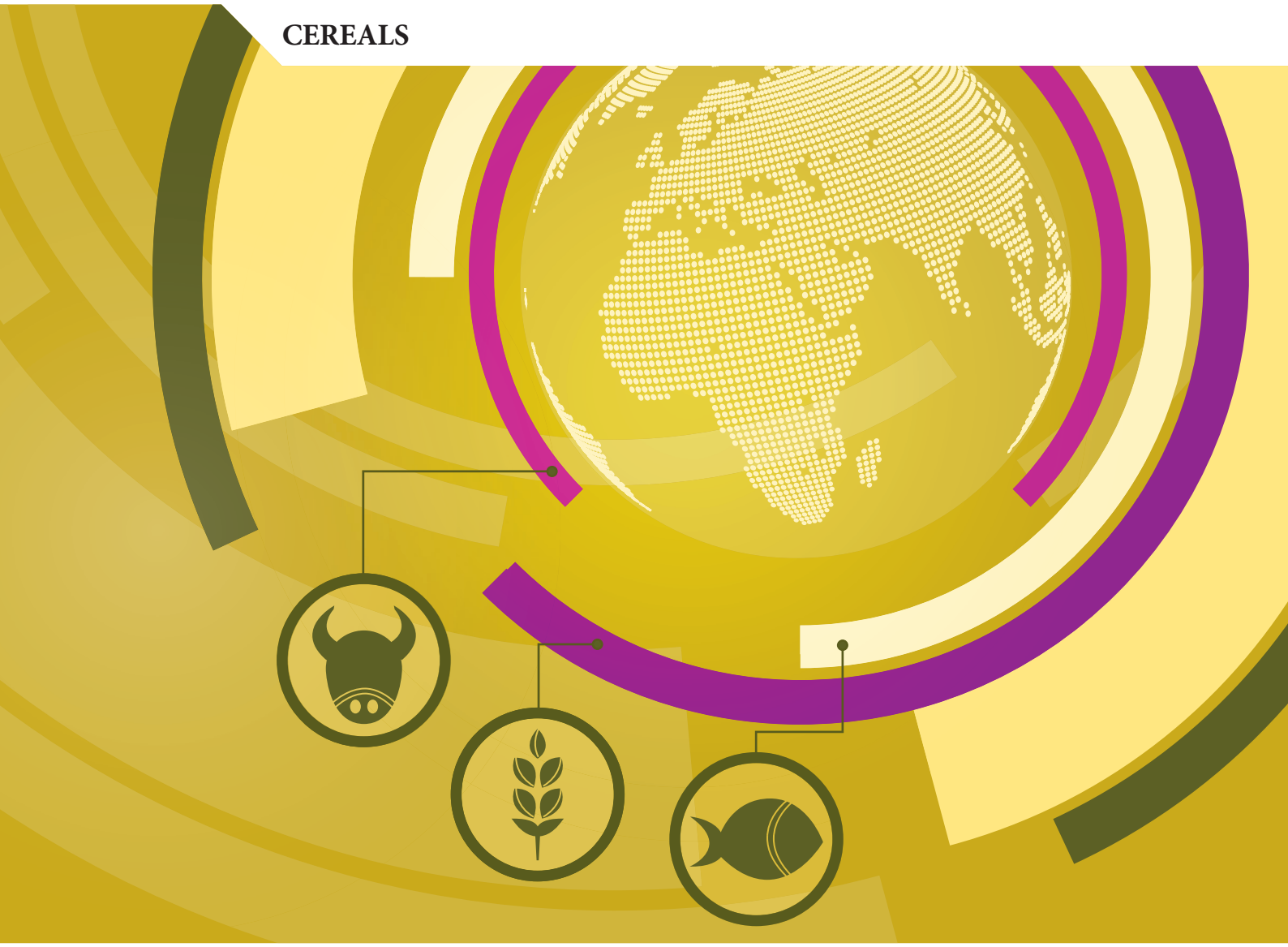
OECD-FAO Agricultural Outlook 2018-2027

CEREALS



OECD

Food and Agriculture Organization of the United Nations

Chapter 3. Cereals

This chapter describes the market situation and highlights the latest set of quantitative medium-term projections for world and national cereals markets for the ten-year period 2018-27. Global cereal production is projected to expand by 13% by 2027, accounted for in large part by higher yields. For maize and wheat, the Russian Federation is emerging as a major player on international markets, having surpassed the European Union in 2016 to become the top wheat exporter. For maize, market shares will increase for Brazil, Argentina and the Russian Federation while declining for the United States. Thailand, India, and Viet Nam are expected to remain the major suppliers on international rice markets, while Cambodia and Myanmar are projected to capture a greater share of the global export market. Over the projection period, prices are expected to increase slightly in nominal terms but decline modestly in real terms.

Market situation

Global supplies of major cereals have exceeded overall demand in recent years, leading to a significant build-up of inventories and much lower prices in international markets as compared to the previous decade. World production of cereals reached a new high in 2017, exceeding the previous peak in 2016. Maize output increased the most, reaching a record in 2017, driven largely by higher production in several major exporting countries. Wheat output was high but slightly below the record set in 2016, and other coarse grain output declined in 2017 due mainly to lower barley production in Australia and lower sorghum and barley production in the United States. Rice output overtook the previous year's record due to continued growth in Asia and a recovery in Latin American production. Given years in which growing cereals production has outpaced demand growth, leading to ample supplies and stocks, international nominal prices in the near term are expected to rise only moderately with support from stable demand and rising oilseed prices. However, in real terms prices will decline over the next ten years.

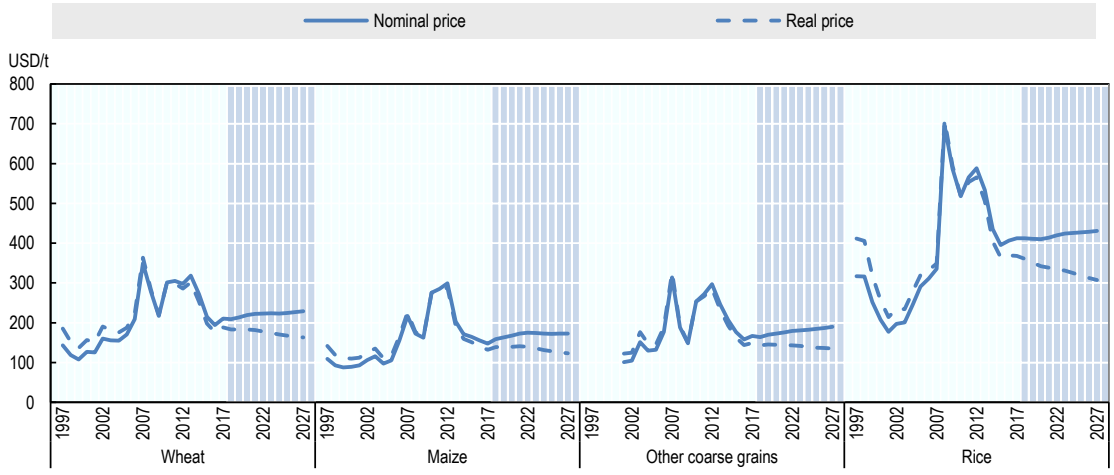
Projection highlights

Prices for cereals, except for maize, reversed the downward trend that started a few years earlier and climbed modestly in 2017. Maize prices, however, fell in 2017 pressured by high stocks. The low prices for all cereals registered during the base period (2015-2017) are likely to give way to higher prices in the near term supported by higher oilseed prices although the gain is expected to be limited because of continued large stocks and slower growth in food and feed demand compared to the previous decade. In the medium term, however, cereal prices are projected to increase in nominal terms, but to decline slightly in real terms.

Global cereal production is projected to expand by 13% between the base period and 2027, mainly owing to higher yields. Production of wheat is projected to increase from 750 Mt in the base period to 833 Mt in 2027, with most of the growth in India (20 Mt), followed by the European Union (12 Mt), the Russian Federation (10 Mt), Pakistan (6 Mt) and Turkey (5 Mt). Maize production is expected to rise by 161 Mt to 1.2 bln t, led by the People's Republic of China (hereafter "China") (31 Mt), Brazil (24 Mt) and the United States (22 Mt). Production of other coarse grains is projected to increase by 29 Mt to 327 Mt by 2027, with the largest increases in Ethiopia (5 Mt) and the European Union (4 Mt). Rice production is projected to increase by 64 Mt to 562 Mt, with 84% of this increase in Asian countries, led by India (20 Mt), Indonesia (8 Mt) Thailand (7 Mt) and Viet Nam (4 Mt). Producers in the Least Developed Countries (LDC) Asian region, which include Bangladesh, Myanmar and Cambodia, will increase rice production by 7 Mt by 2027.

Global cereal use is projected to increase by 14% between the base period and 2027, mainly owing to higher food and feed use in developing countries. Wheat consumption is expected to increase by 13% compared to the base period, and continues to be largely used for human consumption, with food use accounting for about two-thirds of total use throughout the projection period. The use of wheat for animal feed is projected to increase, mostly in China, the Russian Federation and the EU28, while use of wheat for biofuels is projected to account for only 2% of global use in 2027.

Figure 3.1. World cereal prices



Note: Wheat: US wheat No.2 Hard Red Winter (fob), maize: US GULF Maize, No.2 Yellow (fob), other coarse grains: barley (feed Rouen), rice: Thailand, 100% B, 2nd grade
Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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Maize consumption is expected to increase by 16% by 2027, with maize used for animal feed increasing its overall share of total use from 56% in the base period to 58% in 2027, largely due fast expanding livestock sectors in developing countries. Maize for human consumption will increase mainly in developing countries, especially those in Sub-Saharan Africa where populations are growing rapidly and white maize is an important staple for several countries. The use of other coarse grains is also set to grow, increasing 11% with higher feed demand (+17 Mt) followed by food demand (+15 Mt). The expansion of food use mainly comes from African countries, while China has the highest expansion for feed.

Direct human consumption remains the main end-use of rice, a major staple food in parts of Asia, West Africa, Latin America and the Caribbean. Total rice consumption is projected to rise by 13% by 2027. Asian countries account for over 70% of the projected increase in global consumption, largely due to population growth rather than per capita gains. African countries account for 23% of the increase, with income growth and urbanization driving demand.

World trade of cereals is projected to reach 459 Mt by 2027, up 55 Mt from the base period. The share of global wheat production that is traded is expected to reach 24% by 2027, compared with 13% for maize and 15% for other coarse grains. For maize and wheat, the Russian Federation has started to play a major role on international markets over the past few years. It was the fifth largest exporter of wheat on average over the past decade, surpassed the European Union in 2016 to become the top exporter, and is expected to account for 20% of global exports in 2027. For maize, market shares will increase for Brazil, Argentina, Ukraine, and the Russian Federation while declining for the United States. Developed countries are expected to continue to be the main exporters of coarse grains, while rice is mostly traded among developing countries. The global suppliers on international rice markets are expected to remain the same, principally

Thailand, India and Viet Nam, while Cambodia and Myanmar are projected to expand exports over the next decade and capture a greater share of the global export market.

Compared to the previous decade, the anticipated lower absolute cereal prices through the projection period will impact producers' planting decisions and hence supply responses. Prices relative to other crops, such as oilseeds, are also an important factor, and although higher oilseed prices will support cereal prices, the continued lower cereal prices relative to these crops might lead to stronger reallocation towards non-cereals. On the demand side, developments in the fastest growing economies will have profound implications for trade. Changes in China's demand as well as its overall level of domestic supplies and associated changes in stocks are among the main uncertainties during the projection period.

Prices

The world wheat price, as measured by the benchmark US wheat No. 2 Hard Red Winter (fob), is expected to increase to USD 211/t in the 2017 marketing year, reversing the downward trend that started in 2014. With low but increasing oil prices, average harvest expectations and moderate growth in exports and food use, wheat prices are projected to increase to USD 229/t by 2027. In real terms, however, prices are expected to decline over the ten-year period.

The world maize price, as measured by the benchmark US maize No. 2 Yellow (fob), is projected to average USD 148/t in the 2017 marketing year, continuing the downward trend that started in 2013. Despite sustained high stock levels, the strength of global feed grain demand and oilseed prices will support higher maize prices and moderate growth until 2027. While nominal prices are expected to reach USD 173/t by 2027, prices in real terms will stabilise over the next few years before declining in 2022 and over the rest of the projection period.

The world price for rice (milled, 100% B, fob Bangkok) increased to USD 412/t in the 2017 marketing year, the highest level since 2014. With large global supplies, the rice price is projected to remain flat in the short term, but then recover to reach USD 431/t by 2027 with growing demand from countries in Asia, Africa and the Middle East. Despite this projected increase, prices in real terms are expected to modestly decline over the ten-year horizon.

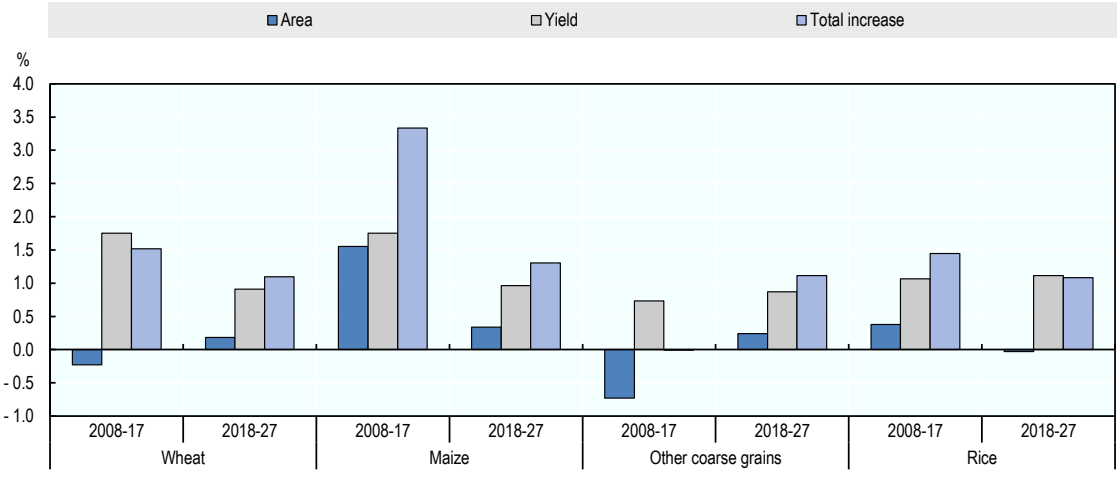
The world market price for other coarse grains, as measured by the price for feed barley (fob. Rouen), is expected to increase to USD 167/t in the 2017 marketing year, reversing a downward trend that started in 2013. By 2027, the world market price for other coarse grains is set to increase to USD 189/t, sustained by growing import demand from China and Saudi Arabia. In real terms, prices are expected to decline slightly by 2027.

Production

Global area harvested to cereals is expected to grow by 17.6 Mha between the base period (2015-17) and 2027, implying weaker growth than the increase in overall harvested crop land. Harvested area in developed countries is expected to slightly decline (-0.4 Mha) as increased wheat area harvested is offset by lower maize and other coarse grain area. Conversely, area harvested in developing countries is projected to expand 18 Mha. Slow global area expansion is largely due to low cereal prices relative to other crops and higher yields that support the growth in production and demand. Area growth is also limited by

more restrictive land availability compared to the previous decade due to constraints on converting forest or pasture into arable land and ongoing urbanisation. Global wheat and maize areas are projected to increase by 1.4% and 3.2%, while other coarse grains are expected to increase by 2.4% by 2027. Rice area will remain stable mainly due to lower area in China being offset by area growth in other parts of Asia. Although the overall area to cereals will grow, the growth in yields is expect to contribute more to higher production (Figure 3.2), especially in developing countries with improving technology and cultivation practices. Global yields for wheat, maize and rice are projected to increase 9%, 10%, and 12%, respectively, between the base period and 2027.

Figure 3.2. Global growth rates of harvested areas and yields for cereals



Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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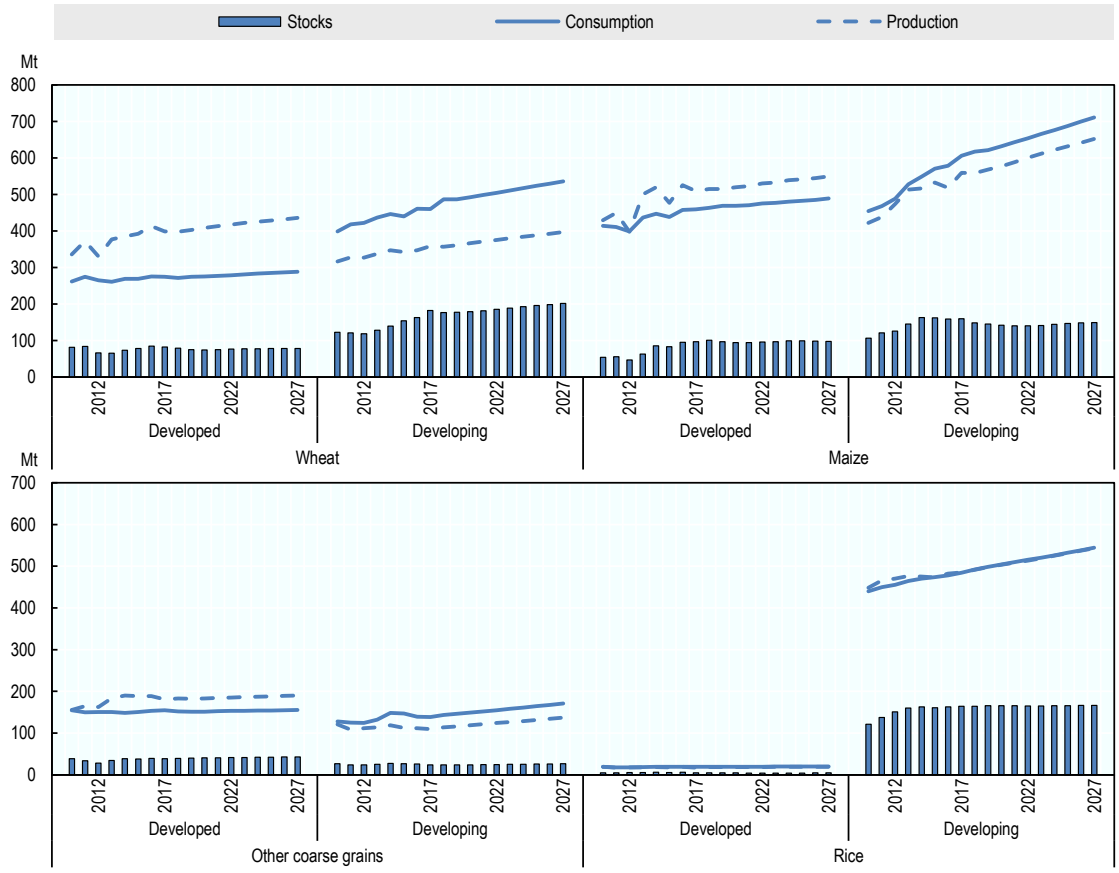
Global wheat production is expected to increase by 82 Mt to 833 Mt by 2027, a more moderate pace compared to the last decade. While developed countries are set to increase production by 34 Mt by 2027, developing countries are expected to add 48 Mt to global output thus increasing their share of global production (Figure 3.3). India, the world's third largest wheat producer, is expected to provide the largest share of additional wheat supply, increasing wheat production by 20 Mt by 2027, driven largely by area expansion and the response to national policies to enhance self-sufficiency in wheat. Following India, there will be significant production increases for the European Union (12 Mt), the Russian Federation (10 Mt), Pakistan (6 Mt), Turkey (5 Mt). Ukraine (4 Mt), China (4 Mt) and Argentina (3 Mt). In Argentina, wheat area harvested over the next ten years will average over 1 Mha more compared to the previous decade due to national export policies favouring wheat production.

In some developing countries, notably India and Pakistan, wheat production growth will be driven by area gains in. In other developing countries, like Egypt and Ukraine, yields will be the main driver to production growth due to increased access to higher yielding and drought tolerant varieties, and increased investment in new technologies. While good post-harvest practices are common in developed countries, assumed improvements in post-harvest practices in developing countries will likely improve wheat quality and may

play a larger role in determining the prices farmers receive. This is particularly important for China as the government moves away from fixed prices.

Figure 3.3. Supply, demand and stocks of cereals in developed and developing countries



Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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Global maize production is expected to grow by 161 Mt to 1.2 bln t over the next decade, with the largest increases in China (31 Mt), followed by Brazil (24 Mt), the United States (22 Mt), the European Union (11 Mt) and Argentina (10 Mt). Increased production in Brazil will be largely driven by higher second-crop maize following soybeans. Production growth in the United States is expected to slow to less than 1% p.a. over the next ten years, compared to 2.4% p.a. the decade before, due to slower growth in domestic demand, particularly for ethanol, and increased export competition. Slow production growth in the United States will be supported by higher yields as planted area is expected to decline with pressure from higher soybean area and slightly higher wheat area. Production in Argentina will increase motivated by the removal of export taxes in 2016.

With feed demand driving maize production, the bulk of the increase is expected to with come from yellow maize, with the exception of Sub-Saharan Africa where the total maize output is projected to increase by 24 Mt, of which white maize – a major staple crop in

the region – accounts for the largest share. While increases in maize production are expected to stem primarily from yield improvements, area expansion will be an important driver of white maize production in Sub-Saharan African countries, despite projected area contractions in South Africa in favour of yellow maize and soybeans. White maize yields in most of Sub-Saharan Africa are projected to rise by more than 1% p.a. Output is also expected to increase by about 3 Mt in the Russian Federation, as a result of efforts to maintain domestic feed as the main source for their growing meat and dairy industries.

Although China will contribute the most to increases in global maize output, production in China is projected to grow much slower (1.3% p.a.) than over the previous decade (3.7% p.a.), as a consequence of China's policy change in 2016 under which price supports were reduced with a view to ending stock piling and replace with market-oriented purchasing combined with direct subsidies for farmers. Despite lower farmer support, area will slightly increase (0.3% p.a.) as feed demand strengthens at 1.9% p.a. over the next ten years, incentivising farmers to keep area in maize production. As a result, consumption growth will outpace production growth as the feed sector strengthens leading to the release of accumulated stocks over the projection period. China's stocks are expected to decline from near 100 Mt in the base period to 71 Mt by 2027. Since China held about 70% of global stocks during 2015-2017, as production slows and China's maize stocks are released, the global stocks-to-use ratio will decline from 24% in the base period to 21% in 2027 (Figure 3.5)

Global production of other coarse grains, such as sorghum and barley, is projected to reach 327 Mt by 2027, up 29 Mt from the base period. Developing countries will contribute the most, increasing their share of global output from 37% to 42% in 2027. Several countries in Africa, with fast-growing populations and strengthening feed sectors, rely on other coarse grains, such as millet for food and feed uses. Nearly half of the global production increase of other coarse grains is expected to happen in these countries. Ethiopia will contribute the most, adding 5 Mt to reach 18 Mt by 2027. Unlike developing countries, output in most developed countries will stagnate due to slower growth in feed demand. For instance, production in the United States will increase slightly but not reach the production level of 2016. On the other hand, production in the European Union will reverse the downward trend that started in 2014, and production will grow 4 Mt over the projection period to reach 97 Mt by 2027. Latin America and the Caribbean will contribute a fifth to the increase in production, with higher production mainly in Argentina and Mexico (+3 Mt each).

Global rice production is expected to grow by 64 Mt to reach 562 Mt in 2027. While production in developed countries is projected to increase marginally, from 18 Mt in the base period to 19 Mt in 2027, production in developing countries is expected to be relatively robust, increasing by 62 Mt to 543 Mt in 2027. Asia contributes the majority of the additional global production, accounting for 54 Mt of the increase during the outlook period. The highest growth is expected in the world's second largest rice producer India (+20 Mt), followed by Indonesia (+8 Mt), Thailand (+7 Mt), LDC Asian region (+7 Mt) and Viet Nam (+4 Mt). India will remain a major producer of indica rice, but also of aromatic varieties. Viet Nam is expected to increase production mainly through yield improvement, while harvested area is expected to decline, assuming government efforts promoting a shift towards alternative crops continue and are effective. China, the world's largest rice producer, is expected to increase production by 2 Mt by 2027, implying a slower pace than during the last ten years. Area planted to rice in China is expected to decline despite government policies to maintain production through its minimum purchase price. Production in developed markets, like Korea, Japan and the European

Union, is expected to stagnate or fall slightly below the base period's production level. Production in the United States and Australia will expand at about 1% and 3% p.a. respectively, but not exceed peaks in 2010 for the United States and 2001 for Australia.

Consumption

Global consumption of cereals is projected to increase from 2.6 bln t in the base period to 2.9 bln t in 2027, driven mainly by higher feed use (+167 Mt) followed by food use (+151 Mt). Developing countries will account for 84% of the projected increase in overall consumption, but contrary to the global outlook, the absolute growth in food use (+148 Mt) for developing countries will exceed the growth in feed use (+132 Mt). Conversely, for developed countries, feed use (+36 Mt) will grow more than food use (+3 Mt).

Global feed consumption of cereals is expected to expand the most for maize (1.6% p.a.) and more modestly for wheat (1.5% p.a.) and other coarse grains (1.0% p.a.) during the next ten years (Figure 3.4). Food consumption per capita of cereals is expected to increase at a faster pace compared to the previous decade as higher per capita use of maize, rice and other coarse grains is only partly offset by slower growth for wheat.

Wheat consumption is expected to increase 13% by 2027. Four countries account for nearly half of this increase in consumption: China (+23 Mt), India (+12 Mt), Pakistan (+6 Mt) and Egypt (4 Mt). Global food use is projected to expand 51 Mt and remain stable at about two-thirds of total consumption, but growth will be slower compared to the prior decade as world population increases at a more moderate pace. Feed use is expected to grow more slowly, increasing by 27 Mt compared to the base period (Figure 3.4).

In developed countries, the increase in feed use of wheat is about five times the increase in food use; in developing countries, the increase in food use is over two times larger than the increase in feed use. Food use is expected to expand in Asia where there is increasing demand for non-staple food products, like pastries and noodles. These products call for higher quality and higher protein wheat, which is produced in the United States, Canada, Australia and to a lesser extent in the European Union and potentially the Russian Federation. Further, countries in the Middle East, like Egypt, Algeria and the Islamic Republic of Iran, will remain major consumers with high levels of per capita consumption. Global production of wheat-based ethanol is not expected to increase significantly, as biofuel policies in the European Union – the major user of wheat in ethanol processing – are assumed to no longer support growth of first generation biofuels.

Global maize consumption is projected to increase by 1.3% p.a. over the projection period, a slower pace compared to 3.3% p.a. in the previous decade. This increase is principally driven by higher feed demand, which holds the largest share of total utilisation, rising from 56% in the base period to around 58% in 2027. Developing countries account for over three quarters of the increase in feed consumption due to fast expanding livestock and poultry sectors. Feed demand is expected to rise 120 Mt to 699 Mt, and major countries that account for the increase are China (+32 Mt), the United States (+20 Mt), Argentina (+5 Mt), Indonesia (+5 Mt) and Viet Nam (+5 Mt). Production in Viet Nam and Thailand, in particular, will grow due to fast-expanding poultry industries.

Food use of maize is expected to expand mostly in developing countries where there are growing populations and maize is becoming increasingly important in diets, especially white maize. Maize will remain an important staple for Sub-Saharan Africa, where consumption of white maize is expanding and where maize accounts for about a quarter of total caloric intake. Overall, African countries show the strongest growth in maize consumption for food among all developing countries at about 3% p.a.

Maize use for biofuel production more than doubled between 2007 and 2017. During the outlook period, however, growth is expected to be limited as the international ethanol market is restrained given current biofuel policies (Figure 3.4). Lower biofuel consumption is partly driven by a decline in gasoline use in the United States, but consumption could increase given uncertainty regarding the expansion of the maize-based ethanol industry in Brazil.

Rice is mostly utilized for direct human consumption and continues to be a major staple food in Asia, Africa, and Latin America and the Caribbean. World rice consumption is expected to increase by 1.1% p.a. over the next ten years, compared with 1.5% p.a. in the last decade. Asian countries account for more than 70% of the projected increase in global rice consumption. This growth is largely due to population increases rather than per capita gains, as per capita consumption is expected to remain flat or decrease in many countries in the region, with diversification of diets as income increases (Table 3.1). One exception is India where per capita consumption is below the regional average. Rice consumption will also increase in the Middle East and West Africa where rice is gaining importance as a major food staple and source of calories. Due to difference in per capita incomes, demand in the Middle East is driven by both the quality and price of rice, while price plays more of a role in West Africa. Worldwide, food per capita rice consumption is projected to maintain a similar level to the base period at around 55 kg per year.

Figure 3.4. Cereal use in developed and developing countries

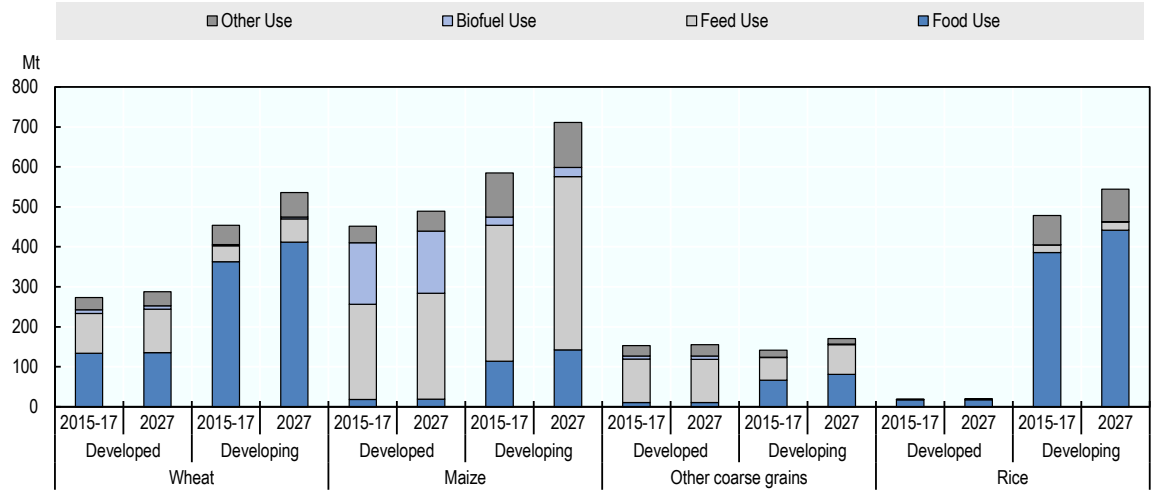

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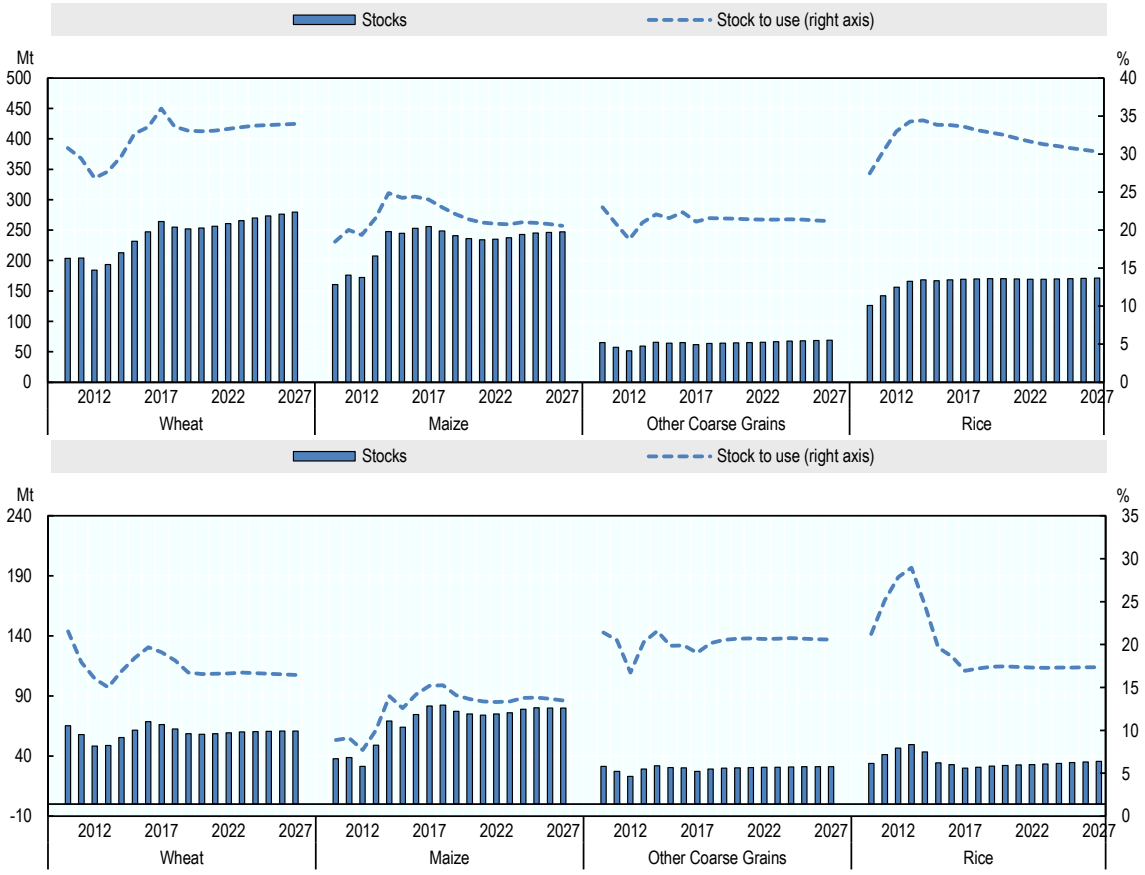
Figure 3.5. Major exporter stocks and stocks-to-use



1. Top 5 exporters, wheat (2015-2017): Australia, Canada, the European Union, the Russian Federation, the United States.
2. Top 5 exporters, maize (2015-2017): Argentina, Brazil, the Russian Federation, the United States, Ukraine.
3. Top 5 exporters, other coarse grains (2015-2017): Australia, Canada, the European Union, Ukraine, the United States.
4. Top 5 exporters, rice (2015-2017): India, Pakistan, Thailand, the United States, Viet Nam.

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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Table 3.1. Rice per capita consumption

kg/person/year

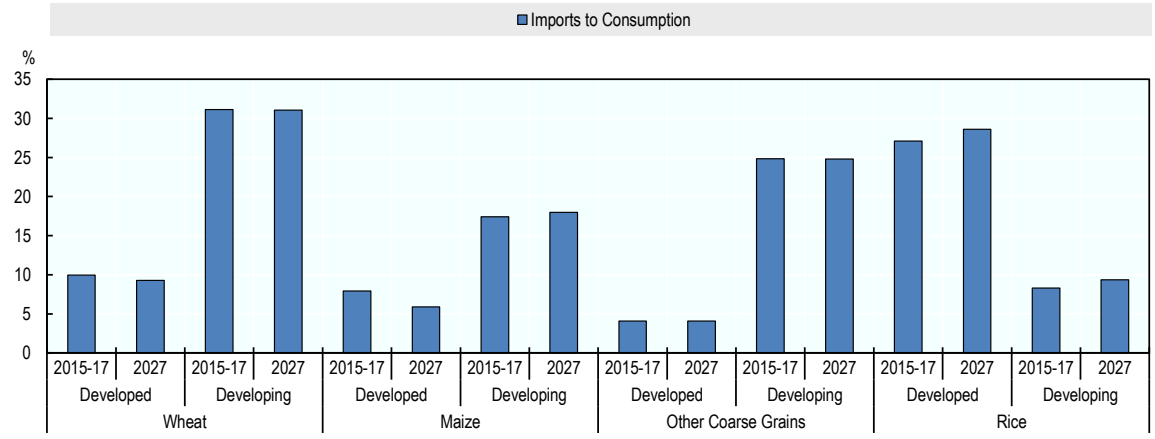
	2014-16	2026	Growth rate (% p.a.)
Africa	24.7	28.2	1.22
Asia and Pacific	77.8	78.9	0.08
North America	13.1	14.0	0.49
Latin America and Caribbean	28.5	28.7	0.24
Europe	5.5	5.9	0.63

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

Trade

Trade of wheat, maize and other coarse grains accounts for about 17% of global consumption throughout the projection period and is an important source of food and feed for importing countries (Figure 3.6). Traditionally, the developed world supplies cereals to developing countries, where growing food demand from increasing populations and higher feed demand from expanding livestock sectors mean that domestic demand expands faster than domestic supply. This situation is expected to intensify in the next decade as combined exports of cereals are set to increase by 13% by 2027.

Figure 3.6. Trade as a percentage of consumption



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Wheat exports are expected to grow by 24 Mt to reach 199 Mt by 2027. The Russian Federation surpassed the European Union as the top exporter in 2016 and is expected to maintain this position, accounting for 20% of global wheat exports by 2027. Supply in the major wheat-producing members of the Commonwealth of Independent States (CIS) – the Russian Federation, Kazakhstan and Ukraine – has been volatile in the past decade mainly due to yield fluctuations. Nonetheless, in the recent past, production growth has on average outpaced consumption growth, so further increases of wheat production and exports are expected. The Russian Federation's growing presence on wheat export markets over the past few years has had a larger impact on international prices, and further growth in its market share will continue to influence prices over the next ten years.

World utilisation of other coarse grains is projected to increase by 32 Mt or 1.1% p.a. over the next ten years, a notably faster pace than the 0.2% p.a. over the past decade. This acceleration is driven by developing countries (+29 Mt) as consumption is expected to remain stable in developed countries. The food share of total consumption is projected to increase from about 26% in the base period to 28% in 2027, and the main driver is increasing food demand in Africa (2.7 p.a.), followed by Latin America and the Caribbean (0.9% p.a.) and Asia (0.5% p.a.). Ethiopia and the remaining Sub-Saharan African region rely heavily on millet as a source of calories. Saudi Arabia will continue to contribute to global demand as its feed sector expands. With other coarse grains

utilisation growing faster than supply, the global stocks-to-use ratio is expected to decline to 21% by 2027, compared to 22% in the base period.

By 2027, the European Union, the second largest wheat exporter, will account for 18% of global trade, followed by the United States (13%), Canada (11%), Australia (10%) and Ukraine (10%). The Russian Federation, Ukraine, Argentina, Kazakhstan and Turkey, will increase export market share while developed country exporters, mainly the United States, Canada, and Australia, may lose overall export share but are expected to maintain the higher quality and higher protein wheat markets, particularly in Asia. The Russian Federation and Ukraine may also play a role in higher quality markets, but will be more competitive in soft wheat markets, such as the Middle East and Central Asia, due to proximity to those regions. Wheat imports for the top five importers – Egypt, Indonesia, Algeria, Brazil and Japan – will maintain a stable share of 25-27% over the next ten-year horizon.

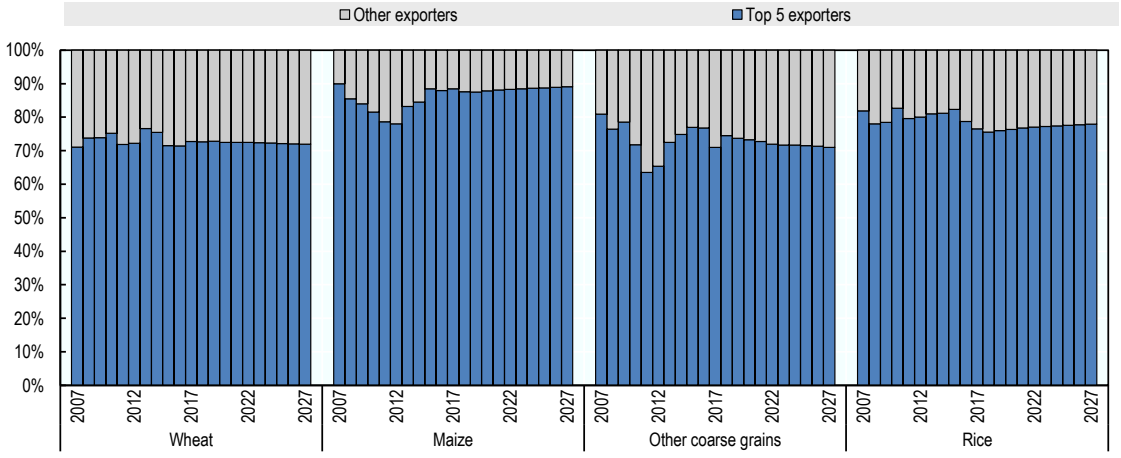
Maize exports are expected to grow by 19 Mt to 157 Mt in 2027. The export share of the top five exporters – the United States, Brazil, Ukraine, Argentina, and the Russian Federation – accounts for nearly 90% of total trade through the projection period. The United States is projected to remain the top maize exporter, with exports flat compared to the base period at 53 Mt by 2027, but the US export share will decline (from 38% to 34%) with higher exportable supplies in Brazil, Argentina, Ukraine and the Russian Federation. Brazil will increase its export market share from 19% in the base period to 23% in 2027 as production of second-crop maize following soybeans increases. Shipments from Argentina, the third-largest exporter, will continue to increase incentivised by the termination of export taxes in 2016. Ukraine and the Russian Federation are also projected to increase exports as supplies increase faster than domestic consumption leading to surpluses entering the global market. The LDC Sub-Saharan African region will continue to play a major role supplying white maize for food consumption in the region. South Africa will also remain as a regional supplier, but expansion is limited as they produce GMO varieties that face barriers in neighbouring countries.

The top five maize importers during the base period – Japan, the European Union, Mexico, Korea, and Egypt – account for 45% of world imports during the base period; this share is expected to decrease to 41% due mainly to lower imports in the European Union where higher domestic maize production supports the growth in feed demand and in Japan where consumption growth is limited by the declining population. Viet Nam is expected to become the third largest maize importer by 2027 after a strong increase in maize imports since 2012, with further demand growth coming from the strengthening livestock sector. Malaysia will also increase imports to sustain the growth in the livestock sector, increasing from imports of 3.6 Mt in the base period to 4.7 Mt by 2027.

The international trade volume of other coarse grains, such as barley and sorghum, is much smaller than for maize or wheat. Other coarse grain exports are expected to increase by 3 Mt to 49 Mt in 2027. The top five exporters – the European Union, Australia, the United States, Ukraine and Canada – had an export share of 75% of global trade during the base period, and this share is expected to decline to 71% by 2027 as lower exports for Australia and Canada are offset by higher exports by Argentina and the Russian Federation (Figure 3.7). In contrast to maize and wheat markets, imports of other coarse grains are much less widespread among countries. The five major importers – China, Saudi Arabia, Japan, the Islamic Republic of Iran and the United States – absorb almost 70% of global trade, with China alone accounting for 30% in 2027.

Given policy changes in China aimed at reducing record stock levels, this *Outlook* assumes that maize and other coarse grain imports will limit the downward trajectory of total coarse grain stock levels until China reaches a sustainable stocks-to-use ratio for maize, which is expected to decline to 28% by 2027. With maize production growth in China projected to slow, maize imports are therefore expected to reach 6.7 Mt by 2027. China's imports of barley and sorghum increased from about 3 Mt in 2012 to more than 18 Mt in 2014. Since then, imports of other coarse grains have declined but are expected to reverse this trend starting in 2018 due to lower prices relative to maize and other domestically-produced coarse grains.

Figure 3.7. Cereal trade concentration



Note: For top exporters, see Figure 3.5
Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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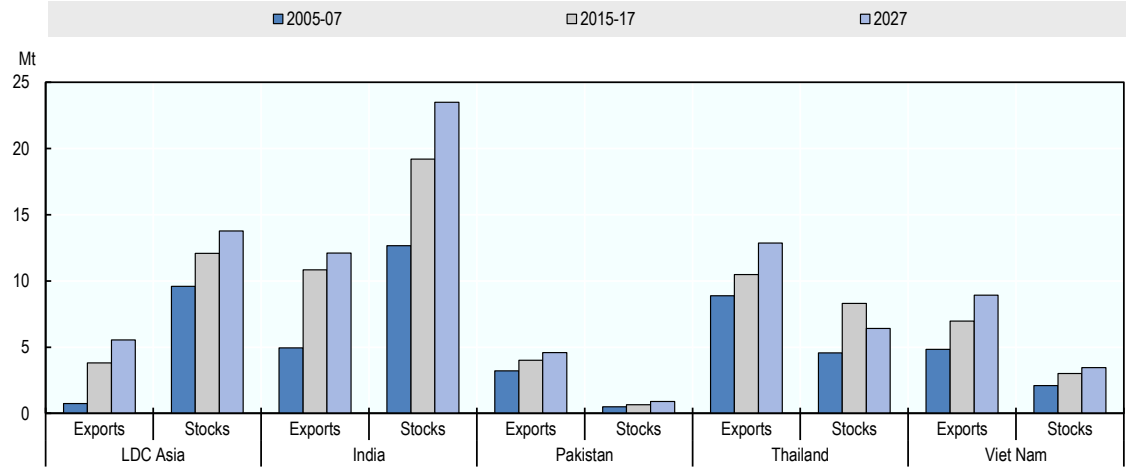
During the past ten years, rice trade grew robustly at near 6% p.a. This expansion is expected to slow to about 2% p.a. with export volume rising 9 Mt to reach 54 Mt by 2027. The export share of the top five major rice exporters – India, Thailand, Viet Nam, Pakistan and the United States – is expected to remain above 75%, with Thailand replacing India as the largest global rice exporter (Figure 3.8). Given infrastructure and supply chain improvements as well as production diversification, Viet Nam could reach markets in Africa and the Middle East thus reducing its dependence on the Chinese market. Thailand may continue to focus on exporting high quality rice but could face more competition from India and Viet Nam.

The largest exporters will lose market share to countries in the LDC Asia region, particularly Cambodia and Myanmar, as the region becomes more competitive internationally. Shipments from the LDC Asia region will increase from 4 Mt in the base period to 6 Mt in 2027, amid expectations that ample exportable supplies will allow these countries to capture a greater share of the Chinese and other Asian markets. Historically, rice trade has been mainly dependent on supply, demand and prices of indica rice, the largest rice type traded on the world market; however, given increasing demand for other varieties, particularly in the Middle East, this situation could shift over the next ten years (Box 3.1).

Figure 3.8. Exports and stocks for Asian rice exporters



Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

StatLink http://dx.doi.org/10.1787/888933742967

China will remain the largest importer of rice throughout the next ten years despite imports declining by 16% (-1 Mt) from the base period. The largest import growth will be in African countries where demand is expected to outpace production. While production is expanding in African countries, it is restrained by climate conditions, limited use of inputs and infrastructure development. Nigeria, in particular, is projected to maintain its position as the second largest importer after China, increasing imports by 2 Mt, such that imports account for 55% of domestic consumption by 2027. Overall, imports in Africa are expected to increase from 15 Mt in the base period to 25 Mt in 2027, lifting Africa's share of world imports from 34% to 44%. In addition to China and Nigeria, the group of the five major importers includes the Islamic Republic of Iran, Saudi Arabia and the Philippines. Altogether, these five countries are expected to account for about a third of global rice imports by 2027, compared to 28% in the base period. By region, LDC Sub Saharan Africa represents about 28% of the total imports by 2027.

Main issues and uncertainties

While normal assumptions for weather lead to positive production prospects for the main grain-producing regions, adverse weather events that are accentuated by climate change may cause higher volatility in crop yields thereby impacting global supplies and prices. Historical deviations of crop yields from expected values are higher for wheat than for other cereals, and wheat yields in Australia, Kazakhstan, the Russian Federation and Ukraine are particularly uncertain. Crop yields in South American countries, such as Argentina, Brazil, Paraguay and Uruguay, also show relatively high variability. Cereal imports comprise of 16% of global consumption and are an important source of food and feed, especially for developing countries. Over the past decade, increased participation of new players in global trade has lessened some of the risks associated with crop shortages in major exporting countries, such as price spikes for countries that are more dependent on imports. Continued growth in export participation over the next decade may further mitigate the risks of volatile yields in certain regions.

Cereal prices could be affected by a potential further slowdown in economic growth of fast-growing economies and lower energy prices caused by the uptake of new energy sources and new extraction technologies. Moreover, the reinforcement of food security and the sustainability criteria in the reform and design of biofuel policies (i.e. the European Union, Brazil or the United States) may also impact the demand for cereals. China's domestic policies that influence their import demand for cereals are also crucial for future developments in the cereal markets. Additionally, political unrest in either exporting countries (notably Ukraine) or importing countries (in particular North Africa and the Middle East) could provoke market reactions that are not reflected in the projections.

The future developments of global wheat markets remain uncertain owing to real exchange rates appreciation or depreciation in exporting countries, which could stimulate or discourage production. Demand for wheat is concentrated in North Africa and the Middle East, but further political instability in these regions could reduce demand and depress international wheat prices.

The outlook for Argentina is also uncertain since recent policy changes concerning the elimination of export taxes might strengthen competitiveness on international cereal markets even more than assumed in the projections.

Maize production in Sub-Saharan Africa is heavily reliant on rain-fed systems, and thereby sensitive to weather fluctuations. In addition, the recent outbreak of the fall armyworm possesses a new source of uncertainty. While the insect prefers maize, it can feed on other cereals, including rice, sorghum and millet, which could undermine food security in the region if not properly managed.

Box 3.1. Japonica rice in the global and domestic markets

Cultivated rice has many varieties and can be categorised into the following rice types: indica, japonica, glutinous and aromatic. Another common classification is into long-grain, medium-grain, short-grain and broken rice (CBI, 2017). Japonica rice mostly produced in more temperate climates, accounts for about 8% of the global rice trade. Indica and aromatic rice account for around 75% and 15% respectively, and glutinous rice accounts for the remainder (USDA ERS, 2016). It can be useful to separate the markets by rice type given that some types (e.g. japonica) command a price premium, reflecting the fact that production faces different climatic condition, while consumer preferences differ. Regardless of this price differential, there is still some substitutability between the different types in domestic markets mainly on the demand side.

The major japonica rice producing countries are China, Japan, Korea, the United States, the European Union, Australia, Egypt and Turkey. Among these, China, the United States and the European Union also produce considerable amounts of indica rice (Calpe 2006; Rakotoarisoa 2006; Hansen et al., 2002; Wailes and Chavez, 2016). Rice balances are separated by type (japonica and other) based on the OECD-FAO agricultural outlook database incorporating following additional material: production data by type available for the United States (California), the European Union and China; consumption and trade data by type derived from linking bilateral trade flows from customs data with production statistics.

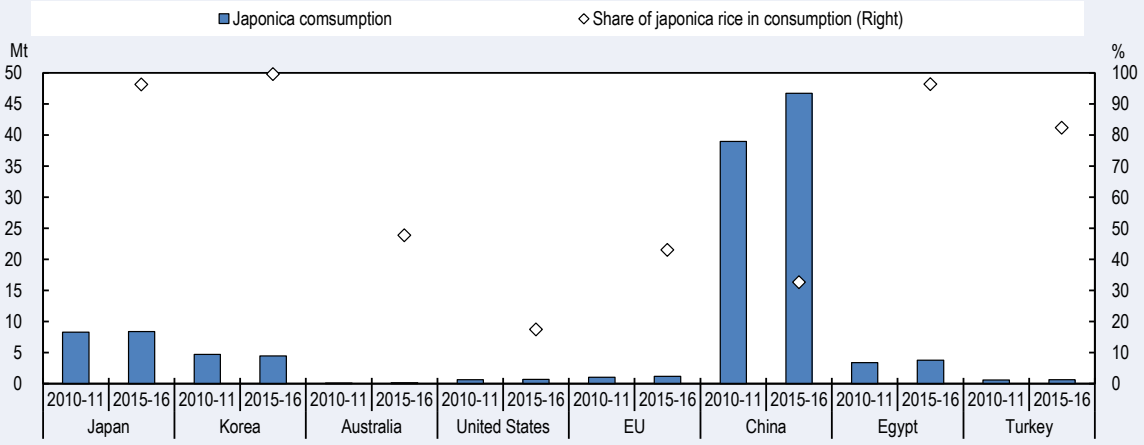
Production and consumption

Japonica accounted for 12-13% of global rice production during the period 2010-2016. In China, japonica production increased by 12 Mt over ten years to 48.9 Mt in 2016. The share of japonica rice in China's total rice area increased from 24.9% in 2006 to 30.5% in 2016, and japonica's share in total rice production increased from 29.0% to 34.5% over the same period. Japonica production in the European Union rose from 1.1 Mt in 2011 to 1.4 Mt in 2016, with japonica's

share of production increasing from 63% to 77% over this period. In the United States, japonica production is mostly concentrated in California and classified as medium- and short-grain rice. US production was 215 000 tonnes in 2016, accounting for 21% of total rice production. Rice production in Japan, Egypt, Korea, Turkey and Australia totalled 7.8 Mt, 4.3 Mt, 4.2 Mt, 0.6 Mt and 0.6 Mt respectively in 2016, and these rice volumes were almost exclusively composed of japonica.

China is the largest consumer of japonica rice, with consumption reaching 46.4 Mt in 2016. However, the share of japonica in total rice consumption is much higher in Japan, Korea and Egypt (Figure 3.9).

Figure 3.9. Japonica rice consumption and its share of total rice in selected countries



Note: The consumption is simply calculated as "consumption = production + import - export - stock change".
Source: own calculation based on domestic statistics, bilateral trade flows and OECD/FAO (2018).

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Trade

Japonica's share in global rice trade was 6-7% during the period of 2010-2016 based on our own estimates. The United States exported 846 000 tonnes in 2016, based on the custom data from California ports. Egypt's exports decreased to 215 000 tonnes in 2016 due mainly to export restrictions, and remained below the average of the period 2010-2016. China's japonica rice exports remained stable at around 200 000 tonnes and are destined mainly for Japan and Korea. Australian exports fluctuate depending on the rice harvest and can reach up 500 000 tonnes. The trade flows of the European Union differ between types. Only 10% of total rice imports or 120 000 tonnes in 2016 were of japonica rice, whereas 90% of rice exports or 264 000 tonnes were japonica rice. Japonica imports in Middle Eastern countries, e.g. Lebanon, Jordan and Saudi Arabia increased and were sourced from the European Union and Egypt, as well as Australia and the United States. The Middle Eastern countries are a growing market for japonica rice.

Discussion

The global rice reference price is Thailand's export price, which corresponds to long-grain indica rice. The US California's medium-grain export price is the best international reference for japonica rice. In the global market both prices move in the long term generally together and the price premium of japonica rice has weakened since 2008 (Chen and Saghaian, 2016). However price movements for indica and japonica rice may move somewhat independently of one another in the short term because of limited substitutability in consumption among the different types and qualities and because of diverging trade flows (John, 2014; Rastegari-Henneberry, 1985; Jayne,

1993).

Rice trade accounts for less than 10% of world production which is low compared with other agricultural commodities. In the case of japonica rice, the share of traded commodity is even lower at below 5% of world production. Consequently, most japonica markets, including those of China, Japan and Korea, are dominated by domestic production and have market price support (MPS) resulting in higher domestic than reference prices for rice. Therefore, potential uncertainties might trigger short-term volatility in demand, supply and prices in the smaller global japonica rice market. These uncertainties in japonica rice producing countries include possible changes in government policies.

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ANNEX A

Table A.1. World cereal projections

Marketing year

		Average 2015-17est	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
WHEAT												
World												
Production	Mt	750.5	754.7	763.7	774.8	783.9	793.3	802.1	810.0	817.1	824.7	832.6
Area	Mha	220.6	220.6	220.9	222.0	222.4	223.1	223.7	223.9	223.9	223.9	224.0
Yield	t/ha	3.40	3.42	3.46	3.49	3.52	3.56	3.59	3.62	3.65	3.68	3.72
Consumption	Mt	726.6	758.4	761.2	767.9	775.2	783.3	791.8	800.3	808.3	816.0	823.8
Feed use	Mt	139.5	146.3	147.6	149.6	152.2	154.6	157.3	159.8	162.3	164.6	166.9
Food use	Mt	496.4	506.1	510.8	515.2	519.9	524.7	529.3	534.1	538.7	543.1	547.4
Biofuel use	Mt	12.4	12.5	12.5	12.4	12.4	12.4	12.5	12.6	12.7	12.8	12.8
Other use	Mt	78.3	93.6	90.2	90.7	90.7	91.6	92.8	93.8	94.7	95.5	96.7
Exports	Mt	175.1	178.6	181.8	183.4	185.5	188.1	190.3	192.4	194.4	196.5	198.7
Closing stocks	Mt	247.6	254.8	251.9	253.3	256.5	260.9	265.7	269.9	273.2	276.4	279.7
Price[1]	USD/t	206.6	209.1	213.8	219.1	222.2	223.2	223.6	223.3	224.7	226.8	229.1
Developed countries												
Production	Mt	401.2	397.8	402.7	408.5	412.9	417.7	421.9	425.5	428.6	432.0	435.6
Consumption	Mt	272.9	271.6	274.3	275.3	276.8	278.7	280.9	282.9	284.6	286.2	288.0
Net trade	Mt	125.4	129.7	132.4	133.6	135.4	137.8	139.9	142.1	143.8	145.6	147.5
Closing stocks	Mt	81.4	78.5	74.5	74.2	74.9	76.0	77.0	77.5	77.8	78.1	78.3
Developing countries												
Production	Mt	349.3	356.9	361.0	366.3	371.0	375.6	380.2	384.5	388.5	392.6	397.0
Consumption	Mt	453.7	486.8	486.9	492.6	498.4	504.6	510.9	517.3	523.7	529.8	535.8
Net trade	Mt	-118.6	-124.2	-126.9	-128.1	-129.9	-132.4	-134.4	-136.6	-138.3	-140.1	-142.0
Closing stocks	Mt	166.3	176.3	177.4	179.1	181.6	185.0	188.6	192.4	195.4	198.4	201.5
OECD[2]												
Production	Mt	292.9	287.0	290.8	295.3	298.1	300.9	303.3	305.3	307.1	309.2	311.3
Consumption	Mt	223.8	222.1	224.6	225.2	226.3	227.8	229.5	231.1	232.3	233.5	234.9
Net trade	Mt	67.6	66.0	68.4	70.3	71.2	72.3	73.0	73.9	74.6	75.4	76.2
Closing stocks	Mt	61.8	57.7	55.6	55.4	56.0	56.8	57.5	57.8	58.0	58.3	58.5
MAIZE												
World												
Production	Mt	1 040.8	1 073.9	1 082.8	1 096.7	1 111.4	1 131.2	1 144.9	1 161.8	1 173.6	1 186.3	1 201.7
Area	Mha	181.2	185.4	185.5	185.9	186.6	187.8	188.5	189.3	189.7	189.9	190.4
Yield	t/ha	5.74	5.79	5.84	5.90	5.96	6.02	6.07	6.14	6.19	6.25	6.31
Consumption	Mt	1 037.0	1 080.4	1 090.2	1 101.3	1 113.2	1 129.5	1 142.4	1 155.7	1 170.8	1 185.0	1 200.7
Feed use	Mt	578.8	606.3	619.1	624.1	631.3	644.1	653.7	664.8	676.1	686.5	698.5
Food use	Mt	132.1	138.3	140.9	143.3	145.7	148.3	150.9	153.5	156.2	158.8	161.6
Biofuel use	Mt	173.9	178.8	178.7	180.6	179.6	179.4	178.7	178.3	178.2	178.1	177.9
Other use	Mt	104.9	108.7	102.7	103.9	106.7	107.7	108.7	108.3	109.3	110.2	111.0
Exports	Mt	138.7	138.5	140.1	142.6	144.8	146.4	148.3	150.5	152.5	155.0	157.2
Closing stocks	Mt	251.1	248.8	241.0	236.0	233.9	235.2	237.3	243.0	245.4	246.4	247.0
Price[3]	USD/t	155.9	158.7	163.2	167.4	172.6	174.6	174.0	172.4	172.2	172.4	173.0
Developed countries												
Production	Mt	504.0	515.2	514.8	519.5	522.7	530.5	532.9	539.2	541.7	544.6	549.9
Consumption	Mt	451.9	463.1	468.6	469.0	470.3	475.7	477.0	479.8	482.9	485.3	489.4
Net trade	Mt	48.4	48.1	50.3	52.2	52.8	53.4	54.9	57.1	58.7	60.1	60.7
Closing stocks	Mt	91.4	100.3	96.1	94.5	94.0	95.3	96.3	98.6	98.7	97.9	97.7
Developing countries												
Production	Mt	536.8	558.7	568.0	577.1	588.7	600.7	612.0	622.5	631.9	641.7	651.8
Consumption	Mt	585.1	617.3	621.6	632.3	642.9	653.8	665.4	675.9	687.9	699.7	711.3
Net trade	Mt	-47.3	-47.7	-49.9	-51.9	-52.5	-53.1	-54.6	-56.7	-58.4	-59.7	-60.4
Closing stocks	Mt	159.7	148.5	144.8	141.5	139.8	139.8	141.0	144.4	146.7	148.4	149.3
OECD[2]												
Production	Mt	475.2	482.2	481.9	486.5	489.6	496.6	498.1	503.6	505.3	507.7	512.5
Consumption	Mt	471.5	486.2	491.7	492.1	493.4	498.8	500.1	503.0	506.2	508.7	512.9
Net trade	Mt	-1.1	-7.6	-5.3	-3.6	-3.1	-3.4	-2.6	-1.5	-0.8	-0.2	-0.1
Closing stocks	Mt	85.9	95.4	90.9	88.9	88.2	89.3	89.9	91.9	91.9	91.0	90.8

Table A.1. World cereal projections *(cont.)*

Marketing year

		Average 2015-17est	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
OTHER COARSE GRAINS												
World												
Production	Mt	297.4	297.1	298.4	301.3	305.3	309.3	312.9	316.2	319.5	323.2	326.9
Area	Mha	157.8	158.3	158.2	158.4	159.1	159.6	160.0	160.4	160.7	161.1	161.5
Yield	t/ha	1.89	1.88	1.89	1.90	1.92	1.94	1.95	1.97	1.99	2.01	2.02
Consumption	Mt	294.3	295.0	297.4	300.4	304.3	308.1	311.6	314.9	318.5	322.2	325.9
Feed use	Mt	164.9	167.7	168.1	169.8	171.7	173.4	175.1	176.7	178.5	180.5	182.4
Food use	Mt	77.0	78.9	80.2	81.4	82.9	84.3	85.7	87.2	88.6	90.1	91.6
Biofuel use	Mt	9.4	9.6	9.5	9.6	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Other use	Mt	43.2	38.8	39.6	39.5	40.2	40.9	41.3	41.6	41.8	42.1	42.4
Exports	Mt	45.8	41.5	42.1	43.2	44.2	45.1	46.0	46.8	47.6	48.4	49.1
Closing stocks	Mt	63.8	63.6	64.1	64.6	65.1	65.8	66.7	67.5	68.0	68.6	69.1
Price[4]	USD/t	167.1	163.9	169.8	173.1	176.0	179.3	181.0	182.3	184.4	186.7	189.4
Developed countries												
Production	Mt	186.0	183.2	182.5	182.8	184.1	185.2	186.4	187.3	188.1	189.1	190.1
Consumption	Mt	152.7	151.8	151.3	151.5	152.3	153.1	153.5	153.8	154.2	154.7	155.3
Net trade	Mt	33.2	30.2	30.5	31.1	31.5	31.8	32.4	33.0	33.6	34.1	34.6
Closing stocks	Mt	38.5	39.6	40.3	40.6	40.9	41.2	41.7	42.2	42.4	42.6	42.9
Developing countries												
Production	Mt	111.4	113.9	115.8	118.5	121.3	124.1	126.5	128.9	131.4	134.1	136.8
Consumption	Mt	141.6	143.2	146.1	148.9	152.0	155.0	158.1	161.1	164.3	167.5	170.6
Net trade	Mt	-28.9	-29.8	-30.1	-30.7	-31.0	-31.3	-31.9	-32.6	-33.2	-33.7	-34.2
Closing stocks	Mt	25.3	24.0	23.8	24.0	24.3	24.6	25.0	25.3	25.6	25.9	26.2
OECD[2]												
Production	Mt	151.2	151.7	151.3	151.6	152.8	153.7	154.8	155.5	156.3	157.3	158.2
Consumption	Mt	130.3	130.9	131.7	132.0	132.8	133.7	134.2	134.5	135.0	135.6	136.2
Net trade	Mt	22.4	19.0	18.9	19.4	19.8	20.0	20.4	20.8	21.3	21.7	22.0
Closing stocks	Mt	28.6	28.1	28.8	29.0	29.2	29.2	29.4	29.6	29.6	29.6	29.7
RICE												
World												
Production	Mt	498.3	509.7	516.4	522.2	526.8	532.3	538.1	544.3	550.5	556.5	562.3
Area	Mha	162.1	163.4	163.8	163.9	163.6	163.4	163.3	163.3	163.4	163.4	163.3
Yield	t/ha	3.07	3.12	3.15	3.19	3.22	3.26	3.30	3.33	3.37	3.41	3.44
Consumption	Mt	497.8	511.6	517.9	524.0	529.3	534.9	540.3	546.0	552.0	558.0	564.0
Feed use	Mt	19.8	20.5	20.7	21.0	21.3	21.5	21.6	21.7	21.9	22.1	22.3
Food use	Mt	403.4	415.0	420.0	425.4	430.3	435.3	439.9	444.7	449.8	454.9	459.5
Exports	Mt	45.2	44.7	45.6	46.6	47.6	48.7	49.7	50.9	52.0	53.2	54.4
Closing stocks	Mt	168.1	169.5	170.1	170.4	169.8	169.3	169.2	169.5	170.1	170.6	171.0
Price[5]	USD/t	404.7	412.3	410.6	409.9	414.1	419.6	423.9	425.8	427.2	428.5	431.0
Developed countries												
Production	Mt	17.9	18.6	18.5	18.5	18.6	18.8	18.9	19.1	19.2	19.3	19.4
Consumption	Mt	19.1	19.3	19.4	19.4	19.5	19.5	19.5	19.6	19.6	19.6	19.7
Net trade	Mt	-0.9	-0.7	-0.6	-0.7	-0.7	-0.6	-0.6	-0.5	-0.5	-0.5	-0.5
Closing stocks	Mt	5.5	4.9	4.6	4.4	4.3	4.2	4.1	4.2	4.3	4.5	4.7
Developing countries												
Production	Mt	480.5	491.2	498.0	503.7	508.2	513.5	519.2	525.2	531.3	537.1	542.9
Consumption	Mt	478.7	492.3	498.6	504.6	509.9	515.4	520.8	526.4	532.4	538.4	544.3
Net trade	Mt	1.2	-1.3	-1.5	-1.4	-1.4	-1.4	-1.5	-1.5	-1.5	-1.6	-1.6
Closing stocks	Mt	162.6	164.6	165.4	165.9	165.6	165.2	165.0	165.3	165.7	166.1	166.3
OECD[2]												
Production	Mt	21.1	21.7	21.5	21.5	21.6	21.7	21.7	21.8	21.9	21.9	21.9
Consumption	Mt	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.6	22.6	22.6
Net trade	Mt	-1.0	-1.0	-0.9	-1.0	-1.0	-1.0	-0.9	-0.9	-0.9	-0.9	-0.9
Closing stocks	Mt	6.1	5.3	5.0	4.8	4.6	4.6	4.5	4.6	4.7	4.9	5.2

Note: Marketing year: See Glossary of Terms for definitions.
Average 2015-17est: Data for 2017 are estimated.

1. No.2 hard red winter wheat, ordinary protein, United States FOB Gulf Ports (June/May).
2. Excludes Iceland but includes all EU28 member countries.
3. No.2 yellow corn, United States FOB Gulf Ports (September/August).
4. Feed barley, Europe, FOB Rouen (July/June).
5. Milled 100%, grade b, nominal price quote, FOB Bangkok (January/December).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.13.1. Wheat projections: Production and trade

Marketing year

	PRODUCTION (kt)		Growth (%)[3]		IMPORTS (kt)		Growth (%)[3]		EXPORTS (kt)		Growth (%)[3]	
	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27
WORLD	**750 461**	**832 623**	**1.52**	**1.10**	**168 418**	**193 179**	**3.48**	**1.20**	**175 149**	**198 667**	**3.79**	**1.17**
NORTH AMERICA	85 217	85 705	-0.70	0.77	3 611	3 466	2.40	-1.27	46 595	48 368	0.42	0.40
Canada	29 769	30 422	1.95	0.18	109	110	9.59	0.00	21 375	21 975	2.96	0.02
United States	55 448	55 283	-1.99	1.12	3 502	3 356	2.29	-1.31	25 220	26 393	-1.39	0.73
LATIN AMERICA	29 311	32 632	2.50	1.26	23 235	25 878	2.16	0.92	14 165	15 655	2.87	1.19
Argentina	15 897	18 933	6.37	1.22	3	3	0.00	0.00	10 660	12 402	6.07	1.30
Brazil	5 905	5 983	0.96	1.17	6 880	8 276	0.17	1.42	850	1 185	-2.74	3.90
Chile	1 468	1 304	1.31	1.52	1 186	1 269	6.32	-0.55	0	0	..	..
Colombia	16	46	-2.72	0.68	1 767	1 735	2.81	0.49	57	52	12.58	-0.48
Mexico	3 664	3 979	-1.29	1.24	4 645	5 222	5.52	0.58	1 224	1 109	4.20	-1.27
Paraguay	1 048	1 037	-4.17	1.41	1	1	0.00	0.97	730	437	-9.25	1.64
EUROPE	260 133	288 191	1.93	0.98	7 762	7 170	-0.71	-0.37	79 653	96 960	8.47	1.50
European Union	152 281	164 445	0.89	0.71	5 469	5 075	-2.10	-0.37	29 913	34 939	4.84	1.33
Russia	73 391	83 876	3.89	1.39	376	347	33.48	2.09	31 285	40 186	13.65	1.60
Ukraine	26 244	30 647	2.75	1.29	49	50	49.06	0.08	16 989	19 426	10.54	1.48
AFRICA	26 409	31 202	2.28	1.71	47 907	60 402	3.12	2.09	1 031	931	-3.25	-1.07
Egypt	9 136	10 091	1.89	1.33	11 767	15 162	2.14	2.07	0	0	..	..
Ethiopia	4 563	5 671	7.80	2.11	1 340	2 307	-0.66	7.25	0	0	..	..
Nigeria	65	76	-2.83	1.53	4 533	5 422	2.67	2.09	600	509	4.14	-2.05
South Africa	1 614	1 844	-2.41	1.30	1 634	1 827	2.14	0.27	82	128	-12.06	5.26
ASIA	322 664	367 308	1.76	1.19	85 021	95 306	4.61	0.98	15 564	17 283	2.21	1.79
China[1]	129 608	133 275	1.78	0.57	3 852	4 477	25.80	2.46	142	200	-10.43	3.62
India	92 401	112 058	2.20	1.29	2 758	174	62.15	-18.60	631	711	69.23	6.31
Indonesia	0	0	..	..	10 136	13 754	9.28	1.93	130	125	24.85	-1.89
Iran	12 040	15 713	3.51	1.58	1 763	938	-8.07	-5.78	184	431	12.24	1.41
Japan	891	925	2.60	0.44	5 675	5 419	0.65	-0.52	0	0	..	..
Kazakhstan	14 197	16 467	0.27	1.44	68	52	8.91	0.05	7 295	8 501	0.46	1.56
Korea	35	49	7.97	2.37	4 537	5 207	0.35	1.54	50	54	0.00	0.67
Malaysia	0	0	..	..	1 499	1 673	3.95	0.54	108	111	11.19	-0.54
Pakistan	25 439	31 648	1.68	2.03	13	24	-37.29	1.91	750	105	-2.85	-1.91
Philippines	0	0	..	..	5 300	6 498	7.38	1.96	0	0	..	..
Saudi Arabia	17	3	-46.34	-7.21	3 633	4 488	12.27	1.67	0	0	..	..
Thailand	1	1	0.42	1.38	3 833	3 567	13.73	1.64	15	13	8.48	-1.61
Turkey	21 567	26 223	1.27	1.94	4 571	4 027	4.95	-2.77	4 344	5 258	6.40	2.85
Viet Nam	0	0	..	..	4 400	5 854	14.06	2.38	41	44	-27.88	-2.33
OCEANIA	26 727	27 585	1.06	1.14	882	956	4.07	0.71	18 141	19 470	1.00	1.10
Australia	26 299	27 038	1.07	1.09	24	20	8.95	0.00	18 141	19 470	1.00	1.10
New Zealand	427	547	0.14	3.44	507	555	6.63	0.43	0	0	-17.96	0.00
DEVELOPED COUNTRIES	**401 190**	**435 639**	**1.16**	**1.01**	**27 230**	**26 748**	**0.86**	**-0.37**	**152 602**	**174 217**	**3.94**	**1.14**
DEVELOPING COUNTRIES	**349 271**	**396 984**	**1.98**	**1.20**	**141 188**	**166 431**	**4.06**	**1.48**	**22 547**	**24 450**	**2.99**	**1.40**
LEAST DEVELOPED COUNTRIES (LDC)	8 468	9 739	3.44	1.61	14 108	19 000	5.32	2.54	107	69	-3.61	-1.95
OECD[2]	**292 875**	**311 313**	**0.44**	**0.87**	**32 703**	**33 024**	**1.60**	**-0.29**	**100 275**	**109 203**	**1.92**	**0.90**
BRICS	**302 919**	**337 036**	**2.32**	**1.02**	**15 500**	**15 101**	**7.08**	**0.74**	**32 990**	**42 410**	**11.43**	**1.74**

.. Not available

Note: Marketing year: See Glossary of Terms for definitions.

Average 2015-17est: Data for 2017 are estimated.

1. Refers to mainland only. The economies of Chinese Taipei, Hong Kong (China) and Macau (China) are included in the Asia aggregate.
2. Excludes Iceland but includes all EU28 member countries.
3. Least-squares growth rate (see glossary).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.13.2. Wheat projections: Consumption, food

Marketing year

	CONSUMPTION (kt)		Growth (%)[3]		FOOD (kt)		Growth (%)[3]		FOOD (kg/cap)		Growth (%)[3]	
	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27
WORLD	**726 564**	**823 813**	**1.42**	**0.97**	**496 386**	**547 425**	**1.22**	**0.88**	**66.5**	**65.8**	**0.03**	**-0.09**
NORTH AMERICA	40 138	40 796	-0.06	0.36	28 699	29 348	0.38	0.28	80.1	75.7	-0.38	-0.43
Canada	8 803	8 573	1.80	0.10	2 789	2 811	-0.04	0.11	76.9	70.7	-1.05	-0.70
United States	31 335	32 223	-0.55	0.44	25 910	26 537	0.43	0.30	80.4	76.3	-0.31	-0.40
LATIN AMERICA	38 020	42 809	1.34	0.94	34 285	38 208	1.48	1.02	53.8	54.4	0.34	0.16
Argentina	5 856	6 520	2.04	0.98	5 152	5 790	1.24	1.06	117.5	120.0	0.20	0.20
Brazil	11 501	13 065	1.11	0.78	10 900	12 095	0.86	1.04	52.5	54.3	-0.05	0.44
Chile	2 432	2 574	2.13	0.37	1 942	1 947	1.16	-0.08	108.4	100.7	0.26	-0.75
Colombia	1 595	1 727	2.05	0.56	1 420	1 504	1.35	0.40	29.2	28.7	0.36	-0.24
Mexico	7 018	8 104	1.31	1.19	6 186	7 211	4.15	1.37	48.5	50.1	2.69	0.31
Paraguay	516	599	2.58	1.41	342	382	1.45	1.12	50.9	50.1	0.11	-0.01
EUROPE	187 291	198 347	-0.10	0.60	79 952	79 709	0.00	-0.04	107.7	107.4	-0.11	-0.02
European Union	128 216	134 464	-0.11	0.56	55 779	56 267	0.11	0.01	109.8	109.8	-0.05	-0.04
Russia	40 560	44 101	0.36	0.66	14 660	13 723	0.14	-0.38	101.8	96.7	0.06	-0.21
Ukraine	10 390	11 260	-2.73	1.06	4 699	4 991	-1.57	0.43	105.7	118.9	-1.08	0.96
AFRICA	73 278	90 315	3.23	1.97	61 016	75 517	2.52	2.01	49.8	47.4	-0.09	-0.38
Egypt	20 917	25 178	2.96	1.74	17 717	21 423	2.24	1.71	185.2	186.6	0.11	0.09
Ethiopia	5 909	7 952	6.02	3.30	4 726	6 433	4.74	3.49	46.2	48.9	2.06	1.20
Nigeria	3 998	4 982	2.33	2.63	3 767	4 717	3.33	2.70	20.3	19.2	0.62	0.15
South Africa	3 266	3 541	1.01	0.64	3 193	3 462	1.23	0.64	57.0	55.0	-0.11	-0.38
ASIA	378 312	442 522	2.03	1.00	289 491	321 705	1.34	0.91	64.9	66.3	0.29	0.17
China[1]	115 190	137 812	0.34	0.39	87 833	90 223	0.19	0.22	62.6	62.6	-0.34	0.02
India	97 195	108 913	3.14	1.00	79 229	89 062	1.57	1.03	59.8	60.3	0.32	0.05
Indonesia	9 840	13 603	8.44	1.97	6 673	8 391	4.25	1.90	25.6	29.0	2.96	0.98
Iran	14 820	16 214	0.78	0.93	13 403	14 689	1.30	0.79	167.0	167.5	0.07	0.05
Japan	6 593	6 334	0.71	-0.37	5 182	5 001	0.27	-0.31	40.6	40.6	0.36	0.03
Kazakhstan	6 955	7 977	-0.53	1.58	2 555	2 807	1.14	0.82	142.1	141.1	-0.36	-0.05
Korea	4 389	5 188	0.94	1.55	2 430	2 506	0.52	0.28	47.8	47.8	0.12	0.01
Malaysia	1 425	1 560	4.64	0.71	991	1 031	2.36	0.20	31.8	28.8	0.60	-1.01
Pakistan	25 269	31 528	1.57	2.00	24 247	30 168	2.18	2.00	125.5	129.0	0.08	0.29
Philippines	5 233	6 479	7.69	1.98	2 400	2 662	2.03	0.81	23.2	22.0	0.39	-0.59
Saudi Arabia	3 683	4 458	3.44	1.44	3 250	3 799	3.51	1.39	100.8	99.4	0.74	-0.06
Thailand	3 569	3 531	14.04	1.58	1 175	1 410	3.86	0.98	17.1	20.2	3.43	0.90
Turkey	22 438	24 985	1.66	0.88	16 680	18 456	1.54	0.73	209.8	212.2	-0.02	0.11
Viet Nam	4 059	5 784	15.62	2.39	1 508	1 977	4.19	2.54	15.9	19.0	3.06	1.65
OCEANIA	9 525	9 024	4.08	1.40	2 943	2 938	3.50	0.69	75.0	65.0	1.89	-0.56
Australia	8 235	7 544	4.28	1.36	2 217	2 146	4.62	0.63	91.9	78.3	3.07	-0.49
New Zealand	944	1 101	4.09	1.91	396	430	0.76	0.76	85.0	84.3	-0.32	-0.05
DEVELOPED COUNTRIES	**272 891**	**287 968**	**0.14**	**0.65**	**133 519**	**135 337**	**0.35**	**0.15**	**94.9**	**93.0**	**-0.07**	**-0.14**
DEVELOPING COUNTRIES	**453 673**	**535 845**	**2.26**	**1.15**	**362 866**	**412 088**	**1.55**	**1.14**	**59.9**	**60.0**	**0.17**	**0.01**
LEAST DEVELOPED COUNTRIES (LDC)	22 135	28 560	4.97	2.18	17 487	22 935	3.77	2.32	22.0	22.5	1.34	0.06
OECD[2]	**223 825**	**234 945**	**0.32**	**0.61**	**121 674**	**125 740**	**0.67**	**0.28**	**92.1**	**90.9**	**0.10**	**-0.12**
BRICS	**267 711**	**307 432**	**1.34**	**0.66**	**195 816**	**208 564**	**0.78**	**0.57**	**62.5**	**62.3**	**-0.06**	**0.01**

Note: Marketing year: See Glossary of Terms for definitions.
Average 2015-17est: Data for 2017 are estimated.

1. Refers to mainland only. The economies of Chinese Taipei, Hong Kong (China) and Macau (China) are included in the Asia aggregate.
2. Excludes Iceland but includes all EU28 member countries.
3. Least-squares growth rate (see glossary).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.14.1. Maize projections: Production and trade

Marketing year

	PRODUCTION (kt)		Growth (%)[3]		IMPORTS (kt)		Growth (%)[3]		EXPORTS (kt)		Growth (%)[3]	
	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27
WORLD	**1 040 844**	**1 201 713**	**3.33**	**1.30**	**137 645**	**156 881**	**6.35**	**1.41**	**138 724**	**157 227**	**6.73**	**1.41**
NORTH AMERICA	380 709	404 001	2.38	0.62	2 520	2 299	1.53	-0.66	54 306	54 834	2.38	1.52
Canada	13 616	14 980	3.28	0.57	1 047	1 007	-5.60	-1.45	1 465	1 585	27.13	-0.16
United States	367 093	389 021	2.35	0.62	1 473	1 292	18.76	0.03	52 842	53 248	2.20	1.57
LATIN AMERICA	163 051	202 506	5.71	1.90	31 356	36 047	5.38	2.13	49 233	62 888	12.26	1.70
Argentina	36 863	46 731	10.07	2.13	4	4	0.00	0.00	19 347	22 821	8.27	1.63
Brazil	82 663	106 672	5.89	2.01	1 484	697	5.10	0.23	26 152	36 099	16.40	1.68
Chile	1 260	1 401	-1.86	2.53	1 463	1 708	7.71	1.83	107	140	5.00	-1.79
Colombia	1 688	2 894	0.60	3.26	4 613	5 081	5.12	1.00	88	84	17.54	-0.93
Mexico	26 222	27 566	2.44	0.72	12 974	16 717	7.14	2.59	1 166	925	34.11	2.64
Paraguay	4 713	4 590	12.17	1.89	10	10	-5.27	-0.18	2 337	2 784	11.10	2.82
EUROPE	108 166	127 139	2.96	1.32	15 027	9 786	17.48	-2.58	28 301	32 791	16.35	1.44
European Union	59 908	70 929	-0.29	1.15	14 289	9 229	19.31	-2.75	2 367	2 895	4.49	1.46
Russia	13 792	17 115	15.97	2.09	45	53	-3.36	0.06	5 192	6 145	43.07	2.01
Ukraine	25 167	30 538	11.52	1.51	48	25	6.20	-0.10	18 935	21 762	18.75	1.50
AFRICA	77 302	102 018	3.32	2.18	22 522	26 798	6.64	2.28	4 118	4 829	-0.44	-1.77
Egypt	7 635	8 474	0.54	2.14	8 933	12 295	7.33	2.31	0	0	..	..
Ethiopia	7 810	9 516	8.98	2.00	0	0	..	..	650	305	26.23	-6.51
Nigeria	10 686	13 205	4.88	1.83	443	722	24.14	2.38	150	125	-9.49	-0.80
South Africa	12 132	15 426	-0.39	0.60	1 399	0	64.11	..	1 370	1 862	-5.06	-5.22
ASIA	311 012	365 332	3.58	1.52	66 068	81 808	5.36	1.50	2 694	1 809	-7.09	-1.72
China[1]	220 031	250 628	3.70	1.34	3 212	6 689	35.99	4.22	37	12	-23.60	12.82
India	24 853	32 525	3.79	2.27	99	54	25.89	-0.87	547	131	-19.86	-9.19
Indonesia	21 486	28 158	3.18	1.81	1 881	1 052	17.41	3.88	137	77	7.55	-0.49
Iran	989	1 112	-5.81	1.76	6 708	9 815	9.33	2.10	0	0	..	..
Japan	0	0	..	..	14 950	14 924	-1.13	-0.11	0	0	..	..
Kazakhstan	600	632	2.34	1.47	40	33	43.30	1.10	40	49	29.96	-1.10
Korea	77	81	-0.70	0.22	10 210	10 985	4.20	0.33	0	0	..	..
Malaysia	59	71	4.00	1.56	3 621	4 734	3.47	1.63	36	31	17.12	-1.61
Pakistan	5 433	6 842	6.25	1.69	7	30	4.80	23.05	50	2	-31.91	-31.29
Philippines	7 538	9 137	1.52	1.56	463	910	20.93	16.83	0	0	..	..
Saudi Arabia	84	106	-6.28	2.53	3 733	5 523	9.97	1.94	0	0	..	..
Thailand	4 560	5 426	0.01	1.82	146	242	-11.93	1.58	465	186	-3.95	-1.56
Turkey	6 233	7 639	5.63	2.09	1 056	1 268	14.49	-3.29	69	70	3.17	0.63
Viet Nam	5 213	6 215	1.94	1.83	8 476	12 745	33.58	3.17	92	63	39.82	-0.95
OCEANIA	604	717	0.33	2.35	152	143	68.50	1.32	73	76	12.07	0.64
Australia	398	496	1.37	2.51	0	0	..	..	68	71	14.88	0.68
New Zealand	195	209	-1.62	2.04	148	141	118.09	1.37	5	5	-2.05	0.00
DEVELOPED COUNTRIES	**504 032**	**549 906**	**2.44**	**0.78**	**35 755**	**28 900**	**5.25**	**-0.99**	**84 110**	**89 636**	**5.36**	**1.29**
DEVELOPING COUNTRIES	**536 812**	**651 807**	**4.25**	**1.76**	**101 890**	**127 981**	**6.77**	**2.05**	**54 614**	**67 590**	**9.41**	**1.58**
LEAST DEVELOPED COUNTRIES (LDC)	38 163	52 587	4.29	2.71	2 215	2 159	5.34	-1.27	2 756	3 360	5.77	2.24
OECD[2]	**475 206**	**512 530**	**2.02**	**0.72**	**59 217**	**59 040**	**5.37**	**0.16**	**58 088**	**58 946**	**2.65**	**1.52**
BRICS	**353 471**	**422 365**	**4.39**	**1.58**	**6 240**	**7 493**	**21.09**	**3.70**	**33 298**	**44 248**	**12.32**	**1.24**

.. Not available

Note: Marketing year: See Glossary of Terms for definitions.

Average 2015-17est: Data for 2017 are estimated.

1. Refers to mainland only. The economies of Chinese Taipei, Hong Kong (China) and Macau (China) are included in the Asia aggregate.
2. Excludes Iceland but includes all EU28 member countries.
3. Least-squares growth rate (see glossary).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.14.2. Maize projections: Consumption, feed, food

Marketing year

	CONSUMPTION (kt)		Growth (%)[3]		FEED (kt)		Growth (%)[3]		FOOD (kg/cap)		Growth (%)[3]	
	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27
WORLD	**1 037 043**	**1 200 684**	**3.31**	**1.20**	**578 823**	**698 507**	**3.11**	**1.57**	**17.7**	**19.4**	**0.65**	**0.76**
NORTH AMERICA	323 265	351 941	1.93	0.48	144 072	165 737	1.11	1.08	19.0	18.6	-0.17	-0.26
Canada	12 799	14 405	1.15	0.51	7 174	8 806	-0.16	0.89	44.3	40.9	-0.96	-0.84
United States	310 466	337 536	1.97	0.48	136 898	156 931	1.18	1.09	16.1	16.0	0.03	-0.10
LATIN AMERICA	141 851	175 076	3.75	1.71	91 955	117 868	3.79	2.02	51.1	52.9	0.33	0.33
Argentina	17 635	23 832	11.95	2.65	12 110	17 208	13.57	3.27	34.9	36.6	2.33	0.19
Brazil	57 995	71 123	3.34	1.63	43 679	54 907	2.49	1.86	24.1	24.7	0.39	0.20
Chile	2 497	2 942	1.58	1.93	1 833	2 223	1.15	2.33	21.2	20.9	0.81	-0.17
Colombia	6 173	7 870	3.81	1.84	4 196	5 695	5.06	2.32	39.5	40.3	0.35	0.02
Mexico	36 629	43 332	2.85	1.08	18 467	22 561	4.65	1.02	130.8	133.5	-0.29	0.21
Paraguay	1 369	1 718	8.50	2.16	443	571	17.92	2.20	55.6	61.3	1.33	0.99
EUROPE	97 757	103 899	2.14	0.83	73 965	76 927	2.14	0.45	8.2	8.3	0.19	0.21
European Union	74 348	77 059	1.90	0.65	55 276	55 277	1.91	0.03	9.5	9.8	0.09	0.27
Russia	8 296	11 015	10.56	1.70	6 284	8 704	10.13	2.11	1.4	1.5	4.30	0.58
Ukraine	7 581	8 768	2.43	1.60	5 968	6 994	3.28	1.75	10.7	11.6	-0.16	0.64
AFRICA	94 591	123 687	4.35	2.35	33 414	41 599	5.89	2.18	40.7	43.4	0.65	0.42
Egypt	16 435	20 727	3.83	2.20	12 035	15 612	5.03	2.51	41.5	40.5	-0.75	-0.11
Ethiopia	7 176	9 219	8.29	2.46	1 300	931	20.12	0.02	46.3	54.7	2.67	0.90
Nigeria	10 983	13 788	5.85	1.90	2 133	2 115	15.37	0.53	35.6	36.5	1.32	0.10
South Africa	11 444	13 532	1.43	1.50	5 366	6 751	1.63	2.53	87.5	83.6	-0.31	-0.40
ASIA	378 882	445 297	4.54	1.36	234 935	295 817	4.23	1.90	8.2	8.6	-0.14	0.31
China[1]	227 797	257 482	4.78	1.14	139 667	171 389	4.04	1.89	6.1	6.1	-2.10	0.01
India	24 800	32 419	6.24	2.33	9 731	14 407	10.09	3.62	6.8	7.3	-0.34	0.18
Indonesia	23 297	29 093	4.11	1.86	8 867	13 648	6.73	2.39	28.8	29.5	0.43	0.28
Iran	7 763	10 907	5.81	2.06	7 538	10 639	5.97	2.06	0.9	0.9	-1.21	0.05
Japan	14 929	14 946	-1.16	-0.09	11 312	11 148	-1.15	-0.22	0.8	0.8	0.07	-0.85
Kazakhstan	637	612	5.92	1.87	533	485	4.57	1.97	0.6	0.6	2.32	0.97
Korea	10 119	11 063	3.45	0.21	7 814	8 658	3.57	0.15	1.9	1.9	-0.20	0.01
Malaysia	3 664	4 773	3.48	1.67	3 494	4 597	3.66	1.73	1.6	1.5	-0.84	-0.83
Pakistan	5 507	6 852	6.81	1.63	2 533	3 382	7.97	2.22	8.1	8.2	1.47	-0.21
Philippines	7 794	10 015	1.19	2.35	5 090	6 507	-0.13	2.59	18.5	20.0	1.37	0.78
Saudi Arabia	3 800	5 625	9.11	1.95	3 594	5 403	8.55	2.00	0.2	0.2	-2.57	-1.00
Thailand	4 341	5 475	0.31	1.92	4 002	5 135	0.61	2.04	1.2	1.1	-0.42	-0.09
Turkey	7 253	8 826	6.91	1.25	5 370	7 014	8.36	1.68	16.1	15.7	0.69	-0.03
Viet Nam	13 573	18 868	13.12	2.70	10 367	15 071	11.62	2.98	6.6	8.2	3.22	1.62
OCEANIA	697	784	3.48	2.34	482	559	3.38	3.31	2.4	2.2	-1.26	-0.70
Australia	331	425	0.43	2.85	138	223	-3.43	6.00	3.2	3.0	-1.08	-0.61
New Zealand	353	345	7.66	1.80	339	329	8.01	1.87	1.5	1.5	-1.06	0.00
DEVELOPED COUNTRIES	**451 914**	**489 385**	**1.86**	**0.58**	**238 573**	**264 910**	**1.35**	**0.88**	**12.9**	**13.1**	**0.17**	**0.11**
DEVELOPING COUNTRIES	**585 129**	**711 300**	**4.57**	**1.65**	**340 250**	**433 596**	**4.53**	**2.01**	**18.8**	**20.7**	**0.68**	**0.80**
LEAST DEVELOPED COUNTRIES (LDC)	37 360	51 247	4.76	2.54	8 084	10 281	8.09	1.44	27.8	32.0	0.89	1.11
OECD[2]	**471 534**	**512 850**	**1.98**	**0.56**	**246 347**	**275 056**	**1.61**	**0.80**	**23.0**	**24.2**	**0.34**	**0.50**
BRICS	**330 331**	**385 570**	**4.59**	**1.35**	**204 727**	**256 157**	**3.98**	**2.00**	**8.8**	**9.1**	**-0.65**	**0.15**

Note: Marketing year: See Glossary of Terms for definitions.
Average 2015-17est: Data for 2017 are estimated.

1. Refers to mainland only. The economies of Chinese Taipei, Hong Kong (China) and Macau (China) are included in the Asia aggregate.
2. Excludes Iceland but includes all EU28 member countries.
3. Least-squares growth rate (see glossary).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.15.1. Other coarse grain projections: Production and trade

Marketing year

	PRODUCTION (kt)		Growth (%)[3]		IMPORTS (kt)		Growth (%)[3]		EXPORTS (kt)		Growth (%)[3]	
	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27
WORLD	**297 420**	**326 887**	**-0.01**	**1.12**	**41 452**	**48 659**	**6.60**	**1.96**	**45 761**	**49 112**	**4.43**	**1.94**
NORTH AMERICA	29 414	27 715	-0.21	0.11	1 800	1 773	-0.52	-0.17	11 032	10 992	4.30	0.45
Canada	12 227	11 469	-1.47	-0.85	145	127	14.39	-0.26	4 461	3 854	0.41	-2.55
United States	17 188	16 247	0.76	0.86	1 655	1 646	-1.24	-0.16	6 572	7 137	7.94	2.57
LATIN AMERICA	18 444	24 662	0.99	2.74	2 868	3 222	-5.63	0.92	3 099	4 920	1.34	8.51
Argentina	7 297	9 972	5.78	4.13	1	1	0.00	0.00	2 924	4 740	1.46	9.16
Brazil	2 769	3 422	2.28	1.43	599	369	4.41	-2.50	19	17	12.17	1.33
Chile	580	871	3.48	1.59	177	85	-16.35	-0.01	46	117	-1.38	0.01
Colombia	21	24	-21.33	1.52	1 049	1 297	10.18	1.78	0	0	..	..
Mexico	5 891	8 537	-2.33	2.42	801	947	-15.95	-0.68	1	0	45.40	..
Paraguay	31	38	-1.00	1.90	0	0	..	..	2	1	-1.57	-6.48
EUROPE	136 110	141 016	-0.39	0.47	1 347	1 619	-0.36	2.85	19 569	21 066	4.73	1.48
European Union	92 281	96 523	-0.17	0.35	801	830	2.57	4.04	10 327	10 498	8.20	1.54
Russia	26 792	25 919	0.62	0.38	58	163	-11.28	9.66	4 147	4 780	6.26	0.87
Ukraine	10 506	11 517	-2.90	1.32	17	15	-2.28	-0.06	5 012	5 669	0.17	1.86
AFRICA	52 403	67 447	0.61	2.37	4 248	4 873	7.84	1.64	2 643	1 805	10.05	-0.99
Egypt	899	902	-1.91	1.82	71	14	7.77	-22.65	0	0	..	..
Ethiopia	12 812	17 905	6.43	3.65	10	0	-15.18	..	1 500	1 005	24.43	8.01
Nigeria	8 306	9 797	-6.15	1.52	20	18	0.00	-0.23	100	122	-3.11	0.56
South Africa	504	541	-0.18	1.42	181	200	7.31	-1.44	21	26	-7.27	1.23
ASIA	47 351	52 472	0.08	1.33	31 083	37 038	9.60	2.17	1 384	2 611	3.29	4.18
China[1]	8 573	7 380	-1.46	1.01	13 289	14 564	34.52	2.82	72	92	-11.20	2.12
India	17 584	20 089	-1.76	1.26	8	4	8.77	-1.11	467	1 378	7.17	8.24
Indonesia	0	0	..	..	90	92	5.55	0.69	0	0	..	..
Iran	3 087	3 471	4.89	1.23	1 854	3 521	9.05	2.62	0	0	..	..
Japan	218	211	0.07	-0.42	2 017	1 738	-5.83	-1.62	0	0	..	..
Kazakhstan	3 530	4 093	6.43	1.36	10	10	-12.22	0.00	829	1 122	9.97	0.89
Korea	92	123	-5.34	1.34	114	126	3.47	0.76	0	0	..	..
Malaysia	0	0	..	..	0	0	..	..	0	0	..	..
Pakistan	615	720	1.97	1.64	204	303	65.80	3.50	0	0	..	..
Philippines	0	0	..	..	37	50	1.17	2.90	0	0	..	..
Saudi Arabia	212	307	-0.45	1.85	9 676	12 216	3.72	2.18	0	0	..	..
Thailand	166	192	-0.16	1.44	24	19	0.00	-3.67	2	2	-0.19	0.72
Turkey	7 969	9 548	0.73	1.62	251	459	14.01	2.18	8	11	-14.85	-0.40
Viet Nam	2	2	3.44	1.66	70	81	5.61	1.36	0	0	..	..
OCEANIA	13 698	13 574	1.40	0.78	106	134	6.34	2.13	8 034	7 718	4.96	2.46
Australia	13 297	13 241	1.47	0.81	0	0	..	..	8 034	7 718	4.96	2.46
New Zealand	397	328	-1.03	-0.47	20	26	49.07	0.52	0	0	-2.85	0.00
DEVELOPED COUNTRIES	**186 007**	**190 115**	**-0.05**	**0.47**	**6 261**	**6 318**	**-2.12**	**0.27**	**39 485**	**40 925**	**4.72**	**1.35**
DEVELOPING COUNTRIES	**111 413**	**136 771**	**0.18**	**2.08**	**35 191**	**42 340**	**9.06**	**2.24**	**6 276**	**8 187**	**3.45**	**5.53**
LEAST DEVELOPED COUNTRIES (LDC)	19 680	25 195	1.59	2.12	365	495	1.78	3.01	801	463	1.10	-7.28
OECD[2]	**151 171**	**158 227**	**-0.09**	**0.53**	**7 063**	**7 307**	**-4.57**	**0.14**	**29 448**	**29 337**	**5.41**	**1.34**
BRICS	**56 223**	**57 350**	**-0.53**	**0.83**	**14 135**	**15 300**	**28.88**	**2.63**	**4 726**	**6 294**	**5.59**	**2.11**

.. Not available

Note: Marketing year: See Glossary of Terms for definitions.

Average 2015-17est: Data for 2017 are estimated.

1. Refers to mainland only. The economies of Chinese Taipei, Hong Kong (China) and Macau (China) are included in the Asia aggregate.
2. Excludes Iceland but includes all EU28 member countries.
3. Least-squares growth rate (see glossary).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.15.2. Other coarse grain projections: Consumption, feed, food

Marketing year

	CONSUMPTION (kt)		Growth (%)[3]		FEED (kt)		Growth (%)[3]		FOOD (kg/cap)		Growth (%)[3]	
	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27
WORLD	**294 307**	**325 909**	**0.21**	**1.14**	**164 872**	**182 370**	**0.05**	**0.97**	**10.3**	**11.0**	**-0.09**	**0.70**
NORTH AMERICA	20 189	18 422	-2.08	-0.05	10 787	10 273	-4.63	-0.21	3.6	3.1	0.18	-0.92
Canada	7 709	7 751	-2.37	-0.17	6 774	6 960	-2.81	-0.15	9.6	6.4	2.85	-1.74
United States	12 480	10 671	-1.91	0.03	4 013	3 312	-7.18	-0.32	2.9	2.7	-0.73	-0.70
LATIN AMERICA	18 263	22 902	0.12	1.55	13 104	16 872	-1.16	1.86	4.0	4.2	-0.03	0.00
Argentina	4 441	5 214	9.64	0.96	2 822	3 153	8.68	1.01	16.4	18.5	1.34	-0.21
Brazil	3 449	3 764	3.37	1.13	2 171	2 349	2.62	1.75	2.8	2.6	0.29	0.14
Chile	700	831	-4.89	1.70	461	571	-7.27	2.03	3.6	4.2	2.13	1.00
Colombia	1 073	1 321	7.31	1.77	720	925	11.54	2.30	1.5	1.4	-0.98	-0.59
Mexico	6 692	9 480	-4.23	2.06	5 975	8 612	-4.72	2.12	5.6	6.0	-0.15	0.38
Paraguay	29	37	-0.96	2.18	22	27	-2.68	2.01	0.0	0.0	..	..
EUROPE	117 867	121 425	-1.17	0.39	87 388	87 301	-0.78	0.09	11.2	10.9	-0.96	-0.04
European Union	83 942	86 895	-0.65	0.38	63 620	62 588	-0.48	-0.10	9.4	9.7	0.09	0.28
Russia	21 722	21 170	-1.31	0.01	15 039	14 932	-0.32	0.10	13.7	11.8	-2.71	-0.56
Ukraine	5 540	5 820	-5.50	1.20	3 691	3 965	-5.02	1.65	17.8	16.3	-2.66	-0.49
AFRICA	54 410	70 326	0.83	2.41	7 281	8 882	-4.29	2.32	32.6	33.8	0.09	0.29
Egypt	970	915	-1.43	-0.28	615	533	-2.38	-0.96	3.1	2.7	-1.56	-1.11
Ethiopia	11 308	16 827	5.52	3.40	600	1 033	10.31	5.96	91.6	109.7	2.48	1.25
Nigeria	8 308	9 678	-7.20	1.59	598	480	-23.69	2.21	39.0	35.2	-1.78	-0.90
South Africa	670	714	2.18	0.42	35	42	-5.41	2.30	4.0	3.6	-1.85	-1.01
ASIA	77 505	86 846	2.99	1.60	42 319	54 868	5.78	2.55	5.5	5.2	-1.55	-0.22
China[1]	21 658	21 907	10.47	2.18	9 879	14 853	32.35	4.81	3.4	3.1	0.71	-0.67
India	17 603	18 712	-1.79	0.89	503	718	4.07	3.89	12.3	11.5	-2.62	-0.27
Indonesia	90	92	5.55	0.69	0	0	..	..	0.3	0.3	4.25	-0.21
Iran	4 907	6 981	5.49	1.88	4 730	6 768	5.74	1.88	0.3	0.3	-1.44	-0.64
Japan	2 227	1 961	-4.81	-1.48	1 625	1 381	-6.59	-1.54	3.6	3.8	0.73	0.49
Kazakhstan	2 508	2 964	3.95	1.76	1 632	1 943	3.79	2.01	2.6	2.3	-1.48	-1.04
Korea	206	248	-1.39	1.05	59	60	-1.42	-0.19	2.9	3.6	-1.76	1.19
Malaysia	0	0	..	..	0	0	..	..	0.0	0.0	..	..
Pakistan	819	1 023	5.66	2.15	195	266	0.00	2.79	3.0	3.0	6.72	0.28
Philippines	37	50	1.07	2.90	29	39	2.04	2.84	0.0	0.0	..	..
Saudi Arabia	10 154	12 476	4.11	2.10	9 958	12 271	4.21	2.13	2.8	2.5	-2.70	-1.00
Thailand	188	209	-0.14	0.85	52	65	-0.44	2.03	1.4	1.4	-0.74	-0.17
Turkey	8 211	9 984	0.76	1.72	7 125	8 859	0.85	1.90	3.7	3.4	-1.21	-0.69
Viet Nam	72	83	5.48	1.37	0	0	..	..	0.0	0.0	..	..
OCEANIA	6 073	5 988	-0.51	-1.22	3 994	4 175	-0.73	-1.53	7.5	7.0	-2.81	-0.29
Australia	5 557	5 523	-0.66	-1.33	3 631	3 807	-0.92	-1.64	9.0	8.0	-4.43	-0.74
New Zealand	428	354	-0.01	-0.40	344	346	0.64	-0.41	1.7	1.6	-1.06	-0.80
DEVELOPED COUNTRIES	**152 731**	**155 264**	**-1.11**	**0.29**	**108 289**	**108 518**	**-1.11**	**0.05**	**7.6**	**7.1**	**-1.01**	**-0.34**
DEVELOPING COUNTRIES	**141 576**	**170 645**	**1.81**	**1.97**	**56 583**	**73 852**	**2.55**	**2.51**	**11.0**	**11.8**	**0.02**	**0.79**
LEAST DEVELOPED COUNTRIES (LDC)	19 529	25 200	2.53	2.42	922	1 149	4.66	2.57	18.6	19.8	0.26	0.54
OECD[2]	**130 283**	**136 150**	**-1.10**	**0.43**	**95 441**	**98 614**	**-1.41**	**0.18**	**6.2**	**6.2**	**-0.24**	**-0.01**
BRICS	**65 102**	**66 268**	**1.68**	**1.00**	**27 627**	**32 895**	**5.45**	**2.18**	**7.6**	**7.2**	**-1.78**	**-0.20**

.. Not available

Note: Marketing year: See Glossary of Terms for definitions.

Average 2015-17est: Data for 2017 are estimated.

1. Refers to mainland only. The economies of Chinese Taipei, Hong Kong (China) and Macau (China) are included in the Asia aggregate.
2. Excludes Iceland but includes all EU28 member countries.
3. Least-squares growth rate (see glossary).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.16.1. Rice projections: Production and trade

Marketing year

	PRODUCTION (kt)		Growth (%)[3]		IMPORTS (kt)		Growth (%)[3]		EXPORTS (kt)		Growth (%)[3]	
	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27
WORLD	**498 327**	**562 323**	**1.15**	**1.08**	**44 911**	**56 471**	**5.33**	**2.13**	**45 161**	**54 428**	**5.81**	**2.22**
NORTH AMERICA	6 266	7 297	-1.04	0.75	1 137	1 272	2.40	1.12	3 425	3 914	0.22	1.38
Canada	0	0	..	..	369	446	0.02	1.98	0	0	..	..
United States	6 266	7 297	-1.04	0.75	767	826	3.70	0.69	3 425	3 914	0.22	1.38
LATIN AMERICA	18 507	21 004	0.47	1.26	4 142	4 466	2.65	0.45	3 228	3 789	4.14	0.82
Argentina	979	1 289	1.13	3.21	8	8	-0.62	0.00	434	681	-2.00	4.74
Brazil	8 019	8 236	-0.62	0.65	630	664	1.93	-1.17	806	872	3.94	-0.06
Chile	104	99	3.30	1.44	142	153	2.00	0.53	2	3	25.61	-0.21
Colombia	1 731	2 237	1.32	1.13	217	0	27.47	-70.24	1	2	15.34	9.89
Mexico	164	145	0.90	-0.70	710	1 044	-2.39	2.21	29	84	2.94	0.00
Paraguay	618	801	22.41	1.45	1	2	6.61	0.23	488	667	25.07	1.63
EUROPE	2 911	2 967	2.59	0.73	1 764	1 874	3.61	0.80	419	475	7.67	1.10
European Union	1 795	1 717	0.37	0.03	1 244	1 339	4.62	1.11	256	251	8.29	0.37
Russia	1 057	1 179	8.82	1.83	216	210	1.35	-0.15	154	212	7.40	2.10
Ukraine	43	52	-10.15	1.13	70	85	1.76	0.98	1	2	-10.25	-0.55
AFRICA	19 846	25 963	3.14	2.33	15 227	24 826	6.14	4.46	598	384	0.44	-3.41
Egypt	4 273	5 015	0.99	1.49	73	34	4.46	1.71	271	144	-3.16	-4.71
Ethiopia	96	128	8.02	2.52	283	538	30.78	5.06	0	0	..	..
Nigeria	3 010	3 813	4.52	1.05	2 490	4 564	3.53	5.69	0	0	..	..
South Africa	2	2	0.00	1.34	853	946	3.57	0.64	0	0	..	..
ASIA	450 342	504 335	1.11	1.02	22 118	23 464	5.82	0.60	37 216	45 310	6.73	2.50
China[1]	142 448	144 540	0.95	0.27	6 133	5 159	45.28	0.37	768	955	1.54	2.71
India	108 005	128 276	1.72	1.57	1	1	28.22	0.41	10 838	12 100	22.54	2.70
Indonesia	45 984	53 682	2.06	1.28	983	415	6.69	1.78	1	1	-0.18	-0.33
Iran	1 789	2 106	3.74	1.47	1 400	1 804	1.12	2.28	1	1	-4.63	-0.17
Japan	7 640	7 610	-0.31	0.10	780	784	-0.10	0.10	96	109	-7.84	1.38
Kazakhstan	300	385	5.73	1.04	22	16	9.51	0.49	70	98	19.10	-0.49
Korea	4 165	3 678	-1.68	-1.10	402	461	4.14	0.70	7	10	1.56	0.00
Malaysia	1 786	2 135	1.91	1.16	908	1 109	-2.30	2.10	41	4	69.78	-0.90
Pakistan	7 022	8 475	1.75	1.37	10	8	-11.60	-0.01	4 022	4 597	2.28	0.97
Philippines	12 086	14 807	1.83	1.42	1 307	1 581	-4.58	2.86	1	1	7.15	-0.20
Saudi Arabia	0	0	..	..	1 350	1 766	0.80	2.51	0	0	..	..
Thailand	20 670	27 489	-0.88	1.84	247	284	-6.08	1.81	10 490	12 869	3.04	3.44
Turkey	548	630	1.93	1.47	259	274	1.55	-1.06	48	43	1.47	1.07
Viet Nam	28 405	32 585	1.47	1.31	537	686	-1.59	2.66	6 968	8 924	2.39	2.57
OCEANIA	455	757	18.58	2.99	523	569	0.07	0.73	275	555	18.55	2.57
Australia	446	747	20.27	3.01	158	152	-4.62	0.13	275	555	18.75	2.58
New Zealand	0	0	..	..	47	57	2.30	1.59	0	0	..	..
DEVELOPED COUNTRIES	**17 875**	**19 417**	**0.19**	**0.60**	**5 186**	**5 627**	**2.30**	**0.78**	**4 285**	**5 151**	**1.18**	**1.43**
DEVELOPING COUNTRIES	**480 451**	**542 906**	**1.19**	**1.10**	**39 725**	**50 844**	**5.78**	**2.29**	**40 877**	**49 277**	**6.40**	**2.30**
LEAST DEVELOPED COUNTRIES (LDC)	74 730	85 983	0.95	1.34	9 762	16 259	8.91	3.18	4 111	5 771	10.97	1.17
OECD[2]	**21 129**	**21 923**	**-0.52**	**0.21**	**5 160**	**5 881**	**1.45**	**1.00**	**4 139**	**4 972**	**0.97**	**1.41**
BRICS	**259 531**	**282 233**	**1.23**	**0.86**	**7 833**	**6 981**	**22.02**	**0.23**	**12 567**	**14 139**	**17.80**	**2.50**

.. Not available

Note: Marketing year: See Glossary of Terms for definitions.

Average 2015-17est: Data for 2017 are estimated.

1. Refers to mainland only. The economies of Chinese Taipei, Hong Kong (China) and Macau (China) are included in the Asia aggregate.
2. Excludes Iceland but includes all EU28 member countries.
3. Least-squares growth rate (see glossary).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.16.2. Rice projections: Consumption, food

Marketing year

	CONSUMPTION (kt)		Growth (%)[3]		FOOD (kg/cap)		Growth (%)[3]	
	Average 2015-17est	2027	2008-17	2018-27	Average 2015-17est	2027	2008-17	2018-27
WORLD	**497 793**	**563 981**	**1.47**	**1.07**	**54.1**	**55.2**	**0.02**	**0.16**
NORTH AMERICA	4 186	4 648	-0.21	0.76	11.7	12.0	-0.97	0.05
Canada	369	446	0.02	1.98	10.2	11.2	-0.99	1.15
United States	3 817	4 202	-0.24	0.64	11.8	12.1	-0.97	-0.06
LATIN AMERICA	19 403	21 659	0.58	1.18	28.5	28.8	-0.64	0.27
Argentina	534	618	4.54	1.69	10.3	11.5	3.74	1.01
Brazil	7 976	8 026	-0.34	0.52	38.4	36.1	-1.24	-0.08
Chile	233	249	2.14	0.83	12.5	12.3	1.03	0.16
Colombia	1 791	2 238	1.68	1.25	33.4	35.6	0.16	0.01
Mexico	828	1 101	-1.96	1.97	6.5	7.7	-3.34	0.90
Paraguay	133	136	16.63	0.75	7.2	6.8	3.18	-0.94
EUROPE	4 084	4 362	2.04	0.64	5.5	5.9	1.94	0.66
European Union	2 716	2 807	1.23	0.45	5.3	5.5	1.06	0.39
Russia	1 003	1 171	5.51	1.22	7.0	8.3	5.43	1.39
Ukraine	117	135	-3.40	1.09	2.6	3.1	-2.76	1.62
AFRICA	34 658	50 189	4.61	3.39	25.0	28.5	2.16	1.22
Egypt	4 034	4 891	1.32	1.76	38.2	38.6	-0.27	0.19
Ethiopia	392	662	21.50	4.50	3.6	4.8	19.35	2.34
Nigeria	5 660	8 350	4.18	3.41	26.5	30.6	1.33	1.19
South Africa	895	948	3.52	0.64	15.7	14.9	2.15	-0.38
ASIA	434 799	482 352	1.30	0.86	77.5	79.1	-0.06	0.15
China[1]	142 413	149 651	1.42	0.26	77.1	77.6	0.07	0.06
India	98 051	115 742	1.20	1.47	68.6	72.8	-0.03	0.44
Indonesia	46 833	53 983	2.35	1.29	134.8	139.2	0.07	0.25
Iran	3 155	3 896	1.90	1.82	35.2	40.5	0.46	1.18
Japan	8 637	8 070	0.31	-0.64	54.0	51.1	-1.13	-0.49
Kazakhstan	236	301	3.12	1.84	11.7	13.6	1.39	1.00
Korea	4 704	4 112	-0.34	-0.94	62.5	55.3	-2.35	-1.12
Malaysia	2 700	3 236	0.77	1.51	81.0	85.1	-0.33	0.28
Pakistan	3 000	3 870	0.98	1.86	12.4	13.2	-0.87	0.22
Philippines	13 364	16 334	1.04	1.60	114.6	117.3	-0.24	0.15
Saudi Arabia	1 390	1 762	2.46	2.47	42.3	45.4	-0.21	1.04
Thailand	13 827	14 865	1.55	0.63	99.4	99.6	-0.10	0.03
Turkey	788	861	2.21	0.65	9.2	9.2	0.49	0.01
Viet Nam	21 991	24 326	1.34	0.94	154.6	157.6	-0.94	0.18
OCEANIA	663	771	2.36	1.04	16.7	16.9	0.79	-0.21
Australia	293	344	2.01	1.14	12.2	12.6	0.50	0.01
New Zealand	47	57	2.30	1.59	10.2	11.3	1.21	0.78
DEVELOPED COUNTRIES	**19 123**	**19 664**	**0.85**	**0.20**	**12.3**	**12.2**	**-0.17**	**-0.08**
DEVELOPING COUNTRIES	**478 670**	**544 317**	**1.49**	**1.11**	**63.8**	**64.3**	**-0.12**	**0.05**
LEAST DEVELOPED COUNTRIES (LDC)	80 524	96 239	1.48	1.64	79.5	76.5	0.15	-0.36
OECD[2]	**22 722**	**22 590**	**0.22**	**-0.05**	**14.7**	**14.1**	**-1.16**	**-0.38**
BRICS	**250 338**	**275 537**	**1.30**	**0.76**	**66.6**	**68.6**	**0.01**	**0.24**

Note: Marketing year: See Glossary of Terms for definitions.
Average 2015-17est: Data for 2017 are estimated.

1. Refers to mainland only. The economies of Chinese Taipei, Hong Kong (China) and Macau (China) are included in the Asia aggregate.
2. Excludes Iceland but includes all EU28 member countries.
3. Least-squares growth rate (see glossary).

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

Table A.17. Main policy assumptions for cereal markets

Marketing year

		Average 2015-17est	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
ARGENTINA												
Crops export tax	%	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rice export tax	%	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CANADA												
Tariff-quotas[1]												
Wheat	kt	350.0	350.0	350.0	350.0	350.0	350.0	350.0	350.0	350.0	350.0	350.0
In-quota tariff	%	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Out-of-quota tariff	%	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7
Barley	kt	399.0	399.0	399.0	399.0	399.0	399.0	399.0	399.0	399.0	399.0	399.0
In-quota tariff	%	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Out-of-quota tariff	%	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0
EUROPEAN UNION[2]												
Voluntary coupled support												
Wheat[3]	mln EUR	88.9	90.0	89.3	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7
Rice[4]	mln EUR	56.4	55.9	55.7	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6
Cereal reference price[5]	EUR/t	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3
Direct payments ceilings[6]	bln EUR	41.5	41.6	41.6	42.2	42.3	42.3	42.3	42.3	42.3	42.3	42.3
Rice reference price[7]	EUR/t	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
Wheat tariff-quota[1]	kt	4 452.4	4 513.2	4 523.2	4 523.2	4 523.2	4 523.2	4 523.2	4 523.2	4 523.2	4 523.2	4 523.2
Coarse grain tariff-quota[1]	kt	72.8	78.3	69.0	66.4	61.5	53.1	49.4	44.6	39.9	35.3	29.6
JAPAN												
Wheat tariff-quota	kt	5 740.0	5 740.0	5 740.0	5 740.0	5 740.0	5 740.0	5 740.0	5 740.0	5 740.0	5 740.0	5 740.0
In-quota tariff	'000 JPY/t	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Out-of-quota tariff	'000 JPY/t	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Barley tariff-quota	kt	1 369.0	1 369.0	1 369.0	1 369.0	1 369.0	1 369.0	1 369.0	1 369.0	1 369.0	1 369.0	1 369.0
In-quota tariff	'000 JPY/t	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Out-of-quota tariff	'000 JPY/t	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0
Rice tariff-quota	kt	682.2	682.2	682.2	682.2	682.2	682.2	682.2	682.2	682.2	682.2	682.2
In-quota tariff	'000 JPY/t	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Out-of-quota tariff	'000 JPY/t	341.0	341.0	341.0	341.0	341.0	341.0	341.0	341.0	341.0	341.0	341.0
KOREA												
Wheat tariff	%	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Maize tariff-quota	kt	6 102.0	6 102.0	6 102.0	6 102.0	6 102.0	6 102.0	6 102.0	6 102.0	6 102.0	6 102.0	6 102.0
In-quota tariff	%	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Out-of-quota tariff	%	304.7	304.7	304.7	304.7	304.7	304.7	304.7	304.7	304.7	304.7	304.7
Barley tariff-quota	kt	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6
In-quota tariff	%	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Out-of-quota tariff	%	271.4	271.4	271.4	271.4	271.4	271.4	271.4	271.4	271.4	271.4	271.4
Rice quota[8]	kt	408.7	408.7	408.7	408.7	408.7	408.7	408.7	408.7	408.7	408.7	408.7
In-quota tariff	%	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
MERCOSUR												
Wheat tariff	%	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Coarse grain tariff[9]	%	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Rice tariff	%	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
MEXICO												
Barley import tariff	%	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UNITED STATES												
ARC participation rate												
Wheat	%	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6
Coarse grains	%	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1
Wheat loan rate	USD/t	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0
Maize loan rate	USD/t	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8
CHINA												
Wheat tariff-quota	kt	9 636	9 636	9 636	9 636	9 636	9 636	9 636	9 636	9 636	9 636	9 636
In-quota tariff	%	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Out-of-quota tariff	%	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Coarse grains tariff	%	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Maize tariff-quota	kt	7 200	7 200	7 200	7 200	7 200	7 200	7 200	7 200	7 200	7 200	7 200
In-quota tariff	%	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Out-of-quota tariff	%	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Rice tariff-quota	kt	5 320	5 320	5 320	5 320	5 320	5 320	5 320	5 320	5 320	5 320	5 320
In-quota tariff	%	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Out-of-quota tariff	%	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7

Table A.17. Main policy assumptions for cereal markets *(cont.)*

Marketing year

		Average 2015-17est	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
INDIA												
Minimum support price												
Rice	INR/t	14 988	16 361	16 990	17 651	18 341	19 059	19 806	20 585	21 388	22 225	23 095
Wheat	INR/t	15 714	17 375	18 059	18 582	19 103	19 650	20 209	20 828	21 411	22 031	22 673
Wheat tariff	%	50.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Rice tariff	%	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1
RUSSIA												
Wheat ad valorem import tax	%	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Rice tariff equivalent of import barriers	%	11.7	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Coarse grains tariff equivalent of import barriers	%	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coarse grain specific tariff	RUB/t	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coarse grain ad valorem import tax	%	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Marketing year: See Glossary of Terms for definitions.
Average 2015-17est: Data for 2017 are estimated.
The sources for tariffs and Tariff Rate Quotas are the national questionnaire reply, UNCTAD and WTO.

1. Year beginning 1 July.
2. Since 2015 the Basic payment scheme (BPS) holds, which shall account for 68% maximum of the national direct payment envelopes. On top of this, compulsory policy instruments have been introduced: the Green Payment (30%) and young farmer scheme (2%).
3. Mainly for durum wheat. Implemented in 6 Member States.
4. Implemented in 6 Member States.
5. Buying-in at the fixed reference price is operable automatically only for common wheat up to a maximum quantity of 3 million tons per marketing year. Above that ceiling and for durum wheat, maize and barley intervention can take place only via tender.
6. Estimated net amounts for all direct payments based on Annex II of EU Regulation No 1307/2013, accounting for the transfers between direct aids and rural development envelopes.
7. Intervention is set at zero tonnes per marketing year. However, the Commission may initiate intervention if market requires.
8. Milled rice basis.
9. Applied by Brazil only.

Source: OECD/FAO (2018), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database). doi: dx.doi.org/10.1787/agr-outl-data-en

OECD-FAO Agricultural Outlook 2018-2027

The fourteenth joint edition of the OECD-FAO Agricultural Outlook provides market projections for major agricultural commodities, biofuels and fish, as well as a special feature on the prospects and challenges of agriculture and fisheries in the Middle East and North Africa.

World agricultural markets have changed markedly since the food price spikes of 2007-8, as production has grown strongly while demand growth has started to weaken. In the coming decade, real agricultural prices are expected to remain low as a result of reduced growth in global food and feed demand. Net exports will tend to increase from land abundant countries and regions, notably in the Americas. Countries with limited natural resources, slow production expansion and high population growth will see rising net imports. Increasing import dependence is projected in particular for the Middle East and North Africa, where a scarcity of arable land and water constrains agricultural production.

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