

## 2. Regional briefs

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This chapter describes key trends and emerging issues facing the agricultural sector in the six FAO regions, i.e. Asia and Pacific, Sub-Saharan Africa, Near East and North Africa, Europe and Central Asia, North America, and Latin America and the Caribbean. For each region, it provides background on key regional characteristics (e.g. population, per capita income, agro-ecological conditions and natural resources endowment) and highlights medium-terms projections for production, consumption, and trade for the period 2020-29.

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## 2.1. Introduction

Since the 2013 edition, the feature chapter of the *Outlook* has focused on the prospects of a specific country or region. Rather than a specific focus this year, this chapter provides broad highlights for the regions which are defined by the FAO in the implementation of its global work plan. These regions are highly diverse and the intention of these briefs is not to compare the regions, but to coalesce the main messages of the *Outlook* into the trends and emerging issues which are evident in them. The focus of the assessment is primarily on the end point of the *Outlook*'s projection (2029) compared to the base period of 2017-19. These briefs do not include a quantitative assessment of the COVID-19 pandemic as presented in the Overview. These will be assessed as more information becomes available. However, the trends and issues presented in this chapter are those which are expected to underlie the *Outlook* as conditions gradually re-emerge from the unexpected "shock" of the spread of the novel corona virus, assuming that its effects on food production, consumption and trade will gradually moderate. The current projection is anticipated to remain a basis for the assessment of how the shock will impact across the regions in the next decade.

This chapter proceeds in six sections, with text, tabular and graphic information for each region following a similar template, with each of the regions presented sequentially. A background section provides the key regional characteristics and provides the setting from which the projection is described in the subsequent sections for production, consumption and trade. A templated annex to each regional brief provides common charts and tables outlining the key aspects of the projection for the region.

## 2.2. Regional outlook: Asia and Pacific

### **Background**

The Asia and Pacific region<sup>1</sup> is as diverse as it is large compared to the other regions. Economies range from least developed countries such as Bangladesh to high income countries such as Japan. With 4.1 billion people, the region has more than half the world's population. However, it has only about 30% of agricultural land and while its natural resources are significant, the pressures on its resource base are increasing. The region is rapidly urbanising, largely due to rapid change in the People's Republic of China (hereafter "China"), but it is advancing rapidly in all countries. About 48% of people live in urban settings, but urbanisation is anticipated to rise to 54% by 2029. The region's population will grow at a rate of 0.7% p.a., an increase by 324 million with 445 million moving to urban locations.

Developing countries in the region are among the fastest growing, with average per capita incomes in the region anticipated to grow at almost 5% p.a. over the next decade, China, India and Viet Nam are projected to grow 5-6% p.a., and Thailand and Indonesia at around 3% p.a. The share of primary agriculture and fish value added in the economy is currently about 6% and has been declining. Rapid economic growth has also reduced the share of food in household expenditures to around 15% in 2017-19 implying considerable impact of prices and incomes on consumers<sup>2</sup>.

There are major uncertainties in the outlook for the region. Ongoing trade conflicts have not been fully resolved. The incidences of African Swine Fever (ASF) in China and parts of Southeast Asia have critically impacted pig-meat production.

## Production

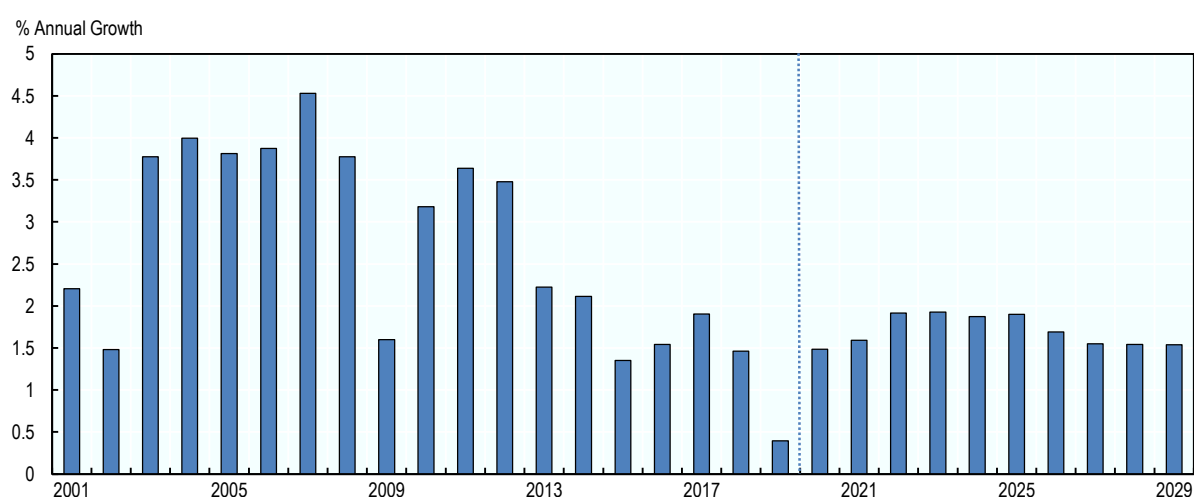
The region is the largest producer of agricultural and fish commodities, and is anticipated to account for 51% of global agriculture and fish output by 2029. Production is projected to expand by 14% by 2029 compared to the 2017-19 base level. Crop production, which represents 64% of value added, is projected to grow 12%, while that for livestock will increase 18% over the period, recovering from a low base due to ASF. Livestock production fell 4% in 2019, due to a 9% decline in China and Viet Nam, where ASF wiped out about 30% and 20% respectively of pig inventories in these countries. Fish output is projected to expand 16%, due to the continued expansion in aquaculture. These rates of growth are considerably less than a decade ago when regional agricultural and fish output growth averaged 3-4% p.a. Growth has slowed as domestic markets have matured, policies have changed, markets have opened, and trade competition has strengthened.

The region is a major producer of grains for the world, notably in rice with a 90% global production share. Its contribution to global rice, wheat and coarse grains output remains steady over the *Outlook*. While production of rice and wheat remains strong in India, the destocking of maize in China could create opportunities for diversifying production towards other commodities in that country.

Due to land scarcity within countries across the region, crop production growth will result from productivity enhancements and intensification. Irrigation expansion and improved seed varieties account for much of production growth, but there are mounting environmental and food safety concerns, associated with water scarcity and the heavy use of chemical inputs. Multiple harvests and double cropping will contain expansion in land use to an additional 3 Mha, compared to 13 Mha increase in area harvested, which will be allocated mostly to rice, maize, soybean and pulses.

Livestock production over the outlook period will also come largely from productivity gains sourced in increased feed intensity and breeding improvements. Pasture area is projected to contract by 12 Mha over the next ten years and animal numbers will grow at a slower rate than total meat production. Instead, increases in feed use will outpace meat production growth, which is projected to slow in part due to the ongoing consequences of African Swine Fever in China, and is expected to affect other countries in the region.

**Figure 2.1. Slowing growth of agriculture and fish output in Asia Pacific region**



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <https://doi.org/10.1787/888934141741>

Nearly 70% of global fish output is produced by the Asia and Pacific region, most coming from a combination of capture fisheries and aquaculture production in China. The efficiency and sustainability changes set out in China's 13<sup>th</sup> Five Year Plan are expected to constrain growth; the region will nonetheless account for 85% of global production growth in the sector.

Total GHG emissions by the region are projected to increase 6% by 2029, with those coming from crop and animal sources up by 3% and 9% respectively.

### **Consumption**

As a region where population growth is slowing but income growth is robust, demand for calorie and nutrient dense foods will rise. Average calorie intake is projected to rise by 170 kcal/day to average 3 000 kcal mainly due to increases in vegetable oils and animal products, particularly dairy products. Average protein intake will rise 5 g to 85 g/day, mainly due to increases in dairy products and meat consumption.

Urbanised lifestyles will lead to growth in consumption of sugars and fats that will outpace that of most other food groups. Paired with stronger population growth in several countries of region such as India, consumption of vegetable oil will exceed the global average by 2029, reaching 21 kg/capita per year. Sugars and fats will comprise 22% of total calories in the region by 2029, the only food group to increase its calorie share over the outlook period.

Rice consumption per capita, which is so important in many countries of the region, often accounting for as much as 50% or more of calorie availability, is projected to grow slowly at best, and decline in many countries such as China, Thailand, and Viet Nam. Per capita rice consumption in the region is projected to rise less than 1%, as increased consumption in India offsets declines in other countries.

Meat consumption will rise by 1.5 kg/capita to an average consumption of 35 kg/capita per year (or 8% of daily calories); however there is large divergence within the region, in countries such as Korea and Viet Nam demand is rising more than 5 kg, whereas in India consumption will expand less than a kilogram. Dairy product consumption will expand by 25%, largely driven by consumption in South Asia. Dairy products will account for 15% of total calories in India and Pakistan by 2029.

With increasing livestock and dairy production, and increasing intensification through higher use of feed grains, feed use is projected to increase by over 50% by 2029. Feed use of maize and protein meals are projected to increase 58% and 65% respectively. Such growth in feed is also associated with increased commercialisation of farms, and less backyard production which may use non-grain inputs as feed.

The Asia and Pacific region is projected to account for 33% of global growth in ethanol use and 62% in biodiesel use given new mandates in China and Indonesia. In China, the blend rate will reach about 4% and will spur cassava imports, which are expected to come mostly from Thailand.

Although this *Outlook* assumes that the ambitious E10 mandate in China will not be reached by 2029, it does assume that gasoline-type fuels will be blended with 4% of ethanol. This corresponds to a production increase of 5 bln L as this *Outlook* assumes most of the ethanol demand will be produced from domestic feedstocks. This *Outlook* assumes the government of Indonesia will implement the B30 programme nationwide as planned, but reaching the intended target to increase biofuel demand will largely depend on the relationship between domestic and palm oil international prices. By 2030, biodiesel demand would reach about 7 bln L.

In Indonesia, an increase in the blending mandate is expected to redirect domestic palm oil supplies to the biodiesel market, and could help catalyse investment in the sector. Limited land availability and low vegetable oil prices are leading to replanting delays in oil palm, underpinning slower growth in the region's vegetable oil production over the outlook period. Production will expand 17% up to 2029 compared to 65% over the last ten years.

### ***Trade***

The region is the largest net importing region for primary agricultural commodities, with over 40% of global imports, and net imports are trending higher over the medium term as demand outpaces supply. The largest imports are soybeans into China, which were reduced in recent years due to trade actions; they are anticipated to resume growth in the medium term. Wheat and maize imports are also significant and growing.

Net imports of livestock products are rising. While exports of bovine meat by India, Australia, New Zealand and Thailand continue to rise slowly, they are more than offset by rising imports by China, Indonesia, Malaysia, Korea, Viet Nam and other countries of the region. Net pigmeat imports have trended higher in the last decade, and spiked to 6 Mt in 2019 as a result of the ASF outbreak. The region's poultry imports too have been rising.

The region is also a major exporting region contributing 30% of global exports. The largest primary export commodity is rice, which is projected to rise to 55 Mt, led mainly by India, Thailand, and Viet Nam.

Figure 2.2. Change in area harvested and land use in Asia Pacific

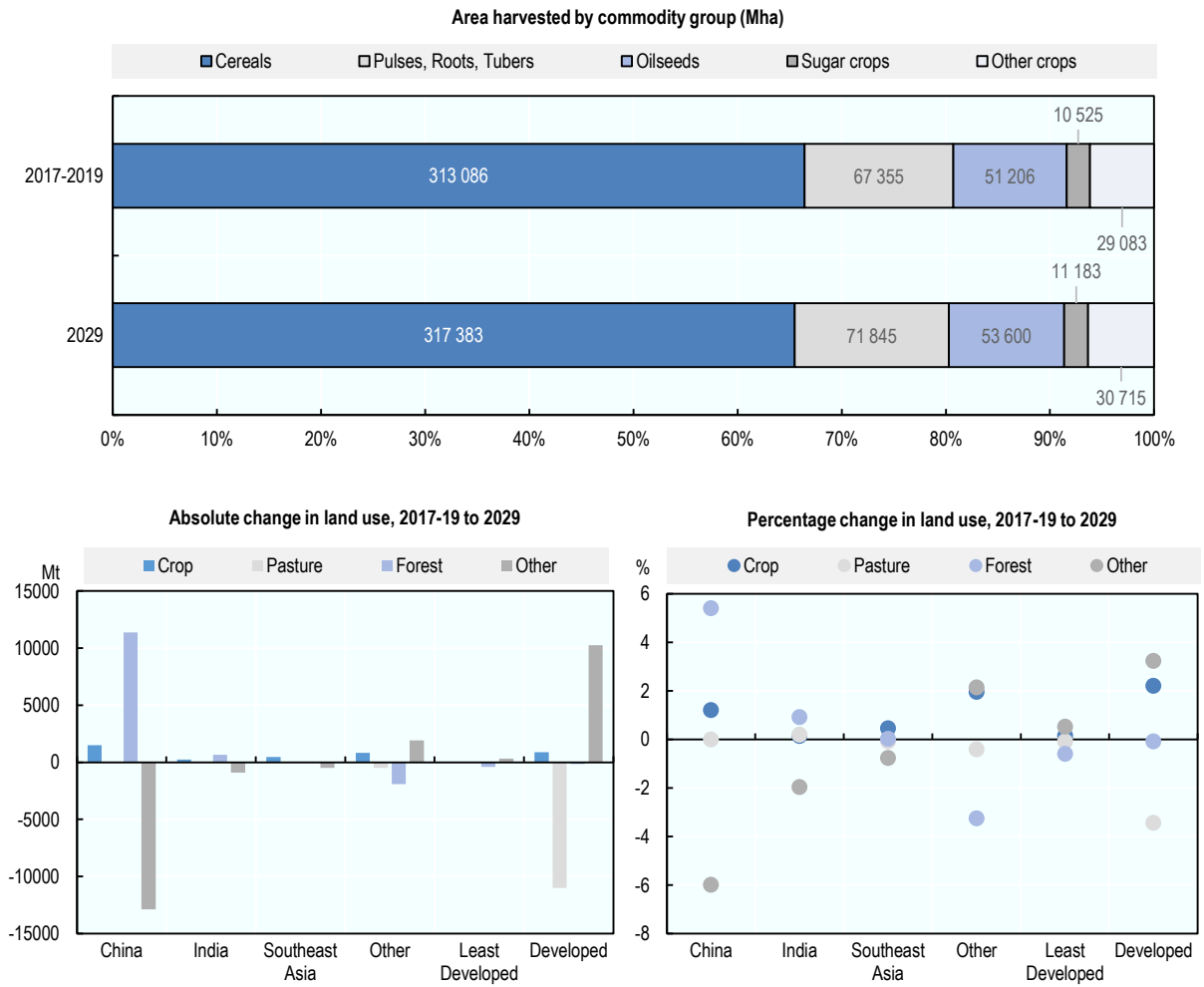
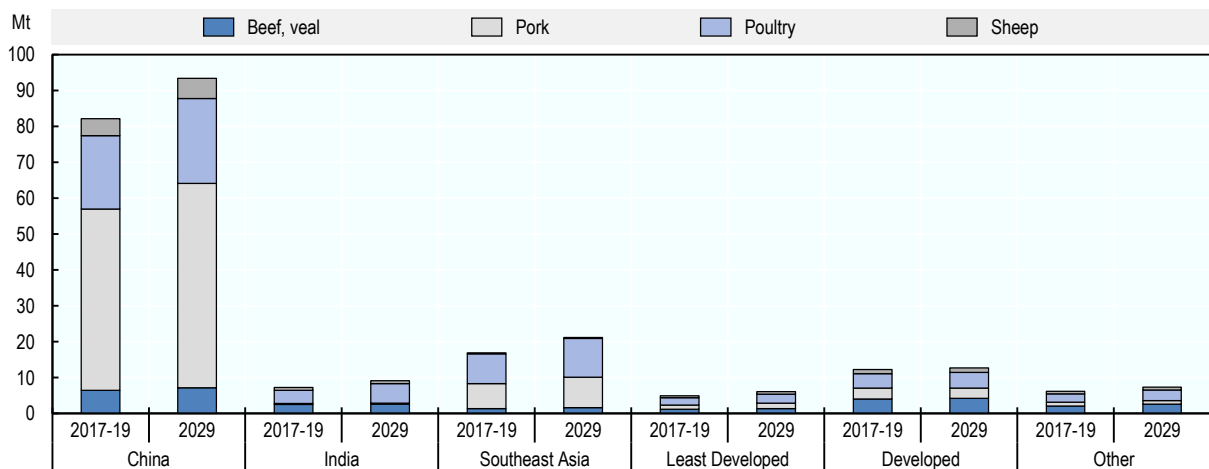
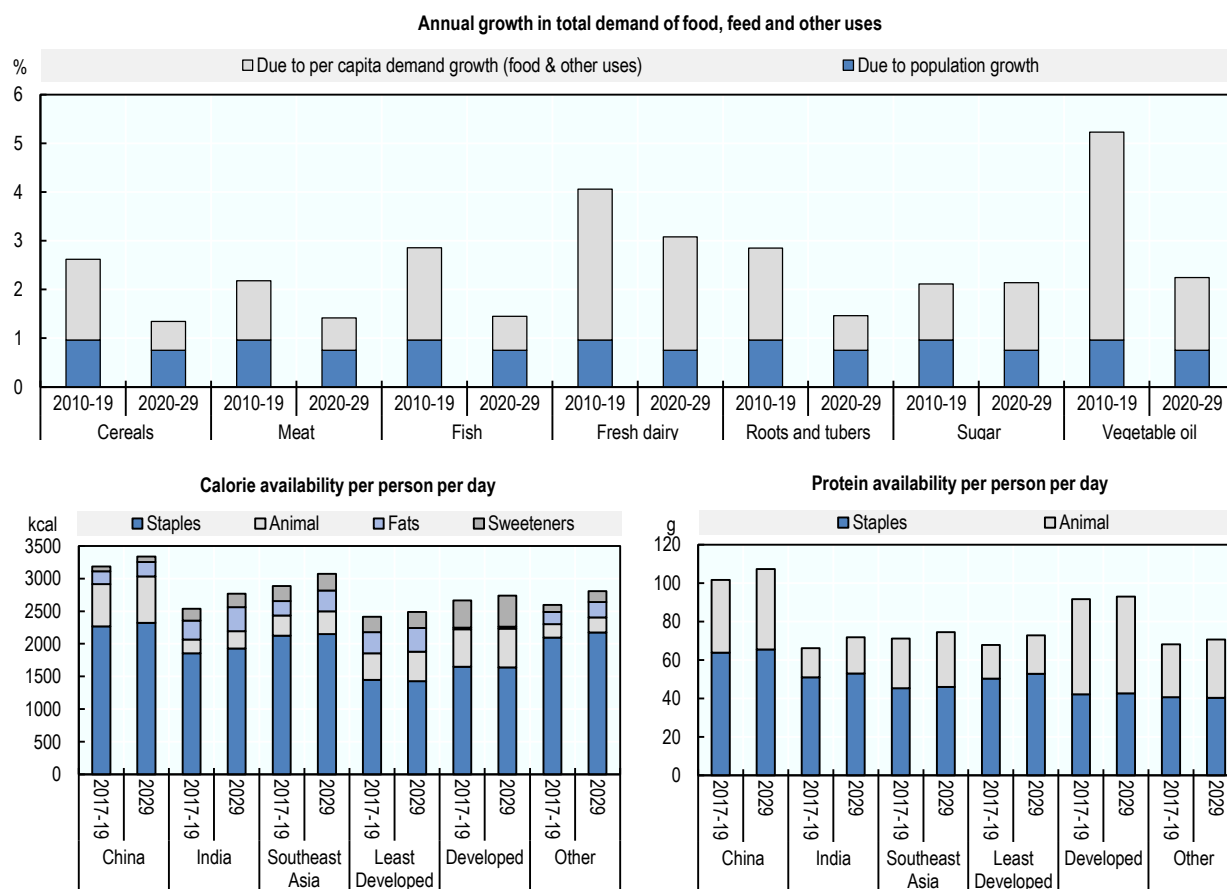


Figure 2.3. Livestock production in Asia Pacific



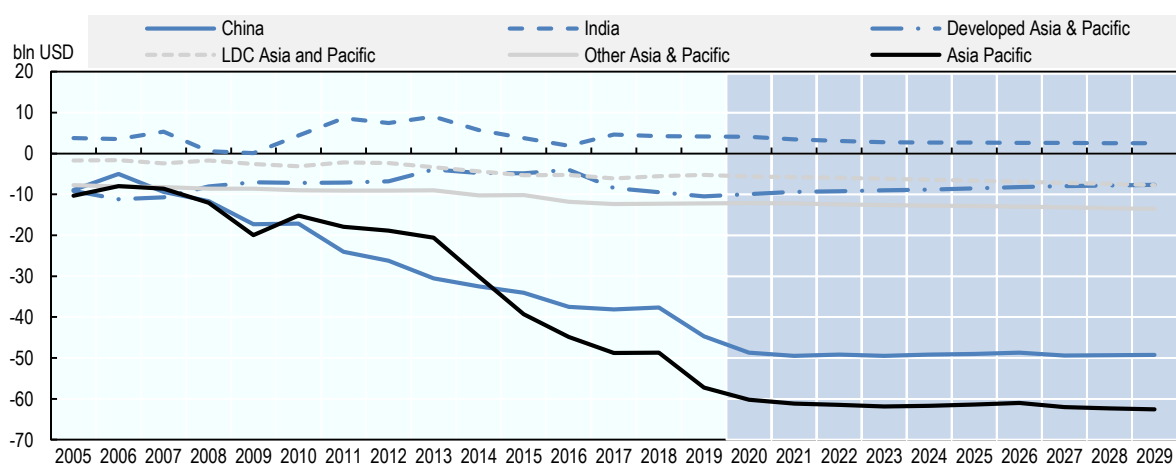
Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

Figure 2.4. Demand for key commodities and food availability in Asia Pacific



Note: Upper panel – population growth is calculated by assuming per capita demand remains constant at the level of the year preceding the decade. Lower panel – Fats: butter and oils. Animal: egg, fish, meat and dairy except for butter. Staples: cereals, pulses and roots.

Figure 2.5. Agricultural trade balances in Asia Pacific



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

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database),

<http://dx.doi.org/10.1787/agr-outl-data-en>.

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Table 2.1. Regional Indicators: Asia and Pacific

|                                                           | Average   |                |           | %     | Growth <sup>2</sup> |         |
|-----------------------------------------------------------|-----------|----------------|-----------|-------|---------------------|---------|
|                                                           | 2007-09   | 2017-19 (base) | 2029      |       | Base to 2029        | 2010-19 |
| <b>Macro assumptions</b>                                  |           |                |           |       |                     |         |
| Population                                                | 3 766 151 | 4 146 172      | 4 469 965 | 7.81  | 0.94                | 0.65    |
| Per capita GDP <sup>1</sup> (kUSD PPP)                    | 4.94      | 7.10           | 10.55     | 48.62 | 3.61                | 3.76    |
| <b>Production (bln USD)</b>                               |           |                |           |       |                     |         |
| Net value of agricultural and fisheries <sup>3</sup>      | 1163.5    | 1457.8         | 1738.4    | 19.25 | 1.96                | 1.75    |
| Net value of crop production <sup>3</sup>                 | 289.8     | 350.0          | 404.4     | 15.53 | 1.35                | 1.31    |
| Net value of other not incl. crop production <sup>3</sup> | 449.5     | 578.1          | 710.5     | 22.90 | 2.18                | 1.90    |
| Net value of livestock production <sup>3</sup>            | 234.9     | 282.2          | 334.5     | 18.54 | 1.62                | 2.17    |
| Net value of fish production <sup>3</sup>                 | 189.2     | 247.4          | 288.9     | 16.79 | 2.73                | 1.54    |
| <b>Quantity produced (kt)</b>                             |           |                |           |       |                     |         |
| Cereals                                                   | 920 977   | 1142 689       | 1314 673  | 15.05 | 1.58                | 1.34    |
| Pulses                                                    | 28 075    | 38 062         | 46 458    | 22.06 | 2.53                | 1.73    |
| Roots and tubers                                          | 70 862    | 91 745         | 106 626   | 16.22 | 2.52                | 1.23    |
| Oilseeds <sup>4</sup>                                     | 67 035    | 76 800         | 91 175    | 18.72 | 0.65                | 1.34    |
| Meat                                                      | 107 832   | 129 669        | 149 862   | 15.57 | 1.11                | 2.41    |
| Dairy <sup>5</sup>                                        | 32 920    | 47 315         | 62 517    | 32.13 | 3.77                | 2.45    |
| Fish                                                      | 92 068    | 120 284        | 140 453   | 16.77 | 2.72                | 1.54    |
| Sugar                                                     | 57 254    | 72 553         | 83 823    | 15.53 | 1.37                | 1.89    |
| Vegetable oil                                             | 78 707    | 121 646        | 146 573   | 20.49 | 4.05                | 1.56    |
| <b>Biofuel production (Mn L)</b>                          |           |                |           |       |                     |         |
| Biodiesel                                                 | 1 791     | 10 208         | 12 435    | 21.81 | 14.26               | 0.16    |
| Ethanol                                                   | 10 407    | 16 459         | 20 421    | 24.07 | 4.07                | 1.08    |
| <b>Land use (kha)</b>                                     |           |                |           |       |                     |         |
| Total agricultural land use                               | 1 440 311 | 1 404 635      | 1 397 114 | -0.54 | -0.35               | -0.05   |
| Total land use for crop production <sup>6</sup>           | 491 474   | 515 691        | 519 675   | 0.77  | 0.40                | 0.06    |
| Total pasture land use <sup>7</sup>                       | 948 837   | 888 943        | 877 439   | -1.29 | -0.77               | -0.12   |
| <b>Direct GHG emissions (Mt CO<sub>2</sub>-eq)</b>        |           |                |           |       |                     |         |
| Total                                                     | 2176      | 2345           | 2489      | 6.12  | 0.46                | 0.53    |
| Crop                                                      | 1010      | 1084           | 1113      | 2.67  | -0.01               | 0.25    |
| Animal                                                    | 1166      | 1261           | 1376      | 9.08  | 0.88                | 0.76    |
| <b>Demand and food security</b>                           |           |                |           |       |                     |         |
| Daily per capita caloric availability <sup>8</sup> (kcal) | 2664      | 2826           | 2992      | 5.87  | 0.50                | 0.57    |
| Daily per capita protein availability <sup>8</sup> (g)    | 74        | 81             | 85        | 5.36  | 0.92                | 0.54    |
| <b>Per capita food availability (kg)</b>                  |           |                |           |       |                     |         |
| Staples <sup>9</sup>                                      | 173.4     | 178.9          | 180.8     | 1.09  | 0.18                | 0.05    |
| Meat                                                      | 23.4      | 26.6           | 28.4      | 7.01  | 0.63                | 1.44    |
| Dairy <sup>5</sup>                                        | 8.5       | 11.4           | 14.1      | 24.02 | 3.03                | 1.88    |
| Fish                                                      | 21.5      | 26.0           | 28.2      | 8.67  | 1.98                | 0.81    |
| Sugar                                                     | 15.9      | 17.8           | 20.4      | 14.61 | 1.39                | 1.29    |
| Vegetable oil                                             | 13.4      | 17.8           | 21.1      | 18.36 | 3.13                | 1.45    |
| <b>Trade (bln USD)</b>                                    |           |                |           |       |                     |         |
| Net trade <sup>3</sup>                                    | -13.5     | -51.6          | -62.6     | 21.31 | ..                  | ..      |
| Net value of exports <sup>3</sup>                         | 93.1      | 122.6          | 139.3     | 13.62 | 1.46                | 1.48    |
| Net value of imports <sup>3</sup>                         | 106.7     | 174.2          | 201.9     | 15.90 | 4.58                | 1.09    |



|                                            | Average |                | 2029  | %     | Growth <sup>2</sup> |         |
|--------------------------------------------|---------|----------------|-------|-------|---------------------|---------|
|                                            | 2007-09 | 2017-19 (base) |       |       | Base to 2029        | 2010-19 |
| <b>Self-sufficiency ratio<sup>10</sup></b> |         |                |       |       |                     |         |
| Cereals                                    | 96.4    | 94.1           | 94.3  | 0.27  | -0.49               | 0.04    |
| Meat                                       | 97.9    | 94.9           | 95.3  | 0.43  | -0.40               | 0.27    |
| Sugar                                      | 95.5    | 96.4           | 91.4  | -5.10 | 0.05                | -0.14   |
| Vegetable oil                              | 116.9   | 110.8          | 106.7 | -3.73 | -0.62               | -0.27   |

Notes: 1. Per capita GDP expressed in thousands of real USD. 2. Least square growth rates (see glossary). 3. Net value of agricultural and fisheries output follows FAOSTAT methodology, based on the set of commodities represented in the Aglink-Cosimo model valued at average international reference prices for 2004-06. Projections for not included crops have been made on the basis of longer term trends. 4. Oilseeds represents soybeans and other oilseeds. 5. Dairy includes butter, cheese, milk powders and fresh dairy products, expressed in milk solid equivalent units. 6. Crop Land use area accounts for multiple harvests of arable crops. 7. Pasture land use represents land available for grazing by ruminant animals. 8. Daily per capita calories represent availability, not intake. 9. Staples represents cereals, oilseeds, pulses, roots and tubers. 10. Self-sufficiency ratio calculated as Production / (Production + Imports - Exports).

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

## 2.3. Regional outlook: Sub Saharan Africa

### Background

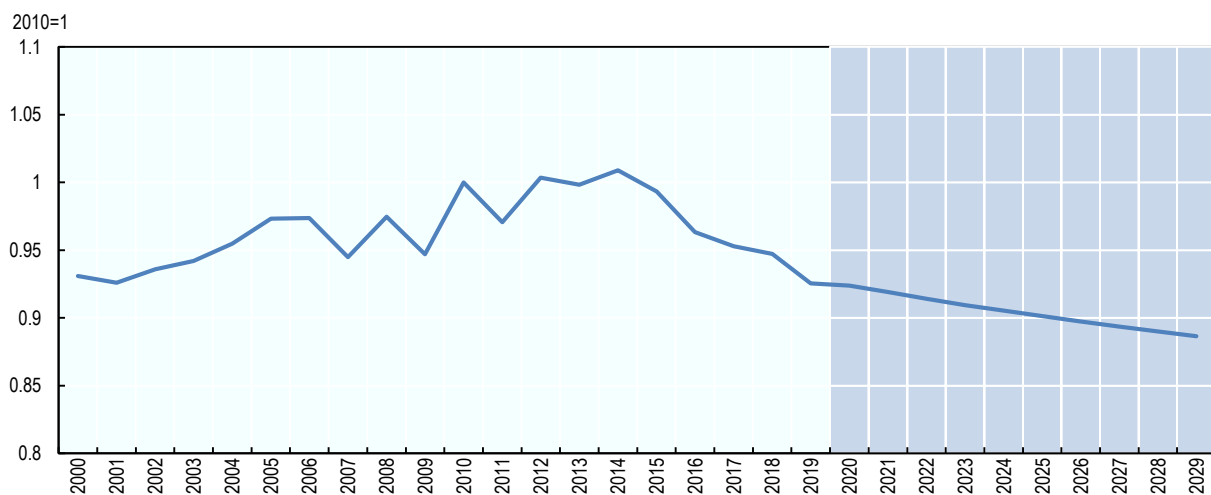
The demographic and economic growth profile of Sub-Saharan Africa<sup>3</sup> is unique among the six regions.<sup>4</sup> Population growth is highest and while urbanisation has been growing quickly, it remains by far the lowest among the regions. The region is anticipated to add some 329 million people by 2029 compared to the 2017-19 base period, growing at over 2.5% p.a., and while almost two thirds of that addition will be urban, 55% of the population will still live in rural areas by 2029. Economies in the region typically have a high dependency on resource commodities, including agriculture, oil and metals. Agriculture, fish and forestry account for about 16% of GDP, and this is expected to around 13% by 2029. Per capita economic growth is anticipated not to be as robust as in emerging developing countries, expanding by 1.3% p.a. over the outlook period. Economic performance varies considerably within the region, with least developed economies growing faster, albeit from a lower base level. Average per capita incomes in the region are the lowest globally, but are projected to rise 20% over the next decade. However, average per capita incomes in least developed countries (LDCs) of the region will only average USD 1 100 per year by 2029. Households in the region spend on average about 38% of their incomes on food, but this share varies considerably by country, from as low as 18% in South Africa to about 50% in Rwanda.<sup>5</sup> Nevertheless, with per capita calorie availability significantly lower than in other regions, any food price or income shock threatens to have serious repercussions on food security and economic welfare.

Sub-Saharan Africa is an agro-ecologically diverse, land abundant region, accounting for 14% of global cropland and 21% of pasture. Nonetheless, the agricultural sector in many countries faces land shortages given high population density in rural areas, such that most available land is concentrated in few countries and/or is largely under forest cover. The region thus produced only 7% of the global value of agricultural and fish production in 2017-19. By contrast, given its sizeable consumption requirements, the region consumed 37% of global roots and tubers, 21% of global pulses but just 7% of global cereals. Compared to other regions, Sub-Saharan Africa's consumption of sugar and vegetable oil also remained low, both at only 7% of global use. Overall, Sub-Saharan Africa's self-sufficiency for major food commodities is decreasing, as the region's population is expanding quickly, beyond the pace of growth in domestic supply.

## Production

Agricultural and fish production in the region is expected to grow by 21% over the next ten years in net value added terms, implying that per capita production in the region will continue the decline that started in 2015 (Figure 2.6). Crop production is projected to account for over three quarters of total production, while the share of livestock products will gain marginally to 16% and the share of fish production will decline to under 8%. Food and feed staples, namely coarse grains, pulses, roots and tubers, will be the main sources of growth for the region. Each of these are commodities for which the region's global market share will rise over the outlook period. By 2029, the SSA region may account for over 40% of global roots and tubers output, 8% of coarse grains production and 20% of pulses output. Support to the cotton sector, paired with area expansion in West Africa will sustain cotton production, which is projected to grow by nearly 40% by 2029 at regional level.

**Figure 2.6. Per capita value of net agriculture and fish production in Sub Saharan Africa**



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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Area harvested is expected to expand by more than 4 Mha by 2029. Due to cropping intensification (such as double cropping) this net growth is expected despite a small reduction in agricultural land use. The expansion of rice cultivation in the region, notably in Nigeria, is expected to be based upon multiple harvests per year. Inter-cropping is also common in soy producing regions of South Africa, obtaining multiple crops from the same plot of land.

In other parts of the region, the ongoing expansion of agricultural land use is constrained by various sources of uncertainty, including land fragmentation trends, conflict in land abundant countries, and the presence of other competing uses such as mining and urban sprawl.

Average cereal yields across the region are projected to grow 16% over the outlook period, about the same rate as the last ten years. Yields for major crops in the region will continue to increase, based on investments in locally adapted improved crop varieties, and optimised management practices. Rapid growth in yields will help narrow the region's gap with yields achieved in the rest of the world, which on average are more than twice those achieved in Sub-Saharan Africa. Although productivity improvements will be central to output growth in the medium term, fully closing the yield gap is challenged by the limited use of inputs, irrigation and farm infrastructure.

Livestock production is projected to expand by 25% over the next ten years, with the fastest increases coming from poultry and milk production. The region will add 1.1 Mt of new bovine meat output, based on a 17% increase in animal numbers and 5% increase in productivity by 2029; by then the region will have 18% of the global bovine herd. Ovine meat production will grow faster over the next decade; the region will increase its share of global production by 1% to 14% by 2029. Meat production will be based primarily on larger herds, grazing on diminishing pasture area, while feed use will remain stable, growing in line with average meat production over the next decade. For poultrymeat, greater feed intensity will support increased production as the supply chain modernises in countries such as South Africa and Zambia.

Based on these production projections, direct greenhouse gas (GHG) emissions from agriculture are expected to grow by a large 18% by 2029 compared to the base period. Sub-Saharan Africa will account for 44% of the global increase in direct emissions from agriculture and will reach a share of 17% of global direct emissions by 2029.

### ***Consumption***

Population growth remains by far the main driver of total consumption growth for major food commodities. With rising calorie use, and a rising population, the region's share of global food calorie consumption is anticipated to rise from about 11% in the base period to 13% in 2029, constituting one of the largest sources of additional demand for the global agricultural sector.

For many commodities, including cereals, pulses, sugar, vegetable oils, per capita consumption levels are currently the lowest in the world. Substantial growth in these commodities is expected in the coming decade.

Calorie intake is nonetheless expected to remain the lowest in the world, adding 75 kcal/day over the outlook period, to reach about 2 510 kcal/capita per day in 2029, compared to the projected world average of 3 014 kcal/day. An increasing share of calories will come from cereals, vegetable oils and sugar, while meat and fish consumption will not rise in per capita terms over the next decade, thus limiting gains in vital nutrients.

The region concentrates most of the world's poor and undernourished individuals, necessitating improvements in availability, accessibility and utilisation of food supplies.

Roots and tubers, followed by cereals, are the main sources of feed for the region's livestock sector. However, total feed use in the region is low, accounting for only 4% of global feed consumption.

### ***Trade***

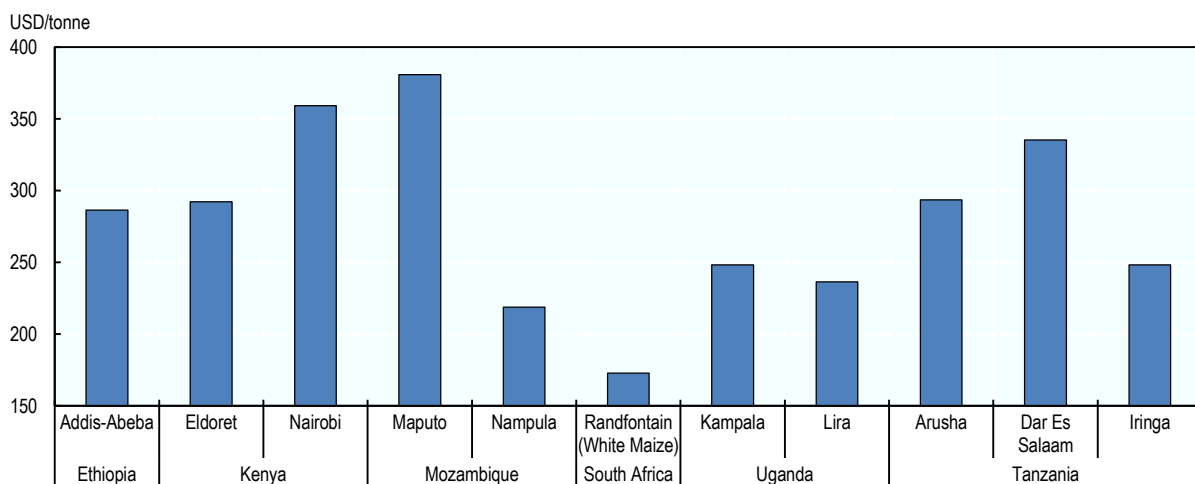
Most basic food commodities in the region are produced for domestic consumption rather than exports as the region increasingly relies on imports to close the gap between domestic production and consumption. The region's trade deficit in major food items is anticipated to widen. Evaluated at constant (2004-06) global reference prices, the deficit is anticipated to grow from about USD 18 billion to USD 31 billion by 2029.

Import volumes of cereals, meat, sugar and oils are rising. Apart from sugar, imports are growing at a faster rate than production or exports. In fact, exports are decreasing for nearly all main commodities. The region is not self-sufficient in basic commodities and instead, its import dependence is expected to deepen over the next ten years.

Most cotton production is sold on global markets, and the role of the region in global markets is expected to rise over the outlook period. Nearly 90% of cotton production from the region will be exported by 2029, most of which comes from the least-developed countries of the region. The region will account for 18% of global cotton exports by 2029. In the light of favourable cotton prices projected over the outlook period, the sector is expected to slightly increase its share in the total value of crop output for the region.

Improving internal trade in the SSA region is an important policy objective. As a result of the African Continental Free Trade Agreement signed in 2019, tariffs will be reduced to zero on 90% of products originating in signature countries by 2020, and on 97% of products by 2030. According to recent estimates by the UN Economic Commission for Africa, the agreement is projected to increase intra-African trade of agriculture and food products by 20-35% (or USD 10-17 bln). Intra-trade gains are expected to be particularly pronounced for meat products, milk and dairy products, sugar, beverages and tobacco, vegetables/fruit/nuts and paddy and processed rice. However, high non-tariff barriers exist to trade within the region, and these are more difficult to remove or reduce. A major contributor in this regard is the high cost of road transportation, which emanates from poor infrastructure, as well as inefficiencies at border posts. Other non-tariff measures such as Sanitary and Phytosanitary regulations have increased over time and the imposition of discretionary export controls inhibits better market integration. Figure 2.7 shows diverse maize prices in various cities in the region, illustrating the lack of market integration due to both tariff and non-tariff barriers.

**Figure 2.7. High price spreads for maize across the region indicate low market integration**



Note: Wholesale prices collected by the FAO GIEWS FPMA tool for 2018.

Source: FAO GIEWS FPMA (2020).

StatLink  <https://doi.org/10.1787/888934141798>

Figure 2.8. Change in area harvested and land use in Sub Saharan Africa

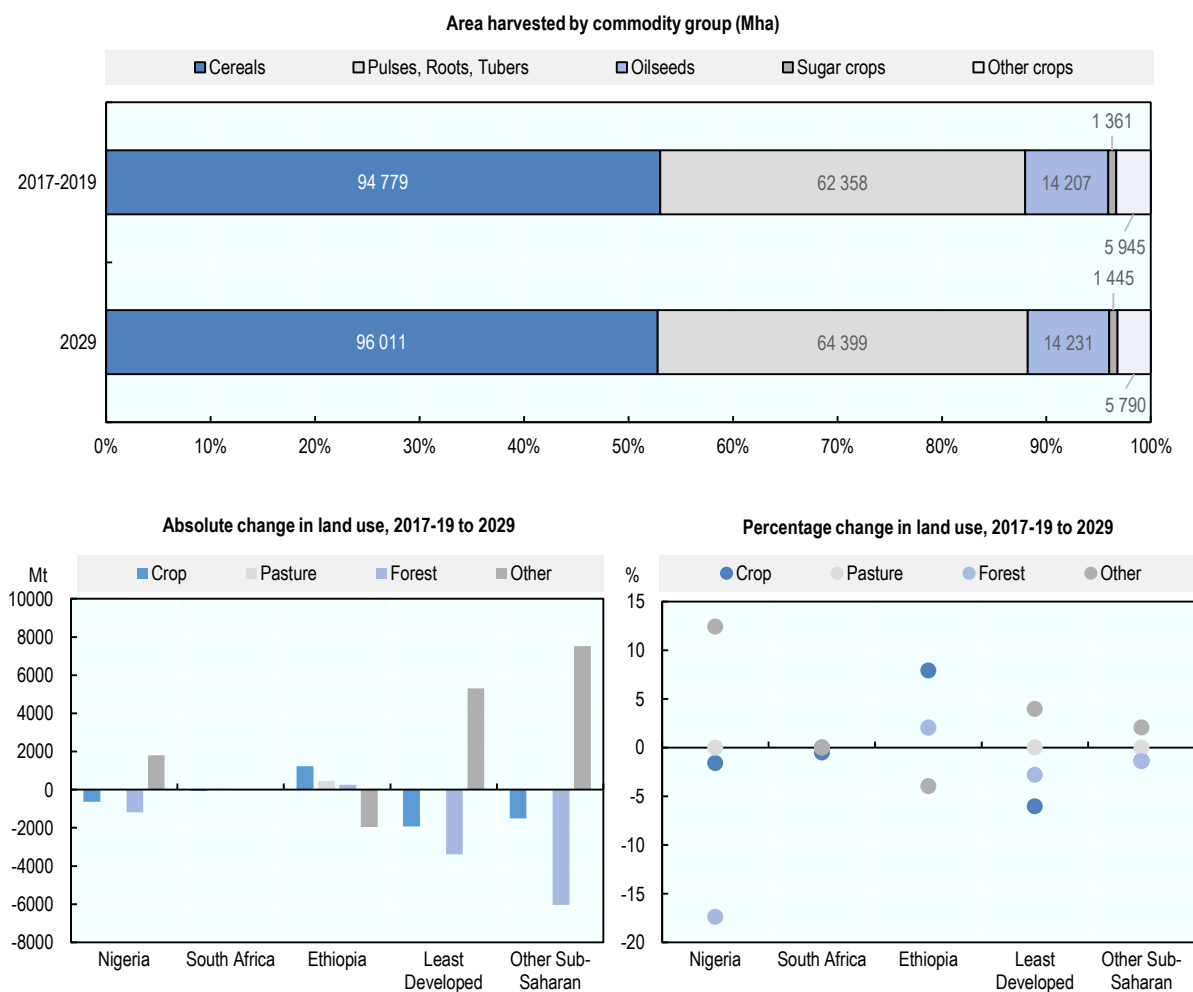
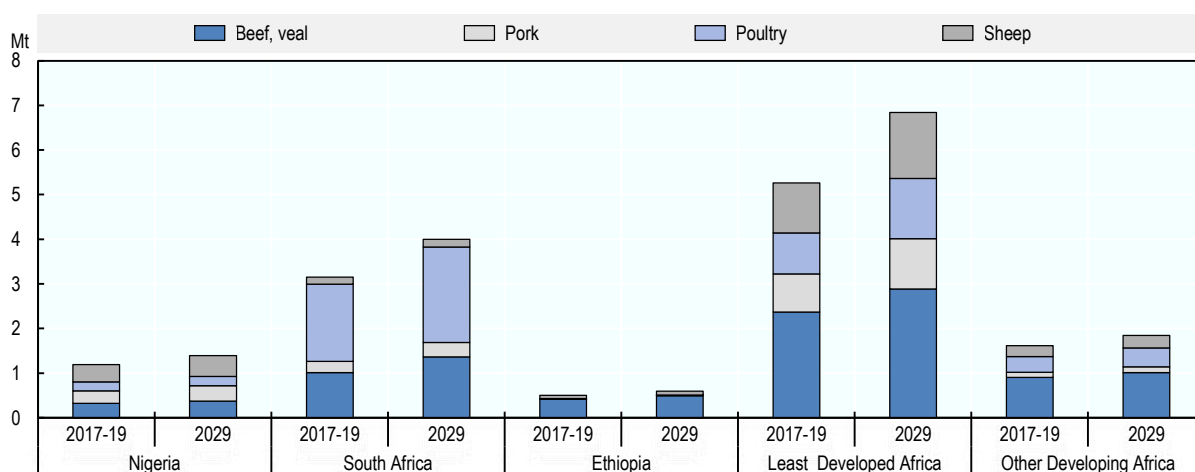
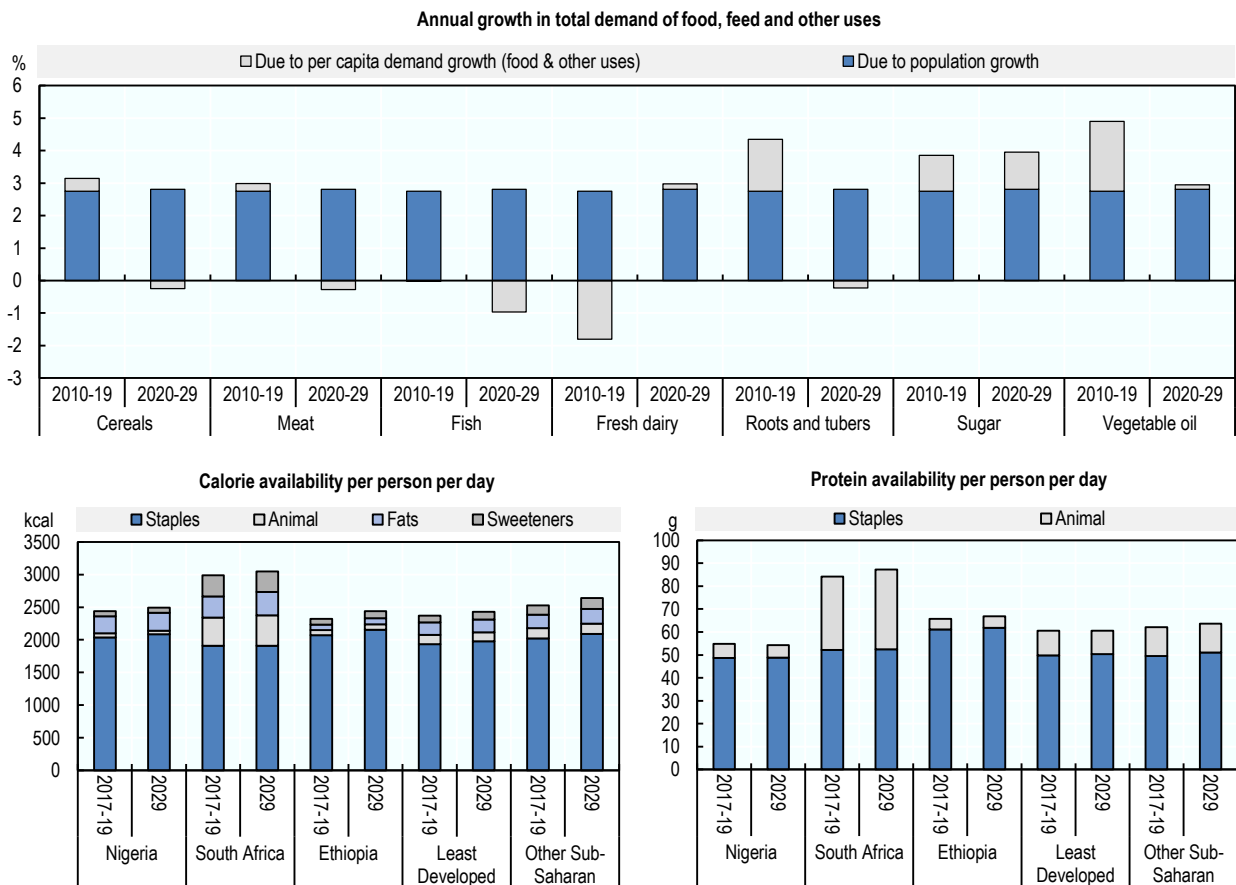


Figure 2.9. Livestock production in Sub Saharan Africa



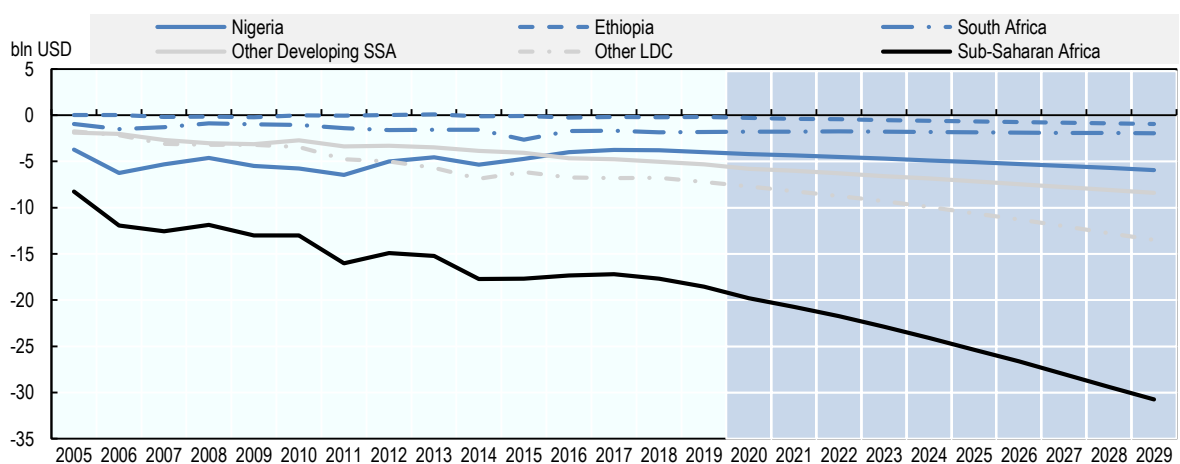
Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

Figure 2.10. Demand for key commodities and food availability in Sub Saharan Africa



Note: Upper panel - population growth is calculated by assuming per capita demand remains constant at the level of the year preceding the decade. Lower panel – Fats: butter and oils. Animal: egg, fish, meat and dairy except for butter. Staples: cereals, pulses and roots.

Figure 2.11. Agricultural trade balances in Sub Saharan Africa



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

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database),

<http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink <https://doi.org/10.1787/888934141817>

Table 2.2. Regional indicators: Sub Saharan Africa

|                                                           | Average |                | 2029      | %     | Growth <sup>2</sup> |         |
|-----------------------------------------------------------|---------|----------------|-----------|-------|---------------------|---------|
|                                                           | 2007-09 | 2017-19 (base) |           |       | Base to 2029        | 2010-19 |
| <b>Macro assumptions</b>                                  |         |                |           |       |                     |         |
| Population                                                | 786 849 | 1 032 263      | 1 361 538 | 31.90 | 2.74                | 2.53    |
| Per capita GDP <sup>1</sup> (kUSD PPP)                    | 2.24    | 2.61           | 3.13      | 20.23 | 1.04                | 1.93    |
| <b>Production (bln USD)</b>                               |         |                |           |       |                     |         |
| Net value of agricultural and fisheries <sup>3</sup>      | 139.6   | 180.5          | 224.2     | 24.18 | 1.97                | 2.06    |
| Net value of crop production <sup>3</sup>                 | 39.5    | 55.0           | 67.1      | 22.08 | 2.86                | 1.78    |
| Net value of other not incl. crop production <sup>3</sup> | 65.8    | 81.8           | 104.4     | 27.57 | 1.44                | 2.28    |
| Net value of livestock production <sup>3</sup>            | 22.8    | 27.8           | 35.5      | 27.79 | 1.35                | 2.47    |
| Net value of fish production <sup>3</sup>                 | 11.6    | 15.9           | 17.1      | 7.73  | 2.86                | 1.07    |
| <b>Quantity produced (kt)</b>                             |         |                |           |       |                     |         |
| Cereals                                                   | 109 695 | 141 025        | 169 397   | 20.12 | 2.42                | 1.66    |
| Pulses                                                    | 12 350  | 17 788         | 19 758    | 11.08 | 2.83                | 0.93    |
| Roots and tubers                                          | 56 740  | 86 825         | 112 016   | 29.01 | 3.67                | 2.28    |
| Oilseeds <sup>4</sup>                                     | 8 044   | 11 149         | 13 288    | 19.18 | 2.26                | 1.58    |
| Meat                                                      | 9 080   | 11 715         | 14 675    | 25.27 | 2.36                | 2.21    |
| Dairy <sup>5</sup>                                        | 3 163   | 3 543          | 4 701     | 32.66 | 0.11                | 2.78    |
| Fish                                                      | 5 626   | 7 695          | 8 291     | 7.75  | 2.84                | 1.07    |
| Sugar                                                     | 6 445   | 7 632          | 10 174    | 33.31 | 1.56                | 2.53    |
| Vegetable oil                                             | 4 657   | 6 855          | 8 106     | 18.24 | 2.82                | 1.37    |
| <b>Biofuel production (Mn L)</b>                          |         |                |           |       |                     |         |
| Biodiesel                                                 | 0.04    | 0.04           | 0.06      | 41.11 | 0.00                | 3.51    |
| Ethanol                                                   | 498     | 827            | 1 056     | 27.61 | 5.95                | 2.16    |
| <b>Land use (kha)</b>                                     |         |                |           |       |                     |         |
| Total agricultural land use                               | 873 660 | 888 354        | 886 033   | -0.26 | 0.09                | -0.02   |
| Total land use for crop production <sup>6</sup>           | 196 204 | 210 088        | 207 202   | -1.37 | 0.39                | -0.13   |
| Total pasture land use <sup>7</sup>                       | 677 456 | 678 266        | 678 831   | 0.08  | 0.01                | 0.01    |
| <b>Direct GHG emissions (Mt CO2-eq)</b>                   |         |                |           |       |                     |         |
| Total                                                     | 618     | 827            | 972       | 17.54 | 2.81                | 1.49    |
| Crop                                                      | 216     | 262            | 306       | 16.56 | 1.34                | 1.31    |
| Animal                                                    | 402     | 565            | 666       | 18.00 | 3.56                | 1.57    |
| <b>Demand and food security</b>                           |         |                |           |       |                     |         |
| Daily per capita caloric availability <sup>8</sup> (kcal) | 2 393   | 2 438          | 2 504     | 2.71  | 0.00                | 0.30    |
| Daily per capita protein availability <sup>8</sup> (g)    | 61      | 62             | 62        | 0.30  | -0.16               | 0.11    |
| <b>Per capita food availability (kg)</b>                  |         |                |           |       |                     |         |
| Staples <sup>9</sup>                                      | 176.9   | 191.9          | 196.6     | 2.41  | 0.65                | 0.25    |
| Meat                                                      | 10.4    | 10.7           | 10.4      | -2.51 | -0.23               | -0.07   |
| Dairy <sup>5</sup>                                        | 4.6     | 3.8            | 3.8       | 0.62  | -2.61               | 0.28    |
| Fish                                                      | 9.0     | 9.0            | 8.2       | -8.85 | -0.70               | -0.70   |
| Sugar                                                     | 10.8    | 12.0           | 13.4      | 11.75 | 1.09                | 1.07    |
| Vegetable oil                                             | 7.0     | 8.7            | 9.1       | 4.96  | 1.18                | 0.49    |
| <b>Trade (bln USD)</b>                                    |         |                |           |       |                     |         |
| Net trade <sup>3</sup>                                    | -12.5   | -17.8          | -30.7     | 72.61 | ..                  | ..      |
| Net value of exports <sup>3</sup>                         | 7.3     | 9.7            | 9.4       | -3.78 | 1.78                | -0.55   |
| Net value of imports <sup>3</sup>                         | 19.8    | 27.5           | 40.1      | 45.64 | 2.60                | 3.48    |

|                                            | Average |                | 2029 | %     | Growth <sup>2</sup> |         |
|--------------------------------------------|---------|----------------|------|-------|---------------------|---------|
|                                            | 2007-09 | 2017-19 (base) |      |       | Base to 2029        | 2010-19 |
| <b>Self-sufficiency ratio<sup>10</sup></b> |         |                |      |       |                     |         |
| Cereals                                    | 84.1    | 80.8           | 74.9 | -7.3  | -0.66               | -0.74   |
| Meat                                       | 88.4    | 85.0           | 82.9 | -2.5  | -0.13               | -0.24   |
| Sugar                                      | 76.1    | 61.9           | 55.1 | -11.0 | -2.03               | -1.08   |
| Vegetable oil                              | 58.3    | 53.4           | 47.1 | -11.7 | -1.23               | -1.26   |

Notes: 1. Per capita GDP expressed in thousands of real USD. 2. Least square growth rates (see Glossary). 3. Net value of agricultural and fisheries output follows FAOSTAT methodology, based on the set of commodities represented in the Aglink-Cosimo model valued at average international reference prices for 2004-06. Projections for not included crops have been made on the basis of longer term trends. 4. Oilseeds represents soybeans and other oilseeds. 5. Dairy includes butter, cheese, milk powders and fresh dairy products, expressed in milk solid equivalent units. 6. Crop Land use area accounts for multiple harvests of arable crops. 7. Pasture land use represents land available for grazing by ruminant animals. 8. Daily per capita calories represent availability, not intake. 9. Staples represents cereals, oilseeds, pulses, roots and tubers. 10. Self-sufficiency ratio calculated as Production / (Production + Imports - Exports).

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

## 2.4. Regional outlook: Near East and North Africa

### Background

The Near East and North Africa<sup>6</sup> region is a difficult environment for agriculture and fish production. Land and water resources in the region are low. Less than 5% of land is arable. All countries in the region, except for Iran, Iraq, and Mauritania face water scarcity, and for some countries water scarcity is extreme, at less than one quarter of sustainable levels on a per capita basis.

The countries of the region have diverse income and resource profiles. Among them are least developed, middle income, and high income oil exporting countries in the Gulf. As one of the highest food net importing regions, and the highest in terms of net imports per capita, self-sufficiency rates for most commodities are low, particularly for cereals. It faces significant uncertainties on both the supply and demand side, and these uncertainties raise concerns regarding reliable access to basic foods. The limited land and water resources that are characteristic of most countries in the region constrain growth and have been further stretched by policy incentives that have sought to increase production to limit the deficit in cereal trade. On the demand side, uncertainties abound with geopolitical conflict that hinders production, reduces needed investments and induces displacement of populations. Furthermore, revenues from oil exports are the main source of the region's income and unstable energy markets affect economic activity including consumption and investment. With food expenditures around 16% of total household expenditures, income and price shocks can have an important impact on welfare.<sup>7</sup>

Population growth, which exceeded 20% in the last decade, is the key source of additional demand. It will grow further by 1.5% annually over the next decade. Three-quarters of the additional population will be urban which may encourage consumption of higher value products, including those that include vegetable oil and sugar, but also meat and dairy products. Per capita incomes in the region are assumed to grow only 1% p.a., and will not constitute a major driver of demand over the next ten years.

Egypt and Iran produce 50% of the net value of agriculture and fish production in the region, and their shares are expected to increase marginally while the Other North Africa region produces 25%, the least developed countries 8% and remaining countries about 17%. Gross domestic product in the agriculture, forestry and fishery sector is currently about 5.3% of total GDP in the region, and this share will shrink to 4.7% by 2029.

Fish production is about 12% of total net agricultural and fish production. Capture in coastal areas has grown most recently, but fish stocks are under pressure. Aquaculture is growing but limited to key rivers in Egypt and Iran.



## **Production**

Agricultural and fish production in the region is projected to expand by 1.5% p.a. over the next ten years, marginally below population growth of 1.6%, implying increasing dependency of the region on the global markets. Crop production share of production will remain at 63% of total net value, as it grows 1.5% p.a. while livestock grows at 1.4% p.a. and fish at 1.5% p.a. over the next decade.

Land use under crops will increase marginally as pasture declines. Land use in cereal production is projected to remain unchanged at 50% of total crop use, while wheat's share of cereals may increase to 43%. Total area harvested in the region is expected to remain stagnant, and yield improvements will account for all crop production gains, with wheat, maize and rice yields growing at 0.7%, 1.5% and 1.5% p.a. respectively. Wheat yields will remain at 70% of the global average, while maize yields will remain close to global average.

Poultry production will grow faster than the production of other meat products at 1.9% p.a., down from 2.6% p.a. in the last decade, while bovine meat production is anticipated to grow 1.2% p.a. again in the next ten years. These rates of growth will help to curb the longer term decline in meat self-sufficiency.

With 1.6% annual growth in livestock production, the region's GHG emissions from livestock activities will expand only 3% by 2029 compared to the base period. Emissions from ruminants, such as cows and sheep, are expected to decline due to a decrease in herd size, but emissions from poultry are expected to increase in step with its production. Total GHG emissions in the region are projected to expand 3% by 2029.

## **Consumption**

Food policies in the region have focused also on food security by supporting consumption of basic foodstuffs, primarily cereals. Average calorie availability in the region will average almost 3 100 kcal/day by 2029, an increase of 41 kcal/day from the base period, and marginally higher than the global average of 3 014 kcal/day.

The projection for the average diet in the region indicates about 54% of calories will come from cereals by 2029, down 1% from the base period. This compares to the world average of 44%. A similar phenomenon applies to sugar consumption, where the region's sugar calorie share of the total will be 10% compared to a global average of 7%. This diet, which relies on starchy foods and sugar, is associated with a rising incidence of over-weight and obesity, and various noncommunicable diseases such as diabetes. With undernourishment remaining prevalent in certain countries, the "triple burden" of malnutrition will be a policy challenge over the medium term.

The average level of protein availability in the region is projected to be 85 g/day in 2029, up only 0.8 g/day from the base period. A fall in protein from cereal consumption is expected to be more than offset by rises from meat and fish sources and from pulses. Protein availability in the region will be similar to the global average.

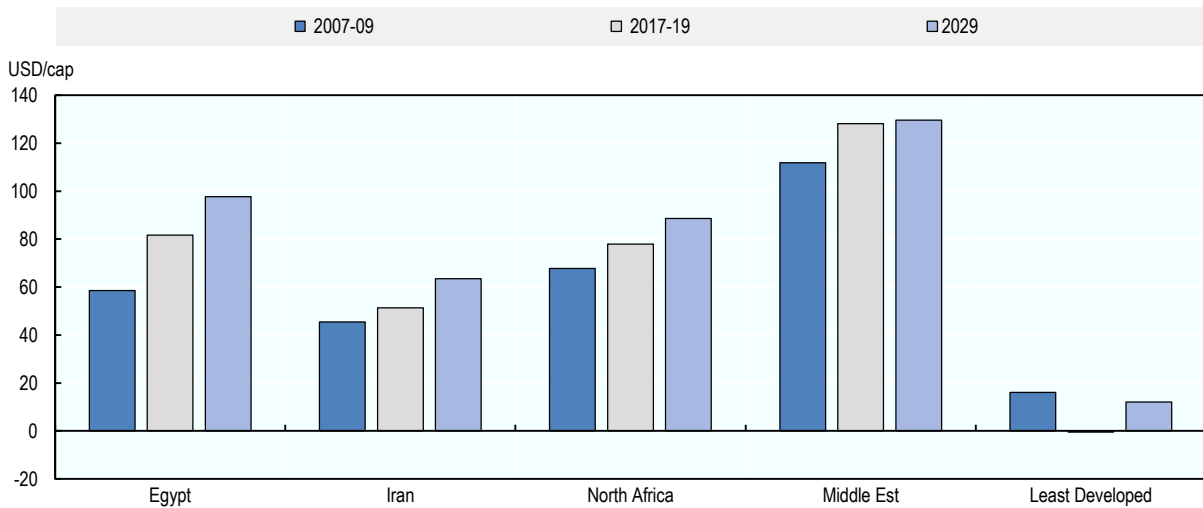
The growth of the livestock sector will increase feed use. Three commodities, maize, barley and protein meals are expected to account for about 75% of the total feed use, with imports accounting for about 90% of feed demand. This trend reflects policies that prioritise the production of food crops over feed crops. The region is a large importer of animal feed and will import 47 Mt of maize by 2029 compared to 36 Mt in the base period.

## **Trade**

The region's strong population growth together with limited production capacity will drive higher food imports over the projection period. The region is expected to remain the second largest importer of food

following the Asia and Pacific region but on a per capita basis will be the largest. Within the region, food imports per person are highest in the Other Middle East area, which includes the Gulf States, followed by Egypt and other countries of North Africa.

**Figure 2.12. Value of net food imports per capita in Near East and North Africa**



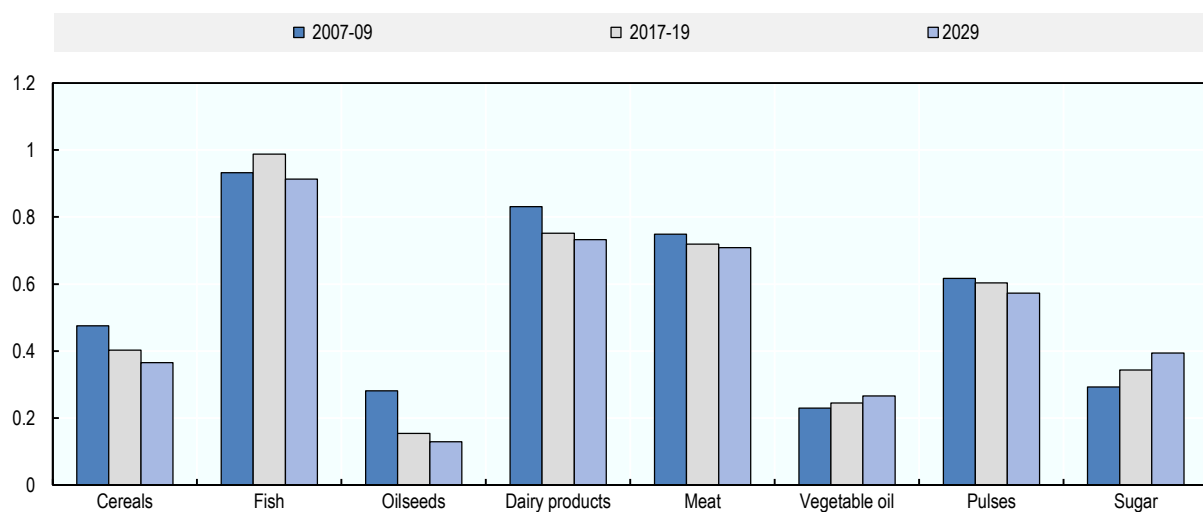
Note: Values in 2004-06 constant.

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink <https://doi.org/10.1787/888934141836>

The regions imports will increase for almost all commodities and, with the exception of fish and meat products, self-sufficiency ratios will remain low and possibly continue their long-term decline, as seen in Figure 2.13. The region's imports will maintain high shares of certain global markets such as maize, other coarse grains and wheat which will rise to 24%, 46% and 28% respectively by 2029. The region's imports will also account for 20% of global trade in poultry meat and cheese, and 35% of sheep meat trade.

**Figure 2.13. Self-sufficiency rates for selected commodities in Near East and North Africa**



Note: Self-sufficiency is calculated by dividing quantity produced by quantity consumed.

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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Figure 2.14. Change in area harvested and land use in Near East and North Africa

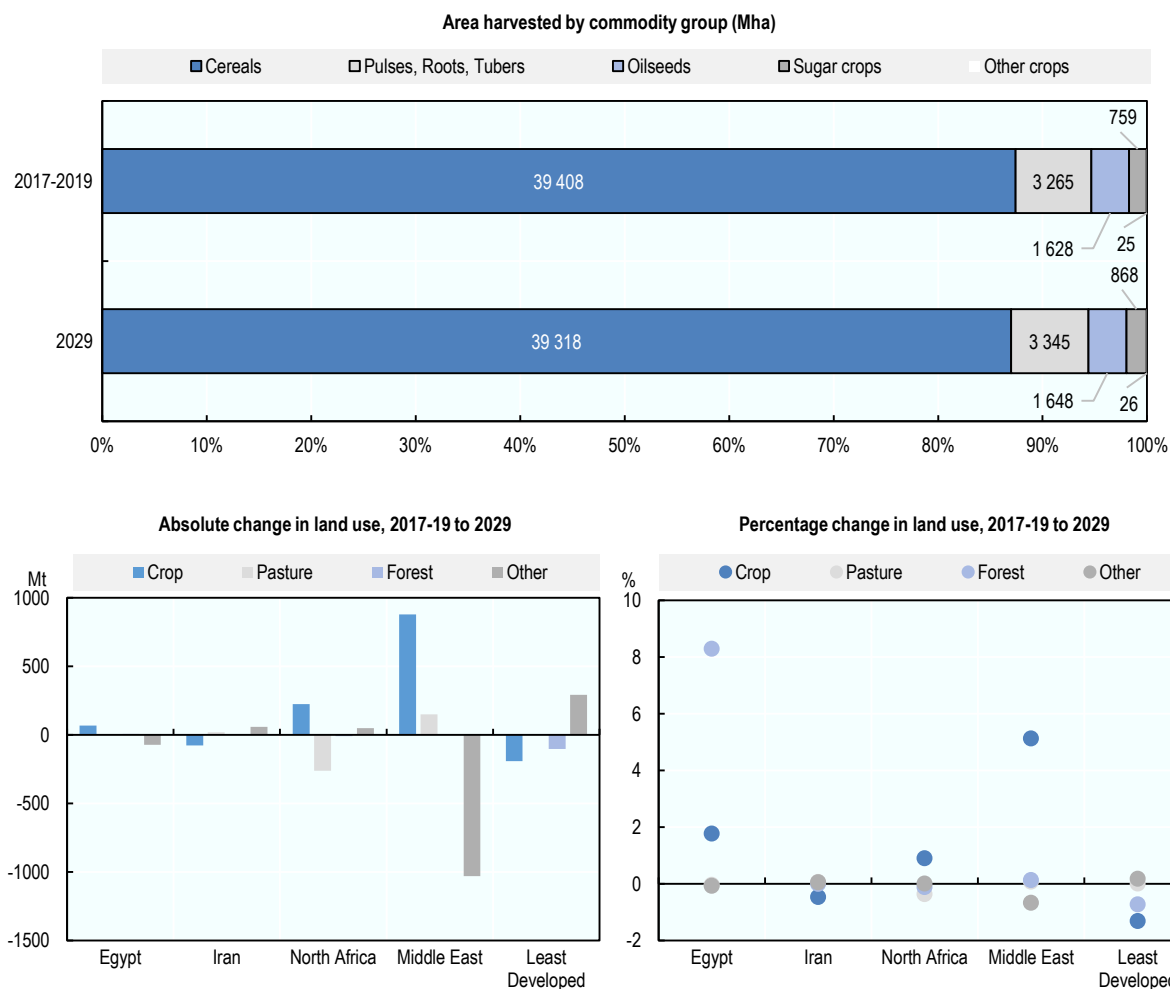
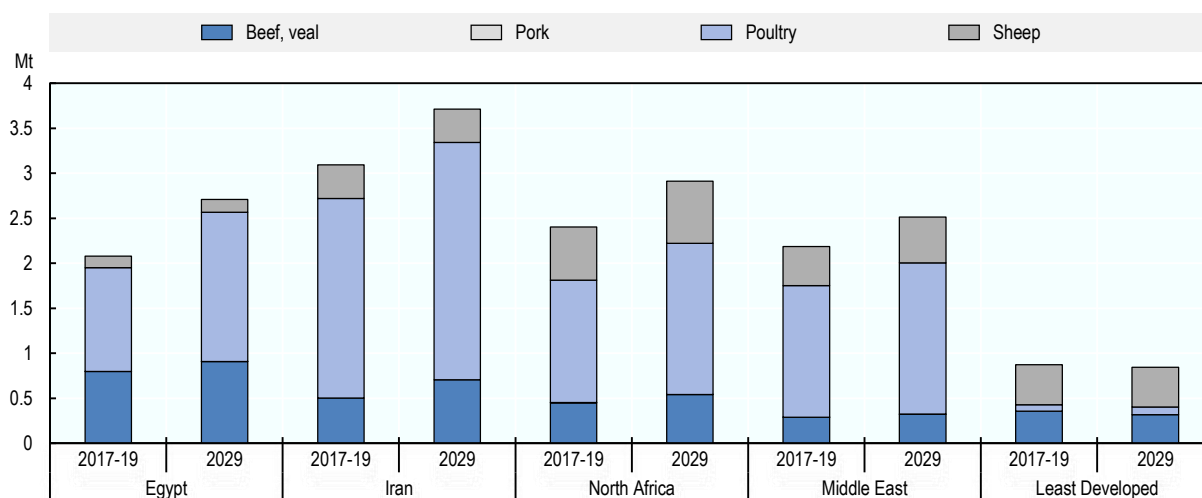


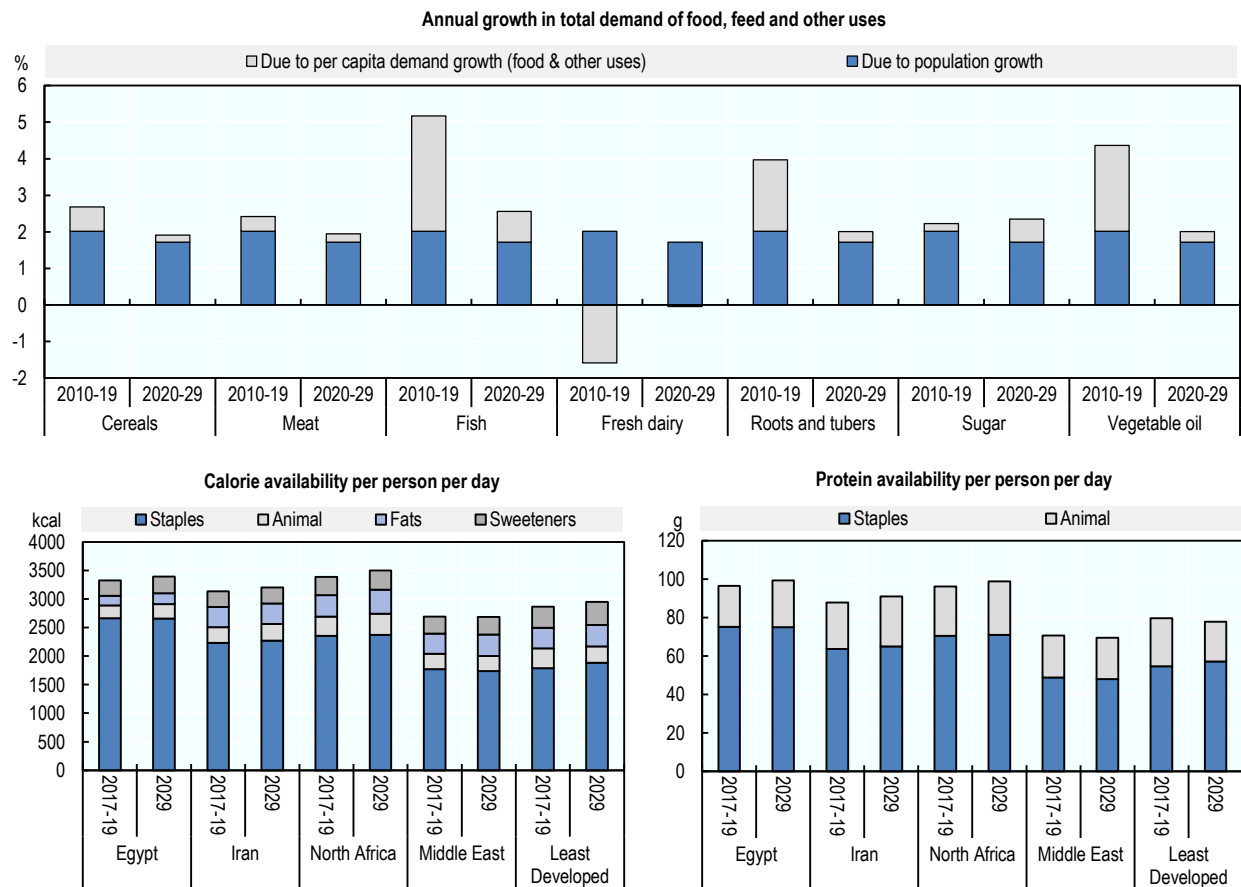
Figure 2.15. Livestock production in Near East and North Africa



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

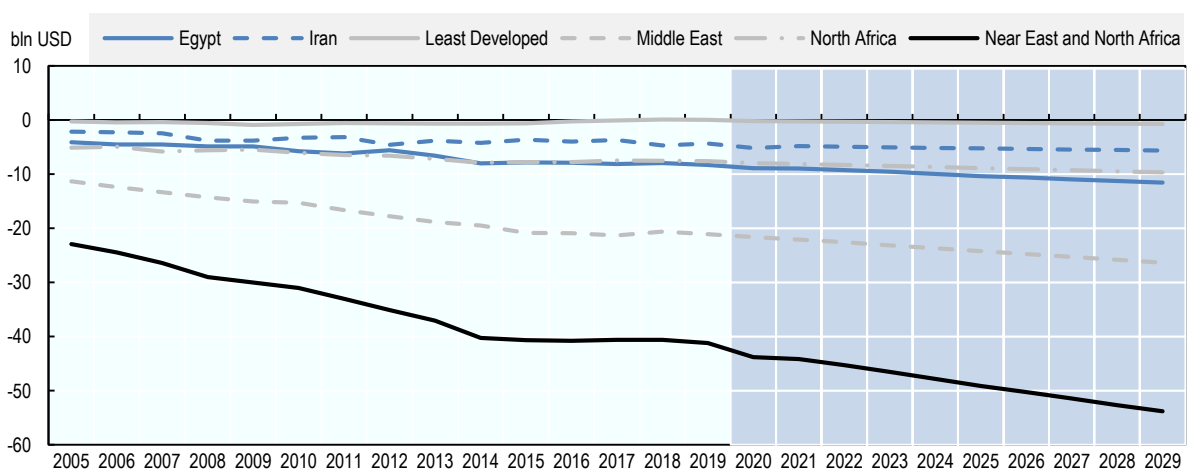
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Figure 2.16. Demand for key commodities and food availability in Near East and North Africa



Note: Upper panel - population growth is calculated by assuming per capita demand remains constant at the level of the year preceding the decade. Lower panel – Fats: butter and oils. Animal: egg, fish, meat and dairy except for butter. Staples: cereals, pulses and roots.

Figure 2.17. Agricultural trade balances in Near East and North Africa



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

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database),

<http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink <https://doi.org/10.1787/888934141893>

Table 2.3. Regional indicators: Near East and Northern Africa

|                                                           | Average |                | 2029    | %     | Growth <sup>2</sup> |         |
|-----------------------------------------------------------|---------|----------------|---------|-------|---------------------|---------|
|                                                           | 2007-09 | 2017-19 (base) |         |       | Base to 2029        | 2010-19 |
| <b>Macro assumptions</b>                                  |         |                |         |       |                     |         |
| Population                                                | 399 638 | 487 741        | 578 229 | 18.55 | 1.93                | 1.53    |
| Per capita GDP <sup>1</sup> (kUSD PPP)                    | 10.05   | 10.48          | 11.45   | 9.20  | 0.33                | 1.00    |
| <b>Production (bln USD)</b>                               |         |                |         |       |                     |         |
| Net value of agricultural and fisheries <sup>3</sup>      | 94.9    | 112.7          | 133.4   | 18.32 | 1.62                | 1.64    |
| Net value of crop production <sup>3</sup>                 | 14.2    | 15.8           | 17.9    | 13.56 | 1.09                | 1.27    |
| Net value of other not incl. crop production <sup>3</sup> | 47.2    | 55.4           | 67.0    | 20.89 | 1.57                | 1.85    |
| Net value of livestock production <sup>3</sup>            | 25.7    | 27.8           | 32.1    | 15.61 | 0.29                | 1.38    |
| Net value of fish production <sup>3</sup>                 | 7.9     | 13.8           | 16.4    | 18.88 | 5.88                | 1.71    |
| <b>Quantity produced (kt)</b>                             |         |                |         |       |                     |         |
| Cereals                                                   | 64 858  | 71 540         | 78 562  | 9.82  | 0.97                | 0.98    |
| Pulses                                                    | 1 970   | 2 708          | 3 187   | 17.70 | 2.41                | 1.57    |
| Roots and tubers                                          | 3 210   | 4 670          | 5 721   | 22.49 | 2.79                | 1.81    |
| Oilseeds <sup>4</sup>                                     | 1 584   | 1 720          | 2 023   | 17.56 | 1.91                | 1.49    |
| Meat                                                      | 8 715   | 10 628         | 12 696  | 19.46 | 1.71                | 1.56    |
| Dairy <sup>5</sup>                                        | 4 460   | 4 245          | 4 926   | 16.05 | -1.11               | 1.51    |
| Fish                                                      | 3 822   | 6 713          | 7 978   | 18.84 | 5.90                | 1.71    |
| Sugar                                                     | 3 769   | 5 509          | 7 971   | 44.71 | 4.51                | 2.82    |
| Vegetable oil                                             | 1 671   | 2 731          | 3 615   | 32.38 | 6.35                | 2.08    |
| <b>Biofuel production (Mn L)</b>                          |         |                |         |       |                     |         |
| Biodiesel                                                 | 0.02    | 0.02           | 0.02    | 13.93 | 0.00                | 1.36    |
| Ethanol                                                   | 257.8   | 170.2          | 191.9   | 12.76 | -5.34               | 1.69    |
| <b>Land use (kha)</b>                                     |         |                |         |       |                     |         |
| Total agricultural land use                               | 477 583 | 473 135        | 473 943 | 0.17  | -0.20               | 0.02    |
| Total land use for crop production <sup>6</sup>           | 80 622  | 77 009         | 77 908  | 1.17  | -1.03               | 0.11    |
| Total pasture land use <sup>7</sup>                       | 396 961 | 396 126        | 396 035 | -0.02 | -0.03               | 0.00    |
| <b>Direct GHG Emissions (Mt CO<sub>2</sub>-eq)</b>        |         |                |         |       |                     |         |
| Total                                                     | 249     | 199            | 204     | 2.62  | -2.04               | 0.33    |
| Crop                                                      | 67      | 37             | 37      | 1.85  | -4.84               | 0.46    |
| Animal                                                    | 181     | 162            | 167     | 2.79  | -1.27               | 0.30    |
| <b>Demand and food security</b>                           |         |                |         |       |                     |         |
| Daily per capita caloric availability <sup>8</sup> (kcal) | 2972    | 3049           | 3090    | 1.34  | -0.04               | 0.13    |
| Daily per capita protein availability <sup>8</sup> (g)    | 84      | 85             | 85      | 0.84  | -0.32               | 0.10    |
| <b>Per capita food availability (kg)</b>                  |         |                |         |       |                     |         |
| Staples <sup>9</sup>                                      | 221.5   | 220.5          | 218.1   | -1.09 | -0.01               | -0.13   |
| Meat                                                      | 24.2    | 25.3           | 25.9    | 2.29  | -0.04               | 0.30    |
| Dairy <sup>5</sup>                                        | 13.4    | 11.6           | 11.6    | 0.44  | -1.80               | 0.33    |
| Fish                                                      | 9.0     | 12.4           | 14.0    | 12.57 | 2.27                | 1.10    |
| Sugar                                                     | 32.2    | 32.9           | 35.0    | 6.37  | 0.36                | 0.64    |
| Vegetable oil                                             | 11.5    | 13.7           | 14.7    | 6.99  | 2.46                | 0.63    |
| <b>Trade (bln USD)</b>                                    |         |                |         |       |                     |         |
| Net trade <sup>3</sup>                                    | -28.5   | -40.8          | -53.8   | 31.91 | ..                  | ..      |
| Net value of exports <sup>3</sup>                         | 6.2     | 8.9            | 8.5     | -4.68 | 3.02                | -0.27   |
| Net value of imports <sup>3</sup>                         | 34.7    | 49.7           | 62.3    | 25.38 | 3.08                | 2.03    |

|                                            | Average |                | 2029 | %      | Growth <sup>2</sup> |         |
|--------------------------------------------|---------|----------------|------|--------|---------------------|---------|
|                                            | 2007-09 | 2017-19 (base) |      |        | Base to 2029        | 2010-19 |
| <b>Self-sufficiency ratio<sup>10</sup></b> |         |                |      |        |                     |         |
| Cereals                                    | 47.2    | 40.7           | 36.4 | -10.45 | -1.46               | -0.73   |
| Meat                                       | 74.9    | 71.9           | 70.8 | -1.47  | -0.14               | -0.26   |
| Sugar                                      | 28.1    | 34.3           | 39.0 | 13.61  | 2.30                | 0.63    |
| Vegetable oil                              | 23.2    | 24.6           | 26.6 | 7.85   | 1.88                | 0.35    |

Notes: 1. Per capita GDP expressed in thousands of real USD. 2. Least square growth rates (see glossary). 3. Net value of agricultural and fisheries output follows FAOSTAT methodology, based on the set of commodities represented in the Aglink-Cosimo model valued at average international reference prices for 2004-06. Projections for not included crops have been made on the basis of longer term trends. 4. Oilseeds represents soybeans and other oilseeds. 5. Dairy includes butter, cheese, milk powders and fresh dairy products, expressed in milk solid equivalent units. 6. Crop Land use area accounts for multiple harvests of arable crops. 7. Pasture land use represents land available for grazing by ruminant animals. 8. Daily per capita calories represent availability, not intake. 9. Staples represents cereals, oilseeds, pulses, roots and tubers. 10. Self-sufficiency ratio calculated as Production / (Production + Imports - Exports).

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database),

<http://dx.doi.org/10.1787/agr-outl-data-en>

## 2.5. Regional outlook: Europe and Central Asia

### **Background**

Europe and Central Asia<sup>8</sup> is a diverse region that includes the European Union, United Kingdom, Russian Federation, Ukraine, and Turkey as the main agricultural producers. There is considerable variation across its countries in terms of stage of development, demographics, agricultural resources and public policies. The region's population is slowly growing; static in Western Europe, shrinking in Eastern Europe, growing at just less than 1% p.a. in Central Asia. The region is highly urbanised and by 2029 75% of its population will live in urban environments.

Average income in the region is greater than USD 25 000, but there are substantial differences across countries. While the economies of Western Europe are diverse, those in more eastern regions are focused on commodities, particularly in the Russian Federation where oil and gas are critical sectors. The share of primary agriculture, forestry and fish production in total GDP is low, ranging from just 1.4% in the European Union, to 11% in Ukraine. It is estimated that the share of food in household expenditures averaged about 12% in the region in 2017-19 base period, ranging from around 6% for United Kingdom to around 21% in Central Asian countries such as Kazakhstan.<sup>9</sup>

The region produces 17% of the global value of agricultural and fish production, a share which has been declining over time, largely due to slow growth in Western Europe over the past 20 years. Crop production averages about 56% of the net value of total production, fish about 8%, and livestock the remainder of about 36%. Whereas the region accounted for 12% of the total growth in the global net value of agriculture and fish in the last decade, it accounted for 22% of growth in global exports. This growing export orientation is largely driven by Eastern Europe where productivity levels in both the crop and livestock sectors have improved but static population and relatively mature consumption levels mean demand growth has been weak. Trade within the region is affected by various uncertainties, notably concerning the outcome of negotiations to determine future trading arrangements between the United Kingdom and the European Union and the Russian embargoes on imports from the European Union that have been continuously renewed since 2014.

Relative to other regions, livestock and animal products are important in both production and consumption. They constitute one third of the net value of agriculture and fish production. On the consumption side, calories and proteins from animal products comprise 21% and 51% respectively of total availability. The subregion of Western Europe is a very large producer, consumer and trader of milk and dairy products, and while its share of global milk production is falling over time, production and trade of high value products such as cheese are growing. Per capita fresh dairy product consumption is twice the world average and cheese in particular is four times higher.

### ***Production***

The net value of agriculture and fish production (net of feed and seed inputs) is projected to grow 8% by 2029 compared to the base period average of 2017-19, with Western Europe growing by less than 2% compared to growth in Eastern Europe of 18% and Central Asia of 19%. Eastern Europe's strong growth will be led by the Russian Federation and Ukraine at 12% and 26% respectively, driven by strong growth in the crop sectors of these countries, although the Russian sector is anticipated also to show strong growth in meat production, given the impact that import embargoes have had on domestic markets to stimulate local production.

Productivity improvements will underlie growth in the sector, with agricultural land use in the region projected to continue its contraction of the last ten years. By 2029, a marginal increase in cropland use is projected to be more than offset by a reduction in pasture area. In relation to changes in land use, direct GHG emissions from agriculture are projected to decline 2% over the next decade.

Crop production in the region is expected to expand by 11% over the next decade, accounting for more than half of the region's growth in agricultural and fish production. This expansion will be largely due to rising cereals and oilseeds output in the Black Sea region. The Russian Federation and Ukraine are projected to sustain robust growth in maize, wheat, soybean and other oilseeds to increase their share in regional production to 38% for maize, 36% for wheat and 54% for all oilseeds. Yield improvements will drive nearly all production growth in these commodities.

Livestock production is projected to grow more slowly at 0.6% p.a. over the next decade, and will be based on intensified production resulting in higher carcass weights. Nonetheless, a slower expansion of meat production is expected to take place, as demand for meat will remain stagnant for bovine and porcine meats. Poultry production is expected to rise across the region over the outlook period. Most poultry will be produced to supply the domestic market and per capita consumption will rise by nearly 2 kg/capita to an average consumption of 28 kg/capita per year.

Production of dairy products is projected to accelerate, with a more rapid expansion of cheese and whole milk powder relative to the last decade. Domestic food demand for dairy products will remain strong, contributing 22% of daily calories toward diets across the region. However, the dairy output expansion will increasingly feed international demand – an increasing share of the region's butter, cheese and milk powders is expected to be exported over the next decade. The region will remain a leading source of dairy production in the world, led largely by Western Europe whose global share of milk production still exceeds 20%. The region as a whole will account for 40% of global cheese and skim milk powder production, and over 25% of global butter production by 2029.

## **Consumption**

Daily per capita calorie availability in the region is projected to increase by 45 kcal/day to almost 3 430 kcal/day mainly due to increases in cereal and pulse consumption, and small increases in meat and dairy products. Food demand for sugar is projected to continue to contract as consumers in Europe seek to curb high consumption levels amid increasing health consciousness. Western Europe's sugar consumption per capita is projected to fall by 1 kg per year to 34 kg in 2029, but this is still over 40% higher than the world average. Vegetable oil consumption is also expected to fall marginally over the next decade reducing its contribution to regional diets.

Protein availability per capita in the region is projected to increase by 3 g/day to 105 g/day by 2029, which is almost 25% higher than the world average of 85 g/day. Pulse consumption, which has been rising rapidly from a low base in the last decade given its positive health image, is projected to rise 12% to 4kg per capita by 2029. Per capita meat consumption may rise slightly to 57 kg/capita per year, largely due to higher poultry meat consumption, which is anticipated to be the fastest growing meat item, reaching 28 kg per capita. Bovine and pigmeat consumption per capita is anticipated to decline over the period. Fish consumption is projected to rise slowly over the outlook period, with per capita levels 2.2 kg below the global average.

Owing largely to the importance of animal products, the region consumes almost one quarter of global protein feed. With slow growth projected for the livestock sector, with an increasing poultry, but declining pigmeat sector, feed use is anticipated to increase only 4% by 2029 over the base period, with increases in maize and protein meals offset by a decline in wheat feed.

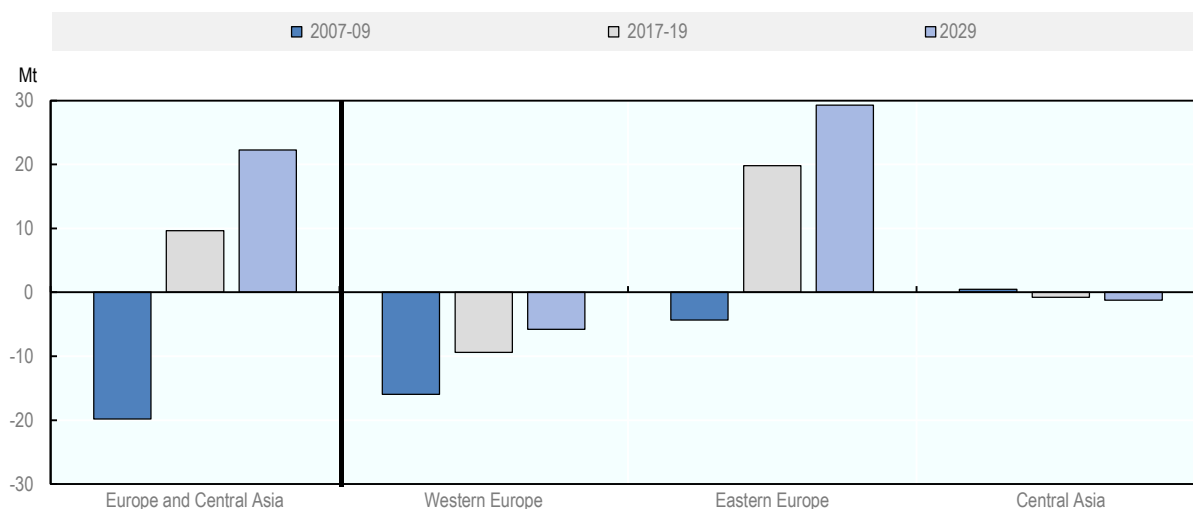
Non-food demand for vegetable oil is expected to contract as its role in biofuel production in the European Union will diminish. The region is moving towards second generation – non-food – feedstocks for biodiesel and is also decreasing its demand for diesel. The region's production of biodiesel is therefore projected to contract 10% by 2029, reducing its share of global biodiesel production from 36% to 28%.

## **Trade**

Prior to 2014, the region as a whole was a large net importer of agricultural commodities. However, due to rising exports from Eastern Europe, particularly Russian Federation and Ukraine, the region is emerging as the third main net-exporting region of the world. The reasons for this are rising productivity, but also slow domestic demand growth given already high consumption levels, and slow population growth. With a large land base, both Eastern Europe and Central Asia have a comparative advantage in cereal and oilseed production.



Figure 2.18. Net exports of agriculture and fish products from Europe and Central Asia



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <https://doi.org/10.1787/888934141912>

The region's cereal exports will grow from 151 Mt in the base period to 193 Mt in 2029, an increase of 28%, with the Near East and North Africa region as a major importer. Its market share in cereal exports is projected to reach 38%, its highest ever. The region's wheat export share will rise to 56%, with exports of 117 Mt. Maize exports may reach almost 50 Mt, or 25% of world maize trade by 2029. On the import side, soybean and protein meal imports are anticipated to remain steady around 27 Mt and 32 Mt, respectively, keeping the region one of the major importers of these products.

The region is a major gross exporter pigmeat and poultrymeat with global shares of 43% and 27% respectively. However, with extensive internal regional trade these shares on a net export basis fall to 23% and 8%, indicating the importance of internal trade to the region. In this context, the future status of the Russian Federation's import embargo will affect trade inside and outside the region. The region is the most important dairy product exporter, with shares in global dairy products remaining high or rising, with cheese, SMP and butter exports reaching 63%, 42% and 47% respectively.

Figure 2.19. Change in area harvested and land use in Europe and Central Asia

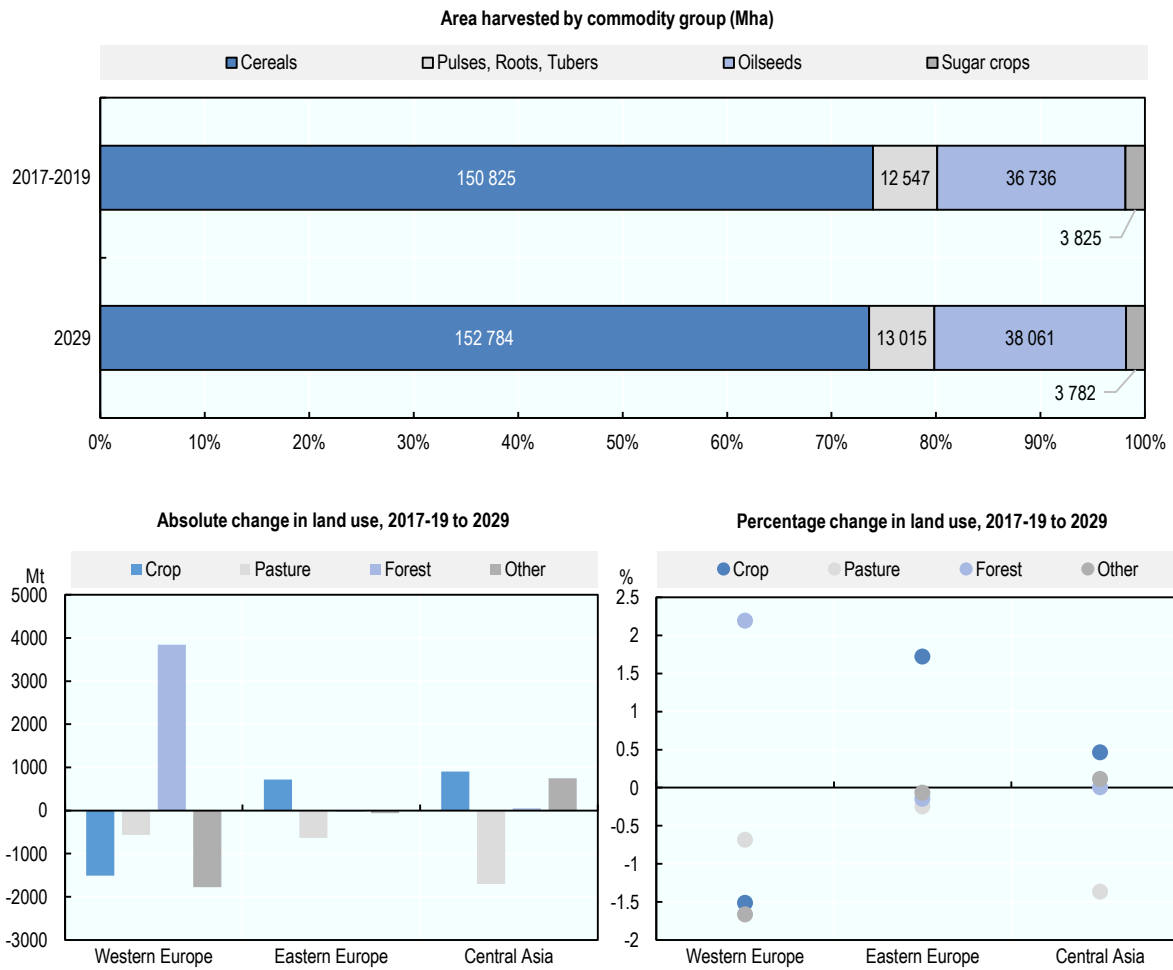
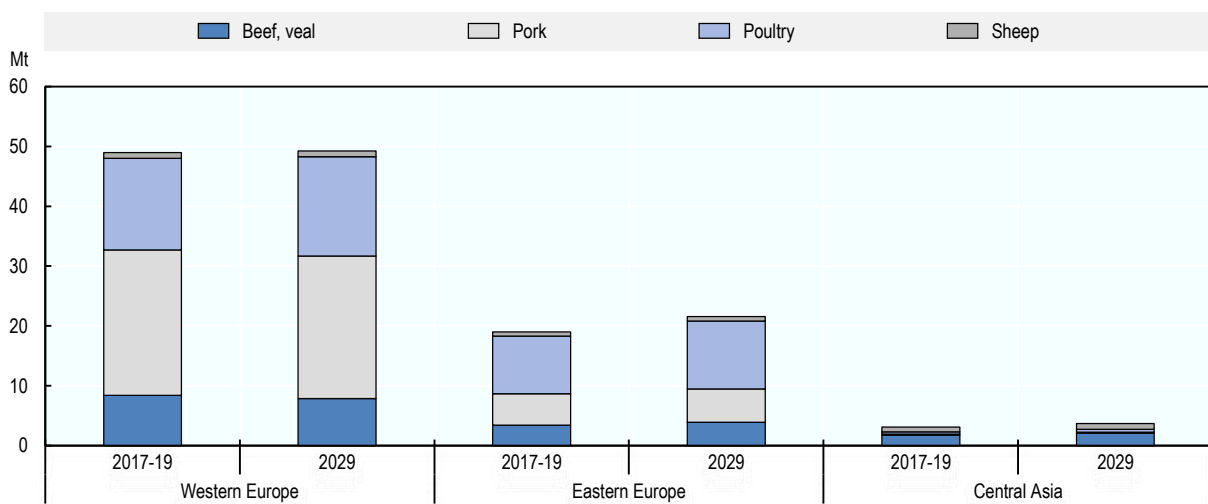
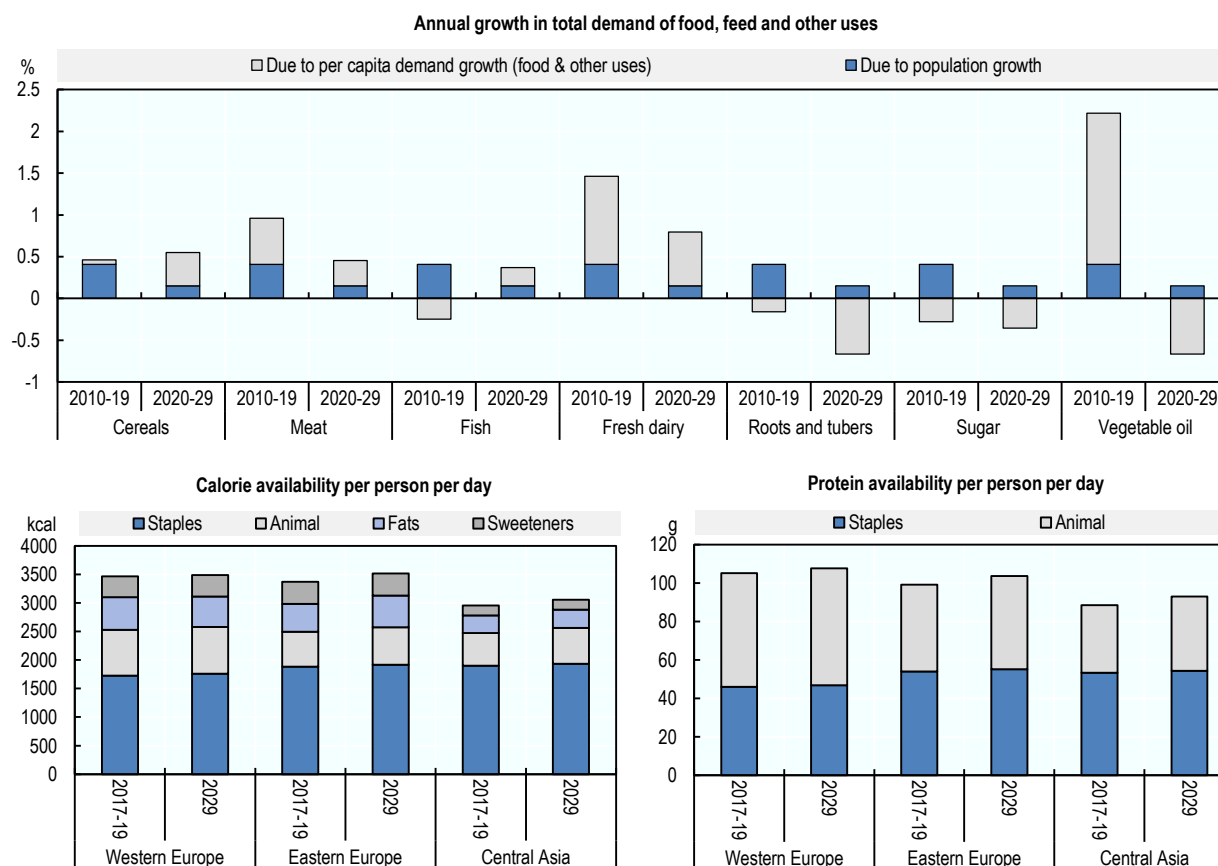


Figure 2.20. Livestock production in Europe and Central Asia



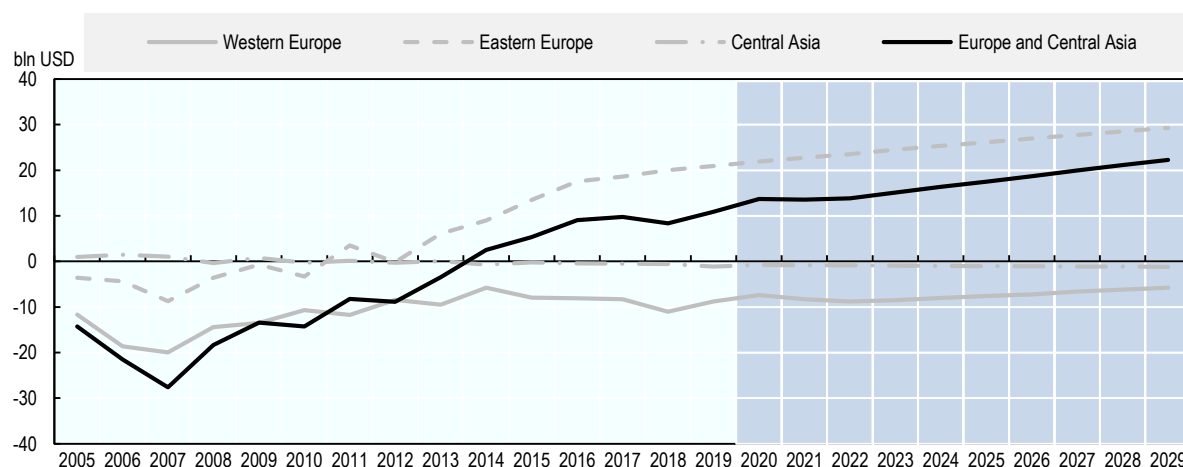
Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

Figure 2.21. Demand for key commodities and food availability in Europe and Central Asia



Note: Upper panel – population growth is calculated by assuming per capita demand remains constant at the level of the year preceding the decade. Lower panel – Fats: butter and oils. Animal: egg, fish, meat and dairy except for butter. Staples: cereals, pulses and roots.

Figure 2.22. Agricultural trade balances by region



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

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database),

<http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <https://doi.org/10.1787/888934141931>

Table 2.4. Regional indicators: Europe and Central Asia

|                                                           | Average |                | 2029    | %      | Growth <sup>2</sup> |         |
|-----------------------------------------------------------|---------|----------------|---------|--------|---------------------|---------|
|                                                           | 2007-09 | 2017-19 (base) |         |        | Base to 2029        | 2010-19 |
| <b>Macro assumptions</b>                                  |         |                |         |        |                     |         |
| Population                                                | 889 018 | 925 930        | 940 149 | 1.54   | 0.41                | 0.09    |
| Per capita GDP <sup>1</sup> (kUSD PPP)                    | 24.48   | 27.28          | 32.65   | 19.70  | 1.45                | 1.73    |
| <b>Production (bln USD)</b>                               |         |                |         |        |                     |         |
| Net value of agricultural and fisheries <sup>3</sup>      | 406.0   | 465.1          | 504.0   | 8.36   | 1.42                | 0.68    |
| Net value of crop production <sup>3</sup>                 | 104.4   | 125.9          | 141.2   | 12.19  | 2.76                | 1.06    |
| Net value of other not incl. crop production <sup>3</sup> | 125.0   | 130.8          | 140.5   | 7.49   | -0.14               | 0.63    |
| Net value of livestock production <sup>3</sup>            | 142.3   | 169.0          | 180.4   | 6.73   | 1.77                | 0.45    |
| Net value of fish production <sup>3</sup>                 | 34.3    | 39.4           | 41.8    | 6.02   | 1.50                | 0.63    |
| <b>Quantity produced (kt)</b>                             |         |                |         |        |                     |         |
| Cereals                                                   | 513 673 | 581 353        | 650 784 | 11.94  | 2.33                | 1.00    |
| Pulses                                                    | 6 709   | 9 562          | 12 411  | 29.79  | 3.15                | 2.32    |
| Roots and tubers                                          | 28 765  | 29 623         | 28 355  | -4.28  | 1.23                | -0.19   |
| Oilseeds <sup>4</sup>                                     | 47 484  | 78 291         | 88 449  | 12.97  | 5.01                | 1.16    |
| Meat                                                      | 58 664  | 71 099         | 74 480  | 4.75   | 1.99                | 0.28    |
| Dairy <sup>5</sup>                                        | 24 314  | 28 971         | 32 207  | 11.17  | 1.75                | 0.98    |
| Fish                                                      | 16 785  | 19 228         | 20 376  | 5.97   | 1.49                | 0.63    |
| Sugar                                                     | 25 279  | 31 270         | 31 832  | 1.80   | 1.91                | 0.90    |
| Vegetable oil                                             | 21 709  | 32 944         | 36 039  | 9.40   | 4.12                | 0.87    |
| <b>Biofuel production (Mn L)</b>                          |         |                |         |        |                     |         |
| Biodiesel                                                 | 7 956   | 15 522         | 13 908  | -10.39 | 4.48                | -1.22   |
| Ethanol                                                   | 5 325   | 8 264          | 8 120   | -1.74  | 2.02                | -0.65   |
| <b>Land use (kha)</b>                                     |         |                |         |        |                     |         |
| Total agricultural land use                               | 802 550 | 801 440        | 798 650 | -0.35  | -0.05               | -0.03   |
| Total land use for crop production <sup>6</sup>           | 339 702 | 335 102        | 335 213 | 0.03   | -0.02               | -0.01   |
| Total pasture land use <sup>7</sup>                       | 462 848 | 466 339        | 463 437 | -0.62  | -0.08               | -0.05   |
| <b>Direct GHG emissions (Mt CO2-eq)</b>                   |         |                |         |        |                     |         |
| Total                                                     | 682     | 708            | 696     | -1.69  | 0.60                | -0.15   |
| Crop                                                      | 197     | 216            | 211     | -2.55  | 1.05                | -0.17   |
| Animal                                                    | 485     | 492            | 485     | -1.30  | 0.41                | -0.14   |
| <b>Demand and food security</b>                           |         |                |         |        |                     |         |
| Daily per capita caloric availability <sup>8</sup> (kcal) | 3 332   | 3 383          | 3 451   | 2.01   | 0.20                | 0.25    |
| Daily per capita protein availability <sup>8</sup> (g)    | 100     | 102            | 105     | 3.15   | 0.11                | 0.30    |
| <b>Per capita food availability (kg)</b>                  |         |                |         |        |                     |         |
| Staples <sup>9</sup>                                      | 168.8   | 170.1          | 172.3   | 1.27   | 0.15                | 0.12    |
| Meat                                                      | 55.1    | 58.7           | 60.7    | 3.38   | 0.80                | 0.30    |
| Dairy <sup>5</sup>                                        | 24.5    | 27.4           | 29.5    | 7.81   | 1.12                | 0.73    |
| Fish                                                      | 18.9    | 18.3           | 19.2    | 4.72   | -0.10               | 0.44    |
| Sugar                                                     | 36.0    | 35.0           | 33.7    | -3.50  | -0.65               | -0.19   |
| Vegetable oil                                             | 22.0    | 24.3           | 23.9    | -1.49  | 2.95                | 0.45    |
| <b>Trade (bln USD)</b>                                    |         |                |         |        |                     |         |
| Net trade <sup>3</sup>                                    | -19.8   | 9.7            | 22.3    | 130.59 | ..                  | ..      |
| Net value of exports <sup>3</sup>                         | 53.9    | 86.4           | 100.0   | 15.76  | 4.56                | 1.22    |
| Net value of imports <sup>3</sup>                         | 73.8    | 76.7           | 77.7    | 1.29   | 0.52                | 0.13    |

|                                            | Average |                | 2029  | %    | Growth <sup>2</sup> |         |
|--------------------------------------------|---------|----------------|-------|------|---------------------|---------|
|                                            | 2007-09 | 2017-19 (base) |       |      | Base to 2029        | 2010-19 |
| <b>Self-sufficiency ratio<sup>10</sup></b> |         |                |       |      |                     |         |
| Cereals                                    | 108.5   | 119.0          | 126.6 | 6.3  | 1.21                | 0.42    |
| Meat                                       | 95.3    | 105.0          | 105.1 | 0.1  | 0.86                | -0.09   |
| Sugar                                      | 80.7    | 96.3           | 100.2 | 4.0  | 2.54                | 1.01    |
| Vegetable oil                              | 73.2    | 89.9           | 103.2 | 14.7 | 1.47                | 1.03    |

Notes: 1. Per capita GDP expressed in thousands of real USD. 2. Least square growth rates (see glossary). 3. Net value of agricultural and fisheries output follows FAOSTAT methodology, based on the set of commodities represented in the Aglink-Cosimo model valued at average international reference prices for 2004-06. Projections for not included crops have been made on the basis of longer term trends. 4. Oilseeds represents soybeans and other oilseeds. 5. Dairy includes butter, cheese, milk powders and fresh dairy products, expressed in milk solid equivalent units. 6. Crop Land use area accounts for multiple harvests of arable crops. 7. Pasture land use represents land available for grazing by ruminant animals. 8. Daily per capita calories represent availability, not intake. 9. Staples represents cereals, oilseeds, pulses, roots and tubers. 10. Self-sufficiency ratio calculated as Production / (Production + Imports - Exports).

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database),

<http://dx.doi.org/10.1787/agr-outl-data-en>.

## 2.6. Regional outlook: North America

### Background

As a region comprising of just two highly developed countries, it is not entirely appropriate to compare it with the other regions of this *Outlook*, which are more diverse composites. However, the importance of the region in global agriculture is notable. While it comprises about 5% (365 million people) of the global population, it produces 10% of global agricultural and fish output. It has the most agricultural land per person and the highest per capita value of agricultural and fish production. For the commodities of this outlook, the region also has the largest commodity trade surplus, with exports per person at twice the global average. Nevertheless, the role of North America in global agriculture is diminishing over time as other regions are growing more quickly. The share of agriculture and fish (including forestry) in its GDP is likely to slide below 1%.

Agricultural production in North America uses inputs intensively, particularly fixed capital, as it is produced to a significant degree on large commercial units. As a result, the region has very high partial factor productivities as measured by crop yields, livestock/meat off-take ratios and milk yields. Agricultural land use has been declining in the last decade, as that for crops declined by 3.5%, but yields have continued to increase such that crop production has increased almost 14%. Animal production is very important in the region, contributing just over one third of its net value of agricultural production. This compares to the global average share of livestock of 28%. However, livestock inventory is proportionately lower given its high productivity. For example, bovine meat production per animal in inventory is over three times the global level. The region is a comparatively small producer of fish compared to other regions, with a current 4% and falling production share of global production.

Food consumption per capita in the region is the highest of all regions, encouraged by the highest per capita income (USD 61 000) and the highest urbanisation rate (82%) which affect both the level and composition of food intake. With real per capita incomes projected to decline marginally over the next decade, population growth at 0.6% p.a. and possible changes in dietary preferences are likely the main factors influencing food demand over the outlook period. While estimates include considerable food waste, calorie and protein availabilities in the region already average 3 760 kcal/capita per day and 113 g/capita per day, some 30% and 37% higher than the global average. Food intake is proportionately high in animal products, with a calorie and protein shares of 25% and 63% respectively, compared to global averages of 16% and 37%. North Americans consume copious amounts of vegetable oil and sweeteners, with calorie shares of 19% and 15% compared to the global averages of 10% and 7% respectively. The

North American diet has led to increasing problems of obesity and incidence of food related non-communicable diseases such as diabetes. However, despite this level of aggregate consumption, food insecurity is estimated to be experienced by 10-12% of the region's population.

North America (specifically the United States) is the largest bio-fuel producing region, with a production share of global output exceeding 40%, primarily consisting of ethanol derived from maize feedstocks, and to a much lesser extent, biodiesel derived from soybean oil. Production has nevertheless been largely policy driven, and with mandates largely filled at blending rates near the blend wall for transportation fuels, and in the context of oil price projections, the era of rapid growth in biofuel production appears to be over.

### ***Production***

Agricultural and fish production in the region is projected to expand slowly over the next ten years, with output rising by 7%, compared with a rise in the last decade of twice that rate. The general cause of slowing growth is low or sluggish real prices for the main crop and livestock commodities, strength in the US dollar relative to competitive countries, and trade policy which is seen to limit the growth in trade.

After declining in the last decade, land under crop production in the region is projected to fall a further 3.5% by 2029. Land use in cereal production is projected to remain largely unchanged at 38% of total crop use, while land use in oilseeds will fall 2% and that in other crops continue to fall over 10%. The largest gain is for pulses, which may enjoy a rise 6% after a large 80+% rise in the last decade. Total area harvested in the region is expected to remain stagnant, falling about 1% by 2029 compared to the base period. Total crop output in quantity terms will rise to 774 Mt, up 8% from the base period, will be met by yield improvement in the range of 9% for cereals to 11% for oilseeds.

With declining real prices and despite low feed costs, total meat production will rise to 55 Mt by 2029, up just 8.5% over the base of the last three years. Sheep-meat is expected to be the fastest growing meat sector, but from a very low base. The poultry sector will increase its dominance among meats, growing by 10%, to attain a production share in the region of 47% by 2029, as it takes advantage of low feed costs, and relatively firm demand. The bovine meat sector is expected to be the slowest growing subsector under weak domestic demand.

An increase in milk production of 9.5% will be achieved by growth in dairy cow milk yields of 9%, as dairy herds remain largely static, following the trends of recent years. Of the increase in milk production, an increasing share of milk will be allocated to processed dairy products, and less to fluid milk products where production is anticipated to fall over the outlook period following the lead of consumer preferences.

Fish production in North America, which is dominated by capture fish production (90%), is expected to remain flat over the outlook period as declines in capture fish production are offset by rapid gains in aquaculture (25%), as the latter sector continues to develop from a low base, encouraged by low feed prices and firm demand for fish.

Total GHG emissions from agriculture are expected to continue to grow at the rate of the previous decade, and will be 2.5% higher in 2029 than in the base period. Emissions from livestock activities show less growth given declining ruminant inventories. Emissions from the crop sector, however, are projected to increase almost 3% by 2029.

### ***Consumption***

Movements in food consumption on a per capita basis in the region will largely be determined by adjustments in preferences, which are projected to be minor. As measured by calorie availability, food consumption in North America is set to remain at high levels, but will decline marginally over the medium term by some 38kcal/capita per day to 3 725 kcal per day, as the trend declines in sweeteners (-48 kcal) and cereals (-24 kcal) offset the rise in animal products (13 kcal), vegetable oil (3 kcal) and products which

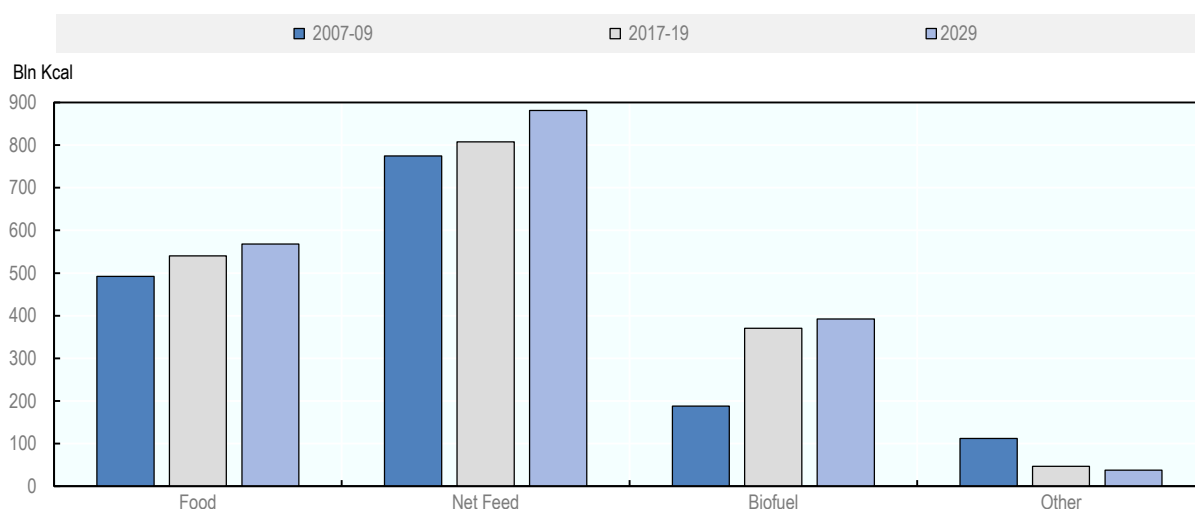
are not included in the *Outlook* such as fruits and vegetables. The projected decline in calorie availability is less pronounced in the United States (-29 kcal) than in Canada (-112 kcal), where the latter may see a larger fall in cereals and sweeteners and a fall in vegetable oils.

Protein intake in the region will remain flat at 113 g/day with the split between animal and vegetal sources remaining at 63%/37% respectively. In the meat sector, consumption is expected to rise further, increasing by 1.4 kg/capita per year due largely to higher poultry but lower bovine meat consumption. Lower intake of proteins from dairy products is anticipated, largely due to a decline in fresh dairy products which follows trend changes of the past decade. Fish consumption is projected to increase modestly. The trend decline in cereal consumption will modestly reduce protein availability from the major staples.

Feed use in the region is a significant user of agricultural output, consuming more energy/calories than final food use (Figure 2.23). Following livestock production, total feed use is projected to rise over 9% to 292 Mt by 2029, with shares from sources of maize (including distiller-dried grains) and protein meal rising slowly over time to 68% and 16% over the period.

Feedstocks used in biofuel production in the region use about 70% of energy/calories from agricultural output as are used in final food use. Ethanol production in the region is projected to reach 65.5 billion litres up almost 6% by 2029, as the prices and policies encourage biofuel use. Growth in biodiesel production is anticipated to remain flat. The outlook for biofuel is heavily contingent on developments in the energy sector, and biofuel policies in the region.

**Figure 2.23. Calories used in food, feed, biofuel and other use in North America**



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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## Trade

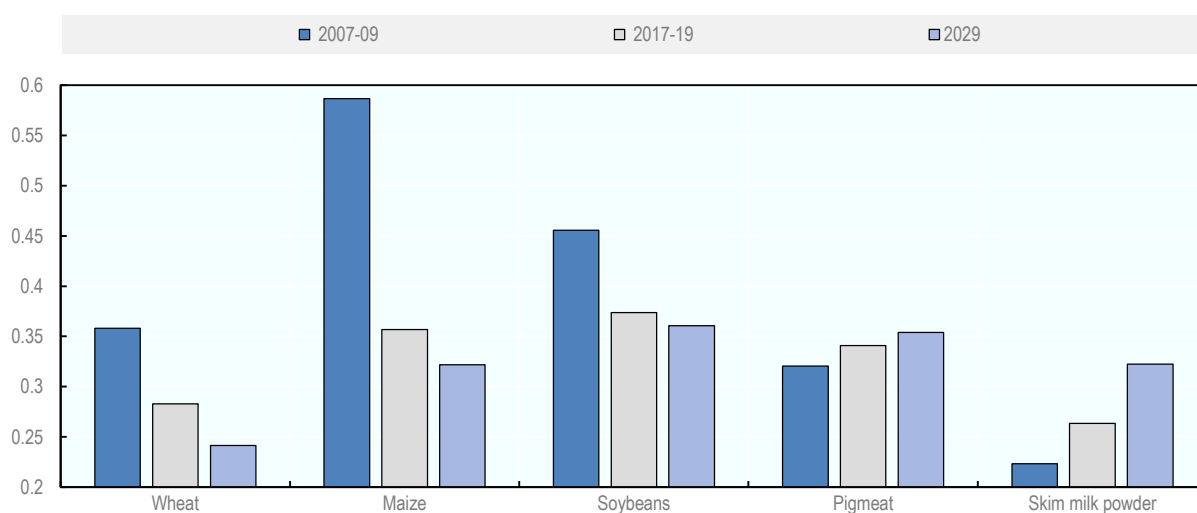
While the trade surplus grew over 30% in the last decade, the region's position as the largest net exporter globally was been overtaken by the LAC region and that is expected to prevail over the outlook period. Growth in net exports is projected to be only 14%. Both exports and imports will register slower growth. Reasons for slower growth relate to both weakening domestic and foreign demand, affected to some degree by a higher US dollar. Trade relations, particularly between the United States and China, will substantively affect the region as bilateral trade has been significant. Recent agreements between these two countries could set the basis for resumed and potentially expanded trade opportunities. The

United States-Mexico-Canada (USMCA) Agreement, replacing the North American Free Trade Agreement (NAFTA), will improve intra-regional trade, especially for certain dairy products.

The volume of exports, measured at international commodity prices in 2004-06, is projected to rise 11% compared to an increase in the last decade of 25%. Reasons for slower growth compared to the base period also relate to largely soybean exports which have not regained their peak before China imposed tariffs and to pigmeat where the rapid rise in the past decade will taper over the period. The region has lost considerable trade share in recent times for cereals and oilseeds, and this trend is anticipated to continue given higher competition from both the Latin America and Caribbean and from Central Asia regions (Figure 2.24). At the same time, rising shares for pigmeat and skim milk powder are expected to continue.

Relatively, the region is not a large importer of agricultural commodities covered in this *Outlook*, and much of that is intra-regional trade (which is not monitored in this *Outlook*). Imports are projected to slow, growing by only 4% to 2029. The region used to be a large net importer of bovine meat, and while it still has a large share of world imports (18%), the region became a net exporter in the last decade and this trend is expected to continue. The region remains a relatively large importer of fish, with a share on global markets of 14%, and imports are set to grow by 4% by 2029.

**Figure 2.24. Trends in export market shares of selected commodities of North America**



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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Figure 2.25. Change in area harvested and land use in North America

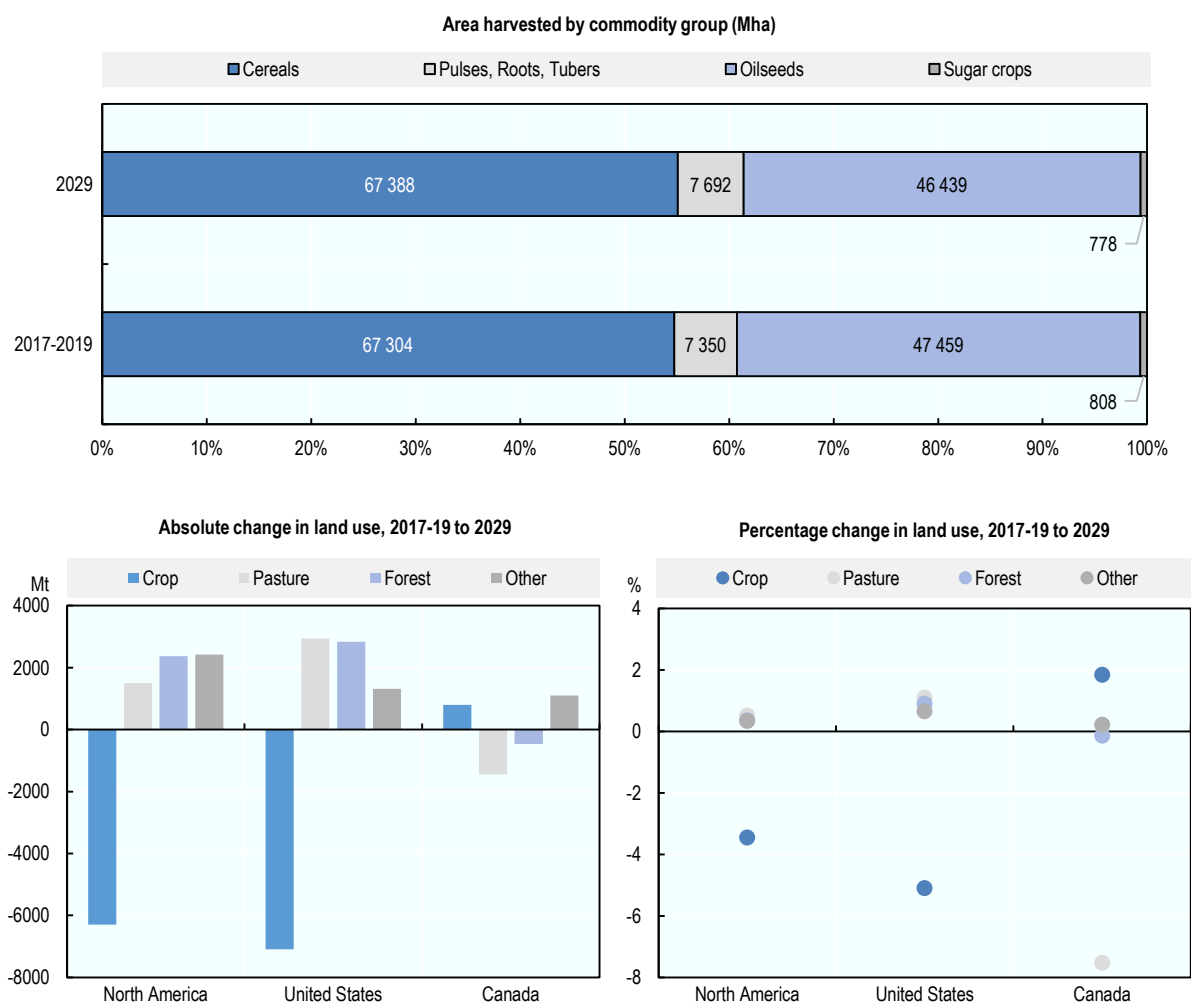
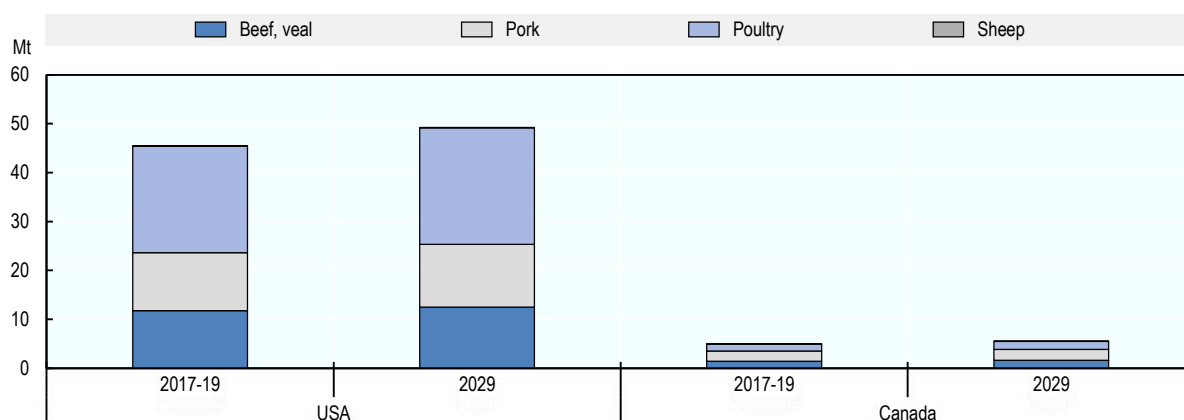
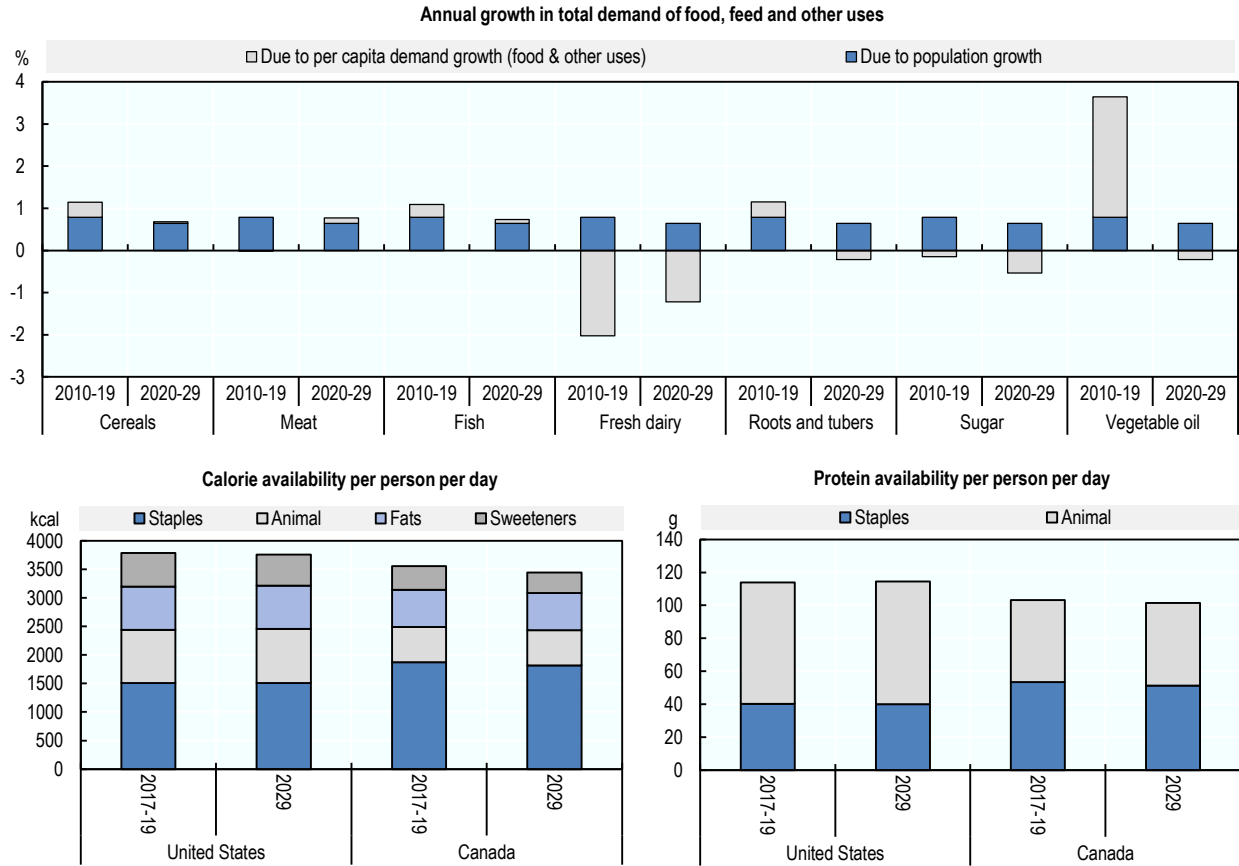


Figure 2.26. Livestock production in North America



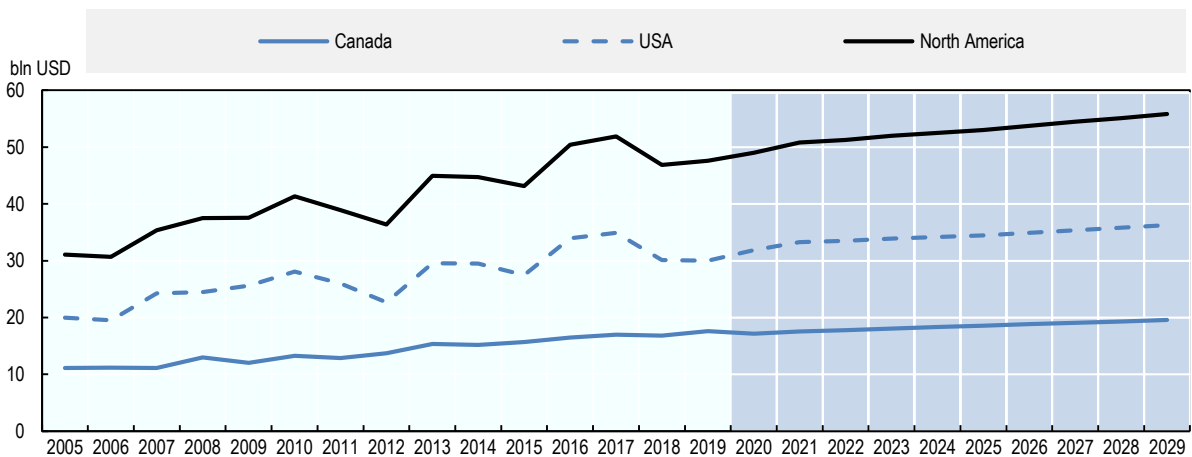
Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

Figure 2.27. Demand for key commodities and food availability in North America



Note: Upper panel - population growth is calculated by assuming per capita demand remains constant at the level of the year preceding the decade. Lower panel – Fats: butter and oils. Animal: egg, fish, meat and dairy except for butter. Staples: cereals, pulses and roots.

Figure 2.28. Agricultural trade balances in North America



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

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <https://doi.org/10.1787/888934141988>

Table 2.5. Regional indicators: North America

|                                                           | Average |                | 2029    | %     | Growth <sup>2</sup> |         |
|-----------------------------------------------------------|---------|----------------|---------|-------|---------------------|---------|
|                                                           | 2007-09 | 2017-19 (base) |         |       | Base to 2029        | 2010-19 |
| <b>Macro assumptions</b>                                  |         |                |         |       |                     |         |
| Population                                                | 336 806 | 364 155        | 388 334 | 6.64  | 0.73                | 0.58    |
| Per capita GDP <sup>1</sup> (kUSD PPP)                    | 49.06   | 54.97          | 66.69   | 21.32 | 1.73                | 1.76    |
| <b>Production (bln USD)</b>                               |         |                |         |       |                     |         |
| Net value of agricultural and fisheries <sup>3</sup>      | 247.2   | 281.0          | 302.7   | 7.74  | 1.49                | 0.61    |
| Net value of crop production <sup>3</sup>                 | 104.7   | 124.1          | 135.1   | 8.87  | 2.46                | 0.77    |
| Net value of other not incl. crop production <sup>3</sup> | 50.0    | 52.1           | 54.6    | 4.82  | 0.01                | 0.37    |
| Net value of livestock production <sup>3</sup>            | 80.0    | 91.7           | 99.3    | 8.23  | 1.31                | 0.52    |
| Net value of fish production <sup>3</sup>                 | 12.5    | 13.0           | 13.7    | 5.22  | 0.09                | 0.60    |
| <b>Quantity produced (kt)</b>                             |         |                |         |       |                     |         |
| Cereals                                                   | 461 061 | 489 325        | 532 605 | 8.84  | 1.73                | 0.61    |
| Pulses                                                    | 6 882   | 10 282         | 12 012  | 16.82 | 4.40                | 1.37    |
| Roots and tubers                                          | 5 095   | 5 498          | 5 687   | 3.45  | 1.18                | 0.20    |
| Oilseeds <sup>4</sup>                                     | 100 105 | 144 163        | 155 822 | 8.09  | 3.81                | 0.91    |
| Meat                                                      | 45 564  | 50 483         | 54 725  | 8.40  | 1.42                | 0.49    |
| Dairy <sup>5</sup>                                        | 8 836   | 10 100         | 11 290  | 11.79 | 1.24                | 1.05    |
| Fish                                                      | 6 098   | 6 349          | 6 680   | 5.22  | 0.08                | 0.59    |
| Sugar                                                     | 6 696   | 7 475          | 7 684   | 2.80  | 0.75                | 0.46    |
| Vegetable oil                                             | 12 855  | 17 876         | 18 818  | 5.27  | 3.62                | 0.64    |
| <b>Biofuel production (Mn L)</b>                          |         |                |         |       |                     |         |
| Biodiesel                                                 | 2 207   | 8 722          | 8 701   | -0.24 | 17.45               | -2.57   |
| Ethanol                                                   | 35 324  | 61 999         | 65 521  | 5.68  | 2.39                | 0.44    |
| <b>Land use (kha)</b>                                     |         |                |         |       |                     |         |
| Total agricultural land use                               | 476 639 | 467 356        | 462 559 | -1.03 | -0.15               | -0.09   |
| Total land use for crop production <sup>6</sup>           | 192 958 | 182 412        | 176 118 | -3.45 | -0.46               | -0.31   |
| Total pasture land use <sup>7</sup>                       | 283 680 | 284 944        | 286 441 | 0.53  | 0.05                | 0.05    |
| <b>Direct GHG Emissions (Mt CO<sub>2</sub>-eq)</b>        |         |                |         |       |                     |         |
| Total                                                     | 404     | 416            | 427     | 2.59  | 0.46                | 0.21    |
| Crop                                                      | 144     | 157            | 162     | 2.93  | 0.71                | 0.16    |
| Animal                                                    | 261     | 259            | 265     | 2.38  | 0.31                | 0.24    |
| <b>Demand and food security</b>                           |         |                |         |       |                     |         |
| Daily per capita caloric availability <sup>8</sup> (kcal) | 3 677   | 3 764          | 3 726   | -1.00 | 0.47                | -0.03   |
| Daily per capita protein availability <sup>8</sup> (g)    | 74      | 81             | 85      | 5.36  | 0.92                | 0.54    |
| <b>Per capita food availability (kg)</b>                  |         |                |         |       |                     |         |
| Staples <sup>9</sup>                                      | 142.4   | 140.7          | 136.5   | -2.95 | -0.05               | -0.24   |
| Meat                                                      | 95.8    | 96.5           | 97.8    | 1.44  | 0.84                | -0.01   |
| Dairy <sup>5</sup>                                        | 23.8    | 24.3           | 24.4    | 0.55  | 0.25                | 0.08    |
| Fish                                                      | 22.2    | 22.4           | 22.8    | 1.61  | 0.47                | 0.22    |
| Sugar                                                     | 31.4    | 31.0           | 29.4    | -5.17 | -0.76               | -0.38   |
| Vegetable oil                                             | 34.4    | 39.2           | 39.0    | -0.56 | 1.20                | 0.60    |
| <b>Trade (bln USD)</b>                                    |         |                |         |       |                     |         |
| Net trade <sup>3</sup>                                    | 36.8    | 48.8           | 55.8    | 14.39 | 2.87                | 1.31    |
| Net value of exports <sup>3</sup>                         | 61.6    | 76.8           | 84.9    | 10.56 | 2.41                | 0.99    |
| Net value of imports <sup>3</sup>                         | 24.8    | 28.0           | 29.1    | 3.89  | 1.67                | 0.39    |

|                                            | Average |                | 2029  | %     | Growth <sup>2</sup> |         |
|--------------------------------------------|---------|----------------|-------|-------|---------------------|---------|
|                                            | 2007-09 | 2017-19 (base) |       |       | Base to 2029        | 2010-19 |
| <b>Self-sufficiency ratio<sup>10</sup></b> |         |                |       |       |                     |         |
| Cereals                                    | 129.6   | 128.2          | 128.1 | -0.09 | 0.15                | 0.09    |
| Meat                                       | 112.5   | 115.2          | 115.8 | 0.52  | -0.09               | -0.07   |
| Sugar                                      | 63.4    | 66.3           | 67.4  | 1.57  | 1.15                | 0.26    |
| Vegetable oil                              | 99.8    | 98.5           | 98.5  | -0.05 | -0.45               | 0.41    |

Notes: 1. Per capita GDP expressed in thousands of real USD. 2. Least square growth rates (see glossary). 3. Net value of agricultural and fisheries output follows FAOSTAT methodology, based on the set of commodities represented in the Aglink-Cosimo model valued at average international reference prices for 2004-06. Projections for not included crops have been made on the basis of longer term trends. 4. Oilseeds represents soybeans and other oilseeds. 5. Dairy includes butter, cheese, milk powders and fresh dairy products, expressed in milk solid equivalent units. 6. Crop Land use area accounts for multiple harvests of arable crops. 7. Pasture land use represents land available for grazing by ruminant animals. 8. Daily per capita calories represent availability, not intake. 9. Staples represents cereals, oilseeds, pulses, roots and tubers. 10. Self-sufficiency ratio calculated as Production / (Production + Imports - Exports).

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database),

<http://dx.doi.org/10.1787/agr-outl-data-en>.

## 2.7. Regional outlook: Latin America and the Caribbean

### **Background**

Latin America and the Caribbean<sup>10</sup> region comprise about 8.5% of the global population and will add another 60 million people by 2029. Its urban population will grow by 66 million people, pushing the rate of urbanisation to 83%, which is the highest among developing regions. Most of the region's poor dwell in urban locations. The region's farm structures are highly diverse: large, commercial export-oriented farms dominate agriculture in the Southern Cone, particularly in Argentina and Brazil, but there are also some 15 million smallholder and family farms responsible for much of the region's food production.

Considerable economic uncertainty has impacted the region. Per capita incomes grew only at a rate of 0.1% in the last decade, with exchange rate volatility, particularly in Argentina. Incomes in the region are assumed to resume growth at 1.8% p.a. to an average of USD 12 000 per capita. The average share of food in household expenditures is estimated to be around 15% in 2017-19, implying considerable impacts of macro instability and food prices on welfare.<sup>11</sup>

Abundant in land and water, the region accounts for 13% of global production of agricultural and fish commodities and 25% of exports of such products, underscoring the importance to the region of trade openness at a global level. Export demand will therefore be the critical source of growth for the sector over the medium term.

Despite the importance of exports, the primary agriculture and fish sectors now play a modest role in the economy accounting for about 5% of Gross Domestic Product. As for other regions, this share is anticipated to decline further over the medium term.

### **Production**

Agricultural and fish production in the Latin America and Caribbean region is projected to expand by 14% over the next ten years. Almost two thirds of this growth (65%) can be attributed to growth in crop production, about 28% is due to the livestock sector, and the remaining 7% originates from the expansion of fish output.

Intensive growth will be important to crop production expansion. Cropland use is projected to grow by 3% while crop area harvested will grow by 6%, due to an increase in multiple harvests per year. Total area harvested in the region will increase by 9 Mha, with nearly 54% and 19% coming from higher soybean from maize cultivation respectively. The region will remain the largest producer of soybeans with its global production share rising to over 54% by 2029. Average yields are expected to rise over the next ten years, and will account for most output growth in cereals, pulses, roots and tubers and sugarcane. Increased yields will account for 75% of the increase in production of maize, and over 50% for soybeans.

Livestock production growth will be based largely on intensive growth, with higher use of feed grains in production. Pasture area is expected to decline marginally by 2029, with the regions share of global pasture remaining at 17%. Bovine meat expansion will follow rising bovine numbers in Brazil and Argentina, as the herd expansion cycle is projected to remain strong. Low feed grain prices will support poultry and pork production, given feed-intensive production processes.

Fish production will recover from a contraction over the past ten years, with more than half of output growth attributable to the development of aquaculture in several countries across the region. Consumption of fish will also rise by 0.8 kg/capita, but at a slower pace than historical trends.

GHG emissions are projected to grow marginally by 4% p.a. over the next decade with an increase of 5% from animal sources. Emissions from crop sources are expected to remain unchanged by 2029.

### ***Consumption***

Per capita calorie intake is projected to rise to 3100 kcal/day, a rise of 78 kcal/day from the base period 2017-19, with over 60% of the increase coming from vegetal products, including cereals and vegetable oil. Calorie intake of sugar will decline following a longer-term decline in the region's sugar consumption. But the region will remain the largest consumers of sugar in the world, with an intake of 39 kg/capita per year, well above the global average of 24 kg/capita per year. Initiatives across the region have sought to address the rising prevalence of overweight and obesity.

Per capita protein intake may rise to 87 g/day, an increase over the period of 2.8 g/day. Almost 60% of the increase will come from animal products, with the largest increase due to higher consumption of milk products. For its middle-income profile, the region is a large meat consumer at almost 60 kg/yr, which is almost double world levels. However, per capita meat consumption is projected to rise by only 2.4% over the next decade, as consumers increase their intake of protein from other sources.

Increasing intensification of the livestock sector is expected to lead to a 35% increase in feed use over the period. Most of that increase will come from maize, whose feed use will expand by almost 50%, but protein meal is also projected to expand by 35%.

A high share of sugarcane production will continue to be directed to ethanol production, consuming up to 58% of sugarcane production as the Renovabio program in Brazil is expected to sustain the country's major role in ethanol markets. Ethanol production will expand by 8.3 bln L, accounting for 45% of global growth over the next ten years. A major uncertainty facing the sector will be how global energy markets evolve.

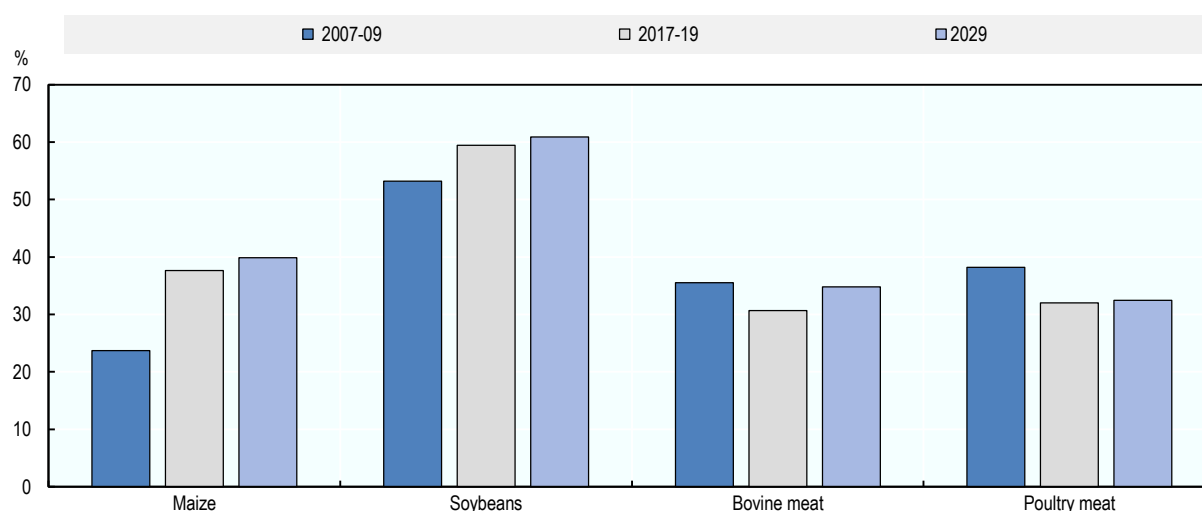
## Trade

Trade is key to the success of the agriculture and fish sectors, with the share of output traded increasing each year – reaching over 28% by 2029 for these sectors. For the two main exporters, Argentina's share of output exported may rise to 52% and that of Brazil's to 34%. Paraguay's share of output exported will be higher at almost 70%. However, many countries in the region are net importers of the commodities covered in this *Outlook*, such as Mexico and Peru.<sup>12</sup> These data do not include fruit and vegetable trade, and countries such as Costa Rica and Ecuador export a large share of their fruit and vegetable production.

The region's expansion in supplies will allow it to remain an important global exporter of maize, soybean, beef, poultry and sugar. The market shares of the region for key commodities will rise over the medium term. By 2029, the region will account for 60% of global soybean and protein meal exports, 40% of global maize exports, 39% of sugar exports and 35% of bovine meat and poultry meat exports.

The status of global openness to trade will have important consequences for the sector. Trade agreements, and in particular trade relations between China and the United States, will play an important role in affecting the region's trade profile. A finalised EU-Mercosur Free Trade Agreement would support further growth in the agriculture and fish sectors of the region.

**Figure 2.29. Trends in export shares of the Latin America and the Caribbean**



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <https://doi.org/10.1787/888934142007>

Figure 2.30. Change in area harvested and land use in Latin America and the Caribbean

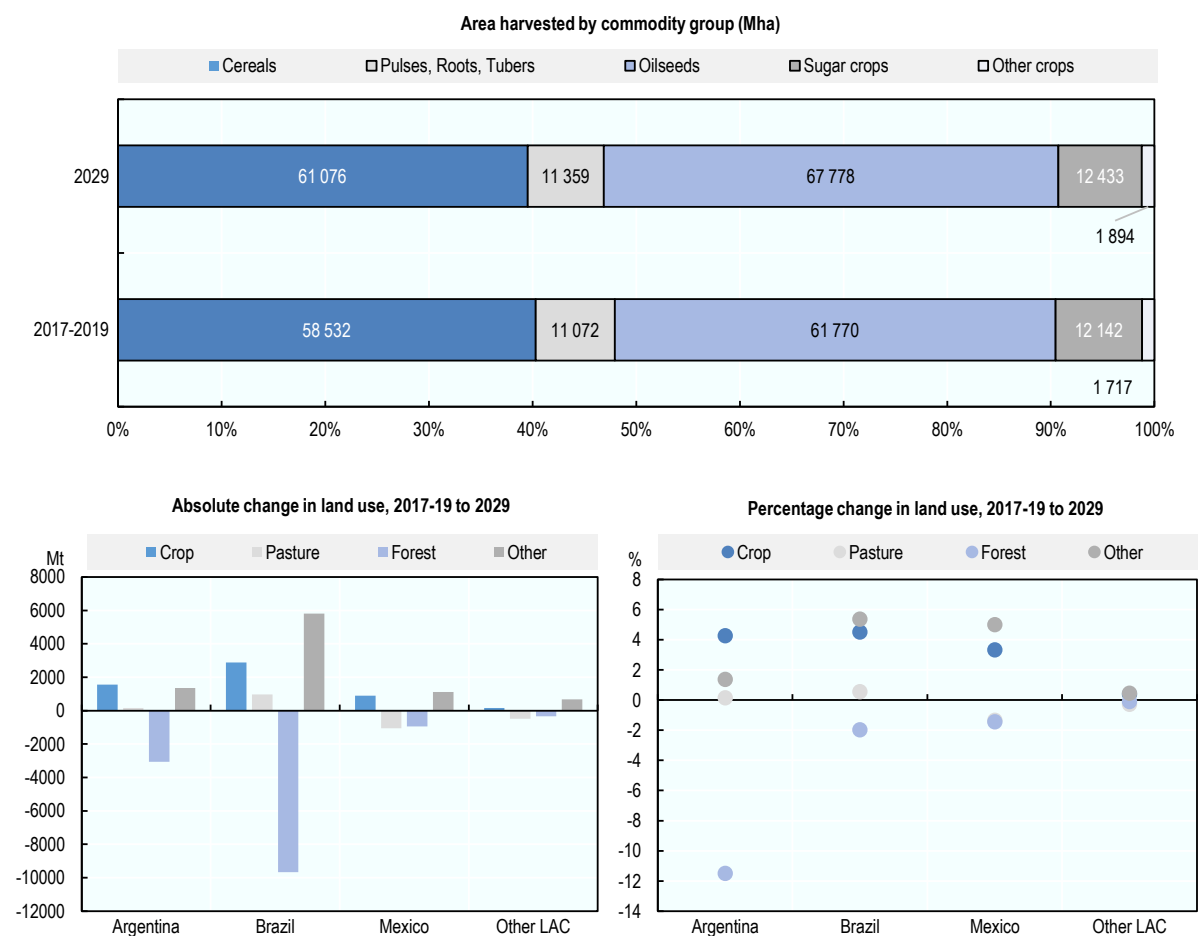
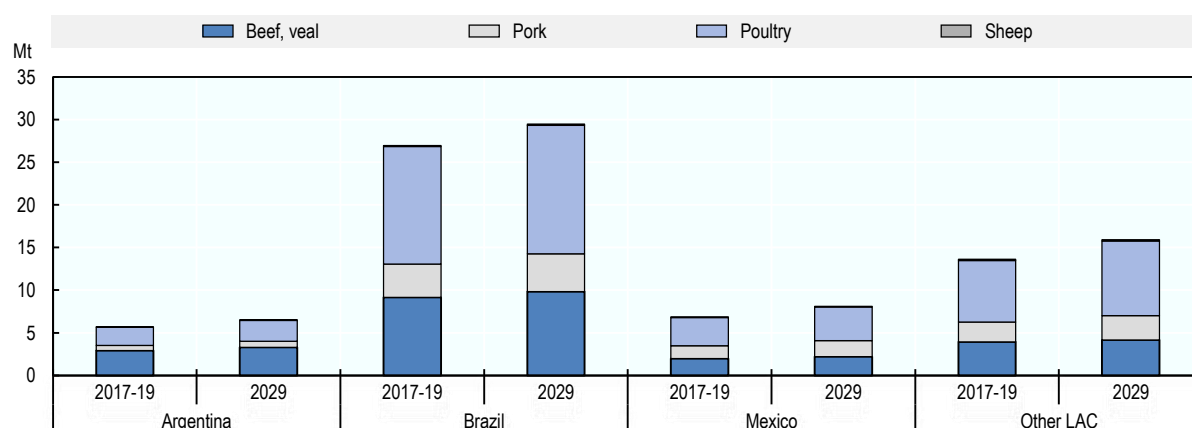
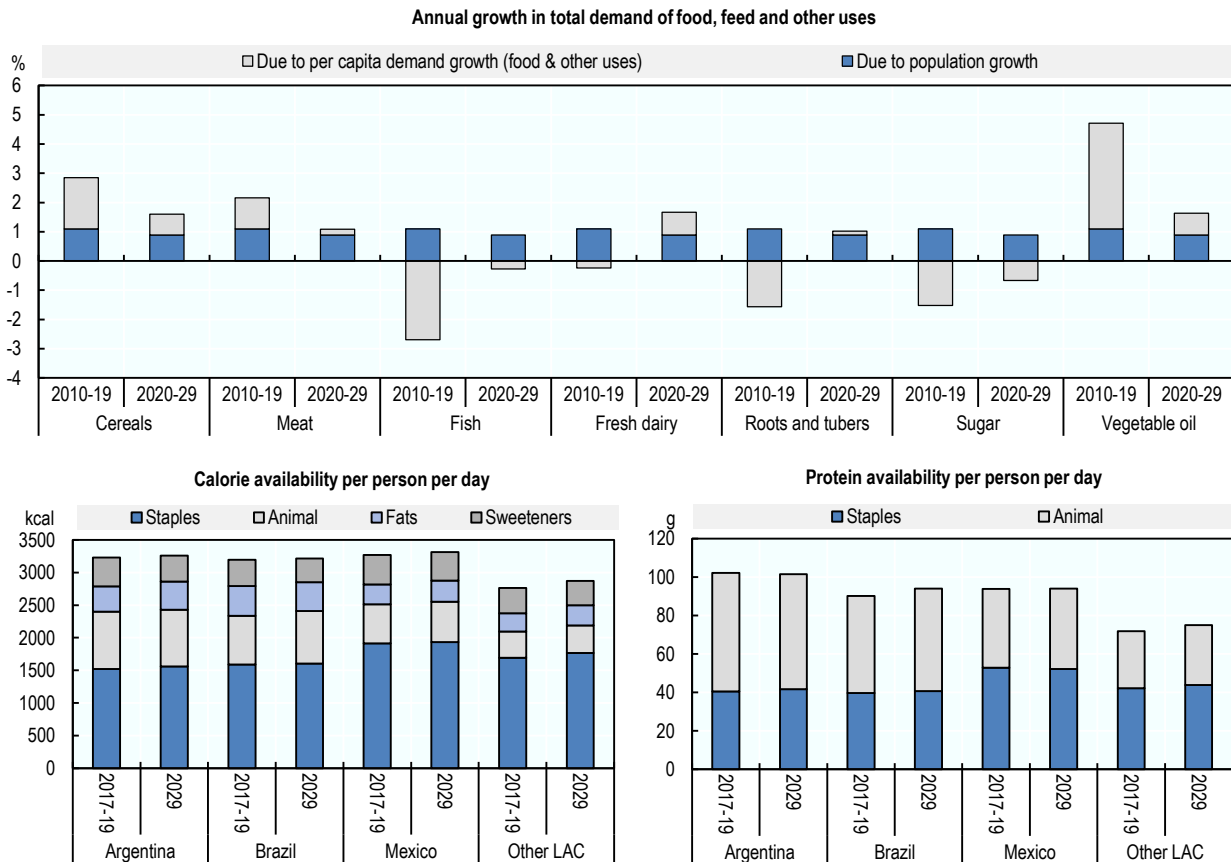


Figure 2.31. Livestock production in Latin America and the Caribbean



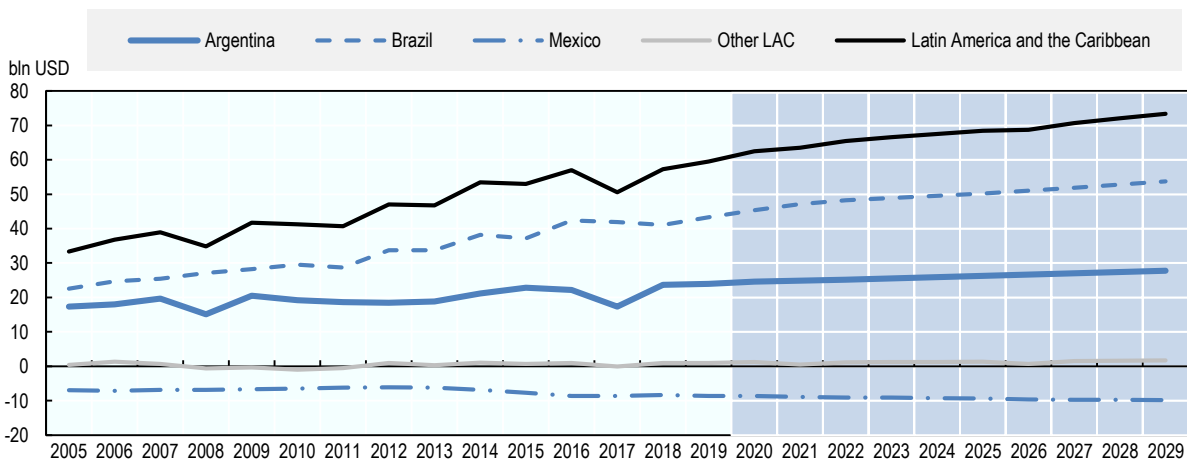
Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

Figure 2.32. Demand for key commodities and food availability in Latin America and the Caribbean



Note: Upper panel - population growth is calculated by assuming per capita demand remains constant at the level of the year preceding the decade. Lower panel – Fats: butter and oils. Animal: egg, fish, meat and dairy except for butter. Staples: cereals, pulses and roots.

Figure 2.33. Agricultural trade balances in Latin America and the Caribbean



Note: Net trade (exports minus imports) of commodities covered in the *OECD-FAO Agricultural Outlook*, measured at constant 2004-06 USD. Source: OECD/FAO (2020), “OECD-FAO Agricultural Outlook”, OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <https://doi.org/10.1787/888934142026>



Table 2.6. Regional Indicators: Latin America and Caribbean Region

|                                                           | Average |                | 2029    | %     | Growth <sup>2</sup> |         |
|-----------------------------------------------------------|---------|----------------|---------|-------|---------------------|---------|
|                                                           | 2007-09 | 2017-19 (base) |         |       | Base to 2029        | 2010-19 |
| <b>Macro assumptions</b>                                  |         |                |         |       |                     |         |
| Population                                                | 577 518 | 643 959        | 703 584 | 9.26  | 1.06                | 0.78    |
| Per capita GDP <sup>1</sup> (kUSD PPP)                    | 9.59    | 10.25          | 12.15   | 18.50 | 0.09                | 1.81    |
| <b>Production (bln USD)</b>                               |         |                |         |       |                     |         |
| Net value of agricultural and fisheries <sup>3</sup>      | 303.6   | 352.8          | 401.8   | 13.88 | 1.38                | 1.17    |
| Net value of crop production <sup>3</sup>                 | 95.8    | 131.7          | 157.4   | 19.53 | 3.17                | 1.44    |
| Net value of other not incl. crop production <sup>3</sup> | 74.7    | 80.5           | 88.7    | 10.16 | -0.19               | 1.09    |
| Net value of livestock production <sup>3</sup>            | 96.1    | 108.6          | 121.5   | 11.82 | 1.12                | 0.97    |
| Net value of fish production <sup>3</sup>                 | 37.0    | 32.0           | 34.2    | 7.01  | -0.21               | 0.89    |
| <b>Quantity produced (kt)</b>                             |         |                |         |       |                     |         |
| Cereals                                                   | 171 881 | 253 450        | 308 351 | 21.66 | 3.57                | 1.62    |
| Pulses                                                    | 6 752   | 8 028          | 8 818   | 9.85  | 2.61                | 1.18    |
| Roots and tubers                                          | 14 842  | 14 015         | 15 545  | 10.92 | -0.51               | 1.00    |
| Oilseeds <sup>4</sup>                                     | 123 817 | 189 096        | 230 364 | 21.82 | 4.35                | 1.47    |
| Meat                                                      | 44 022  | 53 135         | 59 999  | 12.92 | 1.54                | 1.01    |
| Dairy <sup>5</sup>                                        | 7 156   | 7 959          | 9 582   | 20.39 | 0.10                | 1.76    |
| Fish                                                      | 17 952  | 15 529         | 16 623  | 7.05  | -0.21               | 0.89    |
| Sugar                                                     | 53 213  | 51 207         | 61 329  | 19.77 | -1.00               | 0.96    |
| Vegetable oil                                             | 19 210  | 27 446         | 33 536  | 22.19 | 3.32                | 1.77    |
| <b>Biofuel production (Mn L)</b>                          |         |                |         |       |                     |         |
| Biodiesel                                                 | 1 937   | 8 686          | 10 586  | 21.88 | 6.53                | 1.84    |
| Ethanol                                                   | 27 513  | 37 163         | 44 767  | 20.46 | 4.21                | 1.29    |
| <b>Land use (kha)</b>                                     |         |                |         |       |                     |         |
| Total agricultural land use                               | 694 485 | 706 480        | 711 534 | 0.72  | 0.15                | 0.06    |
| Total land use for crop production <sup>6</sup>           | 159 766 | 167 231        | 172 708 | 3.27  | 0.40                | 0.25    |
| Total pasture land use <sup>7</sup>                       | 534 719 | 539 249        | 538 827 | -0.08 | 0.07                | 0.00    |
| <b>GHG emissions (Mt CO2-eq)</b>                          |         |                |         |       |                     |         |
| Total                                                     | 885     | 922            | 962     | 4.32  | 0.29                | 0.30    |
| Crop                                                      | 109     | 129            | 130     | 0.15  | 0.64                | 0.27    |
| Animal                                                    | 775     | 792            | 832     | 5.00  | 0.23                | 0.30    |
| <b>Demand and food security</b>                           |         |                |         |       |                     |         |
| Daily per capita caloric availability <sup>8</sup> (kcal) | 2 918   | 3 035          | 3 096   | 2.01  | 0.34                | 0.22    |
| Daily per capita protein availability <sup>8</sup> (g)    | 84      | 85             | 85      | 0.84  | -0.32               | 0.10    |
| <b>Per capita food availability (kg)</b>                  |         |                |         |       |                     |         |
| Staples <sup>9</sup>                                      | 162.5   | 166.1          | 170.0   | 2.33  | 0.21                | 0.17    |
| Meat                                                      | 53.9    | 60.8           | 62.2    | 2.29  | 0.69                | 0.22    |
| Dairy <sup>5</sup>                                        | 12.8    | 12.8           | 13.9    | 8.38  | -0.71               | 0.96    |
| Fish                                                      | 9.6     | 10.6           | 11.4    | 6.97  | 1.33                | 0.63    |
| Sugar                                                     | 45.8    | 39.4           | 36.9    | -6.40 | -1.75               | -0.52   |
| Vegetable oil                                             | 17.7    | 19.2           | 20.2    | 5.22  | 0.57                | 0.48    |
| <b>Trade (bln USD)</b>                                    |         |                |         |       |                     |         |
| Net trade <sup>3</sup>                                    | 38.5    | 55.8           | 73.3    | 31.44 | 4.12                | 1.72    |
| Net value of exports <sup>3</sup>                         | 64.6    | 91.9           | 112.8   | 22.75 | 3.76                | 1.47    |
| Net value of imports <sup>3</sup>                         | 26.1    | 36.1           | 39.4    | 9.31  | 3.21                | 1.02    |

|                                            | Average |                | 2029  | %     | Growth <sup>2</sup> |         |
|--------------------------------------------|---------|----------------|-------|-------|---------------------|---------|
|                                            | 2007-09 | 2017-19 (base) |       |       | Base to 2029        | 2010-19 |
| <b>Self-sufficiency ratio<sup>10</sup></b> |         |                |       |       |                     |         |
| Cereals                                    | 94.0    | 105.7          | 109.0 | 3.13  | 0.79                | 0.28    |
| Meat                                       | 112.2   | 109.4          | 110.8 | 1.32  | -0.14               | 0.01    |
| Sugar                                      | 203.5   | 205.4          | 235.1 | 14.47 | -0.19               | 0.60    |
| Vegetable oil                              | 146.5   | 132.0          | 137.1 | 3.88  | 0.54                | 0.30    |

Notes: 1. Per capita GDP expressed in thousands of real USD. 2. Least square growth rates (see glossary). 3. Net value of agricultural and fisheries output follows FAOSTAT methodology, based on the set of commodities represented in the Aglink-Cosimo model valued at average international reference prices for 2004-06. Projections for not included crops have been made on the basis of longer term trends. 4. Oilseeds represents soybeans and other oilseeds. 5. Dairy includes butter, cheese, milk powders and fresh dairy products, expressed in milk solid equivalent units. 6. Crop Land use area accounts for multiple harvests of arable crops. 7. Pasture land use represents land available for grazing by ruminant animals. 8. Daily per capita calories represent availability, not intake. 9. Staples represents cereals, oilseeds, pulses, roots and tubers. 10. Self-sufficiency ratio calculated as Production / (Production + Imports - Exports).

Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database),

<http://dx.doi.org/10.1787/agr-outl-data-en>.

## Notes

<sup>1</sup> Southeast Asia: Indonesia, Malaysia, Philippines, Thailand and Viet Nam. Other: Pakistan, Oceania and Other Developing Asia. Least Developed: Asia Least Developed. Developed: Australia, Japan, New Zealand, Korea. For mentioned regions, see Summary table for regional grouping of countries.

<sup>2</sup> Source is the 2011 database for the Global Trade Analysis Project (GTAP). Interpolation has been applied using expenditure data and GDP data for the region.

<sup>3</sup> For mentioned regions, see Summary table for regional grouping of countries.

<sup>4</sup> More detailed regional information may be found in *OECD-FAO Agricultural Outlook 2016-25*.

<sup>5</sup> Source OECD-FAO interpolated for 2017-19 from the database of the Global Trade Analysis Project (GTAP) 2011, using food expenditure and GDP data used in this *Outlook*.

<sup>6</sup> Middle East: Saudi Arabia and Other Western Asia. Least Developed: North Africa Least Developed. North Africa: Other North Africa. For mentioned regions, see Summary table for regional grouping of countries.

<sup>7</sup> Source OECD-FAO interpolated for 2017-19 from the database of the Global Trade Analysis Project (GTAP) 2011, using food expenditure and GDP data used in this *Outlook*.

<sup>8</sup> For mentioned regions, see Summary table for regional grouping of countries.

<sup>9</sup> These share data are extrapolated from Global Trade Analysis Project database, 2011, using food expenditure and GDP data from the *Outlook* database.

<sup>10</sup> Other LAC: Chile, Colombia, Paraguay, Peru and South and Central America and the Caribbean. For mentioned regions, see Summary table for regional grouping of countries.

<sup>11</sup> This estimate is made based on the GTAP (2011) database, using estimates for food expenditures and GDP.

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<sup>12</sup> This analysis is based on USD constant 2004-06 international reference prices for commodities. The data include values for commodities covered in the *Outlook*.