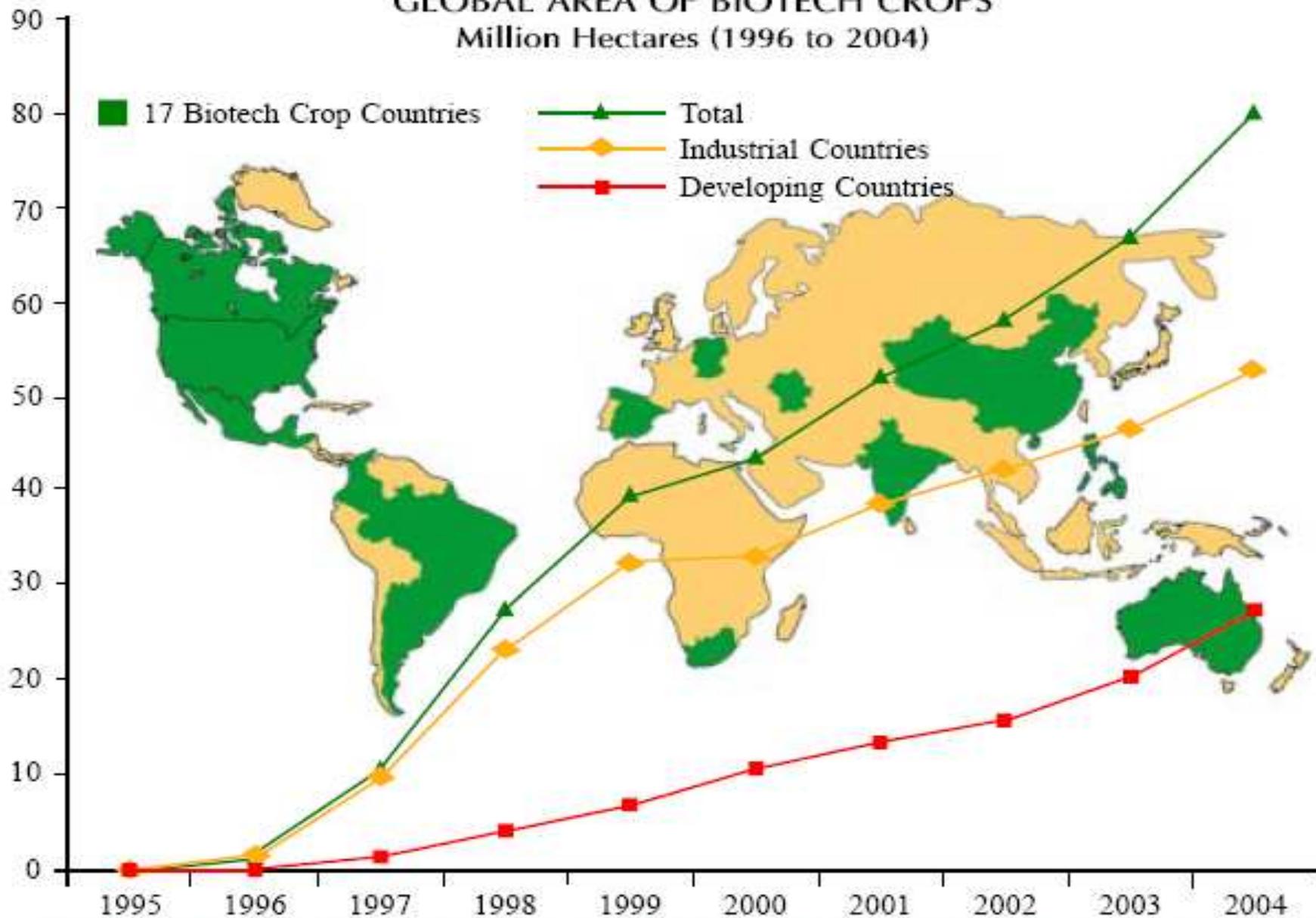
Productivity paradigm

- **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.

Life science paradigm

- ***Life science model*** integrates the food chain in form of **clusters** of 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 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.



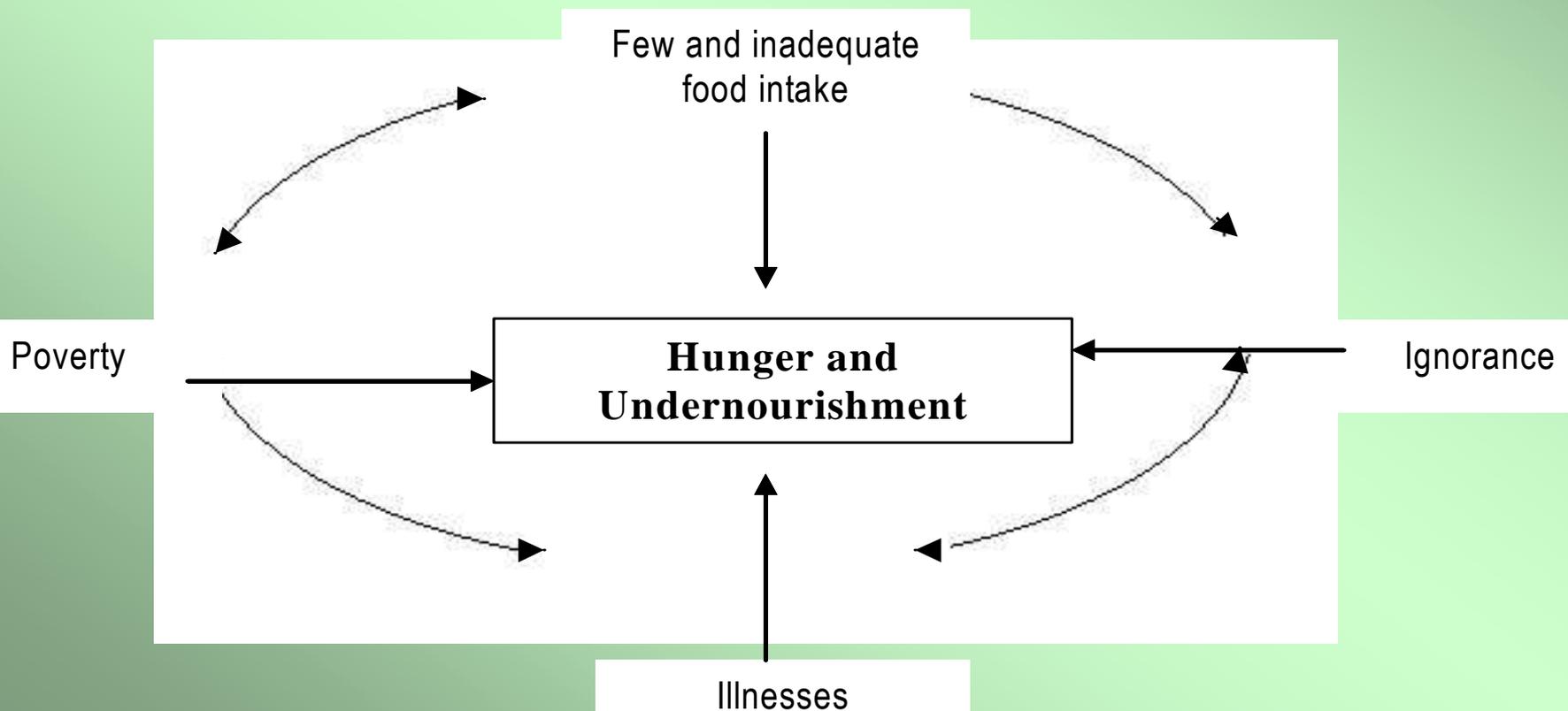
**6. Conclusions: Food
Sovereignty as Resilience-
Building from Top-Down
Combined with Bottom-up**

FAO Program after Food Summit

- To **eradicate hunger** from the earth.
- To **feed 2050 world population**: will grow 50 % & reach 9 billion
- **More coherent and effective system of governance** of food security at national and international levels.
- **Developing countries get fair chance** in world commodity markets (no unfair international trade).
- **Ensure farmers incomes** comparable to other sector workers.
- **Mobilize additional public and private sector investments in agriculture** and rural infrastructure to boost food production and productivity.
- More than **30 countries** have food emergencies: **effective mechanisms for early reaction to food crises**.

Survival strategies, micro-business and local food sovereignty

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





Survival Strategies



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

Human, Gender, Environmental Security

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



**Thank you
for your
attention**

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