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Transforming industries: Focus on agro-food in the Dominican Republic

Agro-food is an important activity in the Dominican Republic. The industry was already undergoing major changes and now faces unprecedented challenges due to the COVID-19 pandemic. Improving extension services, effective branding, and broad-based innovation will be key to sustaining competitiveness. This chapter analyses the characteristics and performance of agro-food in the country and identifies opportunities for the future.

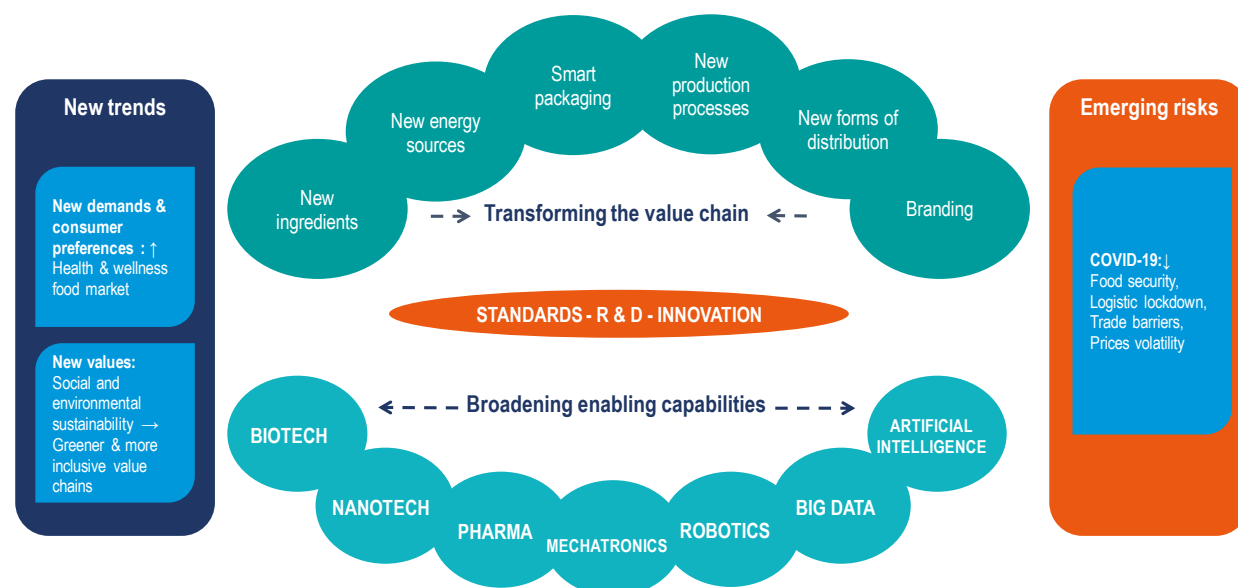
Introduction

The agro-food industry is undergoing major changes due to emerging demands for sustainability, transparency in production and origin, information about the nutritional content of products, as well as proximity to final consumers. Digital technologies are also redefining logistics and operational processes and enabling better traceability. In the current moment, the agro-food industry has had to transform its performance globally to meet new demands due to the unfolding global COVID-19 pandemic (Figure 3.1).

Agro-food is a well-established industry, so it is important to identify what is needed to manage the present emergency and set the industry on a competitive path into the future. Regional markets, tapping into new demands, and better using new technologies will be crucial.

The first section of this chapter presents an overview of global trends, while the second analyses the industry's specific characteristics in the Dominican Republic. The third identifies opportunities for policy reforms.

Figure 3.1. The future of global agro-food: New trends and increasing uncertainty



Source: Updated and adapted from (OECD/UN, 2018^[1]), *Production Transformation Policy Review of Chile: Reaping the Benefits of New Frontiers*.

Two global trends are redefining the agro-food industry globally:

1. **New demands.** Consumers worldwide increasingly value quality, traceability, and sustainability of agro-food production. Consumers are more aware of the consequences of long and complex food value chains for the environment and their health. The market for healthy food is growing, linked to the increased attention of middle classes to overall well-being, and not only price. Demand is shifting to local products (0-Km products), and consumers value products they see as authentic and unique, often coming from distant markets but with a recognised impact on health. The booming market in quinoa, a product almost unknown a decade ago in Western markets, is a perfect example (OECD/UN, 2018^[1]).

2. **New technologies are reshaping production and exports.** Digital technologies are influencing the whole value chain from production (e.g. precision irrigation, molecular engineering), marketing (e.g. data scientists) to logistics and retail (e.g. digital trading platforms). The capabilities needed to compete in the industry are becoming more sophisticated. Smart Farming, the Internet of Things, and Big Data are enabling precision agriculture through advanced monitoring systems, smart analysis and planning, leading to increased yields, higher productivity, reduced environmental impact and less impactful natural disasters (FAO, 2017^[2]). Firms in both agriculture and food processing industries are increasingly relying on data scientists, who collect data on soil, water, and minerals from farms, and use them to predict crop yields, and manage crop disease and pests. For example, Canadian company Farmers Edge takes daily satellite images of farms and combines it with other relevant data, including information from more than 4 000 connected weather stations to forecast production and yields (Matthews, 2019^[3]).

As a growing number of countries are implementing lockdown measures to halt the COVID-19 pandemic, the agro-food industry and its stakeholders are contending with changing demands, as consumers are reorienting choices, and new safety measures in the work-place and logistic bottlenecks are challenging the entire value chain. There is no consensus on the potential of food scarcity. IFPRI for example estimates that countries are sufficiently equipped with stocks of staple foods like rice and wheat (Vos, Martin and Laborde, 2020^[4]). Nevertheless, some food chains in the United States are starting to face shortages. The highly concentrated meat processing industry is one example. Closing one large beef processing plant results in the loss of over 10 million beef servings in a single day (Quinn, 2020^[5]).

Likewise, fresh products such as fruits, vegetables that are more labour intensive are facing greater uncertainty as governments balance the need for production with the need to protect workers and farmers (FAO, 2020^[6]; Vos, Martin and Laborde, 2020^[4]). Logistics bottlenecks are emerging in different countries putting a strain on consumer access. For example, in April 2020 in one of the biggest producers of soybeans, Rosario (Argentina), municipal government measures blocked transport to crushing plants, affecting the country's export of soybean meal for livestock (Bronstein and Heath, 2020^[7]).

The pressure on supply could affect the volatility of food prices. Countries that are net importers and dealing with currency depreciation face a high-risk of reduction in purchasing power, particularly for processed and non-perishable food products. In Italy and the United Kingdom, prices of certain items increased steeply due to a reorientation of consumption and an increase in demand for basic products, such as flour, and long-shelf-life products, as canned food. On the contrary, perishable products such as fresh fruits, vegetables, and fish are facing a reduction in prices as consumers shift towards long-life products and countries increase trade barriers to first satisfy domestic demand. For example, the shutdown has reduced the fish prices from USD 12 to USD 7 per pound in the United States due to limited shipping from China and other Asian countries and many states suspended fishing (Shin, 2020^[8]).

In the short term, governments and firms are putting in place actions to address the COVID-19 emergency. Box 3.1 presents some examples of what is happening in the agro-food industry.

How the current global crisis will affect agro-food in the future is highly uncertain. Much will depend on how long it will take countries to ease lockdowns, what type of new normality the global economy will face, and/on how long it will take to develop, manufacture and make available a vaccine. The two main forces that were reshaping the agro-food industry pre-pandemic may accelerate. Shorter value chains, increased transparency, traceability, and more environmentally-friendly production and consumption modes could be the new features of agro-food. The pandemic has also opened a debate on "strategic industries" and the need for countries to prepare resilience plans in cases of global emergencies. Being able to secure access to food is of primary importance, so agro-food will be a focus of these discussions. Trade has always been and will remain an important driver especially as this industry secures access to products not available otherwise. Strengthening regional integration on this front is one dimension currently under debate, which is worth exploring.

Box 3.1. COVID-19 and agro-food industry: What are countries doing?

China is ensuring food security and subsidies the purchase of agricultural machinery

During the lockdown, China adopted the Vegetable Basket programme, first launched in 1988, to reduce the virus' impact and keep food shortages to a minimum. The project aims to increased urban access to fresh products by expanding vegetable farms in the suburbs and establishing reserves. Under this scheme, farmers and merchants in nine provinces worked together to supply grains, oil, meat, vegetables, milk, eggs, and aquatic products to Hubei province, the epicentre of the outbreak. In addition, local governments have unified purchases, centralised animal slaughtering and cold chain storage of county co-operatives, and fully subsidised the storage costs. Likewise, the central government distributed USD 20 million in subsidies for machine and tool purchases to revive agriculture with low-interest rates and subsidised rent reductions to firms to develop high-tech agriculture technologies, such as agricultural drones and unmanned vehicles to reduce human contact while keeping the supply chains moving. Moreover, e-commerce platforms are facilitating the trading of accumulated production. Online retailer Alibaba has set up a special platform to help farmers find markets for unsold agricultural products and is building a marketing channel dedicated to fresh agricultural products (FAO, 2020^[6]).

Italy is backing up long-term financing with government guarantees

The Italian Government is providing businesses affected by the pandemic with a package of financial assistance. The measures include guarantee schemes from export credit agency SACE, a six-year loan guarantee through the national development bank (CDP), and the Central Guarantee Fund that covers up to 100% for disbursement up to EUR 25 000 and up to 70% for disbursement up to EUR 1.5 million. In addition, the government has put in place measures to support the agriculture sector to ensure access to a supply of seeds and fertilisers. The programme allocates EUR 100 million to support agricultural or fishing companies that had to suspend their operations and another EUR 100 million allowing farmers to receive advanced payments from the European Union's subsidies for farmers. The policy package includes also EUR 600 transfer to agriculture workers with short-term contracts.

India is deferring tax and implementing public procurement for exceed rice production

The government implemented several important relief measures to support farmers during the COVID-19 outbreak. These include tax relief measures such as the postponement of the income tax return deadline for the 2018-19 tax year to 30 June 2020 (extended from 31 March 2020); a reduced rate of interest for tax payments made by 30 June 2020. Besides, the availability of rice surplus induced the Ministry of Agriculture and Farmers Welfare and the National Biofuel Co-ordination Committee to launch a large government procurement scheme to buy exceeded production and use it to produce ethanol for the production of alcohol-based hand-sanitisers.

The EU is pointing at long-term innovative solution

Digital technologies, as agricultural drones and unmanned vehicles can reduce human contact while keeping the supply chains intact. The European Investment Bank (EIB), in April 2020 launched a new financing mechanism that aims to unlock USD 750 million in investment in the resilient technologies for agriculture to face epidemics and future uncertainty. The financing covers projects of up to a 12-year duration for co-operatives operating throughout the value chains of production and processing of food and it is supported by the EU budget under the European Fund for Strategic Investments (EFSI).

Source: (Ministero delle politiche agricole alimentari e forestali, 2020^[9]; FAO, 2020^[6]; Government of India, 2020^[10]; EIB, 2020^[11]).

The Dominican Republic should aim for more sophisticated local production

Since the mid-2000s, the agro-food sector has accounted for 10% of GDP, similar to other countries in Latin America and the Caribbean region such as Chile (9%) and Costa Rica (9.5%). Over the years, the country has increased its relative specialisation in food processing. Today food processing accounts for 41% of overall agro-food value-added (up from 36% in 2007), and agricultural activities account for 58% of overall agro-food value-added (down from 64% in 2007).

The country exports mostly agricultural commodities

Agriculture is the third-largest employer in the Dominican Republic after commercial services and manufacturing. It accounts for 9.5% of national employment and 5.5% of national gross value-added (Table 3.1). The majority of producers are smallholders. The average size of a farm is 6 hectares, approximately 4 times smaller than in Costa Rica. About 71% of producers cultivate a farm smaller than 4 hectares. The large part of production is dedicated to crop activities (63%), followed by livestock activities (20%) and both crop and livestock activities (16.3%) (INEC, 2015^[12]; ONE, 2016^[13]). Agriculture expansion has benefited from both organic and greenhouse production, with 8.7% of agricultural land devoted to organic production, is second only to Uruguay in Latin America and the Caribbean region. The Dominican Republic is the world's largest producer of organic cocoa (153 000 hectares) and organic bananas (20350 hectares), representing more than 30% of organic cocoa and 55% of organic banana production. Between 2004 and 2017, agricultural production in greenhouses grew from 200 000 square meters to 10 million square meters (ITC/IISD/FiBL, 2018^[14]; FAO, 2017^[2]).

Table 3.1. The relevance of agriculture in the economy, the Dominican Republic and selected economies, 2018

	Share of gross value-added	Share of employment	Share of agriculture land	Share of organic agriculture land	Share of total gross exports	Share of total gross imports
	2018	2018	2016	2016	2016-18	2016-18
Brazil	4.4	9.4	33.9	0.3	18.3	2.9
Chile	3.6	9.2	21.2	0.1	9.9	1.8
Colombia	6.3	16.4	40.3	0.1	13.9	5.1
Costa Rica	4.6	12.5	34.5	0.4	25.5	4.3
Dominican Republic	5.5	9.5	48.7	8.7	8.0	4.3
Italy	1.9	3.8	43.2	14.1	2.0	3.8
Netherlands	1.6	2.2	53.3	2.9	6.1	5.4
Peru	6.7	27.5	18.5	1.4	10.1	4.6
Spain	2.6	4.3	52.6	7.7	6.5	4.2
Uruguay	5.6	8.7	82.6	13.0	27.6	4.3

Source: Authors' elaboration based on the United Nations Food and Agriculture Organisation [database] <http://www.fao.org/faostat>, the World Data Databank <https://databank.worldbank.org>.

Food processing is also the largest and the fastest-growing manufacturing sector in the Dominican Republic. In 2018, with USD 3.5 billion of total value-added, the entire sector contributes to 40% of total manufacturing value-added in the country. In addition, with 135 000 employees it also covers 26% of total employment in manufacturing. During 2007-18, food-processing output alone grew at 4.7% on average, faster than local manufacturing and FTZ manufacturing at 3.6 and 3.1%, respectively. Alcoholic beverages are an important production segment. The Dominican Republic has grown to be the 5th largest exporter of rum in the world and is also among the top 10 exporting countries of beer to the United States. Additionally, the country's share of processed products in its agro-food export basket is higher with respect to other countries in the region such as Peru (35%) and Costa Rica (40%). Nevertheless, Costa Rica with half of the population is exporting as much as four times more agro-food products (USD 5 billion) than the Dominican Republic.

Primary agricultural products dominate the agro-food export basket and trade is concentrated in a few countries and products. The top 10-destination markets account for 85% of total agricultural exports and 90% of food processing (Figure 3.2). In the agricultural segment, the United States (50%), Brazil (11%), and Argentina (8%) are the three main import sources. Maize (31%), raw tobacco (20%), and wheat (17%) are the main imports that satisfy local requirements as well as the intermediate demand from agro-processing industries (FAO, 2017^[2]). Bananas (33%), cocoa beans (30%), unmanufactured tobacco (10%), and tropical fruits such as avocado, coconuts, and mangoes are the main exported products, which are destined for the United States (27%) and European markets, such as the United Kingdom (16%), the Netherlands (11%), and Belgium (8%). In the food-processing segment, the United States account for 43% of imports for a total of USD 2.2 billion in 2015-17. The main products include sugar, soybean, meat, and feed minerals. On the other side, the United States and Haiti absorb 72% of total food processing exports. The main exported products are non-centrifugal sugar (36.5%),¹ beer and rum (11%), and prepared food (10.6%).

The Dominican Republic remains a net food importer. To complete the basic diet requirements it imports quantities of maize and wheat that represent 45% of total agricultural imports; that in turns makes the country a net agro-food importer (FAO, 2016^[15]). Moreover, the increase in imports has been driven by the growing demand for more sophisticated products from households, and for tourism activities. Also, the processing industry is importing increasing quantities of intermediate inputs. For example, the main processed goods that include meat, alcoholic beverages, dairy products, and wheat-based products rely on imported wheat, maize, molasses and powdered milk (USDA, 2018^[16]). The large share of imported manufactured products and staple goods in the country's trade basket creates a high level of uncertainty in its agro-food value chain.

Figure 3.2. Agro-food exports are concentrated in few countries and products

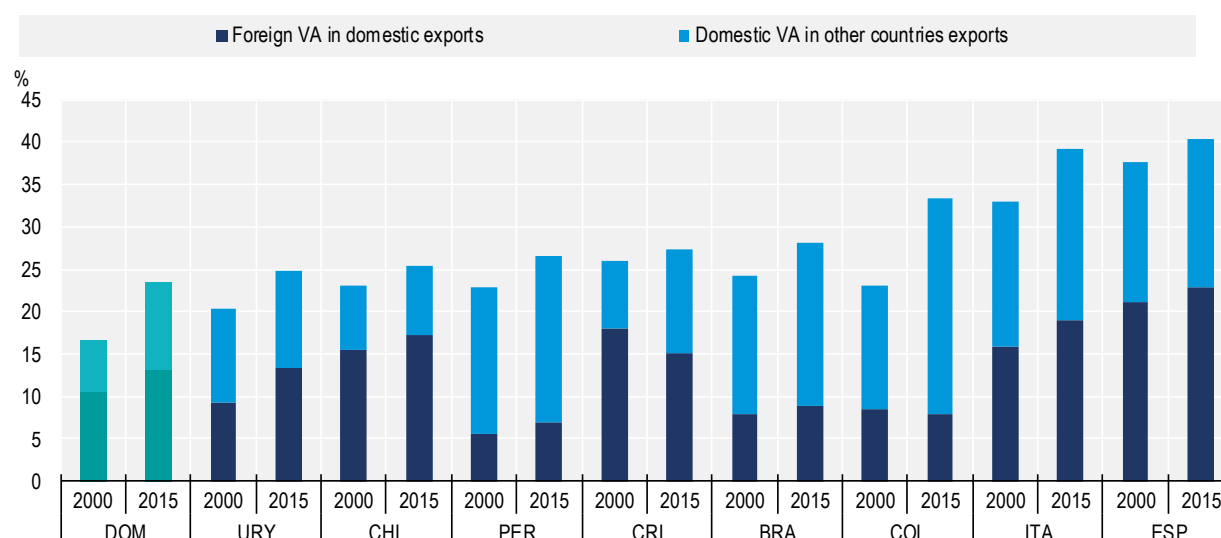
Top 10 imports and exports markets, 2016-18, agriculture and food processing



Note: 1. The distinction between agriculture and food manufacturing is obtained by combining the Harmonized System (HS07) classification, the Standard Industrial Trade Classification (SITC Rev 3) and the FAO products definition, <http://www.fao.org/faostat/en/#definitions>;
2. In order to minimise the volatility of prices three consecutive years are taken into account.
Source: Authors' calculations based on FAOSTat database, <http://www.fao.org/faostat/en/>, Commodity Trade Statistics (COMTRADE) <https://comtrade.un.org/>.

There is room to increase participation in regional and global production networks. Only 23% of agro-food exports are linked to regional and global agro-processing value chains (Figure 3.3). Although this figure is up from 17% in 2000, it remains low compared to regional peers such as Costa Rica (27%) and European countries with a developed and interconnected food processing industry such as Spain (40%) and Italy (39%). Intermediary imports, mostly from the United States, contribute to domestic exports of food-processed products, as for example with maize, wheat, and raw tobacco, which are used to produce cigars, distilled alcoholics, and flour related products. Domestic commodities are often processed abroad, as in the case of cocoa beans, which are transformed into agro-food branded products in countries such as Belgium, Germany, and Italy. Countries with similar employment and value-added share of food processing in total manufacturing such as Chile and Costa Rica, feature a share of food processing exports as a percentage of total manufacturing exports that is nearly three times more than the Dominican Republic. With 8% food processing exports over total manufacturing exports, it matches the share of Italy, which nevertheless has more sophisticated and diversified manufacturing and agro-food sectors and consequently a lower share of employment (11.3%) and value-added (12%) in food processing.

Figure 3.3. Local firms participate little to international agro-food value chains

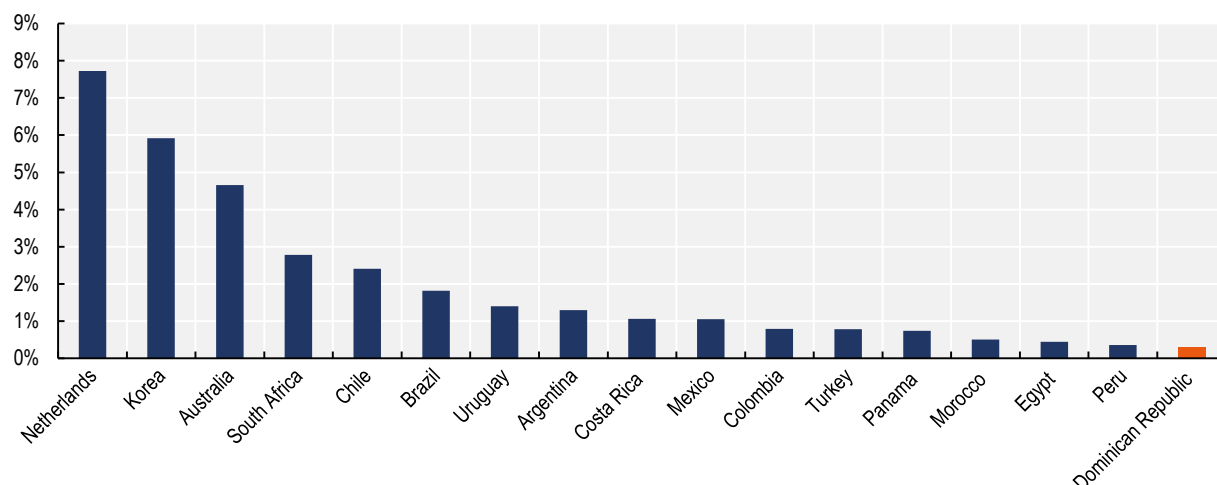


Source: Authors' calculations based on UNCTAD-Eora Global Value Chain Database, <https://worldmrio.com/unctadgvc/>, United Nations Food and Agriculture Organisation [database] <http://www.fao.org/faostat>, Dominican Republic Central Bank <https://www.bancentral.gov.do/>, OECD STAN Database <http://oe.cd/stan>. For a definition of agro-food see <http://www.fao.org/faostat/en/#definitions>.

The Dominican Republic invests too little in agro-food research and development (R&D) (Figure 3.4). Estimates indicate that agricultural expenditures in R&D as a share of agricultural value-added in the country are around 0.19%, in 2018, below top-performing agro-food exporters and other countries in the region as Chile (2.41%), Brazil (1.82%) and Costa Rica (1.1%). A greater effort in R&D and innovation could boost productivity as well as the quality of production (Pérez, De Los Santos and M. Beinte, 2015^[17]).

Figure 3.4. The Dominican Republic invests little in agro-food research

Agricultural R&D expenditure by government, non-profit and higher education agencies as a share of agricultural value-added, 2018 or latest available year



Note: 2017: South Africa; 2016: Korea, Chile; 2015: Netherlands, Turkey, Morocco; 2014: Uruguay, Colombia, Egypt; 2013: Australia, Brazil, Argentina, Costa Rica, Mexico, Peru; 2018: Dominican Republic.

Source: Authors' analysis based on OECD Science and Technology Statistics database (2019) <http://stats.oecd.org/> and ASTI Agricultural Science and Technology Indicators database (2019), www.asti.cgiar.org/data.

The Dominican Republic will face new challenges

Moving ahead, the country will need to identify how to position itself in the global, regional and local agro-food market taking into account global trends and new technologies. The Dominican Republic must also cushion the impact of the pandemic and ensure access to food as well as protect all workers and firms in the agro-food value chain. The country is already acting in this respect (Box 3.2).

Box 3.2. COVID-19 and the agro-food value chain in the Dominican Republic

Local agricultural production has not been interrupted and the government has secured local supply through a set of initiatives. A public procurement initiative has secured primary agro-food products for households, as have price controls on the basic food basket. Moreover, the agriculture development bank (Bancoagropecuaria) has implemented a programme to renegotiate loans for up to 12 years, with a maximum interest rate of 8%.

Nevertheless, the Dominican Republic faces two major issues related to exports and tourism. Total exports in January-April 2020 dropped by 17% with respect to the same period in 2019 (equivalent to a drop of USD 133 million). This is the result of a lockdown in transport around the world (ground, ocean freight, and airfreight) that resulted in a disruption in the logistics of the agro-food value chain. Exports are primarily concentrated in perishable products such as fruits and vegetables, exacerbating the challenge. Likewise, the halt in inbound tourists deprived the entire value chain of an important final market worth USD 500 million a year. A drop between 45% to 70% for 2020 of inbound tourists could lead to a loss of between USD 90 to 140 million for the entire agro-food value chain.

The reactivation of logistics (domestically and abroad) and the rebound of tourism activities will be essential. However, both will be affected by other external factors. The countries that have been hit hardest by the COVID-19 pandemic such as the United States, the United Kingdom, and Spain are also the main destinations of Dominican exports as well as the main origin of inbound tourists in the country.

Source: (JAD, 2020^[18]; Presidency of the Republic, 2020^[19]).

In addition, the country faces two specific emerging challenges: the exhaustions in the flexibilities of its trade agreements for its major agricultural products and the growing environmental vulnerability.

Since the mid-2000s, the Dominican Republic has had trade agreements with its major partners. The Central America Free Trade Agreement and the Dominican Republic (CAFTA-DR) with the United States entered into force in 2005 and the Economic Partnership Agreement (EPA) in 2009. In the case of the Dominican Republic, specific agricultural products enjoy tariff protection for up to 20 years through three protective measures: gradual tariff reduction, tariff-rate quotas (TRQ), and automatic agricultural safeguards. The full tariff reduction will be completed in 2025 (CAFTA-DR, 2005^[20]). In particular, the TRQ provide increases in the quota of trade that is not subject to tariffs for 20 products, with different annual rates, that were considered of strategic importance for the Dominican economy (Table 3.2).

The approaching full elimination of quotas is posing new challenges ahead as local production in specific crops is not sufficiently competitive. For example, between 2006 and 2017 the quota for rice free of tariff moved from 8 560 metric tons to almost 15 000 metric tonnes. However, the rice yield of the Dominican Republic and the United States have diverged, with the Dominican Republic unable to raise production. Moreover, the country's ability to comply with the United States and the European Union's Sanitary and Phytosanitary (SPS) measures is low compared to other countries in the region and undermine its export penetration (UNIDO, 2012^[21]; Iwulski et al., 2015^[22]).

Table 3.2. Agricultural products subject to tariff-rate quotas in the DR-CAFTA

Product category	Initial quantity of duty-free (MT)	Years to unlimited free trade
Milled rice	8 560	20
Beas	8 560	15
Turkey meat	3 840	12
Pork cuts	3 465	15
Powder milk	2 970	20
Brown rice	2 140	20
Glucose	1 320	12
Prime and choice beef	1 100	15
Chicken leg quarter	550	20
Pig fat	550	12
De-Boned Chicken meat	440	10
Beef trimmings	220	15
Bacon	220	10
Liquid milk	220	10
Butter	220	10
Ice cream	165	12
Mozzarella cheese	138	20
Cheddar cheese	138	15
Other cheeses	138	10
Yogurt	110	20

Source: Authors' elaboration based on article 3.15 and annex 3.3 of CAFTA-DR.

Vulnerability to climate change is affecting agriculture production and competitiveness. The level of exposure and vulnerability to extreme climates events in the Dominican Republic has been higher than the regional average between 1998 and 2017, with severe consequences on local production. Climate hazards in the country include heavy rainfall, tropical storms and hurricanes, floods, and droughts (FAO, 2016^[15]). Rainfall during the second half of 2016, especially in the last quarter, was erratic and caused serious flooding in the north and northwest of the country. This weather generated significant economic losses to the main crops such as banana, oriental vegetables, cassava, and sweet potato. The change in climate is also affecting coffee production. Since 2012, the fungus *hemileia vastratrix*² affected 70% of the total coffee area and reduced production from 38 000 tons to 13 000 (IICA, 2017^[23]). Other countries in the region, such as Brazil, are putting in place plans to increase climate change adaptation (Box 3.3).

Box 3.3. Promoting climate-resilient and sustainable agriculture in Brazil: The ABC Plan 2012

In Brazil, agriculture makes up 23% of GDP and 35% of jobs. Agriculture is greatly influenced by environmental conditions and climate change is one of the most important risks to sustainable production. In 2012, Brazil committed to increase and strengthen the sustainability of its agricultural systems and to promote resilient production.

The Brazilian national plan for agriculture and climate change, the ABC Plan (BRASIL, 2012), part of the National Policy for Climate Change, emphasised the identification and implementation of measures to create resilient production systems, where adaptive capacity and the reduction of climatic risk are the core priorities. The ABC Plan is a national policy developed in synergy with regional policies and with the involvement of private stakeholders. The plan fosters the adoption of standardised practices and technologies through technical extension and empowerment through the ABC Platform.

The ABC Platform, a multi-institutional monitoring and evaluation of the ABC Plan, evaluates studies and indicators regarding the resilience of agricultural systems and what constitutes the adaptive capacity of such systems. The platform has information and planning instruments, such as Sisdagro (a decision-support system for agriculture from the National Meteorological Institute), SCenAgri (simulation of future agricultural scenarios) and the SOMABRASIL (an observation and monitoring system for agriculture in Brazil), both co-ordinated by Embrapa. These systems are increasingly adjusting their methodologies for facing climatic uncertainty in order to improve decision-making by farmers and governments.

Source: Crespolini (2019^[24]), *Policies and Instruments for Innovation in Agro-Food: The Case of Brazil*, Department of Sustainable Production and Irrigation, SIRD, MAPA. Presentation at the Roundtable on the Agro-Food Value Chain organised in the framework of the PTPR of the Dominican Republic, hosted by the government of the Dominican Republic in July 2019.

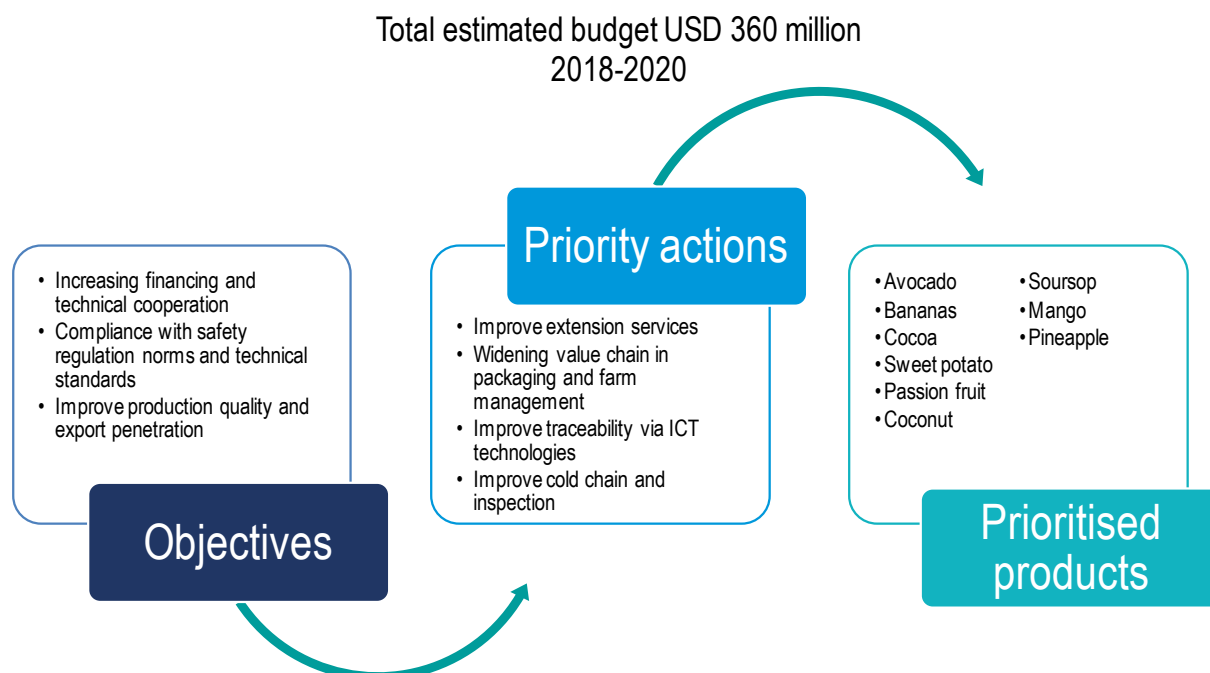
A competitive agro-food sector is a national priority

The responsibility for policies to create a sustainable and competitive agro-food industry falls across different ministries and agencies. The National Development Strategy (NDS) 2010-2030 (Law 1/2012), led by the Ministry of Economy, and Planning and Development (MEPyD), is the first document in the country that defines the guiding principles of medium- and long-term support to the agricultural sector. Increased financing and technical assistance for farmers and producers are the main policy levers for increasing the quality of local production and promoting exports. Moreover, 2020 has been declared, by presidential decree, the year for the consolidation of food security (Presidency of the Republic, 2019^[25]). As a complement to the NDS, the Ministry of Agriculture is leading the sustainable agriculture agenda that prioritises export promotion and food security outlined in the Strategic Agricultural Development Plan 2010-2020. The strategic plan is built around three main objectives: increasing productivity and competitiveness, promoting agricultural exports, and strengthening self-sufficiency.

Other areas of intervention include nutrition and sustainability. In 2013, the National Strategic Plan for Nutrition 2013-2016 was launched by the Ministry of Public Health. The document aimed to guide public policies on the health and nutrition of the population. The Dominican Republic is also placing sustainability at the core of its approach towards agriculture. The 2014 National Strategy for Climate Change Adaptation in Agriculture 2014-2020 aims to foster agricultural resilience. More recently, the Public Sector Plurennial National Plan (PNPSP) 2017-2020, led by the MEPyD, provides guidelines for improving the quality of local production and its export penetration by fostering innovation. Increased financing and technical co-operation for farmers and producers have been indicated as main objectives (FAO, 2016^[15]).

The National Council for Competitiveness Council (CNC) prioritises the agro-food sector by devoting 65% of the total budget of the *Dominicana Competitiva* to it. (For more information on this Initiative, see Chapter 2.) In particular, the subcommittee for Agricultural Production Development and Exports, chaired by the Ministry of Agriculture, agreed on three main objectives, five priority actions, and ten targeted agricultural products. The total proposed budget for implementation is USD 360 million (Figure 3.5). The prioritised products have been chosen based on their production and export capacity coupled with their level of productivity and propensity to create employment (Cluster Consulting, 2019^[26]).

Figure 3.5. Priority actions for the development of the agro-food value chain, National Competitiveness Council (CNC), 2018-20



Source: Authors' illustration based on National Competitiveness Council (CNC) <http://.gob.do/index.php/es/noticias/item/377-dominicana-competitiva-cinco-acciones-concretas-para-competer>.

The agenda developed for *Dominicana Competitiva* represents a step forward for the country as it synthesises the perspective of several public-private institutions and it raises the importance of quality control and standards as an essential element for the development of an effective policy.

Improving country branding, extension services, and innovation will drive up competitiveness

The peer-dialogue exercise of the PTPR has identified three main enabling factors and associated areas of reforms that could become major game changers for the agro-food value chain in the Dominican Republic. These include strengthening of country image, more research and innovation and modernisation of extension services. Notwithstanding the uncertainty of how agro-food will evolve in a post-COVID-19 landscape, these competitiveness drivers will likely continue, and potentially be increasingly more relevant.

Improving country image management

Leveraging a country's image can increase the capacity to capture value from local production and services. The different tools used to promote country image act as signalling mechanisms and can improve domestic firms' reputation and facilitate access to markets. The Dominican Republic could leverage its unique territorial, cultural and natural characteristics to promote local agro-food production and strengthen its position in export, tourism and diaspora markets. In 2019, the Export and Investments Centre of the Dominican Republic (CEI-RD), in co-operation with the Ministries of Tourism, Culture, Industry, Commerce and MSMEs, Foreign Affairs and Agriculture, has started the process of defining a national branding strategy. In parallel, the country is currently improving the regulatory framework to protect agro-food production. For example, in October 2019 the country signed the WIPO Lisbon Agreement for the Protection of Appellations of Origin. The treaty entered into force in January 2020 (WIPO, 2020^[27]). The accession process was driven by the co-operation between the National Office for Intellectual Property (ONAPI) and the CEI-RD.

Consumer perceptions stem from several factors that must drive any country branding strategy. Creating a clear, simple, and differentiating image built around emotional qualities that can be symbolised both verbally and visually are part of the process. A country must also understand the diverse tastes of its audience. All of this can be as important as the intrinsic quality of a product (Carvalho, 2007^[28]). Some countries implement branding strategies that recall their territorial uniqueness, as in the case of the Spanish *Marca España*; others rely on specific products like Ecuador with cocoa; others stick to specific characteristics of the production system such as Italy, which is identified with luxury and exclusivity.

Additionally, some countries adopt integrated approaches that convey several attributes to define the country's brand. Peru relies on the territorial and climate specificities, cultural heritage, and the uniqueness of its agro-food production (Box 3.4). Branding can be steered by both public and private initiatives. In Colombia, for example, the National Federation of Coffee Producers (FNC) introduced in 1959 the *Café de Colombia*, the certification of origin awarded to Colombian coffee producers matching specific geographic requirements. To work effectively, country branding must embrace political, cultural, business, and sports activities that uniquely identify a country or a region. Branding requires a multi-stakeholder approach backed up by highest possible political commitment and conscious management of a country's image and reputation (Nurse, 2018^[29]).

Box 3.4. Building country image in Peru: *Marca Peru* and *Superfood*

Peru has successfully developed a country brand, which enabled to raise exports in traditional products. In 2009, the Ministry of Foreign Trade and Tourism (MINCETUR) and PromPeru introduced *Marca Peru*, to support exports, attract investment, and promote tourism. The initiative is associated with a logo that relates to the country identity and its ancestral origins. Peruvian firms obtain the right to use the brand *Marca Peru* through an easy online procedure after meeting fiscal and social responsibility requirements. The initiative aims at i) projecting an image of Peru as a rich and diverse country; ii) communicating that Peru is endowed with special skills (such as traditional embroidery); and iii) raising awareness on the richness of Peru's cultural, gastronomic, and diverse biological assets. The experience of *Marca Peru* shows that awareness and communication with citizens and national companies and consumers, in addition to foreign promotion, is key for success. In addition to traditional promotional activities abroad, through fairs, trade missions, and special events, a national campaign has encouraged Peruvians to use the brand. The brand is used to signal an asset that relates to quality, status, price and distinction. Peruvian authorities deliver information and organise workshops to monitor the correct use of the brand.

The successful case of *Marca Peru* coupled with the emerging demand for functional and healthy food worldwide led the Peruvian Government to the launch of the *Superfood* branding strategy in 2017. The visual branding recalls the ancestral origin of *Marca Peru*. The campaign highlights the uniqueness of production of grains, vegetables and fruits, while meeting the increasing global demand for such products, particularly in Europe and Asia.

Source: Isabella Falco, Director Department of Country Image of Promperu. Presentation at the PTPR Peer Learning Group (PLG) of the Dominican Republic, Lima, 1 April 2019.

Increasing commitment and investment in research and innovation

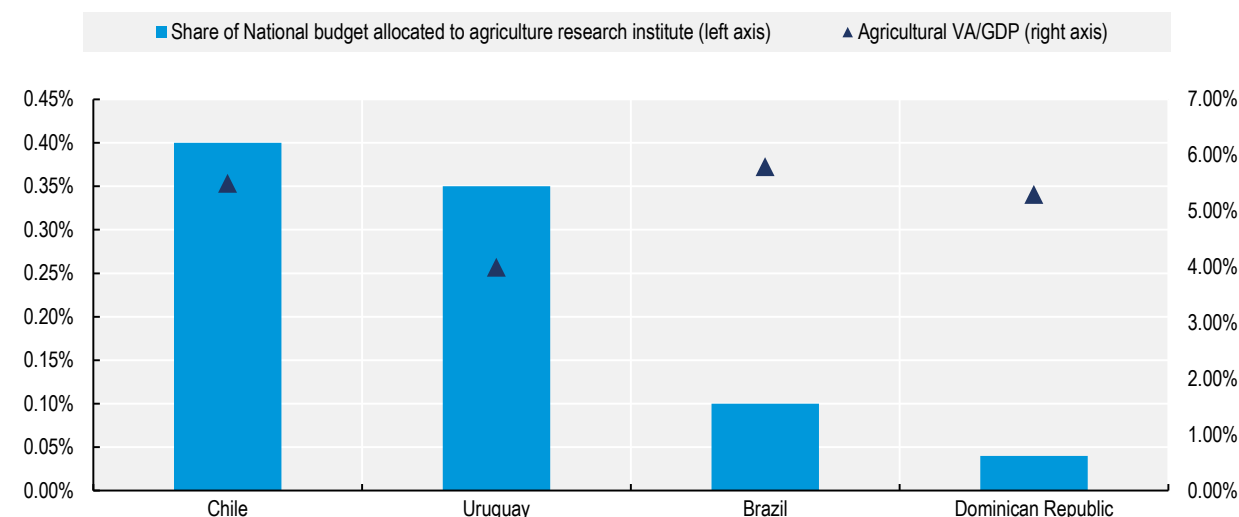
Investment in research and innovation in agro-food is low. Although the country has financing instruments to promote R&D and innovation, such as the National Fund for Scientific and Technological Innovation and Development (FONDOCYT) and the National Fund for Agricultural and Forestry Research (FONIAF), their budget allocations are limited.

Since 2000 in the Dominican Republic, research and innovation in agro-food have been organised under the Ministry of Agriculture that oversees the National System for Agricultural and Forestry Research (SINIAF). The system groups the main institutions in charge of innovation in agro-food. The National Agricultural and Forestry Research Council (CONIAF) is responsible for setting up and co-ordinating the SINIAF. CONIAF operates through the National Agricultural and Forestry Research Fund (FONIAF) that finances the Dominican Institute of Agricultural and Forestry Research (IDIAF), which is the main public institution in charge of R&D and technology transfer in agro-food (Pérez, De Los Santos and M. Beinte, 2015^[17]). In the area of product development in food processing, the leading public institution is the Institute for Innovation in Biotechnology and Industry (IIBI). The IIBI is an autonomous agency of the Ministry of Higher Education, Science and Technology (MESCyT) created in 2005. It carries out research, technology transfer and offers services such as testing laboratories for microbiology, chemical and physical testing. Since 2014, the IIBI is also involved in supporting the development of processed products and cosmetics in rural communities through the Presidential Surprise Visit Programme (*Visitas a Sorpresa*).³

IDIAF and IIBI operate with a limited budget to promote R&D and innovation. In 2019 the IDIAF had a total budget of USD 6 million; the IIBI had a budget of USD 3 million. Although they have grown on average 2.5% each in constant terms since 2017, their share of the total national budget remains 0.04% and 0.02% respectively. Similar agencies in other countries have larger budgets. The National Institute for Agricultural and Food Research and Technology (INIA) in Uruguay has 0.3% of total national budget; the Brazilian Agricultural Research Corporation (Embrapa) reaches 0.1% (Figure 3.6). The budgetary constrain makes it difficult for IDIAF to attract staff, especially at the PhD level. Although the IDIAF accounts for roughly half of all agricultural researchers in the country (134 full-time equivalent or FTE researchers in 2012), the majority of researchers in IDIAF possess a BSc (44%) or MSc (49%) degree; only 7% hold a PhD. In other countries, the share of PhDs employed by national research is higher (13% in Peru, 14% in Costa Rica and 26% in Uruguay (IFPRI, 2019^[30]).

Figure 3.6. Budget allocation to national research institutes in agriculture

The Dominican Republic and selected economies



Note: Data for Chile, Uruguay and Brazil refer to 2018.

Source: Authors' illustration based on the national budget law of Chile <https://www.dipres.gob.cl/>, Uruguay <https://transparenciapresupuestaria.opp.gub.uy/>, Brazil <http://www.portaltransparencia.gov.br/orcamento> and the Dominican Republic <https://www.digepres.gob.do/>.

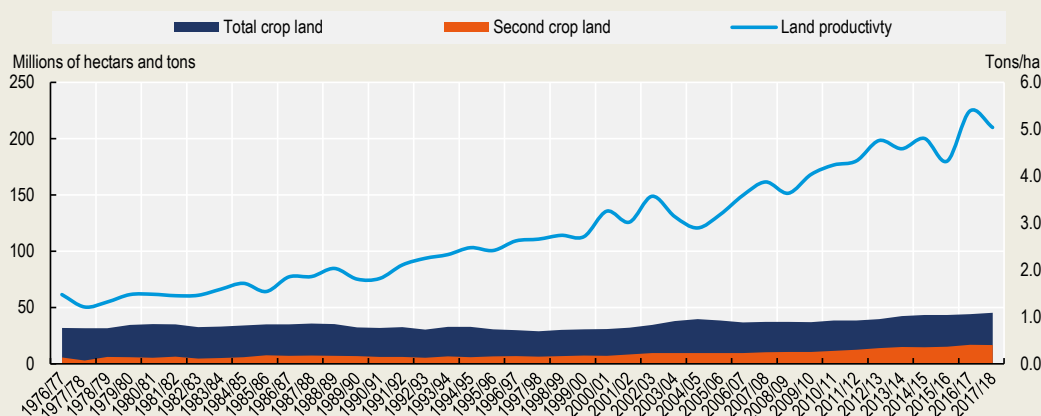
Co-operation between research institutes as IDIAF and agencies in charge of technological development like IIBI is limited. The subcommittee for the agro-food industry of the CNC could represent an opportunity to move forward and foster synergies. To do so the group would update its mandate incorporating technical working groups with all relevant stakeholders such as the Ministry of Agriculture and the MESCyT and a revision of operational incentives shifting the focus from strategy setting to financing and implementation (UNCTAD, Forthcoming^[31]). In Brazil, the Ministry of Agriculture, Livestock and Supply (MAPA) has put in place actions to foster the co-ordination between the Brazilian Agricultural Research Corporation (EMBRAPA) with other public and private institutions to increase the impact of research on agro-food production development (Box 3.5).

Box 3.5. Embrapa: A leading agency for applied research in agriculture

The Brazilian Agricultural Research Corporation (EMBRAPA) was established in 1972 to modernise Brazilian agriculture by investing in R&D and innovation. EMBRAPA is a public research company linked to the Brazilian Ministry of Agriculture, Livestock and Supply (MAPA) and it aims to promote innovation that solves practical problems. EMBRAPA is composed of 46 research centres located in all territories and that employ over 9 000 people, of which 2 400 are researchers (84% with PhD degree). EMBRAPA is part of the National Agricultural Research System (SNPA), which also comprises other federal and state public institutions such as the State Agricultural Research Organizations (OEPAS), universities, private companies, and foundations, which co-operate to conduct research in different geographical areas and fields of knowledge.

EMBRAPA has been extremely important for raising productivity in Brazil. With yields continuously growing, the country's production in 2016-17 was more than 200 million tons of agricultural commodities, compared to less than 50 million in 1976-77. If there had been no increases in yields, Brazil would have needed an extra 150 million hectares to achieve the same production levels (Figure 3.7). Brazil's attention to innovation has paid off in terms of productivity: a 1% increase in the R&D expenditures in Brazil has led to an increase in total factor productivity of 0.2%.

Figure 3.7. Productivity increased rapidly in Brazil's agriculture



Since March 2019, the Department of Innovation for Agriculture (DIAGRO) of the Secretariat of Innovation, Rural Development and Irrigation (SDI) at MAPA has been in charge of innovation policies at the national level. The main objectives of DIAGRO are:

- promoting the conservation and use of genetic and natural resources for agriculture and food security, seeking to ensure the sustainability and competitiveness of agriculture
- strengthening basic and applied research and adoption of new technologies by co-ordinating all public and private stakeholders
- co-ordinating and implementing innovation projects, financed through international co-operation with the leading role of the Secretariat of Commerce and International Relations
- promoting the adoption of cutting-edge technologies in automation, genomics, bioinformatics, synthetic biology, and precision agriculture.

Source: Crespolini (2019^[24]), *Policies and Instruments for Innovation in Agro-Food: The Case of Brazil*, Department of Sustainable Production and Irrigation, SIRD, MAPA. Presentation at the Roundtable on the Agro-Food Value Chain organised in the framework of the PTPR of the Dominican Republic, hosted by the government of the Dominican Republic in July 2019.

Modernising and strengthening extension services

Effective extension services are crucial to increasing the impact of agro-food research and development. In the Dominican Republic, multiple agencies handle these services. The main institution is the Ministry of Agriculture, through the vice minister for Agricultural Extension and Training. The total budget allocated for extension services in 2020 is USD 15 million, 6.2 % of total ministry budget and up from 5.1% in 2018⁴ (Digepres, 2019^[32]). In parallel, other institutions provide ad-hoc extension services related to specific thematic and/or products. For example, the National Institute of Hydraulic Resources (INDRHI), an independent public institution, is responsible for preserving and managing the use of water resources and irrigation in the rural area.

The private sector and bilateral development co-operation efforts have also fostered extension services. For example, the Centre for Agriculture and Forestry Development (CEDAF), founded in 1987 with the support of the private sector and the US International Development Agency (USAID), offers technical training to farmers on specific issues including environmental protection and production techniques. The Dominican Agribusiness Board (JAD), the main private association of agriculture producers in the country, offers support and direct technical assistance on themes such as integrated pest management, protection of natural resources, agricultural reforestation and special projects and programmes to support organic agriculture. The National Confederation of Dominican Cocoa Cooperatives (CONACADO) has 30 extension specialised officers who provide technical training to improve yields, convert to organic production, and plant new trees (Fairtrade Foundation, 2017^[33]).

Agro-food extension services would benefit from the following changes:

- *Increasing co-ordination among the different agencies.* Brazil, for example has created a national agency to foster co-ordination in this area (Box 3.6).
- *Raising awareness of potential beneficiaries.* An increased supply of extension services is not enough. Proactively reaching out to the beneficiaries, increasing awareness and stimulating the demand for technical assistance is needed to make them effective. Co-operatives and associations in the Dominican Republic, such as the CEDAF, could play an important role in stimulating demand and foster greater connection with all, relevant stakeholders in the entire value chain. In addition, the institutions in charge of extension services need to be managed in a way that encourages contact and outreach activities of their personnel with local farmers and producers.
- *Providing technology transfers and management training.* Modern extension services tend to couple technical advice with the provision of market and business development services. In Ethiopia, a public-private partnership has enabled improving the competitiveness of local coffee producers (Box 3.7).

Box 3.6. The National Agency for Technical Assistance and Rural Extension (ANATER) in Brazil

In 2016, the Brazilian Government created the National Agency for Technical Assistance and Rural Extension (ANATER) to co-ordinate the work of the pre-existing rural extension agencies (EMATERs) that operated at the state level. In 2018 extension services provided assistance to 90 000 families in 1 549 municipalities. The central government allocated approx. USD 1.09 billion for technical assistance.

ANATER also co-ordinates with other extension services provided by private sector associations, educational institutions and NGOs. For example, large producers often rely for technical assistance or technology transfer on consulting firms or on their own teams. Technical assistance from producer co-operatives is also significant, especially in the southern, south eastern, and Midwestern states. Organisations maintained with funds from the productive sector, such as Rural Learning Service (SENAR), also play a significant role in technical assistance, in their own programmes or in partnership with the Federal and State governments.

Source: Crespolini (2019^[24]), *Policies and Instruments for Innovation in Agro-Food: The Case of Brazil*, Department of Sustainable Production and Irrigation, SIRD, MAPA. Presentation at the Roundtable on the Agro-Food Value Chain organised in the framework of the PTPR of the Dominican Republic, hosted by the government of the Dominican Republic in July 2019.

Box 3.7. International public and private partnerships in farm management: The case of the Ethiopian coffee value chain

Ethiopia is the world's fifth-largest coffee producer, and the product represents 32% of total exports in the country. Now Ethiopia is focusing on increasing the quality of coffee production.

In line with this effort, the Ethiopian Ministry of Industry agreed in 2015 to host a three-year project to foster farm management practices among small Ethiopian coffee growers, as part of the Ethiopia Programme for Country Partnership. The project is supported by the Italian Agency for Development Co-operation, which comes with a budget of USD 2.5 million, and implemented by UNIDO in co-operation with Illy Caffè and the Ernesto Illy Foundation. Specific activities involved the introduction of new technologies to improve quality and production capacity, the adoption of best agronomical practices, the promotion of advanced sustainable production systems, as well as processing and international marketing capacity-building.

The project defined concrete working models of co-operation between governments, stakeholders, donors, private sector actors and UNIDO. In addition, it also benefited from the synergies with Ethiopian institutions, such as the Ethiopian Coffee and Tea Development and Marketing Authority.

Source: Luca Turello, Head, Agronomy Coffee Procurement Department, Illy, presentation at the PTPR Peer Learning Group (PLG) of the Dominican Republic, Lima, 1 April 2019.

Conclusions

The global economic outlook is highly uncertain. The agro-food industry has been at the frontline during the COVID-19 emergency, and continues operations despite the circumstances. In the pre-COVID-19 world, the country had two major unexploited opportunities such as the growing attention of final consumer towards niche markets and the relevance of tourism activities in the country. On the one hand, the Dominican Republic could strive to capture growing niche markets that value sustainability and quality of food production. In this respect, the Dominican Republic had already made progress. With 8.7% of agriculture land devoted to organic production, second only to Uruguay in Latin America and the Caribbean, it is the world's largest producer of organic cocoa (153 000 hectares) and organic bananas (20 350 hectares), representing more than 30% of organic cocoa, and 55% of organic banana production, in the world.

On the other hand, the country could increase the potential of tourism for local agro-food development. According to the Dominican Ministry of Agriculture, the local agricultural sector already supplies 85% of total fresh primary products required by the tourism industry (In total the consumption of food and beverage of the tourism industry stands at over USD 490 million in 2017 (ASONAHORES, 2017^[34]; USDA, 2018^[16]). In 2017, the Dominican Agribusiness Board (JAD) and the National Association of Hotels and Tourism (ASONAHORES) agreed to promote the consumption of local agro-food products. Meeting this new demand will require a consistent and regular supply of high-quality primary and processed products, the expansion of local food brands, as well as an awareness campaign that could boost the demand for local products. However, making progress on these two fronts requires a reactivation of the global economy.

What the Dominican Republic can do now is to prepare for different scenarios by deepening the upgrading process and improving the sophistication of local products, processes, and enterprises. Increasing investments in innovation, branding, and intellectual property asset management, along with the integration of new technologies will be crucial. These changes will require a comprehensive policy approach based on a coherent country strategy to face increased global competition and unprecedented disruptive change, as the COVID-19 crisis has illustrated. The disruption of supply chains has severely unsettled the entire agro-food value chain. New management, logistics, and distribution protocols will be needed to co-exist in the COVID-19 era. Such an approach is likely to raise the cost of doing business as well as require new modes of compliance and certification. Worker training and institutional capacity-building in the public and private sectors will be essential.

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Notes

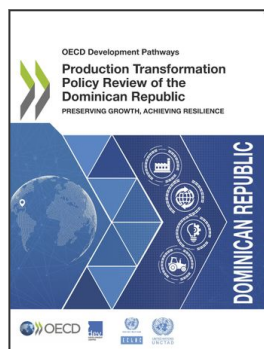
¹ According to the FAO definition Non-Centrifugal sugar is generally derived from sugar cane through traditional methods without centrifugation. For more information

<http://www.fao.org/waicent/faoinfo/economic/faodef/faodefe.htm>

² Hemileia vastatrix, also known as Coffee Rust, is a fungus that causes coffee leaf rust. It is a disease that is devastating to susceptible coffee plantations. There is no cure at the moment, although farms have managed to reduce their impact by replanting infected farms with hybrids that have a strong genetic resistance to rust. https://www.plantvillage.com/en/topics/coffee/infos/diseases_and_pests_description_uses_propagation#diseases

³ The Surprise Visit (or *visita a sorpresa*) is an initiative of the Presidency of the Republic that in co-operation with the agricultural bank and other public agencies, delivers business training (including support for identifying and targeting domestic and international markets for local products and services) and financial support through specific projects in rural communities <https://mapre.gob.do/visitassorpresa/>

⁴ The total budget for extension services is the result of summing up two items in the general budget of the ministry: 12- assistance and technology transfer and 13- animal health, agriculture technical assistance. <http://www.digepres.gob.do/wp-content/uploads/2017/09/A.-Otros-detalles-del-gasto-Distribucion-Institucional-del-Gasto-por-Estructura-Programatica-2015-2018.pdf>



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