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LAC REGIONAL WORKFORCE
DEVELOPMENT PROGRAM (Advance)



Dominican Republic Labor Market Assessment

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ACRONYMS

ADOZONA	Asociación Dominicana de Zonas Francas (Dominican Association of Free Trade Zones)
AECID	Agencia Española de Cooperación Internacional para el Desarrollo (Spanish Agency for International Development Cooperation)
AIRD	Asociación de Industriales de República Dominicana (Industrial Association of the Dominican Republic)
CAMARATIC	Cámara Dominicana de las Tecnologías de la Información y la Comunicación (Dominican Chamber of Information and Communications Technology)
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (Tropical Agronomic Research and Teaching Center)
COVID-19	Coronavirus Disease 2019
DR	Dominican Republic
EBOPS	Extended Balance of Payments Services
ECLAC	Economic Commission for Latin American and the Caribbean
ENCFT	Encuesta Nacional Continua de Fuerza de Trabajo (National Continuous Labor Force Survey)
ENHOGAR	Encuesta Nacional en Hogares (National Household Survey)
ENI	Encuesta Nacional de Inmigrantes (National Immigrant Survey)
EU	European Union
FDI	Foreign Direct Investment
GAIN	Global Agricultural Information Network
GDP	Gross Domestic Product
HS	Harmonized System
ICT	Information and Communications Technology
IDB	Inter-American Development Bank
ILO	International Labor Organization
INTEC	Instituto Tecnológico de Santo Domingo
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
ITLA	Instituto Tecnológico de las Américas
IU	Incomplete university
LAC	Latin America and the Caribbean
LMA	Labor Market Assessment
MEPyD	Ministerio de Economía, Planificación, y Desarrollo (Ministry of Economy, Planning, and Development)

ACRONYMS

MESCyT	Ministerio de Educación Superior, Ciencia y Tecnología (Ministry of Higher Education, Science and Technology)
MINERD	Ministerio de Educación (Ministry of Education)
MIT	Massachusetts Institute of Technology
MSEs	Micro and Small Enterprises
ONE	Oficina Nacional de Estadística (National Statistics Office)
PROETP-II	Programa de Apoyo a la Educación y Formación Técnico Profesional (Program of Support to Professional-Technical Education and Training)
PROSOLI	Proyecto Integrado de Promoción y Protección Social (Integrated Social Promotion and Protection Project)
PSNU	Post-secondary non-university
RCA	Revealed Comparative Advantage
SCAT	Sector Competitiveness Analysis Tools
SMEs	Small and Medium Enterprises
UC	University completed
UK	United Kingdom
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIBE	Universidad Iberoamericana (Ibero-American University)
US	United States
USAID	United States Agency for International Development
USDA FAS	United States Department of Agriculture, Foreign Agricultural Service
WHO	World Health Organization

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I. EXECUTIVE SUMMARY

The LAC Regional Workforce Development Program—known as the Advance Program—is strengthening the capacity of select two- to three-year tertiary technical education programs in Honduras, Guatemala, Jamaica, and the Dominican Republic (DR) to provide market-relevant, quality training to disadvantaged youth for increased employment. Advance builds target institutions' capacity by (1) improving curriculum design and pedagogy, (2) providing professional development opportunities for faculty and staff, (3) enhancing labor market bridging services to help students find gainful employment after graduating, (4) strengthening recruitment and admissions processes, and (5) providing local scholarships for disadvantaged students to attend technical programs. Advance commenced in the DR in spring 2020, and the priority geographic areas of focus are: Distrito Nacional, Santo Domingo Oeste, Santiago, San Francisco de Macorís, Puerto Plata, and the border region with Haiti.

The Advance Program conducted a baseline labor market assessment (LMA) to examine the supply and demand in selected sectors—market demand for skills, in particular—in each of the countries in which the Program is working. This assessment was previously completed in Honduras, Guatemala, and Jamaica and has now been completed in the DR. The goal for this assessment is to not only help technical training institutions in the DR revamp their offerings, but to help decision-makers understand more generally how the demand for skills might look in the future. This evaluation of the country's labor market analyzes economic trends and patterns and identifies growth sectors. The study looks at the demand for technical education graduates and the supply of qualified workers in selected growth sectors. The assessment also identifies the key stakeholders and participants who may be involved in efforts to strengthen market-relevant technical training programs based on the DR's workforce needs.

FHI 360's labor market assessments identify priority skill needs by working backwards from market demand. This entails significant use of a value chain framework, a tool that is designed to be adopted by local stakeholders to identify and analyze ongoing demand for the types of skills provided through technical education at the tertiary level. A traditional labor market assessment is based on detailed occupational mapping, but in the Dominican Republic—as in many other developing countries—this approach is not viable due to data limitations. The process of gathering and analyzing data to properly select growth sectors, identifying and interviewing key informants in those sectors, and validating information with experts can take a significant amount of time but is indispensable for conducting analysis based on sound quantitative and qualitative evidence. In the context of the COVID-19 pandemic, this work has been carried out virtually, adding new challenges related to contacting and coordinating with local stakeholders and interview subjects.

The assessment begins with an in-depth look at the country's socio-economic context, including the demographic, employment, and educational context. The last section includes an educational “stocks and flows” analysis, which traces the flow of youth from the educational system into the labor force to identify the composition of the youth labor force by educational attainment and system dynamics including key pathways and “leaks” or early exits from the education system.

The research found promising pre-COVID tendencies towards higher economic and export growth, decreases in the unemployment and poverty rates, and increased levels of formal employment and education attainment. In particular, a very high proportion of secondary graduates – 60 percent, on par with the UK and Switzerland – transition to higher education, and the percentage of the population with a university education has doubled in the last 10 years. However, major regional, age, gender, and national-origin disparities persist in outcomes. There is still a large proportion – 630,000, almost half of the population of youth in the labor force – who have completed only secondary education, and the university graduation rate is not matched by the increasing enrollment rate, meaning that many students are not graduating on time or at all. The economic sectors that have grown the most strongly in recent years have not always produced positive knock-on effects in the local economy (e.g., free trade zone exports) or led to formal well-paying jobs (e.g., in the tourism sector). Furthermore, the hospitality sector – one of the key sectors underpinning growth in recent years, and a major employer of youth and women – is undergoing a cataclysmic shock during the pandemic.

Advance then conducted a sector selection based largely on qualitative data, since publicly available data at the sector level is difficult to find. To compile the data to complete the sector selection matrix, the team conducted a desk review; drew from publicly available databases; and interviewed economic analysts at the World Bank, Deloitte's Santo Domingo office, the Dominican economic consulting firm Grupo Pareto, and the Instituto Tecnológico de Santo Domingo. The key selection criteria were the sector's size and importance in the geographic areas of focus, potential growth, and the estimated likelihood of the project having an impact on the sector's employment or competitiveness. Each sector's scores were estimated in part by carrying out analyses of secondary data including a trade share matrix analysis and a product space analysis. Based on the results of this process, the team combined several related sectors to select three aggregate sectors as a starting point for the assessment:

1. Premium Food Processing,
2. Light Manufacturing, and
3. "Orange Economy" (tourism, creative industries, and information and communications technology (ICT)).

The team also included a focus on two cross-cutting sectors:

4. Transport and Logistics, and
5. Health.

After sector selection, Advance identified and interviewed industry and employer representatives to validate value chains within each priority sector and the opportunities they offer for technical tertiary education graduates. Given the difficulty in establishing contact with employers during the COVID-19 pandemic, the team also drew on several recent studies looking at current and anticipated employment demand in these sectors, including the Study of Detection of Training Needs and Labor Demand carried out (Study of Detection of Training Needs and Labor Demand) carried out under the PROSOLI program and published in 2019 by the Office of the Vice Presidency, as well as surveys and studies carried out by cluster associations in tourism, medical devices, and logistics. To accompany the value chains, the team

developed “parallel diagrams” to show the existing relevant educational offerings (and highlight gaps). The report presents the results by sector, along with considerations for sector growth and employment in the COVID and post-COVID contexts.

The team found that, as of 2017, approximately six to eight percent of existing jobs in the country required education at the associate degree (“técnico superior”) level, with 14 percent of large employers noting this as to be a minimum educational requirement. Employers reported difficulty in finding qualified technical workers in a variety of roles. This level of education was frequently required in several job families, including physical, sports, and recreational activities; ICT; and health and wellness. In terms of cognitive and practical skills, nearly two-thirds employers required office software skills; 52 percent required foreign language skills, and 49 percent required the ability to use job-related machinery and equipment. Approximately 63% required prior work experience. Nearly 8 in 10 employers said that available workers needed more training.

In the **Premium Food Processing** sector, some of the anticipated in-demand occupations in agriculture requiring post-secondary technical education are expected to be **veterinary technicians and agricultural technicians**. For food and beverage processing workers, the anticipated in-demand occupations requiring this educational level include **supervisors**. For both agricultural and food and beverage processing workers, the difficulties that employers reported in finding these workers was not related to a general lack of trained jobseekers, but rather that the available workers did not have the required skills or competencies, pointing to a need to calibrate existing educational offerings and attainment rates. As mechanization of agriculture advances globally and in the country, the total number of jobs in the sector may decrease, but the skill levels of those hired will likely need to increase.

Although the Program’s region of focus is served by educational institutions offering technical tertiary programs in a number of agribusiness and food-processing related areas, there appears to be an absence of such programs in agronomy, animal production, veterinary science, and dairy production in the relevant regions of focus (the capital, the Corredor Duarte – the main urban corridor of the country, running from Santo Domingo to Puerto Plata -- and the border zone). Furthermore, the country appears to have no associate degree programs in ecology, environmental science, or agritourism, or any university programs in fishing/aquaculture, biochemistry, agritourism, or agricultural enterprise management.

In the **Light Manufacturing** sector, demand for skilled technical workers outstrips supply in key subsectors such as medical devices. Potential in-demand manufacturing sector workers with post-secondary technical qualifications include **manufacturing industry supervisors** and **mechanical engineering technicians**. Other possibly relevant in-demand workers include **electrical and electronics engineering technicians**. A recent study by the medical devices production cluster estimates a need by 2024 for 3,500 workers with associate degrees in manufacturing, quality control and assurance, supply chain management, electrical engineering, electronic engineering, and mechatronic engineering, in roles including **maintenance and facilities mechanics, engineering and automatization technicians, quality technicians, materials and logistics technicians, and administrative and support technicians**.

Many workers with an associate degree also work in the manufacturing industry as **warehouse workers and material managers, machine operators, and group leaders and production assistants.**

Educational institutions in the Dominican Republic currently offer a variety of programs relevant to the light manufacturing sector. As Advance learned from employers in medical device manufacturing, the cluster is already working with local institutions to train needed workers, but current programs are insufficient to keep up with demand for technicians, and some are not located close to employment opportunities.

In the **Orange Economy**, occupations in demand in the music and film subsector requiring post-secondary technical education include **broadcasting and audiovisual recording technicians and photographers.** In-demand ICT occupations requiring post-secondary technical training include **computer network and systems technicians; ICT operations technicians; and web technicians.** In tourism, **chefs** trained at the associate degree level are in demand.

Current orange economy-relevant programs at the higher technical education level in the country include those in design, publicity, promotion, marketing, and hotel and tourism management. ICT directly supports activities in this sector via, e.g., digital capabilities in design, production, and marketing. (ICT also directly supports activities in the other selected value chains, namely premium food processing and light manufacturing.) Other orange economy programs at this level that could be relevant, but are not currently offered as technical tertiary degree programs in the Dominican Republic, include those in climbing and mountaineering (relevant for adventure travel as the country is home to several mountain ranges and includes the tallest mountain in the Caribbean, Pico Duarte); sports management (relevant for the golf and baseball industries as well as sports-related tourism); as well as cross-sector relevant offerings in agritourism (applicable for both tourism and premium food processing).

In **Transport and Logistics, clearing and forwarding agents** are expected to be in demand. Discussions with representatives of the logistics cluster revealed the need, in port and warehousing operations, for **ship or terminal dispatchers; shipyard planners and operations supervisors; and superintendents or senior supervisors.** In the area of maintenance, there is also a need for maintenance supervisors. Two logistics programs at the associate degree level exist; however, the team's analysis noted a lack of existing programs focusing on maritime transport (relevant for tourism as well as export industries).

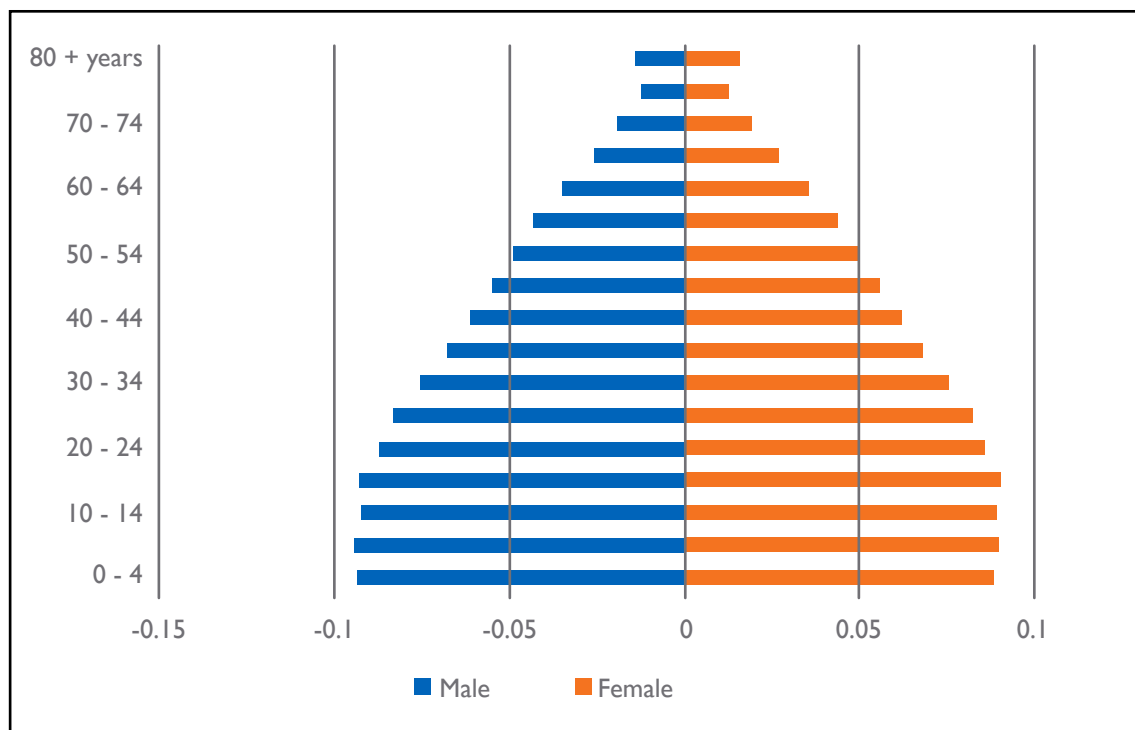
In **Health**, which the team included after the sector selection process as a transversal sector of focus due to the increasing importance of health and hygiene measures to the Dominican economy during the COVID-19 pandemic, Advance anticipates that the pandemic has exacerbated the existing need for **nurses**, especially those with a focus on primary, family, and community care, and for mid-level **diagnostic laboratory professionals.** In recent years, low graduation rates from associate degree programs focusing on preparing these students have translated into a dearth of mid-level health professionals in the labor market. The team found no programs at the associate degree level preparing students for occupational health and safety careers, which will be critical for helping the economy return to normal in the wake of the pandemic.

II. SOCIO-ECONOMIC CONTEXT

DEMOGRAPHIC CONTEXT

The Dominican Republic is located in the Caribbean, on the island of Hispaniola, which it shares with the Republic of Haiti. **The country's population is estimated at 10.5 million¹, with young people accounting for 26.1 percent of the total population, and 34.4 percent of the working-age population.²** The gender ratio is approximately 1.002 women per man. Population growth rates have been declining in recent decades, with the population expected to reach 11.25 million by 2030.³ As shown in the population pyramid (Figure 1), the Dominican population is relatively young.

Figure 1. Population pyramid by age group (2020)



Source: National Statistics Office (Oficina Nacional de Estadística, ONE) population projection data.

An estimated 64.4% of the population is concentrated in seven of the country's 32 provinces (Table 1), with more than four million inhabitants concentrated in the capital area, Greater Santo Domingo.⁴

¹Estimates and projections of the total population by calendar year, by region and province, 2000-2030.

²Authors' analysis using ENCFT 2019 data.

³Estimates and projections of the total population by calendar year, by region and province, 2000-2030.

⁴Greater Santo Domingo includes the National District (seat of government) and the province of Santo Domingo.

Table I. Number of inhabitants per province, 2020

Province	Population	Percentage	Cumulative percentage
Santo Domingo	2,906,003	27.8%	27.8%
Santiago	1,045,169	10.0%	37.8%
National District	1,043,186	10.0%	47.8%
San Cristóbal	637,429	6.1%	53.9%
La Vega	411,290	3.9%	57.8%
La Altagracia	353,406	3.4%	61.2%
Puerto Plata	333,221	3.2%	64.4%
San Pedro de Macorís	304,966	2.9%	67.3%
Duarte	298,913	2.9%	70.2%
La Romana	272,597	2.6%	72.8%
Españillat	239,845	2.3%	75.1%
Azua	222,256	2.1%	77.2%
San Juan	221,736	2.1%	79.3%
Peravia	197,434	1.9%	81.2%
Monte Plata	191,033	1.8%	83.1%
Barahona	189,177	1.8%	84.9%
Valverde	176,720	1.7%	86.6%
Monseñor Nouel	174,278	1.7%	88.2%
Sánchez Ramírez	151,978	1.5%	89.7%
María Trinidad Sánchez	141,097	1.4%	91.0%
Monte Cristi	117,221	1.1%	92.2%
Samaná	112,160	1.1%	93.2%
Bahoruco	101,005	1.0%	94.2%
El Seibo	93,508	0.9%	95.1%
Hermanas Mirabal	92,148	0.9%	96.0%
Hato Mayor	85,762	0.8%	96.8%
Dajabón	66,467	0.6%	97.4%
Elías Piña	63,402	0.6%	98.0%
Independencia	58,424	0.6%	98.6%
Santiago Rodríguez	57,266	0.5%	99.1%
San José de Ocoa	54,405	0.5%	99.7%
Pedernales	34,997	0.3%	100.0%
Total Country	10,448,499	100.0%	

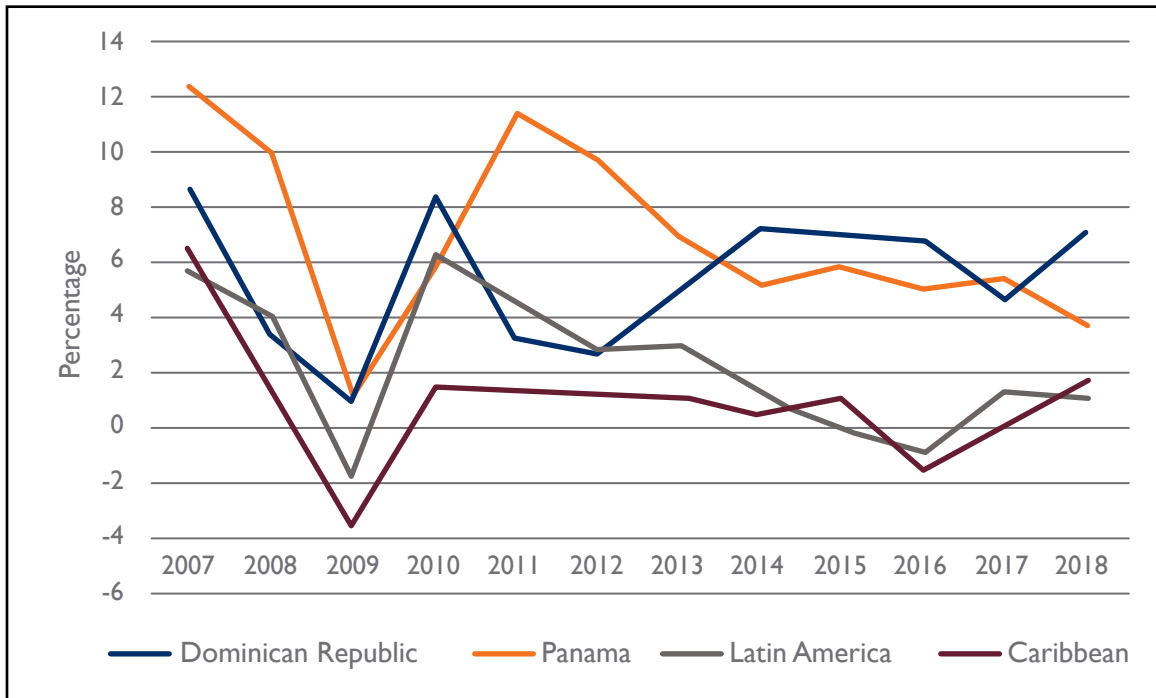
Source: Population projections 2020 (ONE)

This phenomenon goes hand in hand with the urbanization process of recent decades, which has resulted in 82.3 percent of the population living in urban areas, according to 2020 population projections (ONE). This irreversible trend over the last few decades has been motivated by improvements in social conditions and rural-urban mobility.

MACROECONOMIC CONTEXT

The Dominican Republic has experienced high economic growth in recent years, performing well above the average of Latin American and Caribbean countries in the last decade, shadowed only by Panama during 2010-13 (Figure 2).

Figure 2. Real GDP growth rate in Latin America, the Caribbean, Panama, and the Dominican Republic (2007-18)



Source: Authors' analysis based on ECLAC data.

This economic growth is based on the positive performance of all economic activities, **in particular mining and quarrying, which on average showed growth of 22.6 percent**; Financial Intermediation, Insurance and Related Activities, with an average of 7.5 percent growth; Health with 6.4% growth; and Construction, averaging 6.0 percent growth (Table 2).

An analysis of the country's economic growth shows that **the activities of the services sector have most contributed to this growth, contributing 2.9 percent of all the growth** experienced, mainly due to transport and storage with an impact of 0.5 percent, and Trade and Other market services activities with 0.4%. **In addition, the industrial sector is responsible for 1.3% of the total cumulative growth, largely due to construction activity with 0.7 percent**, or just over half of the accumulated impact.

Table 2. Average growth and impact on growth by sector of economic activity (2008-19)

Economic Sector	Growth (%)	Impact (%)
Agriculture	4.5	0.3
Farming Subsector	5.6	0.2
Livestock, Forestry and Fishing	2.8	0.1
Industries	5.0	1.3
Mining and Quarrying	22.6	0.2
Local Manufacturing	3.5	0.4
Food Industries	4.5	0.2
Preparation of Beverages and Tobacco Products	3.9	0.0
Manufacturing of Petroleum and Refined Chemical Products	3.3	0.0
Other Products	2.6	0.1
Free Trade Zone Manufacturing	3.0	0.1
Construction	6.3	0.7
Services	4.8	2.9
Energy and Water	3.0	0.1
Trade	4.4	0.4
Hotels, Bars, and Restaurants	4.3	0.3
Transport and Storage	5.7	0.5
Communications	4.9	0.1
Financial Intermediation, Insurance, and Related Activities	7.5	0.3
Real Estate and Rental Activities	4.0	0.3
Education	4.2	0.2
Private Education	2.4	0.0
Public Education	6.0	0.1
Health	6.4	0.2
Private Health	7.5	0.1
Public Health	4.3	0.0
Other Private Services Activities	5.5	0.4
Public Administration and Defense; Compulsory Social Security, and Other Services	3.2	0.1

Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

An analysis of the figures of domestic production growth by the focus on spending in real terms (Table 3) shows that **private consumption has been responsible for much of the growth experienced (3.5 percent)**, as well as **gross fixed capital formation (1.2 percent)**. In recent years, this has been generated by public and private sector construction projects.⁵

⁵Central Bank of the Dominican Republic, Report of the Dominican Economy January-December 2019.

Table 3. Average growth and impact on growth by spending focus (2008-19)

Component	Growth	Impact
Final Consumption	4.8	3.9
Private Consumption	4.9	3.5
Public Consumption	3.8	0.4
Gross Capital Formation¹	Nd	1.2
Gross Fixed Capital Formation	5.5	1.2
Stock Variation ¹	Nd	-0.1
Exports	4.7	1.1
Imports	4.0	-1.1
Gross Domestic Product	5.0	5.0

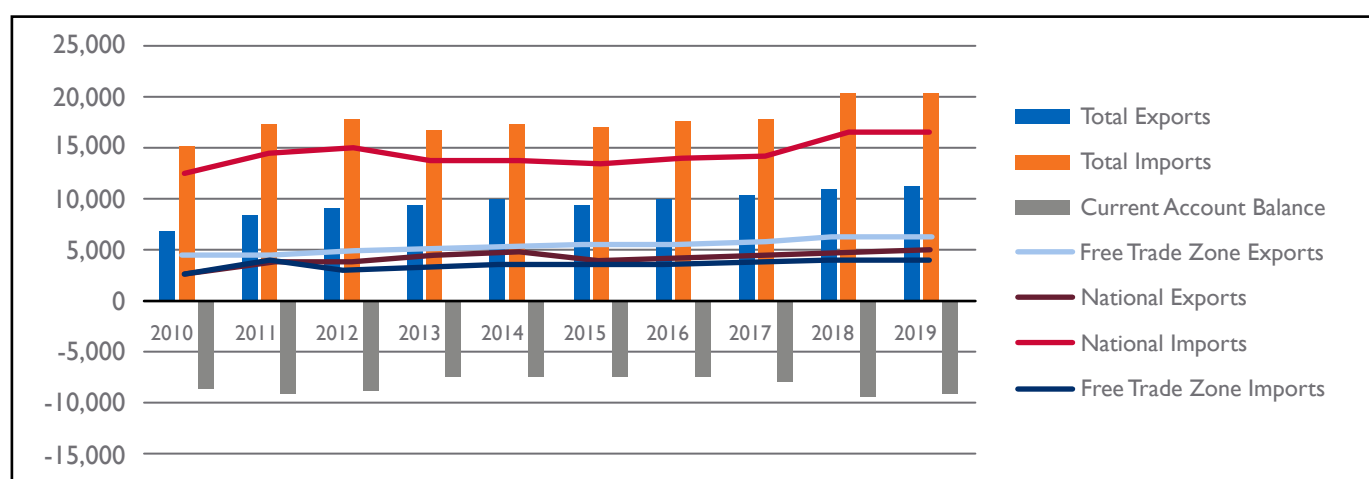
(1) Stock variation is the residual variable in the GDP estimate by the spending approach; its result frequently changes signs, making it difficult to interpret the growth rate of the chained index of this component. This variable's behavior is analyzed through the contribution to the percentage variation in the aggregate to which it belongs, i.e., the impact on GDP growth expressed in percentage points. Only growth rates for gross fixed capital formation are disclosed.

Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

Given this strong starting position in the context of the COVID-19 outbreak in the country, “[t]he Economic Commission for Latin America and the Caribbean (ECLAC) projects that, although the region will have an average decrease of 5.3 percent in GDP, by contrast, the DR will have a zero percent economic growth rate.”⁶

In terms of participation in international markets, the Dominican economy has seen a trade deficit in exports and imports of goods and services, although between 2012 and 2015 there was a reduction in the gap. Since then, however, the gap began to increase (Figure 3).

Figure 3. Amount of Dominican exports and imports (2010-19) (In Millions of US)

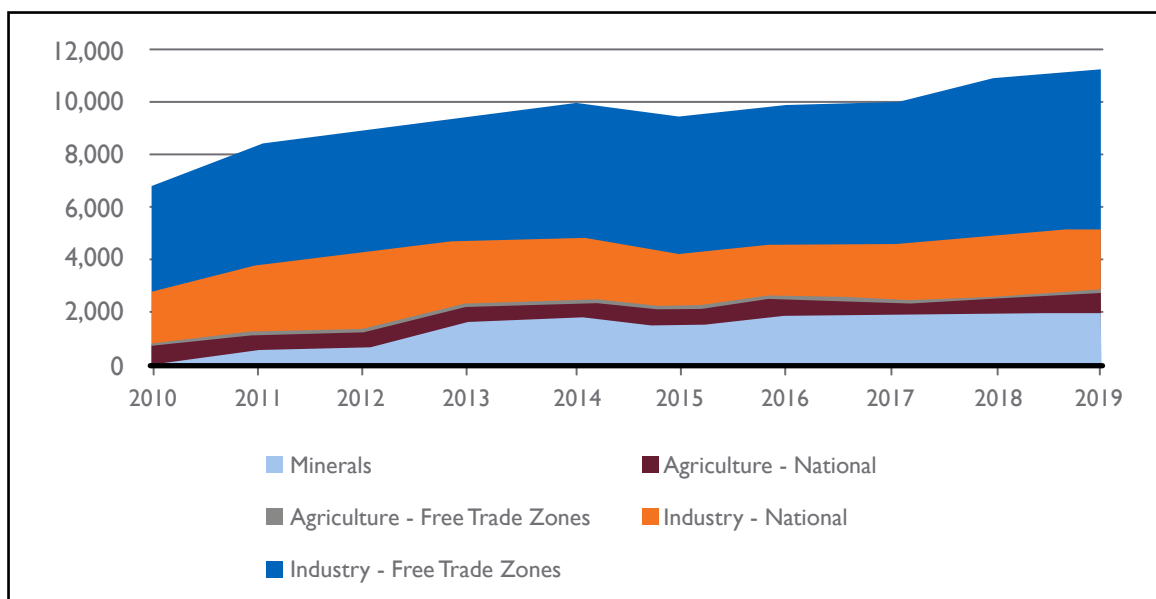


Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

⁶USDA FAS and GAIN. “COVID-19 Impact on the Dominican Republic Agricultural Sector-May 2020.”

Despite these annual fluctuations, the value of Dominican exports grew by 64.6 percent between 2010 and 2019, while the value of imports barely grew 33.4 percent, reflecting the dynamism of export sectors. This increase is mainly due to the growth of the industrial free trade zones sector (48.5 percent) during this period.

Figure 4. Amount of exports by sector of origin (2010-19) (In Millions of US)



Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

There has been a notable increase in mineral exports, especially gold and iron-nickel alloys, which accounted for 19.2 percent of the value exported in 2019. Bananas were the most important agricultural export, reaching about 1 percent of total domestic exports for the year. In addition, cocoa beans were the second-most important agricultural export, reaching 1.6 percent of all agricultural exports (including domestic and free trade zone exports).

Table 4. Exported value of the main items by economic sector (2010-19, in Millions of US)

Product	Years									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1. Minerals	113.7	449.3	582.0	1,523.5	1,737.1	1,358.6	1,807.2	1,767.0	1,770.9	2,043.0
Gold	20.1	25.0	174.7	1,190.6	1,544.8	1,227.3	1,575.3	1,456.7	1,360.6	1,544.3
Ferronickel	-	290.2	267.3	157.3	-	-	90.9	153.6	233.8	383.4
Other minerals	93.6	134.1	140.0	175.6	192.3	131.3	141.0	156.7	176.5	115.3
2. Agriculture	628.4	693.3	654.6	675.1	768.0	754.4	774.3	639.7	730.6	741.0
2.1 National	519.3	598.3	508.0	503.0	575.6	561.5	583.9	472.1	524.0	543.3
Bananos	282.1	306.1	266.0	300.1	330.6	306.7	324.1	275.7	262.2	289.3
Cacao beans	108.2	115.5	75.1	63.2	78.5	109.1	111.7	54.6	87.5	81.7
Other agriculture	129.0	176.7	166.9	139.7	166.5	145.7	148.1	141.8	174.3	172.3
2.2 Free Trade Zones	109.1	95.0	146.6	172.1	192.4	192.9	190.4	167.6	206.6	197.7
Cacao beans	65.7	60.4	87.4	98.0	121.4	132.3	113.4	78.6	118.2	99.2
Other agriculture	43.4	34.6	59.2	74.1	71.0	60.6	77.0	89.0	88.4	98.5
3. Industry	6,073.9	7,219.3	7,698.9	7,225.8	7,393.8	7,328.8	7,258.1	7,727.9	8,406.1	8,434.6
3.1 National	1,988.6	2,547.2	2,926.6	2,421.5	2,324.5	2,098.1	1,944.6	2,185.9	2,382.7	2,368.8
Raw sugar and derivatives	195.7	205.0	200.6	131.3	125.2	126.0	124.0	141.9	147.7	128.1
Chemical products	119.6	96.9	112.3	105.2	109.2	112.8	108.8	123.7	140.4	116.7
Aircraft fuel	398.1	545.9	554.6	525.6	540.7	379.2	332.9	456.7	518.6	465.7
Other industry	1,275.2	1,699.4	2,059.1	1,659.4	1,549.4	1,480.1	1,378.9	1,463.6	1,576.0	1,658.3
3.2 Free Trade Zones	4,085.3	4,672.1	4,772.3	4,804.3	5,069.3	5,230.7	5,313.5	5,542.0	6,023.4	6,065.8
Textile apparel	946.4	1,207.0	1,222.8	1,219.1	1,241.9	1,247.9	1,102.8	1,095.9	1,106.7	1,048.4
Electric products	581.4	604.1	638.8	658.2	752.8	707.3	750.6	883.1	1,150.3	1,075.1
Jewelry and related articles	434.7	487.9	405.3	315.6	283.7	369.9	407.0	422.2	490.5	530.6
Medical and surgical equipment manufacturing	1,055.6	1,147.2	1,189.8	1,197.2	1,232.5	1,320.3	1,449.1	1,422.8	1,503.5	1,627.3
Shoe manufacturing	312.8	375.5	406.5	422.2	449.5	443.0	424.7	386.8	351.6	279.5
Tabacco products	381.7	396.8	475.9	531.6	586.9	660.3	695.9	798.4	850.3	889.5
Other industry	372.7	453.6	433.2	460.4	522.0	482.0	483.4	532.8	570.5	615.4
Total exports	6,816.0	8,361.9	8,935.5	9,424.4	9,898.9	9,441.8	9,839.6	10,134.6	10,907.6	11,218.6

Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

By 2019, three dollars out of every four dollars exported came from the industrial sector, with industries in the free trade zones having performed best, accounting for 55 percent of total domestic exports. Medical and surgical equipment manufacturing had the greatest export dynamics within free trade zones for that year, with an export value that reached 14.5 percent of the overall total.

Following this were the production of textiles and electrical products (9.4 percent and 9.6 percent of the total exported value, respectively). In particular, electrical products showed high growth over the last decade.

In terms of **domestic exports**, two main product categories have seen a decrease between 2010 and 2019 -- the raw sugar and derivatives industry (-34.5 percent) and chemical industry products (-2.5 percent). Despite this, overall exports have increased over this time period, due to a large diversification of exported products.

In terms of investment, as previously seen in Table 3, **gross fixed capital formation** affected 1.2 percent of the growth in domestic production in the period 2009 to 2018. The balance of payments indicates that the country received net foreign investment equivalent to \$25.4 billion between 2010 and 2019, mainly for Industry/Trade (24.2 percent) and for Tourism (19.4 percent) (Table 5).

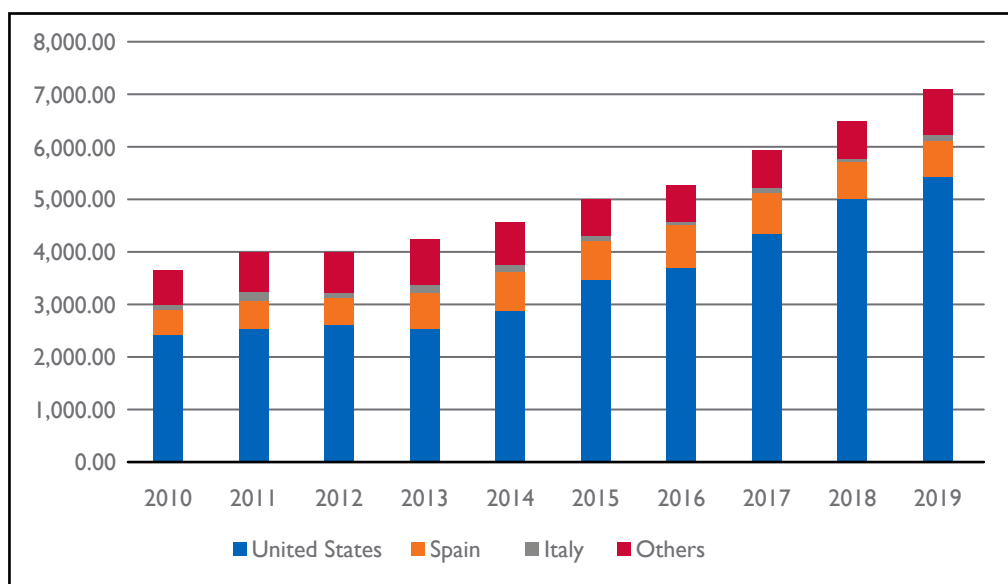
Table 5: Flows of foreign direct investment (FDI; 2010-19 in Millions of US)

Economic Activity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total	%
Tourism	180.0	107.8	162.0	256.5	300.7	671.9	790.0	704.0	854.2	884.1	4,911.2	19.4
Trade / Industry	566.1	355.2	1,257.3	403.7	606.9	367.9	413.2	1,365.2	539.8	252.1	6,127.4	24.2
Telecommunications	500.2	53.6	-21.2	187.8	256.7	335.9	-263.9	67.1	-240.1	337.1	1,213.2	4.8
Electricity	108.1	258.8	304.5	449.6	352.1	-96.3	-8.3	63.7	202.6	373.9	2,008.7	7.9
Finance	93.5	134.3	159.4	152.0	207.2	189.7	124.6	90.9	178.7	100.5	1,430.8	5.6
Free Trade Zones	71.8	147.8	163.0	149.7	190.9	236.6	223.9	263.9	233.6	274.8	1,956.0	7.7
Mining	239.9	1,059.7	1,169.4	92.6	-38.5	6.1	485.7	409.6	184.8	275.3	3,884.6	15.3
Real Estate	264.1	159.5	203.0	273.6	305.6	411.7	587.3	545.9	518.3	453.1	3,722.1	14.7
Transport	0.0	0.0	-255.0	25.0	26.9	81.4	54.2	60.4	63.4	61.9	118.2	0.5
Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
FDI Flows	2,023.7	2,276.7	3,142.4	1,990.5	2,208.5	2,204.9	2,406.7	3,570.7	2,535.3	3,012.8	25,372.2	100

Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

An important component of the Dominican economy is family remittances received from members of the diaspora. **Between 2010 and 2019, remittances to the Dominican Republic grew an average of 7 percent annually, representing an approximate total of US\$50.3 billion over the period.** The origin of these flows was primarily from the United States (70.0 percent), followed by Spain (13.3 percent; see Figure 5).

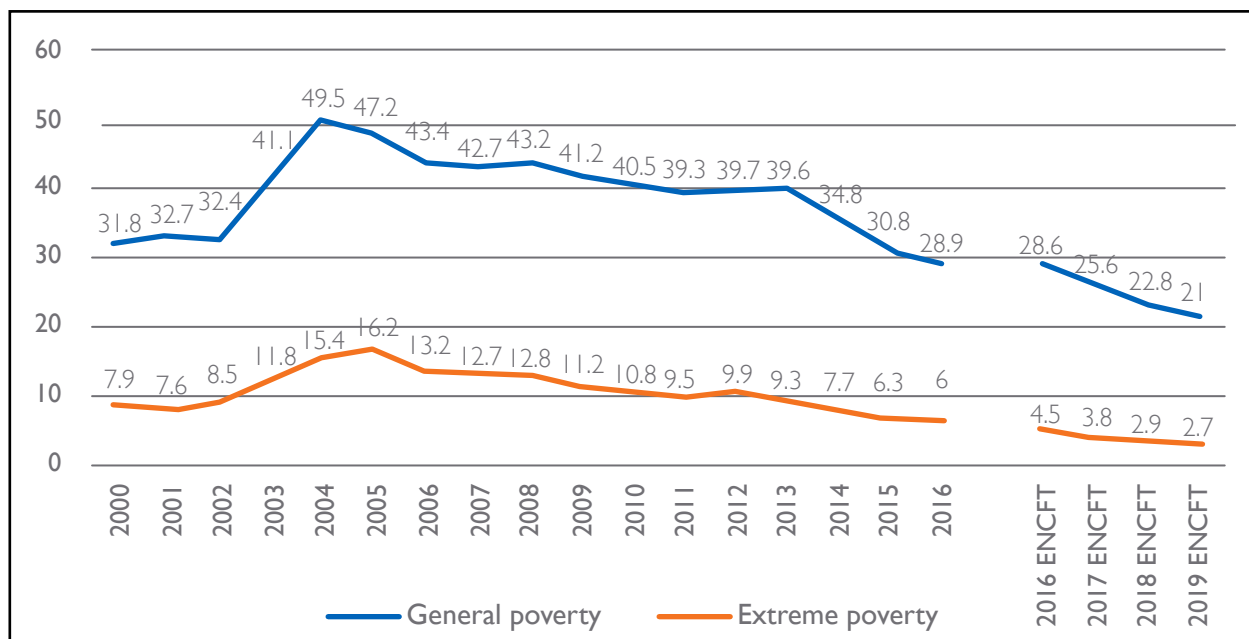
Figure 5: Family remittances received by country of origin (2010-19) (In Millions of US\$)



Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

Assessing the country's welfare indicators demonstrates substantial improvement in the **country's poverty** conditions, with a **reduction of almost 20 percentage points of the overall poverty rate from 39.6 percent in 2012 to 21.0 percent in 2019**. This situation is also reflected in the **extreme poverty rate, which was significantly reduced in this period, from 9.9 percent to just 2.7 percent** (Figure 6).

Figure 6: Evolution of the total and monetary poverty rate (2000-19) (Percentage)

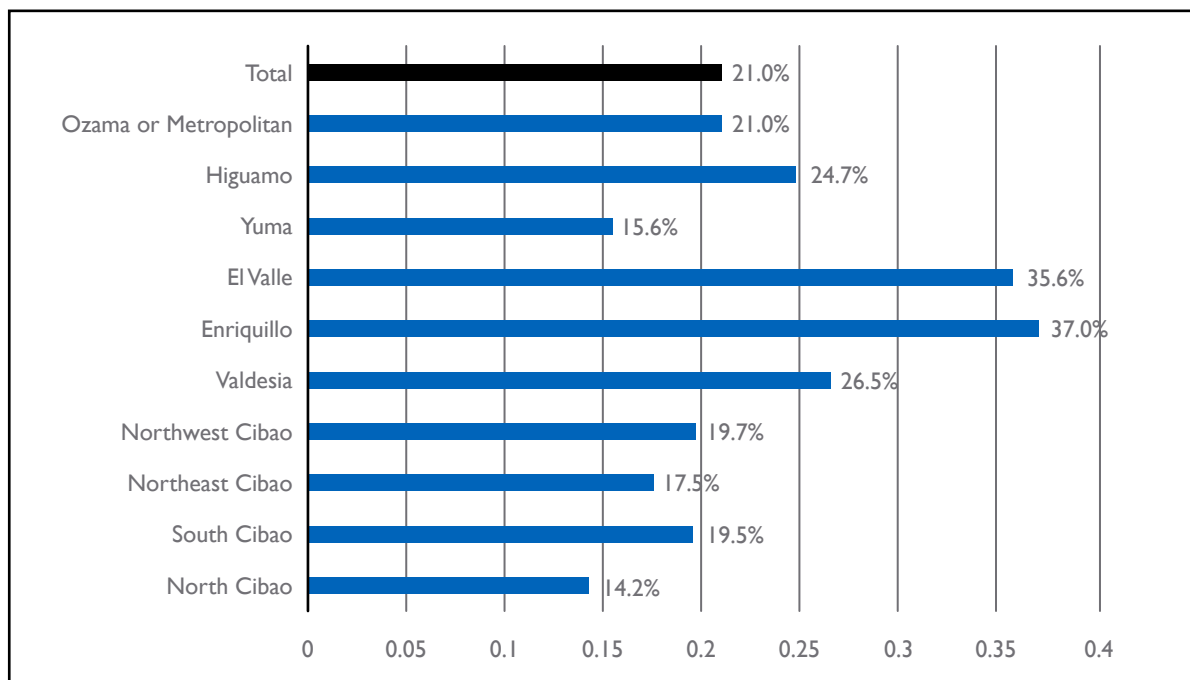


Source: Authors' analysis based on statistics available in Bulletin 7 of Poverty of the Ministry of Economy, Planning and Development.

Source: As of 2016, the Central Bank made methodological changes to the National Continuous Labor Force Survey, which is why it is separate.

Looking at specific geographical areas, the Enriquillo region, which includes the provinces of Barahona, Bahoruco, Independencia and Pedernales (the latter two border Haiti), has the highest poverty rate in the country, with 37.0 percent of the population in poverty. In addition, the region of El Valle, which includes the provinces of San Juan and Elías Piña (border with Haiti), has the second-highest poverty level in the country, with 35.6 percent of the population in poverty (Figure 7). More socioeconomic data on the geographic priority areas can be found in Table 7.

Figure 7. Monetary poverty rate per planning region (2019)



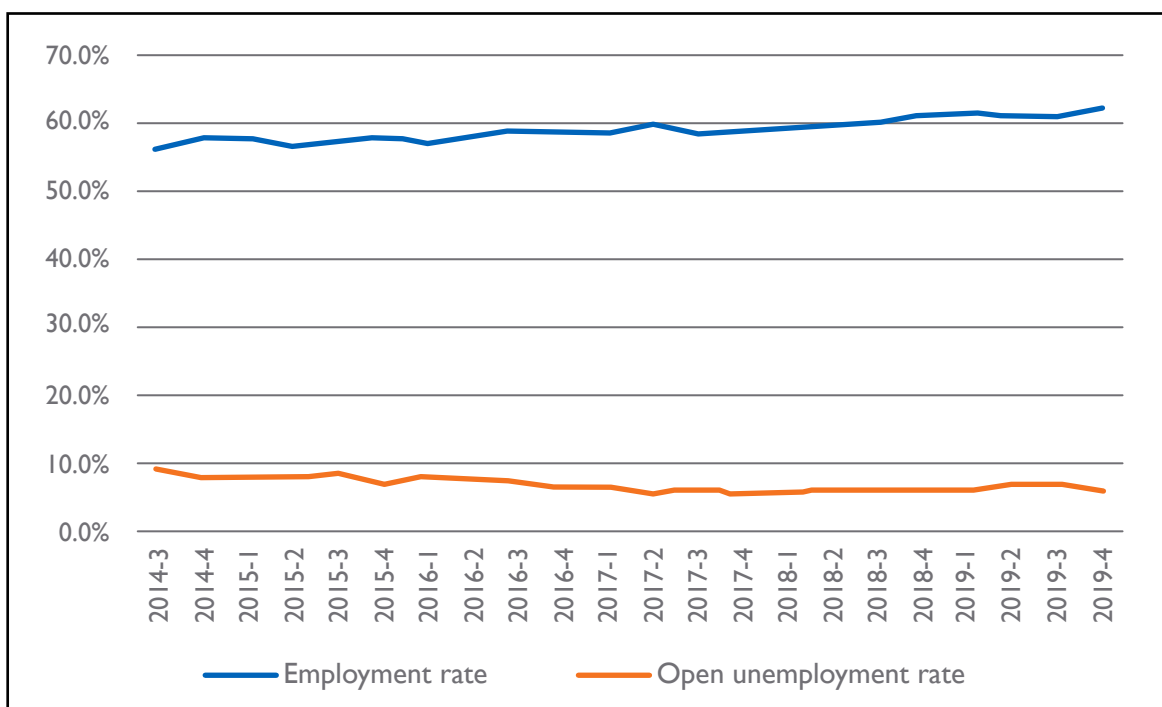
Source: Authors' analysis based on statistics available in Bulletin 7 on Poverty of the Ministry of Economy, Planning and Development.

Other macroeconomic indicators that stand out are **price stability, measured through inflation, which reached an annual average of 4.28 percent between 2007 and 2019**. Looking at the figures over the last 5 years, the average was 2.2% annual inflation. In relation to the exchange rate of the national currency to the US dollar, the average annual depreciation **between 2007 and 2019 was 3.7 percent, from 33.2 to 51.3 pesos for each dollar**.

LABOR MARKET

The Dominican Republic's favorable economic environment has had a positive impact on job creation, contributing to an increase in the (pre-COVID) employment rate, which in the 3rd quarter of 2014 reached 56.4 percent of the working-age population, and by the last quarter of 2019 reached 61.5 percent. In addition, the open unemployment rate saw a significant drop over the past five years, from 8.8 percent to 6 percent (Figure 8).

Figure 8. Evolution of the employment and open employment rates (2014-19, %)



Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

Unfortunately, current open unemployment rates for youth (15-24 years old) are almost three times higher at 16 percent.⁷ Young women in that age group are two times more likely to be unemployed, with rates at 11 percent for young males and 22 percent for young females.

If the underemployed and members of the youth population who are not looking for a job but would accept one are counted, however, the overall picture looks even more difficult for young people. In 2016, 28.1 percent of youth aged 15-24 fell into this “expanded unemployment” category, as did 23.7 percent of all youth aged 15-29.⁸ In 2019, 24.7 percent of youth (30.5 percent of young women, and 18.8 percent of young men) in the DR were neither enrolled in school nor employed (“ni-nis”).⁹

During the COVID-19 pandemic and resulting economic fallout, the employment situation has worsened. In general, increased unemployment during the crisis appears to be affecting female and rural Dominicans more strongly than urban-dwellers and males.¹⁰ **ECLAC “forecasts that the Dominican unemployment rate will rise one percent, the extreme poverty level by 0.4 percent, the poverty level by 0.8 percent and the inequality level to 1.4 percent due to the effects of the pandemic.”¹¹**

⁷<https://data.worldbank.org/indicator/SL.UEM.I1524.NE.ZS?locations=DO>. Different data sources may use different definitions for “youth.”

⁸EDUCA. 2019. Los jóvenes dominicanos, esos desconocidos: Estado de situación y políticas en materia de formación y empleo juvenil en la República Dominicana. Accessed online at <http://economia.gob.do/wp-content/uploads/drive/DFIES/Publicaciones/Los%20j%C3%B3venes%20dominicanos%20esos%20desconocidos.pdf>

⁹<https://data.worldbank.org/indicator/SL.UEM.NEET.ZS?locations=DO>

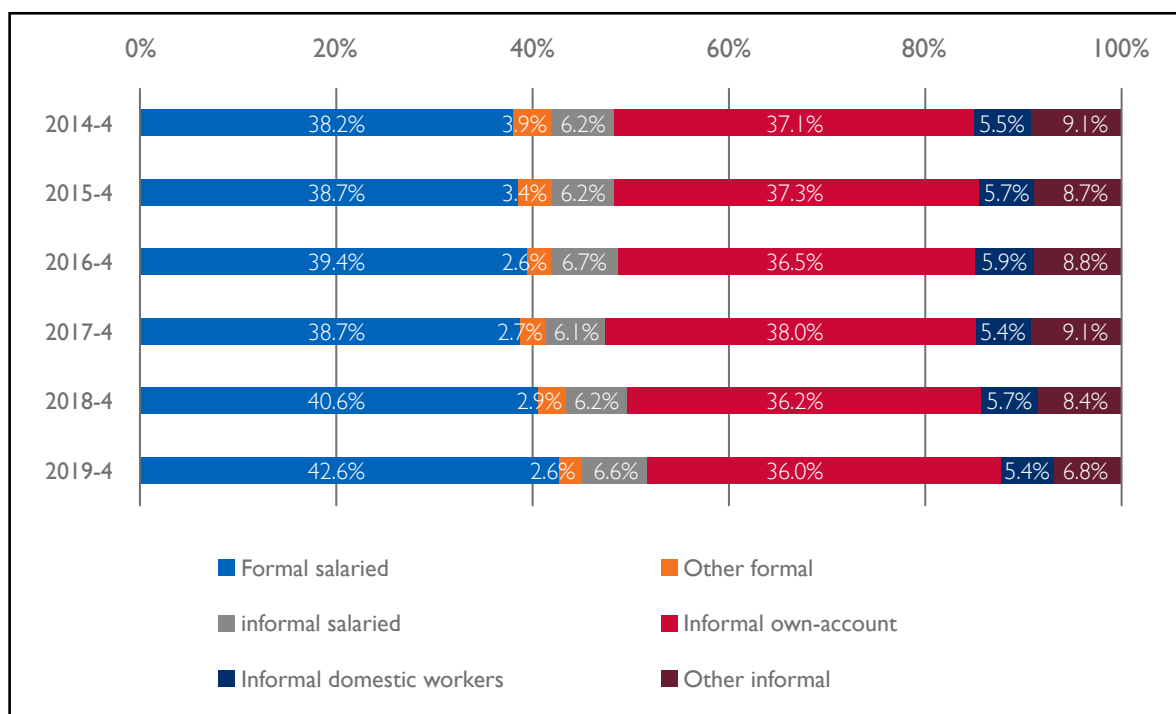
¹⁰World Food Programme. 2020. Remote Assessment COVID-19 DOMINICAN REPUBLIC.

¹¹USDA FAS and GAIN. “COVID-19 Impact on the Dominican Republic Agricultural Sector-May 2020.”

Young people appear to be strongly impacted: the number of employed youth aged 15-24 decreased in the first quarter of 2020 by around 35,000 over the previous quarter, or 4.9 percent; around 10,000 fewer young men, and 25,000 fewer young women, were employed in the country as of the end of March.¹²

One of the main challenges of the Dominican economy is the high rate of informal jobs in the economy, since more than **54 percent of the occupied population is engaged in informal activities, a figure that has shown a slight decrease in the last five years.**

Figure 9. Year-over-year evolution of the occupation population in formal and informal sectors (Q4 2014-Q4 2019, percentage)



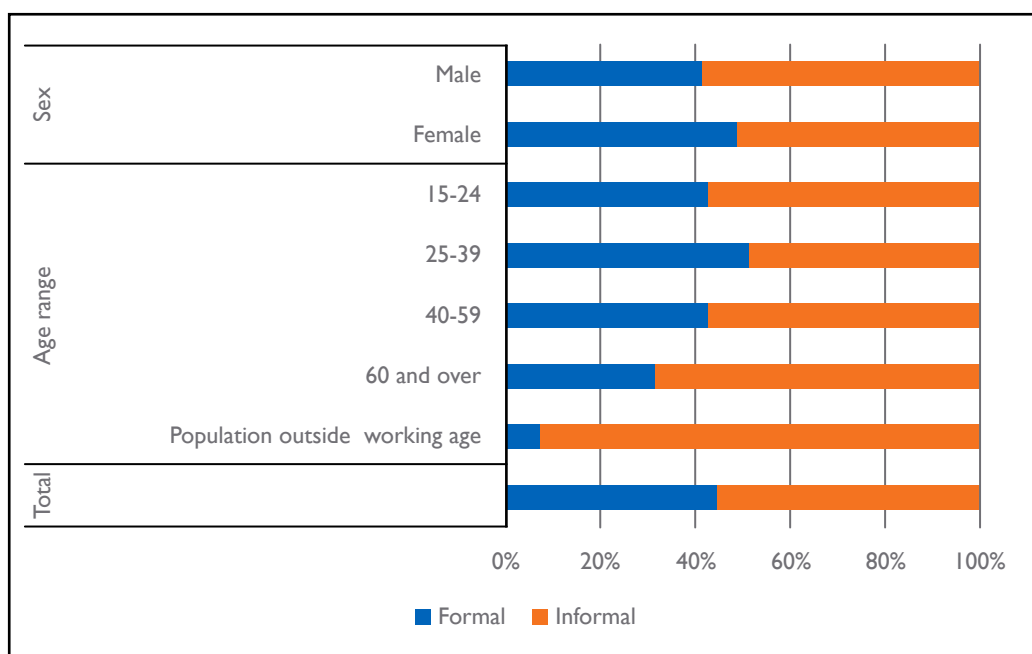
Source: : Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

The job category with the highest number of workers is informal own account workers, which accounted for **36 percent of the occupied population in the last quarter of 2019.** Informal salaried workers (6.6 percent) and informal domestic workers (5.4 percent) have maintained the same weight in the labor market over the past 5 years, indicating that these types of occupations have grown at a rate similar to the overall workforce. **As for formal activities, the main movement is occurring in the proportion of formal salaried employees (42.6 percent),** which increased by four percentage points over the last five years.

Taking a deeper look at the dynamics of informality, the results reflect that male and older workers are more likely to be in informal work. However, it is striking that **workers aged 15-24 years are as likely to be informal as those aged 40-59 years.**

¹²ENCFT. 2020

Figure 10. Percentage of formal and informal population according to gender and age range (2019)



Source: Authors' analysis based on statistics available from the Central Bank of the Dominican Republic.

As of 2017, 5.9 percent of the employed population, or approximately 262,000 individuals, were employed as mid-level technicians. These occupations require a Competency Level 3, gained through a 2–3-year technical post-secondary education (ISCED Level 5b) according to ISCO-08, the most relevant occupational level for the Advance Program. In a 2019 survey carried out under the PROSOLI program, 65.3 percent of private employers reported employing workers at this level. Another 82,000 or 1.8 percent of employed people in the country were working as managers and administrators; some of these positions require a Competency Level 3 while others require a Competency Level 4 (the latter gained through study at the bachelor's degree level or higher).¹³

¹³Amargos, Oscar. "Estudio de Detección de Necesidades de Capacitación y Demanda Laboral." 2019. Vicepresidencia de la Republica Dominicana. Proyecto Integrado de Promoción y Protección Social. Note: the study included employers in 14 provinces, including Santo Domingo, Distrito Nacional, Santiago, Barahona, but not Dajabón, Duarte (San Francisco de Macorís), or Puerto Plata.

Table 6. Employed population according to occupational group (2017 Q4)

Occupational Group	Number	%	Competency Level (ISCO-08)
Managers and Administrators	81,533	1.8	3 y 4
Professionals and Intellectuals	354,043	8.0	4
Mid-level Technicians	261,748	5.9	3
Office Employees	339,167	7.7	2
Services Workers	1,172,485	26.5	2
Skilled Agricultural Workers	256,681	5.8	2
Manual Workers and Craftspeople	695,712	15.7	2
Operators and Drivers	394,057	8.9	2
Unskilled Workers	876,485	19.8	1
Total	4,431,911		

Source: Amargos, Oscar. "Estudio de Detección de Necesidades de Capacitación y Demanda Laboral." 2019. Vicepresidencia de la República Dominicana. Proyecto Integrado de Promoción y Protección Social.

In the 2019 survey, 40 percent of employers indicated having a moderate (32 percent) or high (8 percent) level of difficulty in finding new employees, while 12.5 percent indicated difficulty in finding qualified technicians, and 11 percent had difficulty finding accounting and finance staff. In terms of finding new staff with specific technical training, 10.2 percent reported high levels of difficulty and 41.4 percent moderate levels. Employers in Santo Domingo reported higher than average difficulty in finding qualified employees, while employers in Barahona and Santiago reported lower than average difficulty.

Employers reported the highest levels of difficulty in finding employees in socio-cultural and community services; electricity and electronics; health and wellness; hotels and tourism; and construction and mining. Medium-sized businesses had the highest levels of difficulty in finding employees, followed by large, small, and micro-enterprises, respectively.

Furthermore, 78 percent of employers said that available workers needed more training, 13.9 percent of large employers noted that the minimum educational level for employment was post-secondary non-university (PSNU) training (which the study considers to include associate degree programs programs), followed by small businesses at 10.6 percent. Job families for which a greater percentage of businesses require post-secondary non-university training or higher include:

- Arts and Humanities (66.7 percent require university completed).
- Administration, Finance and Law (7.5 percent require post-secondary non-university education (PSNU), 29.9 percent incomplete university (IU), and 25.4 percent university completed (UC)).
- Physical, Sports, and Recreational Activities (27.3 percent require PSNU, 9.3 percent IU, and 13.6 percent UC)

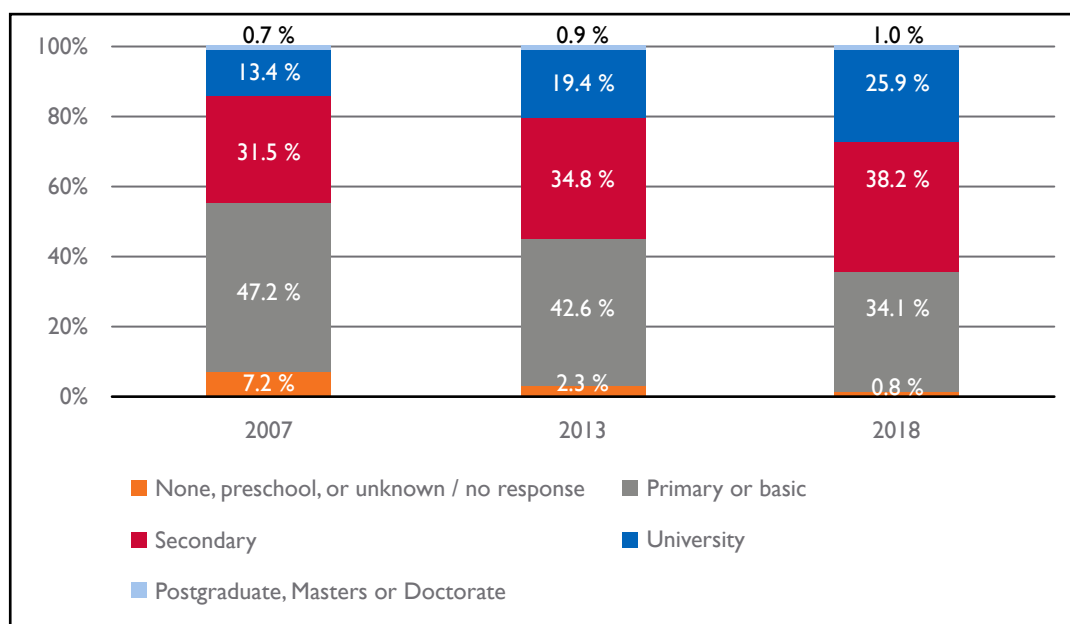
- ICT (16.7 percent require PSNU, 10 percent IU, and 16.7 percent UC)
- Health and Wellness (13.7 percent require PSNU, 10.1 percent IU, and 15.8 percent UC)
- Construction and Mining (17.1 percent PSNU, 14.3 percent IU, and 5.7 percent UC)
- Audiovisual and Graphics (6.5 percent PSNU, 12.9 percent IU, 12.9 percent UC)

In terms of cognitive and practical skills, nearly two-thirds of employers required office software skills; 52 percent required foreign language skills, and 49 percent required the ability to use job-related machinery and equipment. Finally, 63 percent required prior work experience.

EDUCATIONAL CONTEXT

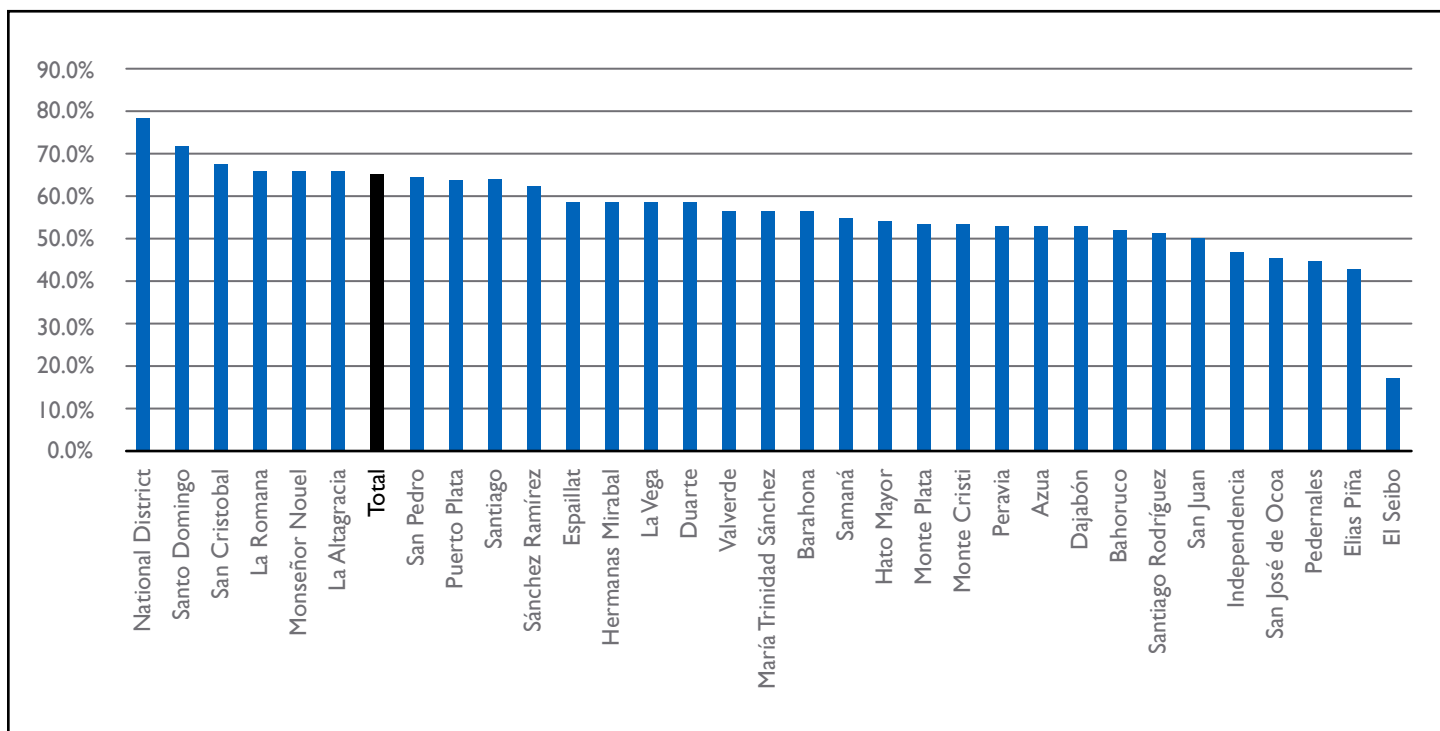
The Dominican Republic has seen improvement in educational attainment, evidenced by the decrease in the percentage of the population aged 15 years and older with primary education or lower, from 54.4 percent in 2008 to 34.9 percent in 2018, an almost 20 percentage-point drop (Figure 11). During this same period, the percentage of people in this age group with a university education almost doubled, from 13.4 percent to 25.9 percent.

Figure 11. Percentage of people aged 15 and over according to the highest level of studies achieved (2007-18)



Source: Authors' analysis from the databases of ENHOGAR 2018.

Figure 12. Percentage of people aged 15 and over with at least secondary education (2018)



Source: Authors' analysis from the databases of ENHOGAR 2018.

As of 2018, **only six provinces** (National District, Santo Domingo, San Cristóbal, La Romana, Monseñor Nouel and La Altagracia) **were above the national average in terms of percentage of people aged 15 and over with at least secondary education, demonstrating high levels of geographic inequality in education.** In fact, in six provinces the percentage is below 50 percent, and in one of them (El Seibo) only 17.5 percent of the population has attained this level (Figure 12).

Education Stocks and Flows

Education stocks and flows is one method the Advance Program uses to analyze the supply side of the workforce and education equation, i.e., the composition and dynamics of the in-school and youth labor force populations. The corresponding figure attempts to capture in a single diagram as complete a picture as possible of the flows from the educational system into the workforce.

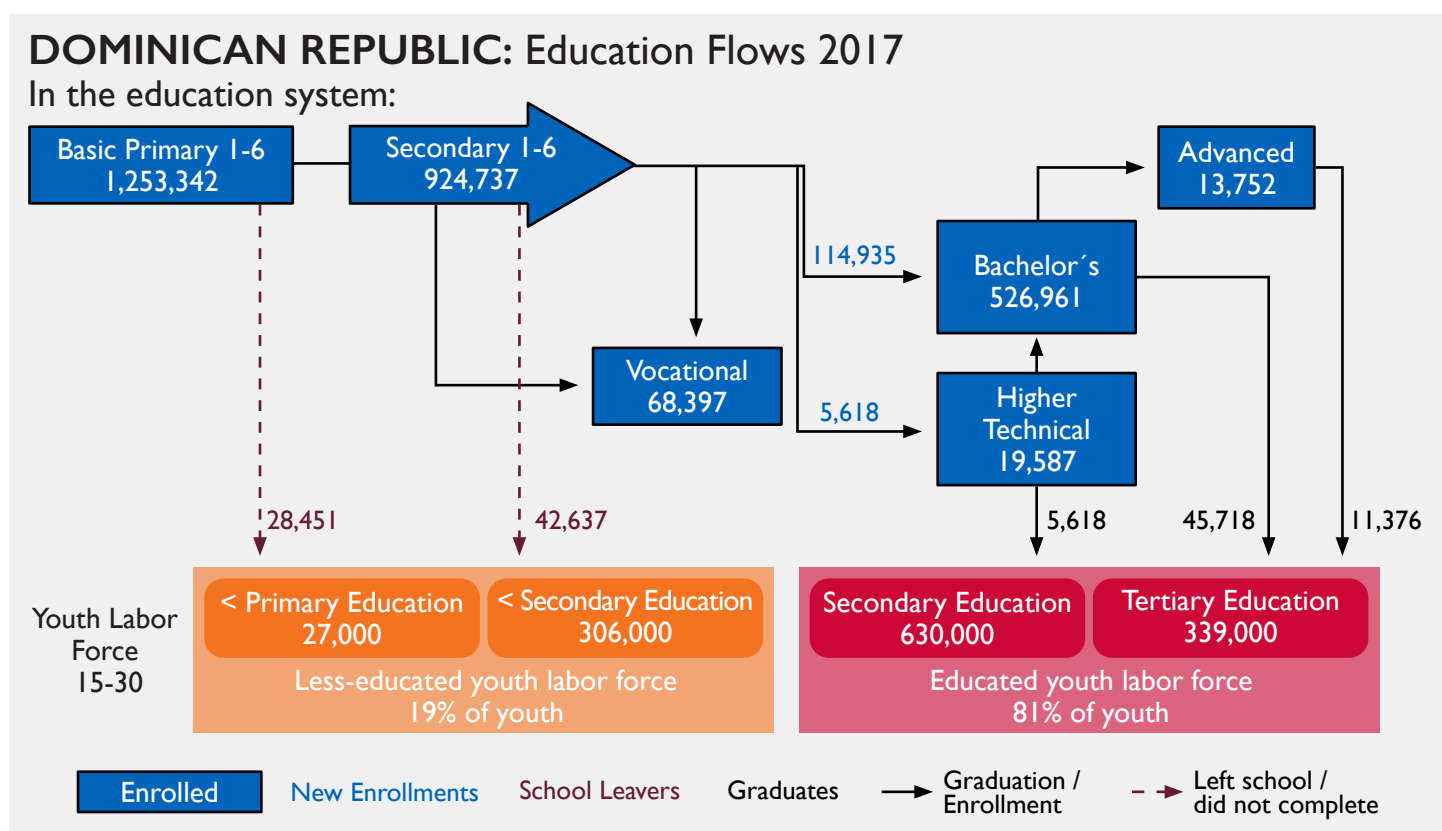
Drawing from systems thinking concepts, the education stocks and flows figure allows the viewer to instantly visualize the composition of a labor market in terms of educational attainment and age at a snapshot in time. The diagram reveals a dynamic picture of skills supply in a workforce, helping stakeholders learn how young people are moving through the education system, estimate the number of youths in various levels of education and in the labor pool at one point in time, understand changes in the workforce over time, and gain insights into future trends in the labor market.

- A **stock** represents a quantity of something (in this case, people) in the system at one point in time. For example, a bathtub; one can measure the amount of water in the bathtub at any given time.
- A **flow** represents the rate at which the stock is changing. In the bathtub example, the flow is how fast the water is increasing or decreasing.

In Figure 13, the flows from “school leavers” (red dotted downward arrows) and “graduates” (narrow blue downward arrows) from the “stocks” of the school system (blue boxes) create the “stocks” of observed youth in the four categories of the out-of-school youth workforce:

- those with less than primary education (27,000)
- those with primary but less than secondary education (306,000)
- those with secondary education (630,000), and
- those with tertiary education (339,000).

Figure 13. Educational Stocks & Flows for Dominican Republic, 2017



Source: Authors' analysis based on the information published in the Yearbook of Educational Statistics of the Ministry of Education (MINERD), the statistical report of the Ministry of Higher Education, Science and Technology (MESCyT) and the National Continuous Labor Force Survey (ENCFT) of the Central Bank of the Dominican Republic.

In comparison to the Advance Program's other focus countries (Guatemala, Honduras, and Jamaica), the Dominican Republic is fortunate to have a relatively small proportion (19 percent) of its youth population in the two least-educated categories. Comparing the educational attainment among the labor force aged 15-30 years¹⁴ and the general population, **it is evident that the proportion of people with less than primary education is much higher in the general population than in the segment aged 15-30, which coincides with the improved access to education mentioned above.** In fact, when analyzing the figures for who completed secondary or tertiary education, the segment aged 15-30 years represents 39.0 percent of the total, well in excess of 20.3 percent of the population with less than a secondary education.

In addition, a very high proportion of secondary graduates in the Dominican Republic transition to higher education: the gross matriculation rate in tertiary education is 60 percent (on par with the UK and Switzerland) – that is, 77 percent for females and 43 percent for males -- and expected years of schooling are approximately 13.5 years for males and approximately 15 years for females.¹⁵ However, there is still a large proportion – 630,000, almost half of the population of youth in the labor force – who have completed only secondary education.

The diagram also shows the role of the associate degree in the education system, with nearly 20,000 students enrolled in 2017. It plays a key role in ensuring that these students receive a specialized education that qualifies them as part of the most-educated portion of the workforce.

At the same time, it is notable in the flows that there is an over-expected retention in university enrollees, with an exit rate much lower than the expected average outflow per year, which shows delays in the graduation of students from this level.

MIGRATION

According to the Second National Immigrant Survey (ENI-2017)¹⁶, the **foreign-origin population residing in the country was 847,979 people, representing 8.3 percent of the national population.** Of these, some 570,933 are immigrants born in other countries, while the rest are descendants of migrants in the national territory, representing some 277,046 people, the equivalent of 2.7 percent of the total population.

By disaggregated data by nationality, **87.2 percent of immigrants were born in Haiti, or 497,825 people.** Of the rest of immigrants (12.8 percent), 4.5 percent were born in Venezuela, 1.8 percent in the United States, and 1.3 percent in Spain, among others. Although data on the Haitian-origin population are notoriously scarce, the report focuses on this group, due to its high representation compared to those originating in other countries. The Haitian immigrant population is mainly male (62.9 percent), aged 20 to 39 (65.3 percent) and located in urban areas (66.2 percent).

¹⁴Different data sources use different definitions of "youth".

¹⁵<http://uis.unesco.org/en/country/do>

¹⁶National Bureau of Statistics (ONE); Second National Immigrant Survey (2017); 2018.

As for the Dominican Republic-born population with a father or mother born in Haitian territory, it amounted to 252,349 people, of whom 51.4 percent are female, and 66.4 percent are in urban areas. In 2017, around 25 percent of Haitian-born Dominican residents, and around 17 percent of those born in the Dominican Republic to Haitian-origin parents, were between the ages of 15-24.¹⁷

As for **labor market conditions**, some **334,092** of those born in Haiti are **10 years or older and currently working**, of whom **187,647 (56.2 percent)** work as an “Employer or Worker of private companies”, while 109,280 (32.7 percent) work as “Unprofessional self-employed.” Similarly, **Haitian-born immigrants are concentrated in the agricultural sector (33.8 percent) and in the construction sector (26.3 percent), while 16.3 percent work in commercial activities.** In addition, Haitian-born immigrants are more likely to be engaged in informal employment (86.4 percent). **In relation to education levels, 27.7 percent of those born in Haiti do not know how to read and write, and only 32.2 percent know the Spanish language very well.**

Haitian-Dominicans face challenges in access to employment and self-employment opportunities due to lack of documentation and discrimination. In 2013, birthright citizenship for those of Haitian-origin was effectively repealed, leaving up to hundreds of thousands of individuals born in the Dominican Republic stateless. Tens of thousands more have been deported, while the undocumented who remain behind live and work in the informal sphere under the specter of deportation. Many Haitians living in the country are also undocumented, unable to obtain proof of Haitian nationality or regularize their residency. As of 2017, around one-third of residents of foreign origin, the vast majority of them of Haitian origin, had no documents at all, and only about a third of those born in the Dominican Republic had documentation that would establish either Dominican residency, Dominican citizenship, or foreign citizenship.¹⁸ Although these Haitian-Dominicans are able to access basic education without documentation, they cannot take the required national exams after 8th grade, nor attend university, vote, enter formal employment, or register formal businesses.

GEOGRAPHIC PRIORITY AREAS

The following table summarizes key information on the geographic areas USAID has prioritized for the Advance Program. It is interesting to note that, for example, despite the relatively low levels of poverty in Santiago and Puerto Plata provinces, only 20-25 percent of inhabitants have more than a secondary education (in comparison to 40 percent in Distrito Nacional), likely due in part to the prevalence of the agricultural and tourism sectors, which have traditionally required lower levels of formal education.

¹⁷bid.

¹⁸bid.

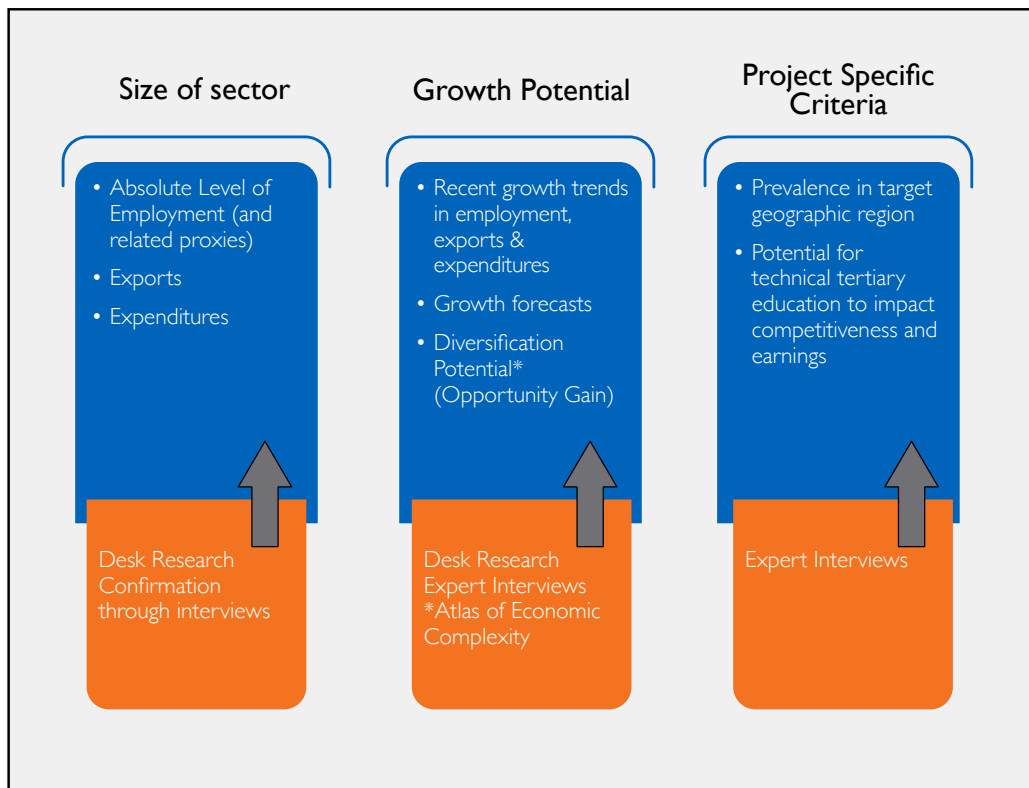
Table 7. Geographic priority areas: Socioeconomic details

	Barahona (province)	Dajabón (province)	National District	Duarte (province)	Puerto Plata (province)	Santiago (province)	Western Santo Domingo (municipality)
Region	Enriquillo	Northwestern Cibao (border with Haiti)	Southeastern	Central Cibao (home to San Francisco de Macorís)	Northern Cibao	Northern Cibao	Southeastern
Population	189,080	66,017	1,029,607	297,452	331,491	1,030,121	363,321
Province population ranking	16	27	3	9	7	2	n/d
Population Density (inhabitants/km²)	113	65.5	11,234	180.3	180.5	367.3	6,728
Gender Ratio (M:F)	107	105	91	103	103	98	94
Province poverty ranking (out of 32; lower number = higher poverty)	7	14	32	22	24	30	154 / 155 (municipality ranking)
% of those 15 and older with secondary education or less	~75%	~80%	~60%	~70%	~80%	~75%	n/a
# of productive units	7,391	5,987	58,396	11,765	18,029	60,479	n/a
Top sectors (% of productive units)	Commerce 39.4%; food services 11.3%; other services 9.4%	Commerce 42.6%; food services 9.5%; gambling activities 9.4%	Commerce 29.2%; food services 9.3%; other services 8.6%	Commerce 35.9%; other services 11.1%; food services 11.1%	Commerce 32.4%; food services 13.2%; other services 10.1%	Commerce 28.6%; food services 11.9%; Other services 9.4%	n/a
Key economic sectors	Sugar cane, bananas, plaster, building materials, larimar	Commercial activity with Haiti, through the binational market; live-stock & wood production.	Government, home to main companies, financial center of the country	Cocoa, rice, milk	Tourism, agro-industry, alcoholic beverage production	Tobacco, coffee, cocoa, milk, free trade zones	Industrial zone

III. SECTOR SELECTION

The sector selection procedure for the Dominican Republic was both a qualitative and quantitative exercise, though published data at the sector level is very limited. As demonstrated in Figure 14 below, the key selection criteria were the sector’s size, growth potential, and the estimated likelihood of the project having an impact on the sector’s employment or competitiveness. The following sections describe in further detail the indicators that went into construction of the Sector Selection Matrix (presented later in Table 9).

Figure 14. Sector Selection Categories and Criteria



Source: FHI 360

In order to inform the “Growth Potential” criteria, FHI 360 conducted two key analyses using secondary data: the Trade Analysis and the Product Space Analysis. Both analyses -- which help the analysts and readers visualize dynamics in the sectors, ascertain their relative sizes, and formulate questions about what is driving their performance -- are described in the following section.

TRADE ANALYSIS

In considering growth potential, both the volume and performance of exports emerged as critical criteria in the sector selection evaluation.¹⁹ It is necessary to assess whether exports have grown only because the market size has grown or if market shares have indeed expanded. Therefore, it is important to combine the value of exports with patterns of market behavior.

One tool to analyze the dynamic behavior of recent trade is the trade share matrix.²⁰ The matrix categorizes exports into two dimensions: (1) on the x-axis, the annual growth rate of the world market during a given period, and (2) on the y-axis, the annual growth rate of the Dominican Republic's exports during that period. The size of each bubble indicates the value of exports in 2018.

- **Quadrant + +:** indicates that both the world market and the country's exports are growing faster than average; this corresponds to the "stars" quadrant.
- **Quadrant + -:** indicates that world markets are growing faster than average, but the country's exports are growing slower than average (or shrinking); this corresponds to the "opportunities".
- **Quadrant - -:** indicates that the world market and the country's exports are growing slower than average (or shrinking); this corresponds to the "challenges" quadrant.
- **Quadrant - +:** indicates that the world market is growing slower than average (or shrinking), but the country's exports are growing faster than average; this corresponds to the "cash cows".

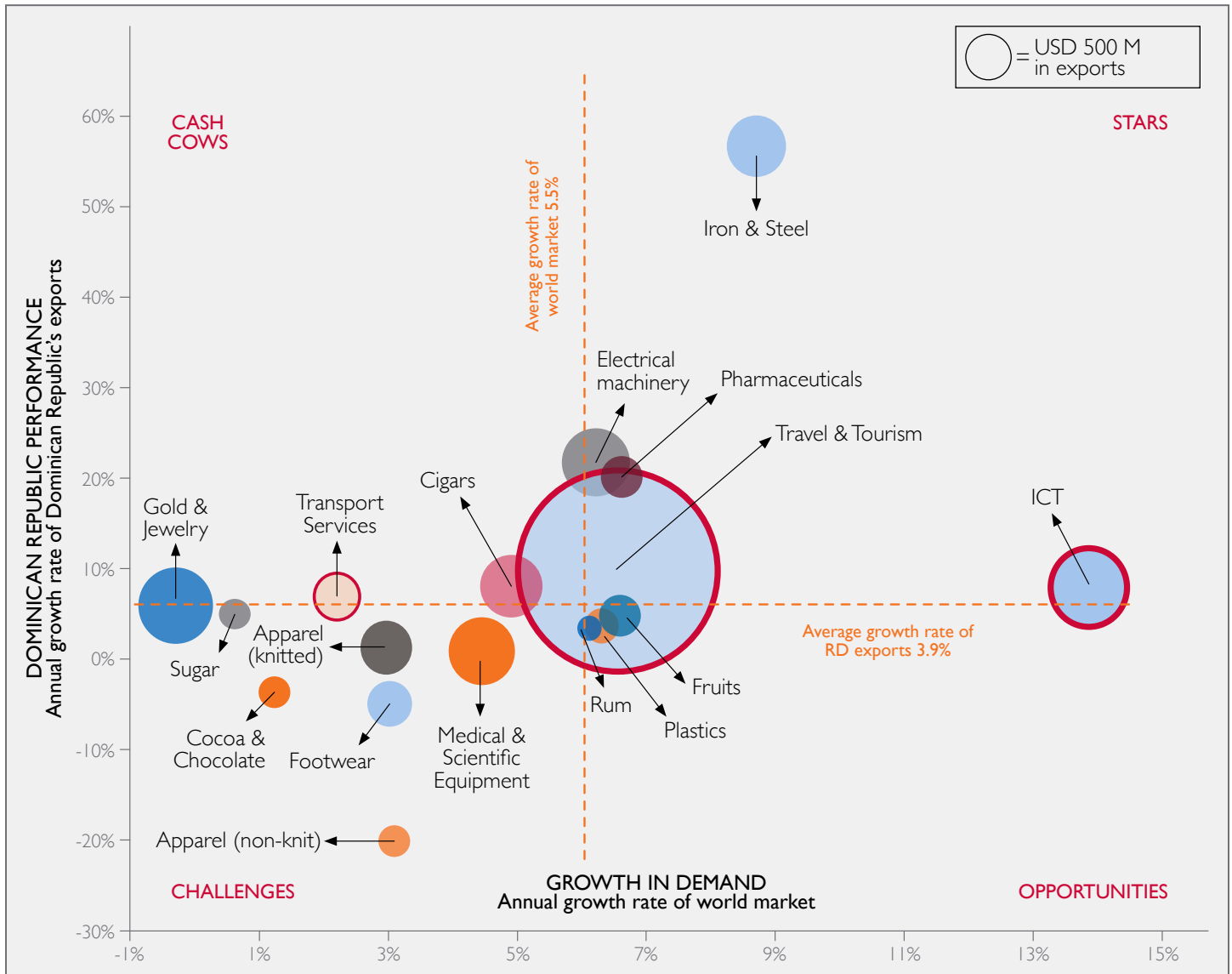
The resulting DR trade share matrix, Figure 15, shows the top 20 exported goods and services²¹, capturing the dynamic behavior of trade in the Dominican Republic relative to the world. The goods and services depicted in Figure 15 are the top 20 among the list of 99 product families among the "2-digit" Harmonized System of Trade (HS) product categories, and the 5 types of traded services currently

¹⁹This data appears in Table 9, the Sector Selection Matrix, as the first two columns under the "Growth Potential" criterion.

²⁰The trade share, or Bethesda, matrix is an adaptation of the venerable Boston matrix originally introduced by the Boston Consulting Group for the analysis of firm-level strategy. For a compact and accessible treatment of the strategic implications of the Boston matrix, see Koch, R., (2009). *The Financial Times Guide to Strategy. How to Create and Deliver a Useful Strategy.* 3rd edition. London. The trade share matrix has a similar strategic dimension but is used here primarily as a predictive device.

²¹Figure 15 shows the top 17 out of 99 products in the Harmonized System (HS) codes at the 2-digit level, and the 3 largest exported services as reported by the EBOPS (Extended Balance of Payments Services) system in UN Comtrade, which is the primary source of data on world trade. The EBOPS accounts has recently become accurate enough to allow the team to juxtapose data on exports of products and services together. Figure 16 shows only individual products (the top 14 exported products out of 1123 4-digit HS codes), since correspondingly detailed data on services is not yet available.

Figure 15. Dominican Republic Trade Share Matrix, 2-DIGIT 2015-2018



Source: FHI 360 calculations based on export data from MIT Observatory of Economic Complexity & UN Comtrade.

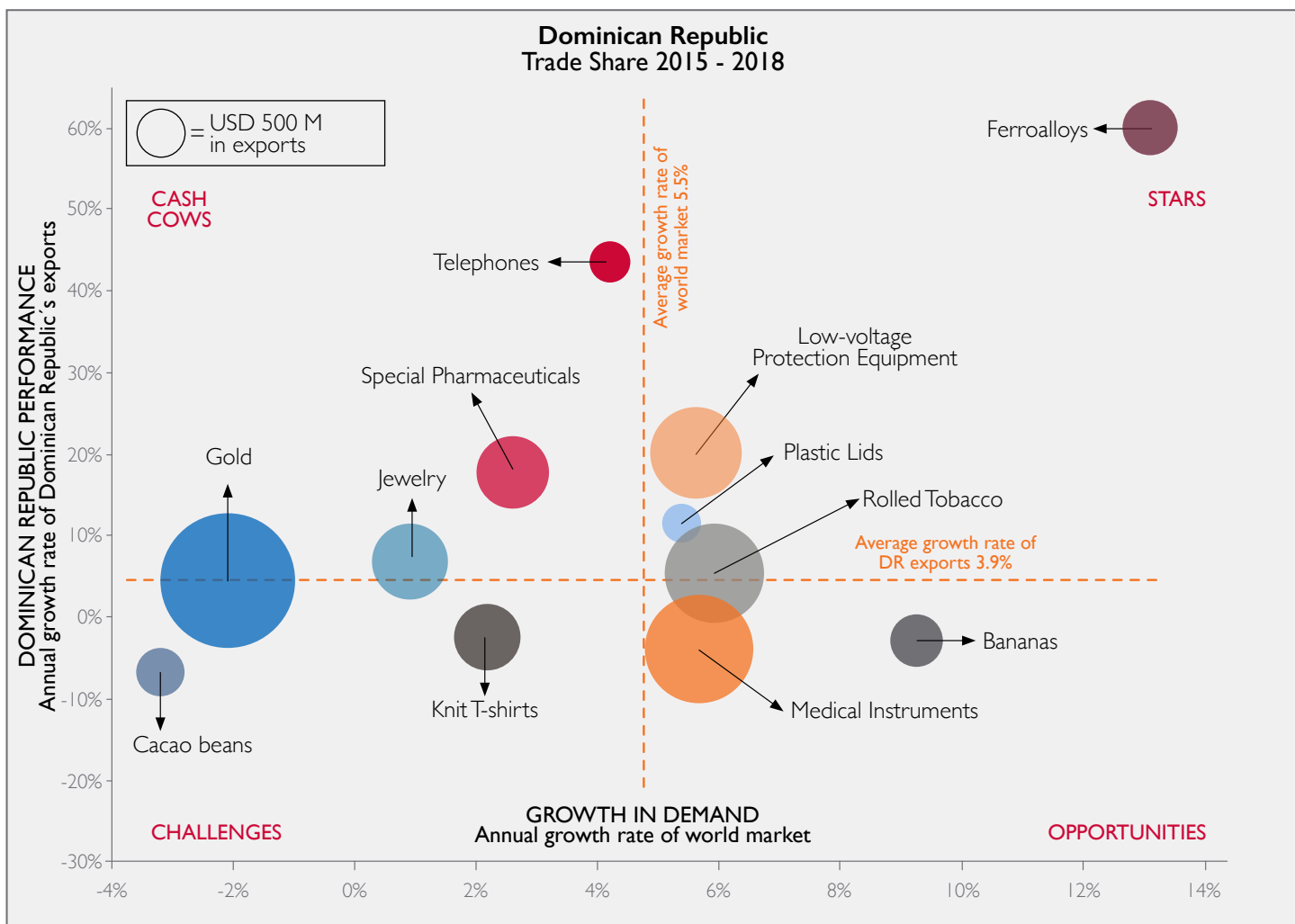
Note: Exports of services are distinguished with a red outline.

In order to provide greater detail on some of those product categories, Figure 16 shows the top exports for the more detailed, disaggregated product categories at the 4-digit HS code level, which means that these are the top 14 products exported from the Dominican Republic from a list of over 1,000 products. Thus, while Figure 15 provides information about broad categories such as fruits, electrical machinery and apparel, Figure 16 drills down to show some of the largest components of those categories, such as bananas, telephones and knit T-shirts.

The annualized growth rates (compounded annual growth rates) cover the period 2015 to 2018 for commodities and 2015 to 2017 for service exports. To provide the “relative” context to optimize the four quadrant titles, an extra frame showing the average growth of the Dominican Republic’s exports (parallel

to the x-axis) and the average growth of the world market (parallel to the y-axis) has been added with red dotted lines. The higher the growth rate of a) the country's exports of that specific category and b) world exports of the same category, the higher the score that specific export category will receive in those respective indicators in the eventual selection matrix. Therefore, exports in the "Stars" quadrant will score the highest between these two indicators; exports in the "Cash Cows" quadrant will score high on domestic export growth while exports in the "Opportunities" quadrant will score high on world export growth, putting exports from these two quadrants into the second-best performing category; and exports in the "Challenges" quadrant score the lowest in both indicators, putting them in last place according to this analysis.

Figure 16. Dominican Republic Trade Share Matrix - 4-DIGIT, 2015-2018



Source: FHI 360 calculations based on export data from MIT Observatory of Economic Complexity & UN Comtrade.

- The Dominican Republic’s “stars” quadrant, where the country’s exports have grown at an above average rate in markets that are also growing above average includes (at the 2-digit level) travel and tourism, ICT, iron & steel products, electrical machinery, and pharmaceuticals. At the 4-digit level, the products that fall into the stars’ quadrant are ferroalloys, low-voltage protection equipment (switches, control panels, etc.), rolled tobacco, and plastic lids. These are the exports that score highest across both indicators.
- The “cash cows” quadrant, indicating where the Dominican Republic’s performance is strong in a relatively weak market, includes (at the 2-digit level) gold and jewelry, cigars, and transport services; and (at the 4-digit level) telephones, gold, jewelry, and special pharmaceuticals. These are exports for which, given existing investment in the sector, the Dominican Republic could benefit from an increase in global demand.
- The “opportunities” quadrant, where the global market is growing faster than average but the Dominican Republic’s export growth rate is below average, includes (at the 2-digit level) fruits, plastics, and rum, and (at the 4-digit level) bananas and medical instruments. These are exports for which, if global trends hold, investment in the sector by the Dominican Republic could pay off.
- Finally, the products found in the “challenges” quadrant, where both the global market and the Dominican Republic’s exports are both growing slower than average, includes (at the 2-digit level) medical and scientific instruments²², knitted and non-knit apparel, footwear, cocoa and related products, and sugar, and (at the 4-digit level) cocoa beans and knit t-shirts.

This analysis does not include all the sectors the team ultimately shortlisted, as detailed information on services beyond broad categories is not included in the trade data.

PRODUCT DIVERSIFICATION AND ECONOMIC COMPLEXITY

Another indicator that can add accuracy to the “Growth Potential” criteria – the Economic Diversity Index column in Table 9, the Sector Selection Matrix - is derived from the Atlas of Economic Complexity. The ability to extract meaningful information from highly aggregated and unreliable data is often quite limited, but trade data tends to be more detailed and of a more uniform quality (since data can be verified from two sources, the exporters and the importers). Researchers at Harvard University have developed pioneering new methods to utilize these data. Their “product space analysis” examines, across all countries, the correlation between increases in exports for specific products and that country’s subsequent growth (note that this analysis does not look at services exports of, e.g., tourism services or logistics, only goods exports.).

²²In Figure 15, which depicts the 2-digit sectors, medical and scientific equipment is in the “Opportunities” quadrant, while in Figure 16’s 4-digit sectors, medical instruments is located in the “Challenges” quadrant. This apparent discrepancy is explained by the fact that the 2-digit HS code “90” covers a wide variety of scientific, measuring, and medical equipment. Until 2010, a single 4-digit category – medical instruments or HS code 9018 – was responsible for over 95% of the Dominican Republic’s exports of HS code 90. Since 2010, the Dominican Republic began to rapidly increase its exports of other scientific and medical equipment, such as chemical analysis instruments and orthopedic appliances.

Accordingly, while the narrow category of medical instruments exports from the Dominican Republic declined at an annual rate of 4% per year from 2015 to 2018, the same products experienced a growth of world demand of 6% per year, which classifies it as a “Opportunity” quadrant in Figure 16. In the broader category of Scientific and Medical Equipment, which includes some of the rapid-growth products, Dominican Republic exports only declined by 2% per year, while the world market grew a bit more slowly, at 4% per year, placing it in the “Challenge” quadrant in Figure 15. This is explained further in Annex A.

Their analysis concludes that income rises faster in countries whose product mix has a higher “economic complexity,” meaning that production is dependent on a denser and more tightly integrated network of overlapping capabilities, ranging from natural resources to infrastructure to human capital such as skills and intellectual property. This economic complexity is correlated with income growth because, overall, the complex products tend to be more difficult to produce, and their scarcity raises their value.

The product space analysis can serve as a guide to optimizing a country’s future export diversification, using a special mapping of the products’ relationships to one another. This network (as opposed to geographic) map depicts products as closer to one another if growth in their exports is correlated.²³ The structure of this map is the same for all countries. Based on conditional probability analysis of trade flows -- the likelihood of a certain event occurring, given that another event has already occurred -- for any given export product in which a country currently specializes, there are other products that share the same resources and labor capabilities (including skills). For example, countries competitive in the export of fresh flowers also tend to be competitive in the export of fresh fish, since both depend on the existence of a world-class cold chain.²⁴ In other words, if an economy is competitive in exporting product X, then it will have higher chances of upgrading to production of other products that are in the neighborhood of product X on the map.

All other things being equal, Advance would want to focus on sectors that are near many other sectors, because the higher density the “neighborhood,” the more likely it is that certain capabilities (mostly labor skills but also others) will be transferable to other sectors, thus helping generate a genuine synergy of industrial development and mutually reinforcing spillovers.

In the product space visualization below, each colored bubble on the chart represents a product that the Dominican Republic exports. Colored (as opposed to gray) bubbles have a Revealed Comparative Advantage (RCA) score of 1 or greater.²⁵ This means that the Dominican Republic is already successfully exporting the selected product. The color of the bubble represents the category of export products (e.g., light green for garments, orange for horticultural products), while the location of the bubbles on the map reflects the degree to which the products are highly linked or sparsely linked in global experience, through the kinds of technology, skill sets, or other factors required to produce them.

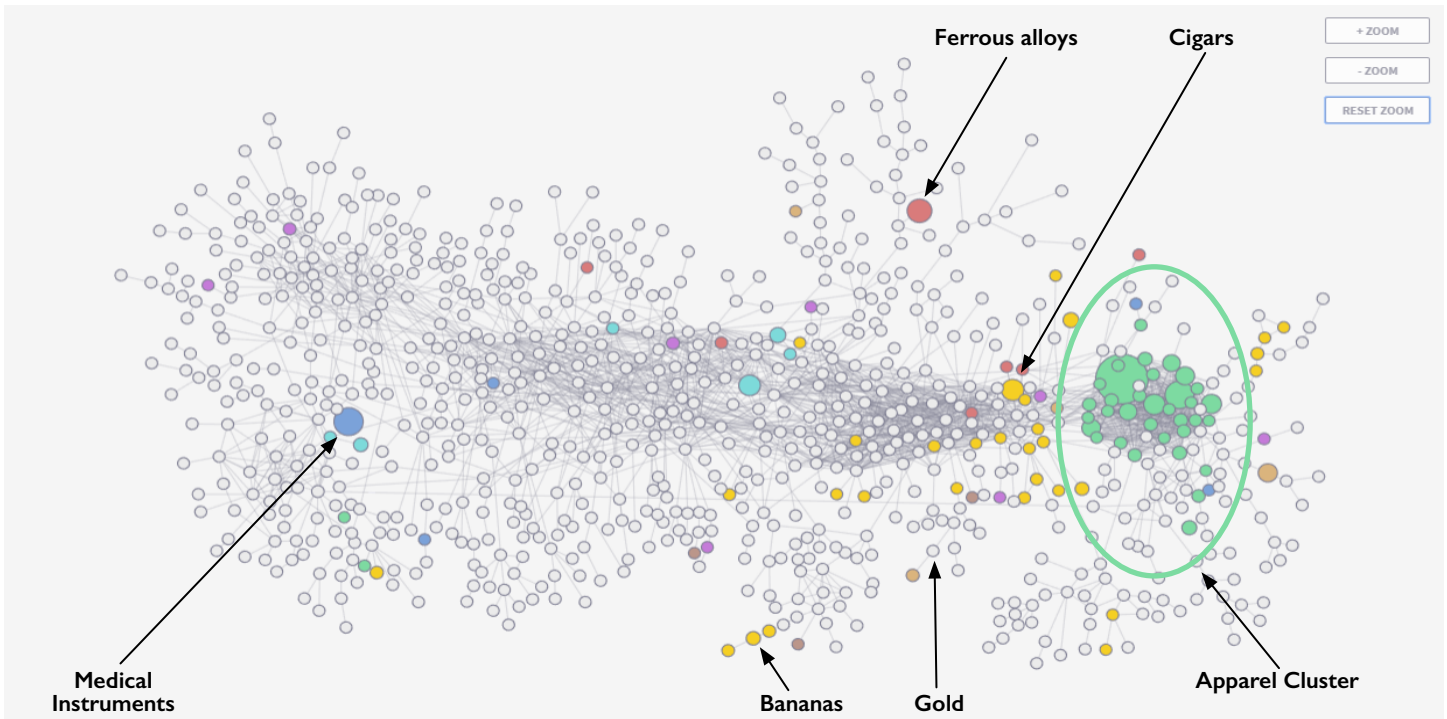
An analysis of the Dominican Republic’s product space from 2000 and 2017 (Figure 17 and Figure 18) reflects moderate evolution and diversification of the industrial structure over time, away from the dominance of the apparel sector and into agricultural products, and strong growth in specific exports such as medical devices, pharmaceutical products, and gold. Several of these products are labeled in the below figures.

²³The Atlas of Economic Complexity. Accessed at <http://atlas.cid.harvard.edu/about/glossary/>

²⁴DAI (2010). The World Bank Sector Competitiveness Analysis Tools (SCAT) Reference Guide, 35-36.

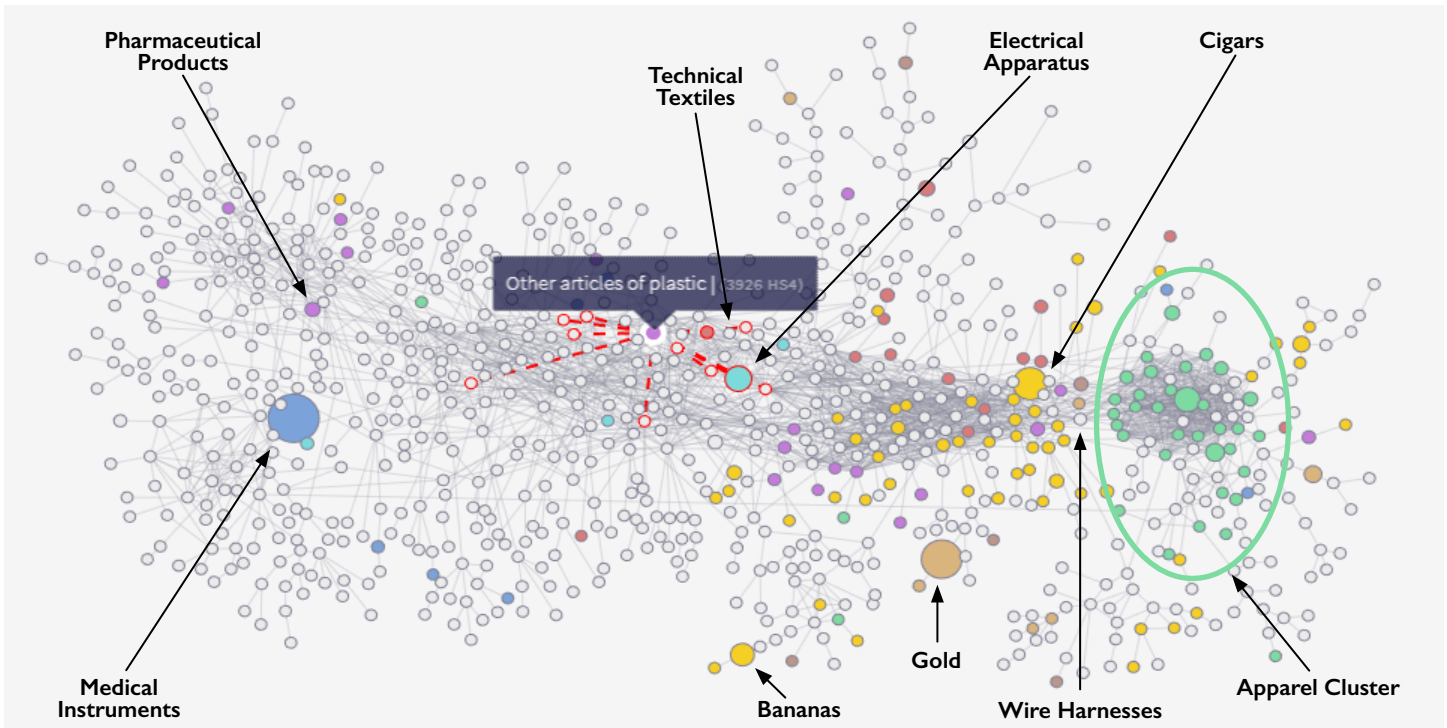
²⁵The Revealed Comparative Advantage (RCA) is an index used to calculate the relative success a country has had in the export of a certain good. An $RCA > 1$ indicates that the country’s share of the world export market in that product is higher than its average world market share (across all products). See <http://atlas.cid.harvard.edu/about/glossary/>.

Figure 17: Product Space for Dominican Republic, 2000



Source: Atlas of Economic Complexity, Harvard

Figure 18. Product Space for Dominican Republic, 2017



Source: Atlas of Economic Complexity, Harvard

If this were a standalone analysis, other things being equal, the product space would suggest Advance look at e.g., pharmaceutical products, electrical apparatus, medical instruments, plastics, and apparel as promising sectors.

Of course, other things are not equal: one would prefer to invest in pharmaceutical products, medical instruments, and technical textiles than in gold or apparel items. Even though they are in a cluster, the team knows from Figure 15 and Figure 16 that the expected growth of global demand for apparel is weak, and that the Dominican Republic's competitiveness in that sector has been diminishing for some time. The Program also needs to consider other factors like employment, influence of tertiary technical education, and the fact that the product space analysis does not look at the services sectors. Therefore, the report captures this factor (and a related concept of economic complexity) in the "Economic Diversification" indicator in the Sector Selection Matrix.

SECTOR SELECTION FOR THE DOMINICAN REPUBLIC

Based on these analyses, the literature review and initial interviews, the following short list of candidate sectors was considered: premium food processing, medical devices, technical textiles, equipment manufacturing, ICT, tourism, creative industries, milk products, plastics, logistics (transport & storage), footwear, and apparel. Some of these sectors did not surface in the previous analyses, for example because the data did not cover services sectors (product space analysis) or only covered broad services categories (trade matrix). Table 8 shows the sources of information used in developing the sector shortlist. In the interest of efficiency and as necessitated by a shorter project time frame in the DR, other sectors were discarded in the early phases of research based on less-promising findings in initial interviews, or because USAID is prohibited from working in them (e.g., tobacco and alcohol products).

Table 8. Shortlisted sectors with sources of information

	Desk Review	Initial Interviews	Trade Share Analysis	Product Space Analysis
Digital Technologies (ICT)	X	X	X	
Tourism	X	X	X	
Premium Food Processing	X	X	X	X
Equipment Manufacturing			X	X
Medical Devices		X	X	X
Logistics (Transport & Storage)	X	X	X	
Orange Economy	X	X		
Plastics	X		X	X
Apparel	X		X	X
Milk products			X	X
Technical Textiles		X	X	X
Footwear	X		X	X

The sector selection matrix organizes the indicators according to the three categories depicted in Figure 14, with three indicators for Size (employment, expenditures²⁶ and level of exports in 2018), four indicators for Future Growth Potential (Dominican export growth 2015 to 18, world export growth 2015 to 18 (which together comprise the trade share matrix), anticipated future growth in exports (a qualitative indicator), and an economic diversity index (based on the Product Space Analysis), and two Project-Specific Indicators (the sector's geographic match with the project, and its potential to be impacted by this project focusing on tertiary technical education). This structure, with scores on a scale of 1 to 5, allows the qualitative indicators (employment, growth potential and potential impact) to be merged directly with the remaining quantitative indicators, to reach one single ranking of the sector's attractiveness for this project based on the stated criteria. This is a particularly useful feature in countries in Central America and the Caribbean, where reliable quantitative indicators at the sector and sub-sector level are seldom available.

The weighting allows for rebalancing of the categories according to differing criteria. For example, a sensitivity analysis shows that increasing the weight assigned to exports from 15 percent to 20 percent and for expected export growth from 10 percent to 15 percent, while reducing the weight assigned to

²⁶As of this writing, the Expenditures data was still being cleaned. The matrix currently does not show values for expenditures.

employment from 15 percent to 5 percent, has an impact on the ranking for technical textiles, raising it from 11th to 9th place, while apparel, currently one of the largest sectors, falls from 9th to 11th. However, the impact on other sectors is much less dramatic, and the top three sectors -- ICT, tourism, and premium food processing -- do not change their ranking at all. Thus, the sector selection matrix appears to be fairly robust, despite its use of qualitative estimates where hard data are not available.

While nearly all the indicators are quantitative, two of the indicators -- the five-year future economic growth potential and the higher education potential impact -- are qualitative indicators based on interviews and comparative experiences in other countries with these sectors. While a precise statistical source for these two indicators is not possible, having at least some way to represent the professional opinions of several Dominican experts as well as the FHI 360 project team allows a more balanced assessment of the sectors. As described above, the sensitivity analysis allows the team to determine how much these qualitative indicators influence the overall rankings.

Table 9. Dominican Republic Sector Selection Matrix

CANDIDATE VALUE CHAINS	CURRENT SIZE	GROWTH POTENTIAL		2015-18 Growth in DR's Exports	2015-18 Growth in Market Size	5-YR Export Growth Potential	Economic Diversity Index	OTHER CRITERIA	Geographic Match with project	Higher Education Potential Impact	TOTAL SCORE	RANK		
		Employment	Exports											
	<i>Weights</i> →	30	15	15	40	10	10	10	10	30	15	15	100	
1	Digital Technologies (ICT)	3.8	4	4	4.2	4	5	4	4	3.8	4	4	79.3	1
2	Tourism	4.7	5	5	3.1	4	4	2	2	4.0	5	3	77.0	2
3	Premium Food Processing	3.3	3	3	3.5	3	4	5	3	3.7	3	4	69.9	3
4	Equipment Manufacturing	3.0	2	4	4.0	5	3	4	4	2.8	2	4	66.6	4
5	Medical Devices	3.3	3	4	3.4	2	2	4	5	3.0	2	4	64.8	5
6	Logistics (Transport & Storage)	3.7	4	3	2.5	3	3	3	2	3.2	4	2	61.3	6
7	Orange Economy*	1.2	1	1	4.2	4	4	5	4	3.1	1	5	59.2	7
8	Plastics	2.3	2	2	2.8	3	3	3	2	3.2	2	4	55.7	8
9	Apparel	3.3	4	3	1.1	1	1	1	1	3.5	4	3	50.1	9
10	Milk products	1.8	2	2	2.2	1	2	2	3	3.3	3	4	48.5	10
11	Technical Textiles	1.2	1	1	2.7	2	2	4	3	2.6	1	4	44.0	11
12	Footwear	2.3	3	2	1.4	2	1	1	1	3.0	3	3	43.5	12

Source: FHI360 estimates.

*The "Orange Economy" (Economía Naranja in Spanish), or the creative economy, is defined as "the set of activities that in an interlocking way allow for ideas to be transformed into cultural goods and services" (IDB, 2013).

The sector selection matrix is not a rulebook that must be followed rigidly. It is a tool to organize information from widely divergent sources and degrees of reliability, and to make explicit assumptions about the importance of various criteria. Thus, it should be regarded as a rough guideline for sector selection. If there is a strong push from some quarters to select a sector that appears at the bottom of the ranking, it is a good time to ask whether the criteria need to be adjusted, whether data need to be updated, or whether the 'push' to select that sector is coming from subjective feelings rather than observable facts. But a rigid requirement that the priorities strictly follow the scores is not recommended – some flexibility is appropriate.

AGGREGATION OF SECTORS

One of the lessons learned from the sector selection analysis performed for the Advance Program in Honduras, Guatemala and Jamaica was that too narrow a definition of sectors can be counterproductive. For example, while this study has found interesting distinctions between the employment and export growth potential of premium cocoa and related products, coffee, avocados and organic bananas, the implications for educational institutions among those four sectors is nearly identical regarding the need for improved curricula and increased graduation rates in areas such as agronomy, quality control, certifications, and marketing. Additionally, examining global historical trends in export diversification, via the product space analysis, can show that the underlying conditions and capacities required to produce one type of good may facilitate production of another (seemingly unrelated) good, such as apparel and automotive wire harnesses. In the Dominican Republic, it is possible some of the capacities required to produce, for example, footwear may support the process of producing medical gowns and masks. Again, quality control and certifications will be relevant across manufacturing subsectors. And within the orange economy, despite the disparate skills required to produce, for example, a song versus a movie, capacities in design, management, digital production, marketing, and events management support the entire sector.

Accordingly, rather than identifying overly narrow sectors with limited applications in some geographic locations in the Dominican Republic, the approach taken here has been to group some of the most promising sectors into groups that span several geographies. Table 10 below summarizes the three main functional groups of sectors identified for the DR. In general, the traditional sectors have lower value-added but higher employment, while the high value-added sectors generate much higher incomes and export revenues per employee, but currently employ fewer workers. The table includes the majority of the sectors under consideration, excluding plastics, as it is not easily grouped with the other sectors, and equipment manufacturing, as there is minimal employment in that industry in the target geography.

Table 10. Candidate sectors aggregated into three functional groups

Group Designation	Traditional or Commodity Sector	High Value-Added Sector
Food Processing	Milk Conventional bananas	Milk products Organic bananas Avocados Cocoa & chocolate Specialty coffee
Light Manufacturing	Apparel Footwear	Technical textiles Medical devices
Orange Economy	Traditional Tourism ICT	Experiential tourism Cultural heritage (music, dance) Filmmaking Digital/ICT support for above Managerial support for above

Most of the employment in the high value-added segments of these sector groupings is concentrated in Santo Domingo and a few other larger cities. Improved availability of labor in key occupations can release bottlenecks holding back the growth of employment and exports in those sectors. In some of the less developed regions of the country, such as along the western border, there is currently relatively little employment in the high value-added segments. However, with improved availability of well-trained staff in some of the basic functions, those sectors can experience growth and eventually attract some operations which are currently only being undertaken in the larger urban areas.

IV. PRIORITY SECTORS AND VALUE CHAINS

Following on the sector selection, the Advance team developed one generalized value chain structure per aggregate sector (three value chains total) and has validated these with informants across each of the broader sectors. Each value chain includes information for both the traditional and more-sophisticated ends of the spectrum and shows common illustrative employment entry points as well as examples of specific employment entry points. The team has also gathered primary information from firms and from secondary resources on employment and entrepreneurship opportunities in each of the value chains and developed diagrams which show existing and potential educational offerings for each opportunity.

As emergency measures during the COVID-19 outbreak have led to the temporary closure of many of the entities from which Advance had hoped to gather data, the team contacted potential informants via email to request interviews and has followed up via phone when possible. As necessitated by best practice in social distancing, Advance conducted interviews via platforms such as Google Meet, Zoom and Skype (depending on the interviewees' preferences), which allowed the team to show informants the base value chains and adjust and modify them in real time, as well as record the interviews. Multiple team members conducted each interview, to allow for questioning, presentation/adjustment of the value chain, and note-taking. The team supplemented data gathered in interviews with recent studies on training needs and labor demand in the selected sectors.

The team found some of the sector clusters organized under the auspices of the National Competitiveness Council and the Dominican Association of Free Trade Zones to be helpful entities for gaining an understanding of employer needs and facilitating conversations with firm representatives. Many of these clusters – such as those in medical devices and logistics – are undertaking their own research into labor market needs and alignment with existing technical educational offerings, and/or are collaborating with the efforts of the EU- and AECID-funded National Qualifications Framework project.

Ultimately, although the sector selection research was carried out prior to the spread of the pandemic, Advance considers the three aggregate sectors to have continued relevance during the current situation and during the aftermath and recovery; none of them will disappear entirely, and several sub-sectors may grow more strongly than they would have otherwise.

The anticipated economic and skills demand impact on the selected sectors are detailed below. Overall, the biggest likely changes in these sectors, which would have implications for the mix of skills demanded by employers, are a speeding-up of automation in the food and manufacturing sectors that can support best practice in physical distancing; and at least a short-term shift in focus within the orange economy away from tourism and in-person experiences, and towards remote production and digital content and platforms. Of course, these changes, and a prolonged pandemic, may also have implications for the volume of opportunities available to young people in these sectors. Additionally, opportunities in transversal services such as transport and logistics may change their locus as demand expands or contracts in different sectors and supply chains adapt. Continued engagement with employers and the private sector throughout the course of the Program will inform the ability to respond to real-time skills demands.

²⁷<http://proetp2.edu.do/proetp2-objetivos/r1/>

Value Chain Framework

After sector selection, the team used value chain mapping to arrive at the demand for skills by employers. This tool helps implementers and policymakers understand industry structure and dynamics by identifying the type of firms and diagramming their roles and relationships.²⁸ A value chain map shows how a particular product flows through different market channels at the country level and helps to identify constraints and opportunities for improving the performance of each channel.²⁹ Adapted from agricultural economics to broader uses in development, value chain mapping is often the first step for economic growth programs wishing to increase the incomes of a particular group of firms or individuals (for example, smallholder farmers or contract workers). A workforce overlay to a value chain map helps identify where training and skills development are needed and how they can be delivered, such as through general education, technical education, vocational training, or on-the-job learning. It can also help identify career pathways for youth within a sector.

Value chain maps also help the user understand industry structure and firm-to-firm relationships. For example, some channels may be vertically integrated (where all functions are performed by one firm), whereas others may be partially integrated, and others completely fragmented (where many microenterprises are selling products directly in an open market). Industry structure is directly related to value chain governance—whether power is concentrated in the hands of one firm or many firms, and whether chains are buyer- or supplier-driven. Consequently, understanding industry structure is critical when identifying potential employer partners to work with on skill building. For example, a lead firm buying products from hundreds of supplier firms will effectively set quality standards in the market, and these quality standards will have implicit skills requirements throughout the value chain. A lead firm is likely to be interested in bringing the quality (and therefore the skills) of suppliers up to standard and may be willing to co-invest in skill-building initiatives. Such a partnership provides what value chain practitioners call “leverage”—a point of entry that allows an intervention to impact large numbers of firms and/or workers.

On the other hand, where lead buyers are located overseas (as with the garment industry), this relationship changes; the lead buyer may not be interested in investing in quality and skills improvements in its suppliers as it may be more cost-effective to source from countries where quality is already high. In these situations, industry may work with the government and educational system to develop their own training programs to improve the quality of suppliers—but the investments and quality improvements may not trickle down to the SME level.

In the value chain figure, the colored arrows are used to signify examples of employment opportunities. These entry points have particular skills needs that are identified according to the arrow's patterns and color, indicating the education or training requirements for the position (in this assessment, the team has only included positions typically requiring a two- to three- year university technical degree). Other information, such as which roles are typically filled by women or youth, may also be indicated.

²⁸Steen, C., Magnani, R., & Goldmark, L. (2005). Competitive strategies for agriculture-related MSEs: From seeds to supermarket shelves. United States Agency for International Development. Accessed online at <http://www.value-chains.org/dyn/bds/docs/507/USAID%20AMAP%20Competitive%20Strategies%20for%20Ag%20MSEs%202005.pdf>

²⁹Ibid. 10.

Note that a particular entry point may be relevant for various stages, channels, or actors within a value chain, even if not depicted multiple times in the graphic. Furthermore, the example employment opportunities are not exhaustive.

As part of the study, in addition to the value chain maps, parallel diagrams are presented in Figure 20, Figure 22, and Figure 25. These parallel diagrams link technical positions in the value chain with educational programs (existing and non-existent) in the Dominican Republic. They identify current and suggested educational programs and technical positions according to the level of education required: a) at the post-secondary, non-tertiary (ISCED 4) education cycle -- called “maestro tecnico” in the DR, b) at the short-cycle tertiary technical level or associate degree level (ISCED 5) -- “tecnico superior” in the DR, and c) at the bachelor’s degree level (ISCED 6) - resulting in a bachelor’s (“licenciatura”) or engineering (“ingnieria”) degree. Below this description of educational offerings associated with the technical needs by stage in the value chain, the diagram shows a) occupations identified by sector actors and b) those occupations defined by the International Labor Organization’s (ILO) International Standard Classification of Occupations (ISCO-08).

The ILO’s ISCO-08 is important to understand in the case of the Dominican Republic, as the diagram shows not only existing occupations in the sectors, but also those occupations that have the potential to contribute to productivity and competitiveness in identified sectors according to international standards. Understanding the function of positions as they relate to knowledge, skills, and attitudes taught at the post-secondary non-tertiary, tertiary-technical, and university levels aids in analyzing the continuity of education for young people. However, it is important to note that continuity is not mandatory for young people to advance academically and professionally. Moreover, degree programs, although they follow linear production processes, do not mean that young people are forced in a defined direction or path in their long-term professional roles.

BUILDING A VALUE CHAIN MAP

In order to develop the value chain maps, FHI 360 interviewed representatives of businesses about key interacting elements: core processes, direct and indirect actors, labor needs, links between actors in the value chain, and environmental influences. The team also reviewed existing industry and country-specific value chain maps.

Core Processes

Through secondary information, core processes were identified as stages through which a product must pass—from the idea to its consumption in the market.

Direct Actors

Principal direct actors are those that are involved with production processes such as inbound logistics, production, processing, outbound logistics, marketing and sales, and service. The main direct actors who are embedded in the production processes were identified. Direct actors are those who take direct

³⁰Lundy, Mark. A. “LINK Methodology: Participative Guide for Inclusive Business Models for Small Farmers.” Version 2.0. 2014. Accessed November 2020. <https://cgspace.cgiar.org/handle/10568/49607>

possession of the product and “own it” in connection with other actors in the chain.³⁰

Indirect Actors

Principal indirect actors were identified as those who provide operational services and/or support services in the chain to direct actors on different levels. These actors do not assume a direct role in the product, and while they can have a link with the product or service at a certain moment of production, they are not connected throughout the process. These include input suppliers, operational service providers, service providers, and regulatory support organizations.

Environmental Influences

Environmental influences identified include external economic, political, environmental, and cultural forces that affect the chains, even though they cannot be controlled by direct or indirect actors in the value chain. Some examples are the creation of new health laws, the price of products such as coffee, and the availability of environmental resources, among others. This issue of the power and influence of external forces was addressed throughout the field interviews.

COLLECTING THE INFORMATION

Secondary Information

This information includes a collection of statistics, studies, documents, desk analysis, and evaluation, and selection of different sectors, which provides knowledge of products, services, and links that make up each value chain. This is part of the technical economic and social context evaluation that provides a comprehensive analysis in order to identify the potential of a product or sector.

Primary Information

This step allows the technical team to obtain in-depth information to understand the operations and concerns of a group or actor in the chain. Primary information collection was conducted via interviews with actors in the selected sectors. An interview guide³¹ was developed to obtain data regarding value chain information, business networks, company information, staff recruitment, general and specific skills, and the current and future needs of the sector itself. The selection of actors interviewed was conducted based on the sector focus of the Program. Below, the report details each of the selected sectors, beginning with an overview, then discussing key workforce positions and skills needs, as well as education and training offerings.³²

Below, the report details each of the selected sectors, beginning with an overview, then discussing key

³¹See Annex D, Interview Forms.

³²A team in the Dominican Republic and the US conducted a mix of in-person and virtual interviews with 17 different entities in Greater Santo Domingo, Barahona, and Puerto Plata. See Annex B for full list.

PREMIUM FOOD PROCESSING

Agribusiness, comprising agriculture and food processing, is one of the largest employers in the Dominican Republic. The number of agricultural establishments grew 17.7 percent between 2010 and 2016, while the number of food, beverage, and tobacco processing establishments grew 8.9 percent.³³ Though a detailed breakdown by subsector is not readily available, data show that as of 2017, agriculture alone employed 10 percent of occupied workers, or around 443,000 people. Additionally, especially in the targeted rural geographic regions for this study, Advance estimates that agriculture plus food processing is 20 percent or more of the local employment.

Four specific premium products have been mentioned repeatedly in interviews: organic banana, avocado, cocoa and related products, and coffee. Banana exports reached \$200 million in 2017, with over 60 percent of the bananas being certified organic, which command a premium price and result in higher incomes for farmers. Similarly, avocado exports have tripled since 2015, reaching \$48 million in 2017. Growing and post-harvest handling for such high value perishable products has such exacting technical requirements and packaging that, while not 'processed' into other types of food products, is considered part of the premium food processing segment.

Dominican cocoa and coffee are both considered some of the highest quality in the world. Efforts to expand production of cocoa and especially value-added products have been increasing recently, and observers also believe that increased investments in coffee could lead to re-growth of a high-value segment for the Dominican Republic.

Most of the skill requirements for each of these four products (and other similar products with high growth and high income potential) are similar, and for this reason, they have been grouped together as a type of agricultural product where improved skills at the associate degree level level can make a significant difference in the competitiveness of the segment, leading to faster employment growth overall. This grouping of sectors ranked 3rd overall on the Sector Selection matrix, mainly due to its strong projected growth and high potential impact of project activities on employment growth.

Premium food processing is perhaps the most unpredictable sector of the three during and following the coronavirus pandemic and ensuing global economic crisis: consumers have changed where they consume food, and stockpiling has led to shortages of basic goods in some places, but to what extent consumers may change their consumption habits in the longer term depends on how long shutdowns last and the impacts on income. Even with the disruptions of COVID-19 which began in mid-March 2020, the agricultural sector experienced 5 percent growth in the first quarter of 2020.³⁴

³³Amargos, Oscar. "Estudio de Detección de Necesidades de Capacitación y Demanda Laboral." 2019. Vicepresidencia de la Republica Dominicana. Proyecto Integrado de Promoción y Protección Social.

³⁴United States Department of Agriculture, Foreign Agriculture Service (USDA FAS) and Global Agricultural Information Network (GAIN). "COVID-19 Impact on the Dominican Republic Agricultural Sector-May 2020." Report DR2020-0010. May 28, 2020. Accessed online at <https://www.fas.usda.gov/data/dominican-republic-covid-19-impact-dominican-republic-agricultural-sector-may-2020>

Analysis of trade during and after the 2008 to 2009 financial crisis showed that while there were sharp drops in world exports for two years in (e.g.) coffee, cocoa products, and fruit, demand came back strongly within several years and prior to the current outbreak was higher than the pre-2008 numbers, with particular growth in the higher value-added segments (e.g. chocolate and avocados).

As of the end of May 2020, according to a USDA report, “[d]airy, poultry, and fruits and vegetables have been the most affected by lost markets, notably in the tourism sector, with reduced sales and lack of access to sales channels.” While the disappearance of tourism has hit the dairy and poultry sectors hard, “[t]ravel bans on flights to Europe have limited the “belly” air cargo regularly available for avocado, pineapple and vegetable exports. Exporters have access to some flights that are transshipping products through Colombia, but the cost is prohibitive. Shipping cargo is also limited. Producers of oriental and greenhouse vegetables are claiming that their products are “basically rotting on their farms.”³⁵ To alleviate the difficulties in the agricultural sector due to the coronavirus crisis, the government has put in place programs to support businesses and consumers.

In addition, prices of food products have increased 8-12 percent domestically.³⁶ During the coronavirus pandemic, some grocery sales have shifted online, but capacity is low. “[D]espite the prominence and growth of local supermarket chains, they only account for 20-25 percent of total retail sales. Most sales are still in the traditional channel, which includes neighborhood stores (colmados) and warehouses, which offer largely local products.”³⁷

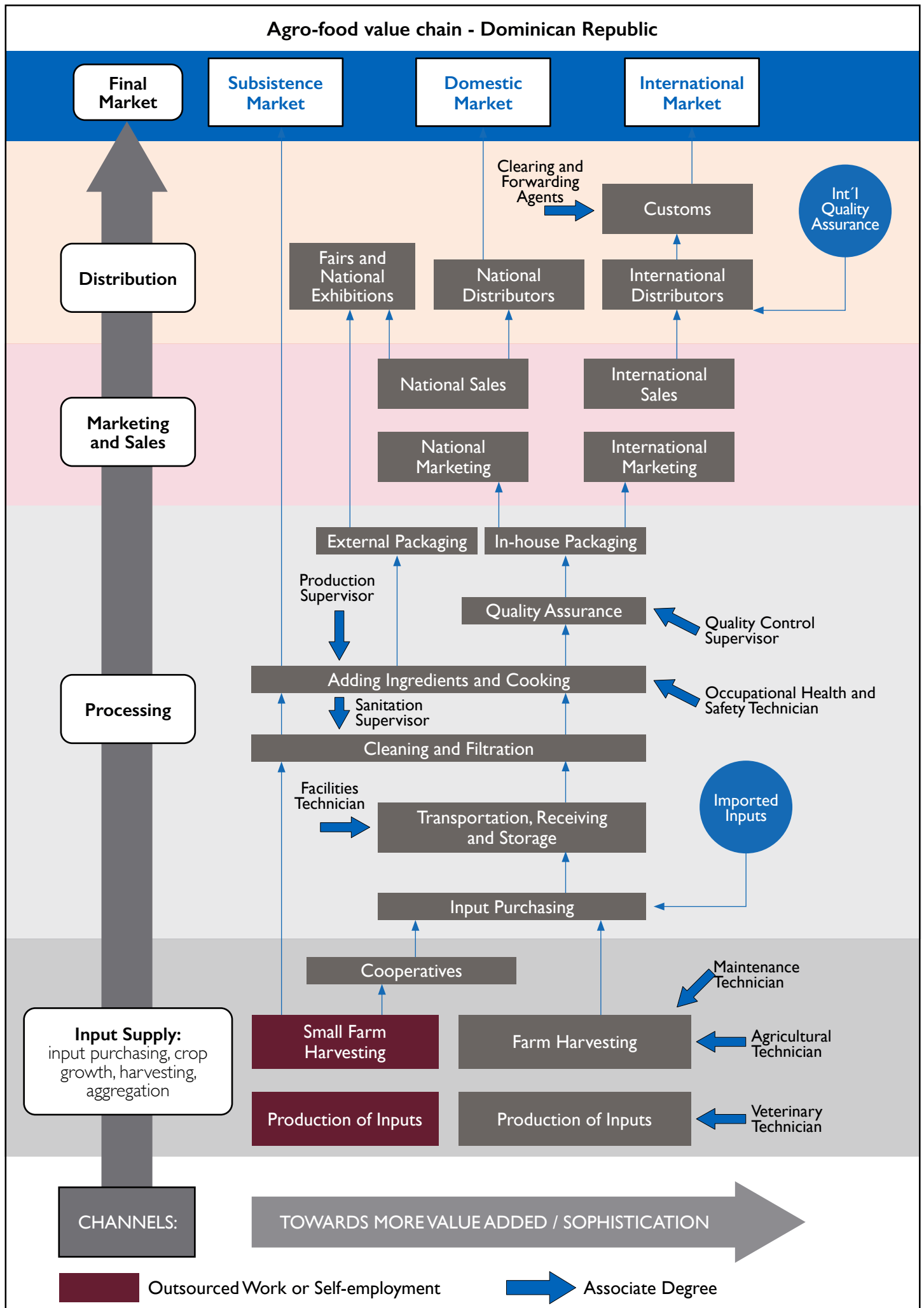
³⁵USDA FAS and GAIN. “COVID-19 Impact on the Dominican Republic Agricultural Sector-May 2020.”

³⁶ibid.

³⁶USDA FAS and GAIN. “Update on the Dominican Republic Retail Sector.” Report DR2020-0012. June 29, 2020. Accessed online at https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Retail%20Foods_Santo%20Domingo_Dominican%20Republic_06-30-2020

Value chain, potential employment opportunities and skills needs

Figure 19. Premium agriculture and food processing value chain with employment entry points, Dominican Republic



According to the 2019 survey, around 11 percent of employers in the DR's agriculture sector require post-secondary education. Some of the anticipated in-demand occupations in agriculture requiring post-secondary technical education are expected to be **veterinary technicians and agricultural technicians**. **Clearing and forwarding agents** are also expected to be in demand, a position relevant to any value chain linked to import or export markets. Of the priority geographic areas examined in the survey, employers of agricultural workers in Distrito Nacional indicated the highest level of demand.

Approximately 86 percent of employers of agricultural workers required specific technical training of their workers. Unsurprisingly, there were lower levels of requirement of foreign language and office software skills (31 percent and 39 percent respectively) than in other sectors. However, hands-on knowledge is more important: 53 percent required practical skills in using job-related machines and equipment.

For food and beverage processing workers, around 12 percent of employers surveyed require post-secondary education, and the anticipated in-demand occupations requiring this educational level include **supervisors**. The unmet demand for workers in the sector was most marked among employers in Santiago, with Santo Domingo employers also registering some difficulty in finding workers. Furthermore, 79 percent of employers of food and beverage processing workers required specific technical training for workers, with 57 percent requiring a foreign language skill, 62 percent office software skills, and 41 percent practical skills in using job-related machines and equipment.

For both agricultural and food and beverage processing workers, the difficulties that employers reported in finding these workers was not related to a general lack of trained jobseekers, but rather that the available workers did not have the required skills or competencies, pointing to a need to calibrate existing educational offerings. A 2020 study, funded by the IDB and the National Competitiveness Council, identified the general and specific competencies of agribusiness professionals that companies considered a) high priority; b) most lacking; and c) strongest. The general competencies cited as most lacking by agribusiness companies included managerial knowledge in agribusiness (42 percent of respondents); leadership (25 percent); and organization and planning (24 percent). Specific competencies which companies considered lacking included those related to designing or directing implementation of quality management, monitoring, and health and safety systems (25 percent); increasing competitiveness (24 percent); and sustainability (19 percent).³⁸

As mechanization of agriculture advances globally and in the country, the total number of jobs in the sector may decrease, but the skill levels of those hired will likely need to increase. A 2016 survey of agricultural employers in Barahona province indicated that the majority (91 percent) of businesses had not mechanized their production process – but only one out of five due to limitations by type of terrain or because they were producing an artisanal product. The majority of firms considered mechanization of some processes possible but were not investing in it because of lack of resources.³⁹

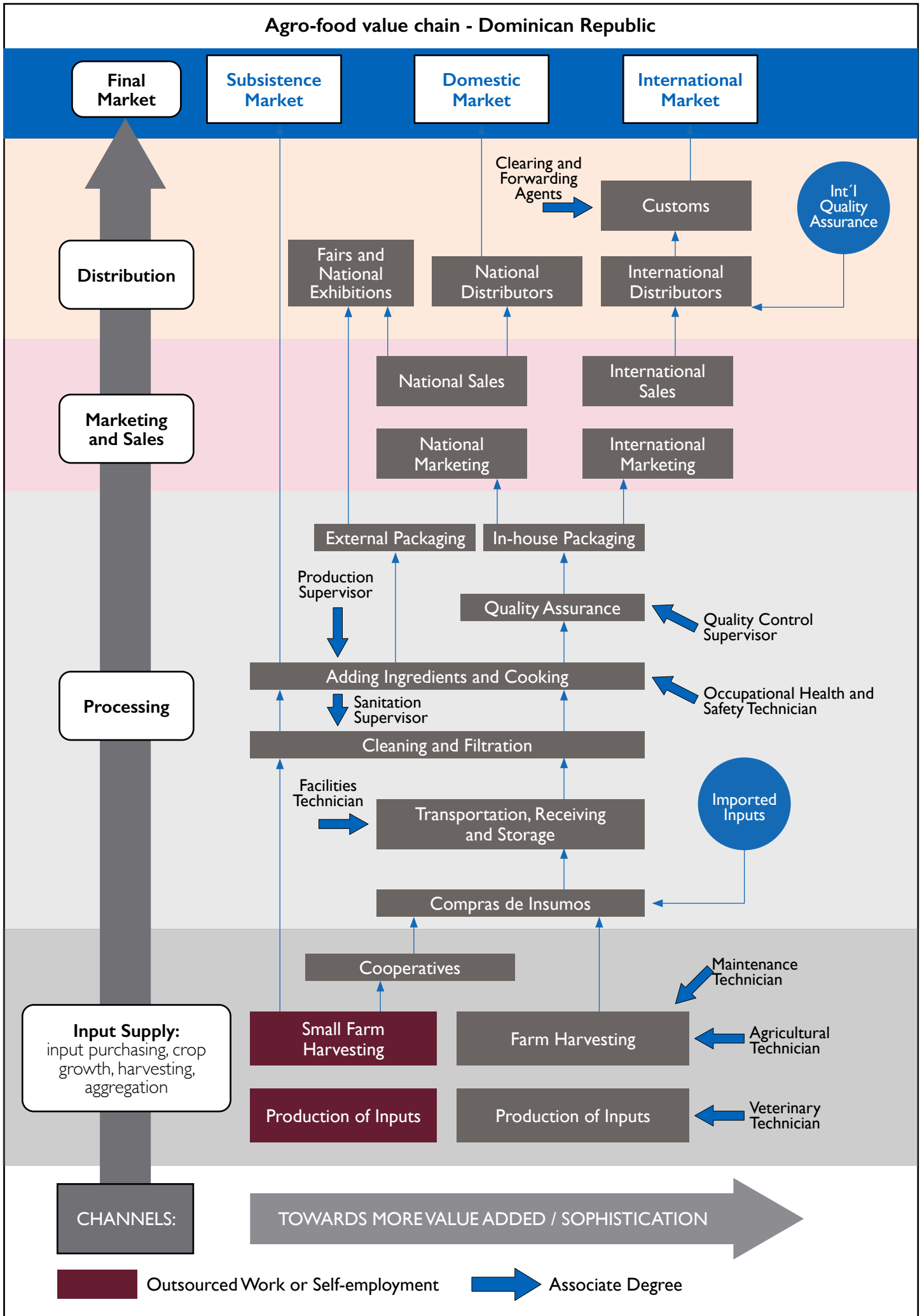
³⁸Malagón, J. et al. (2020). Propuesta Adecuación Oferta Formativa Técnico Profesional en el Sector Agroindustrial. Informe Final. Presentation of results accessed online at <https://competitividad.gob.do/phocadownload/PRESENTACION%20ESTUDIO%20BID-CNC.PDF>

³⁹Reyes Martínez, C. (2016). "Informe Económico: Provincia de Barahona." Clúster Turístico y Productivo de la Provincia de Barahona. November 14.

Relevant technical tertiary offerings

Although the Program's region of focus is served by educational institutions offering technical tertiary programs in a number of agribusiness and food-processing related areas, there appears to be an absence of such programs in agronomy, animal production, veterinary science, and dairy production in the relevant regions of focus (the capital, the Corredor Duarte and the border zone) – programs which are offered in the country, but not in the regional area of focus, are highlighted in yellow in the below "parallel diagram". Furthermore, the country appears to have no appears to have no associate degree (ISCED Level 5) programs at all in ecology, environmental science, fishing/aquaculture, occupational health and safety, or agritourism, or any university programs in fishing/aquaculture, biochemistry, agritourism, occupational health and safety, or agricultural enterprise or food systems management (highlighted in black below).

Figure 20. Premium agriculture and food processing value chain with parallel diagram



ICSED 4 (Post-secondary, non-tertiary - “maestro técnico” level in INFOTEP)	ICSED 5 (Short-cycle technical education - “técnico superior” and “tecnológico”)	ICSED 6 (First cycle of higher education, bachelor’s degree or equivalent)
	<ul style="list-style-type: none"> • Associate Degree in Logistics • Associate Degree in Informatics • Associate Degree in Hospitality and Tourism • Associate Degree in Agritourism 	<ul style="list-style-type: none"> • Telematics Engineering • Logistics and Transportation Engineering • Hospitality and Tourism • Agritourism
	<ul style="list-style-type: none"> • Associate Degree in Marketing • Associate Degree in Accounting 	<ul style="list-style-type: none"> • Marketing • Accounting • International Trade • Informatics
	<ul style="list-style-type: none"> • Associate Degree in Human Resources • Associate Degree in Food Technology • Associate Degree in Business Administration • Associate Degree in Management • Associate Degree in Systems Engineering • Associate Degree in Dairy Industries • Associate Degree in Occupational Health and Safety 	<ul style="list-style-type: none"> • Business Management and Entrepreneurship • Human Resources • Food Technology • Business Administration • Management • Biotechnology • Dairy Industries • Biochemistry • Agribusiness Administration • Operations • Occupational Health and Safety
<ul style="list-style-type: none"> • Artisan Operator in Controlled Environment • Producer in Greenhouses 	<ul style="list-style-type: none"> • Associate Degree in Surveying • Associate Degree in Finance • Associate Degree in Agronomy (Technician) • Associate Degree in Agronomy (Technologist) • Associate Degree in Animal Production • Associate Degree in Veterinary Science and Zootechnics • Associate Degree in Fishery Science • Associate Degree in Ecology and Environmental Management 	<ul style="list-style-type: none"> • Agronomy • Biology • Ecology and Environmental Management • Finance • Microbiology • Animal Production • Chemistry • Veterinary Science and Zootechnics • Agroforestry Engineering • Agronomic Engineering • Surveying Engineering • Engineering in Zootechnics • Fishery Science; Agricultural Production and Food Systems Management

Occupations Defined by Sector Actors (DR):

1. Maintenance and facilities technicians
2. Supervisors
3. Agricultural technicians
4. Veterinary technicians
5. Clearing and forwarding agents

Occupations Standardized by Sector (ILO):

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Managing directors & chief executives 2. Business services & Admin. managers 3. Sales, marketing & development managers 4. Production managers in agriculture, forestry & fisheries 5. Finance professionals 6. Administration professionals 7. Sales, marketing & public relations professionals 8. Sales & purchasing agents & brokers 9. Business services agents 10. Administrative & specialized secretaries 11. Artistic, cultural & culinary associate professionals 12. Environmental & occupational health & hygiene professionals 13. Secretaries (general) | <ol style="list-style-type: none"> 14. Cooks 15. Waiters & bartenders 16. Market gardeners & crop growers 17. Animal producers 18. Mixed crop & animal producers 19. Subsistence crop farmers 20. Subsistence livestock farmers 21. Subsistence crop & livestock farmers 22. Machinery mechanics & repairers 23. Food processing & related trades workers 24. Food & related products machine operators 25. Heavy truck & bus drivers 26. Agricultural, forestry & fishery laborers 27. Transport & storage laborers 28. Food preparation assistants |
|--|---|

LIGHT MANUFACTURING

Light manufacturing is usually less capital-intensive than heavy industry and is more consumer-oriented, using partially processed inputs to produce items of relatively high value per unit weight. Five manufacturing sectors were included among the candidate sectors, four of which could be classified as light manufacturing: apparel, footwear, medical instruments, and technical textiles.

Apparel and footwear employ some of the greatest numbers of workers in the manufacturing sector. Both are based primarily on very traditional business models, and have seen declines in exports in recent years, with very little prospect for increased competitiveness or income growth in the near future. Nevertheless, in some of the poorest target regions, especially adjacent to the Haitian border, they do represent an important source of jobs. Improved availability of skilled personnel in some key occupations could contribute to the sustainability of that overall employment (even if it is only a reduction in the rate of decrease of jobs).

On the other hand, as has been seen in Costa Rica and Nicaragua, the availability of trained workers from the apparel industry, especially technicians, supervisors, and quality control, has helped accelerate the rapid expansion of the medical instrument sector, and it is likely to play a similar role in the Dominican Republic.

The medical device sector is a very promising industry for the Dominican Republic, with employment over 20,000 and exports hovering around \$900 million. U.S. manufacturers have been very pleased with the productivity of their facilities and appear poised for a new round of investments. Again, according to the pattern of investments in several other countries, it is possible that the sector could be a catalyst to generate more jobs in provinces with high unemployment and high vulnerability, especially in the Haitian border area, provided that the Law 28-01 declaring a Special Border Development Zone is renewed.⁴⁰ See Annex A for more details.

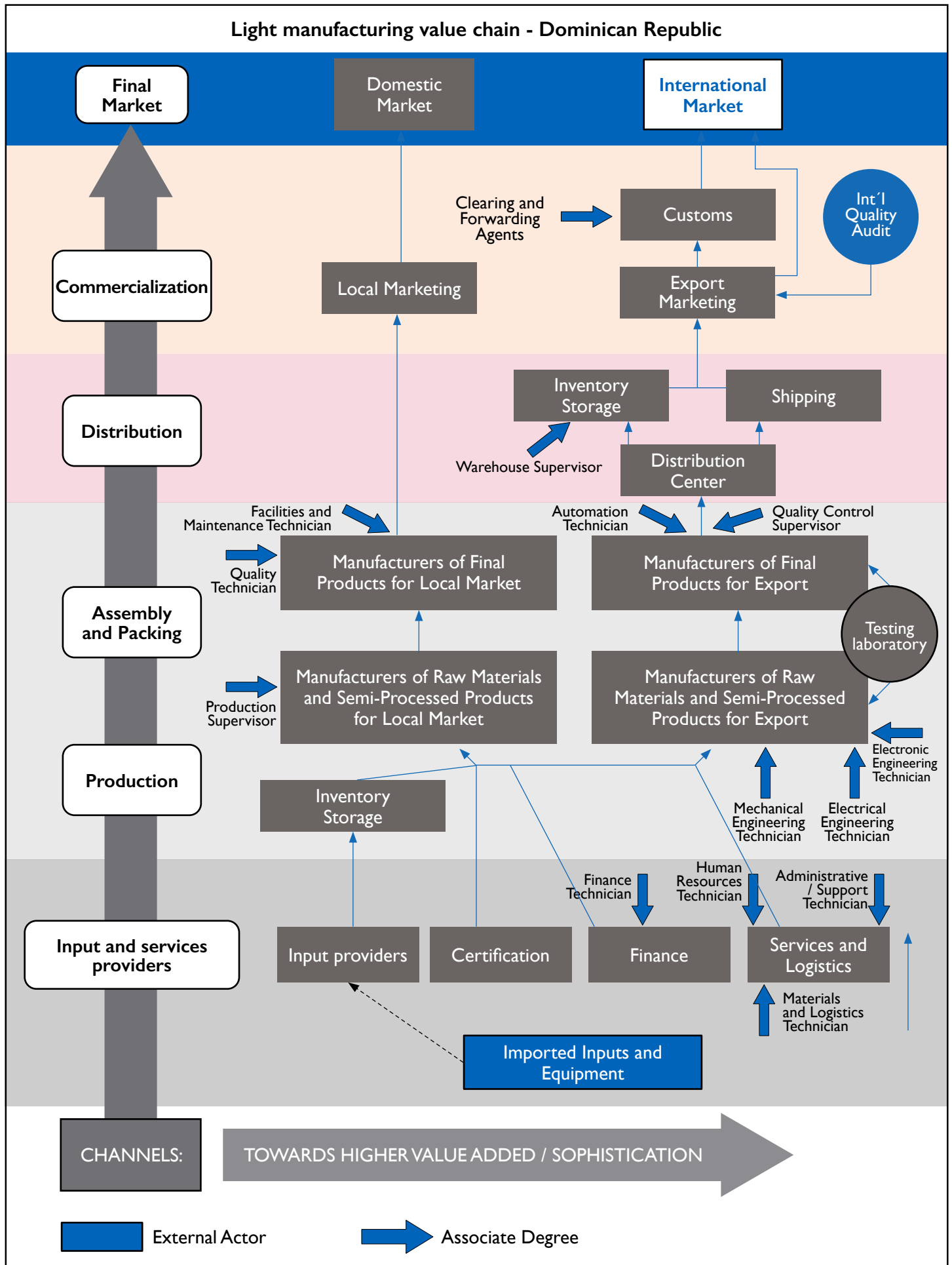
Technical textiles, which specializes in (e.g.) firefighters' uniforms and other high-value textiles with special coatings and high design standards, is also an industry that builds on basic manufacturing skills of the apparel industry, but at a higher technical level. Both medical devices and technical textiles require additional sanitary precautions, quality control and technical expertise, as well as overall managerial standards. In this sense, they represent a logical 'step up' from existing traditional apparel operations. While the technical textiles industry is not particularly large in the Dominican Republic at this point, it has been grouped along with medical devices in part because once such an industry is shown to be productive in a country, the investments can take off quite rapidly.

Light manufacturing in the Dominican Republic already includes a substantial focus on medical devices, for which domestic and international demand have increased during the pandemic.

⁴⁰The law, passed in 2001, creates a special border development zone for companies in (e.g.) the industrial, agro-industrial, agriculture/livestock, metal-mechanic, free zone, tourism, metallurgical and energy industries in Pedernales, Independencia, Elías Piña, Dajabón, Montecristi, Santiago Rodríguez and Bahoruco provinces. It is valid for 20 years, and if not renewed will expire in 2021.

Value chain, potential employment opportunities and skills needs

Figure 21. Light manufacturing value chain with employment entry points, Dominican Republic



According to a 2019 employer survey and study, potential in-demand manufacturing sector workers with post-secondary technical qualifications include **manufacturing industry supervisors and mechanical engineering technicians**. Of the geographic regions prioritized by the project, employers in Santo Domingo province registered the most difficulty in finding skilled manufacturing workers, followed by the Distrito Nacional and Santiago. Other possibly relevant in-demand workers include **electrical and electronics engineering technicians**.

Discussions with representatives of the medical device manufacturing sector, and a review of a recent study carried out by the Medical Devices Cluster (a group of companies organized under the auspices of the Dominican Association of Free Trade Zones, ADOZONA) revealed that demand for technicians far outstrips supply.⁴¹ The study estimates a need by 2024 for 3,500 workers with associate degrees in manufacturing, quality control and assurance, supply chain management, electrical engineering, electronic engineering, and mechatronic engineering. The specific technician positions these workers will be needed for include:

- **Maintenance and Facilities Mechanics**
- **Engineering and Automatization Technicians**
- **Quality Technicians**
- **Materials and Logistics Technicians**
- **Administrative and Support Technicians**

Currently, the major skills deficiencies among these technical workers include a lack of English language skills and a lack of solid technical training and experience using relevant equipment. One employer also mentioned mathematics skills as an area of needed reinforcement.

In the companies surveyed, 36.3 percent of technicians were female. Many workers with an associate degree also work in the medical device industry as **warehouse workers and material managers, machine operators, and group leaders and production assistants**. Much more detail on the above findings can be found in the referenced study.

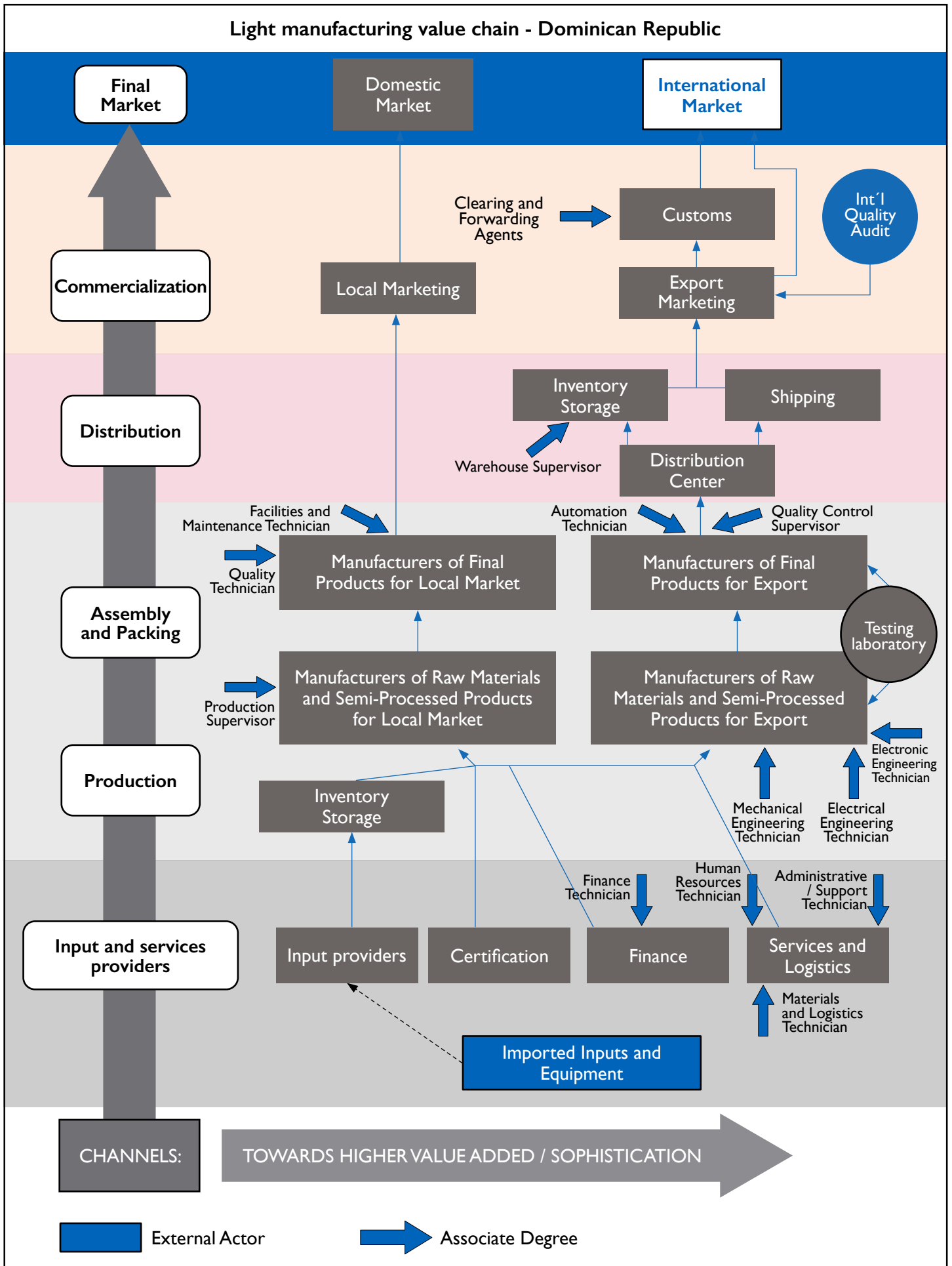
Relevant technical tertiary offerings

Educational institutions in the Dominican Republic currently offer a variety of programs relevant to the light manufacturing sector. As Advance has learned from employers in medical device manufacturing, the cluster is already working with local institutions ITLA, in Santo Domingo, and Instituto Politécnico de Loyola, in San Cristóbal, to train needed workers, but current programs are insufficient to keep up with demand for technicians (and San Cristóbal was noted as being geographically distant from employers in the sector). AIRD and ADOZONA have highlighted a need for programs preparing students for work as technologists in mechatronics and 3D printing.

⁴¹Martí, T.E. (2019). "Estudio de Necesidades de Talento para Apoyar el Crecimiento del Sector de Dispositivos Médicos: Presentación de Resultados." November. Accessed online at https://www.micm.gob.do/images/pdf/publicaciones/libros/estudios/Estudio_Necesidades_de_Talento_Sector_Dispositivos_Medicos.pdf

⁴²AIRD and ADOZONA. (2020).

Figure 22. Light manufacturing value chain with parallel diagram



ISCED 4 (Post-secondary, non tertiary)	ISCED 5 (Short-cycle tertiary education)	ISCED 6 (Bachelor's or equivalent)
	<ul style="list-style-type: none"> • Associate Degree in Marketing 	<ul style="list-style-type: none"> • International Trade • Marketing • Publicity
	<ul style="list-style-type: none"> • Associate Degree in Logistics • Associate Degree in Informatics 	<ul style="list-style-type: none"> • Telematics Engineering • Logistics & Transportation Engineering • Informatics
	<ul style="list-style-type: none"> • Associate Degree in Industrial Design • Associate Degree in Systems Engineering • Associate Degree in Electrical Engineering • Associate Degree in Electronics Engineering • Associate Degree in Industrial Engineering • Associate Degree in Electromechanical Engineering • Associate Degree in Automated Manufacturing • Associate Degree in Mechatronics 	<ul style="list-style-type: none"> • Industrial Design • Systems Engineering • Electrical Engineering • Electromechanical Engineering • Electronic Engineering • Industrial Engineering • Mechanical Engineering • Mechatronics • Operations
	<ul style="list-style-type: none"> • Associate Degree in Accounting • Associate Degree in Management • Associate Degree in Human Resources • Associate Degree in Business Administration • Associate Degree in Finance • Associate Degree in MSME Administration 	<ul style="list-style-type: none"> • Business Leadership and Entrepreneurship • Accounting • Management • Quality and Productivity Management • Human Resources • Business Administration • Finance • MSME Administration

Occupations Defined by Sector Actors (DR):

1. Maintenance and Facilities Technician
2. Mechanical Engineering Technician
3. Electrical Engineering Technician
4. Electronic Engineering Technician
5. Production Supervisor
6. Warehouse Supervisor
7. Quality Control Supervisor

Occupations Standardized by Sector (ILO):

1. Business services and administration managers
2. Sales, marketing and development managers
3. Finance professionals
4. Administration professionals
5. Sales, marketing and public relations professionals
6. Sales and purchasing agents and brokers
7. Business services agents
8. Administrative and specialized secretaries
9. Physical and engineering science technicians
10. Mining, manufacturing and construction supervisors
11. Process control technicians
12. Electrical equipment installers and repairers
13. Electronics and telecommunications installers and repairers
14. Garment and related trades workers
15. Machinery mechanics and repairers
16. Other craft and related workers
17. Clearing and forwarding agents

ORANGE ECONOMY

The Orange Economy -- *Economía Naranja* in Spanish -- or the creative economy, is defined as “the set of activities that in an interlocking way allow for ideas to be transformed into cultural goods and services” (IDB, 2013). In the Dominican Republic, this third grouping is another area where large amounts of employment in a traditional, low value-added activity is linked to smaller emerging niche segments with considerably higher value added. In this case, the large service sector employment in tourism, estimated at 338,000, provides a fertile base activity from which several more specialized segments can diversify, with the addition of more skilled workers in key technical and middle management occupations. Trends in tourism in the country show diversification away from beach destinations towards other activities such as mountain tourism, ecotourism, and the revitalization of Santo Domingo’s colonial zone, and an increasingly diverse set of offerings including historical tourism, religion, gastronomy, and an expansion of recreational activities to entertain and engage visitors.⁴³

There is a growing filmmaking industry, which is linked to distinctive cultural tourism attractions, especially in music and dance. As the Advance Program learned in Jamaica, where the Creative Cluster is composed of sports, music, and filmmaking, having sufficient trained staff in key areas such as talent and event management, finance, intellectual property protection, distribution, and digital marketing, was a key success factor for take-off of that industry. Similarly, in the Dominican Republic’s Orange Economy, which employs some 500,000 workers or 12.5 percent of the workforce, these tourism-related activities are creating dynamic synergies, which allow Dominicans to take advantage of fast-growing entertainment markets.

In the Orange Economy, though the drop in tourism and in-person experiences as a result of the COVID-19 pandemic is significant (and one forecast indicates that the country would lose between 2.5 percent-6.1 percent of GDP should the pandemic last nine months, which will have passed by publication of this report⁴⁴), the shift towards remote production and digital content and platforms already underway will be catalyzed by economic adaptations. Specifically, AIRD and ADOZONA have emphasized the following areas as key to supporting Dominican industry going forward:⁴⁵

- Robotization and intelligent automation
- Big data and business analytics
- Digital leadership
- Digital transformation
- Traceability and blockchain
- Machine learning
- Digital marketing
- Design thinking
- Digitization of business processes

⁴³Ministry of the Presidency. (2019). Estudio Sectorial de Hostelería y Turismo República Dominicana: Resumen Ejecutivo. December. Accessed online at <http://proetp2.edu.do/wp-content/uploads/2020/03/Informe-de-Hosteleria-y-Turismo-CLAEM-Versi%C3%B3n-04.01.2020-Web.pdf>

⁴⁴Statista. (2020). Dominican Republic: Impact of COVID-19 on tourism GDP by scenario 2020. June 4. Accessed online at <https://www.statista.com/statistics/1110784/coronavirus-impact-tourism-gdp-dominican-republic/>

⁴⁵AIRD and ADOZONA. (2020). Estrategia de Desarrollo del Sector Industrial. República Dominicana. July.

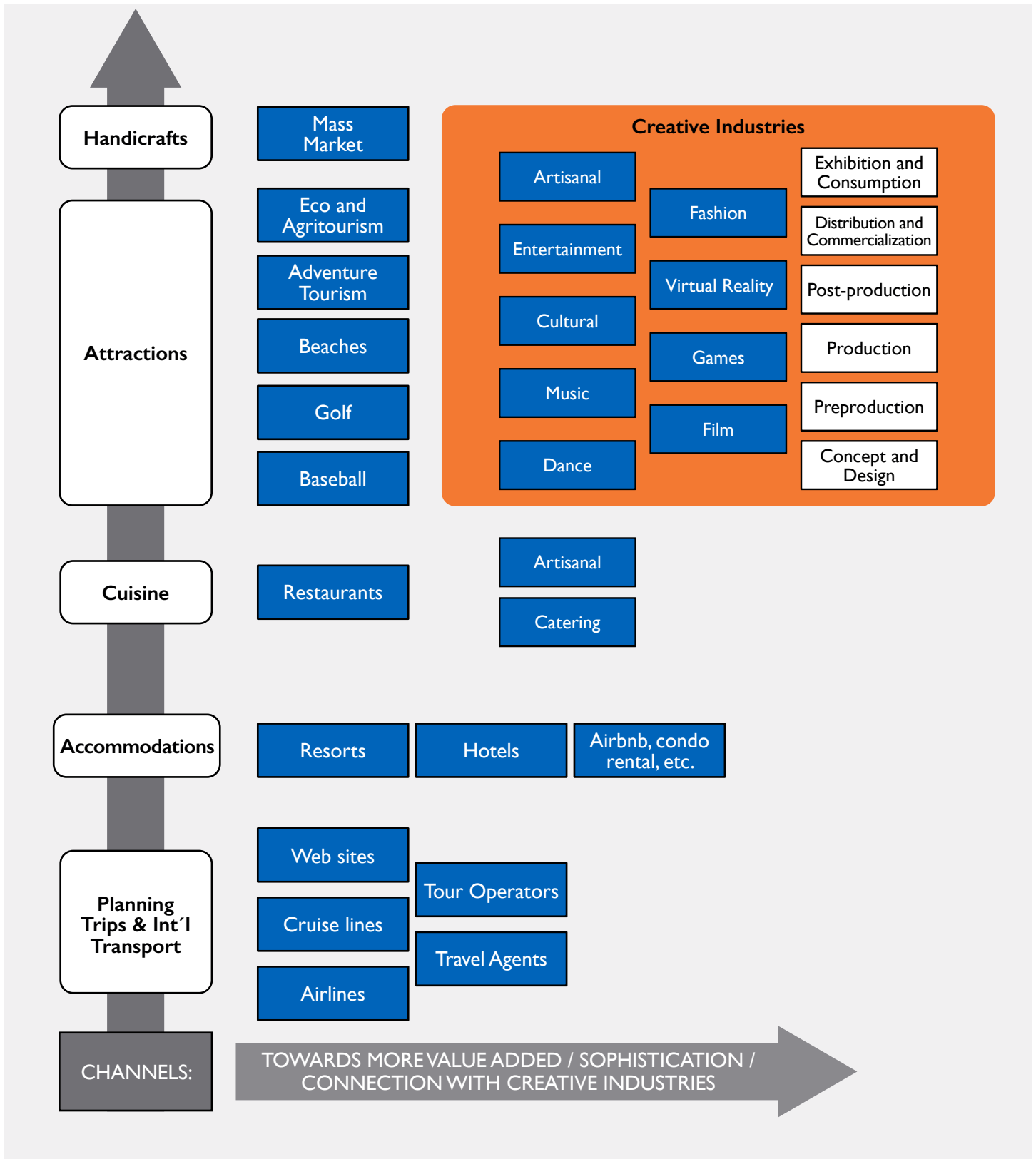
Smaller enterprises in sectors such as tourism which have relatively low rates of ICT use⁴⁶ will need to adapt to survive, and technical tertiary graduates can help support this shift. Even as the domestic economy returns to something more approaching “normal”, the ICT skills that were already in demand are now in even stronger demand across all sectors of the economy as Dominicans shift to conducting more of their lives online, from school, work, and buying goods and services, to socializing and entertainment.

The already-underway transformation of the tourism sector towards more personalized, customized experiences, diversification into outdoor and adventure activities with lower likelihood of viral transmission, the turn toward rental apartments rather than large all-inclusive resorts, and the seeming interest of North American travelers to stay relatively close to home while COVID-19 is still widespread, are some of the tendencies which should help the country regain its footing in tourism. However, the tourism sector has crucial work to do in inspiring confidence in travelers as the pandemic recedes. Health and hygiene certifications will be key in this process to keeping travelers and workers safe, as will educating workers across the tourism sphere not only in following anti-transmission protocols but also in communicating about them to potential and actual travelers and co-workers.

As Advance takes on key sub-sectors of traditional tourism and ICT, one of the most valuable contributions the Program can make is to be “forward-looking,” including more specialized occupations related to the Orange Economy (such as those mentioned above) so that the Dominican Republic is well prepared to take advantage of some of the most distinctive aspects of its cultural heritage. The following figure illustrates some of the relationships between the tourism and creative industry value chains.

⁴⁶Sánchez, A. G., & Aquino, H. J. R. (2017). Análisis del sector turístico dominicano: estrategias, oportunidades, barreras y perspectivas de crecimiento de la industria hotelera. UCE Ciencia. Revista de postgrado, 5(2). Accessed online at <https://pdfs.semanticscholar.org/c771/b979285aeedaf0bf54ef1bfcca2152c7931c.pdf>

Figure 23. Illustrative relationships between tourism and the creative industries



Value chain, potential employment opportunities and skills needs

In the music and film subsector, the number of businesses grew nearly 22 percent on average annually from 2010-2016, from 46 establishments to 150. In the Audiovisual industry in general, 32.3 percent of employers required some post-secondary education. In-demand occupations requiring post-secondary technical education include **broadcasting and audiovisual recording technicians and photographers**. As standards for digital content increase, employers in the Distrito Nacional registered higher levels of difficulty finding employees, with Santiago employers also registering some difficulty. According to the 2019 survey, 97 percent prefer workers with technical training, 58 percent with office software skills, and 58 percent with practical experience in using job-related equipment and machines, while 65 percent prefer previous work experience. Many creative agencies subcontract content development work to freelancers, as well, and this is considered an area of opportunity. Additionally, the Publicity and Marketing subsector (which supports sectors across the economy) grew nearly 14 percent annually from 2010-2016 and in terms of number of businesses, from 418 to 908.

In ICT, the number of businesses grew nearly 6 percent annually from 2010-2016, from 1,124 to 1,581. According to the 2019 survey, 43 percent of employers required post-secondary education. Another 2019 ONE survey of ICT firms found that of 52,329 workers nationally in the ICT sector in 2018 (3 percent growth in employment over the prior year), 3,489 were employed specifically in ICT occupations, 2,904 had a university degree in an ICT field, and 18.1 percent of these had an associate degree, with the vast majority of higher education graduates in ICT occupations (74.5 percent) holding a bachelor's degree. However, three in 10 new hires in 2018 had an associate degree, indicating the growth in demand for workers with this qualification. 66 percent of ICT workers with an associate degree in 2018 worked in telecommunications. Although 67 percent of employers of ICT workers in the sector were satisfied with their employees' skills overall, their creativity (capacity for planning) received lower marks than other skills areas. Unfortunately, more than 81 percent of ICT firms surveyed in 2019 did not have a connection to higher education institutions.⁴⁷

In-demand occupations requiring post-secondary technical training include **computer network and systems technicians, ICT operations technicians, and web technicians**. Employers in Distrito Nacional and Santiago indicated the greatest unmet need for ICT workers with relevant skills, where 73 percent required technical training; 63 percent preferred foreign language skills; 67 percent, office software skills; 48 percent, practical experience in job-related equipment and machines; and 58 percent preferred prior work experience. According to the head of the ICT Chamber, in the COVID-19 environment, IT, telecom, and internet services providers are expanding their services and looking for workers to hire. E-commerce, internet sales, and use of digital communications platforms are increasing significantly.

⁴⁷Oficina Nacional de Estadística (ONE) and MESCyT. (2020). Encuesta Demanda de Recursos Humanos en la Tecnología de la Información y la Comunicación y Cooperación Empresarial Universitaria en la República Dominicana 2019. October. Accessed online at <https://web.one.gob.do/publicaciones/2020/encuesta-demanda-de-recursos-humanos-en-la-tecnologia-de-la-informacion-y-la-comunicacion-y-cooperacion-empresarial-universitaria-en-la-republica-dominicana-2019/>

Of the 180 unfilled jobs posted by firms in the 2019 ONE survey, nearly 85 percent were in the telecommunications sector, with 77 percent related to software design and development.⁴⁸

In contrast to the above, tourism employers generally require lower levels of formal education; according to the 2019 survey, 17.1 percent of employers required some post-secondary education. Of note is that 54 percent of tourism industry workers are women, 20 percentage points higher than in the rest of the private sector. More than half (59 percent) of employment in the industry is informal, and while men working in tourism have the same average years of schooling as men outside the sector (nine years), women in the sector have on average eight years of schooling compared to 11 years of those outside the sector.⁴⁹ In-demand occupations (prior to the COVID-19 outbreak) requiring education at the associate degree level include chefs. Approximately 84 percent of employers required technical training; 78 percent foreign language skills; 79 percent office software skills; and just 34 percent required practical skills using job-related machines or equipment. Of the priority geographic areas of this study, Santo Domingo employers registered the greatest difficulty in finding tourism workers.

Additionally, a 2019 study of the hotel and tourism sector identified a number of positions which require an associate degree, including:

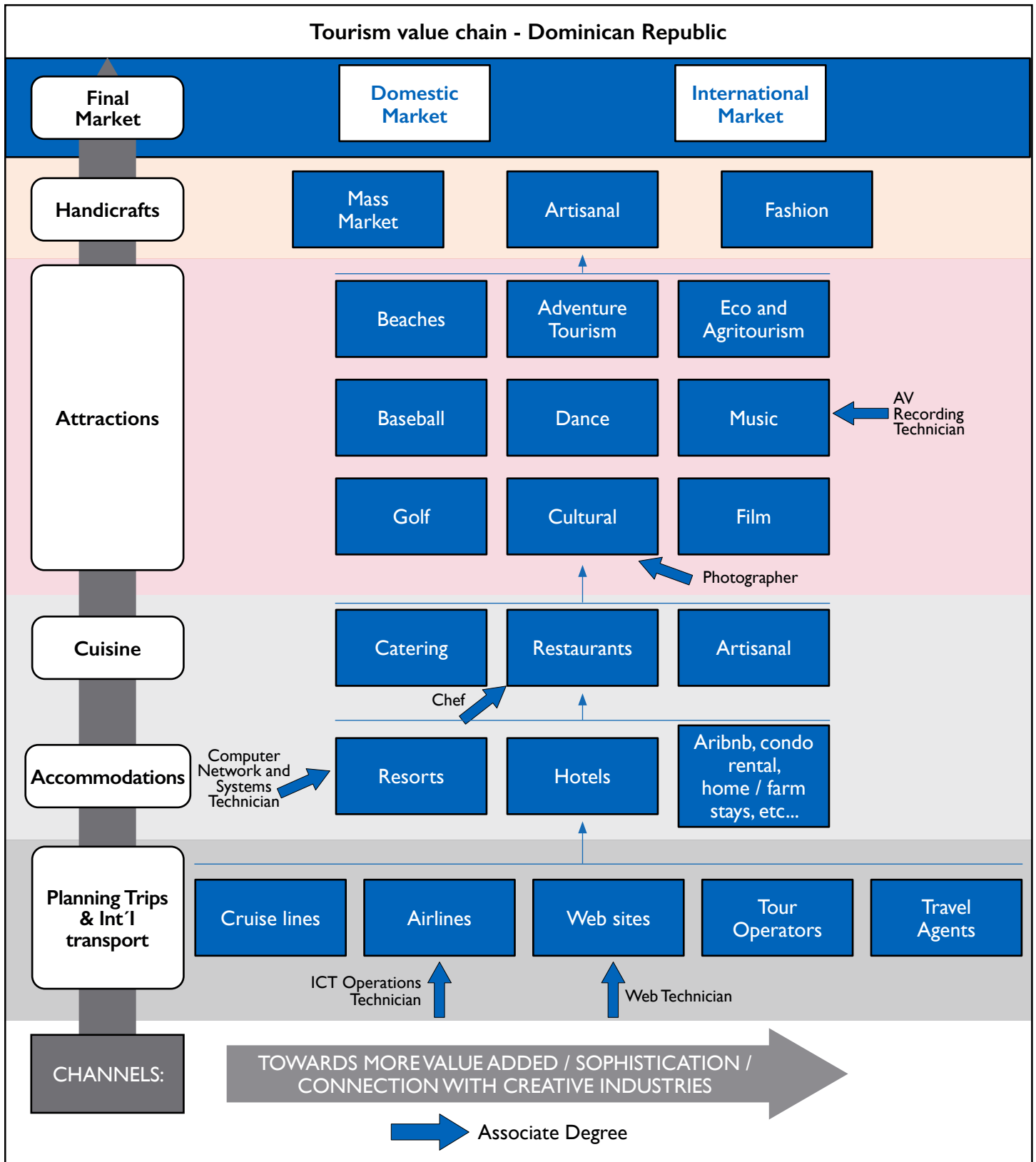
- **Travel and Event Management**
- **Tourism Quality Analysis**
- **Reception Management and Hotel Reservations**
- **Cleaning Management**
- **Tour Guiding**
- **Tourism Entertainment Management**
- **Tourism Information Management**
- **Kitchen Management**
- **Food and Beverage Services Management**
- **Sommellerie**

Furthermore, discussions with tourism sector experts revealed that some existing trends have deepened in the wake of the pandemic, including an interest in and a need for entrepreneurship training in the tourism sector, including in key emerging segments such as agri-, eco-, adventure, culinary, and cultural tourism.

⁴⁸Oficina Nacional de Estadística (ONE) and MESCyT. (2020).

⁴⁹Analytica. (2017). "Turismo dominicano: un mar de oportunidades." Accessed online at https://issuu.com/popularenlinea/docs/estudio_sobre_el_sector_hbr_-_asona

Figure 24. Tourism value chain with employment entry points, Dominican Republic



Relevant technical tertiary offerings

Current programs at the higher technical education level in the country include those in design, publicity, promotion, marketing, and hotel and tourism management. ICT directly supports activities in this sector via, e.g., digital capabilities in design, production, and marketing. ICT also directly supports activities in the other selected value chains, namely premium food processing and light manufacturing.

Illustrative examples of findings of existing surveys of firms in this sector include:

- Hotels and restaurants in Barahona had difficulty in finding trained workers; restaurants generally required higher levels of training than hotels, but some restaurant employers indicated that even with technical training and/or degrees and internship experience, workers' performance was lacking.⁵⁰
- In a recent survey of hotel industry experts, just 12 percent rated workers' professionalism and qualifications as "very good" or "excellent".⁵¹
- AIRD and ADOZONA have highlighted a need for programs preparing students for work as technologists in multimedia, software, and data science and analysis.⁵²
- Graduates of ITLA's associate degree programs in IT services and networking, among others, have very high employment levels.⁵³

Other orange economy programs at this level that could be relevant, but are not currently offered as degree programs in the DR, include those in climbing and mountaineering (relevant for adventure travel as the DR is home to several mountain ranges and includes the tallest mountain in the Caribbean, Pico Duarte); sports management (relevant for the golf and baseball industries as well as sports-related tourism); as well as cross-sector relevant offerings in agritourism (applicable both for tourism and premium food processing).

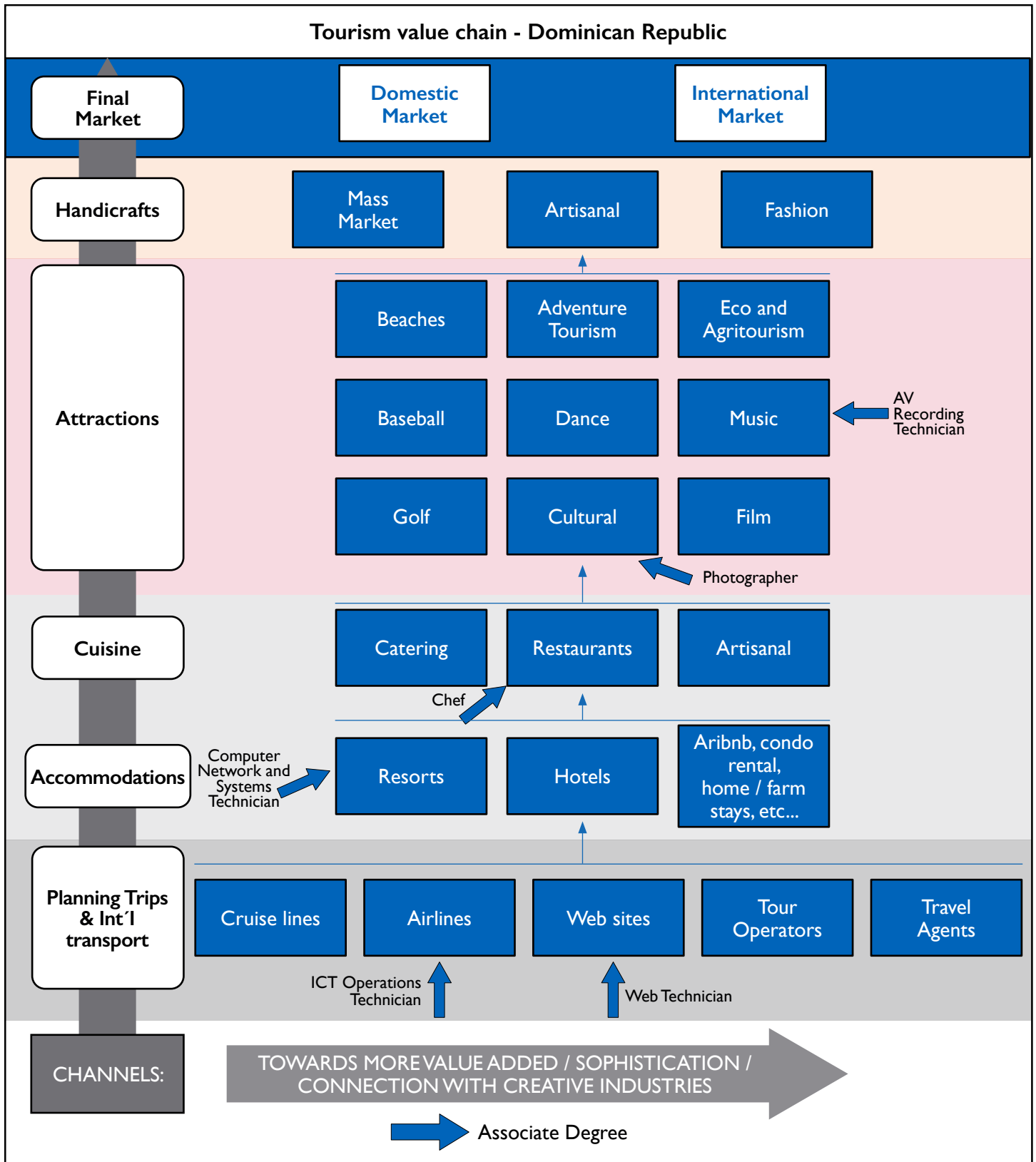
⁵⁰Reyes Martínez, C. (2016). "Informe Económico: Provincia de Barahona." Clúster Turístico y Productivo de la Provincia de Barahona. November 14.

⁵¹Aquino, H. J. R. (2019). República dominicana: la actividad turística, estrategias de gestión del destino y de inversión en alojamientos turísticos (Doctoral dissertation, Universidad Politécnica de Cartagena). Accessed online at <https://repositorio.upct.es/bitstream/handle/10317/8326/hjra.pdf?sequence=1&isAllowed=y>

⁵²AIRD and ADOZONA. (2020).

⁵³Interview with Jose Armando Tavarez, President of CamaraTIC and former Rector of ITLA

Figure 25. Tourism value chain with parallel diagram



ICSED 4 (Post-secondary, non tertiary – “maestro técnico” level in INFOTEP)	ICSED 5 (Short-cycle technical education – “técnico superior” and “tecnológico”)	ICSED 6 (First cycle of higher education, bachelor’s degree or equivalent)
	<ul style="list-style-type: none"> • Associate Degree in Fashion Design • Associate Degree in Industrial Design 	<ul style="list-style-type: none"> • Visual Arts • Fashion Design • Industrial Design
<ul style="list-style-type: none"> • Television - Makeup and Character Portrayal 	<ul style="list-style-type: none"> • Associate Degree in Marketing • Associate Degree in Accounting • Associate Degree in Informatics • Associate Degree in Graphic Design • Associate Degree in Photography and Audiovisual Media • Associate Degree in Multimedia and Sound • Associate Degree in Publicity and Digital Media • Associate Degree in Web Programming • Associate Degree in Climbing and Mountaineering • Associate Degree in Sports Management 	<ul style="list-style-type: none"> • Social Communication • Marketing • Accounting • International Trade • Film • Graphic Design • Photography and Audiovisual Media • Music • Advertising • Theatre • Software Engineering • Informatics • Telecommunications Engineering • Art History and Criticism • Communication Technologies • Information Technologies • Information Systems
<ul style="list-style-type: none"> • Furniture Design • Drawing Interiors • Interior Decoration • Interior Design • Hotel Reception 	<ul style="list-style-type: none"> • Associate Degree in Management • Associate Degree in Human Resources • Associate Degree in Business Administration • Associate Degree in Hospitality and Tourism • Associate Degree in Interior Design • Associate Degree in Systems Engineering • Associate Degree in Networking and Connectivity • Associate Degree in Networking and Cybersecurity • Associate Degree in Finance • Associate Degree in Administration of MSMEs • Associate Degree in Agritourism 	<ul style="list-style-type: none"> • Architecture • Finance • Management • Business Leadership and Entrepreneurship • Human Resources • Business Administration • Hospitality and Tourism • Interior Design • Design and Decoration • Systems Engineering • Information Security • Agritourism • Administration de MSMEs
<ul style="list-style-type: none"> • Technician in Application Design and Development • Technician in Informatics 	<ul style="list-style-type: none"> • Associate Degree in Logistics • Associate Degree in Aeronautical Sciences • Associate Degree in Maritime Transport 	<ul style="list-style-type: none"> • Telematics Engineering • Aeronautical Sciences • Engineering in Logistics and Transportation • Maritime Transport

Occupations Defined by Sector Actors (DR):

- | | | |
|--|--|--|
| 1. Web Technician | 6. Chef | 12. Tour Guide |
| 2. Computer Network and Systems Technician | 7. Agritourism operator | 13. Tourism Entertainment Manager |
| 3. ICT Operations Technician | 8. Travel and Event Manager | 14. Tourism Information Manager |
| 4. Broadcasting and Audiovisual Recording Technician | 9. Tourism Quality Analyst | 15. Kitchen Manager |
| 5. Photographer | 10. Reception and Hotel Reservations Manager | 16. Food and Beverage Services Manager |
| | 11. Cleaning Manager | 17. Sommelier |

Occupations Standardized by Sector (ILO):

- | | | |
|--|--|---|
| 1. Business services and administration managers | 6. Sales and purchasing agents and brokers | 11. Cooks |
| 2. Sales, marketing and development managers | 7. Business services agents | 12. Environmental & occupational health & hygiene technicians |
| 3. Finance professionals | 8. Administrative and specialized secretaries | 13. Information and communications technicians |
| 4. Administration professionals | 9. Artistic, cultural and culinary associate professionals | 14. Ship and aircraft controllers and technicians |
| 5. Sales, marketing and public relations professionals | 10. Secretaries (general) | 15. Sports and fitness workers |

TRANSPORT AND LOGISTICS

A transversal sector which supports the functioning, development, and growth of nearly every other sector in the country – but in particular the three sectors of focus of this study – transport and logistics employs 10.1 percent of the occupied population, or 448,000 people, a figure which grew 5.5 percent annually from 2015 to 2017. From 2010 to 2016, the number of businesses in the sector grew at an 8.6 percent rate annually, reaching a total of 2,026 establishments in 2016.

According to the 2019 survey, 27.5 percent of employers of transport and logistics workers required post-secondary education, and in-demand workers with a post-secondary technical education include **clearing and forwarding agents**. In addition, 82.5 percent of employers required technical training; 62 percent foreign language skills; 72 percent office software; and 48 percent practical experience with job-related machines and equipment.

Discussions with representatives of the Logistics Cluster (a group of companies organized under the auspices of the Dominican Association of Free Trade Zones, ADOZONA), and a review of a recent informal survey carried out by this cluster, revealed the need, in port and warehousing operations, for ship or terminal dispatchers (typically university students are hired for this position); **ship/yard planners and operations supervisors; and superintendents or senior supervisors** (generally university graduates). In the area of maintenance, the document identified a need for **maintenance supervisors** (who usually have an engineering background). The document details specific skills and knowledge required in the sector, and also notes a need for the transversal skills of effective communication, office software (especially Excel), and English language.⁵⁴ Additional skills and attributes mentioned were integrity; common sense; conflict management; teamwork; preparation of reports; and effective internal and external communication.

Representatives of the cluster – which has organized a technical committee on education -- noted that typically they looked to students and graduates of four-year degree program since the associate degree was still emerging in the sector, but that they would consider two-year program students and graduates for these roles, depending on the skills, knowledge, and experience required by the position, and were interested in working with higher education institutions to meet their needs for skilled employees. A handful of logistics programs exist at the associate degree level; however, the analysis noted a lack of existing programs focusing on maritime transport (relevant for tourism as well as export industries).

HEALTH

As a result of the COVID-19 pandemic, and its impact upon the Dominican economy and labor market, the team has included a brief snapshot of the health sector labor market here. To control the pandemic, roll out a vaccination program, and return economic growth and employment to the country, the

⁵⁴Clúster Logístico de República Dominicana. (n.d.). “Necesidades de Conocimiento Ideales para el Sector Logístico de la RD.”

Dominican Republic will require a workforce capable of implementing and communicating occupational safety and health and hygiene protocols across all sectors of the economy and in inspiring visitors' confidence to return. Prior to the pandemic, the country had a lower-than-optimal ratio of 2.5 skilled health workers for every 1000 inhabitants (the threshold the WHO calculates as necessary to achieve the Sustainable Development Goals is 4.45⁵⁵). This includes just .38 nurses for every 1000 inhabitants – whereas in North America the number is 11.1. There is an insufficient number of professionals overall in the area of primary, family, and community care, including in nursing.⁵⁶ This phenomenon is likely due in part to the emigration of skilled health workers seeking higher remuneration abroad, as well as a historical tendency in the country to prepare doctors rather than graduate nurses.⁵⁷ Furthermore, there is a low presence of mid-level **diagnostic laboratory professionals**, including in bioanalysis and pathology. In some contexts, a focus on preparing and deploying mid-level health professionals can achieve better health outcomes with fewer resources. However, in recent years, low graduation rates from associate degree programs focusing on preparing these students have translated into a dearth of mid-level health professionals in the Dominican labor market. The team also found no programs at the associate degree level preparing students for occupational health and safety careers, which will be critical for helping the economy return to normal in the wake of the pandemic.

⁵⁵World Health Organization. (2016). Health Workforce Requirements for Universal Health Coverage and the Sustainable Development Goals. Human Resources for Health Observer Series No 17. Accessed online at <https://apps.who.int/iris/bitstream/handle/10665/250330/9789241511407-eng.pdf;sequence=1>

⁵⁶Marco Nacional de Cualificaciones de la República Dominicana. (2018). Informe del Proyecto Piloto en el Sector Salud Producto 5. Comité Técnico para la Elaboración del Marco Nacional de Cualificaciones. Accessed online at <http://proetp2.edu.do/wp-content/uploads/2019/12/InformePilotoSaludMNC-RD.pdf>

⁵⁷Pan-American Health Organization. (2013). Panorama de la Migración de Médicos y Enfermeras de la Región de Centroamérica y República Dominicana. Accessed online at https://centro.observatoriorh.org/sites/centro.observatoriorh.org/files/webfiles/fulltext/2013/libro_migracion_ca/libro_migracion_ca.pdf

V. SUMMARY AND CONCLUSIONS

In the decade prior to the COVID-19 pandemic, the Dominican Republic showed promising tendencies towards higher economic and export growth, decreases in the unemployment and poverty rates, and increased levels of formal employment and education attainment. Unfortunately, major disparities in outcomes persist along regional, age, gender, and national-origin lines. A large proportion of youth has still completed only secondary education, and many of those who do go into higher education are not graduating on time or at all. Strong growth in key sectors such as light manufacturing and tourism has not always translated into formal, well-paying jobs or into positive local economic spillovers. Meanwhile, employers mention key skills deficits among job seekers and, in some sectors and roles, fierce competition for technical workers. Furthermore, the pandemic has sent shockwaves through key economic sectors, in particular the tourism industry, with serious repercussions for youth employment.

This assessment, through a review of secondary data and interviews with economic experts and employers in the country, has identified several key aggregate sectors with high potential to employ graduates of short-cycle technical tertiary education programs, in the regions prioritized by USAID in the Dominican Republic. These include:

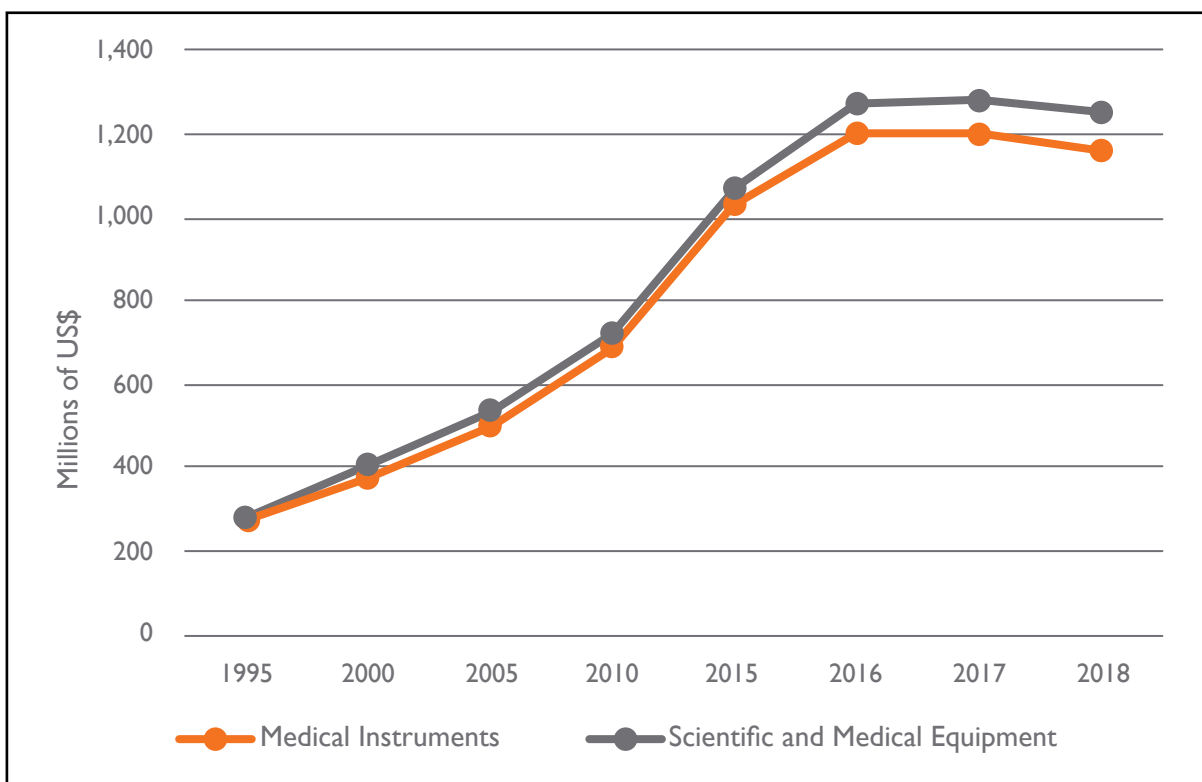
- Premium Agricultural Processing
- Light Manufacturing
- Orange Economy
- Transport and Logistics, and
- Health

The study mapped value chains within the first three sectors and identified key employment entry points which currently present opportunities for technical tertiary graduates, or are anticipated to do so in the future, even given the context of the pandemic and recovery. The parallel diagrams the team developed illustrate existing relevant educational offerings in the priority geographic regions and highlight gaps that might be a focus of future efforts. Employers and experts in all the sectors of focus highlighted the need to better align technical education offerings with labor market demand, and signaled interest in engaging with higher education institutions to upgrade curricula and provide labor bridging opportunities for students. The team considers the country's existing sector clusters to hold high potential for such collaboration.

ANNEX A. DETAIL ON SCIENTIFIC AND MEDICAL EQUIPMENT EXPORTS

Figure A1 shows the growth in exports of medical instruments (4-digit HS Code 9018) as compared with the entire category of Scientific and Medical Equipment (2-digit HS Code 90) from 1995 to 2018. It is clear from the figure that the Medical Instruments sub-category drives the larger Scientific and Medical Equipment category. From 1995 to 2016, medical instrument exports grew very rapidly (averaging 16 percent per year), after which it experienced a decline of 3 percent. Although figures for 2020 are not yet available, interviews with manufacturers indicate that growth has rebounded during the COVID-19 pandemic.

Figure A1: Exports of Medical and Scientific Equipment, 1995-2018



Source: FHI 360 calculations based on export data from Harvard Atlas of Economic Complexity

However, since 2010, the Dominican Republic's exports of Scientific and Medical Equipment diversified, and products such as Therapeutic Appliances and Chemical Analysis Instruments have grown rapidly, as shown in Table A1. Further interviews with companies in this sector will hopefully reveal why medical instruments has been falling, and what categories are expected to grow in the near future. Nevertheless, overall, it is clear that this category is dynamic and improved human resource development will be crucial to the Dominican Republic's competitiveness.

Table A1: Dominican Exports of Scientific and Medical Equipment, HS Code 90 (USD\$)

HS Code	Product Description	2010	2015	2016	2017	2018
9018	Medical Instruments	688,000,000	1,030,000,000	1,200,000,000	1,200,000,000	1,160,000,000
9019	Therapeutic Appliances	3,330,000	13,900,000	32,100,000	34,700,000	39,800,000
9027	Chemical Analysis Instruments	609,000	969,000	793,000	1,180,000	227,000
9021	Orthopedic Appliances	5,890,000	10,400,000	22,200,000	24,700,000	28,600,000
90xx	All other HS Code 90 Products	17,171,000	14,731,000	14,907,000	19,420,000	21,373,000
	TOTAL	715,000,000	1,070,000,000	1,270,000,000	1,280,000,000	1,250,000,000

Source: FHI 360 calculations based on export data from Harvard Atlas of Economic Complexity

ANNEX B. LIST OF INTERVIEWS

Organization	Name	Title
Asociación Dominicana de Zonas Francas (Dominican Association of Free Trade Zones, ADOZONA)	Dariana Lorenzo	Head of International and Interinstitutional Affairs
Asociación de Cargadores Dominicanos (Association of Dominican Shippers)	Marco Henríquez	Representative, Logistics Cluster
Asociación de Industriales de Republica Dominicana (Industrial Association of the Dominican Republic, AIRD)	Glory Fermín Terrero	Public Policy Manager
Cámara Dominicana de las Tecnologías de la Información y la Comunicación, INC. (Dominican Chamber of Information and Communications Technology, CAMARATIC)	José Armando Tavarez	President
Centro Agronómico Tropical de Investigación y Enseñanza (Tropical Agronomic Research and Teaching Center, CATIE)	Alfredo Mena P.	Representative of CATIE in the Dominican Republic and Haiti
CONACADO	Isidoro De La Rosa	President of Grupo CONACADO
CONACADO	Franklin Gómez	Project Manager
CONACADO	Rocío Peña	Human Resources Manager
Deloitte	Nassim Alemany	Economic Advisor
Grupo de Consultoría Pareto (Pareto Consulting Group)	Magdalena Lizardo	Executive Director
MedTronic	Belkis Batista Concepción	Senior Talent Development Specialist
MedTronic	Ana Isabel	Principal HR Generalist
MedTronic	Inés Ochoa	Recruitment and Selection Coordinator
Medical Devices Cluster	Rafael Piantini	Coordinator of the Technical Education Committee
Ministry of Tourism	Jakaira Cid	Director of Tourism Reactivation, Puerto Plata Province
Observatorio Dominicano de comercio internacional-INTEC (Dominican Observatory of International Trade)	Pavel Isa Contreras	Researcher
Productive Tourism Cluster of Barahona Province	Dra. Elena Nunziatini	Executive Director
Programa de Apoyo a la Educación y Formación Técnico Profesional (Program of Support to Professional-Technical Education and Training, PROETP-II)	Pilar Constanzo	National Coordinator, Qualifications of the Professional Family of Hospitality and Tourism Project, National Qualifications Framework
Tropical Shipping	Jhonatan Báez	Coordinator, Logistics Cluster
Universidad Iberoamericana (UNIBE)	Gloria Alina Valdés Lazzaro	Director of Academic Management
World Bank	Miriam Montenegro	Social Development Specialist
World Bank	Ulrich Lachler	Consultant

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ANNEX D. INTERVIEW FORMS

Cuestionario para consultoras especializadas, economistas, y organismos internacionales

I. Contactos (Encuestador, procurar llevar las informaciones llenas)

Nombre	
Posición	
Organización	
Correo Electrónico	
Teléfono	
Ciudad	
Sector	
Fecha de entrevista	

II. Tendencias

Objetivos del programa: FHI360 es una organización internacional de desarrollo humano sin fines de lucro, dedicada a mejorar las condiciones de vida de forma permanente, que promueve soluciones integrales y gestiones locales. El programa “Avanza” es implementado por FHI360, y auspiciado por USAID, con el propósito de fortalecer la capacidad de instituciones de educación superior con carreras de nivel técnico superior, apoyando el diseño y la revisión curricular; el desarrollo profesional del personal docente y administrativo, y buscando ampliar servicios de vinculación al mercado laboral para que los estudiantes obtengan nuevos o mejores empleos. El Programa también trabaja en la mejora de procesos de atracción, promoción, admisión y reclutamiento, permanencia y culminación, para estudiantes en condiciones de desventaja con un potencial fuerte de liderazgo.

1. Tendencias mundiales y/o regionales claves pertinentes para los objetivos del proyecto.	
1.1 Evidencias sugeridas (indicar documentos, fuentes, enlaces Web, entre otros)	
2. ¿Cómo podría beneficiarse el país de estas tendencias?	
3. ¿Cuáles son las oportunidades emergentes ante estas tendencias?	

III. Sectores productivos

1. Sectores de mayor desempeño en términos de producción, exportación, empleo e inversión.	
2. Sectores proyectados de mayor desempeño	Puede incluir sectores económicos o alguna cadena de valor:
2.1 A corto plazo (1 a 3 años)	
2.2 A mediano plazo (4 a 9 años)	
2.3 A largo plazo (10 años y más)	
3. De estos sectores, cuáles se destacan en la cadena productiva del Gobierno	
4. ¿En cuáles sectores (o cadena de valor) percibe la mayor cantidad de oportunidades para los trabajadores con educación técnica superior?	
5. ¿En qué sectores, cadenas de valor cree Ud. que la mejora y la alineación de la educación técnica superior con la demanda del mercado tienen el mayor potencial para aumentar la productividad y las ganancias?	

IV. Referentes / Casos de éxitos

1. ¿Conoce algún caso de éxito a nivel empresarial que pueda ser utilizado como un referente en materia de aplicación de las principales tendencias existentes? ¿Podría indicarnos donde se encuentra?	
2. ¿Puede recomendar algún experto en los sectores que mencionó que pueda proporcionar información adicional?	
3. ¿Nos recomienda algún otro actor empresarial / asociaciones / experto que nos podría proporcionar información adicional? ¿Podríamos utilizar su referencia?	
4. Algún otro comentario adicional	

Guía para las Entrevistas de las Cadenas de Valor en República Dominicana

D= Director; G= Gerente; GRH= Gerente de Recursos Humanos; E= Empleado

A. ¿Puede brindarnos una breve descripción de la empresa, su propiedad, y las operaciones en el país?

- 1.) Nombre de la empresa
- 2.) Dirección de la empresa
- 3.) Sector de la empresa
- 4.) Nombre del informante
- 5.) Puesto del informante
- 6.) Información de contacto: correo(s) electrónico(s), teléfonos oficial y personal
- 7.) Fecha de la entrevista
- 8.) Datos básicos sobre las zonas donde funciona en República Dominicana (D)(G)*
- 9.) Tamaño de la empresa (D)(G)*
 - Micro (1-10 trabajadores y ventas brutas anual de hasta RD\$8,000,000.00)
 - Pequeña (11-50 trabajadores y ventas brutas anual de hasta RD\$54,000,000.00)
 - Mediana (51-150 trabajadores y ventas brutas anual de hasta RD\$202,000,000.00)
 - Grande (150 o más trabajadores y ventas brutas anual de RD\$202,000,000.00 y más)
- 10.) En función de los últimos 5 años (antes de la pandemia), ¿cómo han cambiado sus empleos y ventas? (D)(G)*
- 11.) ¿Dónde se ubica la empresa en el mapa de la cadena de valor? (mostrar mapa) (D)(G)*
- 12.) ¿Harías algún ajuste a este mapa? (D)(G)*

B. Productos Principales:

- 1.) ¿Cuáles son sus productos o servicios y mercados principales? ¿Hay un enfoque en el mercado nacional, en los mercados de exportación, o los dos? (D)*
- 2.) ¿Cuáles son las formas en que usted vende su(s) producto(s)/servicio(s) (salidas en los canales de distribución)? ¿A quién le vende? (D)*

C. Estructura de producción:

- 1.) ¿Trabajan con otros servicios de apoyo, técnicos, empresas de logística, etc.?
 - a. ¿Estos servicios que vienen de afuera incluyen individuos? ¿En qué parte de producción? (D)(G)*
- 2.) ¿Cuáles son las principales limitaciones que afectan a la productividad (mano de obra, habilidades, los costos de energía, ambiente de negocios, etc.)?
 - a. ¿Cómo pueden ser abordadas por la industria y el gobierno? (D)(G)(E)*

D. Estructura y competencias de la fuerza laboral:

- 1.) ¿Cuáles son los puestos/posiciones técnicas dentro de su empresa que garantizan el éxito del negocio? (G)(GRH)(E)*
 - a. ¿En su empresa, cuántas personas están empleadas en estas posiciones técnicas antes referidas?

- b. ¿En cuál(es) parte(s) de la cadena de valor funciona el puesto? (G)(GRH)*
- c. ¿En cuáles de estos puestos se ha empleado mujeres en su empresa? (G)(GRH)*
- 2.) ¿Qué nivel de educación es requerido para los puestos claves para llevar a cabo su trabajo? (Educación Básica completa o incompleta; Bachillerato; Politécnico; Técnico Superior; Grado (Licenciatura); Postgrado (G)(GRH)*
- 3.) ¿Cuáles son las principales competencias (conocimientos, habilidades, destrezas y valores) requeridas en los puestos técnicos por su función en la cadena de valor? (G)(E) *
- 4.) ¿Cuál a su juicio son las limitaciones en competencias que presentan en la actualidad las personas que están ocupando puestos técnicos? (E)*

Nombre de puesto	Ubicación en la cadena de valor	Nivel de educación requerido (especificar completa o incompleta)	Conocimientos	Habilidades y Destrezas	Valores y Actitudes	¿Ha trabajado una mujer en este puesto?

(continuar si necesario)

E. Reclutamiento:

- 1.) ¿Qué fuentes de reclutamiento se utilizan? (G)(GRH)
- 2.) ¿Cuáles son los criterios que califican a una persona para estar empleada en su empresa? (G)(GRH)*
- 3.) ¿Cuáles son los retos que se enfrentan al contratar un personal? ¿Tiene problemas para encontrar empleados apropiadamente capacitados? Explique. (G)(GRH)*
- 4.) ¿Qué esfuerzos se están desarrollando para compensar estos retos? (G)(GRH)*
- a. ¿Estos esfuerzos están siendo liderados o abordados por la industria? (D)*

F. Educación Técnica:

- 1.) Pensando en los puestos que requieren educación técnica superior...
- a. ¿De cuáles instituciones vienen los trabajadores en esta empresa/este sector que tienen una educación técnica superior? ¿Hay una razón por eso? (G)(GRH)*
- b. ¿De cuáles carreras vienen?
- 2.) ¿Según su percepción, cuáles instituciones y carreras son los mejores? ¿Por qué? (G)(GRH)*

Nombre de la institución	Carrera(s)	Calificación de la institución en general (de 1-10, con 10 lo mejor)	Calificación de la carrera específica (de 1-10, con 10 lo mejor)

- 3.) ¿Cuáles son los principales déficits de conocimientos, habilidades/destrezas (técnicas y blandas), valores y actitudes de estos trabajadores? (G)(GRH)*
- 4.) ¿Cuáles son las principales capacitaciones que requieren los trabajadores con educación técnica superior? (G)(GRH)*
- 5.) ¿Cuál es, en su caso, la interacción que tiene la empresa con los institutos de formación locales, universidades / institutos técnicos? (D)*

G. La situación actual y hacia el futuro

- 1.) ¿Cómo han cambiado las operaciones de esta empresa, y este sector, durante la pandemia? (D)(G)(GRH)
- 2.) ¿Que piensa que pueda pasar con su empresa/este sector... (D)(G)(GRH)
 - a. ...Dentro de 6 meses
 - b. ...Dentro de un año
 - c. ...En adelante
- 3.) ¿Usted ve alguna oportunidad para su empresa/este sector durante esta situación, o cuando se resuelva? (D)(G)(GRH)
- 4.) ¿Cuáles puestos técnicos tendrán mayores oportunidades de empleo en su empresa? En su sector? (G)(GRH)(E) *
 - a. ...Dentro de 6 meses
 - b. ...Dentro de un año
 - c. ...En adelante

H. Para terminar...

- 1.) ¿Tiene otros comentarios adicionales que no hemos discutido? (D)(G)(GRH)*
- 2.) ¿Hay otros actores de esta cadena de valor con quienes se considera que deberíamos hablar? ¿Me podría dar referencias? (D)(G)(GRH)*
- 3.) ¿Concretamente, me puede recomendar/dar los contactos/hacer una introducción a un experto del sector que puede brindar más información? (D)(G)(GR)

