

11 Other products

This chapter provides a market overview and a description of the current market situation for roots and tubers (i.e. cassava, potato, yams, sweet potato, taro), pulses (i.e. field peas, broad beans, chickpeas, lentils), and banana and major tropical fruits (i.e. mango, mangosteen and guava, pineapple, avocado, and papaya) markets. It then highlights the medium term (2022-31) projections for production, consumption and trade for these products and describes the main drivers of these projections.

11.1. Roots and tubers

11.1.1. Market overview

Roots and tubers are plants that yield starch derived from either their roots (e.g. cassava, sweet potato and yams) or stems (e.g. potatoes and taro). They are destined mainly for human consumption (as such or in processed form) and, like most other staple crops, can also be used for animal feed or industrial processing, notably in the manufacturing of starch, alcohol, and fermented beverages. Unless they are processed, they are highly perishable once harvested, which limits the opportunities for trade and storage.

Within the roots and tubers family, potato dominates in worldwide production, with cassava a distant second. With respect to global dietary importance, potato ranks fourth after maize, wheat and rice. This crop provides more calories, grows more quickly, uses less land, and can be cultivated in a broad range of climates than cereals. However, potato production, which forms the bulk of the root and tuber sectors in developed countries, has been declining over several decades, with growth in production falling well below that of population.

Output of cassava is growing at well over 3% p.a., almost three times the rate of population growth. Cultivated mainly in the tropical belt and in some of the world's poorest regions, cassava production has doubled over two decades. Once considered a subsistence crop, it is now seen as a commodity and key for value-addition, rural development and poverty alleviation, food security, energy security; and for bringing important macroeconomic benefits. These factors are driving rapid commercialisation of this crop and large-scale investments in upscaling the processing of cassava, both which have contributed significantly to its global expansion.

11.1.2. Current market situation

The largest producing regions of roots and tubers in the base period are Asia (103 Mt) and Africa (98 Mt). In Sub Saharan Africa, roots play a significant role as a staple crop. Globally, about 131 Mt are used as food, 56 Mt as feed, and 56 Mt for other uses, mostly biofuel and starch. As the perishable nature of these crops prohibits significant international trade in fresh produce, countries tend to be self-sufficient. About 14 Mt are currently traded internationally, mostly in processed or dried form. Thailand and Viet Nam are the leading exporters and The People's Republic of China (hereafter "China") is the main destination.

Global production of roots and tubers reached 247 Mt (dry matter) in the base period (2019-21); about 5 Mt has been added annually in the past years and consumed mainly as food. The prices of roots and tubers (measured by the Cassava (flour) wholesale price in Bangkok) increased in 2021 as demand was strong. Global quantities traded increased by 0.3 Mt.

11.1.3. Main drivers for projections

Producing cassava requires few inputs and affords farmers greater flexibility in terms of timing the harvest as the crop can be left on the ground well after reaching maturation. Cassava's tolerance to erratic weather conditions, including drought, makes it an important part of climate change adaptation strategies. Compared to other staples, cassava competes favourably in terms of price and diversity of uses. In the form of High Quality Cassava Flour (HQCF), cassava is increasingly targeted by governments in Africa as a strategic food crop which does not exhibit the same levels of price volatility as other imported cereals. Mandatory blending with wheat flour helps reduce the volume of wheat imports, thereby lowering import bills and conserving precious foreign exchange. The drive towards energy security in Asia, combined with mandatory blending requirements with gasoline, has led to the establishment of ethanol distilleries that use cassava as a feedstock. With regard to trade, processed cassava manages to compete successfully in the global arena, e.g. with maize-based starch and cereals for animal feeding applications.

Potatoes are generally confined to food use and are a substantial component of diets in developed regions, particularly in Europe and North America. As overall food intake of potato in these regions is very high and may have reached saturation, the scope for consumption increases to outpace population growth remains limited. Developing regions, however, provide some growth momentum to potato production at the world level.

Global sweet potato cultivation has declined in recent years, mostly due to a sharp decline in acreage (which shows no sign of abating) in China, the world's foremost producer. Food demand largely defines the growth potential of sweet potato and other less prominent roots and tuber crops given the limited commercial viability for diversified usage. Consequently, consumer preferences along with prices play important roles in shaping consumption.

11.1.4. Projection highlights

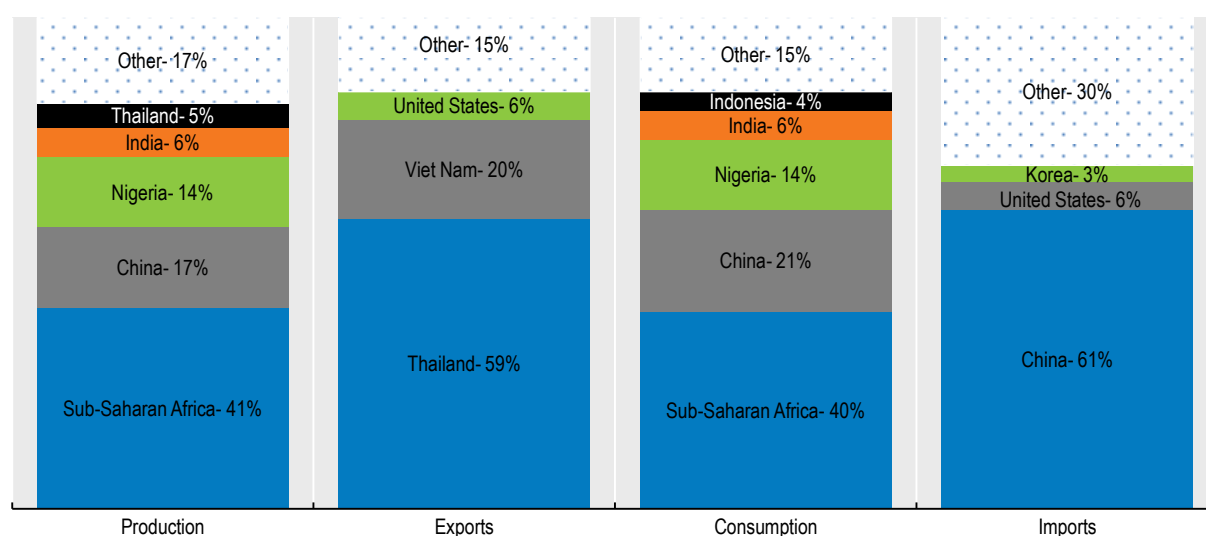
World production and utilisation of roots and tubers is projected to increase by about 17% over the next decade. Production growth in low-income regions could reach 2.2% p.a. while supply in high-income countries should grow at only 0.3% annually. Global land use is projected to increase by 5 Mha to 66 Mha, but there will be some regional shifts. African countries are expected to increase their cultivation area, while reductions are projected for Europe and America. Production growth is mainly attributed to investments in yield improvements in Africa and Asia, as well as an intensification of land use in these regions.

By 2031, an additional 1.7 kg/capita per year of root crops will enter diets at the global level, driven mostly by consumers in Africa where per capita intake of roots and tubers could surpass 42 kg per year. Biofuel use, albeit from a low basis (3% of use), is expected to grow by nearly 50% over the next ten years driven by the Chinese biofuel industry. Feed and other industrial use will remain significant, albeit with slower growth of about 10% and 13%, respectively, over the outlook period.

International trade in roots and tubers comprises about 6% of the global market production. Over the medium term, this share is expected to remain constant. Exports from Thailand and Viet Nam are growing and are expected to reach a combined total of 14 Mt, mainly to supply the growing biofuel and starch industries in China.


Given the substitutability between roots and tubers and cereals on food and feed markets, prices of roots and tubers are projected to follow a similar path to cereal prices in the medium term; namely, an increase in nominal prices but a decline in real terms.

Figure 11.1. Global players in roots and tubers markets in 2031



Note: Presented numbers refer to shares in world totals of the respective variable

Source: OECD/FAO (2022), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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11.2. Pulses

11.2.1. Market overview

Pulses are the edible seeds of plants in the legume family. Commonly, eleven types are recognised.¹ They provide protein, dietary fibre, vitamins, minerals, phytochemicals, and complex carbohydrates. Apart from the nutritional benefits, pulses help to improve digestion, reduce blood glucose, minimise inflammation, lower blood cholesterol, and prevent chronic health issues such as diabetes, heart disease, and obesity. However, their consumption levels differ from region to region depending on the dietary patterns, availability and prevailing conditions.

Cultivation of pulses has a long tradition in almost all regions of the world. For centuries, legumes have played a fundamental role in the functioning of traditional agricultural systems, also due to their function as nitrogen-fixing crop. Prior to 2000, global production of pulses stagnated due to the widespread disappearance of small farms in developing countries which led to a decline of traditional farming systems that included pulses in their crop rotation. Production was further hampered because of their weak resilience to diseases due to a lack of genetic diversity, limited access to high-yield varieties, and the lack of policy support to pulses growers. The sector began to recover in the early 2000s and has since seen an annual increase of about 3% globally, led by Asia and Africa. These two regions combined accounted for about 73% of the 25 Mt production increase in the past decade.

Global per capita consumption of pulses started to decline in the 1960s (Figure 11.2) due to slow growth in yields and resulting increases in price. Income growth and urbanisation shifted preferences away from pulses as human diets became richer in animal proteins, sugar, and fats. Nonetheless, pulses have remained an important source of protein in developing countries, and average global per capita consumption has increased to about 8 kg/year to date. This growth has been driven mainly by income

gains in countries where pulses are an important source of protein; this is particularly true of India where vegetarians account for about 30% of the population.

Pulses can be processed into different forms such as whole pulses, split pulses, pulse flours, and pulse fractions like protein, starch and fibre. The flour and fractions have diverse applications in industries related to meat and snack food, bakery and beverages, and batter and breadings.

11.2.2. Current market conditions

India is by far the largest producer of pulses, accounting for about 25% of global production in the past decade. Canada (8%), China (6%) and the European Union (4%) are the next largest producing countries. The Asian market accounts for 54% of all consumption, but only about 46% of production, making it the most significant import destination. About 18% of global production is traded internationally with Canada (31% of global trade) by far the largest exporter and India the largest importer (15% of global trade). Africa has further expanded its production and consumption in the past decade and has remained largely self-sufficient.

In 2021, the global pulses market reached a volume of 100 Mt, after an average annual growth of 3.8% p.a. during the previous decade; this growth was led by Asia and Africa. World trade volumes were registered at 19 Mt, 0.4 Mt higher than in 2020. Due to a tight supply situation, international prices for pulses, approximated by the Canadian field pea price, have jumped to USD 479/Mt, its highest value ever recorded as Canada was suffering from a very bad harvest.

11.2.3. Main drivers for projections

As pulses are associated with various health benefits, health-conscious consumers are increasingly integrating these in their daily diets, which in turn is propelling the growth of the global pulses market. Rapid urbanisation, changing lifestyles, and hectic work schedules are also making snack foods popular amongst the working population, and pulses are increasingly used in the processing of ready-to-eat (RTE) food products.

Health and environmental benefits are reasons why governments of pulses-producing countries are providing assistance to farmers, and thus supporting growth of this market. Support to the production of pulses production plays an important role in the Protein Strategy of the European Union and are a major ingredient in products such as meat substitutes. Depending on the future dynamics of demand for such products, this could significantly change the future importance of pulses in the agricultural production mix.

11.2.4. Projection highlights

Pulses are expected to regain importance in the diets in many regions of the world. This *Outlook* foresees the global trend in this area to continue and projects global average annual per capita food use to increase to 9 kg by 2031. Per capita consumption is projected to increase in nearly all regions over the coming decade, with the largest increase expected in Europe (+3% p.a.) (Figure 11.2)

Global supply is projected to increase by 23 Mt. Almost half of this increase is expected to come from Asia, particularly India, the world's largest producer. Sustained yield improvements are projected to raise India's domestic production by an additional 7.3 Mt by 2031. India has introduced high-yielding hybrid seeds, supported mechanisation, and implemented a minimum support price aimed at stabilising farmer's income. In addition, the central government and some state governments have included pulses in their procurement programmes, although not with the same geographical coverage as in the case of wheat and rice.

This expected production expansion is driven by the assumption of continued intensification of the pulses production systems due to improved yields and intensified land use. About 65% of production growth can

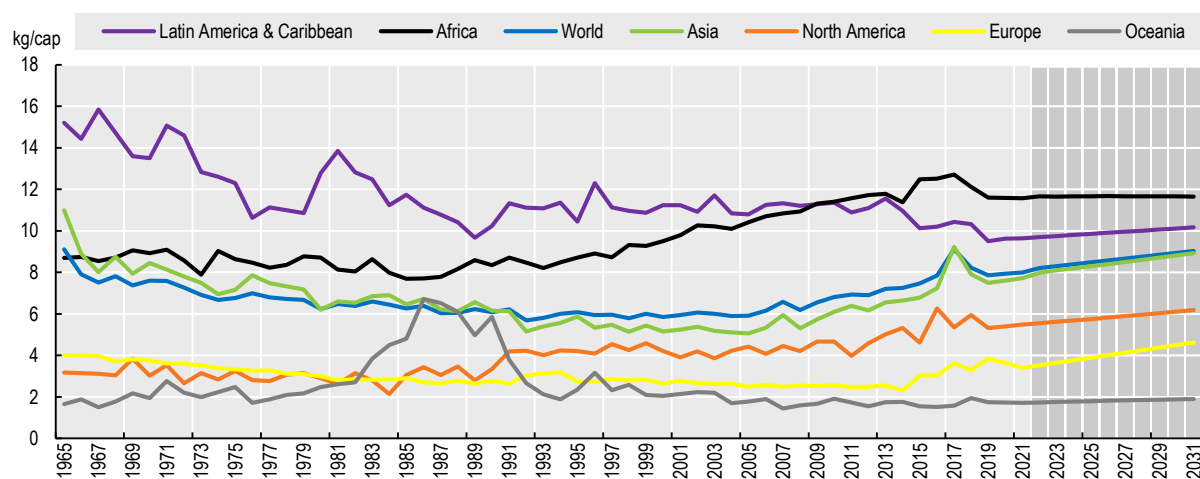
be attributed to yield improvements during the projection period, and the remaining 35% to land use intensification, mainly in Asia, Africa and North America. Particularly in Africa, a combination of area expansion and yield growth is estimated to add about 0.6 Mt annually to the regional production.

This *Outlook* assumes that growth will be sustained by increased intercropping of pulses with cereals, in particular in Asia and Africa where smallholder farmers represent a large share of producers. The projected yield improvements of pulses will continue to lag cereals and oilseeds because in most countries pulses are not included in the development of high-yielding varieties, improved irrigation systems, and agricultural support policies.

World trade of pulses grew from 13 Mt to 18 Mt over the past decade and is projected to reach 20 Mt by 2031. Canada remains the main exporter of pulses, with volumes expected to grow from 5.6 Mt at present to 6.7 Mt by 2031, followed by Australia with 2.1 Mt of exports by 2031.

International prices in nominal terms are expected to decrease until 2026 then increase over the coming decade, while real prices will decline.

Figure 11.2. Per capita food consumption of Pulses per continent



Source: OECD/FAO (2022), "OECD-FAO Agricultural Outlook" OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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11.3. Bananas and major tropical fruits

11.3.1. Introduction

Bananas and the four major fresh tropical fruits – mango, pineapple, avocado and papaya – play a vital role in securing the nutrition and livelihoods of smallholder producers in tropical countries. In recent decades, income growth and changing consumer preferences in both emerging and high-income markets, alongside improvements in transportation and supply chain management, have facilitated fast growth in international trade in these commodities.

Based on preliminary 2021 figures, the global banana and major tropical fruit export industries, respectively, generate around USD 11 billion and USD 12 billion per year. Although only approximately 15% of global banana production and 5% of global major tropical fruit production are traded in international

markets, in exporting countries - which are mostly low-income economies - revenue from production and trade of these fruits can weigh significantly in agricultural GDP. For instance, in 2018 bananas represented about 42% of agricultural export revenue in Ecuador, and 17% in Guatemala.

11.3.2. Market situation

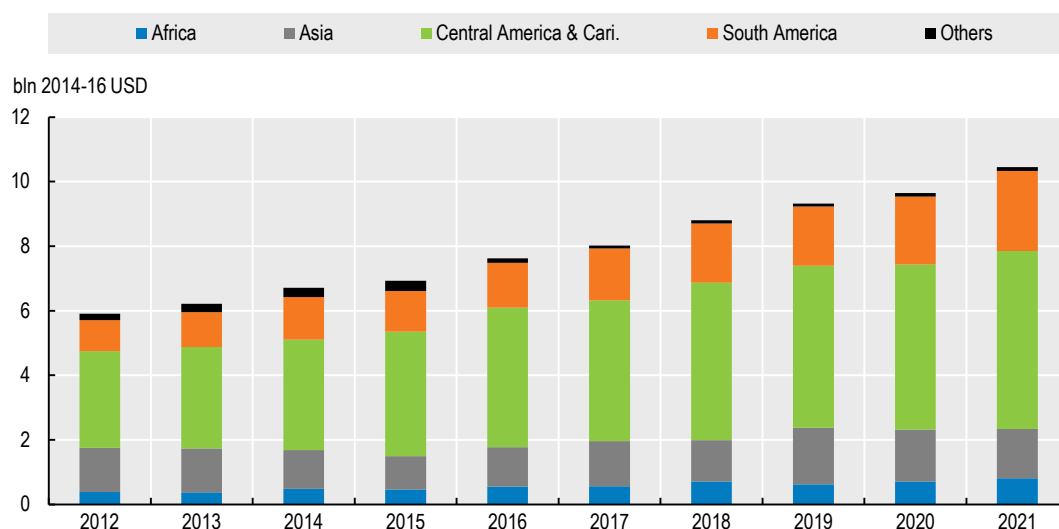
Bananas

Global trade in bananas fell by an estimated 1.5 Mt in 2021, which would be among the largest annual drops in global banana shipments. Since the onset of the COVID-19 pandemic the impact of the disease, as well as the containment measures, have discernibly affected production, transportation, distribution, marketing and consumption of fresh bananas. In 2021, additional constraints included substantially higher fertiliser and packaging material costs, shortages in refrigerated containers, and significant rises in global transportation costs. Beyond the impact of COVID-19, production shortages caused by adverse weather conditions and concerns surrounding the spread of plant diseases caused further challenges to the industry.

Further key developments of concern in 2021 were the introduction of new maximum pesticide residue levels in importing markets, which led to higher export reject rates as produce not meeting these new requirements could not be imported, and the alarming discovery of the Banana Fusarium Wilt Tropical Race 4 (TR4) disease in Peru in April 2021. The plethora of simultaneous difficulties experienced by the sector in 2021 significantly impeded producers' ability to remain operational and especially affected smallholder farmers. Like the situation observed in 2020, these pressures continued to hamper exports, in particular from Asia. Moreover, in 2021 shipments from Latin America were also affected.

Major tropical fruits

Provisional data indicate that, despite significant COVID-19 related bottlenecks in global supply chains and rising costs for inputs and transport, the volume of world trade in major tropical fruits in 2021 rose to a record of USD 10.5 billion in constant 2014 2016 dollars, marking an expansion of approximately 8% from 2020 (Figure 11.3). Developments by commodity saw global exports of mango, guava and mangosteen rise to an estimated 2.3 Mt in 2021 (+3%); pineapple exports to 3.3 Mt (+7%); avocado exports to 2.5 Mt (+11%); and papaya exports to around 0.38 Mt (+8%). This overall positive performance was underpinned by abundant supplies from the major production zones, which had invested in strong production expansion in 2021 in response to burgeoning global demand and lucrative export opportunities in previous years. On the import side, the reopening of the hospitality sector supported demand growth, particularly for avocados and pineapples in both the United States and the European Union, the two main import markets. Consumers displayed a higher propensity to spend on nutrient-rich foods, encouraged by advertising campaigns in retail markets highlighting the purported health benefits of tropical fruits. This particularly underpinned rising demand for avocados, whose global exports continued to expand to their historical peak in 2021 despite rising costs of production, transportation and marketing along the value chain. Indicative average wholesale prices in the United States tended to increase for most major tropical fruits, with the exception of pineapples, whose average wholesale prices remained low due to strong pressure along the value chain.

Figure 11.3. Major Tropical Fruits: Global aggregate export volumes, 2012-21

Note: Data in this chart refer to global aggregate export volumes of the four major tropical fruits, namely the commodity cluster mango, mangosteen and guava, pineapples, avocados and papayas, aggregated in constant dollar terms (2014-16) as per customary FAOSTAT methodology.

Source: FAO data.

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11.3.3. Outlook and uncertainties

The difficult production and trade environment for bananas and tropical fruits has been further complicated by Russia's war against Ukraine, causing higher global energy and fertiliser prices. Expenditures on fertilisers and pesticides factor heavily in the production of bananas and some tropical fruits, because of their heavy use. Prior to the current crisis, expenditures on agrochemicals, other inputs and transport accounted for about 47% of production costs, more than the costs for direct and indirect labour. The input prices hikes will eventually translate into higher product prices for consumers. Data on price developments over the first four months of 2022 already point in this direction for all four of the major tropical fruits and bananas.

The war has also resulted in the discontinuation of important trade relations as a result of economic sanctions imposed on Russia and has caused severe disruptions to transport routes to Ukraine. The repercussions of these developments for global banana and tropical fruit markets have been immediate and drastic. Russia ranks as the fourth largest importer of bananas globally, procuring some 1.4 to 1.5 Mt from world markets annually. The country further imports some 0.16 Mt of tropical fruits annually, predominantly pineapples, avocados and mangoes, with supplies principally originating in Costa Rica and Peru. These quantities translate into some 6 to 7% of global banana shipments and some 2% of global tropical fruit shipments that are now facing considerable obstacles to reach their destination markets. This situation has had particularly dire consequences for Ecuador, from where some 98% of Russian banana imports originate. Prior to the war, Ecuador supplied some 20 to 25% of its yearly banana exports to Russia, and some 3% to Ukraine. In turn, Ecuador imported approximately one third of the fertiliser used in its agricultural production from Russia. This sudden loss of export markets has resulted in large quantities of bananas going to waste, prices plummeting from USD 6.25 to around USD 1.20 per box, and a dramatic number of bankruptcies among producers.

Beyond the impact of COVID-19 and the war, there are several significant threats to global production, trade and consumption of bananas and major tropical fruits. In the face of rising temperatures, more rapid and more severe spreads of plant pests and diseases are being observed. The effects of global warming are also resulting in a higher occurrence of droughts, floods, hurricanes and other natural disasters, which render the production of bananas and major tropical fruits increasingly difficult and costly. Given the perishable nature of tropical fruits in production, trade and distribution, environmental challenges and insufficient infrastructure continue to jeopardise production and supply to international markets. This is a particularly acute difficulty since the vast majority of tropical fruits are produced in remote, informal settings, where cultivation is highly dependent on rainfall, prone to the adverse effects of increasingly erratic weather events and disconnected from major transport routes.

Note

¹ Pulses types: dry beans, dry broad beans, dry peas, chickpeas, cow peas, pigeon peas, lentils, Bambara beans, vetches, lupines and minor pulses (not elsewhere specified)