



Global Food Security:

Facts and Myths

Per Pinstrup-Andersen

IFA-FAO Agricultural Conference
“Global Food Security and the Role
of Sustainable Fertilization”
Rome, March 26-28, 2003



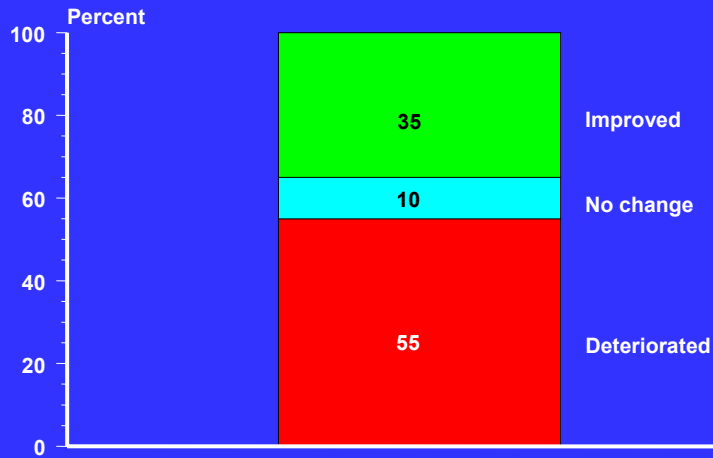
Enough calories for all now and by 2020 (if evenly distributed)

Year	Kcal/person/day
2000	2,800
2020	3,000





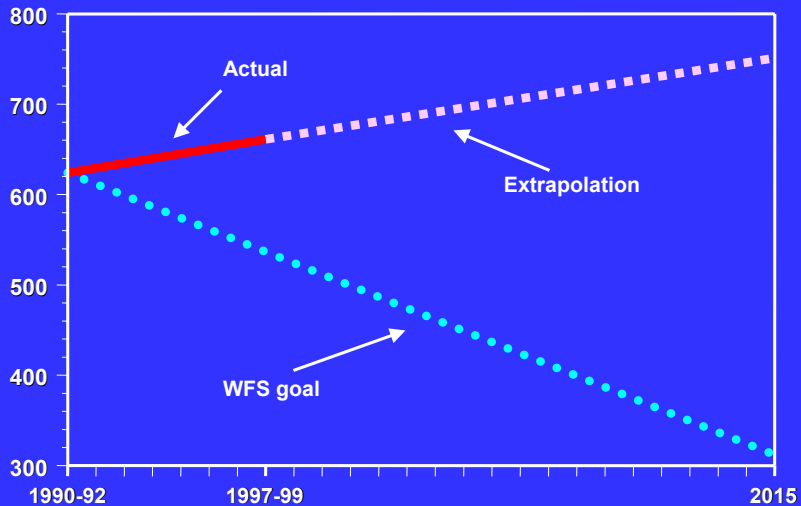
Percent of countries where food security has improved, remained the same, or deteriorated during the 1990s



Source: FAO, *The State of Food Insecurity in the World 2001* (Rome: FAO, 2001)



Number of food-insecure people in all developing countries, except China, trend during the 1990s, Extrapolation to 2015 and WFS goal



Source: Based on data from FAO, *The State of Food Insecurity in the World 2001* (Rome: FAO, 2001).



Driving Forces

- Increasing globalization

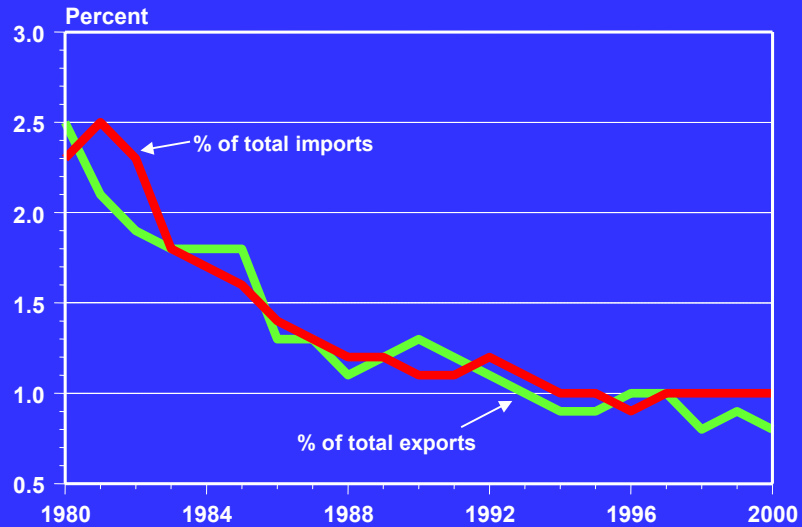


- International trade liberalization
- Integrated capital markets
- Freer flow of labor, information, technology





Share of Sub-Saharan Africa in Global Trade, 1980-2000



Source: <http://apps.fao.org> (2002)



**Seeking trade liberalization
or
Negotiating trade distortions?**





Institutional innovation

- International accountability
- International spillovers



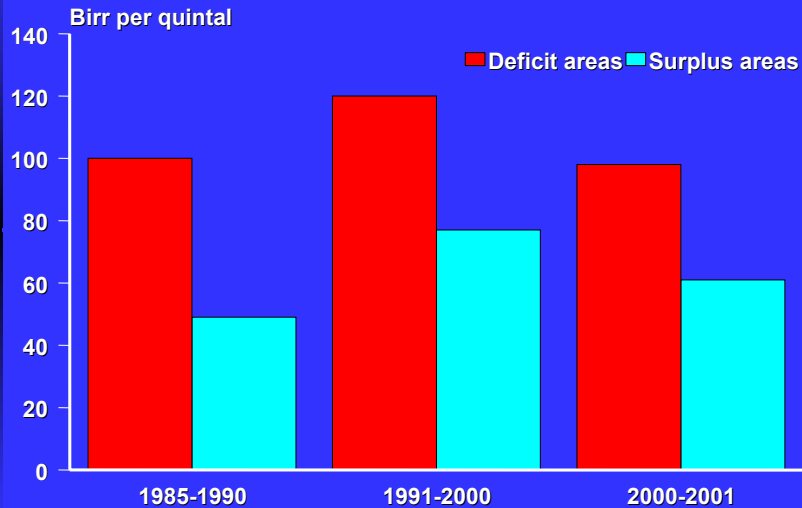
At national level:

- Phase out trade distorting policies
- Investment in public goods and institutions
 - ◆ *Rural infrastructure*
 - ◆ *Markets*
 - ◆ *Research and technology*
 - ◆ *Education and health*
 - ◆ *Coping and risk management*





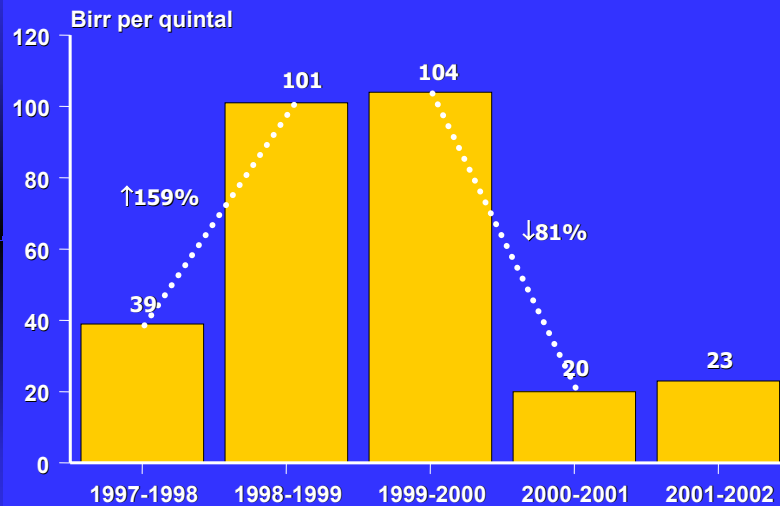
Spatial difference in average maize prices for two deficit and two surplus areas in Ethiopia



Source: Kuma (2002)



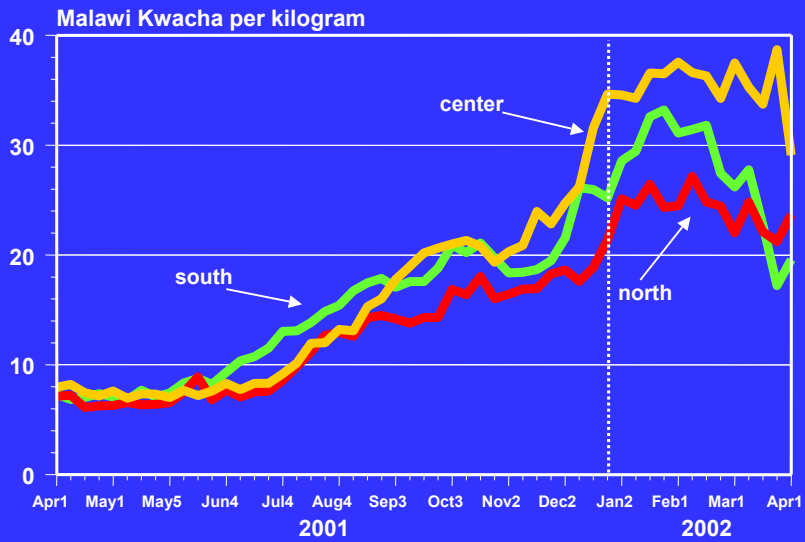
Maize price fluctuations in Jimma Horo district of Ethiopia, 1997-2001



Source: Kuma (2002)



Weekly maize prices in Malawi, April 2001 to April 2002



Source: FEWS NET/Malawi and Ministry of Agriculture and Irrigation, 2002



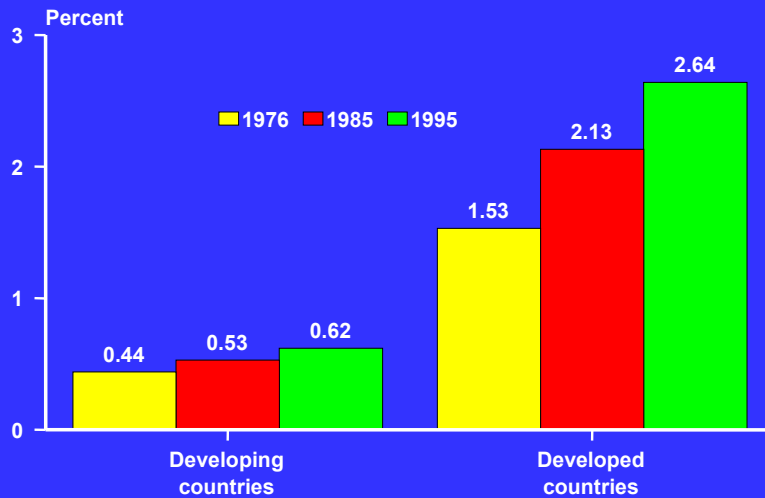
Driving Forces

- Increasing globalization
- Sweeping technological change





Public agricultural research in percent of the value of agricultural production



2020
VISION

Source: P. Pardey and N. Beintema, "Slow Magic: Agricultural R&D A Century After Mendel," for an IFPRI Food Policy Report, draft dated September 4, 2001



Public or private investment?

- The case of the small farmer
 - ◆ *Public goods or inability to pay?*
 - ◆ *The case of Bt-cotton*

2020
VISION



Area planted with Bt cotton in China

1997	2000 hectares
2000	700,000 hectares (20%)
Average farm size <1 hectare	

Source: Jikun Huang et al. (2001).



Pesticide use in cotton in China, 1999

	# of applications	Quantity (kg/ha)	Cost Yuan/ha	Total cost Yuan/kg
Non-Bt cotton	20	61	1,465	4.28
Bt cotton	7	12	261	3.10
Difference (%)	-65	-80	-80	-28

Source: Jikun Huang et al. (2001).





Reported health problems associated with pesticide use on cotton farms in China, 1999

Farms growing:	
Only non-Bt cotton	22%
Both Bt & non-Bt	11%
Only Bt cotton	5%

Source: Jikun Huang et al. (2001).



Public or private investment?

- The case of the small farmer
 - ◆ *Public goods or inability to pay?*
 - ◆ *The case of Bt-cotton*
- Informed debate
- Biosafety
- IPR
 - ◆ *Developing countries and TRIPS*
 - ◆ *Public research institutions*





Driving Forces

- Increasing globalization
- Sweeping technological change
- Degradation of natural resources



- Soils
- Forests
- Marine fisheries and aquaculture
- Water
- Energy
- Pesticides and fertilizers
- A focus on less-favored areas





- **Are higher yields good or bad for the environment?**
- **Resource substitution and sustainability**



Driving Forces

- **Increasing globalization**
- **Sweeping technological change**
- **Degradation of natural resources**
- **Climate change**





- **Source or sink?**
- **Management of risk and uncertainty**



Driving Forces

- **Increasing globalization**
- **Sweeping technological change**
- **Degradation of natural resources**
- **Climate change**
- **Structural change**





- **Is the small farm in developing countries viable?**
- **Is the rapid production and market concentration in the U.S. in society's best interest?**



Driving Forces

- **Increasing globalization**
- **Sweeping technological change**
- **Degradation of natural resources**
- **Climate change**
- **Structural change**
- **Changing consumer behavior**





- **Population growth**
- **Income change**
- **Price change**
- **Urbanization**
- **Food safety**
- **Organic foods**
- **Natural foods**
- **Locally-produced foods**
- **Identity preservation**



- **Labeling for content and process?**
- **The political consumer**
- **The power of promotion**





Driving Forces

- Increasing globalization
- Sweeping technological change
- Degradation of natural resources
- Climate change
- Structural change
- Changing consumer behavior
- Health crises



- HIV/AIDS
- Malaria
- Tuberculosis (TB)
- Micronutrient deficiencies
- Obesity and chronic diseases





HIV/AIDS in Sub-Saharan Africa

Life expectancy 62 → 47 years

Average prevalence 9%

Seven countries > 20%

Source: Piot and Pinstrup-Andersen (2002)



- **Health care costs**
- **Labor shortages**
- **Declining asset base**
- **Disintegrating households**





Driving Forces

- Increasing globalization
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- Degradation of natural resources
- Climate change
- Structural change
- Changing consumer behavior
- Health crises
- Rapid urbanization



Developing countries by 2020:

- Urban population doubled
- Rural population up 4 percent





Driving Forces

- Increasing globalization
- Sweeping technological change
- Degradation of natural resources
- Climate change
- Structural change
- Changing consumer behavior
- Health crises
- Rapid urbanization
- Accelerated instability and conflict



- **Hunger ⇔ Conflict**
- **Hopelessness ⇒ instability, terrorism**
- **Poverty and inequality both important**





Driving Forces

- Increasing globalization
- Sweeping technological change
- Degradation of natural resources
- Climate change
- Structural change
- Changing consumer behavior
- Health crises
- Rapid urbanization
- Accelerated instability and conflict
- Changing roles



- **State:** *governance, public goods, accountability*
- **Market:** *strengths and weaknesses*
- **NGOs:** *opportunities and accountability*
- **Private sector:** *opportunities and accountability*

