



COMMITTEE ON COMMODITY PROBLEMS

Seventy-sixth Session

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MEDIUM TERM AGRICULTURAL OUTLOOK 2024-33 AND EMERGING ISSUES

Executive Summary

This document provides an overview of the trends and prospects for global and national agricultural markets over the next decade, from 2024 to 2033. The projections cover consumption, production, trade and prices for 25 agricultural products.

Over the next decade, global total food commodity use is projected to increase by 1.2 percent annually, driven by population growth and income gains. While a shift in dietary structure from staples to more high-value items is expected, this transition remains slow as food baskets around the world evolve only gradually, conditioned by income growth and dietary preferences. Production is projected to expand by 1.1 percent annually, with growth predominantly located in middle- and low-income countries in Asia, Africa and Latin America. The intensity of agriculture's global greenhouse gas (GHG) emissions is projected to decline as production growth will be primarily based on land and livestock productivity improvements, although direct emissions will still increase by 5 percent. Halving food loss and waste by 2030 has the potential to reduce global agricultural GHG emissions by 4 percent and the number of undernourished people by 153 million. Trade volumes are projected to be aligned with global production developments over the next decade. Well-functioning international agricultural commodity markets will remain important for global food security, as trade accounts for 20 percent of intake calories and rural livelihoods benefit from participation in markets and global agrifood value chains. A slight fall in the real international reference prices of the main agricultural commodities is projected over the next ten years, but this may not be transmitted to local markets.

Suggested action by the Committee

The Committee is invited to note the information and medium-term projections presented in this document and provide guidance as deemed appropriate. In particular, the Committee is invited to:

- review the medium-term projections and discuss emerging issues over the next decade and their implications for global food security;
- advise on the usefulness of the projections to the Members and how their uptake could be promoted;

- provide guidance on possible future forward-looking scenario analyses using the model.

Queries on the substantive content of the document may be addressed to:

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I. INTRODUCTION

1. The medium-term outlook presents a consistent baseline scenario for the expected evolution of agricultural and fish markets at national, regional and global levels over the next decade (2024-2033). The projections presented in this document are based on the *OECD-FAO Agricultural Outlook 2024-2033*, which was published in July 2024. The Outlook exercise brings together the commodity, policy and country expertise of the Food and Agriculture Organization of the United Nations (FAO) and the Organisation for Economic Co-operation and Development (OECD) and collaborating Members of both organizations.

2. The baseline projections are based on current market conditions as well as assumptions about the macroeconomic conditions, longer-term productivity trends, consumer preferences, weather conditions, and agriculture and trade policy settings. The OECD-FAO Aglink-Cosimo model, which links all sectors and countries covered in the report, ensures consistency and global equilibrium across all markets.

3. The projections were generated under market conditions influenced by the ongoing war in Ukraine and other conflicts and geopolitical tensions. While the consequences of the conflicts for agricultural and fish markets over the medium term are uncertain, their emerging short-term supply and demand impacts have been incorporated into the projections.

II. CURRENT MARKET CONTEXT AND MACROECONOMIC ASSUMPTIONS

4. Ample grain supplies from the United States of America and Argentina and competition among exporters lowered global wheat and maize prices in 2023. Alternative Ukrainian shipment routes and lower input costs also eased market pressure. By contrast, the rice market faced turbulence due to the El Niño event but has stabilised by late 2023, as actual production impacts were milder than expected. International prices of oilseeds and products declined from the record highs of 2022-2023 and have stabilised since late 2023, mainly reflecting positive prospects of adequate global supplies of soybean, rapeseed, sunflower seed and palm oil.

5. Despite challenges such as animal diseases, rising costs, regulatory constraints and adverse weather conditions, meat production registered a slight growth in 2023, led by Asia, South America, and Oceania, though Europe's output declined. Due to the sustained production from key regions and reduced demand from major importers, global meat prices fell in 2023.

6. Dairy product prices dropped significantly from their 2022 high levels, mainly driven by a decrease in input costs and lower global demand. Domestic prices often develop differently as only a small share of milk is traded internationally. World trade in dairy products declined in 2023, mainly due to lower import demand from China.

7. In 2023, global fish production remained broadly stable, with a rise in aquaculture output offset by a lower capture fisheries production, particularly in Peru. International fish prices declined in 2023 compared to the high levels reached in 2021 and 2022, primarily due to lower prices of aquaculture products.

8. World population¹ is projected to increase by over 700 million over the next 10 years to reach 8.7 billion in 2033. Continually high growth rates are foreseen in Sub-Saharan Africa, the Near East and North Africa, while population is projected to decline in Europe and China.

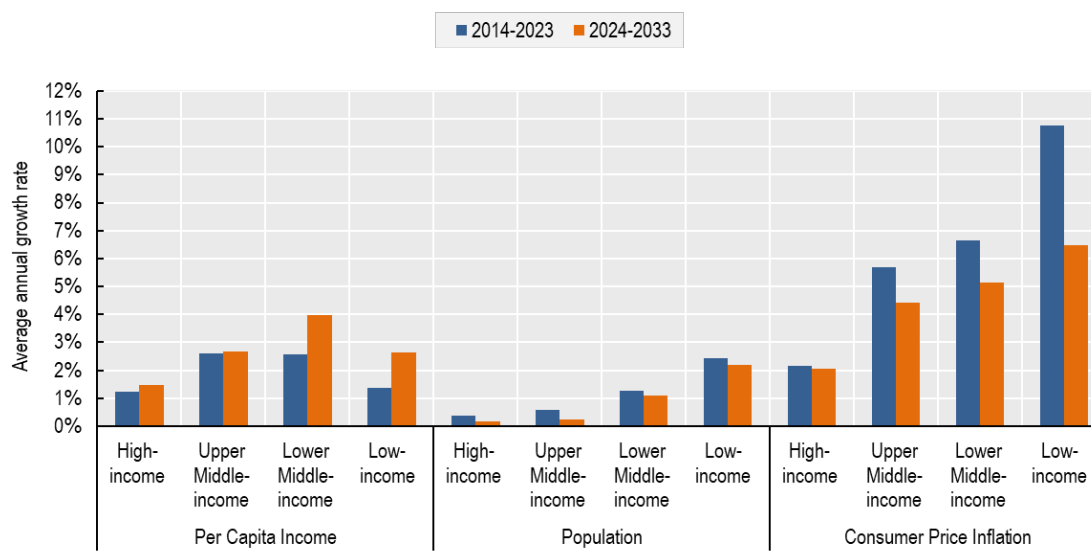
9. Global per capita income is expected to grow by 1.6 percent per annum on average over the next decade. The strongest growth is projected for Asian economies, while economic prospects in the

¹ For population growth, the *Outlook* uses the UN Medium Variant set of estimates from the 2022 Revision of the United Nations Population Prospects database. National Gross Domestic Product (GDP) and per capita income assumptions are based on the IMF *World Economic Outlook* (October 2023).

rest of the world remain significantly lower. Prices of energy, fertilizer and other agricultural production inputs have eased from their 2022 peaks and are projected to remain flat in real terms to 2033. Global consumer price inflation has also eased in 2023 and is projected to average about 4 percent per annum over the next decade.

10. The expected macroeconomic conditions vary considerably between high-income countries (HICs), upper-middle-income (UMICs), lower-middle-income (LMICs) and low-income countries (LICs)² (Figure 1).

Figure 1. Main macroeconomic assumptions



Source: FAO calculations based on UN Population Prospects 2022, IMF World Economic Outlook 2023 and OECD Economic Outlook 2023 numbers

III. PROJECTION HIGHLIGHTS

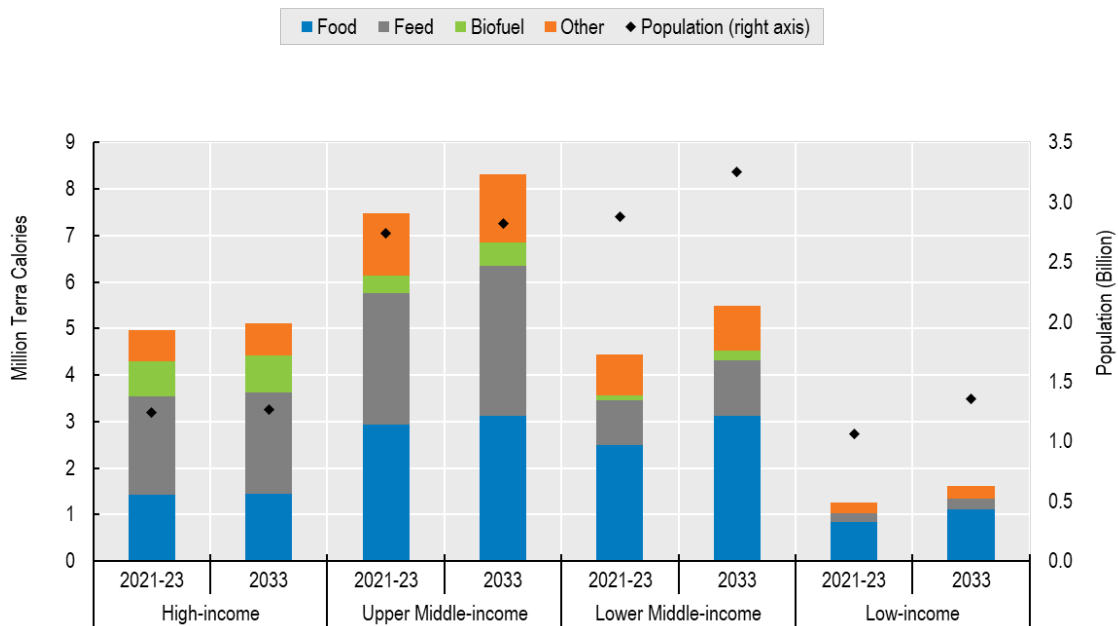
A. Consumption

11. Over the coming decade, total consumption of agricultural commodities and fish (including intermediate and non-food uses) is projected to grow by 1.1 percent annually. Nearly 94 percent of the additional consumption is projected to occur in middle- and low-income countries, where growing and increasingly affluent populations with slowly evolving nutrition patterns are shaping the demand for agricultural commodities in the form of food, feed and industrial raw products, including biofuels.

12. Globally, direct food use remains the primary utilization component, currently accounting for 42 percent of total consumption. Feed use, which has expanded strongly over the past decades due to income-driven diversification of diets towards livestock sources and subsequent expansion and intensification of livestock production, accounts for a third of the total use. The largely policy-driven biofuel sector is responsible for another 7 percent of total consumption. The remaining 17 percent are either lost along the supply chains or used as inputs for other industrial applications. No significant structural shifts in these patterns are expected over the coming decade (Figure 2).

² The 38 individual countries and 11 regional aggregates in the baseline projection model are classified into the four country income groups according to their respective per capita income in 2018. The applied thresholds are low: < USD 1 550, lower-middle: < USD 3 895, upper-middle: < USD 13 000, high: > USD 13 000.

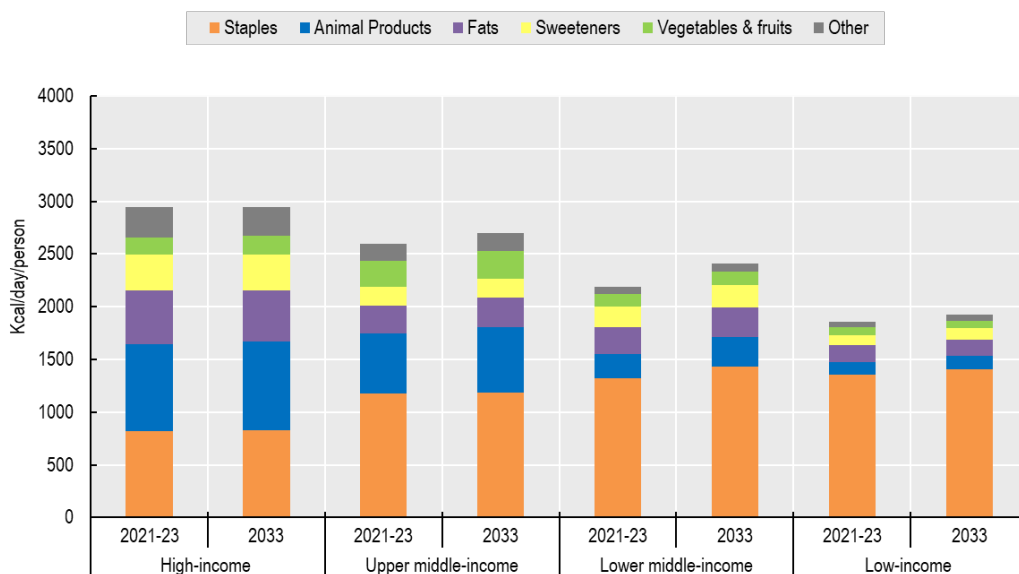
Figure 2. Use of agricultural commodities



Source: OECD/FAO (2024), “OECD-FAO Agricultural Outlook”, OECD Agriculture statistics (database).

13. Daily per capita calorie intake (consumption net of household waste) is projected to increase predominantly in middle-income economies over the next 10 years (Figure 3). Income growth in India and emerging Asian economies, in particular, are expected to underpin the expansion in food consumption. In low-income countries, only moderate increases in food intake are expected due to limited gains in per capita income. Consumers in high-income economies will increase their calorie intake only marginally as diets have already stabilised.

Figure 3. Daily per capita calorie intake



Source: OECD/FAO (2024), “OECD-FAO Agricultural Outlook”, OECD Agriculture statistics (database).

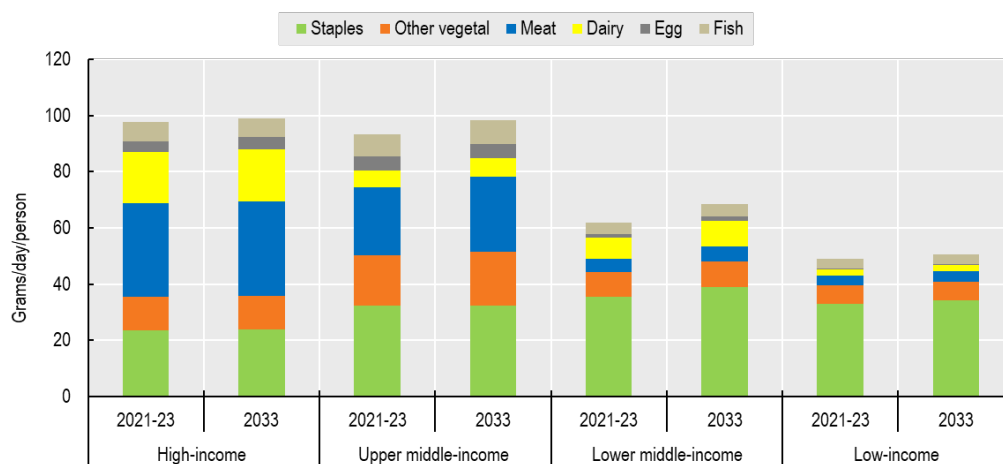
14. Per capita intake of staple commodities, the main source of calories, is projected to increase by 5.3 percent globally. Growth will be concentrated in low- and middle-income countries as intake in high-income countries has levelled off. The transition in dietary patterns from staples to more high-value items will remain constrained by incomes and influenced by food consumption habits and cultural preferences. By 2033, the share of dietary energy from livestock products and fruits and vegetables in middle-income countries is projected to increase by just over 1 percent. In low-income countries, the share of dietary energy from livestock sources is expected to remain unchanged as about 70 percent of calories will continue to come from staples.

15. In response to increasing affluence among consumers in middle-income economies, global per capita intake of protein is projected to rise to 79.8g per day by 2033, from 76.6g in the base period. While upper middle-income countries are projected to reach the protein intake level of high-income countries over the next decade, the projected increases in poorer countries are not enough to close the consumption gap significantly by the end of the decade.

16. Differences in the composition of protein sources are also expected to persist, with countries in Sub-Saharan Africa and the Near East and North Africa projected to consume mostly proteins from vegetal sources, given their substantially lower average household incomes. In South Asia, fresh dairy products continue to increase their role as a source of protein. India and Pakistan are each projected to add more than 2g of dairy protein to their average daily per capita intake.

17. In the high-income countries of North America, Europe and Oceania, consumer demand is projected to strengthen for food items that are perceived as healthier and more environmentally friendly, such as poultry, fish and plant-based proteins. Growing health awareness in these countries is also expected to raise demand for some other high-value items such as fruits, vegetables, nuts and seeds (Figure 4).

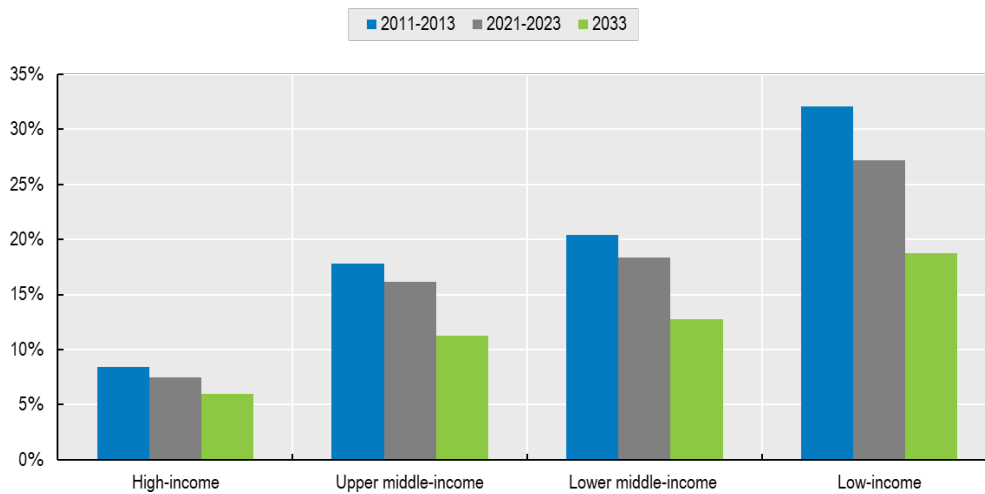
Figure 4. Daily per capita protein intake



Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

18. The share of disposable household income spent on food is expected to continue to fall in all regions (Figure 5). Although the largest decline is foreseen in the low-income countries, their food expenditure share will remain high, indicating a greater vulnerability to food commodity price shocks in the most food insecure countries. A high share of food in total expenditure can also have adverse effects on the macroeconomic performance of low-income countries, particularly large net importers of food commodities, where high and fluctuating international prices would impact food import bills, exacerbating balance of payments problems and adding to inflationary pressure in domestic markets.

Figure 5. Food expenditure shares



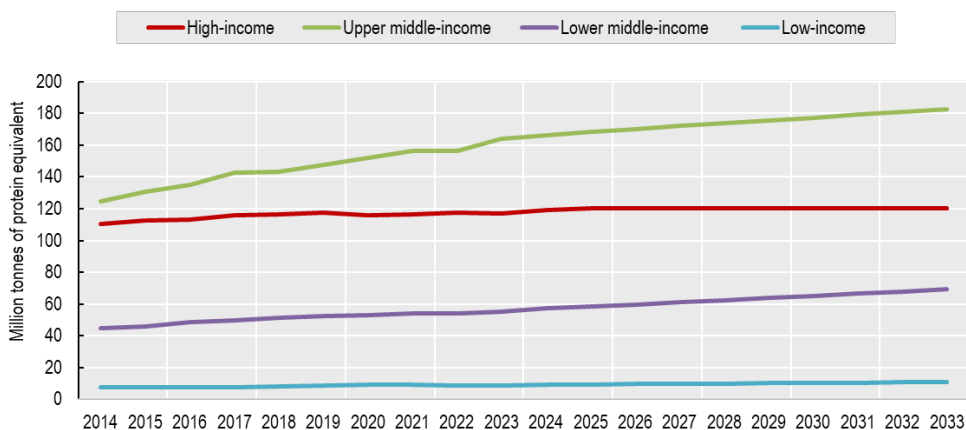
Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

19. Expanding livestock herds and evolving production technologies are projected to lead to a 13 percent global increase in the feed use. Global livestock inventories are projected to expand by 10 percent, and output³ by 14 percent, indicating intensification in feed use and improvements in feed efficiency.

20. Commercially raised livestock is mainly fed on compound feed rations to produce high value proteins in the form of meat, fish, eggs and milk. This process uses a wide variety of concentrate feeds that have a high energy and protein concentration. Despite the ongoing innovation in the livestock sector, only about a quarter of feed energy is eventually consumed as human food. The bulk of energy is spent maintaining the animal and cannot be harvested.

21. The bulk of the expected increase in the feed use will come from middle-income countries where livestock numbers are growing and the share of commercialised and feed-intensive farms is increasing (Figure 6). Feed use is projected to intensify especially in Southeast Asia, where expanding pork and poultry production will push demand for mostly imported protein meal and cereals.

Figure 6. Feed use

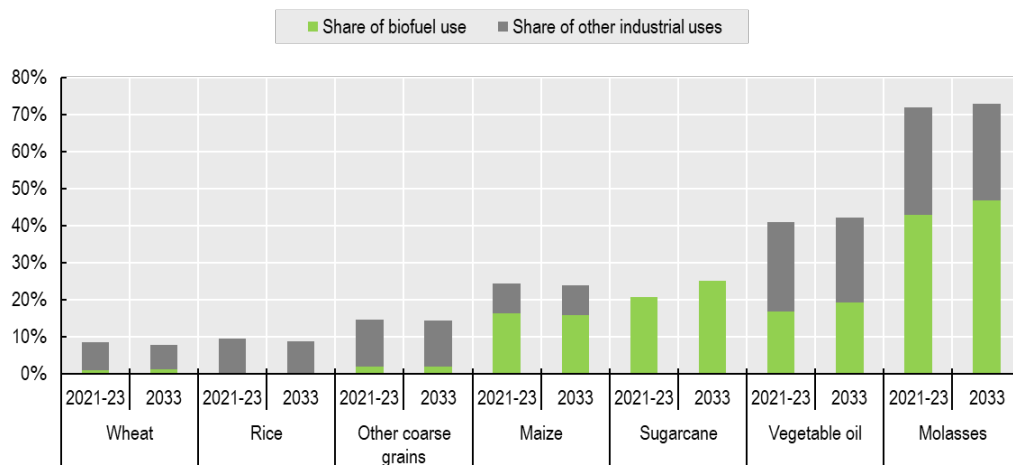


Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

³ Livestock production and feed are aggregated on a protein basis.

22. Global biofuel use is projected to grow, driven by transport fuel demand and public policies. Over the coming decade, a significant share of new biofuel production will be located in emerging economies, especially Brazil, Indonesia and India, where transport fuel demand is rising and policy support for biofuel consumption and production is assumed to continue. In the United States of America and the European Union, additional biofuel use in land transportation fuel will likely be constrained by the increasing adoption of electric vehicles, vehicle efficiency improvements, and policies promoting sustainable feedstocks that do not compete directly with food and feed crops (Figure 7).

Figure 7. Biofuel and other industrial use



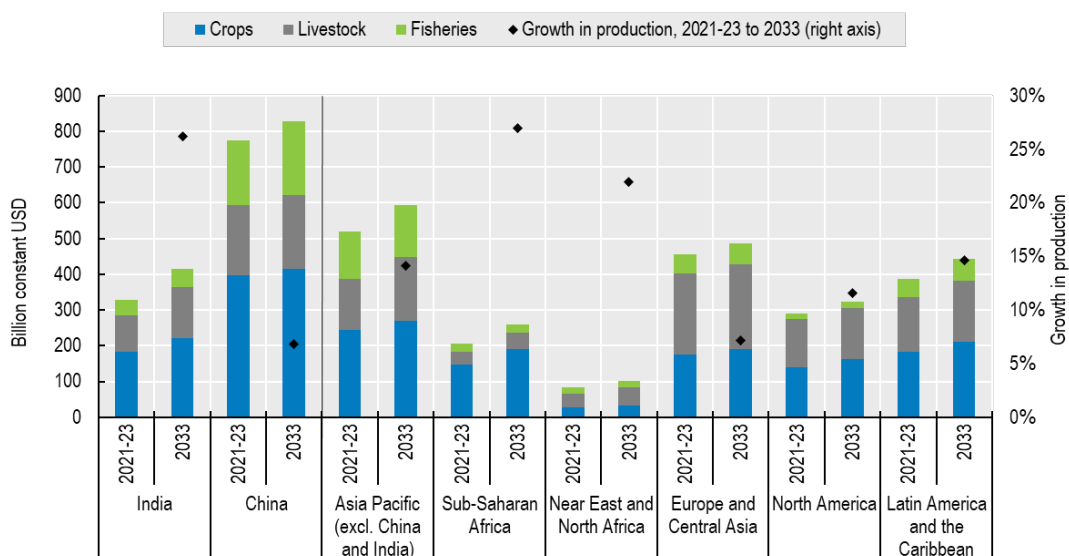
Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

B. Production

23. Over the next 10 years, global agricultural production⁴ is projected to increase by 1.1 percent annually. Livestock production is anticipated to lead this growth, at 1.3 percent per annum. Fish production is expected to increase by 1.1 percent annually, while crop production is projected to grow at an annual rate of only 1.0 percent, based on the projected structural and technological evolution of global agriculture.

24. More than half of the projected increase in global agricultural production is expected to occur in Asian countries, where it will be based mainly on productivity improvements achieved with continued investments in technology and farm management practices, combined with a moderate expansion in agricultural area and livestock herds (Figure 8). India is projected to achieve the fastest growth in the region and contribute over one-fifth of the additional global agricultural output. China is projected to have a lower share in both crop and livestock outputs, given limited agricultural land and tighter environmental regulations, but to increase its production share in fisheries.

⁴ Global agricultural and fisheries production is aggregated by net value, measured at constant prices.

Figure 8. Agricultural and fisheries production

Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

25. The Latin America and the Caribbean region is also projected to continue its strong growth and contribute a sizeable share of the additional global production, mostly in the form of livestock and fisheries products, to meet the growing domestic and export demand for animal proteins. Crop production is also expected to expand in the region, driven by additional cultivated area and land productivity gains.

26. Sub-Saharan Africa and the Near East and North Africa regions are projected to achieve some of the highest production growth rates, albeit from a low base. Although crops continue to dominate agricultural output in Sub-Saharan Africa, strong growth is projected in the livestock sector, especially in dairy production. Livestock production is projected to account for over half of the additional agricultural output in the Near East and North Africa region, with poultry to be the primary source of growth.

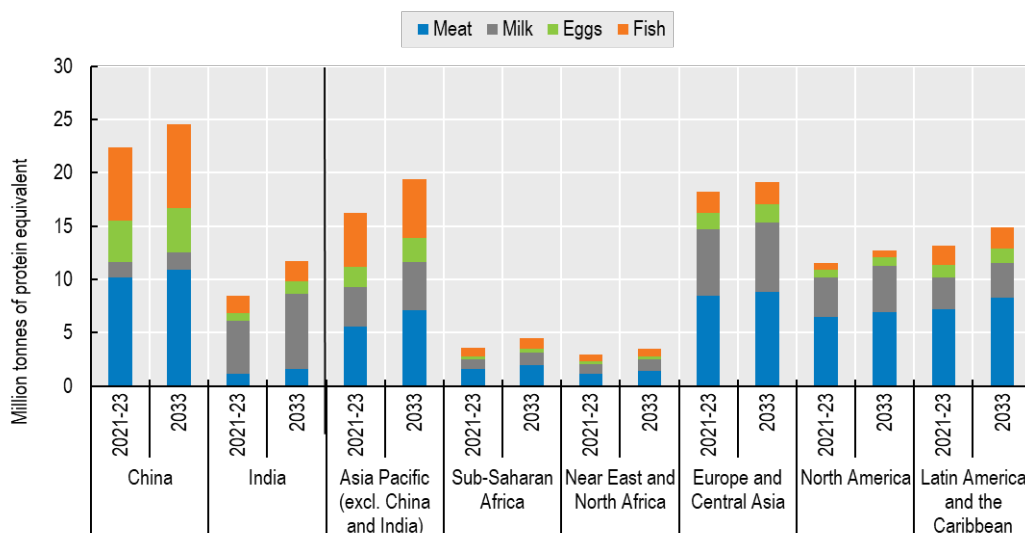
27. In the industrialized economies of North America and Europe, production growth is expected to be moderate, as productivity levels are close to their agronomic potential and environmental regulations limit expansion in agricultural land and livestock production.

28. Assuming continued transition to more intensive production systems, particularly in middle- and low-income countries, projections suggest that 80 percent of the global crop production growth will come from improvements in yields. Yield gains are expected across all crops and production systems, so a significant spread in the yield levels of the various commodities is anticipated to persist. Fertilizer application per hectare is expected to intensify, particularly in Sub-Saharan Africa, India, and South-East Asia, underpinning the projected yield improvements, while it is expected to remain at baseline levels in China.

29. Similarly, a significant proportion of the projected growth in livestock and fish production is also expected to result from productivity improvements, although herd expansion will also contribute to livestock production growth. The anticipated rise in global meat production will mainly originate in Asian countries across all livestock sectors, primarily supported by intensified feeding practices and advances in breeding. Poultry production is projected to account for over half of the projected total increase in meat production.

30. Dairy is projected to remain the fastest-growing livestock sector over the next decade, with India and Pakistan leading in absolute milk production growth (Figure 9). Growth factors will vary by region. High-income countries will focus on intensifying production through yield improvements, while middle- and low-income countries, particularly India and Pakistan, will also increase the number of milking animals.

Figure 9. Livestock and fish production



Note: Products are aggregated on a protein basis

Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

31. Future growth in the aquatic food sector is expected to be based on a continued, though slower expansion in aquaculture, while capture fisheries production is projected to remain relatively constant. The slowdown in aquaculture growth is largely attributed to tightened environmental regulations in China. The negative effects of El Niño on capture fisheries are expected to be temporary. Over the outlook period, projections reflect rising production, particularly in Africa and the Americas.

32. Globally, the carbon intensity of agricultural production is expected to decline over the coming decade, as direct greenhouse gas (GHG) emissions are projected to grow more slowly than agricultural production. Geographically, most of the increase is projected to occur in Africa and Asia due to higher output growth in sectors that are more emission intensive. At the same time, Sub-Saharan Africa is expected to achieve the most substantial decrease in intensity of GHG emissions. Livestock production will still account for most of the increase in global direct GHG emission from agriculture.

33. About 700 million metric tonnes (Mt) of food are projected to be lost between harvest/ slaughter/catch and retail, while a further 1140 Mt will be wasted at retail and household levels⁵ by 2033. This represents a food loss and waste increase of about 230 Mt compared to the base period (2021-2023). Fruits and vegetables account for more than half of the loss and waste in food quantity, while more than half of the calories are lost or wasted as cereals.

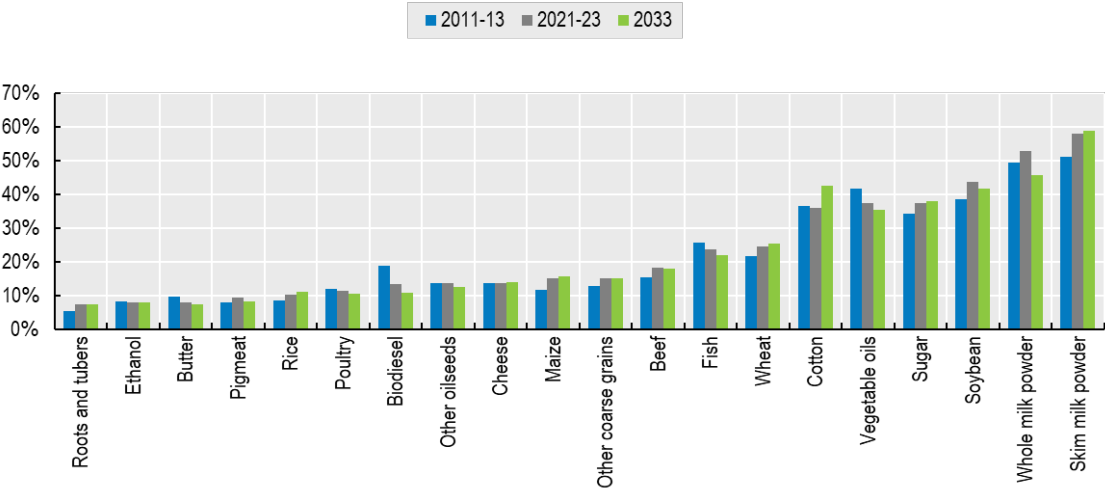
C. Trade

34. Over the next decade, trade in the major agricultural commodities is projected to expand by 1 percent annually, which corresponds to a globally stable share of about 23 percent of agricultural production. This ratio will continue to vary from less than 10 percent to over 50 percent among

⁵ Projections are made under the assumption of constant food loss and waste shares.

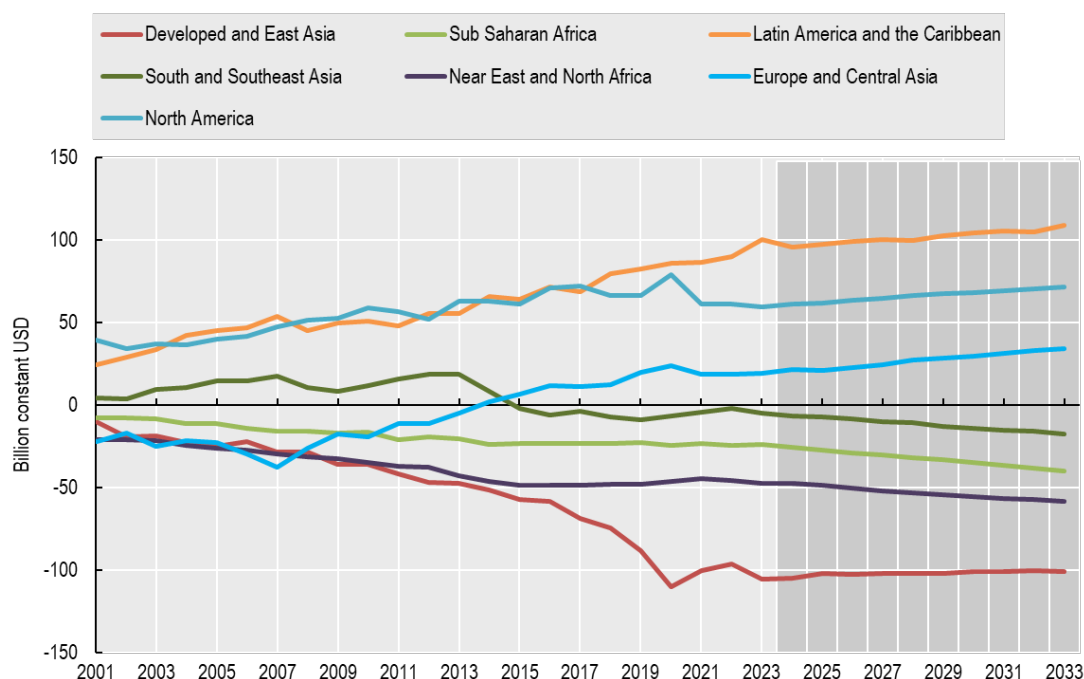
commodities and evolve only slightly by 2033 (Figure 10). The projected increases in trade ratios reflect mostly demand growth in importing regions, e.g. African rice imports. Declining ratios result either from weaker import demand, most evident in soybeans, or, as in the case of biodiesel, increasing domestic use in Indonesia combined with reduced imports by the European Union.

Figure 10. International trade as a share of global production



Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

35. The Americas are projected to consolidate their position as the world’s largest exporter of agricultural commodities (Figure 11). Net exports out of the Latin America and Caribbean region, the world’s prime exporter of agricultural commodities, are projected to increase by 18 percent between 2021-23 (three-year average) and 2033, while the expansion of exports from North America, the second leading exporter in the world, is projected at 17 percent. The main export products will still be cereals, soybeans, sugar and meat.

Figure 11. Net trade of the major agricultural commodities

Note: Net trade (exports minus imports) of commodities covered in the OECD-FAO Agricultural Outlook, measured at constant 2004-06 USD.

Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

36. The Europe and Central Asia region has also developed into a significant exporter of agricultural commodities in recent years, due to the strong production growth in the Russian Federation and Ukraine. Based on the expected fundamental supply and demand conditions over the coming decade, net exports from the region are projected to almost double by 2033. However, the war in Ukraine is expected to temporarily slow down the region's trade surpluses due to disruptions to agricultural production and exports, particularly impacting Ukraine's agricultural sector.

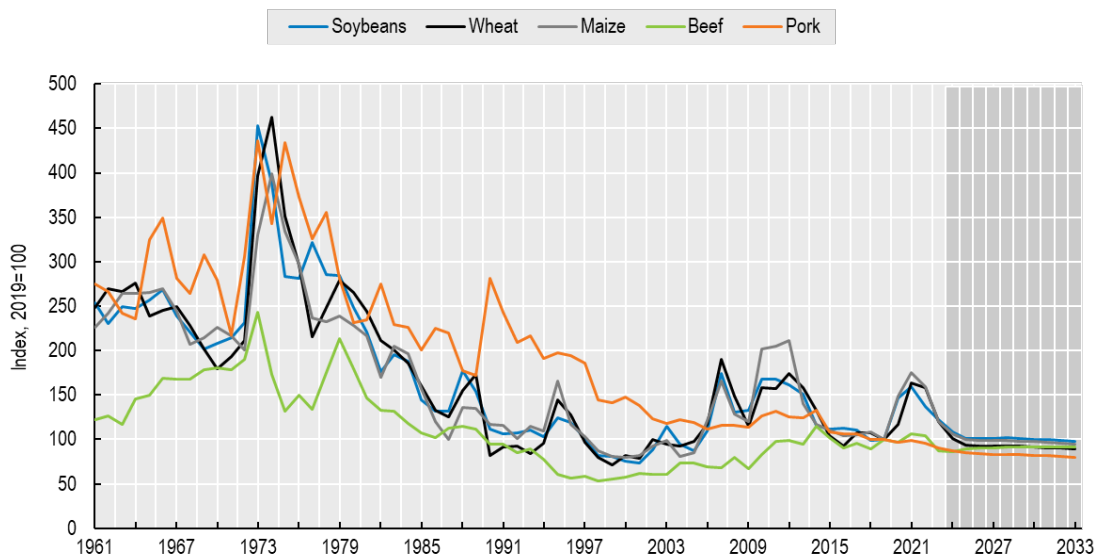
37. Net imports by the East Asia and Pacific region, are projected to stabilise over the coming decade, mostly because of the marked slowdown in Chinese imports, due to population decline, near saturation in per capita food consumption for basic food commodities, and projected growth in the country's domestic agricultural production.

38. Net imports into Sub-Saharan Africa are projected to expand by 68 percent over the next decade, further increasing the share of food produced outside the region in total food consumption. It is mainly the fast-growing demand for rice, wheat, meat and soybeans that has to be met by imports.

39. Land and water constraints, a lack of investments in agriculture and fast population growth underpin the 27 percent net import growth of basic food commodities projected for the Near East and North Africa, the largest importing region of basic foods on a per capita basis.

D. International Prices

40. Prices at key international trade hubs are used as reference prices to describe medium-term trends in global agricultural commodity markets. In the first few years of the next decade, projected prices reflect not only fundamental developments in supply and demand, but also the gradually subsiding effects of macroeconomic, geopolitical or weather-related market shocks. Prices have fallen from recent peaks and are projected to fall more rapidly in the near term until the effects of the events underpinning their increases are expected to subside (Figure 12).

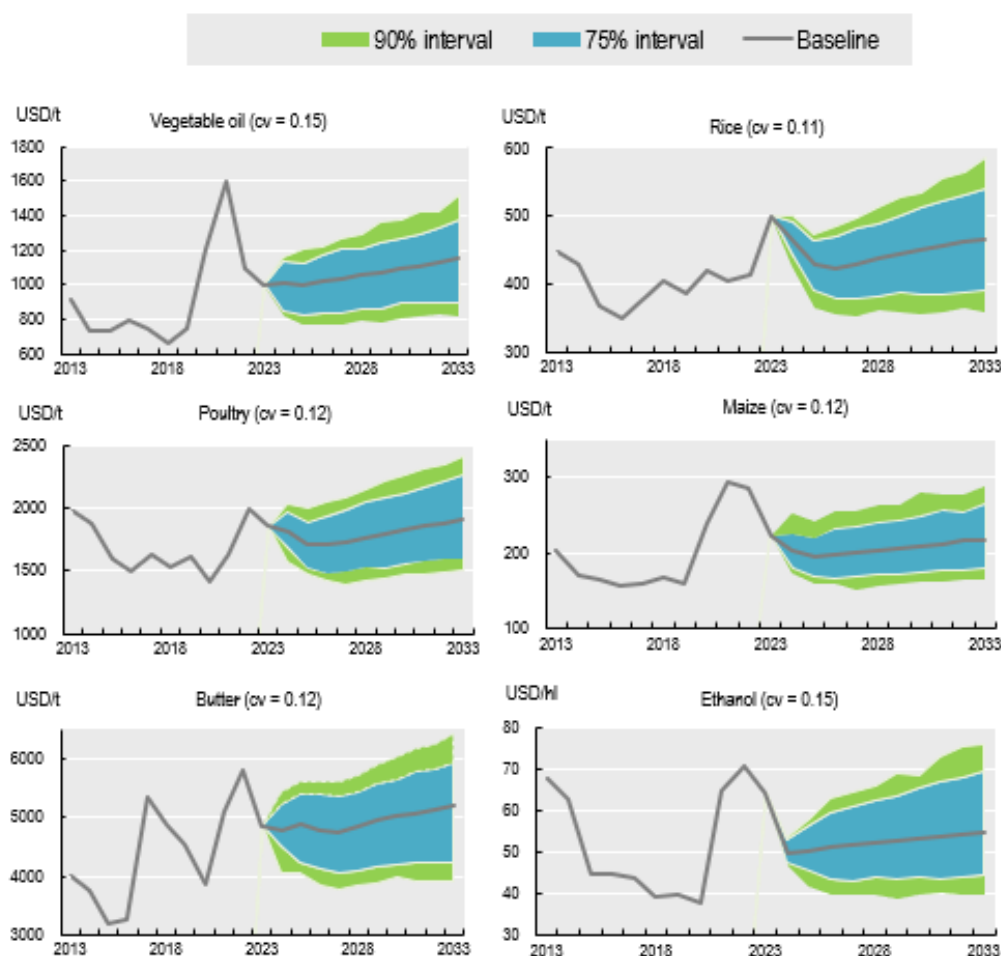
Figure 12. Long-term evolution of commodity prices, in real terms

Source: OECD/FAO (2024), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database).

41. Real international reference prices for the main agricultural commodities are projected to resume their long-term declining path for the remainder of the projection period, based on the assumption that the expected demand for agricultural commodities can fundamentally be met by an increasingly more efficient supply and lower marginal production costs in the sector. When transmitted to local farm and food prices, lower real international prices could put pressure on farmers' incomes while benefitting consumers. However, their actual influence on local markets depends on the degree of integration of domestic markets into the global trading system, currency movements as well as other factors, including domestic market transaction and processing costs. Local food price trends may therefore differ substantially from global commodity price trends.

42. The assumptions underlying the projections are inherently uncertain. A partial stochastic analysis assessing the impact of the potential future variability of global macroeconomic variables and agricultural crop yields indicates the sensitivity of the baseline price paths to these uncertainties. The results provide an expected price range and the associated probabilities for deviations from the baseline. Prices may fall at least once outside these ranges with a probability of 40 percent during the projection period. The vegetable oil price peak in 2021 and 2022, attributed to a 5 percent production decrease in Malaysia, marked such an event (Figure 13).

Figure 13. Baseline and stochastic intervals for selected international reference prices



Source: OECD/FAO (2024), “OECD-FAO Agricultural Outlook”, OECD Agriculture statistics (database).

IV. USING THE MODEL FOR SCENARIO ANALYSIS

43. While the primary function of the Aglink-Cosimo modelling system is to produce a set of consistent baseline projections over the next 10 years, the model can also be used to estimate the potential impacts of various policies, external shocks, or changes in the market. By simulating different scenarios, policymakers can compare outcomes and choose the most appropriate strategies to achieve the desired objectives. This section provides examples of scenarios that were simulated using the Aglink-Cosimo model.

44. In collaboration with the FAO Investment Centre (CFI) and several FAO decentralized offices, the model was used to conduct various scenarios to support investment projects by the European Bank for Reconstruction and Development aimed at strengthening food security in the Southern and Eastern Mediterranean region. Country baseline projections and scenario simulations of the effects of improved domestic production, dietary changes, trade policies, food price subsidies and stock holding were completed for Lebanon, Tunisia, Morocco, Egypt and Jordan. The work provided quantitative assessments of the complex interdependencies of domestic policy measures and increased global market integration of the region in the medium term.

45. As part of a consortium of European research institutions, a contribution was made to the European Union’s project “Fostering the positive linkages between trade and sustainable development”. Aglink-Cosimo simulations contributed to the work package “Quantitative model-

based analysis of the sustainability impacts of agricultural trade”, which integrated partial and general equilibrium models as well as environmental indicators using a new sustainability toolbox. The scenario analyses simulated the reduction of global trade distortions, combined with productivity enhancement to gain insights into potential food security improvements. The work also included simulation analyses of sustainability implications of an accelerated evolution of global diets towards livestock-based products, fats and sweeteners.

46. A scenario analysis was undertaken to simulate the impact of a 25 percent increase in fertilizers prices on fertilizer application, crop yields and commodity prices, compared to the baseline levels. The results show that agricultural commodity prices would increase by 5 percent on average. The impact on producers would be mixed, as only the most efficient users of fertilizers are found to benefit from the higher product prices.

47. A scenario analysis explored the potential agricultural supply and demand implications of achieving a 50 percent reduction in food loss and waste by 2030. The scenario results indicated that global direct GHG emissions from agriculture would fall by 4 percent and the average per capita calorie intake in low- and lower-middle-income countries would increase, potentially reducing the number of undernourished people in 2030 by an estimated 153 million. The scenario also revealed challenges for producers, as decreased production and lower producer prices would impact their livelihoods.

48. Aligning with the One Health approach that emphasizes the interconnectedness of people, animals and the environment, scenarios were conducted to assess the impact of reducing the use of antimicrobial substances in the livestock sector to combat antimicrobial resistance, which is associated with millions of human deaths each year. The scenarios analyse the cost and benefits and assess the inherent trade-offs of reducing the need for antimicrobials, including its use as growth promoters in the livestock production. The preliminary results suggest that pork and poultry trade patterns may be affected by changes in the regulations.