

Food Security Challenges



April 28, 2010 - London

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Presentation Flow

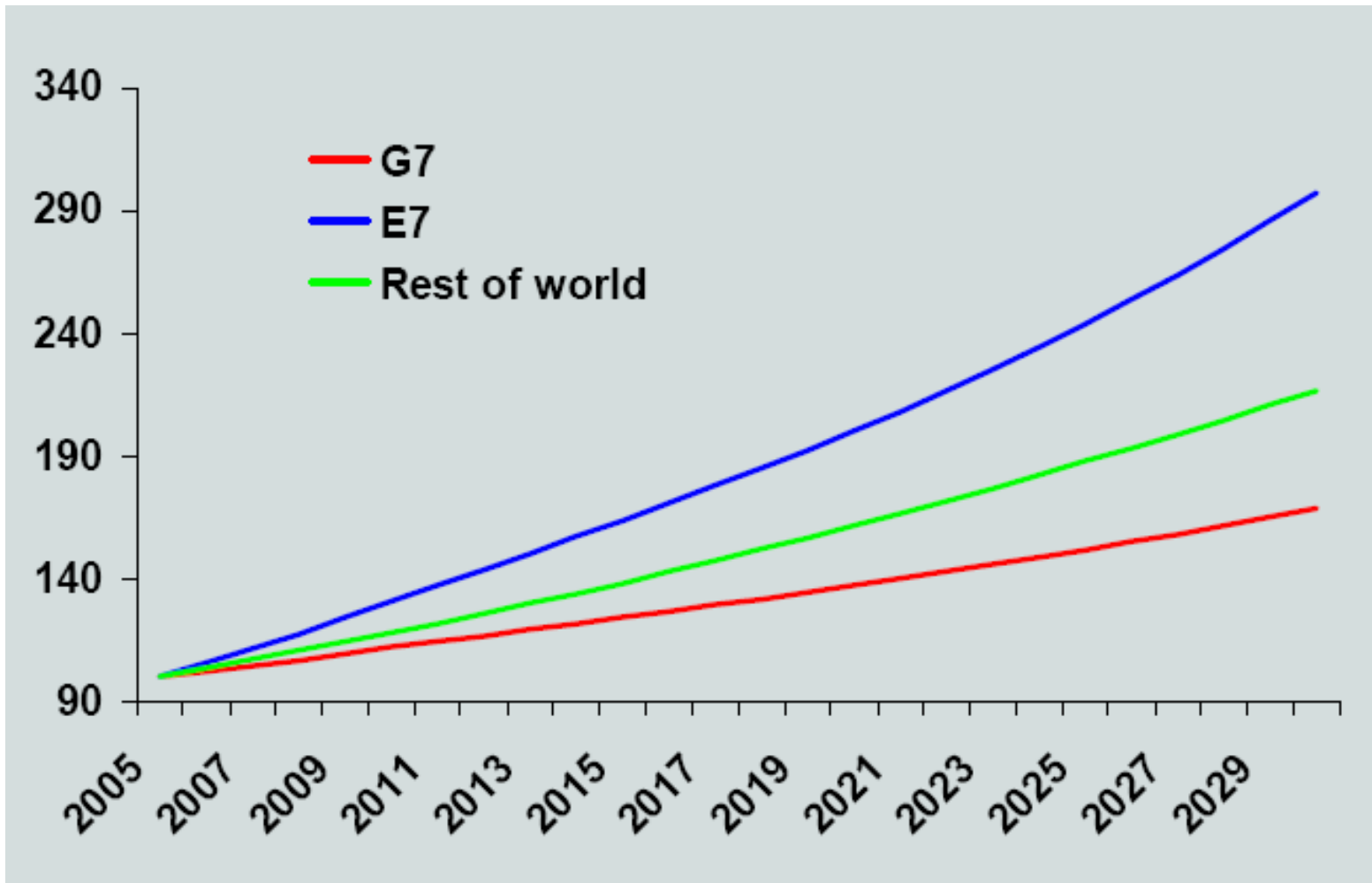
- **Evolving Global Economy**
- **Food Crisis & Hunger**
- **Food Security Challenges**
- **New Approaches**
- **India - Food, Retail & Agriculture**

Three Ages of Globalisation



Source: Daniel Franklin, March 2010, The Economist

Dynamic Markets

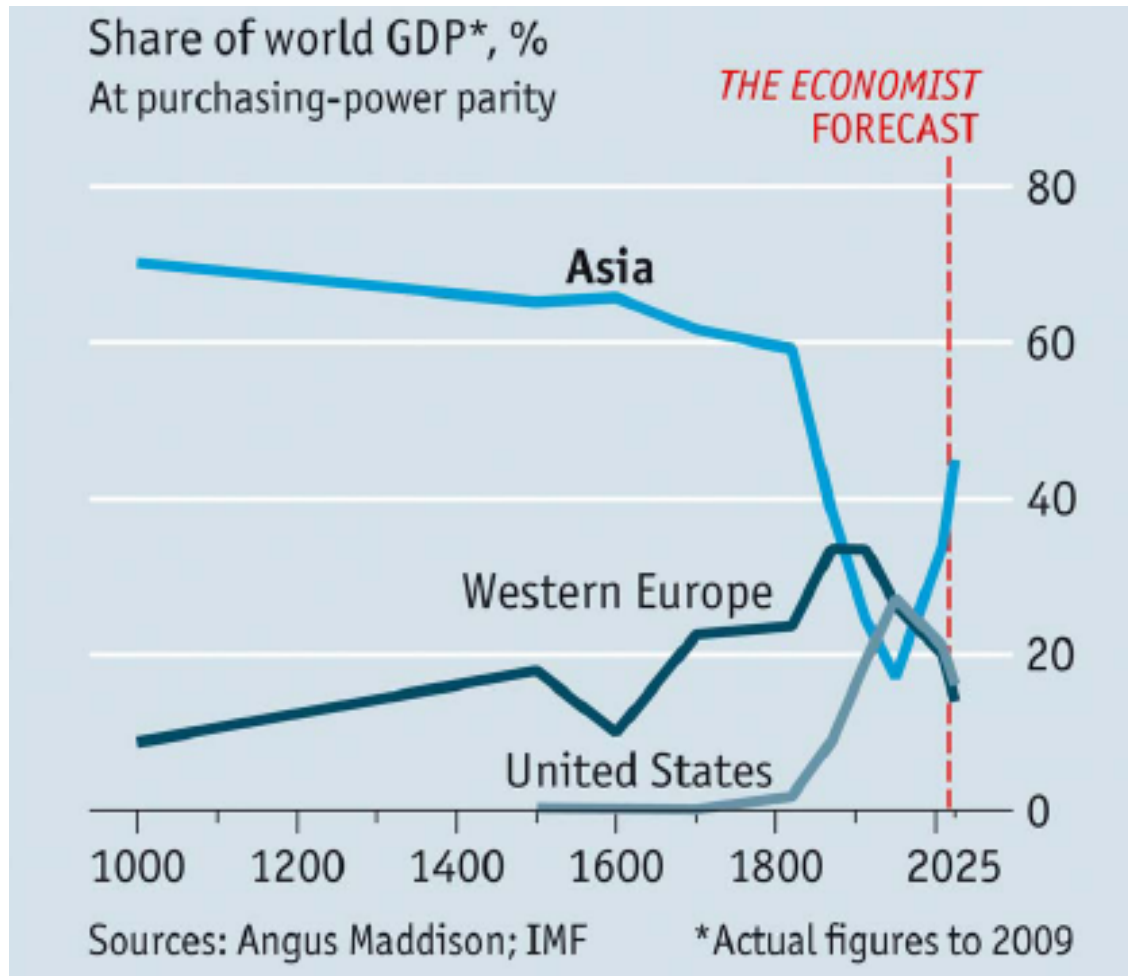


Real output, 2005 =100

Source: Economist Intelligence Unit

E7 = China, Brazil, Korea, India, Russia, Mexico, Taiwan

The Sun Rises Again

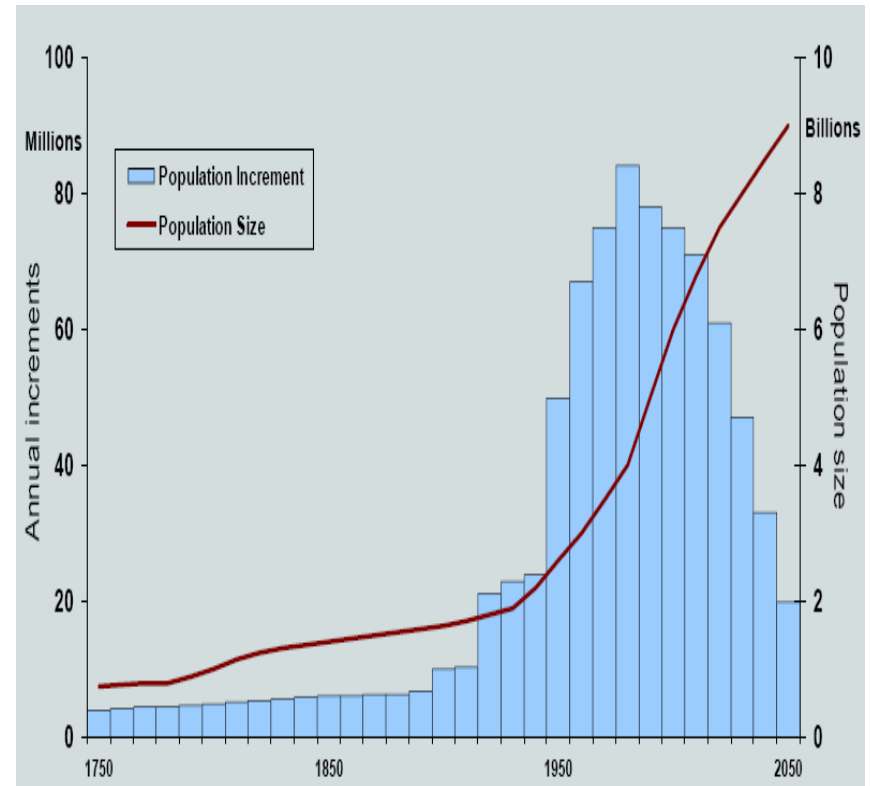


Source: Economist Intelligence Unit

World Population Growth

- Global population expands by 175% since 1950, from 2.5 billion people to 6.9 billion, with 80% living in less developed regions
- In 2050, according to UN projections, the world will have 9.1 billion people, 32% more than today
- Europe's share declines rapidly, from 22% in 1950 to 11% today and 7% in 2050. Africa's share rises, N. America's falls only slightly

Long-Term World Population Growth, 1750 -2050



Source: Daniel Franklin, March 2010, The Economist

What can we expect as the world population grows?



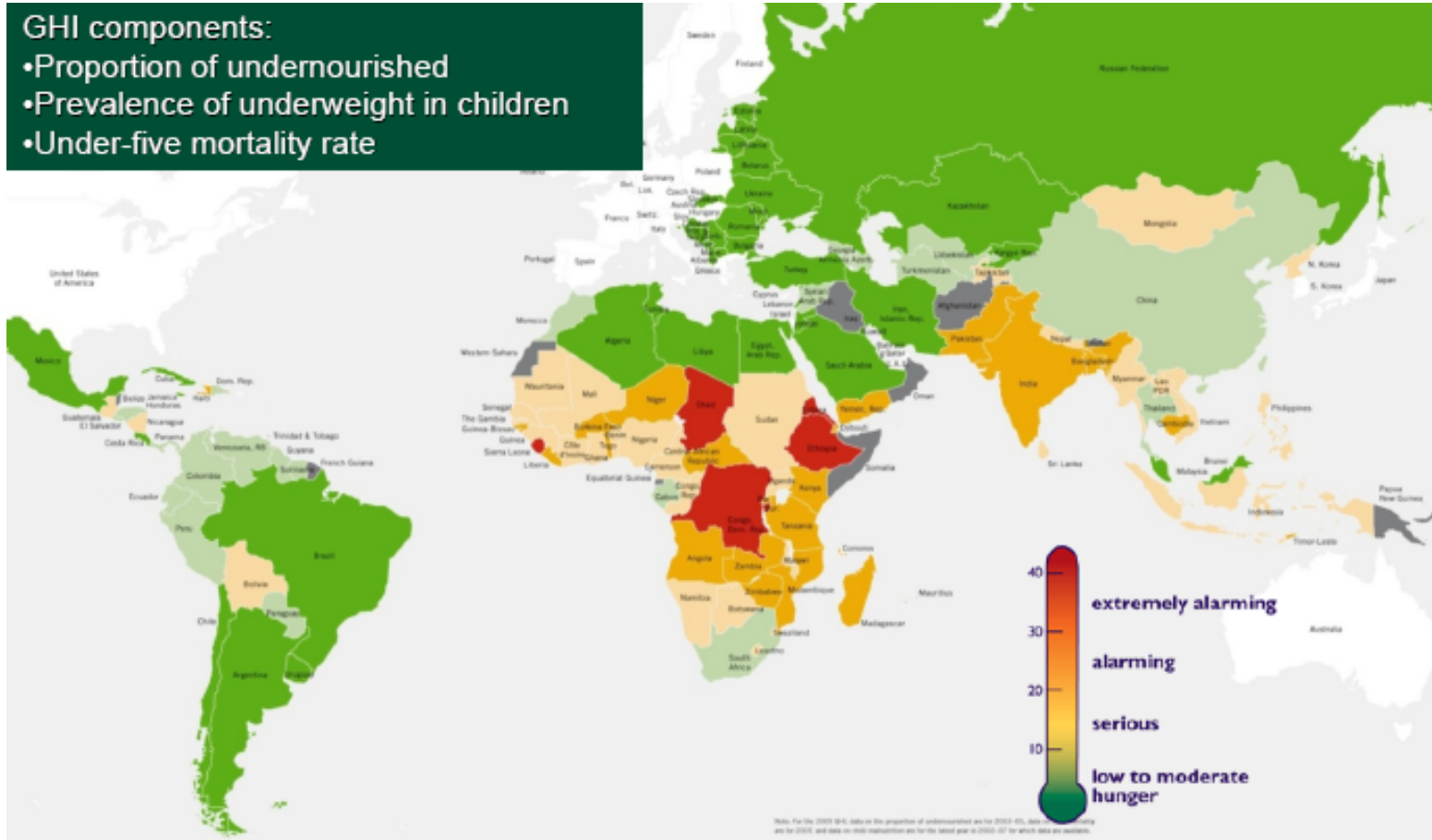
- World population reaches 9 bil. by 2050
- All growth to come from urban areas
- Most growth to come from developing countries

Larger Urban population will demand more and better food

29 countries have “alarming”/“extremely alarming” levels of hunger (2009 GHI)

GHI components:

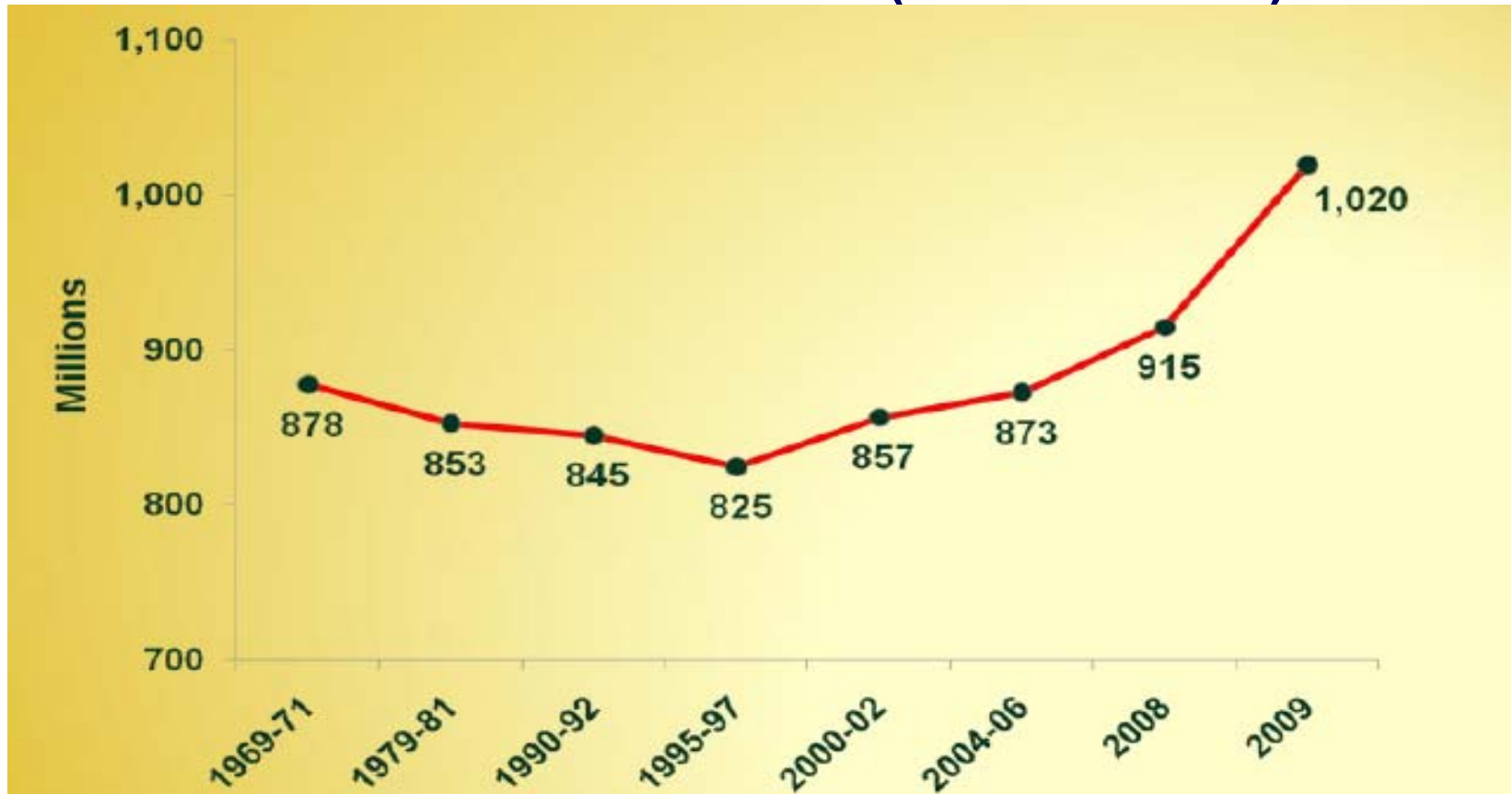
- Proportion of undernourished
- Prevalence of underweight in children
- Under-five mortality rate



Source: Von Grebmer et al. 2009

Hunger increased in the last decade

Number of Undernourished (1969-71 to 2009)



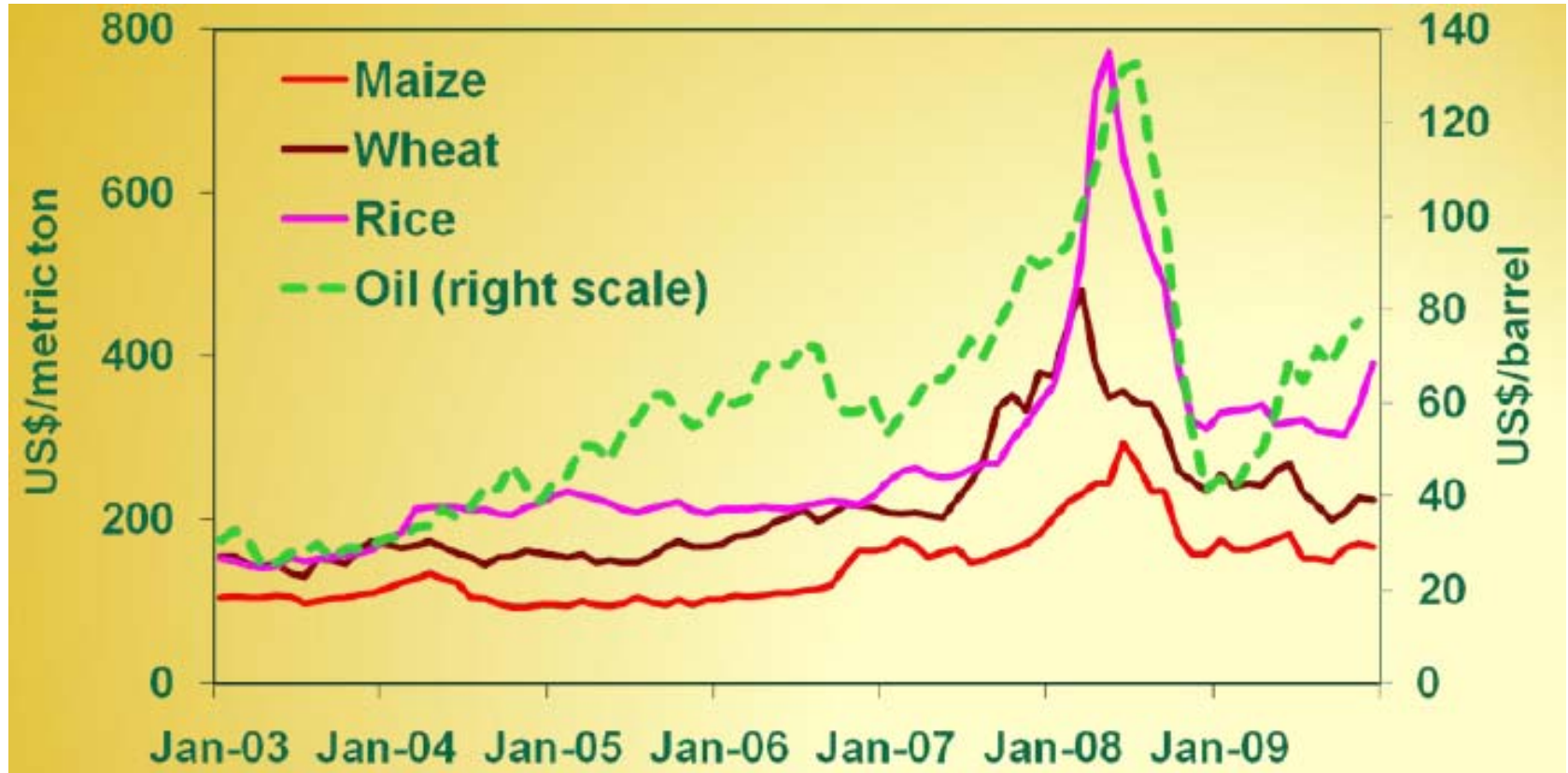
FAO 2009

Hunger and Nutrition issues continue to haunt...major open issues

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Rising Energy & Food Prices

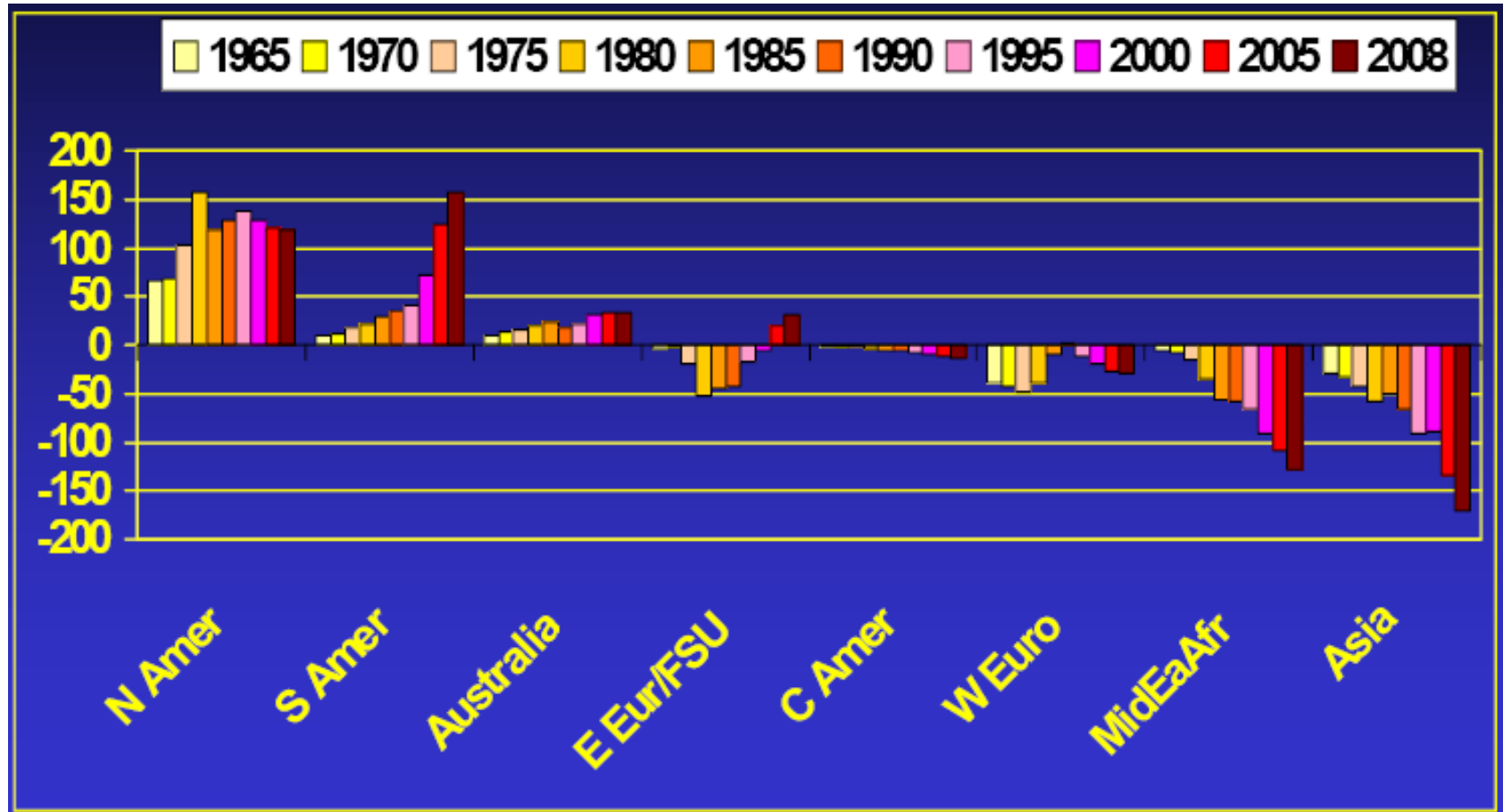


Source: Data from FAO 2009 and IMF 2010

Fusion of Food, Energy and Financial Market....increased complexity

Net Interregional Food Flows

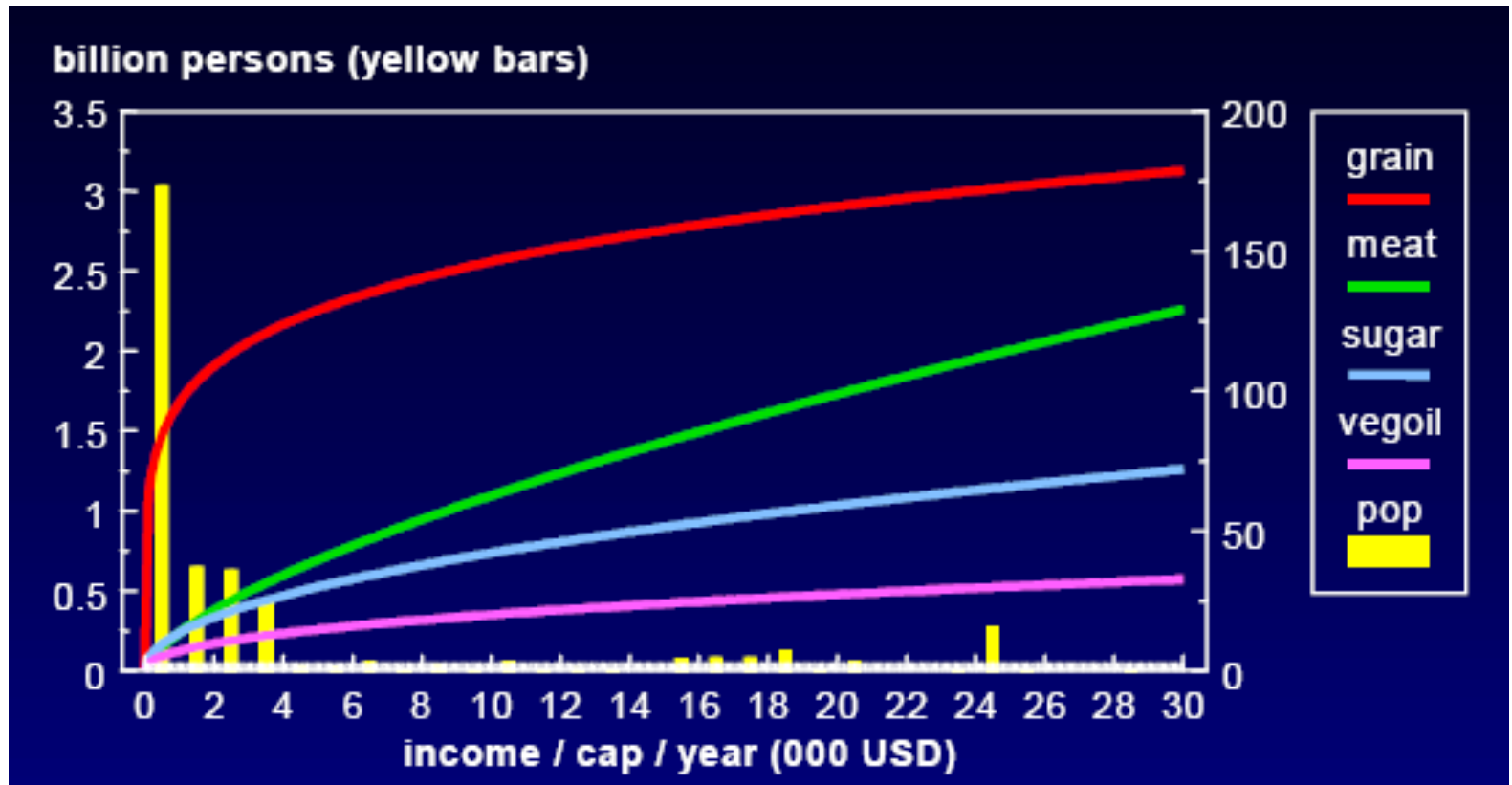
(grains, rice, oilseeds, meals, oils, feed equivalent of meat – in mmt)



Deeply integrated trade flows but highly sensitive....

Global Population: Income Growth = Diversified Diets

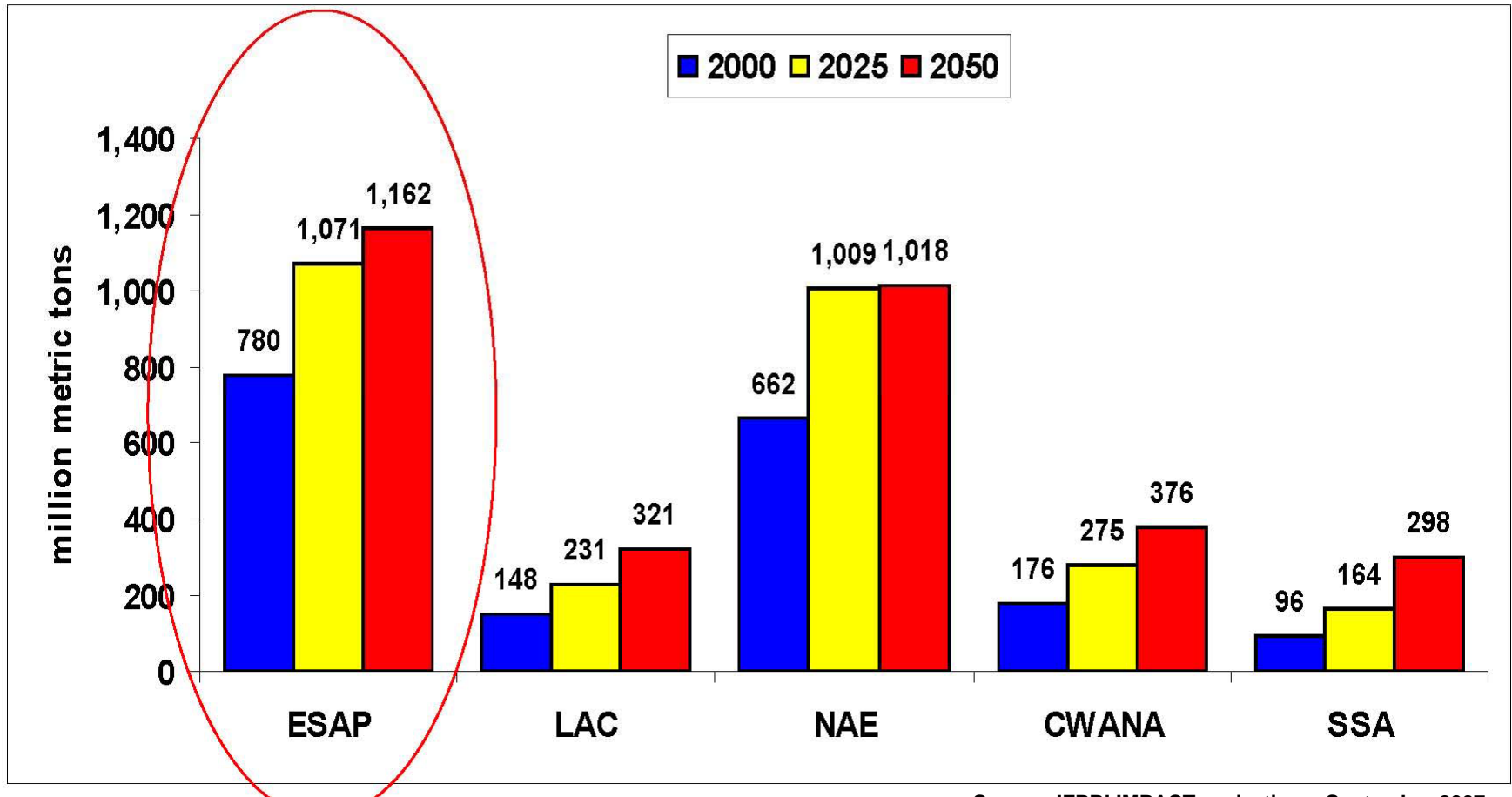
Population, Per Capita Income & Food Consumption



Source: USDA, Foreign Agricultural Services

Massive pressure on basic commodities....

Cereal Demand will Continue to Rise Globally, and Especially in Asia



Source: IFPRI IMPACT projections, September 2007

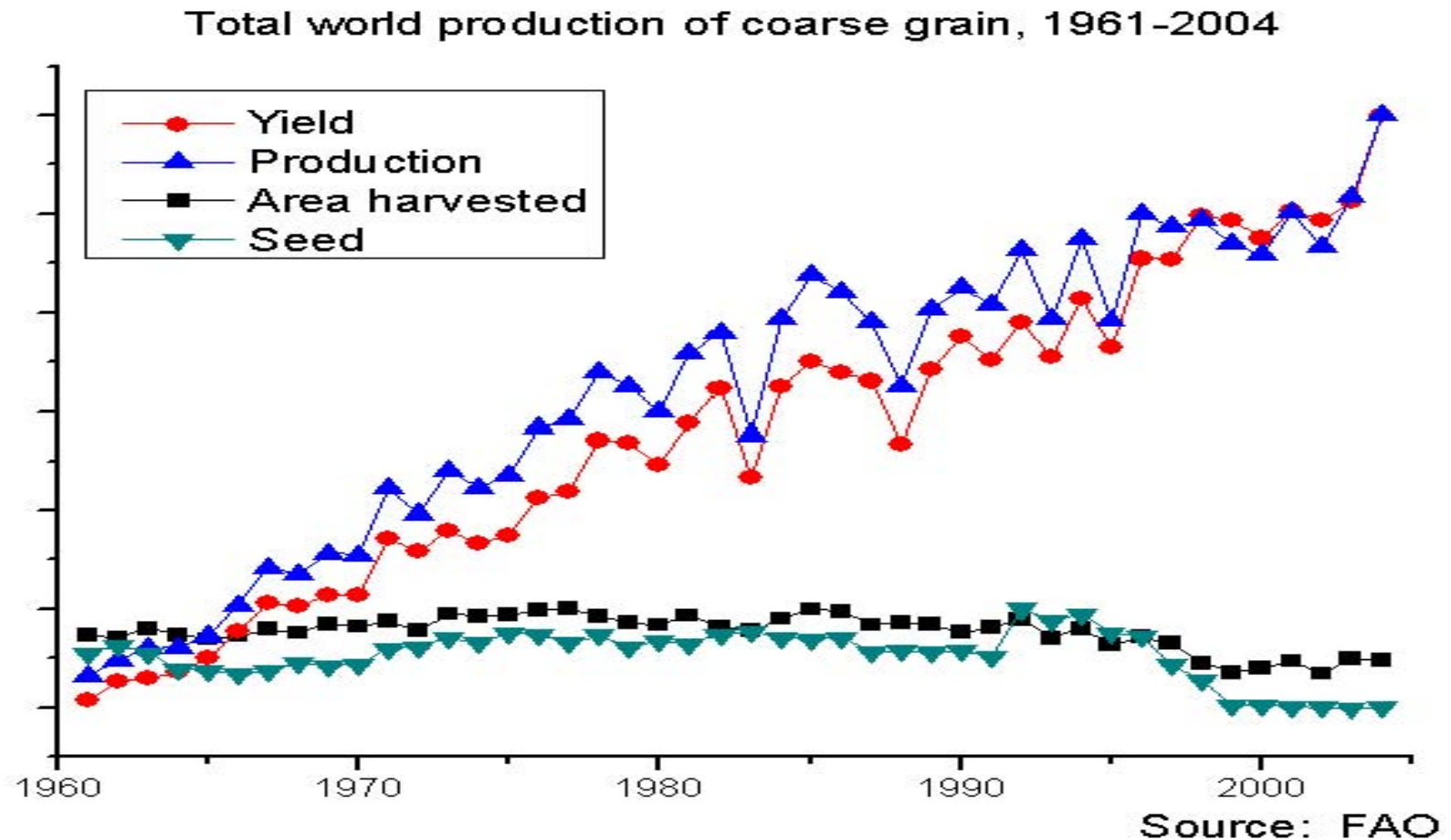
Where will this Increased Production Come from?

- According to FAO, about 10% will come from area expansion from current level of 3.75 billion hectares
- Maybe 20% will come from intensification
- Remaining 70% must come from innovation



10:20:70 Principle

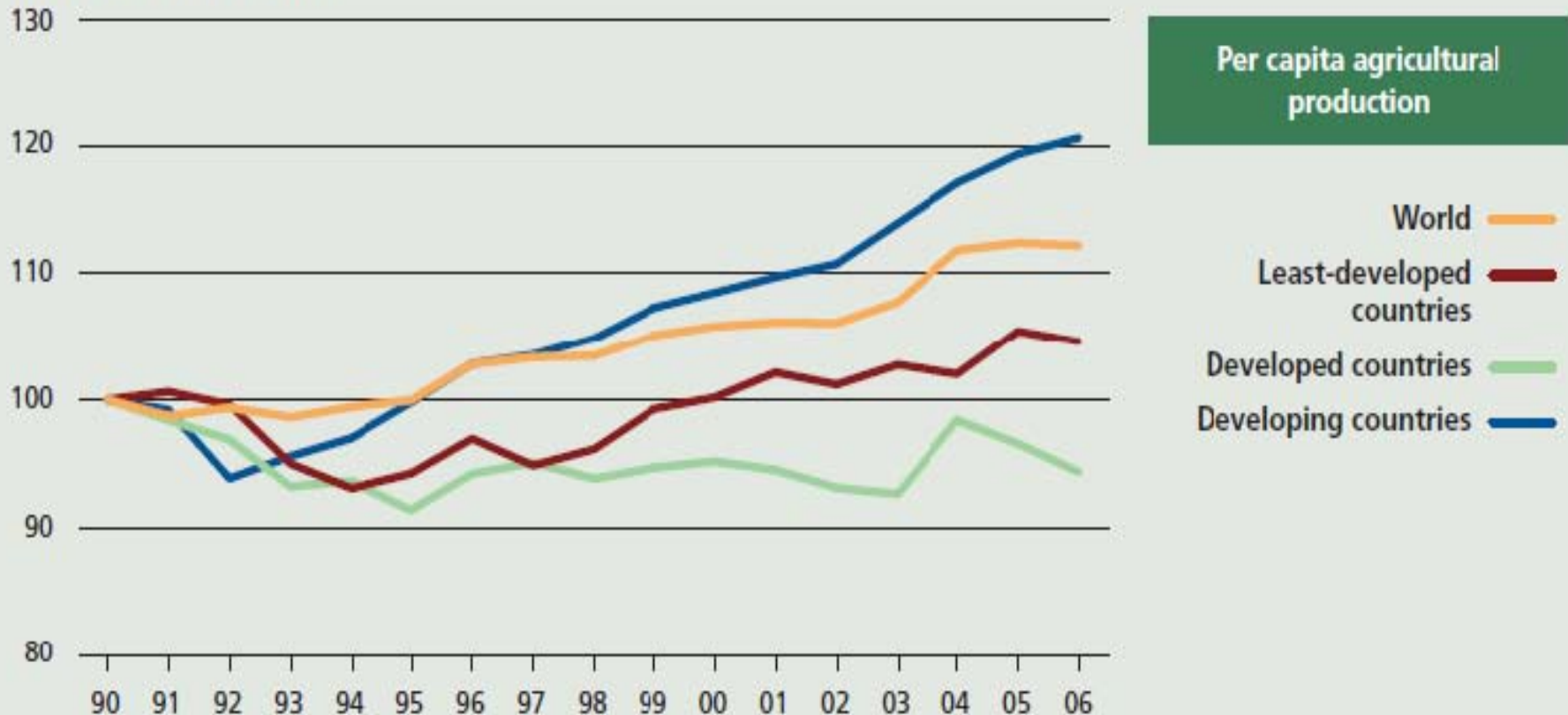
Global Yields and Production of Grains did Rise Steadily over Four Decades



Global cereal output doubled to 7 billion MT.....Flattening trend though

but Per Capita Agricultural Production for the World has been Stagnant Since 2004...

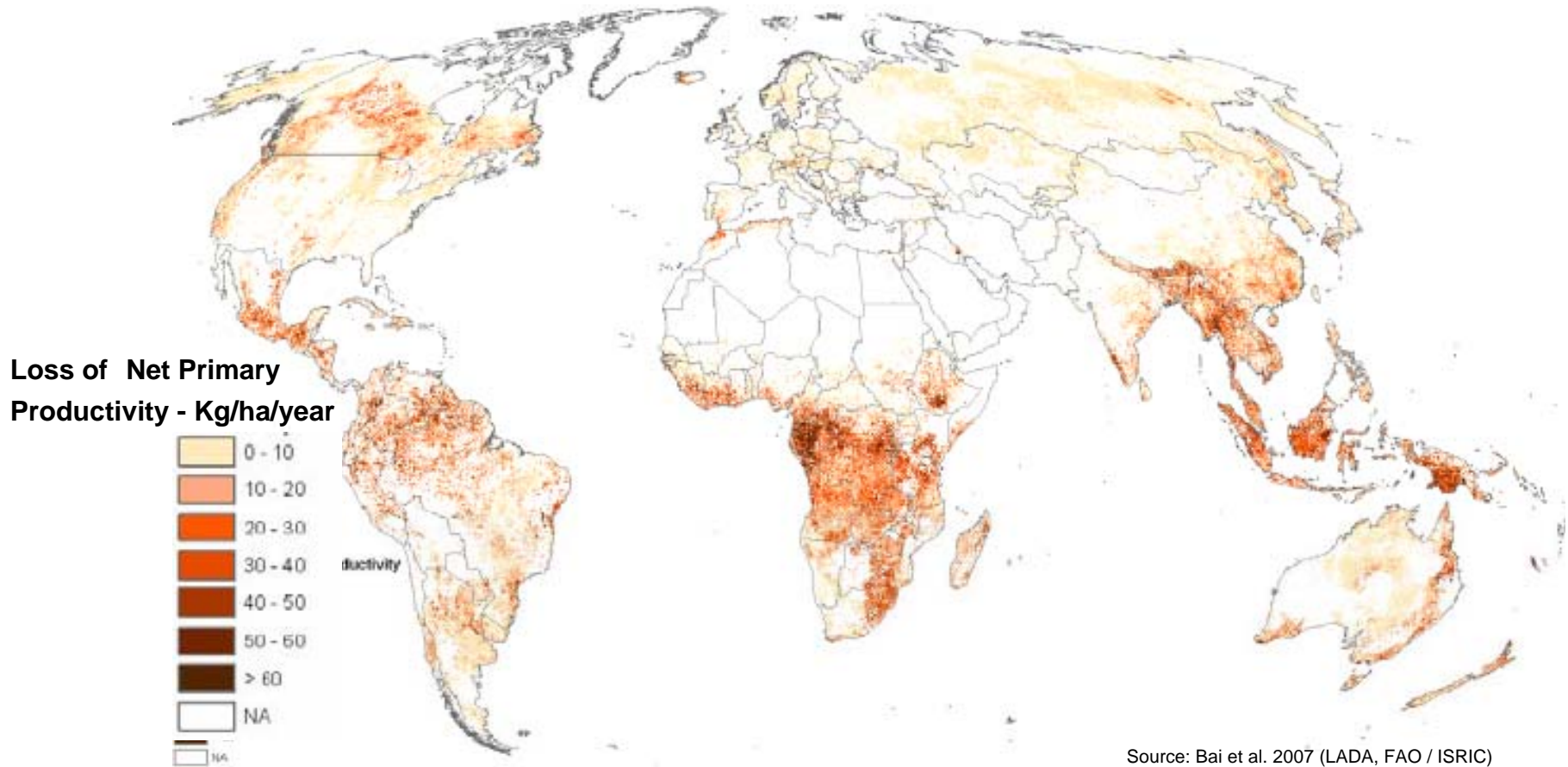
Index (1999–2001 = 100)



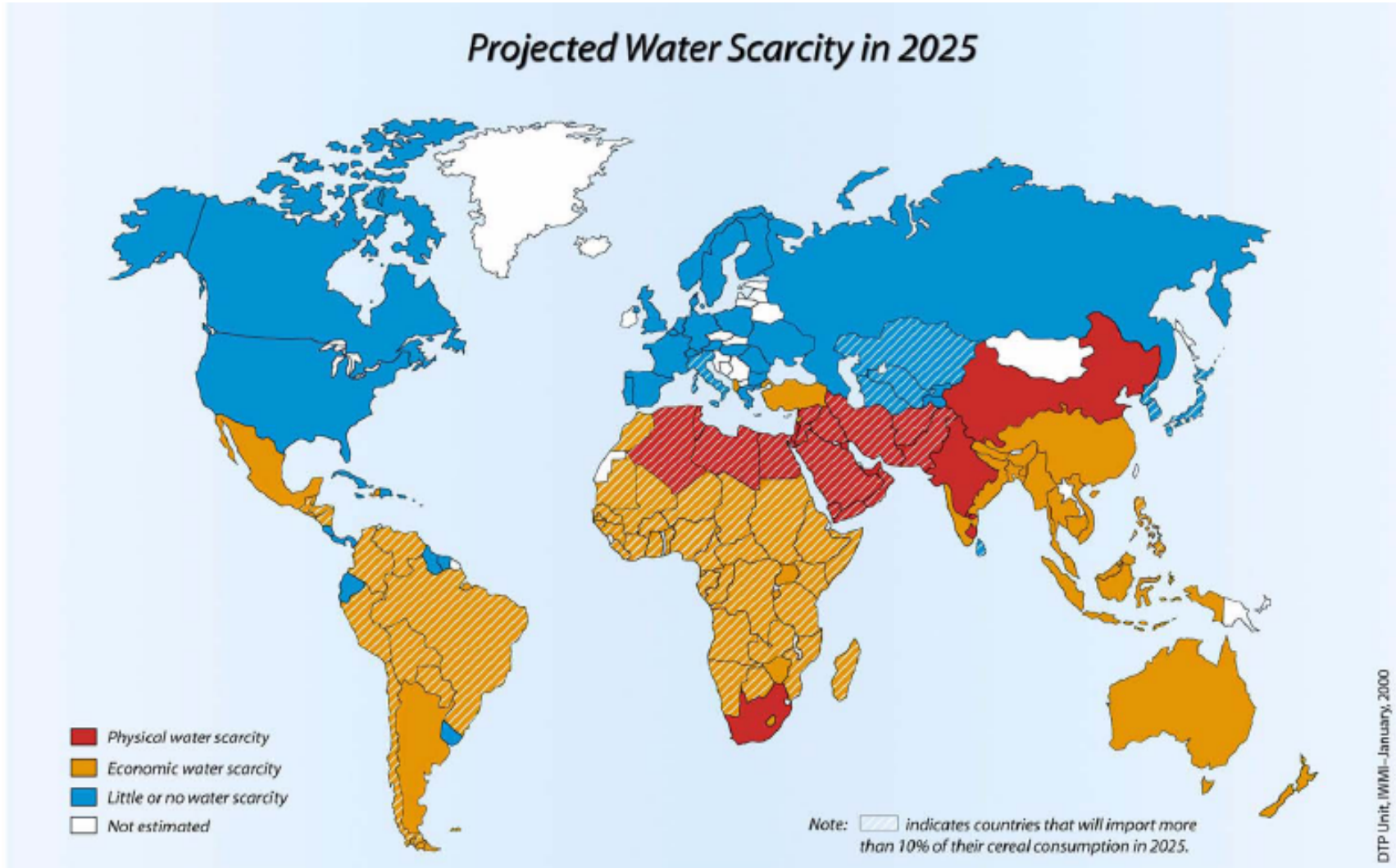
Source: FAO, 2008i.

Land Constraints are High

Land Degradation 1981-2003



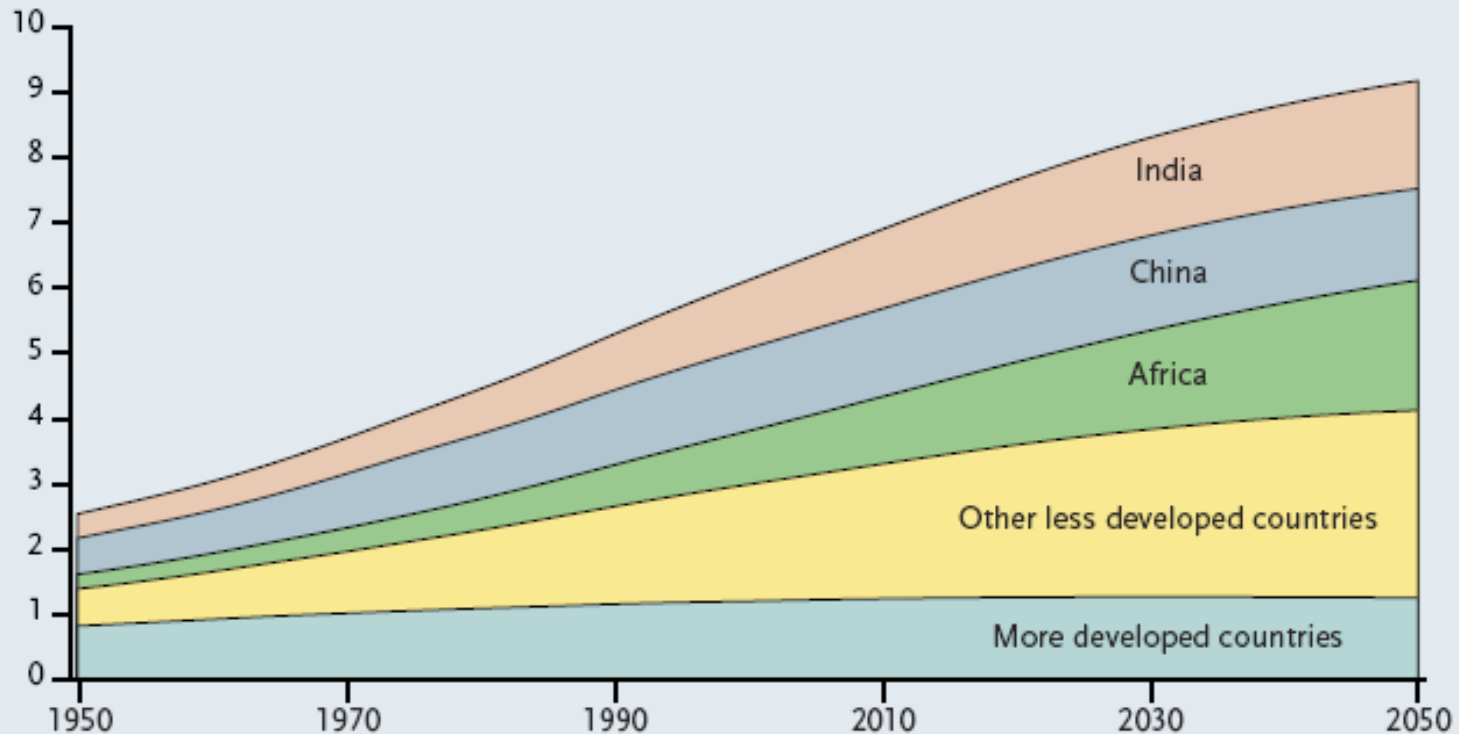
..and Some Countries or Major Producing Regions Face Water Scarcity...



Many More Mouths to feed, Especially in the Developing World

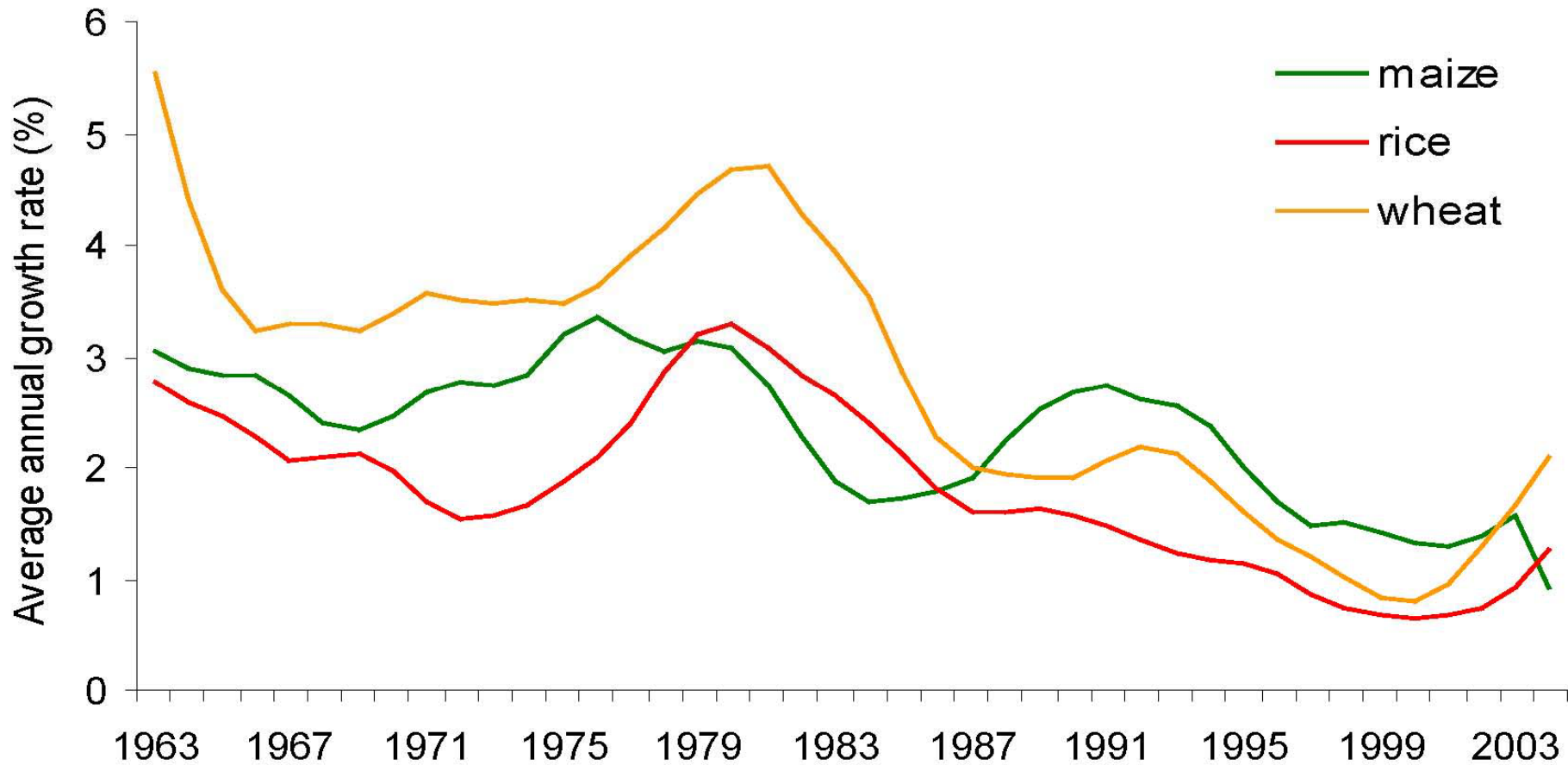
Africa and Other Developing Regions Make Up an Increasing Share of World Population.

Billions



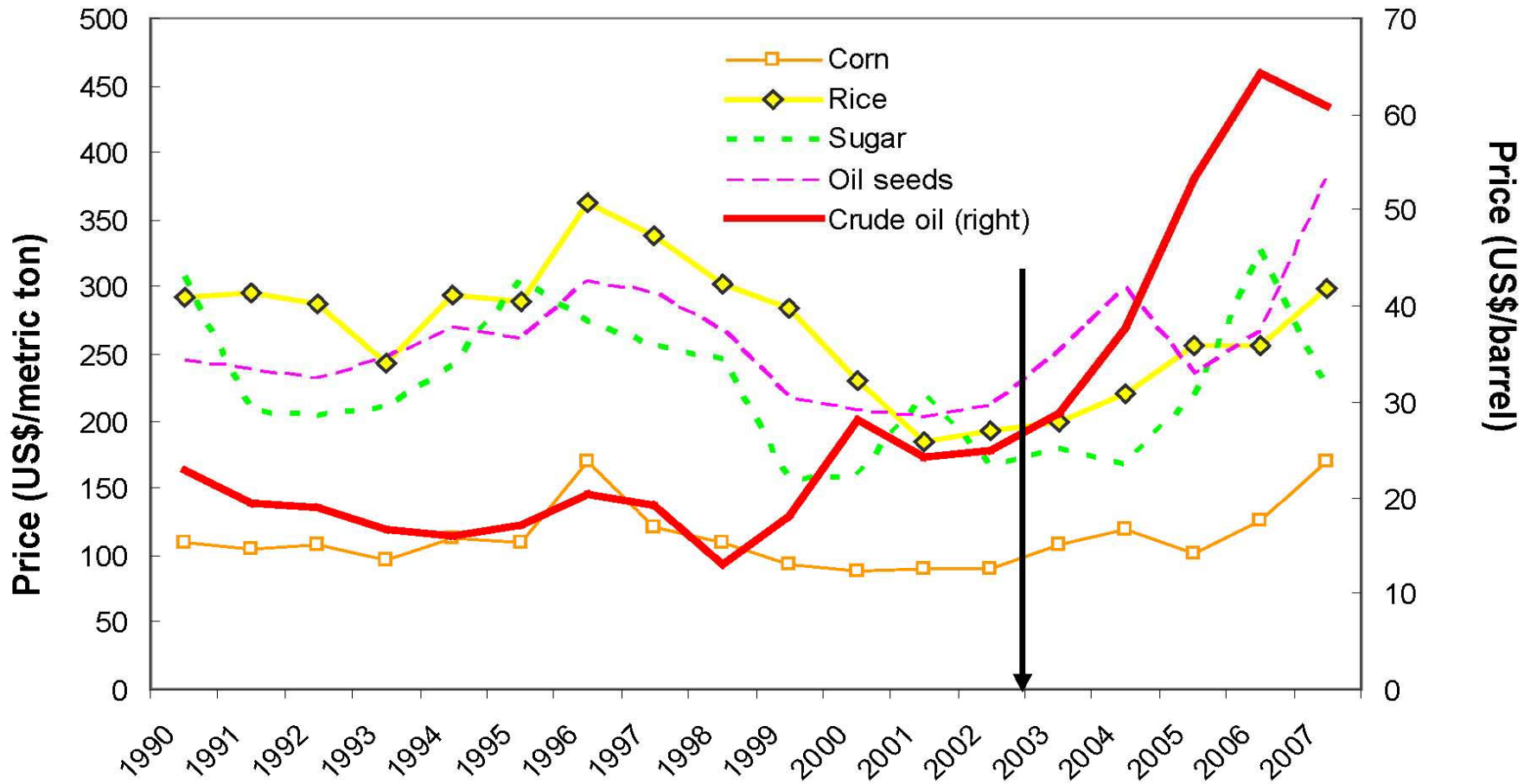
Source: UN Population Prospects: The 2006 Revision, Medium Variant (2007)

and Growth Rates in Yields for Major Cereals in Developing Countries are Slowing



Source: World Development Report 2008

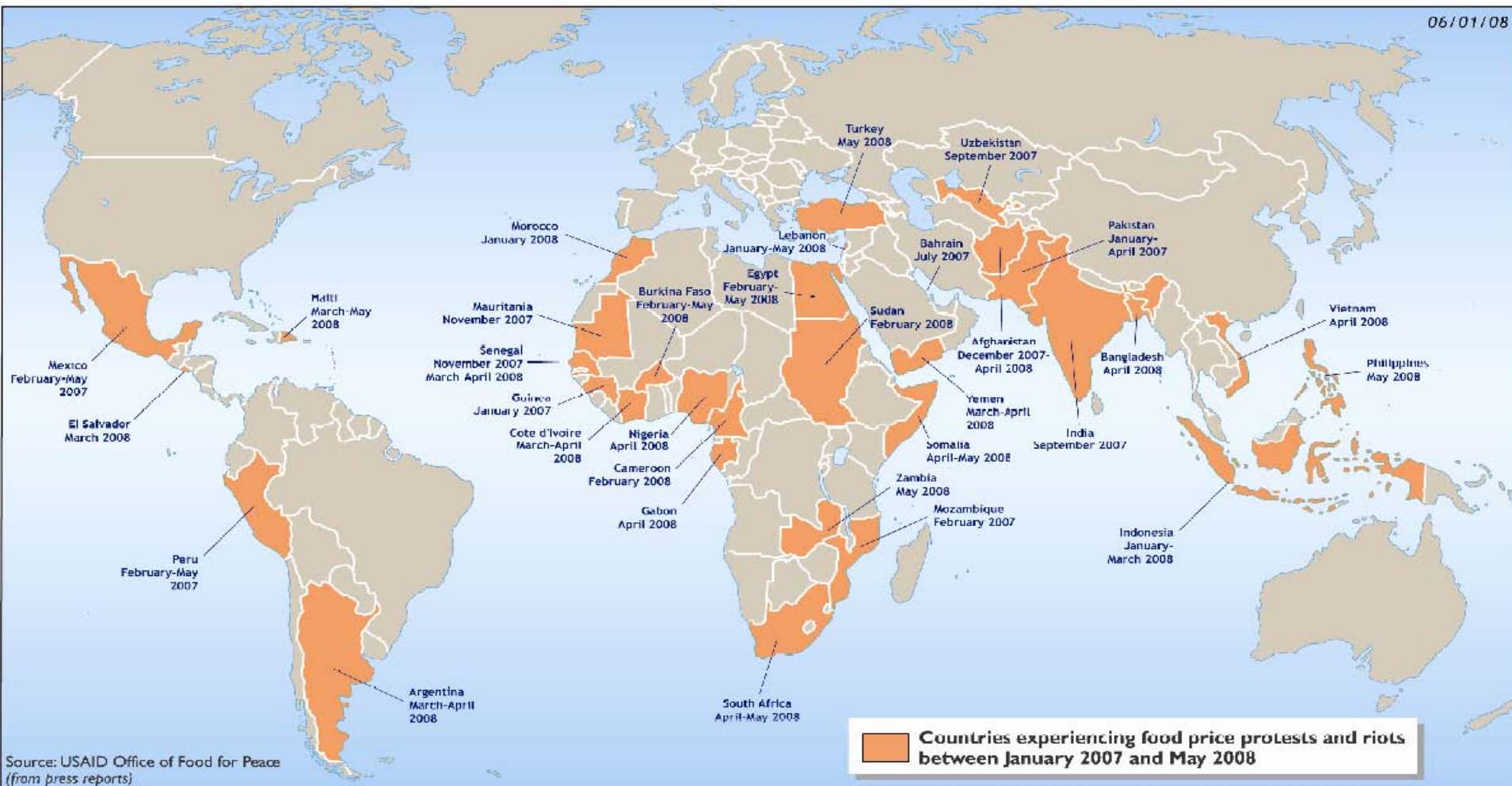
Nominal Prices for Major Foods began to Rise in 2003, Peaking in 2008...



Source: World Development Report 2008



It led to Food Price Protests and Riots from January 2007 to May 2008



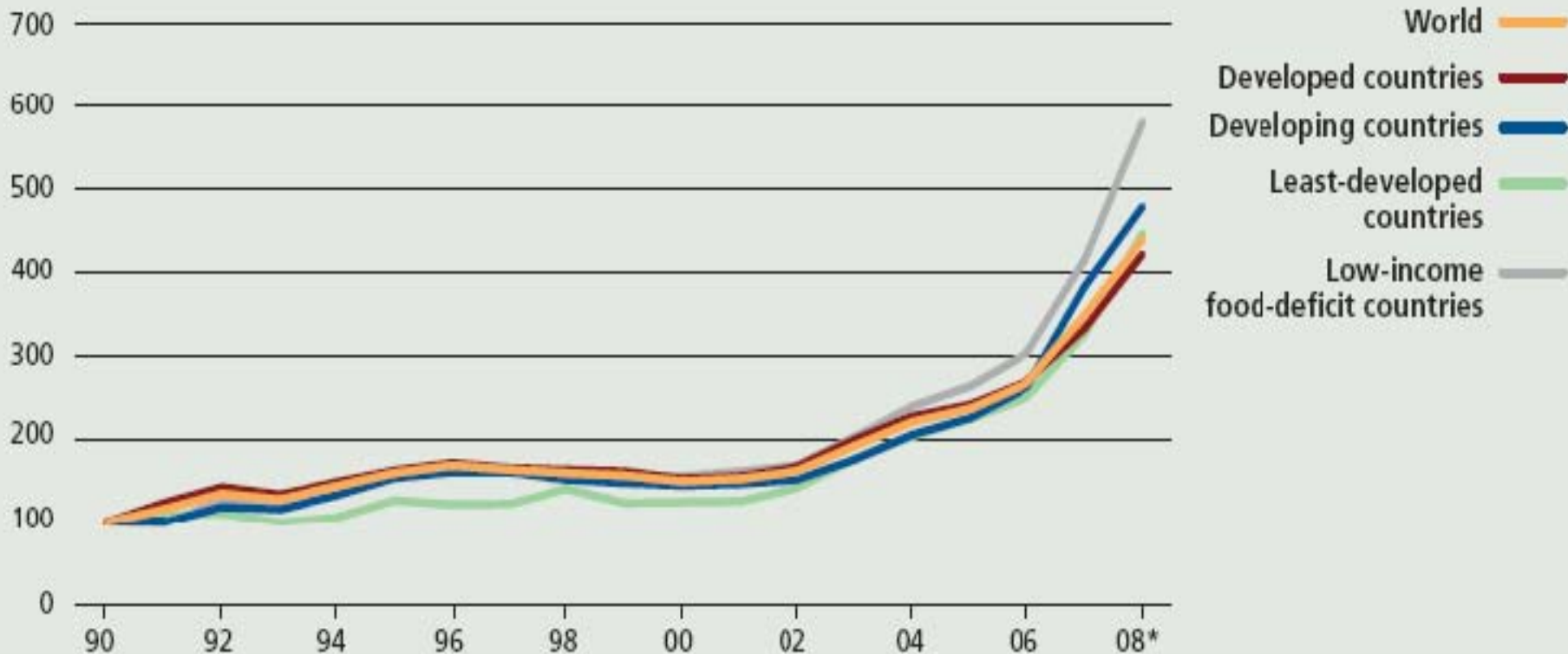
Source: USAID, Office of Food for Peace

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The Food Import Bill for Developing Countries Rose Steadily for 5 Years, LIFDCs Faster Still

Index (1990 = 100)



Projection

Source: adapted from FAO, 2008b.

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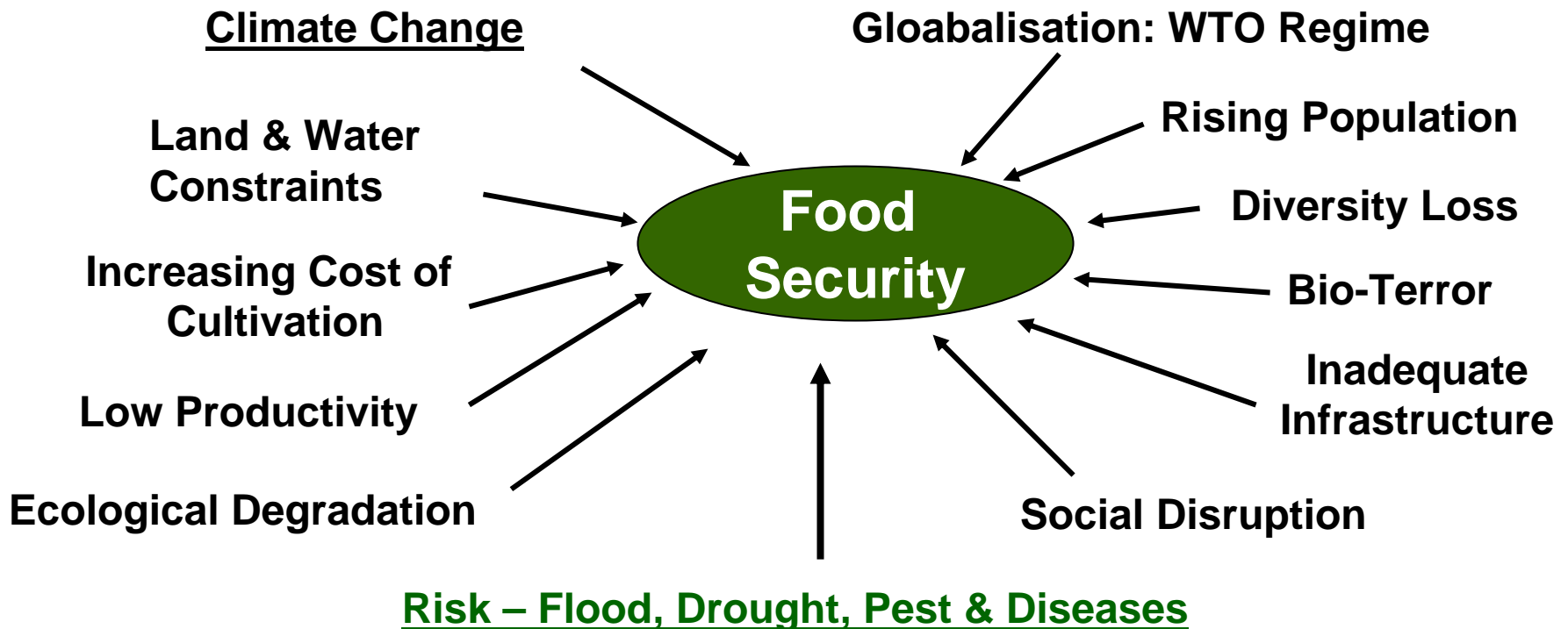
Global Food System Faces serious challenge



Food Security - At the Cross Roads

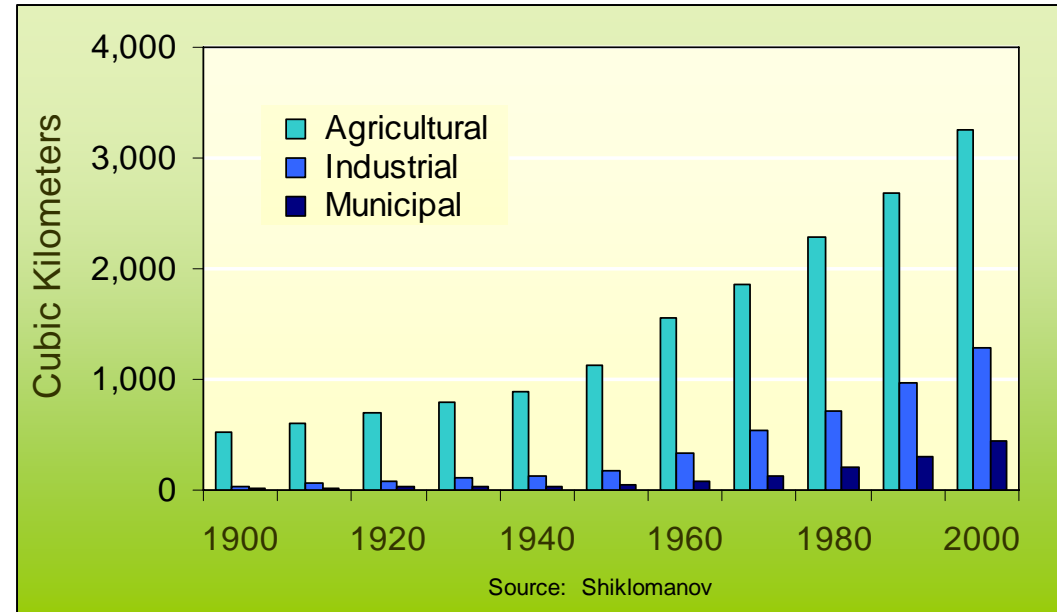
Sustainable Food Security – A Life Cycle Approach

- Physical, Economic, Social and Ecological access to balanced diet & safe drinking water



Water

- Falling water tables
- Droughts
- Diversion for urban needs and power generation
- Pollution



Source: State of the World - World Watch Institute

Agriculture accounts for 70% of global water use and as much as 90% in many developing countries

Diversity & Food Security

What do we risk if agricultural diversity is lost?

- **Future options are narrowed due to loss of genetic material**
- **Increased susceptibility to disease and pests because of mono-cropping and a limited number of high-producing livestock breeds**
- **Loss of self-sufficiency among farmers on marginal lands who rely on crop diversity to maintain local food production**



© USDA

GMOs and Hunger

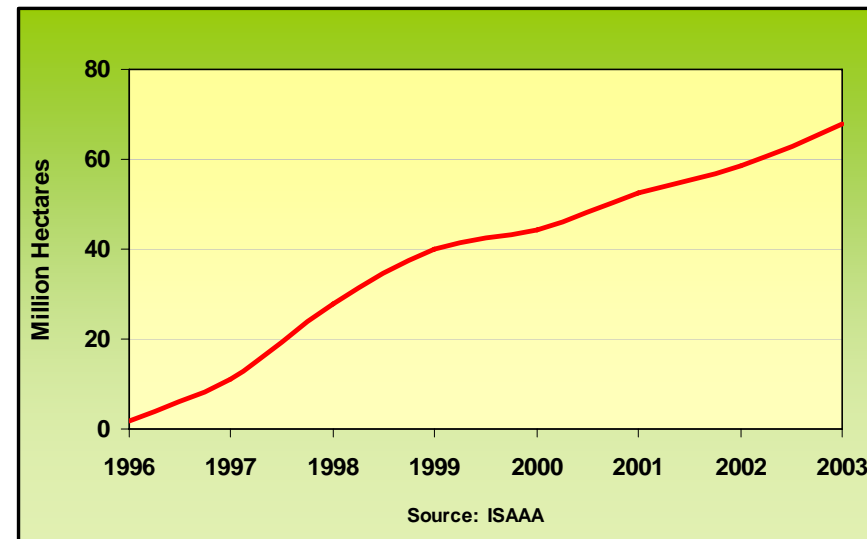
Can biotechnology and GMOs solve world hunger?

Some agricultural scientists hope that GMOs will produce higher than usual yields with less inputs, better yields in a wider range of environments, and more nutritious products

BUT

Hunger is caused by inequalities in purchasing power and the lack of access to land and resources rather than a global shortage of food

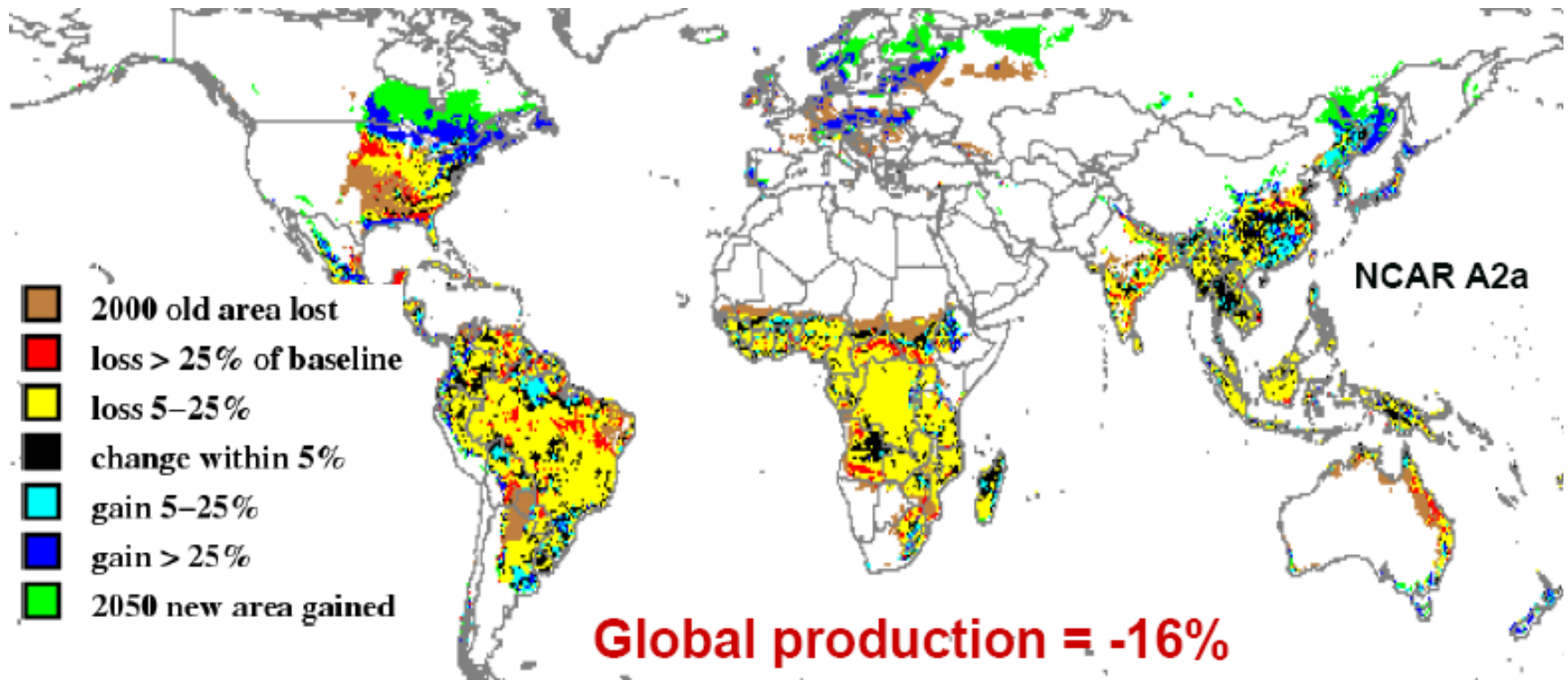
Global Area Planted to Transgenic Crop, 1996-2003



Source: State of the World - World Watch Institute

Climate change puts huge pressure on food production system...

Climate change impact on production: Rainfed maize, 2050



Source: M. Rosegrant (IFPRI) 2009

Climate Change

Climate changes impacts temperatures, precipitation and weather events which can in turn impact:

- **Rainfall, drought, storms**
- **Rice, wheat and maize**
 - Grain yields are likely to decline 10% for every one degree (Celsius) increase over 30 years
- **Pollination**
 - CO₂ and increased temperature may promote lush growth but are deadly at the pollination stage reducing some yields by 30%
- **Disease**
 - Warm wet weather promotes diseases like blight
- **Pests**
 - Pests survive warmer winters and a longer growing seasons mean increased incidence of pest attacks



Developing Countries

Climate change will hit farmers in developing countries the hardest

- farmers in the tropics are already near the temperature limits for most major crops
- these farmers have less money, more limited irrigation technology and no weather tracking systems
- crop failures push many farmers off the land and into cities

New Approaches

What can be done to cultivate food security?

- **Focus on conceptual and political change in addition to technological fixes**
 - International treaties such as:
 - Treaty on Plant Genetic Resources
 - Treaty on livestock breeds
 - International cooperation by health organizations
 - WHO and FAO programs that monitor diseases
- **Support and train farmers to:**
 - Maintain indigenous breeds
 - Preserve plant diversity
 - Promote seed saving and gene banks
 - Use less energy and encourage self reliance for fertility inputs
 - Develop agro forestry and mixed crop plantings
- **More public commitment**



New Strategy...

- Focus on yield increase and market access of small farmers
- Capacity building of small farmers
- Investment in research and development
- Structured links between lab and farm
- Integrate climate change into strategy at all levels
- Improved communication on climate changes and options to adapt to them
- Efficient drought and water management



India - Retail, Food & Agriculture

India is growing



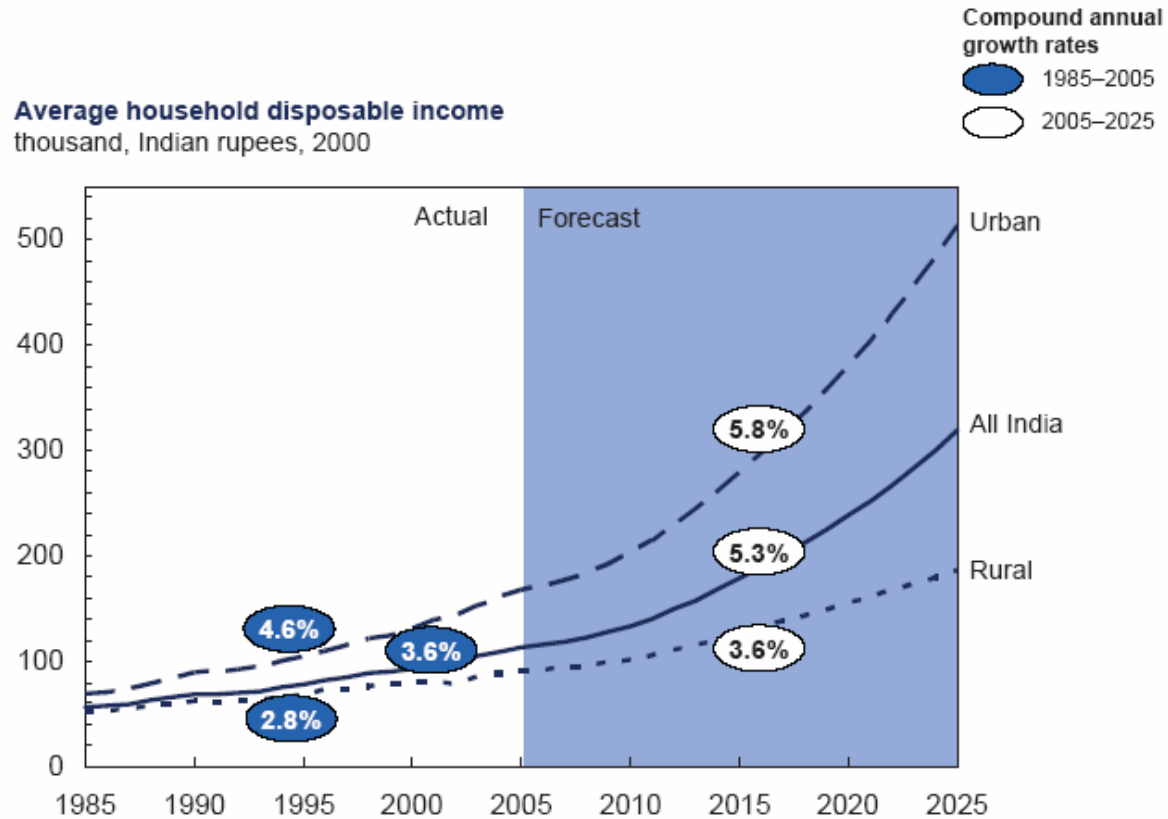
- **India will be the third largest economy by 2040**

(Source: The Economist, IMF and Goldman Sachs)

- **India's GDP at current prices is estimated to be US\$ 1721 billion by 2015**

(Source: Goldman Sachs)

Household Incomes Increasing

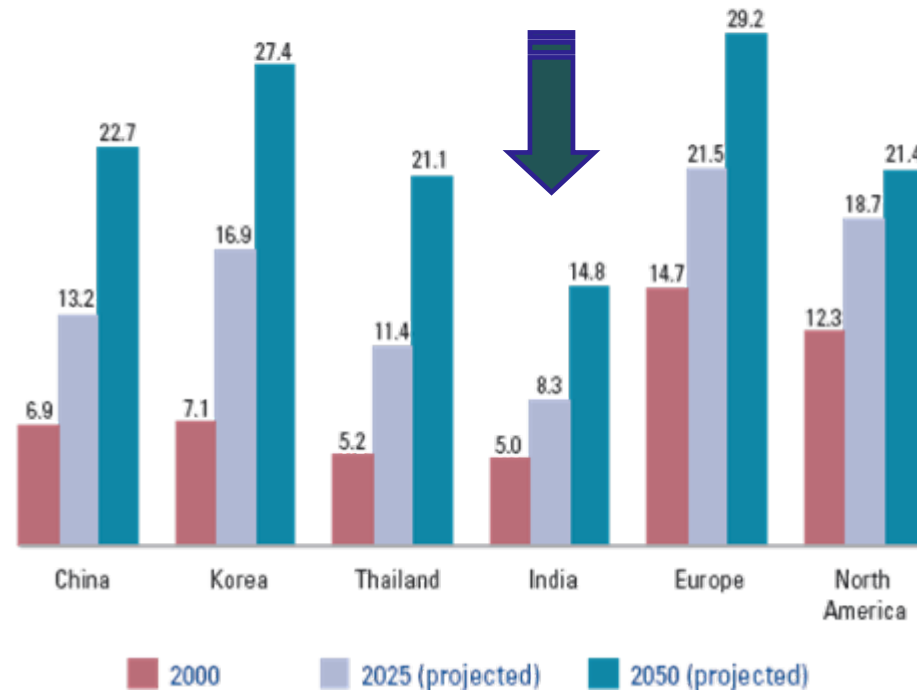


Source: Mckinsey Global Institute

- Household incomes in India to cross Rs 150,000 by 2010

Young Population

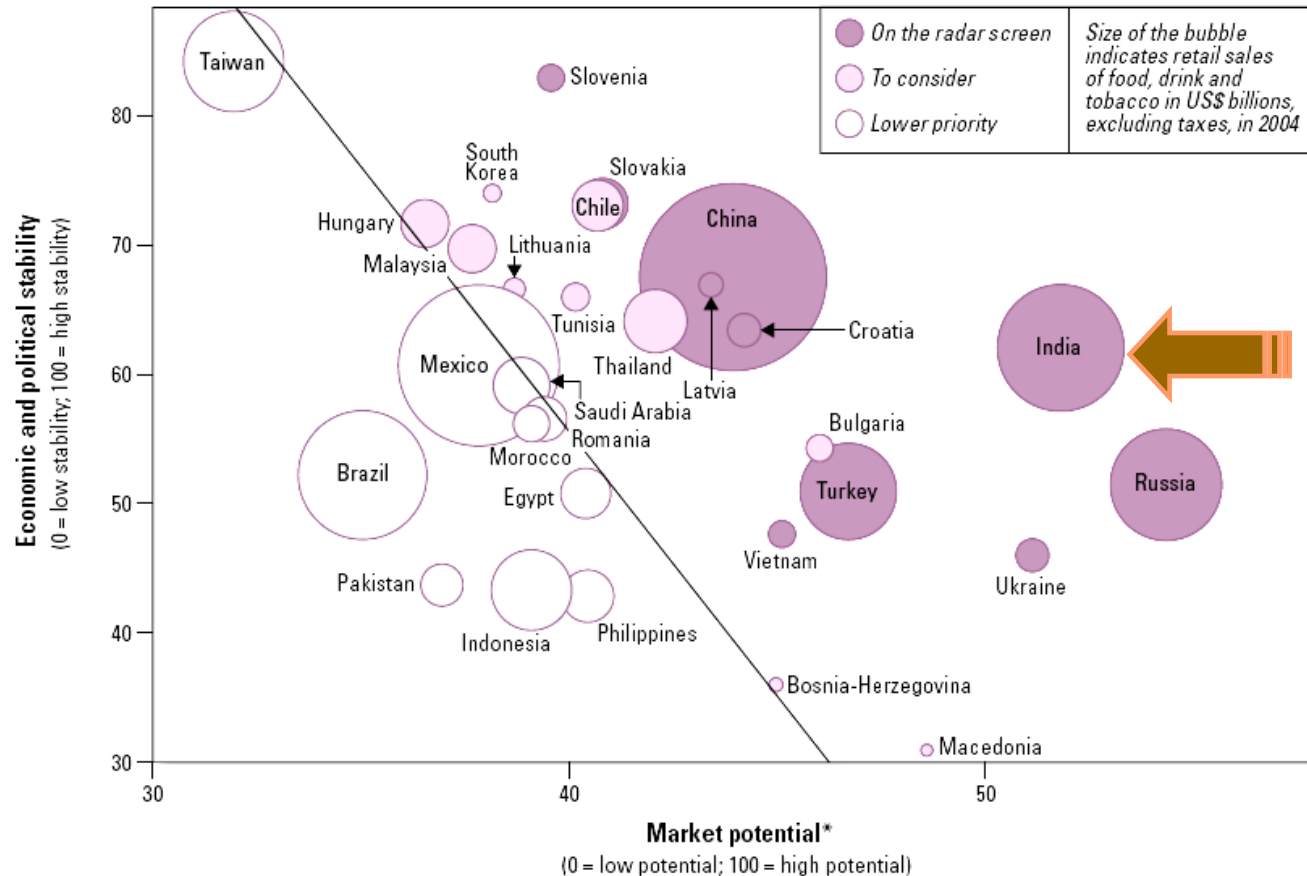
Percentage of population aged 65 and older in 2000, 2025 and 2050



(Source: UN)

- **India has a demographic advantage with a large young population**
 - More than 85% population estimated aged less than 65 in 2050

Most attractive retail market !



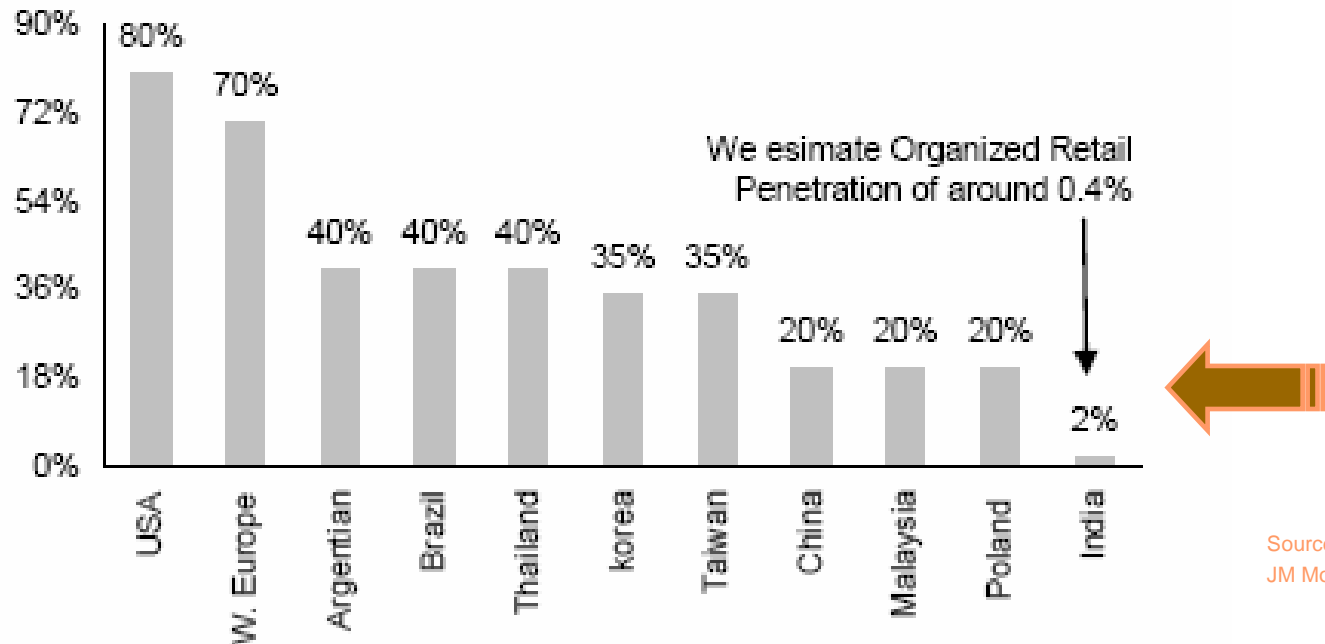
Source:
 AT Kearney
 Global Retail
 Development
 Index (GRDI)

India's retail market has grown by 10% on average for past 5 years

...steadily rising to top position in GRDI

Organized retail is still in its infancy !

Penetration of Organized Retail



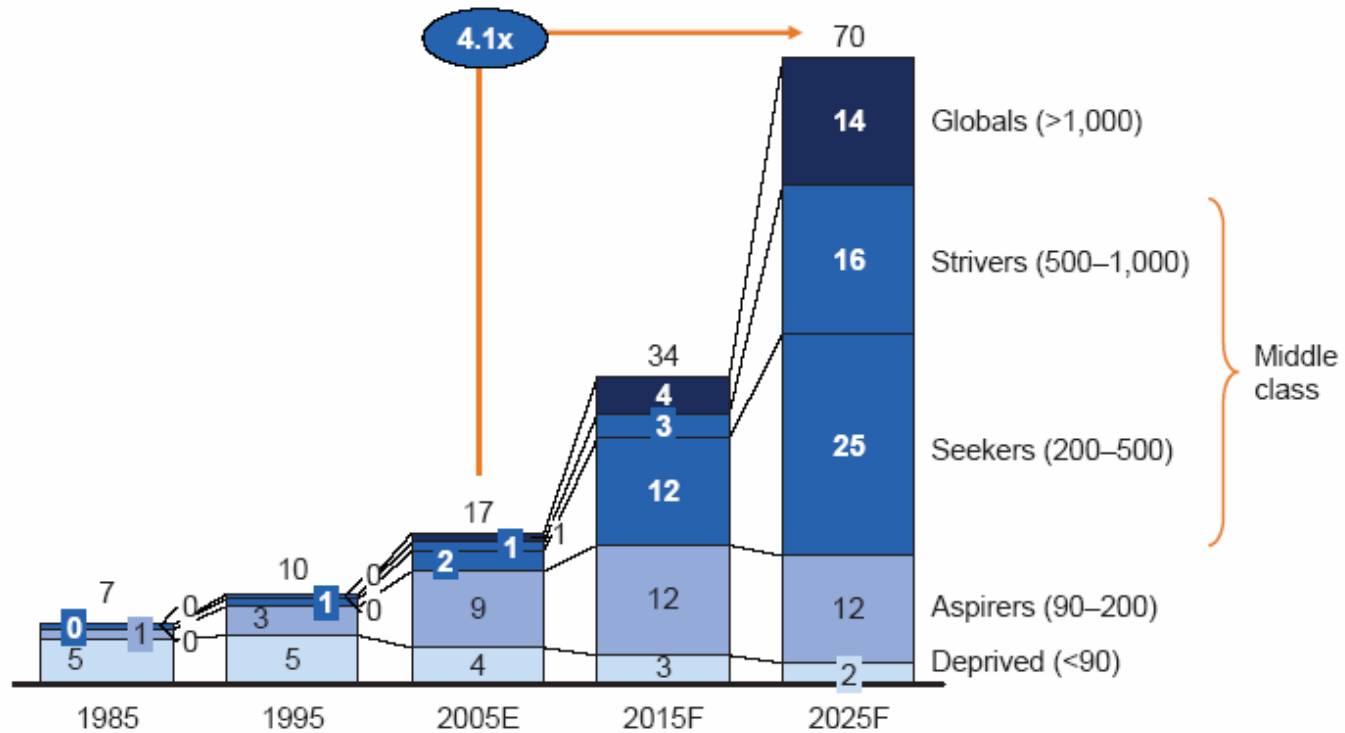
Source: FDI In Retail Sector (ICRIER), Morgan Stanley Research

- **With just 2 % organized retail ...**
....India is a big opportunity

Consumption Growing

Aggregate consumption across income brackets
trillion, Indian rupees, 2000

Household income brackets
thousand, Indian rupees, 2000



Note: Figures are rounded to the nearest integer and may not add up exactly to column totals.

Source: Mckinsey Global Institute

- India's aggregate consumption will quadruple by 2025

Consumer Preferences Evolving



- From *traditional* to...



- ... *modernized traditional*



- From *globalize* to...



- ... *Indianise*



- From *functional* to...



- ... *lifestyle*

Indian Agriculture - Snapshot

We are a large producer and consumer of food

- ✓ All 15 major climates of the World are present in India
- ✓ 52% of total land is cultivable as against world average of 11%
- ✓ India is a multi crop country unlike major ag economies

Fruits and Vegetables

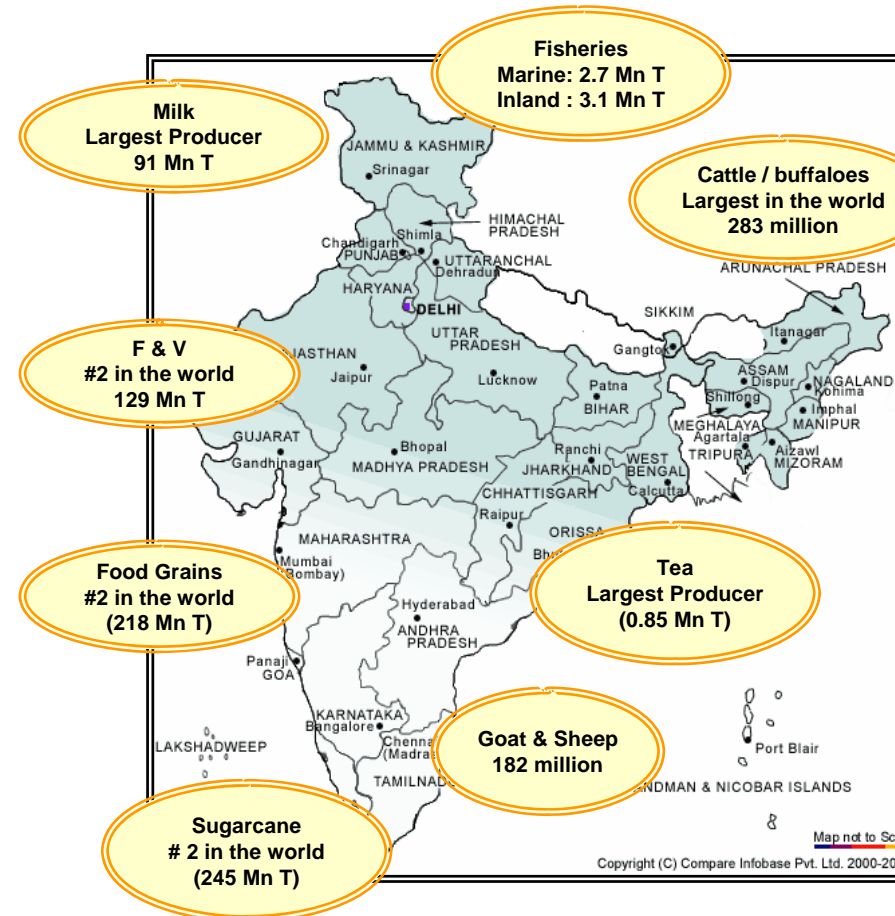
- 41% of mango
- 23% of Banana
- 24 % of cashew nut
- 10% of onion
- 30% of cauliflower
- 36% of Green Peas.

Meat and Poultry

- 53% of world's buffalo
- 17% of goat
- Fifth in world egg production

Cereals

- Largest Producer of Pulses
- Second largest producer of Food grains
- Second largest producer of Sugarcane

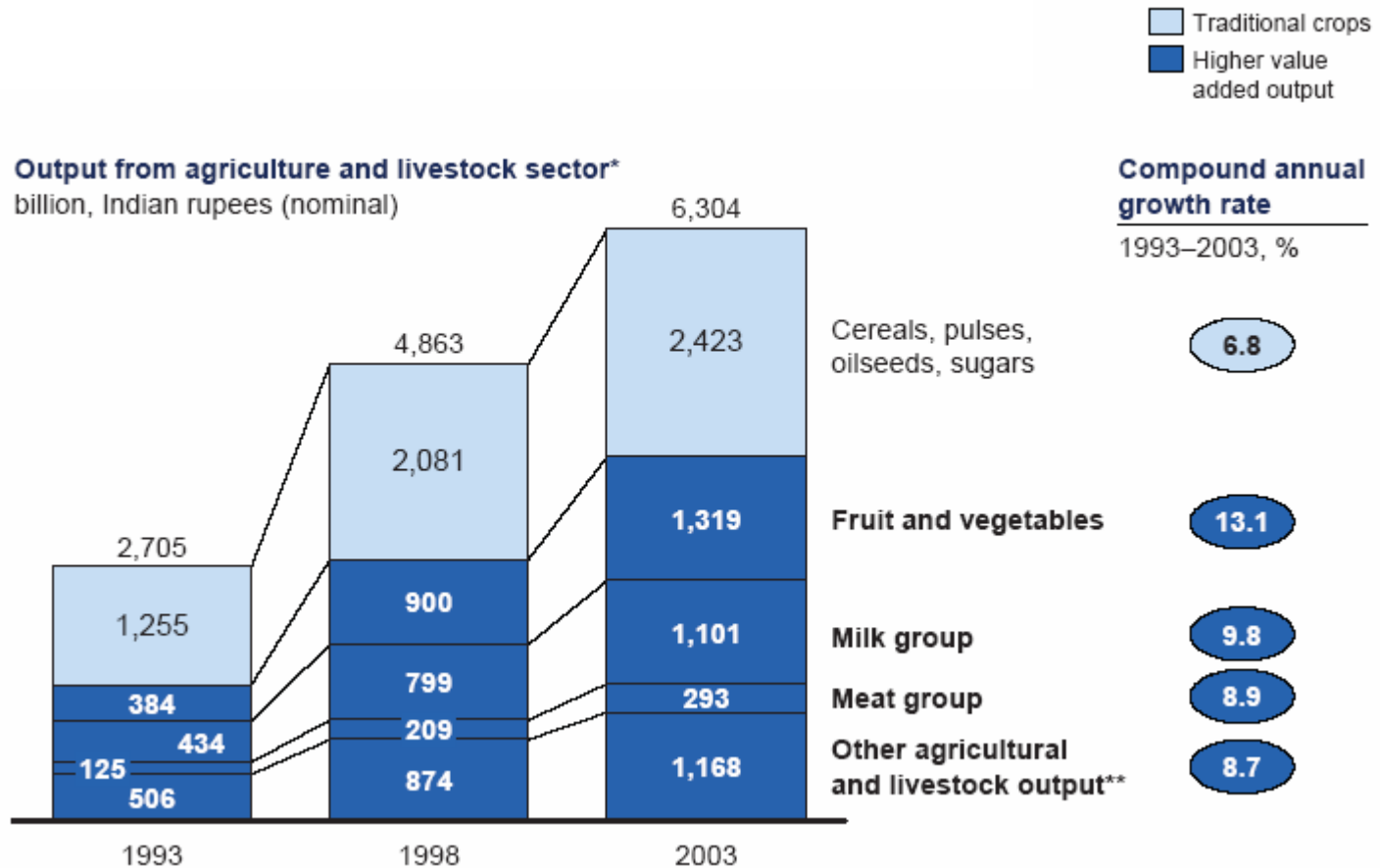


Source: FAO / NHB / Department of Animal Husbandry

Agriculture Scenario in India

- **Increased demand for food**
 - Reducing/stagnating crop yields: fatigue of intensive agriculture and climate change
- **Reducing availability of natural resources for agriculture**
 - Need for increased resources: land, water, fertilizers, capital
- **Need to preserve environment**
 - Greater environmental impact of agriculture

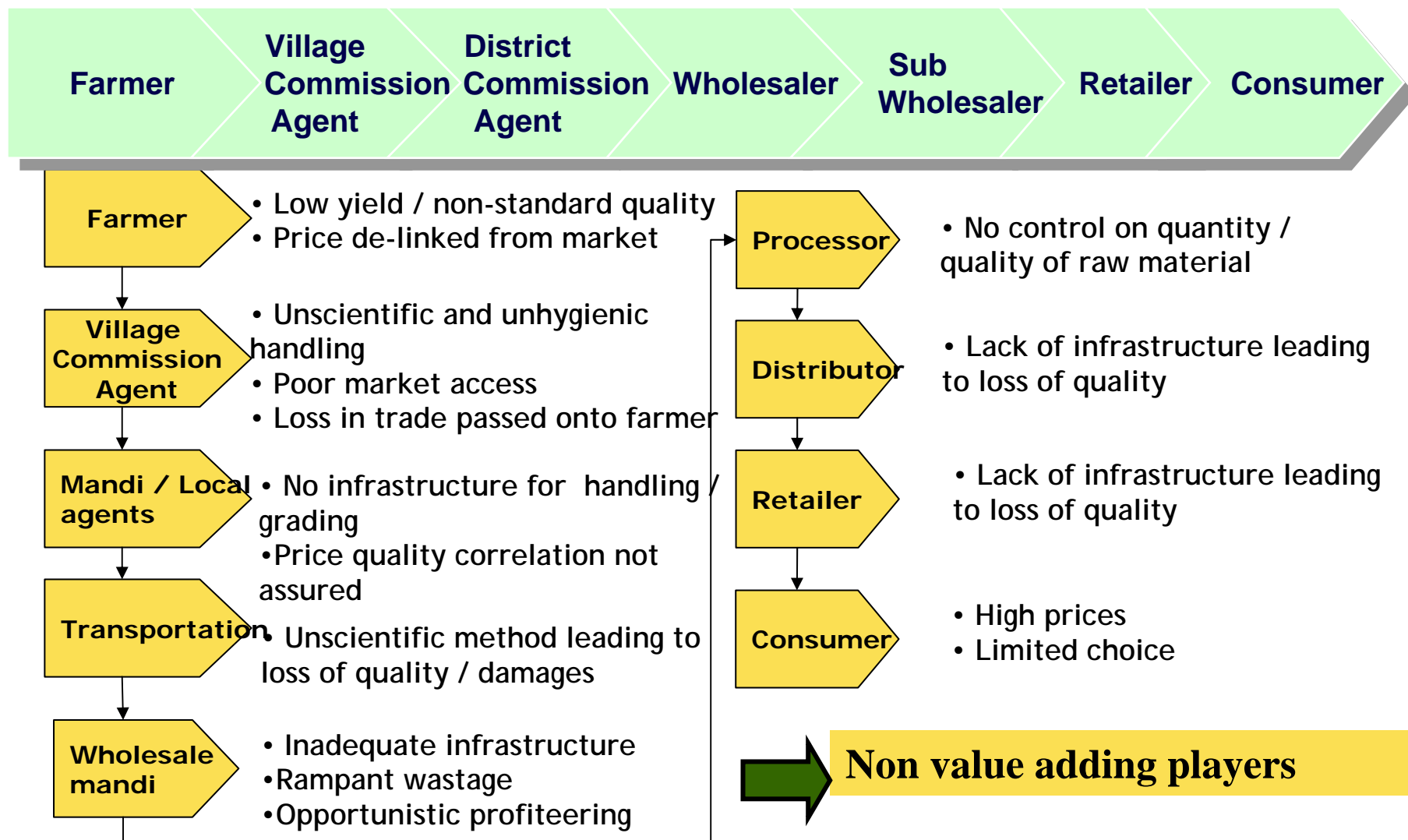
Diversifying Agriculture



✓ High value agriculture taking root over traditional crops

✓ Further increase in big imports as a consequence

Disjointed Supply Chain



Poor Supply Chain Infrastructure

- **Poor infrastructure facilities for**
 - **Storage**
 - **Transportation**
 - **Processing**
 - **Packaging**
 - **Distribution**
- **About 3,500 cold storages/warehouses**
 - **Only 13m tonnes of storage capacity for production or 140 mn tonnes of Fruits/Vegetables**

Thank You!



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