Food Security - "big picture" of global challenges and some directions for action

Joachim von Braun
Director General
International Food Policy Research Institute

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What intellectual framework?

- Distinguish endogenous and exogenous food security issues
- Take note of globalization of food systems
- Address short and long term food security
- Consider changing actors for governance and action
- Combine and optimize institutional *and* technological innovation in the food systems

The Changing Equation of Food and Agriculture

Supply

Land
Water
Inputs & Transport costs
Workforce
Climate change
Agrarian structure
Technology

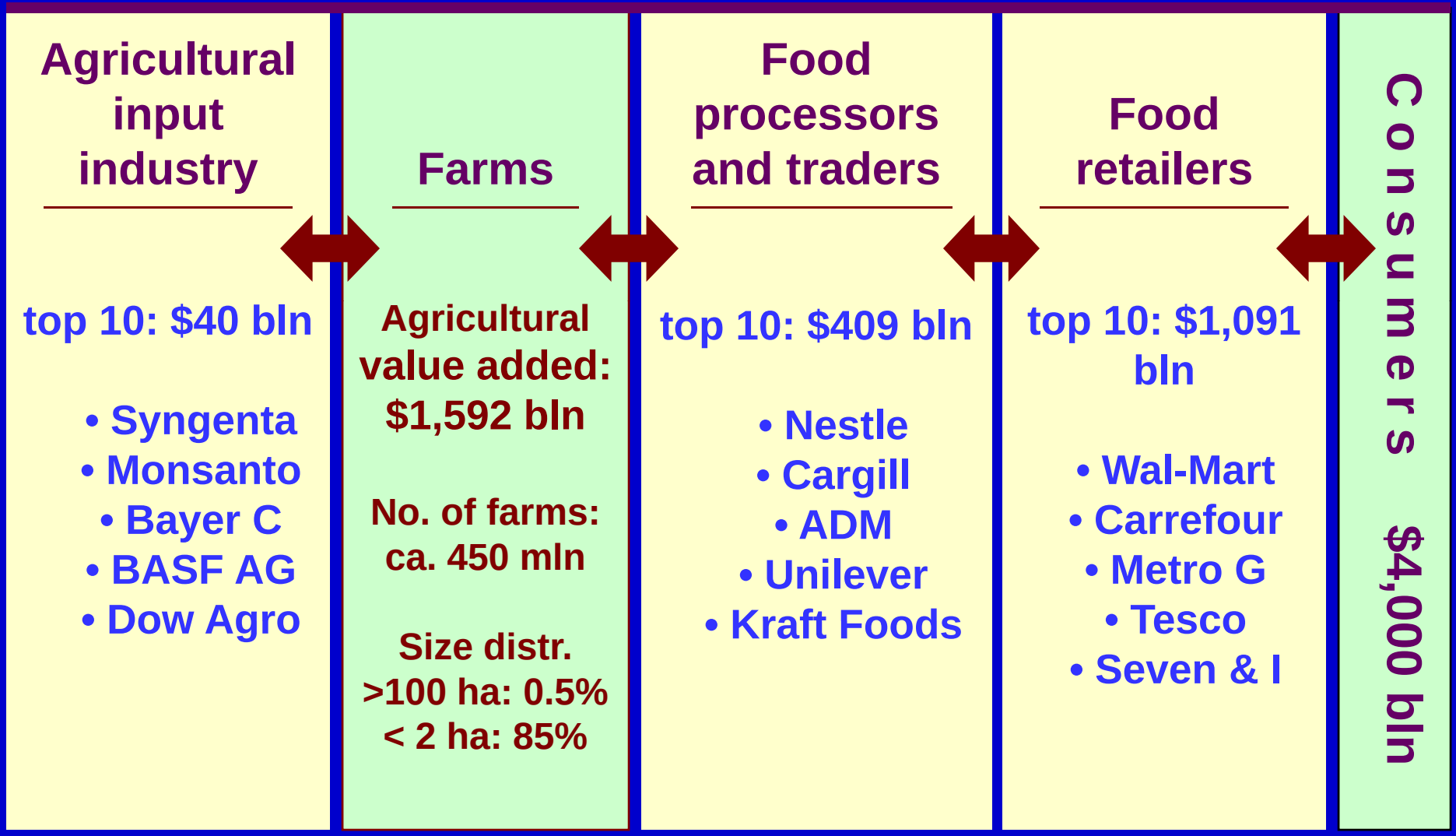
Demand

Income growth
Poverty and inequality
Consumer behavior
Bioenergy
Biomass (CO_2)

Processing, Markets & Trade

Information & Standards
Food safety
Supermarkets

Globalization of the agri-food business chain



Source: von Braun 2008.

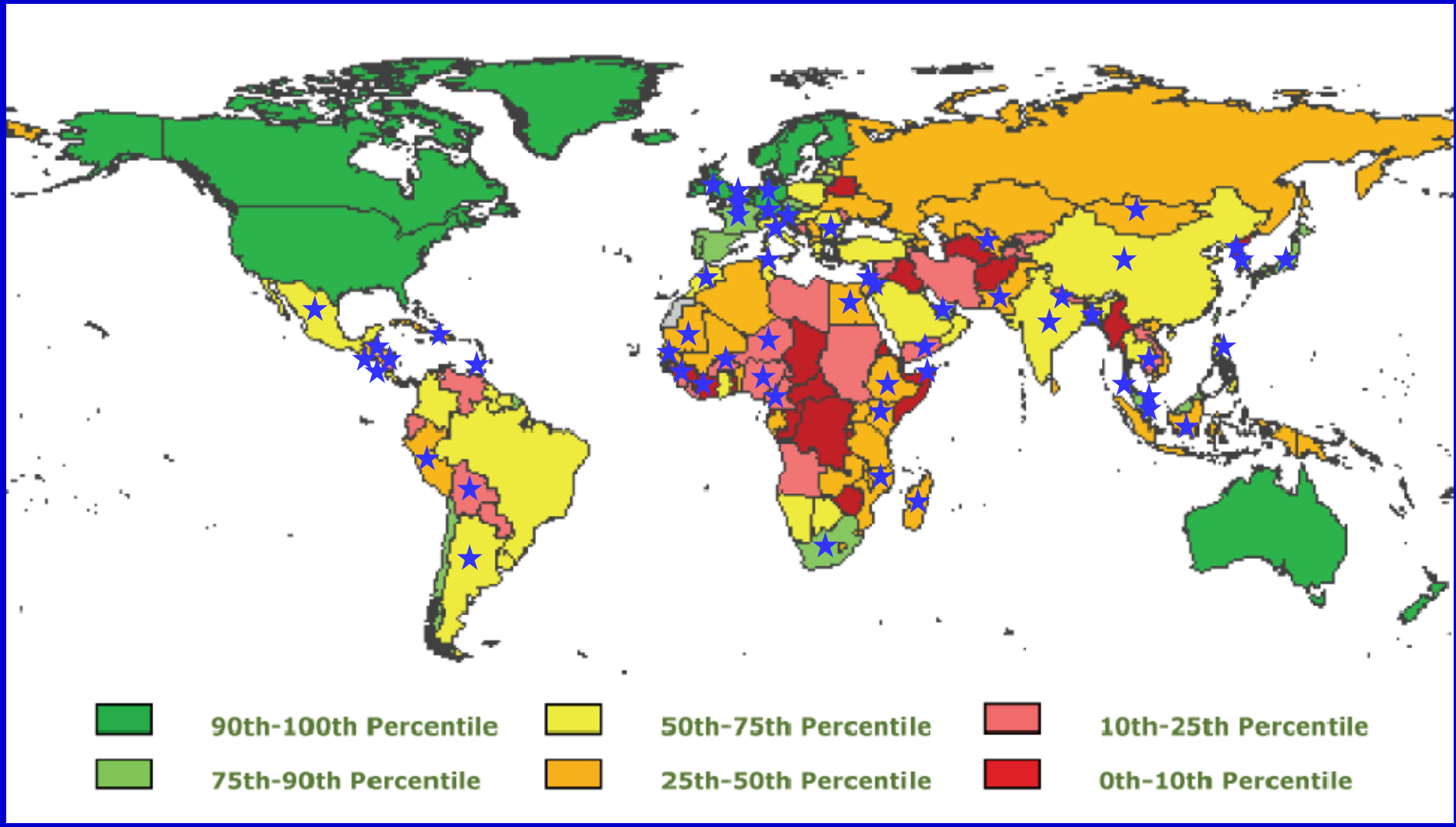
Overview

1. Global and national food governance architecture
2. Food market policy
3. Nutrition and social protection policy
4. Agricultural science policy
5. Priorities for action

Food-related global public goods that must be addressed by governance architecture

- Global food emergency responses
- Trade and standards
- Competition policy
- International agricultural research
- Food safety and agriculture – health links
- Climate change adaptation and mitigation
- Cross-boundary water
- Natural resources (soils, genetic resources, etc.)

Government effectiveness 2007 & food protests



Source: Kaufmann, Kraay, and Mastruzzi 2008.

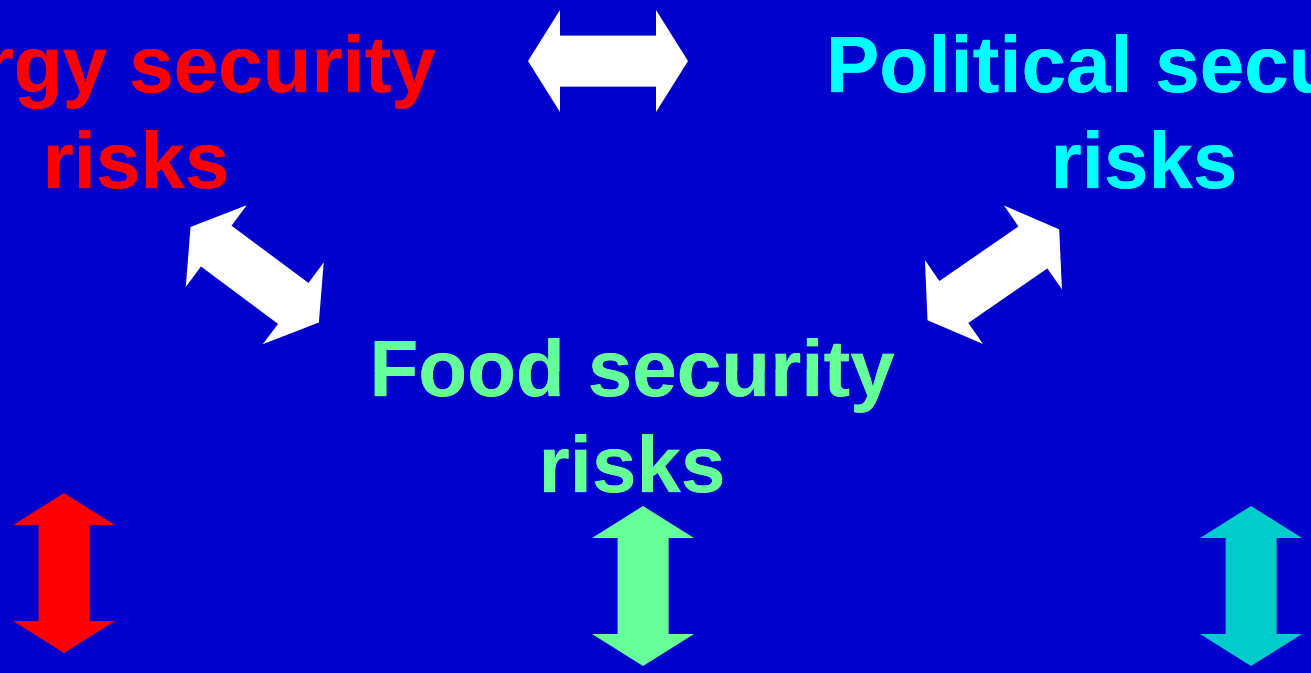
Biofuels: Fundamental change in world food price determination

Energy prices now strongly affect not just agric. input prices, but also output prices via grain and oil seed based biofuel competition

Elastic energy demand creates *price bands* for agricultural commodities

Increased biofuel demand in 2000-07 contributed to 30% of weighted average increase of global grain prices

Food security policy tradeoffs



+ *Mass protests in almost 60 countries*
+ *Inflation and macro-economic imbalances*
+ *Environmental sustainability consequences*

Options for the new global governance system design

1. Improve existing institutions + umbrella structure for food and agriculture
2. Form an innovative government - to - government network
3. Expand current system to explicitly engage new players

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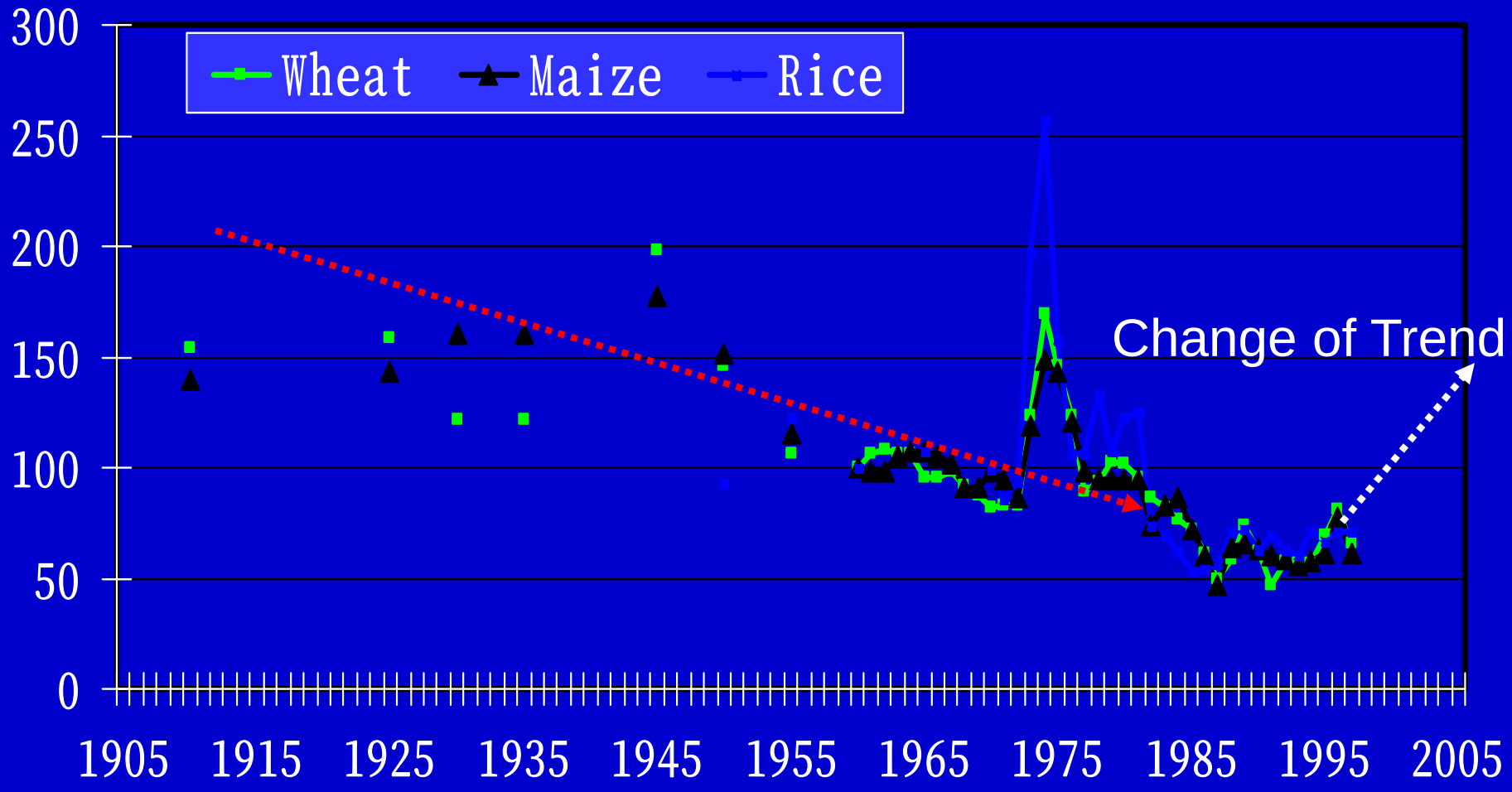
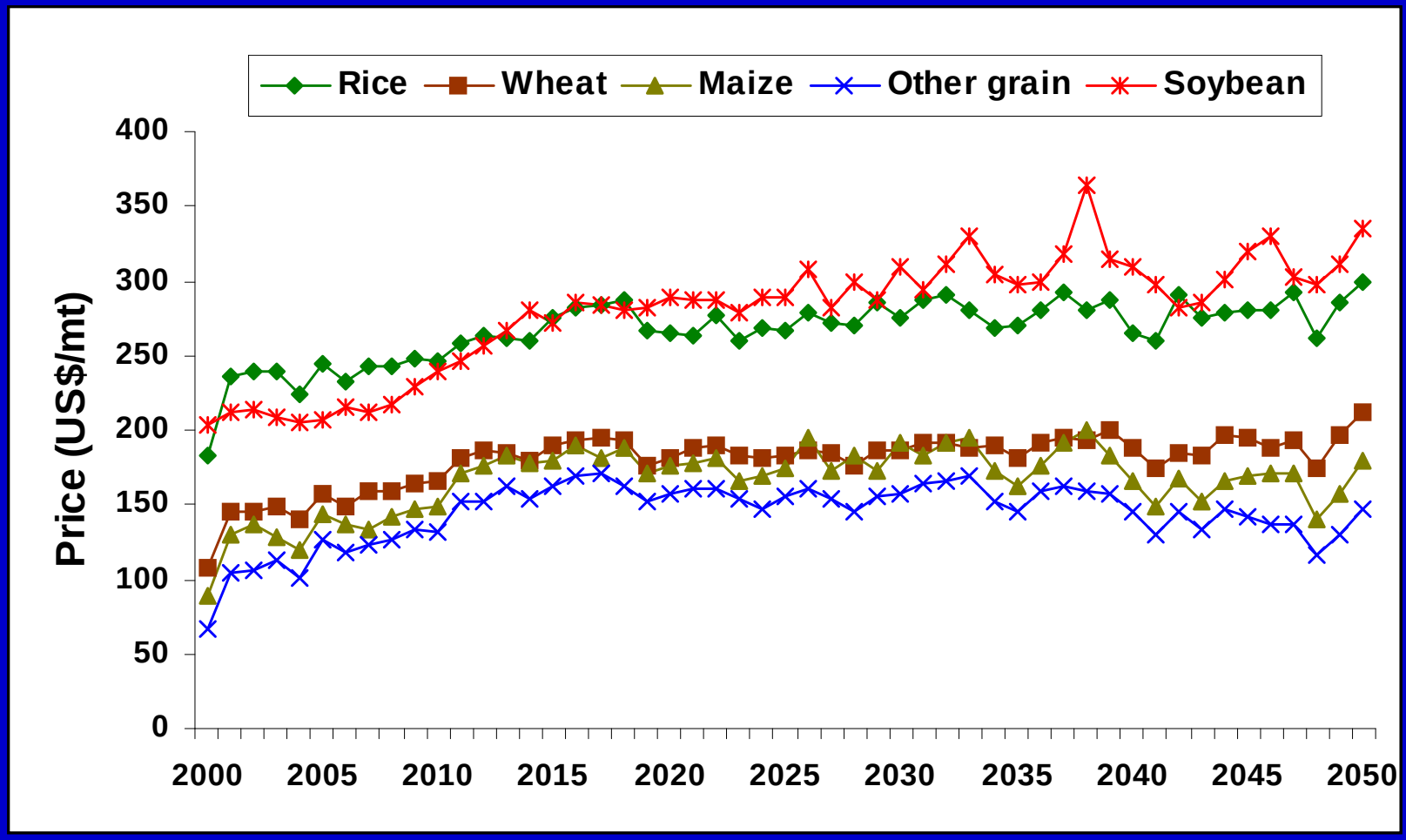
Cereal Price - Index 1905 - 2000

(All prices = 100 in 1960)



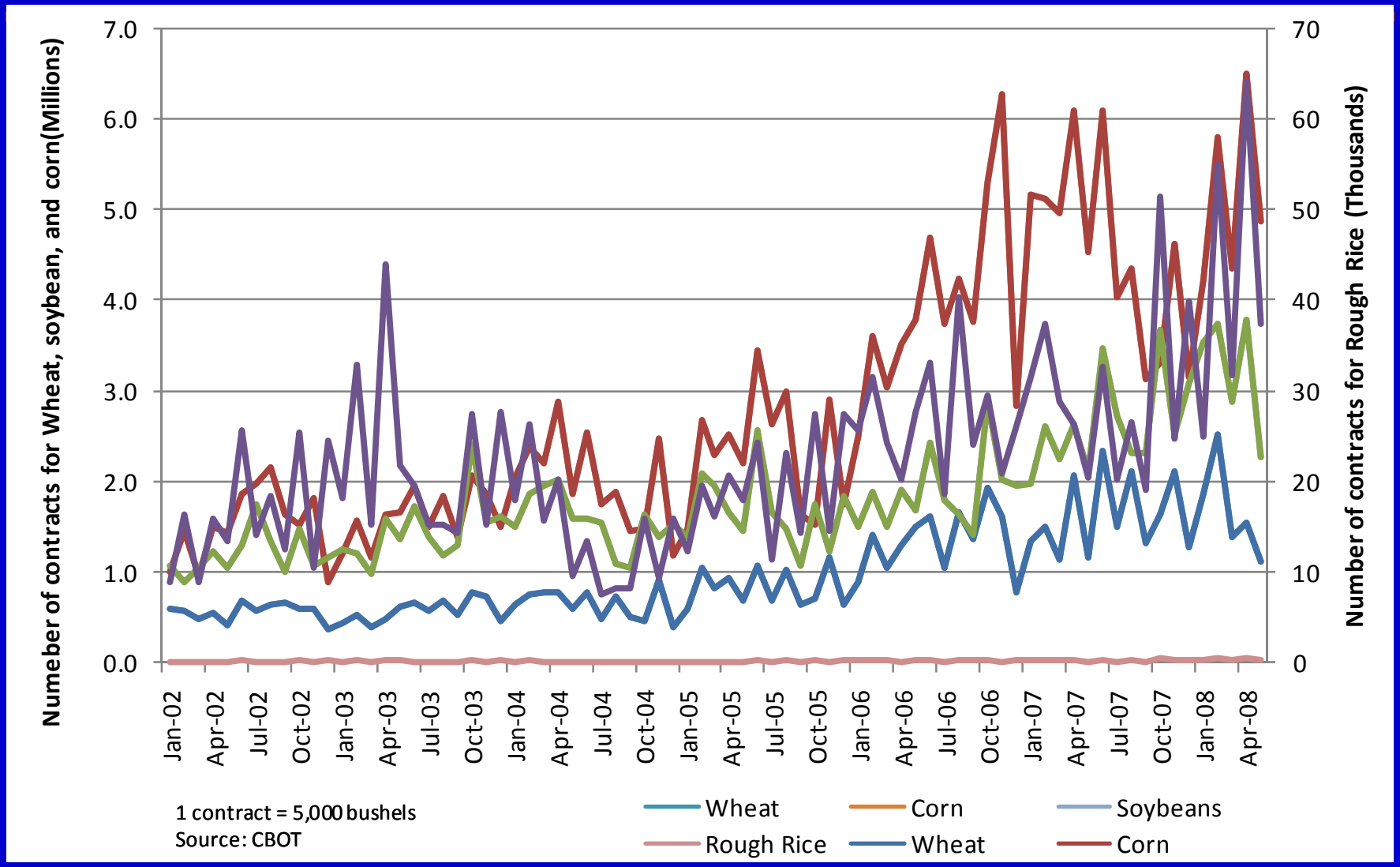
Joachim von Braun, IFPRI, October 2008

Real world cereal prices projected to rise 20-40 percent beyond current levels



Source: IFPRI IMPACT projections, business as usual, IPCC SRESB2 climate scenario, September 2007.; Mark Rosegrant

a. Increase in volume



SOURCE: U.S. Commodity Futures Trading Commission

Ad hoc trade measures add up to policy failures

- **Export bans/restrictions:**
  - Reduce global market size, increase volatility, and harm import-dependent trading partners
- **Categories of speculators:**
  - Governments, farmers, households, small traders
  - Commercial traders
  - Non-commercial traders

In Q1 of 2008 futures & options up by 32%

Virtual grain reserve policies needed

1. **Independent <u>emergency</u> reserve**
   - Supplied by major producing countries, funded by G8+5, managed by WFP

2. **<u>Virtual</u> global reserve**
   - Promissory resources by each participant
   - Guided by high-level technical commission
   - Intervention through futures markets

Source: von Braun and Torero 2008.

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A meal for 4 ?

Loss in Purchasing Power: e.g. in El Salvador

In rural areas of El Salvador households can now buy only 56% of what they used to buy 18 months before with the same amount of money

Source: WFP with data from DIGESTYC, EHPM, 2003 y MAG, División de Información de Mercado, mayo 06- enero 08. Análisis: PMA, El Salvador, 2008.

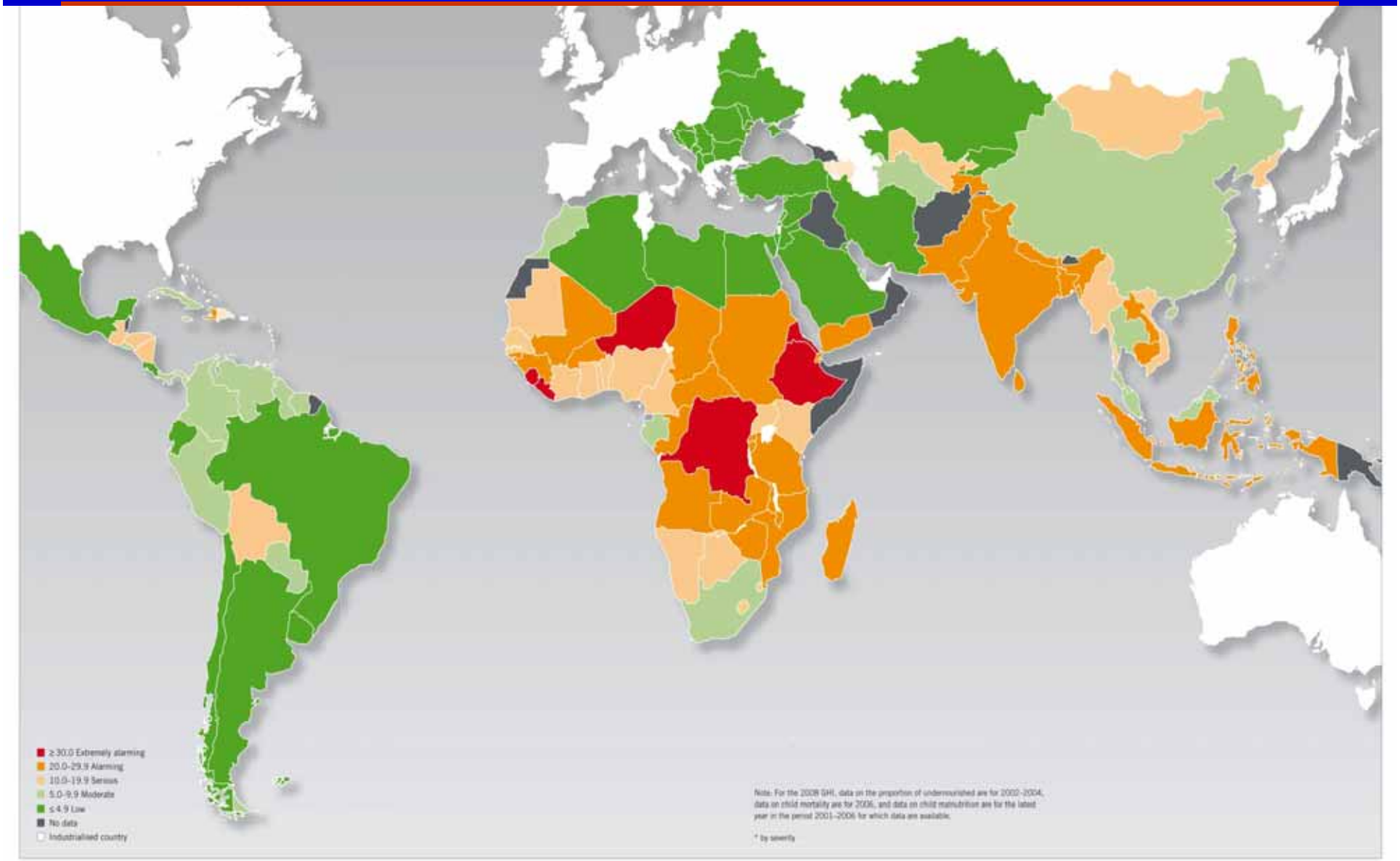
Price is only one aspect of food security: Slow progress in *hunger* reduction

	1990	Most recent*
Proportion of undernourished (%)	18.4	17.0
Underweight in children (%)	28.4	22.5
Under-five mortality rate (%)	9.2	7.1

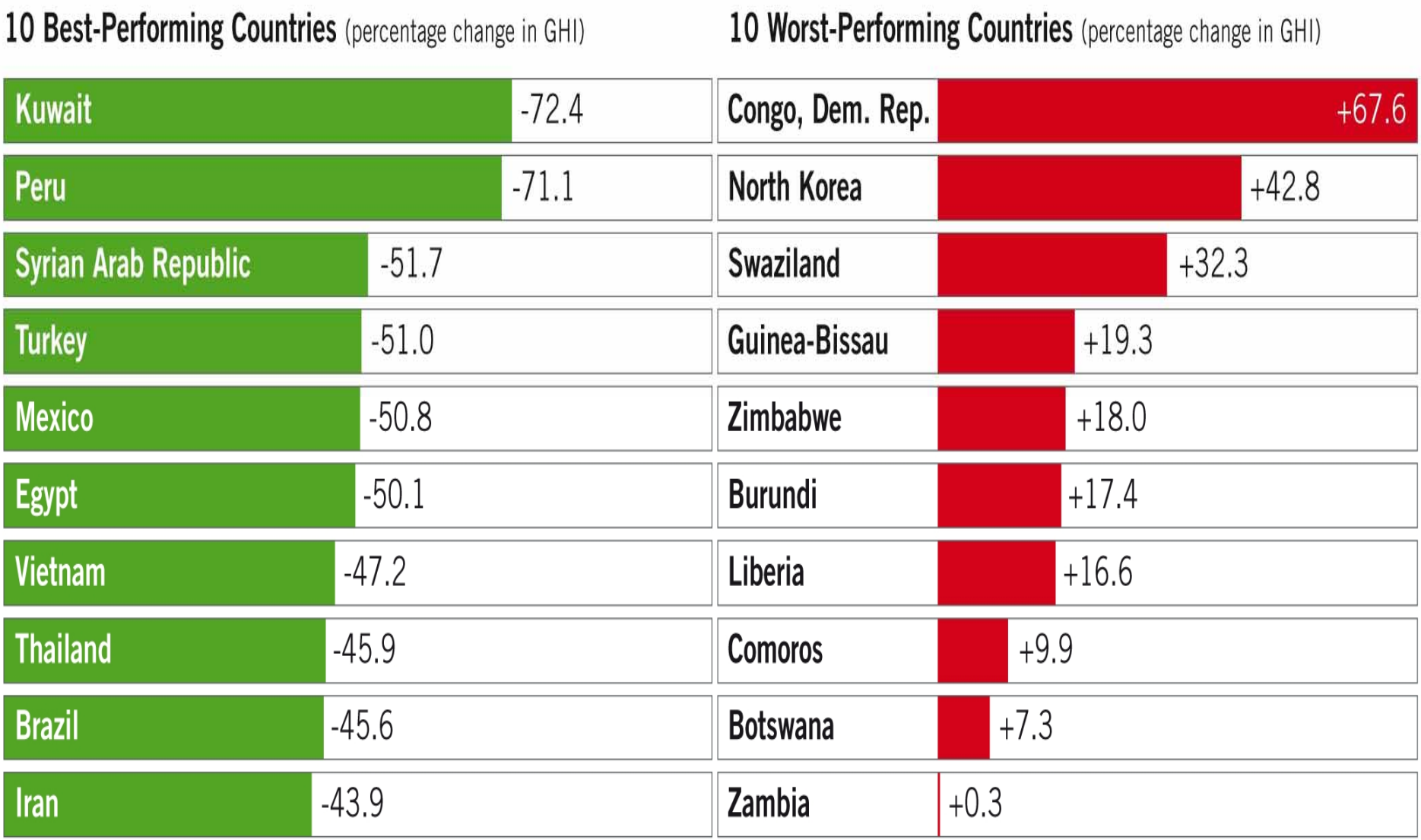
*Undernourishment: 2007
Underweight: most recent year in 2001-2006
Mortality: 2006

Sources: FAO 2006 and 2008, UNICEF 2006, WHO 2008.

2008 Global Hunger Index



GHI-Winners and Losers
1990 - 2008



Impacts of high food prices

Impacts driven by *initial conditions* and *adjustments* in labor, finance, and goods markets

- **A 50% increase in food prices in Bangladesh = 25% more prevalence of iron deficiency in women and children (Bouis 2008)**

- **Other malign effects: withdrawal of girls from school, distress sale of productive assets, etc.**

Nutrition policies

Priority areas:

- **(Conditional) cash transfers**
- **Early childhood nutrition**
- **School feeding**
- **Employment-based food security programs**

Children's nutrition is crucial for their productivity and earnings as adults

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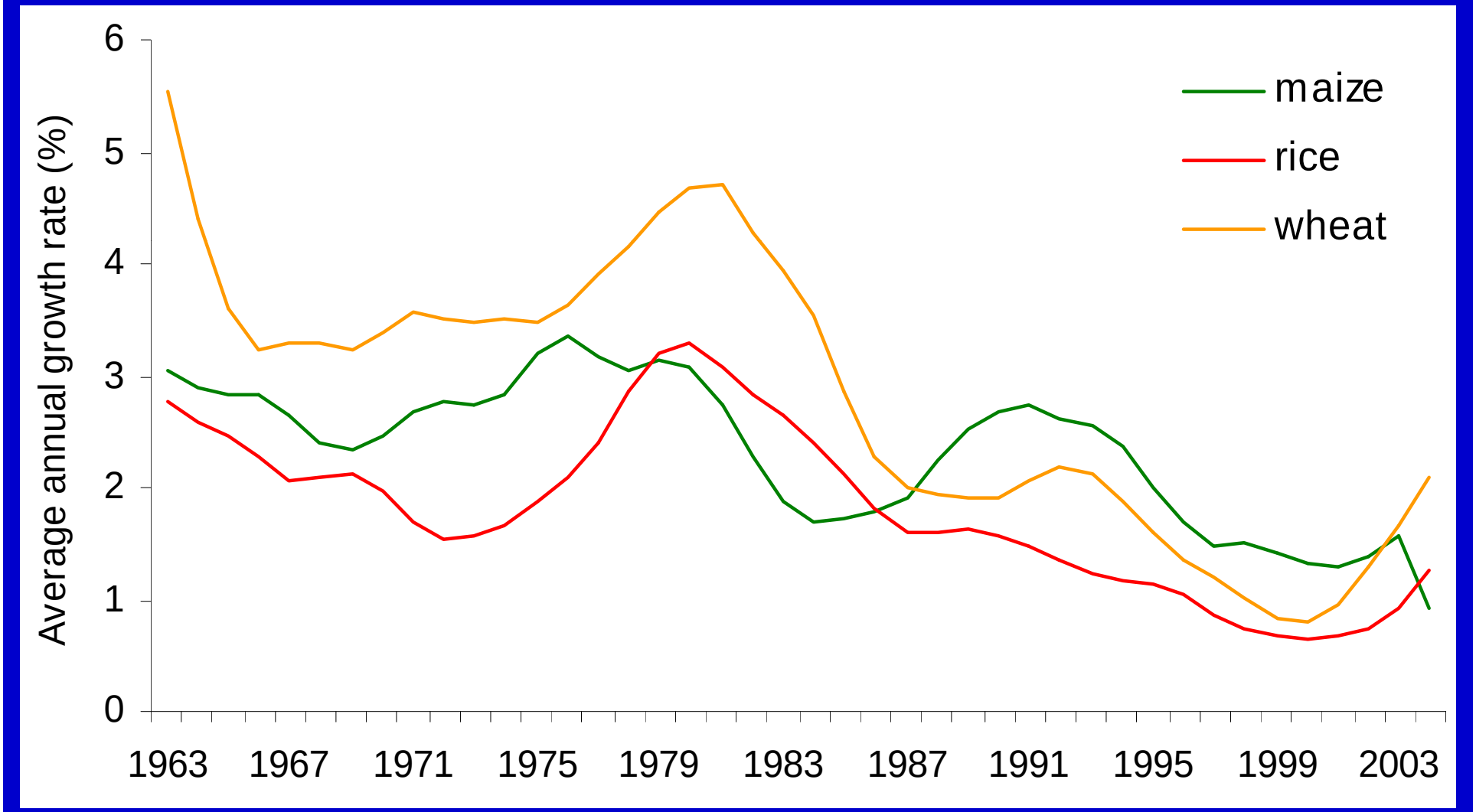
Productivity growth is declining



Source: World Development Report 2008.

Agricultural total factor productivity growth in developing countries

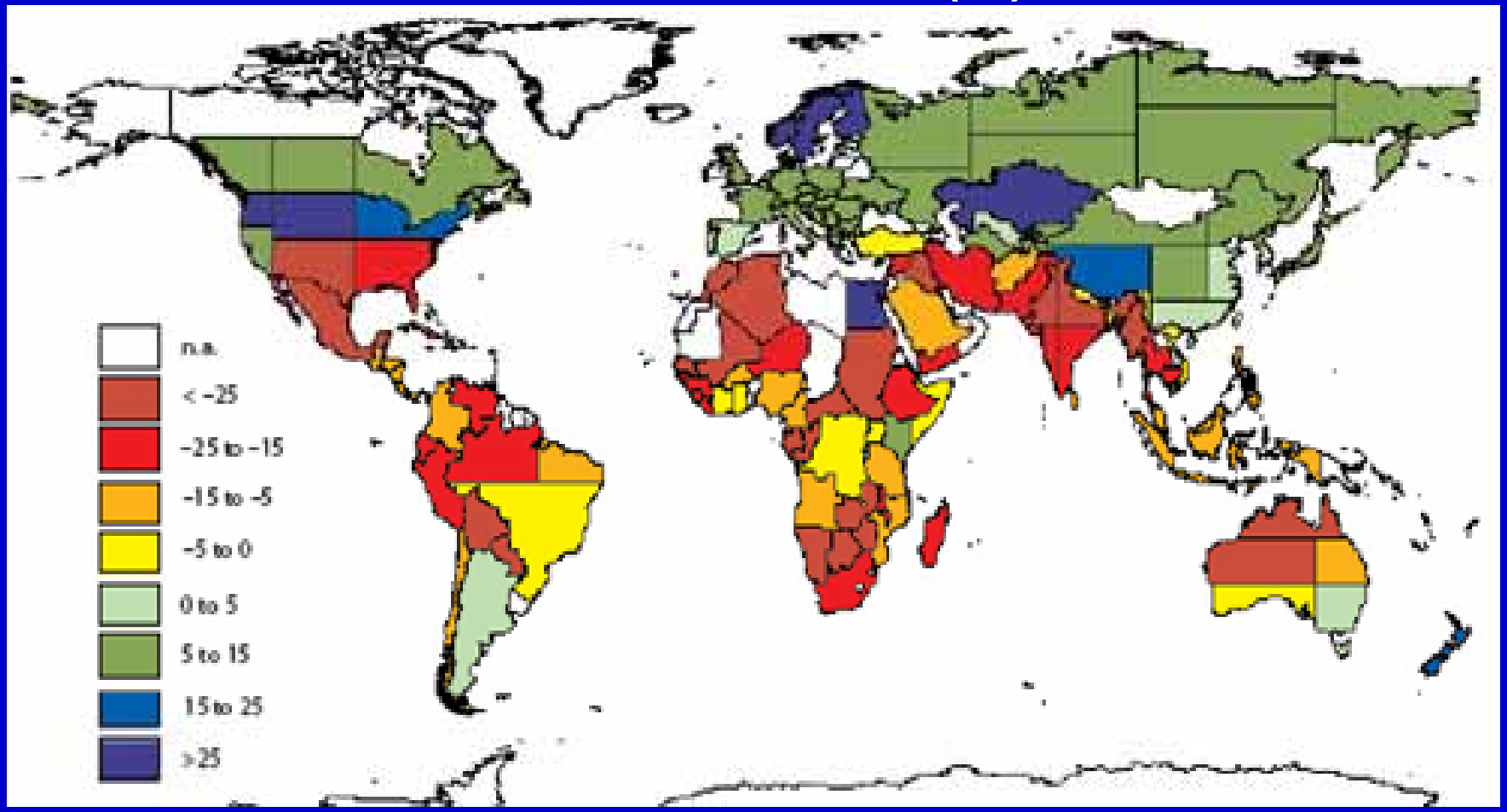
1992-2003

	%
East Asia	2.7
South Asia	1.0
East Africa	0.4
West Africa	1.6
Southern Africa	1.3
Latin America	2.7
NAWA	1.4
AVERAGE	2.1

Source: von Braun et al. 2008.

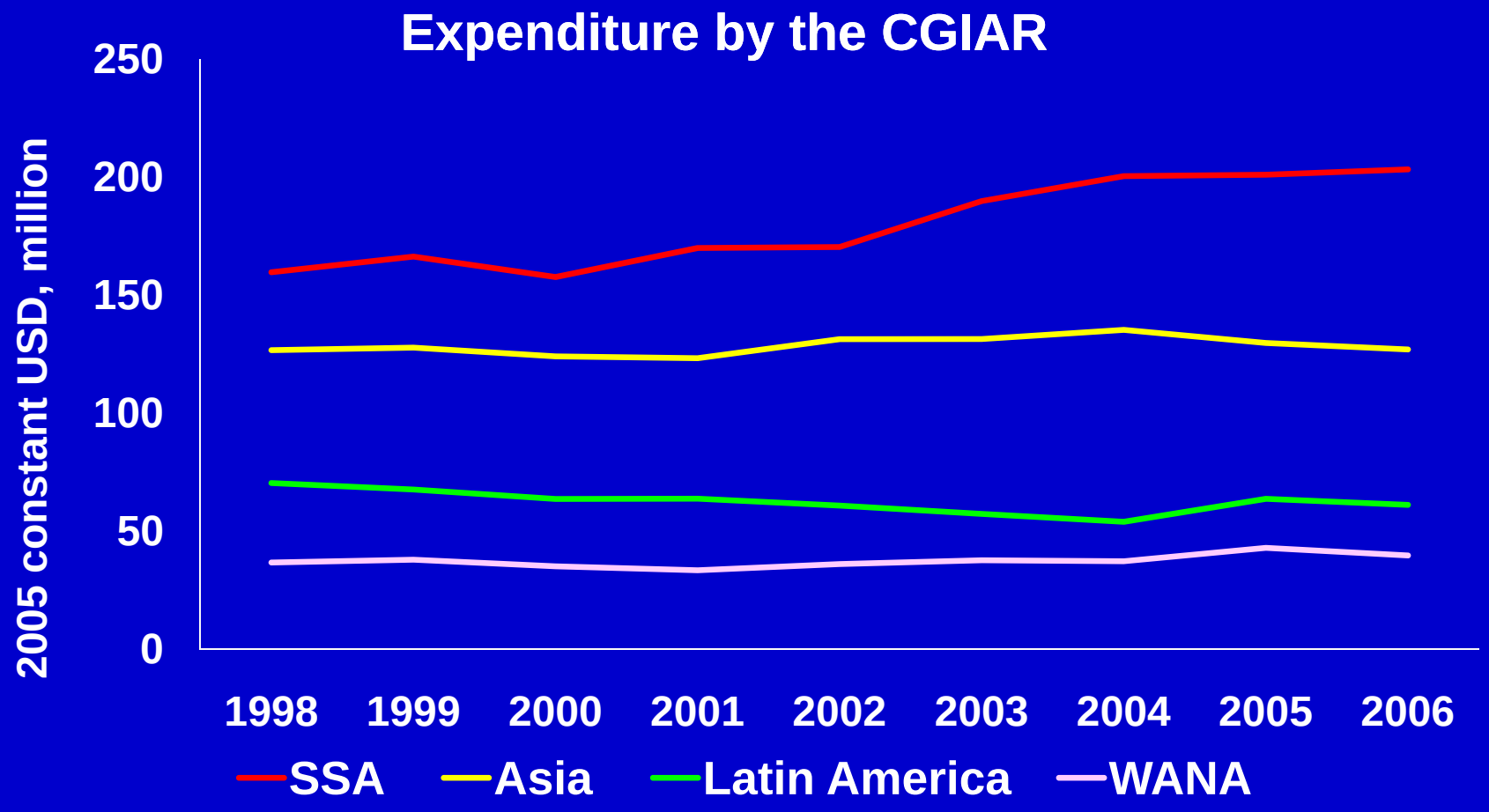
Threats from climate change – and opportunities in the low carbon economy

Climate change impact on agric. production, factoring in carbon fertilization (%)



Source: Cline 2007.

Underinvestment in agricultural R&D



Not enough resources to work at the frontiers of science (nanotech, biotech, etc.)

Source: CGIAR.

Scaling Up R&D Investments

Goal: Reducing risks and maximizing benefits for agricultural growth and food security

- **WHAT investments should be scaled up?**
- **WHERE should investments take place?**
- **HOW MUCH should investment be accelerated?**
- **WHAT RETURNS on investment can be expected?**

Overview

1. Effects of increased international agricultural R&D spending on
   - agricultural production
   - poverty reduction
   - food prices

2. The centers' 14 "best bets" examples for increased investment

Effects of Doubling Agricultural R&D* 1: Allocation for Maximum Output

*CGIAR investment rises from US$0.5 to US$1.0 billion

	R&D allocation (mil. 2005 $)		Δ in # of poor (mil.)	Agr. output growth (% pts.)
	2008	2013	2008-2020	2008-2020
SSA	608	933	-67.2	1.14
S Asia	908	2,131	-95.4	1.78
SE Asia	1,956	5,268	-41.0	2.26
NAf WAs	546	614	-0.2	0.23
L America	957	1,004	-0.2	0.08
TOTAL	4,975	9,951	-203.8	1.55

Source: von Braun, Fan, Meinzen-Dick, Rosegrant, Pratt 2008.

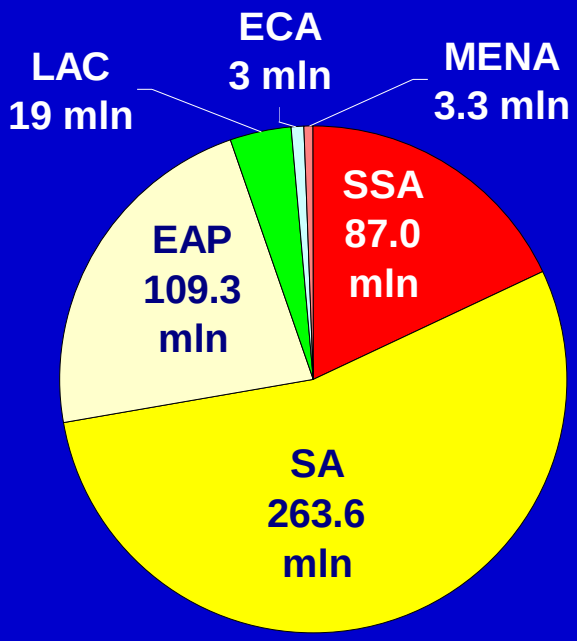
Doubling Agricultural R&D*
2: Allocation for Poverty Reduction

***CGIAR investment rises from US$0.5 to US$1.0 billion**

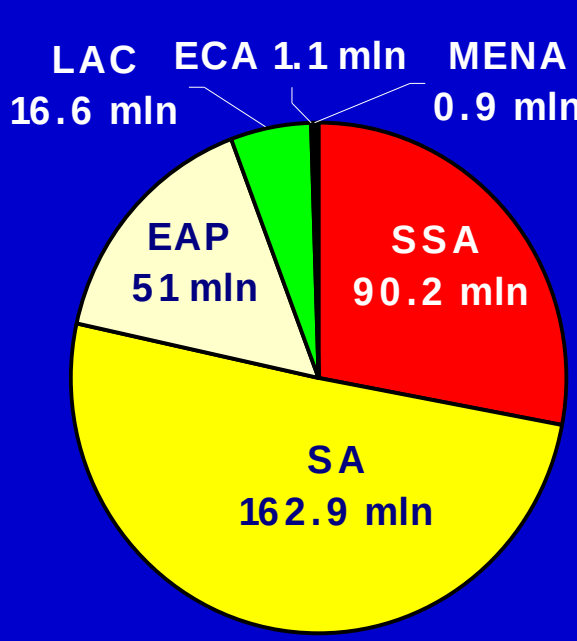
	R&D allocation (mil. 2005 $)		Δ in # of poor (mil.)	Agr. output growth (% pts.)
	2008	2013	2008-2020	2008-2020
SSA	608	2,913	-143.8	2.75
S Asia	908	3,111	-124.6	2.40
SE Asia	1,956	2,323	-13.4	0.69
NAf WAs	546	614	-0.2	0.23
L America	957	990	-0.2	0.07
TOTAL	4,975	9,951	-282.1	1.11

Source: von Braun, Fan, Meinzen-Dick, Rosegrant, Pratt 2008.

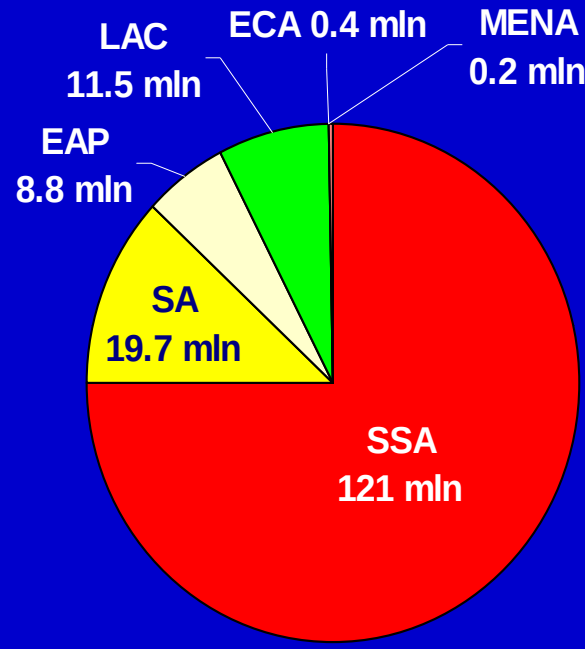
Where the Poor and Ultra Poor Live (2004)



People living on $0.75-$1 a day: 485 million



People living on $0.50-$0.75 a day: 323 million



People living on <$0.50 a day: 162 million

Source: Ahmed et al. 2007.

"Best Bets" for Research Investments
I. Food for People

	Approach	Cost (Mil. US$)	Beneficiaries
1	Revitalizing yield growth in intensive cereal systems of Asia	150	More than 3 billion people
2	Ensuring productive and resilient small-scale fisheries	73.5	32 million people
3	Controlling wheat rust	37.5	2.9 billion people
4	Developing vaccine for East Coast Fever in cattle	10.5	32 million people
5	Developing drought-tolerant maize for Africa	100	320 million people
6	Scaling up biofortification	125	672 million people

"Best Bets" for Research Investments
II. Environment for People

	Approach	Cost (Mil. US$)	Beneficiaries
7	Increasing carbon sequestration and improving livelihoods of forest people	45	48 million people
8	Conducting climate change and adaptation research	127.5	1.2 billion people
9	Combining organic and inorganic nutrients for increased crop productivity	55	400 million people
10	Promoting sustainable groundwater use	24	261 million people

"Best Bets" for Research Investments
III. Innovation for People

	Approach	Cost (Mil. US$)	Beneficiaries
11	Enhancing germplasm exchange	15	Global impact
12	Improving market information and value chains	10.5	45 million people
13	Including women in extension and innovation	30	200 million people
14	Exploiting agriculture-health links to benefit the poor	75	Global impact

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Policies for food security: emergency response and resilience

1. **Markets:** Change biofuel policies; Re-build trust in regional and global trade; virtual reserves; safe value chains

2. **Nutrition:** Expand smart food assistance and invest in protection of the vulnerable

3. **Productivity:** Undertake 1) fast-impact production programs, and 2) scale up agric. investment and innovations that are pro-food security and pro-climate