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Dominican Republic: Assessment of logistics skills, competencies, and training

Final Report - revised

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ABBREVIATIONS

ADAA	Dominican Association of Customs Brokers *(Asociación Dominicana de Agentes Aduanales)*
ADACAM	Dominican Association of Freight Forwarders and Logistics Operators *(Asociación Dominicana de Agentes de Carga y Operadores Logísticos)*
ADOEXPO	Dominican Association of Exporters *(Asociación Dominicana de Exportadores)*
ADOZONA	Dominican Association of Free Zones *(Asociación Dominicana de Zonas Francas)*
AIRD	Association of Industries of the Dominican Republic *(Asociación de Industrias de la República Dominicana)*
AMCHAMDR	American Chamber of Commerce of the Dominican Republic
ANRD	Association of Shipowners of the Dominican Republic *(Asociación de Navieros de la República Dominicana)*
ASOLOGIC	Dominican Association of Logistics Centers and Operators *(Asociación Dominicana de Centros y Operadores Logísticos)*
CLRD	Dominican Republic Logistics Cluster *(Clúster Logístico de la República Dominicana)*
DEE	Directory of Companies and Establishments *(Directorio de Empresas y Establecimientos)*
DR	Dominican Republic
ENAE	National Survey of Economic Activity *(Encuesta Nacional de Actividad Económica)*
INFOTEP	Institute of Vocational Technical Training *(Instituto de Formación Técnico Profesional)*
MESCYT	Ministry of Higher Education, Science and Technology *(Ministerio De Educación Superior, Ciencia Y Tecnología)*
MICM	Ministry of Industry, Commerce and MSMEs *(Ministerio de Industria, Comercio y Mipymes)*
MINERD	Ministry of Education of the Dominican Republic *(Ministerio de Educación de la República Dominicana)*
ONE	National Bureau of Statistics *(Oficina Nacional de Estadística)*
ONLT-RD	National Observatory of Logistics and Freight Transport *(Observatorio Nacional de Logística y Transporte de Carga)*
PNLOG	National Cargo Logistics Plan *(Plan Nacional de Logística de Cargas)*

RNE	National Register of Establishments *(Registro Nacional de Establecimientos)*
SNL	National Logistics System *(Sistema Nacional Logístico)*
TRAL	Professional Family of Transportation and Logistics *(Familia Profesional de Transporte y Logística)*
UNCTAD	United Nations Conference on Trade and Development
WMS	Warehouse Management System

1 EXECUTIVE SUMMARY

Introduction

Logistics is fundamental for a country's economy as it facilitates the movement of goods and services between producers and consumers, which is essential for economic growth and development. Efficient logistics systems can help reduce transportation costs, shorten delivery times, increase productivity, and improve competitiveness in global markets. In addition, logistics plays a key role in facilitating international trade and connecting a country to global supply chains. Hence, investments in logistics infrastructure and technologies can have a positive impact on a country's economy by improving efficiency, reducing costs, and increasing trade.

Several elements are required for logistics to be effective in enhancing trade and competitiveness, including a well-developed transportation and communication infrastructure; the use of technology, inventory management systems and real-time data analysis; a supportive regulatory environment that encourages investment in logistics infrastructure, technology, and human resources; collaboration between different stakeholders, including suppliers, logistics service providers, and customers; and a skilled workforce with expertise in logistics, supply chain management, and transportation.

Developing industry-specific skills in logistics is a key element that can enhance its competitiveness and innovation:

- Directly: Skills development supports the learning and competency development needs of employees in the industry, particularly operational staff (e.g., truck drivers and warehouse operators).
- Indirectly: A more competent logistics workforce is better equipped to manage complex international supply chains, thereby contributing to a reduction of transport and production costs and contribute to enabling the country to diversify and improve integration to global value chains.

Logistics is an important element for the development and growth plans of the Dominican Republic. The National Development Strategy 2030[1] establishes the following specific objectives within the objective of "Competitiveness and Innovation in an Environment Favorable to Cooperation and Social Responsibility":

- Expand coverage and improve the quality and competitiveness of transport and logistics infrastructure and services, orienting them to the integration of the territory, the support of productive development and competitive insertion in international markets.
- Turn the country into a regional logistics hub, taking advantage of its geographical location.

Likewise, the National Cargo Logistics Plan – PNLog[2] establishes that, based on the fact that logistics is a fundamental tool for the economic growth and competitiveness of countries, the main challenge facing the Dominican Republic is the establishment of a logistics system that: a) underpins the development of

[1] (National Development Strategy 2030, 2012)
[2] (Directorate of Infrastructure and Logistics, Inter-American Development Bank (IDB), 2014)

national productive sectors, b) becomes a fundamental factor for attracting foreign investment, and c) positions the country as the logistics hub of the Caribbean, thereby complying with the provisions of the National Development Strategy.

Little material is available on skills in logistics in the country. There is a comprehensive study on the logistics sector by the International Development Bank (IDB), but it does not cover skills. The National Observatory of Logistics and Cargo Transport has a report profiling the logistics sector which includes a broad overview on skills.[3] Similarly, the Regional Workforce Development Program (Avanza), with support from the United States Agency for International Development (USAID), issued a "Study of the Labor Market in the Dominican Republic"[4], which among other sectors covers Logistics and Transportation, yet skills is covered only in broad terms. The Ministry of the Presidency, which leads the coordination of the National Qualifications Framework, recently completed a diagnostic report for the professional family of Transport and Logistics (TRAL) that covers information about trends and skills required by the global logistics industry and provides information about the formal educational offer in the country.

None of these studies includes a detailed assessment of logistics skills and competencies in the country that covers pre-employment and on-the-job training as well as the demand side of logistics skills. To contribute to improving the competitiveness of logistics services in the Dominican Republic, the World Bank Group conducted an assessment of the skills, competencies, and professional training available for logistics in the country. The assessment is intended to assist the Ministry of Industry, Commerce and MSMEs (MICM), other policymakers in the country, and anyone interested in logistics skills, to determine the logistics skills requirements of the country, assess to what extent they are met by the current provision of training and education, identify the nature and scale of skills shortages, and provide recommendations for appropriate policy responses that can serve as the basis for subsequent action planning.

The assessment is based on the "Logistics skills and competencies assessment toolkit",[5] developed in 2016 by Jean-François Arvis and Christina Wiederer of the World Bank's Global Trade Team in cooperation with researchers at the Kühne Logistics University Hamburg, Germany (Alan McKinnon, Kai Hoberg, and Christoph Flöthmann). The assessment for the Dominican Republic is a qualitative study based on qualitative research and on expert judgement applied on information from 37 interviews, which do not constitute a statistical representation of the sector. The study is still valid despite the interviewee sample not being representative as interviews were conducted with relevant representatives of the main stakeholders' groups, including business organizations, educational institutions, government and administration institutions, logistics service providers, shippers, professional associations, and recruitment agencies.

For this assessment, the functional boundary of logistics is widely drawn around activities related to the movement, storage and handling of goods and related information and communication technology (ICT). It includes supply chain management responsibilities but excludes employees whose focus is purchasing, production management or sales. The functional range is defined by the nature of the job rather than the type of business. It is not confined to the employees of logistics companies and includes staff performing

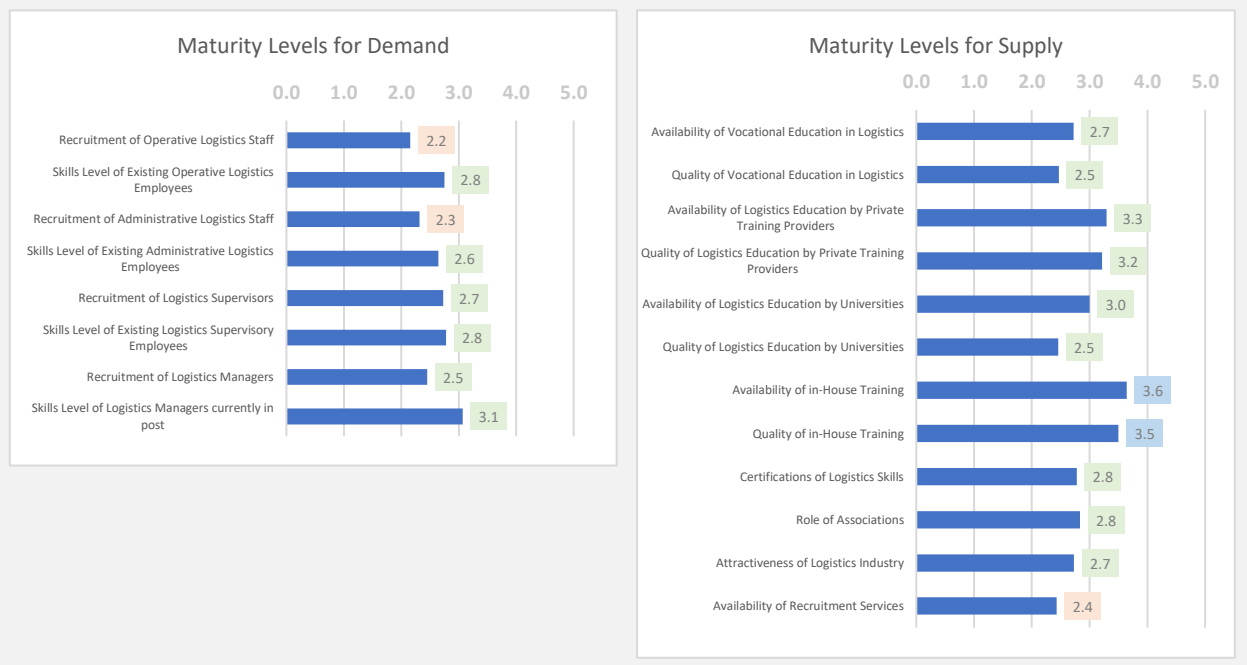
[3] (Toirac et al., n.d.)
[4] (FHI360, 2020)
[5] (The World Bank Group, Trade & Competitiveness Global Practice, Global Trade Team In Cooperation With Kühne Logistics University, 2016)

logistics tasks in the production and retail sectors. The study looks at demand, represented by the the number of personnel required and their required skill levels, and supply, represented by the number of people trained and the skills they possess when entering the sector, plus the share of people that actually stays in the sector, and covers skills both pre-employment and during employment.

Assessment Results

The scope of the assessment covers 20 distinct assessment areas for which a total of 37 interviews were completed. Scores and maturity levels were assigned based on the results of the interviews. Interviewees were selected prioritizing organizations that are representative for the industry and covering all the stakeholder groups and key actors that are relevant for logistics skills development in the country. Interviewees include senior company executives, logistics managers, HR managers and specialists, logistics and management professors, educational institutions faculty and staff, government officials, and chairs of business and professional associations. The results for the 20 areas covered by the assessment are summarized in Figure 1.

Figure 1: Assessment scores (maturity levels) for demand and supply assessment areas



Source: Assessment data

Main Results of Demand Assessment Areas

Recruitment of Operative Logistics Staff

The availability of qualified candidates for operative level positions is low for 55% of companies, particularly in more specialized roles. Most applicants lack required qualifications and many companies recruit recent graduates from universities and schools and rely on internal training to complete needed skills. Recruitment agencies are rarely used, and turnover rates vary, with high turnover among younger personnel seeking better opportunities.

Skills Level of Existing Operative Logistics Employees

Current staff has the necessary skills thanks to training that is provided by companies to all new hires. Specific job skills, such as shipping documentation and equipment operation, are often lacking in new hires. Weaknesses in basic math, critical thinking, and English proficiency were mentioned. If the right skills are missing can lead to errors, fines, security issues, and customer complaints.

Recruitment of Administrative Logistics Staff

Companies face a shortage of qualified candidates for administrative jobs, with 52% indicating low availability. While some candidates possess general skills, there is a lack of specialized logistics skills required for many positions. Job rotation is relatively low for 71% of companies, but ranges from 40% to 60% for 29%, mainly affecting younger personnel who are harder to retain.

Skills Level of Existing Administrative Logistics Employees

Existing staff has the necessary skills only after going through training. All companies train their new hires, mainly in the technical an operational aspects of the job. Lack of skills can have negative impacts like increase in costs, poor customer service, and fines from regulating institutions.

Recruitment of Logistics Supervisors

Availability of candidates with logistics qualifications is low for 43% of companies and 38% rely mainly on internal promotions to fill open jobs. Turnover is low, agencies are not widely used, and it can take from 30 days to up to 6 months to fill a job, depending on specific job requirements.

Skills Level of Existing Logistics Supervisory Employees

Supervisors' skills vary, 50% of interviewees say current incumbents have the necessary skills, acquired through company training and on-the-job experience. However, 25% feel that supervisors lack some essential skills required for the sector's current challenges, including technology and information systems knowledge, cargo safety, leadership, ability to work under pressure, process design and implementation, and critical thinking.

Recruitment of Logistics Managers

There is limited availability of logistics-qualified managers, but good supply of trainable general managers. Certain positions as commercial managers and traffic managers are hard to fill for most companies. Turnover is low and recruitment processes can be long, ranging from 2 to 6 months. Agencies are used by 67% of companies to recruit manager vacancies.

Skills Level of Logistics Managers currently in post

Most logistics managers have the required essential skills, but many lack knowledge in areas like technology, advanced logistics, and international regulations. Lack of skills can lead to significant negative impacts on customer service and costs. Training is provided for all new hires, but promotion opportunities are limited due to expats or company owners' family members occupying top positions.

Main results of Supply Assessment Areas

Pre-employment: Availability of Vocational Education in Logistics

There is a limited vocational education offer for logistics that mainly covers general logistics topics, but that does not provide a response to all the current needs of the sector. Vocational education together with logistics education by private training providers and universities (covered in the next two sections) constitutes pre-employment training, whereas in-house training covers on-the-job training.

Pre-employment: Quality of Vocational Education in Logistics

The quality of vocational education is qualified as good by 61% of interviewees, but 81% say current educational offer needs to be improved and mention having more specialized programs and better and more specialized trainers as key areas for improvement. There is lack of awareness on existing programs and more collaboration is needed between institutions and industry.

Pre-employment: Availability of Logistics Education by Private Training Providers

Training offer from private training providers has increased, with business associations playing an important role in training and skills development, but demand is growing faster than supply. There is limited offer from foreign providers in the country.

Pre-employment: Quality of Logistics Education by Private Training Providers

Private training providers are well accepted by the industry, but improvements can be made in having a more practical orientation and in having more focus on industry's best practices. Their offer is mostly of short courses with certificates of participation. Collaboration between private providers and business associations is good, but there is a need for more specialized trainers and better alignment with current job demands.

Pre-employment: Availability of Logistics Education by Universities

The educational offer for logistics careers from universities and colleges is limited, existing careers have comparatively lower demand and attracting students to them is a challenge. Many of the professionals in

the sector come from more general careers like industrial engineering and international commerce and receive logistics specific training on the job and through private training providers. Few receive specialized training abroad.

Pre-employment: Quality of Logistics Education by Universities

The limited offer of logistics programs in universities lead to companies hiring available graduates and providing them with training to complete needed skills. Collaboration between industry and universities exists, but more collaboration is needed on programs content improvement. No foreign universities are present in the country.

On-the-job: Availability of in-House Training

Between 50% to 80% of logistics training for employees is provided in house by companies. All new employees receive training and advanced training is regularly offered based on job needs. Main types of training offered are on basic logistics skills and technical training for operative and administrative levels, soft skills for supervisors and above, and training on country and company specific processes as per job requirements.

On-the-job: Quality of in-House Training

Companies use multiple sources to scope their in-house training, including job descriptions, skill gaps identified and company procedures, with 85% using external trainers. Main deficiencies and challenges cited include a limited availability of qualified trainers, capacity to train all required personnel in the required time, more focus needed on technical logistic skills, and adaptation of corporate training to cultural and local changes.

Certifications of Logistics Skills

Certification systems are widely accepted, with options available for aeronautics, secure commerce, ports, customs, and supply chain. Companies show interest in certifications, but the current offer is limited.

Role of Associations

There are 10 local associations with an interest in logistics, with overlapping activities and a need for overarching integration. Associations are involved in a good share of the training that is delivered by private training providers. There is no presence of international associations in the country.

Attractiveness of Logistics Industry

The logistics sector faces challenges in public perception but is gaining interest post-pandemic. Certain jobs are attractive, while others are seen as less appealing. Salary levels vary, and there is a discrepancy between qualifications and compensation at operational levels, where pay is generally considered low. However, logistics companies offer growth opportunities and careers. While attracting managers from other sectors is generally successful, some difficulties exist.

Availability of Recruitment Services

86% of companies outsource recruitment to external agencies, primarily for administrative, supervisory, and managerial positions. There are no specialized logistics agencies available. Interviewees lack knowledge of government recruitment for logistics jobs.

Assessment of Demand Findings

The logistics sector in the Dominican Republic is growing driven by the economic growth sustained by the country, as shown by a 10.2% growth in Gross Domestic Product between 2013 and 2022 and a compound annual rate growth of 4.0% in goods exports in the same period, its increasing participation in regional and global value chains through the attraction of nearshoring investment, and the strategic direction communicated by the government for the country to become a regional logistics hub.[6] Hence, there is also an increased staffing demand driven by the growth and expansion projects that companies in the logistics services and many relevant shippers are executing, with the biggest share of vacancies at the operative level (50% to 60%), and at the administrative level (30% to 40%).[7]

Against this, there is a shortage of candidates with adequate logistics skills in the market. 55% of interviewees indicate there is low or very low availability of qualified candidates for operative level positions, and 52% indicate availability is low or very low for administrative level positions, with the most specialized jobs difficult to find in the market. All companies mostly fill their staffing needs by recruiting unexperienced personnel with basic skills at lower operational and administrative levels and rely on their internal training programs to complete the specific skills required for each type of job.

All companies indicate it is difficult to find supervisors skilled and experienced in logistics in the market, and 38% of them have strategies to fill jobs at this level and above through internal development and promotions. 58% of respondents indicate availability of managers with logistics qualifications is low and there is strong competition for a limited market of experienced managers. 42% indicate there is good availability of candidates with good managerial skills that can be trained in the additional specific logistics skills needed.

Assessment of Supply Findings

Regarding the availability of the pre-employment educational offer for logistics, 45% of interviewees indicate that at the vocational level the offer is limited. The main offer comes from the governmental institution Instituto de Formación Técnico Profesional (INFOTEP) and several business associations that have

[6] Defined as specific objective 3.3.7 in the National Development Strategy, (National Development Strategy 2030, 2012)

[7] The assessment uses four main levels of logistics employment:

1. Operative logistics staff: employees who carry out basic operational tasks and do not have any staff responsibility.
2. Administrative logistics staff: employees who perform information-processing tasks and have limited supervisory or managerial responsibilities.
3. Logistics supervisors: Supervisors have frontline responsibility, controlling logistics operations on the ground rather than in the office.
4. Logistics managers: This category includes managerial staff, with higher-level decision-making responsibility.

developed programs that mainly cover basic logistics topics, but the offer does not provide a response to cover all the needs of the logistics sector. There is a technical high school program on logistics and transportation offered in several schools, but companies interviewed do not know it.

The (pre-employment) educational offer from universities and colleges is limited, as identified by 75% of interviewees. There are 5 universities and 2 colleges offering careers for logistics. Their offer includes 2 programs at a master's degree level, 8 at a bachelor's degree level, and 5 at the higher technical level. 4 of the institutions interviewed indicate logistics careers have comparatively lower demand and attracting students to them is a challenge. Many of the professionals in the sector come from careers like industrial engineering, business management, and international commerce, and obtain logistics specific training on the job and through internal training and private training providers. 46% of interviewees indicate the public still has a poor perception of the logistics sector as an employer or does not know the sector. But 50% indicate logistics is receiving attention and gaining interest from the public, especially after the Covid-19 pandemic.

There is little information on projections of skills demands for the logistics sector. The National Survey for the Detection of Skills and Qualifications Needs in Employment (ENDHACE) 2020, prepared by the National Bureau of Statistics[8] identified that vacancies reported by the companies in the transportation and warehousing economic activity group totaled 5,277 in 2020. In contrast, the number of graduates for that same year were 94 from the logistics careers offered by universities and colleges, and 411 from the 2 logistics technical high school programs, both of which seem low against vacancies reported by companies. The largest share of graduates from logistics programs came from INFOTEP with 10,930, but their vocational programs are mainly focused on general logistics, transportation, and warehousing subjects, and 73.2% of the graduates were on short certificate programs.

A simple projection based on the mix by occupations in that year yields a potential demand of 19,894 vacancies for operational jobs in a 5-year period, another 5,673 for administrative and technical jobs, and 818 for managerial positions. These numbers reflect potential challenges when contrasted with the quantities of graduates and enrolled students in the logistics careers and programs that are currently available. More than a challenge in meeting the quantities of talent demand, the challenge for the country appears to be able to generate sufficient specialized talent for logistics, with the right skills that are demanded by companies. This challenge requires attracting more students to existing professional and technical careers in logistics, and development of more specialized programs in advanced logistics subjects.

Reasons for current shortages

Several topics are mentioned by the stakeholders interviewed as reasons for the current shortage of logistics staff. 48% of interviewees see it as a result of a limited educational offer that is specialized for logistics, resulting from a lack of communication between business, education and government sectors regarding the talent and skill needs for logistics in the country, and combined with lack of interest from students in logistics careers and in the sector as an employment destination. 40% indicate it is driven by

[8] (DR National Statistics Office (ONE) & Ministry of Economy, Planning and Development (MEPyD), 2020

the fact that the sector is experimenting rapid growth, but the country did not prepare with adequate strategies, policies, and resources to support the growth, especially with regards to the identification of staffing and skills needed to support it. 12% mention that until recently, many companies followed a practice of hiring unskilled personnel and keeping pay at low levels, as one of the key reasons for current shortages.

The following key issues and challenges were identified a a result of the assessment, which need to be addressed to improve both the availability of qualified staff and the skills for logistics:

- Current educational supply is not aligned with the talent and skill demands of the logistics sector in both training on the right skills that are required by companies, and in providing the quantities of skilled staff that are demanded by a sector that is growing. The available educational offer is focused on basic technical and operational aspects of logistics.

- Specific careers and programs for logistics are offered at different educational levels, but those programs have not been able to attract a relatively good volume of students. Traditional careers like industrial engineering, business administration, and international commerce, continue to be the main feeders of talent for logistics jobs.

- There is a need to improve and expand the offer of specialized logistics training at the professional, technical, and vocational levels. Private providers are trying to address current identified gaps, but more programs are needed that can be implemented through existing educational institutions like INFOTEP, and through existing universities, colleges, and schools.

- There is a misalignment between the level of qualifications that the sector is demanding and prevalent payment structures in the logistics sector. This seems to be more evident in entry level jobs at the operative and administrative groups, where companies have traditionally followed an approach of paying at the lowest market salary levels to maintain low costs in a low margins competitive market.

- The perception of the logistics sector as a key sector for the country and the opportunities it can provide needs to be improved, to make it more attractive as a career destination. The public needs to be better educated on the types of jobs and career development the sector can offer.

- Communication and collaboration between business, academia, and government to address skill needs for logistics is happening, but efforts in that direction are highly disaggregated and are not effective in responding to all the needs of the sector. A broader and more structured collaboration is needed that can address sector wide issues and challenges.

Recommendations

To address these challenges and correct the skills shortages multiple actions are identified as part of the assessment, that are summarized in the following recommendations:

Recommendation 1

Expand and improve the educational offer of specialized programs for logistics through increased dialogue between companies and education providers, prioritizing specialized technical and vocational education, and development of new specialization programs for logistics to respond to job and skills demands of the companies.

Short-Term Actions

1. Develop short cycle post-secondary programs for operational training, using both the polytechnic schools and INFOTEP, as an expanded vocational training offer for logistics.
2. Expand the existing technical high school program on logistics and transportation to a wider number of polytechnic schools, targeting those that are in the areas that concentrate clusters of logistics activities and service providers.
3. Develop a basic technical program with INFOTEP for a logistics operator or basic technician in logistics, which covers the basic competencies for entry level positions at the operational and administrative levels.
4. Develop a logistics concentration or certification with universities, to be implemented as part of current careers that can feed professionals for the sector like industrial engineering, international commerce, business administration, and similar ones that can be identified.

Mid- and Long-Term Actions

5. Develop masters' degree and specialization degree level programs for logistics with universities, based on the feedback from companies on which are the specific areas in which they are demanding more professional specialization.
6. Create a program to train and validate the competencies of government employees that have inspection roles for cargo entering and leaving the country, and that are working for the implementation of the Joint Inspection Protocol.
7. Co-creation of logistics training centers and academies through public-private partnerships that can focus on the development of a specialized educational offer for logistics, covering the areas and topics that are identified by companies as not covered in current educational offer available in the country.

Recommendation 2

Integration of government, academia and business sector in an alliance to collaborate in the execution of a strategy to address major challenges to improve education and availability of qualified staff for logistics in the country, with the key ones being: better identification of the type of talent and skills demanded by the logistics sector, changes in regulatory framework that can support alignment and faster responses

from government and the formal education system to the needs of the sector, and identification of resources needed to support the development and specialization of programs.

Short-Term Actions

1. Establish a formal alliance with a supporting structure and adequate funding to enhance education and the availability of skilled talent. One proposed approach is to create a Task Force as part of the Commerce Facilitation Committee that focus on addressing transversal issues such as developing a comprehensive strategy for skills development, identifying and prioritizing the sector's skill requirements, attracting students to logistics careers, and promoting the logistics sector.

2. Execute a prospective study for better identification of the type of talent and skills that are demanded by the logistics sector and the staffing volumes that the industry will be needing to fill.

Mid- and Long-Term Actions

3. Identify changes in regulatory framework that can support alignment and faster responses from government and the formal education system to the needs of the sector, including the finalization and implementation of professional profiles for the logistics and transportation family within the National Qualification Framework.

4. Establish a program of educational grants to support talented and lower income students to follow careers in logistics, both locally and in international universities.

Recommendation 3

Improve the public perception of logistics as a key strategic sector for the country and as an attractive employment destination, and promote the careers that are offered to feed the sector to attract more students to logistics programs.

Short-Term Actions

1. Execute a promotional campaign through multiple media to improve knowledge in the public about the logistics sector in the country.

2. Increase contacts between students, schools, and the logistics sector, through execution of programs to visit ports, airports, logistics parks, and similar places that can serve as showcase to students of typical logistics activities, participation of logistics companies and associations in student fairs, and other similar activities to motivate and attract talent.

3. Bring universities, colleges and polytechnic schools that have logistics programs together with logistic companies and business associations, to develop internship programs for the students of those academic institutions, and to create candidate databases from their graduates, which can be used as a source for recruitment by logistic companies.

Recommendation 4

Continue to develop the sector, its companies, and logistics professionals, through improvement of processes, adoption of information technologies and digitalization, to make the sector more attractive, and achieve better alignment between occupational qualifications and payment structures.

Short-Term Actions

1. Bring together the logistics business sector, academia, and government to implement initiatives to support the development and continuous upgrading of logistics services in the country, through benchmarking and sharing of best practices, encouraging implementation of latest technologies, fostering international networking and transfer of know-how from global markets, and similar initiatives that can help the development of local companies and professionals.

2. Encourage international logistics associations to establish local chapters in the country to allow engagement and participation of local logistics professionals in the networking, training, and professional development activities that these types of organizations promote.

Mid and Long-Term Actions

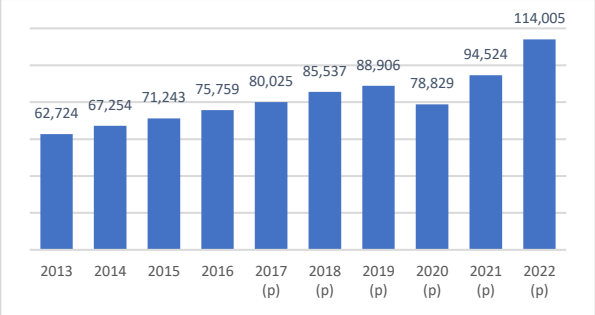
3. Encourage a better alignment between compensation structures and the skills and qualification levels that the sector is demanding at its different occupational groups, to ensure the attraction and retention of skilled talent to support the development and growth of the logistics sector in the country, as part of the strategy to turn the Dominican Republic into a regional logistics hub.

2 CONTEXT

2.1 OVERVIEW OF THE LOGISTICS SECTOR IN THE COUNTRY

The Dominican Republic has shown good economic performance during the last decade. The country's exports of goods grew at a compound annual rate of 4.0% between 2013 and 2022, and in that same period, the country obtained a 10.2% annual growth in the Gross Domestic Product.

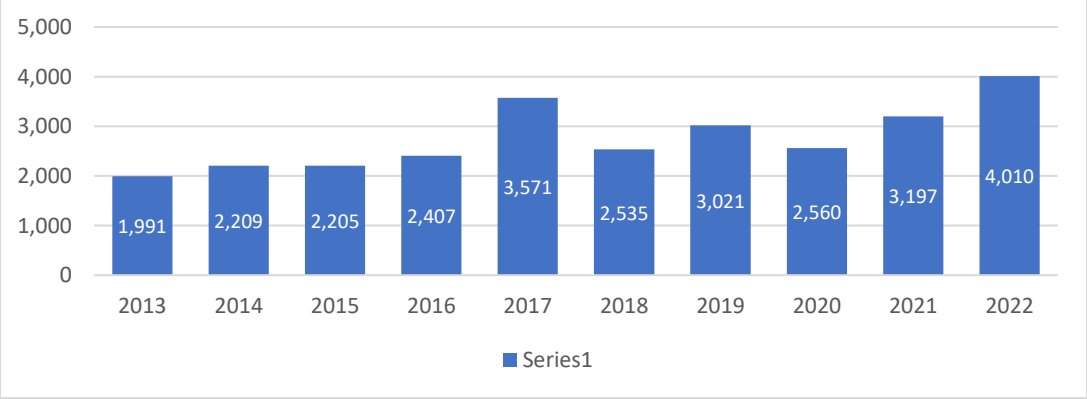
Figure 2: Dominican Republic GDP 2013-2022 (in US$ million)



Source: Dominican Republic Central Bank Statistics

Foreign direct investment (FDI) plays an important role for the country, and the Dominican Republic is a key recipient of FDI in the Caribbean and Central America, receiving US$ 4,010 millions of FDI in 2021, the largest inflow of foreign investment in the last 10 years.

Figure 3: DR Foreign Direct Investment



Source: Dominican Republic Central Bank Statistics

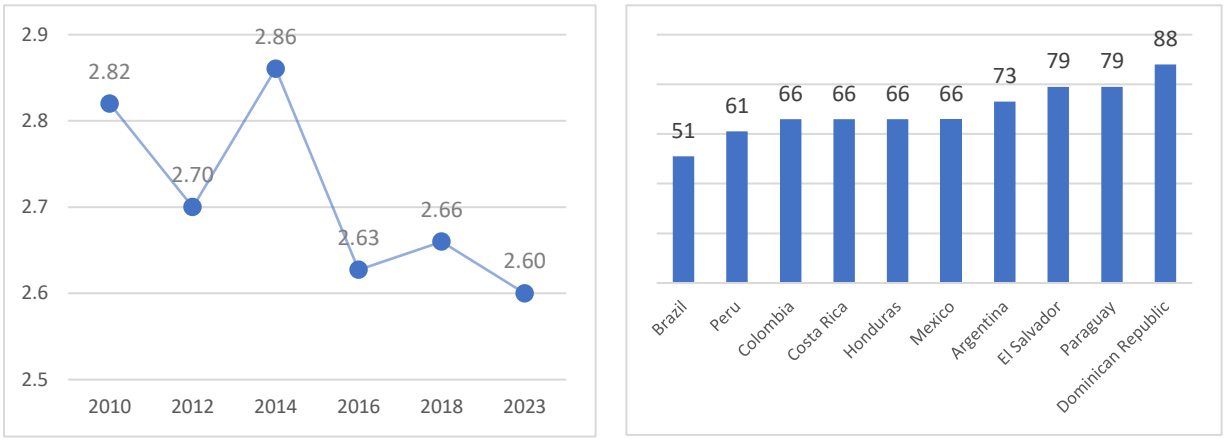
Logistics is an important element for the development and growth plans of the Dominican Republic with a direct impact on its domestic and international trade. The country has good logistics infrastructure and an advantageous geographic location close to large consumer markets such as the United States, which

offer the country an advantageous position compared to other countries in the LAC region as a strategic point of logistics distribution.

The logistics Infrastructure of the country is composed of 12 commercial ports, 8 international airports, of which, according to the latest Statistical Report on Air Transport of the Dominican Republic 2020 published by the JAC[9], 7 conduct commercial air operations on an international scale, 6 domestic aerodromes and 4 border points.[10]

In the World Bank's 2023 Logistics Performance Index (LPI) the Dominican Republic scored 2.6 on a scale from 1 to 5 and was ranked 88 out of 139 scored countries in the global ranking, which also places the country in the 10th place among countries in the Latin America and Caribbean group (excluding high income countries), in which the top ranked countries are Brazil (51), Peru (61), Colombia (66) Costa Rica (66) Honduras (66) and Mexico (66).[11]

Figure 4: Logistics Performance Index (LPI)– Dominican Republic (left) and comparators in LAC (2023)



Source: Logistics Performance Index (LPI), The World Bank

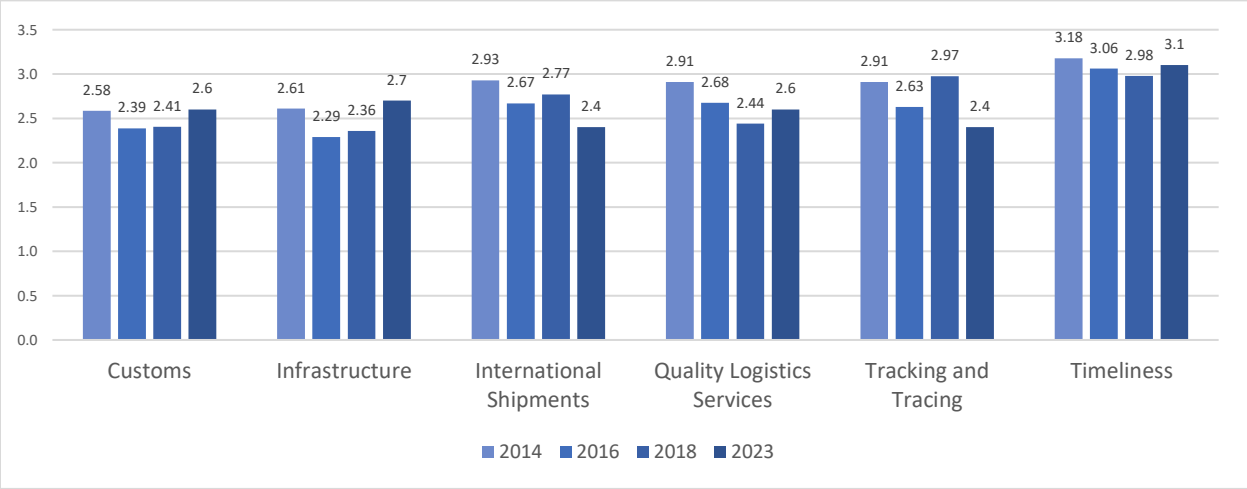
The logistics performance of the Dominican Republic has decreased since the 2014 report when the country achieved its highest score of 2.86 and its best position in the global ranking at 69. From 2014 to 2023 the LPI score has decreased 9.6% to 2.6 and the country dropped 19 positions in the global ranking. In that period the changes in the performance of the individual components that make up the aggregated score of the country were as follows:

- The ability to track and trace consignments decreased by 20.6%, from 2.91 to 2.4, and the country dropped 33 positions in the ranking, from 72 to 105.
- The ease of arranging competitively priced shipments decreased by 18.7%, from 2.93 to 2.4, and dropped 40 positions in the ranking, from 71 to 111.

[9] (Statistics Section of the Civil Aviation Board, 2020)
[10] (Toirac et al., n.d.)
[11] (World Bank Group, n.d.)

- The competence and quality of logistics services decreased by 11.4%, from 2.91 to 2.6, and dropped 27 positions in the ranking, from 65, which was the highest ranked element for the country in 2014, to a ranking of 92 in 2023.
- The frequency with which shipments reach consignees within scheduled or expected delivery times decreased 2.6%, from 3.18 to 3.1, but remains the component where the country has the highest score, and maintained the same ranking at 76.
- The efficiency of customs and border management clearance had a minor increase of 0.6%, from 2.58 to 2.6, and moved up 6 positions in the ranking, from 80 to 74.
- The quality of trade and transport infrastructure increased 3.4% from 2.61 to 2.7, and moved up 5 positions in the ranking, from 73 to 68, placing it as the highest ranked element for the country.

Figure 5: Logistics Performance Index Scores by Components – Dominican Republic 2014 to 2023



Source: Logistics Performance Index (LPI), The World Bank

These results reflect that the country needs to continue to improve its logistics performance to be able to support its objectives of making logistics an important element for the country's development and growth plans, and of turning the country into a logistic hub in the region. Development of specific skills that can meet the needs of the logistics industry has to be a fundamental component of the strategies and actions the country needs to execute to be able improve its logistics performance and the competitiveness of its logistics sector.

Ports

The infrastructure of ports in the Dominican Republic is listed in the following table, as per the Dominican Republic National Logistics Report, 2021 -RESLRD.

Table 1: Ports in Dominican Republic

Ports in the Dominican Republic	
Port of Santo Domingo	Administered by Sansouci and located in the province of Santo Domingo on the Ozama River. It handles general, containerized, liquid and solid cargo, has a cargo storage area of +180,000 m2, of which 20,000m2 is certified under the Logistics Center regime for vehicle transshipment operations.
Haina River Port	Managed under the port operating company Haina International Terminal (HIT), it is located at the mouth of the Haina River. It is currently the busiest port in the city of Santo Domingo. It handles all types of loads and has +70,000 m2 for unloading, storage and dispatch of cargo, of which 9,700 m2 are roofed warehouses to store loose cargo.
Caucedo Multimodal Port	Managed under the company DP World, it is located in Punta Caucedo, 25km from Santo Domingo in Boca Chica, a short distance from Las Americas International Airport. It is considered the youngest and most modern port in the country and one of the most important, handles loose and containerized general cargo, has warehouses under free zone regimes continuous to the docks, as well as, due to its multipurpose dock, it allows to receive RoRo type ships.
Port of Boca Chica	Managed by the Dominican Port Authority (APORDOM), it is located 20 miles east of the city of Santo Domingo and 5 miles east of Las Americas International Airport, and is mainly responsible for the handling of containers, general cargo, liquids, trailers, some wood, and paper by-products. Has an enclosed area of approximately 8,400 m2 for the storage of general cargo.
Port of San Pedro de Macorís	Managed by the Dominican Port Authority (APORDOM) and located at the mouth of the Higuamo River, 70 km east of the city of Santo Domingo, it handles mainly bulk cargo, cement, sugar and molasses, and fertilizers.
La Romana Port	Administered by Central Romana, it is located at the mouth of the Chavon River. It consists of two docks: a commercial pier and a tourist pier for the arrival of cruise ships in the country. As a commercial dock, it is responsible for the export and import of general cargo, sugar and molasses, steel, wood, fuel, and containerized cargo.
Port of Manzanillo	Located in the Bay of Montecristi, the Port of Manzanillo is the deepest in the Dominican Republic. The port does not have a warehouse within the facilities and is one of the ports with the lowest movement of maritime transport. It handles refrigerated container cargo, general cargo, and dry bulk cargo.
Port of Puerto Plata	Administered by the Port Authority of the Dominican Republic (APORDOM), it is located on the north coast of the country and is the third most important port in the Republic. It handles bulk, general, containerized, and liquid fuel cargo, and is the only one in the area in the movement of these types of cargo.
Arroyo Barril Port	Located in the Bay of Samana, the port is not currently offering its commercial maritime transport services.

Ports in the Dominican Republic	
Cabo Rojo Port	Managed by the company Cementos Andino and located a short distance from the river of Pedernales, is responsible for the export of bulk cargo and minerals such as limestone, bauxite, clinker, and cement. Its facilities allow the reception of self-unloading vessels.
Port of Barahona	Managed by the Port Authority of the Dominican Republic (APORDOM), located in the province of Barahona and recently remodeled based on APORDOM's strategic plan, it handles containerized cargo, mineral product cargo and bulk sugar cargo.
Port of Azua	Administered by the Port Authority of the Dominican Republic (APORDOM), located 15 km southwest of the city of Azua. It does not handle containerized cargo, but it conducts commercial operations with liquid and dry bulk cargo, and liquefied petroleum gas.

Source: Dominican Republic National Logistics Report, 2021 -RESLRD

Airports

The infrastructure of international airports in the Dominican Republic is listed in the following table, as per the Dominican Republic National Logistics Report, 2021 -RESLRD.

Table 2: Airports in Dominican Republic

Dominican Republic airport information	
Punta Cana International Airport	Operated by Corporación Aeroportuaria del Este S.A, is located 40 km northwest of the city of Higüey, has 4 runways of 3,100 x 45 meters each, 2 terminals and 12 taxiways. The airport's cargo center contains 400 m2 of cold chambers with temperatures between 0°and 15°C for exports.
Las Americas International Airport, Dr. José Francisco Peña Gómez	Operated by Aeropuertos Dominicanos Siglo XXI S.A, is located on Punta Caucedo, has 2 runways of 3,354 x 60 meters each and 9 taxiways.
Cibao International Airport, Santiago	Operated by Cibao International Airport and located in Licey, Santiago. It has 2 runways of 2,590 x 45 meters and 2,620 x 45 meters respectively, and 1 taxiway.
Gregorio Luperón International Airport, Puerto Plata	Operated by Aeropuertos Dominicanos Siglo XXI S.A, is located 16 km east of the city of Puerto Plata, has 2 runways of 3,081 x 46 meters each and 3 taxiways.
La Romana International Airport	Operated by Central Romana Corporation LTD, located in Casa de Campo, La Romana, has 2 runways of 2,950 x 45 meters and 1 taxiway.
Juan Bosch International Airport, El Catey, Samaná	Operated by Aeropuertos Dominicanos Siglo XXI S.A, located on the Nagua - Sánchez highway in Samana. Has 2 runways of 2,900 x 45 meters and 3,000 x 45 meters respectively and 1 taxiway.
La Isabela International Airport, Dr. Joaquin Balaguer, El Higüero	Operated by Aeropuertos Dominicanos Siglo XXI S.A, is located in Higüero. Has 2 runways of 1,659 x 30 meters each and 4 taxiways.
Maria Montez International Airport, Barahona	Operated by Aeropuertos Dominicanos Siglo XXI S.A, has 2 runways of 3,000 x 45 meters each, 1 taxiway and 1 terminal of 2,656 m2.

Source: Dominican Republic National Logistics Report, 2021 -RESLRD

Profile of logistics companies

Logistics is a transversal activity that impacts many sectors and companies, including companies directly involved in providing logistic and transportation related services, as well as companies that provide other types of products and services but use logistics as part of their relevant activities, like those involved in export, import and distribution activities.

The Directory of Enterprises and Establishments (DEE) 2021, from the National Statistics Office (ONE) [12] provides statistical information on the companies that are formally registered in the Dominican Republic, and for 2021 the total number of companies and establishments was 109,293, which can be seen classified by economic activity sections in Table 3. Only a portion of those companies will be demanding logistics skills due to its activities. The companies that provide logistics and transportation related services are classified under the Transport and storage activity section, which lists 3,476 companies, representing 3.2% of the total number of companies and establishments. These companies can be seen as demanding logistics skills, although a total of 2,681 of them are classified as micro enterprises, which means they are composed of individuals and companies with 10 or less employees and may have only basic logistics activities.

Table 3: Number of companies by employment range, according to economic activity section, 2021

Economic activity section	1 to 10 employees	11 to 50 employees	51 to 150 employees	151 employees or more	Overall total	%
Artistic, entertainment and recreational activities	1,291	397	124	72	1,884	1.7%
Accommodation and meal service activities	5,721	1,348	259	178	7,506	6.9%
Human health care and social assistance activities	4,583	561	138	101	5,383	4.9%
Activities of households as employers; non-differentiated activities of households as producers of goods and services	70	7	2		79	0.1%
Activities of extraterritorial organizations and bodies	72	17	1	1	91	0.1%
Administrative and support services activities	2,522	535	172	130	3,359	3.1%
Financial and insurance activities	3,139	641	126	85	3,991	3.7%
Real estate activities	5,174	492	50	11	5,727	5.2%
Professional, scientific and technical activities	9,991	1,077	123	45	11,236	10.3%
Public administration and defense; Compulsory social security schemes	77	184	144	196	601	0.5%
Agriculture, livestock, forestry and fisheries	1,765	377	86	35	2,263	2.1%
Wholesale and retail trade; Repair of motor vehicles and motorcycles	29,766	5,471	658	182	36,077	33.0%
Construction	6,375	843	124	54	7,396	6.8%
Teaching	1,442	686	104	40	2,272	2.1%
Mining and quarrying	58	25	12	4	99	0.1%

[12] (DR National Statistics Office (ONE), 2022)

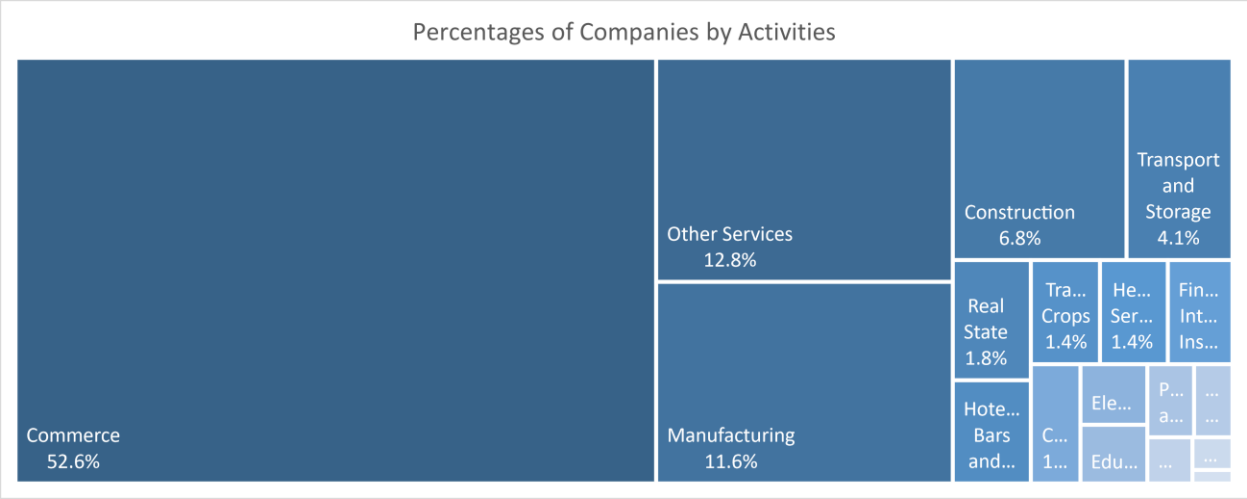
Manufacturing	5,716	1,712	409	343	8,180	7.5%
Information and communications	1,895	319	59	33	2,306	2.1%
Other service activities	5,715	1,037	133	55	6,940	6.3%
Water supply; wastewater disposal, waste management and decontamination	196	49	15	12	272	0.2%
Electricity, gas, steam and air conditioning supply	112	22	11	10	155	0.1%
Transport and storage	2,681	641	117	37	3,476	3.2%
Totales	**88,361**	**16,441**	**2,867**	**1,624**	**109,293**	

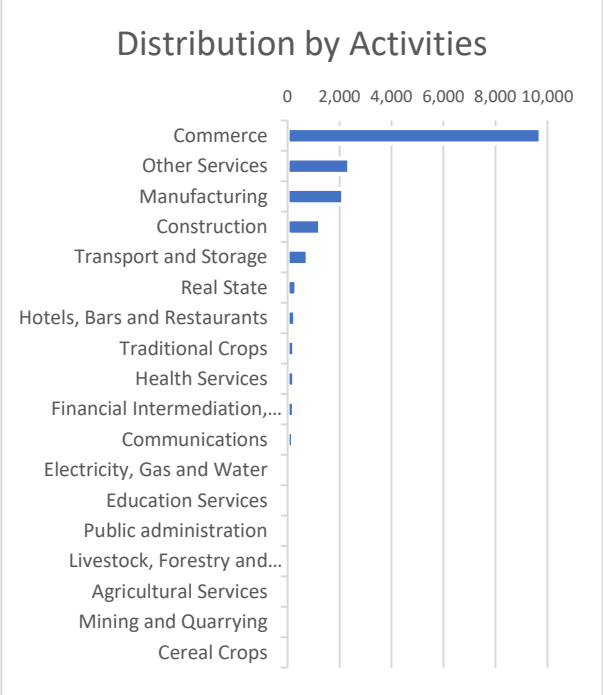
Source: National Statistics Office

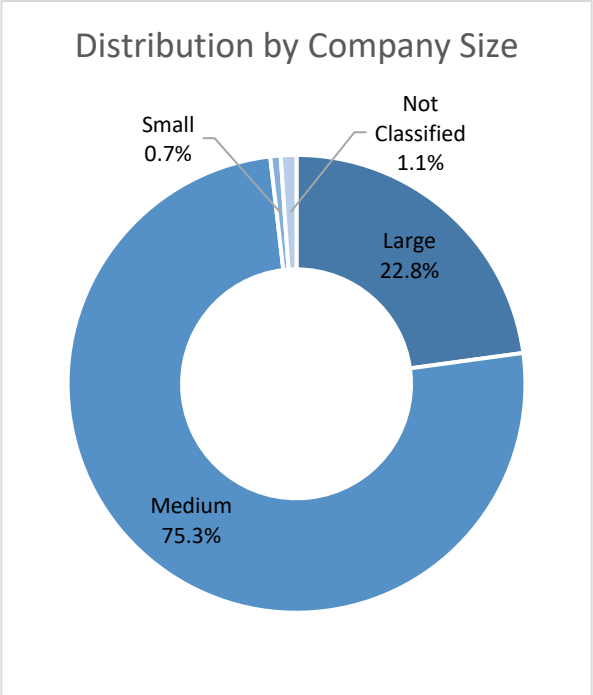
The list of companies that are having import and export activities provides another approach for an estimate of companies that demand logistics skills, as it represents a significant share of companies involved in logistics, export, import and commerce activities. From the DR Customs Agency Database of importers and exporters, a total of 18,507 appear registered for the year 2022, taking into consideration only legal entities and excluding physical persons also listed in the database. From this number, 4,228 are large companies, representing 22.8% of the total, and 13,939 are medium size companies, representing 75.3% of totals. Commerce represents the largest activity group with 52.6% of companies, followed by Other Services with 12.8%, Manufacturing with 11.6%, Construction with 6.8%, and Transport and Storage with 4.1%.

Figure 6: Exporters and Importers by Activity and Company Size (excluding physical persons)

Activity	Large	Medium	Small	Not Classified	Total	%
Commerce	1,892	7,741	80	28	9,741	52.6%
Other Services	407	1,840	13	116	2,376	12.8%
Manufacturing	777	1,338	18	5	2,138	11.6%
Construction	228	1,018	7	2	1,255	6.8%
Transport and Storage	191	568	4	3	766	4.1%
Real State	64	267	3	1	335	1.8%
Hotels, Bars and Restaurants	141	144	3	0	288	1.6%
Traditional Crops	61	194	1	0	256	1.4%
Health Services	66	185	1	0	252	1.4%
Financial Intermediation, Insurance and Others	103	134	3	1	241	1.3%
Communications	84	126		1	211	1.1%
Electricity, Gas and Water	54	88	1	2	145	0.8%
Education Services	47	87		6	140	0.8%
Public administration	34	50		38	122	0.7%
Livestock, Forestry and Fisheries	39	61		1	101	0.5%
Agricultural Services	14	59		1	74	0.4%
Mining and Quarrying	19	28		0	47	0.3%
Cereal Crops	7	11	1	0	19	0.1%
Total	**4,228**	**13,939**	**135**	**205**	**18,507**	





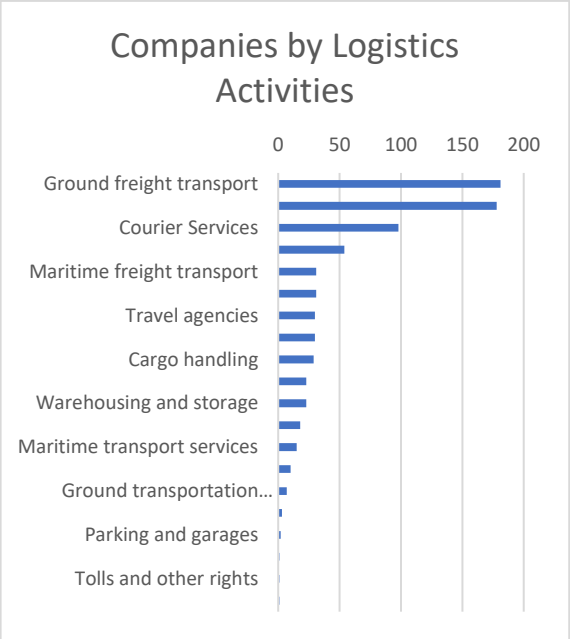


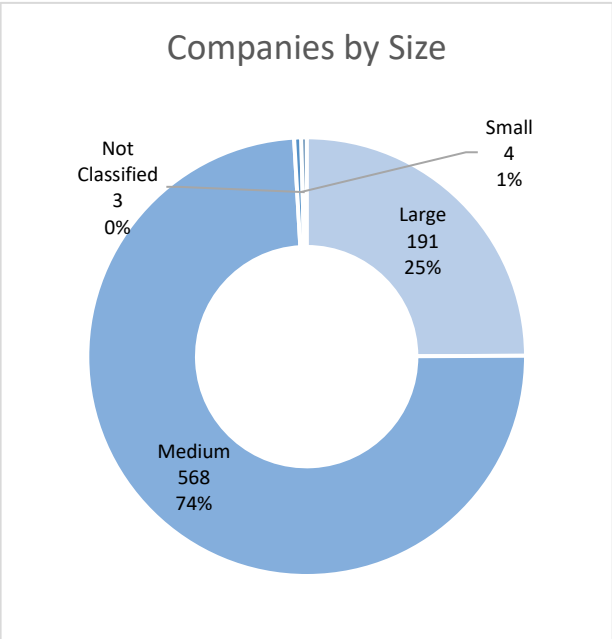
Source: Data from DR Customs Agency

The transport and storage activity group in the list of importers and exporters has a total of 766 companies, of which 191 are large companies, representing 25% of total, and 568 are medium size companies, representing 74% of the total. Small companies represent less than 1% of total. The breakdown of this group by activities shows 181 companies under Ground freight transport (23.6%), 178 for Logistic Services (23.2%), 98 for Courier Services (12.8%), 54 for Tourism Services (7.0%), 31 for Maritime freight transport (4.0%), and 31 for Ground passenger transportation (4.0%), 30 for Travel agencies (3.9%), 30 for Air passenger transport (3.9%), as the top activities by number of companies.

Figure 7: Breakdown of Transport and Storage Group by Activity

Actividad	Large	Medium	Small	Not Classified	Total	%
Ground freight transport	36	143	1	1	181	23.6%
Logistic Services	20	157	1		178	23.2%
Courier Services	20	77		1	98	12.8%
Tourism Services	22	32			54	7.0%
Maritime freight transport	5	26			31	4.0%
Ground passenger transportation	9	22			31	4.0%
Travel agencies	11	19			30	3.9%
Air passenger transport	18	12			30	3.9%
Cargo handling	6	23			29	3.8%
Customs Brokers	4	19			23	3.0%
Warehousing and storage	11	11	1		23	3.0%
Air transport services	12	5	1		18	2.3%
Maritime transport services	8	6		1	15	2.0%
Air freight transport	3	7			10	1.3%
Ground transportation services	2	5			7	0.9%
Airline representatives	1	2			3	0.4%
Parking and garages	1	1			2	0.3%
Port rights	1				1	0.1%
Tolls and other rights	0	1			1	0.1%
Passenger rail transport	1				1	0.1%
Total	**191**	**568**	**4**	**3**	**766**	





Source: Data from DR Customs Agency

2.2 RELEVANT ACTORS FOR SKILLS, COMPETENCIES AND TRAINING

There are multiple institutions and organizations that have an interest in logistics in the country, which include government institutions with policymaking and regulation roles for logistics, government institutions from the education sector, public and private education providers, and business associations. A good number of them are involved in skills development for the sector and many of these institutions and organizations are executing their own strategies and actions to address skills development challenges. There is also a lot of redundancy and overlapping in roles and activities among institutions, and inter-institution coordination is not perceived as a strength in the country, which reduces the overall effectiveness of actions, especially when trying to address structural and sector wide problems.

The main organizations and institutions that are currently involved in education and training for logistics are described in the following sections.

Government and administration - Education

The educational system of the Dominican Republic is governed by the Organic Law of Education (Law 6697) that establishes the educational structure through which the offer of recognized programs of education and training for work is provided. This offer is carried out within the framework of three laws independent of each other and through the institutions defined in them, which are described below.

Ministry of Education - MINERD (General Education Law 66-97).

Government institution in charge of planning, managing, and executing the country's education system, as well as administrating public schools and supervising private centers.

Ministry of Higher Education, Science and Technology - MESCYT (Law 139-01).

Its mission is to promote, regulate, advise, and administer the National System of Higher Education, Science and Technology, establishing policies, strategies and programs aimed at developing the sectors that contribute to the economic competitiveness and the sustainable human development of the country.

National Institute of Vocational Technical Training - INFOTEP (Law 116-80).

Public institution that provides technical and vocational training programs to prepare individuals for the workforce and improve their employability.

National Qualifications Framework

In addition to these legal and institutional frameworks, the National Qualifications Framework of the Dominican Republic (MNC-RD) is currently in process of approval in Congress. The National Qualifications Framework of the Dominican Republic will be the nationally recognized structure, which will standardize qualifications and associated competences based on a set of technical criteria contained in descriptors, to guide training, classify occupations and positions for employment, and facilitate the mobility of people at different levels, according to the dynamics of the labor market.

The National Catalogue of Qualifications is a fundamental component for the creation of the National Qualifications Framework as a guiding and referential instrument that allows the standardization of competencies required in the labor market, organized in families. This instrument is under construction under the coordination of the Vice-Ministry of Monitoring and Coordination of the Ministry of the Presidency. One of the occupational families addressed as part of its construction is the Professional Family of Transport and Logistics (TRAL).

Government and administration – Transportation and Logistics

The activities related to transport and logistics in the Dominican Republic are regulated by the public institutions described below.

Customs

General Directorate of Customs (DGA): a dependency of the Ministry of Finance of the Dominican Republic, whose mission is to facilitate legitimate trade and protect society, promoting collections and transparency.

Ground transportation

National Institute of Transit and Land Transport (INTRANT): the national governing body of the mobility, land transport, transit and road safety system of the Dominican Republic, attached to the Ministry of Public Works and Communications.

Air transport

Civil Aviation Board of the Dominican Republic (JAC): establishes the superior policy of civil aviation and regulates its economic aspects, applying rules and regulations in the areas of its competence.

Dominican Institute of Civil Aviation (IDAC): supervises and controls civil aviation in the Dominican Republic, except for the powers conferred by law to the JAC, and is responsible for the effective application of the regulations, orders, norms, and rules that are within its competence.

Shipping

Dominican Port Authority (APORDOM): regulates the National Port System; its task is to direct and manage seaports and increase the country's international trade.

Continuous flow transport

Ministry of Energy and Mines (MEM): formulates and administers policies for the responsible and sustainable development of the energy sector and national metallic and non-metallic mining. Among its functions is to regulate gas pipelines.

Universities and colleges

A total of 9 universities and colleges are identified that offer careers for logistics in the country at bachelor's degree, master's degree, higher technical, and certificate academic levels. The universities identified are:

- Academia Superior de Ciencias Aeronáuticas (ASCA)
- Instituto Técnico Superior Comunitario (ITSC)
- Instituto Tecnológico de Santo Domingo (INTEC)
- Pontificia Universidad Católica Madre y Maestra (PUCMM)
- Universidad APEC (UNAPEC)
- Universidad Autónoma de Santo Domingo (UASD)
- Universidad del Caribe (UNICARIBE)
- Universidad del Instituto Cultural Domínico Americano (UNICDA)
- Universidad Iberoamericana (UNIBE)

Technical and vocational education

The largest offer of technical and vocational education in the country is provided by the National Institute of Vocational Technical Training (Instituto de Formación Técnico Profesional - INFOTEP), which is a public institution that provides technical and vocational training programs to prepare individuals for the workforce and improve their employability. INFOTEP works in collaboration with other government agencies, private companies, and international organizations to design and implement training programs to meet the needs of the labor market.

Technical education is also offered through the technical high schools and polytechnic schools in the country, which provide technical bachelor programs as part of upper secondary education within the educational system of the Dominican Republic. For the 2020-2021 school year, three technical high school programs were delivered: Logistics and Transport, Vehicle Electromechanics and Aircraft Maintenance in 35 educational centers nationwide. The total enrollment registered in these programs was 3,023 students, according to data from Diagnostic Report with Prospective Approach, Professional Family Transport and Logistics (TRAL) prepared by the Directorate of National Coordination Framework of Qualifications, Vice Ministry of Monitoring and Government Coordination of the Ministry of the Presidency.[13]

[13] (Pérez, 2022)

Business associations

There are business associations and trade bodies in the country that have an interest in logistics. Each association represents a particular segment within the sector and deals with issues related to the group of companies and activity segments they represent. An area of focus of these associations has been in training, mainly coordinating needs from the companies they represent, and in offering a good share of the logistics specific training that is delivered by private training providers.

Relevant business associations and trade bodies identified are:

- American Chamber of Commerce of the Dominican Republic (AMCHAMDR).
- Association of Industries of the Dominican Republic (AIRD).
- Association of Shipowners of the Dominican Republic (ANRD).
- Commerce Facilitation Committee.
- Dominican Association of Customs Brokers (ADAA).
- Dominican Association of Exporters (ADOEXPO).
- Dominican Association of Free Zones (ADOZONA).
- Dominican Association of Freight Forwarders and Logistics Operators (ADACAM).
- Dominican Association of Logistics Centers and Operators (ASOLOGIC).
- Dominican Republic Logistics Cluster (CLRD).

2.3 MAPPING OF EXISTING SKILLS DEVELOPMENT PROGRAMS

Mapping of educational programs available for logistics

A mapping was performed to identify all the educational programs that are offered for logistics in the country. This mapping includes programs that are specialized for logistics, like a bachelor's degree in transportation and logistics engineering; programs were logistics is a key subject, like international business or supply chain programs; programs that cover elements of logistics, like port management, aeronautics, customs management; and programs that are offered by educational institutions specialized in logistics, like those offered by logistics business associations and other institutions focusing on logistics education.

The mapping identified a total of 83 programs that are currently offered for logistics, with the largest offer coming from private training providers with 29, although this is and offer that changes frequently and represents what could be identified at the moment the mapping was executed. From the formal education system in the country, 16 programs are offered by universities and colleges, 3 are logistics degrees, 6 are degrees in international commerce, or in industrial engineering with logistics minors[14] (many companies are recruiting graduates from these careers to fill logistics jobs), 5 are higher technical degrees, and 2 are post graduate degrees. These institutions are also offering 13 certificates and courses in supply chain and logistics.

For the upper secondary education level there are 2 programs offered under the technical high school format that belong to the Professional Family of Transportation and Logistics (TRAL). These are the Technical Bachelor in Logistics and Transport, and the Technical Bachelor in Aircraft Maintenance. Vocational education is offered by the Institute of Vocational Technical Training (INFOTEP), which offers 23 programs related to the TRAL family as part of their current available offer. These programs cover vocational and technical training for areas like inventory and supply control, cranes and material handling equipment operation, transportation services, and mobile agricultural and forestry machinery operators.

Table 4: Educational programs available for logistics by types of degrees and institutions

Type of logistics education	University	College	Polytechnic school	Vocational institution	Private training provider	Total
Masters in supply chain	2					2
Logistics degrees	3					3
Industrial engineering with logistics or supply chain minors	3					3
International commerce degrees	3					3
Logistics technical programs	3	2	2	2		9
Certificates and courses in supply chain and logistics	3	10		21	29	63
Total	17	12	2	23	29	83

[14] Current degree structure in the educational system does not include minors, but universities offer specializations or orientations within certain careers through elective subjects and issue a certificate to students that complete them.

Source: Assessment data

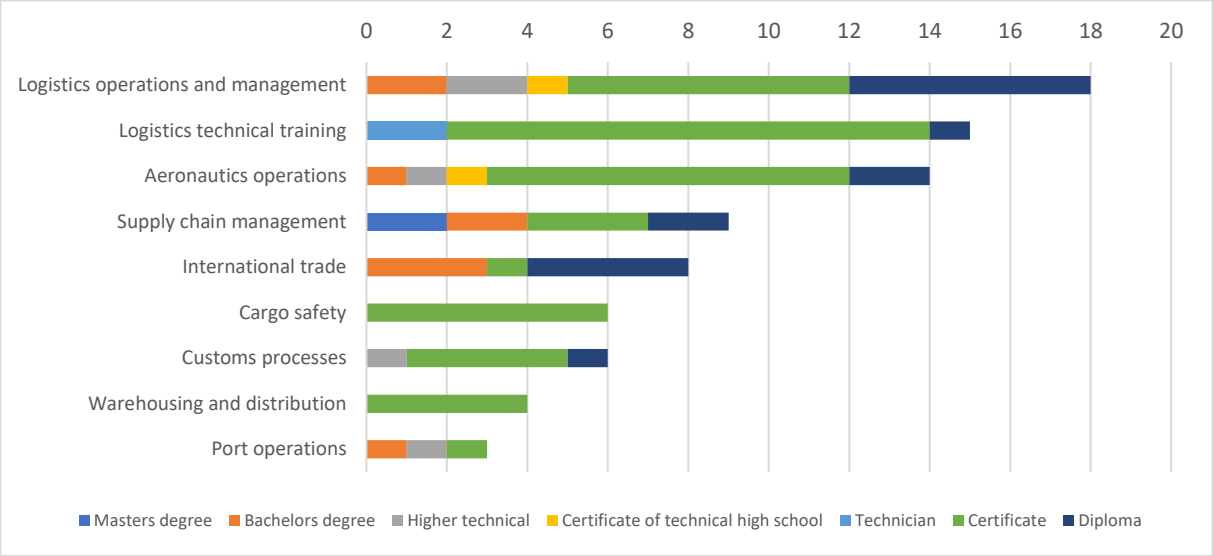
The educational offer for logistics covers both general education on logistics and supply chain, and education on technical and specialized areas of logistics, although the offer on specialized training is not very wide and focuses mainly on technical training in basic operational and administrative activities, aeronautics, cargo safety and port operations. In terms of the subject areas covered by the programs offered, 47% of the programs focus on general education areas that include logistics operations and management (21.7%), supply chain management (10.8%), international trade (9.6%), and warehousing and distribution (4.8%). The remaining 53% of the programs are focused on more specialized areas of logistics that include basic logistics technical training (18.1%), aeronautics operations (16.9%), cargo safety (7.2%), customs processes (7.2%), and port operations (3.6%).

Table 5: Educational programs available for logistics by subject areas and types of degrees

Subject area	Master's degree	Bachelors degree	Higher technical	Certificate of technical high school	Technician	Certificate	Diploma	Total
Logistics operations and management		2	2	1		7	6	18
Logistics technical training					2	12	1	15
Aeronautics operations		1	1	1		9	2	14
Supply chain management	2	2				3	2	9
International trade		3				1	4	8
Cargo safety						6		6
Customs processes			1			4	1	6
Warehousing and distribution						4		4
Port operations		1	1			1		3
Total	2	9	5	2	2	47	16	83

Source: Assessment data

Figure 8: Educational programs available for logistics by subject area and type of degree



Source: Assessment data

A list of all the educational programs for logistics that are offered by universities, colleges, polytechnic schools, and private providers whose offer is publicly available is available in Appendix 1: List of educational programs offered for logistics.

Data on enrolled and graduated students from logistics programs

Statistical data from the Ministry of Higher Education, Science and Technology shows that there were 447 students enrolled in higher education careers that belong to the Transportation and Logistics Family (TRAL) in 2021, and there were 58 graduates from those careers in that year. The number of enrolled students improved versus 2020, a year when overall enrollment numbers were impacted by the pandemic, and represents an increase of 239 versus 2019, fueled in part by recently launched careers Aeronautical Management, Port Administration and Logistics and Transport Engineering, that account for 193 of enrolled students for that year, although Logistics and Transport Engineering has a low number of 8 enrolled.

The number of enrolled and graduates in these careers is a relative low number considering there were 18,507 companies involved in import and export activities in that same year (Figure 6), which are companies that have logistics related positions, and which include 766 companies that are logistics service providers (Figure 7). The demand for logistics related positions that can be filled with recent graduates is most likely filled with graduates from other careers that are not classified under the TRAL family, which aligns with feedback received from the companies that participated in the interviews of the assessment, many of which mention they hire a good share of their younger professionals from careers like industrial engineering, international commerce, and business administration.

Figure 9: Enrolled students and graduates from higher education logistics programs in the DR 2019 - 2021

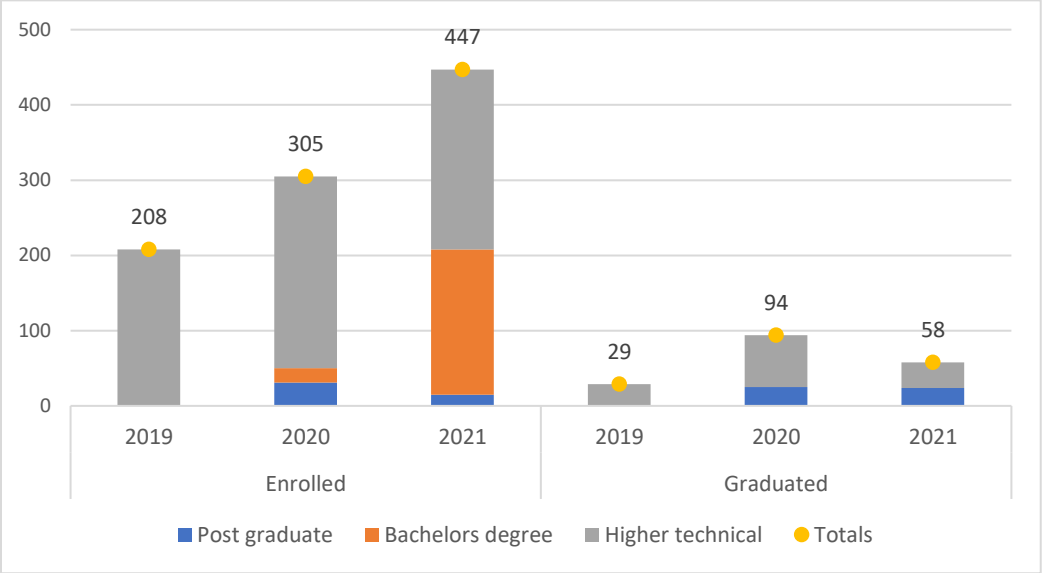


Table 6: Logistics professional careers enrolled and graduated by year

	Enrolled			Graduated		
Career	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**
Higher Technician in Logistics	208	185	187	0	19	34
Higher Technician in Aeronautical Administration	0	70	52	0	42	0
Higher Technician in Aeronautical Sciences	0	0	0	29	0	0
Higher Technician in Air Traffic Controller at Aerodrome	0	0	0	0	8	0
Aeronautical Management	0	0	96	0	0	0
Port Administration	0	12	89	0	0	0
Logistics and Transport Engineering	0	7	8	0	0	0
Master in supply chain management	0	24	15	0	24	15
Master in Management and Supply Chain Engineering	0	7	0	0	1	4
Master in Logistics Management of Customs and Ports	0	0	0	0	0	4
Master in Logistics Management	0	0	0	0	0	1
Totals	208	305	447	29	94	58

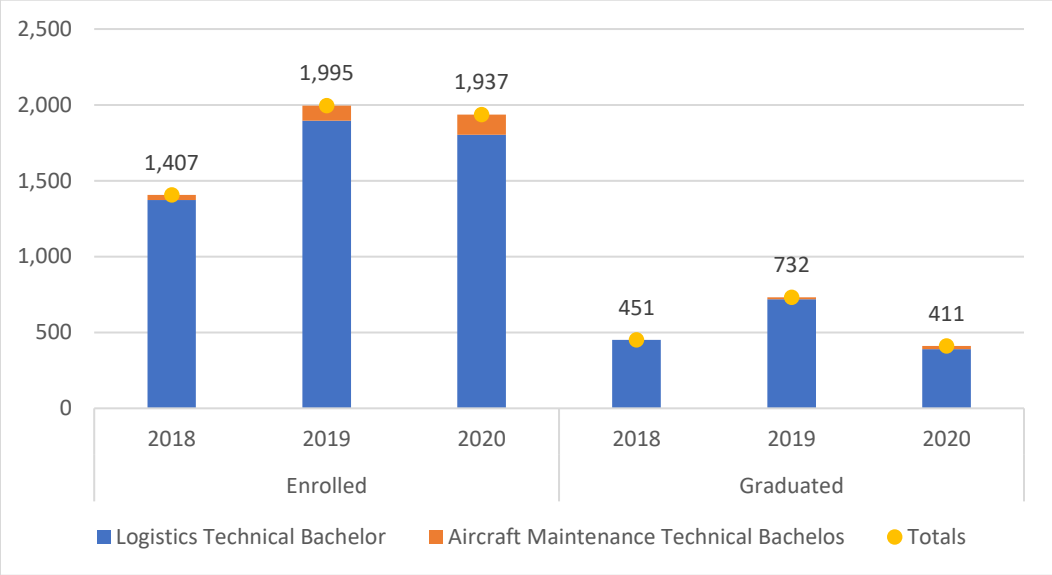
Source: Directorate of Coordination National Qualifications Framework, with data from the Ministry of Higher Education, Science and Technology statistics

In terms of technical and vocational education the 2 programs that are offered in technical high schools had 1,937 enrolled and 411 graduates in 2020, according to statistical data from the Ministry of Education of the Dominican Republic (MINERD)[15]. The logistics technical bachelor has the largest share, with 1,803

[15] Diagnostic Report with Prospective Approach, Professional Family Transport and Logistics (TRAL) (Pérez, 2022)

enrolled, representing 93.1% for that year, and 390 graduates, representing 94.9%. This program was implemented in 23 polytechnic schools across the country in 2021.

Figure 10: Enrolled students and graduates from technical bachelor programs in the DR 2019 - 2021



Source: Directorate of Coordination National Qualifications Framework, with data from the Ministry of Education

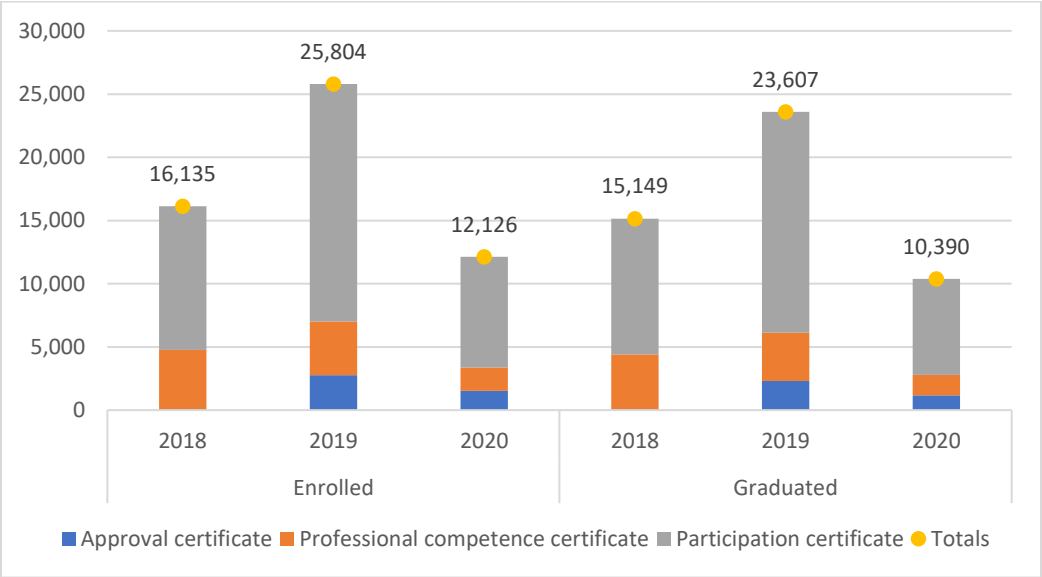
The Institute of Vocational Technical Training (INFOTEP) is the largest provider of technical and vocational education in the country. Their educational offer, according to the duration of the program and the type of certification or qualification it awards, is classified in 3 types of courses: specific courses that are directed to meet specific demands of companies, organizations and individuals, which are of relatively short duration (100 hours or less), and receive a Participation Certificate upon completion of its requirements; medium-term technical programs (up to 350 hours), which receive an Approval Certificate of Vocational Competence; and long-term technical courses, which range from 400 to 1600 hours and are identified as technical careers receiving a Professional Competence Certificate.

The programs offered by INFOTEP that relate to the TRAL family had a total of 25,804 students enrolled, and 23,607 graduated for 2019, and those number came down to down to 12,126 students enrolled, and 10,390 graduated for 2020, following restrictions due to the Covid-19 pandemic. Courses that provide participation certificates had the largest participation of enrolled and graduated students, with a share between 70% to 74% of the total for the period 2018 to 2020.

Table 7: INFOTEP logistics related programs enrolled and graduated by year

	Enrolled			Graduated		
	2018	2019	2020	2018	2019	2020
Approval certificate	80	2,765	1,524	78	2,312	1,170
Professional competence certificate	4,696	4,260	1,857	4,343	3,818	1,618
Participation certificate	11,359	18,779	8,745	10,728	17,477	7,602
Totals	16,135	25,804	12,126	15,149	23,607	10,390

Figure 11: Enrolled students and graduates from Infotep's technical and vocational programs in the DR 2018 – 2020



Source: Directorate of Coordination National Qualifications Framework, with data from INFOTEP

From the research carried out as part of the assessment very little information was found on projections of skills demands for the logistics sector and a prospective analysis of those demands are beyond the scope of this study. A reference of skill demands can be found in The National Survey for the Detection of Skills and Qualifications Needs in Employment (ENDHACE) 2020, prepared by the National Bureau of Statistics[16], which provides information on skill requirements of workers in formal enterprises in the 10 main branches of economic activity in the country, with data obtained in 2020.

This report identifies vacancies that were reported by the companies in those main branches in the previous 12 months by the time the survey was completed, which totaled 85,117. The transportation and warehousing economic activity, which is where logistics and transportation related companies get classified, had a share of 6.2% of this total, which amounts to 5,277 vacancies. The report also provides the distribution of those vacancies by occupation types, with operative jobs totaling 3,979 for a share of 75.4%, administrative and technical jobs totaling 1,135 for a share of 21.5%, and managerial jobs totaling 164, for a share of 3.1%.

If we contrast these figures with the number of graduates for that same year, there were 94 graduates from the careers offered by universities and colleges, which seems a low number against the quantities of vacancies for administrative and managerial jobs reported by companies. There were 411 graduates from the 2 technical high school programs, which also seems a low number, given that this is a well-structured program that can serve to fill logistics job at the administrative and operational levels, and that polytechnic schools have presence in many geographical areas of the country, which is good advantage

[16] (DR National Statistics Office (ONE) & Ministry of Economy, Planning and Development (MEPyD), 2020

to facilitate employment. The largest share of graduates from logistics programs are coming from the technical and vocational programs offered by INFOTEP, whose programs are mainly focused on general logistics, transportation, and warehousing subjects, and where the biggest share of graduates corresponds to short certificate courses. The other sources that are used to train for logistics skills are the programs offered by private training providers, and through internal training in the companies, but there are no statistical data available to measure their quantities. It can be inferred that these types of programs are used to fill the gaps that are not covered by the formal education system.

Table 8: Logistics sector recruitment projections

Transportation and warehousing vacancies		
Occupational group	2020 Survey (ENDHACE)	5-yr projection (linear)
Operational	3,979	19,894
Administrative and technical	1,135	5,673
Managers	164	818
Total	5,277	26,385

Source: National Survey for the Detection of Skills and Qualifications Needs in Employment (ENDHACE) 2020, ONE

A simple linear projection of the 2020 surveyed vacancies, yields a potential demand of 19,894 vacancies for operational jobs in a 5-year period, another 5,673 for administrative and technical jobs, and 818 for managerial positions, for a combined total of 26,385 projected vacancies. These figures are conservative, as they are not considering growth projections for the logistics sector, but they reflect potential challenges when contrasted with the quantities of graduates and enrolled students in the logistics careers and programs that are currently available. These challenges are mainly around having sufficient qualified talent from the professional careers that are specific for logistics, and from the more specialized technical careers and programs.

More than a challenge in meeting the quantities of talent demand, and taking into account that logistics as an industry is trending towards higher specialization and technification, and is continuously demanding a more competent workforce, the challenge for the country appears to be able to generate sufficient specialized talent for logistics, with the right skills that are demanded by companies with logistics activities, as those companies continue to grow and develop to become more competitive, both domestically, and in international markets.

3 METHODOLOGY

Concept of the assessment

The assessment of logistics skills, competencies, and training carried out for the Dominican Republic is based on a toolkit developed by the World Bank.[17] The scope of the assessment is mapped out through defining 20 distinct assessment areas. This allows for tailoring the assessment to the different types of stakeholders to be interviewed. Figure 12 provides an initial overview of the assessment areas.

Figure 12 Assessment areas in the Logistics Competences, Skills and Training Assessment Toolkit

Demand	**A1** Recruitment of operative logistics staff	**A2** Skills level of existing operative logistics employees	**A3** Recruitment of administrative logistics staff	**A4** Skills level of existing administrative logistics employees
	A5 Recruitment of logistics supervisors	**A6** Skills level of existing logistics supervisory employees	**A7** Recruitment of logistics managers	**A8** Skills level of logistics managers currently in post
Supply	**A9** Availability of vocational education in logistics	**A10** Quality of vocational education in logistics	**A11** Availability of logistics education by private training providers	**A12** Quality of logistics education by private training providers
	A13 Availability of logistics education by universities	**A14** Quality of logistics education by universities	**A15** Availability of in-house training	**A16** Quality of in-house training
	A17 Certifications of logistics skills	**A18** Role of associations	**A19** Attractiveness of logistics industry	**A20** Availability of recruitment services

Source: Logistics Competences, Skills and Training Assessment Toolkit

The ability of a country to meet the labor requirements of logistics can be defined in terms of both demand and supply. Demand can be measured by the number of personnel required and their required skill levels. For supply, one can measure the number of people trained and the skills they possess when entering the sector, plus the share of people that actually stays in the sector (rather than switching careers after training for a job in logistics). If the supply does not satisfy the industry demand, a country might face a skills shortage.

[17] McKinnon et al. 2017

For demand, eight assessment areas are defined. They pertain to both recruitment of new employees and the skill levels of existing employees on four occupational levels. For supply, twelve assessment areas are defined. They cover the availability and quality of different education providers and also deal with certifications of logistics skills, the role of professional associations in developing these skills, the relative attractiveness of employment in the logistics industry and availability of recruitment services.

To measure a country's capability with respect to the assessment areas, a maturity model is defined. Maturity models have their origins in software development and quality management but are increasingly employed for measuring capabilities in logistics and supply chain management (e.g., Plomp & Batenburg 2010; Mendes Jr. et al. 2016).[18] The idea of such models is the notion of evolution: an organization is considered to pass through distinct intermediate states on its way to maturity. Each of these states is described as typical behaviors the organization exhibits when it has reached a certain maturity level (Lahti et al. 2009).[19]

Figure 13 illustrates the maturity level concept for one of the assessment areas. Levels two and four deliberately contain no descriptions to keep the assessment simple and flexible.

Figure 13: Exemplary illustration of maturity level concept

	Level 1 Minimal Capability	**Level 2** Marginal Capability	**Level 3** Average Capability	**Level 4** Advanced Capability	**Level 5** Global Best Practice
A10 Quality of vocational education in logistics	Vocational education in logistics is not widely accepted in industry Programs are not aligned to industry needs Low skills level of graduates		Vocational education in logistics is accepted in industry Programs meet the basic needs of the industry		Vocational education in logistics is widely accepted in industry Close collaboration with industry results in up-to-date program content Certifications and degrees are established and widely known

Source: World Bank 2017, Logistics Competences, Skills, and Training Assessment Toolkit

Levels of logistics employment covered in the assessment.

Skills requirements in logistics are highly dependent on the job type and occupational level. Employee groups need, therefore, to be split into different categories to analyze competences, skills, and training separately. Many classifications of logistics jobs have been developed and are in use today. Most of them are highly specific and distinguish many different logistics sub- domains and personnel qualification stages (e.g. CILT 2016; Skills for Logistics 2015). However, for this toolkit a simpler and broader classification of

[18] (Plomp & Batenburg, 2010), (Paulo Mendes et al., 2016)
[19] (Lahti et al., 2009)

logistics staff put forward by McKinnon et al. (2017)[20] is adopted. A broad classification ensures that toolkit users and interviewees from both emerging and developed regions can recognize the distinctions despite huge differences in sector maturity and individual job descriptions.

The toolkit distinguishes between four main levels of logistics employment:

1. **Operative logistics staff**: This group includes all logistics employees who carry out basic operational tasks and do not have any staff responsibility. Classic examples are truck drivers, forklift drivers and warehouse pickers.

2. **Administrative logistics staff**: This level includes traffic planners, expediters, warehouse clerks, customs clearance officers and customer service employees. Staff at this level perform information-processing tasks and have limited supervisory or managerial responsibilities.

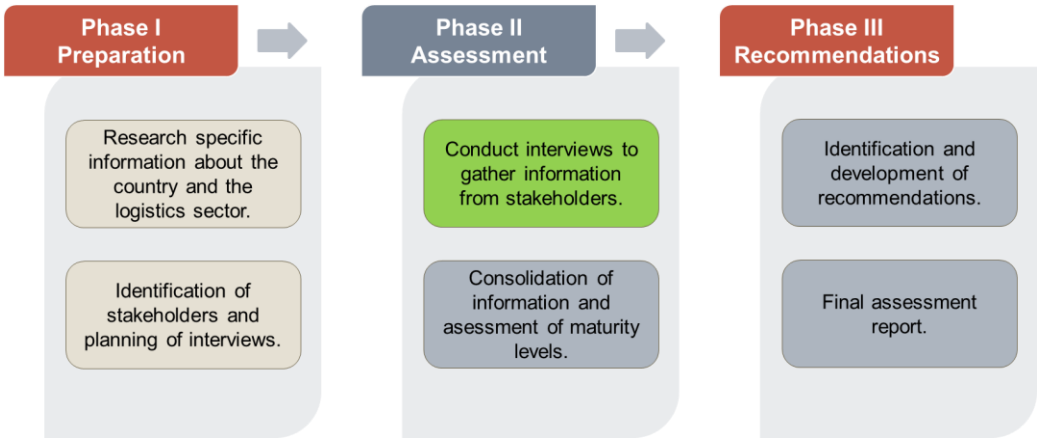
3. **Logistics supervisors**: Supervisors have frontline responsibility, controlling logistics operations on the ground rather than in the office. Examples are shift leaders in warehouses or team leaders in a traffic department.

4. **Logistics managers**: This category includes managerial staff, with higher-level decision-making responsibility. The extent of these responsibilities can range from junior through middle management roles to board level responsibility for logistics and supply chain strategy.

Assessment execution process

The assessment was executed in three phases:

Figure 14: Assessment phases



Source: Assessment data

The maturity assessment is based on expert judgment following the qualitative content of the interviews carried out for the assessment.

[20] (McKinnon et al., 2017)

Stakeholder groups and interviews.

The assessment has a limited timeframe in the country[21] and covers a wide array of issues, so the selection of stakeholders to be interviewed is critical to obtain different perspectives and to provide a good overview of the more relevant issues. The following table shows the stakeholder groups that were considered, from which a sampling of individuals was selected, prioritizing organizations that are dynamic and representative for the industry.

Table 9 : Stakeholder groups

Stakeholder Group	Category	Examples of Appropriate Interviewees
Government and administration	Ministries	Experts on logistics or education
	Statistics and employment agencies	Experts on logistics or education
Logistics service providers	Local companies *(e.g. airport operators, port operators, freight forwarders)*	HR personnel, logistics executives
	Multinational companies *(e.g. UPS, DB Schenker, Maersk, DHL, Kühne + Nagel)*	HR personnel, logistics executives
Shippers	Local companies *(e.g. mining companies, fruit exporters, agricultural cooperatives, state-owned companies)*	HR personnel, logistics executives
	Multinational companies *(e.g. Coca-Cola, P&G, Unilever, Samsung)*	HR personnel, logistics executives
Educational institutions	Universities and colleges	Logistics and management professors
	Vocational institutions	Logistics teachers
	Private training providers	CEOs/ senior executives
Professional associations and others	Local associations	Chairman/ head of professional development
	International associations	Chairs of local branches
Business organizations	Trade bodies	Director generals/ CEOs
	Labor unions	General secretaries
Recruitment agencies	General agencies	HR personnel focused on logistics employment
	Logistics-specific agencies	HR personnel focused on logistics employment

Source: Assessment data

Figure 15: Example of template for data collection

[21] The assessment was carried out between December 2022 and March 2023.

APPENDIX A4: SKILLS LEVEL OF EXISTING ADMINISTRATIVE LOGISTICS EMPLOYEES

Examples of Interview Questions	Maturity Level				
	Level 1 Minimal Capability	**Level 2** Marginal Capability	**Level 3** Average Capability	**Level 4** Advanced Capability	**Level 5** Global Best Practice
▪ Do administrative logistics staff possess the right skills for their job? ▪ If not, what are the main skills they lack? ▪ What are the main consequences of administrative logistics staff lacking the right skills? ▪ What share of administrative logistics staff needs to receive top-up training in their first months of employment? ▪ What share of logistics administrators are promoted to managerial logistics positions within 5 years (period might not apply to small companies)?	Administrative logistics personnel does not possess the necessary skills for their job Incidents caused by a lack of skills happen frequently New employees have to receive introductory training to close skills gaps		Administrative logistics personnel possesses the necessary skills for their job They only seldom have to receive introductory training		Administrative logistics personnel exceeds skills requirements They often participate in advanced training to improve their logistics skills Logistics supervisors are recruited from highly skilled administrative personnel
Evidence for Maturity Assessment:					
Maturity Score (1-5):					

Source: Logistics Competences, Skills and Training Assessment Toolkit

Based on the findings from all interviews (all individual maturity assessments), the overall maturity level of each assessment area was determined, weighting the individual scores from each interview and taking into consideration all relevant information that was identified.

4 Assessment Results

4.1 Results by assessment area

As described in the methodology section, the scope of the assessment covers 20 distinct assessment areas for which a total of 37 interviews were completed. This is not statistically representative, but this is a qualitative study that is based on interviewing key representatives of main stakeholder groups, applying expert judgement based on the qualitative content of the interviews, and using the maturity model previously defined in the methodology to assign maturity levels to each of the assessment areas using the results from the interviews.

Interviewees were selected prioritizing organizations that are representative for the industry and covering all the stakeholder groups and key actors that are relevant for logistics skills development in the country. The list of organizations that participated in the interviews includes logistics service providers, shippers,

business organizations, educational institutions, government institutions, recruitment agencies, and professional associations, prioritizing organizations that are highly representative of the sector and that are actively participating in it.

The interviewees that participated from each organization varied according to the type of organization and were all persons with specific expertise and knowledge of the logistics sector and its current needs, results and challenges around skills and training. The group of people interviewed includes senior company executives, logistics managers, HR managers and specialists, logistics and management professors, educational institutions faculty and staff, government officials, and chairs of business and professional associations.

The following table shows the number of interviews completed and its distribution by stakeholder group. A Complete list of the interviews is available in Appendix 3: List of organizations interviewed.

Table 10 : Completed interviews

Stakeholder group	Completed interviews
Business organizations	5
Educational institutions	7
Government and administration	7
Logistics service providers	10
Professional associations and others	3
Recruitment agencies	2
Shippers	3
Grand Total	**37**

Source: Assessment data

Interviewees are not knowledgeable in every aspect of the assessment, and they were interviewed in subsets of the 20 assessment areas, according to the type of stakeholder they represent and their specific individual expertise and knowledge, distributing them to cover all aspects of interest within the 20 assessment areas. This approach allowed the study to gather qualitative feedback from different perspectives that combine to provide a first-hand representation of the current situation in the country.

A summary of the scores and maturity levels for each assessment area is provided in Figure 16.

Figure 16: Scores and maturity levels by assessment area

Demand							
A1 Recruitment of Operative Logistics Staff	**2.2** L2	**A2** Skills Level of Existing Operative Logistics Employees	**2.8** L3	**A3** Recruitment of Administrative Logistics Staff	**2.3** L2	**A4** Skills Level of Existing Administrative Logistics Employees	**2.6** L2
A5 Recruitment of Logistics Supervisors	**2.7** L3	**A6** Skills Level of Existing Logistics Supervisory Employees	**2.8** L3	**A7** Recruitment of Logistics Managers	**2.5** L3	**A8** Skills Level of Logistics Managers currently in post	**3.1** L3

Supply							
A9 Availability of Vocational Education in Logistics	**2.7** L3	**A10** Quality of Vocational Education in Logistics	**2.5** L3	**A11** Availability of Logistics Education by Private Training Providers	**3.3** L3	**A12** Quality of Logistics Education by Private Training Providers	**3.2** L3
A13 Availability of Logistics Education by Universities	**3.0** L3	**A14** Quality of Logistics Education by Universities	**2.5** L3	**A15** Availability of in-House Training	**3.6** L4	**A16** Quality of in-House Training	**3.5** L4
A17 Certifications of Logistics Skills	**2.8** L3	**A18** Role of Associations	**2.8** L3	**A19** Attractiveness of Logistics Industry	**2.7** L3	**A20** Availability of Recruitment Services	**2.4** L2

Source: Assessment data

Maturity levels were assigned based on the score for each assessment area and are intended to provide an indication of where the country is in its evolution towards a global best practice that is defined for each assessment area, using a scale from 1 (minimal capability) to 5 (global best practice). Scores were determined assigning levels to each response received against the maturity levels definitions for each assessment area and weighting a combined score from all responses. The maturity level descriptions and scores for each assessment area are available in Appendix 3: Scores by assessment areas.

Figure 17: Maturity levels

Level 1 Minimal Capability	**Level 2** Marginal Capability	**Level 3** Average Capability	**Level 4** Advanced Capability	**Level 5** Global Best Practice

Source: Logistics Competences, Skills and Training Assessment Toolkit

A summary of the key results for each assessment is provided in the following sections.

Demand Assessment Areas

Recruitment of Operative Logistics Staff

Availability of qualified candidates for operative level positions is low for 55% of companies, particularly in more specialized roles. Most applicants lack required qualifications and many companies recruit recent graduates from universities and schools and rely on internal training to complete needed skills. Recruitment agencies are rarely used, and turnover rates vary, with high turnover among younger personnel seeking better opportunities.

Skills Level of Existing Operative Logistics Employees

Current staff has the necessary skills thanks to training that is provided by companies to all new hires. Specific job skills, such as shipping documentation and equipment operation, are often lacking in new

hires. Weaknesses in basic math, critical thinking, and English proficiency are mentioned. If the right skills are missing can lead to errors, fines, security issues, and customer complaints.

Recruitment of Administrative Logistics Staff

Companies face a shortage of qualified candidates for administrative jobs, with 52% indicating low availability. While some candidates possess general skills, there is a lack of specialized logistics skills required for many positions. Job rotation is relatively low for 71% of companies, but ranges from 40% to 60% for 29%, mainly affecting younger personnel who are harder to retain.

Skills Level of Existing Administrative Logistics Employees

Existing staff has the necessary skills only after going through training. All companies train their new hires, mainly in the technical an operational aspects of the job. Lack of skills can have negative impacts like increase in costs, poor customer service, and fines from regulating institutions.

Recruitment of Logistics Supervisors

Availability of candidates with logistics qualifications is low for 43% of companies and 38% rely mainly on internal promotions to fill open jobs. Turnover is low, agencies are not widely used, and it can take from 30 days to up to 6 months to fill a job, depending on specific job requirements.

Skills Level of Existing Logistics Supervisory Employees

Supervisors' skills vary, 50% of interviewees say current incumbents have the necessary skills, acquired through company training and on-the-job experience. However, 25% feel that supervisors lack some essential skills required for the sector's current challenges, including technology and information systems knowledge, cargo safety, leadership, ability to work under pressure, process design and implementation, and critical thinking.

Recruitment of Logistics Managers

There is limited availability of logistics-qualified managers, but good supply of trainable general managers. Certain positions as commercial managers and traffic managers are hard to fill for most companies. Turnover is low and recruitment processes can be long, ranging from 2 to 6 months. Agencies are used by 67% of companies to recruit manager vacancies.

Skills Level of Logistics Managers currently in post

Most logistics managers have the required essential skills, but many lack knowledge in areas like technology, advanced logistics, and international regulations. Lack of skills can lead to significant negative impacts on customer service and costs. Training is provided for all new hires, but promotion opportunities are limited due to expats or company owners' family members occupying top positions.

Supply Assessment Areas

Pre-employment: Availability of Vocational Education in Logistics

There is a limited vocational education offer for logistics that mainly covers general logistics topics, but that does not provide a response to all the current needs of the sector.

Pre-employment: Quality of Vocational Education in Logistics

The quality of vocational education is qualified as good by 61% of interviewees, but 81% say current educational offer needs to be improved and mention having more specialized programs and better and more specialized trainers as key areas for improvement. There is lack of awareness on existing programs and more collaboration is needed between institutions and industry.

Pre-employment: Availability of Logistics Education by Private Training Providers

Training offer from private training providers has increased, with business associations playing an important role in training and skills development, but demand is growing faster than supply. There is limited offer from foreign providers in the country.

Pre-employment: Quality of Logistics Education by Private Training Providers

Private training providers are well accepted by the industry, but improvements can be made in having a more practical orientation and in having more focus on industry's best practices. Their offer is mostly of short courses with certificates of participation. Collaboration between private providers and business associations is good, but there is a need for more specialized trainers and better alignment with current job demands.

Pre-employment: Availability of Logistics Education by Universities

The educational offer for logistics careers from universities and colleges is limited, existing careers have comparatively lower demand and attracting students to them is a challenge. Many of the professionals in the sector come from more general careers like industrial engineering and international commerce and receive logistics specific training on the job and through private training providers. Few receive specialized training abroad.

Pre-employment: Quality of Logistics Education by Universities

The limited offer of logistics programs in universities lead to companies hiring available graduates and providing them with training to complete needed skills. Collaboration between industry and universities exists, but more collaboration is needed on programs content improvement. There is no presence of foreign universities in the country.

On-the-job: Availability of in-House Training

Between 50% to 80% of logistics training for employees is provided in house by companies. All new employees receive training and advanced training is regularly offered based on job needs. Main types of training offered are on basic logistics skills and technical training for operative and administrative levels,

soft skills for supervisors and above, and training on country and company specific processes as per job requirements.

On-the-job: Quality of in-House Training

Companies use multiple sources to scope their in-house training, including job descriptions, skill gaps identified and company procedures, with 85% using external trainers. Main deficiencies and challenges cited include a limited availability of qualified trainers, capacity to train all required personnel in the required time, more focus needed on technical logistic skills, and adaptation of corporate training to cultural and local changes.

Certifications of Logistics Skills

Certification systems are widely accepted, with options available for aeronautics, secure commerce, ports, customs, and supply chain. Companies show interest in certifications, but current offer is limited.

Role of Associations

There are 10 local associations with an interest in logistics, with overlapping activities and a need for overarching integration. Associations are involved in a good share of the training that is delivered by private training providers. There is no presence of international associations in the country.

Attractiveness of Logistics Industry

The logistics sector faces challenges in public perception but is gaining interest post-pandemic. Certain jobs are attractive, while others are seen as less appealing. Salary levels vary, and there is a discrepancy between qualifications and compensation at operational levels, where pay is generally considered low. However, logistics companies offer growth opportunities and careers. While attracting managers from other sectors is generally successful, some difficulties exist.

Availability of Recruitment Services

86% of companies outsource recruitment to external agencies, primarily for administrative, supervisory, and managerial positions. There are no specialized logistics agencies available. Interviewees lack knowledge of government recruitment for logistics jobs.

Additional Questions

Is there a shortage of logistics staff at any occupational level in this country, and if so why?

There is a shortage of qualified logistics staff at different levels. At the operational level, 85% of interviewees note a shortage of candidates with the necessary operational skills demanded by companies. At the administrative level, 78% indicate a shortage of candidates with specific logistics skills and training in areas such as customs, finance, and sales, as well as English proficiency. The supervisory level also faces a shortage of candidates with supervision skills, logistics knowledge, and English proficiency, as mentioned by 83% of interviewees. At the managerial level, 64% state a shortage of candidates with logistics skills and

experience, although 42% note good availability of candidates with general managerial skills that can be trained in logistics.

Reasons for the shortage include limited specialized logistics education, lack of communication between sectors, lack of student interest in logistics careers, rapid growth without adequate preparation, and a history of hiring unskilled personnel at low pay levels.

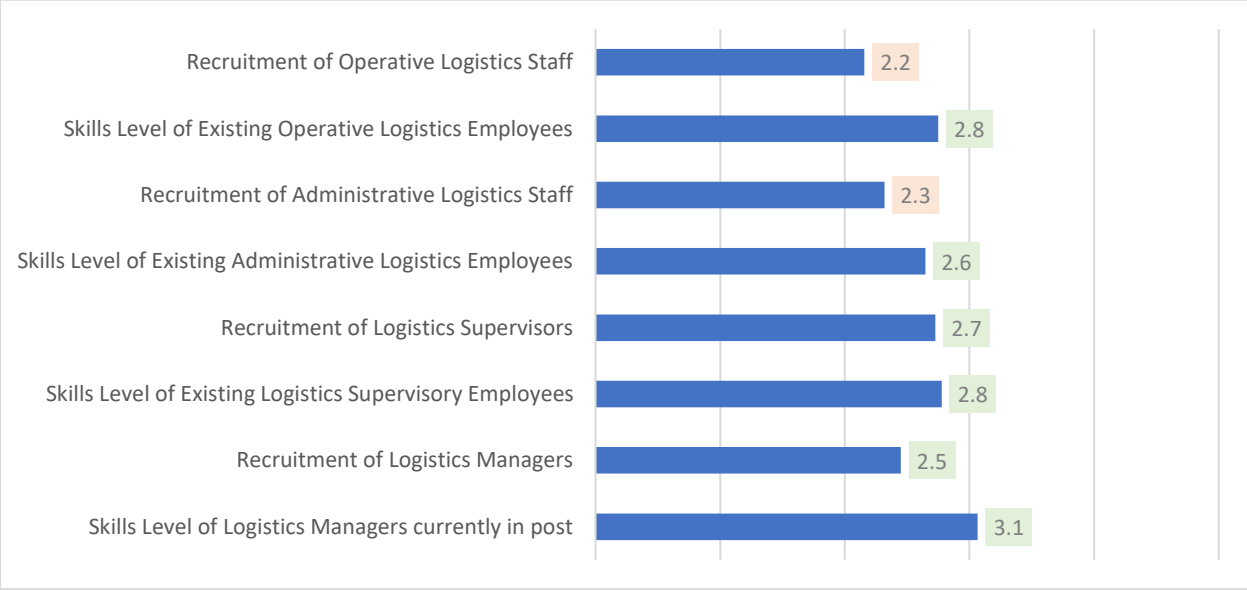
4.2 MAIN FINDINGS

4.2.1 Assessment of demand side factors

Maturity levels

For the demand side of the assessment maturity levels[22] for the country are split between marginal and average capability for recruitment of logistics staff, and at an average maturity capability for skills levels of current logistics staff. Recruitment of operative staff is the lowest (2.2), followed by recruitment of administrative staff (2.3). Recruitment of logistics managers (2.5) and recruitment of logistics supervisors (2.7) are at an average capability maturity level. Skill levels of current staff are all at an average rate with the lowest being administrative employees (2.6) and with managers (3.1) the employment group seen as the one with strongest skills levels of current logistics staff.

Figure 18: Maturity levels for the demand side of the assessment



Source: Assessment data

[22] Maturity levels used in the assessment: Level 1 – Minimal Capability, Level 2 – Marginal Capability, Level 3 – Average Capability, Level 4 – Advanced Capability, Level 5 – Global Best Practice.

Availability of skilled candidates for recruitment

There is an increased staffing demand for logistics in the country driven by the growth and expansion projects that many logistics service providers and many relevant shippers are executing, with the biggest share of vacancies at the operative level (50% to 60%), and at the administrative level (30% to 40%). This growth is fueled by a country strategy that is communicated by key government officials to turn the Dominican Republic into the logistics hub of the region, which is backed by initiatives from government such as the new Customs Law 168-21 to strengthen the regulatory framework, programs like Dispatch in 24 Hours (D24H) to expedite container dispatch from ports, and alliances with private sector organizations like the American Chamber of Commerce of the Dominican Republic (AMCHAMDR) to work on the identification and coordination of actions to support the goal to turn the country into a regional logistics and cargo hub.[23]

Against this, there is a shortage of candidates with adequate logistics skills in the market to fill the increased demand. 55% of interviewees indicate there is low or very low availability of qualified candidates for operative level positions, and 52% indicate availability is low or very low for administrative level positions, with the most specialized jobs difficult to find in the market. Some of the jobs that are mentioned as hard to fill in the market include forklift operators and crane operators, at the operative level, and customs, finance, planners, and sales jobs at the administrative level.

Most applicants to posted jobs do not have the specific requirements that are needed unless they come with experience from other companies in the logistics sector. Companies are mostly filling their staffing needs at the operational and administrative levels by recruiting unexperienced personnel with basic skills levels on entry level jobs and relying on their internal training programs to complete the specific skills required for each type of job, and then on internal promotions to fill higher level jobs.

In the case of supervisors there is less demand for external recruitment but still, 43% of respondents indicate availability of qualified candidates in the market is low to very low and 38% of companies follow policies and strategies to fill jobs at this level and up through internal development and promotions, so they only recruit externally in particular cases when new positions are created, or there are no internal candidates available. But all companies indicate that when they need to recruit externally, it is difficult to find supervisors skilled and experienced in logistics in the market.

For managers, 58% of respondents indicate availability of candidates with logistics qualifications is low and there is strong competition for a limited market of experienced managers. 42% indicate there is good availability of candidates with good general managerial skills that can be trained in the additional specific logistics skills needed.

Turnover rates vary in the sector, at the operative level for 40% of respondents it is less than 2%, while for another 40% it is between 6% and 20%, and 6% report a high turnover that is between 50% and 60%.

[23] As examples of growth and expansion projects, DP World Caucedo has planned to expand Caucedo's port main pier, and to add 3 million square meters for the development of logistics and free zone operations.
The Punta Cana Free Trade Zone was announced in 2022, a project that will include an intermodal logistics center and a manufacturing free zone with an investment of US$ 200 million.

For administrative jobs, 71% of companies report to have a relatively low job rotation of less than 10%, and 29% of companies report high levels of job rotation in the 40% to 60% range. Companies with higher job rotation coincide in indicating they have high levels of rotation among younger personnel, which are more difficult to retain because as soon as they are trained and gain some experience, they look for other options in the market, or are attracted by other companies that are looking to hire staff that is already trained in the sector.

Turnover appears to be low for logistics supervisors, with respondents reporting turnover levels of 6% or less. For logistics managers, turnover rates are reported as low to very low by 92% of respondents and a repeated remark is that it is common for managers to stay a long time with a company and make careers in the sector.

Skill levels of current staff

The interviews revealed that logistics staff in current posts have the required skills because they have acquired those skills through training by their companies, and through accumulated experience on the jobs. For all companies the situation appears to be similar, and the majority are following a similar approach. Most persons do not have the required skills when they start on a position and a combination of internal and external training is used to build the required skills that are needed for each type of job. Only in cases when positions are filled through internal promotions incumbents can have a good share of the required skills for the job.

For operative staff, 64% of respondents indicate most applicants to job postings lack the specific skills required in different jobs, for example, knowledge of shipping documentation, operation of specific types of equipment, receiving and shipping procedures, and a combination of internal and external training is used to complete the required skills. For administrative staff, 60% of respondents indicate most applicants have few of the required skills, and 40% indicate they receive applications from candidates with good general skills that still need to be trained on specific skills for the job.

The skills that usually require more training and development work are those related to technical and operational aspects of the jobs. For example, an accounting person will have the basic skills for accounting, but they do not know what a container is, or how to execute accounting processes in a maritime shipping company. Other skills usually needing development on an ongoing basis are learning about the technology and information systems used in the industry, Excel and related computer skills, soft skills like tools for analytical skills, problem solving, and math skills.

In the case of supervisors, those that are promoted to supervision positions internally usually have the technical skills for the job and need training and development in supervision and leadership skills. Candidates that are recruited externally usually have good supervision skills but need training on logistics specific skills for the job. Common areas in which they need to be trained in those cases are for example, the information systems most used in the sector, mainly WMS systems, there is a lack of training in cargo safety, and the specific processes used in logistics activities in each company. Certain soft skills are mentioned as generally weak in this level like conflict management, effective communication internally and externally, ability to work under pressure, critical thinking, and decision making.

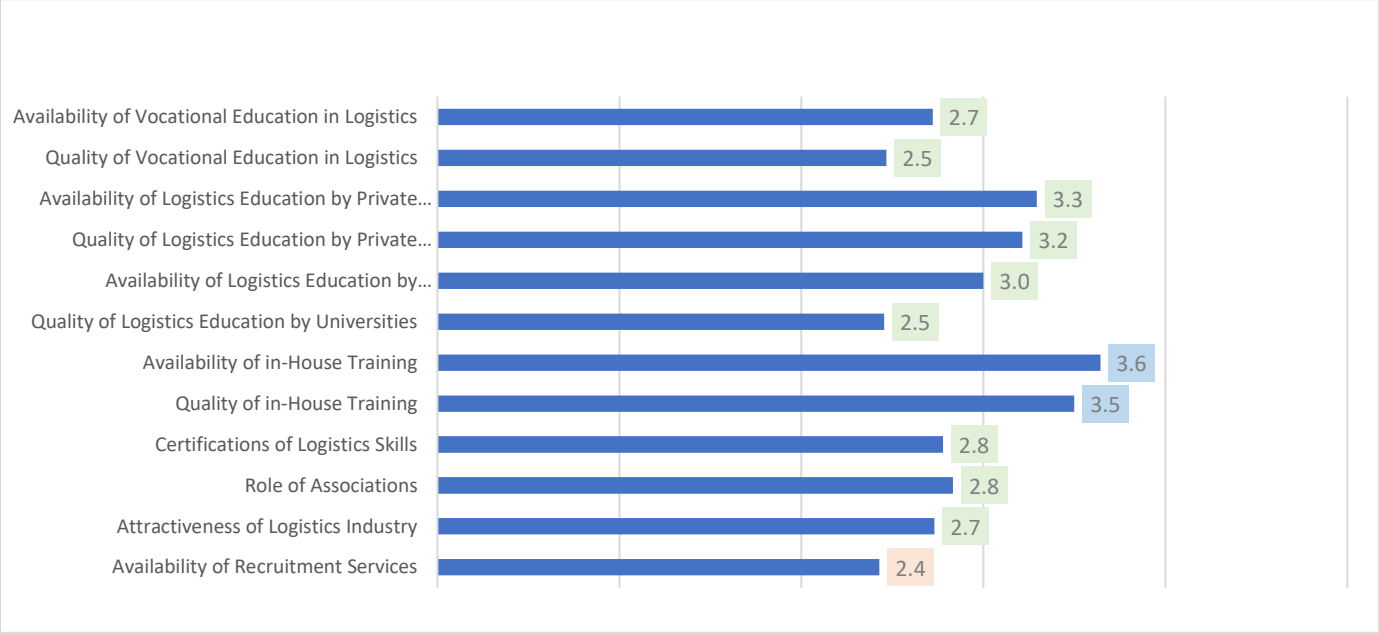
Managers is the group in which current incumbents have the stronger skills as per the responses from all companies. As with previous groups, managers do not have all the skills required when they start on the job for the first time but acquire them through training and experience on the job. This is also the group where companies invest more resources to train and develop their staff, many look to turn their managers into experts and send them to programs at foreign universities like Georgia Tech, for example. That, combined with the fact that there is a low turnover rate at this level, and that many managers stay with the same company for many years, translates into many companies indicating their managerial teams have the right skills and are typically highly qualified for their jobs. Areas that are typically targeted to develop skills for managers are advanced logistics and warehousing related skills for which typically there is no local knowledge or training offer, international regulations, information systems, specific administrative skills for the sector, like mastering the language of the sector, and knowing the specifics of the industry.

4.2.2 Assessment of supply side factors

Maturity levels

The maturity level is at average capability for most of the areas of the supply side of the assessment. Only availability of recruitment services (2.4) is marginal. On the other end, availability of in-house training (3.6) and quality of in-house training (3.5) are assessed at a maturity level of advanced capability.

Figure 19: Maturity levels for the supply side of the assessment



Source: Assessment data

Educational offer for logistics

The feedback received from interviewees is that the educational offer for logistics is limited. There is a lack of qualified trainers with specialization and experience in logistics which is a limitation to offer more

specialized programs. Another element raised is that the quantity of students that is entering the few careers that have been designed for logistics is low, which does not help to incentivize educational institutions to increase that type of offering.

Regarding the availability of vocational education for logistics, 45% of interviewees indicate it is limited. The main offer comes from the public Instituto de Formación Técnico Profesional (INFOTEP) and several business associations that have developed programs that mainly cover basic logistics topics, but what is offered does not cover the needs of the logistics sector. There is a technical high school program on logistics and transportation that is offered in several schools, but a good portion of the companies interviewed do not know it.

The educational offer from universities and colleges is also limited, as identified by 75% of interviewees. There are 5 universities and 2 colleges offering careers for logistics. Their offer includes 2 programs at a master's degree level, 8 at a bachelor's degree level, and 5 at the higher technical level. 4 of these institutions interviewed indicate logistics careers have comparatively lower demand and attracting students to them is a challenge. Many of the professionals in the sector come from more general careers like industrial engineering, business management, and international commerce, and obtain logistics specific training on the job and through internal training and private training providers.

The educational offer from private providers is increasing in contrast to the offering from universities and schools. Private training providers, mainly through several of the business associations in the sector, are seeking to cover the gaps in the training offer. There are new initiatives like that of National Institute of Port Training and Logistics (INPLOG), a training institute sponsored by the Dominican Port Authority and a group of private companies, whose objective is to improve the logistics capacity of ports, as well as strengthen the technical training of the country's port workers. Another project under execution is the Dominican Institute of the Exporter, sponsored by the Dominican Association of Exporters (ADOEXPO), with the objective of providing specialized training in international commerce and logistics.

On top of this, 26% of interviewees indicate there is not enough capacity to cover demand needs that are increasing due to companies' growth, incorporation of more complex activities, and acceleration of digital transformations. The current offer from private providers covers mostly operational courses like, warehousing, forklift operators, port operations, aviation and airfreight-related courses, customs operations, drivers training, and others. The following elements are mentioned as needing to be improved: there is a lack of specialized and certified trainers for logistics, there is too much focus on general skills and an open need to cover more logistics and country specific topics, more standardization of contents is required, there is also a need to incorporate training on latest changes in technology, and in general, a training offer is needed that is better aligned to the jobs and skills needs that companies currently have.

Companies have internal training programs which play an important role in the development of the required skills for all staff groups. All companies offer training for all new employees in each occupational group and offer advanced training to their employees based on job needs and organizational levels. The proportion of training that they are providing in-house varies from 50% to 100% according to interviews. Internal training is focused mainly on technical training for operations, training in the systems used in the

companies, international commerce, regulations, documentation requirements, commercial activities, client procedures, soft skills for supervisors and managers, and addressing of identified skill gaps.

Several sources are used by companies to scope their in-house training, including job descriptions, internal procedures, performance evaluations, developmental plans, local and corporate training programs, and clients' requirements. Only 45% of respondents indicate their companies base their training on competency models, which are developed by their corporations, or are tied to jobs that require an accredited certification. The main deficiencies and challenges in in-house training cited by interviewees are: limited availability of good trainers with practical knowledge and pedagogical skills, having the capacity to train all required personnel in the required time, balancing the workload on trainers and trainees against regular daily activities, higher focus on basic skills instead of on technical logistic skills, and the need to accelerate training in support of digital transformation.

Certifications of Logistics Skills

There are few options for logistics certifications locally, only certifications for specific activities within the sector like ports, customs, aeronautics, maritime. There are also certifications for secure commerce and supply chain related certifications. Several institutions offer these certifications: Higher Academy of Aeronautical Sciences (ASCA) for aeronautics, Business Alliance for Secure Commerce (BASC) for secure commerce, DR Customs OEA Program for secure commerce, UNCTAD for port operations, and the Training Center in Fiscal Policy and Management (CAPGEFI) for customs. International supply chain certifications from Association for Supply Chain Management (APICS) are offered by private providers like Steam.

Role of associations

There are 10 business associations and trade bodies in the country that are identified by interviewees as having an interest in logistics: Shippers Association, ADACAM, ASOLOGIC, ADAA, ADOZONA, ADOEXPO, AIRD, AMCHAMRD, DR Logistics Cluster, and Commerce Facilitation Committee. A significant focus of these associations has been in training, coordinating skills needs from the companies and delivering a good share of the training that is provided by private training providers.

Each association has an area of focus within the sector, which creates disaggregation and overlapping of activities. Some remarks from interviewees about associations' activities were the following: they are disaggregated, there is a need to have an overarching association that can integrate companies from the different activities in the sector, there is a lot of duplication of efforts, there is overlapping among them, the same group of people leads them, there is a need for more concerted efforts to better address sector wide challenges for skills development.

There is no presence of international logistics associations in the country, which represents an area of opportunity to identify international associations that could establish a local chapter in the country to allow engagement and participation of local logistics professionals in the networking, training, and professional development activities that these types of organizations promote (e.g., FIATA, CILT).

Attractiveness of logistics industry

The logistics sector in the country is growing and becoming more specialized and with a wider offer of services. It is also becoming a more relevant activity for many companies beyond those that provide logistic services, as more companies have incorporated activities like import, export, warehousing, and distribution, as part of their regular business processes. Still, 46% of interviewees indicate the public still has a poor perception of the logistics sector as an employer or does not know the sector. But 50% indicate logistics is receiving attention and gaining interest from the public, especially after the Covid-19 pandemic.

59% of interviewees indicate that compensation in jobs of the logistics sector is on par with comparable activities in the market, while 41% indicate that pay in the logistics sector is lower than other sectors, with 14% of them highlighting they are losing people to other sectors like banking and call centers. One of the remarks from respondents was that there is a misalignment between the educational qualifications that are required, specially at operational levels, where companies look to hire in their lower payment scales, but candidates that have adequate qualifications are looking for better compensation than what is typically offered.

Availability of recruitment services

There is a good offer of recruitment agencies in the country, but there are no agencies specializing in logistics. Recruitment agencies in the country work with all occupational levels, but their focus is more on administrative, supervision and managers recruitment. 86% of interviewees indicate companies are outsourcing a share of their recruitment to outside agencies, 29% of them indicate they do it only for supervisors and manager positions.

5 Conclusion and Recommendations

5.1 Summary

In summary, interviewees indicated a shortage of qualified logistics staff in the country, and that it is more significant at the operative and administrative levels than at the supervisory and managerial levels. For the operative level, 85% indicate there is a shortage of staff for logistics and it is becoming significant because of the growth many companies are experiencing. At the administrative level, 78% indicate there is also a shortage of staff. There is talent available in the country for both levels thanks to a growing workforce, but the gap is in the availability of skilled staff for logistics.

For the supervision level, 83% indicate there is a shortage of qualified staff for logistics, although 25% also indicate that gaps at this level are less than at the operative and administrative levels, and that there is better availability of candidates with supervision skills that can be trained in specific skills for logistics. English language proficiency is a key shortage that is identified at both the supervision and administrative levels.

The managerial level has the smallest gap with 33% of respondents indicating that there is not a shortage of staff in the country. Several factors are mentioned as the main reasons, companies use more resources at this level and can have people trained internationally if needed. For example, as an indicator, a respondent says there are basically no foreign managers and most executives in companies are local. It is easier to recruit candidates with good managerial skills from other sectors and train them in specific skills required for logistics. There is a low job rotation and there are not many open positions.

Several topics are mentioned by the stakeholders interviewed as reasons for the current shortage of logistics staff. 48% of interviewees see it as a result of a limited educational offer specialized for logistics, resulting from a lack of communication between business, education and government sectors regarding the talent and skill needs for logistics in the country, and combined with lack of interest from students in logistics careers and in the logistics sector as an employment destination.

Another 40% indicate it is driven by the fact that the sector is experimenting rapid growth, but the country did not prepare with adequate strategies, policies, and resources to support the growth, especially with regards to the identification of staffing and skills needed to support it. 12% mention that until recently, many companies have followed a practice of hiring unskilled personnel and keeping pay at low levels, as one of the key reasons for current shortages.

The following issues and challenges have been identified as part of the assessment which need to be addressed to improve both the availability of qualified staff and the skills for logistics:

A. Current educational supply is not aligned with the talent and skill demands of the logistics sector in both training on the right skills that are required by companies, and in providing the quantities of skilled staff that are demanded by a sector that is growing. The available educational offer is focused on basic technical and operational aspects of logistics.

There is a need to have more specialized education on logistics to develop knowledge and skills in aspects like operation of specialized equipment, customs procedures, shipping processes and documentation, transportation modes, cold chains management, local and international regulations, cargo handling and safety, risk management, commercial activities, finance for logistics, digital transformation, and latest best practices used by the global logistics industry. There is also the need to strengthen soft skills that are critical to provide competitive best in class services like English language proficiency, critical thinking, problem solving and continuous improvement, customer service orientation, and innovation.

B. Specific careers and programs for logistics are offered at different educational levels, but those programs have not been able to attract a relatively good volume of students. Traditional careers like industrial engineering, business administration, and international commerce, as well as the traditional technical and vocational programs, continue to be the main feeders of talent for logistics jobs. This may be a reflection of the logistics programs not attractive enough for students, and of the traditional careers perceived as a more effective route for insertion in the labor market.

   There is no detail prospective information available for the logistics sector on the jobs that are demanded currently, and in the short and long term, neither on the specific skills and competencies that are required for those jobs. Without that information it is difficult to plan what additional careers may be needed. The main need that is expressed by interviewees is of more specialized education, and for that the approach could be to work on the development of concentrations and minors in logistics as part existing careers like industrial engineering and international commerce. Post-graduate specializations and masters in logistics are also an option for managerial and highly specialized jobs, for which there is little offer in the country.

C. There is a need to improve and expand the offer of specialized logistics training at the professional, technical, and vocational levels. Private providers are trying to address current identified gaps, but more programs are needed that can be implemented through existing institutions like INFOTEP, and through existing universities, colleges, and schools. There is an ongoing process of digitalization of operations, especially after the pandemic, but there is also a gap in training and staffing to support this process that also needs to be addressed.

D. There is a challenge in positions that depend on being up to date in topics such as customs regulations and procedures, management of rules of origin, customs tariffs, among others. It's hard to find people with the right knowledge, plus the challenge of keeping them up to date, because many government institutions can impact these changes and the communication of changes is poor in the country.

E. More teachers and trainers are needed that can combine experience in the industry with logistics skills certifications and training skills certifications. The fastest and more effective approach would be to identify resources within the sector with the right experience and logistics qualifications, which are interested in teaching, and train them in pedagogical methods and trainer skills for the level of programs in which they can participate.

F. There is a misalignment between the level of qualifications that the sector is demanding and prevalent payment structures in the logistics sector. This seems to be more evident in entry level jobs at the operative and administrative groups, where companies have traditionally followed an approach of paying at the lowest market salary levels to maintain low costs in a low margins competitive market, something that is relevant to many companies to maintain competitiveness, especially those that provide outsourcing services. Addressing this is difficult, as it requires changes at the market level, so the best approach would be to promote the development of the sector and its companies to upgrade the activities and services they provide to higher value ones, and to improve infrastructure, technology, and processes, to make companies more efficient. Having more companies becoming international businesses will help make the sector more attractive.

G. There are structural issues in the design of the country's educational offer that does not favor technical and short cycle careers and that contributes to students not seeing these programs as a good option for early job placement. The way in which the requirements of university careers are structured do not facilitate students to pursue short cycle technical careers and then validate what is covered to continue with a bachelor's degree career. This makes technical careers less attractive, since students prefer to pursue undergraduate degrees from the beginning, since it will be better economically and in terms of total time to complete a bachelor's degree level, which is also assumed as the one with the best demand by companies.

H. The perception of the logistics sector as a key sector for the country and the opportunities it can provide needs to be improved, to make it more attractive as a career destination. The public needs to be better educated on the types of jobs and career development the sector can offer.

I. Communication and collaboration between business, academia, and government to address skill needs for logistics is happening, but efforts in that direction are highly disaggregated and are not effective in responding to all the needs of the sector. A broader and more structured collaboration is needed that can address sector wide issues and challenges. Government needs to take the leadership in the coordination of steps to improve education and availability of qualified staff for logistics.

5.2 Learnings from Logistics skills assessments in Vietnam and India

The World Bank has conducted logistics skills, competencies, and training assessment in five countries so far in addition to the Dominican Republic: Togo, Vietnam, India, Ethiopia, and Saudi Arabia. The main results from the assessments in Vietnam and India as the two most relevant countries for comparison with the Dominican Republic are included below. This section is not a benchmark of logistics skills at the international level. Instead, it describes how other countries where the World Bank has conducted logistics skills assessments are facing similar problems.

5.2.1 Main results from Logistics Skills Assessment in Vietnam

In 2019, the World Bank carried out an assessment of logistics competencies, skills, and training in Vietnam, focusing on Hanoi and Ho-Chi-Minh City. The following main results emerged:

1) The availability and quality of vocational education in logistics is the area where most interviewees saw a large catch-up potential for the logistics sector in Vietnam.
2) The largest skills deficiencies were reported at the operative level of logistics staff, i.e., at the lowest competency levels, whereas both administrative and supervisory staff were seen as better qualified, and most interviewees rated logistics managers (the highest competency level) fairly highly (4.1 on a scale from 1 to 5).
3) While fairly few problems were reported in hiring lower level logistics staff, i.e., at the operative and administrative level, the skills level of operative staff was found lacking, leading to a need to train new hires on the job for several weeks or months.
4) Most companies rely on on-the-job training as the main method of training staff at all levels. This may mean that staff skills are less fungible across jobs at different companies, as qualifications are not recognized across the board, making it more difficult for staff to move companies.
5) The availability of logistics education by private training providers was found lacking.
6) Modern supply chain technology applications have not yet found widespread use in Vietnam. Several companies reported that they are planning to introduce them. Ramifications for job holders will include reduced demand for manual labor and increased emphasis on technical skills.

5.2.2 Main results from Logistics Skills Assessment in India

The World Bank assessment of logistics competencies, skills, and training was conducted in India in 2021. For the demand side of logistics skills, the key findings included:

Workforce availability

- Unskilled manpower is abundant. The unskilled workforce typically include migrating workers from other industry segments such as construction, municipality services and agriculture labor as well.
- The problem lies with the quality of skilled manpower that suits specific needs of the industry. For example, for activities such as forklift operations and truck drivers.
- Operative level staff skill levels were observed as “marginal” (maturity level 2). Supervisory and Managerial level staff skills were indicated as “average (maturity level 3).

Formal and informal employment

- Logistics service providers employ operating level staff through manpower contractors. Reasons include meeting cost targets in highly fragmented and competitive market and ensuring flexibility to meet varied demand patterns in outsourcing contracts.

For the supply side of logistics skills, the main results included:

Attractiveness of Logistics industry

- No practice of systematic assessment to plan for skills and competencies development exists. Both domestic and multinational organizations conduct “familiarization programs” for operative, administrative, supervisory, and managerial staff.

- Interviewees in food and cold chain logistics indicated a higher level of attractiveness for employment due to both technical and non-technical job roles at operational and supervisory levels. In large scale facilities, automation in handling simplifies work at the operational level.
- Availability of recruitment services indicates minimum capability (maturity level less than 2).
- Attractiveness of logistics industry as indicated by manpower supply agencies is "minimum capability" (maturity level 1.4). Reasons for the lack of attractiveness of the industry include the bad reputation of logistics jobs, relatively lower salaries when compared with other functions, and a lack of established career paths.

Skills and education

- Universities, vocational education, and private training institutes lack adequately trained faculty who possess industry experience and training capabilities.
- The Logistics Skills Council has enrolled 1,800 trainers and 2,800 training centers. The demand for skilled manpower is in millions.
- Readiness for modern supply chain technology and automation is assessed as 2.2 to 2.7 out of a maximum 5, indicating "marginal capability". Availability and quality of logistics education in Universities was assessed as 2.7 to 3.0, i.e., average capability

5.2.3 Recommendations for the development of logistics skills and competencies in Vietnam

Short-term measures (6-18 month timeframe) are highlighted in green; all others are medium-term measures (> 18 month timeframe).

Increase access to training

- Set up vocational training centers to ensure that staff receive qualification recognitions that are transferable across companies (unlike on-the-job training), in particular for operative level staff (forwarding, warehousing, truck driving, forklift operation)
- Promote training at universities/colleges at all levels (B.Sc., M.Sc., Ph.D.)
- Set up exchange programs with foreign universities in logistics and supply chain management
- Institute more train-the-trainer schemes

Improve training content and aligning with company needs

- Improve teaching capacity of lecturers
- Design training courses and regularly update training content
- Align training curricula with industry requirements
- Include global best practices in curriculum
- Attract Ph.D. graduates from abroad to teach in Vietnam

Improve the image of logistics

- Raise awareness of logistics as an employer
- Connect businesses with training institutions and students
- Introduce an initiative similar to the “Logistics Day” in Germany, where people can tour logistics companies and become familiar with the business

Involve companies in training efforts

- Encourage internships
- Encourage in-house training (in addition to vocational training)

5.2.4 Recommendations for the development of logistics skills and competencies in India

Recommendations to decrease the shortage of trained operative level staff

Recommendation 1 – Ensure minimum qualifications for operative level staff

Over a period of 3 to 5 years, companies employing operative logistics level staff (e.g., logistics services providers and shippers) could consider a minimum engagement of at least 20% of staff certified in basic logistics functions such as forklift driving.

Recommendation 2 – Establish logistics employment database

At present, data on logistics-related labor, employment, and skills development are not linked. A database related to logistics employment would provide better understanding of the existing gaps in logistics, especially relating to income, gender, and skills data gaps.

The Transport and Storage sector data is collected at state level with National Industrial Classification Code (H). This is required by the Ministry of Labour and Employment. Linking labor inspection and enforcement data with certifications, training and skill development of workers would provide insights into outcome of skill development activities.

Recommendations to improve the image of the logistics sector and jobs

Recommendation 1 – Improve working conditions

Much of the impression about the work is made through working conditions and facilities. Logistics sites, transportation wayside amenities and truck driver operating conditions may be improved. Provision of uniforms, canteen or refreshments and basic welfare schemes would enhance the workplace.

Recommendation 2 – Recognize and establish standardized logistics profiles

The acceptance of logistics as a key line function in both logistics services and the user sector is the first step in standardizing job roles. Coordinated efforts between logistics service providers and user sector may result in rapid professionalization of the sector. This would lead to improved image and attractiveness of overall logistics sector in the country.

Recommendation 3 – Increase salary levels in logistics

Recognition through respect for the role and activity performed and competitive remuneration packages are key for increasing attractiveness of logistics job profiles.

Recommendation 4 – Encourage set up of trade bodies and professional associations representing logistics

The Indian logistics market is dominated by family-owned logistics services providers and owner-cum-driver carrier services. Professional associations may develop programs to raise awareness of logistics as a broader concept than "transportation of goods". Awareness campaigns to engage with MSME logistics can better be sustained by collaborating with professional associations and trade bodies. Awards could be instituted to recognize best performing resources nominated by member organizations.

Recommendations to increase the quality of skills in all occupational levels and mainstream logistics education

Recommendation 1 – Provide interest subsidy for logistics training

Leverage current public infrastructure for training and development, and expand to meet the growing demand for a skilled workforce. Central and State Governments could subsidize interest on loans for logistics-related education, vocational and training programs. Such schemes would also encourage the formalization of workforce engagement due to increased availability of trained personnel.

Recommendation 2 – Co-create logistics training centers and academies

Establishment of minimum one logistics center in each district would unlock synergies from public-private partnerships. Collaboration with international partners would enhance image, capabilities and profile of logistics training in the country. Logistics academies may be established in association with Government and private Universities to improve logistics literacy.

Recommendation 3 - Learn from other countries with more mature logistics market

Encourage exchange programs such as industry study missions, student and faculty exchange to learn from other countries with more mature logistics market. CII Institute of Logistics presents such a model programs with Japan and Singapore.

Recommendation 4 – Encourage logistics discipline in mainstream education

From schools to universities, emphasis could be on logistics activities and programs for specialized education and training. Introduction of vocational education programs, professional certification programs and work-integrated graduate programs in every state would enhance knowledge and industry readiness of logistics workforce.

Special attention is warranted be on environmental and sustainability goals related to logistics sector. Relevant education material and guidelines may be introduced. For professionals, an annual series of environmental sustainability training seminars may be conducted through industry associations.

Recommendation 5 – Enhance capacity of logistics functions related trainers' pool

Industry associations may consider training of trainers and maintain registry of their contribution. Awards could be instituted to recognize contributing trainers.

5.3 Policy recommendations for the Dominican Republic

This section provides a set of recommendations to address the staff shortages that are identified for the Dominican Republic and to improve the skills and competencies of the logistics workforce.

Recommendation 1

Expand and improve the educational offer of specialized programs for logistics through increased dialogue between companies and education providers, prioritizing specialized technical and vocational education, and development of new specialization programs for logistics to respond to job and skills demands of the companies.

Specific actions:

Short-Term

1. Develop short cycle post-secondary programs for operational training, using both the polytechnic schools and INFOTEP, as an expanded vocational training offer for logistics. This operational training can help prepare graduates for operational jobs, for which there is typically more demand, improving opportunities of first job placement for graduates. This would also be beneficial to companies, which can have these types of training available, thus having to depend less in internal training for their employees.

2. Expand the existing technical high school program on logistics and transportation to a wider number of polytechnic schools, targeting those that are in the areas that concentrate clusters of logistics activities and service providers. Promote the program in student communities to attract more students to it, as part of the campaigns to promote the logistics sector. Promote the program also among companies that demand talent for logistics and that are in the geographical areas of the schools, currently many companies are not aware of the existence of this program.

3. Develop a basic technical program with INFOTEP for a logistics operator or basic technician in logistics, which covers the basic competencies for entry level positions at the operational and administrative levels. The program should be developed with the input of the logistics companies to define the program and content to be covered, aligned with the needs of the companies. This is a program that can be used to fill the needs of entry level positions, with the objective of reducing the amount of internal training companies must provide. It can also be used to facilitate access to employment in the communities where companies that demand talent for logistics jobs are located, as it can be implemented in educational centers that are part of the network of INFOTEP.

4. Develop a logistics concentration or certification with universities, to be implemented as part of current careers that can feed professionals for the sector like industrial engineering, international commerce, business administration, and similar ones that can be identified. The programs and content of the concentration should be developed in collaboration with the logistics companies, to align it to their skills needs. This is a strategy that can be implemented faster than developing new careers and builds on the fact that these careers are already getting a lot of students enrolled, that can be attracted to the concentration using an adequate promotion strategy.

Medium- and Long Term

8. Develop new masters' degree and specialization degree level programs for logistics with universities, based on the feedback from companies on which are the specific areas in which they are demanding more professional specialization. The target should be to cover specialization areas that are aligned with company needs and with the areas of growth and development for the logistics sector in the country, and the logistics industry in general. Examples can be programs that cover technology and digitalization applied to logistics, green logistics, and risk management and resiliency in logistics.

9. Create a program to train and validate the competencies of government employees that have inspection roles for cargo entering and leaving the country, and that are working for the implementation of the Joint Inspection Protocol. This protocol can improve agility of customs processes and having the right skills in the personnel that will have operational roles will contribute to its successful implementation.

10. Co-creation of logistics training centers and academies through public-private partnerships that can focus on the development of a specialized educational offer for logistics, covering the areas and topics that are identified by companies as not covered in current educational offer available in the country.

Recommendation 2

Integrate government, academia, and business sector in an alliance to collaborate in the execution of a strategy to address major gaps and challenges that must be overcome to improve education and availability of qualified staff for logistics in the country.

Specific actions:

Short-Term

1. Establish a formal alliance, supporting structure, and funding to work on the development and execution of a strategy to improve education and availability of skilled talent to support the existing strategy to develop the country into a regional logistics hub. One approach for this could be the creation of a Task Force as part of the Commerce Facilitation Committee focused on attacking transversal issues like: development of a sector wide strategy for skills development in logistics, identification and prioritization of the skill needs of the sector, alignment of training offer, training

and qualification of teachers, attraction of students to the careers feeding the sector, promotion of the logistics sector as an attractive labor destination and a key strategic sector for the country.

2. Execute a prospective study for better identification of the type of talent and skills that are demanded by the logistics sector and the staffing volumes that the industry will be needing to fill. More granular information is needed on current and projected skills needs of the logistics sector, that can be used by educational institutions to plan their offer of programs and careers.

Medium- and Long Term

3. Identify changes in regulatory framework that can support alignment and faster responses from government and the formal education system to the needs of the sector, including the finalization and implementation of professional profiles for the logistics and transportation family within the National Qualification Framework.

4. Establish a program of educational grants to support talented and lower income students to follow careers in logistics, both locally and in international universities.

Recommendation 3

Improve the public perception of logistics as a key strategic sector for the country and as an attractive employment destination and promote the careers that are offered to feed the sector to attract more students to logistics programs.

Specific actions:

Short-Term

1. Execute a promotional campaign through multiple media to improve knowledge in the public about the logistics sector in the country, its composition and main activities, the types of jobs it helps create, the benefits it brings to the country, and the growth potential and added benefits that can derive from the strategy to turn the country into a logistics hub for the region.

2. Increase contacts between students, schools, and the logistics sector, through execution of programs to visit ports, airports, logistics parks, and similar places that can serve as showcase to students of typical logistics activities, participation of logistics companies and associations in student fairs, and other similar activities to motivate and attract talent.

3. Bring universities, colleges and polytechnic schools that have logistics programs together with logistic companies and business associations, to develop internship programs for the students of those academic institutions, and to create candidate databases from their graduates, which can be used as a source for recruitment by logistic companies.

Recommendation 4

Continue to develop the sector, its companies, and logistics professionals, through improvement of processes, adoption of information technologies and digitalization to make the sector more attractive and achieve better alignment between occupational qualifications and payment structures.

Specific actions:

Short-Term

1. Bring together the logistics business sector, academia, and government to implement initiatives to support the development and continuous upgrading of logistics services in the country, through benchmarking and sharing of best practices, encouraging implementation of latest technologies, fostering international networking and transfer of know-how from global markets, and similar initiatives that can help the development of local companies and professionals.

2. Encourage international logistics associations to establish local chapters in the country to allow engagement and participation of local logistics professionals in the networking, training, and professional development activities that these types of organizations promote.

Medium- and Long Term

3. Encourage a better alignment between compensation structures and the skills and qualification levels that the sector is demanding at its different occupational groups, to ensure the attraction and retention of skilled talent to support the development and growth of the logistics sector in the country, as part of the strategy to turn the Dominican Republic into a regional logistics hub. One approach to support this can be the development of policies and initiatives that foster the development and the internationalization of local logistics companies. As companies become more sophisticated in their infrastructure, systems, and service offerings, it gets reflected in higher quality jobs and improved compensation structures.

Conclusion

Emerging countries tend to lag behind industrialized ones with regards to training budgets, course content, and the quality of the educational experience and training provider. Vocational schools for logistics jobs are lacking. And training - if there is any - is often limited to short-term, on-the-job instruction by colleagues during daily operations. This failure disproportionally affects the young, an untapped reservoir of apprentices. National governments and international agencies have traditionally paid more attention to infrastructure and trade facilitation than to fostering quality services and a skilled workforce. Employees are hired by private companies, and their training is largely a private responsibility. But governments play an important role directly by regulating or providing training— and indirectly by facilitating private initiatives. Developing countries need a major expansion of logistics training and skill development initiatives.

Public interventions promoting logistics competence can include the following:

- education and training by public institutions, or financial support to training
- education policy and curricula development

- advocacy, public-private dialogue, and multi-stakeholder collaboration
- regulation of freight and logistics services, including customs brokerage and trucking
- setting and harmonizing competency standards for different jobs
- raising skill levels in state-owned logistics enterprises (e.g., ports and railways)
- investing in human capital as a component of the development of logistics infrastructure [24]

Logistics is undergoing intense change. This must be considered in training programs that, otherwise, might be rapidly obsolete. Changes will depend on national and regional contexts. The divide between "formal" and "informal" logistics in emerging countries will not disappear in a few years. Even in countries where logistics still faces basic problems to reach international quality and performance standards, changes in logistics must receive a growing attention in the public policy agenda. These changes must be anticipated particularly in training program preparing the country's future logistics performance.

Changes that will shape tomorrow's logistics include:[25]

- automation and robotization (in transport, handling and warehousing)
- digitalization
- cyber security and block chain
- geo positioning
- smart infrastructure
- 3D printing
- drones
- platform economy
- city logistics

Still, the basics are stable and should receive even more attention, providing the framework of notions in which future technologies and methods will be acquired. The assessment of logistics skills, training, and competencies for the Dominican Republic broadly confirms this international analysis. The diagnosis for the Dominican Republic is strengthened by this convergence, together with the need for a deliberate strategy to upgrade logistics skills throughout the country.

[24] McKinnon A. et al. (2017).

[25] See OECD (2021) ITF Transport Outlook 2021

6 APPENDIXES

APPENDIX 1: LIST OF EDUCATIONAL PROGRAMS OFFERED FOR LOGISTICS

Table 11: List of educational programs offered

Program name	Institution	Type of institution	Diplomas, qualifications or certificates awarded	Academic level	Credits or Hours
Transportation and Logistics Engineering	Instituto Tecnológico de Santo Domingo (INTEC)	1-University	Bachelors degree	Bachelor's or equivalent level	249 credits
Industrial Engineering - Logistics concentration	Instituto Tecnológico de Santo Domingo (INTEC)	1-University	Bachelors degree	Bachelor's or equivalent level	276 credits
International Business	Instituto Tecnológico de Santo Domingo (INTEC)	1-University	Bachelors degree	Bachelor's or equivalent level	229 credits
Master in Supply Chain Management and Engineering	Instituto Tecnológico de Santo Domingo (INTEC)	1-University	Masters degree	Master's or equivalent level	60 credits
Industrial Engineering - Specialized certification in supply chain management	Pontificia Universidad Católica Madre y Maestra (PUCMM)	1-University	Bachelors degree	Bachelor's or equivalent level	
Integral Logistics (planned)	Pontificia Universidad Católica Madre y Maestra (PUCMM)	1-University	Higher technical	Short-cycle tertiary education	TBD
Executive Master in Supply Chain Management	Pontificia Universidad Católica Madre y Maestra (PUCMM)	1-University	Masters degree	Master's or equivalent level	42 credits
Warehouse Management and Inventory Control	Pontificia Universidad Católica Madre y Maestra (PUCMM) - TEP	1-University	Certificate	General informal education	16 hrs.
International Business	Universidad APEC (Unapec)	1-University	Bachelors degree	Bachelor's or equivalent level	202 credits
Customs and Foreign Trade	Universidad Autónoma de Santo Domingo (UASD)	1-University	Bachelors degree	Bachelor's or equivalent level	173 credits
BS in Aeronautics Management	Universidad del Caribe (UNICARIBE)	1-University	Bachelors degree	Bachelor's or equivalent level	155 credits

Program name	Institution	Type of institution	Diplomas, qualifications or certificates awarded	Academic level	Credits or Hours
BS in Ports Administration	Universidad del Caribe (UNICARIBE)	1-University	Bachelors degree	Bachelor's or equivalent level	158 credits
Customs Administration Technician	Universidad del Caribe (UNICARIBE)	1-University	Higher technical	Short-cycle tertiary education	99 credits
Port Administration Technician	Universidad del Caribe (UNICARIBE)	1-University	Higher technical	Short-cycle tertiary education	96 credits
International Trade Logistics (planned)	Universidad del Instituto Cultural Domínico Americano (UNICDA)	1-University	Diploma	General informal education	80 HRS.
Customs Management and International Trade (planned)	Universidad del Instituto Cultural Domínico Americano (UNICDA)	1-University	Diploma	General informal education	72 hrs
Industrial and Systems Engineering - Concentration in Business, Supply Chain and International Logistics	Universidad Iberoamericana (UNIBE)	1-University	Bachelors degree	Bachelor's or equivalent level	244 credits
SMS Auditor Course	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Certificate	General informal education	35 hrs.
Human Factors in Aviation Course	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Certificate	General informal education	35 hrs.
Safety Risk Management Course	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Certificate	General informal education	35 hrs.
Aeronautical Meteorology Course	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Certificate	General informal education	35 hrs.
ICAO Specialist Course in Aeronautical Cartography AIS	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Certificate	General informal education	60 hrs.
Technical Report Writing Course	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Certificate	General informal education	24 hrs.
Safety Management System (SMS) Course	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Certificate	General informal education	35 hrs.
Safe Transport of Dangerous Goods by Air Course (CAT-6)	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Certificate	General informal education	40 hrs.
Diploma in Aeronautical Law	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Diploma	General informal education	60 hrs.
Airport Management Diploma	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Diploma	General informal education	52 hrs.
Higher Technician in Aeronautical Administration	Academia Superior de Ciencias Aeronáuticas (ASCA)	2-College	Higher technical	General informal education	100 credits

Program name	Institution	Type of institution	Diplomas, qualifications or certificates awarded	Academic level	Credits or Hours
Logistics Technician	Instituto Técnico Superior Comunitario (ITSC)	2-College	Higher technical	General informal education	116 credits
Technical Bachelor in Aircraft Maintenance	Several politechnic schools	3-Polytechnic school	Certificate of technical high school	Upper secondary education	5400 hrs.
Technical Bachelor in Logistics and Transport	Several politechnic schools	3-Polytechnic school	Certificate of technical high school	Upper secondary education	5400 hrs.
Shipping of Goods in Drones	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	260 hrs.
Port Crane Operation	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	355 hrs.
Forklift Operations	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	305 hrs.
Fuel and Automotive Products Service Station Operator	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	170 hrs.
Administrative Scheduling of Bus Route	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Auxiliary Services in Loading Luggage and Bags	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Basic International Cargo Handling	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Basic Warehouse Supervision Techniques	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Bulldozer Tractor Operations	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Bus Driving	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Car Driving	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Inventory Management	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Operation of Tractors and Their Implements	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Warehouse Operations	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Certificate	General informal education	Not specified
Diploma in Logistics and Customs Management	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Diploma	General informal education	80 hrs.

Program name	Institution	Type of institution	Diplomas, qualifications or certificates awarded	Academic level	Credits or Hours
Diploma in Integrated Supply Chain System	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Diploma	General informal education	100 hrs.
Diploma in Export Management	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Diploma	General informal education	Not specified
Diploma in Integral Logistics	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Diploma	General informal education	Not specified
Diploma in International Trade	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Diploma	General informal education	Not specified
Diploma in Logistics for Public Integral Systems	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Diploma	General informal education	Not specified
Diploma in Preventive Maintenance in Container Cranes	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Diploma	General informal education	Not specified
Forklift Operation Technician	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Technician	Professional informal education	595 hrs.
ITV Internal Transfer Vehicle Operation Technician	Instituto Nacional de Formacion Tecnico Profesional (INFOTEP)	4-Vocational institution	Technician	Professional informal education	640 hrs.
Courses on various topics on customs and foreign trade	Asociación Dominicana de Agentes de Aduanas, Inc. (ADAA)	5-Private training provider	Certificate	General informal education	Not specified
IATA International Cargo - Basic	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	16 hrs.
Customs Management	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	10 hrs.
Warehouse Management	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	12 hrs.
Logistics and Transport Management	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	16 hrs.
Introduction to the Logistics Operator	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	12 hrs.
Hazardous Materials - Update	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	16 hrs.
Hazardous Materials - Basic	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	35 hrs.

Program name	Institution	Type of institution	Diplomas, qualifications or certificates awarded	Academic level	Credits or Hours
Logistics Negotiation Program	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	12 hrs.
Air Cargo Security	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	10 hrs.
Special Cargo Week	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	50 hrs.
Workshops on various topics	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	3 - 6 hrs.
Air Freight	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	10 hrs.
Ground Transportation	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Certificate	General informal education	10 hrs.
Diploma in Transportation and Logistics -FIATA- ADACAM	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Diploma	General informal education	80 hrs.
Maritime Transport of Goods	Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADACAM)	5-Private training provider	Diploma	General informal education	12 hrs.
Integral Logistics and Supply Chain	Caes Academy	5-Private training provider	Certificate	General informal education	32 hrs.
Customs Management and International Trade	Caes Academy	5-Private training provider	Diploma	General informal education	Not specified
Business and International Trade	Caes Academy	5-Private training provider	Diploma	General informal education	44 hrs.
Modular Course: Basic Customs Techniques	Centro de Capacitación en Política y Gestión Fiscal (CAPGEFI)	5-Private training provider	Certificate	General informal education	110 hrs.
Courses on various topics on port operations, transportation, supply chain and logistics	DP World Academy	5-Private training provider	Certificate	General informal education	Not specified
Procurement and Customs Management in D.R.	Eximedia	5-Private training provider	Certificate	General informal education	12 hrs.
Supply Chain and Logistics	Eximedia	5-Private training provider	Certificate	General informal education	12 hrs.

Program name	Institution	Type of institution	Diplomas, qualifications or certificates awarded	Academic level	Credits or Hours
Diploma in Customs Management and Imports	QualityGB	5-Private training provider	Certificate	General informal education	Not specified
Diploma in Logistics and Supply Chain Management	QualityGB	5-Private training provider	Certificate	General informal education	Not specified
Supply Chain Management and International Logistics	Sigmatec	5-Private training provider	Diploma	General informal education	56 hrs.
APICS – Certified In Logistics, Transportation And Distribution (CLTD)	Steam	5-Private training provider	Certificate	General informal education	51 hrs.
APICS – Certified Supply Chain Professional (CSCP)	Steam	5-Private training provider	Certificate	General informal education	50 hrs.
Port Management Programme	UNCTAD TRAINFORTRADE Program in Dominican Republic	5-Private training provider	Certificate	General informal education	Not specified

Source: Assessment data

APPENDIX 2: ASSESSMENT AREAS

The scope of the assessment is mapped out through 20 assessment areas. This allows for tailoring the assessment to the different types of stakeholders to be interviewed. The ability of a country to meet the labor requirements of logistics can be defined in terms of both demand and supply. Demand can be measured by the number of personnel required and their required skills levels. For supply, one can measure the number of people trained and the skills they possess when entering the sector. If the supply does not satisfy the industry demand, a country might face a skills shortage.

For demand, eight assessment areas are defined. They pertain to both recruitment of new employees and the skills levels of existing employees on four occupational levels. For supply, twelve assessment areas are defined. They cover the availability and quality of different education providers and also deal with certifications of logistics skills, the role of professional associations in developing these skills, the relative attractiveness of employment in the logistics industry and availability of recruitment services. The following figure provides an overview of the assessment areas.

Figure 20: Assessment areas

Demand	**A1** Recruitment of operative logistics staff	**A2** Skills level of existing operative logistics employees	**A3** Recruitment of administrative logistics staff	**A4** Skills level of existing administrative logistics employees
	A5 Recruitment of logistics supervisors	**A6** Skills level of existing logistics supervisory employees	**A7** Recruitment of logistics managers	**A8** Skills level of logistics managers currently in post
Supply	**A9** Availability of vocational education in logistics	**A10** Quality of vocational education in logistics	**A11** Availability of logistics education by private training providers	**A12** Quality of logistics education by private training providers
	A13 Availability of logistics education by universities	**A14** Quality of logistics education by universities	**A15** Availability of in-house training	**A16** Quality of in-house training
	A17 Certifications of logistics skills	**A18** Role of associations	**A19** Attractiveness of logistics industry	**A20** Availability of recruitment services

Source: Logistics Competences, Skills and Training Assessment Toolkit

APPENDIX 2: MATURITY LEVELS

To measure a country's capability with respect to the assessment areas, a maturity model was defined for the toolkit. The following figure illustrates the maturity level concept for one of the assessment areas (Availability of operative logistics staff). Levels two and four deliberately contain no descriptions to keep the assessment simple and flexible.

Figure 21: Maturity levels

Level 1 Minimal Capability	**Level 2** Marginal Capability	**Level 3** Average Capability	**Level 4** Advanced Capability	**Level 5** Global Best Practice
There is a lack of operative logistics staff Companies experience huge difficulties in filling open positions Employees are wooed by other companies or recruitment agencies	Between level 1 and 3	Demand and supply of operative logistics staff are balanced Companies can fill open positions in an acceptable amount of time compared to other industries	Between level 3 and 5	Many people suited to work as operative logistics staff are on the job market. Open positions can be filled with exceptional personnel at short notice

Source: Logistics Competences, Skills, and Training Assessment Toolkit

APPENDIX 3: SCORES BY ASSESSMENT AREAS

Recruitment of operative logistics staff

Maturity score Level 1 There is a lack of operative logistics staff. Companies experience huge difficulties in filling open positions. Employees are wooed by other companies or recruitment agencies. Level 3 Demand and supply of operative logistics staff are balanced. Companies can fill open positions in an acceptable amount of time compared to other industries. Level 5 Many people suited to work as operative logistics staff are on the job market. Open positions can be filled with exceptional personnel at short notice	2.2

What is the general availability of candidates with operative-level logistics skills?	55% of respondents indicate there is low to very low availability of qualified candidates for operative level positions. Specialized positions such as crane operators are mentioned as difficult to fill. Companies that indicate there is availability of candidates at this level are mostly recruiting recent graduates or seniors from universities and technical schools, without any additional experience or specialization on logistics, and counting on their internal training programs to build additional skills required for each job.
What is the share of unfilled vacancies for operative logistics jobs?	All companies report having vacancies for operative logistics jobs, as a result both of job rotation and growth of operations. These vacancies represent 8% to 20% of all vacancies for 5 companies, and 50% to 60% for 3 other companies.
How long on average does it take to fill an advertised operative logistics post?	3 to 8 weeks for the majority of companies (64% of respondents), with 1 to 3 weeks as the shortest (22% of respondents) and 4 to 6 months as the longest (29% of respondents).
What share of applicants for operative logistics jobs have the required skills?	For 64% of respondents, most applicants have low to none of the requirements that they need for logistics jobs. 36% of respondents indicate they receive a good share of applicants with good enough general skills that can be then completed with training.
What share of operative logistics vacancies are filled by specialized recruitment agencies?	Recruitment agencies are not used for this level as the norm, and in general, there are few specialized agencies for logistics in the country. Only one company says they use a specialized agency to recruit operative staff and is mostly for activities that are outsourced. An airport operator is using general recruitment agencies for all their recruitment, because of the difficulty to find qualified candidates for airport related jobs.

What is the typical turnover rate for staff working in operative logistics jobs (share of staff leaving within one year)?	Turnover rates vary in the sector at the operative level, for 40% of respondents it is less than 2%, for another 40% it is between 6% and 30%, and 6% report a high turnover that is between 50% and 60%. The companies with higher job rotation coincide in indicating high levels of rotation among younger personnel, which is more difficult to retain because as soon as they are trained and gain some experience, they look for other options in the market, or are poached by other companies that are looking to hire staff that is already trained in the sector.

Skills Level of Existing Operative Logistics Employees

Maturity score Level 1 Operative logistics staff does not possess the necessary skills for their job. Incidents caused by a lack of skills happen frequently. New employees have to receive introductory training to close skills gaps. Level 3 Operative logistics staff possesses the necessary skills for their job. They only seldom have to receive introductory training. Level 5 Operative logistics staff exceeds skills requirements. They often participate in advanced training to improve their logistics skills. Logistics supervisors are recruited from highly skilled operative logistics staff.	2.8

Does operative logistics staff in post possess the right skills for their job?	Almost all interviewees provided a similar response: staff in current posts have the required skills because they have acquired them through the training that has been provided to them and through job experience. Most persons do not have the required skills when they start on a position, and a combination of internal and external training is used to build the required skills. Only in cases when positions are filled through internal promotions, incumbents can have a good share of the required skills for the job.
If not, what are the main skills they lack?	For most respondents the situation is similar, they mostly lack the specific skills required in different jobs, for example, knowledge of shipping documentation, operation of specific types of equipment, receiving and shipping procedures. Basic math and critical thinking skills are mentioned as weak at this level, and some companies require at least a basic level of proficiency in English, which is difficult to find.
What are the main consequences of operative logistics staff lacking the right skills?	If the right skills are missing, it can lead to the following impacts: errors that can cause losses due to damages and customer service problems, fines from regulating institutions due to documentation related problems, impact to security of carriers in airport operations, complaints from customers and loss of reputation for the company.

What share of operative logistics staff need to receive 'top-up' training in their first months of employment?	For all companies, 100% of operative logistics staff needs to go through training during their first months of employment. Length of training can vary from 2-3 months in some companies to 6-11 months in others.
What share of logistics operative staff are promoted to more senior roles within 5 years (period might not apply to small companies)?	22% of companies indicate between 40% and 50% of their operative staff are promoted. Another 33% mention they have technical and operational ladders in their organizational structure where higher level positions are filled with lower-level ones, allowing employees to grow and be promoted in the organization.

Recruitment of Administrative Logistics Staff

Maturity score Level 1 There is a lack of administrative logistics staff. Companies experience huge difficulties in filling open positions. Employees are wooed by other companies or recruitment agencies. Level 3 Demand and supply of administrative logistics staff are balanced. Companies can fill open positions in an acceptable amount of time compared to other industries. Level 5 Many people suited to work as administrative logistics staff are on the job market. Open positions can be filled with exceptional personnel at short notice.	2.3

What is the general availability of candidates with administrative-level logistics skills?	In general, responses point to a situation similar to that of the operative level, with most companies indicating there is low availability of qualified candidates for administrative jobs. 52% of respondents indicate availability of qualified candidates is low or very low, and 38% of them mention there is availability of candidates with general skills for the jobs, but that most of them lack specialized logistics skills. Finance jobs are mentioned as challenging to find because they require proficiency in English, which is hard to find for these types of jobs. Candidates for sales jobs, planner-buyer and customs are also mentioned as difficult to find.
What is the share of unfilled vacancies for administrative logistics jobs?	Around 30-40% of vacancies as an overall average.
How long on average does it take to fill an advertised administrative logistics post?	3 to 8 weeks for most companies (63% of respondents), and 3 to 6 months for the rest (25% of respondents), which are mostly companies that have a good share of specialized jobs in their list of vacancies.

What share of applicants for administrative logistics jobs have the required skills?	A similar situation as for the operative level, although there are more candidates with at least the required general skills. For 60% of respondents, most applicants have few of the required skills. 40% of respondents indicate they receive applications from candidates with good general skills. All respondents agree few have specialized logistics skills unless they come with experience from other companies in the logistics sector.
What share of administrative logistics vacancies are filled by specialized recruitment agencies?	Only 29% of companies report they use recruitment agencies to fill administrative vacancies, and they typically do it only for certain positions that tend to be more difficult to find in the market. Most companies use their own internal resources for recruitment.
What is the typical turnover rate for staff working in administrative logistics jobs (share of staff leaving within one year)?	71% of companies report to have a relatively low job rotation of less than 10% for administrative logistics jobs. 29% of companies report high levels of job rotation in the 40-60% range. Like the operative group, companies with high levels of job rotation see it more among younger personnel, which is more difficult to retain and is easily attracted by other companies once they gain some level of training and experience.

Skills Level of Existing Administrative Logistics Employees

Maturity score Level 1 Administrative logistics personnel does not possess the necessary skills for their job. Incidents caused by a lack of skills happen frequently. New employees have to receive introductory training to close skills gaps. Level 3 Administrative logistics personnel possesses the necessary skills for their job. They only seldom have to receive introductory training. Level 5 Administrative logistics personnel exceeds skills requirements. They often participate in advanced training to improve their logistics skills. Logistics supervisors are recruited from highly skilled administrative personnel.	2.6

Does administrative logistics staff possess the right skills for their job?	Same as with the operative level, most candidates do not have all the required skills when they start in a position, but they obtain them through training provided by companies using both internal and external training resources.
If not, what are the main skills they lack?	The skills that usually need more development are those related to technical and operational aspects of the jobs. For example, an accounting person will have the basic skills for accounting, but they do

	not know what a container is, or how to execute accounting processes in a maritime shipping company. Other skills usually needing development are technology and information systems, Excel and related computer skills, soft skills like tools for analysis and problem solving, math skills.
What are the main consequences of administrative logistics staff lacking the right skills?	If staff lacks the right skills the impacts can be the following: lower customer service, increase in costs due to errors, loss of confidence from clients, increase in times to provide services, delays in shipments, fines from regulating institutions due to documentation related problems, complaints from customers.
What share of administrative logistics staff needs to receive top-up training in their first months of employment?	All companies indicate that 100% of administrative logistics staff needs to go through training during their first months of employment.
What share of logistics administrators are promoted to managerial logistics positions within 5 years (period might not apply to small companies)?	There is no conclusive data from responses on the share of administrative staff that is promoted, but 89% of companies indicate a large share of their staff at this level is promoted through their organizational ladders, and due to company growth.

Recruitment of Logistics Supervisors

Maturity score Level 1 There is a lack of logistics supervisors. Companies experience huge difficulties in filling open positions. Employees are wooed by other companies or recruitment agencies. Level 3 Demand and supply of logistics supervisors are balanced. Companies can fill open positions in an acceptable amount of time compared to other industries. Level 5 Many people suited to work as logistics supervisors are on the job market. Open positions can be filled with exceptional personnel at short notice.	2.7

What is the general availability of candidates with logistics supervisory-level skills?	43% of respondents indicate availability of qualified candidates is low to very low, while another 19% indicate there is good availability of candidates with base skills for the jobs. The remaining 38%, composed mostly logistics service providers and shippers, mention their policy is to fill supervision positions through internal promotions, and in few specific occasions they recruit externally. In those occasions, they indicate it is difficult to find candidates with the required logistics qualifications.
What is the share of unfilled vacancies for logistics supervisor jobs?	All respondents indicate the share of unfilled vacancies for supervisor jobs is low, and most companies try to fill these positions preferably through internal promotions, although in several cases they

	recruit externally because of growth or changes in the business. 40% of companies report they recruit 3 to 6 supervisors externally per year.
How long on average does it take to fill an advertised logistics supervisor post?	Filling a supervisor job post takes 30 to 45 days for 38% of respondents, and 3 to 6 months for 25% of respondents.
What share of applicants for logistics supervisor jobs have the required skills?	The experience for 42% of respondents is that all applicants never have all the required skills for logistics supervisors' posts. 29% of respondents indicate most supervisor jobs are filled internally and potential candidates have the required skills thanks to internal training and development programs. For the remaining 29%, it depends on the specific position posted, some receive a good number of qualified candidates, but there are positions for which it is difficult to obtain qualified candidates. One of the competencies that is usually lacking at this level is English language.
What share of logistics supervisor vacancies are filled by specialized recruitment agencies?	Agencies are not widely used at this level, 63% of respondents indicate they do not use external agencies to recruit supervisor vacancies.
What is the typical turnover rate for logistics supervisors (share of staff leaving within one year)?	Turnover seems to be low for logistics supervisors, with respondents reporting turnover levels of 6% or less.

Skills Level of Existing Logistics Supervisory Employees

Maturity score Level 1 Logistics supervisors do not possess the necessary skills for their job. Incidents caused by a lack of skills happen frequently. New employees have to receive introductory training to close skills gaps. Level 3 Logistics supervisors possess the necessary skills for their job. They only seldom have to receive introductory training. Level 5 Logistics supervisors exceed skills requirements. They often participate in advanced training to improve their logistics skills. Logistics managers are recruited from highly skilled logistics supervisors.	2.8

Do logistics supervisors possess the right skills for their job?	25% of respondents indicate supervisors have the right skills for the job, while another 50% also indicate supervisors have the right skills, but because they acquired them through training provided by

	companies and experience on the job. For 25% of respondents, supervisors do not have all the skills needed against current challenges and changes the sector is going through.
If not, what are the main skills they lack?	Skills mentioned as lacking or needing development: knowledge about technology and information systems used, cargo safety, leadership skills, conflict management, ability to work under pressure, process design and implementation, critical thinking.
What are the main consequences of logistics supervisors lacking the right skills?	If staff lacks the right skills the impacts can be the following: lower customer service, increase in costs due to errors, loss of confidence from clients, increase in times to provide services, delays in shipments, fines from regulating institutions due to documentation related problems, complaints from customers, inventory errors, increased spending on training.
What share of logistics supervisors needs to receive top-up training in their first months of employment?	All companies indicate that all their logistics supervisors go through training during their first months of employment.
What share of logistics supervisors are promoted to logistics management positions within 5 years (period might not apply to small companies)?	80% of respondents indicate their supervisors are promoted within 5 years to manager or higher-level positions. 20% of respondents indicate they have not had promotions on this group recently.

Recruitment of Logistics Managers

Maturity score Level 1 There is a lack of logistics managers. Companies experience huge difficulties in filling open positions. Employees are wooed by other companies or recruitment agencies. Level 3 Demand and supply of logistics managers are balanced. Companies can fill open positions in an acceptable amount of time compared to other industries. Level 5 Many people suited to work as logistics managers are on the job market. Open positions can be filled with exceptional personnel at short notice.	2.5

What is the general availability of candidates with management-level capabilities in logistics?	58% of respondents indicate availability of managers in the market with logistics qualifications is limited, and some mention there is some level of cannibalization in some sectors because of this. Certain positions as Commercial Manager and Traffic Manager are hard to fill for most companies. 42% indicate there is good availability of candidates with good general managerial skills that can be trained in the additional specific logistics skills needed, which is what they mostly do when they need to recruit managers externally.

What is the share of unfilled vacancies for logistics managers?	54% of respondents indicate they have few unfilled manager vacancies due to low job rotation and policies to fill jobs at this level through internal promotions. 45% indicate they have unfilled manager vacancies. The share of unfilled vacancies varies by size and type of company, 2 companies report a share between 10% and 15%, 1 company reports a share of 1% to 2%.
How long on average does it take to fill an advertised logistics manager post?	64% of respondents report it takes them from 2 to 6 months to fill a manager post.
What share of applicants for logistics managerial jobs have the required skills?	For 50% of respondents applicants do not have all the required skills for logistics manager posts. 20% of respondents indicate manager jobs are filled internally and potential candidates have the required skills thanks to internal training and development programs. The remaining 30%, indicate they receive from 20% up of candidates that have the skills that are required.
What share of logistics manager vacancies are filled by specialized recruitment agencies?	67% of respondents indicate they use external agencies to recruit manager vacancies.
What is the typical turnover rate for logistics managers (share of managers leaving within one year)?	Turnover for logistics managers is reported as low to very low by 92% of respondents, mentioning that it is common for managers to stay a long time with a company and make careers in the sector.

Skills Level of Logistics Managers currently in post

Maturity score Level 1 Logistics managers do not possess the necessary skills for their job. Incidents caused by a lack of skills happen frequently. New employees have to receive introductory training to close skills gaps. Level 3 Logistics managers possess the necessary skills for their job. They only seldom have to receive introductory training. Level 5 Logistics managers exceed skills requirements. They often participate in advanced training to improve their logistics skills. Logistics managers are natural candidates for high-level executive positions.	3.1

Do logistics managers possess the right skills for their job?	66% of respondents indicate managers have the right skills for the job, while another 17% also indicate managers have the right skills, but because they acquired them through training provided by com-

	panies and experience on the job. For 17% of respondents, managers do not have all the skills needed against current challenges and changes the sector is going through.
If not, what are the main skills they lack?	Skills mentioned as lacking or needing development: knowledge about technology and information systems used, advanced logistics and warehousing, administrative skills that are specific for logistics, knowledge of international regulations, project management and managerial soft skills.
What are the main consequences of logistics managers lacking the right skills?	If staff lacks the right skills the impacts can be similar to those mentioned in previous levels but with higher impact: lower customer service, increase in costs due to errors, loss of confidence from clients, increase in times to provide services, delays in shipments, fines from regulating institutions due to documentation related problems, complaints from customers.
What share of logistics managers needs to receive top-up training in their first months of employment?	All companies indicate that all their logistics managers go through training during their first months of employment.
What share of logistics managers are promoted with 5 years (period might not apply to small companies)?	67% of respondents indicate that 10% to 100% of their managers are promoted within 5 years to higher level positions, or to positions in other countries in the case of multinational companies. 27% of respondents indicate managers do not receive many opportunities for promotions. Key reasons mentioned are thar top positions are occupied by expats or by members of the company owners' families.

Availability of Vocational Education in Logistics

Maturity score Level 1 No vocational education in logistics exists. Level 3 Vocational education in logistics is available. Only some operative and administrative logistics employees have attended vocational schools. Level 5 Vocational education in logistics is widely available. Most operative and administrative logistics employees have attended vocational schools. Vocational schools play a leading role in skills development for operative and administrative logistics staff.	2.7

To what extent does vocational education exist and offer logistics courses and programs?	45% of interviewees indicate that at the vocational level the offer is limited. The main offer comes from the governmental institution Instituto de Formación Técnico Profesional (INFOTEP) and several

	business associations that have developed programs that mainly cover basic logistics topics, but what is offered does not provide a response to cover all the needs of the logistics sector. There is a technical high school program on logistics and transportation that is offered in several schools, but a good portion of the companies interviewed do not know it.
What share of the current logistics employees received vocational training?	In the case of 44% of interviewees, over 80% of employees receive vocational training. 39% of them indicate that few of their employees have received vocational training in logistics.
How important are vocational schools to overall skills development in logistics?	For 42% of interviewees vocational schools are important to overall skills development, and 58% indicate vocational education is important for logistics, but its impact has been low because the educational offer is limited.

Quality of Vocational Education in Logistics

Maturity score Level 1 Vocational education in logistics is not widely accepted in industry. Programs are not aligned to industry needs. Low skills level of graduates. Level 3 Vocational education in logistics is accepted in industry. Programs meet the basic needs of the industry. Level 5 Vocational education in logistics is widely accepted in industry. Close collaboration with industry results in up-to-date program content. Certifications and degrees are established and widely known.	2.5

How well is a vocational education in logistics accepted by the industry?	The quality of vocational education is qualified as good and meeting companies' expectations by 61% of interviewees. The remaining 49% indicate that quality needs to be improved and mention having a more specialized offer and better and more specialized trainers as key areas for improvement.
How well do the vocational institutions collaborate with the industry to keep logistics program contents relevant and up to date?	There is collaboration between vocational institutions and industry, although it seems there is room for improvement. 54% of respondents think there is good collaboration, especially with INFOTEP, which seems to be more active in collaboration initiatives. 46% think that more collaboration is needed. Other vocational institutions beyond INFOTEP indicate they have little contact with industry and only few isolated companies are working collaboration initiatives with them. One comment received was that there is desire to

	collaborate in vocational institutions, but obtaining concrete results tends to be difficult with most institutions.
Which specialist qualifications are available in logistics at the vocational level?	There are 2 upper secondary programs for polytechnic schools, several technical programs offered by vocational institutions like INFOTEP, ASCA and CAPGEFI, plus certificate programs offered by business associations like ADACAM and ADAA. 50% of interviewees mentioned they are not aware of the vocational offer that is available in the country.
In what ways, if any, is vocational education in logistics deficient?	There is a perception that current vocational education offered is not providing a response to the needs of the companies in the logistics sector, it is mostly composed of a general education, as expressed by 81% of respondents. There are many technical aspects in logistics that are not covered, like: documentation and processes used in maritime and air shipments, customs processes, air transportation, information systems used in logistics. Other key issue mentioned is the need to have more qualified trainers. There are not good teachers available. Most people experienced in logistics work in the sector and do not have much time available, plus, teachers' pay is not attractive for them.

Availability of Logistics Education by Private Training Providers

Maturity score Level 1 Little or no private training providers exist. Level 3 Private training providers exist and offer logistics education. They play a minor role in skills development in logistics. Trainers have limited training/ certification themselves. Little segmentation of the market. Market dominated by indigenous providers. Level 5 Private training providers are an important source of logistics education. Participating in their training is common practice for logisticians. Private logistics training meets high professional standards and is well endowed with trained, certified and experienced staff. Well-segmented market by activity, occupational level and compromises a healthy mix of indigenous and foreign providers.	3.3

How much capacity do private training providers have to support logistics skill development?	There is an offer from private providers covering areas like warehousing, forklift operators, port operators, supply chain management, but 26% of respondents indicate the offer is not enough to supply a current growing demand and is not aligned to the needs of the sector. Business associations play a significant role in offering programs for logistics skills development.

What share of the current logistics employees has participated in training programs offered by private training providers?	58% of respondents indicate that a high percentage of their employees has participated in programs offered by training providers.
How is private providers' share of the logistics training market changing?	The offer is increasing due to the limited offering from universities and schools and driven by new projects that are sponsored by business associations from the sector.
How are the private trainers trained?	Private trainers are composed of persons that have experience working in the logistics sector. In the case of programs sponsored by business associations trainers have been trained by foreign trainers brought to the country.
What proportion has specialist qualifications/ certification in logistics?	Trainers used have certifications and/or specializations in logistics, what they usually lack is train the trainer training.
To what extent is the logistics training market segmented by activity and occupational level?	It is segmented by activities based on the area of focus of private providers delivering the training. It is not segmented by occupational levels, there is a lack of logistics skills across all levels of companies and the educational offer responds to this reality.
How is the private logistics training market split between indigenous and foreign providers?	There is no regular offer from foreign providers in the country.

Quality of Logistics Education by Private Training Providers

Maturity score Level 1 Private training providers are not widely accepted in industry. Training courses are not aligned to industry needs. Low skills level of training participants. Level 3 Private training providers are accepted in industry. Training courses meet the basic needs of industry. Level 5 Private training providers in logistics are widely accepted in industry. Close collaboration with industry results in up-to-date training content. Certifications and degrees are established and widely known.	3.2

How well are private logistics training providers accepted in the industry?	For 77% of interviewees private training providers are well accepted by the industry because companies and business associations are participating with them in the identification and development of programs. 23% of interviewees indicate the offer from private pro-

	viders is generally good but can be improved by having a more practical orientation and by more in tune with innovations and best practices of the logistics industry.
How well do private logistics training providers collaborate with industry to keep program contents relevant and up to date?	Collaboration has been very good between private providers and the industry, especially with business associations from the logistics sector. One respondent feels some of the key stakeholders in the industry are becoming reluctant to continue investing in private education without obtaining better results, as they feel they have been supporting it for too long and expect it to be more effective. This has been a driver to launch new initiatives that can respond better to current skills demands from companies.
What certification do they offer for successfully completed courses?	Certificates of participation mostly, with some few exceptions of programs that offer internationally accredited certifications. Training programs offered by private providers are short courses, typically 16 to 35 hours long focused in covering operational requirements from the companies, based on the area of focus of the providers: air freight, port operations, drivers training, aeronautics, customs, warehousing.
In what ways is private provision of logistics training deficient?	The main areas mentioned that need to be improved were: lack of specialized and certified trainers, too much focus on general skills and a need to cover more logistics and country specific topics, incorporation of changes in technology, better alignment between the offer and current job demands companies have, standardization of contents.

Availability of Logistics Education by Universities

Maturity score Level 1 Only programs offered online through foreign universities provide logistics education on a university level. Level 3 Some courses on logistics are offered by universities. Only some of the logistics supervisors and managers have attended these courses. Level 5 Dedicated logistics programs exist and are well-known in the industry. Universities are of high importance for logistics skills development on a supervisor or manager level.	3.0

How much specialist education in logistics is provided by the country's universities?	The educational offer from universities and colleges is limited, as identified by 75% of interviewees. There are 5 universities and 2 colleges offering careers for logistics. Their offer includes 2 programs

	at a master's degree level, 8 at a bachelor's degree level, and 5 at the higher technical level. 4 of these institutions interviewed indicate logistics careers have comparatively lower demand and attracting students to them is a challenge. Many of the professionals in the sector come from more general careers like industrial engineering, management, and international commerce, and receive logistics specific training on the job and through internal training and private training providers. There is also a structural issue in the design of the country's educational offer that does not favor programs at the higher technical level and that contributes to students not seeing these programs as a good option for early job placement. The way in which the requirements of university careers are structured and the curricular designs of undergraduate careers and those of higher technician programs do not allow students to pursue a career of higher technician and then validate what is covered to continue with a bachelor's degree career. They only manage to have part of the credits validated, and it will depend on the agreements between the institutions. This makes higher technical careers less attractive, since students prefer to pursue undergraduate degrees from the beginning, since it will be better economically and in terms of total time to complete a bachelor's degree level, which is also assumed as the one with the best demand by companies.
How common is it for students specializing in logistics to be educated in foreign universities?	Not common. It is expensive, so few can afford it. Only a small group of managers go to foreign universities for specialized training, sponsored by the companies they work for.
Which share of logistics supervisors and logistics managers have degrees or diplomas?	There is a combination of people with degrees and people that are empirical, but there is not enough data from responses on what are the share levels in each case.
How important are universities to overall skills development in logistics?	Their impact has been low, the educational offer from universities is limited and the existing careers are not demanded by many students.

Quality of Logistics Education by Universities

Maturity score Level 1 University education in logistics is not widely accepted in industry. Course contents are not aligned to industry needs. Low skills level of graduates. Level 3 University education in logistics is accepted in the industry. Graduates are known to possess basic logistics skills. Level 5	2.5

Universities are known to provide highly-skilled logistics graduates. Universities collaborate closely with well-known international institutions and companies. Most logistics managers have attended logistics programs or courses by universities.	

How well are logistics-related courses delivered by universities accepted in the industry?	Many graduates from existing programs are hired for logistics jobs, but one reason behind that is that the offer from universities is limited and companies opt to take what is available in the market and complete their skills though training. 50% of interviewees indicate programs offered by universities have a general focus and there is not a good match between company needs and what universities are teaching.
How well do universities collaborate with the industry to keep logistics program contents relevant and up to date?	There is collaboration between universities and the industry, but it is fragmented. 56% of interviewees indicate there is good collaboration with the universities that are offering programs for logistics. The remaining 44% indicate better collaboration is needed and mention: more sector wide collaboration is needed, the process to offer new programs is slow, more collaboration is needed on programs contents, updating programs is difficult due to administrative controls in the educational system.
Do foreign universities specializing in logistics have a presence in the country?	There is no presence of foreign universities in the country.
How well do local universities collaborate with foreign institutions in the field of logistics?	All local universities that have logistics programs have relationships with foreign universities, but they are not collaborating in logistics-specific programs, except for supply chain programs, in which logistics is one of multiple subjects covered.

Availability of in-House Training

Maturity score Level 1 No structured in-house training is offered by companies. Only short on-the-job training is provided if employees lack the right skills. Much poaching of qualified staff. Level 3 Most companies offer some kind of training to improve logistics skills. Level 5 Structured plans for initial and advanced training in logistics are in place in most companies. Regular advanced training is mandatory for employees in logistics.	3.6

What proportion of logistics training is provided in-house?	For 29% of respondents 50% of logistics training is provided in-house, and for another 29% the share is 80% to 100% in-house. The remaining 42% does not know the specific share but indicate a high proportion of their training is in-house.
Typically, what kinds of in-house training in logistics is offered by companies?	The main types of training offered are: basic logistics skills and technical training for operative and administrative levels, soft skills for

	supervisors and above, country and company specific processes, client procedures, operational certifications, international commerce, regulations, training in the systems used in the company, documentation, air transportation, inventory management, equipment operation, customer service, negotiations, cost management.
Do companies offer initial training for all new employees?	All companies offer training for all new employees.
Do companies offer regular advanced training for all employees?	All companies offer advanced training to their employees based on job needs and organizational levels.
To what extent are companies discouraged from training their logistics employees by the fear that they will be poached by other firms?	It is a real concern for companies, but all interviewees indicate their companies continue to invest in training even with the threat that employees may be poached by other companies.

Quality of in-House Training

Maturity score Level 1 Training offered is of low quality No skills certification systems are employed. Level 3 Training offered is of medium quality Some training build on established skills certification systems. Level 5 Most companies collaborate with professional training providers or associations to improve the skills of their logistics workforce The training offered is built around established and well-known skills certification systems.	3.5

How do companies scope their in-house training?	Companies use several sources to scope their in-house training: job descriptions, internal procedures, performance evaluations, developmental plans, skill gaps identified, local and corporate training programs, clients requirements,
Do companies include external trainers in their in-house training?	85% of companies indicate they use external trainers as part of their in-house training.
Do companies build on established skills certification systems for their in-house training?	45% of respondents indicate their companies base their training on competency models developed by their corporations, or in cases where jobs require an accredited certification.
What are the main deficiencies in in-house training?	The main deficiencies and challenges cited by interviewees are: limited availability of good trainers with practical knowledge and pedagogical skills, having the capacity to train all required personnel in the required time, balancing the workload on trainers and trainees against regular daily activities, higher focus on basic skills instead of on technical logistic skills, adaptation of corporate training to cultural and local changes, accelerate training to support digital transformation.

Certifications of Logistics Skills

Maturity score Level 1 Certifications of logistics skills play no role in the country. Level 3 Certifications of logistics skills exist and are used by some companies or education providers They are not accepted as cross-industry standard. Level 5 National or international certification systems are in place to formalize logistics skills Companies require certifications from job applicants.	2.8

Which certification systems are in place for logistics skills?	There are not many options for logistics certifications locally, only certifications for specific activities within the sector like ports, customs, aeronautics, maritime. There are also certifications for secure commerce and supply chain related certifications.
Which organizations award these certificates?	Several institutions offer certifications: ASCA (Academia Superior de Ciencias Aeronáuticas) for aeronautics, BASC (Business Alliance for Secure Commerce) for secure commerce, DR Customs OEA Program for secure commerce, UNCTAD for port operations, CAPGEFI (Centro de Capacitación en Política y Gestión Fiscal) for customs, APICS supply chain certifications are offered by private providers like Steam.
What share of companies employing logistics staff are interest in/ require these certificates?	85% of respondents indicate companies are interested or require these certifications.
Are the certification systems generally accepted across different industries?	Certification systems are accepted across different industries.

Role of Associations

Maturity score Level 1 No activity by associations in the field of logistics. Level 3 National associations exist and participate in skills development of logistics staff. International logistics associations are active in the country. Level 5 National logistics associations are a major facilitator of logistics skills development. They cooperate closely with international organizations.	2.8

What national associations or trade bodies have an interest in logistics?	There are 10 business associations and trade bodies in the country that are identified by interviewees as having an interest in logistics: Shippers Association, ADACAM, ASOLOGIC, ADAA, ADOZONA,

	ADOEXPO, AIRD, AMCHAMRD, Logistics Cluster, and Commité de Facilitación de Comercio (Commerce Facilitation Committee).
What is the main focus of their activity?	Each association has an area of focus within the sector, which creates disaggregation and overlapping of activities. Some remarks from interviewees about associations' activities were the following: they are disaggregated, there is a need to have an overarching association that can integrate companies from the different activities in the sector, there is a lot of duplication of efforts, there is overlapping among them, the same group of people leads them, there is a need for more concerted efforts to better address sector wide challenges for skills development.
What contribution do they make to the development of logistics skills?	A significant focus of the associations has been in training, coordinating needs from the companies and delivering a good share of the training that is delivered by private training providers.
Which international logistics associations (e.g. ELA, CILT, BVL) are active in the country?	There are no international logistics associations in the country.
What role, if any, do international associations play in developing logistics skills?	The role of international associations in the country is not significant.

Attractiveness of Logistics Industry

Maturity score Level 1 Jobs in logistics have a bad reputation. Salaries for logistics jobs are comparatively low. No established career paths exist. The volatility of the workforce is high. Level 3 Logistics jobs neither have a bad nor a good reputation. Salaries are comparable to other jobs. The volatility of the workforce is comparable to other industries. Level 5 The logistics industry is known for high-reputation jobs offering outstanding salaries. Logistics offers attractive career paths. Most employees stick to logistics for their entire career.	2.7

What is the public perception of logistics as an employer?	46% of interviewees indicate the public still has a poor perception of the logistics sector as an employer or does not know the sector. But 50% indicate logistics is receiving attention and gaining interest from the public, especially after the Covid-19 pandemic.
What logistics jobs are the most/ least attractive for applicants?	The following jobs are identified as attractive by interviewees: customer service, commercial jobs, administrative support jobs, supervision, warehouse and inventory management, information processing, customs specialists, logistics assistants, import and export assistants, planners. The following are identified as less attractive:

	drivers, cargo and materials handling, forklift operator, transshipment assistants.
How well paid are jobs in logistics by comparison with other activities?	59% of interviewees indicate that jobs in the logistics sector are at parity with comparable activities in the market. 41% indicate that pay in the logistics sector is lower than other sectors, with 14% of them highlighting they are losing people to other sector like banking and call centers. One of the remarks from respondents was that there is a misalignment between the educational qualifications that are required, specially at operational levels, where companies look to hire in their lower payment scales, but candidates that have adequate qualifications are looking for better compensation than what is typically offered.
Do clear career paths exist for logistics employees?	All interviewees express that logistics companies offer growth and career paths for their employees and many persons make careers in the sector.
How good/ poor is logistics in attracting managers working in other functional areas (such as marketing, production, procurement, finance etc.)?	67% of respondents indicate the logistics sector is able to attract managers from other sectors, against 33% that indicate the sector is poor in attracting managers from other sectors.

Availability of Recruitment Services

Maturity score Level 1 Minimal development of external recruitment. Services for logistics recruitment are mainly an in-house activity. No agencies specializing in logistics recruitment. Government directly advertises logistics vacancies. Level 3 Significant outsourcing of logistics recruitment, mainly to general business employment agencies. Limited development of agencies specializing in logistics recruitment. Government employment agencies assuming greater role in logistics. Level 5 Much logistics recruitment outsourced, especially at managerial level. Well established logistics recruitment market with numerous firms specializing in logistics recruitment and general manpower planning businesses prioritizing logistics.	2.5

To what extent do companies outsource the recruitment of logistics employees to outside agencies?	86% of respondents indicate companies are outsourcing a share of their recruitment to outside agencies, 29% of them indicate they do it only for supervisors and manager positions.
Are these agencies used to recruit logistics staff at particular occupational levels? If so, which level(s)?	Agencies used work with all occupational levels, but the focus is more on administrative, supervision and managers recruitment.

Is there an adequate supply of recruitment agencies specializing in logistics employment?	There is a good offer of recruitment agencies in the country with general focus, but there are no agencies specializing in logistics.
How does the use of external recruitment agencies split between those specializing in logistics and non-specialist ones?	All agencies used are non-specialist.
How does the government recruit staff for public sector logistics jobs?	Interviewees indicate they are not knowledgeable of how the government recruit staff for logistics jobs.

Additional Questions on Skills Shortage

Is there a shortage of logistics staff at any occupational level in this country? - Operational staff	85% of interviewees indicate there is a shortage of qualified logistics staff at the operational level. This is the level with the highest demand for resources and the shortage is not in the availability of candidates looking for jobs, but in the availability of candidates with the operational skills that are demanded by the companies. There is a gap between what is trained through existing formal and vocational education offerings versus the needs that companies currently have.
Is there a shortage of logistics staff at any occupational level in this country? - Administrative staff	78% of interviewees indicate there is a shortage of qualified logistics staff at the administrative level. There is not enough availability in the market of persons with the specific logistics skills and training demanded by companies, in areas like customs, aeronautics, international commerce, traffic, finance, planning, and sales. English proficiency is also mentioned as a gap at this level.
Is there a shortage of logistics staff at any occupational level in this country? - Supervisory staff	83% of interviewees indicate there is a shortage of qualified logistics staff at the supervisory level. Finding candidates with supervision skills that have knowledge of the logistics sector and English language proficiency is one of the main shortages mentioned.
Is there a shortage of logistics staff at any occupational level in this country? - Managerial staff	64% of interviewees indicate there is a shortage of qualified logistics staff at the managerial level. Managers are developed and trained internally by the companies, and in cases where companies recruit externally the available offer of candidates with logistics skills and experience is limited. 42% of companies indicate there is good availability of candidates with good general managerial skills that can be trained in the additional specific logistics skills needed.
Why is there a shortage of logistics staff in this country?	Several topics are mentioned by the stakeholders interviewed as reasons for the current shortage of logistics staff. 48% of interviewees see it as a result of a limited educational offer specialized for logistics, resulting from a lack of communication between business, education and government sectors regarding the talent and skill needs for logistics in the country, and combined with lack of interest from students in logistics careers and in the sector as an employment destination.

	Another 40% indicate it is driven by the fact that the sector is experimenting rapid growth, but the country did not prepare with adequate strategies, policies, and resources to support the growth, especially with regards to the identification of staffing and skills needed to support it. 12% mention that until recently, many companies have followed a practice of hiring unskilled personnel and keeping pay at low levels, as one of the key reasons for current shortages.

Possible solutions for skills shortages

The following list summarizes the actions that are mentioned as ways to correct the skills shortages:

- Develop more specialization programs for logistics at all levels, prioritizing concentrations and minors in existing careers, masters and specializations in universities, and technical programs in universities, colleges, and schools.
- Develop more focused initiatives to address specific training needs, like what INPLOG is trying to do to support port and maritime skills. Similar efforts can be focused in other areas like air transportation, commercial services, or other specialized topics.
- Make use of use of simulators to train people in dealing and managing typical problems and situations faced by the industry.
- Develop short cycle post-secondary programs for operational training in specialized technical aspects of logistics like forklift operator, using polytechnic schools, colleges, and INFOTEP, as a vocational training offer.
- Develop a basic technical program with INFOTEP for a logistics operator or basic technician in logistics, which covers the basic competencies for entry level positions at the operational and administrative levels.
- Provide training in digital skills to support the digitalization processes to which the industry is subjected.
- Expand risk management training to all companies that have to do with logistics in the country, to promote the development of a safe regional logistics hub.
- Create a program to train and validate the competencies of government employees that have inspection roles for cargo entering and leaving the country, and that are working for the implementation of the Joint Inspection Protocol.
- Bring together government, business sector, and academy to better identify skills and training needs, and to work on agreements to develop more programs according to companies' needs, facilitate internships, and expand the use of job boards to attract talent.
- More partnership between government and private sector is required to support educational institutions and to attract students to careers and experienced resources that can be integrated as trainers.
- Provide more scholarships for logistics programs in universities and colleges, both locally and internationally, to attract more students to logistics programs.
- Create programs to train persons from the industry so they can become teachers for logistics programs, covering technical areas and teaching methods.

- Improve the perception of the logistics sector and the opportunities it has, as a key sector for the country, to make it more attractive as a career destination. Focus on younger people, those between 18 and 24, to increase their commitment to stay on their jobs and have longer careers within companies.
- Continue to develop the sector and its companies, having more companies becoming more internationalized is helpful to make the sector more attractive.
- Better alignment is needed between occupational qualifications and payment structures. Salaries in the sector must be improved to make it more attractive.
- More leadership is needed from government to drive actions to improve the availability of qualified personnel. Right now, efforts in that direction are highly disaggregated.
- Create a Task Force as part of the Commerce Facilitation Committee focused on attacking transversal issues: determination of the skill needs of the sector, alignment of training offer, training and homologation of teachers, attraction of students to the careers feeding the sector, promotion of the human capital of the sector internationally.
- Improve the regulatory framework of the education system, including completing the approval of the law of the National Qualifications Framework, to advance the development of the professional profiles that are needed, and to provide greater agility to the processes of updating existing programs and launching new careers.

APPENDIX 3: LIST OF ORGANIZATIONS INTERVIEWED

Table 12: List of organizations interviewed

Organization	Stakeholder group
Aeropuertos Dominicanos Siglo XXI (Aerodom)	Logistics service providers
Asociación Dominicana de Agentes de Carga Aérea y Marítima (ADA-CAM)	Business organizations
Asociación Dominicana de Exportadores (ADOEXPO)	Business organizations
Asociación Dominicana de Zonas Francas (ADOZONA)	Business organizations
Asociación Dominicana de Agentes de Aduanas (ADAA)	Business organizations
Autoridad Portuaria Dominicana (APORDOM)	Government and administration
BASC Dominicana	Professional associations and others
Cámara Americana de Comercio de la República Dominicana (AM-CHAMDR)	Business organizations
Caribe Trans	Logistics service providers
Centro Cuesta Nacional	Shippers
Clúster Logístico de la República Dominicana	Professional associations and others
Consejo Nacional de Competitividad	Government and administration
D&C Consulting	Recruitment agencies
Dirección General de Aduanas (DGA)	Government and administration
DP World Caucedo	Logistics service providers
Eaton	Shippers
ET Heinsein	Logistics service providers
FLAI Freight Logistics Artificial Intelligence	Logistics service providers
Haina International Terminals	Logistics service providers
Instituto Nacional de Capacitación Portuaria y Logística (INPLOG)	Educational institutions
Instituto Nacional de Formación Técnico Profesional (INFOTEP)	Educational institutions
Instituto Politecnico Padre Bartolome Vech	Educational institutions
Instituto Técnico Superior Comunitario (ITSC)	Educational institutions
Instituto Tecnológico de Santo Domingo (INTEC)	Educational institutions
MARDOM	Logistics service providers
Ministerio de Educación Superior Ciencia y Tecnología (MESCYT)	Government and administration
Ministerio de Industria, Comercio y Mipymes (MICM)	Government and administration

Organization	Stakeholder group
Ministerio de la Presidencia - Marco Nacional de Cualificaciones	Government and administration
MSC- Naviera	Logistics service providers
Nestlé Dominicana	Shippers
Observatorio Nacional de Logística y Transporte de Carga- RD	Professional associations and others
Oficina Nacional de Estadística (ONE)	Government and administration
Parque Industrial Itabo	Recruitment agencies
Pontificia Universidad Católica Madre y Maestra (PUCMM)	Educational institutions
Punta Cana Internacional Airport	Logistics service providers
Tropical Shipping	Logistics service providers
Universidad APEC (UNAPEC)	Educational institutions

Source: Assessment data

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