



Global Trends and Development in Food Security

AVA Food Industry Convention 2013

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Cereal production for 2013 (as of October 2013) is expected to increase by 8%, contributed by wheat production increase of 7 %, course grain 11% and rice 1.1%

Cereal production,utilization and stocks

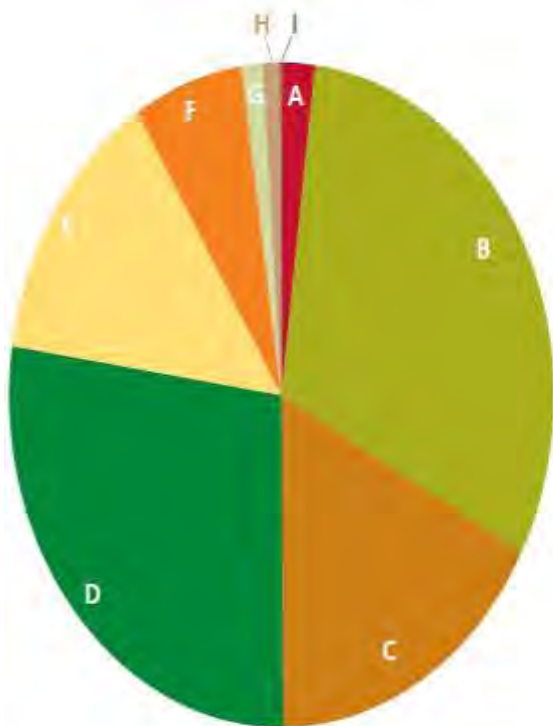


The changing distribution of hunger in the world

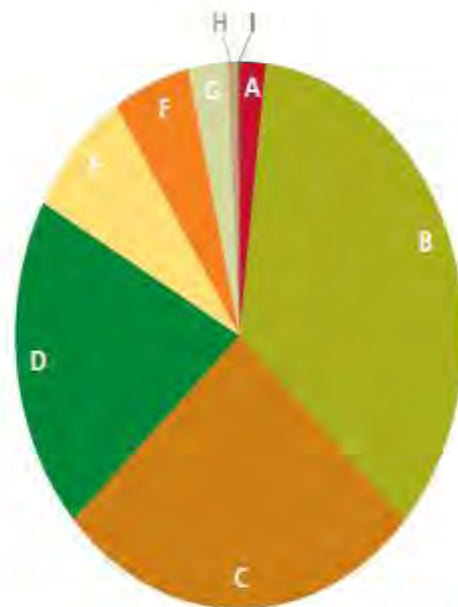
Number and share of undernourished by region, 1990–92 and 2011–13

1990–92

2011–13



Total = 1 015 million



Total = 842 million

	Number (millions)		Regional share (%)	
	1990–92	2011–13	1990–92	2011–13
A Developed regions	20	16	2	2
B Southern Asia	314	295	31	35
C Sub-Saharan Africa	173	223	17	26
D Eastern Asia	279	167	27	20
I South-Eastern Asia	140	65	14	8
F Latin America and the Caribbean	66	47	6	6
G Western Asia and Northern Africa	13	24	1	3
H Caucasus and Central Asia	10	6	1	1
J Oceania	1	1	0	0
Total	1 015	842	100	100

Note: The areas of the pie charts are proportional to the total number of undernourished in each period. All figures are rounded.

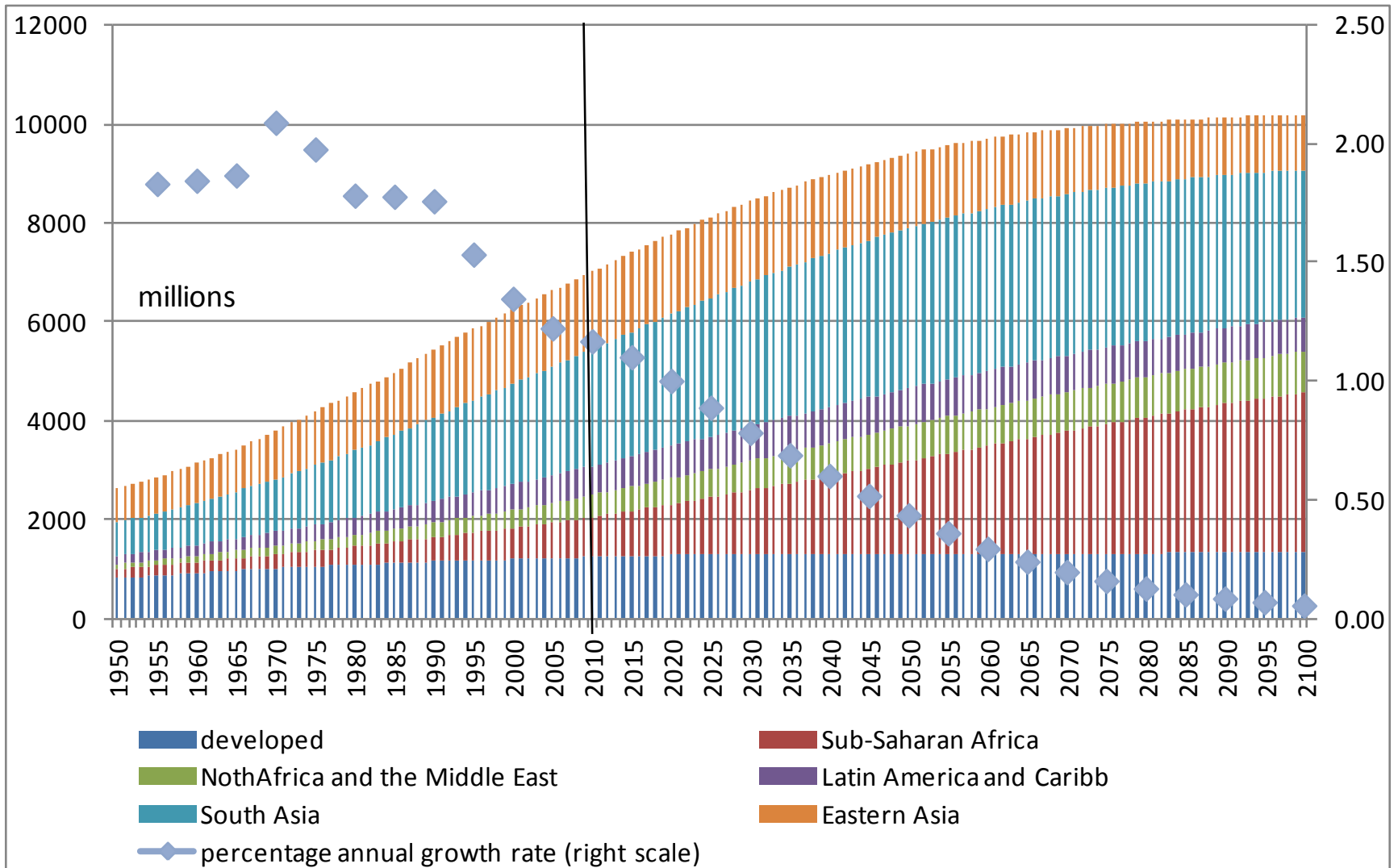
Source: FAO.

Future Outlook Towards Year 2050

Can we produce sufficient food to meet the demand of the growing future population which would reach 9.2 billion by 2050?

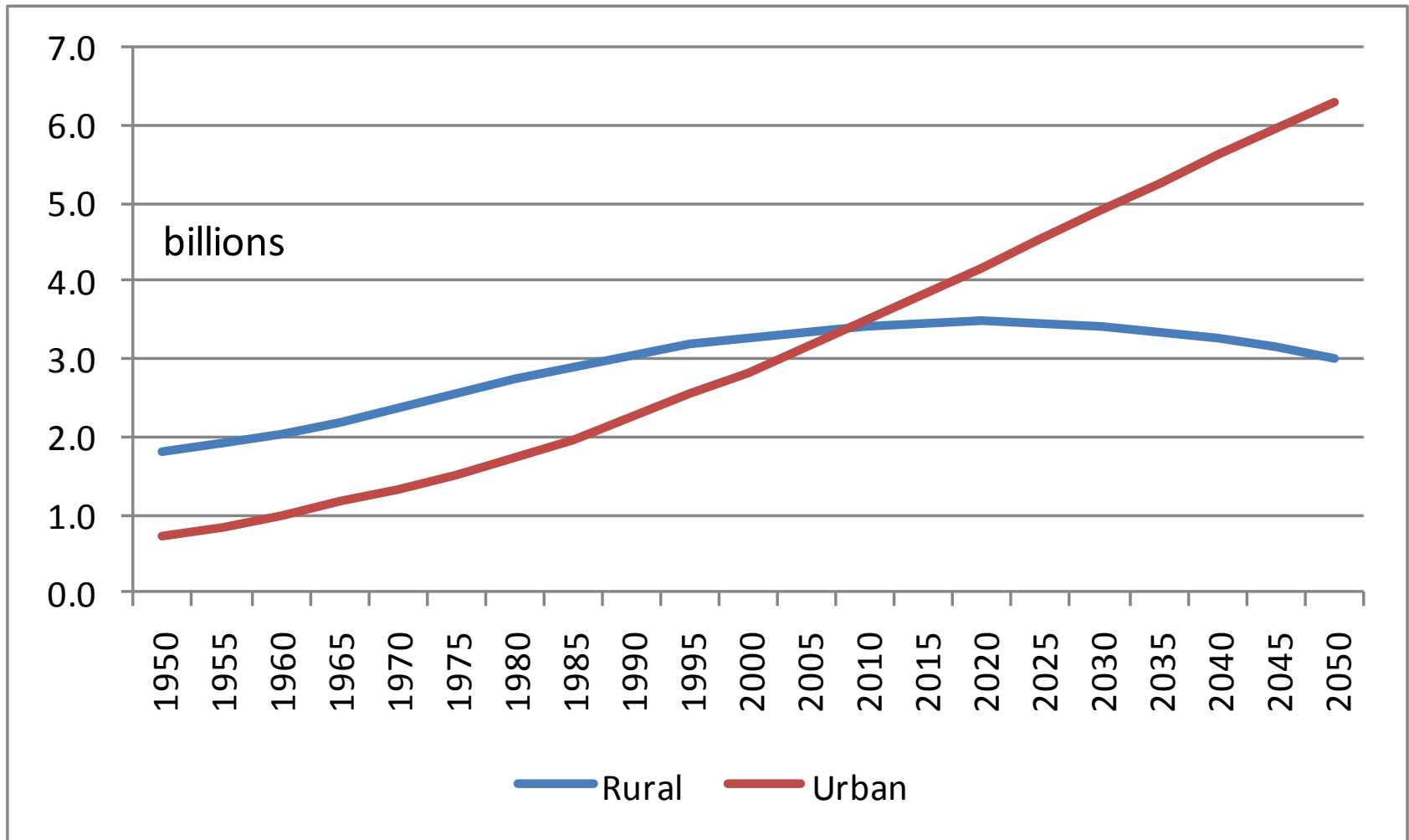


World Population Trends



Source: UN, 2011

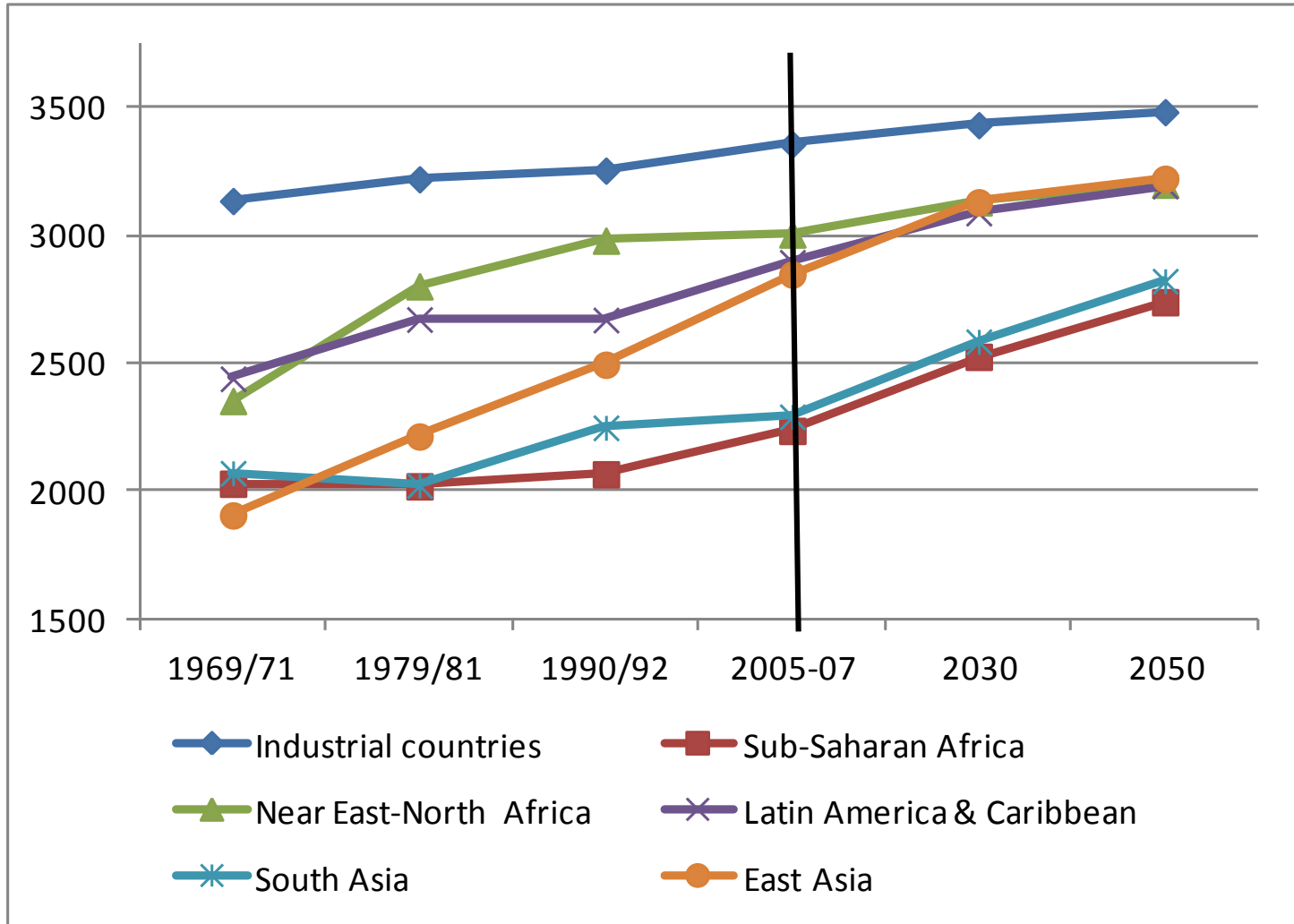
Global Urbanization Trends



Source: UN, 2011

Food Consumption Trends

(Kcal/person/day)



Source: Alexandratos, 2011⁷

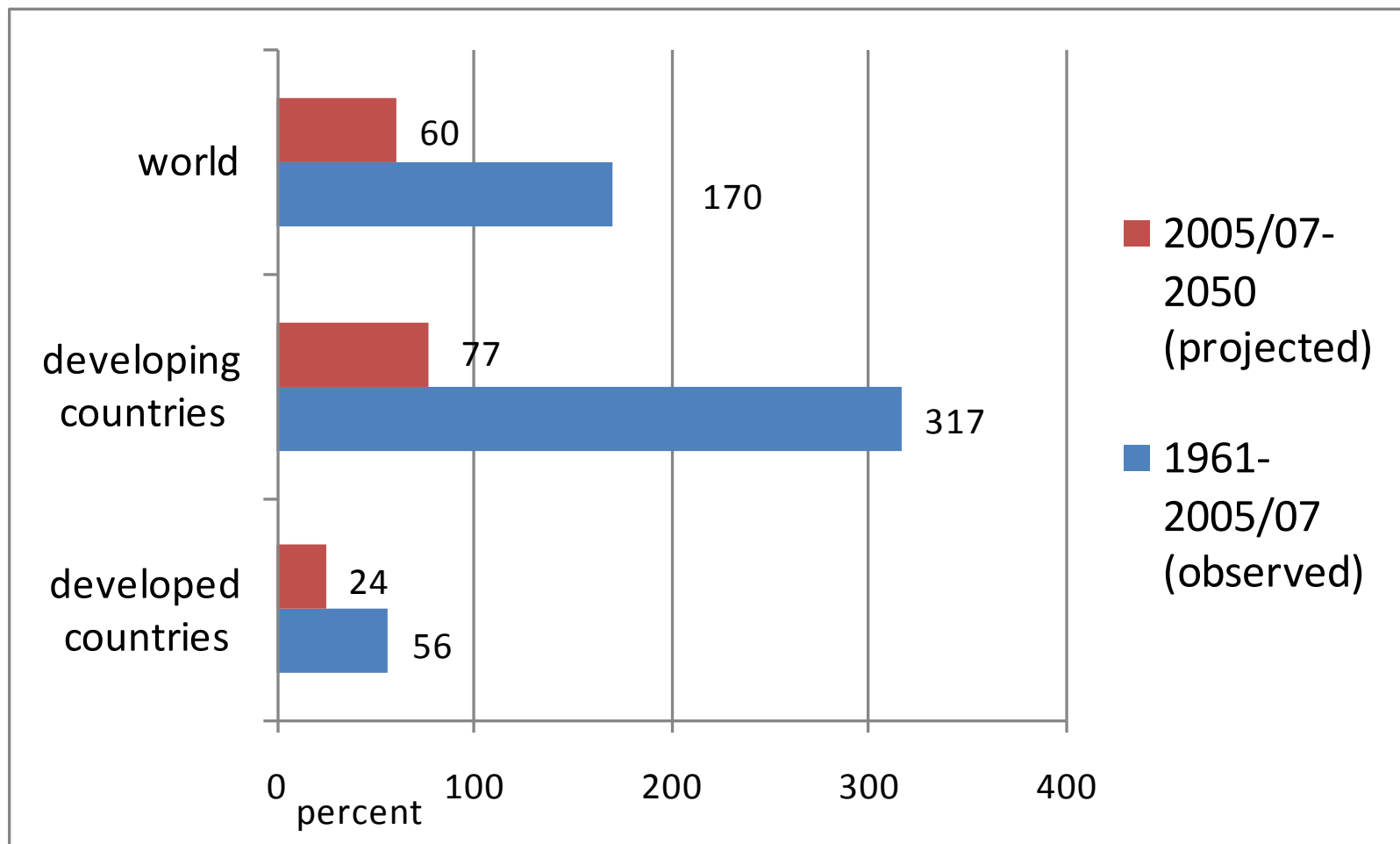
Global production in 2050

Compared to 2005/07, the world would produce every year as at 2050

- one more billion tons of cereals (45%)
- 196 more million tons of meats (76%)
- 713 more million tons of roots and tubers (64%)
- 172 more million tons of soybeans (79%)
- 429 more million tons of fruits (68%)
- 365 more million tons of vegetables (47%)



60% increase in food production needed by 2050 (77% increase, if developing countries only)



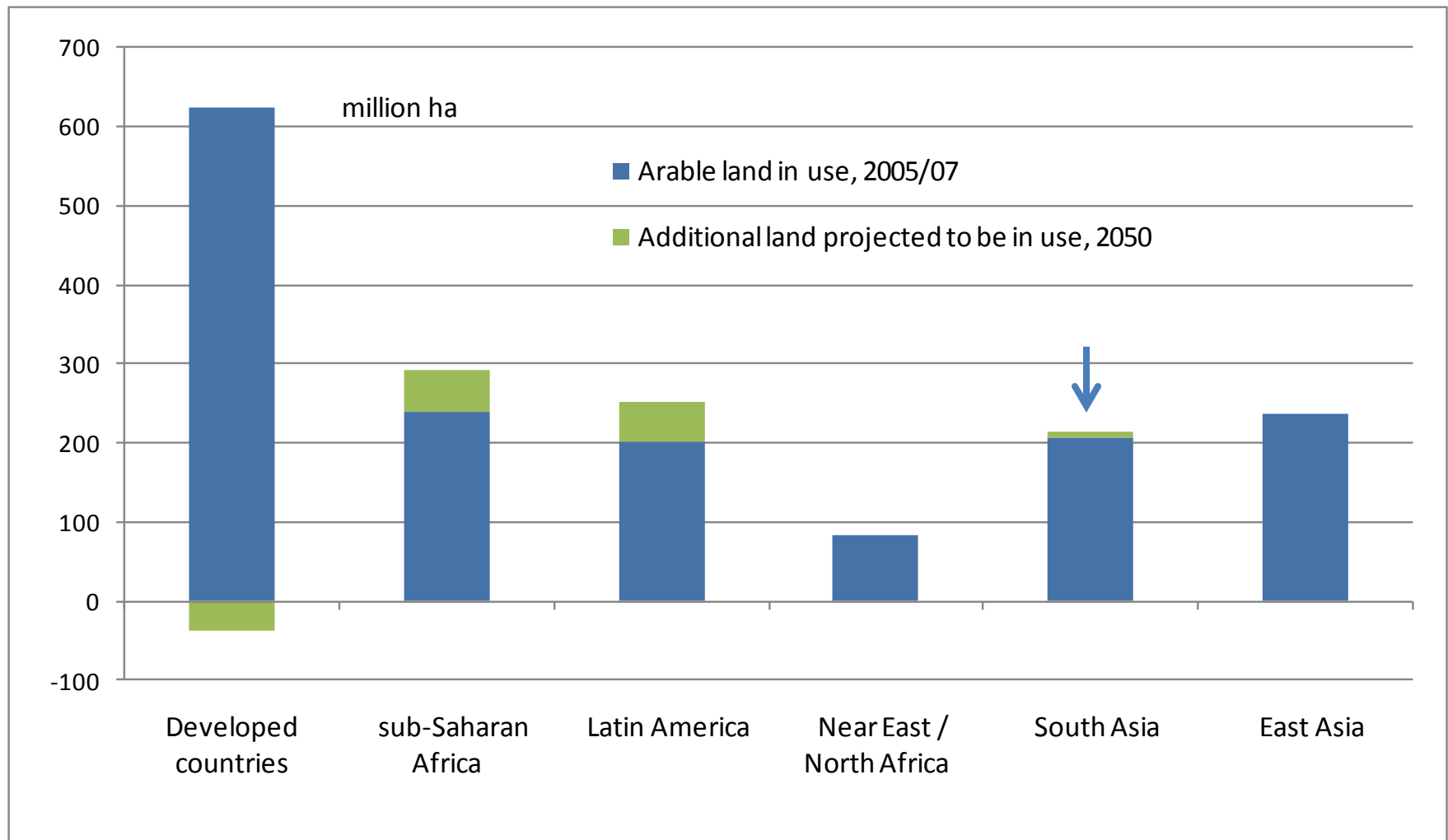
Source: Bruinsma, 2011



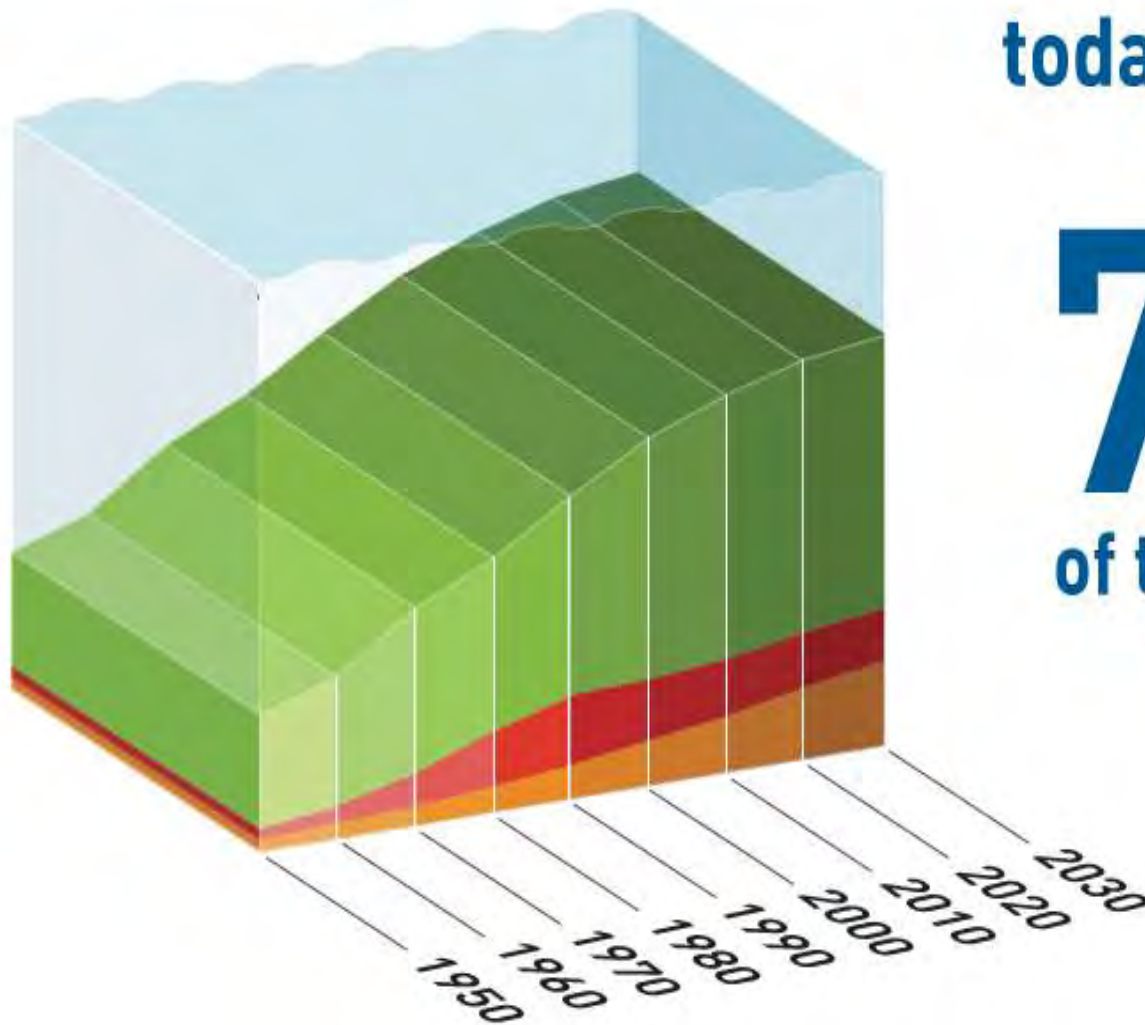
Targeted Increases in Food Production Must be met under Existing Constraints

- Stagnation of expansion of arable land
- Increasing scarcity of water resources
- Decline of productivity growth affected by lack of investment in agriculture in recent decades
- Increasing post-harvest losses and table waste
- Various uncertainties such as future crude oil prices, food price hike and volatilities, negative impact of climate changes and natural disasters, and bio-fuel development.

Limited Scope Exists for Expansion of Arable Land in Asian Countries (only 5% of existing land can be expanded mainly in Africa and Latin America)



Increased Production will Increase the Demand for Water



today agriculture
accounts for
70%
of total water use

- Agricultural use ■
- Industrial use ■
- Domestic use ■

Water is a Key Requirement for Food Production

HOW MUCH WATER IS NEEDED TO PRODUCE...



1 KILO
OF MEAT

15,000
LITRES



1 KILO
OF WHEAT

1,500
LITRES



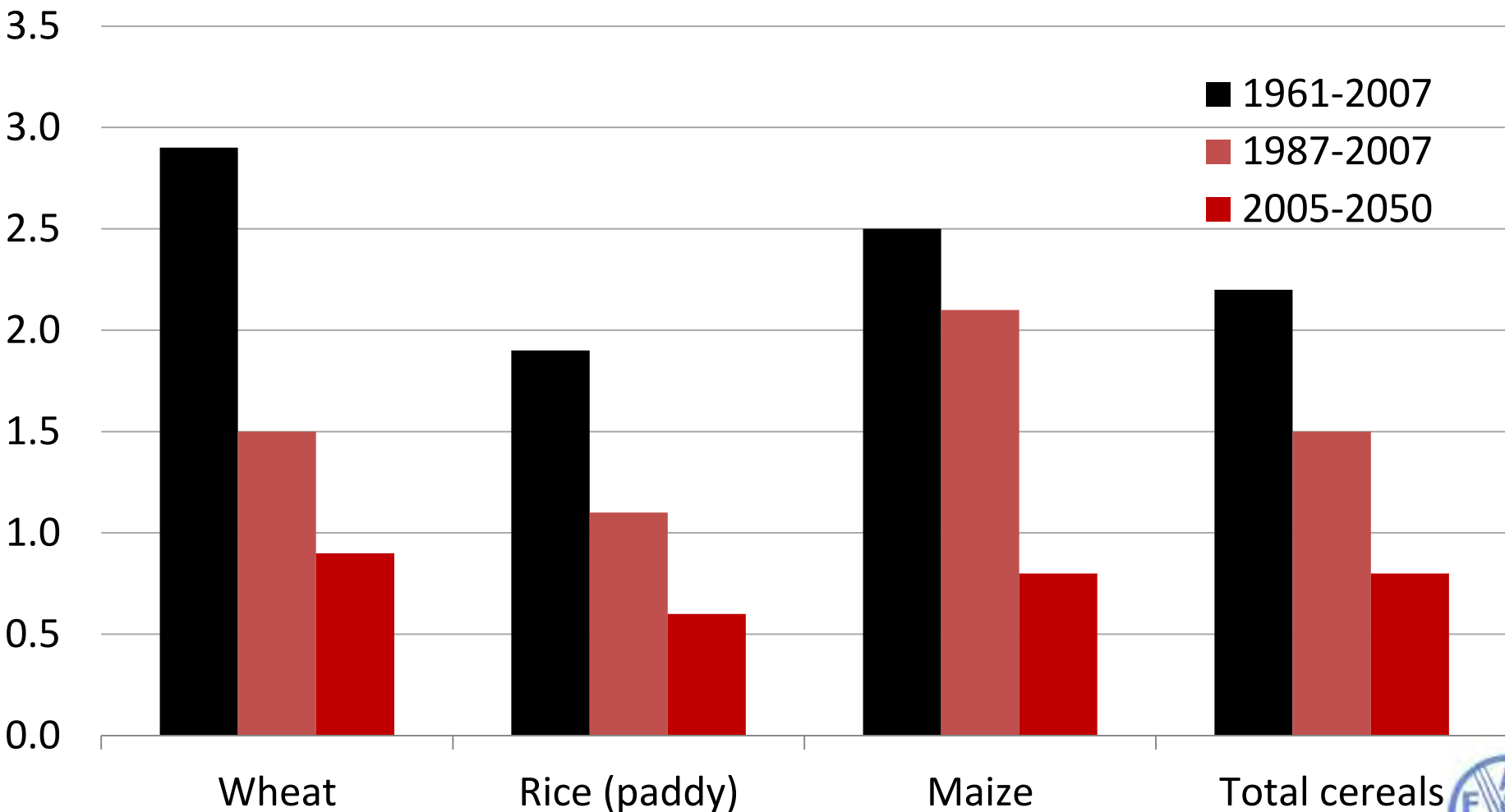
DAILY DRINKING
REQUIREMENTS

2-5
LITRES

To produce enough food to satisfy a person's daily needs takes about 3000 litres of water.

Growth in cereal yields is slowing

Growth rate, percent per year



Source: Bruinsma 2011



GLOBAL FOOD LOSSES AND WASTE

ARE ESTIMATED AT 1.3 BILLION TONNES YEARLY

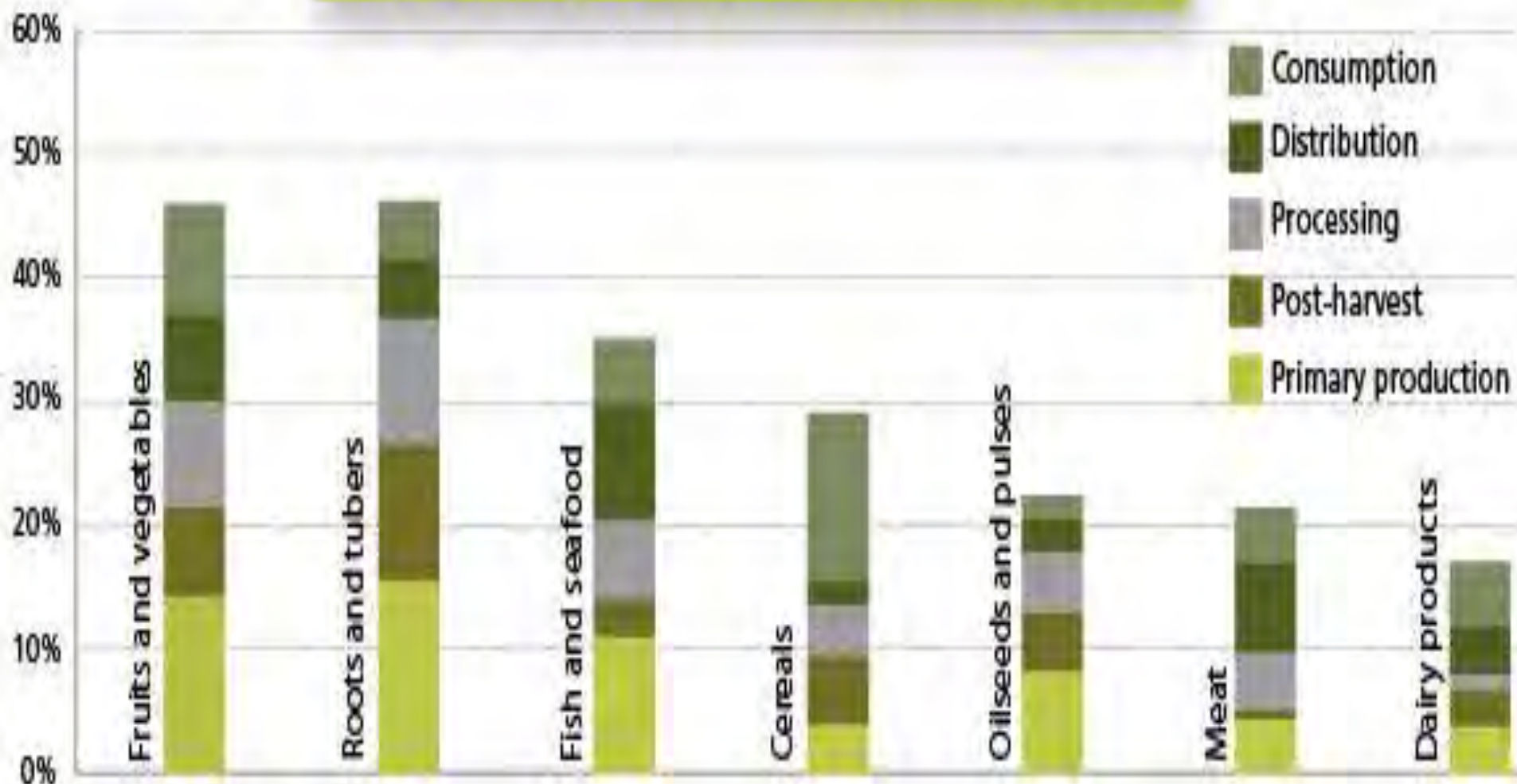
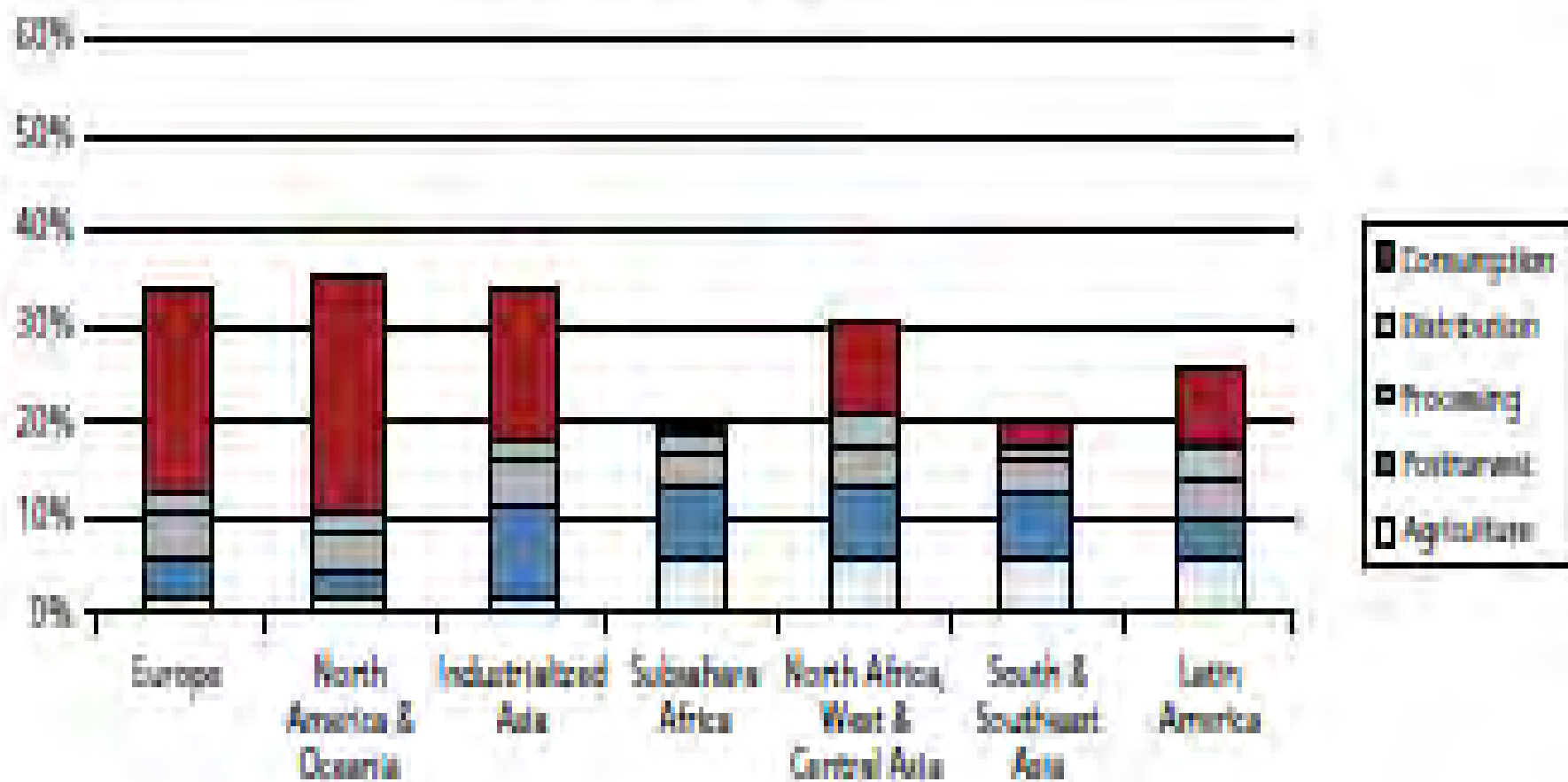


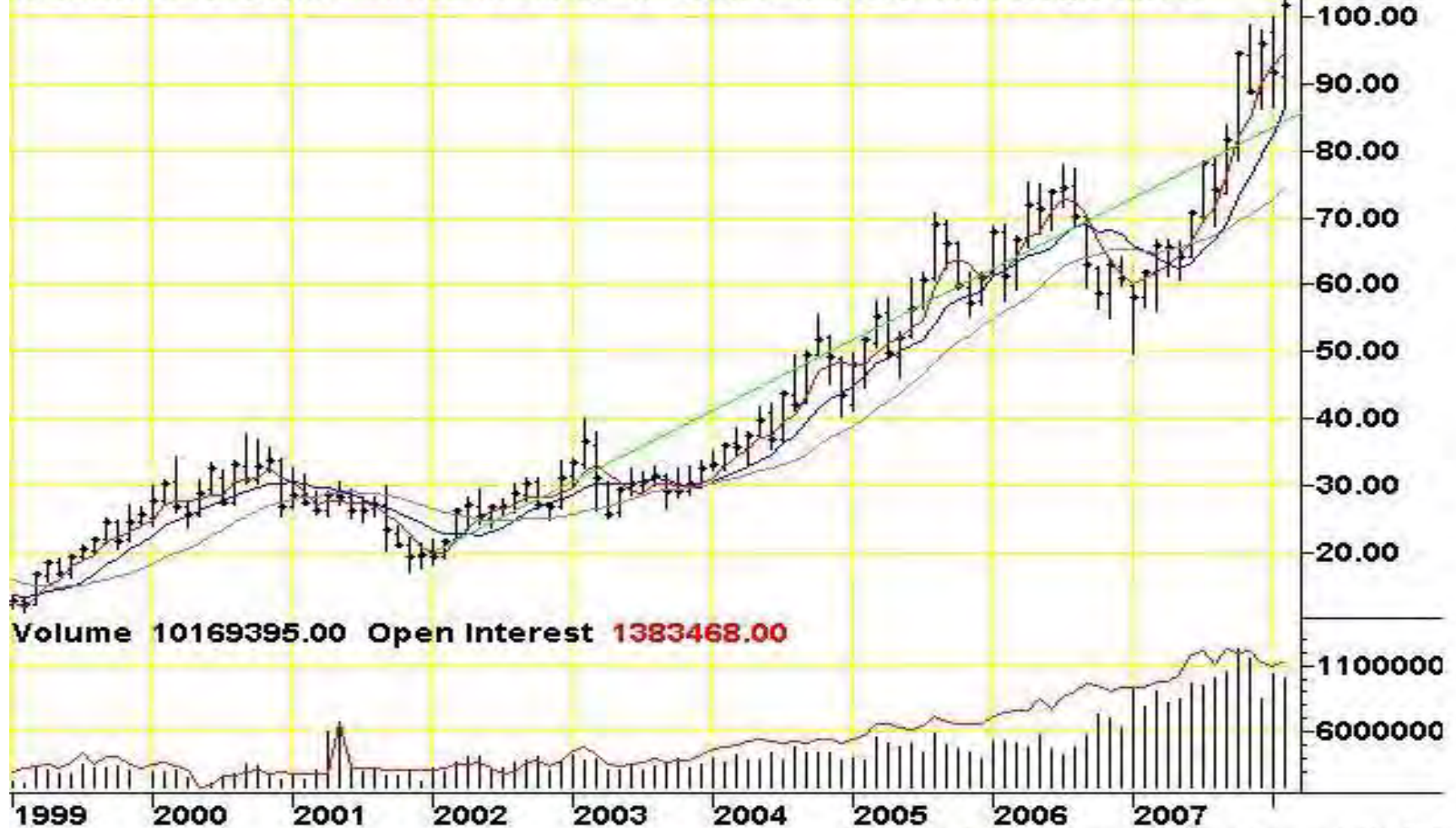
Figure 3. Part of the initial production lost or wasted, at different FSC stages, for cereals in different regions

Food losses - Cereals



Crude oil price increased over 500% since 1999

02/29/2008 C=101.84 +10.09 O=91.20 H=102.70 L=86.25 Mov Avg 3 lines



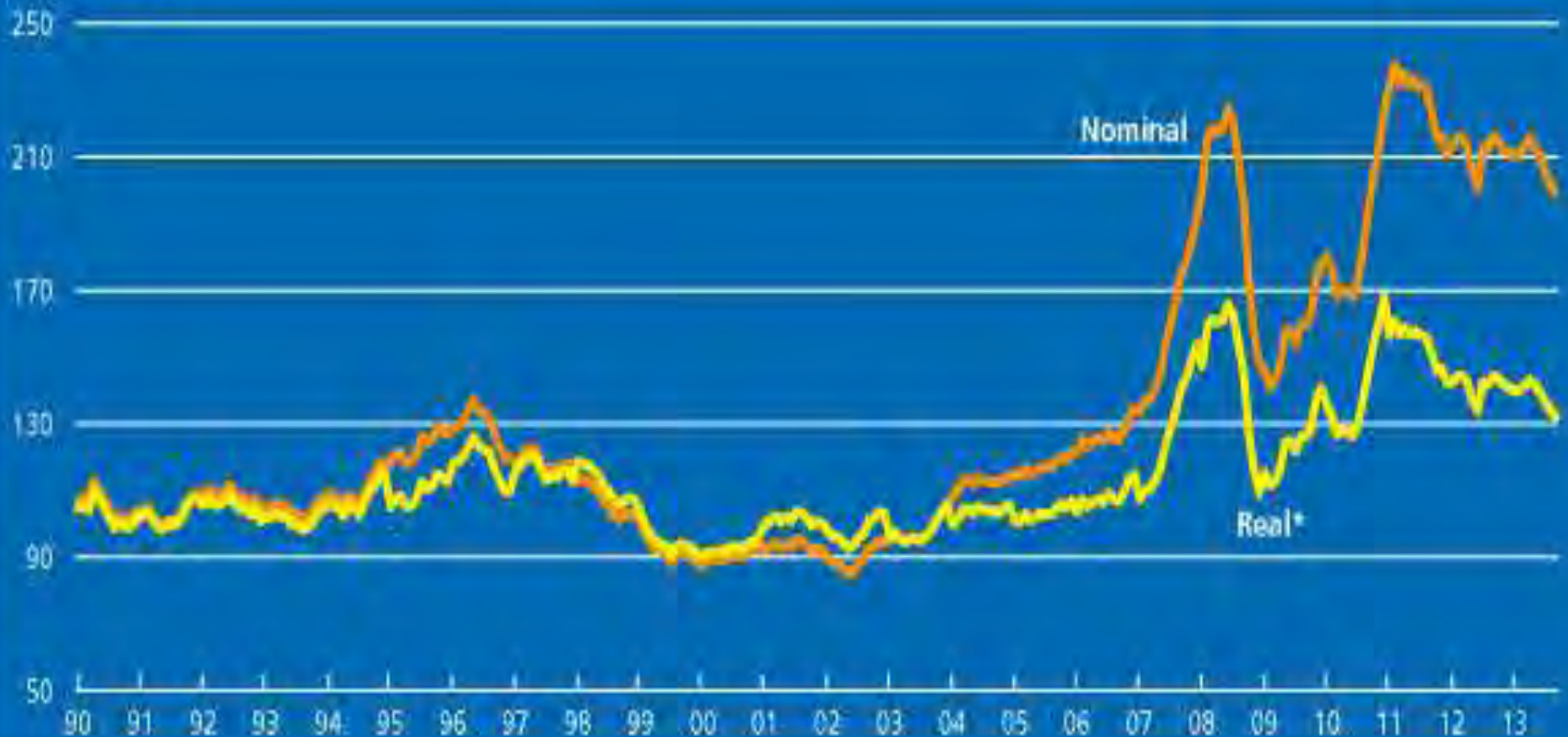
Created with SuperCharts by Omega Research © 1997



FAO Food Price Index in September 2013 averaged 199 points which was 1% lower than previous month, but still 100% higher than 10 years ago

FAO Food Price Index

2002-2004=100



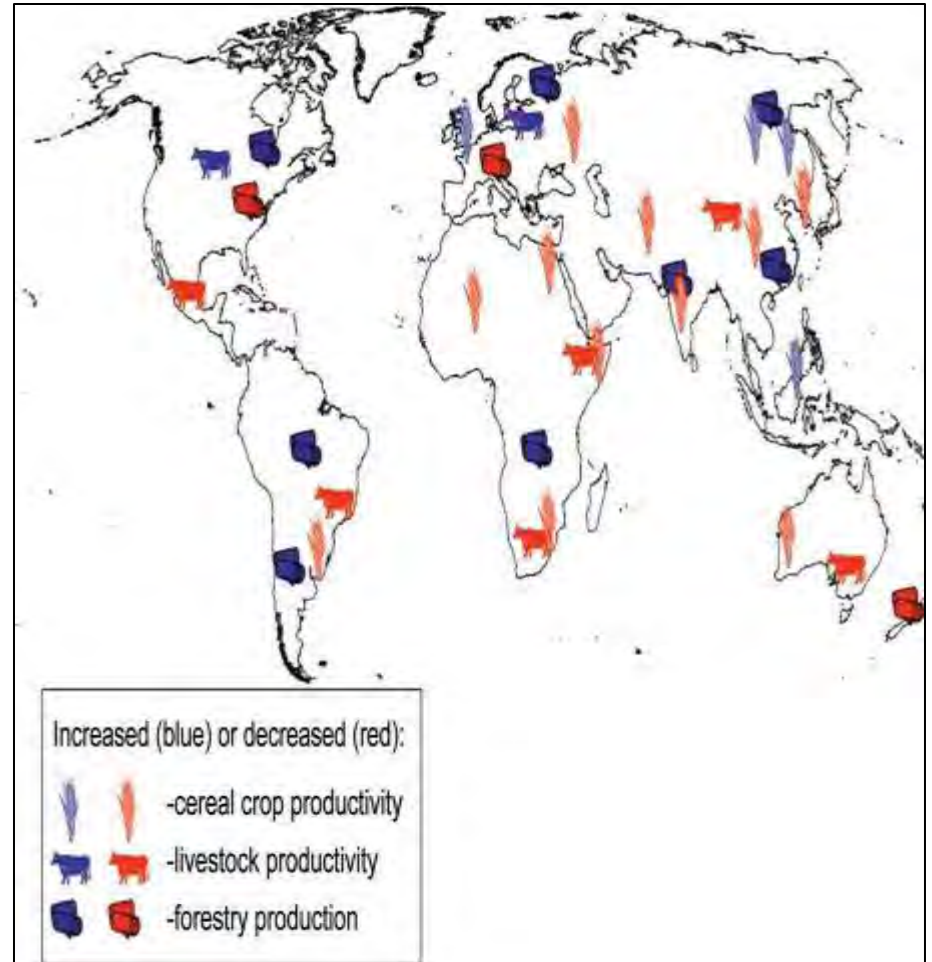
* The real price index is the nominal price index deflated by the World Bank Manufactures Unit Value Index (MUV)

Uncertainty: climate change

“worse case” 2080 scenario:

- less harvested area, up to -39% (World) and -29% (developing countries)
- up to 130 million more undernourished in S-SH Africa

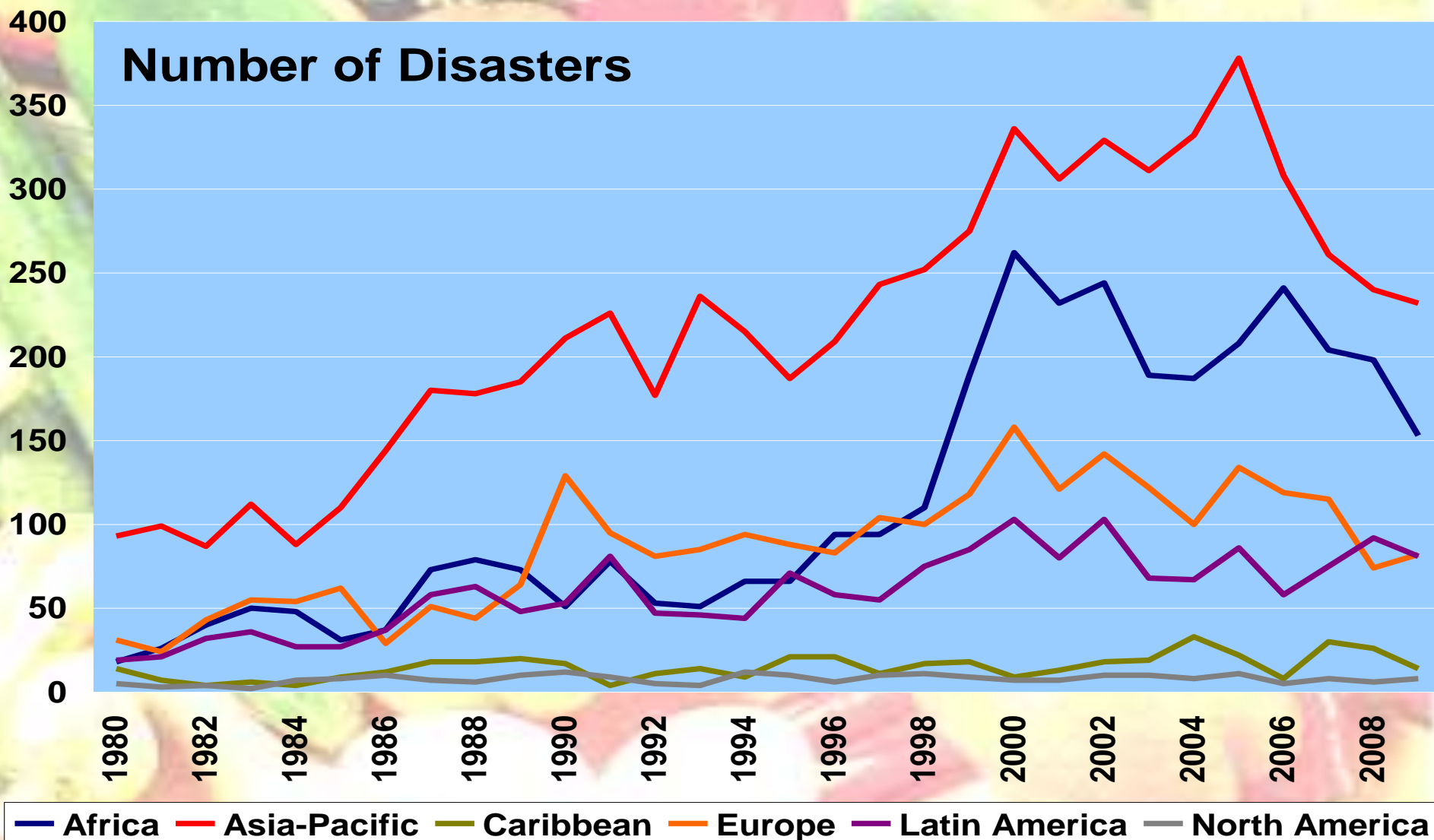
Source: IIASA (Fischer, 2011)



Source: IPCC (2007)



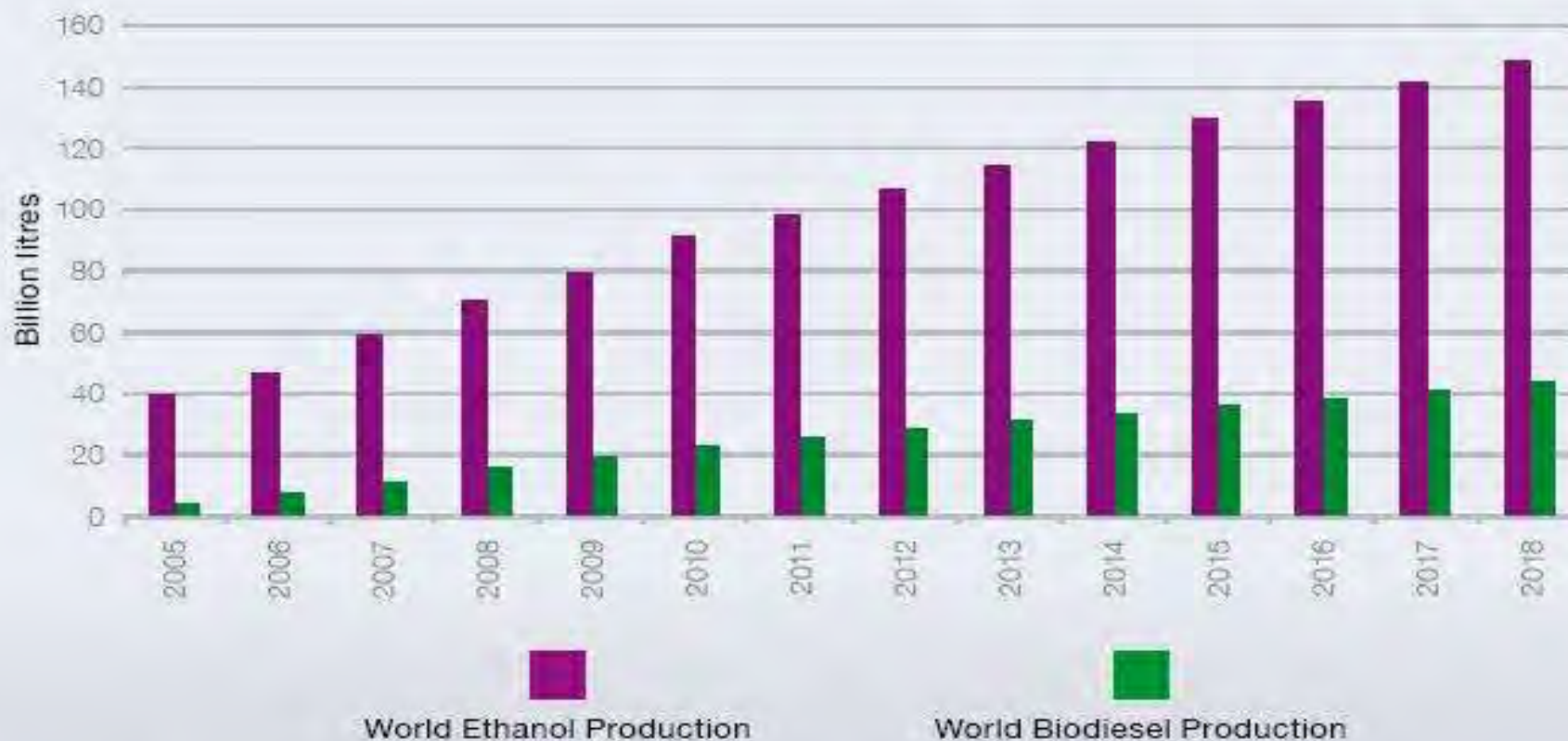
The number of natural disasters occurring worldwide has increased



Source: ESCAP and ISDR, The Asia-Pacific Disaster Report 2010.

World bio-ethanol and bio-diesel production is projected to be doubled in 20 years between 2009 and 2018; increasing competition of land and water use with food production

Figure 2. World ethanol and biodiesel projections, 2005-2018



Source: OECD-FAO Agricultural Outlook 2009-2018

Future Outlook Towards Year 2050

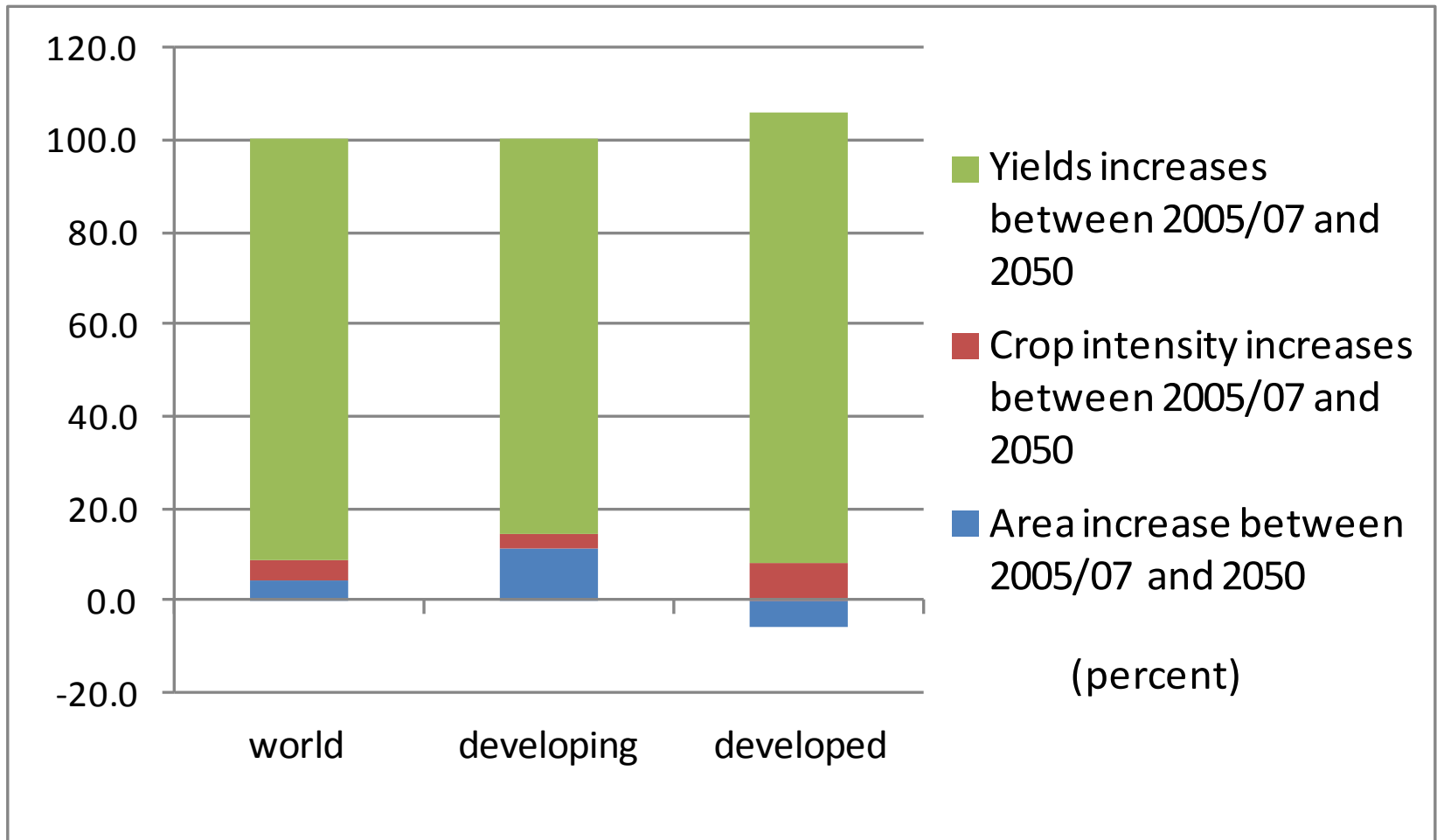
Can we increase food production by 60 %
(or 77% in developing countries) by 2050 to meet
the needs of growing population which would
reach 9.2 billion at that time?

Yes! In principle
we have to

But majority of it has to come from existing arable
land through agricultural research and yield
increase



Sources of Production Growth (91% is expected to come from yield increase)



But many uncertainties

(uncertain factors influencing future food security)

- Impact of climate changes,
- Bio-fuel development and competition between food crops and bio-energy crops on the use of land and water,
- Crude oil prices hike,
- Agricultural research and investment

What are the
implications for a small
net food importing
country like Singapore?

Potential Risks (if the world is unable to meet the production target, and if there is a food shortage)

- Export ban of food by food exporting countries to protect their own consumers
- Uncertainty to secure food import
- Food price hike
- Food price volatility
- Negative impact to the poor consumers
- Social unrest , political instability,

What measures might be taken to minimize the risks

A. Production, Research

- Promote domestic production and productivity through vertical/urban/hydroponic agriculture
- Promote technical cooperation with developing countries, and establish mutual trust
- Contribute to the advancement of agricultural research and technological innovation
- International center of excellence for cutting-edge plant genetics, with a particular focus on Asia/SE Asia

B. Trade

- Encourage more free trade agreements to secure food supply
- Diversify trade sources
- Promote Singapore's competitiveness in food industry through enhancing food quality and safety for domestic and export market
- Negotiate long-term forward trade contracts
- Establish emergency food reserve
- Promote food security partnership within ASEAN

C. Consumption

- Diversify diets, which will help to ensure a diverse range of trade partners as well as healthier and more nutritious balanced diets
- Reduce food losses and waste
- Create awareness and advocate the importance of food and agriculture
- Promote public-private sector partnership, and build-up a sense of solidarity
- Enhance our concerted efforts, help each other, let's work together