

Agricultural Markets and the Challenge of Global Food Security

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The future of agriculture between globalization and local markets

San Michele all'Adige, 22nd September 2016

Questions to be addressed

- Can we meet the supply side challenge of feeding \approx 10 billion people?
 - The answer is “yes” but it is less clear that we will do so sustainably (using basically the same land and less water)
- What role will agricultural markets play and how can policymakers ensure those markets function smoothly?

Two aspects:

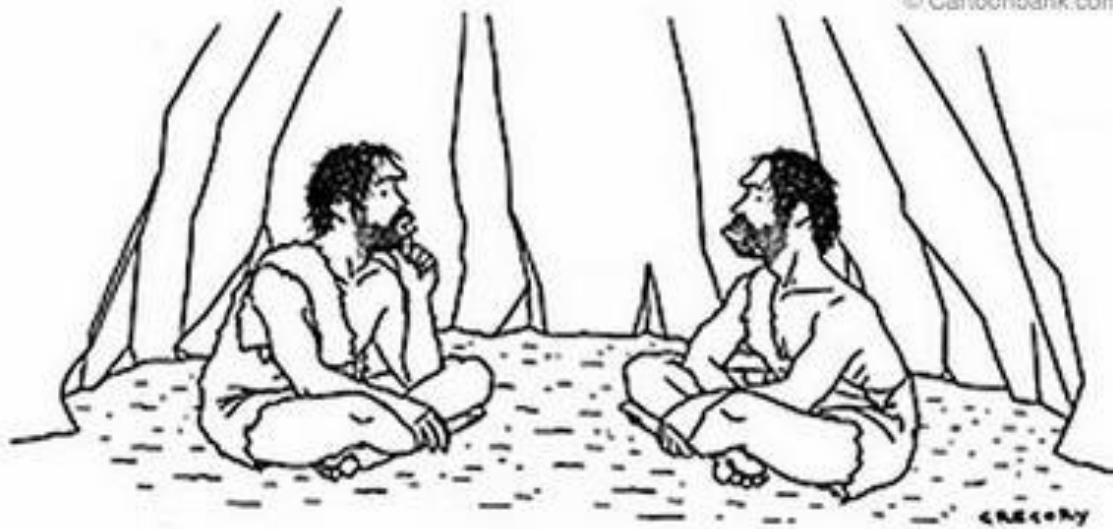
 - Ensuring long term food availability
 - Providing resilience to short term shocks

Summary of the challenge

- Population expected to reach 9.7 billion by 2050 – 30% higher than now (1/3 in China & India)
- Rising incomes will raise demand for livestock products and animal feed
- The population will be more urban – 70%, 50% in mega cities
- Non-food demand (fuel and fibre) will increase
- Food chains will be longer, more complex, more energy intensive
- Climate change will have net negative effects on agricultural productivity
- Increased pressure on land and water resources

A definition of food security

- Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO World Food Summit, 1996)
- 4 dimensions: availability, access, utilisation, stability
- Focus here on role of markets: availability, access (via impact on prices) and stability



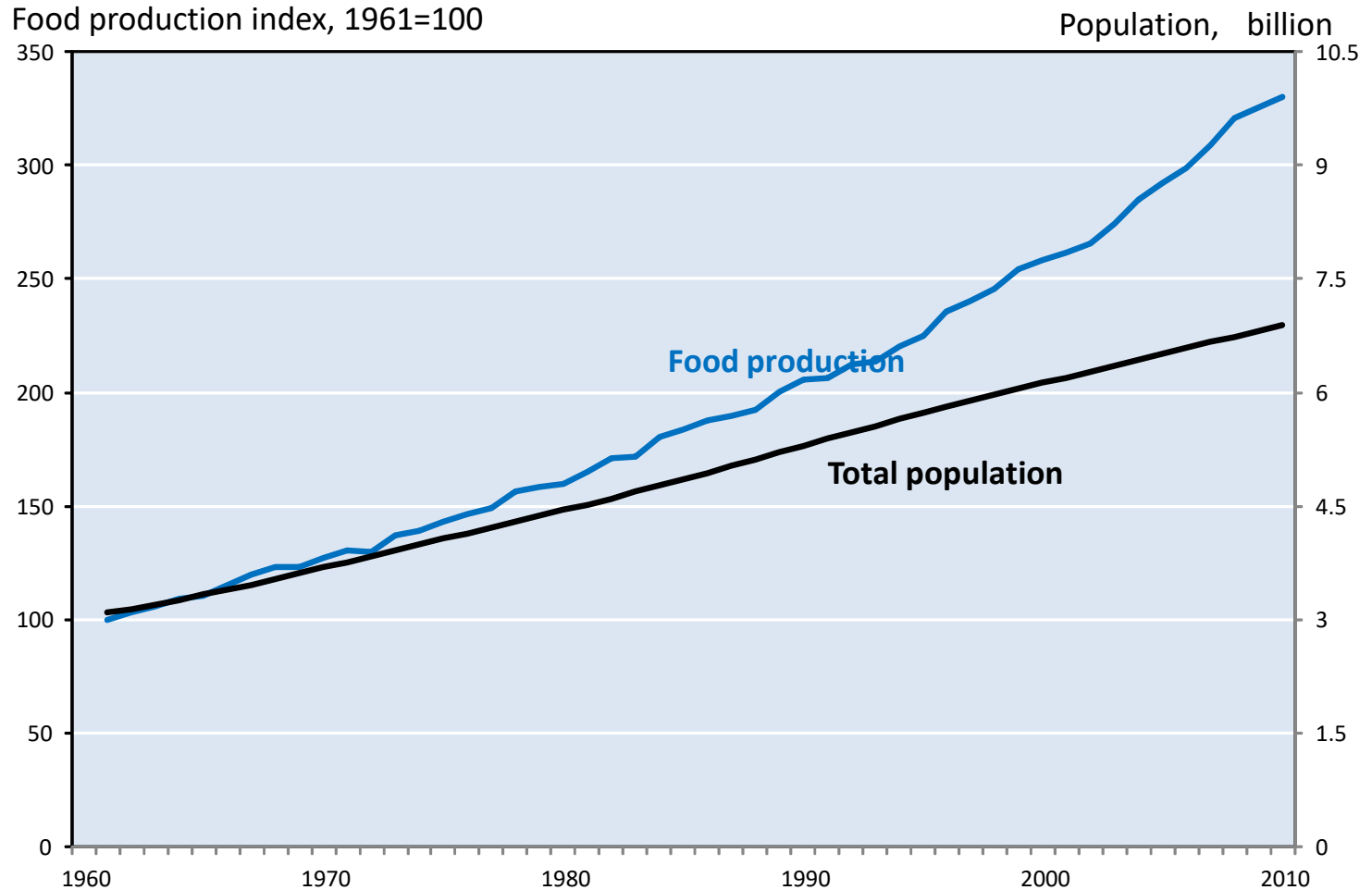
“Something’s just not right—our air is clean, our water is pure, we all get plenty of exercise, everything we eat is organic and free-range, and yet nobody lives past thirty.”

By Alex Gregory in the New Yorker

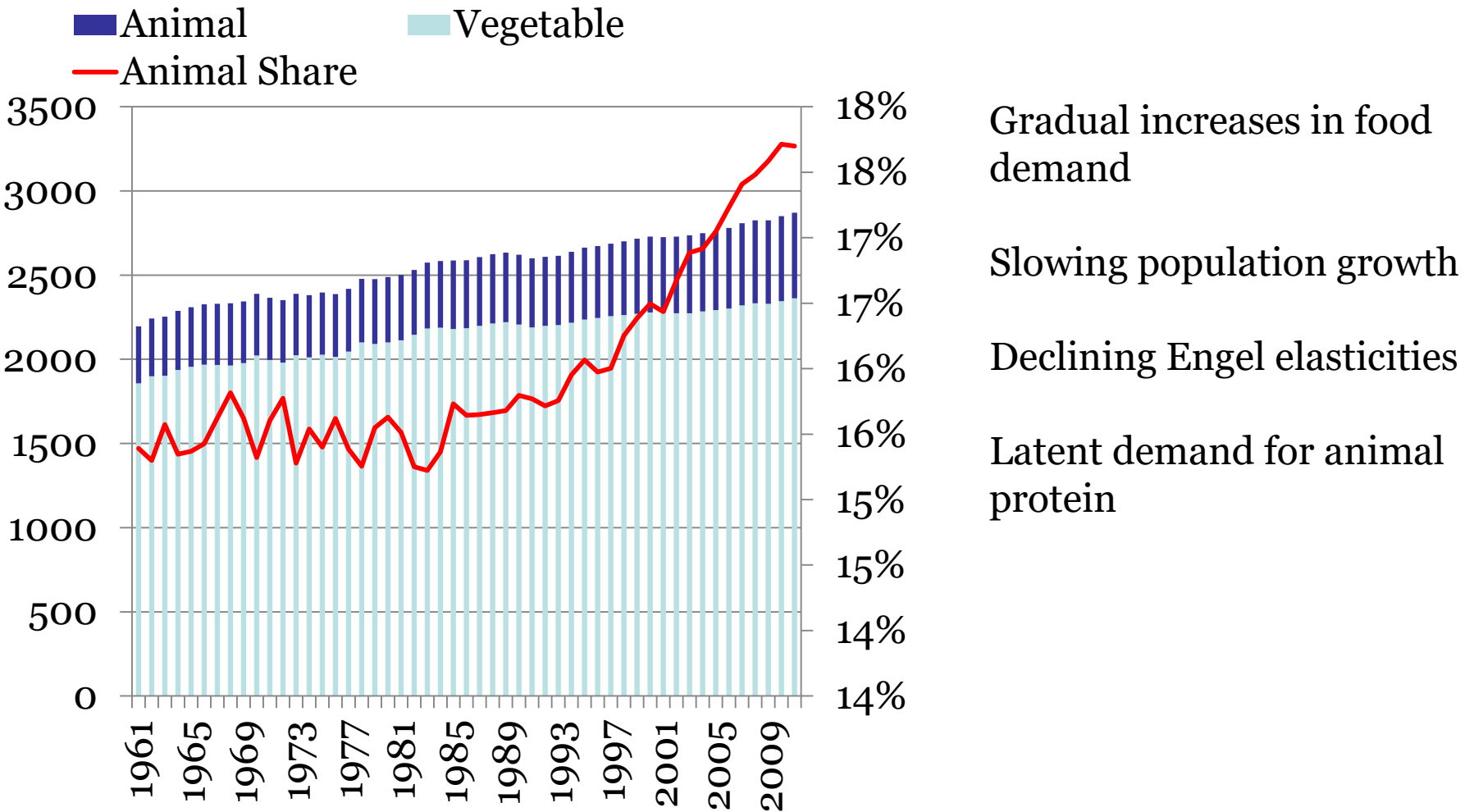
Modelling approaches

- OECD–FAO ten year Agricultural Outlook
 - Partial equilibrium model of supply and demand relationships for major agricultural commodities (Aglink-Cosimo)
- Situate relative to a wide range of models projecting through to 2050 and beyond
 - CGEs: Envisage (World Bank); Magnet (LEI);
 - Partial equilibrium: IMPACT (IFPRI); GLOBIOM (IIASA).

Global food supply growth continues to outpace population growth

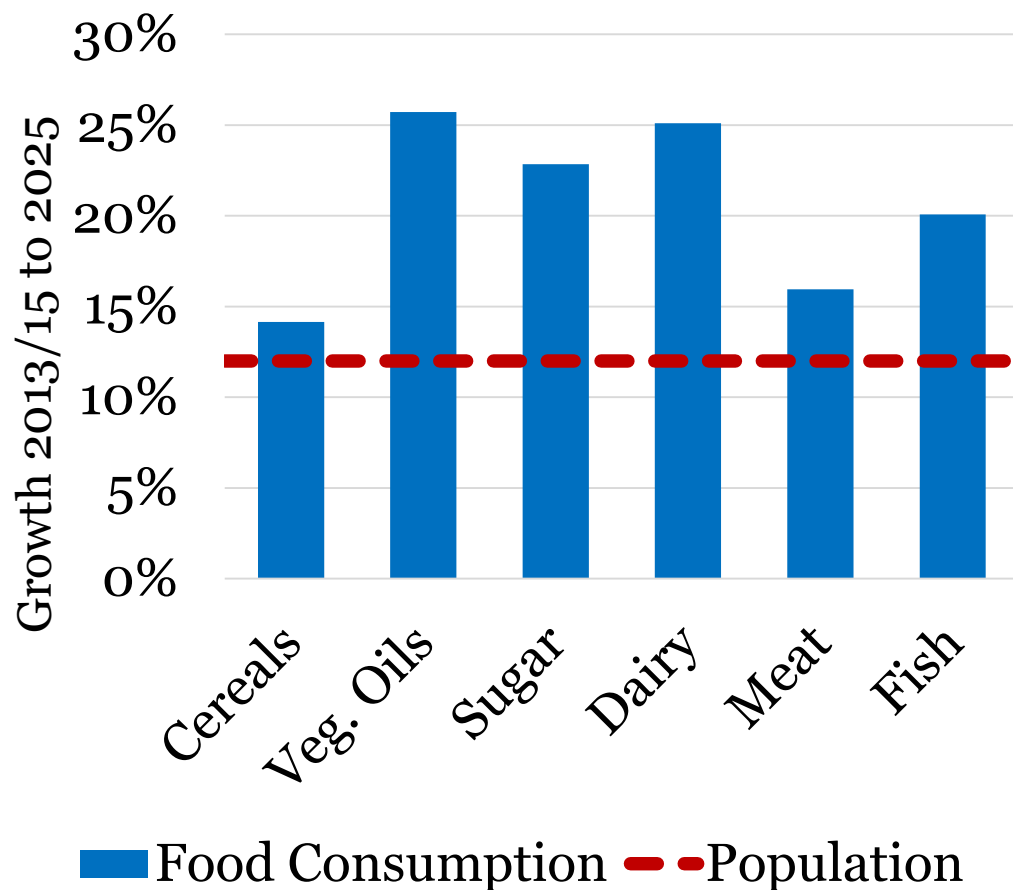


Global calorie demand (kcal/cap/d)



Source: FAOSTAT Food-Balance-Sheets

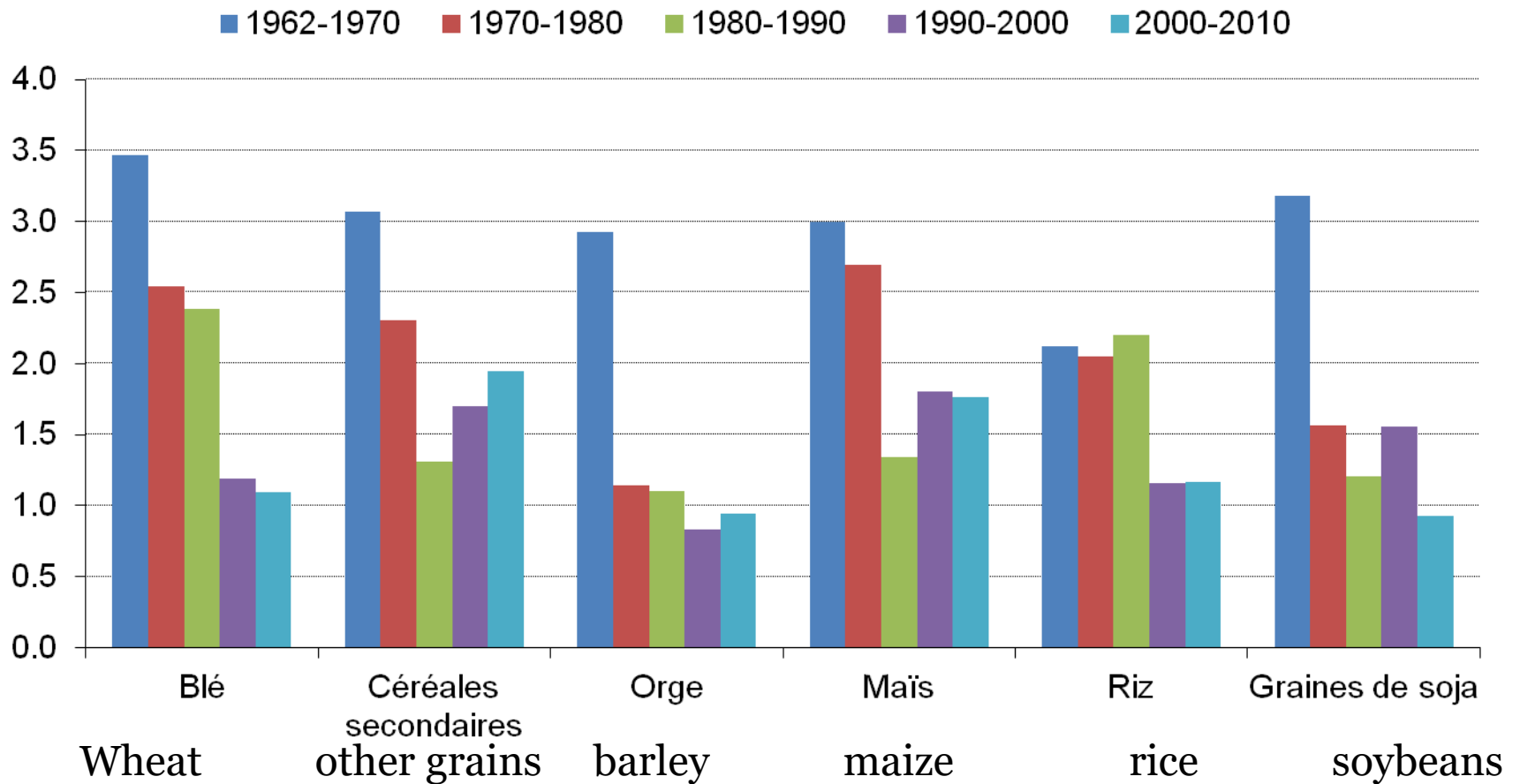
Projected consumption trends across major food groups



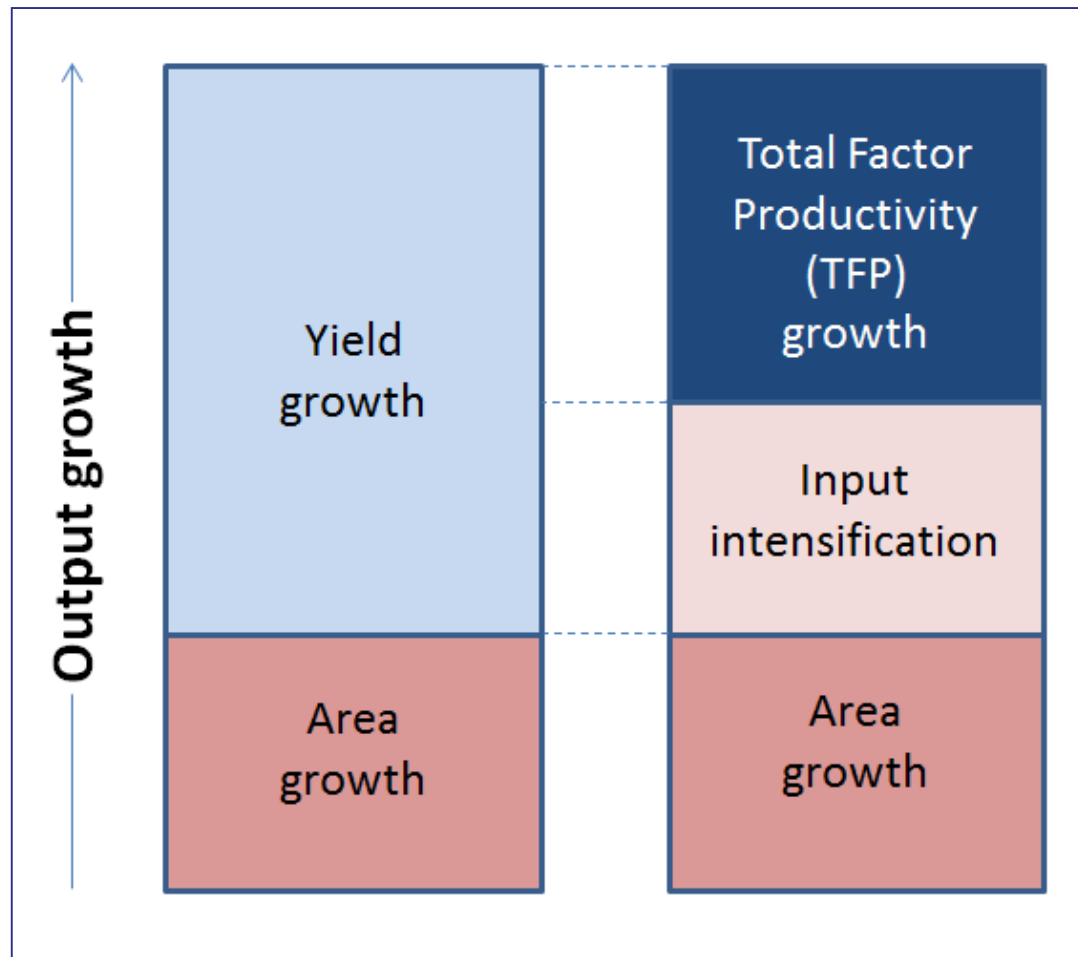
- Strong demand growth for meat, fish and dairy products
- Food consumption of cereals stagnates
- Shift toward livestock products induces additional need for feed crops, particularly coarse grains and protein meals
- Strong increase in sugar and vegetable oil consumption

Yield growth has been declining

Growth in world cereal yields, % per year

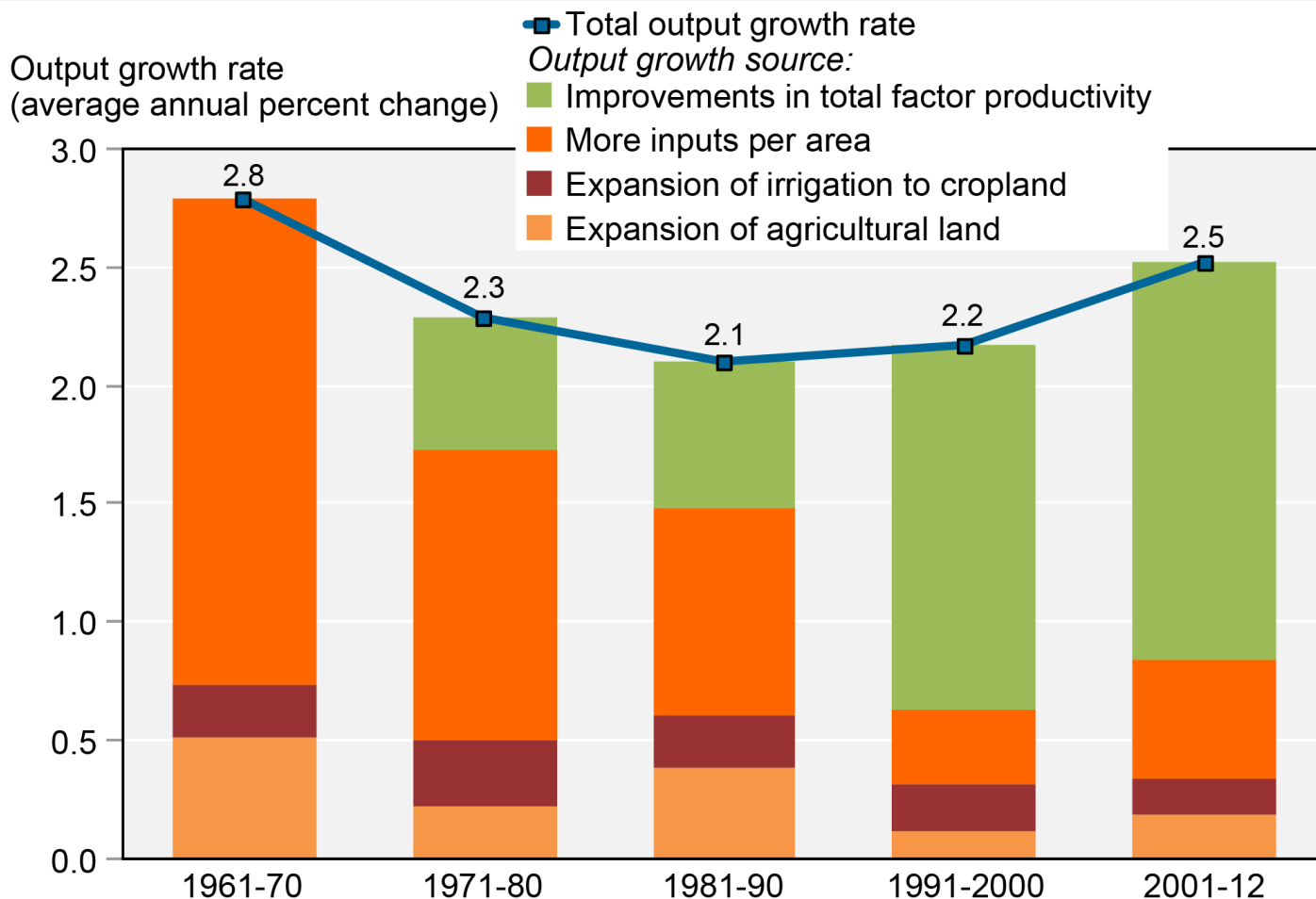


But yield is a partial measure of productivity



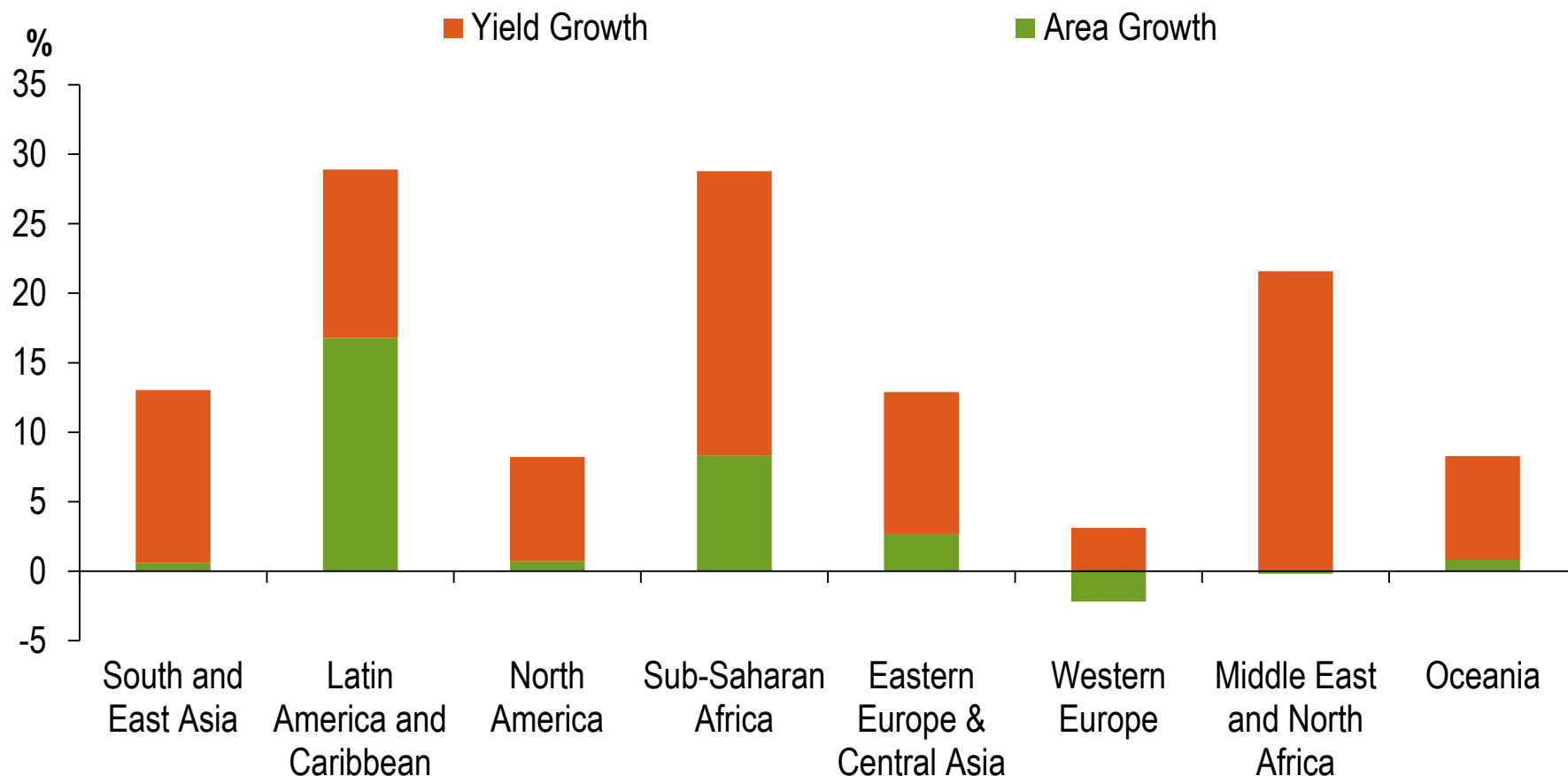
USDA-ERS estimates tell a more positive story for TFP growth

Sources of growth in global agricultural output, 1961-2012



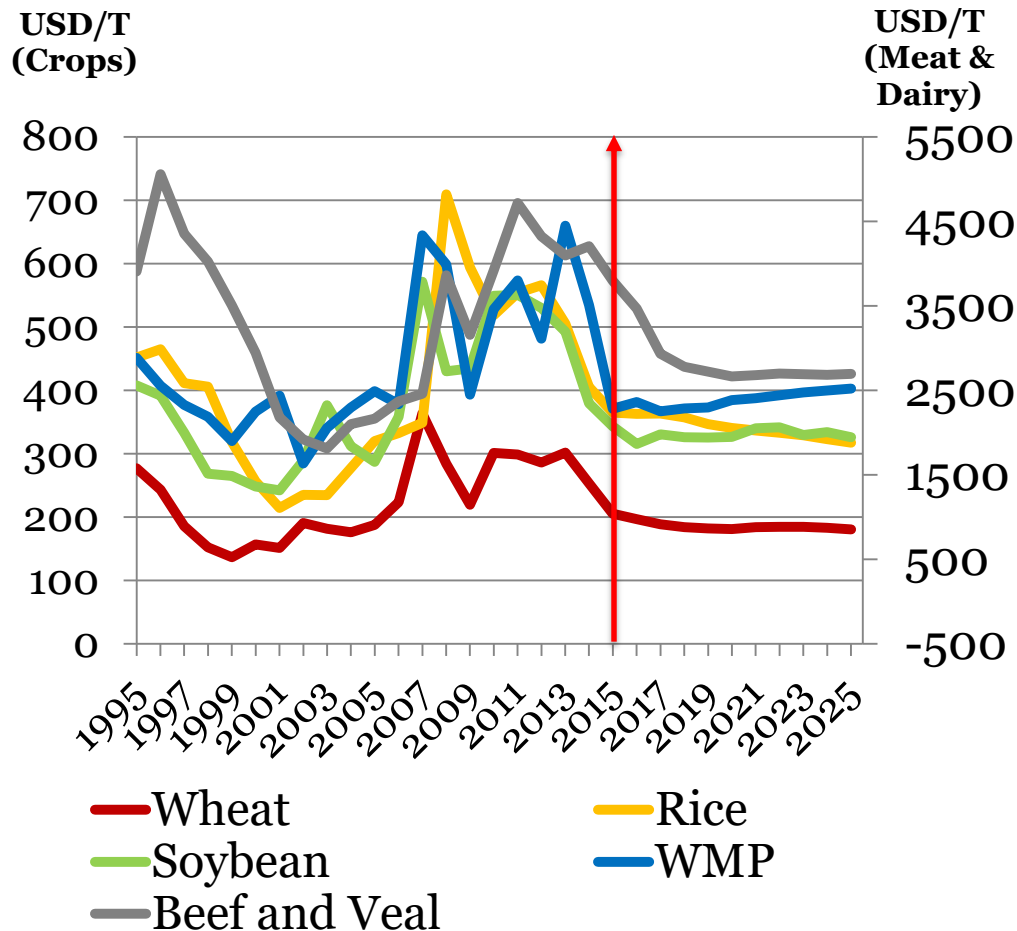
Source: USDA, Economic Research Service, *International Agricultural Productivity* data product, October 2015.

Production growth through intensification and efficiency gains, but regional differences



Change in arable production between 2013-15 and 2025, weighted by acreage; regions are sorted by overall arable acreage

Market fundamentals point to flat real prices



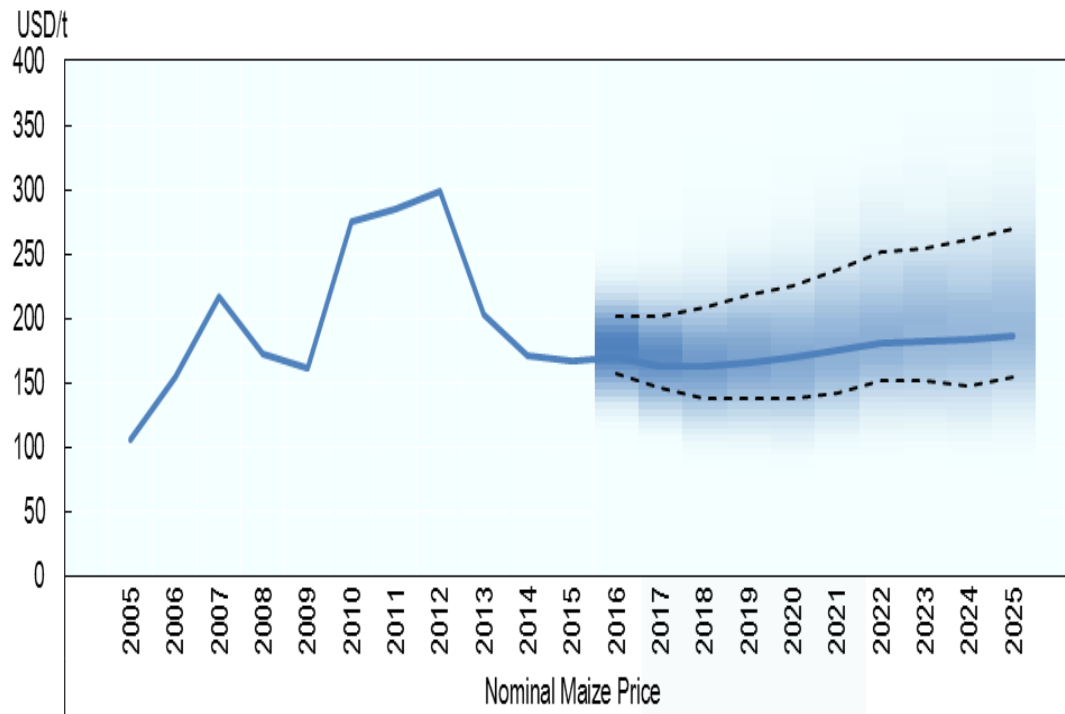
- Prices to remain overall flat, but to change in relative terms
- Relative price changes reflect adjustments in the composition of demand and differences in supply conditions
- Is this a “new normal”?

Divergent long-term projections



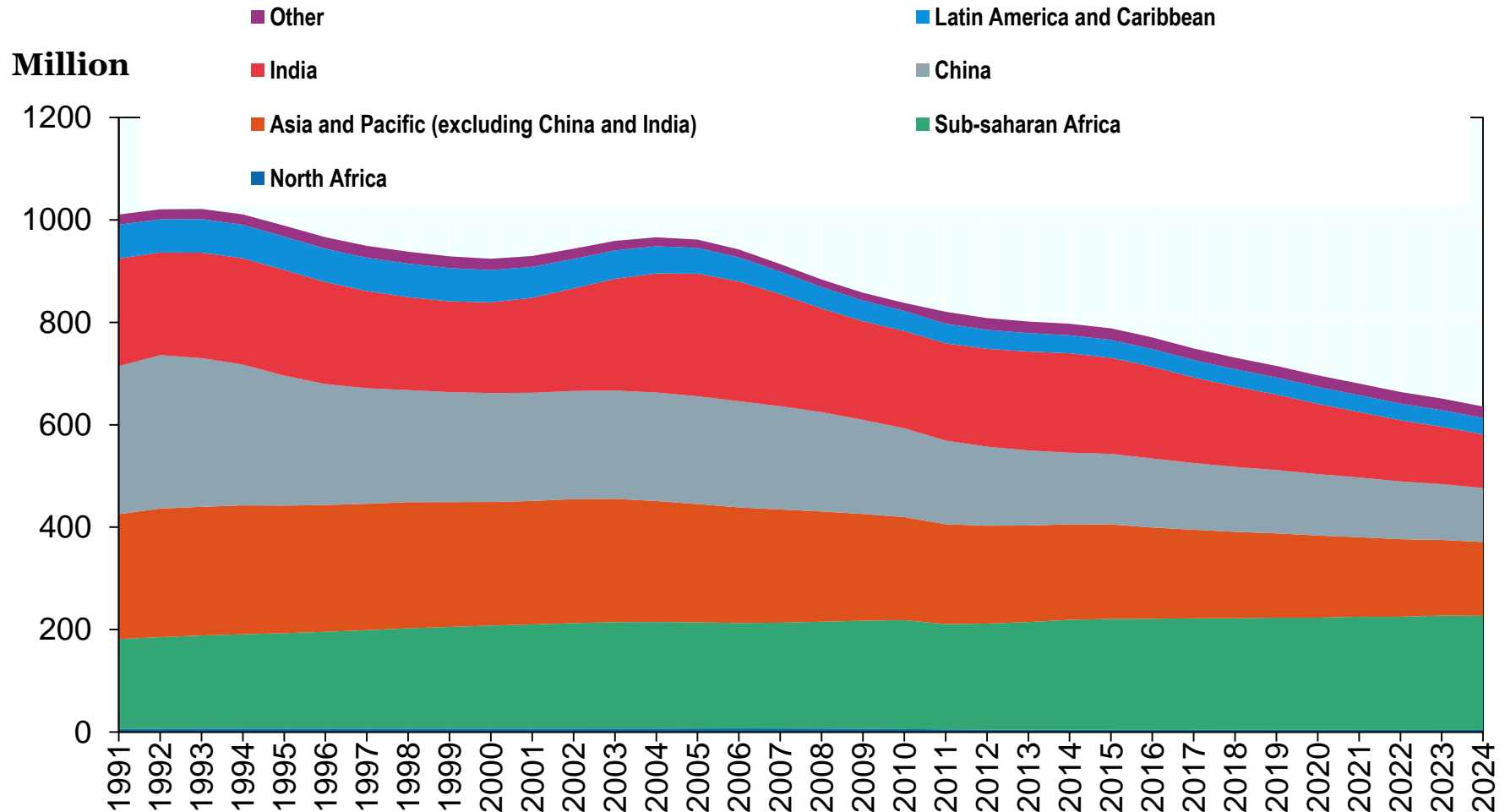
Stochastic analysis suggests a substantial risk of a major price swing

80% probability range for maize price



- Volatility from oil prices, economic growth, exchange rates and yield variations
- Climate change will add to them
- Policy-induced uncertainty not included but will compound volatility
- A crisis more likely when the wrong *policies* compound volatility

Undernourishment projected to decrease but not in SS Africa, SDG2 not met globally



Bottom line on long-term outlook

- No question the world can be fed. But at what price?
- Prices matter: an important driver of the real incomes of producers and consumers.
- But even rock bottom prices won't be enough to ensure access of the poorest – their problem is income generation
- Wide uncertainties on each of the supply and demand shifters, and hence on prices
- Long term drivers can be overwhelmed by bouts of international price volatility
- Need to work on both supply and demand dimensions to improve global food availability

Ways of increasing global food availability

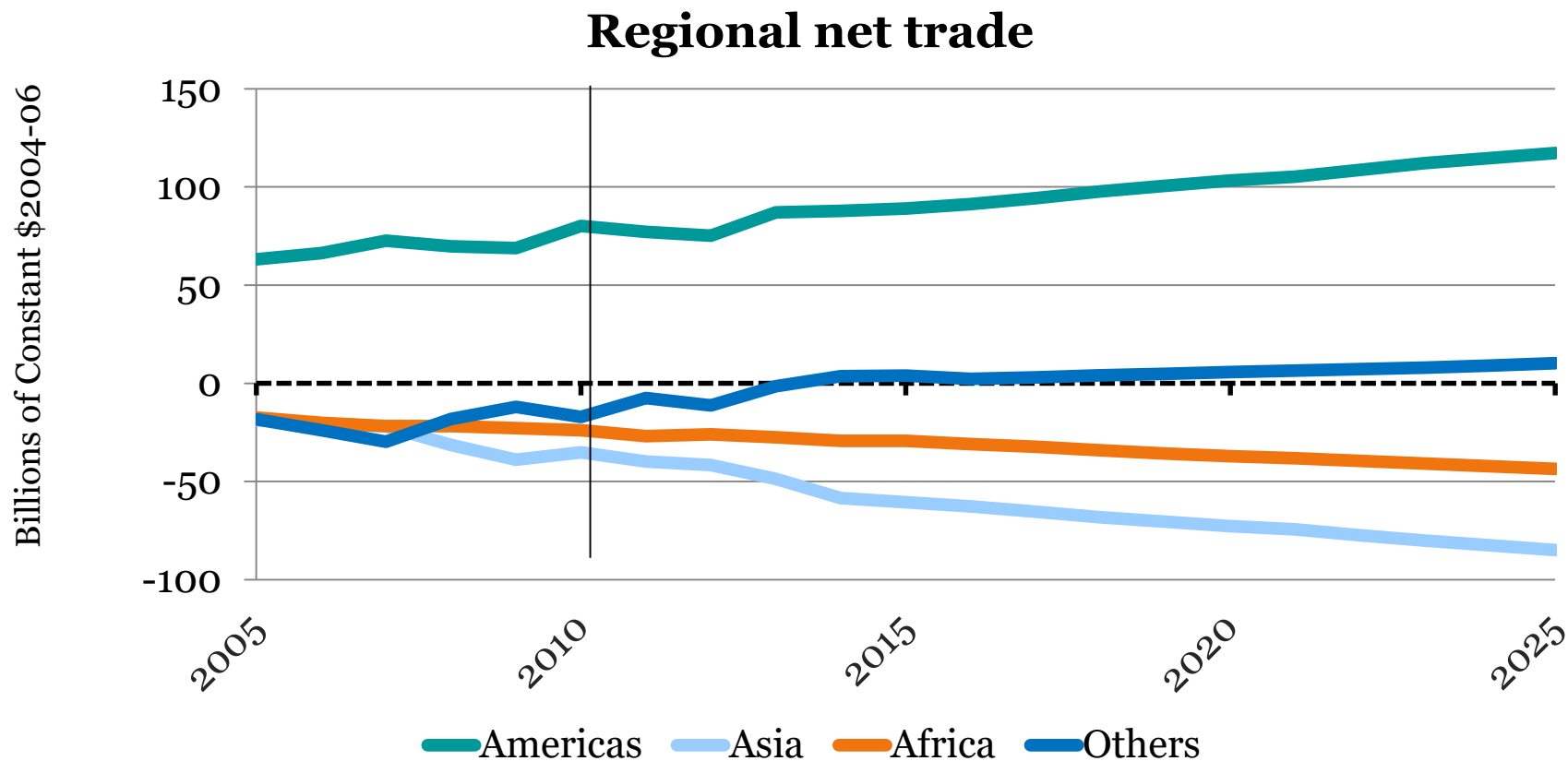
Increasing food supply	Limiting food demand
Improved agricultural productivity (more efficient use of inputs, such as labour, land and water)	Healthier diets (including less meat consumption, reduced over-consumption)
Expansion of land area	Reduced consumer waste
Reduced supply chain (especially post-harvest) losses	
Climate change adaptation	
Less diversion of crops to non-food uses (e.g. biofuels)	

Huge questions with respect to sustainability

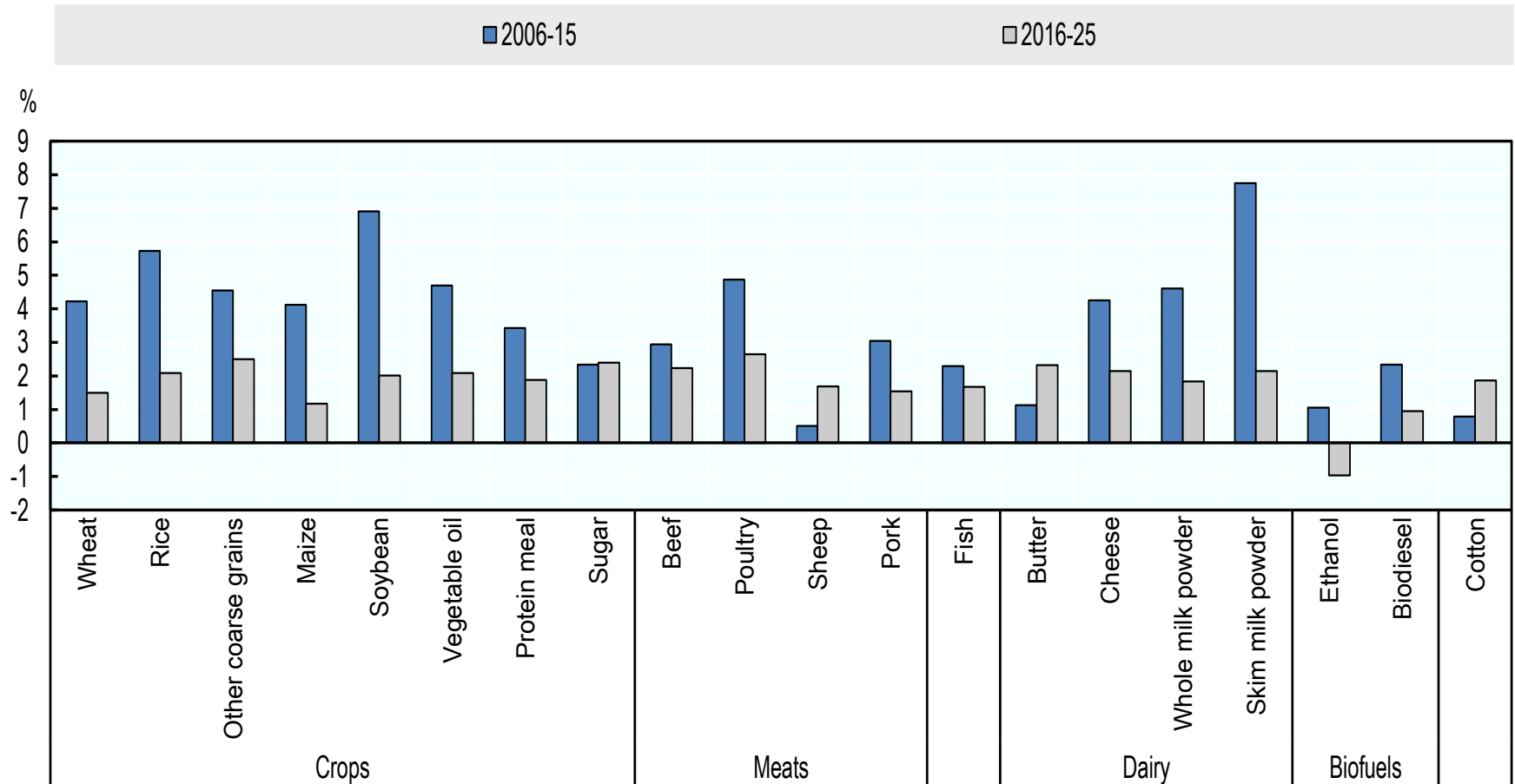
- More scope for raising yields than increasing area sustainably
- Much of the world's population lives in areas of severe water stress, and water is not used sustainably
- But pricing natural resources for sustainable use may imply trade-offs with immediate food security
- “Sustainable intensification” necessary, e.g. improved water management, no-till agriculture
- Agriculture's contribution to climate change mitigation a major uncertainty

Rising exports from Latin America

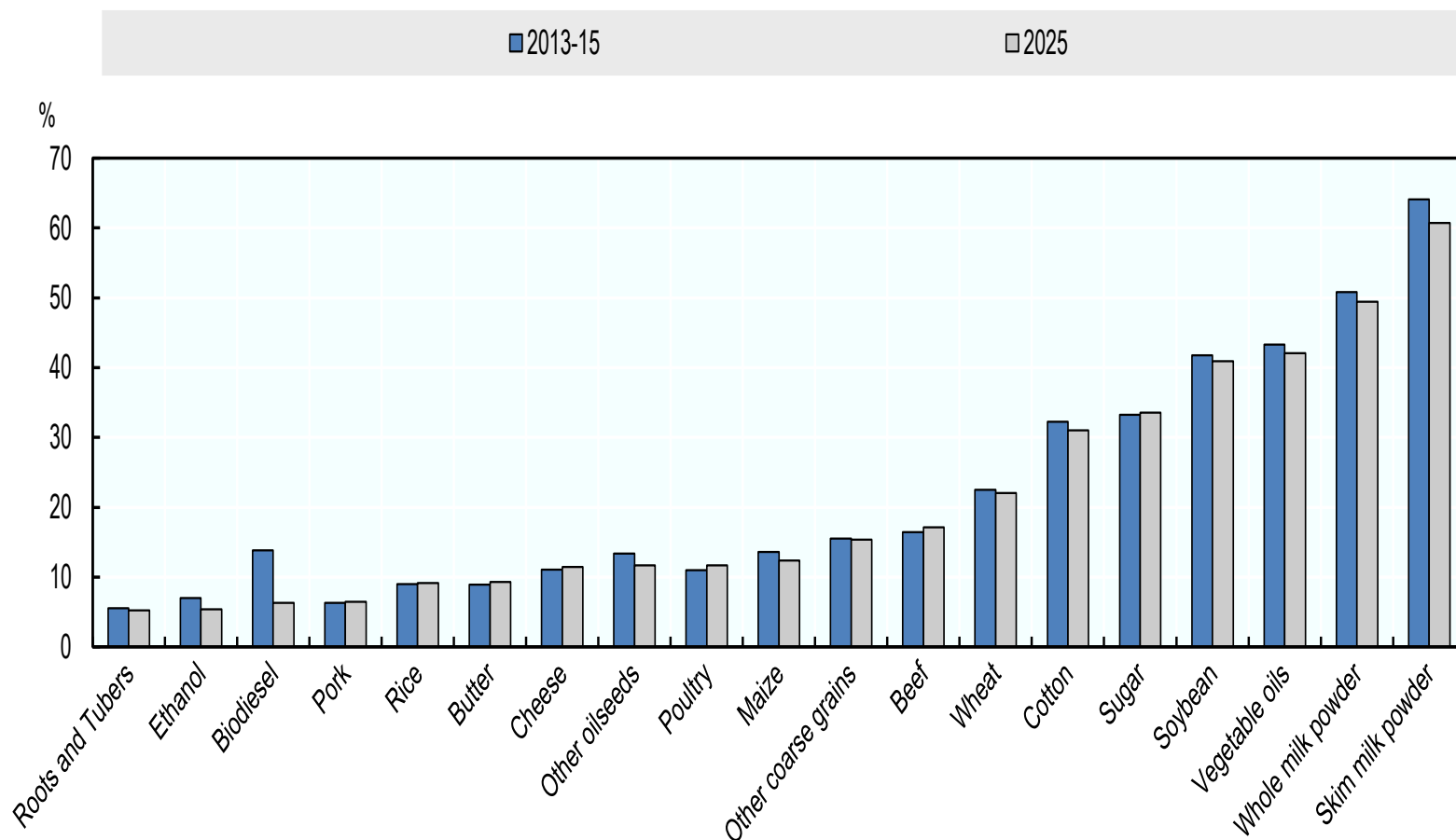
Increasing imports into Africa and Asia



With slowing production and consumption growth, trade will grow more slowly

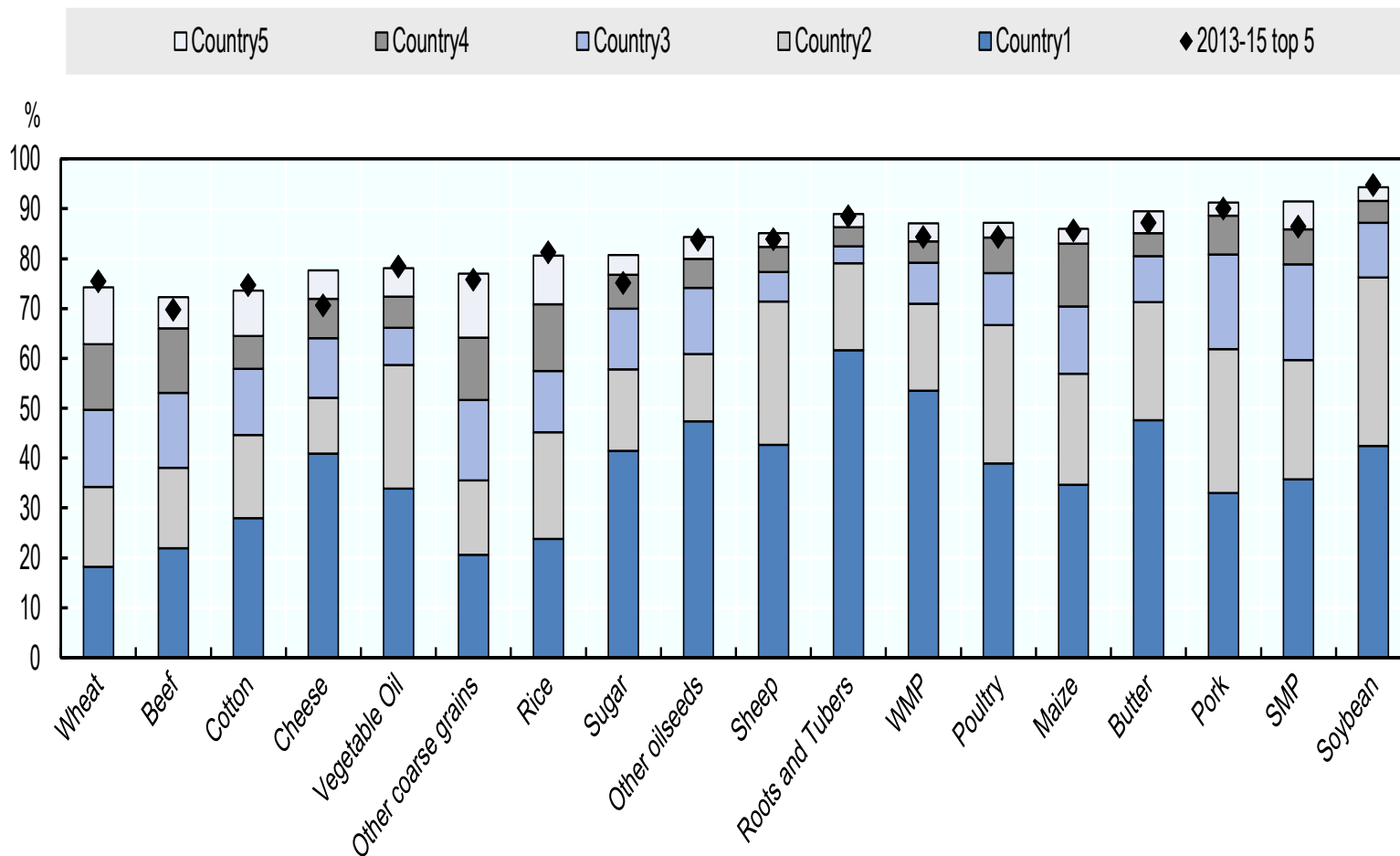


But tradability not projected to change much



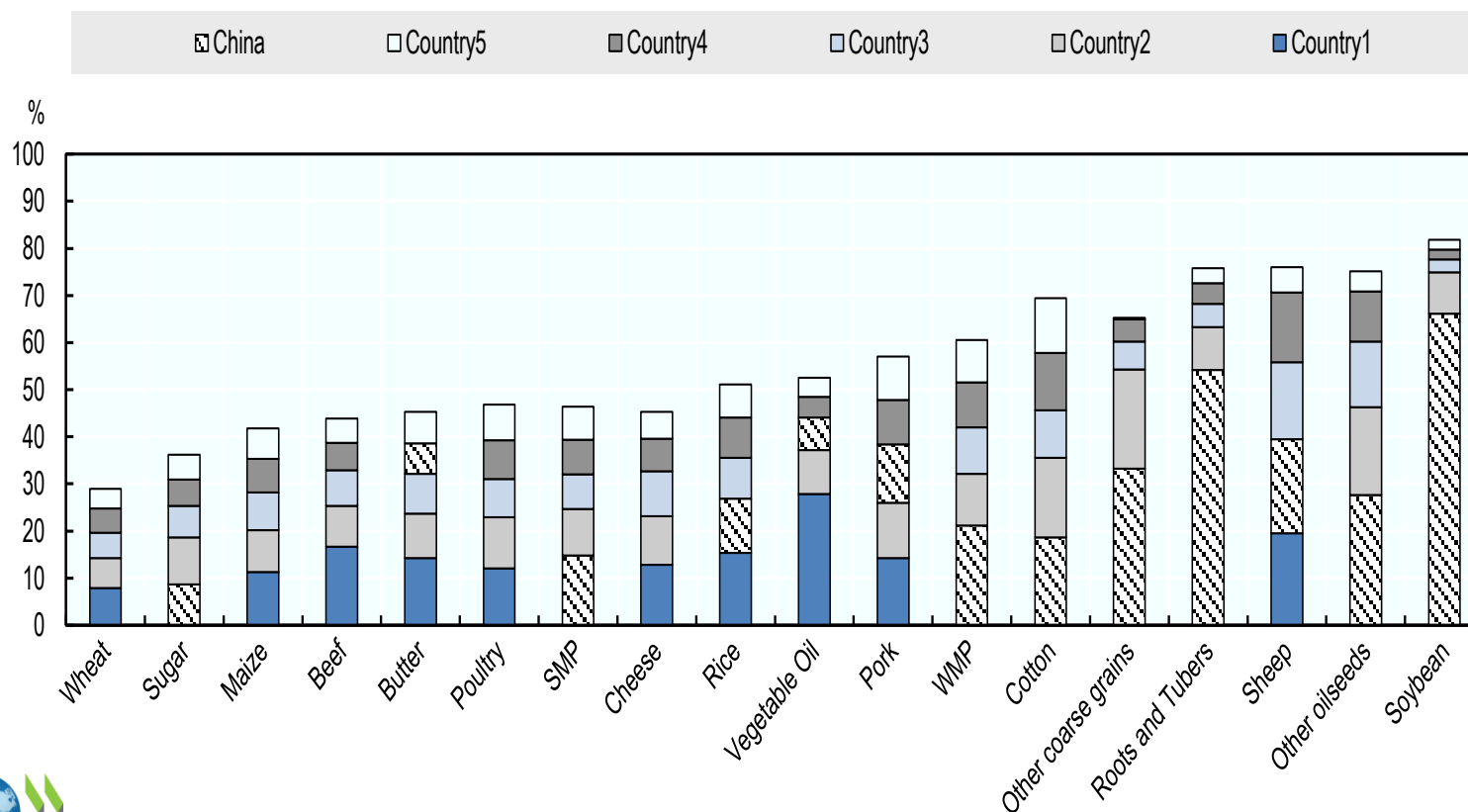
World exports to remain highly concentrated

Shares of top five countries in global exports in 2025



Imports in 2025 more dispersed...but China matters!

Shares of top five importers in world imports

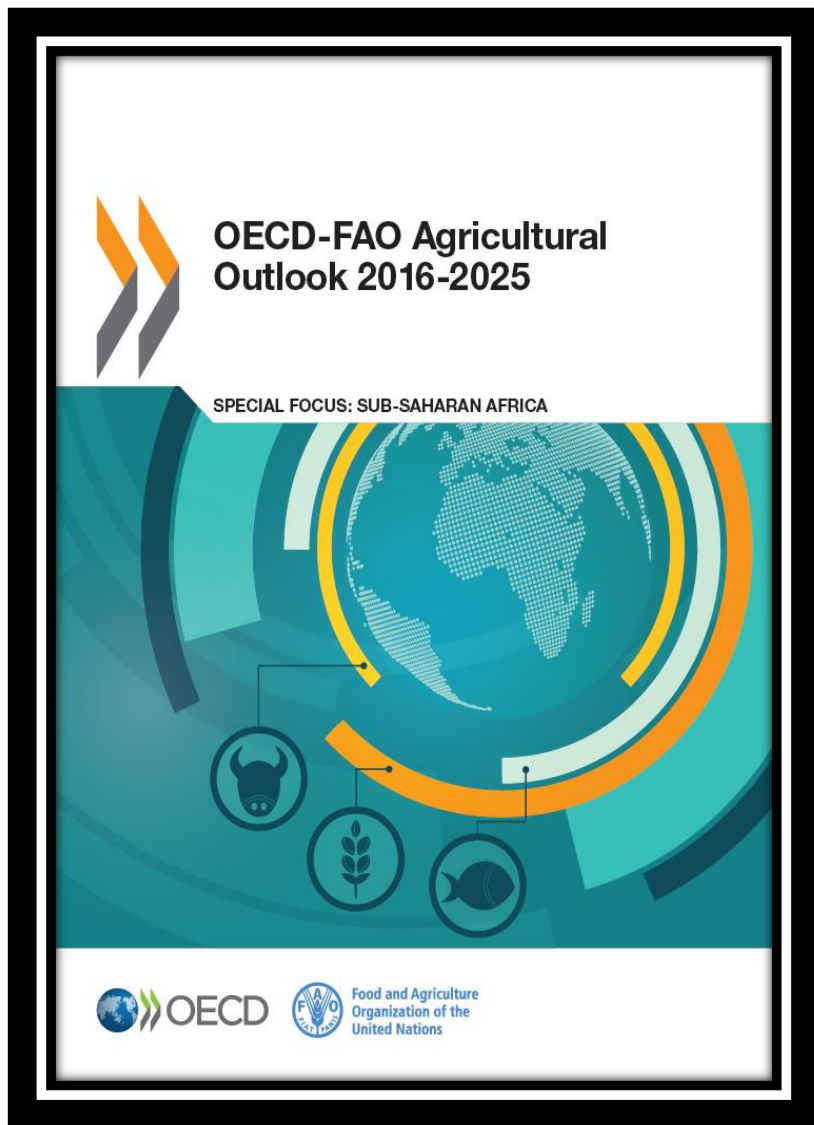


Trade's importance to food security

- Most food is produced and consumed domestically
- But areas of demand growth \neq areas where production can be increased sustainably
- Many countries will require imports to meet their additional food needs (esp in Africa & S. Asia)
- A few key exporters will supply those growing import demands
- Imperative that those exporters are reliable suppliers

Policies to make global markets work

- Opening markets should help stabilise domestic markets
- But we should expect episodic shocks and bouts of international price volatility
- International price stabilisation very difficult
 - Thickening markets can help
 - Avoiding policies that export instability (export subsidies & taxes)
- Domestic price stabilisation of varying effectiveness and it exports instability
- Many countries perceive the need for trade protection to support domestic policy choices (e.g. price guarantees, buffer stocks) but domestic instruments can target the beneficiaries more efficiently



For further information

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