

From Food Production to Food Security: challenges & opportunities

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Content

- Megatrends in agriculture
- Global food security
- Why is Africa lagging behind (IAC study)
- A way forward



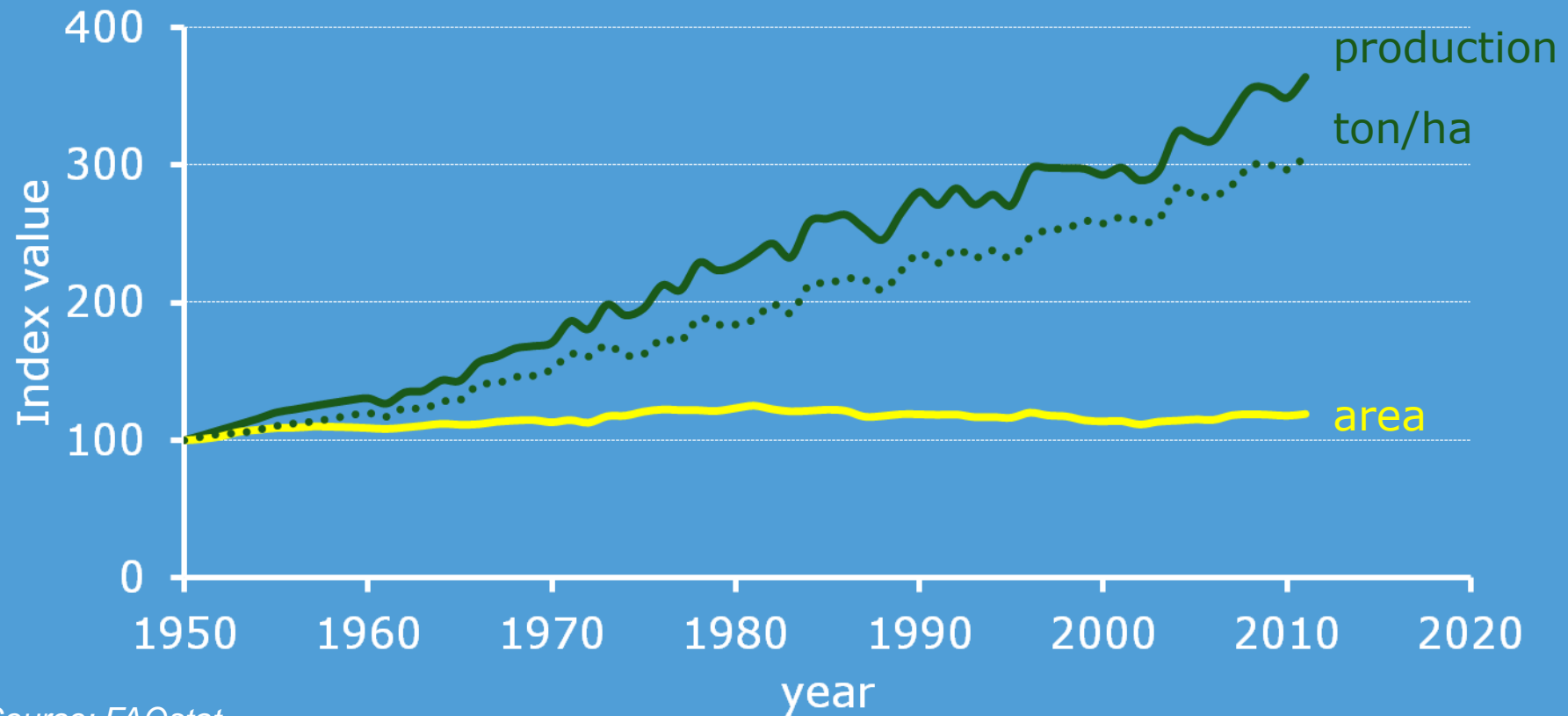
Megatrends in agriculture





...Global Food Security ...

Global grain productivity (1950 – 2010)

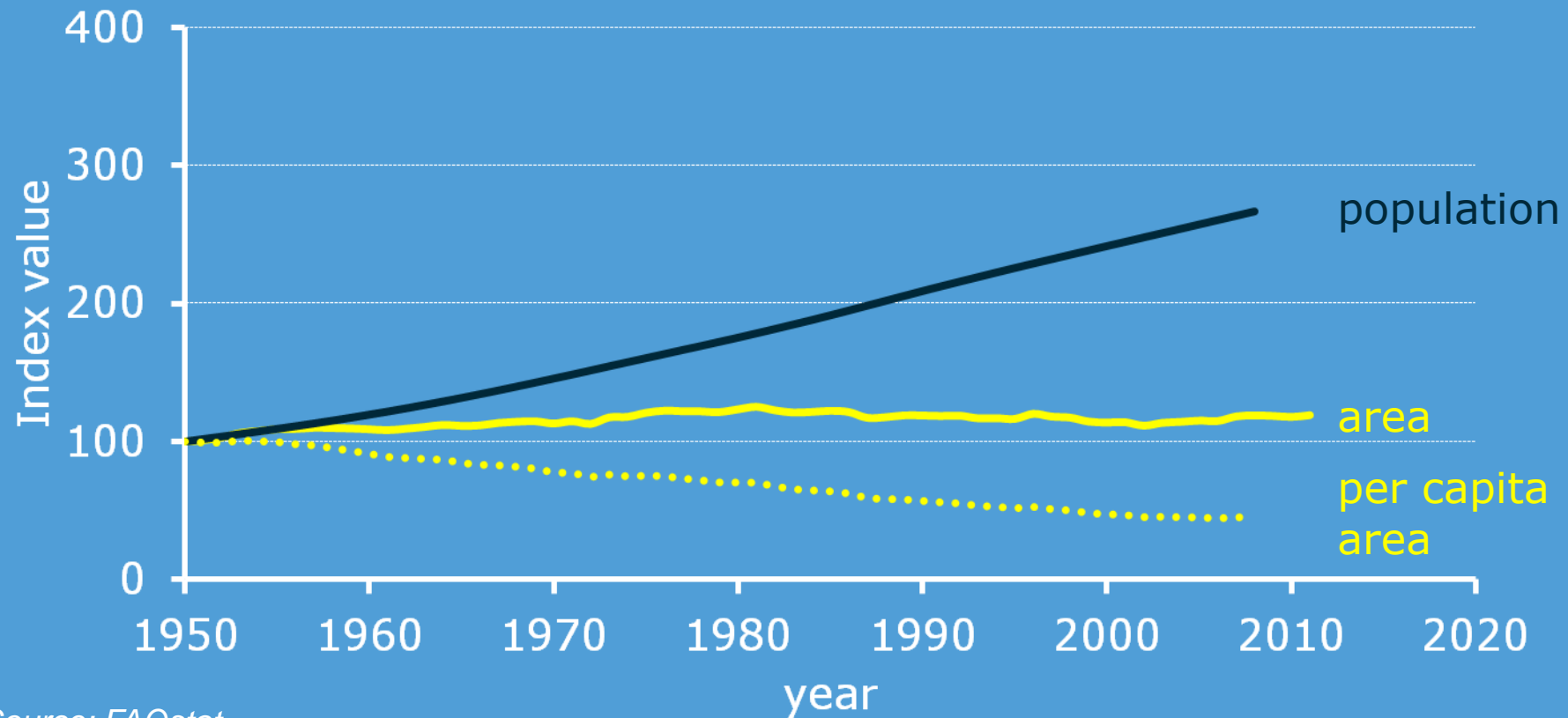


Source: FAOstat



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Global grain acreage (1950 – 2010)

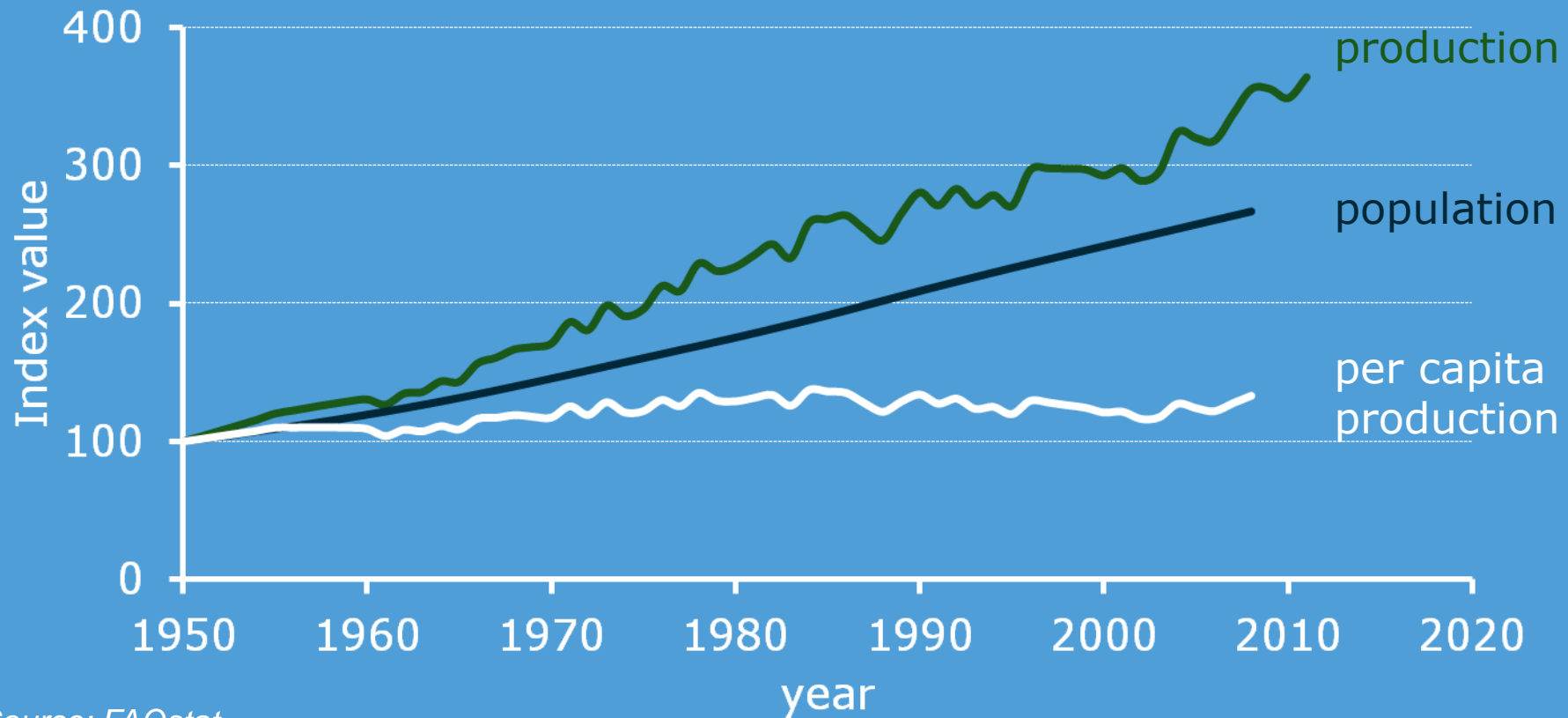


Source: FAOstat



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Global grain production (1950 – 2010)

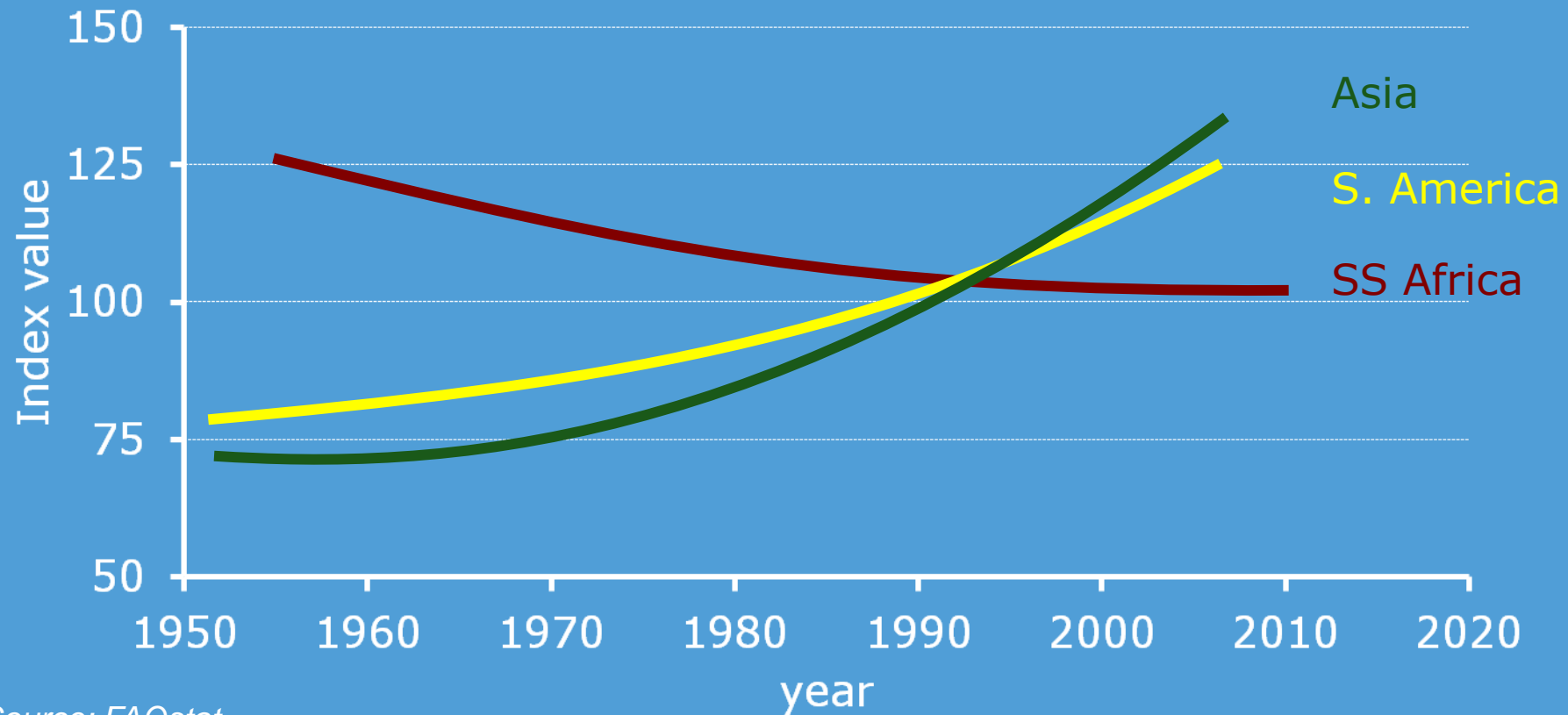


Source: FAOstat



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Food availability per capita (1960 – 2000)



Source: FAOstat

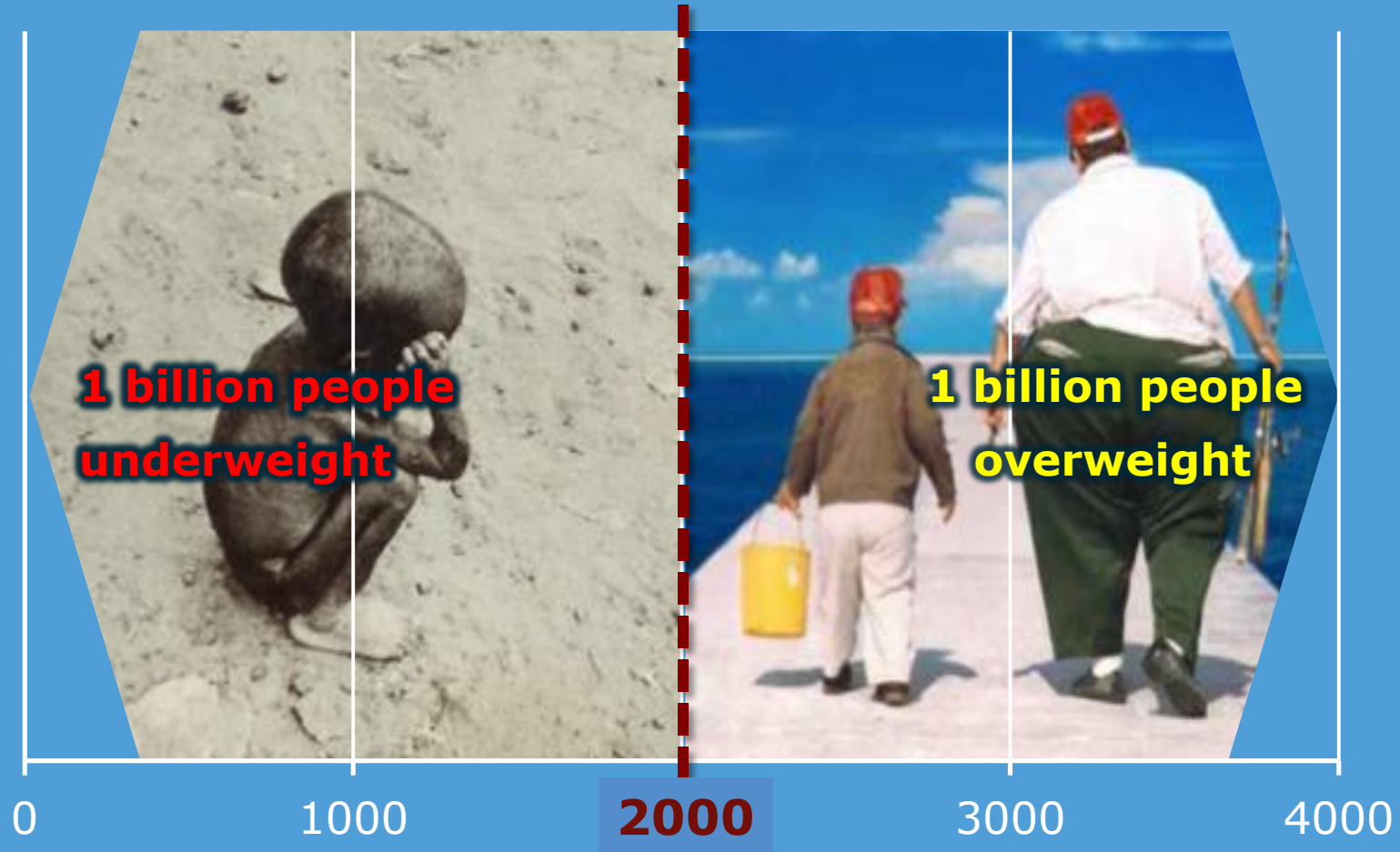


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Global diets

kcal per person.day

need

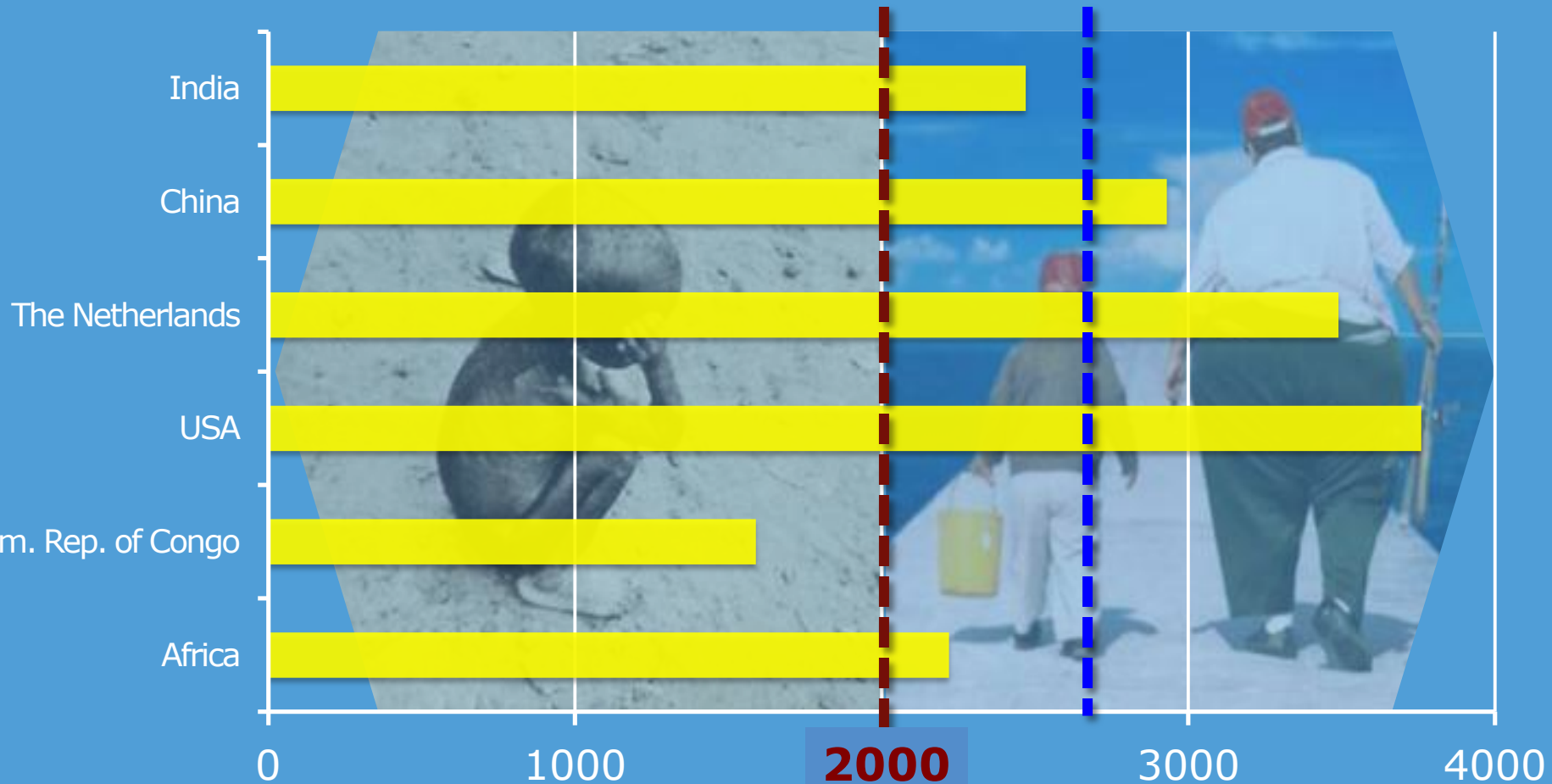


Global diets

kcal per person.day

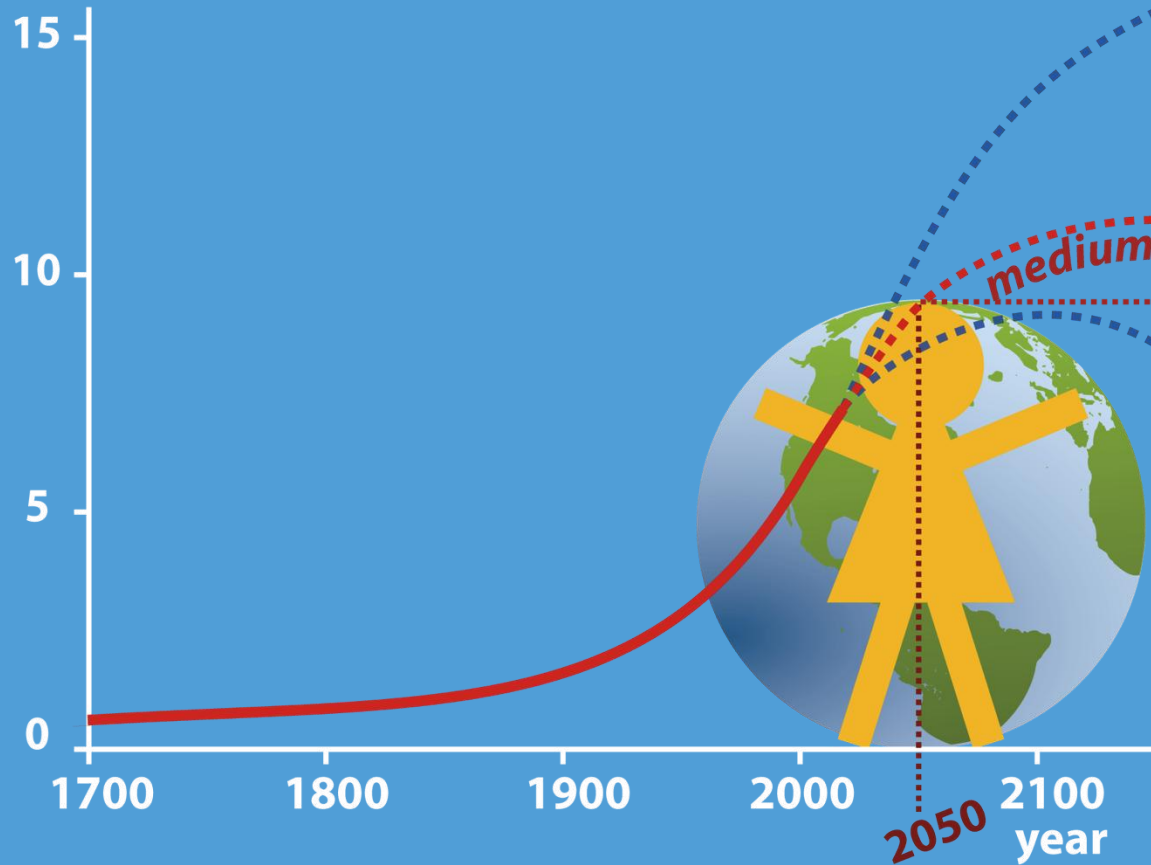
need

world

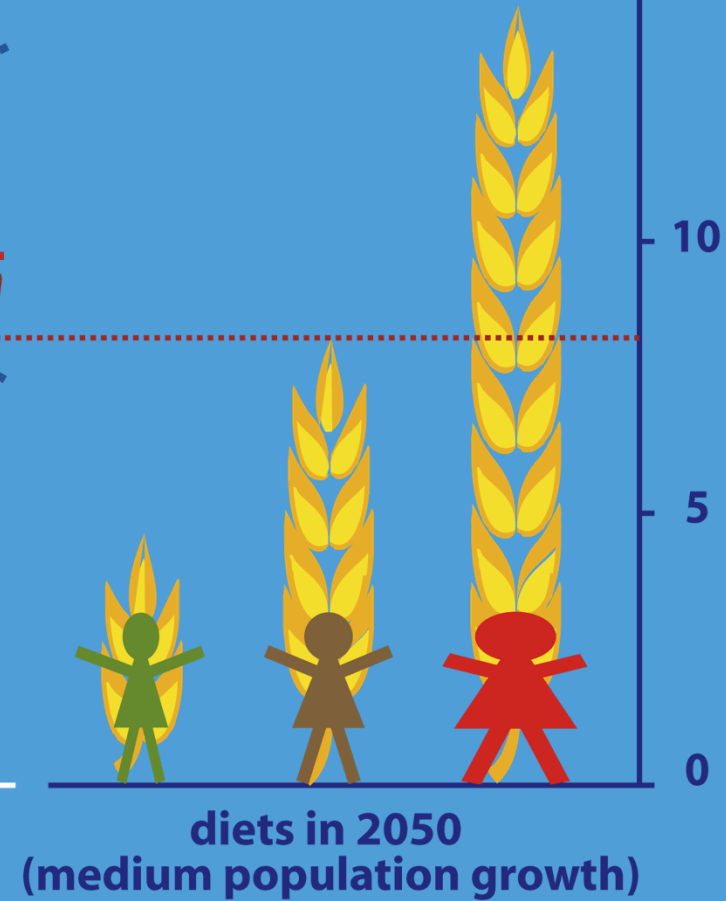


$$\text{Demand} = \text{Population} \times \text{Diet}$$

Population
(billions)

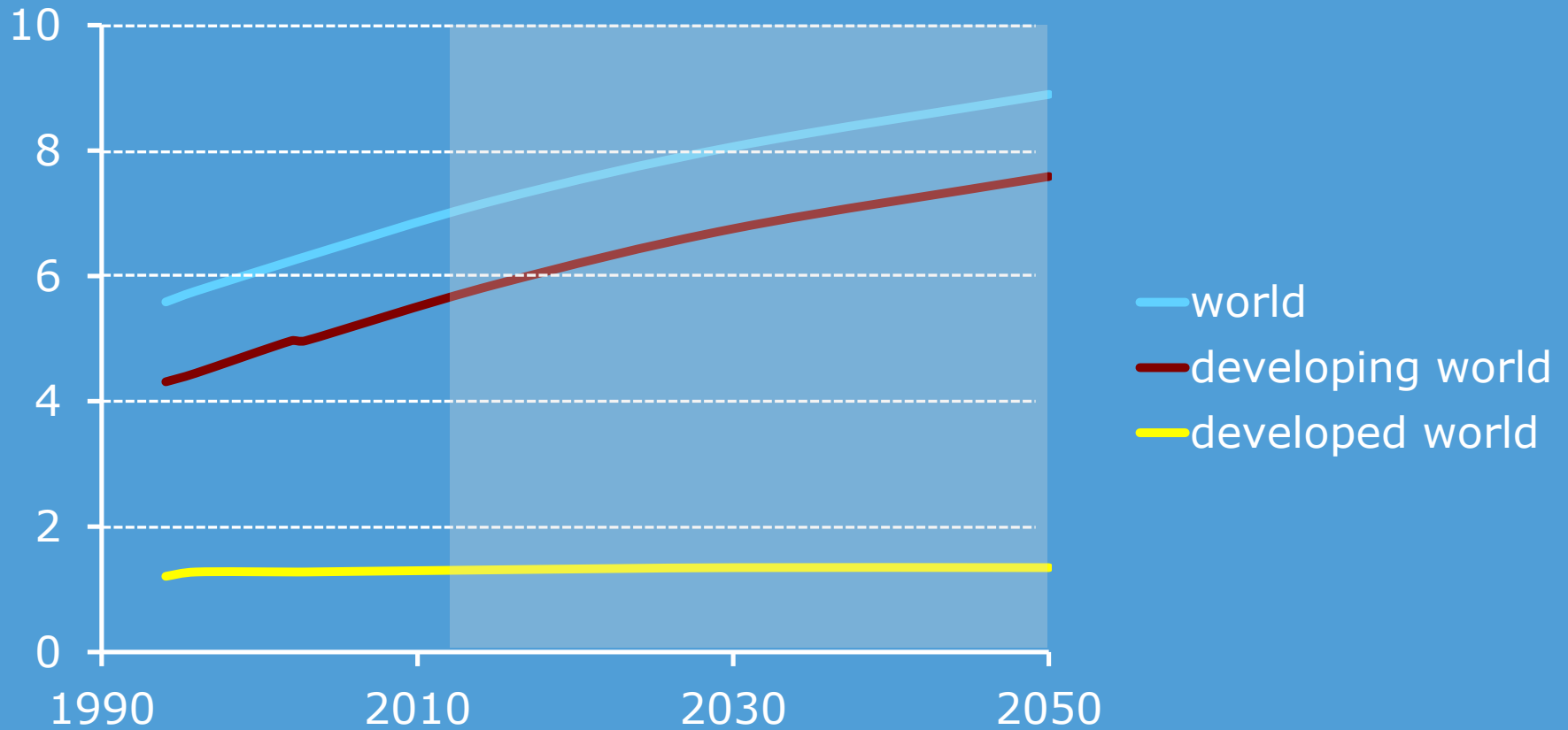


Gton grain eq. per year



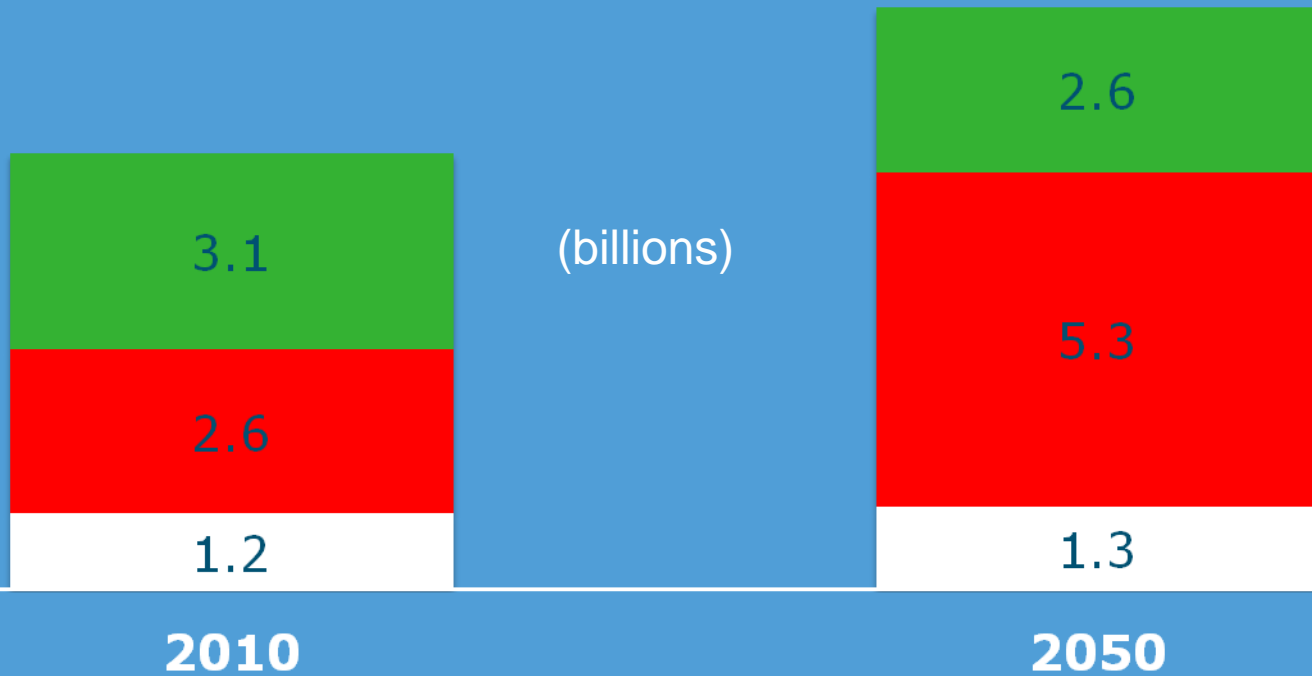
World population

(x billion people)



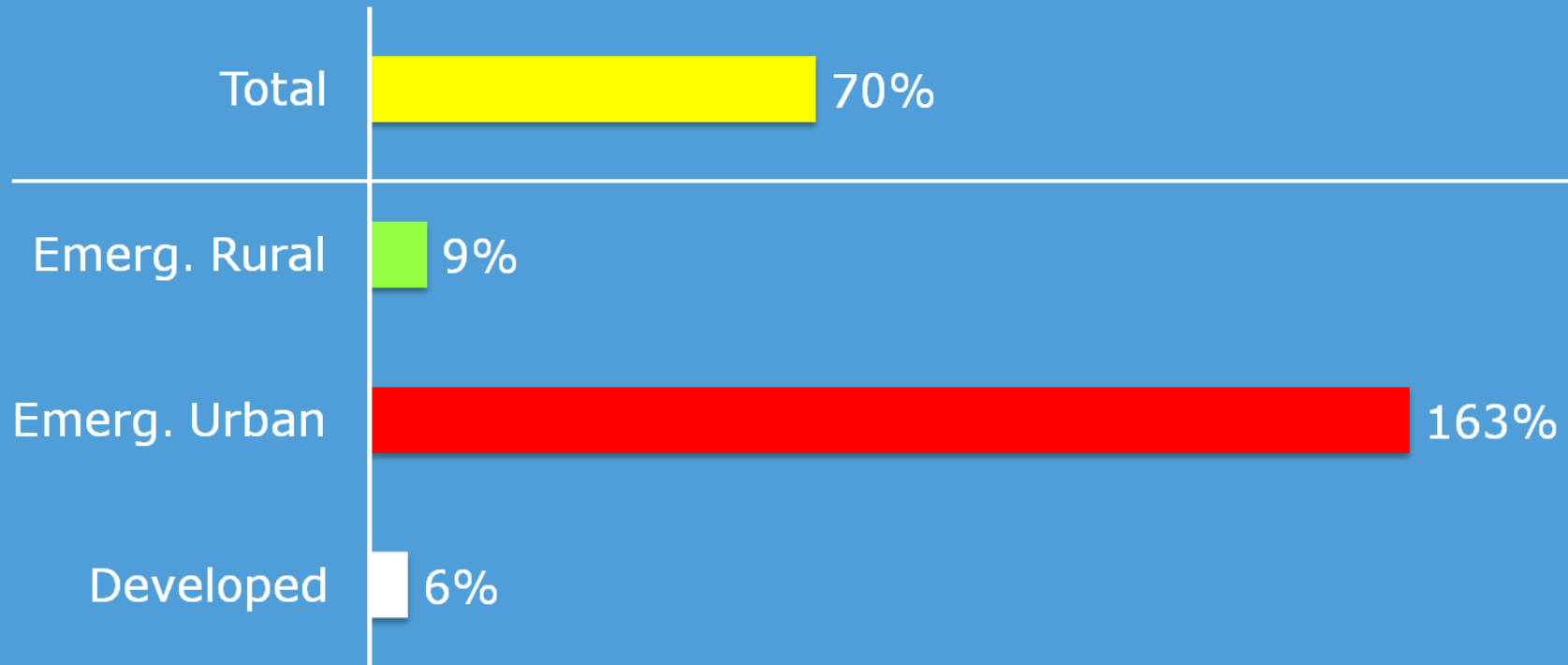
Global population

■ Developed ■ Emerg. Urban ■ Emerg. Rural

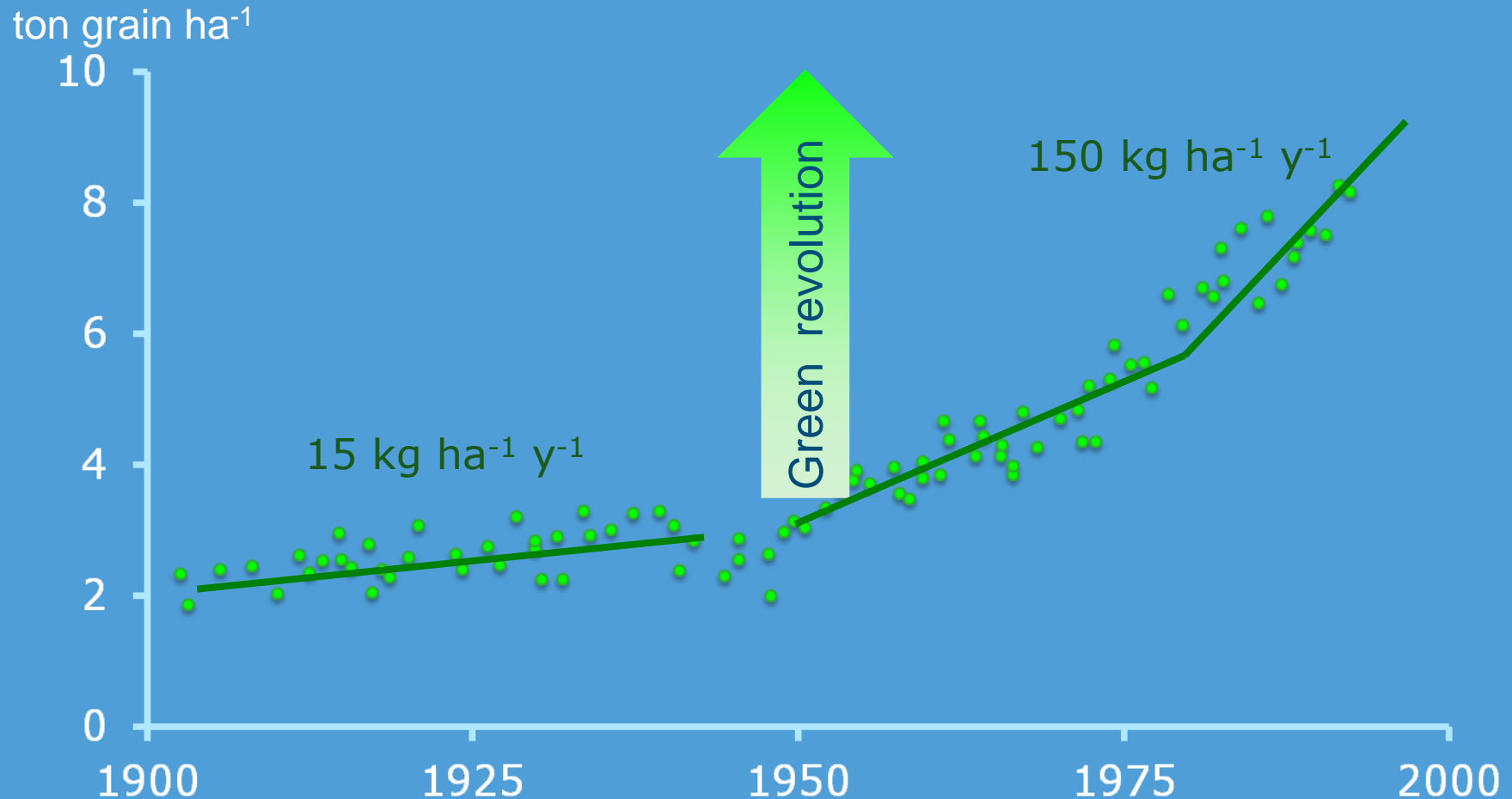


Food demand

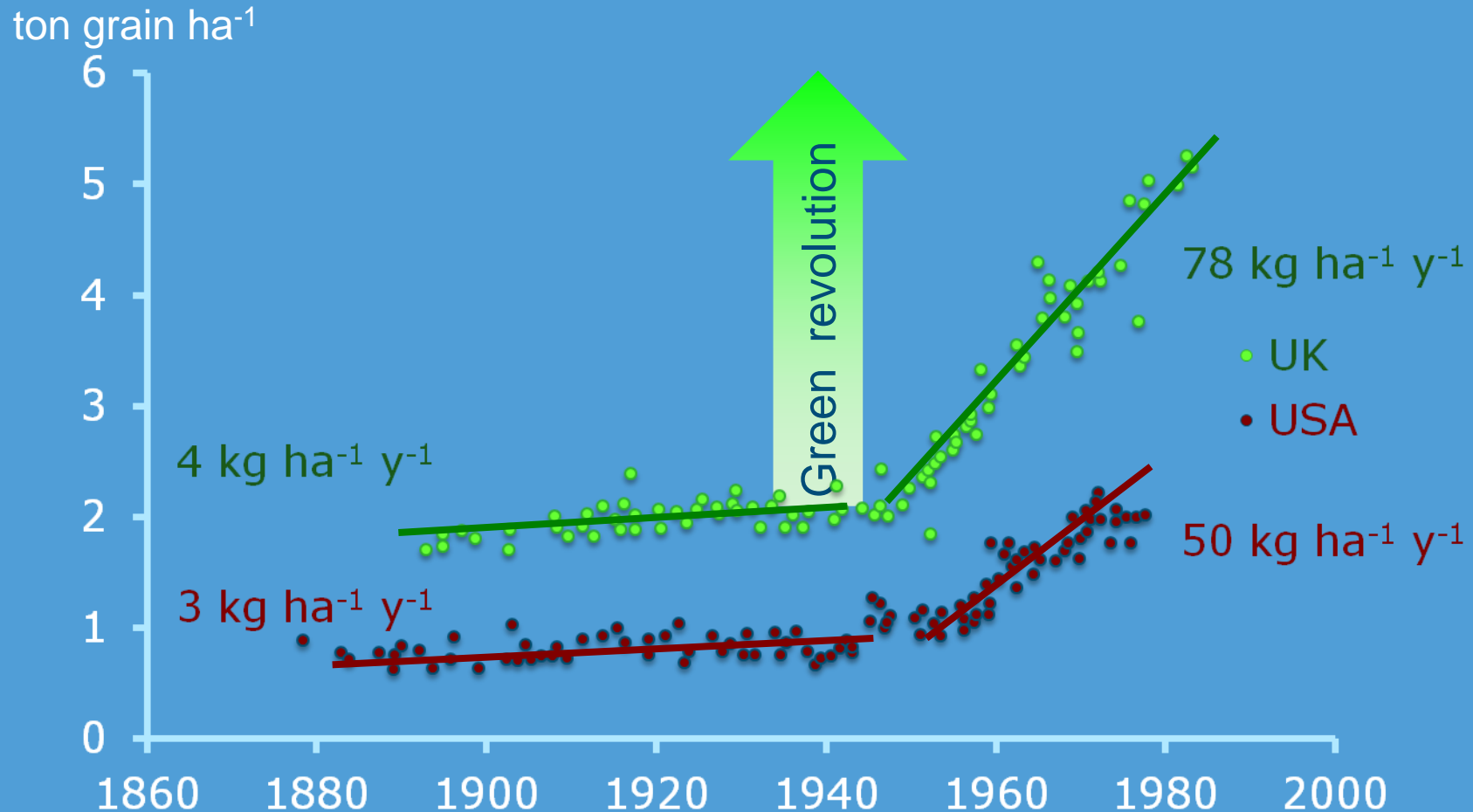
% increase 2050 vs 2010



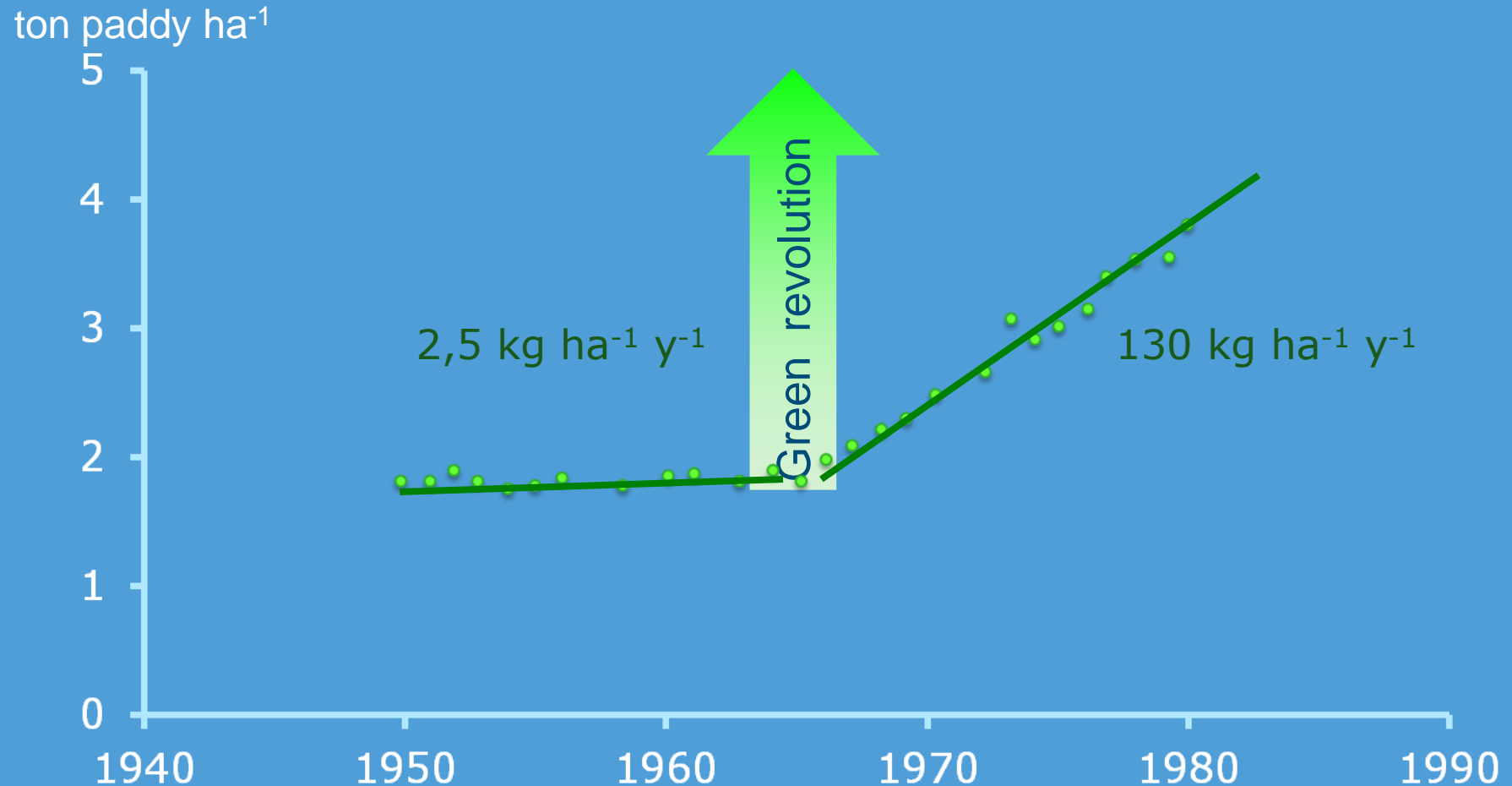
Discontinuities wheat yields (NL)



Discontinuities wheat yields (UK & USA)



Discontinuities paddy yield (Indonesia)



Green revolutions

- Production ecological principles → towards potential production
 - integrated soil and water management
 - control of pests, diseases and weeds
- Plant breeding → short straw varieties (harvest index increased) → higher proportion harvestable product
- Presence of functioning institutions
- Political will
- Functioning markets

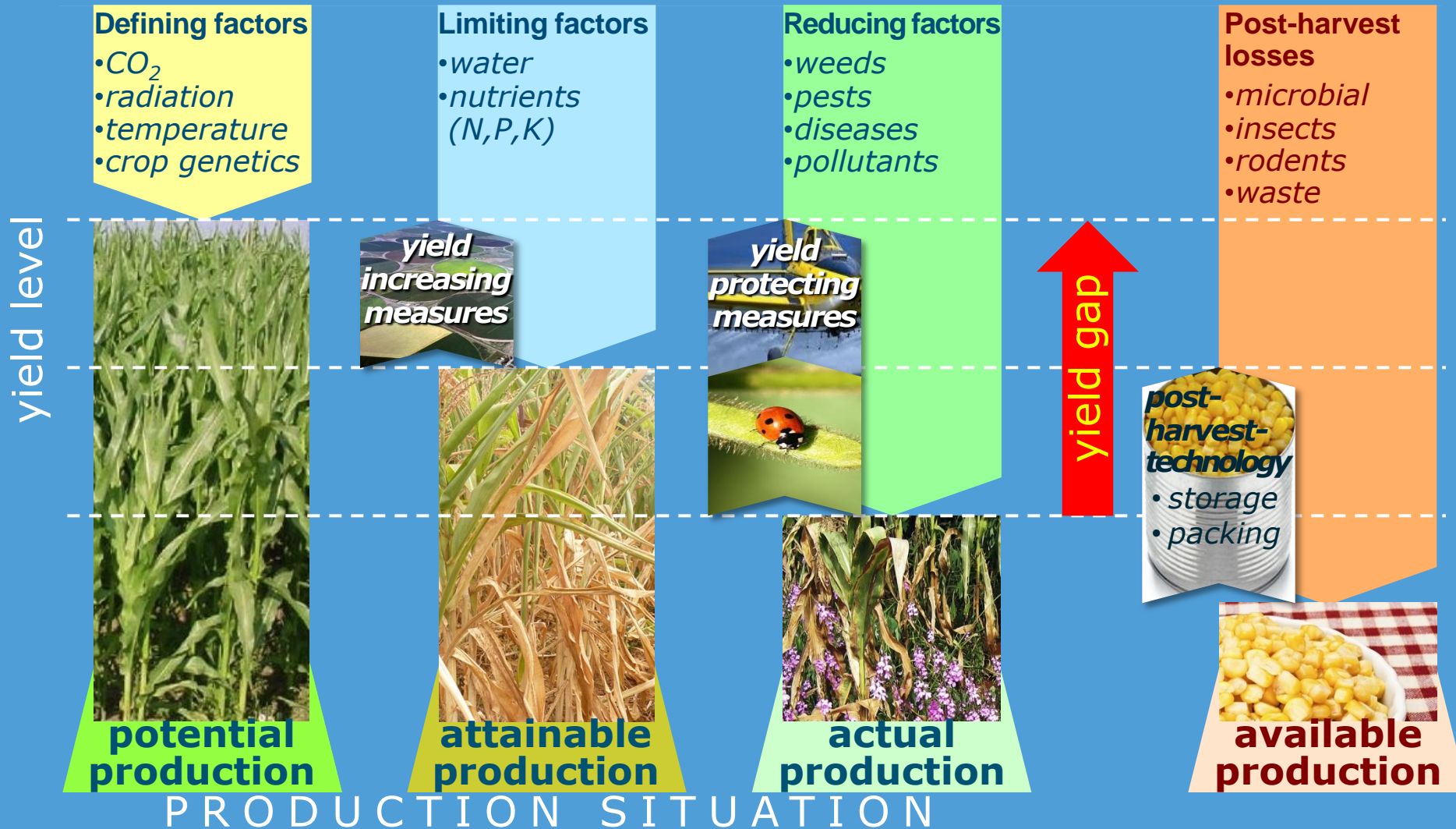


Needs for new green revolutions

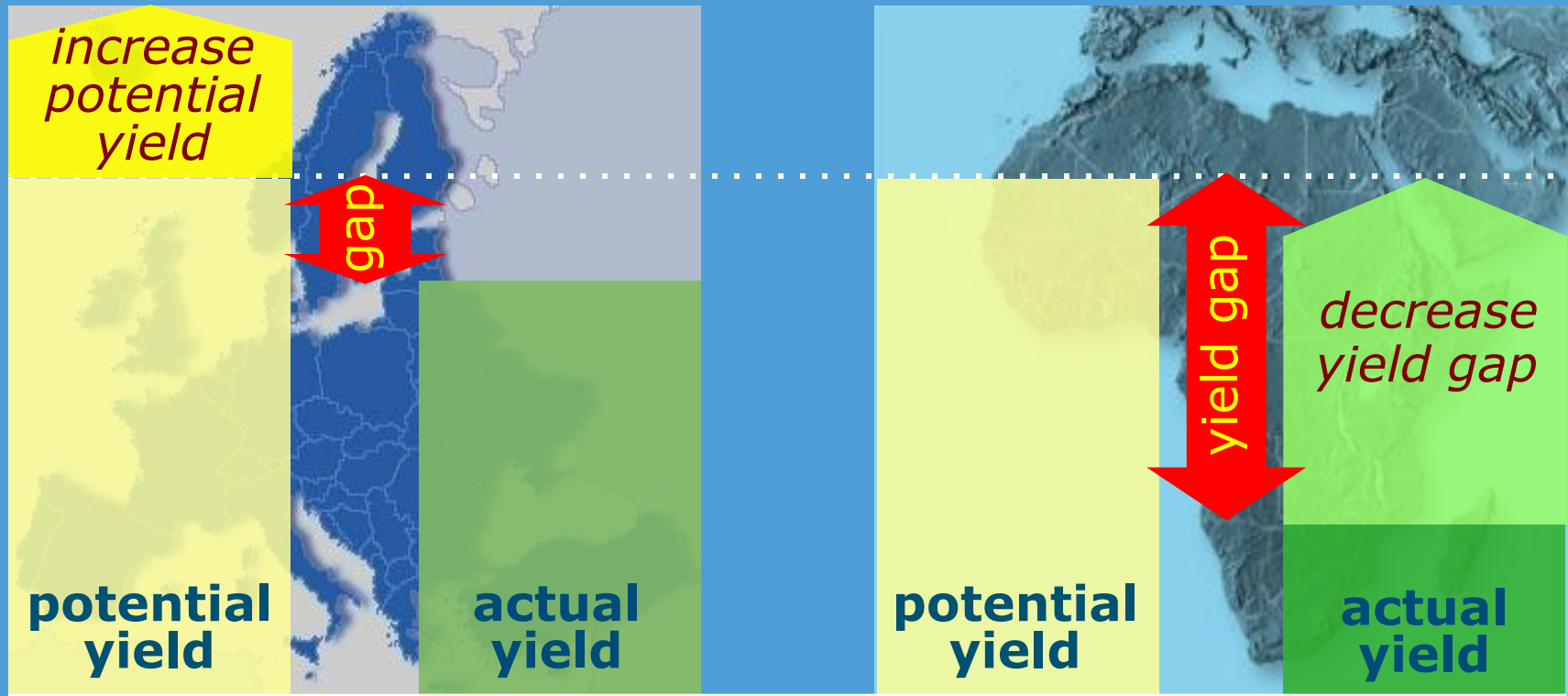
- Demographic reasons (population growth)*
- Changes in diet (more animal proteins)
- Shortage of good agricultural land
- Safeguard biodiversity
- Environmental reasons (degradation/pollution)
- Bio-based economy*
- Climate change



Production-ecological principles & practice



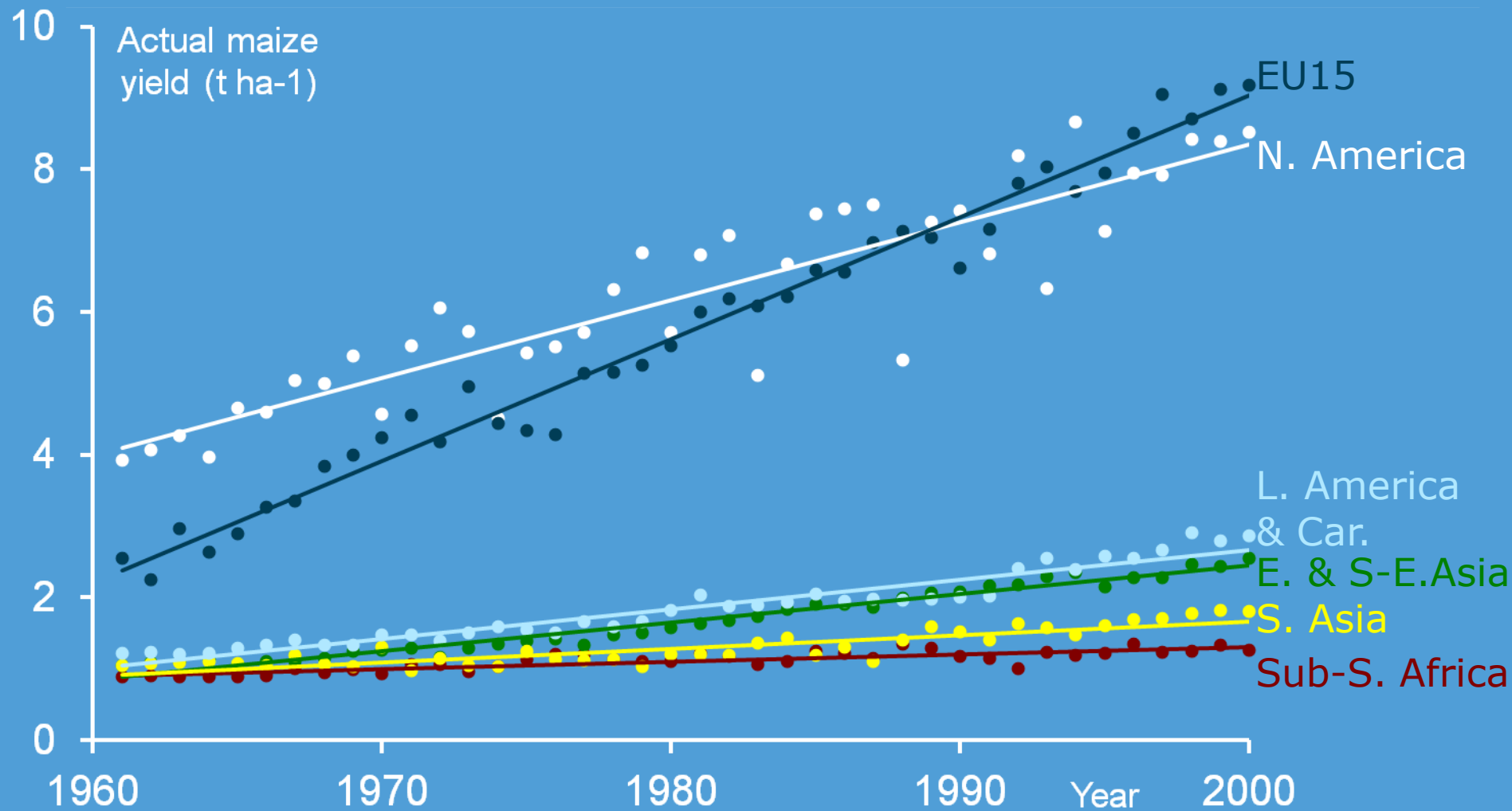
Two strategies





...Why is Africa lagging behind ?...

Africa: Maize yield/ha stagnates



Why is Africa lagging behind?

Study by Inter Academy Council

“ Realizing the promise and potential of African agriculture”

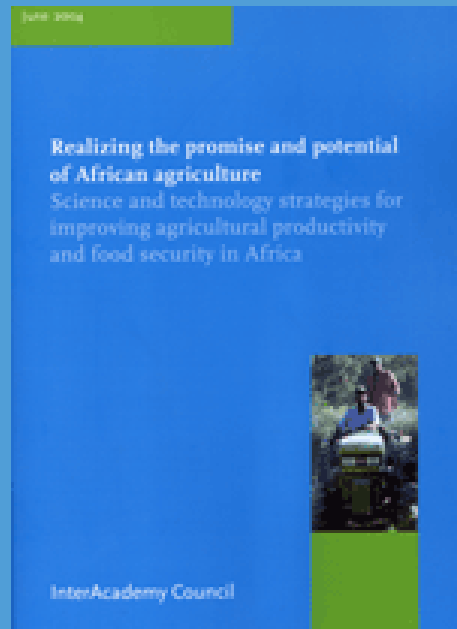


"I request the IAC a report providing a technological strategic plan to provide substantial increase in agricultural productivity in Africa"

Kofi Annan, March 2002

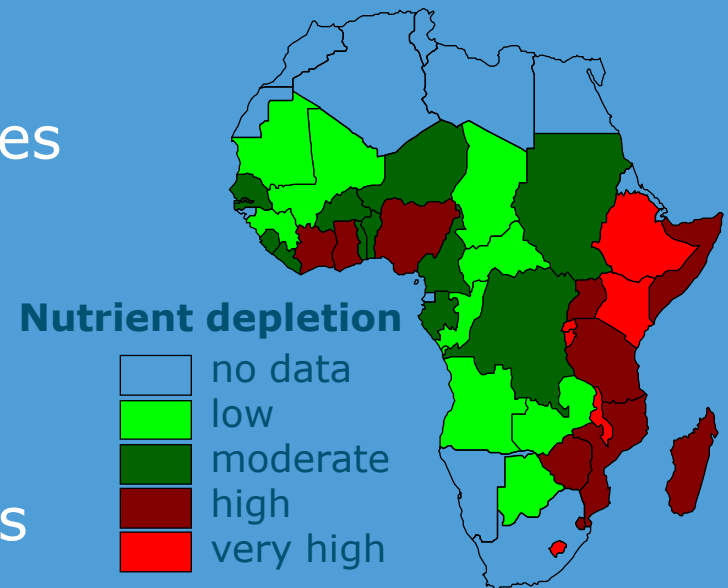


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Study results (1) Problems of Africa

- Weathered soils
- Erratic rainfall
- Endemic plant and animal diseases
 - Poor resource base,
 - Vulnerable environment
- Absence of dominating food crops
- Multitude of farming systems
 - Need for many different technologies



Study results (2) Problems of Africa

- Dominant role for women – limited access to resources
- Land and Labor productivity low

→ How to become competitive?

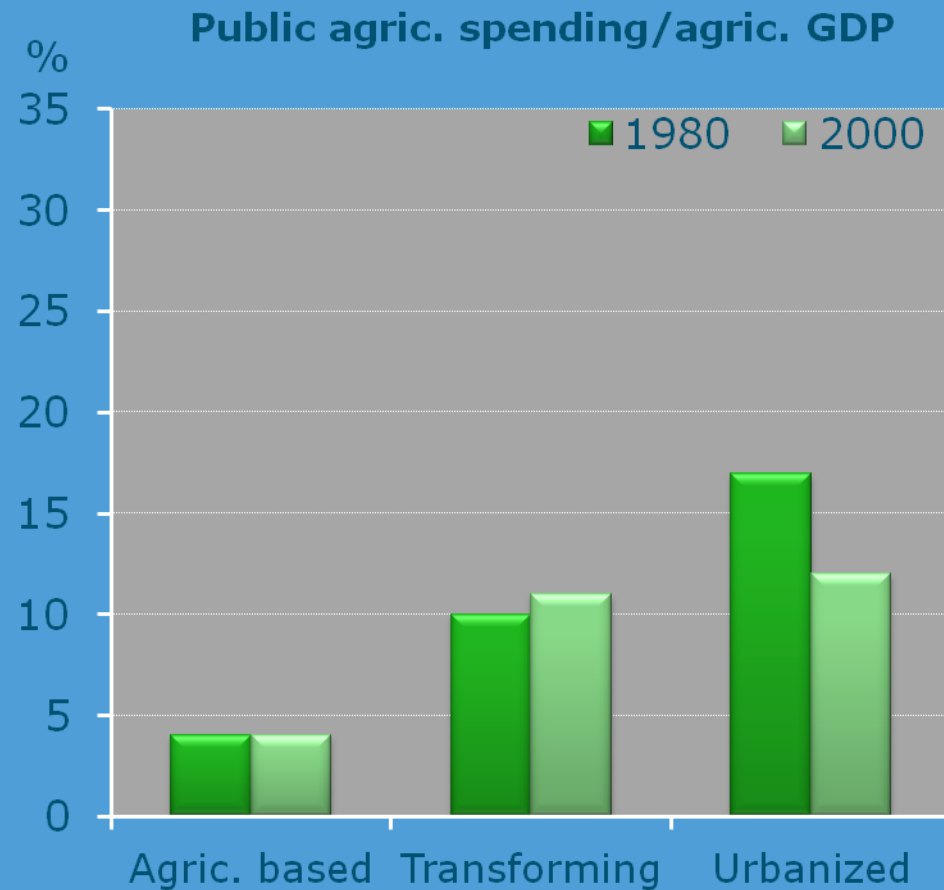
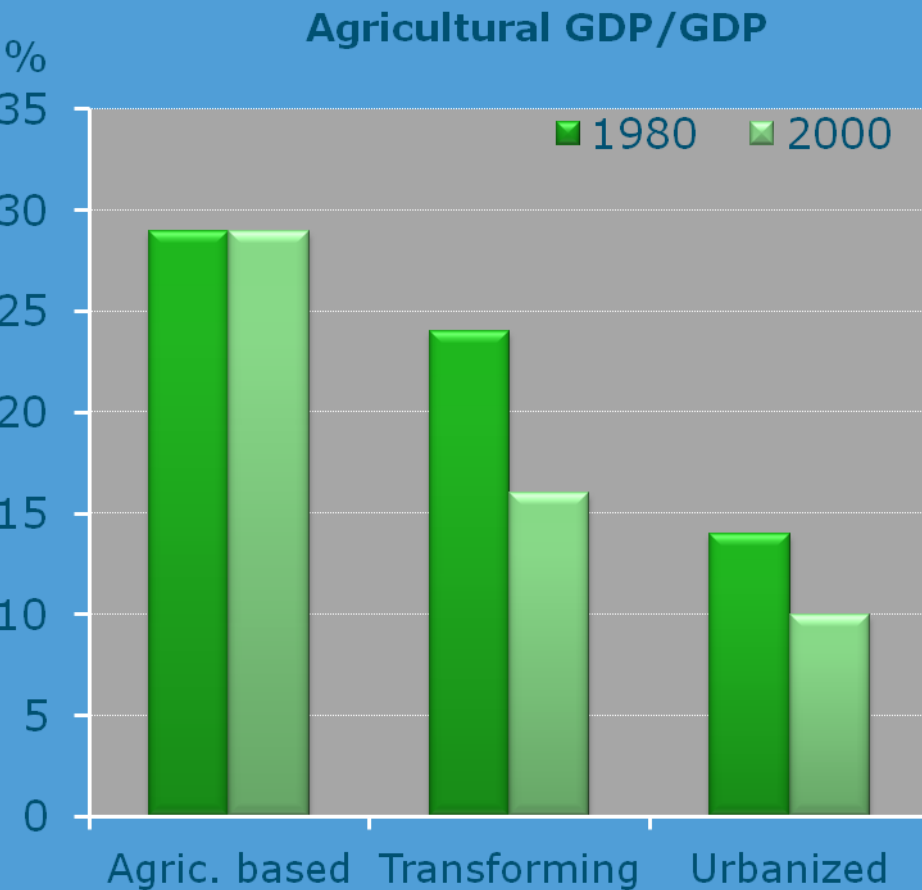
- Lack of investment in agricultural research
- Lack of knowledge infrastructure
- Lack of functioning academic institutions
- Brain drain

→ Need for investment in research and education



GDP & Investments in agriculture

Public spending on agriculture lowest in agriculture based countries while their share of agriculture in GDP is highest



Study results (3) Problems of Africa

- Not functioning local and regional markets
- Land entitlement inappropriate
- No stimulating political and economic environment
- Inadequate capacity to impact global policy formulation
- Lack of good governance

→ Need for renewal of institutional arrangements





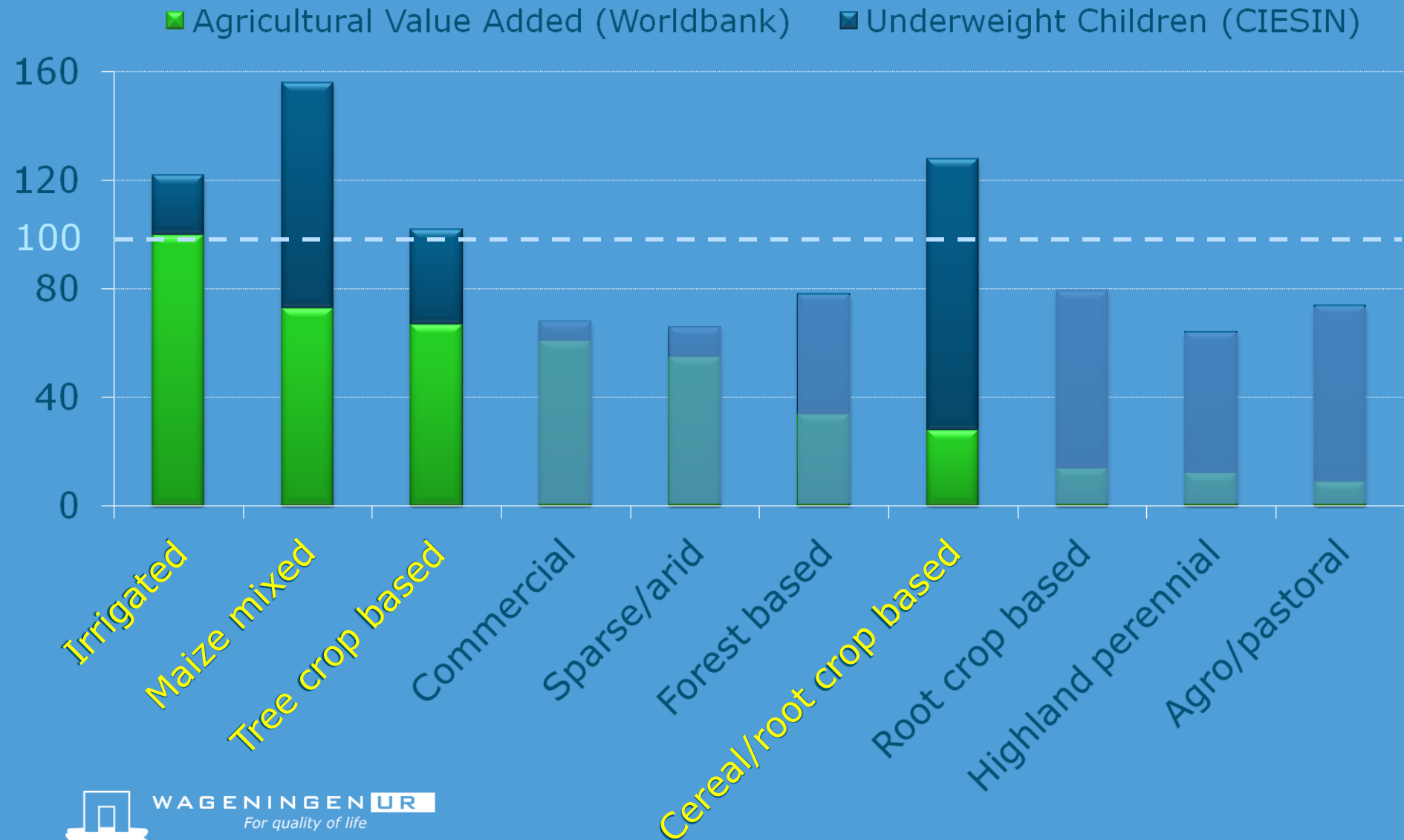
...A way forward ...

IAC report: Strategic Recommendations

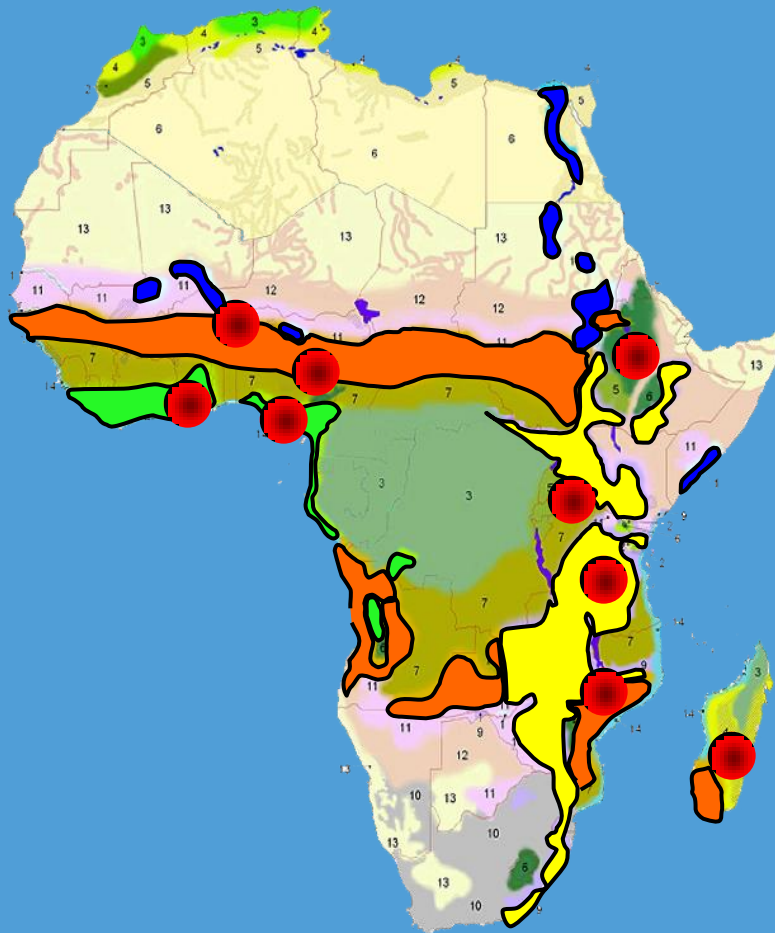
- Technology options that can make a difference (11)
- Building impact-oriented research, knowledge and development institutions (5)
- Creating and retaining a new generation of agricultural scientists (5)
- Markets and policies to make the poor prosperous and food secure (5)
- Increase investments in agriculture and infrastructure








IAC report: Priorities on 4 farming systems



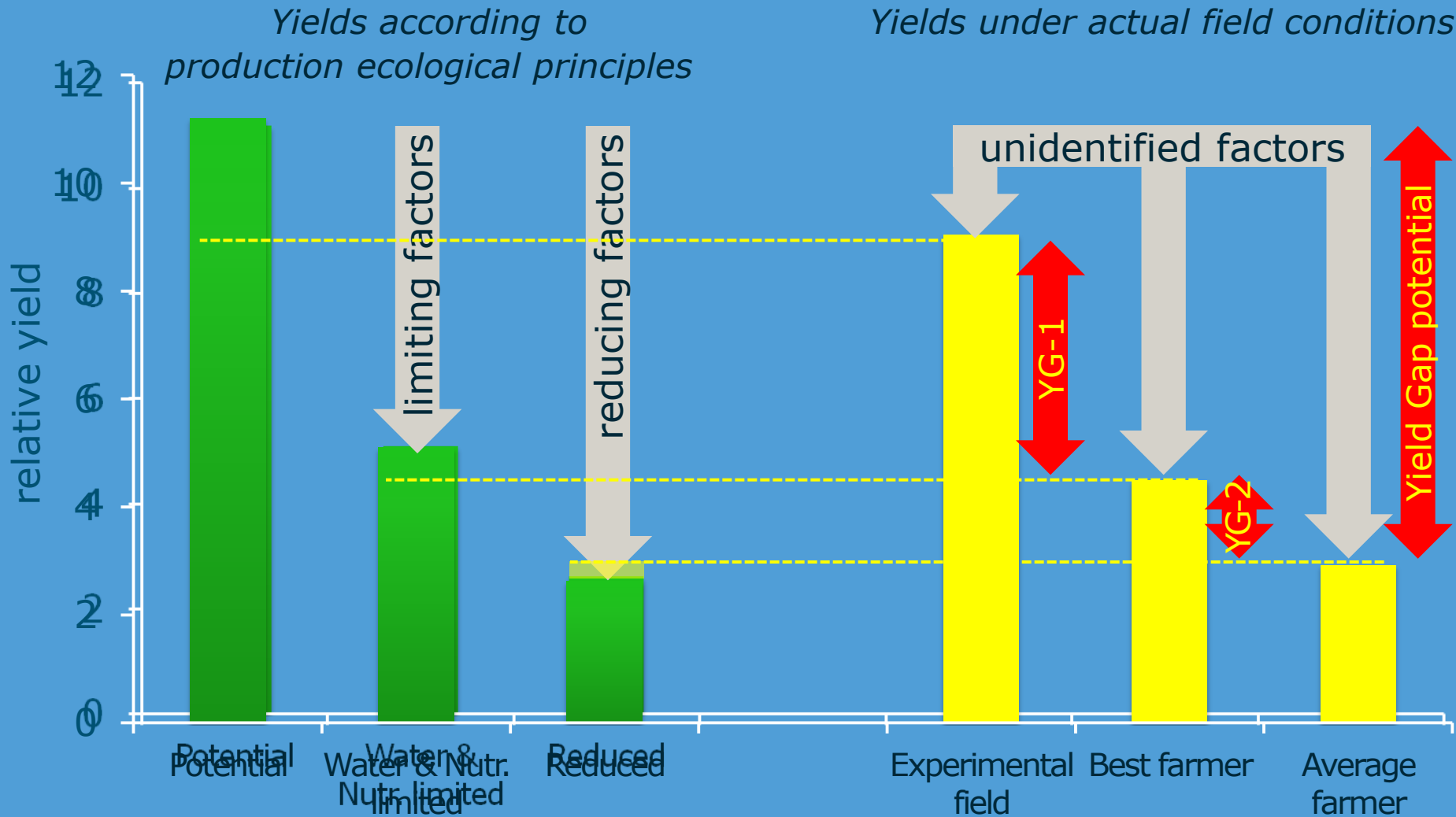
Priority Farming Systems



-  Irrigated system
-  Maize mixed system
-  Tree crop based system
-  Cereal root crop mixed system
-  Hunger Hotspot (CIESIN)



IAC report: *A Production Ecological Approach*



IAC report: Invest in institutions

- Design and invest in national agricultural science systems that involve farmers in education, research and extension.
- Encourage institutions to articulate science and technology strategies and policies
- Increase agricultural research investment on average to at least 1.5 percent of agricultural gdp in African nations in 2015
- Cultivate African centres of agricultural research excellence.
- Strengthen CGIAR



IAC report: Create new scientists

- Broaden and deepen political support for agricultural science.
- Mobilize increased and sustainable funding for higher education in science and technology, minimizing dependence on donor support.
- Focus on current and future generations of agricultural scientists.
- Reform university curricula
- Strengthen science education at primary and secondary school levels.



IAC report: Interventions related to marketing

- Increase investments in rural infrastructure
- Strengthen capacity to expand market opportunities
- Reduce barriers to increased African trade with OECD countries
- Improve data generation and analysis related to agriculture, food, and nutrition security and vulnerability
- Institute effective intellectual property rights regimes to encourage the private sector and facilitate public-private partnerships.



Impact of IAC-report: Alignment in studies

- World Development Report 2008
- International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD)
- MDG: Halving the Hunger: it can be done
- Multi-country agricultural productivity programme for Africa (MAPP)
- OECD Promoting Pro-Poor Growth: Agriculture (POVNET)
- FAO The State of Food and Agriculture (2005): Agricultural Trade and Poverty



A New Green Revolution

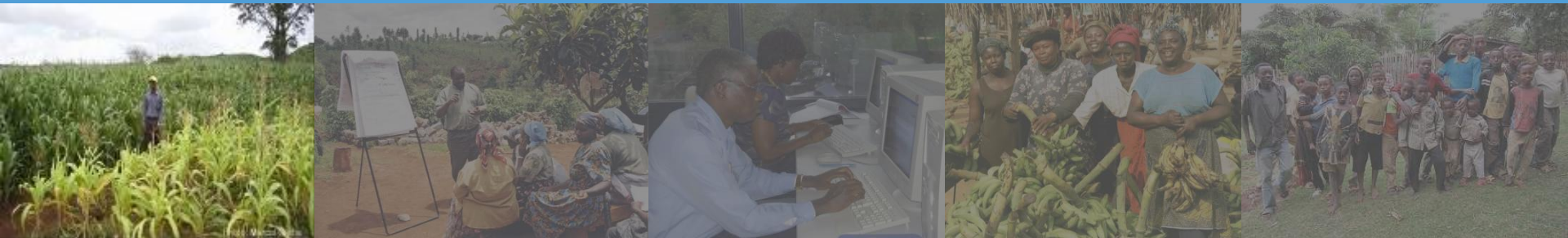


*AGRA programs develop practical solutions to significantly boost **farm productivity** and **incomes** for **the poor** while **safeguarding the environment**.*



Implementation IAC report

- Technology options that make a difference
 - PASS program AGRA
 - Soil health program AGRA and other programs
 - Integrated programs, leapfrogging to new technologies (production ecology)
 - Improved ecological literacy, no ecological dogmatism



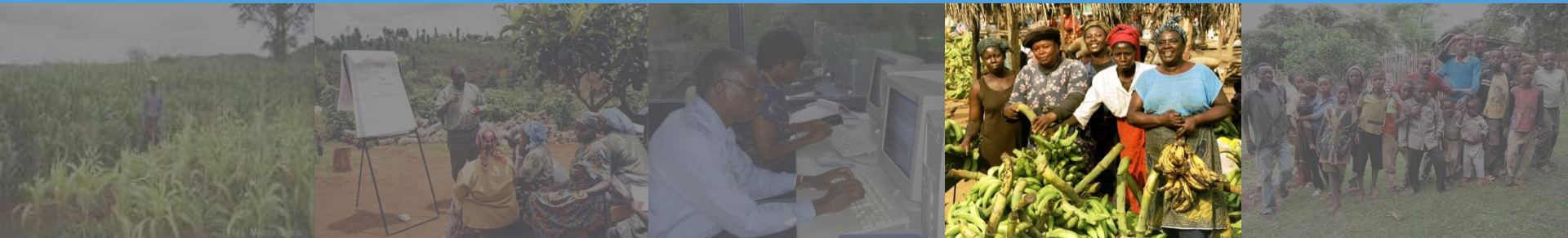
Implementation IAC report

- Building impact oriented research, knowledge and development institutions
 - Strengthening FARA and national programs
 - Many private-public institutions
 - Global Challenge program Sub Sahara Africa



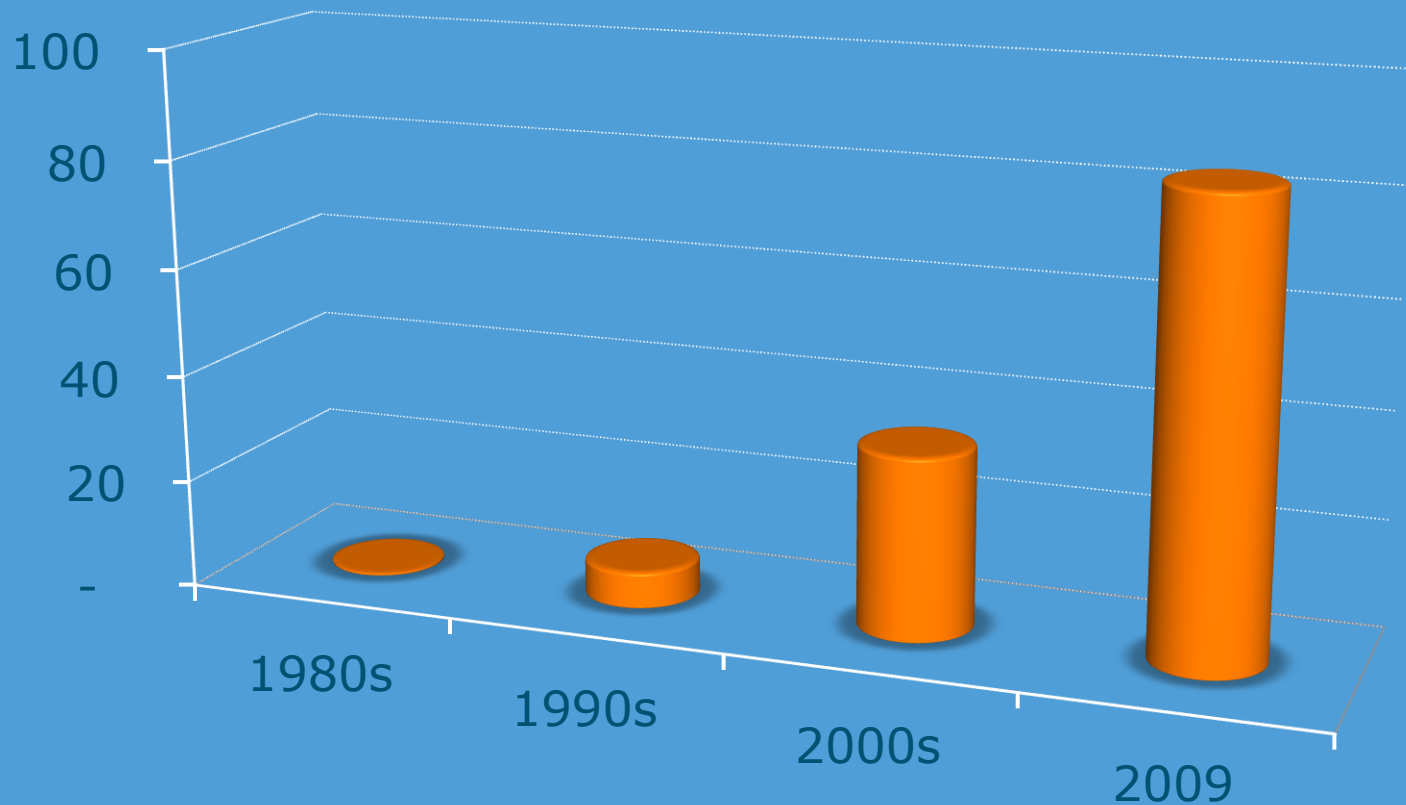
Implementation IAC report

- Markets to make the poor prosperous and food
 - SecureCommitment African Union
 - Strengthening regional and local markets
 - Markets oriented programs AGRA



Progress in Ethiopia - investments

Trends in agri. investment capital (billion Birr)

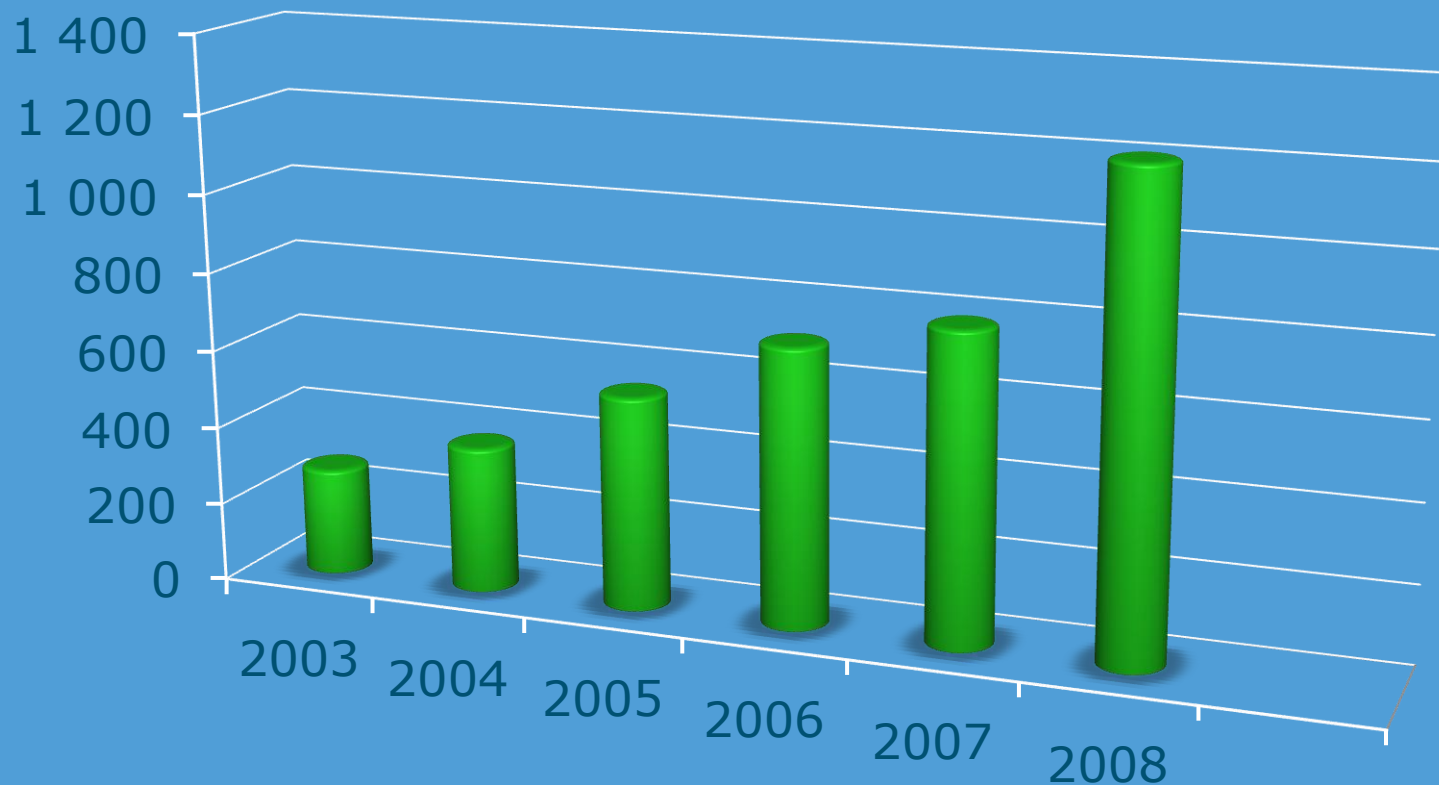


Source: Dr. A. Tsegaye, 2012



Progress in Ethiopia - returns

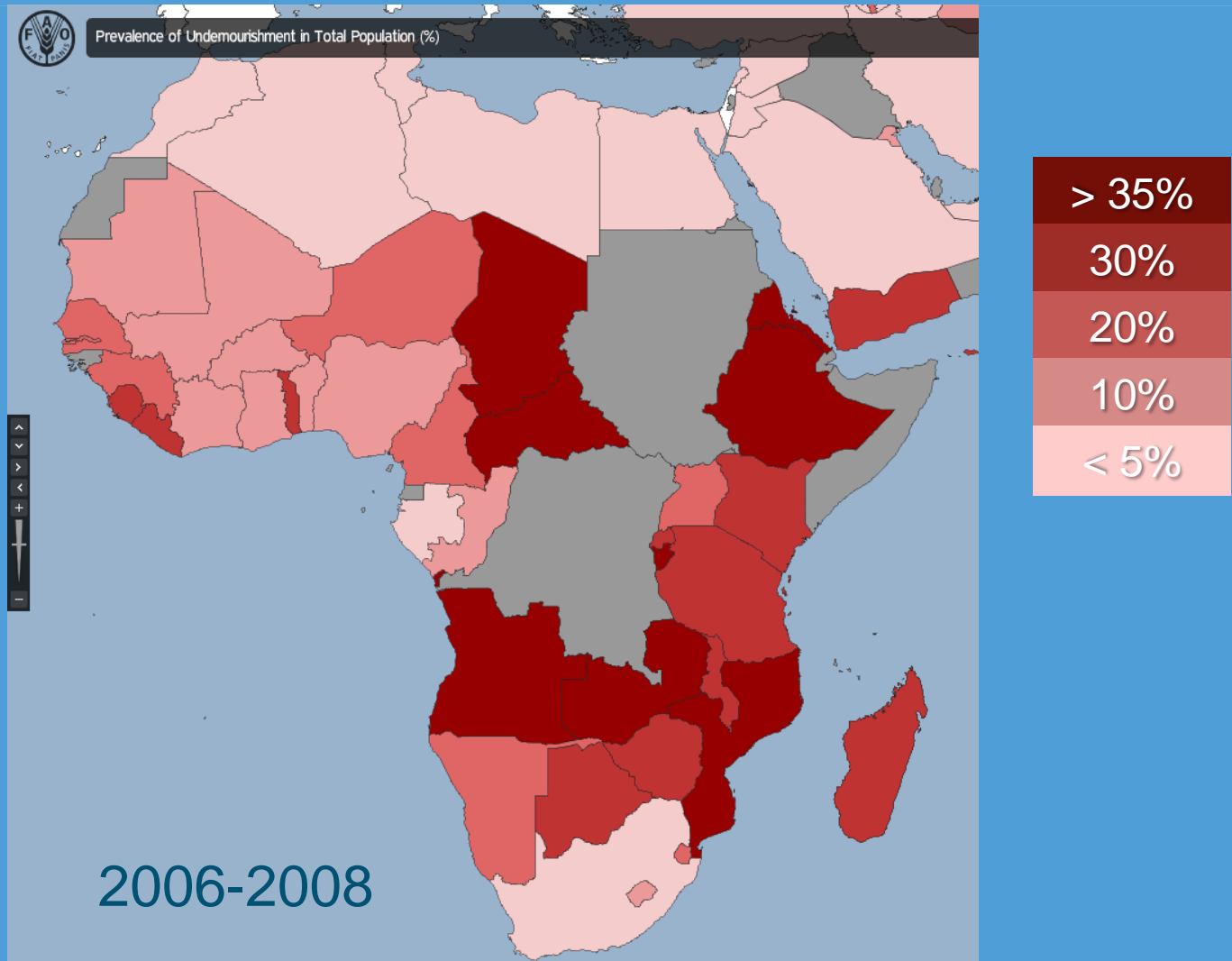
Trends in agricultural export value (x1000 USD)



Source: Dr. A. Tsegaye, 2012



Undernourishment (% of total population)



Follow-up activities

- Consolidation and expansion AGRA
- IFDC programs on integrated soil fertility management including market development for input provision and sale of produce
- CAADP political commitment of African governments: African-led and African-owned initiative focus on
 - soil fertility
 - marketing
 - agricultural research
 - food supply and hunger
- AAA stimulation of entrepreneurship
- Strengthening food security programs in various countries: USA, DFID, The Netherlands



Thank you for your attention

