



Food and Agriculture
Organization of the
United Nations

The future of food and agriculture

Trends and challenges

OVERVIEW

The purpose of this report is to increase understanding of the nature of the challenges that agriculture and food systems are facing now and will face into the 21st century. Its analysis of 15 global trends provides insights into what is at stake and what needs to be done. Most of the trends are strongly interdependent and, combined, inform a set of 10 challenges to achieving food security and nutrition for all and making agriculture sustainable. 'Business-as-usual' is not an option. Major transformations in agricultural systems, rural economies and natural resource management will be needed if we are to realize the full potential of food and agriculture to ensure a secure and healthy future for all people and the entire planet.

TRENDS

A number of global trends are influencing food security, poverty and the overall sustainability of food and agricultural systems.

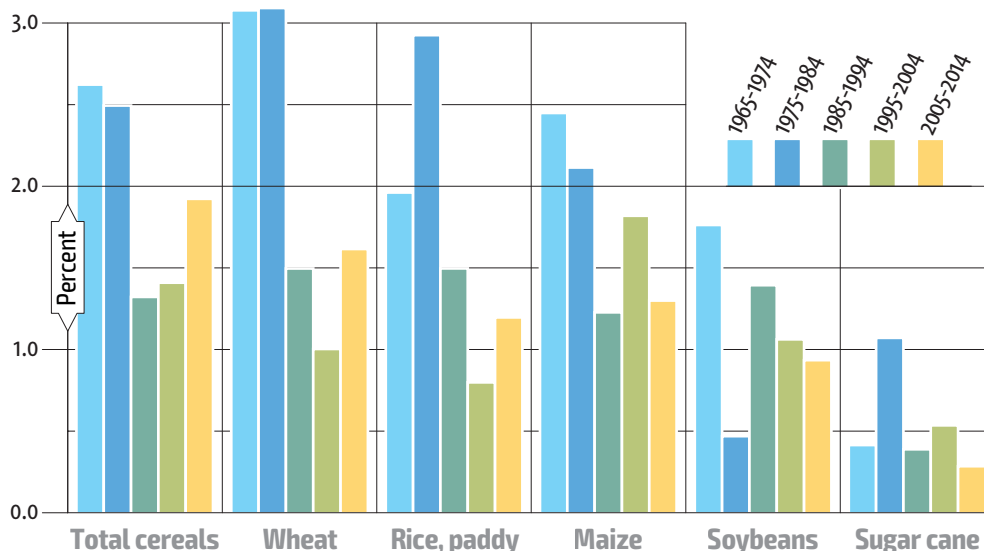
The world's population is expected to grow to almost 10 billion by 2050, boosting agricultural demand – in a scenario of modest economic growth – by some 50 percent compared to 2013. Income growth in low- and middle-income countries would hasten a dietary transition towards higher consumption of meat, fruits and vegetables, relative to that of cereals, requiring commensurate shifts in output and adding pressure on natural resources.

Economic growth and population dynamics are driving the structural change of economies.

The decline in the share of agriculture in total production and employment is taking place at different speeds and poses different challenges across regions. Although agricultural investments and technological innovations are boosting productivity, growth of yields has slowed to rates that are too low

for comfort (see Figure 1). Food losses and waste claim a significant proportion of agricultural output, and reducing them would lessen the need for production increases. However, the needed acceleration in productivity growth is hampered by the degradation of natural resources, the loss of biodiversity, and the spread of transboundary pests and diseases of plants and animals, some of which are becoming resistant to antimicrobials.

Figure 1 Average annual rate of increase in crop yields



Note: Calculations based on FAOSTAT production statistics (downloaded on 20 September 2016). Growth rates estimated using the ordinary least squares (OLS) regression of the natural logarithm of crop yields on time and a constant term. The commodity group 'Cereals (total)' is from FAOSTAT and includes: wheat, rice (paddy), barley, maize, rye oats, millet, sorghum, buckwheat, quinoa, fonio, triticale, canary seed, as well as grains and mixed cereals not elsewhere specified.

Source: FAO. 2016. FAOSTAT [Website] (available at <http://faostat.fao.org>). Accessed November 2016.

Climate change affects disproportionately food-insecure regions, jeopardizing crop and livestock production, fish stocks and fisheries.

Satisfying increased demands on agriculture with existing farming practices is likely to lead to more intense competition for natural resources, increased greenhouse gas emissions, and further deforestation and land degradation.

Hunger and extreme poverty have been reduced globally since the 1990s.

Yet, around 700 million people, most of them living in rural areas, are still extremely poor today. In addition, despite undeniable progress in reducing rates of undernourishment and improving levels of nutrition and health, almost 800 million people are chronically hungry and 2 billion suffer micronutrient deficiencies. Under a 'business-as-usual' scenario, without additional efforts to promote pro-poor development, some 653 million people would still be undernourished in 2030. Even where poverty has been reduced, pervasive inequalities remain, hindering poverty eradication.

Critical parts of food systems are becoming more capital-intensive, vertically integrated and concentrated in fewer hands.

This is happening from input provisioning to food distribution. Small-scale producers and landless households are the first to lose out and increasingly seek employment opportunities outside of agriculture. This is driving increased migratory flows, especially of male members of rural households, which is leading, in turn, to the 'feminization' of farming in many parts of the world.

Conflicts, crises and natural disasters are increasing in number and intensity.

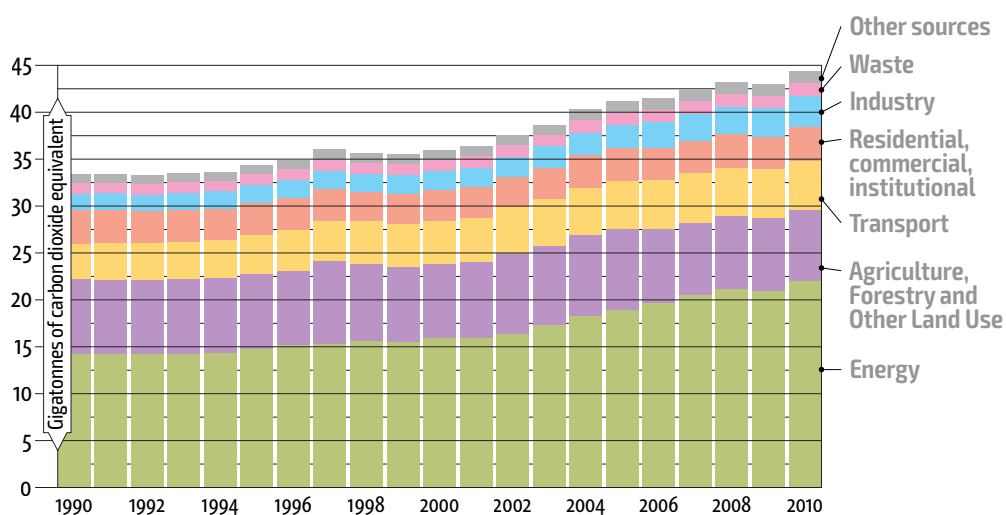
They reduce food availability, disrupt access to food and health care, and undermine social protection systems, pushing many affected people back into poverty and hunger, fuelling distress migration and increasing the need for humanitarian aid. Violent conflict also frequently characterizes protracted crises. On average, the proportion of undernourished people living in low-income countries with a protracted crisis is between 2.5 and 3 times higher than in other low-income countries.

CHALLENGES

These trends pose a series of challenges to food and agriculture.

High-input, resource-intensive farming systems, which have caused massive deforestation, water scarcities, soil depletion and high levels of greenhouse gas emissions, cannot deliver sustainable food and agricultural production. Needed are innovative systems that protect and enhance the natural resource base, while increasing productivity. Needed is a transformative process towards 'holistic' approaches, such as agroecology, agro-forestry, climate-smart agriculture and conservation agriculture, which also build upon indigenous and traditional knowledge. Technological improvements, along with drastic cuts in economy-wide and agricultural fossil fuel use, would help address climate change and the intensification of natural hazards, which affect all ecosystems and every aspect of human life (see Figure 2). Greater international collaboration is needed to prevent emerging transboundary agriculture and food system threats, such as pests and diseases.

Figure 2 Annual greenhouse gas emissions from all sectors



Note: 'Other sources' includes international bunkers.

Source: FAO. 2016. FAOSTAT. Emissions by sector [Website] (available at www.fao.org/faostat/en/#data/EM). Accessed November 2016.

Eradicating extreme poverty, and ensuring that vulnerable people who escape poverty do not fall back into it, requires action to reduce inequalities.

That means addressing inequalities both between and within countries, in levels of income, in opportunities and in ownership of assets, including land. Pro-poor growth strategies, which ensure that the weakest participate in the benefits of market integration and investment in agriculture, would improve their income and investment opportunities in rural areas and address the root causes of migration.

But pro-poor growth must go beyond agriculture, by involving both rural and urban areas and supporting job creation and income diversification.

Social protection combined with pro-poor growth will help meet the challenge of ending hunger and addressing the triple burden of malnutrition through healthier diets. Permanently eliminating hunger, malnutrition and extreme poverty also requires building resilience to protracted crises, disasters and conflicts, and preventing conflicts by promoting inclusive and equitable global development.

A rethinking of food systems and governance is essential for meeting current and future challenges.

Vertically coordinated, more organized food systems offer standardized food for urban areas and formal employment opportunities. But they need to be accompanied by responsible investments and concern for smallholder livelihoods, the environmental footprint of lengthening food supply chains, and impacts on biodiversity. These concerns need to be addressed by making food systems more efficient, inclusive and resilient.

On the path to sustainable development, all countries are interdependent.

One of the greatest challenges is achieving coherent, effective national and international governance, with clear development objectives and commitment to achieving them. The 2030 Agenda for Sustainable Development embodies such a vision – one that goes beyond the divide of ‘developed’ and ‘developing’ countries. Sustainable development is a universal challenge and the collective responsibility for all countries, requiring fundamental changes in the way all societies produce and consume.



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The publication *The future of food and agriculture: Trends and challenges* is available at www.fao.org/3/a-i6583e.pdf



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