Prospects for global production and trade in bananas and tropical fruits
2019 – 2028
MEDIUM-TERM OUTLOOK

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2019 – 2028

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Foreword

The 2019-2028 medium-term outlook for global production and trade in bananas and tropical fruits was produced for the Intergovernmental Group on Bananas and Tropical Fruits, which is a subsidiary body of the Committee on Commodity Problems (CCP).

It has been prepared by the Team on International Investment and Tropical Fruits, Trade and Market Division, Food and Agriculture Organization of the United Nations (FAO), Rome, and the projections contained bring together the information available to FAO, supplemented by data obtained from other sources.

The Team on International Investment and Tropical Fruits provides research and analyses on agricultural investments in developing countries, and economic data and analyses on tropical fruits. Regular publications include market reviews, outlook appraisals and projections for bananas and tropical fruits. The team also provides assistance to developing countries in designing and implementing national policies regarding responsible investment in agriculture.

The report is available at the following FAO webpages:


Note on Methodology

Data and information in this medium-term outlook were compiled from communications with national sources and industry partners in trading countries, monthly data from TDM and COMTRADE and secondary information and data from desk research. All projections in this report should be considered as provisional.
Medium-term Outlook: Prospects for global production and trade in bananas and tropical fruits • 2019 – 2028

Medium-term prospects for global production and trade in bananas and tropical fruits

Introduction

Bananas and, particularly, tropical fruits constitute a significant source of economic growth, income, food security and nutrition for the rural areas of many developing countries. While production and consumption data for these commodities are subject to underestimation owing to extensive cultivation on small household plots, the available information nevertheless indicates that their importance in global food supply has increased significantly in recent decades.

The fruits covered in this outlook include bananas and the four major tropical fruits - mango, pineapple, avocado and papaya. Taken together, production of these commodities grew at an average compound rate of 2.3 percent per year during the decade from 2009 to 2018, reaching a total of 210 million tonnes in 2018. Approximately 99 percent of production took place in developing countries. By region, 56 percent of production originated in Asia, 26 percent in Latin America and 15 percent in Africa. Trade grew rapidly, by 3 percent per year, with over three quarters of exports destined for developed country import markets. However, for these major fruits, with the exception of bananas, international trade is still small in proportion to overall production. The opportunity for trade growth is thus significant.

The projections for bananas and tropical fruits presented in this medium-term outlook span a ten year horizon, from 2019 to 2028. They were generated with the use of a global, partial-equilibrium model that includes major producing, consuming and trading countries. The model takes account of crop area and yield on the supply side in a manner that attempts to capture the diverse supply dynamics inherent to perennial crops as they respond to both price and cost factors. On the demand side, population, income and prices relative to the prices of substitute fruits, are the key drivers of consumption. In this version of the model, only the (real) relative prices of the various tropical fruits are specified in the demand equations. International prices and domestic prices, both of which affect trade volumes, are influenced by tariffs and transaction costs, which in this outlook have been assumed to be constant. Domestic and international prices clear markets so that the supply and demand of domestic and international commodities balance.

The projections are dependent on critically important assumptions concerning the growth of key driving factors such as incomes, population, and input costs, as well as the specific conditions surrounding tropical fruit production in the rural sector. These include opportunity costs for land, which are affected in turn by the prices of other agricultural commodities, rural activities and ownership structures, as well as the structures of the marketing chains involved. The macroeconomic projections used are based on those provided by the International Monetary Fund’s Global Economic Outlook and on population projections by the United Nations. The agricultural conditions that are also likely to affect the sector were drawn from the OECD-FAO Agricultural Outlook, 2018-2027. As a baseline projection, this outlook assumes that policies currently in place will continue into the future. The projections presuppose normal weather, and exclude impacts of climate change and events such as the El Niño weather phenomenon, which periodically affect production in the Latin American region. The projections also presume there is no further impact from established and emerging plant diseases such as Fusarium wilt in bananas.

Any change in these assumptions could be used to generate alternative scenarios, which can be compared to this baseline projection. These include, for example, the impact of supply shocks on production, consumption and trade. Most recently, an alternative...
simulation was run to assess the potential economic impact of the Banana Fusarium Wilt Tropical Race 4 disease on global banana production and trade. The results of this scenario were published in the November 2019 issue of FAO’s biannual publication Food Outlook. The effects of climate-driven changes in global banana and tropical fruit area, changes in actual and attainable yields as well as the impact of increased frequencies of extreme weather events on production and trade could similarly be assessed by making respective changes to the model specifications.

The Outlook

The setting underlying the medium term outlook for bananas and tropical fruits appears very positive. Supported by their novelty status, demand for tropical fruits has largely been robust in the past decade. Meanwhile, demand for bananas, which displayed signs of maturity until some years ago, has also been gaining considerable momentum since 2016. This has been driven by high income growth in developing countries, and by a very positive health image in developed countries, where per capita consumption has been growing from a relatively low base (half the global average per capita quantity). On the supply side, returns per hectare on farm/plantation are oftentimes a multiple of those for temperate crops in the tropics. Furthermore, despite costly inputs, particularly in the form of pesticides, transport and labour, margins for the more valuable fruits - mangoes, avocados and papayas - are high. This is expected to encourage further investment in production for these fruits. From a trade perspective, high margins, combined with relatively weak currencies in the Latin American countries, will underpin production and exports to developed countries, particularly the United States of America and European Union. Strongly growing incomes and improvements in transportation systems in developing countries in Asia are moreover expected to foster greater development and South-South trade in that region.

Production

Total global production of bananas and tropical fruits is projected to grow at 1.8 percent per year between 2019 and 2028, after registering 2.3 percent per year growth in the previous decade. Under the baseline scenario, production is expected to slightly exceed 255 million tonnes by 2028. The largest suppliers of these fruits are expected to continue to be in Asia, which is projected to account for 55 percent of world tropical fruit output, down slightly from 56 percent in the base period of 2016-18. Despite losing some market share, India is projected to remain the largest producer of tropical fruits globally, accounting for approximately one quarter of world production in 2028. China, Indonesia, The Philippines and Thailand are further noteworthy producers of tropical fruits in Asia. Production in Latin America and the Caribbean, which currently has a 26 percent global share, will continue to be led by Brazil, Ecuador, Mexico and Costa Rica. The region’s share is projected to decrease slightly over the next decade, on account of production expansion in competing regions. Developing Africa currently has a 15 percent production share, which is expected to rise by 1 percentage point. Encouraged by growing demand, the incentives for higher production will come from firm prices relative to production costs, and trend growth in crop yields as the sectors become more commercialized. Global area devoted to bananas and tropical fruits is projected to grow by about 1 percent per year, to 15 million hectares in 2028. While this area accounts for less than 1 percent of global crop land use, the share is higher for many tropical countries, such as Costa Rica, where tropical fruit production is projected to have high economic importance compared to other agricultural crops.

World production of bananas is projected to grow at 1.5 percent per annum, to reach 135 million tonnes in 2028. It is the slowest growing fruit among those considered in this projection, owing to the fact that demand for bananas is fairly saturated in most regions and primarily driven by population growth. Bananas rank as the leading crop in volume terms among the tropical fruits and are expected to account for approximately

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5 Developing Africa includes all African states except South Africa.
6 Data based on the database of the OECD-FAO Agricultural Outlook 2019-2028.
Medium-term Outlook: Prospects for global production and trade in bananas and tropical fruits • 2019 – 2028

53 percent of total global tropical fruit production in 2028, down from about 58 percent in 2009, as demand for other tropical fruits, particularly mango and avocado, has increased rapidly. Asia is expected to maintain its large share of production at 54 percent, with India set to remain the largest producer of bananas globally at a projected volume of 33 million tonnes. Production growth in India will be underpinned by ample domestic demand on the back of further population expansion. Production from the leading exporting region of Latin America and the Caribbean - critically Ecuador, Brazil, Guatemala, Colombia, Costa Rica and Mexico - is expected to reach 34 million tonnes, encouraged by import demand from key clients in developed markets.

Global production of mango is projected to reach 65 million tonnes by 2028, increasing at an annual rate of 2.1 percent over the next decade. Asia, being the native region and the largest production region by far, is expected to see a falling production share, from 71 percent in 2019 to about 69 percent in 2028. The share of India, the largest producer in Asia, is expected to fall to 35 percent by 2028, from 38 percent in the base period. Mango production in India is destined largely for local, informal markets. Developing Africa’s share is projected to increase marginally, from 13 to 15 percent, with production in that region increasing by 2.4 percent annually, as local consumption, impelled by population growth, is expected to fuel production. Within the region, Malawi, Nigeria, Sudan and Kenya are expected to continue to rank as the largest producers. During the same period, the production share of Latin America and the Caribbean is projected to fall slightly. This is expected to occur due to weakening growth in some countries of the region, especially in Mexico and Brazil, respectively the region’s largest two suppliers.

Global production of pineapple is projected to grow at 1.9 percent annually, to reach 31 million tonnes by 2028. Among the major tropical fruits, pineapple is the least concentrated in terms of geographic distribution, with no single country producing more than 12 percent of global output. The top ten producers are expected to continue to account for around 70 percent of global supply in 2028, but a gradual shift in production shares can be anticipated. Asia is positioned to remain the largest producing region, but its production share is expected to decline slightly, to 41 percent. The share of the developing countries of Africa is expected to rise from 19 to 23 percent, with continued strong growth in overall production, at about 4.0 percent per year, supported by high population driven growth in domestic demand. Further expansion in Nigeria, the largest producer in the region and eighth largest in the world, as well as in other major African producers, including Angola, Benin, Cameroon, Ghana and Tanzania, will largely be accountable for the region’s rising share in pineapple cultivation. Production in Latin America and the Caribbean will continue to expand, but at a much slower pace than in the previous decade, reflecting
Medium-term Outlook: Prospects for global production and trade in bananas and tropical fruits • 2019 – 2028

a slowdown in import demand as the market moves towards maturity. Costa Rica became the world’s largest producer of pineapple during the last decade with an annual average growth rate of almost 5 percent. Over the outlook period, growth is expected to slow to a more sustainable rate of 1.8 percent per year, with output rising to 3.5 million tonnes in 2028, about 11 percent of global supply. Production in Brazil, the second largest producer, is set to continue the slow growth which has been characteristic for the tropical fruit sector of this country in the last decade.

Global papaya production is projected to rise to 15.8 million tonnes by 2028, growing at 1.6 percent per year. Among the major producing regions the strongest growth is projected to be experienced by Asia, where the overall production share is expected to rise from 58 to 61 percent. The world’s largest producer, India, is predicted to increase output by 1.7 percent per year, down from an impressively large 4.0 percent per year growth rate over the last decade. The production share of the Latin America and the Caribbean region, meanwhile, will continue its decline from 31 percent to 28 percent. Brazil, which currently ranks 4th in global supply after seeing its share decline from 20 percent of global output in 2000, is projected to continue to witness production declines, to an estimated 5 percent in 2028. Africa’s production is likely to expand by an approximate 2 percent annually, thereby marginally increasing the region’s global share of production to 11 percent.

Avocado has the lowest production level of this group of tropical fruits, but its output has been the fastest growing in recent years, underpinned by rapidly expanding import demand. Production is projected to reach 9.2 million tonnes by 2028 – more than two and a half times its level in 2009. Country and region concentration is high in avocado production, with the top ten producing countries accounting for over 80 percent of global output and about 73 percent of production taking place in Latin America and the Caribbean. In response to further rising global demand, output in Mexico, the world’s single largest producer, is expected to grow by 2.9 percent annually over the next ten years. Production of avocado has been taking root in other LAC countries as well, most notably in Colombia, but also in the Dominican Republic and Peru, where production volumes have more than trebled over the last decade and are projected to expand further. Production of avocado in Asia has remained at relatively low levels, standing at only about 520 000 tonnes in the reference period, but is expected to rise to 873 000 tonnes by 2028 on the back of surging regional and domestic demand. Indonesia ranks as the leading Asian producer, albeit at small scale, and is expected to increase at a 3.6 percent annual rate. China’s growth is anticipated to surpass 3 percent per annum, encouraged by continued fast growth in domestic demand. In developing Africa, where annual production growth is projected to remain steady in the 2.5-3 percent range, the leading producers will remain Kenya, Ethiopia and Cameroon, each of which are anticipated to grow by almost 3 percent annually in the next decade, roughly matching population growth. Avocado is also the only major tropical fruit for which developed countries account for a significant share of production, with the United States of America, European Union, Israel and South Africa as the key developed suppliers. However, given stronger growth expectations for developing country producers, the share of developed country producers is anticipated to fall over the next decade, from 8 percent in the reference period to 6 percent in 2028.

Consumption

With the exception of bananas, where demand appears to be moving towards saturation in many countries, per capita demand for tropical fruit is growing most in countries where it has recently started from a relatively low base, that is, particularly in non-tropical areas. In Latin America, where per capita consumption is currently high (Figure 3), consumption is growing slowly - by 1.0 percent per year in per capita terms in the last decade, and by a projected 0.5 percent per year in the next. Similarly, per capita demand in Africa is also not growing rapidly. In Asia, per capita consumption is projected to increase by 0.9 percent per year, largely driven by much higher incomes in India. Demand is growing more rapidly in developed countries; per capita consumption grew by 2.5 percent per year on average in the last decade and is anticipated to continue, albeit at a slower rate of 1.0 percent per year, but this slower rate is heavily affected by much slower projected growth in banana consumption. Given the low level of per capita consumption in developed countries, the opportunity for

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7 As noted, consumption is a calculated residual, and as such will include processing of fresh fruit, which, if traded, will still be considered as domestic consumption in the data presented.
Medium-term Outlook: Prospects for global production and trade in bananas and tropical fruits • 2019 – 2028

future growth is still significant. Consumption estimates may be understated as they do not include informal household production/consumption, which in many developing countries is difficult to quantify. It should also be noted that the calculated levels represent the overall consumption of fresh fruit (production minus net trade of fresh fruit) and, except in the case of pineapples where fruit processing is most significant, do not take account of the volumes of fresh fruit that is processed and which may be destined for export markets.

By type of fruit, banana has the highest intake by far compared to the other fruits, but per capita consumption has remained flat on a global basis at around 15 kg since 2010; it may increase modestly in the medium term. Per capita mango consumption is projected to reach 7.8 kg annually, and will remain highest in Asia at 10.7 kg, compared to 8.6 kg in Latin America. Mango consumption is lowest in developed countries, at under 1 kg per person, but has been rising rapidly. In the case of pineapple, global consumption is expected to rise to 3.7 kg per person, reaching around 11.7 kg per person in Latin America but remaining under 3 kg in Asia, and around 2 kg in developed countries. Papaya consumption in Latin America is set to remain steady in the range of 6 kg per person. It is growing most rapidly in Asia, from about 2 kg per person to 2.3 kg per person by 2028. Avocado consumption is projected to be the fastest growing, albeit from the lowest base. In Latin America, it is projected to rise to 5.7 kg per person in 2028, compared to 4.4 kg in the base period. Developed countries are expected to remain the second largest consumer of avocados, at a projected weight of 2.4 kg per person in 2028. On average, developed country per capita consumption of avocados grew by almost 9 percent annually between 2009 and 2018, and is projected conservatively to grow by 2.9 percent per year over the decade to 2028. Avocado consumption in Asia is similarly expected to increase but remain at less than a quarter of global per capita levels in absolute terms. This offers large opportunity for further growth in global markets for this commodity.

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Trade
Aggregate banana and tropical fruit trade is projected to reach 29.6 million tonnes by 2028, growing at 1.5 percent per year in the medium term, compared to 2.7 percent per year between 2009 and 2018. The slower rate of growth is due primarily to slower growth in banana trade, which has a 73 percent trade share among these fruits. Overall, only some 12 percent of total banana and tropical fruit production is traded. This share

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8 Apparent consumption divided by population. For certain reasons, the estimate may be too low, given production and consumption in households where values may not be reported, or too high, given that some produce may be further processed or wasted within the value chain. The calculations are meant to be indicative of trends.
Medium-term Outlook: Prospects for global production and trade in bananas and tropical fruits • 2019 – 2028

is projected to display a slight tendency to decline in the medium term as production of low trade fruits such as mango, of which only 4 percent of global production are traded, will grow more rapidly than the production of bananas. As shown in Figure 3, Latin America and the Caribbean are the main source of trade for bananas and tropical fruits. The region accounted for 78 percent of total banana and tropical fruit exports in 2016-2018, and this share is projected to rise to 80 percent by 2028. On the import side, developed countries imported almost a similar share of these fruits, approximately 80 percent in 2016-18. This share is projected to decline slightly over the medium term, particularly as imports of Asia, led by China, will rise more quickly.

In world trade, bananas will continue to be the most exported fruit, with shipments expected to reach close to 22 million tonnes in 2028. Latin America and the Caribbean is expected to firmly hold on to its position as the key supplier of bananas to world markets, accounting for an estimated 80 percent of total shipments in 2028, at a volume of 17.1 million tonnes. Ecuador, the leading global exporter, is expected to witness a further expansion in export volumes to 7.4 million tonnes in 2028, compared to 6.3 million tonnes in the base period, thereby sustaining its market share of one third. Costa Rica and Guatemala, the second and third leading suppliers of bananas, are equally expected to maintain their 12-13 percent shares over the outlook. The export share of Africa is projected to continue to fall, in part due to further erosion of its tariff preference with the European Union that has been scheduled over the period 2009-2020 (see below).

Fresh pineapples have been the second most-imported fresh tropical fruits after bananas, and imports are projected to rise by 1.3 percent annually over the next decade, to 3.2 million tonnes by 2028. This rate, however, is projected to be down from the 3.4 percent annual growth registered between 2009 and 2018, a good portion of which can be attributed to the rapid export growth during that period in Costa Rica. The country emerged as the largest exporter of fresh pineapples between 2009 and 2018, but in recent years, the growth of its exports has slowed significantly as its production has reached high capacity. Costa Rica’s exports nevertheless are projected to grow further by 2028, to 2.3 million tonnes or 71 percent of the global total, compared to 67 percent in 2019.

Pineapple imports by developed countries, which represented 85 percent of global imports during the reference period, are projected to increase to almost 2.6 million tonnes by 2028. Trade in fresh pineapple as a share of total production is expected to remain at around 10 percent. However, while excluded from formal analysis in this Outlook, trade in processed and canned pineapple is a significant element of the international market, with Asian countries - Thailand and the Philippines in particular - the most important net exporters, and with
the European Union and the United States as the two major importers.

Exports of mango are projected to reach 2.2 million tonnes by 2028, and, while growing at 3 percent per year, would still remain low relative to total production. Developed countries would continue to account for about 65 percent of total imports, but their share is projected to fall as trade in and with other regions has been increasing. The market shares of exporters from Latin America and the Caribbean are projected to increase to 62 percent, on account of fast growth in Mexico, the largest exporter globally. Asia’s share, meanwhile, is projected to decline from 35 percent in 2019 to an expected 28 percent in 2028. This would be chiefly attributed to stagnation in exports from Thailand, currently the largest exporter in the region, which are projected to remain below the pace of growth of global trade. While exports from India are expected to increase, this is would not have significant effect on Asia’s overall share since India is a comparatively small player in global mango trade, at a projected 12 percent share in 2028.

Trade in fresh avocados relative to production is the highest among the major tropical fruits, standing at 32 percent in the reference period. Avocado trade is also the fastest growing, having increased at an annual average pace of 13.1 percent per year between 2009 and 2018, and being projected to grow by an annual average of 3.4 percent over the next ten years. Exports are expected to reach 3.2 million tonnes by 2028. Developed countries currently account for 91 percent of total imports, and this share is set to rise slightly over the medium term as their demand is expected to remain firm. Latin American countries dominate the export market with 85 percent of exports, and this share is anticipated to increase to 89 percent over the next ten years, mainly as a result of a significant expansion of the sector in Mexico, largely to meet growing demand in the United States and the European Union.

Exports of papaya are projected to grow at 1.7 percent per year over the medium term, to 318 000 tonnes in 2028. Developed countries remain the largest importers of papaya, accounting for some 95 percent of total imports. Latin America dominates exports, with currently about 87 percent of total trade. This share is expected to increase as Asia’s exports decline. Particularly in countries such as Malaysia and India, local supplies will likely fail to keep up with consumption growth.

**Conclusions**

The projections indicate that the banana and tropical fruits sectors will continue to be among the fastest growing sectors in agriculture, and as such deserve attention from policy makers looking for sources of economic growth and poverty alleviation in rural areas of tropical countries. While in quantity terms production and trade of tropical fruits continue to be low when compared to many other agricultural commodities, they weigh considerably in value terms. Particularly for avocado, mango and papaya, which are growing from a lower base, both the volume and value of trade are likely to increase further in the medium term. This will be particularly beneficial to countries in Latin America, which are predominant in meeting the growing demand for these commodities in developed and other temperate countries, where consumption of these tropical fruits is low in per capita terms and their image as healthy foods is being increasingly recognized.

However, it is important to note that the scenario presented in this Outlook is just one plausible outcome among many. Market projections that span 10 years are subject to many uncertainties, caused by factors such as outbreaks of various plant diseases, weather disruptions under climate change, changes in policies and potentially volatile economic environments that may affect economic development in key supply countries. Changes in consumer preferences and technology are additional factors that may lead to unexpected outcomes. Further study of such uncertainties may be useful to understanding the changing economics of the global markets for bananas and tropical fruits and the factors that affect them. In this regard, the baseline results of this Outlook provide the possibility to examine the potential impacts of alternative scenarios that might be obtained under different assumptions. For example, the recently conducted assessment of the potential economic impact of the Banana Fusarium Wilt Tropical Race 4 (TR4) disease on global banana production and trade showed that a further spread of TR4 would, inter alia, entail considerable loss of income and employment in the banana sector in the affected countries as well as significantly higher consumer costs in importing countries, at varying degrees contingent on the actual spread of the disease.
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