



Promises and Challenges When Food Makes Fuel

**CRAWFORD FUND CONFERENCE ON BIOFUELS,
ENERGY, AND AGRICULTURE – Powering Towards
World Food Security?**

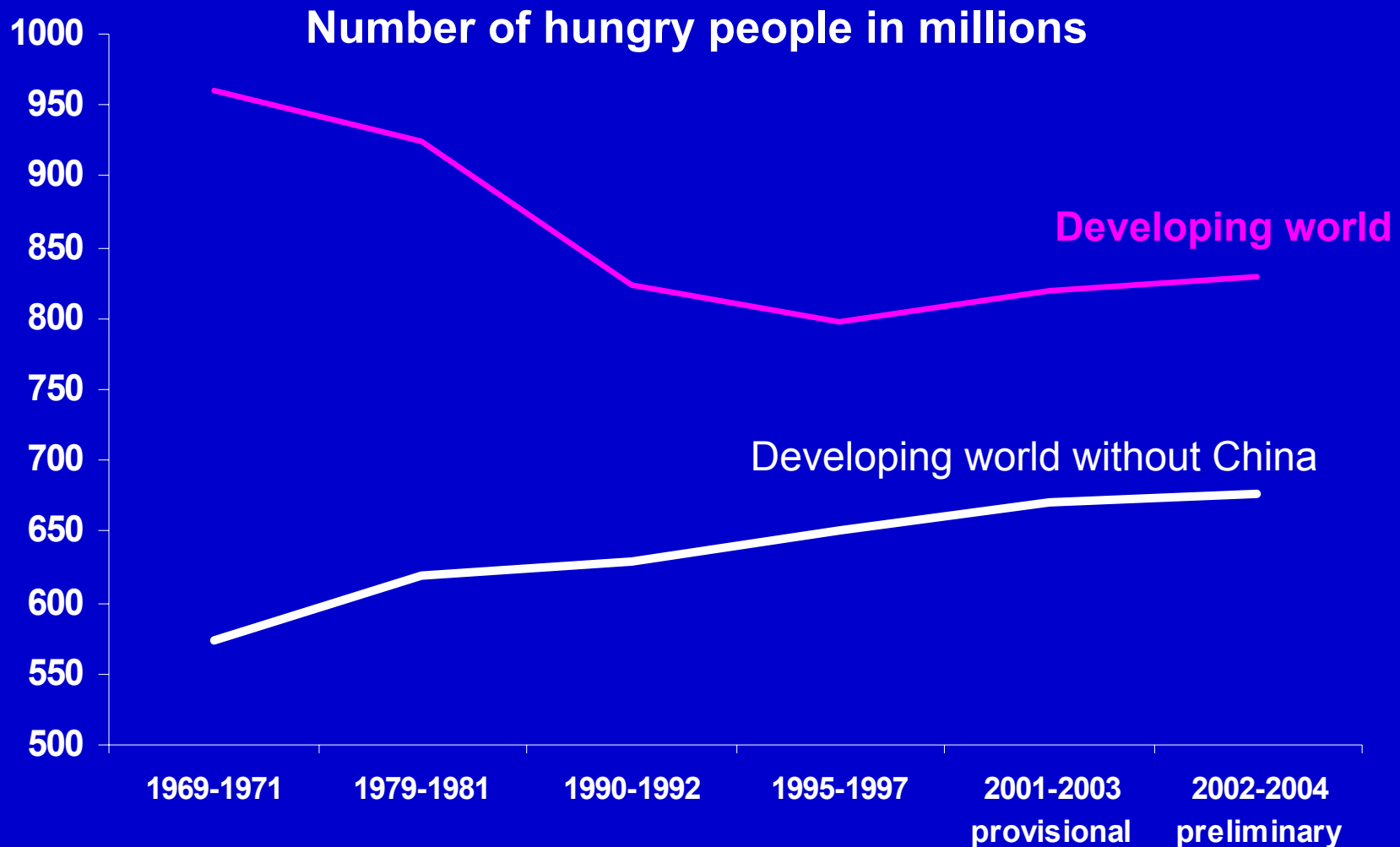
**Joachim von Braun
Director General
International Food Policy Research Institute**

**Canberra
August, 2007**

Global food system under stress

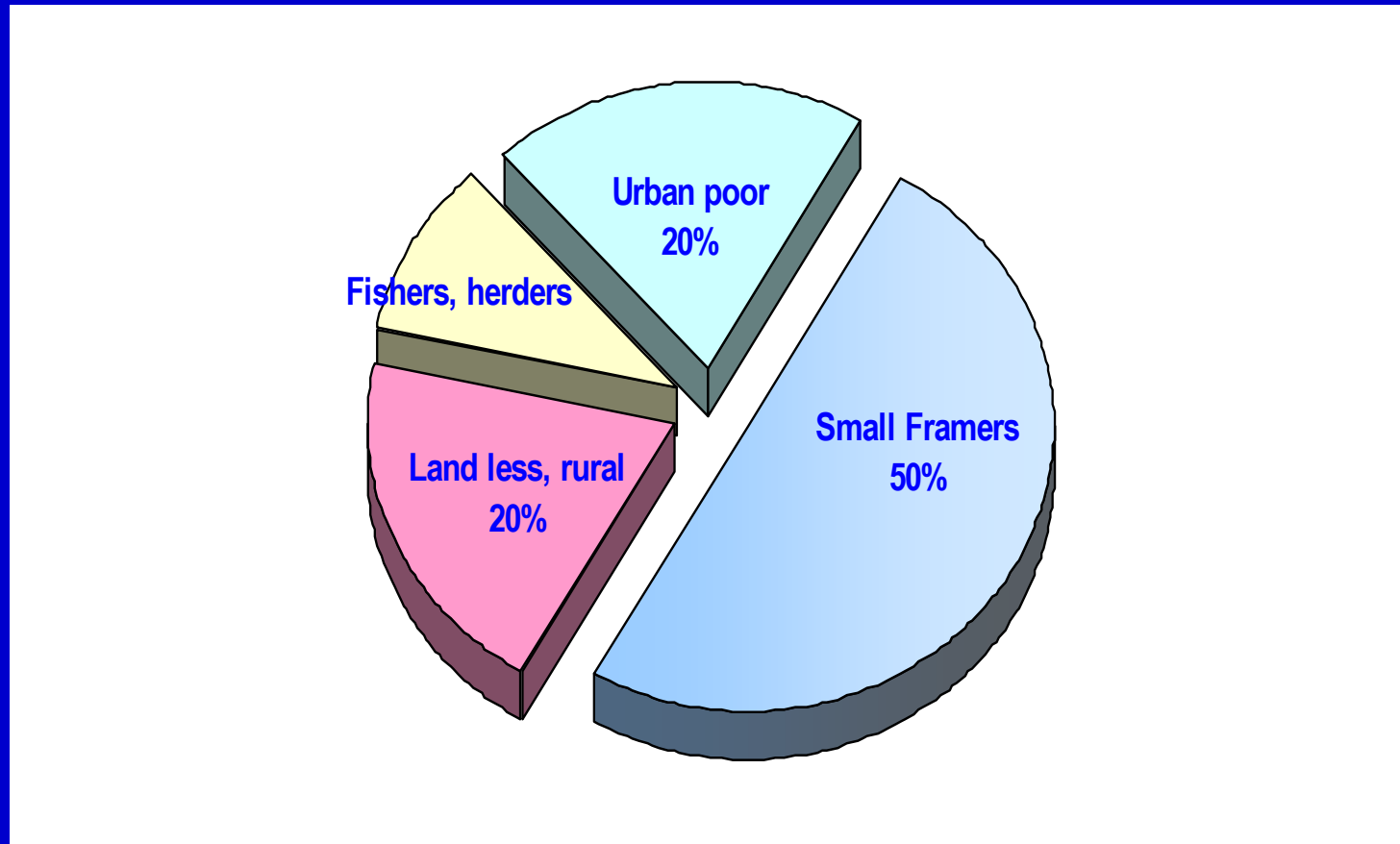
- global population growth
- economic growth high
- number of hungry and undernourished hardly decreasing
- scarcity of land and water resources
- under-investment in agricultural science and technology
- **and now + biofuels?**

Hunger and malnutrition



Data source: FAO 2006

Who is affected by hunger? Why rural/agriculture focus is so relevant



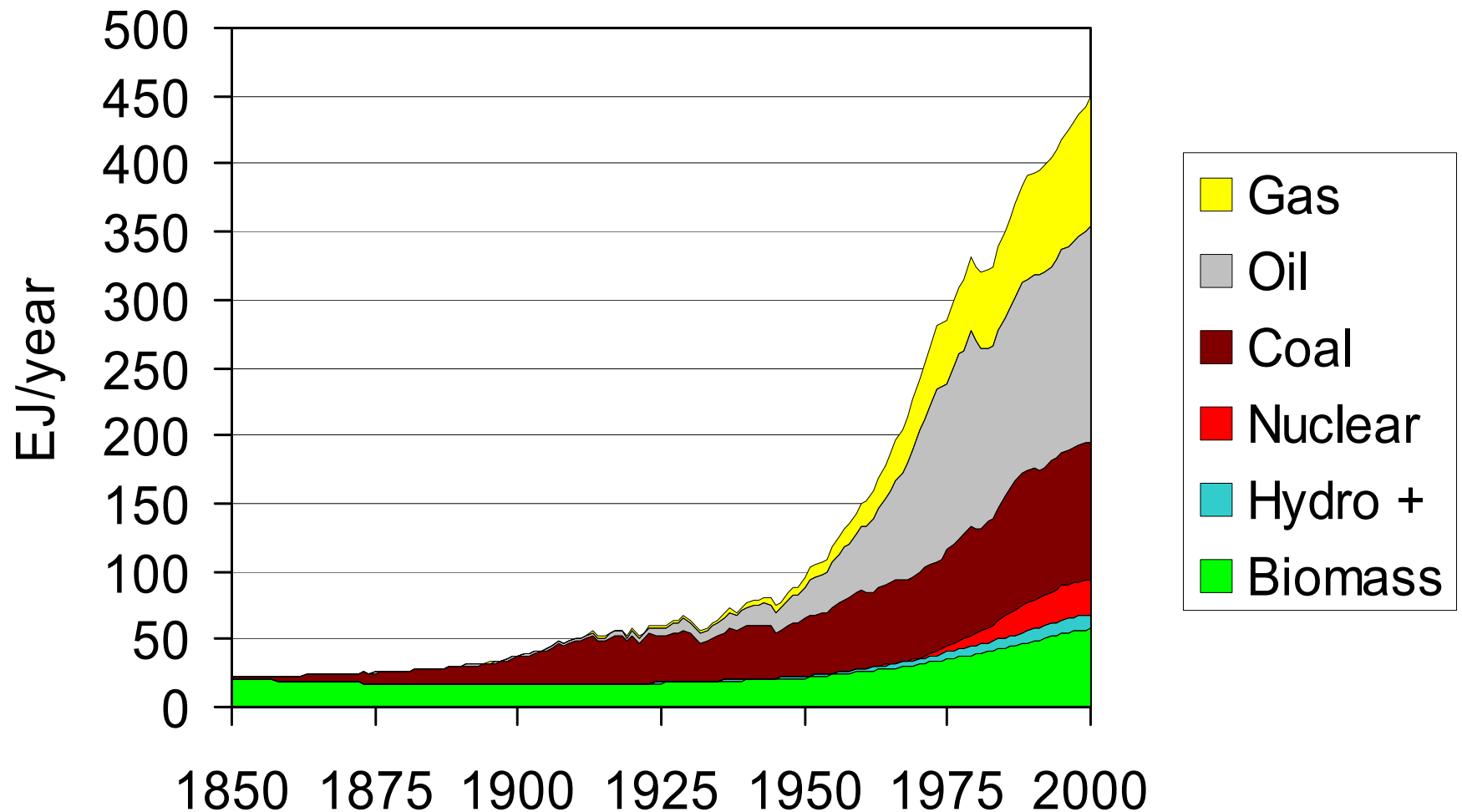
Source: UN Millennium Project, Hunger Task Force, 2005

Old and new global food and nutrition problems

Type	Causes	People affected
Hunger	Deficiency of calories and protein	0.9 billion
Children underweight	Inadequate intake of food and frequent disease	126 million
Micro-nutrient deficiency	Deficiency of vitamins and minerals	More than 2 billion
Overweight to chronic disease	Unhealthy diets; Lifestyle	Increasing also among the poor

Source: Based on data from FAO 2005a, UN/SCN 2004, Micronutrient Initiative and UNICEF 2005

History of world supply of primary energy



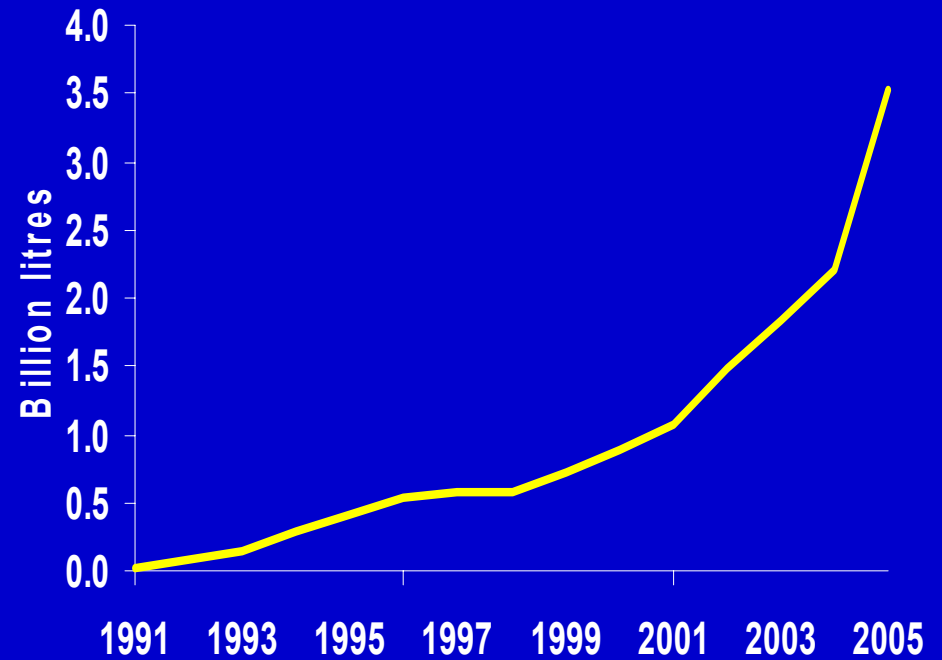
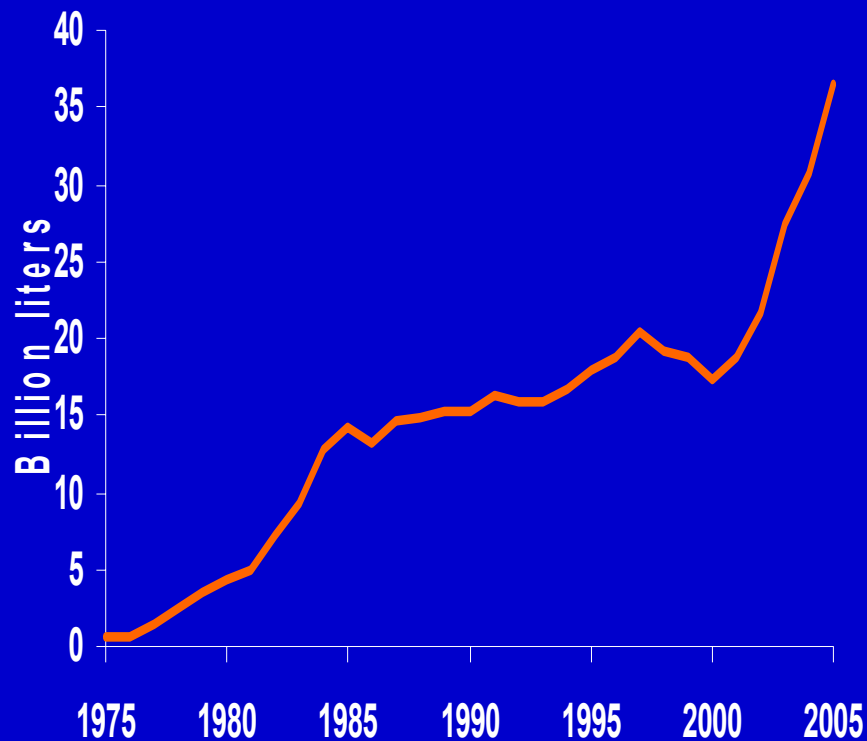
Energy supply grew 20-fold between 1850 and 2000. Fossil fuels supplied 80% of the world's energy in 2000. (Holdren 2007)

Questions

- 1. Where and for whom are there opportunities?**
- 2. What are the associated risks and challenges?**
- 3. How could the opportunities be tapped and risks and challenges addressed?**

The biofuels boom

World ethanol and bio-diesel production, 1975-2005



**Ethanol > 90% of biofuel production;
Brazil & US dominate ethanol market**

**Bio-diesel: EU is the largest
producer & consumer**

Plans

annual growth in biofuel production ...2010/12

• Ethanol:

- USA: 16%
- EU: 45%
- Brazil: 8%
- India: 15%
- China: 3%

Biodiesel:

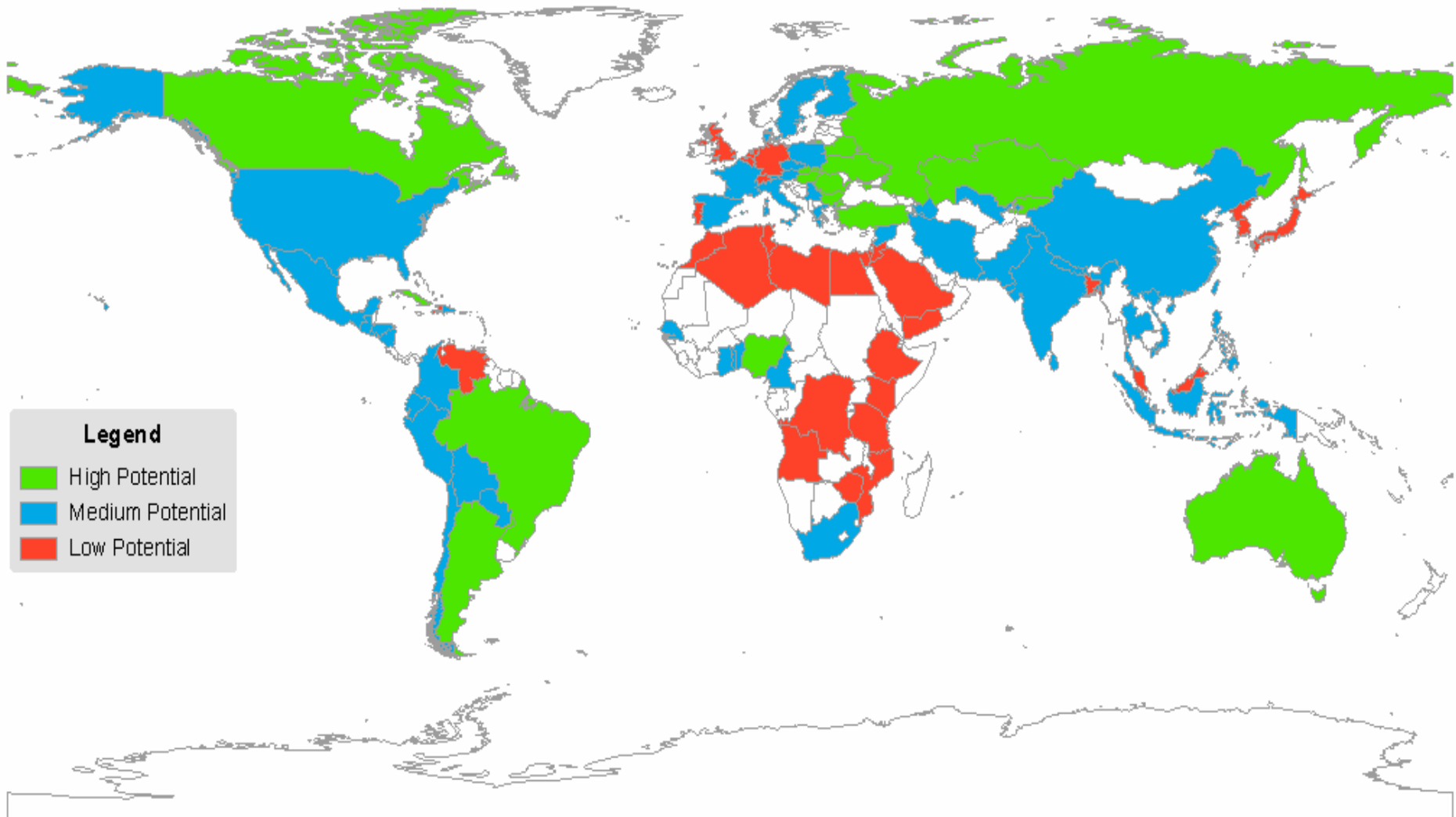
- USA: 19%
- EU: 37%
- Malaysia: 248%
- Indonesia: 143%
- Thailand: 70%

Source: USDA, 2006; 2007

Potentials of biofuels (and risks) - countries

- **If 15% of transport fuel from biofuels (and actual plans realized), would that be a burden for food security?**
- **variables used:**
 - 1. Availability of arable land**
 - 2. Availability of water**
 - 3. Levels of food insecurity**
- **of 102 countries: 36 low potential**

Where are the biofuel potentials and risks?



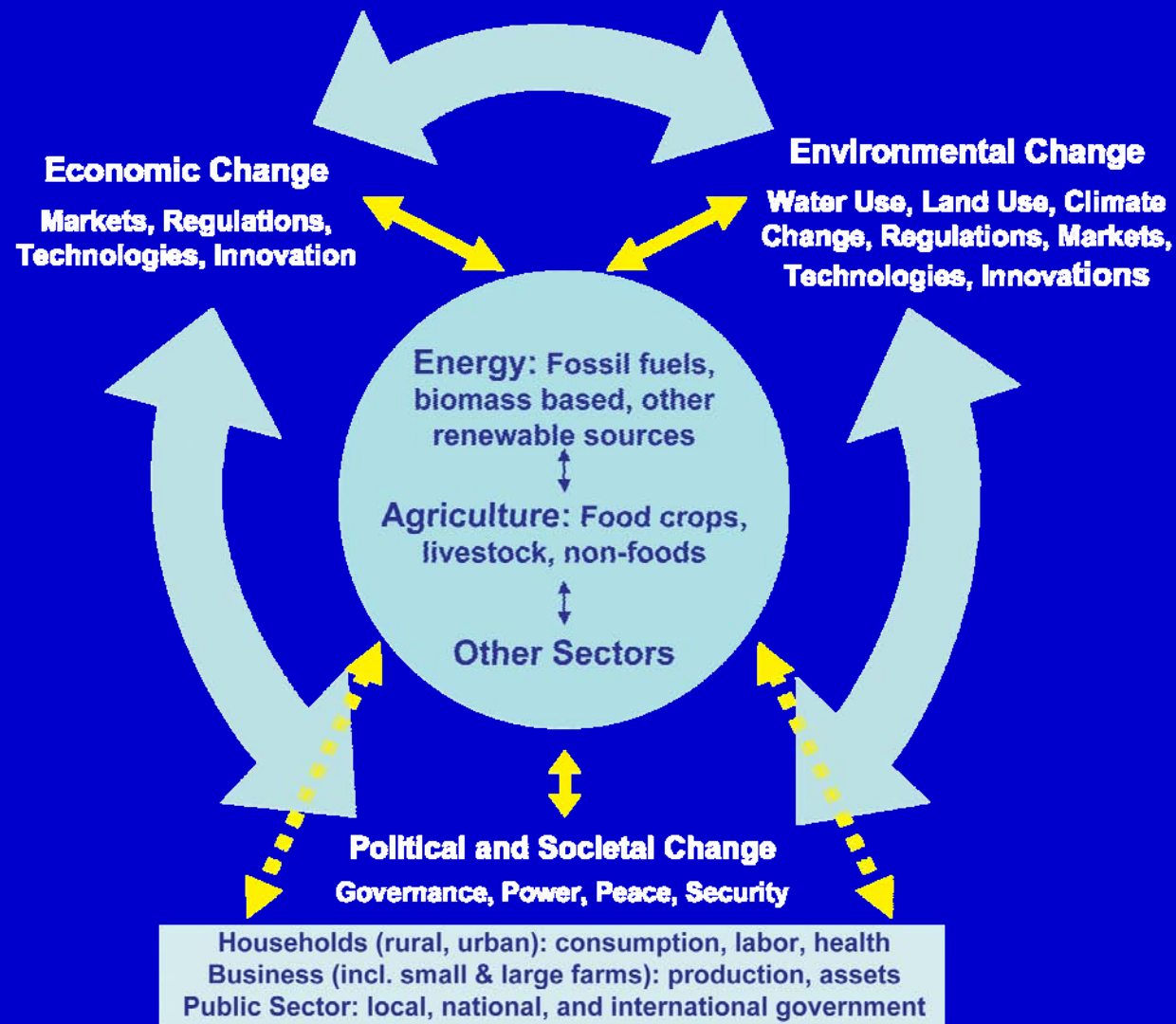
Example of a too simplistic concept of energy - agriculture linkages

**Grain for filling an SUV tank with ethanol
= Grain consumed by 1 person for a year**



Conceptual framework

Energy– Agriculture Linkages in a Broader Conceptual Framework



Political and societal change

- **New powers and rent seeking (-)**
- **Biofuels and peace & security (+)**
- **Agriculture / energy mismatch (?)**
 - **Subsidies for biofuels are anti-poor**
 - **Needed: Establishment of a global market and trade regime with transparent standards for biofuels**

Environmental aspects

- **Biofuels can mitigate climate change or damaging (+/-)**
- **Can be positive or negative for forests, and soils (+/-)**

needed:

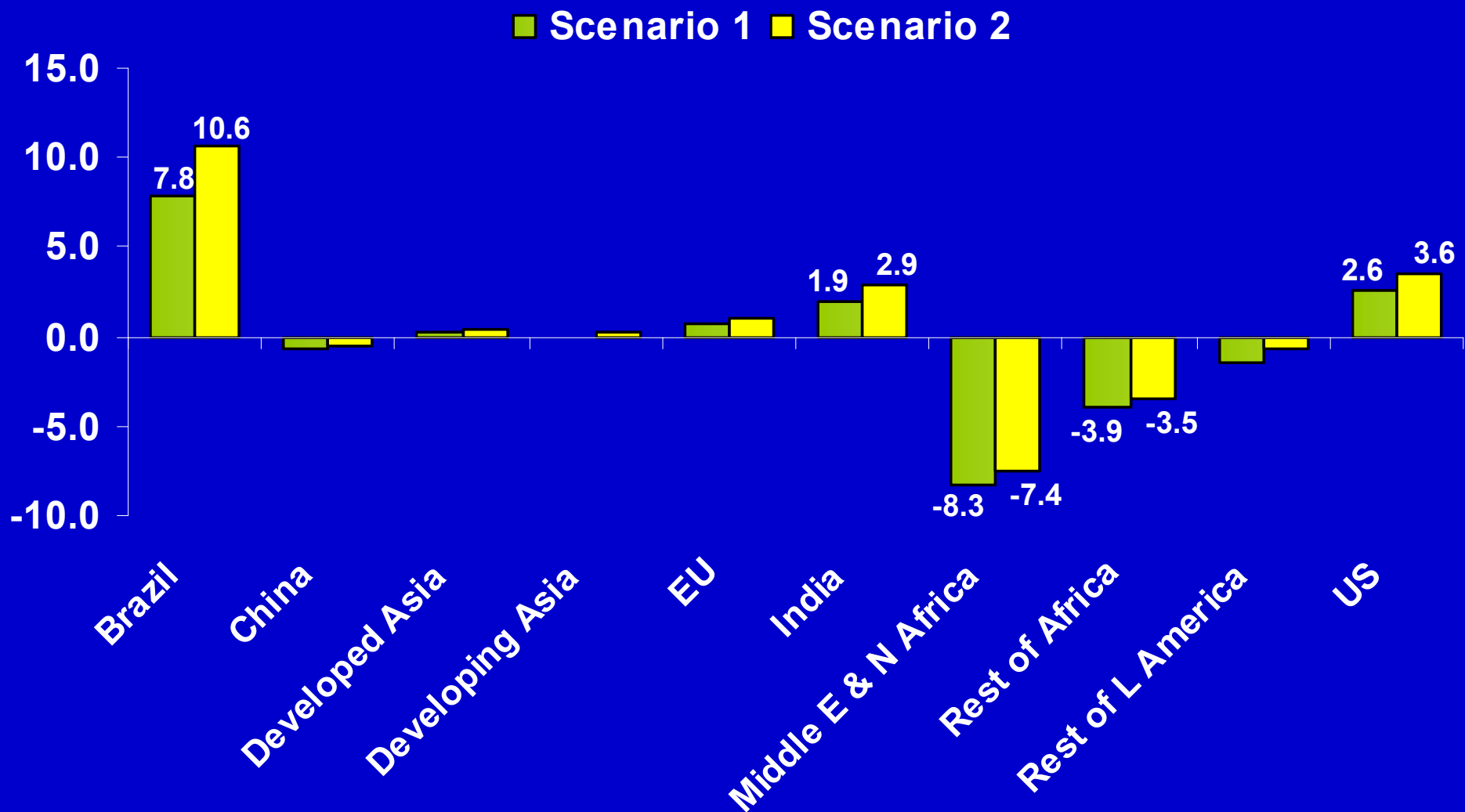
- > **criteria that internalize the positive and negative externalities of biofuels (energy balance; and CO₂ emissions)**
- > **Environmental cost-effectiveness**

Economic change: the issues

- **Growth**
- **Jobs**
- **Competitiveness and technology**

- **Food – fuel competition**
 - **Prices and the poor**
 - **Food security of the poor**

Change in agric. value added by 2020: scenarios compared with baseline (%)



Competitiveness ?

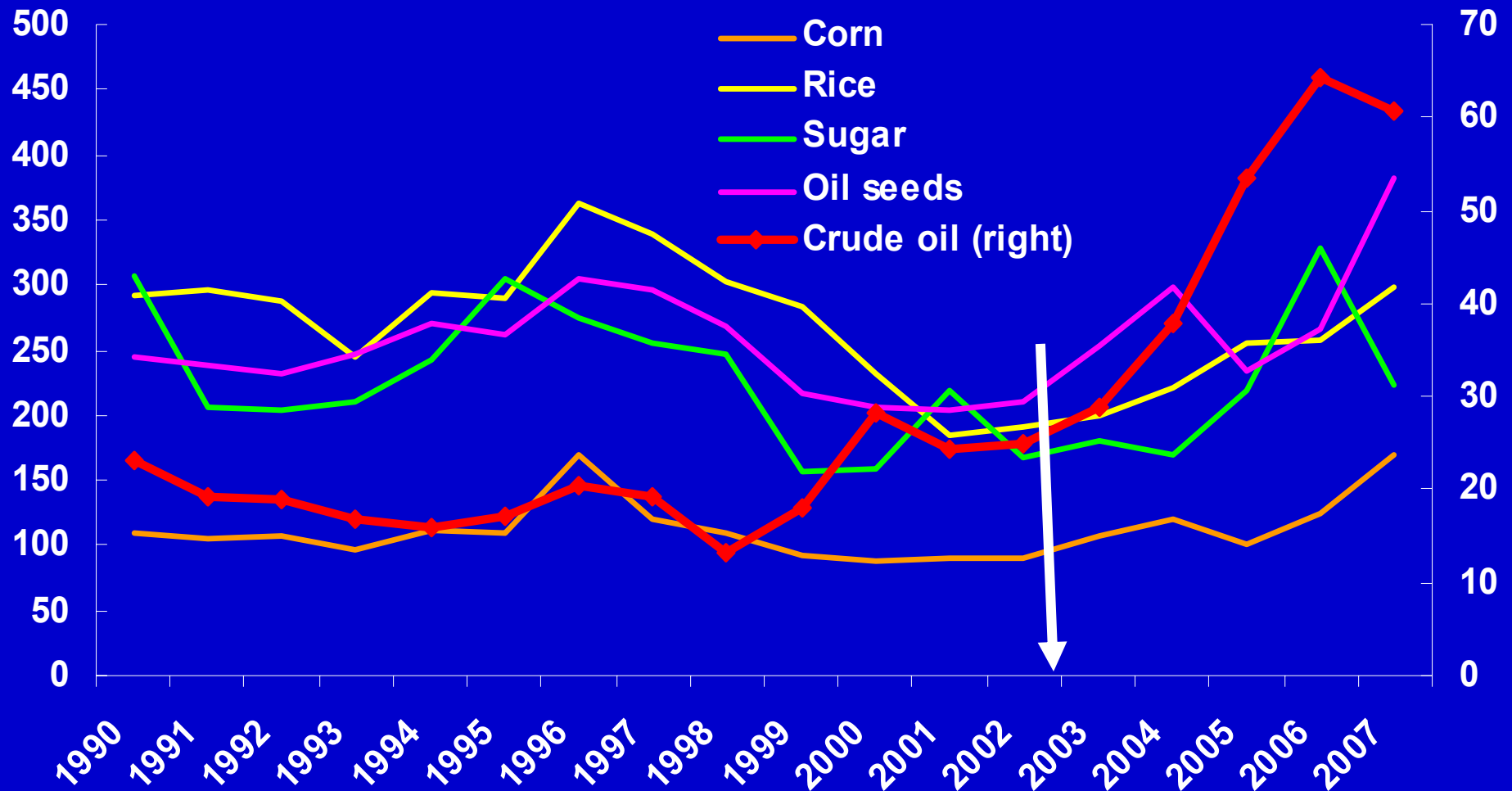
- **Costs of feedstock dominate costs**
Ethanol: 50-70%; Biodiesel: 70-80%
- **Net production costs differ widely**
(Ethanol, US\$ / liter 2003/4):
Brazil .17; Thai .28,
Austral. .37; Germany .59

Technology and the food – fuel competition

Improved technology in biofuels can increase the food fuel competition

- **biofuel and other agriculture technology need to be invested in simultaneously = a CGIAR role**
- **In many developing countries it makes sense to wait for second- and third-generation biofuel- technologies, and plan for “leapfrogging”**

Prices: Agricultural and energy prices increasingly correlate



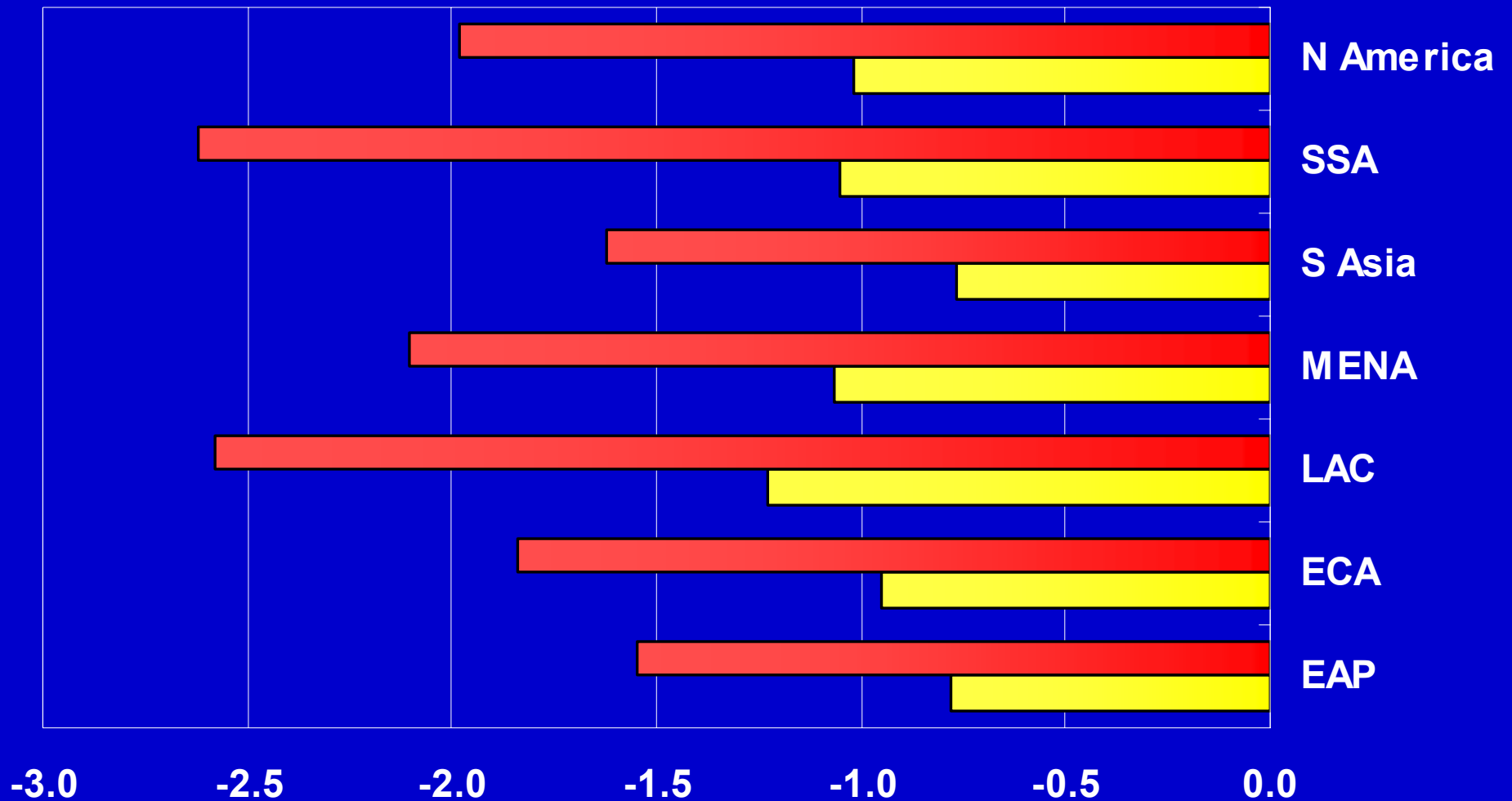
...and price variations are up

Source: IMF, 2007; OECD, 2005; World Bank, 2007

IMPACT-Model: biofuel scenarios by 2020

	Biofuel Expansion	Price changes % by 2020
Scenario 1	Actual plans and assumed expansions	corn: + 3 oilseeds: +8
Scenario 2	Doubling of Scen.1 expansion	corn: + 13 oilseeds: +17
another scenario	Neglect of technology and expansion	Corn: +20–41 Oilseeds: +26-76

Calorie availability changes in 2020 compared to baseline (%)



■ Biofuel expansion ■ Drastic biofuel expansion

Price-effects for Bangladesh five-person household living on one dollar-a-day per person

Spend...their 5 \$

3.00 \$ on food

.50 \$ on energy

1.50 \$ on nonfood

**>a 20 percent increase in food and energy prices
requires them to *cut 70 cents* of their
expenditures.**

Cuts will be made most in food expenditures:

>reduced diet quality, and

>increased micronutrient malnutrition

Conclusions

The world food equation is changing

Biofuel expansion will...

- **accelerate globalization of agriculture**
- **increase crop prizes,**
- **raise land values, thereby draw capital into rural areas**
- **create some jobs**

Risks for the poor

No 1 : food price increase and instability

No 2 : ill-considered policies

Strategic framework for biofuels needed

3 Pillars of pro-poor biofuels strategy:

1. Science and technology strategy
2. Markets and trade strategy
3. Insurance and social protection strategy

*a very different
Green Revolution
is needed*