



# Poverty, Climate Change, Rising Food Prices, and the Small Farmers

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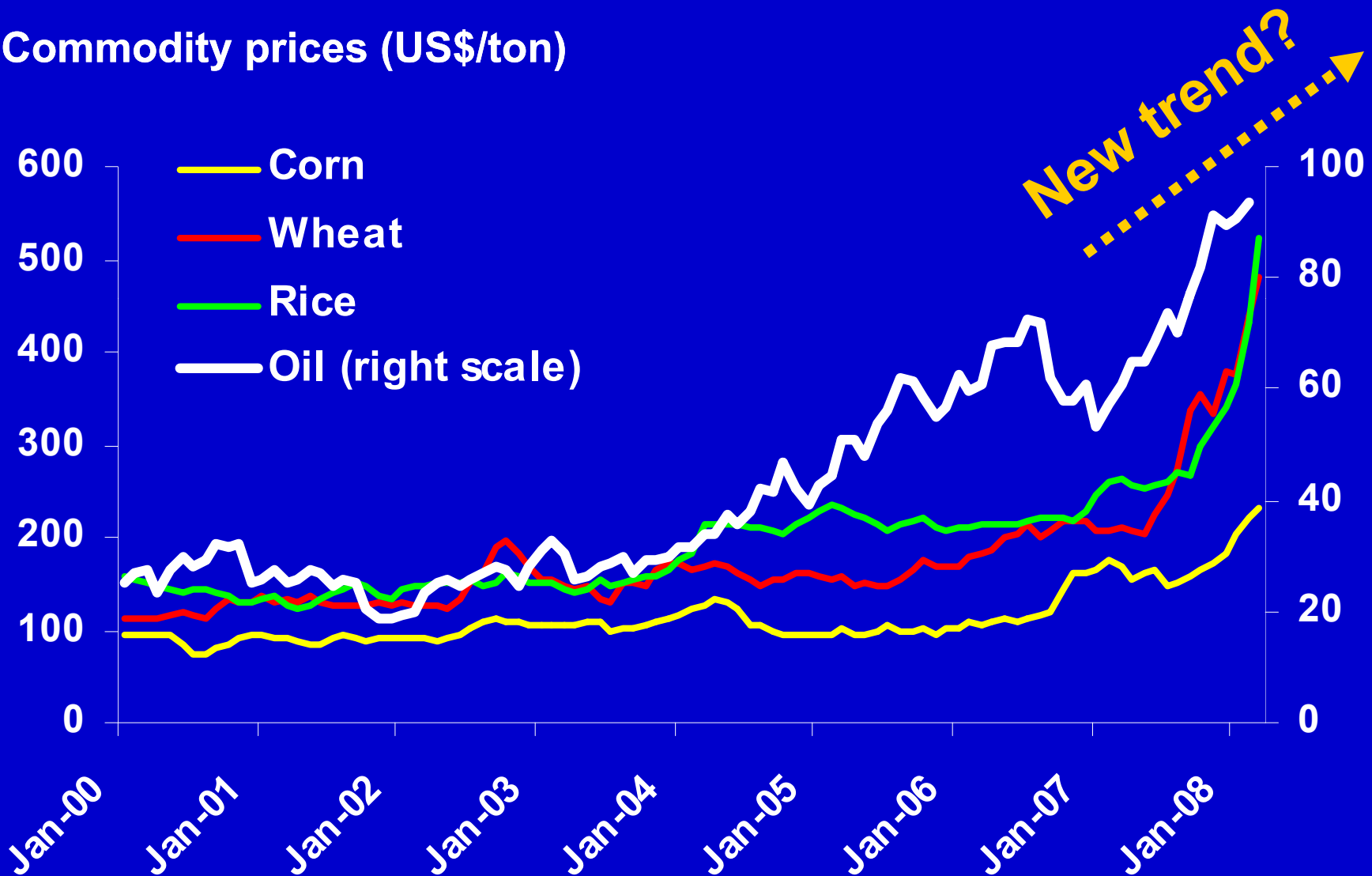
Rome, April 22, 2008

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# Price developments and causes

# The new situation: Surge in prices

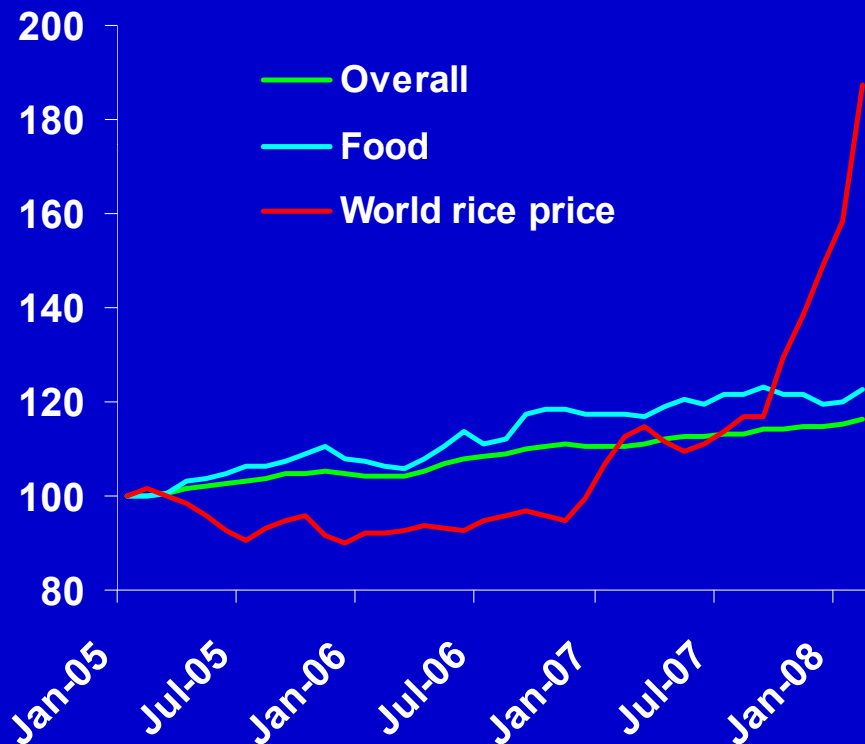
Commodity prices (US\$/ton)



# India and China: World vs. domestic prices

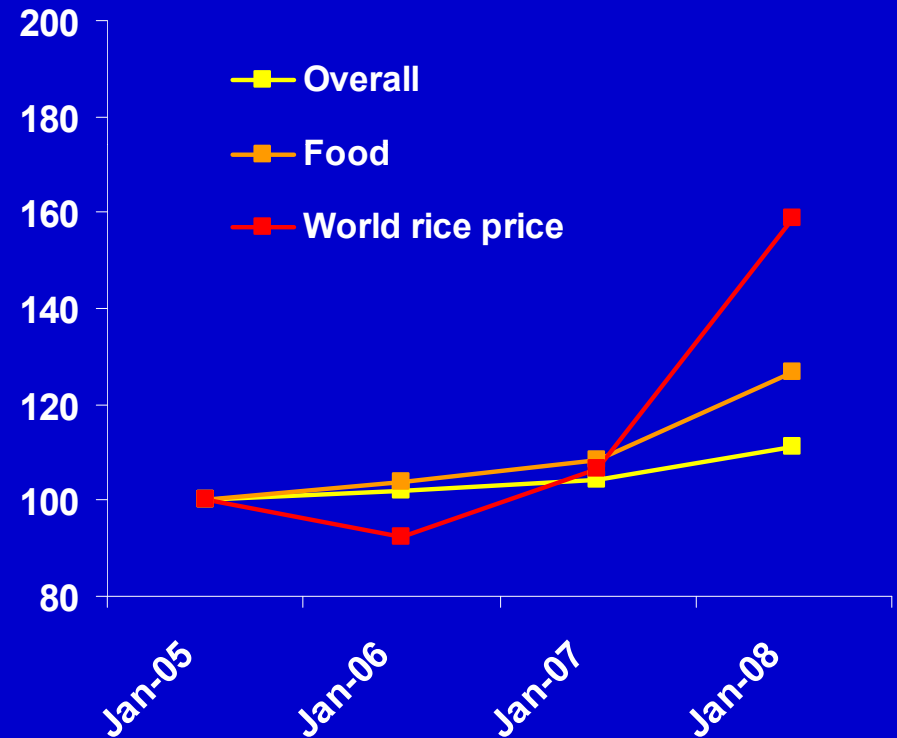
## India

January 2005 = 100



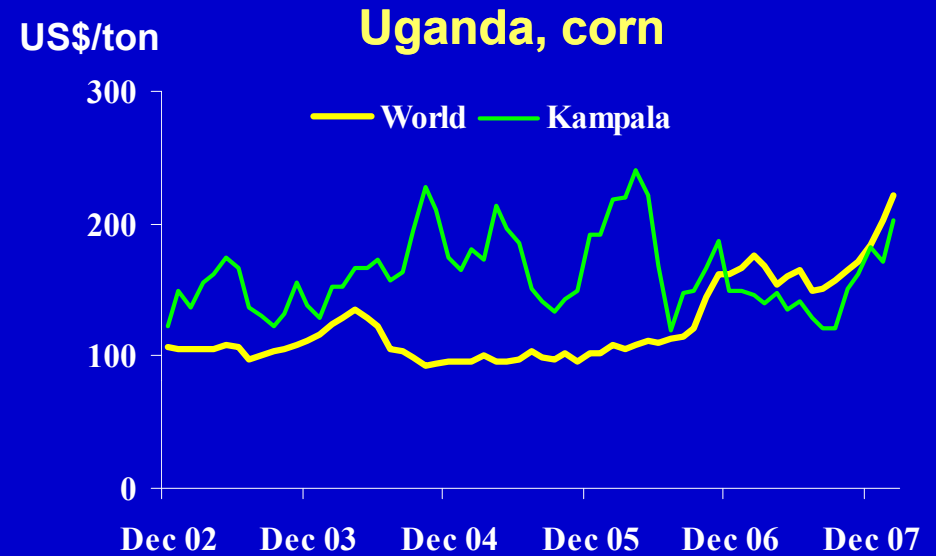
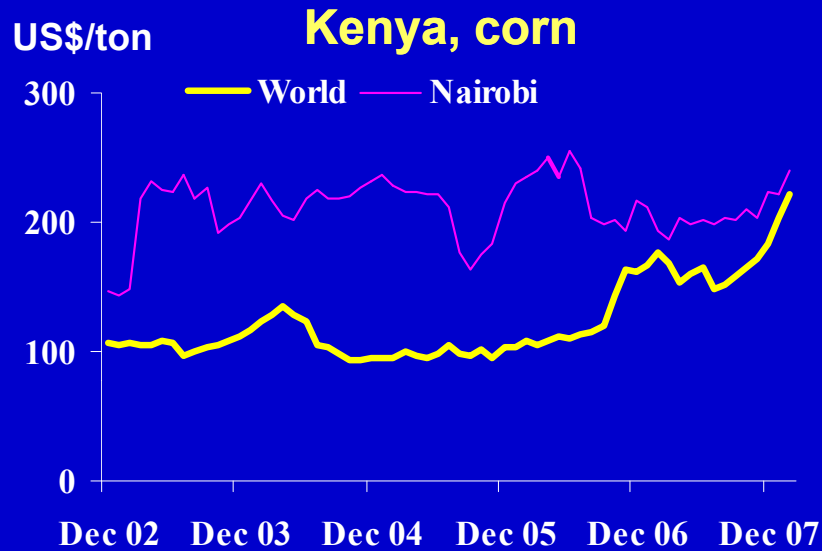
## China

January 2005 = 100



Source: Data from Reserve Bank of India 2008, National Bureau of Statistics of China 2008 and FAO 2008.

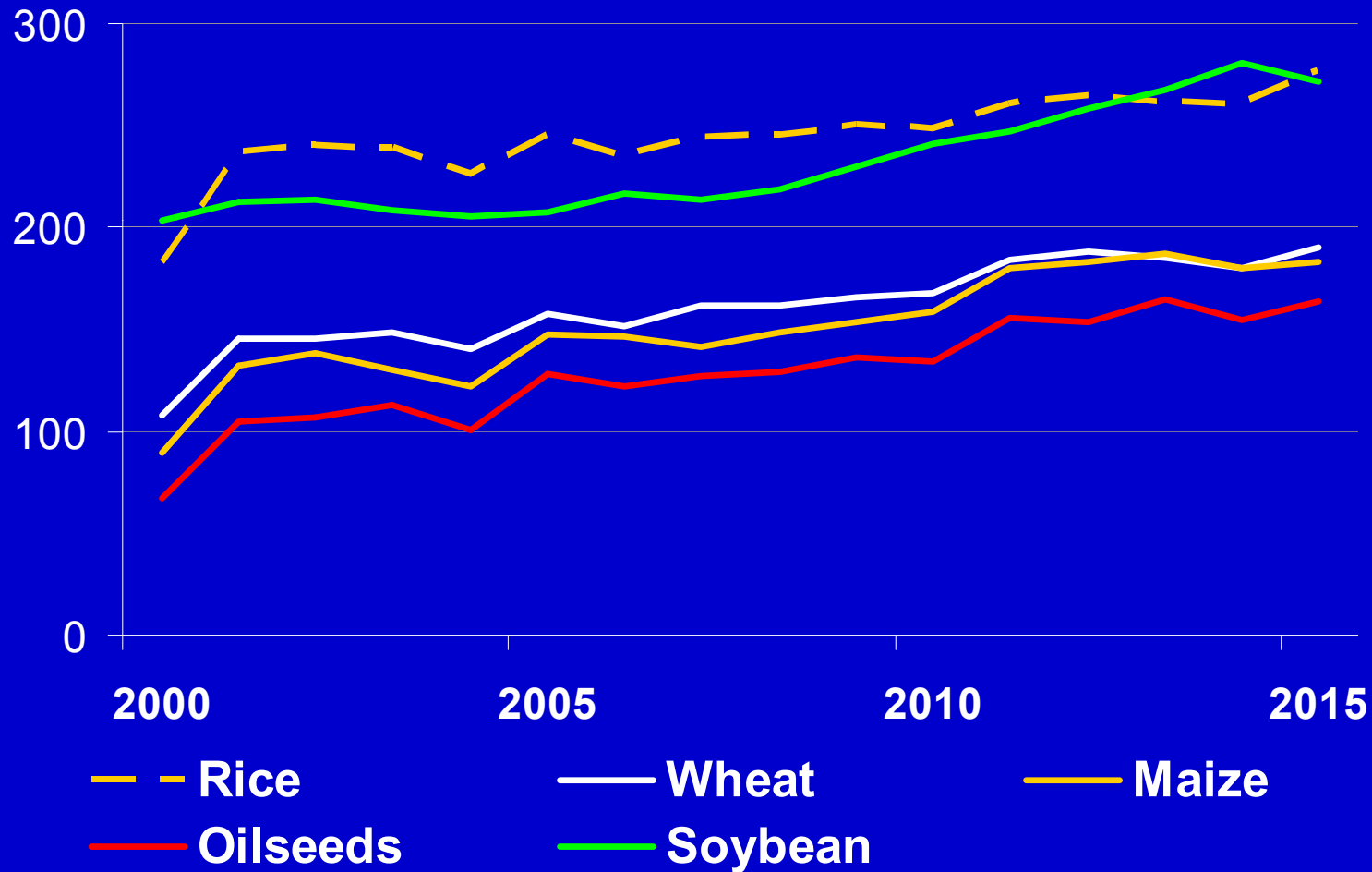
# World prices reach into East African countries



# IFPRI's scenarios

[Models for changes in structural supply and demand factors  
(2000-05 and 2006-15)]

US\$/ton



# Food price related protests 2007-2008

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- |    |               |    |                |
|----|---------------|----|----------------|
| 1  | Argentina     | 14 | Jordan         |
| 2  | Bangladesh    | 15 | Madagascar     |
| 3  | Burkina Faso  | 16 | Malaysia       |
| 4  | Cameroon      | 17 | Mauritania     |
| 5  | China         | 18 | Mexico         |
| 6  | Cote d'Ivoire | 19 | Morocco        |
| 7  | Egypt         | 20 | Mozambique     |
| 8  | Ethiopia      | 21 | Pakistan       |
| 9  | Guniea        | 21 | Philippines    |
| 10 | Haiti         | 22 | Senegal        |
| 11 | Honduras      | 23 | United Kingdom |
| 11 | India         | 24 | Uzbekistan     |
| 12 | Indonesia     | 25 | Yemen          |
| 13 | Italy         |    |                |

# **Summing up: causes of imbalances and volatility in the world food equation**

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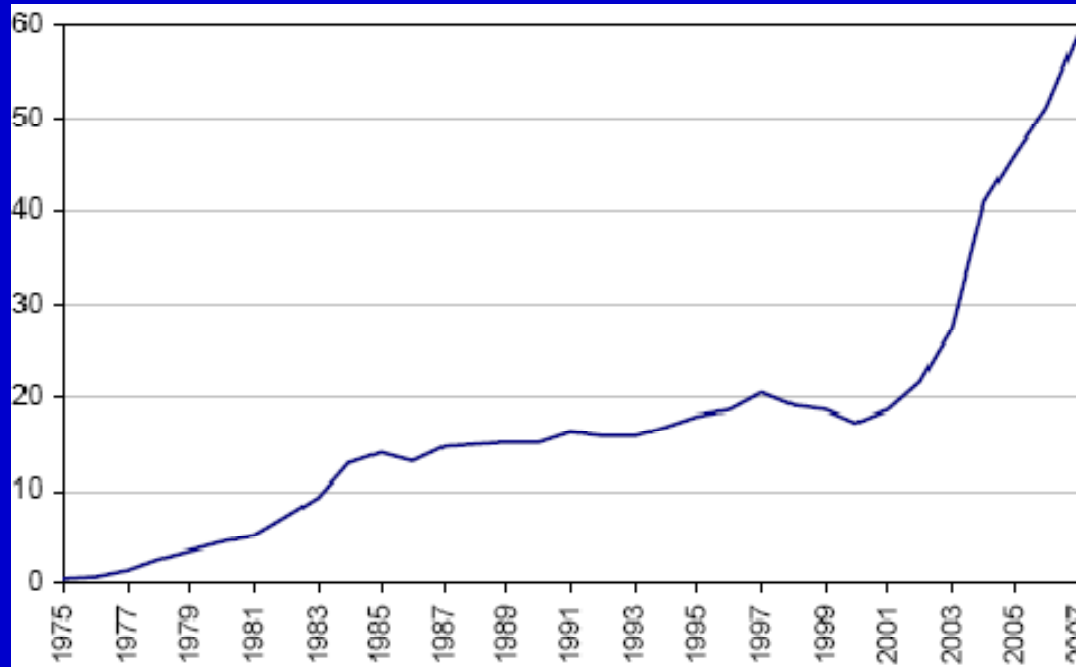
- 1. Income growth**
- 2. Biofuels\***
- 3. Lack of supply response\***
- 4. Low stocks and trade policy\***
- 5. Climate shocks\***
- 6. Population growth**

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# Biofuels

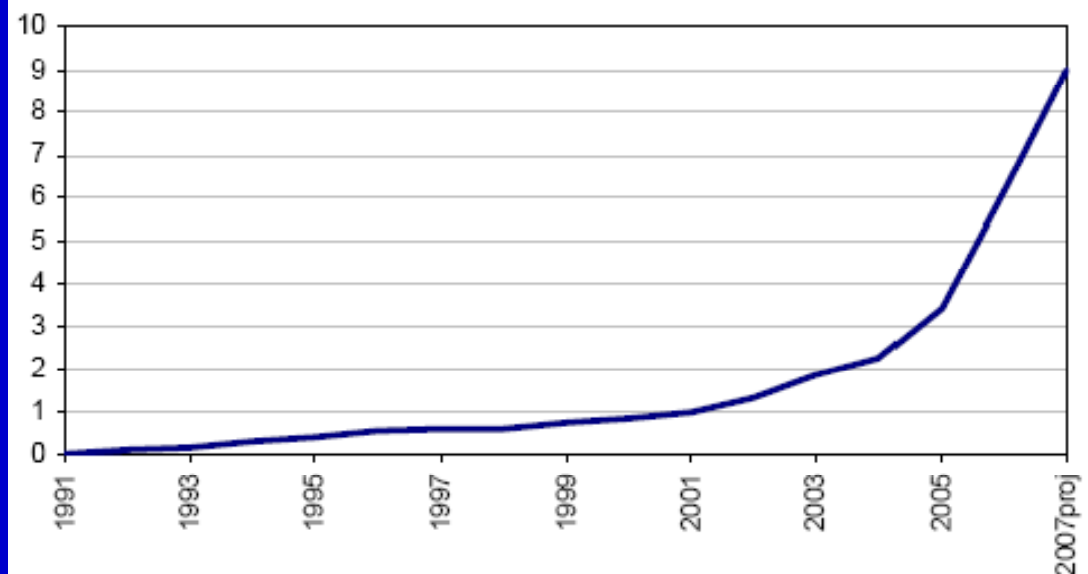
# The biofuels boom

Ethanol production 1975 - 2007 (billion liters)



**Ethanol** > 90% of biofuel production; Brazil and US dominate the market

Biodiesel production 1991 - 2007 (billion liters)



**Biodiesel:** EU is the largest producer and consumer

Source: Global Subsidies Initiative 2007

# Biofuels: fundamental change in world food price determination

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Energy prices always affected agricultural prices through inputs, i.e. P of fertilizer, pesticides, irrigation, transport

Now, energy prices also affect agricultural output prices strongly via opportunity costs

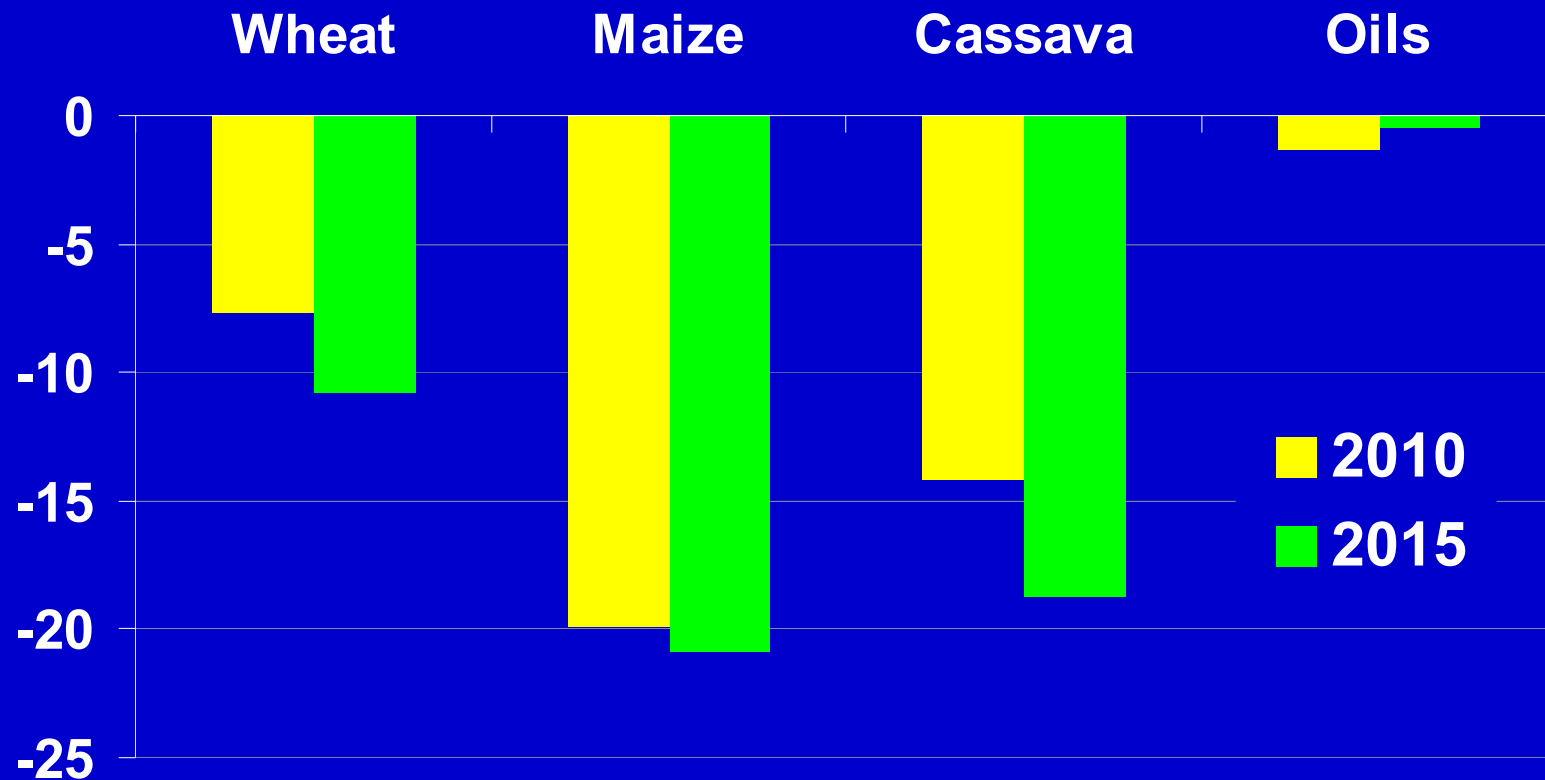
Large and elastic energy demand creates price floors and price bands for agricultural commodities

# Corn breakeven prices for ethanol (2007)

Crude oil (\$bbl)	w/o ethanol subsidy (\$/bu)	w/ ethanol subsidy (\$/bu)
20	<0	1.50
40	0.96	2.56
60	2.01	3.62
80	3.08	4.68
100	4.14	5.74
120	5.20	6.81

# World price changes: 2008 biofuels moratorium on food crop use compared to baseline

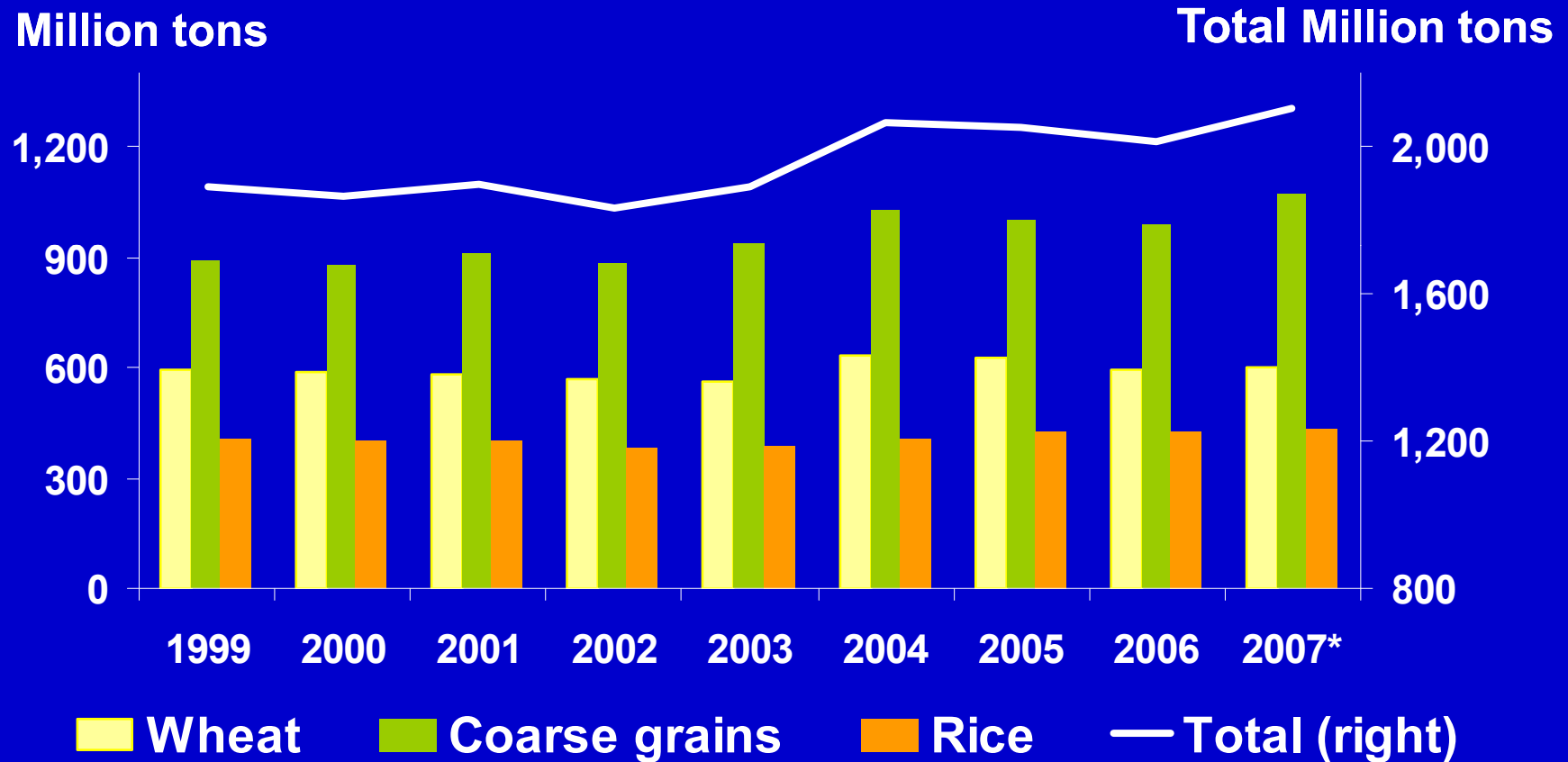
% change



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# Lack of production response

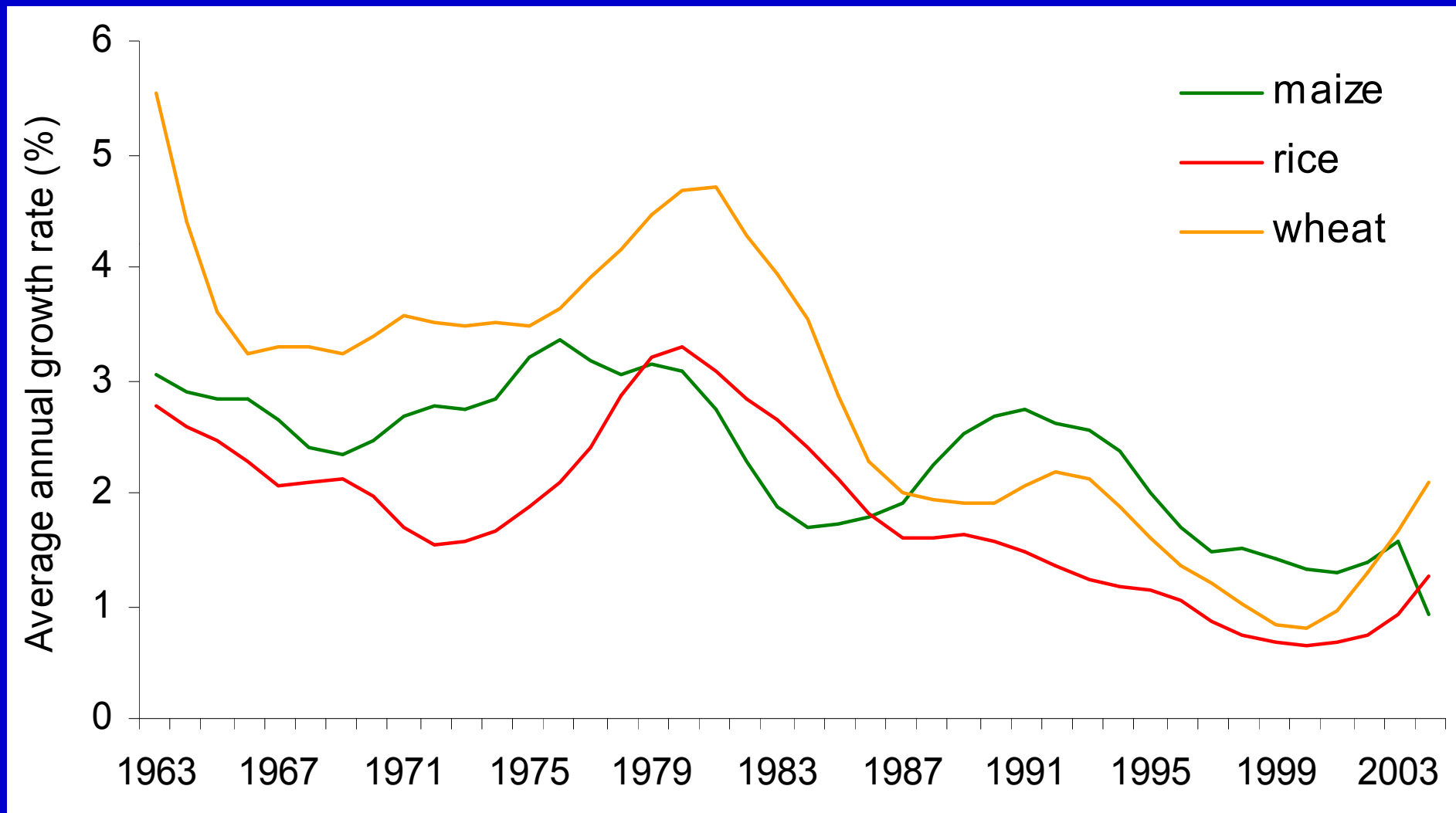
# World cereal production: Not growing enough



Source: Data from FAO 2003, 2005-08.

\* Forecast.

# Productivity growth is declining



# R&D investment in developed countries is too low

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Annual growth rates in public agricultural  
research spending (% per year)

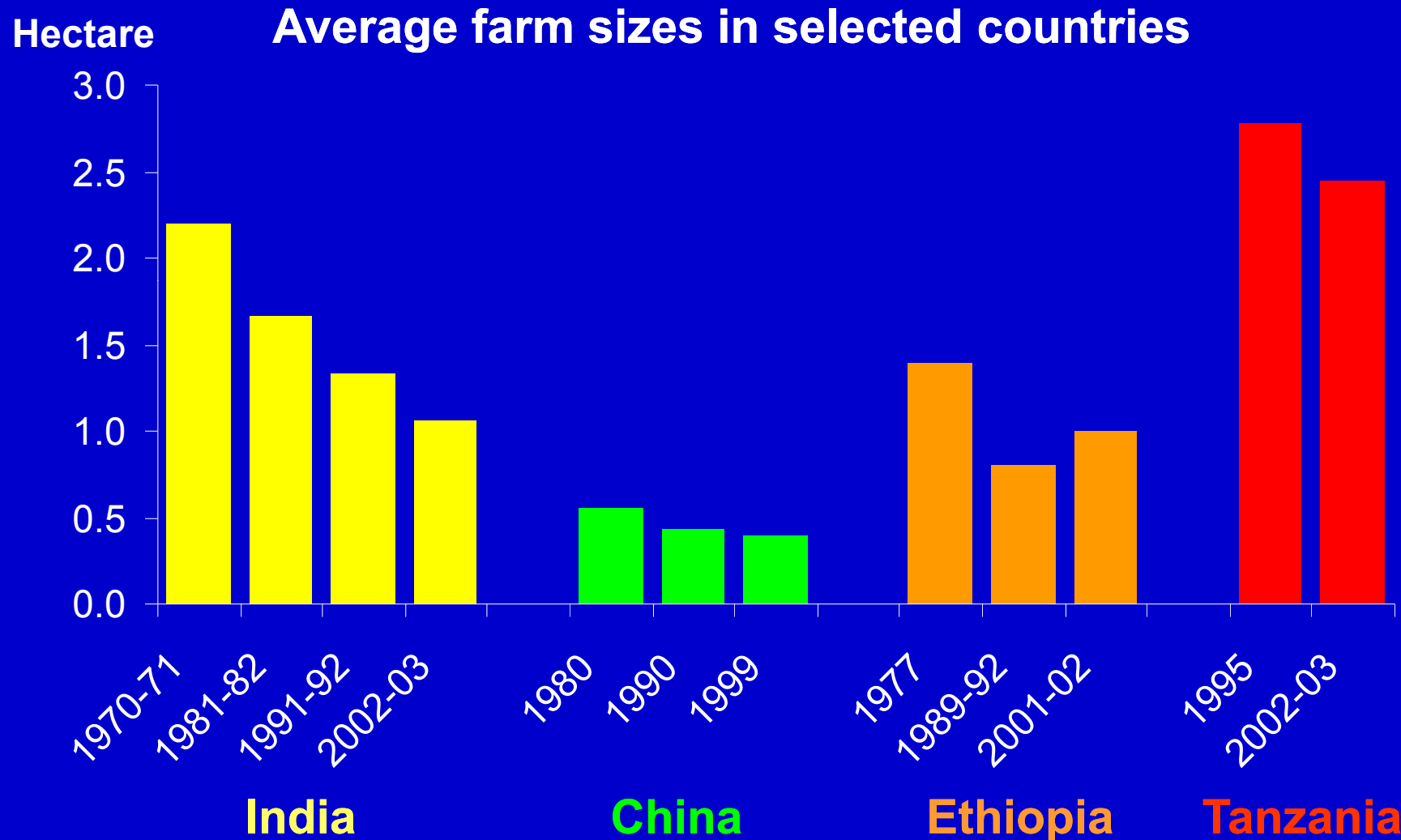
	1991-2000
China	5.0
All developing countries	2.9
All developed countries	-0.6

# Majority of the world's farms are small

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Farm size (ha)	% of all farms	Number of farms (millions)
<b>&lt; 2</b>	<b>85</b>	<b>451</b>
2 - 10	12	62
10 - 100	2.7	14
> 100	0.6	3
Total	100	530

# And average farm sizes are smaller



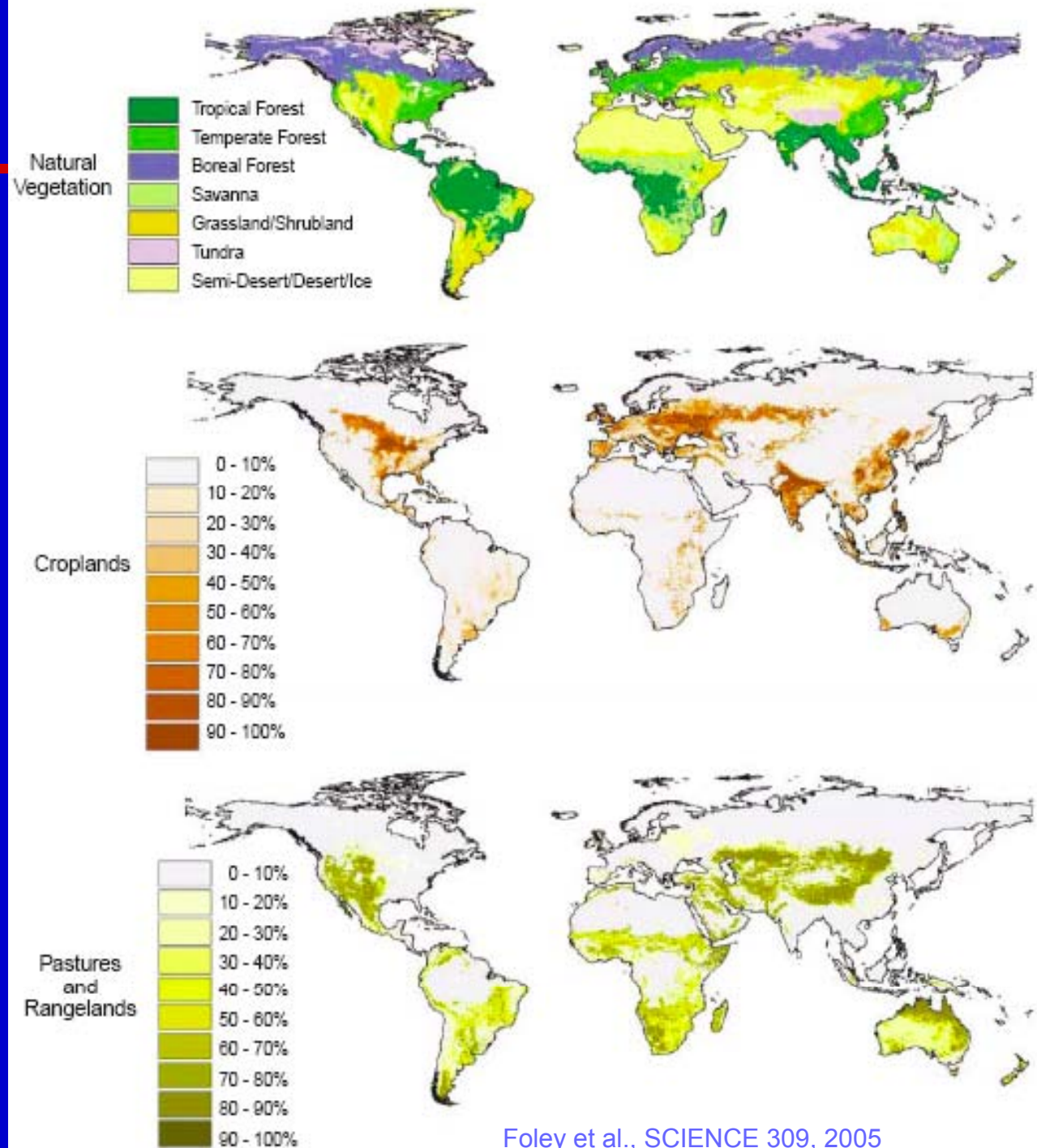
Sources: Fan and Chan-Kang 2003, FAO Agricultural World Census and Indiastat.

# Competition for land

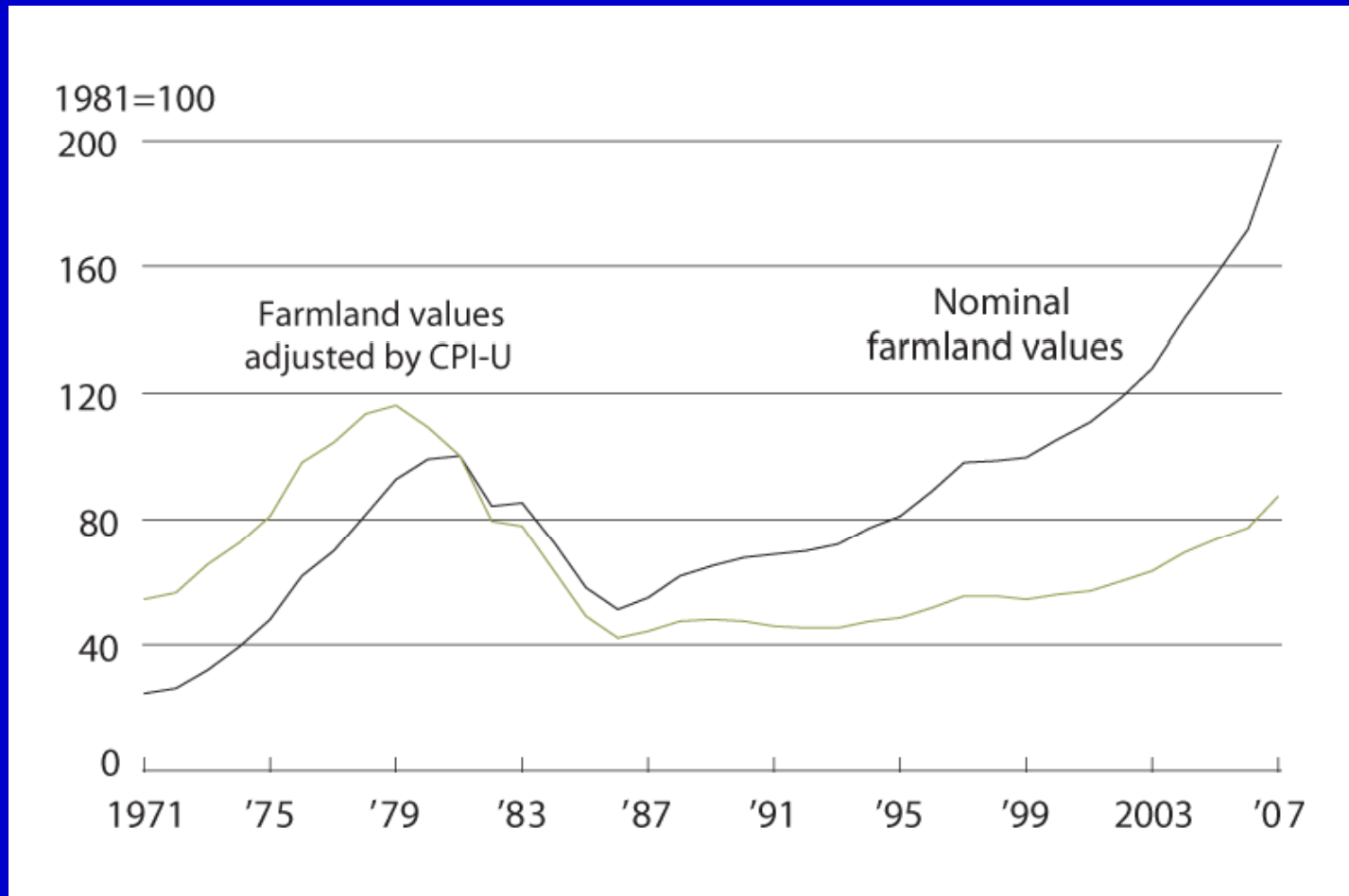
Field and pastures: ~40%

Forests: ca. 10 million km<sup>2</sup>  
(~ 20%)

Cities, roads:  
2%

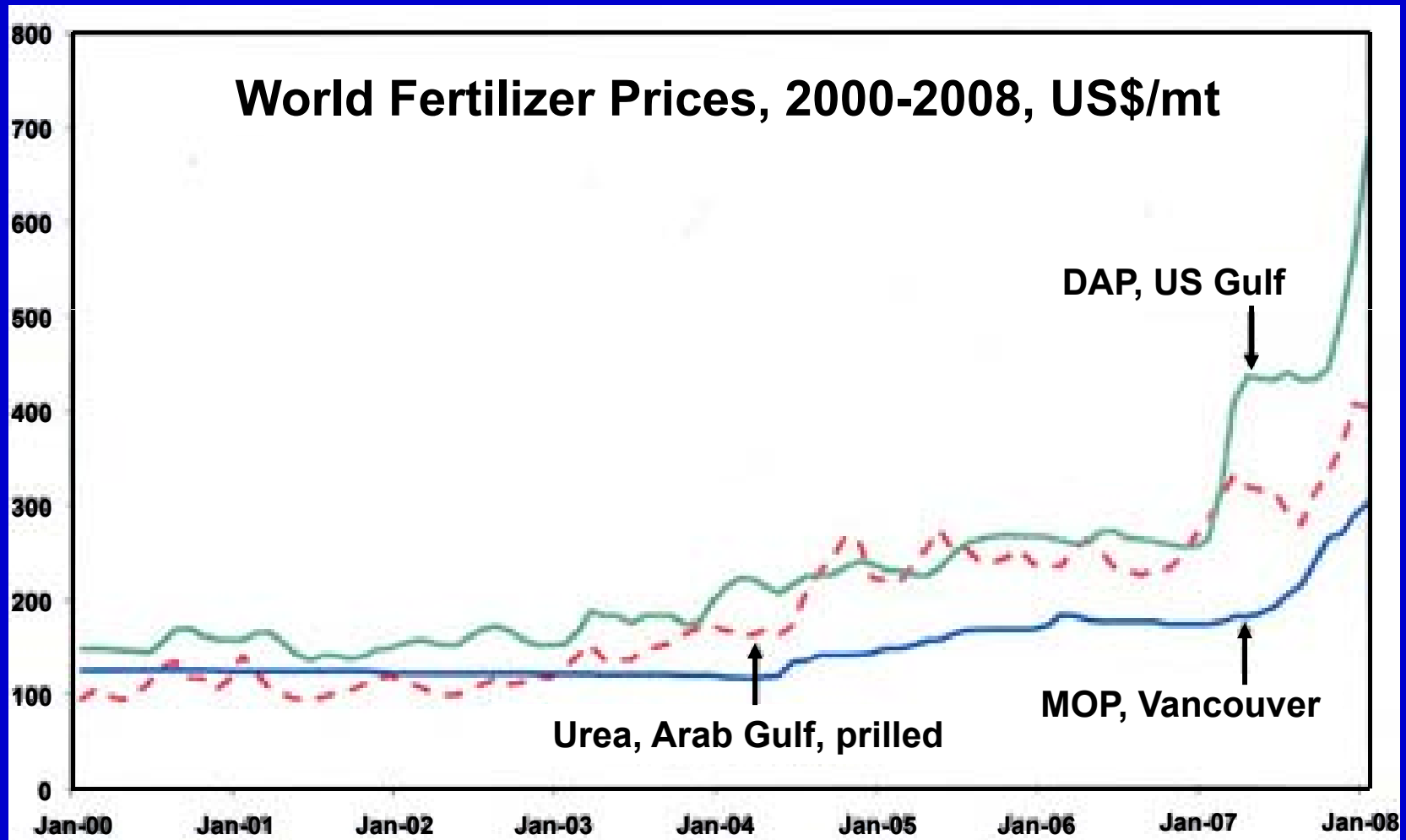


# Rising farmland values (US Midwest)



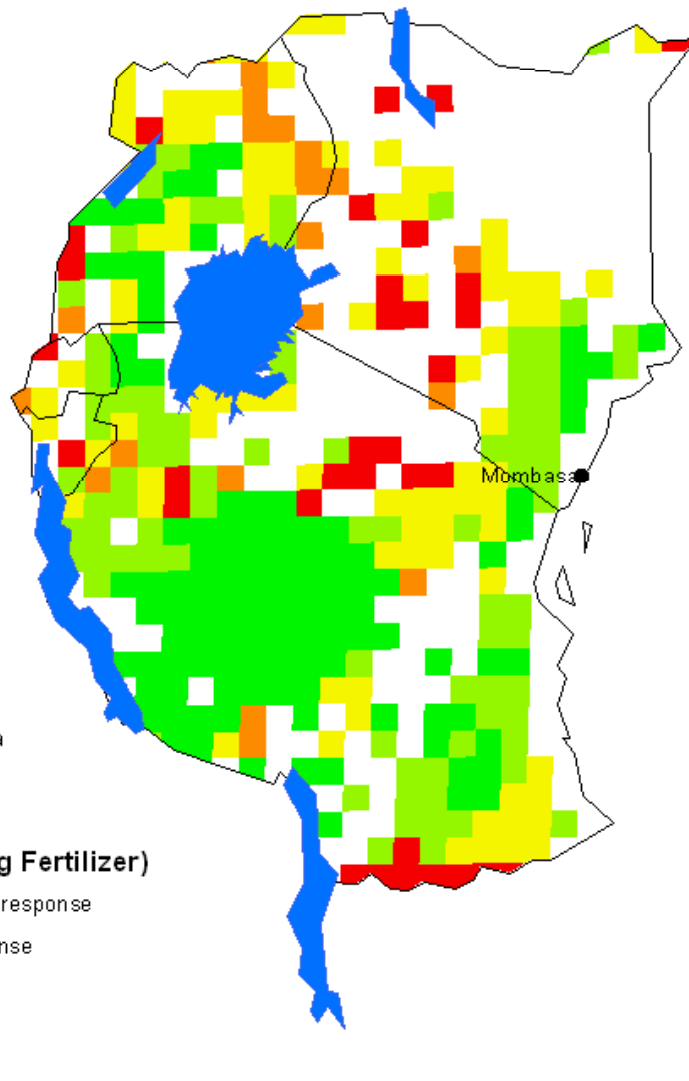
**Annual increase in 2007 (+16 %) largest in 30 yrs**

# Higher input costs: Global fertilizer prices tripled in 2007

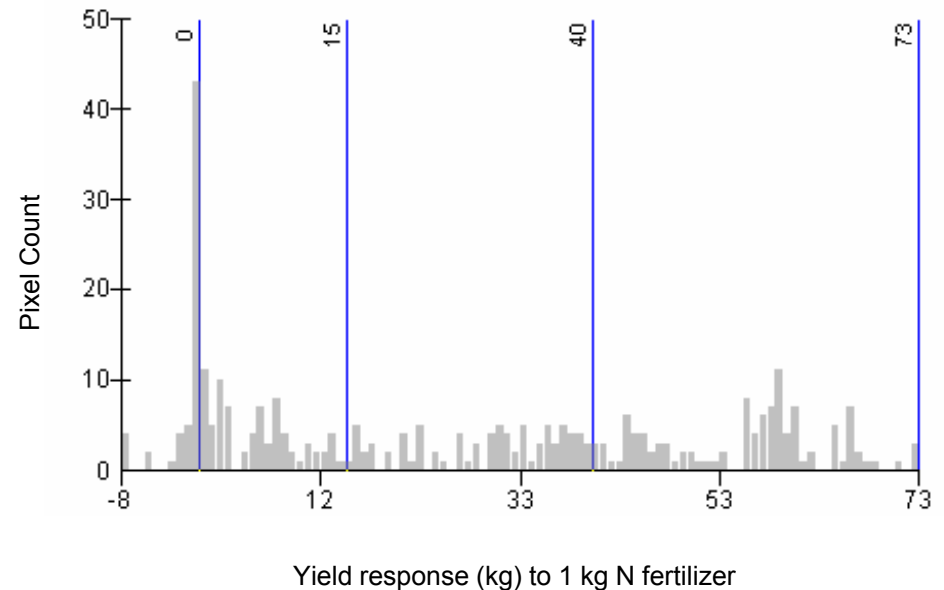


# Expanding supply: High maize yield response to increased fertilizer use

Yield Response to 1 kg N fertilizer



Distribution of Maize Yield Response to N application



**Increased fertilizer use can significantly raise productivity growth in smallholder agriculture**

Source: Harvest Choice, IFPRI.

## **Poor small farmers are hard hit with increasing input and marketing costs**

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- **Marketing costs in SSA are up to 70% of crop retail values reducing the effective price farmers receive for their products**  
(Minot and Hill 2007)
- **Transport costs represent 50 to 60% of total marketing costs in Benin, Madagascar and Malawi**  
(Fafchamps et al. 2005)

# **Expanding supply: High returns to roads and irrigation investments**

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## **Bangladesh** - improvement in rural feeder roads:

- reduced transport costs by 36 to 38%
- lowered fertilizer prices by 45 to 47%
- Increased staple crop prices by 3 to 5%
- Increased per capita expenditure by 11%

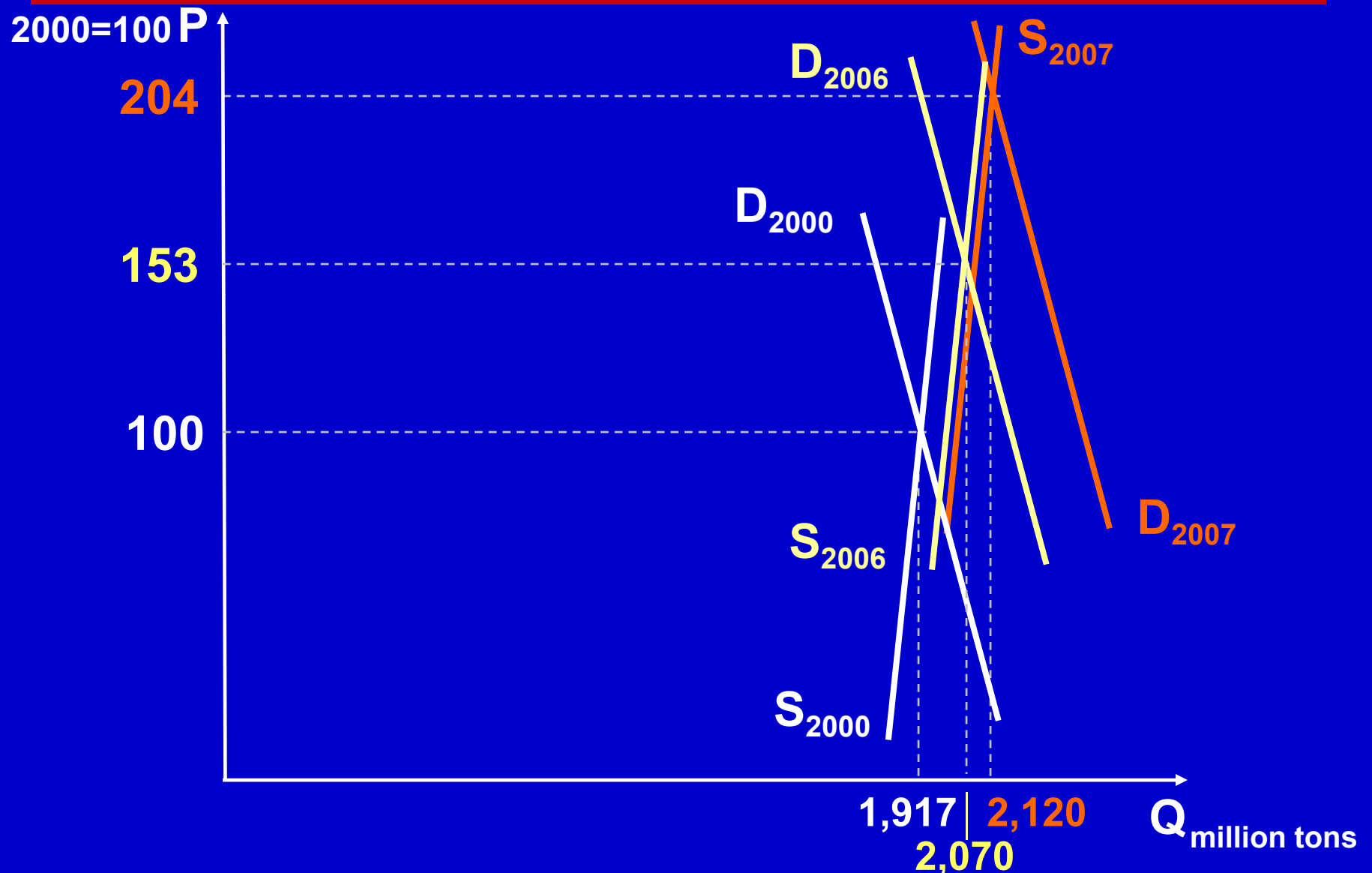
## **Kenya:**

- A 1.0 percent increase in irrigation investments decreases poverty by 3.9 percent
- A 1.0 percent increase in rural road investments decreases poverty by 2.4 percent

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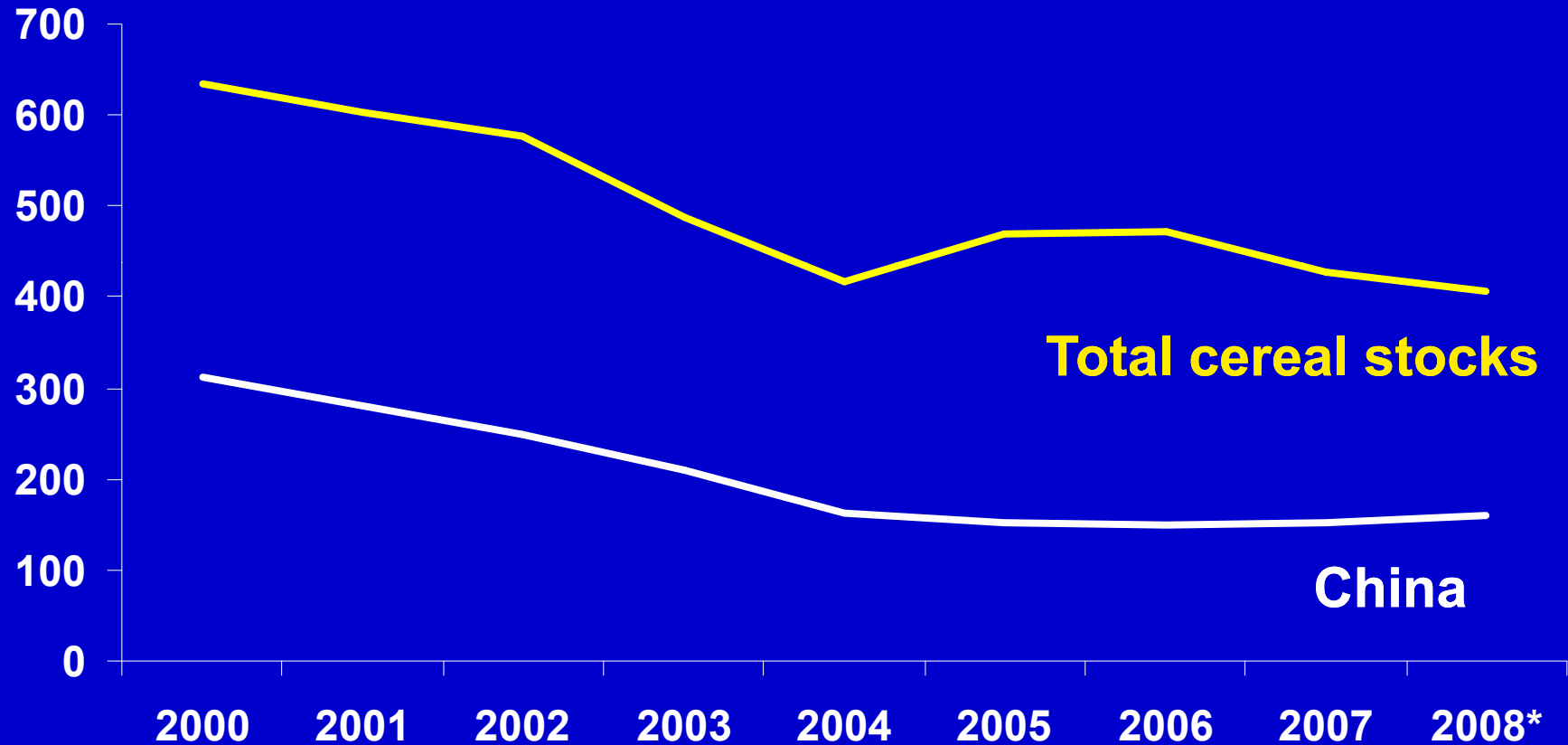
# Trade policy and stocks

# Small quantity changes have large effects on cereal prices



# Cereals: The world eats more than it produces

Million tons



Source: Data from FAO 2003, 2005-08.

\* Forecast.

# Major producers and net exporters (2004-06)

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## Cereal producers

**China**  
**USA \***  
**India \***  
**Russia \***  
**Indonesia**  
**France \***  
**Brazil\***  
**Canada \***  
**Germany \***  
**Vietnam\***  
**Kazakhstan\***

## Oilseed producers

**USA \***  
**Indonesia**  
**China**  
**Malaysia**  
**Brazil \***  
**India \***  
**Argentina \***

*in red = restricting exports*

Source: FAO 2008.

# Speculation driving prices up?

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- **Basics of price trends:**
  - supply & demand
  - rising expectations
  - market behavior e.g. speculation & hoarding
- **In 2007, volume of globally traded grain futures & options ▲ by 33 & 48%** (Chicago Board of Trade)
- **Governments increasingly curb hoarding (e.g. India, Pakistan, Philippines)**

**Commodity exchanges can help create fair, orderly, and efficient food markets**

# More “speculators”

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1. **Capital investors**
2. **Governments**
3. **Traders (small and large)**
4. **Farmers**
5. **Households**

# A new “global coordinated grain reserve policy” is needed

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- **Past arrangements e.g.:**
  - **1950s:** Global Emergency Food Reserve proposal by FAO Council
  - **1975:** Int’l Grain Reserve proposal by US Congress delegation
  - **1976:** Int’l Emergency Food Reserve created (IEFR) pending ’75 negotiations
  - **1980s:** Proposals to strengthen IEFR were not approved
  - **1990s** EU surpluses
  - **2000s** ??? none

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# Climate Change – getting ready for the long run

# Impacts and vulnerability to climate change and variability

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- **Rich countries emit majority of GHG**
- **Poor countries are more vulnerable**
  - **Geography (hotter, less rain, more variation)**
  - **Greater dependence on agric. and natural resources**
  - **Limited infrastructure**
  - **Low income, poverty and malnutrition**
  - **Thus, lower adaptive capacity (also including inadequate complementary services, like health and education)**

# Climate change risks for production

## Expected impact on cereal production

	1990-2080 (% change)
<b>World</b>	-0.6 to -0.9
<b>Developed countries</b>	2.7 to 9.0
<b>Developing countries</b>	-3.3 to -7.2
<b>South Asia</b>	-18.2 to -22.1
<b>Sub-Saharan Africa</b>	-3.9 to -7.5
<b>Latin America</b>	5.2 to 12.5

**This will have further price increasing effects**

# Effective adaptation strategies

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- Requires *judicious selection of measures within a policy context and strategic development framework*
- Must go beyond good development policy to explicitly target the impacts of climate change, particularly on the poor
- Market signals
  - essential factor in determining the necessary responses to a changing environment
  - but involves potentially expensive time lags and overlooks equity

**Climate change adaptation must therefore be proactive, not merely reactive**

# Critical step toward mitigation: Post-Kyoto International Climate Change Regime

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- Emissions targets, rates of convergence, and rates of growth in developing-country emissions
  - Level of emission allowances for developing countries
  - Level of caps by sector and industry
  - Sector-specific mitigation options
  - Incentives for international carbon trade
  - Transparency and complexity of administration
- ➔ All influence the regime's impacts on economic growth, agriculture, food security, and poverty in developing countries

# Pro-poor climate mitigation policy

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- **Climate change policy can generate income for small farmers and investment flows for rural communities**
- **Requires effective integration:**
  - **from global governance of carbon trading,**
  - **to sectoral and micro-level design of markets and contracts, and**
  - **investment in community management**

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# Policy and programs

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

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Spend...their \$5

\$3.00 on food

\$.50 on household energy

\$1.50 on non-foods

✓ A 50% increase in food and energy prices requires them to *cut* \$1.75 of their expenditures

**Cuts will be made most in food expenditures:**

✓ **Reduced diet quality, and**

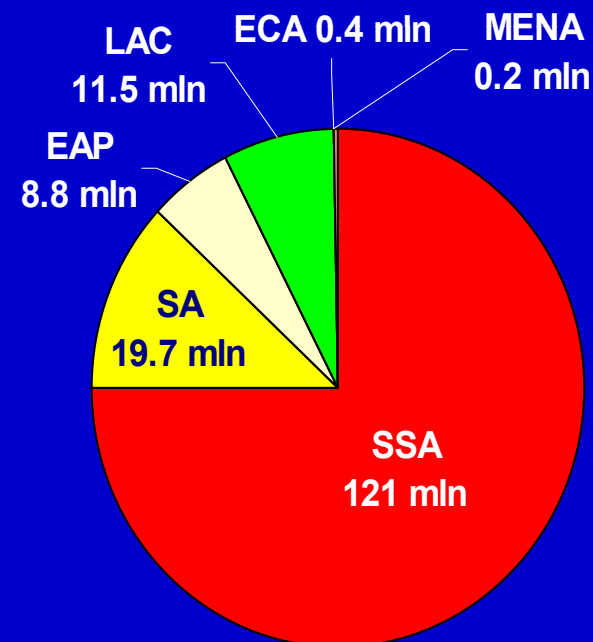
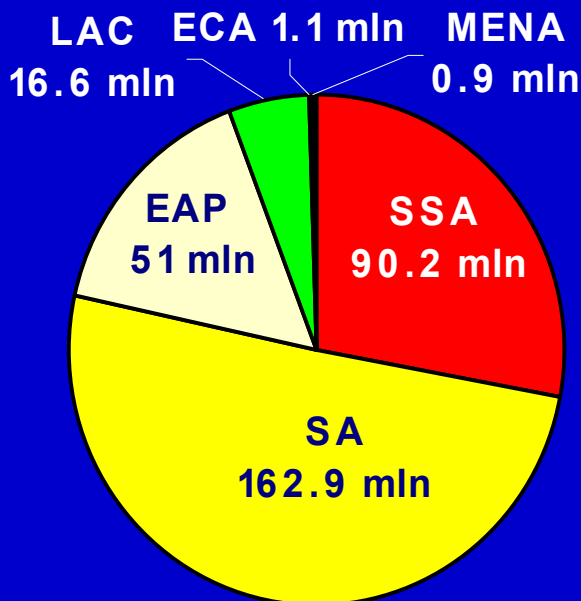
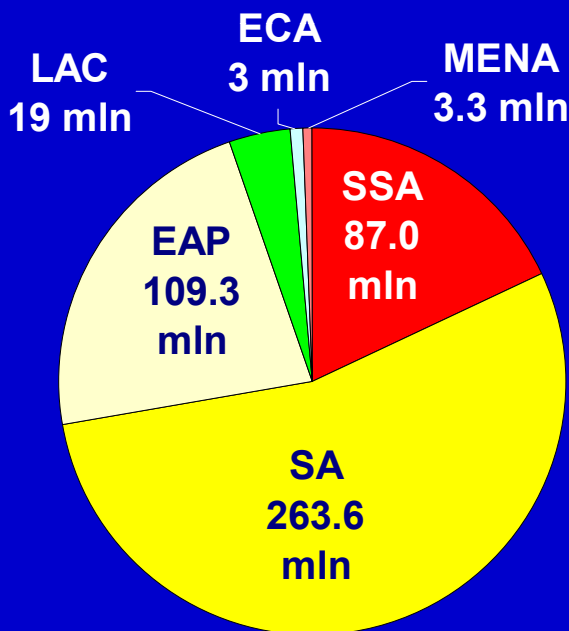
✓ **Increased micronutrient malnutrition**

# 970 mln people live on \$1 or less a day

**Subjacent poor**  
(\$0.75 and <\$1):  
485 mln in 2004

**Medial poor**  
(\$0.50 and <\$0.75):  
323 mln in 2004

**Ultra poor**  
(<\$0.50):  
162 mln in 2004



Source: Ahmed et al. IFPRI, 2007.

# Impacts of high prices on the poorest

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The consequences of increased prices for the poorest and hungry are driven by some initial conditions and by adjustments in labor, finance, and goods markets, and...

- Level of inequality below the poverty line (up)
- *Exclusion and discrimination (women)*
- Level of diet (high) and nutritional deficiencies (low)
- Wage rate adjustments among unskilled labor to changing prices (slow)
- Capability to respond to market opportunities (small)

# Policy actions to correct and mitigate the food price problem

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## Global policies and international aid

- 1. Trade:** Eliminate agricultural trade barriers, and export bans; revisit grain based biofuels
- 2. Agriculture growth:** Expand aid for rural infrastructure, services, agricultural research and technology (CGIAR)
- 3. Protection of the vulnerable:** Expand food and nutrition related development aid, incl. safety nets, child nutrition, employment programs

# **A production components of a program**

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**Taking global action with international organizations, national governments, regional and sub-regional organizations, private sector now**

- 1. Crash programs for key production areas with subsidized seeds, fertilizer, and credit, and guarantee the purchase of outputs. [Worked in the early Green Revolution. A start, but not sustainable, not viable]**
- 2. Rely on the current high food prices to give a jump start in the short run, but immediately move to a investment plans for agriculture: agricultural research, rural roads, irrigation infrastructure, etc.**

## What will it cost?

**Investments for agric. production growth to meet MDG 1  
~~(requires about 50% agric. productivity growth):~~**

**A 2005 IFPRI estimate (to be updated):**

**Incremental investments:**

**\$16 billion per year, 2005-15 for agric. research, rural roads, irrigation infrastructure [assumes continued policy reform and enhanced economic growth].**

**Of this approximately \$8 billion for SSA, \$5 billion for South Asia, & \$3 billion for others**

**2008 updated estimate would need to take account of**

- **of changed US\$ value**
- **changed economic and poverty circumstances**
- **might be up to twice the above quoted values**