Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 1

Natural, Environmental and Cultural Condition

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Appendix 1
Natural, Environmental and Cultural Condition

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Appendix 1 Natural, Environmental and Cultural Condition

1.1 Geographic Features

The study area of this project is six countries in the region known as Central America: Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama as shown in Figure 1.1.1.

The Central American region is an isthmus, an elongated landmass that arcs from northwest to southwest, connecting the two continents of North and South America, and is sandwiched between the waters of the Pacific Ocean and the Caribbean Sea. The isthmus is about 1,400 km long, with the largest width being about 530 km near the border between Honduras and Nicaragua, while the smallest width is about 50 km in central Panama. There are no landlocked countries among the six Central American countries, and while El Salvador faces only the Pacific Ocean, the other five countries have coastlines on both the Pacific Ocean and the Caribbean Sea.

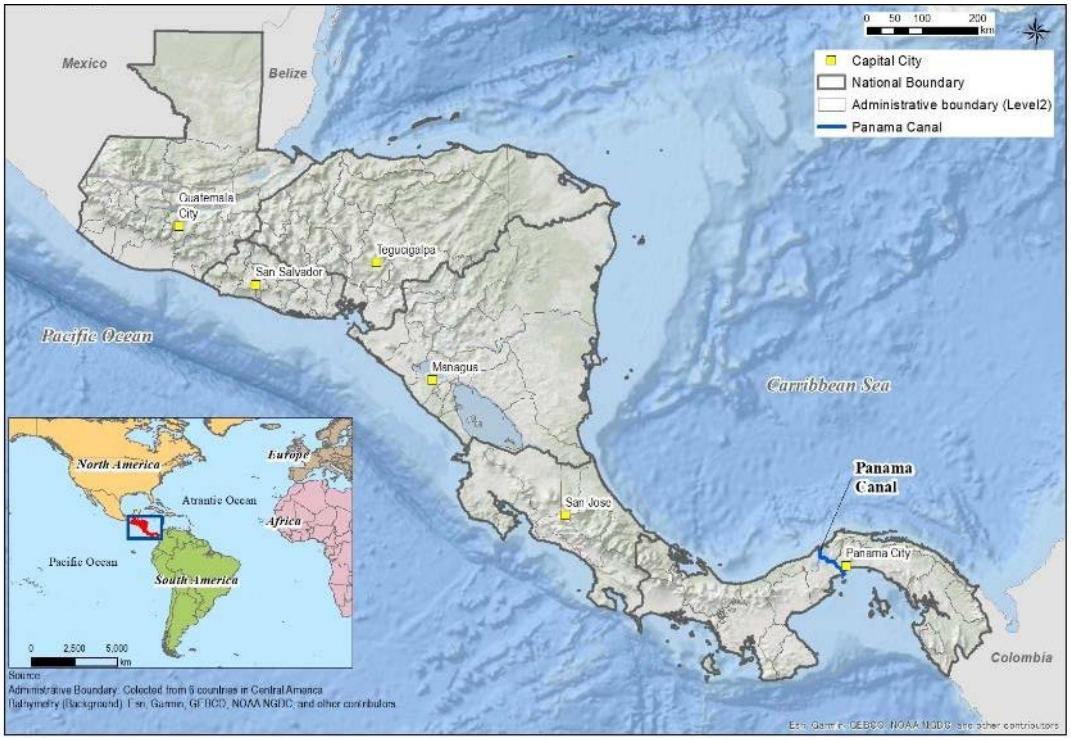


Figure 1.1.1 Geography in Central America Region

The total area of the six Central American countries is approximately 500,000km^2 as shown in Table 1.1.1, which is about 5% of the total area of the U.S.[1] In terms of area, the Central America region is a collection of small countries.

Considering that this study focuses on logistics, Central America is considered to be a region of great geographical convenience due to its access to the Pacific and Atlantic Oceans and the Americas. The Panama Canal, in particular, is a structure constructed by cutting through an isthmus to take advantage of this geographical feature. The Panama Canal makes it possible to travel between the east and west coasts of the Americas by sea without having to go to the edge of the continent.

[1] Land area of United State is 9,833,517 km^2

Table 1.1.1 Land Area and Coastline Length by Country

Country	Land area (km^2)	Coastline (km)
Guatemala	109,438	400
El Salvador	20,429	307
Honduras	112,265	823
Nicaragua	128,296	910
Costa Rica	51,267	1,290
Panama	76,188	2,490
Total	497,883	6,220

Source: GIS Data from each country (land area), World factbook, CIA (coastline length)

1.2 Topographic Features

Most of Central America is a rugged, mountainous area with lots of volcanos; according to the NCEI database[2], there are 68 volcanoes in the Central American region, 11 of which are over 3,000 meters high. As shown in Figure 1.2.1, more than half of the Central American region is mountainous, and lowlands spread in a narrow area from Honduras to northern Panama through Nicaragua and Costa Rica along the Atlantic coast, and from Guatemala to the northern coast of Costa Rica along the Pacific coast. The main mountainous areas in Central America are the vast Siera Madre de Chiapas mountain range, which stretches out from Mexico to Nicaragua, and the relatively small Cordillera Isabella mountain range which exists at the east end of Siera Madre de Chiapas, the Cordillera de Talamanca mountain range, which stretches from central Costa Rica to western Panama and the Serrania de Panama and the Serrania de Tabasara mountain range which lays in the western part of Panama. In addition, there are many volcanoes along the Pacific coast, forming active subduction called the Central America Volcanic Arc.

In the western part of Nicaragua, there is a large basin separated from the Pacific Ocean by a low mountain range. Lake Managua and Lake Nicaragua are located in this basin, and the two lakes are connected by the Tipitapa River, which flows out of Lake Managua. Lake Nicaragua is the tenth-largest freshwater lake in the world, with an area of 8,157 sq km, a length of 164 km, and a maximum width of about 72 km, accounting for approximately 6% of the total area of Nicaragua. Lake Nicaragua has a distribution of volcanic islands, which formed a characteristic topography.

The border area between Panama and Colombia is a vast strip of undeveloped swamp and forest known as the Darien Gap. There are no roads and it is the missing link of the Pan-American Highway.

[2] NCEI: Cational Centers for Environmental Information, National Oceanic and Atmospheric Administrarion (NOAA), U.S. Department of Commerce

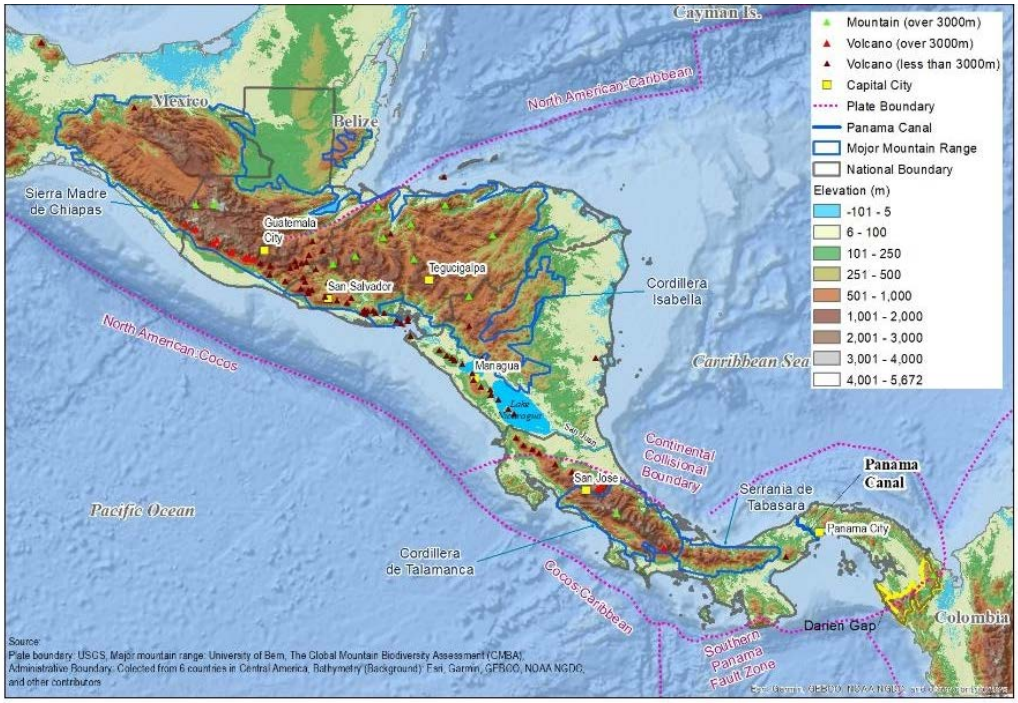


Figure 1.2.1 Topographic Features in Central America

1.3 Climate and Weather Condition

The coastal plains of Central America have tropical and humid type A climates, which includes Class “Af”, “Am”, “As”, and “Aw”, based on Köppen-Geiger climate classification that is the most frequently used climate classification map as shown in Figure 1.3.1. The Köppen-Geiger climate classification map categorizes the major climate types based on their average precipitation, average temperature, and natural vegetation patterns using data between 1980-2016 to depict the present climate classification[3]. Original data depicts the distribution of climate types around the world, based on a classification devised by Vladimir Köppen in 1900.

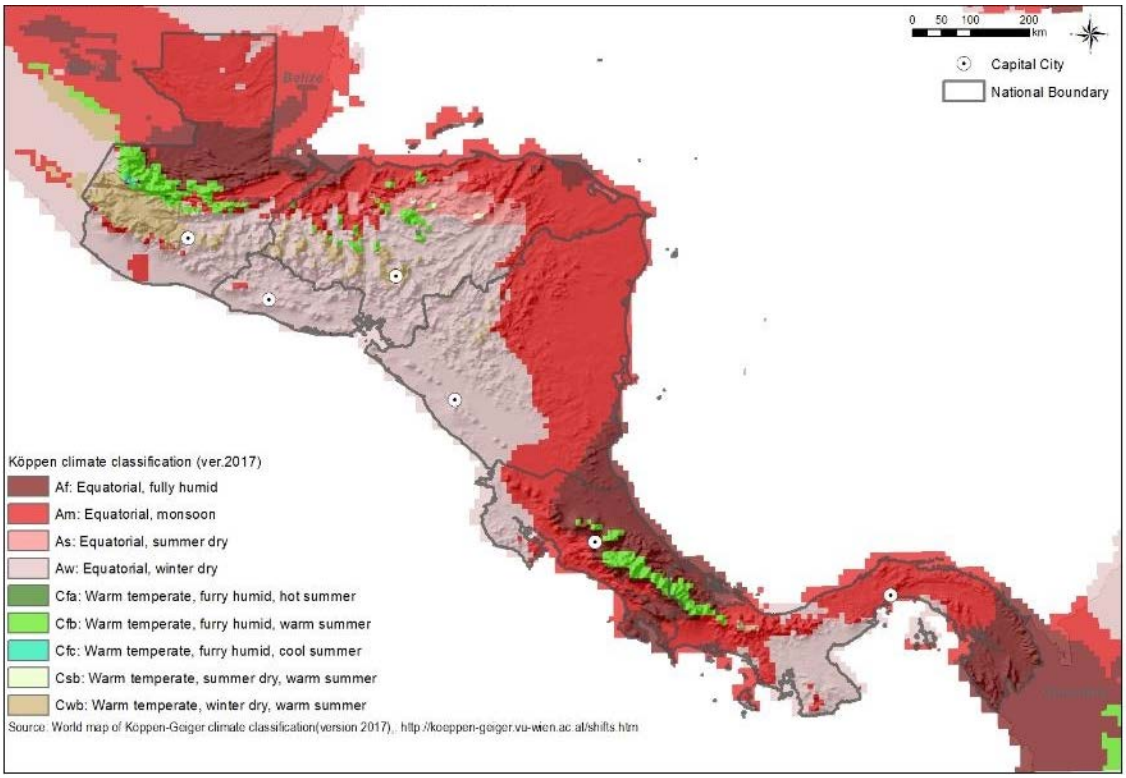
In the highland interior, the climate varies according to altitude. Due to the rich soil and cool climate, the population tends to cluster in the mountainous areas rather than along the coast.

[3] Present and future Köppen-Geiger climate classification maps at 1-km resolution, Beck, H., Zimmermann, N., McVicar, T. et al. Present and future Köppen-Geiger climate classification maps at 1-km resolution. Sci Data 5, 180214 (2018). https://doi.org/10.1038/sdata.2018.214

Table 1.3.1 Köppen-Geiger Climate Classification Type in Central America

Climate Class	Main Climate	Precipitation condition	Temperature
Af	Equatorial	Fully humid	-
Am	Equatorial	Monsoon	-
As	Equatorial	Summar dry	-
Aw	Equatorial	Winter dry	-
Cfa	Warm temperature	Fully humid	Hot summer
Cfb	Warm temperature	Fully humid	Warm summer
Cfc	Warm temperature	Fully humid	Cool summer
Csb	Warm temperature	Summer dry	Warm summer
Cwb	Warm temperature	Winter dry	Warm summer

Note: "Equatorial": temperature of the coolest month 18 °C or higher
Source: World map of Koppen-Geiger Climate Classification (version 2017)

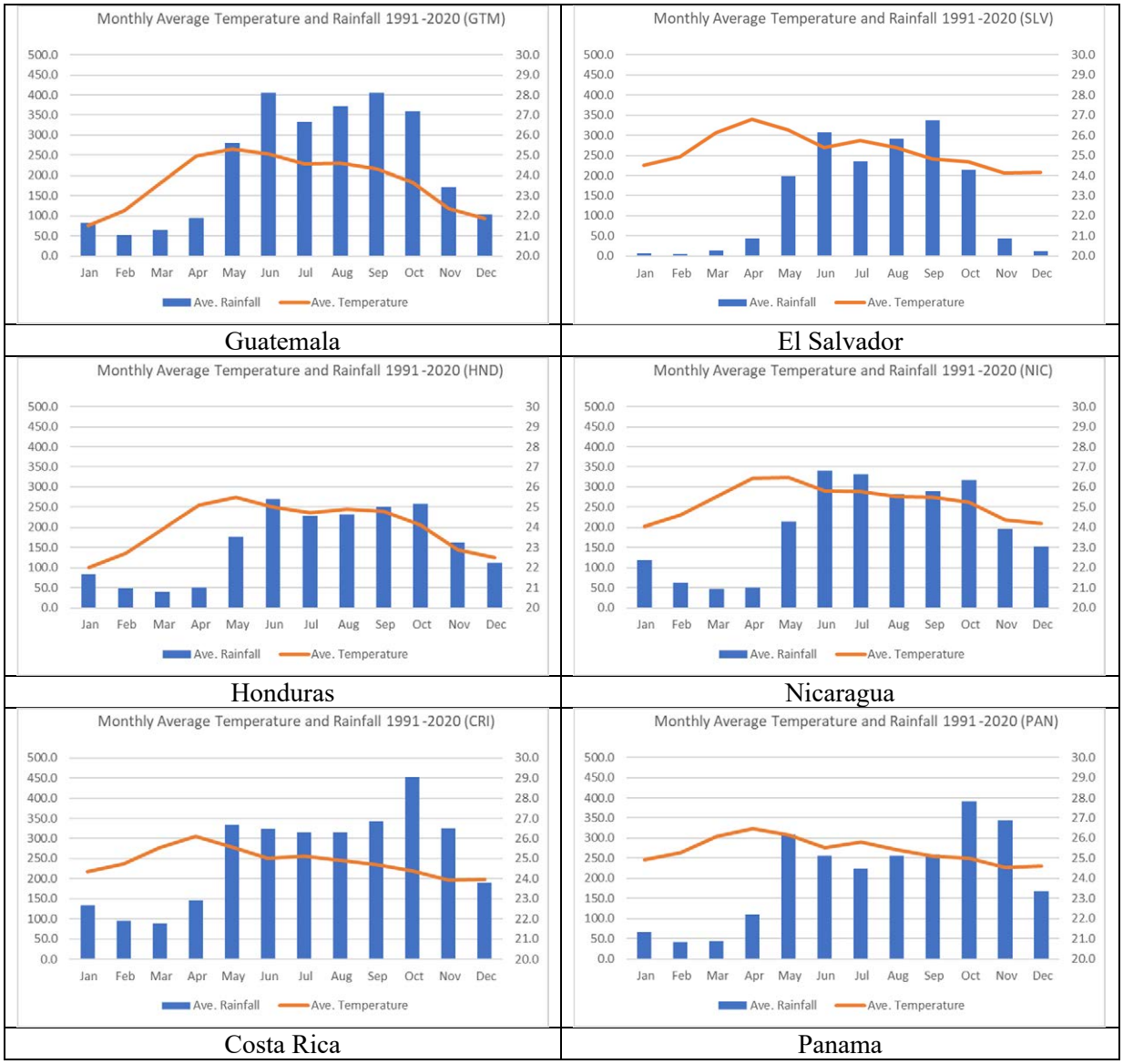


Source: World map of Koppen-Geiger Climate Classification (version 2017)

Figure 1.3.1 Koppen-Geiger Climate Classification in Central America

Figure 1.3.2 shows the average monthly temperature and precipitation for the past 30 years in the six countries. In Central America, the rainy season is generally from May to October in the northern part of the region, and a longer rainy season is in the southern part of the region, lasting until December in Nicaragua, Costa Rica, and Panama.

The average temperature in each country is in the range of 20 degrees Celsius throughout the year, but in reality, it is greatly affected by the topography and elevation, and there is a big difference between coastal and mountainous areas.

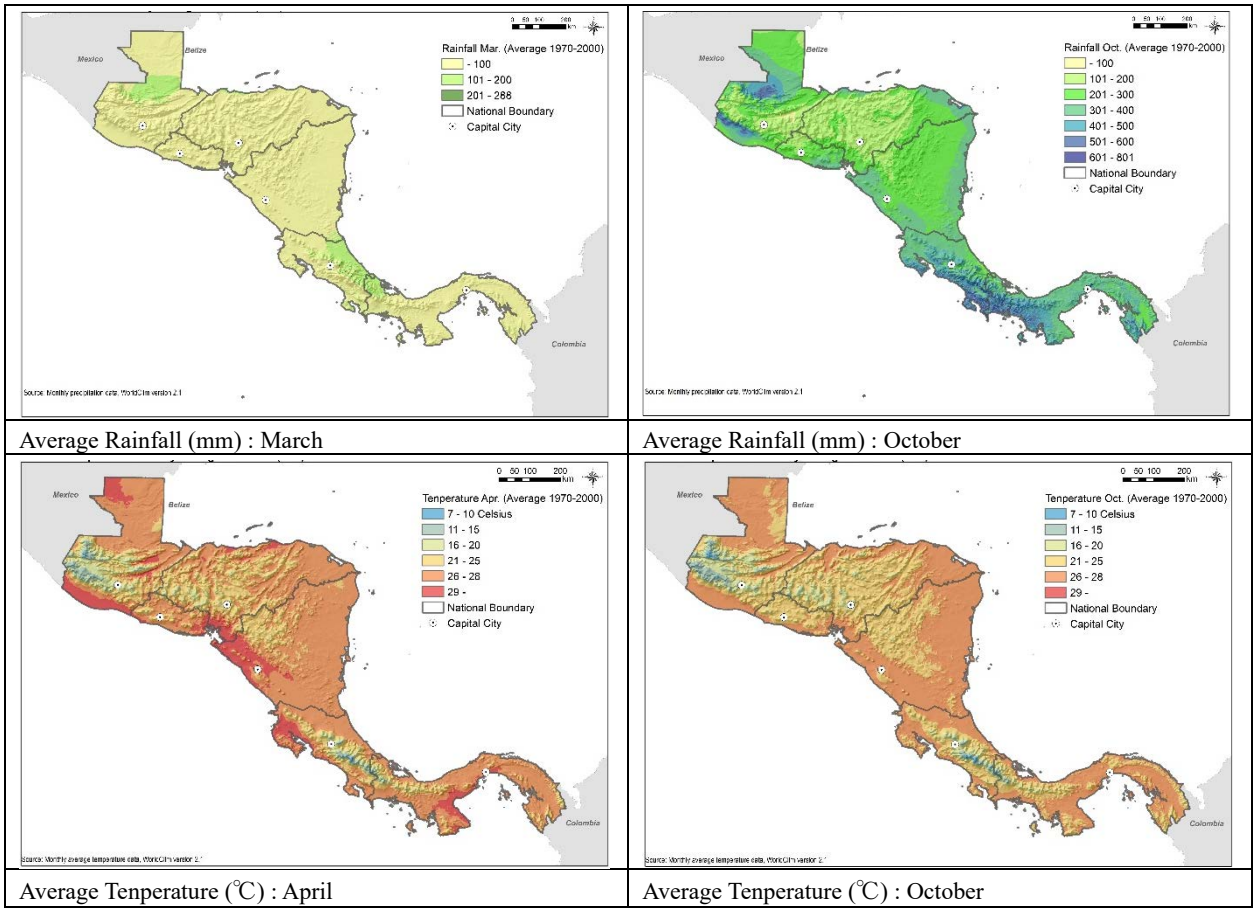


Source: Climate Change Knowledge Portal, World Bank

Figure 1.3.2 Monthly Average Temperature and Rainfall in Central America

Figure 1.3.3 shows the average precipitation during the dry season (March) and the rainy season (October) from 1970 to 2000 for the six Central American countries. In March, when the Central American region as a whole receives the least amount of precipitation, precipitation of 100 mm or more is observed in central Guatemala and the Caribbean side of Costa Rica to Panama, but in the rest of the region, precipitation is less than 100 mm. On the other hand, in October, which is the rainy season, precipitation is extremely high in central-north Guatemala, the Pacific side mountain slope areas of Guatemala, Costa Rica, and Panama. Even in the rainy season, precipitation near Zacapa in central-south Guatemala is low, less than 100 mm.

Figure 1.3.3 also shows the average temperature in April, which is generally the hottest month of the year in the six countries. Looking at the temperature distribution in April, which is generally the hottest month of the year in Central America, the lowlands between the Pacific Ocean and the coastal mountains and the northern part of Guatemala near the Mexican border are very high. On the other hand, the Caribbean side is also high, but not as high as the Pacific side. In addition, in the higher elevations of Guatemala and Costa Rica, there are areas where the temperature is below 10 degrees Celsius even in April, which is the high-temperature season.



Average Rainfall (mm) : March	Average Rainfall (mm) : October
Average Tenperature (℃) : April	Average Tenperature (℃) : October

Source: WorldClim version 2.1

Figure 1.3.3 Monthly Average Rainfall March and October (Average between 1970 and 2000)

1.4 Marine and Coastal Area Condition

Figure 1.4.1 depicts Marine and Coastal conditions in Central America. Observing the oceanic conditions around the Central American region, on the Pacific side, from Mexico to Costa Rica, the depth of water from the landmass to the Middle America Trench is rapidly deepening. The Middle America Trench is the 18th deepest trench in the world and the deepest point is 6,669 meters. On the other hand, a major feature on the Atlantic side is the Nicaragua Rise, a vast triangular ridge of about 410,000km^2 extending from Honduras and Nicaragua landmass to the northwest of Jamaica and the south of Haiti.

The coastline on the Caribbean side from Honduras to Nicaragua is broken by river mouths, deltas, and lagoons, and these areas provide good habitat for mangrove forests and various species.

The Marine Ecoregion of the World (MEOW), defined by World Wildlife Fund (WWF) and the Nature Conservancy, MEOW categorizes the world's oceans into 12 marine realms and subdivided into 62 marine provinces then sub-subdivided into 232 marine ecoregions. MEOW is a biogeographic classification of the world's coasts and shelves considering the following points:

Realm: "Very large regions of the coastal, benthic, or pelagic ocean across which biotas are internally coherent at higher taxonomic levels, as a result of a shared and unique evolutionary history. Realms have high levels of endemism, including unique taxa at generic and family levels in some groups. Driving factors behind the development of such unique biotas include water temperature, historical and broadscale isolation, and the proximity of the benthos."

Provinces: "Large areas defined by the presence of distinct biotas that have at least some cohesion over evolutionary time frames. Provinces will hold some level of endemism, principally at the level

of species. Although historical isolation will play a role, many of these distinct biotas have arisen as a result of distinctive abiotic features that circumscribe their boundaries. These may include geomorphological features (isolated island and shelf systems, semienclosed seas); hydrographic features (currents, upwellings, ice dynamics); or geochemical influences (broadest-scale elements of nutrient supply and salinity)."

Ecoregion: "Areas of relatively homogeneous species composition, clearly distinct from adjacent systems. The species composition is likely to be determined by the predominance of a small number of ecosystems and/or a distinct suite of oceanographic or topographic features. The dominant biogeographic forcing agents defining the ecoregions vary from location to location but may include isolation, upwelling, nutrient inputs, freshwater influx, temperature regimes, ice regimes, exposure, sediments, currents, and bathymetric or coastal complexity."[4]

Applying MEOW, the area bordering the landmass in Central America is divided into five ecoregions, namely, Chiapas-Nicaragua, Nicoya, Panama Bight, Western Caribbean, and Southwestern Caribbean.

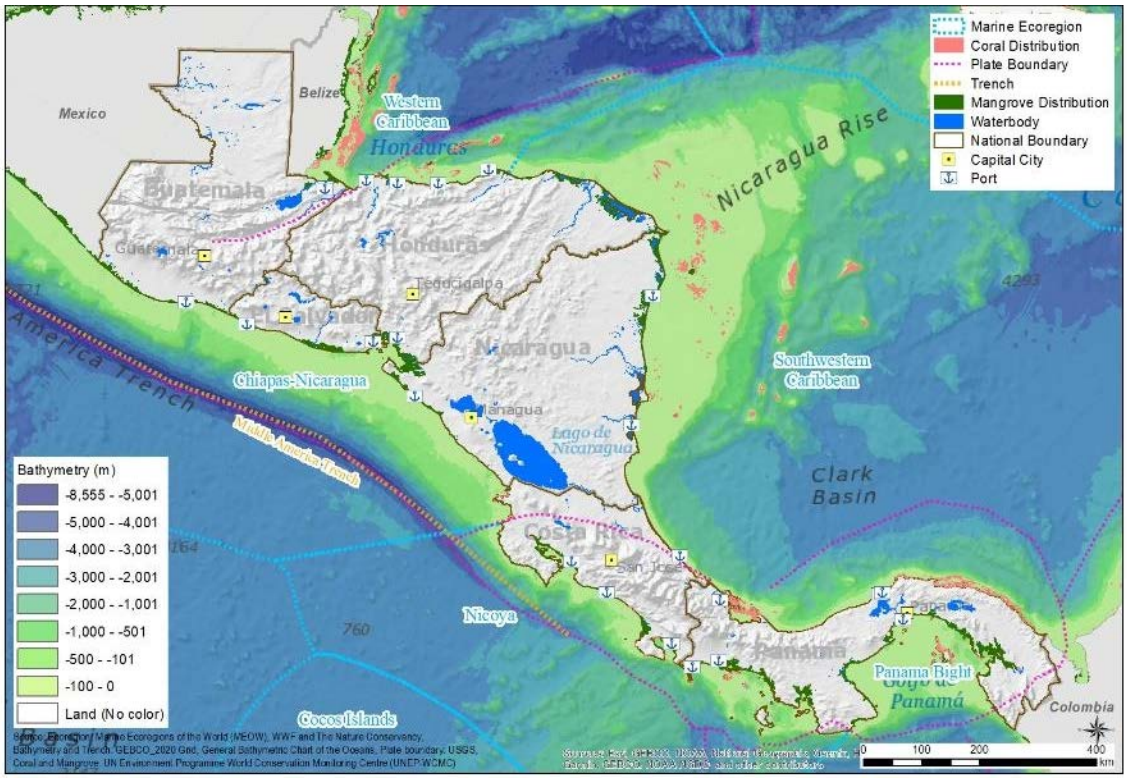


Figure 1.4.1 Marine Ecoregion and Bathymetry in Central America

1.5 Natural Environment (including resources in the tourism sector)

1.5.1 Landcover

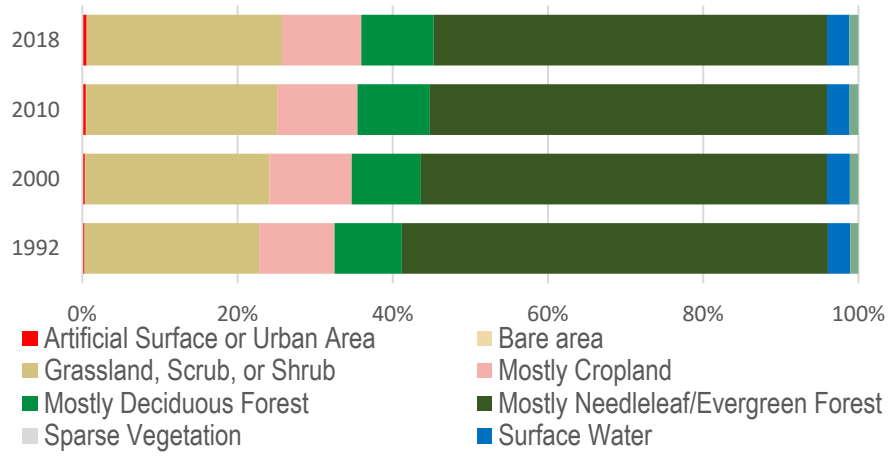
Using the global land cover data published by ESA[5], the land cover changes between 1992 and 2018 in the Central American region are shown in Figure 1.5.1, Figure 1.5.2, and Table 1.5.1. At ESA, as part of the Climate Change Initiative (CCI), the land cover project develops annual land cover data by using satellite data and imagery. Land cover is defined as the physical material on the surface of the earth and land cover

[4] Based on "Conservationgateway.org, http://www.conservationgateway.org/ConservationPractices/Marine/Documents/Spalding%20et%20al%20MEOW.pdf

[5] European Space Agency

includes grass, artificial surface, trees, bare trees, and water, etc.

Figure 1.5.1 shows the ratio of land cover in each year, dominant land cover is "Mostly Needle leaf/ Evergreen forest" following "Grassland, scrub or shrub" in all years, but apparently "Mostly Needle leaf/ Evergreen forest" is gradually decrease in last 26 years approximately 22,313km^2 that is equivalent to 2.7 times of the area of Lake Nicaragua. On the other hand, "Artificial surface or Urban area" has almost doubled in area between 1992 and 2018, although it is a small percentage of the total area. In addition, the "Mostly Cropland" also expanded by more than 10% from 1992 to 2018, an area of about 14,000 km^2, much of which is concentrated in the northern Guatemala area.



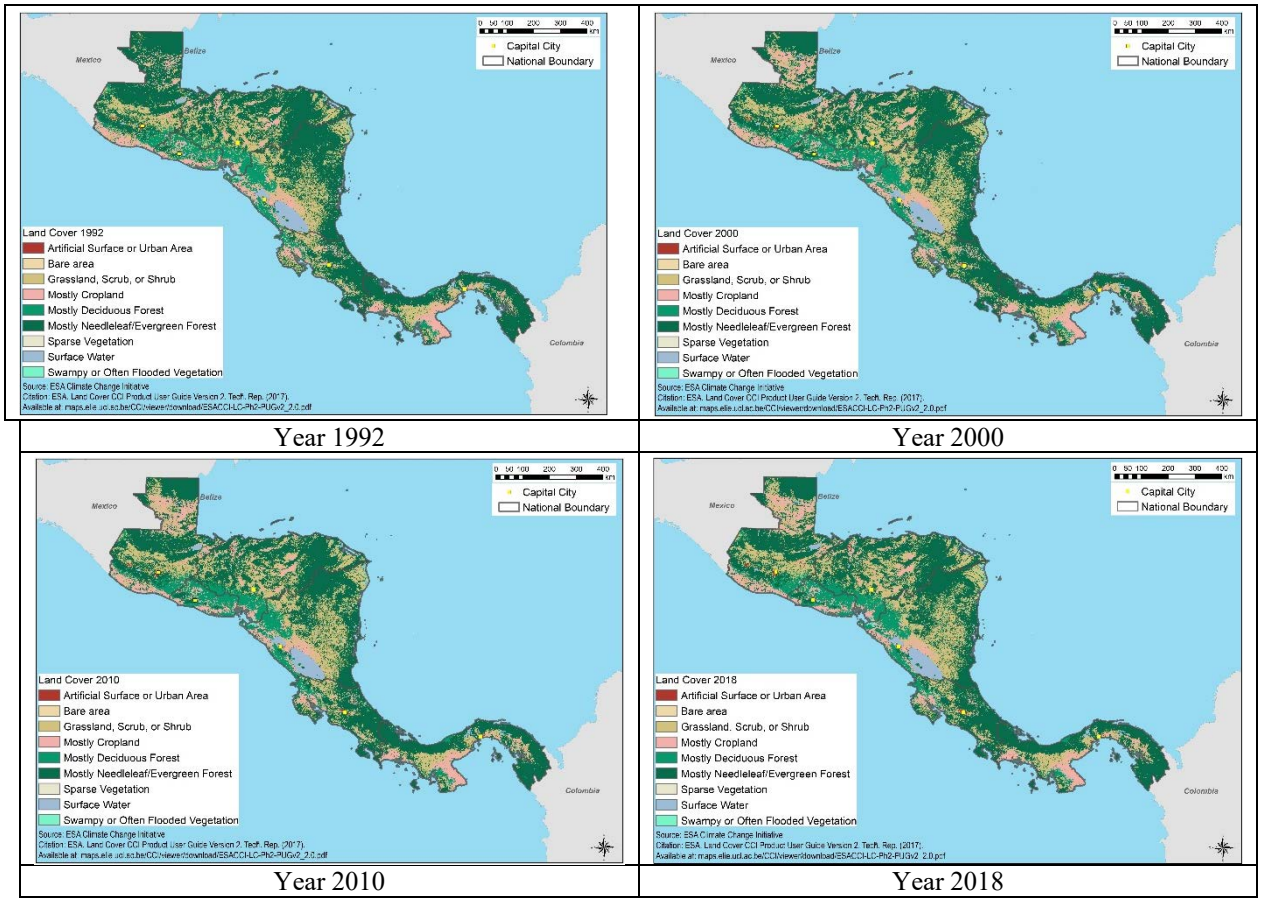
Source: ESA Land cover data 1992,2000,2010,2018

Figure 1.5.1 Landcover Ratio Between 1992 and 2018

Table 1.5.1 Landcover Change between 1992 and 2018

	Year (area unit: km^2)				Rate of Change		
Landcover Category	1992	2000	2010	2018	1992 vs 2018	2000 vs 2018	2010 vs 2018
Artificial Surface or Urban Area	1,488	1,792	2,440	2,947	+98%	+64%	+21%
Bare Area	137	136	143	144	+5%	+6%	+1%
Grassland, Scrub, or Shrub	118,524	125,208	129,737	132,546	+12%	+6%	+2%
Mostly Cropland	51,213	55,850	54,674	53,956	+5%	-3%	-1%
Mostly Deciduous Forest	45,658	47,051	49,068	49,089	+8%	+4%	0%
Mostly Needleleaf/Evergreen Forest	289,580	275,898	269,897	267,267	-8%	-3%	-1%
Sparse Vegetation	9	9	11	12	+35%	+40%	+16%
Surface Water	15,034	15,476	15,258	15,218	+1%	-2%	0%
Swampy or Often Flooded Vegetation	5,631	5,856	6,047	6,096	+8%	+4%	+1%
Total	529,267	529,275	529,285	529,293			

Source: Landcover data by European Space Agency



Source: ESA time series global landcover data 1992 – 2018, © ESA Climate Change Initiative - Land Cover led by UCLouvain (2017)

Figure 1.5.2 Landcover Change Between 1992 and 2018

ESA's land cover data include the ESA's land cover category and FAO's land cover category as attributes. Because ESA's land cover category is more detailed for further analysis purposes, FAO's land cover category is depicted in Figure 1.5.2 to understand the land cover change trend easily. Table 1.5.2 shows the correspondence between ESA and FAO land cover categories.

Table 1.5.2 Landcover Category: ESA and FAO

Value	FAO Class	ESA_Class
10	Mostly Cropland	Cropland, rainfed
11	Mostly Cropland	Herbaceous cover
12	Mostly Cropland	Tree or shrub cover
20	Mostly Cropland	Cropland, irrigated or post-flooding
30	Mostly Cropland	Mosaic cropland (>50%) / natural vegetation (tree, shrub, herbaceous cover) (<50%)
40	Grassland, Scrub, or Shrub	Mosaic natural vegetation (tree, shrub, herbaceous cover) (>50%) / cropland (<50%)
50	Mostly Needleleaf/Evergreen Forest	Tree cover, broadleaved, evergreen, closed to open (>15%)
60	Mostly Deciduous Forest	Tree cover, broadleaved, deciduous, closed to open (>15%)
80	Mostly Needleleaf/Evergreen Forest	Tree cover, needleleaved, deciduous, closed to open (>15%)
90	Mostly Needleleaf/Evergreen Forest	Tree cover, mixed leaf type (broadleaved and needleleaved)
100	Grassland, Scrub, or Shrub	Mosaic tree and shrub (>50%) / herbaceous cover (<50%)
110	Grassland, Scrub, or Shrub	Mosaic herbaceous cover (>50%) / tree and shrub (<50%)

Value	FAO Class	ESA_Class
120	Grassland, Scrub, or Shrub	Shrubland
130	Grassland, Scrub, or Shrub	Grassland
150	Sparse Vegetation	Sparse vegetation (tree, shrub, herbaceous cover) (<15%)
160	Swampy or Often Flooded Vegetation	Tree cover, flooded, fresh, or brackish water
170	Swampy or Often Flooded Vegetation	Tree cover, flooded, saline water
180	Swampy or Often Flooded Vegetation	Shrub or herbaceous cover, flooded, fresh/saline/brackish water
190	Artificial Surface or Urban Area	Urban areas
200	Bare area	Bare areas
210	Surface Water	Water bodies

Source: Land Cover CCI, Product user guide version 2.0, ESA

1.5.2 Natural Resources

The Central American region, as a bridge between the North and South America landmasses, is a region of rich biodiversity, and various protected areas are set up to protect valuable species and the environment. This rich biodiversity, one of the most notable in the world, is an important natural resource that drives ecotourism in the region, too. Figure 1.5.3 illustrates features related to natural resources in the Central American region, using environmental protected area and biological corridor data by SICA since most of the important natural resources are managed as protected or conservation areas. In addition, World Heritage sites, and the Ramsar Wetland, which are designated to protect important wetlands, are also illustrated in the Figure below.

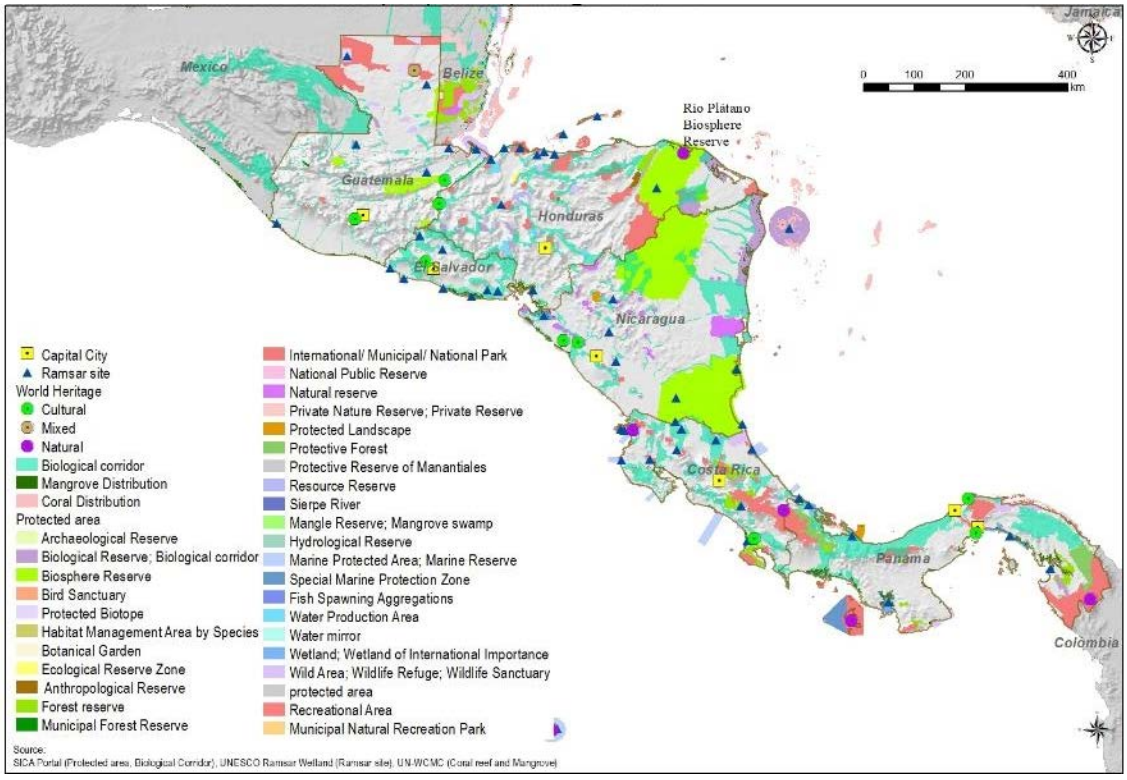


Figure 1.5.3 Natural Resouce Distribution

1.6 Natural Hazard

1.6.1 Overview of Natural Hazards in Central America

Central America is one of the regions that are more vulnerable to natural disaster risks due to its geographical condition. The human and economic losses caused by these natural disaster risks are a major challenge common to the Central American region and a major impediment to development in the region.

The Center for Research on the Epidemiology of Disasters (CRED) accumulates data on more than 20,000 disaster events that occurred worldwide since 1900 in a database called EM-DAT and made it available to the public. The EM-DAT database stores disaster data that meet at least one of the following conditions.

- Ten (10) or more people reported killed
- Hundred (100) or more people reported affected
- Declaration of a state of emergency
- Call for international assistance

EM-DAT database classifies natural disasters into six categories: Biological, Geophysical, Climatological, Hydrological, Meteorological, and Extra-terrestrial, and further subdivides the disasters as shown in Table 1.6.1. The words in bold in the table below are those that exist in the database as natural disasters in Central America.

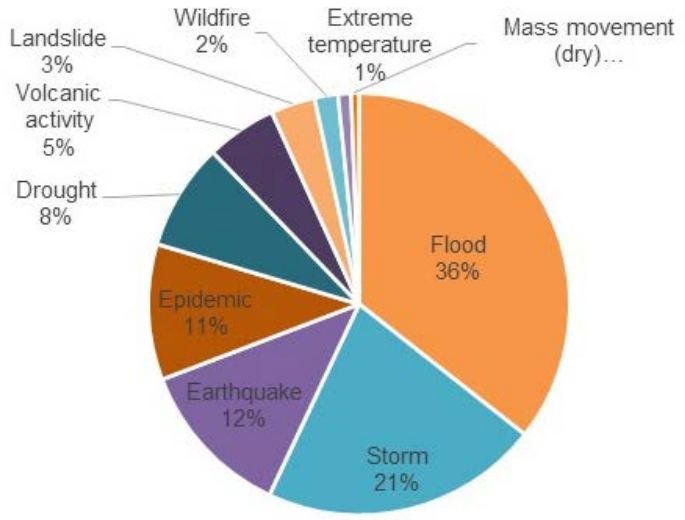
Table 1.6.1 Disaster Types in EM-DAT Database

Disaster Type	Disaster Type	Disaster Sub-Type
Geophysical	**Earthquake**	**Ground movement**, Tsunami
	Volcanic activity	**Ashfall**, Lahar, **Pyroclastic flow,** Lava flow
	Mass Movement	**Rockfall**
Meteorological	**Storm**	**Tropical storm**, Extra-tropical storm, **Convective storm**
	Extreme Temperature	**Cold wave**, Heat Wave, **Severe winter conditions**
	Fog	Fog
Hydrological	**Flood**	**Coastal flood, Riverine flood, Flash flood,** Ice jam flood
	Landslide	**Landslide, Mudslide, Avalanche (snow, debris, mudflow, rock fall)**
	Wave action	Rogue wave
Climatological	**Drought**	**Drought,** Forest fires, Land fire: Brush, bush, pasture
	Glacial Lake outburst	Glacial Lake outburst
	Wildfire	**Forest fires,** Land fire: Brush, bush, pasture, Viral diseases, Bacterial diseases
Biological	**Epidemic**	**Viral diseases, Bacterial diseases**, Parasitic diseases, Fungal diseases, Prion diseases
	Insect Infestation	Locust Grasshopper
	Animal accident	Animal accident
Extraterrestrial	Impact	Airburst
	Space weather	Energic particles, Geomagnetic storm

Source: CRED EM-DAT

In Central America, there are approximately 500 natural disasters in the EM-DAT database since 1900. Floods are the most frequent, accounting for 36%, followed by storms, including hurricanes, which account for 21%. These top two types of disasters account for more than half of the total. Earthquakes account for the third-largest share as shown in Figure 1.6.1and Table 1.6.2.

Natural disasters, once they occur, cause significant human and economic losses. Table 1.6.3 shows the number of people affected by each type of disaster since 2000 by Country.



Source: CRED EM-DAT

Figure 1.6.1 Natural Disaster Event Between 1900-2020

Table 1.6.2 Number of Natural Disaster Event by Country 1900-2020

Disaster Type	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama	Total
Flood	29	17	33	38	23	38	178
Storm	10	19	20	26	24	8	107
Earthquake	17	11	16	3	10	4	61
Epidemic	3	11	10	10	13	5	52
Drought	5	7	7	12	6	4	41
Volcanic activity	7	2	13		5		27
Landslide	1	3	11	1	1		17
Wildfire	2		2	1	3	1	9
Extreme temperature		1	4				5
Mass movement (dry)			2	1			3

Source: Table summarized by JST (JICA Study Team) based on CRED EM-DAT database

Table 1.6.3 Number of Affected People by Natural Disaster Type 2000-2020

Disaster Type	Disaster Subtype	Total Affected	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama
Flood		755,704	126,627	7,099	70,860	522,628	26,715	1,775
Flood	Coastal flood	1,720				1,720		
Flood	Flash flood	90,040		1,000	76,845			12,195
Flood	Riverine flood	2,519,111	351,582	306,332	907,025	433,579	390,741	129,852
Storm		200					200	
Storm	Convective storm	98,663		20,000	78,453		210	
Storm	Tropical cyclone	10,976,328	142,574	327,985	3,841,847	5,380,420	1,254,502	29,000
Earthquake	Ground movement	3,234,667	129,795	1,610,430	1,421,250	52,019	19,758	1,415
Epidemic		50,000		50,000				
Epidemic	Bacterial disease	568					395	173
Epidemic	Viral disease	325,428	16,852	36,564	25,494	148,645	97,873	
Drought	Drought	9,632,026		1,486,610	5,680,081	1,517,335	948,000	

Disaster Type	Disaster Subtype	Total Affected	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama
Volcanic activity	Ash fall	96,129	18,450	65,079	12,600			
Volcanic activity	Pyroclastic flow	1,714,414			1,714,414			
Landslide	Landslide	54,809	200		54,609			
Landslide	Mudslide	6,768		525	474		5,769	
Wildfire		1,436						1,436
Wildfire	Forest fire	16,000					16,000	
Extreme temperature	Cold wave	4,493			4,493			
Extreme temperature	Severe winter conditions	8,141			8,141			
Mass movement (dry)	Landslide	3,028			3,028			

Source: Table summarized by JST based on CRED EM-DAT database

The EM-DAT database is an accumulation of past disaster data, and there is the Index for Risk Management (INFORM) developed by the Disaster Risk Management Knowledge Centre (DRMKC), it is an index of disaster risk by country based on EM-DAT and other 96 kinds of data.[6] In this index, various indicators are rated from 0 to 10, and Table 1.6.4 shows some of the INFORM indicators related to natural disaster risks. The low values of the index represent a better condition (e.g. lower risk), and the high values of the index represent a worse condition (e.g. higher risk). The indices allow a relative comparison of the risk and components between countries.

According to the INFORM 2020 report, a total natural disaster risk index of 7.3 or higher is considered Very High risk, thus Honduras, with an 8.0 index, the highest among the six countries, and Guatemala, Nicaragua, and El Salvador are classified as Very High risk. In addition, Panama and Costa Rica also fall under the category of High-Risk countries, indicating from this data that Central America has a very high risk of natural disasters.

Table 1.6.4 Natural Disaster Risk Index 2020

	Earthquake and Tsunami	Flood	Tropical Cyclone	Environmental degradation and drought	Epidemics	**Total Natural Disaster Risk**
GTM	9.4	6.0	5.8	9.3	7.1	**7.9**
SLV	9.6	3.4	4.6	8.7	6.9	**7.3**
HND	9.1	6.7	5.5	9.5	7.4	**8.0**
NIC	9.4	7.2	4.6	8.4	7.3	**7.7**
CRI	9.7	3.8	2.6	4.3	5.5	**6.0**
PAN	9.7	3.5	3.6	5.0	6.7	**6.5**
Average CA	9.5	5.1	4.5	7.5	6.8	**7.2**

Source: LAC-INFORM index 2020

1.6.2 Natural Hazard Events by Disaster Type

This section focus on major disaster types such as flood, storm, and earthquake in Central America based on the EM-DAT database in order to understand the recent trends of each natural disaster.

[6] https://drmkc.jrc.ec.europa.eu/inform-index

(1) Flood

Floods are one of the most frequent natural disasters and occur in almost every country. Floods are generally defined as discharged water exceeding drainage capacity. At present, it is not possible to systematically detect flood phenomena on a global scale like cyclones and earthquakes.

Floods are generally caused by different phenomena and there are different types of floods. For example, they are often divided into flash floods, riverine floods, and coastal floods, all of which are caused by a combination of heavy rainfall and poor drainage. The severity of these flood types depends on rainfall intensity, the spatial distribution of rainfall, topography, and surface conditions. According to the EM-DAT database, the flood that caused the most human suffering since 2000 was the one in Guatemala in October 2011, which affected more than 500,000 people. The most economically damaging flood was reported in October 2011 in El Salvador due to a tropical depression with estimated damage of USD 1 billion.

Table 1.6.5 Number of Floods by Country 2000-2020

Disaster Type	Disaster Subtype	Total	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama
Flood	N/A	22	2	1	7	8	2	2
Flood	Coastal flood	1				1		
Flood	Flash flood	4		1	1			2
Flood	Riverine flood	91	17	9	16	13	14	22

Source: Table summarized by JST based on CRED EM-DAT database

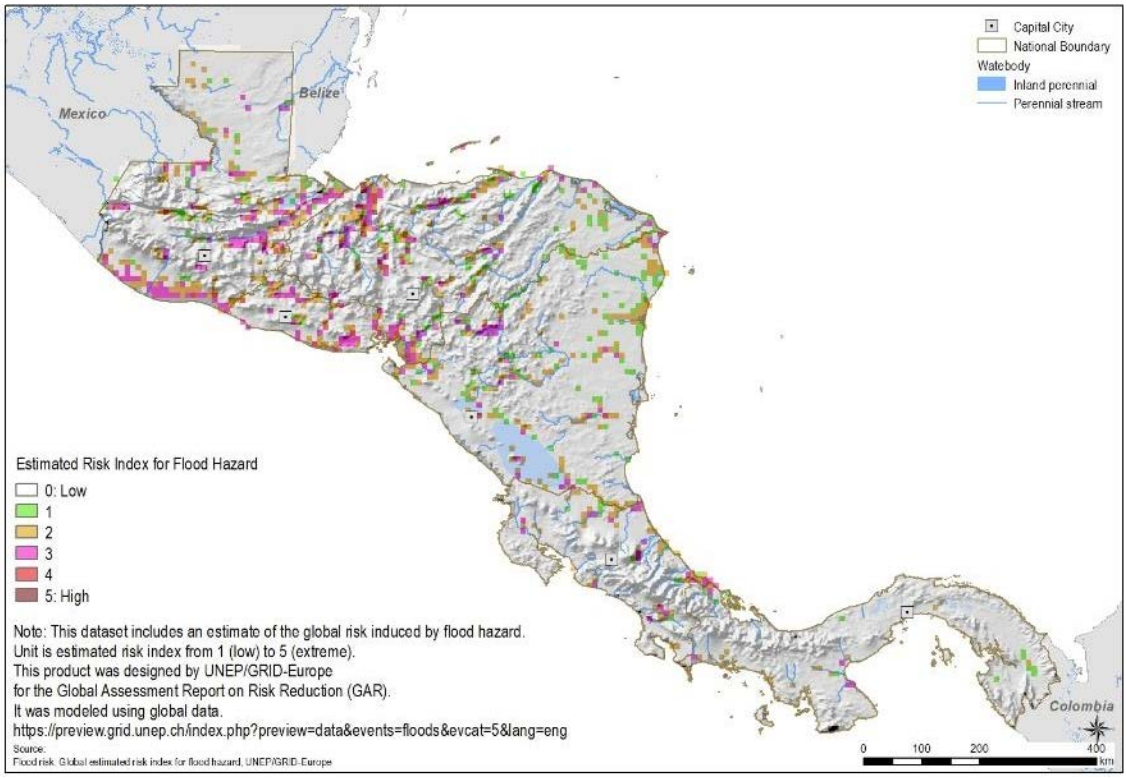


Figure 1.6.2 Flood Risk in Central America

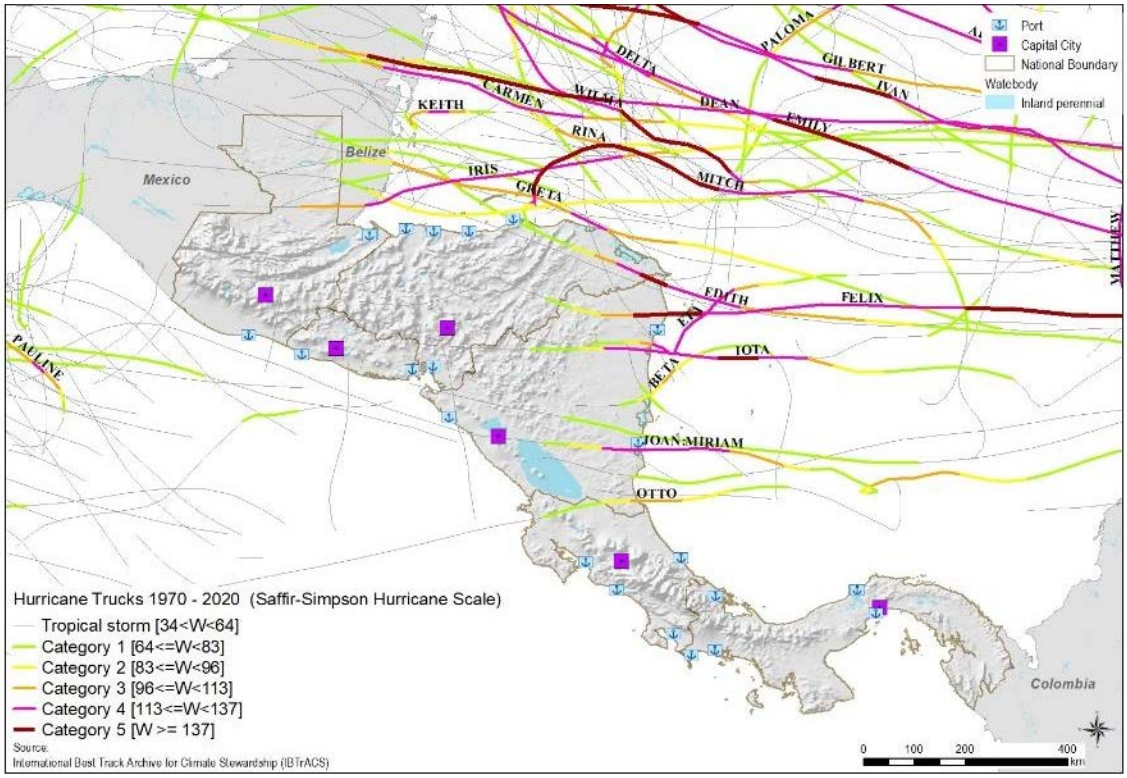
Figure 1.6.2 illustrates the global flood risk data published by Global Risk Data Platform, UNEP-GRID-Geneva. The risk level is evaluated by dividing the world into 1km cells and rating each cell from 0 to 5. In general, the risk is high along rivers with steep slopes in mountainous areas, especially in Guatemala, El Salvador, and Honduras, where the conditions are such that the risk is high, while the risk is relatively low near the mouths of low-lying rivers on the Caribbean side in Honduras and Nicaragua.

(2) Storm (Hurricane)

Generally, hurricanes originate in the central Atlantic Ocean at latitudes of 10 to 20 degrees north and east of the Caribbean Sea, grow and move through the Caribbean Sea to the Gulf of Mexico, then change their course to the northeast along the Gulf of Mexico, and travel along the east coast of the United States. The hurricane affects huge areas including Central America, Caribbean islands, Mexico, and the southern and southeastern United States. Although hurricanes are quite common on the Pacific side, they do not have a major impact as they move northwestward away from land.

IBTrACS (International Best Track Archive for Climate Stewardship) provides global tropical cyclone best track data in a centralized location to aid our understanding of the distribution, frequency, and intensity of tropical cyclones worldwide.

Figure 1.6.3 illustrates the hurricane tracks between 1970 and 2020. As mentioned above, it can be seen that many powerful hurricanes hit the Caribbean side. Hurricanes also trigger related disasters, such as floods and landslides, which often result in greater disaster damage as shown Table 1.6.6.



Source: NOAA's International Best Track Archive for Climate Stewardship (IBTrACS) data, accessed on 7 April 2021

Figure 1.6.3 Historical Hurricane Trucks 1970-2020

Table 1.6.6 Damages causeed by Hurricanes by Country 2000-2020

Disaster Type	Disaster Subtype	Country	Total Affected (No. of Persons)	Total Damages ('000 US$)
Storm	Tropical cyclone	Costa Rica	142,574	205,000
Storm	Tropical cyclone	El Salvador	327,985	1,534,700
Storm	Tropical cyclone	Guatemala	3,841,847	2,024,500
Storm	Tropical cyclone	Honduras	5,380,420	5,217,079
Storm	Tropical cyclone	Nicaragua	1,254,502	922,000
Storm	Tropical cyclone	Panama	29,000	11,000

Source: Table summarized by JST based on CRED EM-DAT database

(3) Earthquake

Central America is located on the western edge of the Caribbean Plate and is one of the most earthquake-prone areas in the world due to the complexity of the plates, including the subduction of the Cocos Plate under the Caribbean Plate from the Pacific side. In addition, the plate boundary is close to the coastal areas on the Pacific coast, and there is a concern about the generation of tsunamis due to earthquakes in the Pacific coastal areas.

As shown in Table 1.6.3, all of the six Central American countries have a very high earthquake risk index of 9 or higher, and as illustrated in Figure 1.6.4, there have been 41 major earthquakes of magnitude 7 or higher, with the largest magnitude of 7.7 recorded in 2001, 1992, and 1942.

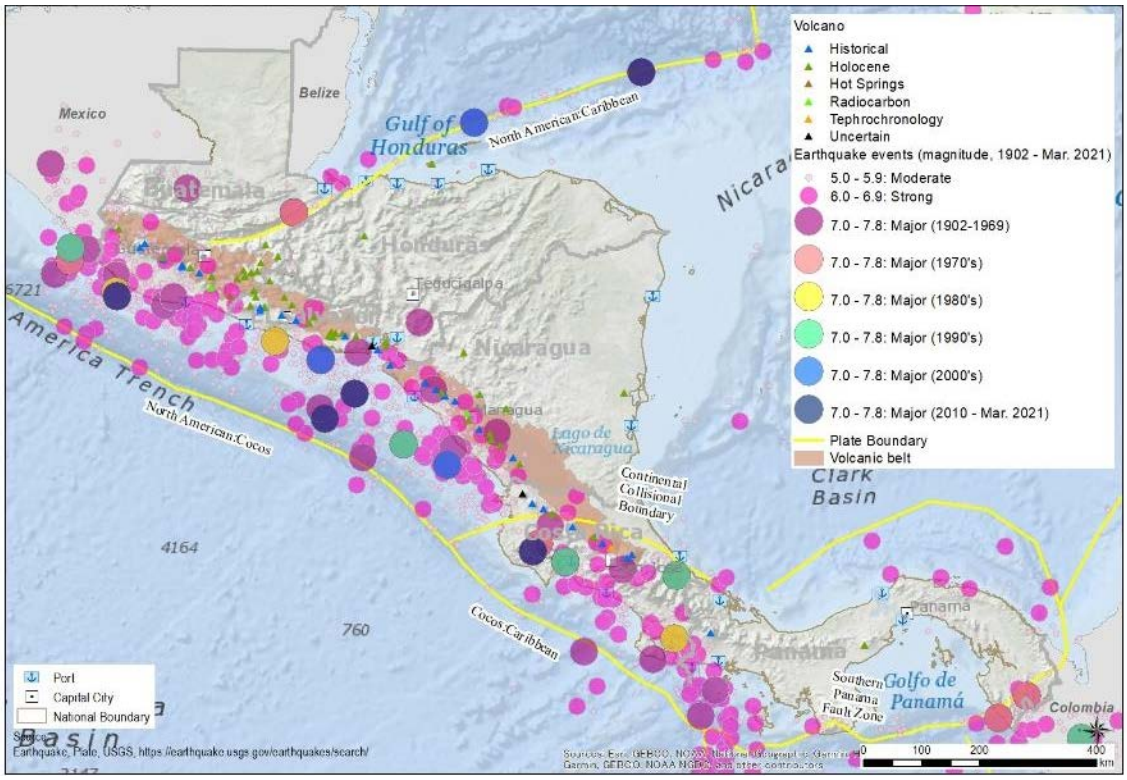
Table 1.6.7 shows the data of earthquakes with a magnitude of 6 or higher since 2000 with huge losses. 7 earthquakes with a magnitude of 7 or higher occurred since 2000, and The earthquake that hit El Salvador in 2001 with a magnitude of 7.7 caused the most damage in terms of human and economic losses.

Table 1.6.7 Damages by Hurricanes by Country 2000-2020

Year	Country	Location	Magnitude	Total Affected	Total Damages ('000 US$)
2001	El Salvador	Berlin, Alegria, Tecapan, Santiago de Maria districts (Usulutan province), Santa Tecla, Comasagua districts (La Libertad province) ; San Miguel, Santa Ana, Sonsonate, Cuscatlan, San Vicente, La Union, Ahuachapan, Cabanas, Morazan, Chalatenango, La Paz, La	7.7	1,334,529	1,500,000
2001	Guatemala	Jutapia province	7.7	152	50
2001	El Salvador	La Paz, Cuscatlan, San Vicente, San Salvador, Morazan, La Libertad provinces ; San Juan Tepezontes district (La Paz province), Cojutepeque district (Cuscatlan province)	7.7	256,021	348,500
2012	Costa Rica	Abangares, Carillo, Hojancgan, Liberia, Nicoya, Nandayure, Santacruz districts (Guanacaste province), Alajuela, Alafaro Ruiz, Atenas, Grecia, Naranjo, Poas, San Carlos, San Ramon, Valverde Vega, Upala districts (Alajuela province), Acosta, Puriscal, San J	7.6	762	45,000
2012	Guatemala	San Marcos, Quetzaltenango, Solola, Retalhuleu, Quiché, Totonicapan, Huehuetenango, Suchitepequez, Chimaltenango, Sacatepequez, Guatemala provinces	7.4	1,321,742	210,000
2009	Honduras	La Ceiba, Tela districts (Atlantida province), La Lima, Omoa, Puerto Cortes, San Pedro Sula districts (Cortes province), Jesus De Otoro, Guanaja, Roatan, Jose Santos Guardiola districts (Islas De Bahia province), Ceguaca, Chinda, Gualala, Ilama, Las Vegas	7.3	50,136	100,000
2017	Guatemala	Huehuetenango, Quetzaltenango, Quiché, San Marcos, Suchitepéquez, Totonicapan	7	3,601	N/A

Year	Country	Location	Magnitude	Total Affected	Total Damages ('000 US$)
2014	Guatemala	Huehuetenango, Quetzaltenango, Retalhuleu, San Marcos, Solola, Suchitepequez, Totonicapan provinces	6.9	94,783	N/A
2019	El Salvador	San Martín municipality (San Salvador Department)	6.6	160	N/A
2003	Costa Rica	Corredores, Golfito districts (Puntarenas province)	6.5	135	N/A
	Panama	Puerto Armuelles municipality (Baru district, Chiriqui province)		1,075	N/A
2004	Costa Rica	San Jose, Puntarenas provinces	6.4	280	N/A
2013	Guatemala	Ciudad Tecun Uman city (Ayutla district, San Marcos province)	6.4	572	2,000
2003	Panama	Colon district (Colon province), Panama district (Panama province)	6.2	340	N/A
2009	Costa Rica	Alajuela, Alfaro Ruiz, Grecia, Poas, Valverde Vega districts (Alajuela province), Barva, Heredia, Santa Barbara, Sarapiqui districts (Heredia province)	6.1	128,618	200,000
2014	Nicaragua	Managua province	6.1	12,281	3,000

Source: Table summarized by JST based on CRED EM-DAT database, Magnitude based on USGS



Source: USGS (Earthquake, Plate), SICA (Volcanic belt)

Figure 1.6.4 Historical Earthquake Records 1902-Mar. 2021

(4) Drought

Drought is a phenomenon that affects more people worldwide than any other natural disaster. Unlike "aridity," which refers to a state of semi-permanently low rainfall, drought is an accumulation of the effects of long-term deficit of rainfall. "deficit" here means that it is below the value expected in a specific location. Ultimately, drought refers to a condition of an insufficient supply of water necessary to meet demand, both

being highly location-specific.[7]

Table 1.6.8 shows the list of droughts that have occurred since 2000. According to the EM-DAT database, the number of affected people is about 2.5 million and the total damage is approximately 617 million USD between 2000 and 2020. Thus, drought is very costly in terms of both human and economic losses.

Table 1.6.8 Drought Records 2000-2020

Year	Country	Location	Start Year	Start Month	End Year	End Month	Total Affected	Total Damages ('000 US$)
2000	Nicaragua	Atlantico Norte, Jinotega, Nueva Segovia provinces	2000	7	2000	N/A		
2000	Honduras	Montana de la Flor area (Marale district, Francisco Morazan province)	2000	7	2000	N/A	1,125	
2001	El Salvador	Usulutan, San Miguel, Morazan, La Union provinces	2001	5	2001	N/A	400,000	22,400
2001	Honduras	Choluteca, Valle, Francisco Morazan, Paraiso, La Paz, Comayagua, Intibuca, Yoro, Lempira provinces	2001	7	2004	N/A	195,000	
2001	Nicaragua	Nueva Segovia, Madriz, Esteli, Leon, Chinandega, Carazo, Boaco, Jinotega, Matagalpa provinces	2001	8	2001	N/A	188,000	
2001	Guatemala	Chiquimula province	2001	9	2001	N/A	113,596	14,000
2002	Honduras	Liure, Soledad districts (Paraiso province), Orocuina, El Corpus districts (Choculeta province)	2002	1	2002	N/A	82,000	
2004	Honduras	Atlantida, Choluteca, Colon, Comayagua, Copan, Cortes, Francisco Morazan, Gracias A Dios, Intibuca, Islas De Bahia, La Paz, Lempira, Name Unknown, Ocotepeque, Olancho, Paraiso, Santa Barbara, Valle, Yoro provinces	2004	7	2004	N/A	137,500	
2009	Guatemala	Baja Verapaz, El Progreso, Zacapa, Jalapa, Chiquimula, Santa Rosa, Jutiapa, Quiché provinces	2009	3	2009	12	2,500,000	
2009	Honduras	Paraiso, Francisco Morazan, Yoro, Choluteca, Valle, Intibuca provinces	2009	11	2011	2	45,000	
2009	El Salvador	Ahuachapan, Cabanas, Chalatenango, Cuscatlan, La Libertad, La Paz, La Union, Morazan, San Miguel, San Salvador, San Vicente, Santa Ana, Sonsonate, Usulutan provinces	2009		2009	N/A		27,000

[7] Description of drought based on Global risk platform

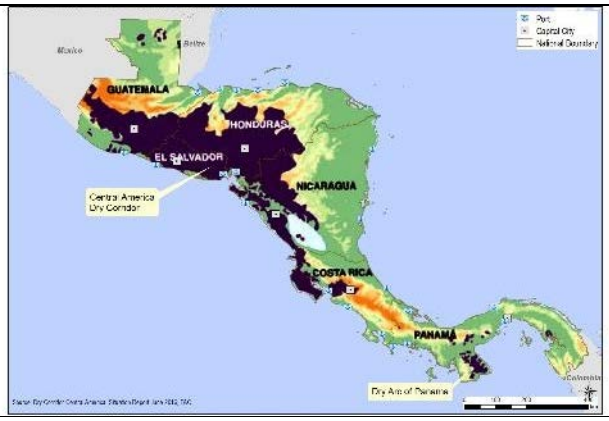
Year	Country	Location	Start Year	Start Month	End Year	End Month	Total Affected	Total Damages ('000 US$)
2012	Guatemala	Jalapa, El Progreso, Zacapa, Santa Rosa, Guatemala, Sacatepéquez, Solola, Chimaltenango, Baja Verapaz, Quiché, Huehuetenango provinces	2012	6	2012	N/A	266,485	
2012	Honduras	Choluteca, Francisco Morazan, Gracias A Dios, La Paz, Olancho, Paraiso, Valle provinces	2012	9	2012	9	125,000	
2013	Panama	Coclé, Veraguas, Los santos, Herrera provinces	2013	1	2013	5		200,000
2014	Honduras	San Marcos De Sierra, Camasca districts (Intibuca province), Moroceli, Alauca, Oropoli, Teupasenti districts (Paraiso province), Ocotepeque, Copan, Santa Barbara, Yoro, Comayagua, Olancho, Lempira, La Paz, Valle, Choluteca, Francisco Morazan provinces	2014	4	2015	7	571,710	
2014	Guatemala	Baja Verapaz, El Progreso, Zacapa, Chiquimula, Jalapa, Jutiapa, Quiché, Huehuetenango, Totonicapán, San Marcos, Retalhuleu, Santa Rosa, Escuintla provinces	2014	8	2016	N/A	1,300,000	100,000
2014	Nicaragua	Atlantico Norte, Atlantico Sur, Boaco, Carazo, Chinandega, Chontales, Esteli, Granada, Jinotega, Leon, Madriz, Managua, Masaya, Matagalpa, Nueva Segovia, Rio San Juan, Rivas provinces	2014	8	2015	2	460,000	
2014	El Salvador	La Union, San Miguel, Morazan, Usulutan, Ahuachapan, Sonsonate, Santa Ana, Chalatenango provinces	2015	4	2016	12	700,000	100,000
2014	Costa Rica	Alajuela, Cartago, Guanacaste, Heredia, Limon, Puntarenas, San Jose provinces	2015	8	2015	8		
2015	Panama	Coclé, Colón, Kuna Yala, Herrera, Los Santos, Panamá, Bocas del Toro, Chiriquí, Darién, Emberá, Ngöbe Buglé, Veraguas provinces	2015	8	2015	8		
2018	Panama		2018	6	2019	3		72,000
2018	El Salvador	San Vicente, Usulutan and San Miguel zones	2018	6	2019	3	386,610	37,000
2018	Guatemala		2018	6	2019	3	1,500,000	44,669
2018	Honduras		2018	6	2019	3	360,000	

Year	Country	Location	Start Year	Start Month	End Year	End Month	Total Affected	Total Damages ('000 US$)
2018	Nicaragua		2018	6	2019	3	300,000	
2018	Costa Rica		2019	3	2019	3		

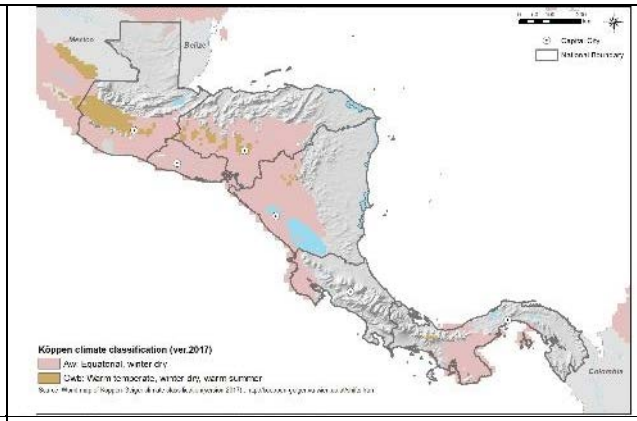
Source: Table summarized by JST based on CRED EM-DAT database

Figure 1.6.5 shows a map of FAO's Central America Dry corridor and the Koppen-Geiger Climate Classification. The FAO definition of the Central America Dry Corridor is "an area with a dry season of four months or more.

In comparison with the Koppen-Geiger Climate Classification, Central America Dry Corridor and Dry Arc of Panama are generally consistent with "Aw: Equatorial, winter dry" and "Cwb: Warm temperate, winter dry, warm Cwb: Warm temperate, winter dry, warm summer".



Central America Dry Corridor and Dry Arc of Panama by FAO



Koppen-Geiger Climate Classification in Central America (showing only "Aw: Equatorial, winter dry" and "Cwb: Warm temperate, winter dry, warm summer")

Source: Dry Corridor Central America SITUATION REPORT – June 2016, WORLD MAP OF THE KÖPPEN-GEIGER CLIMATE CLASSIFICATION

Figure 1.6.5 Comparison Central America Dry Corridor, Dry Arc of Panama and Koppen-Geiger Climate Classification in Central America

1.7 Environmental Management and Regulatory Framework

1.7.1 Protected areas of Central America Regional Level

The Protected area provided by SICA's GIS portal is shown in Figure 1.7.1. The original data includes Belize, but this figure only shows the data for the six countries covered in this study.

There are a total of 911 protected areas, covering a total area of about 170,000 km^2, which means that about 35% of the six Central American countries are protected areas of some kind, although there is some overlap between protected areas.

Environmental protected areas are divided into 50 categories in total, and in the following figure, the 50 categories are grouped together as much as possible to represent them in a simplified form tentatively. Table 1.7.1 shows the correspondence between the categories of SICA and the simplified groups.

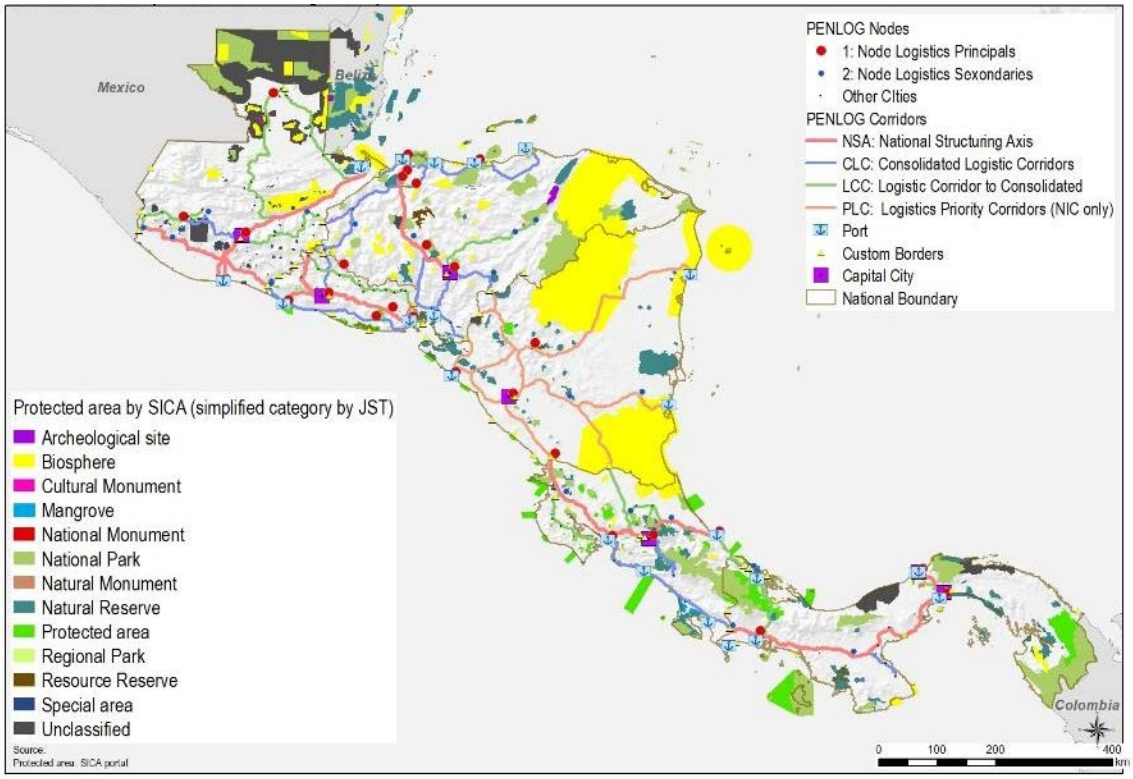


Figure 1.7.1 Protected Area by SICA

Table 1.7.1 Correspondence of Protected area Categories

Grouping by JST	Original Protected area category
Archeological site	Anthropological Reserve
Biosphere	Biological corridor, Biological Reserve, Biosphere Reserve, Ecological Reserve Zone, Protected Biotope, Wildlife Refuge
Cultural Monument	Cultural monument
Mangrove	Mangrove swamp
National Monument	National Monument
National Park	International Park, National Marine Park, National Park
Natural Monument	Natural Monument
Natural Reserve	Anthropological Forest Reserve, Conservation purposes, Forest reserve, Habitat Management Area by Species, Hydrological Reserve, Marine Reserve, Natural reserve, Protective Reserve of Manantiales, Water mirror, Water Production Area, Wetland, Wetland of International Importance
Protected area	Marine Protected Area, protected area, Protected Land Landscape, Protected Landscape, Protective Forest, Protective Zone, Special Marine Protection Zone
Regional Park	Municipal Forest Reserve, Municipal Natural Recreation Park, Municipal Regional Park
Resource Reserve	Genetic Resources Reserve, Resource Reserve
Special area	Definitive Closed Zone
Unclassified	Botanical Garden, Buffer zone, Islands / islets, Multiple Use Area, Multiple Use Zone, Not protected, Other categories, Private Nature Reserve

Source JST

1.7.2 Country Level

Data on environmental protected areas were also collected from the six target countries. The data collected is generally the same as, but not identical to, that collected from SICA's GIS portal, so a summary of the environmental protected areas in each country is presented in this section.

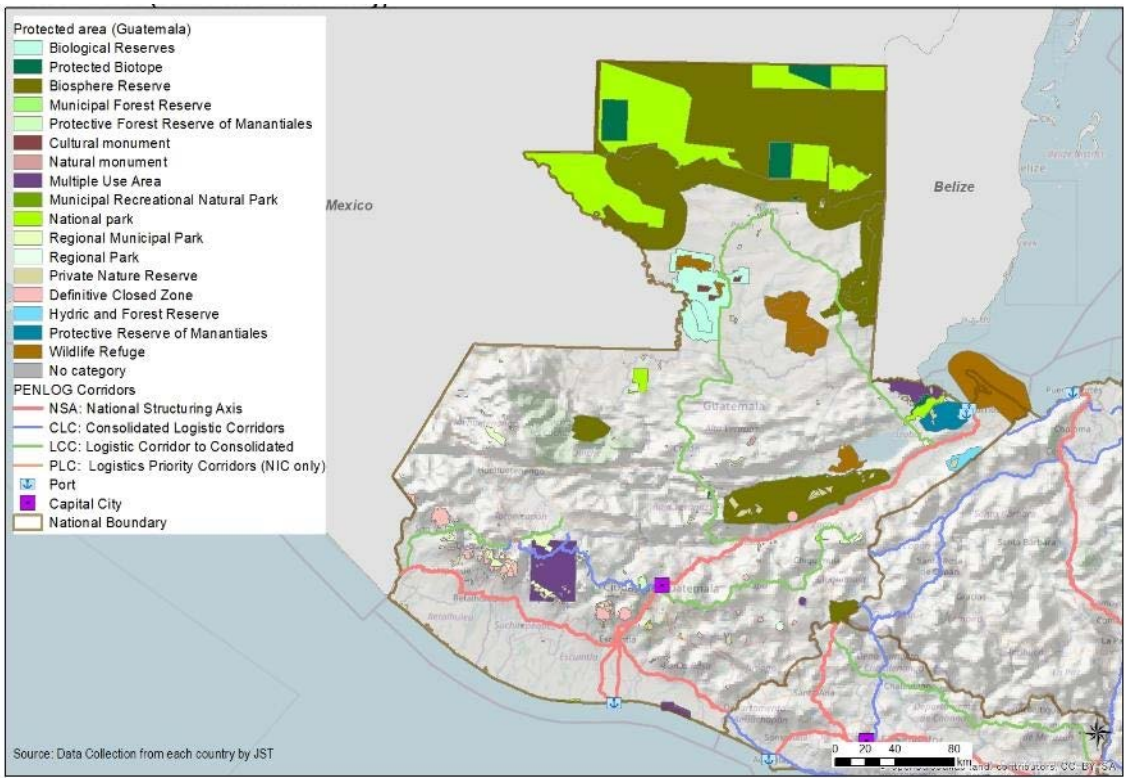
(1) Guatemala

The total area of Guatemala's environmental protected areas is about 68,000 square kilometers. Among them, Biosphere Reserve occupies about 34,000 square kilometers, accounting for 50% of the total area of environmental reserves, followed by National Park which accounts for 15,000 square kilometers. or 21% of the total area of environmental reserves. Two areas, Biosphere and National Park account for 71% of the total environmental protected area.

Table 1.7.2 Summary of Protected Area Country Data: Guatemala

Protected area Category	Area (km^2)	%
Biosphere Reserve	33,881	49.6%
National Park	14,849	21.7%
Wildlife Refuge	5,963	8.7%
Multiple Use Area	3,158	4.6%
Biological Reserve	3,145	4.6%
Protected Biotope	2,404	3.5%
Private Nature Reserve	1,263	1.8%
Definitive Closed Zone	1,193	1.7%
Regional Municipal Park	969	1.4%
Protective Reserve of Manatees	880	1.3%
Hydric and Forest Reserve	337	0.5%
Cultural monument	127	0.2%
Protective Forest Reserve of Manatees	90	0.1%
Regional Park	51	0.1%
Natural monument	37	0.1%
Municipal Forest Reserve	4	0.0%
No category	2	0.0%
Municipal Recreational Natural Park	1	0.0%
Total	68,354	100.0%

Source GIS data provided from each country



Source GIS data provided from each country

Figure 1.7.2 Protected Area Guatemala

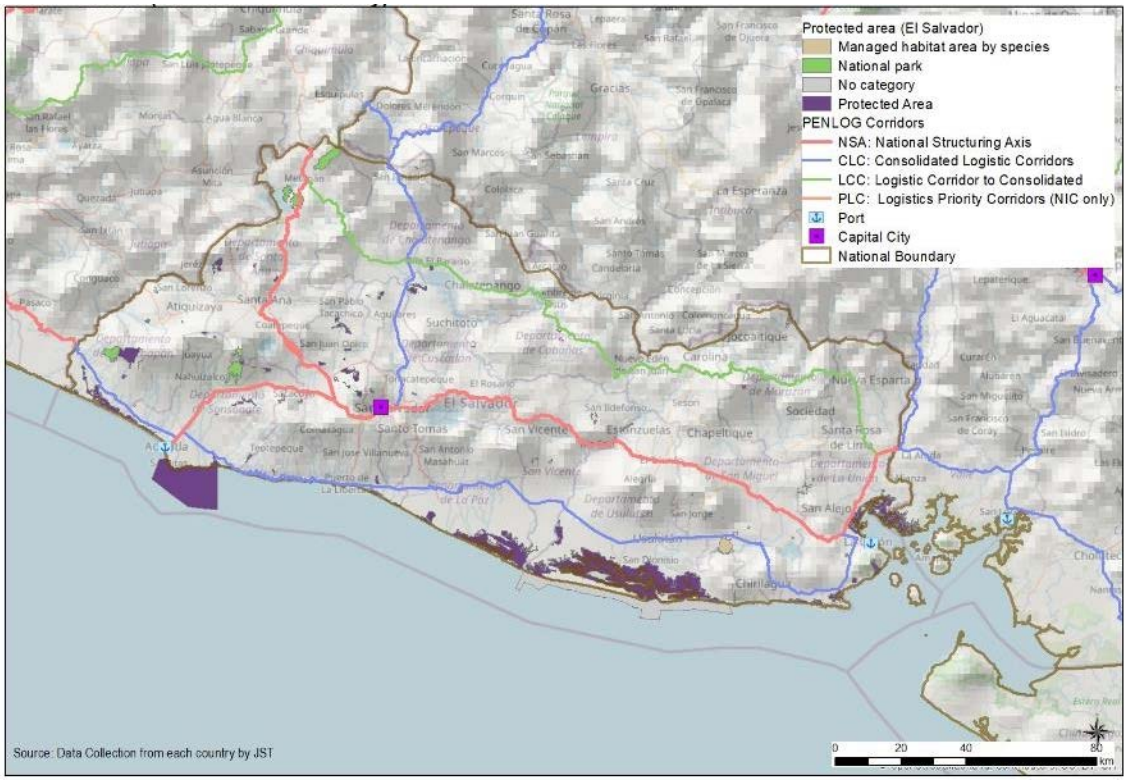
(2) El Salvador

Compared to the other five countries in Central America, El Salvador's environmental protected areas occupy a very small area, only 6% of the country's land area. Category “Protected area” dominates 73% of the protected area. The polygons with the category "No Category" in the environmental protected area data are distributed in El Salvador, but most of them are confirmed to be conservation areas in the Description field in the attribute table of the GIS data.

Table 1.7.3 Summary of Protected Area Country Data: El Salvador

Protected area Category	Area (km^2)	%
Protected Area	870	73%
No category	226	19%
National park	76	6%
Managed habitat area by species	16	1%

Source GIS data provided from each country



Source GIS data provided from each country

Figure 1.7.3 Protected Area El Salvador

(3) Honduras

The total area of protected areas in Honduras is about 40,000 square kilometers. There are 17 categories of protected areas in total, but four categories, National Park, Biosphere Reserve, Maritime National Park, and Biological Reserve, occupy 84% of the total area, and the other categories are very small in area as shown in Table 1.7.4.

Especially, the Bay Islands Marine National Park (Islas de La Bahia), located in the Caribbean Sea, was declared a protected area by the Decree of the National Congress of the Republic of Honduras. This decree includes the entire coastal area of the Islands of Roatan, Utila, and Guanaja, between the high tide line 10 m inland and thence up to 60 m deep, while as Buffer Zone was declared from the 60 m depth line up to 12 nautical miles around The Bay Islands as shown in Figure 1.7.4.[8]

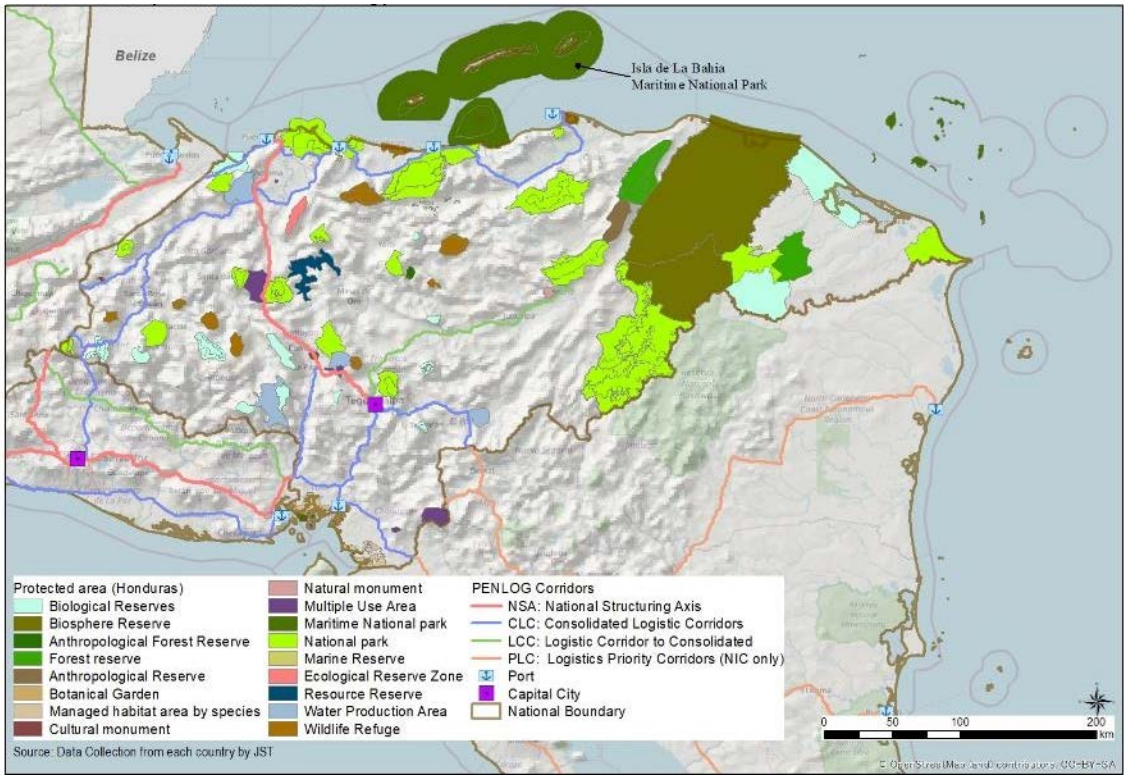
Table 1.7.4 Summary of Protected Area Country Data: Honduras

Protected area Category	Area (km^2)	%
National Park	11,272	27.7%
Biosphere Reserve	10,840	26.6%
Maritime National Park	8,018	19.7%
Biological Reserve	4,092	10.0%
Forest reserve	1,590	3.9%
Wildlife Refuge	1,275	3.1%
Water Production Area	1,106	2.7%
Managed Habitat Area by Species	799	2.0%
Multiple Use Area	573	1.4%
Resource Reserve	481	1.2%

[8] roatantourismbureau.com

Protected area Category	Area (km^2)	%
Anthropological Reserve	355	0.9%
Ecological Reserve Zone	156	0.4%
Cultural Monument	52	0.1%
Anthropological Forest Reserve	50	0.1%
Natural Monument	44	0.1%
Botanical Garden	23	0.1%
Marine Reserve	4	0.0%
Total	40,728	100.0%

Source GIS data provided from each country



Source GIS data provided from each country

Figure 1.7.4 Protected Area Honduras

(4) Nicaragua

The total area of Nicaragua's protected area is approximately 33,000 km^2 and there are 78 protected areas, almost half of which is Natural Reserve. This is followed by Marine Biological Reserve at about 25% and Biological Reserve at 9.5%, all of which account for about 90% of the protected area as shown in Table 1.7.5.

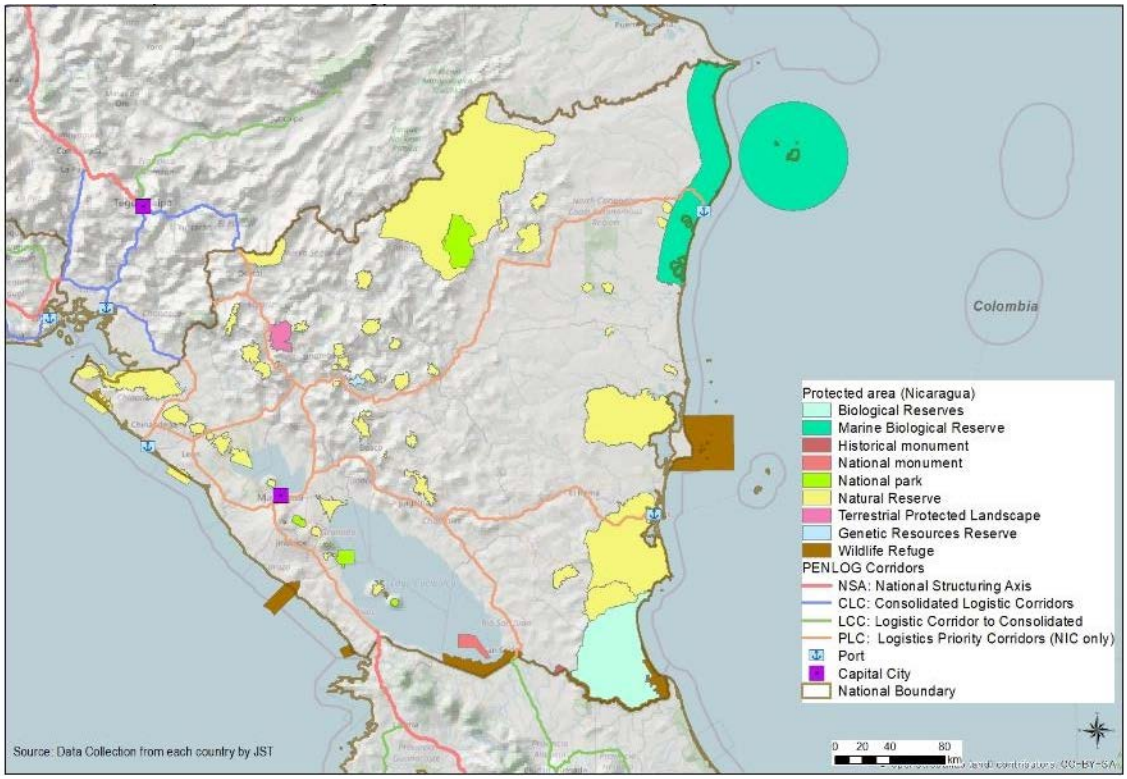
Figure 1.7.5 depicts the protected area distribution in Nicaragua, and Lake Nicaragua, the tenth-largest freshwater lake in the world, and Lake Managua, which is connected by a river, are designated as Genetic Resource Reserves.

Table 1.7.5 Summary of Protected Area Country Data: Nicaragua

Protected Area Category	Area (km^2)	%
Natural Reserve	17,425	52.3%
Marine Biological Reserve	8,567	25.7%

Protected Area Category	Area (km^2)	%
Biological Reserve	3,167	9.5%
Wildlife Refuge	2,730	8.2%
National Park	839	2.5%
Terrestrial Protected Landscape	287	0.9%
National Monument	181	0.5%
Genetic Resources Reserve	72	0.2%
Historical Monument	37	0.1%
Total	33,305	100.0%

Source GIS data provided from each country



Source GIS data provided from each country

Figure 1.7.5 Protected Area Nicaragua

(5) Costa Rica

Costa Rica is worldwide recognized as one of the countries at the forefront of conservation and particularly by its system of protected areas. These efforts at conservation have been developing for many years, but only in the first half of the twentieth century, it formalized the creation of protective areas covered by a legal official figure.[9]

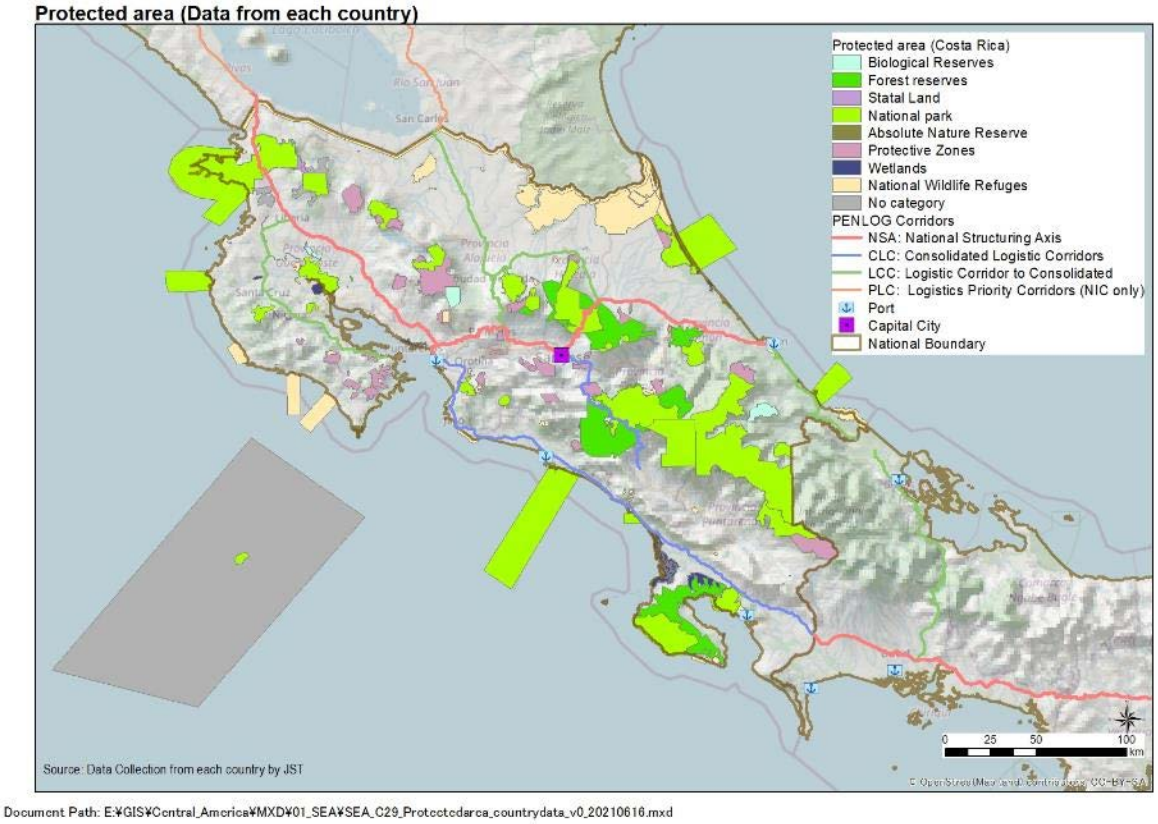
Table 1.7.6 and Figure 1.7.6 shows protected areas in Costa Rica. The largest percentage of protected areas are in the "No category" protected area, but it has the name "Montes-submarinos" as an attribute value. According to SINAC, which is in charge of environmental protected areas in Costa Rica, this area is registered as a protected area as Seamounts Marine Management Area, as shown in Figure 1.7.7.

[9] Website of Sistema Nacional de Areas de Conservacion, Costa Rica (SINAC)

Table 1.7.6 Summary of Protected Area Country Data: Costa Rica

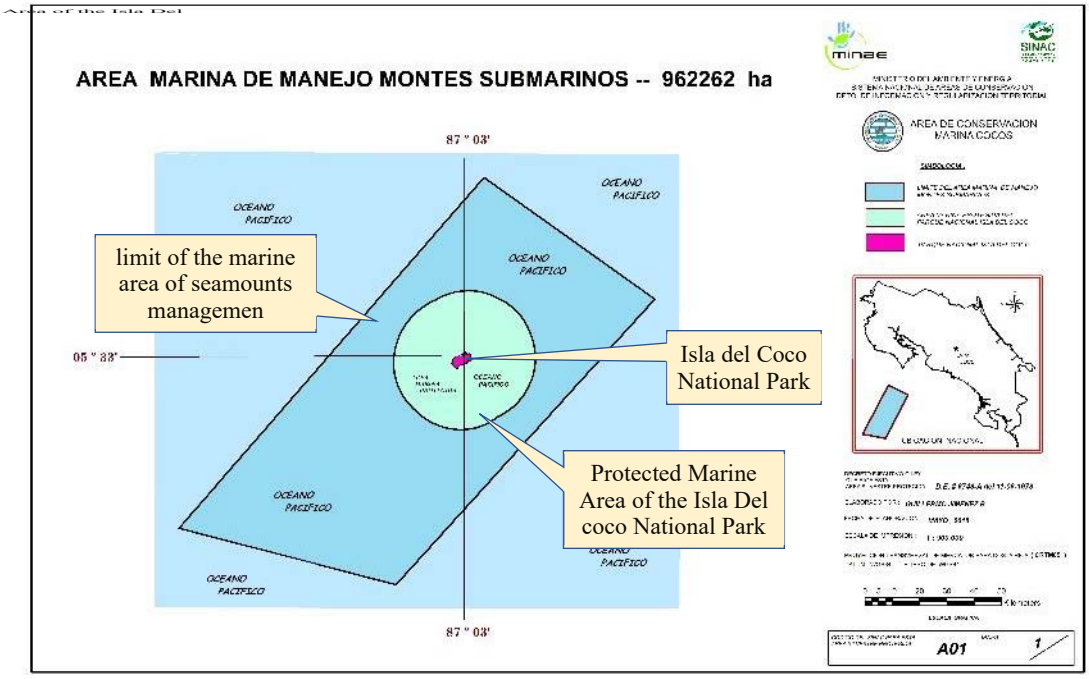
Protected area Category	Area (km^2)	%
No category (seamounts marine management area)	11,721	40.9%
National park	9,699	33.8%
National Wildlife Refuges	2,891	10.1%
Forest reserves	2,200	7.7%
Protective Zones	1,587	5.5%
Wetlands	292	1.0%
Biological Reserves	217	0.8%
Statal Land	31	0.1%
Absolute Nature Reserve	30	0.1%
Total	28,667	100.0%

Source GIS data provided from each country



Source: GIS data provided from each country

Figure 1.7.6 Protected Area Costa Rica



Source: SINAC Website

Figure 1.7.7 Seamounts Marine Management Area

(6) Panama

Panama has a variety of protected areas, but the Managed Resource area is the largest, accounting for almost 45% of the total, followed by the National Par at about 18%, and these two make up two-thirds of the protected areas as shown in Table 1.7.7.

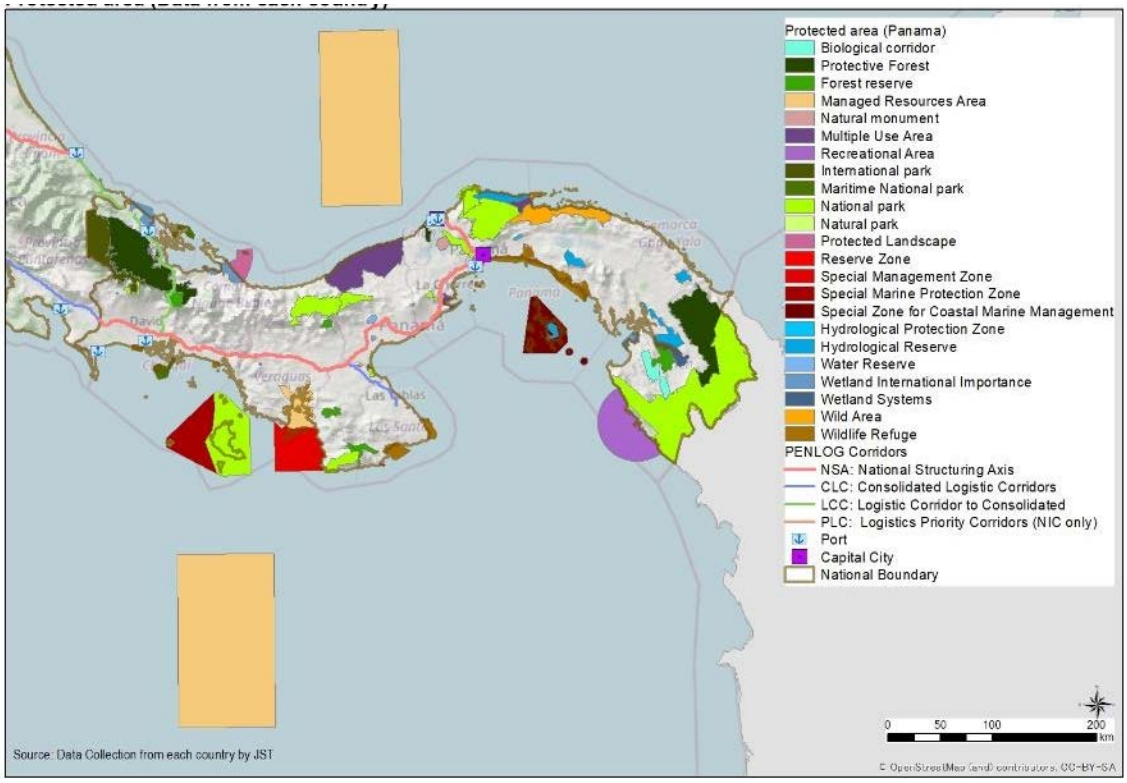
Figure 1.7.8 depicts a Protected area map of Panama.

Table 1.7.7 Summary of Protected Area Country Data: Panama

Protected area Category	Area (km^2)	%
Managed Resources Area	29,333	44.99%
National Park	11,980	18.38%
Protective Forest	4,842	7.43%
Recreational Area	2,378	3.65%
Multiple Use Area	2,219	3.40%
International Park	2,163	3.32%
Special Management Zone	1,899	2.91%
Special Marine Protection Zone	1,796	2.76%
Special Zone for Coastal Marine Management	1,716	2.63%
Wildlife Refuge	1,428	2.19%
Hydrological Reserve	1,117	1.71%
Wild Area	1,013	1.55%
Forest Reserve	890	1.36%
Wetland International Importance	702	1.08%
Protected Landscape	454	0.70%
Biological Corridor	442	0.68%
Maritime National Park	345	0.53%
Wetland Systems	253	0.39%
Natural Monument	123	0.19%

Protected area Category	Area (km^2)	%
Water Reserve	66	0.10%
Hydrological Protection Zone	25	0.04%
Reserve Zone	10	0.02%
Natural park	2	0.00%
Total	65,196	100.00%

Source GIS data provided from each country



Source: GIS data provided from each country

Figure 1.7.8 Protected Area Panama

1.7.3 International Initiatives Related to Environmental Protection

(1) Ramsar Wetland Site

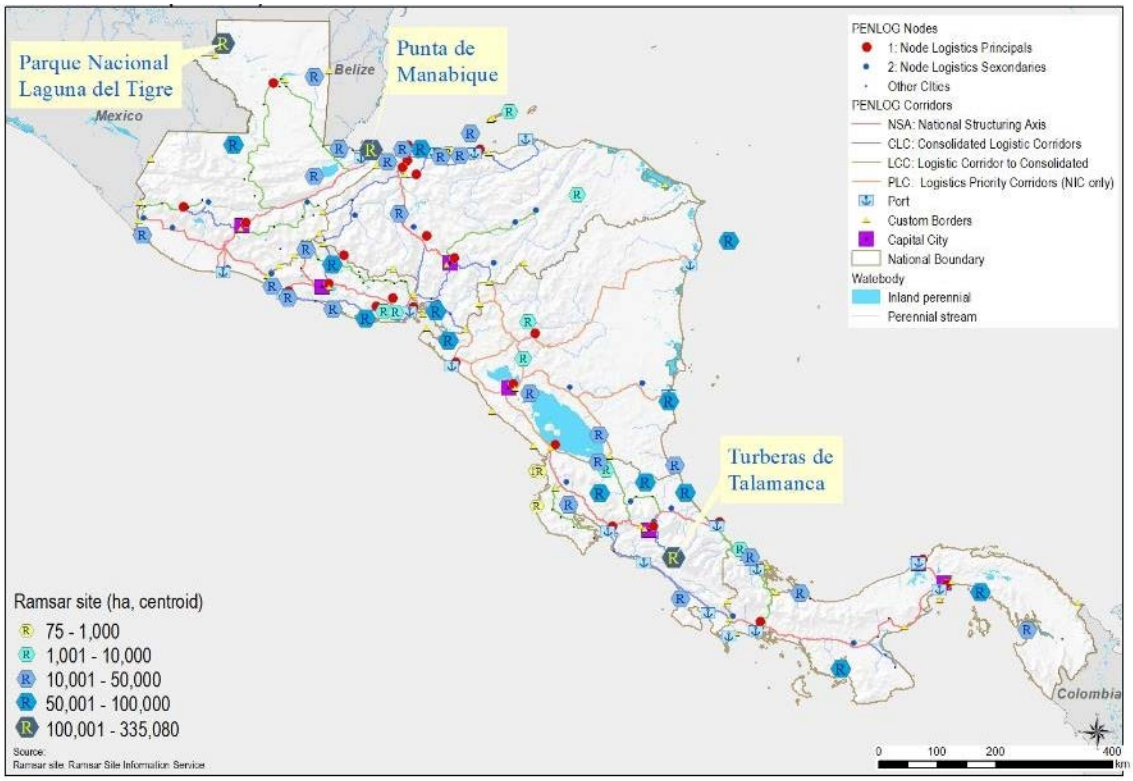
The Convention on Wetlands of International Importance, commonly known as the Ramsar Convention, is a treaty that promotes the conservation and wise use of wetlands. It is the only global treaty that focuses on a single ecosystem. In the Ramsar Convention, the term "wetland" refers to land that is always or seasonally full of water or is covered with water. Inland wetlands include aquifers, lakes, rivers, marshes, peatlands, ponds, flood plains, and swamps. Coastal wetlands include all shorelines, mangroves, saline wetlands, estuaries, lagoons, seagrass beds, coral reefs, etc.[10]

As of May 2021, there are 52 wetlands in the Central American region registered as Ramsar wetlands, with Costa Rica having the largest number of registered wetlands among the six countries with 12 as shown in Figure 1.7.9.

The largest Ramsar wetland in Central America is the Parque Nacional Laguna del Tigre, located in northern Guatemala near the Mexican border, covering an area of about 3,350 km^2, and the area is also listed on the

[10] Brochure from https://www.ramsar.org/

UNESCO Biosphere Reserve. The next largest Ramsar wetland is Punta de Manabique, on the Caribbean side of Guatemala, with an area of 1,330 km^2, and the third-largest Ramsar wetland is Turberas de Talamanca in Costa Rica with an area of 1,925 km^2. Turberas de Talamanca is a unique high mountain wetland in the mountain range and is considered an extremely heterogeneous area in terms of ecosystems.[11]



Source: Based on data from Ramsar site information service, map prepared by JST

Figure 1.7.9 Ramsar Wetland

The Ramsar site has nine criteria and each Ramsar wetland belongs to one or more criteria.

Table 1.7.8 Ramsar Site Criteria

Group		Criteria
Group A	Sites containing representative, rare or unique wetland types	Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.
Group B	Sites of international importance for conserving biological diversity	Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
		Criterion 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.
		Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.

[11] Based on Ramsar Information System, https://rsis.ramsar.org/

Group		Criteria
	Specific criteria based on waterbirds	Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.
		Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.
	Specific criteria based on fish	Criterion 7: A wetland should be considered internationally important if it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions, and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.
		Criterion 8: A wetland should be considered internationally important if it is an important source of food for fishes, spawning grounds, nursery, and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.
	Specific criteria based on other taxa	Criterion 9: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent nonavian animal species.

Source: https://www.ramsar.org/sites/default/files/documents/library/ramsarsites_criteria_eng.pdf

(2) World Heritage Site

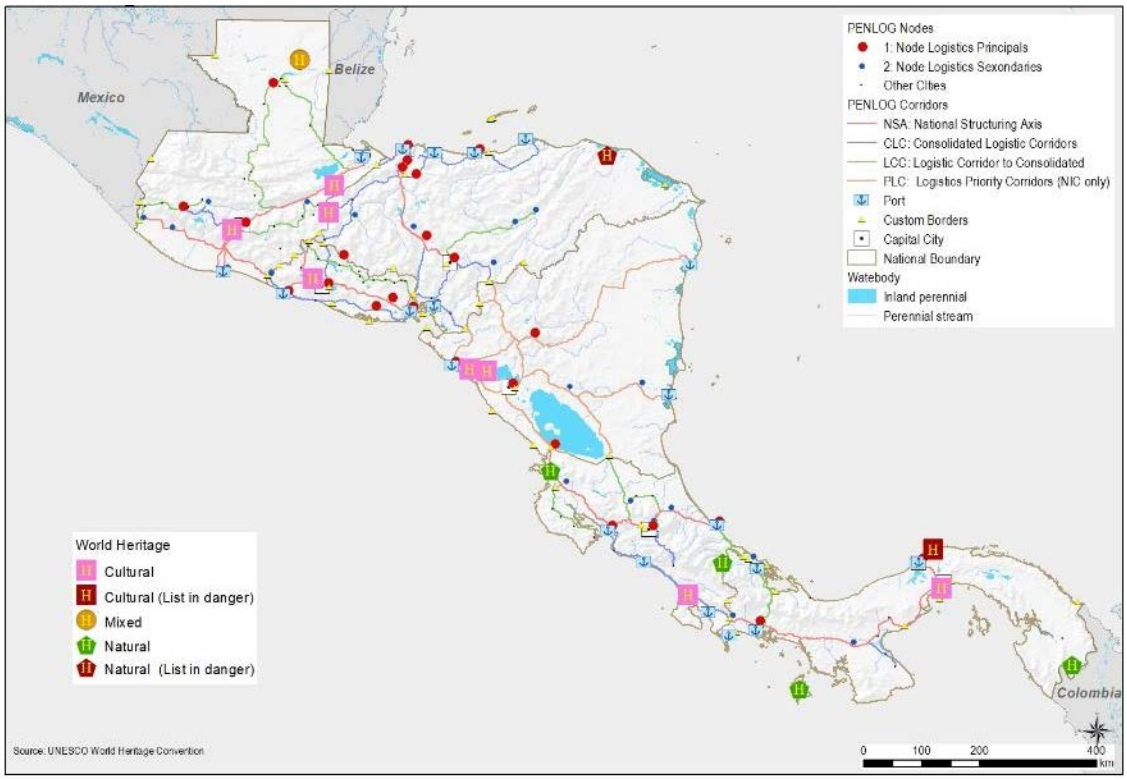
There are 16 World Heritage sites registered in Central America, and they are classified into three categories: Cultural, Natural, and Mixed. In Central America, there are 9 sites registered as Cultural, 6 sites as Natural, and 1 site as Mixed as shown in Figure 1.7.10. Among them, the Rio Platano Biosphere Reserve, located in the Caribbean side in Honduras, is one of the few remaining areas of tropical rainforest in Central America and is also home to more than 2,000 indigenous people who maintain their traditional way of life in the mountainous region that slopes down toward the Caribbean coast. However, this site is currently on the "World Heritage List in Danger" due to road construction and associated deforestation and illegal cultivation at headwaters of the River. Also on the List in Danger due to inadequate conservation is Fortifications on the Caribbean Side of Panama: Portobelo-San Lorenzo as shown in Table 1.7.9.

Table 1.7.9 World Heritage Sites in Central America

Country	Category	Site Name	Year of inscribed
GTM	Cultural	Antigua Guatemala	1979
GTM	Cultural	Archaeological Park and Ruins of Quirigua	1981
GTM	Mixed	Tikal National Park	1979
SLV	Cultural	Joya de Cerén Archaeological Site	1993
HND	Cultural	Maya Site of Copan	1980
HND	Natural	Río Plátano Biosphere Reserve (World heritage in Danger)	1982
NIC	Cultural	Ruins of León Viejo	2000
NIC	Cultural	León Cathedral	2011
CRI	Cultural	Precolumbian Chiefdom Settlements with Stone Spheres of the Diquís	2014
CRI	Natural	Cocos Island National Park	1997
CRI	Natural	Area de Conservación Guanacaste	1999
CRI/PAN	Natural	Talamanca Range-La Amistad Reserves / La Amistad National Park	1983
PAN	Cultural	Fortifications on the Caribbean Side of Panama: Portobelo-San Lorenzo (World heritage in Danger)	1980

Country	Category	Site Name	Year of inscribed
PAN	Cultural	Archaeological Site of Panamá Viejo and Historic District of Panamá	1997
PAN	Natural	Darien National Park	1981
PAN	Natural	Coiba National Park and its Special Zone of Marine Protection	2005

Source: World Heritage list, UNESCO World Heritage Center



Source: Based on data from UNESCO World Heritage center, a map prepared by JST

Figure 1.7.10 World Heritage Site in Central America

1.7.4 Mesoamerican Biological Corridor

The Mesoamerican Biological Corridor (MBC) is a development concept that integrates conservation and sustainable use of biodiversity, maintaining the connectivity function of ecosystems. The concept was proposed in the 1990s which was formally endorsed through a Joint Declaration at the 19th Summit of the Central American Heads of State held in Panama in 1997.

The MBC consists of a cluster of protected areas and the intervening land and it is made of four parts: Core Zones, Buffer Zones, Corridor Zones, and Multiple-Use Zones. Core Zones are protected areas and Buffer Zones include the areas surrounding the protected Core Zones, which are mostly wild land. Pathways between the zones are Corridor Zones, allowing the movement of plants and animals throughout the corridor. Finally, Multi-use Zones are used for forestry, agriculture, and areas of direct human impacts. The following map shows the protected area, biological corridor, and other uses.



Source: CCAD, Project for the Consolidation of the Mesoamerican Biological Corridor, 2002

Figure 1.7.11 Mesoamerican Biological Corridor

1.8 Cultural Features

1.8.1 Indigenous People

Central America has an immense cultural and ethnic diversity represented by the various indigenous communities. The population of indigenous people in Central America is summarized in Table 1.8.1. The largest indigenous population in the region is in Guatemala 5.9 million people account for 41.0% of the total population. Honduras and Nicaragua have over 0.5 million people followed by Panama having 0.4 million people. Recognizing that their livelihood depends on the land and natural resources, sufficient consideration must be given when formulating development plans, especially from the aspect of the right to own, use, control, and access land, territories, and natural resources.

Table 1.8.1 Population of Indigenous People

Country	Total indigenous population*1	Percentage of the total population*1	Number of Indigenous Groups*2
Guatemala	5,881,009	41.0%	24
El Salvador	14,408	0.2%	3
Honduras	536,541	7.0%	7
Nicaragua	518,104	8.9%	9
Costa Rica	104,143	2.4%	8
Panama	417,559	12.3%	7

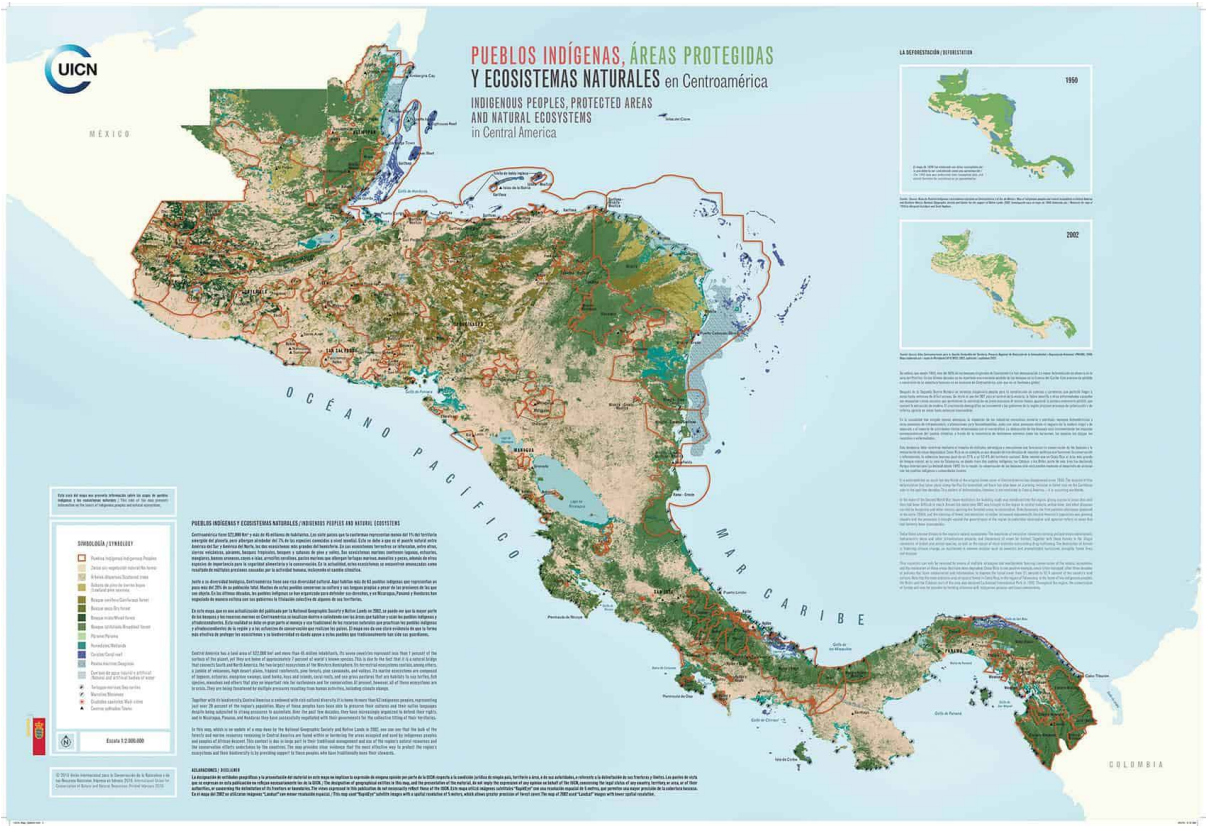
Source: *1 ECLAC 2014 Guaranteeing indigenous people's rights in Latin America; *2 International Bank for Reconstruction and Development and World Bank's (WB) 2015 Indigenous Latin America in the twenty-first century: the first decade.

A summary of available data on indigenous peoples' land is shown in Table 1.8.2. Figure 1.8.1 shows the updated map of the indigenous communities in Central America produced by the International Union for the Conservation of Nature (IUCN) in 2016. The map indicated that 48% of the forest cover in the region, 37% of the terrestrial protected area, and 32% of marine protected area coincide with zones of use and occupation of indigenous peoples. It presents a close relationship among indigenous peoples and important ecosystems in the region.

Table 1.8.2 Summary of Indigenous Land by Country

Country	Indigenous and Community lands (% of country land)	Notes regarding the estimation of indigenous community land
Guatemala Country land: 10,830,294ha	16.6%	0.38 Mha (3.55% of the country land area) are designated for Indigenous peoples and local communities as Community Concessions. 1.40 Mha (13.04% of the country land area) are Communal Lands owned by Indigenous peoples and local communities, In total, 16.58% of Guatemala is formally recognized as indigenous and/or community lands.
El Salvador Country land: 2,020,183ha	No data	No data could be found in the literature regarding the area of indigenous and community lands in the country. There is a government effort to demarcate and title indigenous lands, but the reviewed literature did not provide estimates of the amount of land held and/or used by Indigenous peoples and communities in the country.
Honduras Country land: 11,182,456ha	14%	In Honduras, 0.50 Mha of Social Forestry System or Microwatersheds are designated for Indigenous peoples and local communities (4.42% of the country land area). The Private Tribal Lands and Miskito Coastal Communities cover 1.07 Mha (9.55% of the country land area) and are owned by Indigenous peoples and local communities. Thus, 13.98% of Honduras land area is formally recognized indigenous and/or community land.
Nicaragua Country land: 11,915,525ha	18.9%	Across Nicaragua, 17 of the 23 indigenous and afro-descendant territories the Government engaged to the title have been formally documented, totaling 2.25 Mha - 17.3% of the country land area. 3,98 Mha are additionally claimed, representing 30.6% of the national territory
Costa Rica Country land: 5,123,433ha	6.4%	There are 8 Indigenous peoples in Costa Rica, occupying 0.33 Mha (6.44% of the country's land area) divided into 24 different territories formally recognized as owned by Indigenous peoples.
Panama Country land: 7,461,340	31.6%	According to GIS data and spatial analysis, the indigenous territories that were legally established as Comarcas, combined with all of the claimed lands, represent 31.6% (2.35 Mha) of Panama's land area. With a total of 27 separate areas, the mapped claimed lands represented 9.2% (0.68 Mha) of the country's land area.

Source: Global Platform of Indigenous and Community Lands



Source: IUCN 2016

Figure 1.8.1 Population of Indigenous Communities in Central America

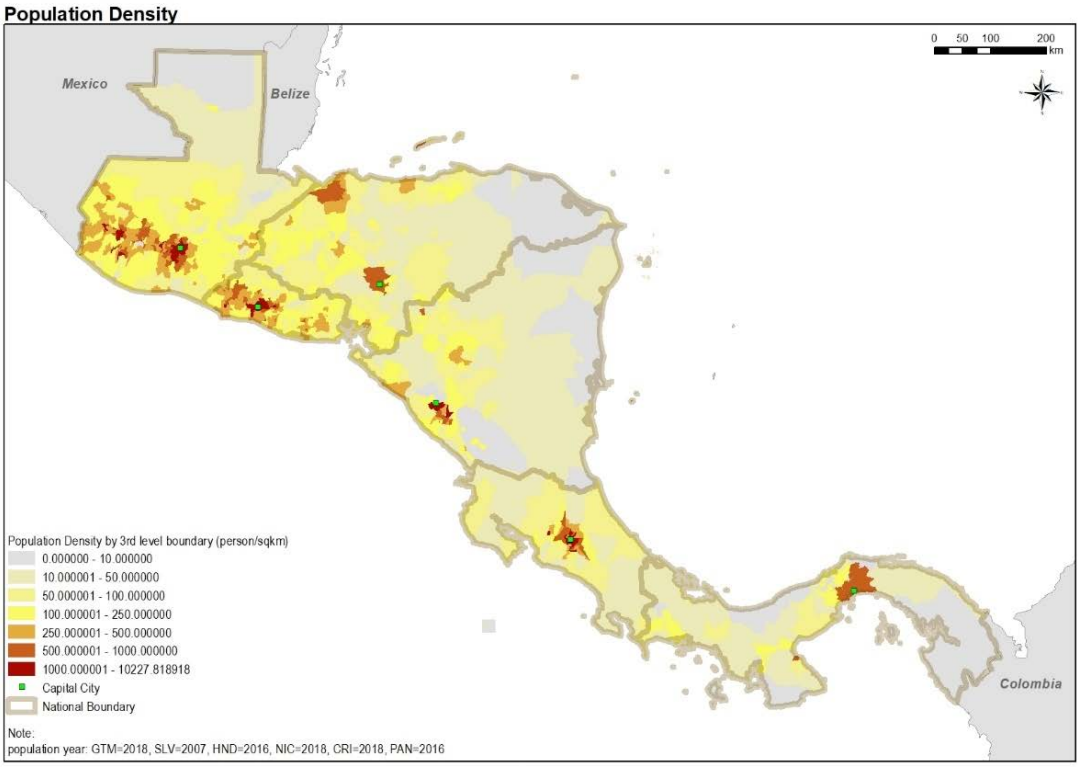
Table 1.8.3 Overlap of Protected Area and Indigenous Community Area

Item	Central America	Indigenous Community Area	Overlap Area
Forest areas	211,793 km^2	102,961 km^2	48%
Terrestrial protected areas	165,716 km^2	65,396 km^2	37%
Marine protected areas	92,114 km^2	32,037 km^2	32%

Source: IUCN 2016

1.8.2 Population Distribution and Poverty Rate

Population distribution in Central America is shown in Figure 1.8.2 and the characteristics of distribution are summarized in Table 1.8.4. The population is generally located on the Pacific Ocean side except for Honduras having the second-largest city facing the Atlantic Ocean. Most of the population is concentrated in the capital city and a high urban population rate is found in Costa Rica (81.4%), El Salvador (74.1%), and Panama (68.8%). While the majority of the population in the region resides in the mountainous area, Rio Ulua valley in the north of Honduras is the only densely populated lowland area.



Source: Based on the census data of each country, a map prepared by JST

Figure 1.8.2 Population Distribution in Central America

Table 1.8.4 Characteristics of Population Distribution in Central America

Country	Characteristics of Population Distribution	Urban Population (2021)
Guatemala	The vast majority of the populace resides in the southern half of the country, particularly in the mountainous regions; more than half of the population lives in rural areas	52.2%
El Salvador	Although it is the smallest country in land area in Central America, El Salvador has a population that is 18 times larger than Belize; at least 20% of the population lives abroad; high population density country-wide, with particular concentration around the capital of San Salvador	74.1%
Honduras	Most residents live in the mountainous western half of the country; unlike other Central American nations, Honduras is the only one with an urban population that is distributed between two large centers - the capital of Tegucigalpa and the city of San Pedro Sula; the Rio Ulua valley in the north is the only densely populated lowland area	59.0%
Nicaragua	The overwhelming majority of the population resides in the western half of the country, with much of the urban growth centered in the capital city of Managua; coastal areas also show large population clusters	59.3%
Costa Rica	Roughly half of the nation's population resides in urban areas; the capital of San Jose is the largest city and home to approximately one-fifth of the population	81.4%
Panama	The population is concentrated towards the center of the country, particularly around the Canal, but a sizeable segment of the populace also lives in the far west around David; the eastern third of the country is sparsely inhabited	68.8%

Source: CIA Factbook

The differences in the poverty level in an urban and rural area are shown in Table 1.8.5. The extreme poverty rate (less than $1.90/day) is higher in a rural area, especially in Honduras where the poverty rate in a rural area is 27.5% against 5.1% in an urban area in 2019. On the other hand, there are no differences between the urban and rural poverty rate in Costa Rica probably because most of the population reside in the urban area.

The poverty rate among indigenous and Afrodescendants is higher compared to the rest of the population. According to the World Bank 2015, 43% of indigenous people in Latin America are living on less than $5.50/day (PPP price in 2011), and 24% are living on less than $1.90/day (PPP price in 2011) that is more than twice the rates for non-indigenous people. Similarly, ECLAC statistics in 2019[12] indicate that the poverty rate for indigenous people was 46.7% and the extreme poverty rate was 17.3%, equivalent to twice and three times the respective rates for the non-indigenous and non-Afro-descendent population.

Table 1.8.5 Poverty Rate in Urban and Rural Area

Country	Country	Urban	Rural
	Extreme poverty ratio (2014)*1	Extreme poverty rate (2019)*2	Extreme poverty rate (2019)*2
Guatemala	8.8	-	-
El Salvador	3.1	0.6	2.2
Honduras	16.3	5.1	27.5
Nicaragua	3.4	-	-
Costa Rica	1.5	1.0	1.1
Panama	3.5	0.3	3.3

Source: World Bank Indicators 2019

*1 Poverty headcount ratio at $1.90 a day (2011 PPP) in 2014

*2 Poverty rate $1.90 a day (2011 PPP) in 2011

[12] Based on the household survey data bank (BADEHOG) of 9 countries: Bolivia, Brazil, Chile, Colombia Ecuador, Mexico, Panama, Peru, and Uruguay.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 2

Socio-economic Condition

November 2023

Japan International Cooperation Agency
Oriental Consultants Global Co., Ltd.
Nippon Koei Co., Ltd.
ALMEC Corporation
Overseas Coastal Area Development Institute of Japan
International Development Center of Japan Inc.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 2
Socio-economic Condition

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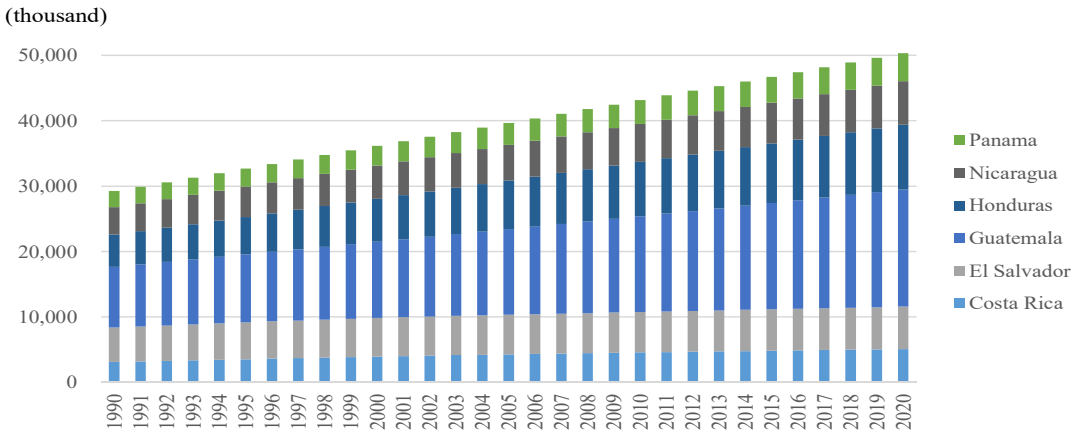
Appendix 2 Socio-economic Condition

2.1 Demographic Condition

2.1.1 Regional Overview

(1) Total Population

The total population of Central America reported by ECLAC reached 50,340,000 in 2020, composed of Guatemala (17,916,000) as the largest, followed by Honduras (9,905,000), Nicaragua (6,625,000), El Salvador (6,486,000), Costa Rica (5,094,000) and Panama (4,315,000) (See Figure 2.1.1).

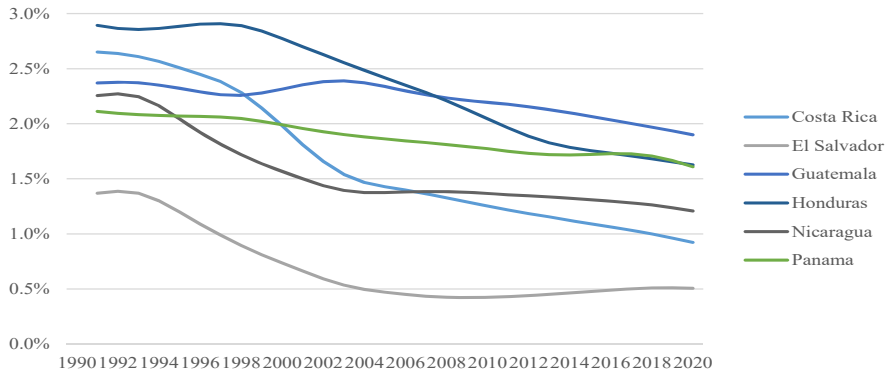


Source: ECLAC

Figure 2.1.1 Total Population in Central America (1990-2020)

(2) Population Growth Rate

While the total population grew from 29 million in 1990 to 50 million in 2020, the annual growth rate of population declined over the decades. The total annual growth rate in 2020 was 1.4%, and by each country, Guatemala grew by 1.9%, followed by Honduras (1.6%), Nicaragua (1.6%), and Panama (1.4%) Costa Rica (0.9%) and El Salvador (0.5%) (See Figure 2.1.2).



Source: ECLAC

Figure 2.1.2 Annual Growth Rate of Population (1990-2020)

2.1.2 Guatemala

(1) Total Population

The total population of Guatemala recorded 16,346,950 in 2018 as a result of the National Census confuted in 2018, the largest country in Central America. The population growth rate in 2018 was 1.6% (lower than the estimation by ECLAC), and based on the official population projection developed by National Institute of Statistics (Instituto Nacional de Estadística: INE), it is expected to continue declining by 1.0% in 2035, with the total population of 20.2 million.

(2) Population by Department

The population distribution by department shows that Guatemala Department has the highest density in Guatemala, with 1,418.2 residents/km^2 in 2018, 1,195 in 2002 and 853 in 1994. Followed by Guatemala Department, the departments with higher density are Sacatepéquez with 710.7 residents/km^2 and Quetzaltenango with 409.6 residents/km^2 in 2018.

2.1.3 El Salvador

(1) Total Population

The result of the Population and Housing Census 2007 showed that the total population of El Salvador was 5,744,113, of which 63% were in urban areas and 37% were in rural areas.

The Multipurpose Household Survey (*Encuesta de Hogares de Propósitos Múltiple*: EHPM) 2019 of the General Directorate of Statistics and Censuses (*La Dirección General de Estadística y Censos*: DIGESTYC) estimated that the total population of the country in 2019 was 6,704,864, of which 62% were in urban and 38% were in rural area.

EHPM 2019 shows that more than 50% of the population is under 30 years of age, which represents a potential for the country to promote higher levels of productivity and a higher level of development. In other words, to take advantage of the so-called demographic bonus.

(2) Population by Department

The distribution of population by department is closely related to the development of economic activity and the provision of services generated within each territory, particularly in the large urban areas. Thus, more than half of the population is concentrated in 5 of the 14 departments: San Salvador, La Libertad, Sonsonate, Cuscatlán and Santa Ana, while Cabañas, Morazán, La Unión and Chalatenango are the least populated.

The density of San Salvador increased from 1,768 residents/km^2 in 2007 to 2,040 residents/km^2 in 2019, the most densely populated country in Central America.

2.1.4 Honduras

(1) Total Population

The National Statistics Institute (INE) presents the results of the XVII Population Census and VI Housing Census (CNPV-2013) showing that the population of Honduras in 2014 recorded 8,303,771, of which 4,436,223 were in urban areas (53%) and 3,867,549 were in rural areas (47%).

The total population of 2020 was estimated to be 9,304,380, with the annual average growth rate of 1.7%.

(2) Population by Department

In comparison with Guatemala or El Salvador, Honduras has relatively lower density of 73.9 residents/km^2 according to the census in 2013. The department with highest density was Cortés with 398.3, and the lowest

was Puerto Lempira with 6.0.

2.1.5 Nicaragua

(1) Total Population

The National Institute of Statistics and Census delivered the VIII Population Census and IV Housing Census in 2005, with the total population of 5,142,098, of which 2,875,550 were in urban areas (55.9%) and 2,266,548 in rural areas (44.1%).

The total population of 2020 was estimated to be 6,595,673, with the annual average growth rate of 1.1%.

(2) Population by Department

The population density of Nicaragua was 46.3 residents/km^2 in 2005 and 53.7 residents/km^2 in 2020. By department, Masaya was the highest density with 623 residents/km^2 followed by Managua, the least populated department was North Caribbean Coast Autonomous Region of 14.8 in 2020.

2.1.6 Costa Rica

(1) Total Population

According to the National Population Census of 2011, Costa Rica reached a total population of 4,301,712 people, of which 3,130,871 were in urban areas (73%) and 1,170,841 were in rural areas (27%). The population was estimated to grow on average by 1.2% annually, and the population of 2020 was estimated to be 5,111,238.

The 2011 Census recorded an increase in the foreign-born population living in Costa Rica. This population reached 385,899 people, which represents 9.0% of the total population of the country. However, the growth rate of immigrants fell from an annual average of 7.5% in the 1984-2000 period to 2.4% annually for the 2000-2011 period. These results indicate that international immigration decreased significantly in relation to the previous census period.

(2) Population by Department

The 2011 Census revealed that the density has reached 90 residents/km^2 in 2011 and 100 residents/km^2 in 2020. By department, Alajuela had a highest density of 335, followed by 198 in Heredia. The lowest density was in Puntarenas with 39 residents/km^2.

2.1.7 Panama

(1) Total Population

The Eleventh National Population Census and Seventh Housing Census of 2010 conducted by the National Institute of Statistics and Census (INEC) revealed that the total population of Panama in 2010 was 3,405,813, of which 2,216,559 were in urban areas (65%) and 1,189,254 were in rural areas (35%). It is estimated to reach 4,278,500 in 2020 with the average annual growth rate of 1.6%.

(2) Population by Department

The density of the 2010 census showed 45.9 residents/km^2 and is estimated to be 57.7 residents/km^2 in 2020. By department, Panamá Oeste has the highest density of 168.6, followed by Panamá of 164.4, and the lowest density was 4.1 in Darién.

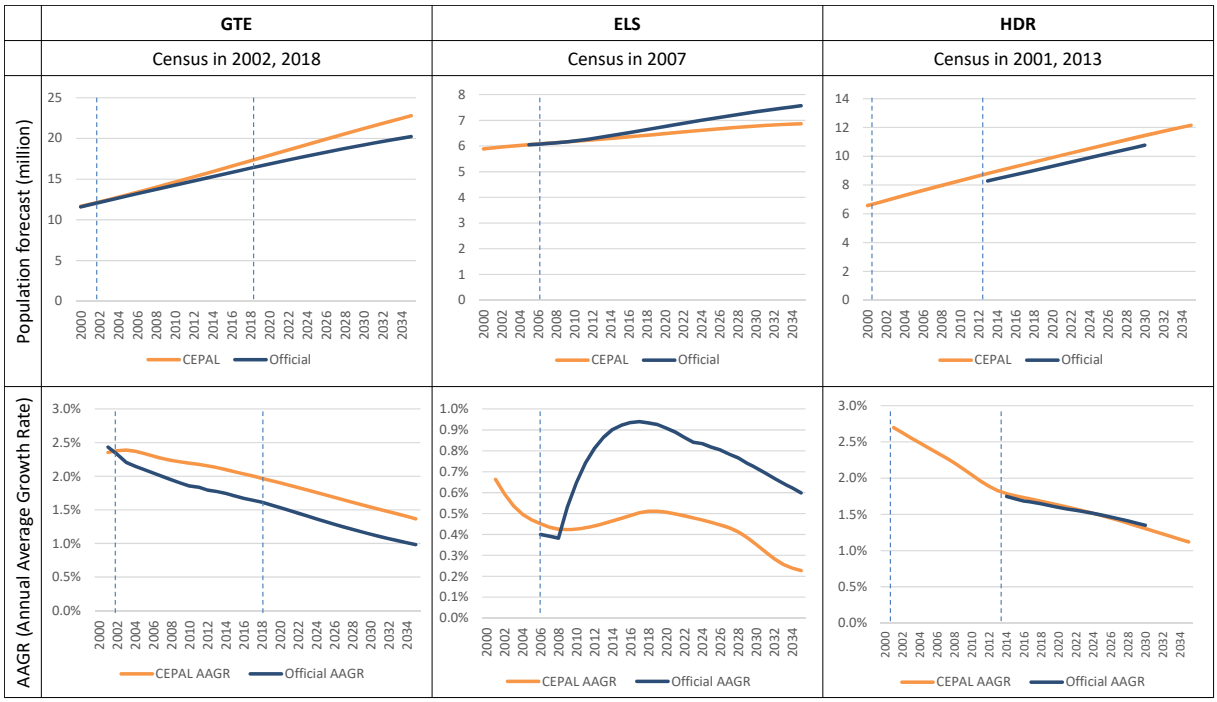
2.2 Demographic Framework

2.2.1 Demographic Forecast of each Country and ECLAC

The following figures show the comparison of official population forecast of each country and the population estimation by ECLAC. Both population figures and the AAGR (Annual Average Growth Rate) show similar patterns in Guatemala, Honduras, Costa Rica and Panama, however, the AAGR of El Salvador and Nicaragua show different patterns of both estimations.

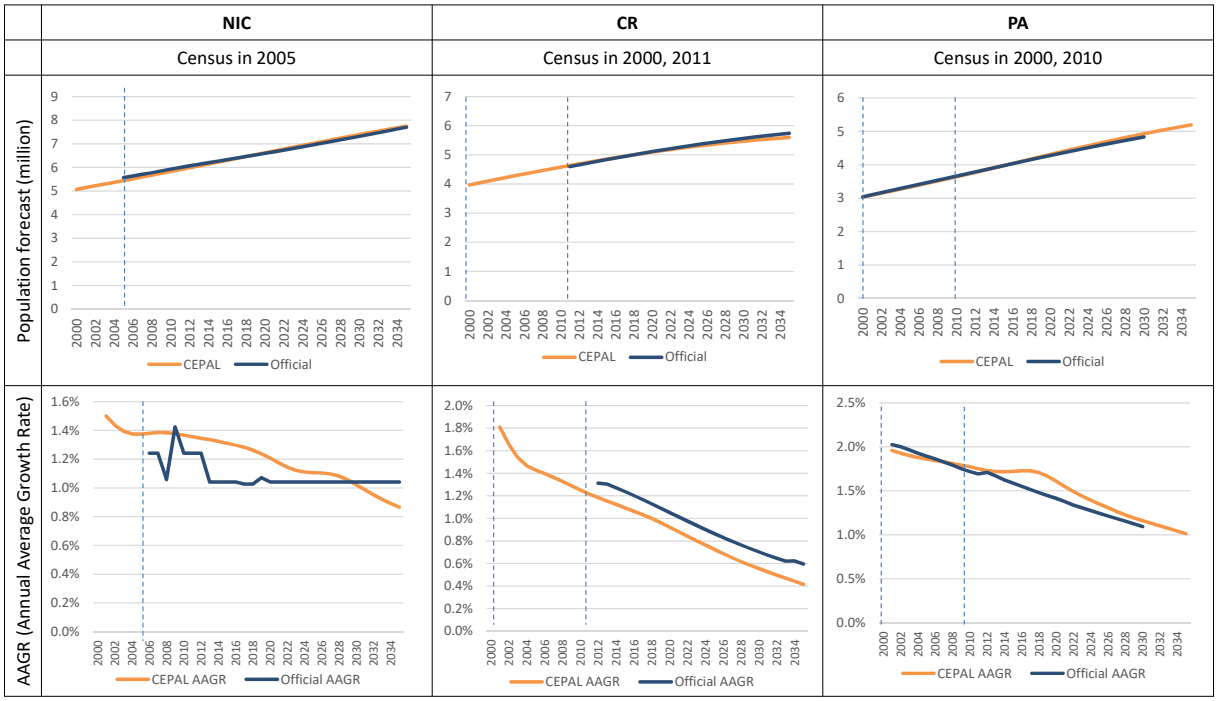
In El Salvador, based on the official projection, the population is estimated to grow by 0.8% annually until 2018, and then going to decline by 0.5% towards 2035, however, the estimation by ECLAC shows the continuous declining trend. Similarly in Nicaragua, the official projection is estimated to keep a stable growth rate of 1.0% until 2035, while ECLAC estimated to have a declining trend.

Throughout the region, it is estimated to have a similar trend of population pattern, therefore, applying the estimation by ECLAC would show a more realistic scenario of the demographic framework.



Source: Statistical office, ECLAC

Figure 2.2.1 Population Forecast of Guatemala, El Salvador and Honduras



Source: Statistical office, ECLAC

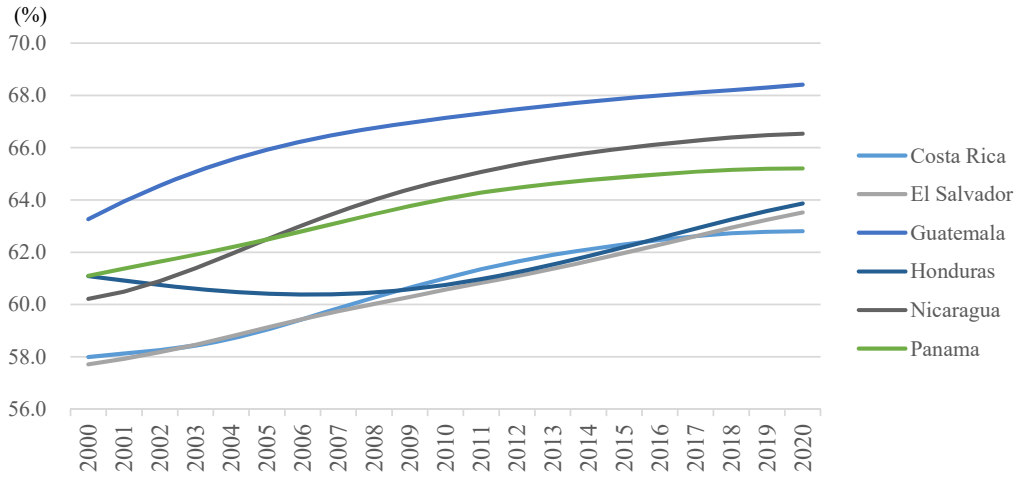
Figure 2.2.2 Population Forecast of Nicaragua, Costa Rica and Panama

2.3 Economic Condition

2.3.1 Employment

(1) Economic Participation Rate

The economic participation rate in Central America, the economically active population aged 15 years and over as a percentage of the total population aged 15 years and over, shows that it will slowly decline as the total population decreases towards 2035, as estimated by ECLAC. In 2020, the highest economic participation rate was 68.41% in Guatemala, and the lowest was 62.80% in Costa Rica, with the average rate of 65.05% (SeeFigure 2.3.1).

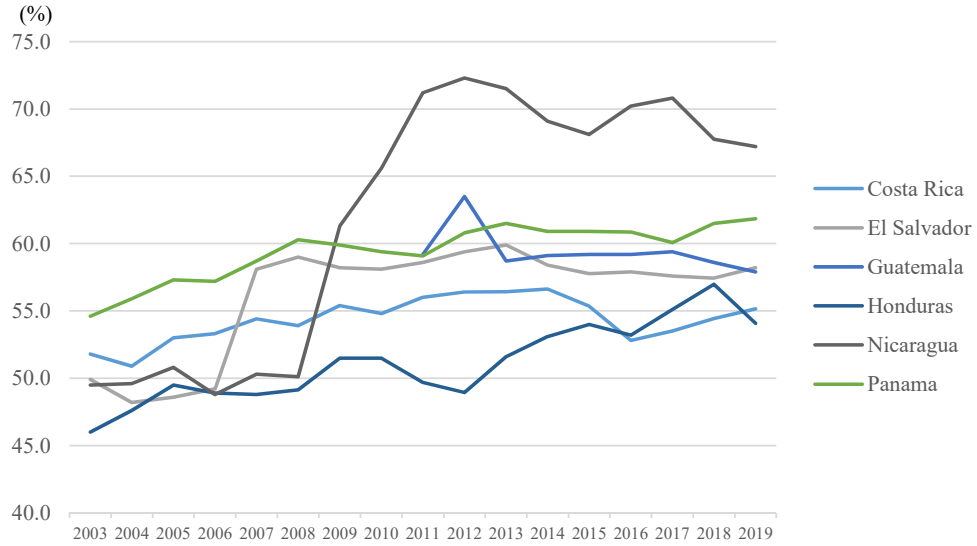


Source: ECLAC

Figure 2.3.1 Economic Participation Rate (2000-2020)

(2) Employment Rate

The employment rate in Central America, the number of employed persons as a percentage of economically active population aged 15 years and over, shows that it has gradually increased over the past 20 years from 2000 to 2019, while the employment rate of Nicaragua and Honduras declined in 2018 and 2019. The highest employment rate was 67.2% in Nicaragua, and the lowest employment rate was 54.1% in Honduras, with the average rate of 59.1% (See Figure 2.3.2).

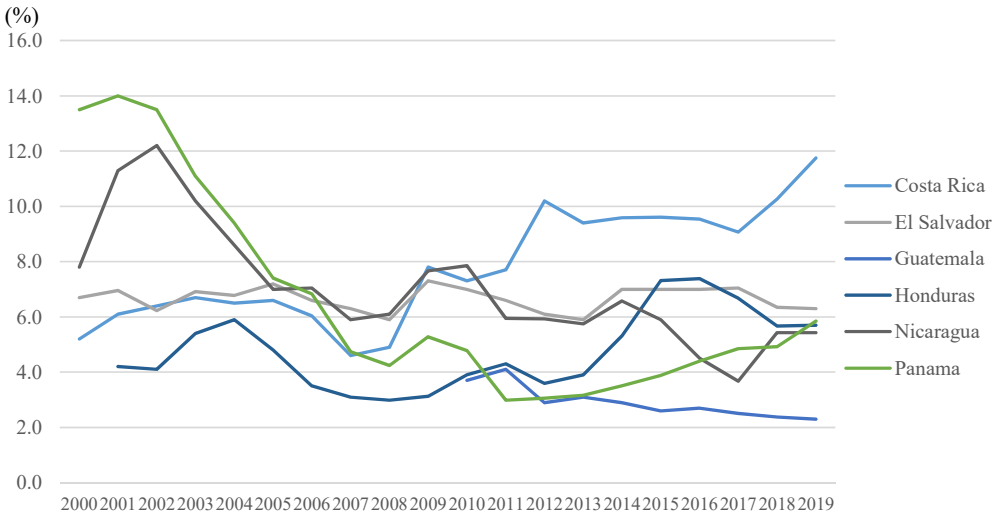


Source: ECLAC

Figure 2.3.2 Employment Rate (2000-2019)

(3) Unemployment Rate

The unemployment rate, the number of unemployed persons as a percentage of economically active population aged 15 years and over, shows that the unemployment rate of each country was lower around 2007, however, in some countries, especially Costa Rica, grew during 2010s, and it reached 11.8% in 2019, the highest in the region. On the other hand, the unemployment rate of Guatemala declined over the years, recorded 2.3% in 2019, the lowest in the region (See Figure 2.3.3).



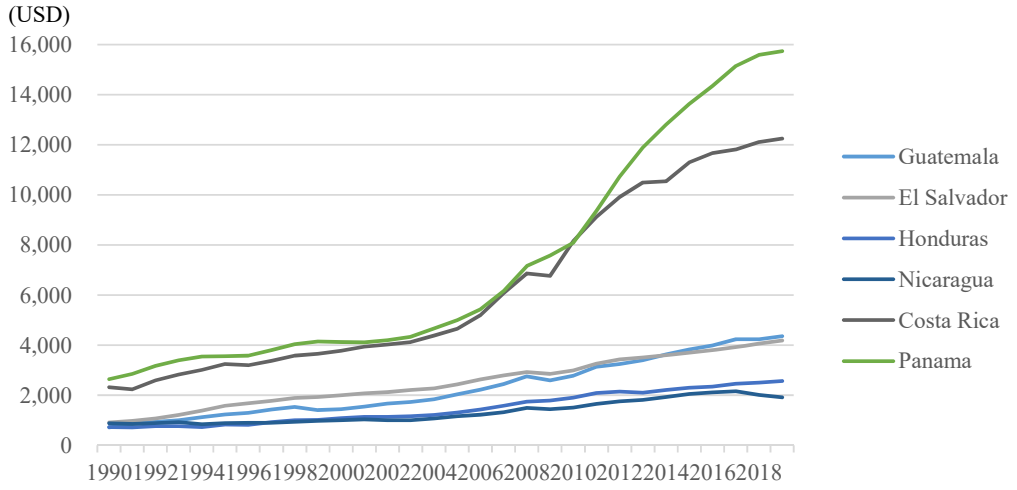
Source: ECLAC

Figure 2.3.3 Unemployment Rate (2000-2019)

2.3.2 GDP

(1) GDP per Capita

The GDP per capita at current prices in the region is diverse; Panama has the highest GDP per capita of USD 15,731 in 2019, while Nicaragua has the lowest of USD 1,913 (12% of Panama). The economic disparity has widened over the years; in 1990, the GDP per capita of Nicaragua was 33% of Panama (See Figure 2.3.4).



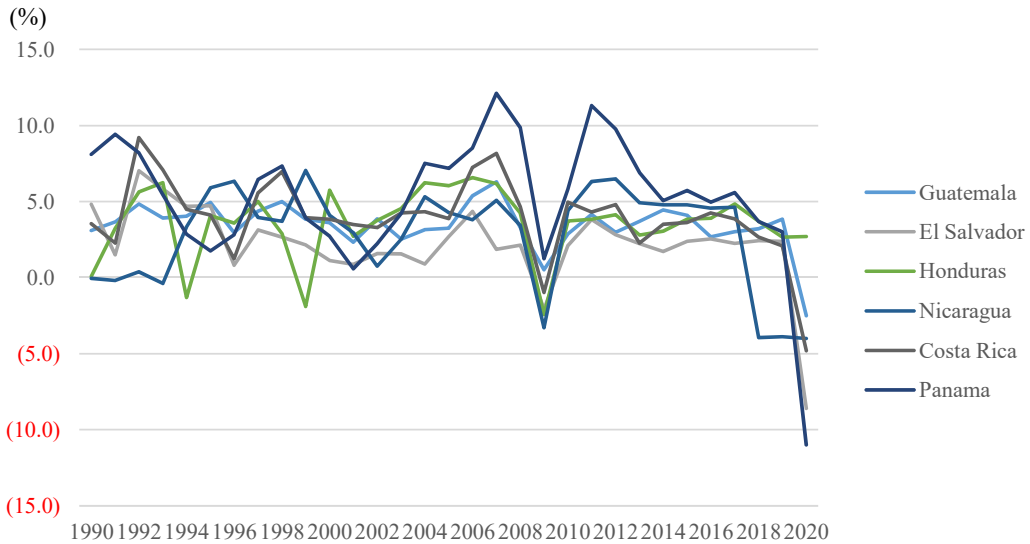
Source: ECLAC

Figure 2.3.4 GDP per Capita at Current Prices in USD (1990-2019)

(2) GDP Growth Rate

The GDP growth rate at constant prices was heavily hit by the COVID-19 pandemic in 2020, the worst record during 1990-2020. Panama recorded the most negative figure of -11.0%, followed by -8.6% in El Salvador, while Honduras sustained the positive growth of 2.7%.

The average GDP growth rate during 1990-2020 showed that Panama recorded the highest of 5.2%, while El Salvador showed the lowest of 2.2% (See Figure 2.3.5).



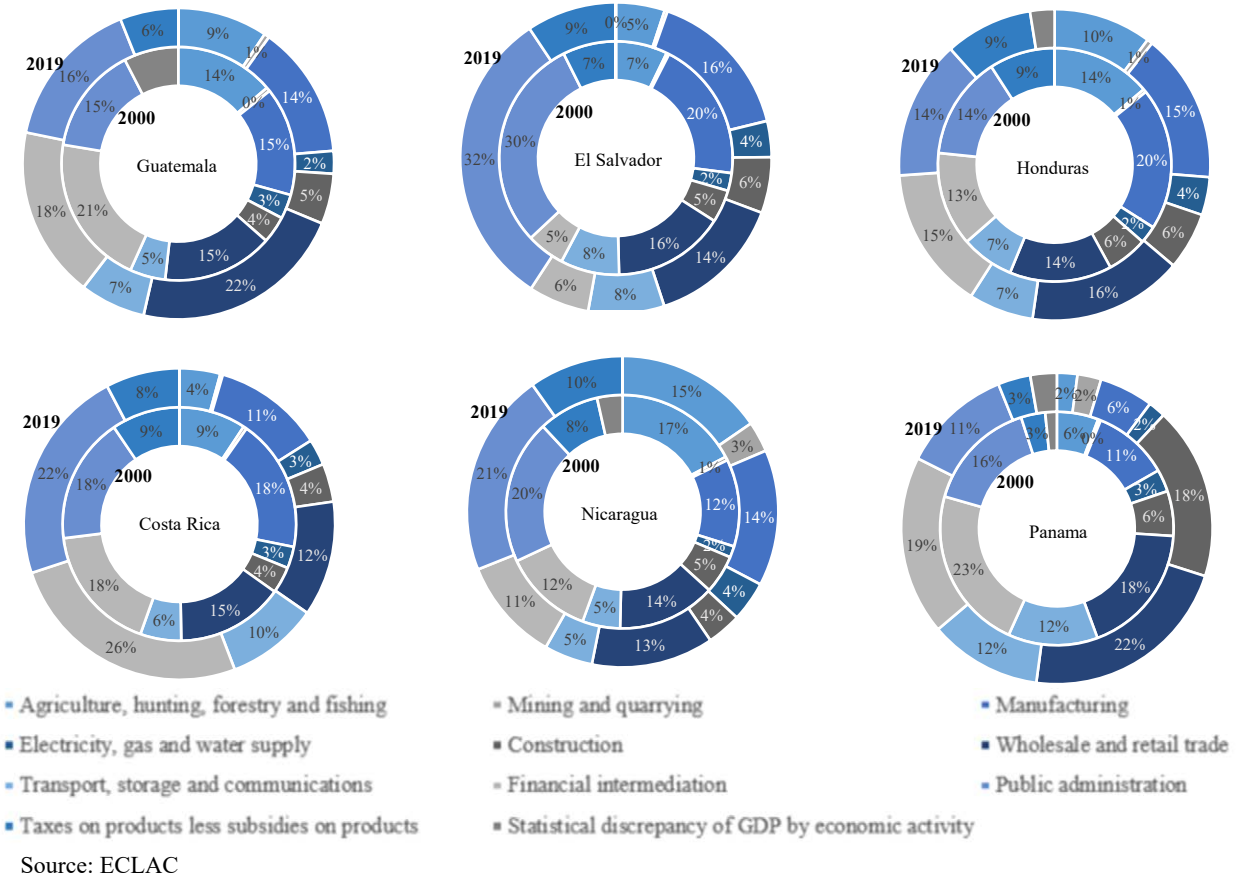
Source: ECLAC

Figure 2.3.5 Rate of Growth of GDP at Constant Prices (1990-2020)

(3) GDP by Sector

The GDP by sector at the current prices of 2000 and 2019 in each country shows that the share of the agriculture sector declined in all countries, and also the share of the manufacturing sector declined except for in Nicaragua. In most of the countries, the service sector such as wholesale, transport, financial intermediation and public administration, some of which are associated with tourism, have increasingly played a key role in the economic activities over the years (See Figure 2.3.6).

Especially in Costa Rica, the share of financial intermediation grew from 18% to 26%, and the share of public administration grew from 18% to 22%. On the other hand, in Nicaragua, the contribution of service sector did not show a significant change.

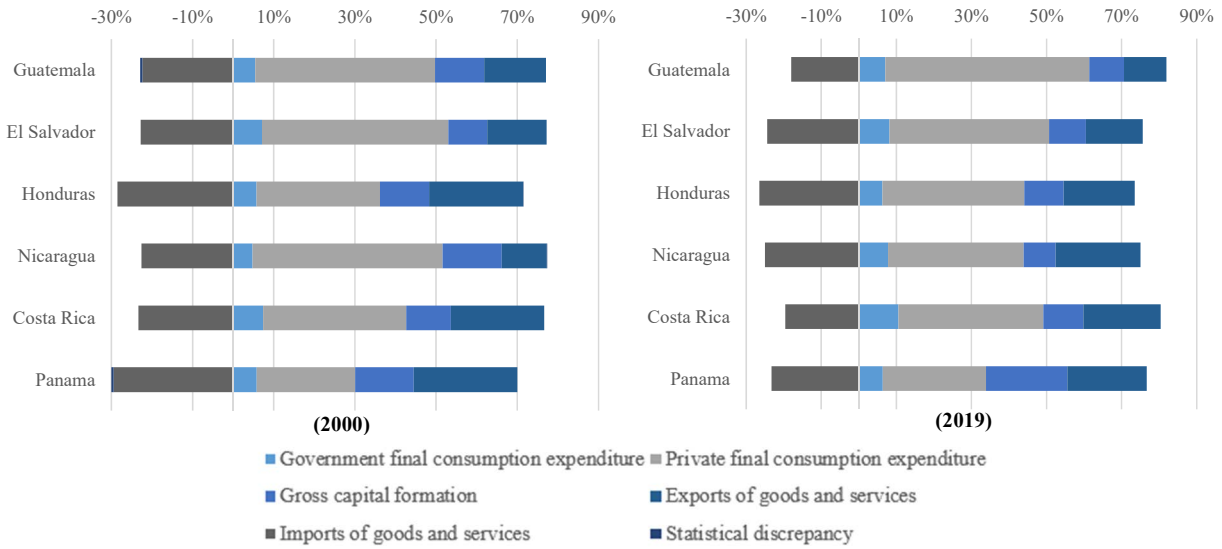


Source: ECLAC

Figure 2.3.6 GDP by Sector at Current Prices (2000 & 2019)

(4) GDP by Expenditure

The GDP by expediture at current prices, composed of government final consumption expenditure, private final consumption expenditure, gross capital formation, export and import of goods and services of each country in 2000 and 2019 shows that private consumption shares a large part of the economies (75% on average in 2000 and 73% on average in 2019). The share of gross capital formation, an important item contributing to the logistics and transport infrastructure investment, declined from the average of 25% in 2000 to 22% in 2019. In Guatemala, the share has declied from 25% to 15%, and in Nicaragua, it declined from 27% to 17%. On the other hand, the share of gross capital formation in Panama increased from 36% in 2000 to 40% in 2019 (See Figure 2.3.7).



Source: ECLAC

Figure 2.3.7 GDP by Expenditure at Current Prices in Dollars (2000 & 2019)

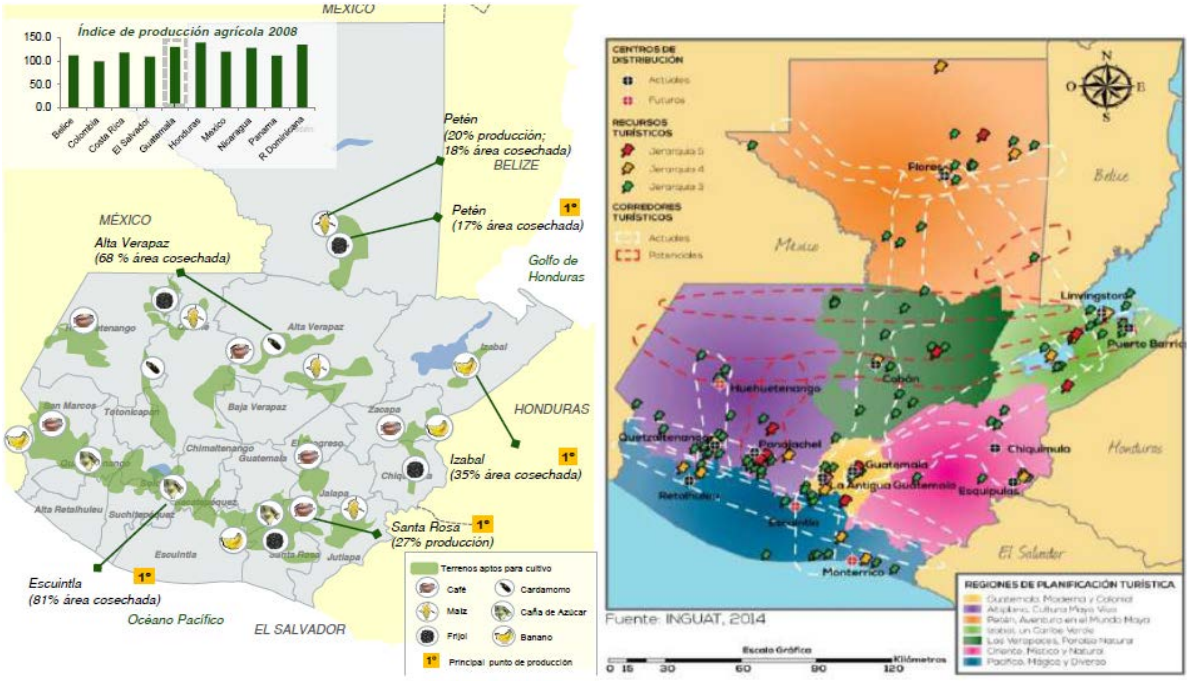
2.3.3 Industry

(1) Guatemala

The agriculture sector of Guatemala accounts for 9% of GDP in 2019, declined from 14% in 2010. The non-traditional agricultural products such as vegetables, fruits, seeds and spices are focused as new export products, and the demands for a cold chain for these products have been increasing. The agriculture production centers are prioritized in the Northern Triangle's Alliance for Prosperity Plan (Quiché, Alta Verapaz, Huehuetenango, Zacapa, Totonicapán, San Marcos).

Manufacturing activity is concentrated in the metropolitan area of Guatemala City, Escuintla and Copán host 41% of the companies, followed by Quetzaltenango, a center of textile production and liquor, as well as trade and services.

The tourism sector has become one of the important foreign incomes after overseas remittance. The tourism development plan identifies some programs such as adventure tourism, eco tourism, convention, health tourism, etc. The main areas are Antigua, Lake Atitlan, Tikal, the Market of Chichicastenanga, green Caribbean, South Coast Corridor, Verapaces, and Quetzal Port.

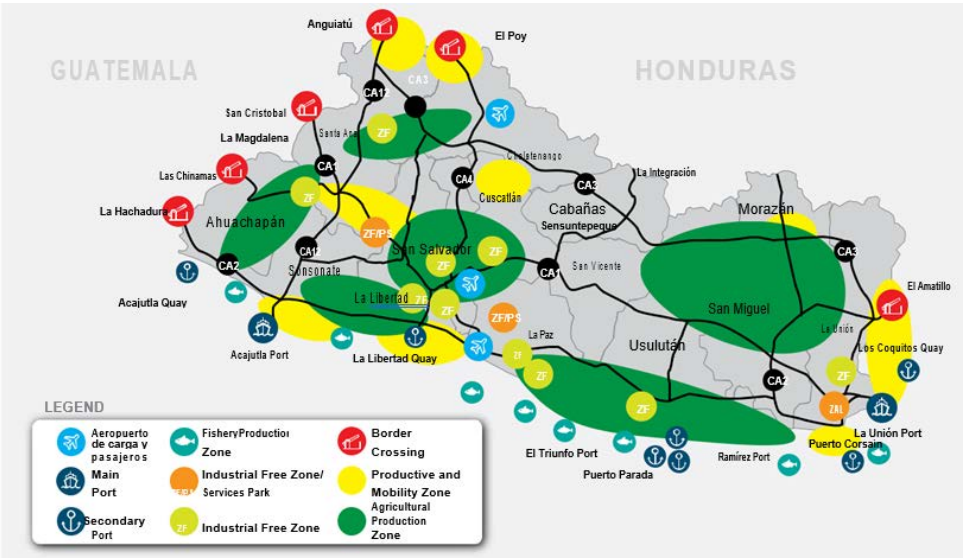


Source: PENLOG Guatemala

Figure 2.3.8 Main Centers of Agricultural Production (left) and Main Tourism Corridors (right)

(2) El Salvador

In El Salvador, the agriculture sector accounts for 16% of GDP in 2019. Maize, coffee and sugar cane represent 40%, 19% and 11% of cultivated areas respectively. Agricultural production is distributed throughout the entire territory, mainly on the central-western coastline with crops such as sugar cane and coffee in the mountainous areas (La Libertad and Santa Ana departments).



Source: PNLOG El Salvador

Figure 2.3.9 Location of Agricultural Production and Manufacturing in Free Zone

The manufacturing sector, representing 16% of GDP in 2019, is driven by the agri business products such as bakery, sugar, drinks, etc. Likewise, textiles and textile products, clothing, leather and leather by-products, and inward processing services represent 20% of the sector. Basic and processed chemical

products (11%), basic and processed metal products (4.7%) are important as well. Manufacturing production is concentrated mainly in San Salvador, Santa Ana, Sonsonate, Colón and San Miguel; 96% the local industry is made up of micro-businesses.



Source: PNLOG El Salvador

Figure 2.3.10 Location of Industrial and Service Free Zones in El Salvador

(3) Honduras

The manufacturing secor in Honduras represents 15% of GDP in 2019; the production is mainly related to agri-business. By the end of 2017, there were 337 companies operating under Free Zone customs regimes with inward processing activities; 122 companies working with Textiles and Clothing; 120 with Trade; 12 with Manufacturing of Car Harnesses and Parts; and 83 with Complementary Services.

The tourism sector has also become an important sector in Honduras. The National Strategy for Sustainable Tourism (ENTS) 2005-2021 identified five differentiated tourism products: sun and beach, nature and adventure, archeology, colonial and modern cities, living cultures and complementary products (fishing, golf, nautical, etc.).



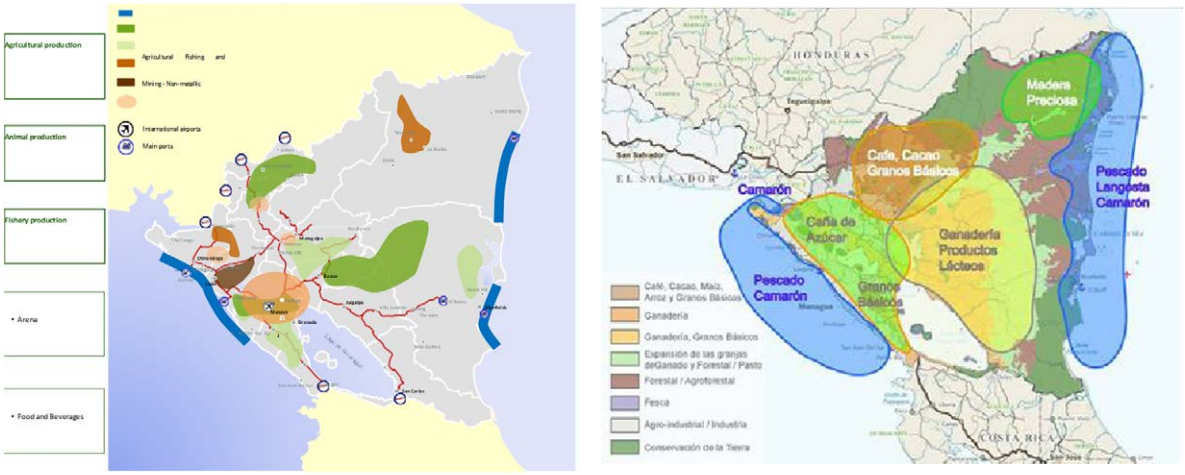
Source: PNLOG Honduras

Figure 2.3.11 Location of Main Production Centers of Honduras

(4) Nicaragua

The agriculture sector in Nicaragua accounts for 15% of GDP in 2019. The main export products are coffee, sugar, peanuts and beans. 80% of coffee production is concentrated in the northern highlands (Jinotega, Matagalpa, and Nueva Segovia); 84% of sugar cane production is found in the Northern Pacific (Chinandega) region.

The manufacturing sector, 14% of GDP in 2019, is largely linked to agro-industrial products. In the service sector, transport, storage and communications play an important role in the development of the sector.



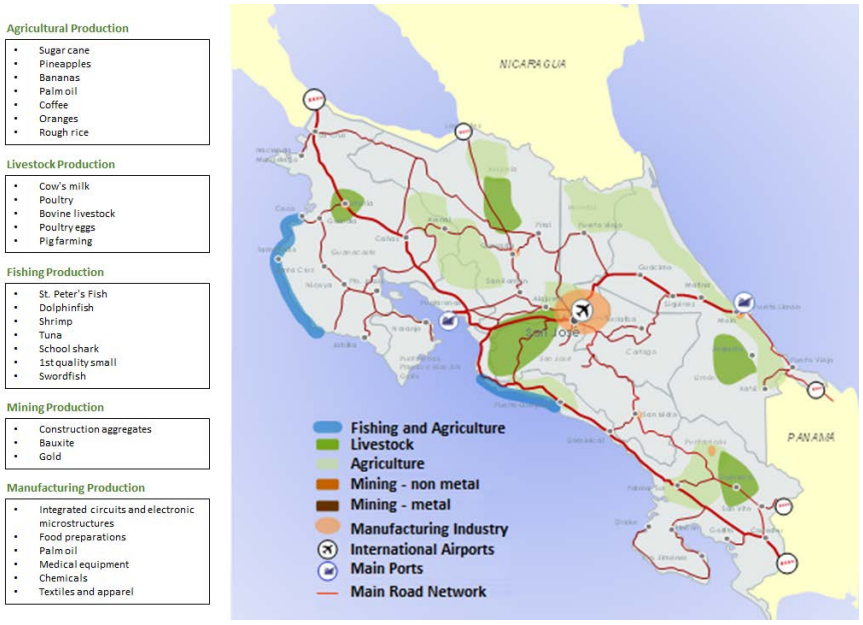
Source: PNLOG Nicaragua

Figure 2.3.12 Productive Activities of Nicaragua

(5) Costa Rica

In Costa Rica, the agriculture sector represents 4% of GDP in 2019, and most of the agricultural products such as sugarcane, pinapple, banana, coffee and palm oil are exported through the Limón-Moín port complex.

The manufacturing sector, which accounts for 11% of GDP, is concentrated in the greater metropolitan area, where around 87% of the companies are located. Electronic equipment (processors), electrical equipment and, high value-added technology products in general, which represent the bulk of domestic production, are also located in the Free Zones in the metropolitan area. Other important manufacturing products are food preparations, medical equipment, chemicals, textiles and clothing.



Source: PNLOG Costa Rica

Figure 2.3.13 Location of Main Production Areas of Costa Rica

(6) Panama

The contribution of the primary and the secondary sector has been limited in Panama. In 2019, their contributions were 2% and 6% respectively. The agriculture production has been limited and the contribution to the export has been decreasing. There is a project of creating a Perishables Hub that allows to increase the volumes exported from Panama, and thus generate scale economies for the Panamanian producers.



Source: PNLOG Panama

Figure 2.3.14 Location of Main Productive Zones of Panama

2.4 Economic Framework

2.4.1 GDP Forecast

The six Central American countries have populations ranging from about 5 million to 16 million and the GDP in 2018 was about 267 billion USD. In each country, the population is relatively small and the level of economic development is different. In recent years, efforts have been made to achieve overall development through regional economic integration.

Panama, where revenue from the Panama Canal accounts for 70% of GDP, and Costa Rica, where security and government stability and attraction of foreign investment has been achieved, have a GDP per capita exceeding 10,000 USD. On the other hand, the per capita GDP of the remaining four countries with unstable security and politics remain at a level of 2,000-4,000 USD, indicating regional disparities in per capita income. The four countries are characterized by high remittances from U.S. immigrants at 10-20% of GDP. In general, their economies are based on monoculture such as bananas and coffee since the period of Spanish rule and the time when they were affected by major U.S. companies. This economic structure is vulnerable to external factors such as price fluctuations.

While 2020 started with the expectation that Latin America and the Caribbean would grow by 1.6%, recovering from almost zero growth in 2019, these hopes were dashed by the new Coronavirus. COVID-19 has cost hundreds of thousands of lives in the region and destroyed livelihoods. GDP fell by an estimated 7.4% in 2020, the largest loss in output in a single year for the region since at least 1821. The crisis has brought economic crisis to virtually all countries around the globe.

The COVID-19 health crisis and measures to contain the spread of the virus provoked steep declines in GDP across all countries in the region. The region lost over 7% of GDP and while the region has just 8% of the global population, it accounts for 25% of global deaths from COVID-19[1]. The baseline projection of Central America[2] for 2021 is a rebound in growth to 4.1% according to IMF. Growth is then projected to revert to the long-run trend of around 2.5% per annum. IDB estimates the loss of GDP relative to the baseline is 1.5% per year for the 3 years for the standard shock scenario, and 3.2% for the negative scenario considering the period 2021 to 2023 (see Table 2.4.1).

Table 2.4.1 Annual Loss in GDP Relative to Baseline (average 2021–23, in % of GDP)

	Baseline growth	Standard negative shock			Negative scenario		
		US	Euro	Combined	US	Euro	Combined
Latin America and the Caribbean	3.2	–0.8	–0.7	–1.5	–1.3	–1.4	–2.7
Southern Cone except Brazil	3.5	–1.0	–0.8	–1.8	–1.7	–1.6	–3.2
Central America and the Caribbean	2.9	–1.1	–0.7	–1.8	–1.8	–1.4	–3.2

Source: IDB

The shock to growth in the United States and the Euro area impacts the entire region, albeit differently across countries. The shock to the United States is particularly relevant for Mexico, Central America, and the Caribbean. Both scenarios imply lower growth in 2021 compared to the baseline, falling back further in 2022 before recovering to approach trend growth in 2023.

[1] Opportunities for Stronger and Sustainable Postpandemic Growth – 2021 Latinamerica and Caribbean Macroeconomic Report, IDB, April 2021.

[2] Central America refers to CAPDR (Central America, Panama and the Dominican Republic)

Table 2.4.2 Emerging Market and Development Economics: Real GDP (Annual percent change)

	Average						Projections					
	2003–12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2026
Latin America and the Caribbean	**3.9**	**2.9**	**1.3**	**0.4**	**–0.6**	**1.3**	**1.2**	**0.2**	**–7.0**	**4.6**	**3.1**	**2.4**
Costa Rica	4.7	2.5	3.5	3.7	4.2	4.2	2.1	2.2	–4.8	2.6	3.3	3.3
El Salvador	2.0	2.2	1.7	2.4	2.5	2.2	2.4	2.4	–8.6	4.2	2.8	2.0
Guatemala	3.5	3.5	4.4	4.1	2.7	3.0	3.2	3.8	–1.5	4.5	4.0	3.5
Honduras	4.3	2.8	3.1	3.8	3.9	4.8	3.7	2.7	–8.0	4.5	3.3	3.9
Nicaragua	3.8	4.9	4.8	4.8	4.6	4.6	–4.0	–3.9	–3.0	0.2	2.7	2.8
Panama	7.7	6.9	5.1	5.7	5.0	5.6	3.6	3.0	–17.9	12.0	5.0	5.0

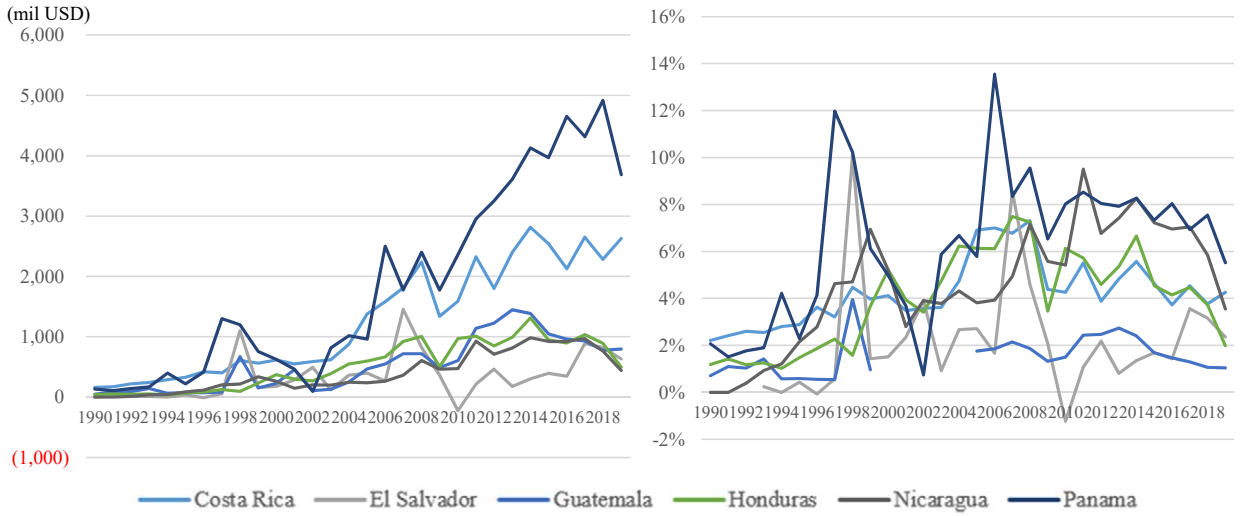
Source: World Economic Outlook, April 2021

2.5 Financial Condition

2.5.1 Investment

The total net FDI in Central America recorded 10.4 billion USD in 2018, and it has declined by 16.9% in 2019 (8.6 billion USD). The net FDI of 2020 has not been announced yet; however, it is estimated to decline further due to the impact of COVID-19. For the past 10 years from 2010 to 2019, the cumulative net FDI in the region reached 92.8 billion USD, of which Panama accounted for 40.8%, Costa Rica for 25.0%, Guatemala for 11.1%, Honduras for 10.2% and El Salvador for 4.4%.

The net FDI as a percentage of GDP reveals that in comparison with Asian countries which achieved high economic growth through attracting FDI, it is relatively small (3.1% on average in 2018) (See Figure 2.5.1).



Source: ECLAC

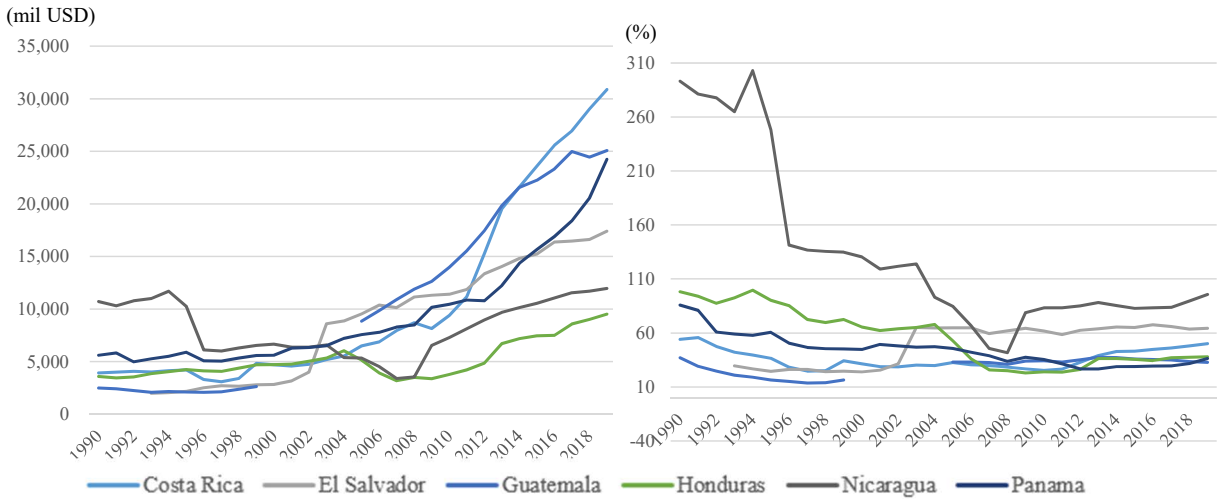
Figure 2.5.1 Net Foreign Direct Investment (value in left and % of GDP in right) (1990-2020)

2.5.2 External Debt

The total external debt reached 119 billion USD in 2019, with Costa Rica as the largest (30.8 billion USD), followed by Guatemala (25.1 billion USD), Panama (24.2 billion USD), El Salvador (17.4 billion USD),

Nicaragua (11.9 billion USD) and Honduras (9.5 billion USD).

In terms of percentage of GDP, although Nicaragua had an excessive external debt during the 1990s for more than 300%, it has declined to 95.5% in 2019. Except for Nicaragua, El Salvador and Costa Rica have relatively high value (64.4% and 50.0% respectively in 2019) (See Figure 2.5.2).



Source: ECLAC

Figure 2.5.2 External Debt (value in left and % of GDP in right) (1990-2020)

2.5.3 PPP Framework

In the six Central American countries, the regulatory framework has allowed procuring PPPs (Public-Private-Partnerships). Although Nicaragua, Costa Rica and Panama do not have a specific PPP Law, there are regulations of private sector projects concession of public works, and they are applied in the concession projects (See Table 2.5.1).

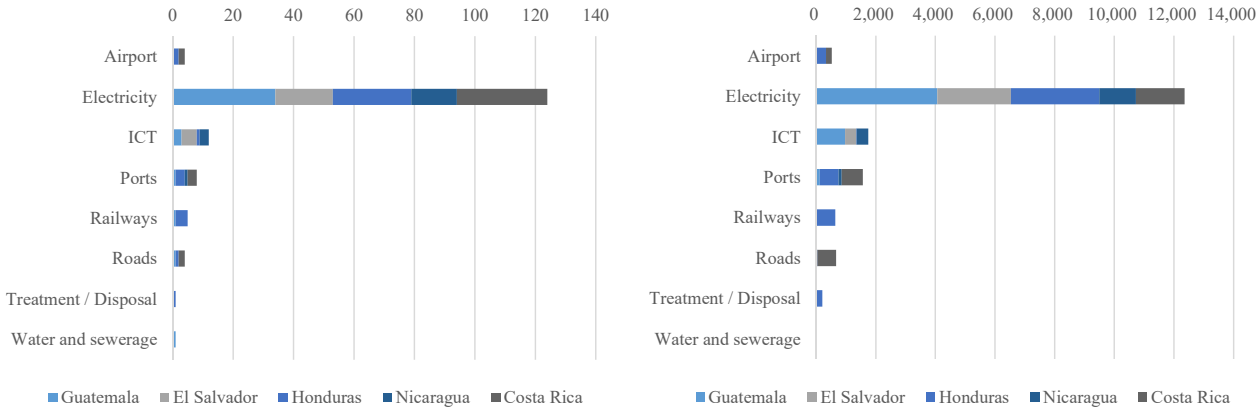
Table 2.5.1 PPP Regulatory Framework

Country	PPP regulatory framework
Guatemala	PPPs in Guatemala are regulated by the Decree No 16-2010 that approves the Law of Partnerships for Economic Infrastructure Development - Decreto No. 16-2010 que aprueba la Ley de Alianzas para el Desarrollo de Infraestructura Economica (the "**PPP Law**") and its Regulations approved by Decree No. 360-2011
El Salvador	The PPP regulatory framework in El Salvador includes the Public-Private Partnerships Law, Decree 379 of 2013, Ley Especial de Asocios Público Privados (hereinafter, the "**PPP Law**") and its Regulations, Decree 64 of 2015 (hereinafter the "PPP Regulation"). Article 104 of the PPP Law that provides that the PPP law will prevail over any other general or special law regulating the matter, notwithstanding the subsidiary applicability of other general and special laws relevant to the matter.
Honduras	The PPP regulatory framework in Honduras is composed of the following laws: Legislative Decree 143 of 2010 - Public-Private Partnership Promotion Law "**PPP Law**"; Executive Decree No. 02073-2010 of 2010 - public-private partnerships Promotion Law General Regulation "PPP Regulatory Decree"; Decree No. 24-2012 "Decree 24 of 2012"; Decree No. 51 - 2011 - Law for the Promotion and Protection of Investment; and Decree No. 58-2011 - Special Law to the Simplification of Public Infrastructure Investment Procedures.
Nicaragua	Nicaragua does not have a specific PPP Law. Currently, Public Procurement in Nicaragua is regulated by (i) Public Procurement Law No. 737, published in the official daily "La Gaceta" no. 213 and 214 of November 8 and 9 of 2010, respectively ("Public Procurement Law); (ii) Regulation to the Public Procurement Law Decree No.75-2010, published in the official daily "La Gaceta" no. 239 and 240 of December 15 and 16 of 2010, respectively ("Public

Country	PPP regulatory framework
	Procurement Regulations). Article 5 of the Public Procurement Law specifies that administrative licenses and concessions are excluded from the public procurement regime and subject to specific laws. This provision, however, seems to refer to simple administrative licenses and concessions not to public works concession contracts. In fact, article 80 of the Public Procurement Law specifies that the public work concession contract will be regulated by the existing special laws according to the type of public work. Specifically for highways, Law No. 264, approved on August 27, 1997 regulates highway concessions (the "Concession Law").
Costa Rica	Costa Rican government has not created a specific regulatory framework for procuring PPPs with that denomination but this kind of partnerships have been regulated by the application of the following laws: General Law of Concessions (Law 7762 of 1998) as modified by Law 8696 of 2008, Law 8643 of 2008 and Law 8114 of 2001 (the Concession Law) as well as the General Concession of Public Works with Public Services Regulation No 27098-MOPT (the Concession Regulations) and the Regulation of Private Sector Projects Concession of Public Works or Public Works Concession with Public Service No. 31836 -MOPT (the Unsolicited Proposal Regulation).
Panama	Panama does not have a specific regulatory framework for PPPs. However, Law 22 of 2006 (as last modified by Law 15 of 2012) that regulates public procurement in Panama governs the procurement of "6. Concessions and all other contract not regulated by special Law". Further regulation is contained in Law No 5 of 1988 of Concession (as last modified by Law 128 of 2013 and Law 76 2010). Certain sectors, such as energy and telecommunications, have other specific laws that handle the PPP relationships within said sectors. In 2011, there Law Project 349 which created the public-private association regime was introduced, however, the Cabinet Council requested that this project be withdrawn for further review and consultation.

Source: JST based on World Bank Group

According to the Private Participation in Infrastructure (PPI), Central America except for Panama recorded in total 159 projects worth 17.7 billion USD for PPP project (See Figure 2.5.3). Guatemala recorded the highest number with 41 projects worth 5.2 billion USD. The project list of infrastructure (airport, ports and roads) is summarized in Table 2.5.2.



Source: Private Participation in Infrastructure (PPI) - World Bank Group

Figure 2.5.3 Projects Reaching Financial Closure by Sector (left), Investment in Projects by Sector (US$ million) (right) (1990-2020)

Table 2.5.2 Private Participation in Infrastructure (PPI) Projects in Central America (Transport Sector)

Sector	Country	Year	Project name	Subtype of PPI	Contract Period	Sponsors	Total Investment (mil USD)
Airports	Costa Rica	2000	San Jose International Airport	Build, rehabilitate, operate, and transfer	20	Houston Airport System (HAS) (United States), Construtora Andrade GutierreBrazil), Airport Development Corporatin (ADC) (Canada)	161.0
Airports	Costa Rica	2009	Daniel Oduber Airport	Build, rehabilitate, operate, and transfer	20	Houston Airport System (HAS) (United States), MMM Group (Canada)	34.0
Airports	Honduras	2000	Honduras Airport Network	Build, rehabilitate, operate, and transfer	20	SFO Enterprises (United States)	120.0
Airports	Honduras	2020	Palmerola International Airport	Build, operate, and transfer	30	Inversions Emco	209.0
Ports	Costa Rica	2006	Caldera Port I	Build, operate, and transfer	20	Sudamericana Agencias Aereas y Maritimas (SAAM) (51% / Costa Rica), Saret SA (21% / Colombia), Logistica de Granos S.A. (19% / Costa Rica), Grupo Empresarial del Pacifico S.A. (GEPSA) 9% / Colombia)	32.0
Ports	Costa Rica	2006	Caldera Port II	Rehabilitate, operate, and transfer	20	Sudamericana Agencias Aereas y Maritimas (SAAM) (51% / Costa Rica), Saret SA (21% / Colombia), Logistica de Granos S.A. (19% / Costa Rica), Grupo Empresarial del Pacifico S.A. (GEPSA) (9% / Colombia)	11.0
Ports	Costa Rica	2015	Moin Container Terminal - 1st Phase	Build, lease, and transfer	33	AP Moller - Maersk Group	663.0
Ports	Guatemala	2014	Puerto Quetzal Container Terminal	Build, lease, and transfer	25	AP Moller - Maersk Group (100% / Spain)	120.0
Ports	Honduras	1999	Puerto Cortes - Texaco	Build, operate, and transfer	N/A	Texaco (100% / United States)	10.5
Ports	Honduras	2013	Specialized Container and General Cargo Terminal of Puerto Cortes	Build, rehabilitate, operate, and transfer	30	International Container Terminal Services Inc. (ICTSI) (100% / Philippines)	624.3
Ports	Honduras	2014	Puerto Cortes Bulk Terminal	Lease contract	20	Grupo Naviero Peninsular	N/A

Sector	Country	Year	Project name	Subtype of PPI	Contract Period	Sponsors	Total Investment (mil USD)
Ports	Nicaragua	2000	Puerto Cabezas	Rehabilitate, lease or rent, and transfer	25	Olympus Venture Capital (100% / United States)	104.0
Railways	Guatemala	1998	Guatemala Rail Network	Build, rehabilitate, operate, and transfer	50	Railroad Development Corp (50% / United States), Capitales e Inversiones S.A. (50% / Guatemala)	10.0
Roads	Costa Rica	2005	San Jose – San Ramon toll road	Build, rehabilitate, operate, and transfer	25	Fomento de Construcciones y Contratas SA (FCC) (42% / Spain), Grupo Soares da Costa (17% / Portugal), Sacyr Vallehermoso SA (SyV) (35% / Spain)	304.2
Roads	Costa Rica	2007	San Jose Caldera Highway	Build, operate, and transfer	25	Fomento de Construcciones y Contratas SA (FCC) 100% / Spain)	330.0
Roads	Guatemala	1997	Autopista Palin - Escuintla - Puerto Quetzal	Build, rehabilitate, operate, and transfer	25	Grupo Marhnos (100% / Mexico)	23.8
Roads	Honduras	2013	Autopista del Atlantico	Build, rehabilitate, operate, and transfer	30	Grodco SA (Colombia), Prodecon Profesionales de la Construccion (Honduras)	150.0
Roads	Honduras	2013	Consorcio Vial Honduras	Build, rehabilitate, operate, and transfer	20	Hidalgo and Hidalgo SA (Ecuador), Construccion Administracion SAC (Peru)	375
Roads	Honduras	2014	San Juan - Gracias - Celaque Toll Road	Build, rehabilitate, operate, and transfer	10	Grupo Eterna (100% / Honduras)	22.5
Roads	Honduras	2015	SPS Siglo XXI	Build, rehabilitate, operate, and transfer	15	William & Molina (100% / Honduras)	87.9

Source: Private Participation in Infrastructure (PPI) - World Bank Group

2.6 Trade Condition

2.6.1 Overall Trade Flow in Central America

(1) Data Souce and Estimation Method

As for this analysis, this study estimated consistent OD (origin and destination) based trade data by using several data sources such as the central bank of each contry, SIECA, UN Comtrade, and SECMA (Consejo Monetario Centroamericano), since the definitions of trade data are different by country, and depending on the specific item and year, some of the data was incomplete. Specifically, it is meaningful to include trade data to/from maquila and free trade zones, since, as summarized in the subsection "2.2.4 Trade", the Central American countries have defined maquila and free trade zones in the 1990s, which led to promoting foreign investment. As for now, these make up significant proportions of imports and exports in the Region. For instance, the composition of export value from maquila consists of 23% for Guatemala, 20% for El Salvador, and 44% for Honduras, and as for from free trade zones, 52% for Nicaragua, 57% for Costa Rica, and 93% for Panama.

Table 2.6.1 1 shows the data source for this analysis and the estimation procedure of the trade data with preconditions is summarized in the Appendix 1. It should be noted that the transit cargo movement and domestic cargo movement of each country are not included in this data. These movements will be discussed in the Second Interim Report together with the result of transport surveys.

Table 2.6.1 Data Source for this Analysis

Country	SEC	UN Comtrade	Other data
Guatemala		✓	
El Salvador		✓	
Honduras	✓[1]		"Honduras en Cifras" and "Informe de bienes para transformacion y actividades conexas 2019" published by Central Bank of Honduras[2]
Nicaragua		✓	
Costa Rica	✓		
Panama	✓[3]	✓	Import and Export statistics published by INEC (Instituto Nacional de Estadística y Censo)[4]

Note: [1]For trade data other than free trade zones. [2]For trade data in maquila and free trade zones, data estimated from Bank of Honduras statistics was utilized. [3]For certain commodities, UN Comtrade data was incomplete. [4]Data from INEC (Instituto Nacional de Estadística y Censo). The details about estimation methodology and preconditions are described in the Appendix 1.

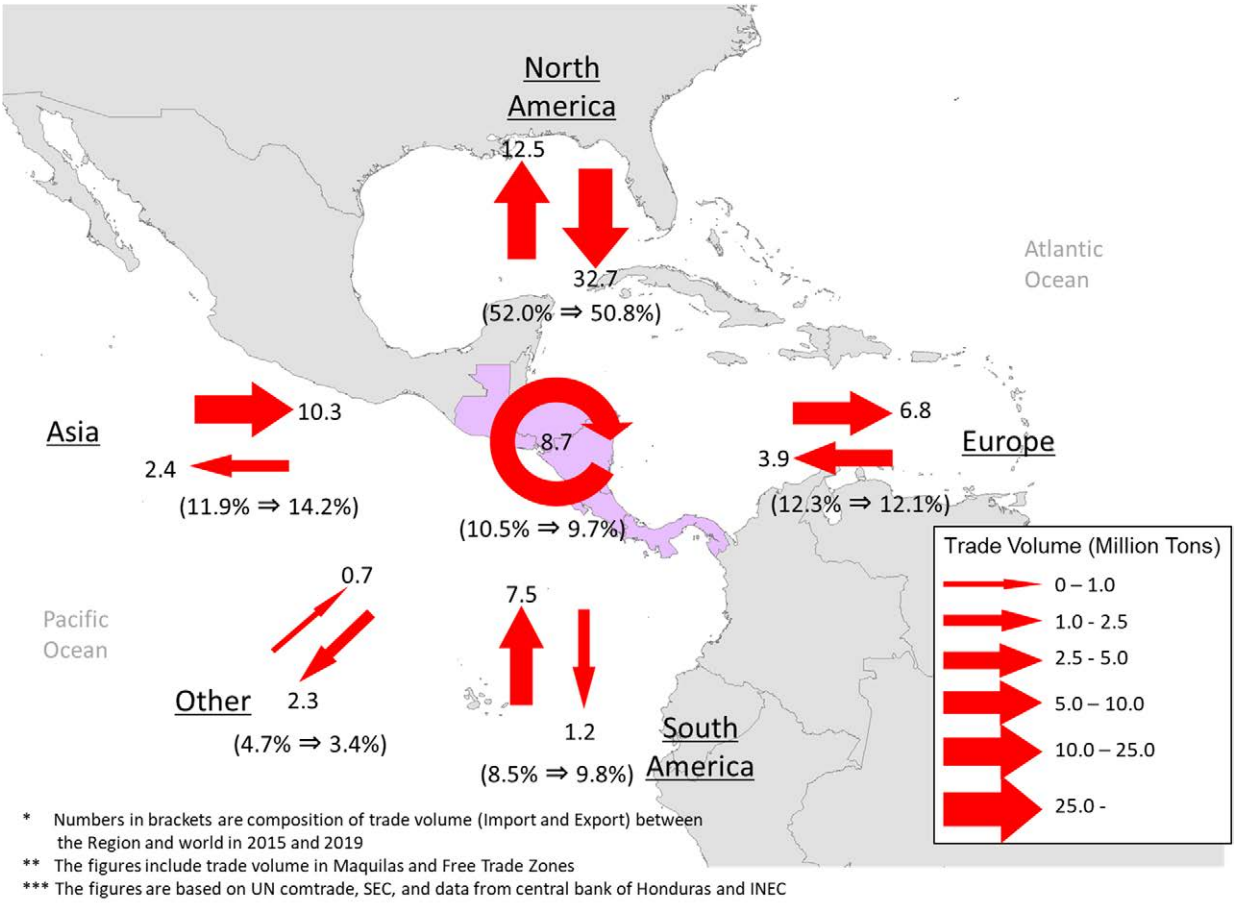
Source: JST

(2) Trade Flow in Central America

Changes in the trade volume and value between 2015 and 2019 are shown in Figure 2.6.1 and Figure 2.6.2. As for trade volume in 2019, the trade volume between the Region and the world were 25.2 million tons for exports and 55.1 million tons for imports, and intra-regional trade volume was 8.7 million tons. When comparing the trade volume in 2015 to that of 2019, the exports and intra-regional trade volume have remained flat but import volume increased by 8.7 million tons in 2019. The trade values were 38.8 billion USD for export and 78.0 billion USD for import, and intra-regional was 11.4 billion USD. When comparing trade value in 2015 to that of 2019, the exports and intra-regional trade volume slightly increased due to increase of high value-added product such as non-traditional agricultural products, precisions, and medical products, and import value was increased by 8.4 billion USD.

In terms of trade partners, North America (including Mexico) accounts for 50.8% in tons (45.2% in USD), and the intra-region accounts for 9.7% in tons (8.9% in USD) in total exports and imports in volume and value. As for exports, those for North America has the highest share of 36.9 % in tons (46.0% in USD), followed by the intra-region of 25.6% in tons (22.7% in USD) and Europe with 20.2% in tons (11.3% in

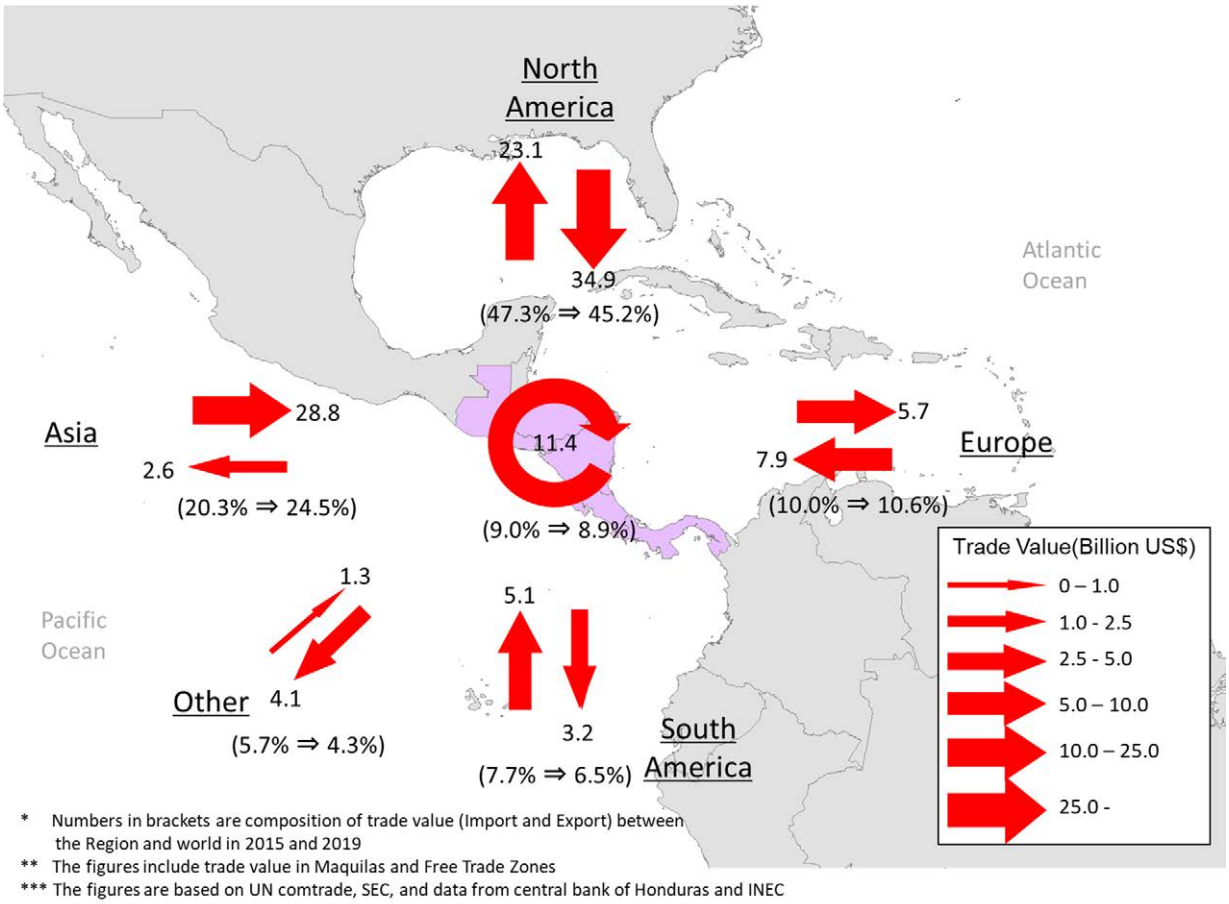
USD). As for imports, North America accounts for 51.3% in tons (39.0% in USD) followed by Asia with 16.1% in tons (32.3% in USD) and the Region with 13.6% in tons (12.8% in USD). Compared with 2015, dependence on North America has declined, and proportion to Asia and Europe has increased in 2019.



Note: For the trade volume of intra-regional trades, only the data of importing country was utilized in order to avoid double counting.

Source: The figures are based on aggregation of each Central American countries' trade data obtained from the following data sources; UN Comtrade for Guatemala, El Salvador, and Nicaragua, SEC for Costa Rica, UN Comtrade for Honduras`s non free trade zone area, "Honduras en Cifras" and "Informe de bienes para transformacion y actividades conexas 2019" calibrated by study team for Honduras`s free trade zones, UN comtrade expanded by INEC (Instituto Nacional de Estadística y Censo) statistics for Panama. For the details on data source and its calibration method, refer to Appendix 1.

Figure 2.6.1 Changes in Trade Volume between Central America and the World (2015 and 2019)



Note: For the trade value of intra-regional trades, only the data of importing country was utilized, in order to avoid double counting.

Source: The figures are based on aggregation of each Central American countries' trade data obtained from the following data sources; UN Comtrade for Guatemala, El Salvador, and Nicaragua, SEC for Costa Rica, UN Comtrade for Honduras`s non free trade zone area, "Honduras en Cifras" and "Informe de bienes para transformacion y actividades conexas 2019" calibrated by study team for Honduras`s free trade zones, UN comtrade expanded by INEC (Instituto Nacional de Estadística y Censo) statistics for Panama. For the details on data source and its calibration method, refer to Appendix 1.

Figure 2.6.2 Changes in Trade Value between Central America and the World (2015 and 2019)

2.6.2 Trade Trend by Commodity

(1) Commodity Classification

In consideration of trade characteristics and future industry policy which are summarized in the subsection "2.6.3 Trade" and "2.6.4 Strategic Export Commodities", this study classified commodity classification into 30 types as shown in Table 2.6.2. This classification will be used for the analysis of transport surveys and transport demand forecast.

Table 2.6.2 Commodity Classification

No.	Commodity Type	HS Code	Note
1	Meats	02	
2	Crustaceans	0306	
3	Fish and Aquatic Invertebrates	03	excl. HS0306
4	Animal and Animal Products	01,04-05	
5	Live Trees and Flowers	06	
6	Banana	0803	

No.	Commodity Type	HS Code	Note
7	Pineapple	080430	
8	Coffee	0901	
9	Cardamom	0908	
10	Cereals	10	
11	Cereal Flours	1101-1102	
12	Palm oil	1511	
13	Vegetable Products	07-15	excl. HS0803, 080430,0901, 0908, 10, 1101,1102 and 1511
14	Sugar	17	
15	Food Preparations	16, 18-24	
16	Mineral Fuels	2710	
17	Mineral Products	25-27	excl. HS2710
18	Pharmaceutical Products	30	
19	Chemicals and Allied Industries	28-38	excl. HS30
20	Plastics and Rubbers	39-40	
21	Raw Hides, Skins, Leather, and Furs	41-43	
22	Wood & Wood Products	44-49	
23	Textiles	50-67	
24	Article of Stone and Glass	68-70	
25	Precious Stones	71	
26	Metals	72-83	
27	Machinery, Electrical and Precisions	84-85, 90-92	excl. HS9018-9022
28	Transportation Products	86-89	
29	Medical Products	9018-9022	
30	Others	93-99	

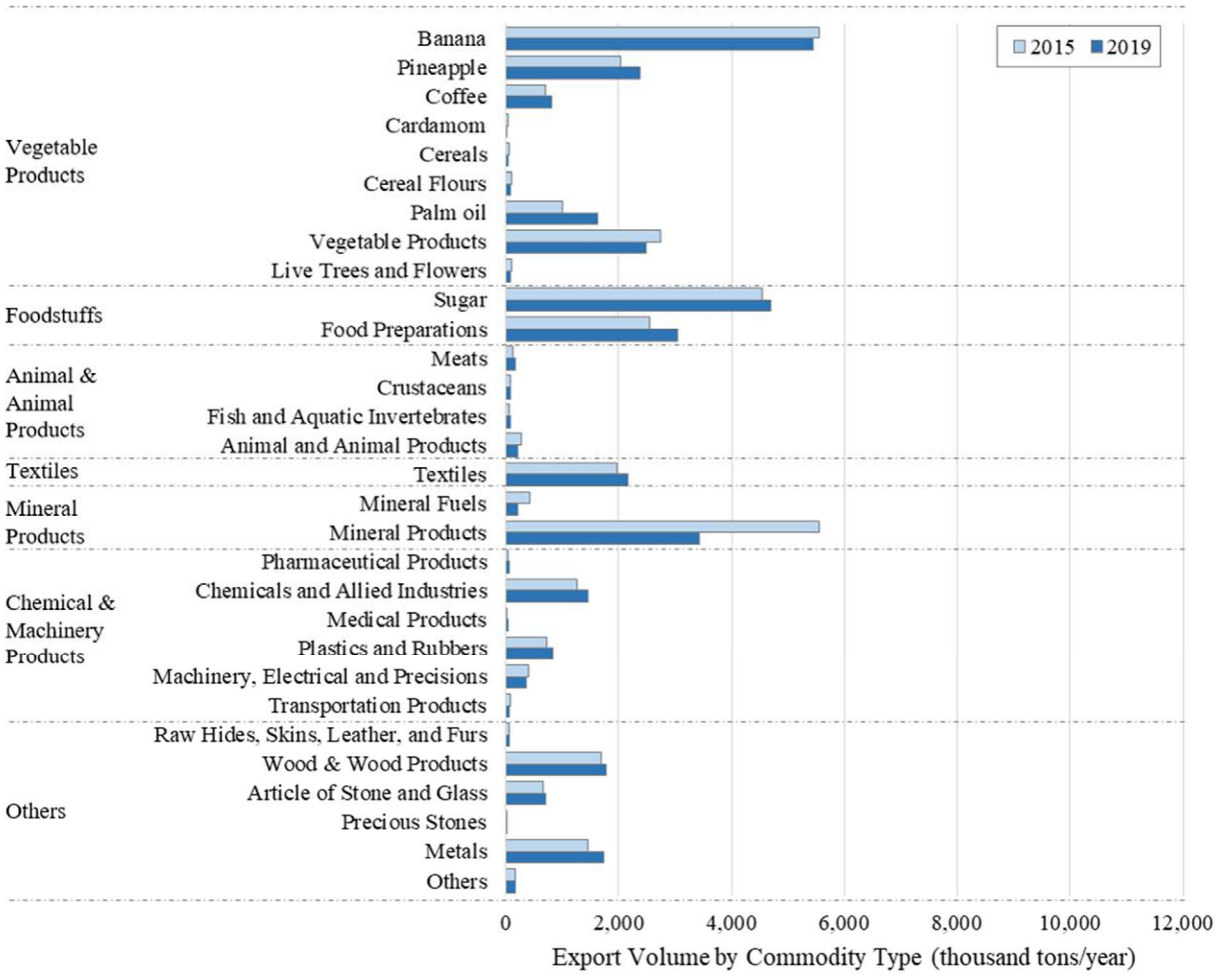
Source: JST

(2) Trends in Export in Central America

a) Export Volume

Figure 2.6.3 and Table 2.6.3 summarized the changes of total export volumes in the Region. As for export commodities in ton base, the major export commodities in the Region are traditional agricultural products such as bananas (15.9%) and sugar (13.7%), and mineral products (10.0%).

The export volume of bananas, a traditional agricultrual export product from Guatemala and Costa Rica,keeps large share when comparing 2015 and 2019. The sugar, traditionaly produced and exported from El Salvador, keeps a large share as well. The share of mineral products has declined from 16.1% in 2015 to 10.0% in 2019, due to the reduction of mineral production in Guatemala. The pineapples, one of the major traditional agricultural product produced in Costa Rica, has grown its export volume by 3.5 % of AAGR from 2015 to 2019.Also, one of the trends in the export volume is that export of value-added products are increasing. The food preparations, such as nuts, processed vegetables or fruit products, the product which the Region is strategically encouraging for export, increased the export volume by 3.8% of AAGR from 2015 to 2019, recording 8.9% of share in 2019.



Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.3 Change of Total Export Volumes in the Region by Commodity

Table 2.6.3 Change of Total Export Volume in the Region by Commodity

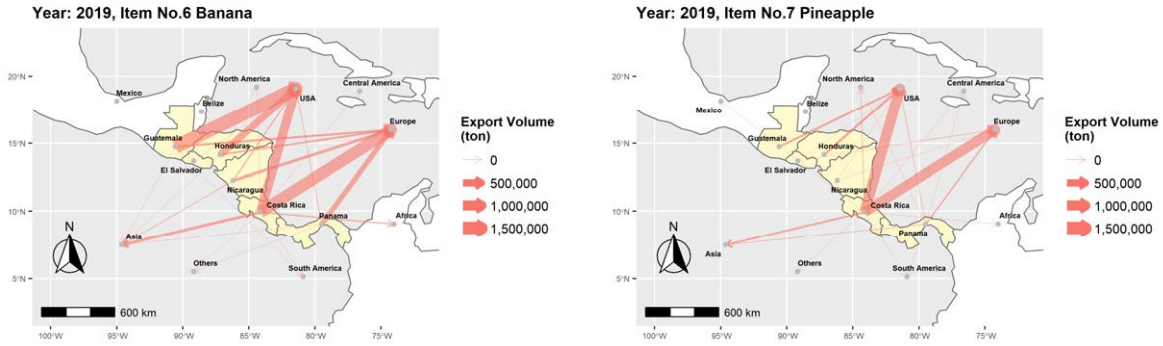
Broad Commodity Cetegory	Commodity Type	Export Volume (thousand tons/year)			Share	
		2015	2019	AAGR (%)	2015	2019
Vegetable Products	**Banana**	**5,553**	**5,448**	**-0.40%**	**16.10%**	**15.90%**
	Pineapple	**2,029**	**2,381**	**3.50%**	**5.90%**	**6.90%**
	Coffee	700	810	3.10%	2.00%	2.40%
	Cardamom	34	21	-7.70%	0.10%	0.10%
	Cereals	64	38	-8.00%	0.20%	0.10%
	Cereal Flours	95	87	-1.80%	0.30%	0.30%
	Palm oil	995	1,619	12.50%	2.90%	4.70%
	Vegetable Products	2,734	2,478	-1.90%	7.90%	7.20%
	Live Trees and Flowers	106	90	-3.00%	0.30%	0.30%
Foodstuffs	**Sugar**	**4,544**	**4,704**	**0.70%**	**13.20%**	**13.70%**
	Food Preparations	2,559	3,041	3.80%	7.40%	8.90%

Broad Commodity Cetegory	Commodity Type	Export Volume (thousand tons/year)			Share	
		2015	2019	AAGR (%)	2015	2019
Animal and Animal Products	Meats	136	176	5.90%	0.40%	0.50%
	Crustaceans	84	93	2.30%	0.20%	0.30%
	Fish and Aquatic Invertebrates	65	80	4.50%	0.20%	0.20%
	Animal and Animal Products	266	220	-3.50%	0.80%	0.60%
Textiles	Textiles	1,964	2,163	2.00%	5.70%	6.30%
Mineral Products	Mineral Fuels	427	212	-10.10%	1.20%	0.60%
	Mineral Products	**5,560**	**3,428**	**-7.70%**	**16.10%**	**10.00%**
Chemical and Machinery Products	Pharmaceutical Products	49	56	2.90%	0.10%	0.20%
	Chemicals and Allied Industries	1,256	1,447	3.00%	3.60%	4.20%
	Medical Products	28	39	7.90%	0.10%	0.10%
	Plastics and Rubbers	734	835	2.80%	2.10%	2.40%
	Machinery, Electrical and Precisions	408	370	-1.80%	1.20%	1.10%
	Transportation Products	75	62	-3.60%	0.20%	0.20%
Others	Raw Hides, Skins, Leather, and Furs	68	60	-2.20%	0.20%	0.20%
	Wood & Wood Products	1,693	1,769	0.90%	4.90%	5.20%
	Article of Stone and Glass	663	712	1.50%	1.90%	2.10%
	Precious Stones	4	6	7.20%	0.00%	0.00%
	Metals	1,466	1,732	3.60%	4.20%	5.00%
	Others	166	168	0.20%	0.50%	0.50%
Total		34,527	34,348	-0.1%	100.0%	100.0%

Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

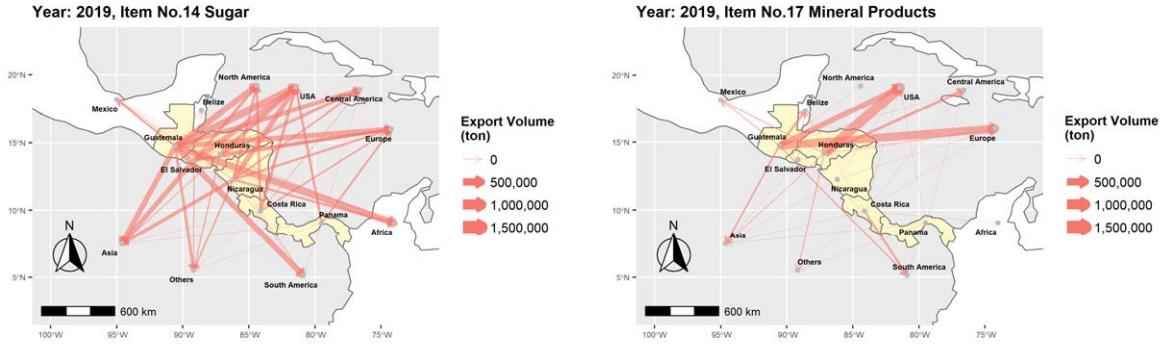
The following figures show the trade flow in volume for major traditional export commodities and strategic export commodities in 2019 (Bananas, Pineapples, Sugar, Mineral Products and Food Preparations). These products are mainly exported to the consuming regions such as the USA and the EU. The bananas are produced mainly in Costa Rica and Guatemala, which are exported to the USA and the EU. Like bananas, the pineapples are produced in Costa Rica and exported to the USA and the EU. The sugar is produced in El Salvador and Guatemala, and exported mainly to the USA and Asia. The mineral product such as silver, zinc, and lead, produced in Honduras and Guatemala has the third share in the export commoditiy of Central America. They are mainly exported to the USA.

The food preparations, such as nuts, processed vegetables or fruit products, are mainly produced in Guatemala and Costa Rica and exported to the USA and the EU.



Note: The intra-regional trade is not included
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.4 Trade Flow in Volume for Banana and Pineapple in 2019



Note: The intra-regional trade is not included
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.5 Trade Flow in Volume for Sugar and Mineral Products in 2019



Note: The intra-regional trade is not included
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.6 Trade Flow in Volume for Foold Preparations in 2019

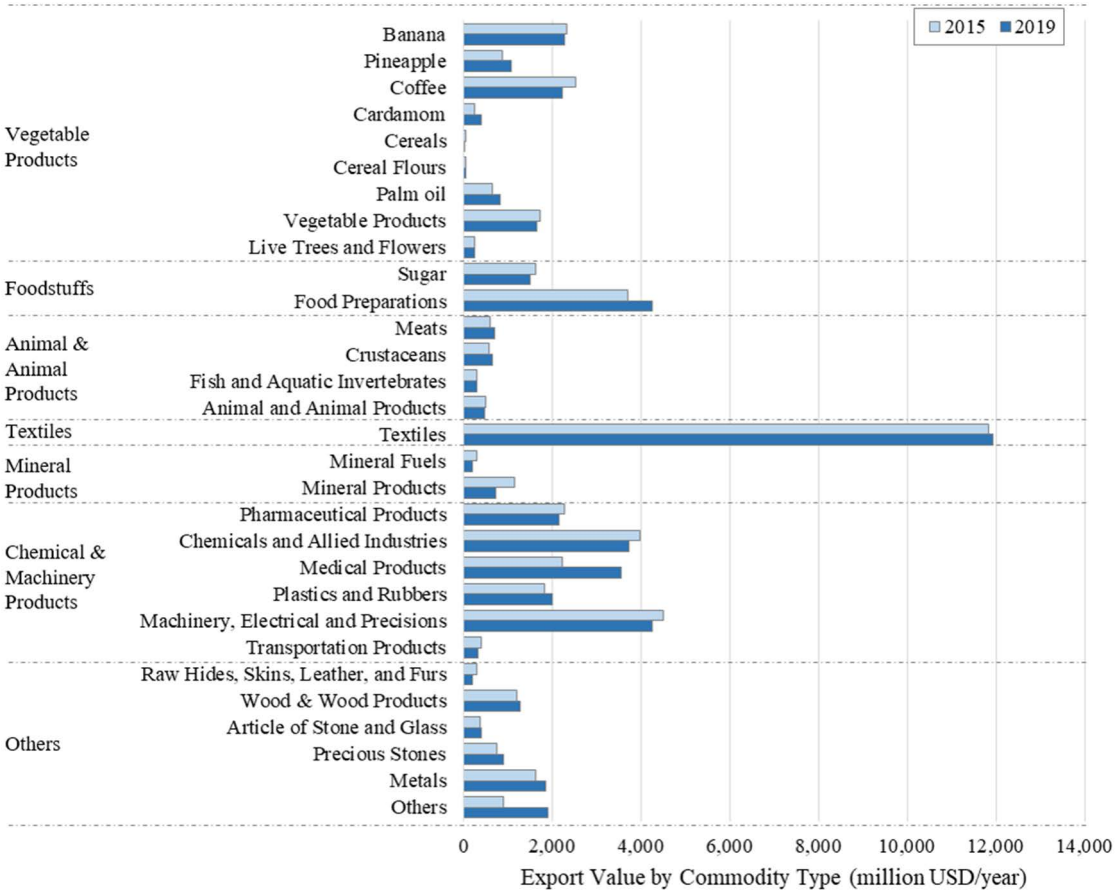
b) Export Value

In terms of export commodities in value (USD), the major export commodities are textiles (23.0%), food preparation (8.2%) and machinery/electrical precision (8.2%) as shown in Figure 2.6.7 and

Table 2.6.4.

The share of traditional agircultural products, namely, bananas, coffee and sugar, slightly decreased from 13.1% in 2015 to 11.6% in 2019. On the other hand, the exported value of strategic products, such as value-added agricultural products, and medical products has increased its volume and share.

The exported value of food preparations produced in Guatemala, Nicaragua, and Costa Rica, in 2019 has increased by 15% compared with 2015. Also, the medical products, which Costa Rica has been actively promoting for foreign investment, has increased its share in export items from 4.5% in 2015 to 6.8% in 2019, becoming 5th major export commodity in Central America on a value basis.



Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

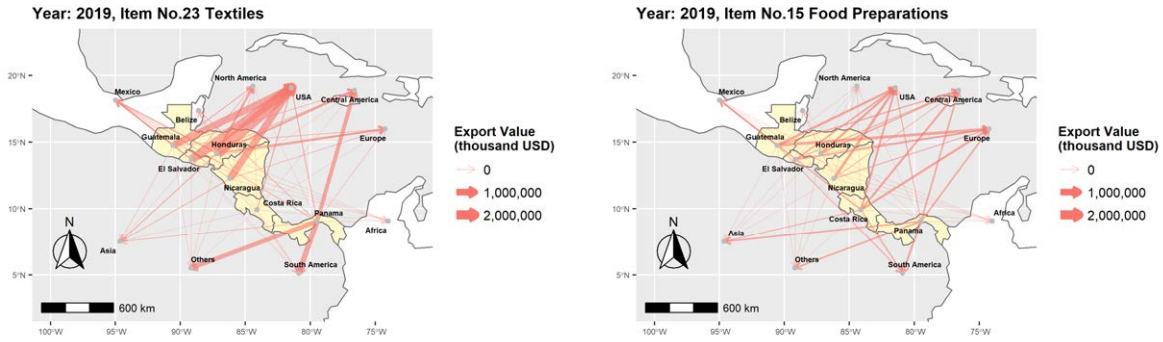
Figure 2.6.7 Change of Total Export Value in the Region by Commodity

Table 2.6.4 Change of Total Export Value in the Region by Commodity

Broad Commodity Cetegory	Commodity Type	Export Value (million USD/year)			Share	
		2015	2019	AAGR (%)	2015	2019
Vegetable Products	Banana	2,312	2,271	-0.40%	4.70%	4.40%
	Pineapple	876	1,063	4.30%	1.80%	2.00%
	Coffee	2,533	2,222	-2.50%	5.10%	4.30%
	Cardamom	246	409	13.30%	0.50%	0.80%
	Cereals	43	17	-12.20%	0.10%	0.00%
	Cereal Flours	49	38	-4.80%	0.10%	0.10%
	Palm oil	644	831	5.80%	1.30%	1.60%
	Vegetable Products	1,711	1,660	-0.60%	3.40%	3.20%
	Live Trees and Flowers	254	247	-0.60%	0.50%	0.50%
Foodstuffs	Sugar	1,624	1,492	-1.60%	3.30%	2.90%
	Food Preparations	**3,710**	**4,253**	**2.90%**	**7.50%**	**8.20%**
Animal and Animal Products	Meats	604	708	3.40%	1.20%	1.40%
	Crustaceans	584	638	1.80%	1.20%	1.20%
	Fish and Aquatic Invertebrates	291	291	0.00%	0.60%	0.60%
	Animal and Animal Products	502	466	-1.40%	1.00%	0.90%
Textiles	**Textiles**	**11,847**	**11,927**	**0.10%**	**23.90%**	**23.00%**
Mineral Products	Mineral Fuels	289	189	-6.90%	0.60%	0.40%
	Mineral Products	1,156	726	-7.40%	2.30%	1.40%
Chemical and Machinery Products	Pharmaceutical Products	2,266	2,151	-1.00%	4.60%	4.10%
	Chemicals and Allied Industries	3,988	3,717	-1.40%	8.00%	7.20%
	Medical Products	2,212	3,554	12.10%	4.50%	6.80%
	Plastics and Rubbers	1,835	1,993	1.70%	3.70%	3.80%
	Machinery, Electrical and Precisions	**4,511**	**4,246**	**-1.20%**	**9.10%**	**8.20%**
	Transportation Products	400	321	-3.90%	0.80%	0.60%
Others	Raw Hides, Skins, Leather, and Furs	289	208	-5.60%	0.60%	0.40%
	Wood & Wood Products	1,192	1,269	1.30%	2.40%	2.40%
	Article of Stone and Glass	374	393	1.00%	0.80%	0.80%
	Precious Stones	759	903	3.80%	1.50%	1.70%
	Metals	1,623	1,851	2.80%	3.30%	3.60%
	Others	891	1,894	22.50%	1.80%	3.60%
Total		49,616	51,945	0.9%	100.0%	100.0%

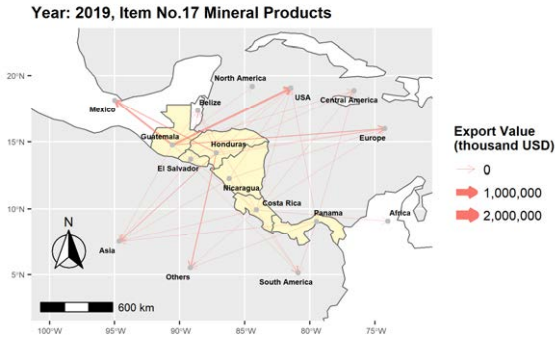
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

The follwing figures show the trade flow in value for textiles and food preparations in 2019. The textiles are mainly produced in maquilas situated in Honduras, El Salvador and Nicargua, and they are exported to the USA. The food preparations, such as nuts, processed vegetable or fruit products, areproduced in Guatemala, Costa Rica, and Nicaragua, which are exported to the USA and the EU.



Note: The intra-regional trade is not included
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.8 Trade Flow in Value for Textiles and Food Preparations in 2019



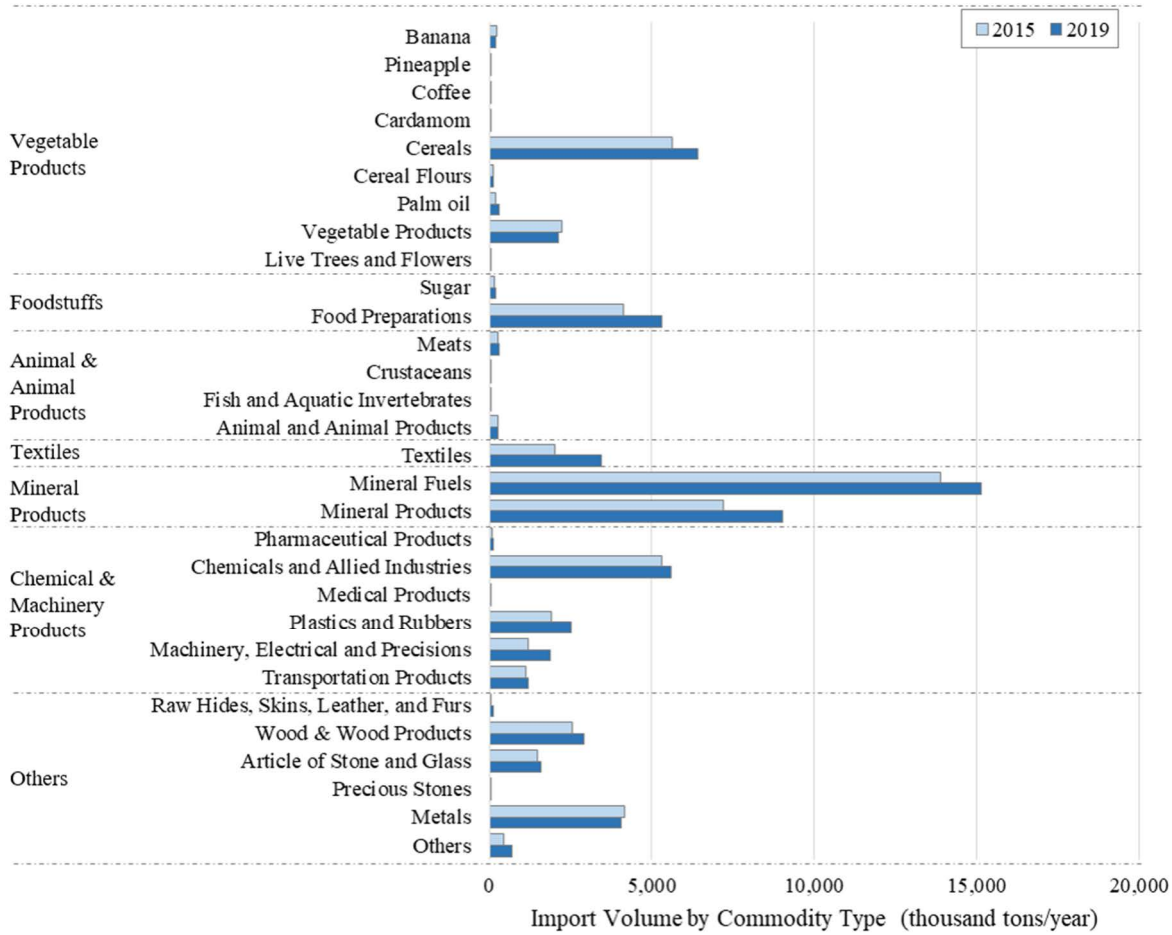
Note: The intra-regional trade is not included
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.9 Trade Flow in Value for Machinery, Electrical and Precisions in 2019

(3) Trends in Import in Central America

a) Import Volume

As for import commodities in ton base, the major import commodities in the Region are raw materials such as mineral fuels (23.8%), mineral product (14.2%), and cereals (10.1%) as shown in Figure 2.6.10 and Table 2.6.5. The import volume of the above mentioned raw materials are increasing with AAGR of 1.8% for mineral fuels, 5.1% for mineral products, and 2.8% for cereals, when comparing the import volume with 2015 and 2019.



Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.10 Change of Total Import Volume in the Region by Commodity

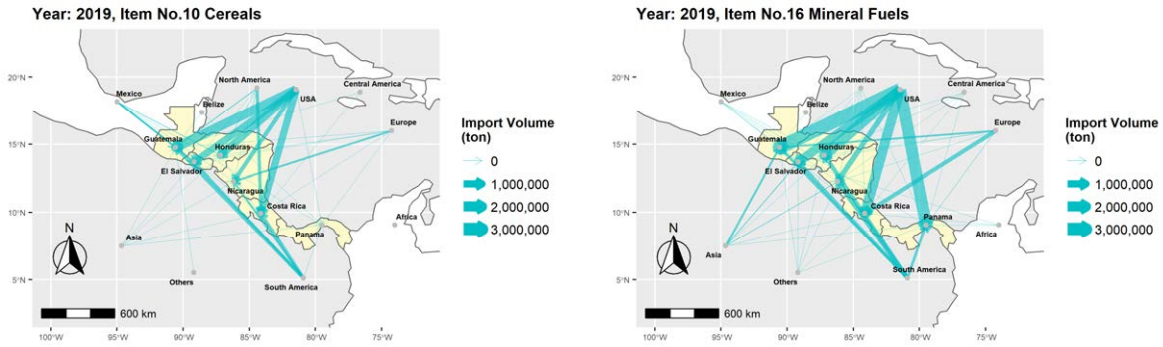
Table 2.6.5 Change of Total Import Volume in the Region by Commodity

Broad Commodity Cetegory	Commodity Type	Import Volume (thousand tons/year)			Share	
		2015	2019	AAGR (%)	2015	2019
Vegetable Products	Banana	234	204	-2.60%	0.40%	0.30%
	Pineapple	38	32	-3.20%	0.10%	0.00%
	Coffee	12	20	14.40%	0.00%	0.00%
	Cardamom	0	1	23.60%	0.00%	0.00%
	Cereals	**5,633**	**6,409**	**2.80%**	**10.30%**	**10.10%**
	Cereal Flours	135	130	-0.80%	0.20%	0.20%
	Palm oil	200	300	10.10%	0.40%	0.50%
	Vegetable Products	2,218	2,132	-0.80%	4.00%	3.30%
	Live Trees and Flowers	12	13	1.30%	0.00%	0.00%
Foodstuffs	Sugar	161	208	5.80%	0.30%	0.30%
	Food Preparations	4,125	5,302	5.70%	7.50%	8.30%

Broad Commodity Cetegory	Commodity Type	Import Volume (thousand tons/year)			Share	
		2015	2019	AAGR (%)	2015	2019
Animal and Animal Products	Meats	268	286	1.30%	0.50%	0.40%
	Crustaceans	13	12	-1.30%	0.00%	0.00%
	Fish and Aquatic Invertebrates	57	54	-0.90%	0.10%	0.10%
	Animal and Animal Products	269	250	-1.50%	0.50%	0.40%
Textiles	Textiles	2,003	3,452	14.50%	3.70%	5.40%
Mineral Products	**Mineral Fuels**	**13,889**	**15,147**	**1.80%**	**25.30%**	**23.80%**
	Mineral Products	**7,216**	**9,039**	**5.10%**	**13.20%**	**14.20%**
Chemical and Machinery Products	Pharmaceutical Products	99	116	3.40%	0.20%	0.20%
	Chemicals and Allied Industries	5,310	5,584	1.00%	9.70%	8.80%
	Medical Products	22	34	11.30%	0.00%	0.10%
	Plastics and Rubbers	1,917	2,515	6.20%	3.50%	3.90%
	Machinery, Electrical and Precisions	1,184	1,863	11.50%	2.20%	2.90%
	Transportation Products	1,132	1,210	1.40%	2.10%	1.90%
Others	Raw Hides, Skins, Leather, and Furs	55	130	27.20%	0.10%	0.20%
	Wood & Wood Products	2,554	2,901	2.70%	4.70%	4.60%
	Article of Stone and Glass	1,475	1,596	1.60%	2.70%	2.50%
	Precious Stones	8	29	51.00%	0.00%	0.00%
	Metals	4,169	4,059	-0.50%	7.60%	6.40%
	Others	425	699	12.90%	0.80%	1.10%
Total		54,833	63,726	3.2%	100.0%	100.0%

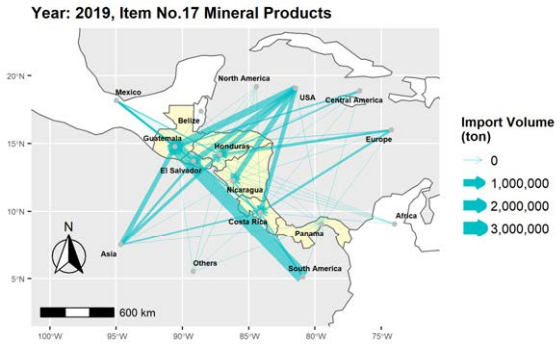
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

The below figures show the trade flow in volume for cereals, mineral fuels, and mineral products.The charachteristic of the main import commodities in volume basis is that they rely on the imports from the USA. The mineral product is imported from South America as well.



Note: The intra-regional trade is not included
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.11 Trade Flow in Volume for Cereals and Mineral Fuels in 2019



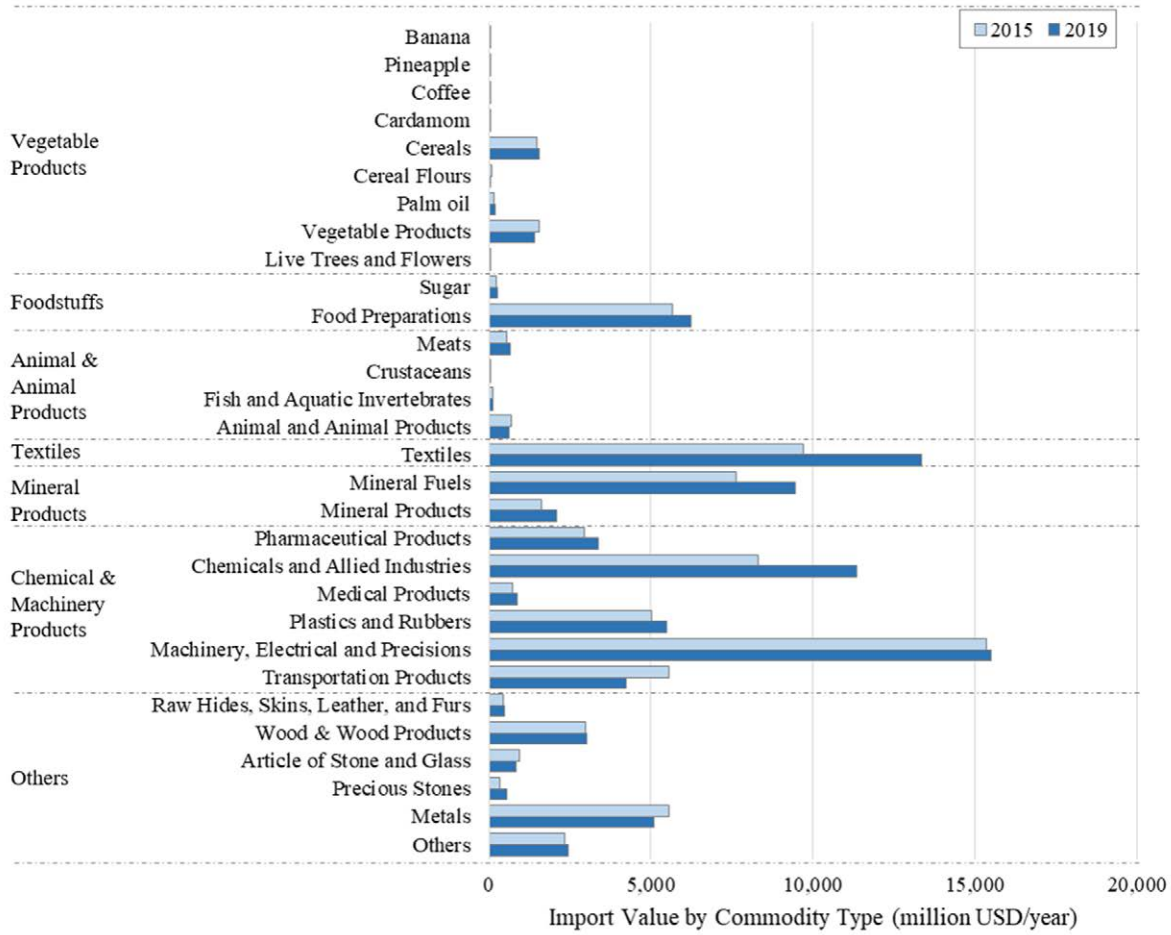
Note: The intra-regional trade is not included
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.12 Trade Flow in Volume for Mineral Products in 2019

b) Import Value

Figure 2.6.13 and Table 2.6.6 summarized the changes of total import values in the Region. The main import commodities are machinery/electrical precisions (17.4%), textiles (14.9%), and the chemicals and allied industries products (12.7%). The imported value of textiles and chemicals and allied industries product is increasing by 7.5% of AAGR for textiles, and 7.3% of AAGR for chemicals and allied industries.

It should be noted that imported textiles are mainly clothing fibers and other raw materials used for apparel industries. They are processed to the final product of clothing in maquila located in the Region, and then exported to the consuming countries such as North America.



Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.13 Change of Total Imports Value in the Region by Commodity

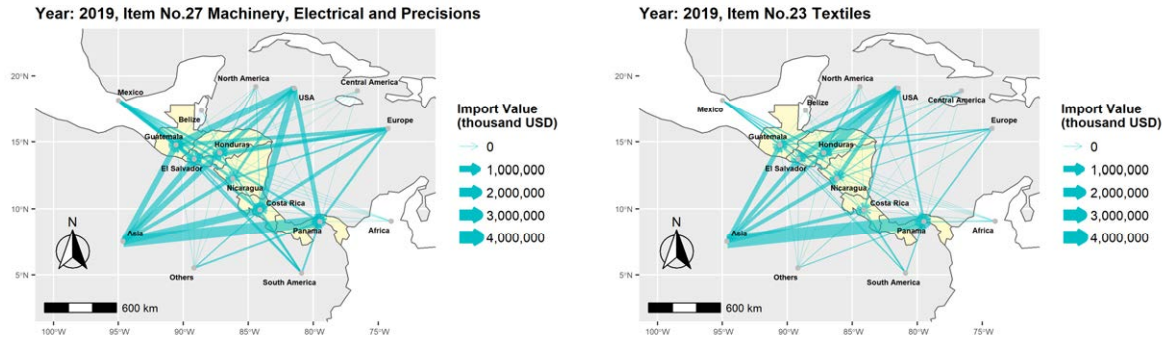
Table 2.6.6 Change of Total Imports Value in the Region by Commodity

Broad Commodity Category	Commodity Type	Import Value (million USD/year)			Share	
		2015	2019	AAGR (%)	2015	2019
Vegetable Products	Banana	22	36	12.70%	0.00%	0.00%
	Pineapple	7	7	1.40%	0.00%	0.00%
	Coffee	27	32	3.60%	0.00%	0.00%
	Cardamom	1	2	32.30%	0.00%	0.00%
	Cereals	1,481	1,538	0.80%	1.80%	1.70%
	Cereal Flours	74	58	-4.30%	0.10%	0.10%
	Palm oil	171	196	2.90%	0.20%	0.20%
	Vegetable Products	1,559	1,423	-1.70%	1.90%	1.60%
	Live Trees and Flowers	31	26	-3.20%	0.00%	0.00%
Foodstuffs	Sugar	220	252	3.00%	0.30%	0.30%
	Food Preparations	5,662	6,243	2.10%	7.10%	7.00%

Broad Commodity Category	Commodity Type	Import Value (million USD/year)			Share	
		2015	2019	AAGR (%)	2015	2019
Animal and Animal Products	Meats	557	640	3.00%	0.70%	0.70%
	Crustaceans	60	44	-5.40%	0.10%	0.00%
	Fish and Aquatic Invertebrates	128	123	-0.70%	0.20%	0.10%
	Animal and Animal Products	688	618	-2.00%	0.90%	0.70%
Textiles	**Textiles**	**9,702**	**13,357**	**7.50%**	**12.10%**	**14.90%**
Mineral Products	Mineral Fuels	7,629	9,469	4.80%	9.50%	10.60%
	Mineral Products	1,622	2,090	5.80%	2.00%	2.30%
Chemical and Machinery Products	Pharmaceutical Products	2,937	3,357	2.90%	3.70%	3.80%
	Chemicals and Allied Industries	**8,311**	**11,343**	**7.30%**	**10.40%**	**12.70%**
	Medical Products	729	884	4.20%	0.90%	1.00%
	Plastics and Rubbers	5,007	5,469	1.80%	6.30%	6.10%
	Machinery, Electrical and Precisions	**15,361**	**15,512**	**0.20%**	**19.20%**	**17.40%**
	Transportation Products	5,541	4,221	-4.80%	6.90%	4.70%
Others	Raw Hides, Skins, Leather, and Furs	425	486	2.80%	0.50%	0.50%
	Wood & Wood Products	2,982	3,027	0.30%	3.70%	3.40%
	Article of Stone and Glass	925	850	-1.60%	1.20%	1.00%
	Precious Stones	334	537	12.10%	0.40%	0.60%
	Metals	5,557	5,094	-1.70%	6.90%	5.70%
	Others	2,340	2,454	1.00%	2.90%	2.70%
Total		80,088	89,390	2.3%	100.0%	100.0%

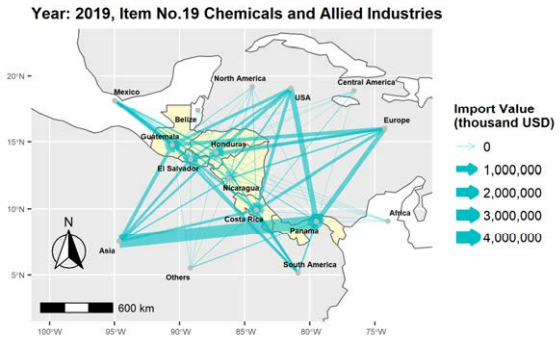
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

The following figures show the trade flow in value for major import commodities (machinery/electrical precisions, textiles, and chemicals and allied industries). The machinery/electrical precisions are mainly imported from the USA and Asia to Guatemala, Costa Rica and Panama, the textiles are mainly imported from the USA and Asia. The chemicals and allied industries products are imported from the USA, the EU, and Asia.



Note: The intra-regional trade is not included
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.14 Trade Flow in Value for Machinery, Electrical and Precisions and Textiles in 2019



Note: The intra-regional trade is not included

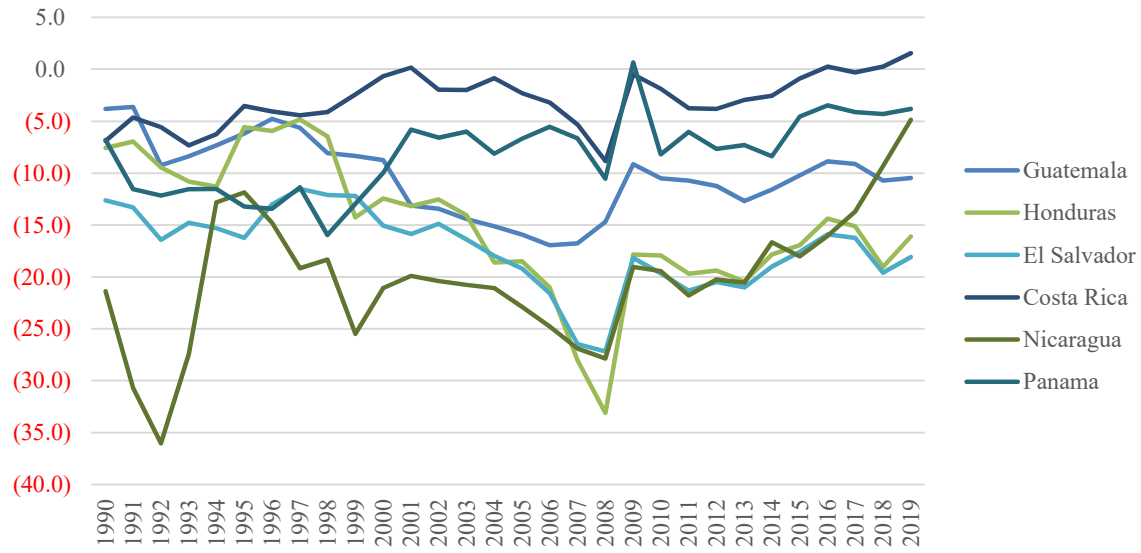
Source: The figures are based on aggregation of UN Comtrade, SEC, and data from central bank of Honduras and INEC

Figure 2.6.15 Trade Flow in Value for Chemicals and Allied Industries in 2019

2.6.3 Trade

(1) Overall

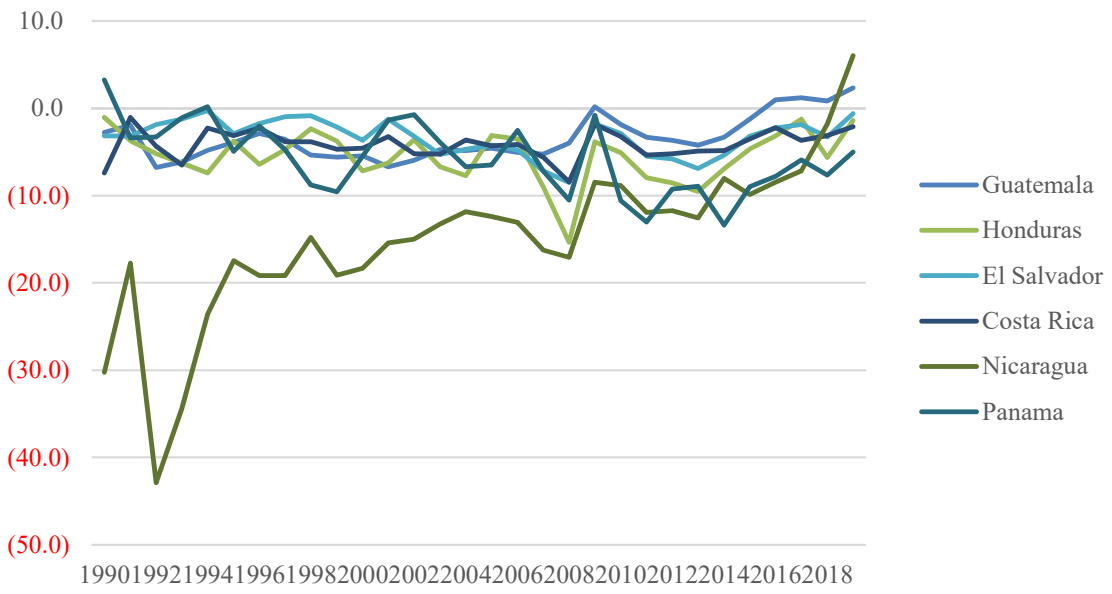
Throughout the region, the trade balance has been in deficit, except for Costa Rica which achieved positive value in 2016, 2018 and 2019 (1.6% of GDP). In 2019, the largest negative value was recorded in El Salvador with 18.0% of GDP (See Figure 2.6.16).



Source: ECLAC

Figure 2.6.16 External Balance on Goods and Services (% of GDP)

Owing to the large volume of overseas remittance, the current account balance (% of GDP) shows positive values in some countries such as Guatemala and Nicaragua (See Figure 2.6.17).



Source: ECLAC

Figure 2.6.17 Current Account Balance (% of GDP)

(2) Guatemala

a) General

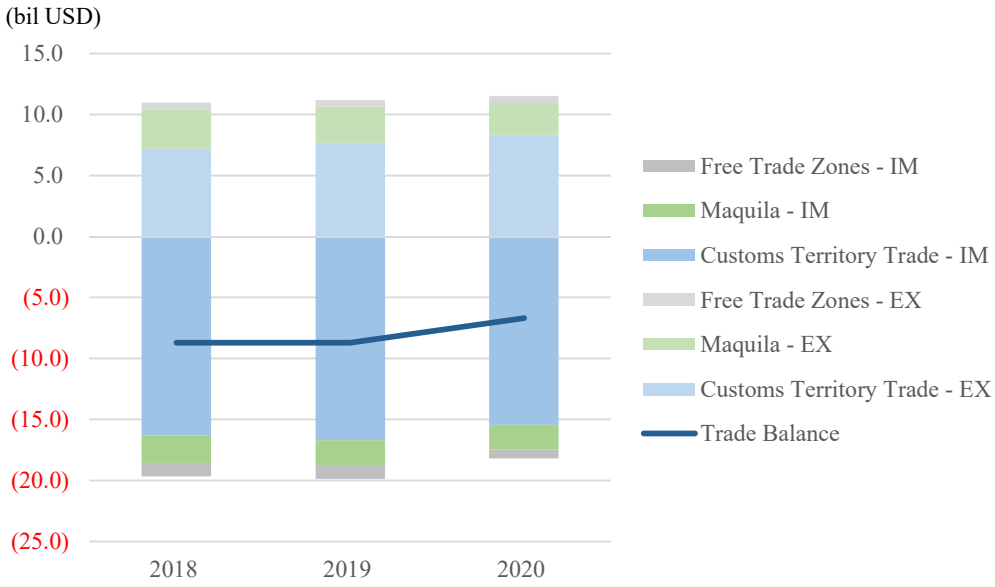
For the past 10 years, the trade deficit of Guatemala has been around 10% of GDP, lower than El Salvador and Honduras. Texiles, vegetables and gold are the main export items. It plays a role of inter-regional trade and diversifying the regional dependence on US and EU markets.

b) Trade Category

Based on the Decree 29-89 of the Congress of the Republic (Law for the Promotion and Development of Exporting and Maquila Activity ", the Decree 65-89 of the Congress of the Republic (Law of Free Zones), the three categories of trade in Guatemala are shown as follows:

a) General Trade (Trade in Customs Territory)
b) Trade in Maquila (Trade protected by the Decree 29-89 of the Congress of the Republic)
c) Trade in Free Trade Zones (FTZ) (Commerce covered by Decree 65-89 of the Congress of the Republic).

The export composition shows 72% for general trade, 23% for Maquila, 5% for FTZ, while in import, 85% for general trade, 11% for Maquila and 4% for FTZ. The trade in Maquila presents a surplus, however, general trade and Free Trade Zones show trade deficits (Figure 2.6.18).

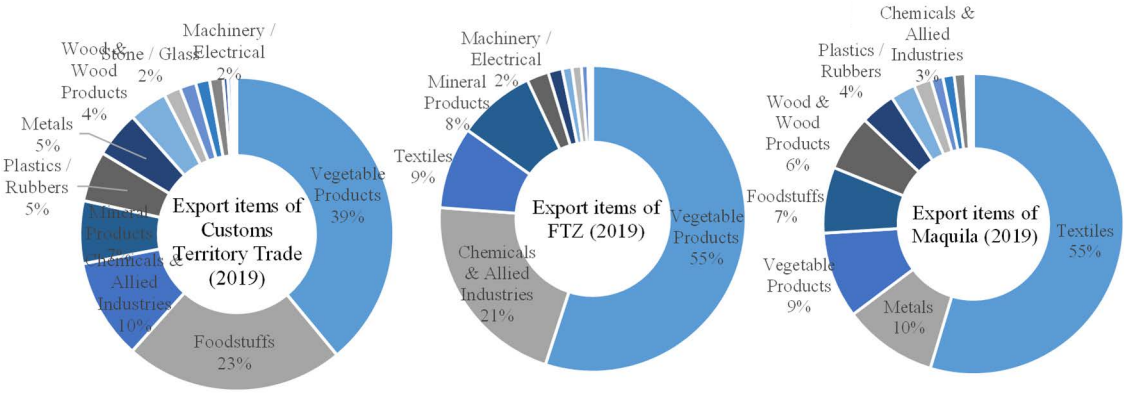


Source: Central Bank of Guatemala

Figure 2.6.18 Trade Trends in Guatemala (2018-2020)

The major export items of each category described in Figure 2.6.19 are:

- General export: vegetable products and food (62%)
- Export in Maquila: vegetable products (55%) and chemical products (21%)
- Export in FTZ: textiles (55%) and metals (10%)



Source: Central Bank of Guatemala

Figure 2.6.19 Major Trade Items in the Thee Categories

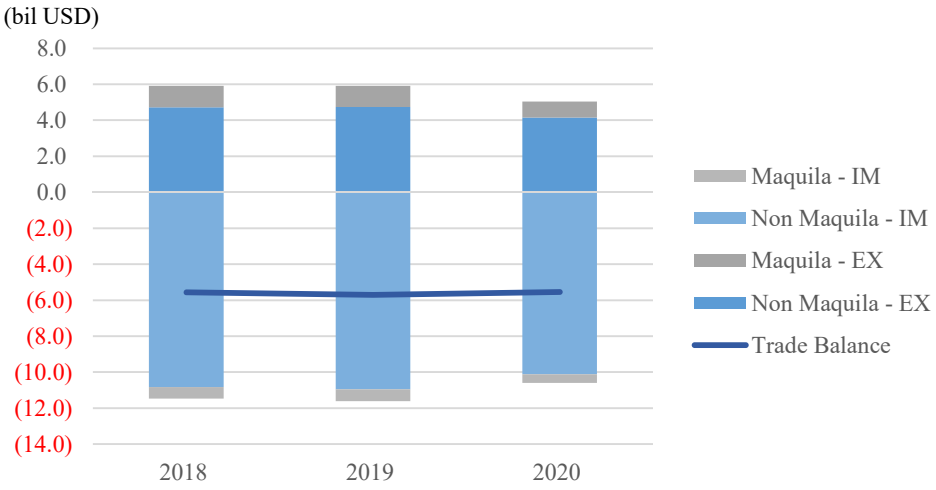
(3) El Salvador

a) General

The trade deficit in El Salvador, 18% of GDP in 2019, is the worst in the region. Textiles have been the major export items (around 40%), and diversifying the export items is essential in improving large trade deficits.

b) Trade Category

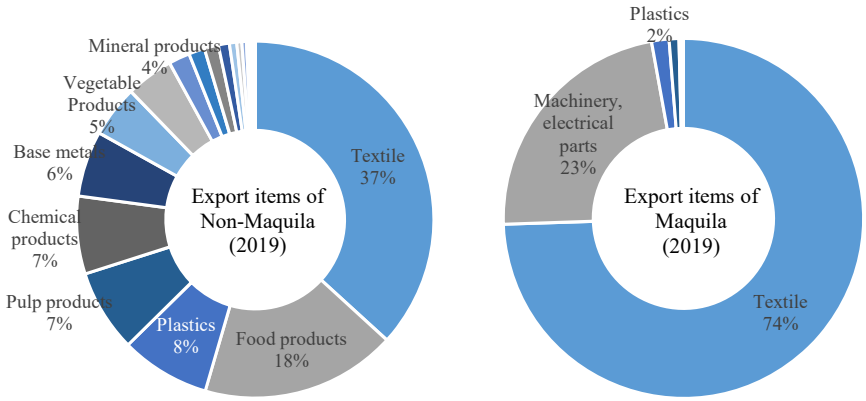
In two categories of trade in El Salvador a) Non-Maquila and b) Maquila, 80% of export is composed of Non-Maquila and 94% in import. While Maquila products show trade surplus, Non-Maquila products continue to show trade deficits (See Figure 2.6.20).



Source: Central Bank of El Salvador

Figure 2.6.20 Trade Trends in El Salvador

The major export items of both Non-Maquila and Maquila are textiles (37% and 74% respectively). Other than texiles, food products (18%) and plastics (8%) are exported from Non-Maquila, and machinery, electrical parts (23%) and plastics (2%) are exported from Maquila (See Figure 2.6.21).



Source: Central Bank of El Salvador

Figure 2.6.21 Major Trade Items in Non-Maquia and Maquila

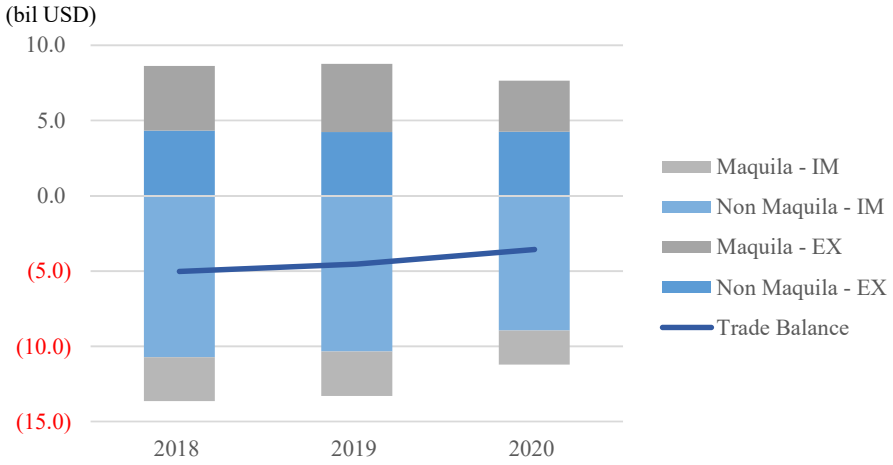
(4) Honduras

a) General

The market diversification of Honduras has been low. In the past ten years, the US has been the major export partner, at the same time, the trade deficits has been around 16% of GDP, the second worst in the region after El Salvador. Vegetable products have been the major export items, but some mid-tech products such as cable assemblies have emerged.

b) Trade Category

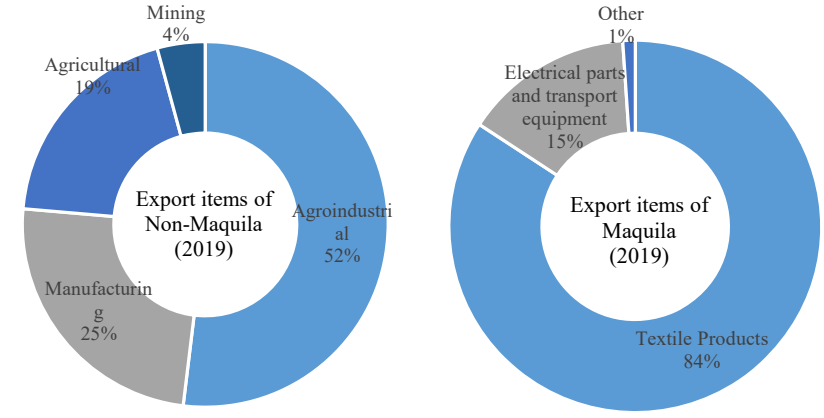
The trade in Honduras is categorized into two: a) Non-Maquila and b) Maquila. The Maquila trade composes significant values in the overall trade; about 44% of export and 20% of import. While Maquila shows trade surplus over the years, the trade balance of Non-Maquila has been in deficits (See Figure 2.6.22).



Source: Central Bank of Honduras

Figure 2.6.22 Trade Trends in Honduras

In export items, while the major export items of Non-Maquila are agroindustrial products (52%) and manufacturing products (25%), the major export items of Maquila are textile products (84%) and electrical parts and transport equipment (15%) (See Figure 2.6.23).



Source: Central Bank of Honduras

Figure 2.6.23 Major Trade Items in Non-Maquia and Maquila

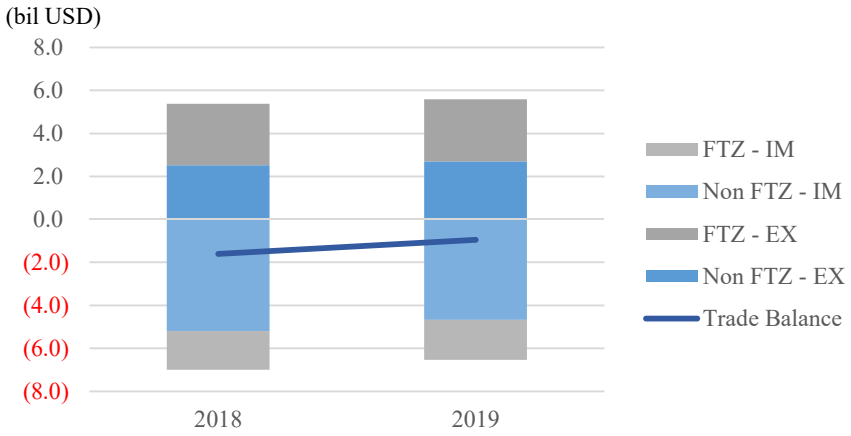
(5) Nicaragua

a) General

In recent years, the trade deficits have been improved (9% of GDP in 2018 and 5% in 2019, which used to be around 30%). While the exports are concentraded on textiles and animal and vegetable products, new products have emerged in the mid-tech sector. As for the export market, export to the US and regional trade have been dominant.

b) Trade Category

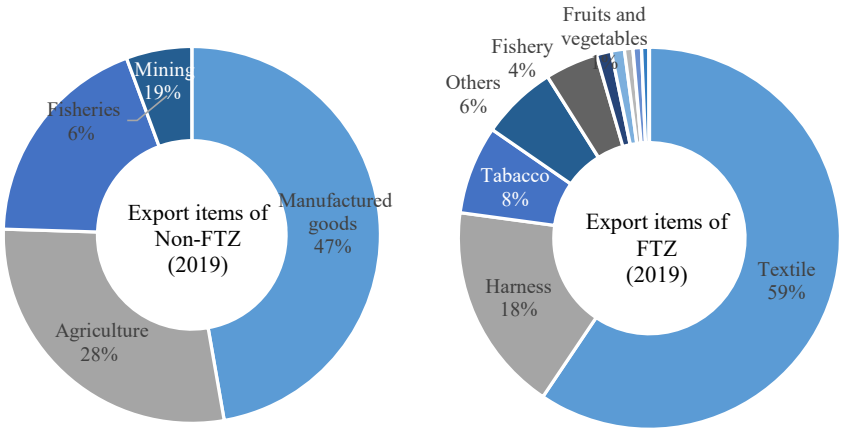
The trade in Honduras is categorized into two: a) Non-FTZ and b) FTZ. The FTZ trade composes significant values in the overall trade; about 52% of export and 28% of import. While the FTZ shows trade surplus over the years, the trade balance of Non-FTZ has been in deficits (See Figure 2.6.24).



Source: Central Bank of Nicaragua

Figure 2.6.24 Trade Trends in Nicaragua

In export items, the major export items of Non-FTZ are manufacturing goods (47%) and agriculture products (28%); the major export items of FTZ are textile products (59%) and harness (18%) (See Figure 2.6.25).



Source: Central Bank of Nicaragua

Figure 2.6.25 Major Trade Items in Non-FTZ and FTZ

(6) Costa Rica

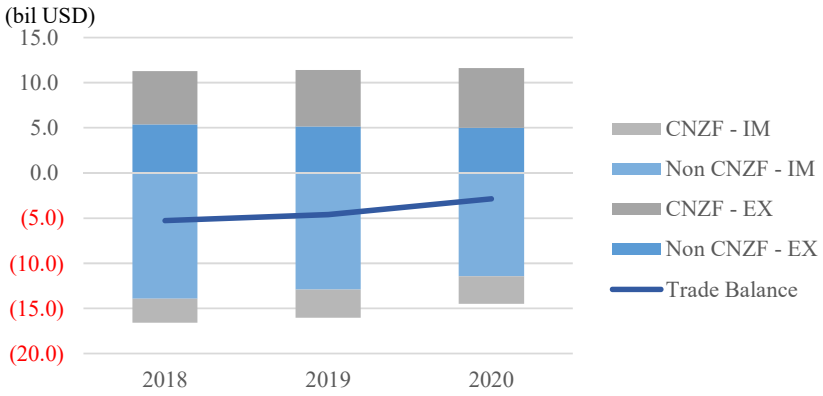
a) General

The trade balance of Costa Rica has been stable over the years compared to its neighbors. In 2016, 2018 and 2019, the trade balance has been positive, and the average trade deficits was 1.4% of GDP in the last ten years.

Although the major export products were concentrated on fruits, vegetables and textiles, they were expanded to high tech products such as integrated circuits, computer parts and medical equipment.

b) Trade Category

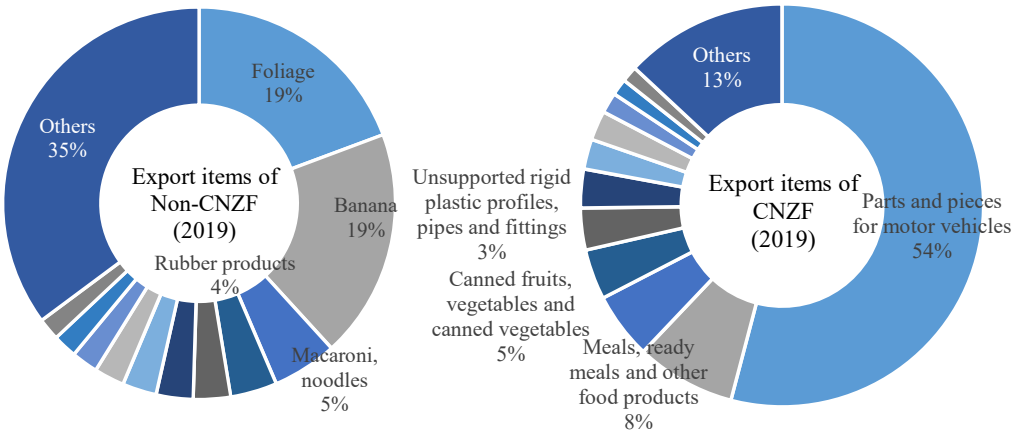
The trade in Costa Rica is categorized into two: a) Non-CNZF (National Free Trade Zone Commission) and b) CNZF. The CNZF trade composes large values in the overall trade; about 57% of export and 21% of import. While CNZF shows trade surplus over the years, the trade balance of Non-CNZF has been in deficits (See Figure 2.6.26).



Source: Central Bank of Costa Rica

Figure 2.6.26 Trade Trends in Costa Rica

In export items, while the major export items of Non-CNZF are vegetable goods (38%), the major export items of CNZF are parts for motor vehicles (54%) and food-processing products (8%) (See Figure 2.6.27).



Source: Central Bank of Nicaragua

Figure 2.6.27 Major Trade Items in Non-CNZF and CNZF

(7) Panama

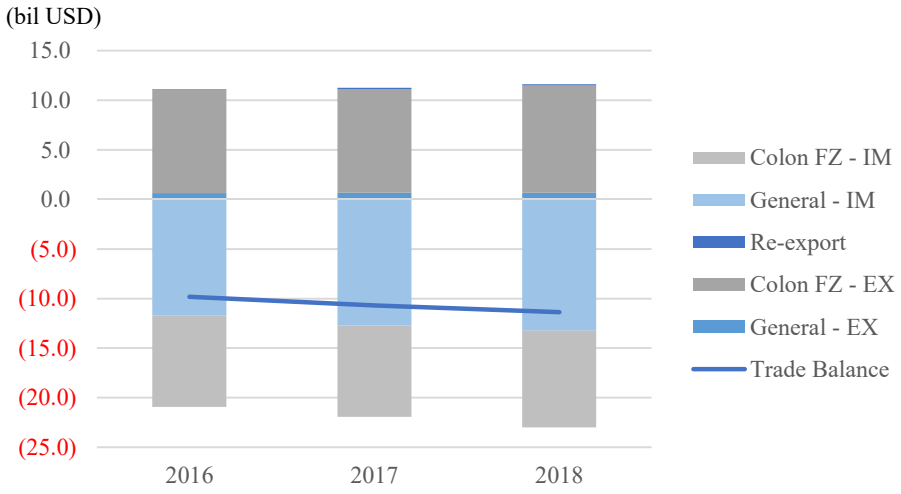
a) General

The Colon Free Trade Zone has played a major role in Panama's trade activities. While the trade balance has been in deficits with the average of 5.7% over the last ten years, it is relatively moderate in comparison with neighboring countries.

b) Trade Category

The trade in Panama is categorized into three: a) general trade, b) re-export and c) Colon FZ. The Colon

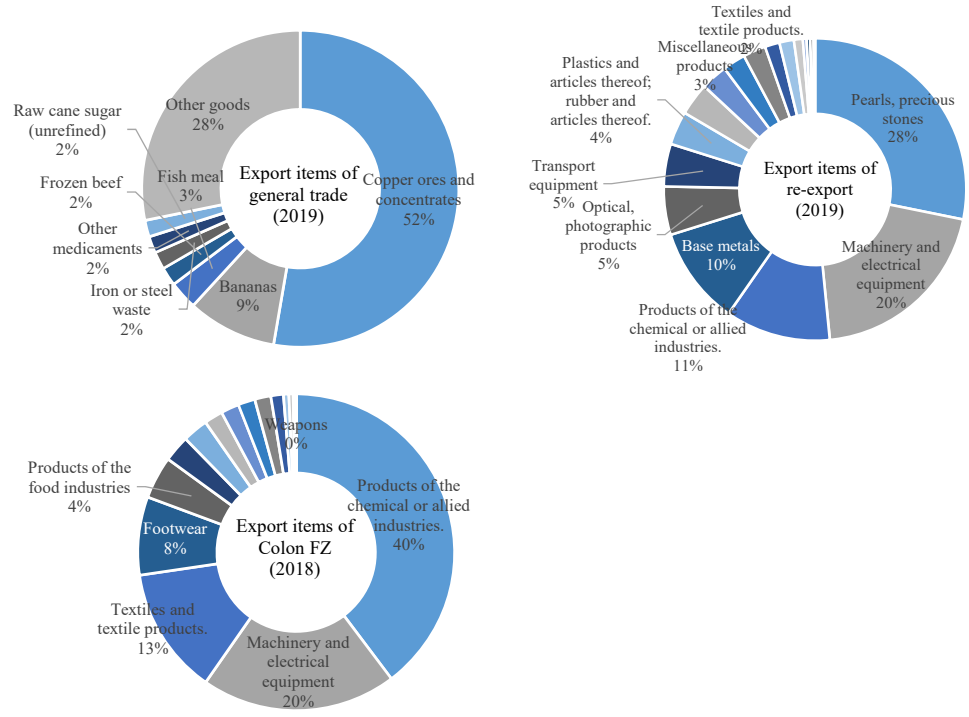
FZ trade composes large values in the overall trade; about 93% of export and 42% of import. Re-export shares only 1% of the total export. While Colon FZ shows trade surplus over the years, the trade balance of general trade has been in deficits (See Figure 2.6.28).



Source: Instituto Nacional de Estadística y Censo (INEC)

Figure 2.6.28 Trade Trends in Panama

In export items, copper ores (52%) and bananas (9%) are the major items in general trade. Pearls, precious stones (28%) and machinery and electrical equipment (20%) are the major items in re-export, and chemical products (40%) and machinery and electrical equipment (20%) are the major items in Colon FZ.



Source: Instituto Nacional de Estadística y Censo (INEC)

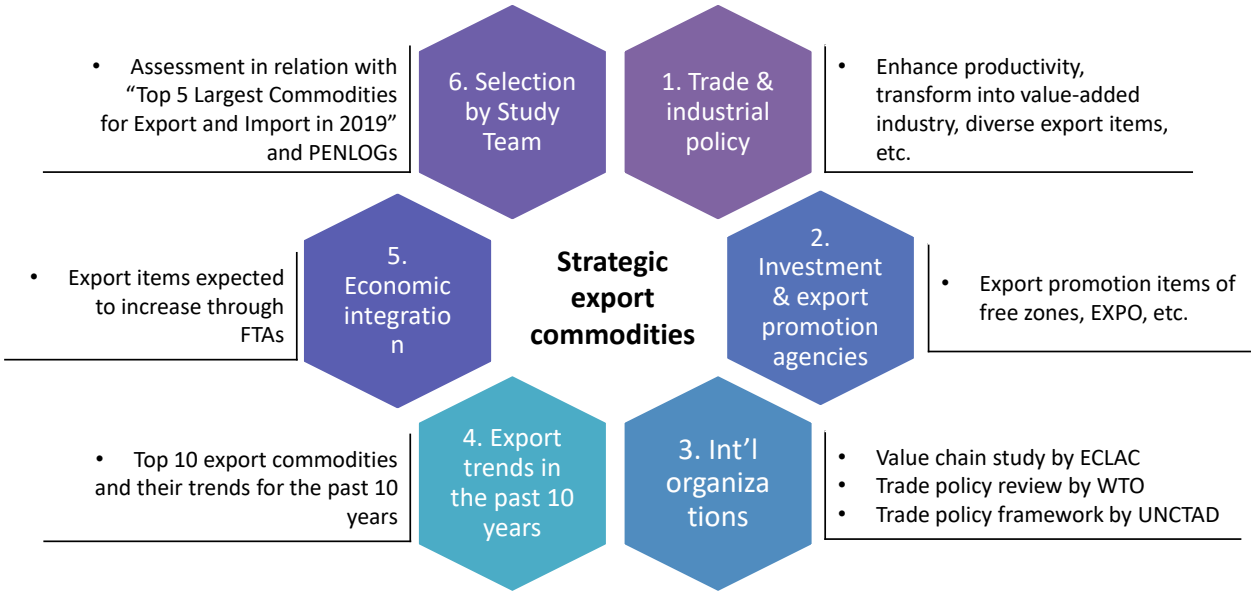
Figure 2.6.29 Major Trade Items in General Trade, Re-export and Colon FZ

2.6.4 Strategic Export Commodities

(1) Methodology of Identifying the Strategic Export Commodities

The strategic export commodities for each country were identified as key competitive strengths in the industrial framework. The six items were examined in identifying the strategic export commodities. The past trends, policy driven items and value chain perspectives were explored.

1. Trade & industrial policy
2. Investment & export promotion agencies
3. International organizations
4. Export trends in the past 10 years
5. Economic integration
6. Selection by the Study Team



Source: JST

Figure 2.6.30 Methodology of Identifying Strategic Export Items

(2) Guatemala

- Wood Products;

  The Value Chain Study by ECLAC lists wood products as an item to strengthen the forestry value chain. The export value has increased 2.4 times over the past 10 years, with a compound annual growth rate of 9.3%, and the future growth is expected.

- Non-traditional Vegetables (peas, broccoli, courgette (calabacín), green beans (ejote), baby carrot and baby corn);

  The Value Chain Study by ECLAC lists non-traditional vegetables as items to strengthen the vegetable value chain, promote employment in the local economy and promote export.

- Beverages;

  One of the key industries specified in "National Competitive Strategy". It consists of purified water, ethyl alcohol, liqueurs, sparkling beverages, fruit-based beverages and beer, and its production accounts for 1.1% of GDP and employs about 18,000 people. Over the last 10 years, export values have increased 1.8 times, with a compound annual growth rate of 6.1%.

- Textile;

  One of the key industries specified in "National Competitive Strategy". It is composed of fabrics, clothing and footwear, and the third largest export item. Export values have increased 1.3 times over the last 10 years, with a compound annual growth rate of 2.4%.

- Light Manufacturing;

  One of the key industries specified in "National Competitive Strategy". It consists of light industrial machinery, electrical and electronic parts, and transportation equipment, and employs 70,000 people. It is expected that another 56,000 jobs will be created by 2021. Over the last 10 years, export values have increased 1.8 times, with a compound annual growth rate of 6.1%.

(3) El Salvador

Important Items in Industrial Policy/Export Strategy

ITC (International Trade Center) Trade Statistics for El Salvador shows that exports from 2019 to 2010 totaled only a slight increase of 6%. The year-on-year decline of 18% in 2015 has had a major impact, and exports in 2019 have not yet recovered to 2014 levels. Among export items, apparel-related items have decreased compared to 2010 (-11%), but continue to account for more than 30%, making them important items. Agricultural products increased slightly (+ 4%) but continued at about 15%, and food and beverages increased by about 8% but increased by 46%. Plastic and paper products are the top export items (8%, 7%), and both have increased significantly by 60%. Exports of sugar and food products continue to increase, but coffee products are decreasing, although there are seasonal factors. Chemical and Pharmaceutical products have increased by about 40%, and the total amount is about 6%. Statistical details are unknown for medical services and aviation-related maintenance industries, depending on the statistical perspective. It can be confirmed from the export statistics that it reflects the priority sector of the above PNLOG.

Strategic Export Items

Policy for export industry: Based on SDG, Agenda 2030 for El Salvador, improvement of productivity, shift to high value-added industry, cost reduction, diversification of export industry, establishment of platform for agricultural products and crafts, etc. It aims to break away from the concentration on specific industrial species while promoting strategic export items.

- Aparel, Textile & Garments;

  It is the PROESA's strategic field and along with the Priority sector for El Salvador Vision 2030, the sub-sector is aiming to develop higher value-added fields such as design and marketing from mere production of apparel products. According to a Japanese apparel company interviewed in November 2019, this field is regarded as an important field though the current situation is that production and exports are not growing significantly.

- Medical Parts (Light Manufacture);

  Chain policy and diversification and also priority sector in the PROESA's strategic field. The amount of medical parts handled is not large yet, but the export value has increased by about 60% compared to 2010 (2019 results). It is expected to contribute to the smart medical city concept promoted by the Japanese Embassy in collaboration with the Government of El Salvador, San Salvador Municipality Hall, private medical institutions, and related companies.

- Chemical, Plastics & Paper;

  Second & third largest items that shows constant growth as a main export product of the light industry, also the priority sector in the PROESA's strategic field. It is necessary to improve its productivity and add more value.

- Sugars and Sugar Confectionery;

  Enhancing basic industry and also in Vision 2030. Although it is the fourth largest export record of

traditional agricultural products in 2019, the production volume is steadily increasing (In 2019, 23% increase from 2010 record). It is inevitable to improve the productivity and add more value.

- Vehicle Parts & Aeronautical Services;

  Chain policy and diversification. Develop advantage of the aero maintenance industry. In line with the supply chain construction strategy. Although the production volume of automobile parts themselves is increasing, the quantity is not so large, but the production of related products such as steel products is also increasing. The aircraft maintenance business by AEROMAN is a successful service industry, and is expected to grow as a related industry together with the Eastern Airport Development Plan.

- Fish and Crustaceans, Mollusks and other Aquatic Invertebrates;

  It is the 45th largest export item in 2019, and the export volume is only 6% higher than in 2010. However, this field has been treated as a priority item in the government's eastern development area plan and various support has been provided. In addition, although it decreased by 33% from the previous year in 2014, it increased by 219% from the previous year in 2016, showing a large increase and decrease in exports by year.

  Shrimp farming is one of the six items listed as having a comparative advantage among small-scale farm products in the eastern region in the El Salvador National Agricultural Products Value Chain Information Collection and Confirmation Survey.

  In addition, micro-fishermen in the eastern coastal areas have traditionally engaged in shellfish collection and coastal fisheries centered on ark shells and native oysters, and have established and paralleled shellfish aquaculture technology that can be disseminated to fishermen. The government is supporting the diversification of income while fostering awareness for fishermen to use shellfish resources sustainably, and has also been implemented by Japan's ODA project.

  On September 15, 2020, President Bukele announced that he would promote agricultural development as the most important area of regional development. The Agro Reactivation Project will be announced soon.

- Beverage and Edible Preparations (cereals, flour, starch or milk; pastrycooks' products);

  As an export industry policy, diversification of the export industry and establishment of a platform for agricultural products and crafts are planned, and agricultural products are a priority industry from the viewpoint of food security. In terms of exports compared to 2010, the food-related sub-sectors all showed an increase of about 30-60%. As mentioned above, with the announcement of President Bukele's agricultural development, future growth can be expected.

(4) Honduras

"2018-2022 Government Strategic Plan" and "Honduras 2020" aim to promote productivity, competitiveness and diversification of the production sector, strengthen the competitiveness of SMEs, diversify agricultural products and innovation.

- Pharmaceutical products;

  "Regulation of Organization, Functioning and Competency of the Executive Power Executive Decree No. PCM-008-97.", related to economic integration and trade policy, identifies the pharmaceutical products as strategic export item. Export values have doubled in the last decade.

- Chemical products;

  "Regulation of Organization, Functioning and Competency of the Executive Power Executive Decree No. PCM-008-97.", related to economic integration and trade policy, identifies the chemical products as strategic export item. Although the growth rate has slowed over the past 10 years, it is expected to be a growing industry in the future.

- Textile;

  One of the major industries listed in Honduras 2020, aiming to export US $7.4 billion and increase employment by 200,000 by 2020. Concluding FTA is expected to strengthen competitiveness.

- Auto parts;

  Although the growth rate has slowed over the past 10 years, auto parts are positioned as a potential industry in the government strategic plan.

- Electrical equipment;

  Although the growth rate has slowed over the past 10 years, electrical equipment are positioned as a potential industry in the government strategic plan.

(5) Nicaragua

Since it is difficult to specify a specific export promotion policy, priority items were extracted from the fields of agriculture and livestock industry, fishery, and light industry with reference to the changes by export item over the past 10 years.

- Textile & Aparel;

  Constantly enhanced to the position most contribute to export. No. 1 in terms of export value in 2019. After attracting foreign companies to the free zone, it has been constantly increasing, and when combined with related industries, it accounts for 30% of the total exports.

- Meat & Dairy Products;

  Largest export products in agriculture sector; Exports are almost flat but still the second largest industry in 2019. Considering the working population and related industries, it can be said to be the most important industry. It is considered to be the issues such as productivity improvement, efficiency improvement, and innovation.

- Tobacco and Manufactured Tobacco Substitutes;

  Important items in agro-industry. Although it ranks 8th in terms of export value, it has increased by more than 70% compared to 2012. It can be said that it is a strategic industry that ranks third in exports from the free zone.

- Natural or Cultured Pearls, Precious or Semi-precious Stones, Precious Metals;

  Second largest export items and strategic item in the PNDH. It is the second largest export value after apparel in 2019. It has increased by 23% compared to 2012. The PNDH is also regarded as a strategic product industry.

- Electric Machinery;

  Stable but priority item for the diversification of export. Although it increased slightly by 13% compared to 2012, it remains the fourth largest export value in 2019. Strategic industry that increased after the establishment of the free zone. Considering the export industry policies such as diversification of export industry items centered on non-traditional products, attraction of foreign investment, and development of overseas markets, it is considered to be an important industry.

(6) Costa Rica

- Precision, Medical Products;

  4 strategic areas for FDI, Historical statistics. The largest export item since 2015. Representative of the strategic industry as a cluster of high-tech companies formed by the activities to attract related electronic devices such as precision equipment and medical products and the CRP movement, which have been carried out since the invitation of Intel. 331% increase from 2010 (2019).

- Chemical, Pharmaceutical, Manufacturing Products;

  4 strategic areas for FDI, Historical statistics. Although the field has not increased significantly compared to 2010, the local industry cultivated through the CRP (Costa Rica Provee) policy after the invitation of Intel is considered to continue to be a strategic field.

- Pineapple, Palm oil, Food & Beverage;

  PROCOMER, MAG. In the agricultural sector, pineapples, meat and lactic acid products are growing in place of coffee and bananas, which were the mainstays. Fruits and nuts are the second largest exporters in 2019. Along with meat and dairy products, the agricultural sector continues to be an important field, especially with COMEX, CINDE, Sistema de Banca para el Desarrollo as well as MAG, which has launched a program called DESCUBRE to promote development.

- Meat and Dairy Products;

  DESCUBRE, PROCOMER, MAG. The same reason as Pineapple, palm oil, Food & Beverage above. DESCUBRE also has a project to export beef to the EU.

- Iron, Plastics;

  WTO Trade Policy Review CR 2019, FTA (Korea). Plastic products are the 5th largest export value in 2019, with an increase rate of 64% compared to 2010. In addition to coffee, sugar and beverages, exports to South Korea include medical equipment, pharmaceuticals, plastic products, and iron products, and exports can be expected to increase after the conclusion of an FTA.

- Pitahaya (Dragon fruit), Cacao Fino, Camote de Carne Naranja, Papaya;

  High value-added project proposed by DESCUBRE.

(7) Panama

- Tropical Fruits such as Mango, Papaya, Pineapple, Avocado, Coconut and Citrus;

  "Panama Strategic Government Plan 2019-2024" states that agricultural products are one of the important export items. Export values have increased 2.8 times in the last 10 years, with an annual growth rate of 10%.

- Open Blue Cobia;

  Panama Exporta, an export promotion agency, states that Open blue cobia is expected to increase exports in the future as an innovative and sustainable marine product. Experiments, tests, and facilities are needed to secure the production.

- Flowers;

  As a new industry, diversification of agricultural products is expected in the future. The introduction of new technologies and facilities has made it possible to expand the production.

- Pharmaceutical and Medical Products;

  "Panama Strategic Government Plan 2019-2024" states that Panama will become a hub for the pharmaceutical industry. It is the third largest export items and is expected to increase in the future.

- Non-metallic Mineral Products;

  "Panama Strategic Government Plan 2019-2024" states that non-metal mineral products will become an important export item due to the development of Copper Panama mine and will contribute to GDP and job creation.

2.6.5 Custom Union

(1) Potential Economic and Social Impacts of the Custom Union

Among Central American countries, the average applied tariff rate for imported goods is low (2%), however, there are several additional costs associated with the lack of infrastructure, as well as administrative barriers that hinder the potential offered by such a broad market (customs forms, phytosanitary and zoosanitary certifications, packaging requirements, and inspections in different stages of the exporting process, among others). The concern over the persistence of non-tariff barriers in intraregional commerce has been one of the focal points in the Central American integration agenda. This has as its main priorities, among others; the implementation of the Customs Union Roadmap 2015-2024, the strengthening of physical regional connectivity, and the start-up of a Central American Strategy of Trade Facilitation.

During 2016, at the request of the Central American Integration Secretariat (SIECA in Spanish), the Ministry of Economy of Guatemala and the Secretariat of Economic Development of Honduras, ECLAC evaluated the cost that would be associated with the removal of the administrative barriers previously calculated. The study considered enacting a trade facilitation plan where exclusive tariff rates were used between both countries. The negotiations concluded by implementing, in June of 2017, bi-national tariff rates in three of the main border crossings between Honduras and Guatemala. Through this, customs territories for both countries were integrated into one unique territory of a little more than 221 thousand kilometers, 52% of the total area of Central America. Customs formalities for 80% of the binational load were reduced from an average of roughly 10 hours, to less than 15 minutes (SIECA, 2018). After implementing the binational Customs Union between both countries, during the second semester of 2017, El Salvador, through its Central Bank and Minister of Finance, solicited support from ECLAC to assist in a new evaluation process. This time, the inclusion of El Salvador in the Customs Union between Guatemala and Honduras was assessed.

Trade facilitation measures are characterized by a variety of activities, such as the reduction of required administrative processing in customs, improvements in transparency, reduction in smuggling, construction of electronic systems for processing cargo, and the development of modern systems that streamline intraregional transport, such as the use of Quick Response codes (QR) that scan customs documents. In the case of the Central American Trade Facilitation Strategy (SCFC in Spanish), measures such as the automation of transit processes for merchandise, the reduction of export/import time, and the automation of the movement of people are relied on. For the purpose of the present analysis, only the first two measures are included. Implementing these requires substantial investments in infrastructure, as well as reforms in trade processes. Applying an economic model that evaluates the removal cost of administrative barriers and bottlenecks to the full capacity of a Customs Union requires in first instance the quantification of said barriers by identifying the tariffs, and later, incorporating the estimates in a model that simulates the political shocks of removing said costs. In this way, the economic impacts on production and trade, as well as the social impacts on wellbeing and employment, can be derived.

The difficulties associated with several administrative and logistical bottlenecks (high transport costs, information difficulties, communication, lack of services, among others) are not a new problem, and are transversal in all Central American countries[1]. Such barriers mostly affect imports from Nicaragua and El Salvador, with ad valorem equivalent tariffs of 25.3% and 18.3%, respectively. In the case of Panama, ad valorem tariffs are of 9% on average. The textiles, confection and footwear sectors, as well as agroindustry products, present surcharges higher in all Central American countries (see Table 2.6.7). These barriers have a negative impact on the competitiveness of regional exporting firms, from which approximately 50% export in the common market.

[1] The Central American Customs Union: potential economic and social impacts, ECLAC, November 2018

Table 2.6.7 Central America: Ad Valorem Equivalents Estimated for Administrative Barriers, 2017

(In percentage of the value of imported products)

Main sectors	Costa Rica	Guatemala	El Salvador	Honduras	Nicaragua	Panama
Agriculture, hunting and fishing	26.4	26.8	36.6	26.8	33.4	11.3
Oil and mining	5.1	1.1	1.0	0.6	7.0	2.0
Food, beverages and tobacco	14.6	17.8	15.6	17.8	19.6	7.3
Textiles, confections and footwear	33.8	30.1	36.5	28.3	61.7	21.8
Chemicals and petrochemicals	12.3	6.2	3.3	14.2	20.0	7.7
Metals and derived products	12.3	13.0	13.0	10.4	19.7	9.0
Machinery and equipment	8.1	9.7	7.5	9.4	19.0	6.2
Other manufacturing	21.0	15.6	17.4	15.6	31.2	11.5
All sectors	**16.3**	**14.0**	**18.3**	**15.8**	**25.3**	**9.0**

Source: ECLAC

Every Central American country has signed the Trade Facilitation Agreement (TFA) of the WTO, which has as its main objective to increase the speed of dispatch, movement and transit of merchandise at a global level. The countries agreed to adopt a series of measures such as applying a single window, implementing a single authorized operator, the use of electronic mediums to exchange data (customs declarations, issuance of licenses, the shipment of maritime and air freight manifests), electronic publication of mandatory customs procedures, the electronic exchange of certificates (origin, sanitary and phytosanitary) and customs data, the reduction of physical audits, and the cooperation of customs agencies, among others.

The first attempt to consolidate a Customs Union was in 2000, boosted by El Salvador and Guatemala and the adherence of Nicaragua and Honduras to such efforts. With this base, and plastered on a framework agreement for the establishment of the Customs Unification, the countries negotiated the Association Agreement with the European Union (UE). The largest advance has come from the establishment of the Customs Union between Guatemala and Honduras in June 2017. The evaluation by ECLAC was carried out on the base of political scenarios that consider the reduction in administrative costs from their estimated level to 60% lower in an ambitious scenario, and alternatively to 30% lower, in one less ambitious. Likewise, results of the inclusion of El Salvador in the CU above described are presented. In this case, the applied Trade Facilitation Program would extend the unified customs union territory to all countries of the Northern Triangle. For this, similar scenarios were considered to those described above, with the distinction that these cases include three countries. Table 2.6.6 presents the *ad valorem equivalents* calculated for the simulated scenarios considering the *status quo* (initial situation), as well as the reduction in the scenarios (ambitious and moderated) for the bilateral liberalization between Guatemala and Honduras; and the Northern Triangle.

Table 2.6.8 Central America: Scenarios of Deepening the Customs Union

(AVE in percentage of product value)

	Deepening of Customs Union, Honduras – Guatemala (17% of intra-Central American commerce)			Deepening of Customs Union in Northern Triangle (52% of intra-Central American trade)		
	Status quo[a]	Ambitious scenario (60%)	Moderate scenario (30%)	Status quo[b]	Ambitious scenario (60%)	Moderate scenario (30%)
Agriculture, hunting and fishing	29.0	11.6	20.3	35.5	15.5	25.5
Oil and mining	47.5	19.0	33.3	0.8	0.3	0.6
Food, beverages and tobacco	15.6	6.2	10.9	18.2	10.9	14.6
Textiles, confections and tobacco	48.4	19.3	33.8	34.2	13.7	23.9
Chemicals and petrochemicals	22.5	9.0	15.7	9.7	3.9	6.8

Metals and derived products	3.7	1.5	2.6	12.0	6.1	9.0
Machinery and equipment	34.3	13.7	24.0	11.3	5.5	8.4
Other manufacturing	23.5	9.4	16.5	16.1	6.7	11.4
All sectors	**28.2**	**8.3**	**14.4**	**17.8**	**8.4**	**13.0**

Source: ECLAC

Table 2.6.9 shows the changes that would arise in tariff protection in all of Central America if a trade facilitation program was implemented involving all SIECA member countries.

Table 2.6.9 Central America: Consolidated scenario of the Full Application of the Central American Customs Union

(All member countries, AVE in percentage of product value)

Sectors	Status quo	Ambitious Scenario (60%)	Moderate Scenario (30%)
Agriculture, hunting and fishing	33.4	13.4	23.4
Oil and mining	4.8	1.9	3.4
Food, beverages and tobacco	20.1	8.0	14.1
Textiles, confections and footwear	43.6	17.5	30.5
Chemicals and petrochemicals	12.8	5.1	8.9
Metals and derived products	14.3	5.7	10.0
Machinery and equipment	10.5	4.2	7.3
Other manufactures	19.9	8.0	13.9
Total	**19.5**	**7.8**	**13.6**

Source: ECLAC

(2) Expected results of the Application of Trade Facilitation Program at the Central American Level

The Customs Union promoted by Guatemala and Honduras shows a change in GDP of between 0.2 and 0.8%, with more variation in the ambitious scenario. Honduras faced a higher variation (0.7% in the ambitious scenario), and Guatemala a lower positive variation (0.4% in the same scenario). Equally, the changes in trade were larger for Honduras, although economic and export activity would be stimulated in all territories of the Union. The impacts are positive and larger under the ambitious scenario, resulting also in an increase in wellbeing for consumers, with a positive impact on employment for non-qualified workers (see Table 2.6.10).

The effect of lower administrative costs on the terms of exchange is added, which increases the competitiveness of traded products in the Customs Union. Extending this to El Salvador produces a larger variation in all macroeconomic variables.

Table 2.6.10 Percent Change in Macroeconomic Variables due to Reductions in Administrative Barriers in Guatemala-Honduras and Northern Triangle Scenarios

(Percent variations with respect to the base line and millions of dollars)

	Customs Union between Guatemala and Honduras (CU2)		Northern Triangle Customs Union (NTCU)	
	Less ambitious (30%)	Ambitious (60%)	Less ambitious (30%)	Ambitious (60%)
GDP	0.2	0.5	0.3	0.8
Exports	0.7	1.8	0.7	2.1
Imports	0.5	1.7	0.9	1..8
Total employment	0.4	0.5	0.4	1.0
Employment (qualified labor)	0.6	0.8	0.4	1.0

Wellbeing[a] (millions of dollars)	162	377	187	419
Percentage of GDP	**0.2**	**0.6**	**0.2**	**0.5**

Source: ECLAC

As in any scenario of change in international trade, there are winning and losing sectors. The biggest positive impacts in economic activity are found in chemicals and petrochemicals, food, beverages, and tobacco, textiles, confection and footwear, as well as in machinery and equipment and other manufacturing. The inclusion of more countries in the trade facilitation program, whether moderate or ambitious, results in a positive product variation of between 1% and 2.4% respectively.

Table 2.6.11 Central America: Macroeconomic Effects of an Extended Customs Union

(Percent variation with respect to base line, and millions of dollars)

	Costa Rica	Guatemala	El Salvador	Honduras	Nicaragua	Panama
Ambitious scenario (60% AVE reduction)						
GDP	1.0	4.5	2.4	2.9	2.4	2.1
Exports	2.6	12.0	5.9	6.7	5.8	1.8
Imports	2.9	9.0	5.1	6.3	5.5	2.0
Total employment	1.0	2.0	1.0	2.4	2.7	1.6
Employment (non-qualified labor)	2.1	3.4	1.8	3.9	4.2	2.5
Wellbeing[a] (millions of USD)	518	614	627	592	299	625
Percentage of GDP	1.2	2.5	1.3	3.1	2.8	1.9
Moderate scenario (30% AVE reduction)						
GDP	0.5	1.8	1.1	1.1	1.1	0.9
Exports	0.9	4.6	2.3	2.5	2.2	0.7
Imports	1.0	3.5	2.0	2.3	2.1	0.8
Total employment	0.4	0.8	0.4	0.9	1.1	0.7
Employment (non-qualified labor)	0.8	1.3	0.7	1.5	1.7	1.0
Wellbeing[a] (millions of USD)	238	255	284	209	135	257
Percentage of GDP	0.6	1.0	0.6	1.1	1.3	0.8

Source: ECLAC

Results show that Central American trade in 2017 faced average rates of protection close to 20% (including tariff and non-tariff barriers), with an important prevalence of administrative barriers which are particularly high in Nicaragua and El Salvador, as well as at a bilateral level, where they are also especially high in bilateral trade between Guatemala and Honduras. By sectors, the most elevated costs are in agricultural products, the agroindustry, and textiles, confections and footwear industries. All this leads to a reduction in trade, and economic and social losses associated to lesser trade flows and higher payment of unitary prices by consumers.

At a macroeconomic level, it was determined that a highly ambitious trade facilitation program (estimated at 60% cuts in *ad valorem equivalents* of administrative barriers) would allow for GDP increases of 0.4% and 0.7% for Guatemala and Honduras, respectively. Simultaneously, such program would allow the increase in imports of goods of 2.2% and 1.4% in Honduras and Guatemala, respectively. In the case of exports, increases of 2.2% and 1.5% for the same countries would be generated[2].

[2] The Central American Customs Union: potential economic and social impacts, ECLAC, November 2018

(3) Integrating Latin America and the Caribbean – Potential Effects of Removing Tariffs and Streamlining Non-tariff Measures, ECLAC, February 2021.

Total Trade Protection

Total trade protection is calculated by adding up the estimated AVE of NTMs with customs tariffs.

Table 2.6.12 presents an estimated ad-valorem total trade protection imposed and faced by different countries/regions in the world, taking into account the costs and benefits deriving from NTMs. Latin American and Caribbean countries were the ones imposing the highest barriers for foreign products. In the case of Latin America, the Caribbean and Sub-Saharan Africa, tariffs were the main barrier.

Figures increase when only costs estimates are contemplated. Now, the burden from NTM increases to more than twice of ordinary tariffs. While developed countries impose the highest protection, Asian countries, alongside with Canada and Latin America and the Caribbean are the countries suffering more with such protection. Exporters from developing regions have a protection coming from NTM more than two times larger than that coming from tariffs. While Latin America and the Caribbean's imposed protection from NTMs is smaller than tariff protection, the barrier faced by the region's exporters is almost 4 times larger than the tariff barrier.

Table 2.6.12 Trade Protection Considering Tariffs and Costs/Benefits of Non-tariff Measures

(Selected countries and regions, in percentages, 2015)

	Protection imposed to Imports			Protection faced by Exports		
Country/Regions	**Applied Tariff (1)**	**AVE of NTMs (2)**	**Total protection (1+2)**	**Applied Tariff (3)**	**AVE of NTMs (4)**	**Total protection (3+4)**
Latin America and the Caribbean	5.4	0.5	5.9	2.4	4.3	6.7
United States	1.5	3.7	5.2	3.3	1.9	5.2
Canada	1.1	1.5	2.6	1.1	4.5	5.7
European Union	2.2	0.7	2.9	3.7	1.3	5.0
Japan	2.3	5.4	7.7	4.3	3.9	8.1
China	3.9	7.4	11.3	3.6	1.0	4.6
Other Asia Pacific	3.6	1.9	5.5	3.2	4.2	7.4
Middle East and North Africa	3.6	1.0	4.5	1.7	1.6	3.2
Sub-Saharan Africa	8.2	-0.1	8.1	1.6	-1.6	0.0
Rest of World	2.1	-1.7	0.4	2.0	2.4	4.4
World	3.0	2.4	5.4	3.0	2.4	5.4

Source: ECLAC

Results indicate that, at a macroeconomic level, an FTA among all LAC countries could generate an increase of 0.41% of GDP from the baseline, while regulatory convergence plus the elimination of trade defense measures would impulse GDP by 0.31%. If both scenarios happen simultaneously, the change of GDP would be higher and would reach 0.73%. As for the rest of the macroeconomic variables, namely consumption, investment and trade, an increase is expected in all simulated scenarios, with the expected changes in scenario 3 being the largest. Foreign trade figures experience positive changes, although modest. Also, trade creation effects dominate that of trade diversion, with trade creation being even more important for intra-regional relationships, as it is later shown.

The scenario which combines both a tariff reduction and elimination of NTM related costs would generate the highest well-being, estimated to surpass US$25 billion. Approximately 62% of this impact is attributed to tariff reductions while the remaining 38% is linked to the reduction of NTM related costs. As a proportion of gross domestic product, the increase in welfare comes to mean 0.3% in the ambitious scenario (Table

2.6.13)[3].

Table 2.6.13 Latin America and the Caribbean: Impact on Macroeconomic Variables and Welfare under Various Scenarios

(Changes in percentage points over the baseline and millions of dollars)

Variables	Regional Free Trade Zone (FTA)	NTMs harmonization and elimination of trade defenses	FTA plus NTM harmonization
Consumption	0.4	0.3	0.7
Investment	0.7	0.6	1.4
GDP	0.4	0.3	0.7
Exports	1.3	0.5	1.9
Imports	1.5	0.8	2.3
Welfare (US$ million)	15 712	9 443	25 155
Welfare (% GDP)	0.2	0.1	0.3

[3] Integrating Latin America and the Caribbean – Potential effects of removing tariffs and streamlining non-tariff measures, ECLAC, February 2021.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 3

Upstream Development Policies and Strategies

November 2023

Japan International Cooperation Agency
Oriental Consultants Global Co., Ltd.
Nippon Koei Co., Ltd.
ALMEC Corporation
Overseas Coastal Area Development Institute of Japan
International Development Center of Japan Inc.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 3
Upstream Development Policies and Strategies

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Appendix 3 Upstream Development Policies and Strategies

3.1 Regional Development Policy and Strategy

3.1.1 Regional Framework Policy on Mobility and Logistics (PMRML)

(1) Background and Goals

The PMRML developed by the Central American countries, with the assistance of the IDB, ECLAC, JICA and the IMT (Mexican Institute of Transport), with the participation of the regional public, private and academic sectors, was validated by the Sectorial Council of Ministers of Transportation of Central America (hereinafter called "COMITRAN ") on December 1, 2016. At the presidential level it was approved on December 14, 2017, within the framework of the Fifty-Ordinary Meeting of Presidents of the Central American Integration System (SICA). Currently, 30% of the total trade of the six countries is done intraregionally and most of the exports and imports are made through road corridors that cross the countries of the region. This means that each country's trade is made up of mobility and logistics services that cover several countries in the region. In view of these circumstances, the PMRML aims to harmonize, systematize and unify the level of policies as a region, rather than proceed individually with mobility and logistics policies in each of the six Central American countries. This regional policy framework was formulated to establish a common goal as a regional economic bloc.

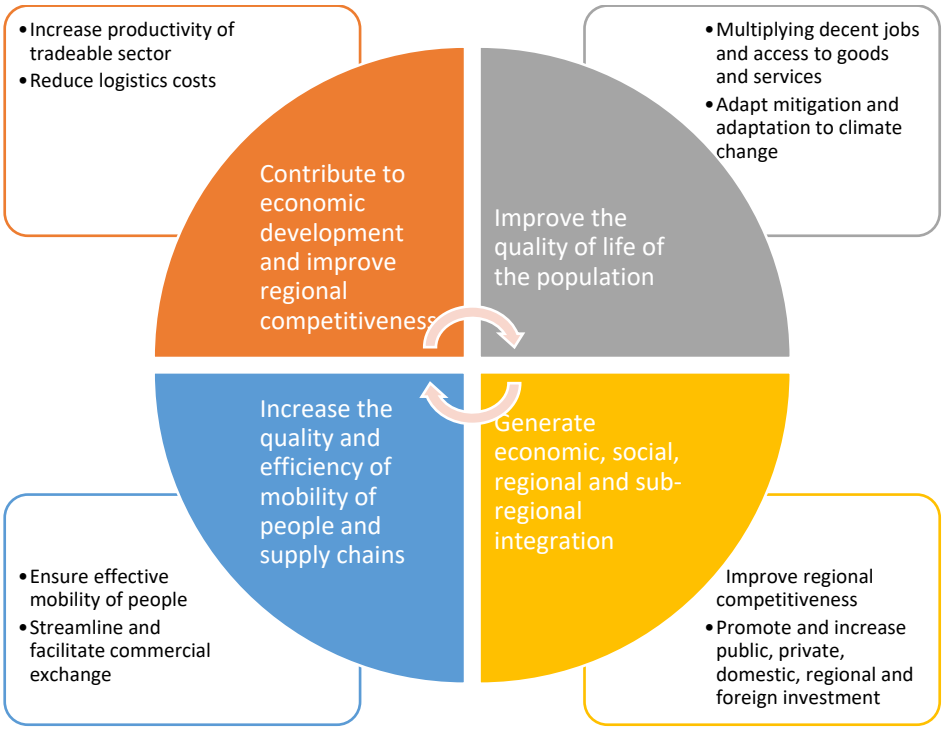
(2) Outline

The PMRML is based on four principles (independence, complementary integration, integrality, sustainability) (see box below); four strategic objectives (economic development, quality of life, efficiency, subregional integration) (see figure below); five pillars of the framework policy (regional character, commodal approach, integrated value chain, public-private cooperation, mobility of people); two cross-cutting axes (production and trade / mobility and people) and six sectoral axes (coordinated border management, road infrastructure and land transport, railway transport, port - maritime, aeronautical-airport and urban logistics). Based on these policies, two geographical areas can be mentioned: 1) a broader, regional level and 2) national level.

Annex I of PMRML include specific guidelines for each of the Cross-cutting Axes and Sector Axes and their corresponding areas of intervention. Also, priority action and initiatives by Axes are mentioned in the PMRML. For example, the establishment of Logistics Master Plan (PNLOG) in each country is one of the priority actions in Productive and Trade Sector. Also, it should be noted that "complete the modernization of the Central American Logistics Corridor and International Network of Mesoamerican Highways (RICAM)' s priority interventions." is one of the priority actions and initiatives of the framework policy in production and trade sector.

[Four Principles of Policy Framework Formulation]

1) **Independence**: This means that all the effort for a regional integration, which enhances the development of our countries, does not impede or undermine the independence in the decision making of each country, on their own developments and initiatives, but that allows for deepening the integration and aligning common objectives based on an independent and self-determined will.
2) **Complementary Integration**: This takes as its central premise the complementary and positive nature of the articulation of national policies to achieve a more efficient and competitive regional system, capable of harmonizing public and private interests and moving from state policies of each country as region policies, from the physical integration to the integration of subsystems to form a regional system, and of the articulation of the organizations of the country and to the homogenization and normative unification and of their mechanisms of application.
3) **Integrality**: Part of a holistic and systemic vision, leads to the inclusion of all parts, but also to all dimension and of all the areas and necessary means comprehension to carry out with the objective. It involves the alignment of transport sector services and considers all transport modes in a same analysis process that at the same time involves a coordinated action planning and execution from all bounded public and private parties.
4) **Sustainability**: To promote a positive and balanced impact of all dimensions of sustainable development: economic, social, environmental and institutional; under a long-term vision and a sense of consistency and predictability. All of this to ensure the furthest horizon in time and continuous ascent.



Source: PMRML

Figure 3.1.1 Four Strategic Objectives and Key Impact in PMRML

Table 3.1.1 Vision, Objective and Areasof Intervention by Transversal Axes in PMRML

Axes	Vision	Objective	Areas of Intervention	Responsible or Executor
Productive and Trade Sector	Central America will have infrastructure, equipment, regulatory framework, and institutionalism that will facilitate contribution to transformation and diversification of its productive entities, trade facilitation, improvement of exports competitiveness, articulation of regional value chains, and achievement of sustainable growth levels.	Promote sustainable increase of production and trade of goods and services through provision of priority logistics infrastructure, facilitating integration of value chains, increase of added-value in production, and improvement of competitiveness in economies with positive impact on the quality of life of the population through provision of infrastructure, attraction of new investment, and job creation.	• Investment in economic and productive infrastructure to integrate regional value chains.	COMIECO COSEFIN COMITRAN
			• Trade facilitation and reduction of obstacles for free transit of goods, people, and vehicles. • Improvement of the region's logistics performance: institutionalism, regulatory frameworks, procedures, and systems.	COMIECO
			• Improvement of the region's logistics performance: institutionalism, regulatory frameworks, procedures, and systems.	COMIECO COMITRAN COSEFIN
Mobility and People	Central America will have an Intelligent People Mobility System which guarantees users equal accessibility, reliability, safety, comfort and environmental sustainability.	Develop a modern and sustainable system which allows for people mobility efficiently, comfortably, reliably, economic, inclusive and safe, by articulating different transport modes under updated regulatory frameworks and strengthened institutionalism.	• Modernization of road infrastructure and vehicle fleet. • Mobility Management: Safety and regulations. • Quality improvement of public transport services. • Strengthening of institutionalism.	COMITRAN

Source: PMRML

Table 3.1.2 Vision, Objective and Areasof Intervention by Sectoral Axes in PMRML

Axes	Vision	Objective	Areas of Intervention	Responsible or Executor
Coordinated Border Management	Central America will be the region where people and goods move expeditiously and efficiently across peripheral and internal borders so that costs and cargo movement times are reduced, people border crossings are more efficient, export competitiveness is increased and Central American economies are invigorated.	Contribute to establish the Central American Customs Union by implementing a model of Coordinated Border Management which will improve the transit of goods and people, collection procedures, control and safety so that transport times and costs are reduced at the region's border crossings.	• Modernization of infrastructure and Equipment as well as streamlining controls to increase operational efficiency of COMIECO border posts, and movement of people and goods from one country to another.	COMIECO
			• Harmonization of regulatory framework in customs, immigration, health, trade, and security.	COMIECO

Axes	Vision	Objective	Areas of Intervention	Responsible or Executor
			• Institutional strengthening in technical operational capabilities of border posts.	COSEFIN
Aeronautical and Airport Services	Central America will provide high-quality airport and aeronautical services, since it will have modern air terminals, with first-class infrastructure, processes, personnel and equipment, which will allow aircraft flight control, adequate handling of passenger flows, and merchandise, and will have integrated logistics activity areas in its airports, which will provide warehousing, distribution and effective cargo handling services.	Raise the quality of air services for passenger transport and handling of high value-added cargo, so that the region becomes a logistics platform of importance for international trade, in which aeronautical clusters are developed, regional exports are promoted, creation of logistics activity zones is promoted, establishment of new aeronautical services providers is stimulated, and tourism is strengthened in the region, contributing to increase competitiveness of Central American companies and the region's social development.	• Aeronautical Operations • Improvement of "Logistics Support Zones" at airports. • Processes and procedures at airports. • Labor productivity in airports. • Market Strengthening.	COMITRAN
Port- Maritime Services	Central America will be a competitive and integrated region in world maritime trade.	Convert Central America into a competitive region integrated into world maritime trade, promoting the development and efficiency of its port offer and adapting its regulatory frameworks to international standards, to transform it into a regional logistics platform of high global relevance and contribute to the improvement of the competitiveness of foreign trade and the commercial and productive integration of Central America.	• Improve supply of maritime transport. • Improve operational capacity of the ports. • Develop port logistics areas. • Improve institutional capacity of maritime administrations, as well as the competencies and capacities of port maritime personnel. • Conserve marine and coastal spaces.	COMITRAN

Axes	Vision	Objective	Areas of Intervention	Responsible or Executor
Rail Transport Services	Central America will have a modern railway system, with a fleet and a network of tracks according to international standards, which will provide safe and sustainable transportation services to people and goods, and will be integrated with the rail network from Mesoamerica, the United States and Canada, helping to facilitate regional trade, reduce operating costs of companies and increase the competitiveness of the region's economies.	Reactivate national railway systems through modern, effective, and sustainable management models that offer efficient, safe, sustainable, and low-cost transportation of people and goods integrated into the region's multimodal logistics system (road, sea, and air transport) and to the railroads of Mesoamerica, to stimulate exports to North and South America, reducing maintenance costs of the road network, promoting the preservation of the environment, increasing the competitiveness of the economies of Central America and contributing to its economic and social development.	• Development of the infrastructure of the railway transport system and the inter-modal connection infrastructure. • Strengthening administration of the railway system. • Training railway system staff. • Relocation of settlements established on railways. • Definition of sustainable financing mechanisms.	COMITRAN
Road Infrastructure and Land Transport Services	Central America will be a region with an integrated, modern and resilient road infrastructure, capable of guaranteeing effective, economic, universal and safe mobility of people, as well as efficient transport of goods through its territory to promote productive integration and competitive insertion in international trade.	Expand, renovate, modernize, and preserve the road system, bridges, tunnels and other transit works according to internationally accepted quality standards, so that the region strengthens the comprehensive management of its road assets and has functional, resilient and safe logistics corridors, duly articulated with different regional transport modes and through which the effective and efficient mobility of people and goods is developed, stimulating trade, connectivity between production - consumption centers and promoting development and integration of the Central American economies.	• Improvement of quality and capacity of the road network: roads, bridges, tunnels, drainage systems, rural roads, urban crossings, and other passing works. • Strengthening the sustainability of road infrastructure. • Increase coverage and connectivity of the road network, articulated to different modes of transport, including rural roads. • Improving resilience and security of infrastructure. • Improve quality of the supply of transport services, institutional capacity, and regulatory framework related	COMITRAN

Axes	Vision	Objective	Areas of Intervention	Responsible or Executor
			to road infrastructure.	
Urban Logistics Services	Central America will have an Intelligent Cargo Transportation System in urban areas that efficiently integrates the different modes of transportation to provide affordable, accessible, and high-quality logistics services that meet the needs of producers, distributors and consumers, as well as those of pedestrians and passengers, and that allows organizing cities and offers optimal conditions for the distribution of merchandise, thus promoting the competitiveness of companies, trade facilitation and economic development in the region.	Optimize the distribution of products in the cities of the region, through development of an Intelligent Cargo Transportation System, which improves urban logistics from a systemic perspective of modal articulation, makes the supply chains of goods more efficient, reduces operating costs of the productive units, facilitate regional trade, improve competitiveness of exports and help to boost Central American economies.	• Connection of strategic logistics corridors, national and regional, with accesses to urban areas. • Modernization and development of infrastructure and equipment for logistics platforms that favor distribution in urban areas. • Improvement in the quality of the supply of urban logistics services. • Strengthening of institutionalism.	Logistics services in urban areas in the 6 countries are not always the responsibility of the Ministries of Transport, so the entity in each country that must act in the areas of intervention of this Axis must be defined.

Source: PMRML

Table 3.1.3 Actions and Priority Initiatives by Transversal Axes in PMRML

Axes	Areas of Intervention	Responsible or Executor
Productive and Trade Sector	• Complete investments in infrastructure of regional logistics priority corridors.	COMITRAN / COSEFIN
	• Implementation of the five short-term measures defined in the Central American Strategy for Trade Facilitation in the prioritized border points of the six countries. • Development and implementation of national cargo mobility and logistics plans in the six countries. • Development of the Regional System of Logistics Platforms to identify high impact interventions for the main production chains. • Action plan to ensure resilient transportation infrastructure. • Regional logistics security program.	COMIECO
	• Professionalization of logistics service offers.	COMITRAN
	• Promotion of innovative sources and models for financing regional infrastructure.	COSEFIN
	• Articulated legal frameworks for private sector participation in infrastructure financing.	COMITRAN

Axes	Areas of Intervention	Responsible or Executor
Mobility and People Services	• Preparation of Comprehensive Urban Mobility Plans, identifying infrastructure, regulatory and institutional needs, as well as the demands of cargo transportation. • Development of priority urban infrastructure focusing on promoting public passenger transport. • Development of urban passenger distribution platforms. • Institutional strengthening of those responsible for Public Transport. • Modernization of regulatory frameworks to improve passenger mobility.	To be identified by country

Source: PMRML

Table 3.1.4 Actions and Priority Initiatives by Sectorial Axes in PMRML

Axes	Areas of Intervention	Responsible or Executor
Coordinated Border Management	• Implementation of the 5 short-term measures agreed in the Central American Strategy for Trade Facilitation • Development and implementation of Border Reform Programs in the 6 countries, to execute the medium and long-term measures identified in the Strategy, in the following components : • Adoption of international standards. • Information interoperability. • Comprehensive risk management. • Authorized Economic Operators (AEO). • Quarantine control. • Integration of procedures and controls. • Infrastructure and equipment. • Border community and security. • Development of management indicators and result monitoring.	COMIECO
Aeronautical and Airport Services	• Expand and modernize Central America's airport infrastructure within the context of a logistics platform development plan. • Promote development and competition in the air mode market. • Design an investment plan for the construction and expansion of logistics activity areas in current and future airports in Central America, as part of regional logistics development plans. • Identify international opportunities to establish alliances, covenants, and agreements that allow the expansion of air transport offering and making public-private investments in the aeronautical sector (APP: Public Private Partnertship). • Identification of innovative mechanisms to finance priority investments in the aeronautical sector in the region. • Provide institutional frameworks of the region with practices and recommendations of ICAO.	COMITRAN / COCESNA
Maritime Port Services	• Formulation of a regional community policy framework for articulated and coordinated implementation of investments in port infrastructure, development of logistics platforms to promote intermodal connections, adoption of maritime security programs and implementation of environmental protection programs, among other aspects of common interest. • Design and establishment of a regional short-distance maritime transport system to increase rates of maritime connectivity at extra and intraregional levels. • Preparation of port development master plans for the main ports in the region, which include definition of infrastructure improvement projects (facilities and equipment), harmonization of operation processes according to international standards, modernization of legal, organizational and regulatory frameworks, and the integration of different modes of transport.	COMITRAN / COCESNA

Axes	Areas of Intervention	Responsible or Executor
	• Definition, design, and development of specialized logistics infrastructure in the countries, regarding national logistics platforms, and specifically, Logistics Activity Zones. • Design and implementation of a regulatory and regulatory update program that leads to an efficient operation of port terminals, promoting the adherence, ratification and implementation of international conventions, adoption of competitive practices of port and maritime services, and participation of the private sector in the development of port investments. • Development, strengthening and consolidation of national Maritime Administrations and implementation of technical education and training programs for maritime ports staff. • Development of a regional program of integrated coastal management and environmental awareness for protection, conservation and sustainable exploitation of marine coastal zones and marine spaces, together with the preparation and development of national contingency plans.	
Railway Transport Services	• Prepare a Regional and / or national Railway Development Master Plan. • Create or update economic, financial, social, and environmental feasibility studies for the development of a rail freight and passenger connection at the regional and / or national level. • Carry out a census of human settlements on rights of way. • Develop legal regulations for the regulation of the railway transport system in Central American countries. • Promote reactivation and modernization of existing railway connections, prioritizing sections to be developed. • Develop or modernize the passenger train system.	COMITRAN
Road Infrastructure and Land Transport Services	• Accelerate modernization and expansion of regional and national logistics priority corridors under compatible standards of physical design and operation. • Modernization and harmonization of regulatory frameworks to improve the provision of land freight transport services in the region and to foster competition. • Development of rural road programs that facilitate interconnectivity with access roads to trade centers and cargo consolidation. • Preparation and implementation of the Regional Logistics Security Program. • Improve road connectivity with cargo and passenger multimodal terminals, • Development of the regional system for traffic counting and a network of weighing scales for cargo transportation. • Preparation or update of road development master plans.	COMITRAN
Urban Logistics Services	• Preparation of Urban Logistics Plans for cargo management in Central American countries. • Completion and implementation of National Cargo Logistics Plans in the 6 countries, identifying the main areas of logistics activity that should be strengthened in the region. • Planning and development of Urban Logistics Platforms, such as integrated merchandise centers, dry ports, areas of logistics activity in ports and airports, etc. • Updating and harmonizing national and regional regulations on supply chain transport, including the necessary elements for effective adaptation to climate change, risk management and minimizing negative environmental impacts.	To be identified by country

Source: PMRML

Priority actions and initiatives of the framework policy in production and trade sector are follows;

1. Complete the modernization of the Central American Logistics Corridor and RICAM's priority interventions.

2. Develop the Prioritized Regional Investment Plan.
3. Implement the five short-term measures defined in the Central American Strategy for Trade Facilitation at prioritized border crossing points of the six countries.
4. Develop National Cargo Logistics Plans (PNLOG) in the six countries.
5. Develop Rural Road Programs.
6. Develop National Systems for Logistics Platforms to identify high impact intervention areas for the main production chains.
7. Action plan to ensure resilient transportation infrastructure.
8. Disaster risk management.
9. Regional Logistics Security Program.
10. Develop information systems, observatories, and national surveys to measure progress in national and regional logistics performance.
11. Modern and harmonized regulatory and institutional frameworks between countries, in terms of mobility and logistics.
12. Promote competition in the land cargo transport sector.
13. Professional logistics service offerings.
14. Articulated legal frameworks for private sector participation in infrastructure financing.

3.1.2 Master Plan for the Trinational Investment Projects and Economic Development of the Gulf of Fonseca

Master Plan for the Trinational Investment Projects and Economic Development of the Gulf of Fonseca was formed by IDOM, funded by CABEI. The three countries, El Salvador, Honduras, Nicaragua, formed the Master Plan based on the Declation of Managua in 2007, which held the following four objectives.

- To guarantee that the Gulf of Fonseca shall become a zone of peace, security, and sustainable development for all three countries.
- Implementation of joint programs and projects to reduce vulnerable ecosystems and populations, or in any other fields mutually agreed upon.
- Develop bi-national or trinational projects and companies, with innovative approach, emphasizing regional planning and sustainable development, without prejudice to national projects.
- Sustainable, fair, and supportive use of natural resources, tourism, strengthening of local governments, artisanal fishing, aquaculture, among others.

The Gulf of Fonseca is a large bay located in the Pacific Ocean, which is shared by El Salvador, Honduras and Nicaragua, one end of which is the Cosigüina peninsula of Nicaragua and the other being the Amapala point of El Salvador. This strategic scenario is made up of 21 municipalities, with a surface area of 7,620 km^2 and 867,000 inhabitants. The water surface of the Gulf covers 2,010 square kilometers including 33 islands, of which 25 belong to Honduras and 8 to El Salvador.

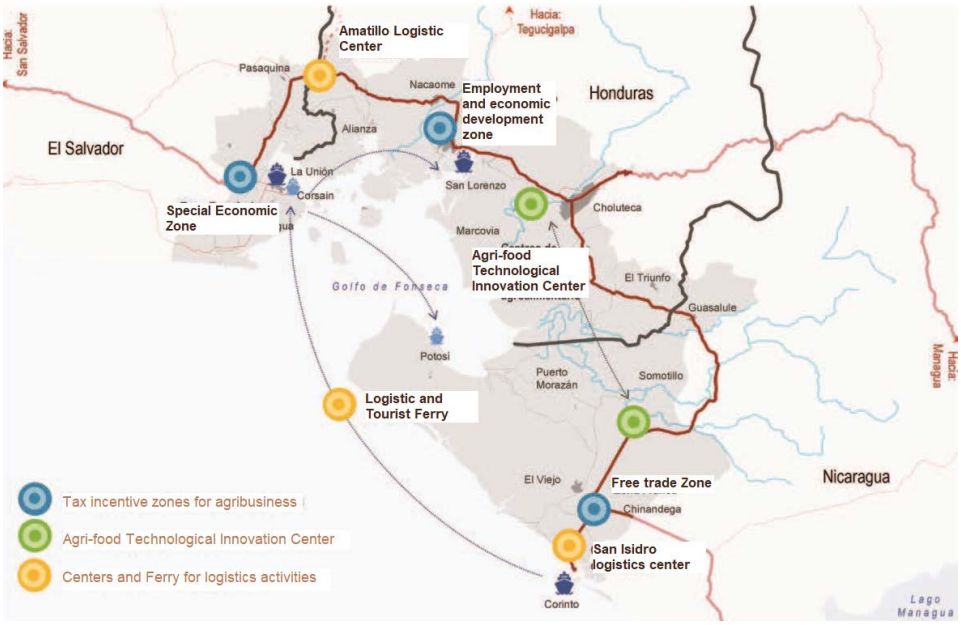
The actions of the Master Plan are focused on **attracting investment to the Gulf of Fonseca**, promoting its values and modernizing the regional productive infrastructure, **ensuring cutting-edge services**, which awaken the interest of global companies. These actions are developed in 6 pillars or programs and two axes of environmental and social sustainability. For the 6 pillars, the following 9 strategic projects are formed.



Source: Master Plan for the Trinational Investment Projects and Economic Development of the Gulf of Fonseca

Figure 3.1.2 Coordination Mechanism

1. Logistics-agroindustrial corridor on the Pan-American Highway and "Dry" Canal
2. Tri-national ferry for logistics and tourism activities. Implementation of the Short Sea Shipping service.
3. Special Economic Zone in El Salvador (SEZ)
4. Development of an Employment and Economic Development Zone in Honduras (EEDZ)
5. Agroindustrial Park in the Free Trade Zone of Nicaragua
6. Modernization of the Amatillo Pass and Logistics Center
7. Technological Innovation Center for the Gulf of Fonseca
8. Tourism corridor for the Gulf coastal plain and Estero Real
9. Creation of a Gulf brand of its own



Source: Master Plan for the Trinational Investment Projects and Economic Development of the Gulf of Fonseca

Figure 3.1.3 Logistic-industrial Corridorof the Gulf of Fonseca

3.1.3 Northern Triangle's Alliance for Prosperity Plan

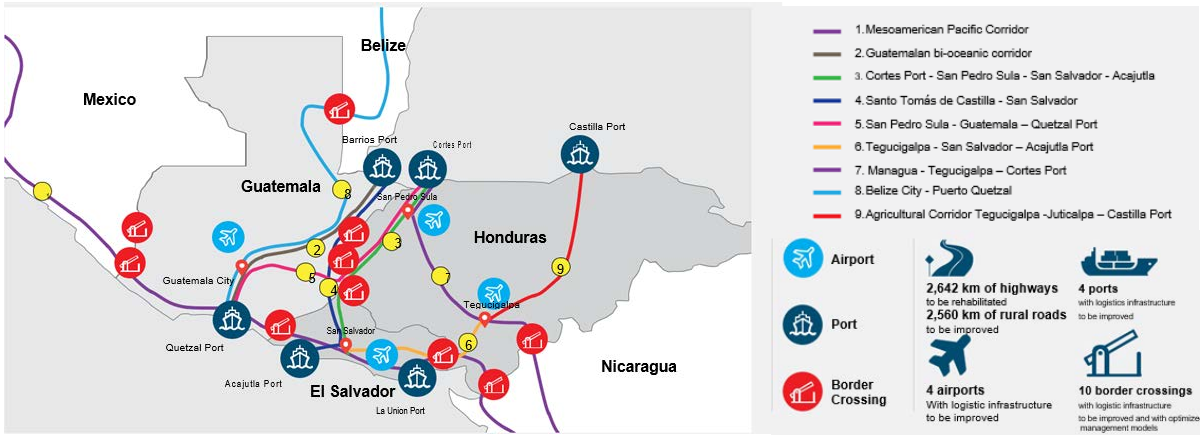
(1) Outline

In September 2014, the Plan of the Alliance for Prosperity in the Northern Triangle was formulated to address the structural causes of irregular migration through the generation of economic opportunities and the improvment of citizens' quality of life in Guatemala, El Salvador and Honduras. The actions implemented under the Plan's framework seek to foster the productive sector to create new economic opportunities, promote measures to develop human capital, improve citizen security and access to justice and strengthen institutions to increase the trust of citizens in the government.

The Plan of the Alliance for Prosperity was structured around four strategic pillars: (i) fostering the productive sector, (ii) developing human capital, (iii) improving citizen security and access to justice, and (iv) strengthening institutions and improving transparency.

(2) Logistics Corridor

One of the actions under the pillars (i) is "Modernizing and expanding infrastructure and logistics corridors" that strengthen regional integration. Nine logistic corridors are identified and actions to be implemented are identified as shown below.



Source: Alliance for Prosperity in the Northern Triangle (2014)

Figure 3.1.4 Infrastrucrure and Prioritized Logistic Corridors-Northern Triangle

Table 3.1.5 Identified Logistics Corridors in Northern Triagle's Alliance

Logistic Corridors	Required Measures
1. The Pacific Corridor joins Mexico with Central America on the west coast of the region	Improvement of the border crossing El Amatillo, Gausaule and La Hachadura, and rehabilitation and road widening in El Salvador and Honduras.
2. The Bioceánico Corridor between Quetzal Port, Guatemala City and Barrios/Santo Tomas de Castilla Ports	Improvement of ports, CA-9 road widening, improvement of rural roads, suburban ring and La Aurora International Airport.
3. The Acajutla Corridor - San Salvador - San Pedro de Sula - Puerto Cortes	Improvement of border crossing El Poy, logistics and freight areas in Cortes Port, Acajutla Port and San Pedro Sula; rehabilitation of roads CA-4, CA-8 and CA-13 including bridges, improvement of tertiary road and urban areas, and construction of a load terminal in San Salvador and San Pedro Sula airports.
4. El Ramal San Salvador - Bioceánico Corridor	Improvement of the border crossing Anguiatu – La Ermita, rehabilitation of the road and improvement of rural roads, upgrade in the cargo handling at the El Salvador International Airport.

Logistic Corridors	Required Measures
5. Quetzal Port Corridor - Guatemala City - San Pedro Sula	Upgrade in the border crossing El Florido, rehabilitation of roads CA-11, CA-4 and 500km of the tertiary road, improvement of cargo handling in the urban area of Guatemala City and La Aurora Airport, internationalization of the Puerto de San José Airport (GT) and road connection.
6. Acajutla Port Corridor - San Salvador - Tegucigalpa	Rehabilitation or roads CA-5, CA-1 and CA-8, tertiary road, bypasses of urban centers, improvement of border crossing El Amatillo.
7. Atlantic Corridor between Managua, Tegucigalpa and Cortes Port	Improvement of the border crossing Las Manos, rehabilitation of roads CA-11, CA-15, CA-6 and CA-5, in the urban area of Tegucigalpa and San Pedro Sula, rehabilitation of rural roads and improvement of Managua and San Pedro Sula International Airports
8. Atlantic Corridor between Belize and the Bioceanic Corridor	Improvement of the border crossing Melchor Mencos - Benque Viejo, the Belize City Port, rehabilitation of George Price Highway and CA-13, improvement of rural roads, upgrade of the cargo terminal at the Phillip Goldson Airport.
9. Agricultural Corridor between Tegucigalpa – Juticalpa –Castilla Port	Required measures are not specified.

Source: Alliance for Prosperity in the Northern Triangle (2014)

3.1.4 Summary of Regional Development Policy and Strategies

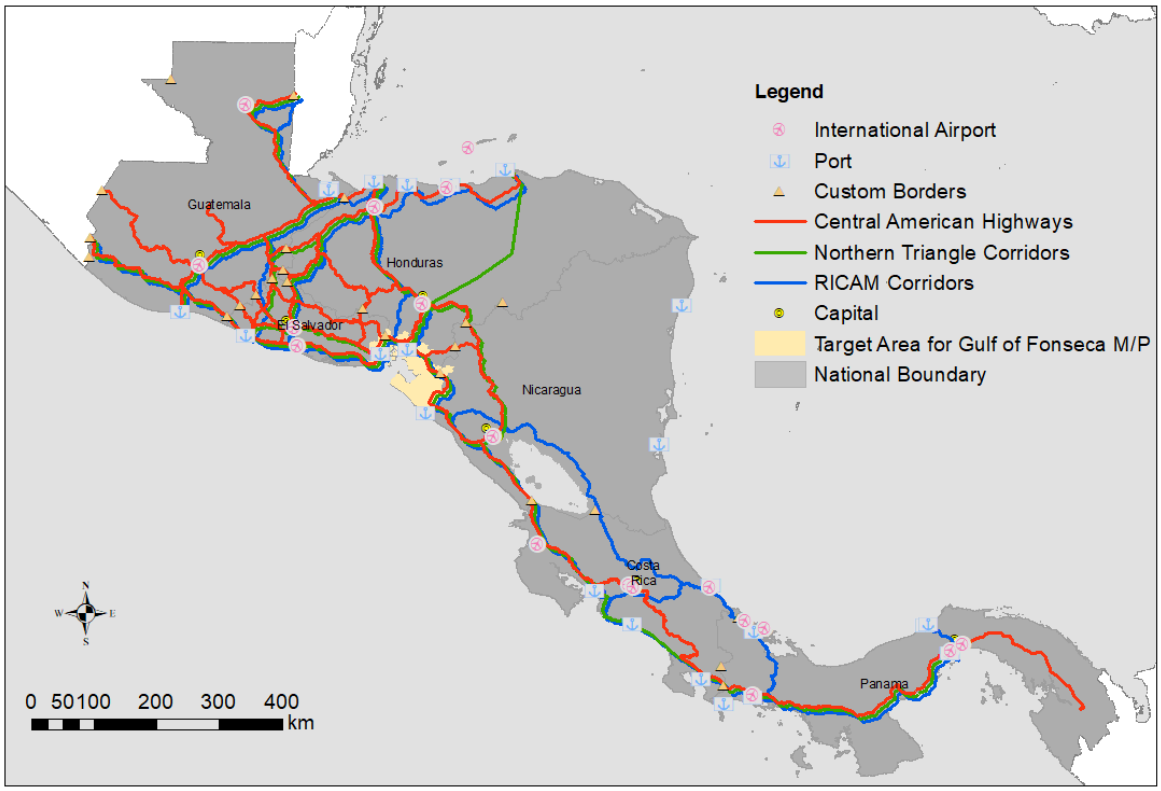
The "Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration" (hereinafter called "M/P") should be formulated for realizing the basic policies of PMRML under the principles of PMRML. PMRML covers 6 key sectors, namely, coordinated management of borders, roads, railways, maritime-port transport, aeronautical-airport and urban logistics. PMRML were formulated considering the proposed projects in Mesoamerica Projects, International Network of Mesoamerican Highways (RICAM).

The Central America region has been improving the cross-border management under with policies and strategies in ECFCC (details are mentioned in 10.1.1. in chapter 10). Customs union were made between Guatemala and Honduras and will be expanded to El Salvador and other countries in Central America.

The plan of the alliance for prosperity in the northern triangle, Guatemala, El Salvador and Honduras, was formulated to address the structural causes of irregular migration through the generation of economic opportunities and the improvement of citizens' quality of life. Nine logistics corridors were identified in the plan.

The regional master plan for Gulf of Fonseca was formulated by CABEI. The target area covers Honduras, Nicaragua and El Salvador.

Gulf of Fonseca shall become a zone of peace, security, and sustainable development for all three countries. To attract the investment for the regions, 9 strategic projects including logistics-agroindustrial corridor, SEZ and ferry services, were proposed.



Source: JST

Figure 3.1.5 Regional Development Corridors in Upstream Development Policies

3.2 National Development Plan

3.2.1 Guatemala

(1) Overview of National Development Plan

Guatemala's National Development Plan is the "K'atun Nuestra Guatemala 2032", formulated by Segeplán (Secretariat of Planning and Programming of the Presidency) in 2014 acts as a guidance to organize and coordinate all public administration, defining priorities, goals, results and guidelines. The five axes of the plan are as follows:

- Urban and Rural Guatemala
- Well-being for the people
- Wealth for everyone
- Natural resources today and for the future
- The State as the guarantor of human rights and driver of development

(2) Main National Economic Goals

In the "K'atun Nuestra Guatemala 2032", the macro economic goals are stated under the "Wealth for everyone" axis. Under the priority section of "Acceleration of economic growth with productive transformation", Goal 1 is to reach 5.4% real GDP growth by 2032. Breakdowns of the real GDP growth goals for each time period are shown below.

- Range between 3.4 and 4,4, from 2015 to 2020
- Range between 4.4 and 5.4%, from 2021 to 2025
- No less than 5.4%, from 2026 to 2032

(3) Industrial Sector Goals and Objectives

Specific industrial sector goals or strategies are not mentioned in the "K'atun Nuestra Guatemala 2032". Instead they are well elaborated in the Politica Nacional de Competitividad 2018-2032, *The National Competitiveness Policy (2018-2032)* made under the Ministry of Economy and PRONACOM. This plan provides an up to date and concise stategy towards increasing the nation's competitiveness and productivity to contribute to economic growth and improvement of the living environment, inline with the overarching national development plan.

In the National Competitiveness Policy (2018-2032), 11 industial clusters were chosen as priority sectors, based on their potential to form new formal and productive jobs, which will contribute to an inclusive, and sustainable economic growth. The 11 industrial clusters were 1) Forest, furniture, paper and rubber, 2) Fruits and vegetables, 3) Processed foods, 4) Drinks, 5) Textile, clothing and footwear, 6) Metalworking, 7) Light Manufacturing, 8) Tourism and Health Services, 9) ICTs, software & Contact Centers, 10) Transport and logistics, 11) Building. Additionally, 11 priority topics have been chosen, which are divided into two by implemention levels, either national or local. This content is further elaborated in Section 3.2.1.

(4) Logistic and Transport Sector Goals, Objectives and Strategies

In the "K'atun Nuestra Guatemala 2032", logistic and transportation sector goals are under the "Urban and Rural Guatemala" axis, related to reinforcing the connection of the production areas, markets and cities, and developing the productive infrastructure and service links in rural areas. These are summarized in Table 3.2.1.

Table 3.2.1 Logistic and Transportation Sector Goals in K'atun Nuestra Guatemala 2032

Goal1: In 2032 the rural population is enjoying the benefits of sustainable human development.	j) Promote interaction between rural and urban in a convergenet and inclusive manner
Goal 3: Rural Guatemala in 2032 will have improved its level of competitiveness. **Result 3.1** The rural territories are connected with the areas of production, market and population centers	a) Design and implement studies, tools and information that allow establishing the existing links and connections in rural systems b) Design and implement the road infrastructure that allows access to services and facilitates connectivity between rural territoriesm and that also stimulates exchanges and communication between them and urban areas and abroad. e) Rural communites must have access to the network of production support services (energy, roads, telephone and internet)
Result 3.2 Rural producers have improved their income thanks to the productive infrastructure and services that link them with the productive and value chains.	b) Facilitate the development of infrastructure for production, transformation and internal and external commercialization. c) Facilitate access of the rural population to financial services and technical assistance, which allow production and competition on equal terms with internal and external actors. d) Support from the Ministry of Economy (Mineco) the autonomy of small rural producers for their link with value chains and the search for markets

Source: K'atun Nuestra Guatemala 2032, Segeplán

In the National Competitiveness Policy (2018-2032), 9 Intermediate Cities are chosen to form a functional link system of intermediate cities network which will provide service distribution to an area that covers 60% of the nation's land and 90% of the population. This network will include a multimodal infrastructure network of highways, roads, ports and airports and includes 1 Global City, 9 Intermediate Cities (5 Regional Nodes, 2 Tourist Cities, 2 Port Citites) and 8 border crossings.

Table 3.2.2 1 Global City and 9 Intermediate Cities

1 Global City	
Área Metropolitana	Guatemala, Sta. Catarina Pinula, Chinautla, Mixco, Fraijanes, Amatitlán, Villa Nueva, Villa Canales, Petapa
9 Intermediate Cities	
Ciudad de los Altos	San Cristob al Totonicapan, Quetzaltenango, Salcaja, Olintepeque, San Juan Ostuncalco, San Mateo, Almolonga, Cantel, La Esperanza
Ciudad las Verapaces	Coban, Santa Cruz Verapaz, Sen Cristobal Verapez, San Pedro Carcha, Sen Juan Chamelco
Ciudad de Guatemágica	Retalhuleu, San Sebastian, Santa Cruz Mulua, San Martin Zapotitlan, San Felipe, Champerico, El Asintal, Mazatenango, Coatepeque
Ciudad de Oriente	Zacapa, Estanzuela, Rio Honda, Teculutan, Chiquimula
Ciudad nor-Occidente	Huehuetenango, Chiantla
Ciudad Portuaria Puerto Barrios	Puerto Barrios, Livingston, Morales
Ciudad Portuaria San Jose	Escuintla, Santa Lucia Cotzumalguapa, Masagua, La Gomera, San José, lztapa
Ciudad Turistica Panchoy	Antigua, Jocotenango, Pastores, Santa Maria de Jesus, Ciudad Vieja, San Miguel Due rias, Alotenango, San Antonio Aguas Caliente, Santa Catarina Barahona
Ciudad Turistica de Peten	Flores, San Benito

Source: JICA Study Team, National Competitiveness Policy (2018-2032)



Source: JICA Study Team, National Competitiveness Policy (2018-2032)

Figure 3.2.1 9 Intermediate Cities (Green areas)



Source: National Competitiveness Policy (2018-2032)

Figure 3.2.2 Multimodal Infrastructure Network

3.2.2 El Salvador

(1) Overview of National Development Plan

It has been reported that the Government Plan 2019-2024 is in the final stages of preparation, and therefore in the meantime the "Plan Cuscatlán Un Nuevo Gobierno para El Salvador" is still in force.

The "Plan Cuscatlán" was Nayib Armando Bukele Ortez's manifesto for his successful 2019 national election campaign, applicable for the years 2019-2024. It summarizes the reforms of the new administration by President Bukele, especially security issues, corruption and bureaucratic inefficiencies of previous administrations by sector. The plan will be implemented through 8 cross sectoral teams within the government that will cover 18 different sectors amongst them (see Table 3.2.3).

Table 3.2.3 18 Sectors to be Covered by 8 Teams in the Plan Cuscatlan

Sectors \ Teams	Social Welfare	Security	Migration and Labor	International	Industry, Production and Technology	Economy and Social Benefits and Finance	Development and Public Works	Territorial Development
Transparancy and Anti-corruption		○						
Culture	○	○					○	○
Agriculture					○			
Infrastructure		○			○	○	○	○
Foreign Policy			○	○				
Youth	○	○						
Tax				○	○	○		
Health	○	○					○	
Tourism				○	○			
Human Rights	○		○					
Environment	○				○			
Innovation and Technology		○	○		○			
Education	○	○	○				○	
Female	○							
Modernization of the State				○				
Sports	○	○					○	○
Security	○	○						○
Economy			○	○	○	○		

Source: JICA Study Team, based on the Plan Cuscatlán Portal (https://plancuscatlan.com/home.php)

(2) Main National Economic Goals

The "Plan Cuscatlan" has set the following economic goals for El Salvador to be accomplished by 2024;

- Higher levels of job creation
- Greater international competitiveness
- Economic growth rate of at least 3.5%
- Controlled fiscal deficit
- Public debt tending to be reduced as a proportion of GDP
- A more equitable and inclusive pension system
- A progressive tax structure that responds to social, institutional and environmental needs
- Greater equality in society

(3) Industrial Sector Goals, Objectives and Strategies

The separate volume classified as Economy contains 3 programs and 12 actions, which benefits not only large companies but also producers about cooperation between industries, high added value of each industry, and manufacturing industry related to Makira. It is touted such reforms, support by creating an export platform for agricultural products and crafts, and cost reduction related to trade in industrial products between Central American countries. As stated in V. Strategies, since the purpose of Plan Cuscatlán is to explore the basis of growth during the 2019-2024 period, there are few specific actions, but the agenda is to break away from the focus on specific industrial sectors. It is proposing the development of higher value-added fields such as renewable energy, eco-friendly agriculture and fisheries, and design and marketing in the apparel industry[1].

[1] (https://www.plancuscatlan.com/)
Plan de Acción Nacional El Salvador 2018-2020 (PAN) AGA (Alianza para el Gobierno Abierto) https://www.opengovpartnership.org/members/el-salvador/

Furthermore, individual strategies for "Agriculture" and "Tourism" are mentioned, as summarized below;

- 7 most important products in the agriculture sector are selected; basic grains, sugar industry, coffee, non-traditional (fruits and vegetables), fishery, poultry and livestock.
- Tourism is to be a major engine of the national economy and all actors are to be aligned on a clearly defined course to develop the sector as a whole. The strategic objectives to achieve this goal are as follows;
    - Achieve greater share in the most significant markets for tourism, such as Central and North America.
    - Attract visitors from Europe, prioritizing countries where there are colonies of resident Salvadorans: Spain, Italy, France, Sweden, Germany and Asia.
    - Obtain financing for programs and projects, with internal and external sources, harmonizing cooperation initiatives with other State institutions.
    - Articulate the initiatives with the formal educational system, including in the curricular, public and private programs, tourist contents from the first years, to create tourist culture.
    - Coordinate with educational institutions that offer baccalaureate, technical and university degrees, to train suitable personnel to perform in the different roles that the tourism sector demands.

(4) Logistic and Transport Sector Goals, Objectives and Strategies

In terms of Logistic and Transport sector goals, the "Plan Cuscatlán" touches upon "Roads", "Transport" and "Ports, airports and customs", under the Infrastructure Sector.

- For the road sector, the objective is to have the best road network in Central America. In terms of individual actions, the highways that will be given priority will be CA-1 and CA-2.
- For Transport, the following actions are raised.
    - Road study and planning of new roads to reduce daily road chaos.
    - Reactivation of rail transport, both for cargo transport and for passengers.
    - Study of load and redistribution of routes in public transport.
    - Classification of motor vehicles for optimization of transport and vehicular flow.
    - Regulation of motorcycles.
    - Optimal road signs, both urban and in all departments of the country
- Action plans for the "Ports, airports and customs" sector is summariesed in Table 3.2.4.

Table 3.2.4 Action Plans for the "Ports, Airports and Customs" Sector

Ports	**Other Ports**	• Equipment and expansion of the main pier • Equipment and expansion of the logistics and communications center • Construction of a container yard with world standards. • Expansion and remodeling of the craft docks, to generate more sources of work. • Construction of terminals for passengers, which have customs, trade and tourist services. • Creation of the Nautical School, which will train professionals to develop careers in the different port and naval areas.
	Pacific Strip (La Unión)	• Fishing and Logistics. • Air, maritime and land infrastructure. • Tourism, Education, Research and Production.
Airports	**Ilopango MSSS Airport**	• Ensure connectivity with the Carretera de Oro and the Carretera a Comalapa • Recover the runway • Increase runway length • Improve infrastructure
	El Salvador Monseñor Oscar Arnulfo	• Construction of new exit areas for passengers. • Construction of new arrival and migration areas. • Construction of a second runway,

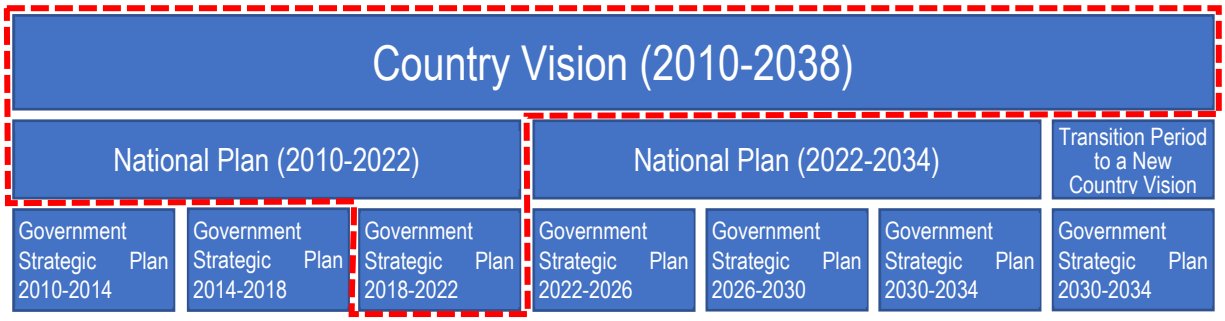
	Romero y Galdámez International Airport	• Commercial development to activate the southern area of the department of La Paz. • Re-equipment of radars, instrument landing systems (ILS), etc • Installation of bird repellent equipment, in accordance with international civil aviation standards, • Expansion of the loading area and maintenance hangars.
	Airport in the East	• Construct new airport.

Source: Plan Cuscatlán

3.2.3 Honduras

(1) Overview of National Development Plan

Honduras' national policies and plans are structured as shown in Figure 3.2.3, with a Country Vision for 2010-2038 encompassing the National Plans formed every 12 years.



Source: Country Vision 2010-2038

Figure 3.2.3 The National Policies of Honduras

The National Vision for 2010-2038 is formed around the following 4 objectives;

1. A Honduras without extreme poverty educated and healthy, with systems consolidated of social security.
2. A Honduras that takes place in democracy with security and without violence
3. A Honduras productive, generating of opportunities and employment, which takes advantage sustainably ites resources and reduces environemntal vulnerability
4. A modern state, transparent, responsible, efficient and competitive.

The current National Plan for 2010-2022 is structured based on the following 11 strategic guidlines.

1. Sustainable Population Development
2. Democracy, Citizenship and Governance,
3. Poverty Reduction Asset Generation and Equality of Opportunities,
4. Education and Culture as Means of Social Emancipation,
5. Health as a Foundation for the improvement of Living Conditions,
6. Safety as a Development Requirement,
7. Regional Development, Natural Resources and Environment, (natural resources)
8. Productive Infrastructure as Engine of Economic Activity,
9. Macroeconomic Stabiliy as the Foundation of Domestic Savings
10. Competitiveness, Country Image and Development of Productive Sectors,
11. Adaptation and Mitigation to Climate Change

Under the national plans are the Government Strategic Plans, which are formed every 4 years. The current Government Strategic Plan (PEG) is for 2018-2022.

(2) Main National Economic Goals

In the National Vision 2010-2038, 4 national objectives and 22 national goals are formed. The goals related to economic targets are extracted below.

- **Objective 1:** A Honduras without extreme poverty, educated and healthy, with consolidated social security systems
  - **Goal 1.1:** Eradicate extreme poverty
    - Target 1.2: Reduce the percentage of households living in poverty to less than 15%
- **Objective 2:** A Honduras that develops in democracy, safely and without violence
- **Objective 3:** A productive Honduras, generator of opportunities and decent employment, that makes use of its resources in a sustainable way and reduces environmental vulnerability
  - **Goal 3.1:** Reduce the open unemployment rate to 2% and the invisible underemployment rate to 5% of the employed population
  - **Goal 3.2:** Expand the Exports / GDP ratio to 75%
- **Objective 4:** A condition modern, transparent, responsible, efficient and competitive
  - **Goal 4.1:** Improve the position of Honduras in the Global Competitiveness Index to position 50

(3) Industrial Sector Goals, Objectives and Strategies

In the National Plan 2010-2022, strategic guideline "10. Competitiveness, Country Image and Development of Productive Sectors", four areas are raised to be promoted towards international markets.

(i) A new moment of the maquila (this time oriented to services such as Contact Centers and Back Office services); (ii) The integral development of Honduras' potential agri-food; (iii) The promotion of the forestry sector as one of the three most important natural resources in the country and; (iv) The integral development of tourism.

Industrial sector goals set in the current Government Strategic Plan (PEG) (2018-2022) are articulated in Section 3.3.3.

(4) Logistic and Transport Sector Goals, Objectives and Strategies

In the National Plan 2010-2022, logistic and transport sector goals and objectives are set under the strategic guidline "8. Productive Infrastructure as Engine of Economic Activity".

- By the year 2022,
  - The necessary investments will have been made to consolidate the leadership of Honduras as the most important inter-oceanic land transportation circuit for the transit of merchandise in Central America. Public-private investments will have been made for the development of renewable energy generation projects in such a way that the energy matrix will show a net participation - of this form of generation - equivalent to 60%, meeting the total demand of the residential sector with quality , commercial and industrial during the period.
  - There will be a renewed network of rural roads that will enhance the commercial opportunities of thousands of small agricultural producers throughout the country. 90% of Honduran households will have access to telephony, which will operate under a modern legal and operational framework, adhering to international standards.
  - The Honduran ports (Puerto Cortés, Puerto Castilla, Henecán and Amapala) will be certified as international ports, forming a network of port services without competition in Central America. The country will have instruments that facilitate private investment in infrastructure, Investment in infrastructure will reach 7.5% of GDP, during the last four years of the period.
- By the year 2034,
  - Honduras will have a consolidated system of public and private investment that will represent at least 20% of GDP.
  - Honduras will have investment means to ensure the permanent maintenance of the country's

road network.

- By the year 2038,
  - Honduras will be the Central American leader in productive infrastructure and will prepare for a new moment of development in order to consolidate and maintain its international position.

The Government Plan 2018-2022 serves as a medium-term planning tool to achieve the national objectives and goals of the Country Vision (2010-2038) and the guidelines and indicators of the National Plan (2010-2022). In order to position Honduras as a regional logistic platform, the Government Plan 2018-2022 includes sectoral strategies for infrastructure and logistics development shown in Table 3.2.5.

Table 3.2.5 Sectoral Strategies for Infrastructure and Logistics Development

Sectors	Strategies
Efficiency and Quality of the Transportation of People and Goods	1. Finalize the construction of the main road corridors, under international norms and standards. 2. Implement a plan to improve the secondary, neighborhood and tertiary road network, which guarantees access to the production centers. 3. Strengthen the system for monitoring and evaluating transportation costs and times in the official, paved road network.
Greater Efficiency in Sea Ports	1. Expedite the execution of works for the expansion and modernization project of Puerto Cortés. 2. Implement a traffic management plan in urban areas of the port, to expedite the entry and exit of cargo transport. 3. Improve and streamline foreign trade processes in ports at the national level, with the coordination of related institutions. 4. Design a master plan for the improvement of the country's port facilities, for cargo, people and tourist activities. 5. Develop adequate international marketing of port services and foster alliances with other ports in the world.
Development of Air Transport	1. Execute the works, within the established deadlines, of the construction project of the civil airport of Palmerola. 2. Develop and implement a master investment plan for airport development and modernization at the national level, which contributes to competitiveness and economic development. 3. Provide the necessary equipment and personnel for non-intrusive inspections in the main airports of the country, streamlining foreign trade processes. 4. Develop a permanent and periodic maintenance plan for airport facilities nationwide.

Source: Honduras Government Plan 2018-2022

3.2.4 Nicaragua

(1) Overview of National Development Plan

Axes of the National Program of Human Development 2018-2021 (PNDH) was formed in 2017 by the Ministry of National Planning and Economic Policy (MIDEPLAN) as the governing body of the National Planning System (SNP). It contains policies and goals to be developed, with the purpose of capitalizing the capacities of the population, especially those in poverty, in order for them to participate as active actors in

solving substansive problems and contribute to the development of the country. This implies a more active and productive public policy approach towards and from the direct participation of the impoverished population, leaving aside welfare policies in investment towards the poor. A structural review of investment is proposed to develop infrastructure that contributes to increasing the competitiveness of the economy and increasing private investment. This is a coalition of programs for 19 sectors, which are the following;

Table 3.2.6 19 Sectors Involved in Axes PNDH (2018-2021)

I. Social development	X. Environmental and natural resource protections policies
II. Technical education, technologies and knowledge,	XI. Infrastructure
III. Gender equity,	XII. Family houses
IV. Youth and adolescence	XIII. Promotion and facilitation of investments
V. Indigenous communities and afro-descendants	XIV. Local development
VI. Work and prosperity	XV. Urban development
VII. Socioproductive development	XVI. Risk managemetns vs disasters and calamities
VIII. Monetary and financial policy	XVII. Sovereign security
IX. Tax and customs policies	XVIII. Climate change
	XIX. Financing

Source: Axes PNDH (2018-2021)

(2) Main National Economic Goals

The Axes PNDH (2018-2021) have not set quantative goals set for the economic development of Nicaragua.

(3) Industrial Sector Goals, Objectives and Strategies

The industrial sectors goals are included in strategy "VII. Socioproductive development", extracted to Table 3.2.7. Further description of industrial sector goals in the Axes PNDH (2018-2021) are written in Section 3.3.4.

Table 3.2.7 Industrial Sector Goals in Axes PNDH (2018-2021)

VII. Socioproductive development	F. Fisheries and Aquaculture
C. Agriculture	1. Promote good practice, innovative technology
1. Horizontal dialogue (National Plan for Production, Consumption and Trade)	2. Investment
2. New agricultural policies	3. Diversify production
3. Increase production, productivity, etc	4. Manage the resources
4. Strengthen systems,	G. Tourism
D. Small and medium industry	1. Sustainable tourism,
1. Strengthen SMEs	2. Small business and productive enterprises for tourism service industry
2. New ventures	3. Involving all entities in tourism
3. Horizontal networks	4. Promote education and training for tourism
E. Industry	5. Promote national and foreing investment on tourism infrastructure
1. Implement industrial policies	
2. Promote modern technology	
3. Bring together different sectors	
4. Industrial and agro-industrial parks	
5. Mining sector	

Source: Axes PNDH (2018-2021)

(4) Logistic and Transport Sector Goals, Objectives and Strategies

The following strategies touch upon logistic and transportation sectors in the Axes PNDH (2018-2021).

"V. Indigenous communities and afro-descendants", "B. Economic, equitable, sustainable and harmonious transformation between human beings and nature".

1. Establish Multisectoral Development Poles on the Caribbean Coast.
2. Promote infrastructure for economic development: transportation, aquatic, land, air, telecommunications and electrical energy.
3. Promote agribusiness in products that have the greatest potential on the Caribbean coast.
4. Promote the development of tourism.
5. Promote mining, under an environmentally sustainable scheme.

"XI. Infrastructure"

1. Develop road, port, airport transportation infrastructure, railway and border crossings that make up the national territory.
2. Develop social infrastructures for the provision of basic public services of education, health, water and sanitation.
3. Continue developing the municipal infrastructure.
4. Strengthen the safe, affordable, accessible and sustainable public transportation system

3.2.5 Costa Rica

(1) Overview of National Development Plan

PNDIP (National Development Plan and Public Investment Plan) (2019-2022), by MIDEPLAN (Ministry of National Planning and Economic Policy), with the purpose of setting a goal and path to for the country in facing its main challenges and to improve provision of public goods and services to its citizens. There are seven strategic areas,

1. Innovation and competitiveness and productivity
2. Infrastructure mobility and territorial ordering
3. Human security
4. Health and social security
5. Education for sustainable development and coesistence
6. Economy for stability and growth
7. Territorial development

The "Territorial Economic Strategy for an Inclusive and Decarbonized Economy 2020-2050 (Strategy 2050)" was made by the Ministry of National Planning and Economic Policy (Mideplan) with the support of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Inter-American Development Bank (IDB). This will be a technical input for the formulation of the National Strategic Plan 2050 (PEN 2050), providing spatial development strategies for multiple economic sectors.

A territorial structure made of 50 strategic economic nodes and 12,752 km two of management areas support for decarbonization that, connected by 6 development corridors, make up the 12 development poles

(2) Main National Economic Goals

Goals for the economic sector up until 2022 in the PNDIP are shown in Table 3.2.8, designed to generate inclusive economic growth at the national and regional level, in harmony with the environment, generating quality jobs, reducing poverty and inequality.

Table 3.2.8 Main National Economic Goals in PNDIP

Goal	Indicator	Baseline	Year	Minimum Value	Maximum Value
Economic Growth	GDP growth 2017: 3.3% real		2019	3.4	3.4
			2020	3.4	3.6
			2021	3.5	3.8
			2022	3.3	3.3
Unemployment		Open	2019	7.9	8.6

Goal	Indicator	Baseline	Year	Minimum Value	Maximum Value
	Unemployment rate 2017: 9.1%		2020	7.7	8.6
			2021	7.5	8.5
			2022	7.3	8.4
Multidimensional Poverty Index	% of poor households according to MPI	2017: 18.8%	2019	18.1	18.2
			2020	17.5	17.6
			2021	16.8	17.0
			2022	16.1	16.5
Decartonization	Vartiation rate of CO_2 emissions due to the use of fossil fuels	2017: 3.3%	2019	1.5	
			2020	1.5	
			2021	-0.9	
			2022	-0.9	
Inequality	Gini coefficient	2018: 0.511	2019	0.511	
			2020	0.511	
			2021	0.511	
			2022	0.511	

Source: PNDIP, MIDEPLAN

(3) Industrial Sector Goals, Objectives and Strategies

In the PNDIP, the following strategies related to industrial strategies are listed under the strategic area of Territorial Development;

- Program to strengthen territorial economies with an emphasis on the added value of production.
- National program for regional markets. Strengthen the marketing system for fruit and vegetable, fishery, aquaculture and other food products in the Chorotega, Brunca, Huetar Caribe and Central Pacific regions.
- Comprehensive management program for tourist destinations
- Construction, Center for the Exhibition of Products, Events and Business PIMA in the Province of Heredia, Canton Heredia, Ulloa District.
- Design and construction of the Tourist Wharf, Province, Puntarenas, Puntarenas Canton, Puntarenas District.
- Design and Reconstruction of Tourist Pier, Province, Puntarenas, San Lucas Island
- Construction of two Tourist Berths in the Limón Province: 1- Talamanca Canton Cahuita District and 2 - Talamanca Canton in Puerto Viejo
- Construction of the Tourist Delegation in the Province of Guanacaste, Santa Cruz Canton, Tamarindo District
- Infrastructure Improvement in the Tenorio Volcano National Park
- Construction of the Tourist Delegation in the Province of Guanacaste, Canton Liberia, in the Papagayo Peninsula

Further description of industrial sector goals in the PNDIP are written in Section 3.3.5.

In the “Strategy 2050”, 12 development poles were identified in the territory of Costa Rica. This ecosystem contains 50 strategic development nodes, 6 development corridors, and 12,752 km^2 of productive management areas. Together, they comprise 27% of the country's area and are home to 83% of the Costa Rican population.

- Principal Nodes: 17 regional catalysts with strong income generation that produces indirect benefits.
- Secondary Nodes: 18 regional crossings with access to essential urban services and opportunities for skilled labour.
- Specialised Nodes: 14 urban-rural interfaces, with strong links between urban centers andrural territories.
- Management Zones: Rural resources including prioritized forest land and arable land.

(4) Logistic and Transport Sector Goals, Objectives and Strategies

The proposed network ecosystem in the "Strategy 2050", is made up of corridors and nodes. Corridors for development are key connectors to expand national productivity by forming a productive ecosystem that allows catalyzing the 3D (decentralized, digitized and decarbonized) economic transition.

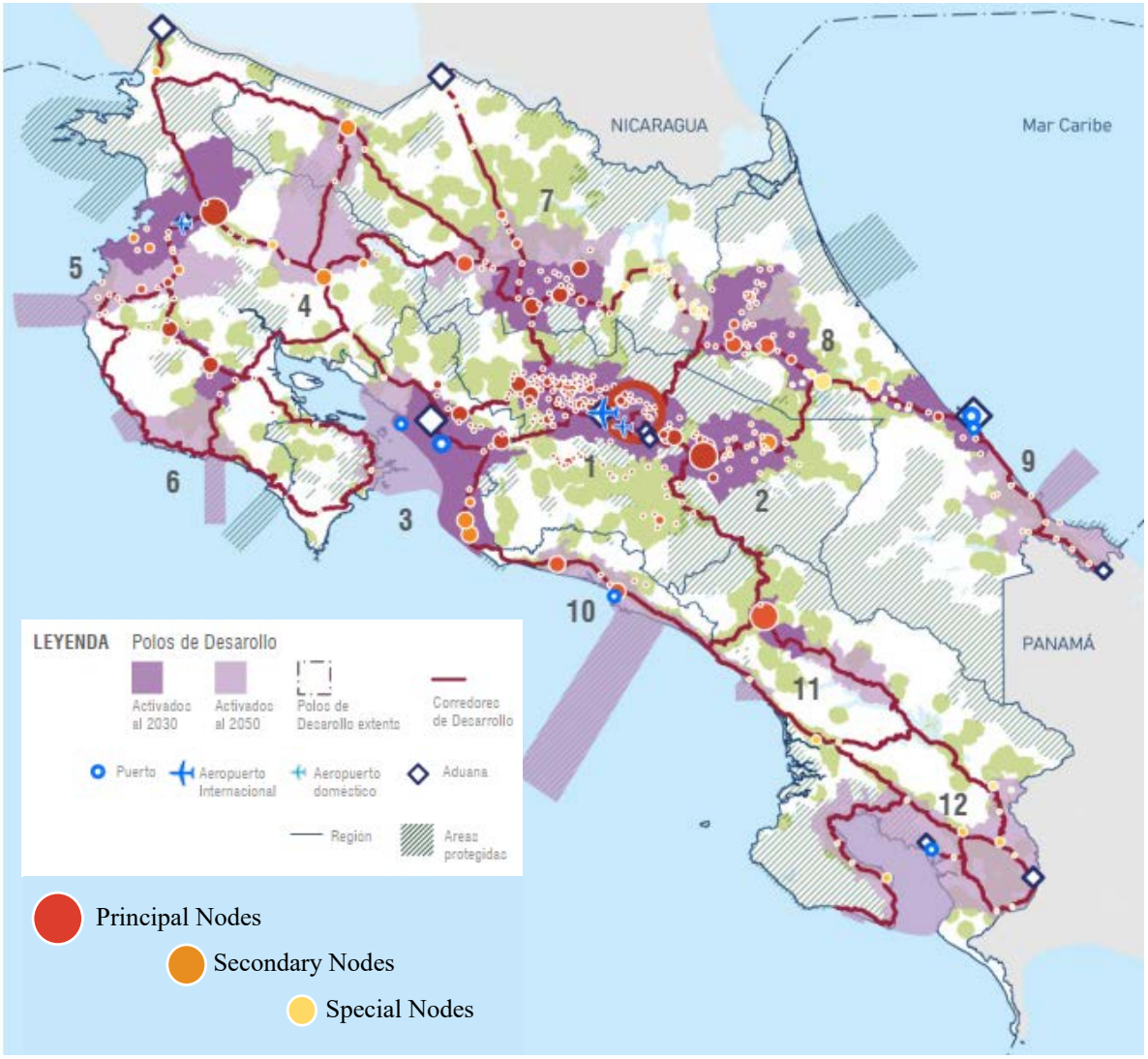
Productive corridors optimize logistics, generate opportunities for adding value to production and imports, and provide better accessibility conditions for those who live in lagging areas. In addition, looking to 2050, they interconnect innovation clusters and knowledge networks. Collectively they expand the productive space of the country.

Table 3.2.9 6 Corridors and 11 Development Poles in Strategy 2050

6 Corridors	1. Corredor Huetar-Caribe + TELCA 2. Súper corredor Pacífico-Caribe 3. Triángulo costero Chorotega	4. Corredor Brunca-Caribe 5. Conector GAM 6. Corredores y escalera marítima
11 Development Poles + La GAM		
1. Gran Área Metropolitana (La GAM)	The GAM is the **administrative, population, and economic center of Costa Rica**, and therefore, the benchmark Development Pole for the entire country. With the greatest economic potential and enabling conditions, the role of the GAM is to promote the 3D economic transition from 2030 with a focus on R&D&I.	
2. I+D+I de Cartago	To the east of the GAM, the Cartagena Pole has the role of promoting and generating links of knowledge with the GAM regarding the dynamics of R&D&I capitalizing on its **established academic centers**. In addition, it has an important **tourist potential related to the Tapantí National Park**.	
3. Turístico-Portuario del Golfo de Nicoya	With Puntarenas as the main node, the Gulf of Nicoya is one of the **central maritime ladders** of the Vision to 2050. **The Port of Caldera, allied with the existing tourist dynamics**, constitutes a key pole to promote the blue economy and integration of the Gulf by 2030.	
4. Conector Ruta 1-Cañas-Tilarán-Upala	Capitalizing on the connections that Route 1 between Cañas-Bagaces provides with Tilarán and Upala, the role of this pole is to achieve **a new gateway to Huétar Norte to close territorial gaps**. From an economic point of view, **agriculture, tourism, and logistics** are the key bets.	
5. I+D+I-Energía Renovable de Liberia	The main role of the pole in Chorotega Norte is to decentralize the development of the GAM and to constitute **a second gravitational economic center for Costa Rica**. It should establish links between **renewable energy projects in Rincón de la Vieja and the advancement of advanced manufacturing in the region.**	
6. Conector Ruta 21-Nicoya-Costa Pacífico	By capitalizing on the connectivity between Nicoya-Santa Cruz on Route 21 and with Route 18 towards the Central Region, the role of this pole is to establish **a gateway for the integration of the Pacific coast**, and consolidation of the ladder **maritime and national blue economy.**	
7. Cultural Quesada-San Carlos	With its axis in the road quadrant between the nodes of Quesada, La Fortuna, San Carlos, and Pital, this pole is key on two fronts: **promoting the green and orange economy,** capitalizing on existing assets in the region, as well as **activating the new customs office in Los Chiles.**	
8. Agrícola-Logístico de Guápiles	One of the **agricultural production centers of the country**, the construction of the **TELCA Corridor** will profoundly change the existing dynamics in the region. Likewise, the role of this hub is to enhance the benefits of this large-scale investment by **increasing the added value of products, generating green jobs and capitalizing on multimodal logistics.**	
9. Portuario del Caribe Limón-Cahuita	It comprises the most important port complex in the country, however the levels of development in this pole are still incipient compared to port complexes globally. Therefore, the role of this pole is to become **the largest port complex with scope in all of Central America.**	
10. Marítimo-Logístico de Quepos-Parrita-Uvita	To **establish a blue economy, a maritime ladder** is necessary connecting the Gulf of Nicoya, the Golfo Dulce, and therefore the Pacific coast. This pole will serve as an intermediate point of connection to achieve these objectives, **both in the maritime and land areas through Route 34.**	

11. Conector Ruta 2-San Isidro-Buenos Aires	The southern portion of the country lacks an efficient **connection between the coast and the central valley** such as that between La GAM and Puntarenas. With a **high agricultural production and proximity to natural resources and important tourist attractions**, the role of this pole is to promote and connect these dynamics with the rest of the country.
12. Turístico-Portuario de Golfito-Golfo Dulce	It has **natural resources, tourism, and the presence of commercial activity,** however the region lacks various enabling conditions and has a high concentration of gaps. The role of this pole is to close these **multidimensional gaps and reactivate economic development by capitalizing on green, blue jobs, and tourism.**

Source: Territorial Economic Strategy for an Inclusive and Decarbonized Economy 2020-2050 (Strategy 2050), MIDEPLAN



Source: Territorial Economic Strategy for an Inclusive and Decarbonized Economy 2020-2050 (Strategy 2050), MIDEPLAN

Figure 3.2.4 Proposed Development Poles in Strategy 2050

3.2.6 Panama

(1) Overview of National Development Plan

The National Strategic Plan with State Vision "Panama 2030", in alignment with the SDGs, was formed by the National Agreement for Development of Panama with aid from UNDP. It is structured around the following four Strategic Axis.

1. Good life for everyone
2. Growing more and better
3. Environmental sustainability
4. Democracy, institutionality and governance
5. Strategic alliances for development

In alignment with "Panama 2030" is the Government Strategic Plan (PEG) was established for the years 2020 – 2024. The five strategic pillars are;

1. Good Governance,
2. Rule of law, law and order functioning,
3. Competitive economy generating income and decent jobs,
4. Fight poverty and inequality,
5. Equitable, comprehensive and quality education.

(2) Main National Economic Goals

Under the strategic axe "2. Growing more and better", the following economic goals are set;

- Strengthen and develop public policies to keep the annual growth rate of real GDP per capita above 4%,
- Increase per capita household income or expenditure growth rates among the poorest 40% of the population and the total population,
- Decrease the number of people living below 50% of the median income.

(3) Industrial Sector Goals, Objectives and Strategies

Under the strategic axe "2. Growing more and better", the following strategy is set;

- Resilient infrastructures, promote inclusive and sustainable industrialization and foster the innovation
- Sustainably increase spending on research, development and innovation (R + D + I) as a proportion of GDP
- Sustainably increase the number of researchers (full-time equivalent value) per million inhabitants for research and innovation to promote inclusive and sustainable industrialization.

Further description of industrial sector goals in the "Strategic Government Plan 2019-2024 of Panama"are written in Section 3.3.6.

(4) Logistic and Transport Sector Goals, Objectives and Strategies

Under the strategic axe "2. Growing more and better", the following strategy is set;

- Resilient infrastructures, promote inclusive and sustainable industrialization and foster the innovation
  - Establish an incentive system for the implementation of resilient infrastructures in the most dynamic engines of the Panamanian economy

In the Government Strategic Plan (PEG) 2020-2024, under the "strategic pillar 3. Competitive economy generating income and decent jobs", the following main tasks and priority actions related to the logistic and transport sector are the following.

Main Tasks under "Public Infrastructure".

1. Strategic planning in public investments, in accordance with the pillars of economic and social development of the country.
2. Modernize the system of public contracting and approval of public and private projects, through the implementation of Digital Government tools.
3. Establish a regulatory framework for PPPs, to guarantee greater efficiency in public investments, seeking to reduce the financial risk of the State.
4. Serve approximately 3,000 kilometers of the national road network, both in new projects and in

maintenance and rehabilitation of existing projects, including bridges.
5. Start the execution of the Urban Drainage Project.
6. Design and implement sections of complete streets in the most important arteries of the Metropolitan Areas of Panama (East and West), to improve mass public transportation (exclusive lanes), to encourage their use and to improve the quality of users.
7. Improve the interconnection between the country's productive sectors and the logistics chain.
8. Improve the connectivity of tourism development poles at the national level.
9. Implement an Infrastructure Management System that allows the optimization of resources and the timely provision of infrastructure. This includes a complete inventory of the national infrastructure.
10. Evaluate Maritime Mobility options. Carry out studies to improve the mobility of residents, tourists and cargo, through the use of ferries and other types of maritime transport.
11. Include in all contracts public infrastructure the "Visible Contractor" clause, so that, from the beginning of the work until its delivery, the contractor keeps the beneficiary communities duly informed.

Priority actions under "Public Infrastructure".

1. Launch the Plan "Manos a la Obra" for the rehabilitation and maintenance of public infrastructures at the provincial and regional level, giving priority to Panamanian companies.
2. Create the "Road Maintenance Fund (FOMAVI)", which will finance projects for the rehabilitation and permanent maintenance of the national road network, by province and region, encouraging the participation of national companies. The infrastructure maintenance program must be implemented in the first year of government.
3. PRISMA: Comprehensive Reorganization Plan of the district of San Miguelito and Surroundings. Investment in Public Infrastructure and Mobility, including the Metrocable, construction of Art, Culture and Sports Centers.
4. Urban Drainage Project, focused on improving metropolitan storm drains and managing rainwater in urban areas, especially in critical flood points in Panama City.
5. Panama West Road Network. Includes a coastal road to Puerto Caimito / La Chorrera and connections, the Highway and the Highway Pan American.
6. Bridges for Progress. Construction of 100 modular bridges to connect hard-to-reach communities.
7. Build the Coquira Bridge in Chepo.
8. Execute the Plan "Comarcal Roads" for the construction of highways, roads, bridges and wattles for the development of the Comarcas, as part of the regional development plans, proposed by the original peoples themselves and validated by planning.
9. Complete streets. New sections of urban streets, with exclusive Metrobús lanes.
10. Build the Peripheral Ring (bypass) of David. (North Route)
11. Build the Arenas / Veraguas - Tonosí / Los Santos roads.
12. Road projects to resolve critical intersections, such as: Via Brasil - Via España, La Cabima / Transístmica, Pocr / Aguadulce, Hospital José Domingo De Obaldia, Sabanita, Hospital Nicolás A. Solano, among others.
13. Build the Quebrada López - Santa Rita - María Chiquita highways. The highway for the development of the Costa Arriba de Colón.
14. "Asphalting Your District" Program. 55 projects nationwide for the rehabilitation of streets.
15. Expand the Via Transístmica between Villa Grecia and the Don Bosco Bridge (Chilibre) to four lanes.
16. Build vehicular access from the Cinta Costera 3 to the Amador Convention Center.

Main tasks under "Transport".

1. Institutional restructuring of the Land Transit and Transportation Authority (ATTT).
2. Continue with the construction of Line 3, Albrook-Ciudad del Futuro.
3. Design and implement complete street sections on the most important arteries of the Metropolitan Areas of Panama (East and West), to improve mass public transport (exclusive lanes), encourage its use and to improve the quality of users.

4. Promote new transportation terminals, either through the State, municipalities or private companies, together with carriers in some main points of district capitals, which do not have these facilities.
5. Promote a national signaling plan to improve vehicular traffic and reduce traffic accidents.
6. Order the cargo transportation system, so as to minimize the negative impact of cargo movement in urban areas.
7. Incorporate new technologies into the taxi service, where the transport employer, the vehicle owner and the user can establish a positive regulatory framework for all.
8. Address the need for public parking in the main cities of the country.
9. Launch a National Plan for the Prevention of Traffic Accidents, which includes the identification of the points of the national highways where there are more accidents for the corresponding signaling.
10. Promote, through the Joint Task Force, a plan for emergency care and timely response to traffic accidents, to attend to victims and reduce waiting on the roads.

3.2.7 Regional Summary

Characteristics of the national development plans are summarized in Table 3.2.10. There are major differences in how up-to-date the national development plans or equivalent plans are, between the six countries. While some countries have hierarchical structures of national policies, from long term visions, mid-term plans and short term action plans, some countries only have one or the other. This can also be said to the structure within each plans; some are rich in diagnosis, have a clear vision and objective that are backed by implementable strategies and actions, while other plans are not as complete.

When looking at the contents of the plans, for all countries that have macro economic goals, mid-term goals are set above 3.3%, showing how each nation identifies large areas of economic development potential. In terms of target industries, it is clear that all countries have agriculture and tourism as a high priority, while some countries also identify manufacturing sectors such as agroprocessing sectors. For the logistic and transport sector goals, all countries have lists of actions and projects for specific sectors, but some countries lack in cross sectoral concepts and strategies, as well as spatial strategies.

In some cases, the industrial strategies and logistic targests are integrated well to achieve the overall development goals. For example in Guatemala's case, the 11-11-9 strategy proposed in The National Competitiveness Policy (2018-2032) identifies target industrial products and issues, combined with 9 intermediate cities that are to develop in to important nodes of the nation's multitransit network. These strategies will contribute to rural development, correcting disparities between urban and rural areas, which is part of the K'atun Nuestra Guatemala's goal under "Urban and Rural Guatemala." While not stated in the plans, similar effects can be envisioned in the other countries' plans. The planned logistic infrastructure aimed to support agriculture will support regional economic development in the underdeveloped areas, contributing to a more balanced and equal development.

Table 3.2.10 Regional Summary of National Development Plans

	Guatemala	El Salvador	Honduras
Nat'l Dev Plan	K'atun Nuestra Guatemala 2032 / The National Competitiveness Policy (2018-2032)	Plan Cuscatlán	National Plan 2010-2022 / Government Strategic Plan (PEG) (2018-2022)
Macro Economic Goals	5.4% real GDP growth by 2032. • Range between 3.4 and 4,4, from 2015 to 2020 • Range between 4.4 and 5.4%, from 2021 to 2025 • No less than 5.4%, from 2026 to 2032	• Greater international competitiveness • Economic growth rate of at least 3.5% etc.	• Poverty households less than 15% • Open unemployment rate to 2%, invisible unemployment rate to 5% • Exports / GDP ratio to 75% • Global Competitiveness Index to position 50
Industrial Sector Goals, Objectives and Strategies	Under the strategic guideline called 11-11-9, 11 industrial clusters with the greatest potential for generating employment, 11 priorities to address competitiveness and 9 territories capable of consolidating were chosen.	Since the purpose of Plan Cuscatlán is to explore the basis of growth during the 2019-2024 period, there are few specific actions, but the agenda is to break away from the focus on specific industrial sectors.	Four areas are raised to be promoted towards international markets. Specific actions are not mantioned (instead included in PEG)
(Target Sectors)	• Forest, furniture, paper and rubber • Fruits and vegetables • Processed foods • Drinks • Textile, clothing and footwear • Metalworking • Light Manufacturing • Tourism and Health Services • ICTs, software & Contact Centers • Transport and logistics • Building	Agriculture and Tourism. New higher value-added fields such as renewable energy, eco-friendly agriculture and fisheries, and design and marketing in the apparel industry	(i) A new moment of the maquila (this time oriented to services such as Contact Centers and Back Office services); (ii) The integral development of Honduras' potential agri-food; (iii) The promotion of the forestry sector as one of the three most important natural resources in the country and; (iv) The integral development of tourism.
Logistic and Transport Sector Goals, Objectives and Strategies	Reinforcing the connection of the production areas, markets and cities, and developing the productive infrastructure and service links in rural areas. Stategies are well shown with spatial description and budgeting.	Since the purpose of Plan Cuscatlán is to explore the basis of growth during the 2019-2024 period, there are few specific actions, but some actions and projects are listed for "Roads", "Transport" and "Ports, airports and customs".	The strategy is to develop regional logistic platforms and improving rural areas. • Efficiency and Quality of the Transportation of People and Goods • Greater Efficiency in Sea Ports • Development of Air Transport • Affordable, Reliable and Sustainable Energy • Breaking the Digital Divide

	Nicaragua	Costa Rica	Panama
Nat'l Dev Plan	Axes PNDH (2018-2021)	PNDIP (2019-2022)	Panama 2030
Macro Economic Goals	The plan mainly explores concepts of social productivity through social development, job creation and poverty reduction, with mention of economic and industrial development, especially on the Caribbean side, but without concrete macro economic goals.	• Real GDP Growth: 2022 (3.3 - 3.3) • Unemployment rate: 2022 (7.3 - 8.4) • Multidimensional Poverty Index: 2022 (16.1 - 16.5) • Inequality Gini coefficient : 2022: 0.511	• Annual growth rate of real GDP per capita above 4%, • Increase per capita household income or expenditure growth rates among the poorest 40% of the population and the total population, • Decrease the number of people living below 50% of the median income.
Industrial Sector Goals, Objectives and Strategies	Broad target industrial sector areas are included in strategy "VII. Socioproductive development".	Industrial strategies are listed under the strategic area of "Territorial Development".	There is little mention of concrete industrial development goals, and instead included in "Strategic Government Plan 2019-2024 of Panama" (see Section 3.3.6)
(Target Sectors)	• Agriculture • Agro-industrial parks, Mining • Fisheries and Aquaculture • Tourism	• Food production • Tourism	Research, development and innovation
Logistic and Transport Sector Goals, Objectives and Strategies	Broad targets on infrastructure development, but no concrete actions or projects.	Network ecosystem made up of corridors and nodes as key connectors to expand national productivity.	Concrete tasks and goals consistent with the overall strategies and goals, but no spatial strategies

Source: JICA Study Team

3.3 Industrial Development Plan

3.3.1 Guatemala

(1) Industrial Policy Proposal based on Competitiveness and Innovation 2016-2044

The Ministry of Economy with the support of the Chamber of Industry of Guatemala provided a diagnosis of the current situation of Guatemalan industry and proposes new strategies to improve the sector's competitiveness internationally.

The expected results for the year 2044 are:

1. Increasing the share of the industrial sector from 19% to 40% of GDP.
2. Tripling the income of workers in the formal manufacturing sector.
3. Increasing formal employment in manufacturing, from 3% of the economically active population to 20%.
4. Ensuring that at least ten new manufacturing products, whose technology has been developed largely in the country, are among the top fifteen export products.

Guatemala must bet on a mix of policies vertical (sectorial) and horizontal (transversal) to initiate and sustain high levels of growth.

Horizontal or cross-cutting policies are:

- Promote the strategic urbanization of the country.
- Expand transportation infrastructure.
- Promote education for work.
- Invest in research and development (R&D).
- Develop the financial market and the capital market.
- Improvement in the level of efficiency in company operations.
- Align the electricity market to the needs of industrial development.
- Make the labor market more flexible.
- Promote market intelligence to diversify markets and products.
- Simplify and facilitate the procedures.

Vertical or cross-cutting policies are:

- Create special development zones.
- Involve local governments in attracting investment.
- Promote different foreign trade tools.
- Export to other developing countries.
- Prioritize the attraction of investors that allow generating leaps of innovation and productivity.
- Promote the integration of value chains.
- Develop research and development (R&D) capabilities.
- Promote the adoption of quality standards.
- Facilitate the entry of foreigners to promote strategic sectors.
- Boost industrialization tactic.

(2) The National Competitiveness Policy 2018-2032

The National Competitiveness Program -PRONACOM- of the Ministry of Economy of Guatemala formulated the National Competitiveness Policy 2018-2032 addressing the interventions and investments necessary to resolve gaps in competitiveness and enhance the productive activity of the clusters identified in territories suitable for urban consolidation. The Policy is structured under the three strategic guidelines called 11-11-9: (11 clusters with the greatest potential for generating employment, 11 priorities that

Guatemala must address in terms of competitiveness and 9 territories capable of consolidating). These guidelines seek improve competitiveness to increase national productivity, and thus generate inclusive, accelerated and sustainable economic growth.



Source: The National Competitiveness Policy 2018-2032

Figure 3.3.1 Guidelines 11-11-9

a) 11 Clusters

The following is a brief description of the 11 clusters including the productive potential, employment and competitive issues to be overcome.



Source: The National Competitiveness Policy 2018-2032

Figure 3.3.2 Prioritized Sectors

Table 3.3.1 Clusters and the Relevance

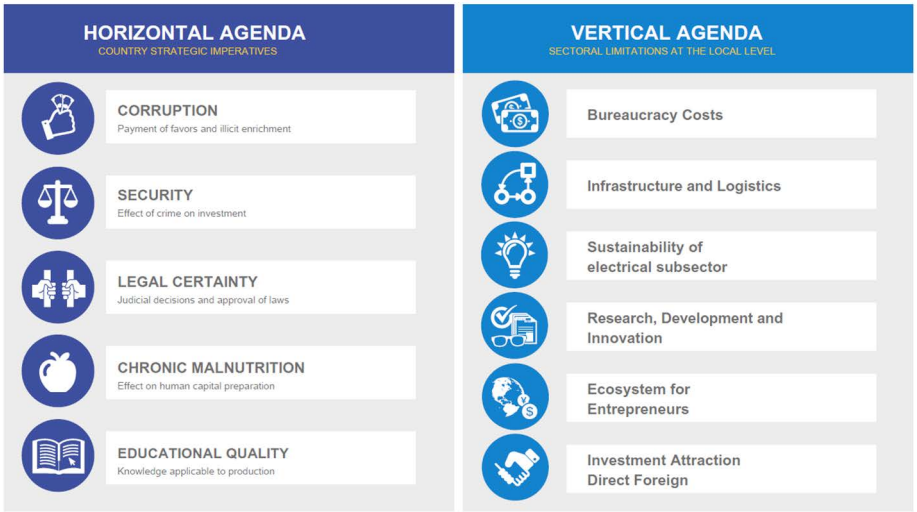
Cluster	Relevance
Forest, furniture, paper and rubber	It consists mainly of wood and non-wood products, paper, cardboard and rubber. The sector employed about 102,000 people by 2009 and, in the last 10 years, it has presented an average increase in its exports of 10% per year.
Fruits and vegetables	It is made up of fresh and frozen fruits and vegetables; in addition to differentiated products such as spices and cardamom. The sector represents about 38% of national agricultural production, which corresponds to about 6.3% of GDP by 2012 and generates approximately 123,000 jobs.
Processed foods	It consists of the production of confectionery, preserves and other processed foods. By 2016, the cluster represents 65% of exports in the food and beverage sector. It generates approximately 75,000 jobs.

Cluster	Relevance
Drinks	It consists of the processing and packaging of purified water, ethyl alcohol, spirits, carbonated drinks, fruit-based drinks and beer. The production of this cluster represents 1.1% of the GDP and employs about 18,000 people. From 2007 to 2010, exports grew by 5%.
Textile, clothing and footwear	It consists of fabrics, clothing and footwear. This sector has represented close to 4% of GDP and in the last 20 years it has had an annual average growth of 9% in its exports, being the largest generator of foreign exchange.
Metalworking	Corresponds to long metal products, drawn, flat, tubular and raw materials. Its participation in the economy is approximately 1.1% of GDP and it has created around 32 thousand jobs.
Light Manufacturing	It is made up of products of light machinery, electronics, transportation and sophisticated instruments. It has created around 70,000 jobs and has the potential to generate 56,000 more by 2021.
Tourism and Health Services	Focused on cultural tourism, business and conventions and special interests (nature, health and wellness, poultry and schools in Spanish). This sector has the capacity to generate 90 thousand jobs by 2021
ICTs, software & Contact Centers	Made up of three main subsectors: software, digital content and development, contact and call centers, and business process services. There are around 700 companies focused on these services and together they provide 22 thousand formal jobs.
Transport and logistics	Focused on the transport of goods. According to the Logistics Performance Index, the country is ranked 111 out of 160, with a score of 2.5 / 5 (World Bank, 2016).
Building	It is made up of two subsectors: housing and infrastructure. By 2015, this sector represented 3.9% of GDP in 2015 and had 232,000 people employed.

Source: The National Competitiveness Policy 2018-2032

b) 11 Priorities

The areas of action were identified for each of the 11 prioritized topics, operatively distributing them into two agendas: A Horizontal Agenda, which integrates 5 “Strategic country imperatives”: Corruption, justice system, costs of violence, chronic malnutrition and educational quality; and a Vertical Agenda, which varies in intensities, but whose approach is better at the local level and which presents 6 "Sectoral limitations at the local level": Bureaucracy, infrastructure, sustainability of the electricity subsector, technical training, ecosystem for entrepreneurs and attraction of investments.



Source: The National Competitiveness Policy 2018-2032

Figure 3.3.3 Competitiveness Priorities

c) 9 Territories

The National Competitiveness Policy focuses actions on the regional territorial scale, towards the so-called Intermediate Cities.



Source: The National Competitiveness Policy 2018-2032

Figure 3.3.4 Intermediate Cities

The nine Intermediate Cities, Territorial Competitiveness Strategies, are conceived as instruments of strategic planning with a territorial nature and built with local actors, considering the potential production of each territory and addressing the identified competitiveness gaps.

3.3.2 El Salvador

In El Salvador, successive administrations have formulated a national development five-year plan (SYDP), and based on this plan, each ministry has created a five-year plan for the responsible sector and operated the administration. President Bukele was born with a big victory of about 53% in the presidential election in February 2019, and has strong support and expectations from the people (the support rate has consistently maintained 80% or more, and as of 7th October, 2020, 92%, CID Gallup). The Bukele administration's SYDP scheduled for January 2020 has not yet been announced, so there is no official sector plan available yet (Ministry of Economy information).

In El Salvador, all previous plans will be blanked out when the administration changes, so the only official policy currently available is the Plan Cuscatlán announced by President Bukele as the Promises when he took office. It was announced in January 2020 that an "economic take-off plan" would be formulated, but it has not been announced as of September (information on the Embassy of Japan in El Salvador).

The LAC countries including El Salvador have policy goals that include poverty eradication, inequality reduction, economic growth, climate change, and the SDG. The Government of El Salvador considers that

the SDGs are an integral and indivisible guide for progress towards sustainable development, which have important coincidences with the development objectives defined by the Government in its Five-Year Development Plan "El Salvador Plan Quinquenal de Desarrollo ～ productive, educated and safe 2014-2019 (PQD 2015)". From the analysis carried out of the 2030 Agenda and the PQD (2014-2019), the coincidences of SDG numbers 8, 4 and 16 can be highlighted: decent work and economic growth; quality education; and peace, justice and solid institutions, with the three priorities defined in the PQD: (i) productive employment generated through a model of sustained economic growth, (ii) education with inclusion and social equity, and (iii) effective citizen security. ("Revisión Nacional Voluntaria de la Implementación de la Agenda 2030 para el Desarrollo Sostenible en El Salvador（2017.07）" https://agenda2030lac.org/es/paises/el-salvador)

(1) Plan Cuscatlán

Plan Cuscatlan summarizes the reforms of the new administration by President Bukele, especially the security issues, corruption and bureaucratic inefficiencies of previous administrations by sector. The separate volume classified as Economy contains 3 programs and 12 actions, which benefits not only large companies but also producers about cooperation between industries, high added value of each industry, and manufacturing industry related to Makira. It is touted such reforms support by creating an export platform for agricultural products and crafts, and cost reduction related to trade in industrial products between Central American countries. As stated in V. Strategies, since the purpose of Plan Cuscatlán is to explore the basis of growth during the 2019-2024 period, there are few specific actions, but the agenda is to break away from the focus on specific industrial sectors. It is proposing the development of higher value-added fields such as renewable energy, eco-friendly agriculture and fisheries, and design and marketing in the apparel industry[2].

(2) Plan de Acción de Facilitación de Comercio[3]

On October 11, 2019, the National Committee for Trade Facilitation approved the first Action Plan that contains those activities agreed upon by the government and the private sector to streamline trade and create a more favorable environment for attracting investment in the country. The Action Plan contains 60 specific activities that focus on areas such as simplifying procedures, reducing costs, improving infrastructure, and institutional strengthening, for the 8 objectives in the following table.

Table 3.3.2 Eight Objectives

Objective 1	Strategic Planning of Long-Term Trade Facilitation
Objective 2	Reduction of Technical Obstacles to Regional Trade and with Third Countries
Objective 3	Time and Cost Reduction through Simplification and Improvements in Control Processes
Objective 4	Improvement in Infrastructure
Objective 5	Legal Order that Favors Agile and Transparent Procedures
Objective 6	Privilege Use of Technology to Facilitate Trade
Objective 7	Transparency and Effective Communication between Government Institutions and the Private Sector
Objective 8	Institutional Strengthening

Source: JST based on Plan de Acción de Facilitación de Comercio, Comite Nacional de Facilitacion del Comercio

These actions are expected to contribute to creating an ecosystem that contains elements that promote local and foreign investment; the production of goods and services of higher added value and quality. Other advances of the National Committee for Trade Facilitation since the re-launch of the Committee last July, significant progress has been made in areas such as:

[2] (https://www.plancuscatlan.com/)
Plan de Acción Nacional El Salvador 2018-2020 (PAN) AGA (Alianza para el Gobierno Abierto)

[3] http://infotrade.minec.gob.sv/ca/wp-content/uploads/sites/7/2019/10/Plan-de-Accion-Facilitacion-de-Comercio-2019-MINEC.pdf

- Simplification of procedures for obtaining health records, by conducting analysis in private laboratories during vacation periods,
- Strengthening of the central laboratory of the Ministry of Health,
- Review of the Customs Law proposal, presented by the private sector.

According to a study carried out by the World Trade Organization, the full implementation of the Trade Facilitation Agreement could reduce trade costs by 14.3%, with developing countries benefiting the most[4].

(3) Economic Takeoff Plan

In January 2020, the government announced the Economic Takeoff Plan, which seeks to improve conditions in the area at both the macro and micro levels. President Bukele demanded coordinated work from his officials for improving the country's economic conditions and facilitating national and foreign investment are two of the objectives that the Government intends to achieve with the implementation of the Economic Take-Off Plan. Agriculture, tourism, e-commerce, streamlining customs, optimizing taxes, establishing "solid" legal frameworks, effective interconnection, improving telecommunications, formalizing the informal sector, developing social housing projects, improving road connectivity and other aspects will be addressed in the plan. In February 2020, the Minister of Economy announced that the Economic Takeoff Plan has identified the changes that must be made, both locally and abroad, to reactivate the economy in the short term. The Minister also stated that the Investment Facilitation Plan contemplates accompaniment to companies, use of technological tools, facilitation of information, reduction of technical obstacles and execution of activities that improve our position in international indicators. According to the plan, it is possible to reduce the import tariffs for electric vehicles from 30 to 0%, promoting electromobility and advancing in innovation, modernization and care for the environment. President Bukele mentioned that it is going to take six months to formulate the plan but at the time of writing, October 2020, the plan is not yet been publicized.

(4) La Política Nacional de Fomento, Diversificación y Transformación Productiva (PNFDTP)

According to Plan Nacional de Logística de Cargas (PNLOG) El Salvador 2018-2032, PNFDTP is an instrument of integrating all public initiatives aimed at improving state-owned enterprises, thus absorbing all production policies to date. In other words, the implementation of industrial policy studies and their objectives, guidelines, priority strategic axes, etc., are summarized. This plan identifies a set of sectors of strategic interest for the development of El Salvador as follows;

- Textil y confección
- Plasticos
- Agroindustría
- Industría Informática
- Quimica farmacéutica y cosmética natural
- Alimentos y bebidas
- Industrias Creativas
- Calzado

Although PNFDTP is mentioned above in PNLOG, the actual document was not found. The nine sectors listed as policy industry sectors shown in the presentation material on PNFDTP by MINEC are shown below. You can see the slight difference in the sector contents.

[4] MINEC website at http://infotrade.minec.gob.sv/plan-de-accion-de-facilitacion-de-comercio/



Source: MINEC Website

Figure 3.3.5 Priority Sectors of PNFDTP

(5) PNODT: ELS Plan Nacional de Ordenamiento y Desarrollo Territorial

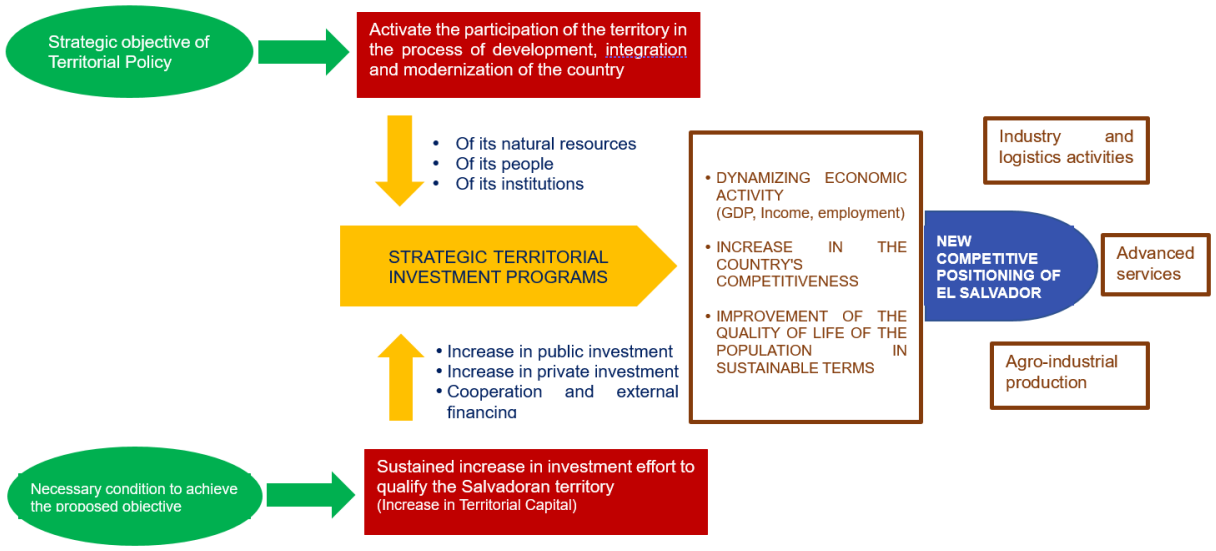
In consideration of the existing problems and the socio-territorial challenges that El Salvador might face, the existing territorial opportunities and the demands of the population, the general objective is to achieve the full incorporation of the territory and its natural resources and humans to the process of modernization and sustainable development of the country in order to achieve the common good and to improve the quality of life of the population.

To achieve this objective, the National Plan for Territorial Planning and Development (PNODT) analyzes the issues that affect territorial policy (social, economic, environmental , urban, infrastructural and institutional). Also, the uses and potential of the national territory are studied and evaluated in order to promote the management of it and its resources under a sustainability approach. Its strategy for economic development is described in the chapter 6, Territorial Strategy for Socio-Economic Development as follows;

"The territory of El Salvador, including its infrastructural and urban systems, requires developments and transformations of high structural significance and high economic cost; it requires a significant investment effort. The qualification of the territory to be achieved through the aforementioned investment effort must be of great importance for:

- Improve the quality of life of the population in sustainable terms;
- Strengthen economic growth in the short and medium term;
- Increase the country's competitiveness in international markets and expand its business base.

The strengthening of public investment in territorial capital is in the long term a necessary condition to enable a greater role for private investment. And this, as a whole, is a factor of great importance for the short-term increase in capital formation and national income. And for the medium and long-term strengthening of the competitiveness and development potential of the Salvadoran economy."



Source: PNODT

Figure 3.3.6 Flow of PNODT

(6) Estrategia Integral de Fomento a Las Exportaciones 2010-2024 ~ 5 objetivos para internacionalizar las empresas e incrementar la competitividad de El Salvador, 2015[5]

El Salvador faces the challenge of making a change in the traditional productive structure, in the way of promoting jobs and in the way of generating national income. This implies adopting a series of changes in the definition of public policies, in the country's vision and in the way of doing things. The government focuses its efforts in the areas of exports; market diversification; and improving the climate for investment, developed within the framework of the Comprehensive Strategy for the Promotion of Production. One of the strategic bets is to strengthen and diversify exports and international markets, in this sense, the CECT (the Economic, Commercial and Tourism Councilors) program seeks to take advantage of the opportunities presented by foreign trade, particularly, preferential access to markets, economies that present higher growth and commercial openness. In Chapter III, it has the clear vision of the country they want, as its Goals;

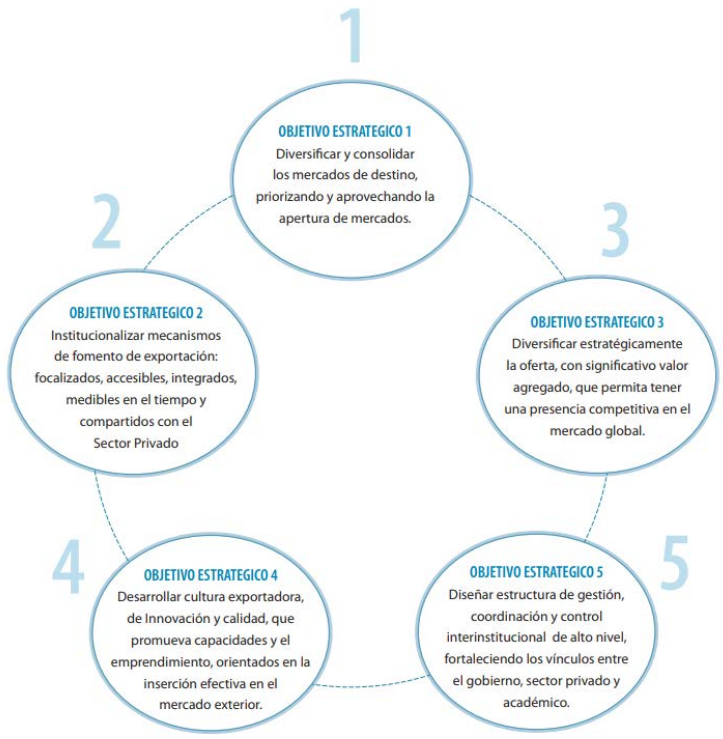
"The establishment of goals in the context of the Axes of the proposed Foreign Trade Agenda encompass 4 areas of measurement of results, which include not only the volume of sales abroad, but also the increase of companies with export capacity, as well as the diversification and increase of the products and destinations that it seeks to penetrate in the medium term."

Meta	2008	2024
N.º exportadores 1/	428	1,200
N.º destinos 2/	52	75
N.º Volumen exportado (US$ millones)	4,500	15,000
N.º de productos 2/	462	750

1/ Exportadores con ventas mayores de US$500,000 anuales.
2/ Destinos y productos con más de US$500,000 de exportaciones.

Five objectives for the internationalization and increase of the competitiveness of El Salvador.

[5] http://www.minec.gob.sv/descargas/estrategia_fomento_exportaciones/



Source: CECT

Figure 3.3.7 CECT Program

Table 3.3.3 Strategic Objectives and Areas

STRATEGIC OBJECTIVE 1	STRATEGIC OBJECTIVE 2
Diversify and consolidate the destination markets, prioritizing and taking advantage of the opening of markets.	Institutionalize export promotion mechanisms: focused, accessible, integrated, measurable over time and shared with the Private Sector
STRATEGIC AREAS	**STRATEGIC AREAS**
1. Taking advantage of priority markets / countries	6. Competitiveness of the local market as a stage prior to export.
2. Identify strategic sectors / products to develop.	7. Financing, especially for SMEs
3. Negotiation, administration and defense of commercial agreements	8. Procedures to support foreign trade
4. Export promotion management	
5. International Marketing: Country Image.	

STRATEGIC OBJECTIVE 3	STRATEGIC OBJECTIVE 4
Strategically diversify the offer, with significant added value, which allows having a competitive presence in the global market.	Develop export culture, innovation and quality, which promotes skills and entrepreneurship, aimed at effective insertion in the foreign market.
STRATEGIC AREAS	**STRATEGIC AREAS**
9. National Innovation System (SNI).	13. Coordinate and promote inter-institutionally the themes of export culture, innovation and quality.
10. National Quality System (SNC).	14. Diffusion of the export culture, innovation and quality.
11. Foreign direct investment.	
12. Platform “Salvadorean Bridge	

STRATEGIC OBJECTIVE 5
Design a high-level inter-institutional management, coordination and control structure, strengthening the links between the government, private sector and academia.
STRATEGIC AREAS
15. Public institutionalization for monitoring, implementation and decision-making for exports, investment, innovation and quality.
16. Strengthening the link between the government and the private sector

Source: JST based on the Estrategia integral de fomento a las exportaciones 2010-2024

Table 3.3.4 Productive Sectors Represented by COEXPORT[6]

Agricultural, Animals	Agri - Food	Coffee	Textiles
Footwear, Accessories	Maquila	Mechanical metal	Wood, building supplies
Pharmaceutical chemist	Plastics	Paper and paperboard	Crafts and Gifts
Services			

Source: COEXPORT

Table 3.3.5 Strategic Sector by PROESA[7]

Agroindustry	Aeronautics	Energy	Textile & Apparel
Light Manufacturing	Auto parts, Medical devices, Passive electronic components, Footwear, Chemical-pharmaceutical and cosmetics		
Offshore Business Services	Contact centers, Business processing services, IT services		
Tourism	Tourism, Medical tourism and Health Services		
Public-Private Partnership			

Source: PROESA

3.3.3 Honduras

(1) The Government Strategic Plan (PEG) (2018-2022)

The Government Strategic Plan (PEG) (2018-2022) will serve as a medium-term planning tool in compliance with the national objectives and goals of the Country Vision (2010-2038) and the guidelines and indicators of the National Plan (2010-2022). Another very important reference for this government plan is the Sustainable Development Goals (SDGs). The implementation of the PEG 2018-2022 in the inclusive and sustainable economic growth sector seeks increasing employment and entrepreneurship opportunities, especially for the young generation, in the formal sector of the economy. This is intended to be accomplished through the following sectoral strategies:

a) Attraction of Investments and Generation of Employment

Objective:

Promote greater economic growth and the generation of decent employment, consolidating the macroeconomic conditions and improving the environment to attract investment.

[6] La Corporación de Exportadores de El Salvador https://catalogoexportador.com/coexport
[7] El Organismo Promotor de Exportaciones e Inversiones de El Salvador https://www.proesa.gob.sv/investment/sector-opportunities

Policy measures:

- Continue implementing the components of the Fiscal Responsibility Law with the purpose to guarantee fiscal consolidation and debt sustainability.
- Strengthen the implementation of the Medium Term Macro Fiscal Framework, as a means to guarantee compliance with the Fiscal Responsibility Law.
- Develop a policy of optimization and rationalization of tax exemptions, to promote strategic sectors and products.
- Manage the approval of the reforms to the Central Bank Law.
- Implement a national competitiveness strategy, focused on the basic factors and the innovation.
- Develop a policy to promote foreign investment that integrates the different programs and actions of related public institutions
- Promote increased productivity of capital and labor in key sectors.
- Expand training and job training programs, especially for the younger population.
- Manage public initiatives to generate employment and opportunities.
- Strengthen the platforms for linking job supply and demand.

b) Development of Productive Potentials

Objective:

Promote productivity, competitiveness and diversification of the productive sectors, of greater potential for economic growth and poverty reduction.

Policy measures:

- Promote productive diversification with crops of high commercial value.
- Promote the development of production chains, with an export orientation.
- Develop and promote the implementation of the National Plan for Scientific Development, Technological and Innovation.
- Strengthen the statistics of the agricultural sector, to improve decision-making.
- Develop a comprehensive tourism development strategy, with the support of public entities related parties and the private sector.
- Expand the irrigation infrastructure, in support of the productivity and agricultural diversification of small and medium producers.
- Strengthen training programs and technical assistance for farmers under a focus of sustainable development.
- Create the Land Bank as a comprehensive information tool, to promote development from the rural area.
- Encourage the development of productive and innovative ventures.
- Develop a comprehensive strategy for the development of MSMEs.
- Design and implement a regulatory framework that makes the conditions of access to credit more flexible for MSMEs
- Consolidate the Solidarity Credit Program and creation of the digital solidarity credit.

c) Financial Inclusion

Objective:

Improve the access of the population and the productive sectors to the products and services they offer in the institutions of the national financial system.

Policy measures:

- Strengthen the national structure for the implementation of the National Inclusion Strategy Financial (ENIF), with multisectoral coordination (public and private sector).

- Promote the diversification of the offer of financial products and services, with an emphasis on development of digital financial services.
- Design and implement a National Financial Education Strategy (ENEF) with the objective to strengthen the financial capacities of the population.
- Follow up on the strengthening of the assets of the reciprocal guarantee funds administered by CONFIANZA SA-FGR, with the purpose of improving MSME access to financial resources
- Design and implement a regulatory framework for financial inclusion, with an emphasis on access on credit through financial institutions.
- Establish a consolidated financial information system that allows generating indicators of inclusion and financial education.

3.3.4 Nicaragua

(1) National Human Development Plan (PNDH 2012-2016)

In Nicaragua, the five-year national development plan is the basic policy for development, and the National Human Development Plan (PNDH 2012-2016) aims for stable growth of the national economy through the participation of citizens from all social classes. It also aims to attract investment, strengthen socio-economic capital, reduce poverty through sustainable economic growth, form a stable society, and restore lost basic human rights. However, the next five-year plan, PNDH 2017-2021, has not yet been formulated. Although far from the updated version of PNDH, there is the Axes PNDH 2018-2021, in which its contents are simple. As for other economic policies, the Economic-Financial Program (PEF) 2014-2018 and The Production, Consumption and Trade Plan (2017-2018) are described in the PNLOG (National Strategic Plan on Cargo Logistics) Nicaragua 2018-2032, but the actual documents are not available.

Although the economy declined by 3.9 percent in 2019, signs of recovery were seen in many productive sectors. Thus, from the second quarter of 2019, most economic activities showed some convergence to better performance compared to previous quarters. Overall results were mixed, with activities that continued registering positive dynamics, mainly from the primary sector and others with a very weak evolution, but that in the second semester they began to show a decrease. Thus, in 2019, due to the focus on production, the result of economic activity was mainly explained by reductions in construction activities, financial intermediation and related services, fishing and aquaculture, commerce, transport and communication, among others. However, dynamism was observed in agriculture, livestock, mining and quarrying, and hotel-restaurant activities, among others.

The productive activity showed a mixed behavior in 2019, with the growth of the mining and agricultural sectors standing out. Thus, the activity of mines and quarries grew 14.7 percent, the livestock sector 4.8 percent and the agricultural 3.7 percent. Meanwhile, forestry decreased 1.5 percent and fishing and aquaculture 14.5 percent. The manufacturing sector, due to the strong decrease in the first quarter, ended the year with a slight growth of 0.2 percent, driven by the positive impulses of the second and fourth quarters. Construction was the sector with the greatest reduction in 2019 (-38.1%). For its part, service activities, although in general they continued to decline, showed signs of stabilization or recovery, in particular, the activity of restaurants and hotels grew 3.4 percent and trade slowed the decline to 9 percent (-12.4% in 2018). Meanwhile, some activities continued to decline, such as financial intermediation (-16.6%) and transportation and communications (-7.7%).

(2) Axes PNDH 2018-2021:

It mainly describes the concept of social productivity through social development, job creation and poverty reduction, but regarding economic growth on the Caribbean side, which is underdeveloped, it is referred to as "Polo Multisectoriales de Desarrollo en la Costa Caribe", especially agricultural products. In addition to emphasizing the potential of the processing industry, it also advocates industrial productivity, modernization, diversification, development of industrial parks and investment promotion. Agricultural and livestock farming accounts for nearly 90% of Nicaragua's primary industry, emphasizing the formation of cooperatives and consideration for small and medium-sized and micro-producers. In terms of GDP

composition, the tertiary industry accounts for 51%, but more than 40% of the working population is engaged in agriculture, and 80% of rural income is particularly important because it is dependent on agriculture. Coffee (18%), sugar cane (5%), peanuts (4%) and legumes (3%) account for exports. Eighty percent of coffee production is in the northern highlands and 84% of sugar cane production is in the northern Pacific region. Livestock products are the most important products, accounting for 31.5% of exports. Beef is exported to the United States, livestock to Venezuela, dairy products to El Salvador and Guatemala, and shrimp to Spain, the United States, Taiwan, France and Mexico.

(3) ProNicaragua: Agencian de Promocion de Inversiones

PRONicaragua is Nicaragua's official investment agency, established in 2002. Its mission is to generate economic growth and job creation by promoting high-quality investments. It offers complimentary support services to qualified investors interested in exploring business opportunities in Nicaragua. The focus is on general investment promotion in the country, and there is no explanation of policies or priority areas in specific fields, but a website has been created for the three sectors of AgriBusiness, Light Manufacturing, and Outsourcing. This categorization may be regarded as an index.

(4) IMF Staff Report for the 2017 Article IV Consultation, 2017.06.08

The debt sustainability analysis (DSA) indicates that Nicaragua's risk of external debt distress remains moderate. Real GDP growth projections for the forecast horizon have been revised upward, based on improvements in infrastructure, and financing on relatively concessional terms is expected to continue. The macroeconomic framework underlying the DSA assumes a continuation of the current relatively favorable macroeconomic conditions. Real GDP growth is assumed to converge to its potential level of 4.5 percent from 2019 onwards. The staff has revised up its estimate of potential GDP growth from 4 percent in the 2013 and 2015 DSAs, grounded in revised quantitative estimates and considering the significant investments in infrastructure over the past decade. Inflation should continue to be anchored by the crawling peg exchange rate regime, with the GDP deflator in dollar terms broadly reflecting U.S. inflation.

Table 3.3.6 Key Macroeconomic Assumptions Underlying the DSA for Baseline Scenario

	Current DSA				2015 DSA				Historical averages
	2016	2017 (p)	2017-2022	2023-2037	2016 (p)	2017 (p)	2015-2020	2021-2035	2010-2016
Real GDP growth (in percent)	4.7	4.5	4.5	4.5	4.2	4.0	4.0	4.0	5.2
GDP deflator in US$ terms (in percent)	-0.9	0.8	1.9	2.1	1.1	1.8	1.3	2.1	1.6
Non-interest current account (in percent of GDP)	-6.8	-6.9	-7.0	-7.3	-6.6	-7.1	-6.8	-6.9	-8.0
Net FDI (in percent of GDP)	6.5	6.3	6.2	6.1	6.2	6.1	6.0	5.8	6.8
Primary balance (in percent of GDP)	-1.2	-1.1	-1.2	-2.3	-1.4	-1.6	-1.4	-1.4	-0.3
Revenue and grants (in percent of GDP)	28.8	28.8	28.6	28.2	29.4	29.3	29.4	30.3	27.3
Primary expenditure (in percent of GDP)	30.1	29.9	29.8	30.5	30.7	30.8	30.8	31.7	27.5
Ave. real int. rate on public debt (FX-denominated)	1.8	1.6	0.4	1.9	1.5	1.1	1.3	2.3	1.3

Source: IMF Country Report No. 17/173

Table below shows the IMF's revised GDP forecast updated in October 2020.

Table 3.3.7 GDP Data for Nicaragua

Subject Descript	Scale	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
GDP constant prices	Billions	130.4	138.7	147.7	154.9	162.4	170.1	177.9	186.1	178.8	171.8	162.3	161.5	165.9	169.2	172.2	175.9
GDP constant prices	%	4.41	6.32	6.50	4.93	4.79	4.79	4.56	4.63	-3.95	-3.88	-5.54	-0.50	2.70	2.00	1.80	2.10
GDP per capita, constant prices	Units	22,426	23,122	24,322	25,258	26,193	27,166	28,113	29,111	27,673	26,326	24,987	24,680	25,085	25,323	25,513	25,781
GDP per capita, constant prices	Units	4,619	4,762	5,009	5,202	5,395	5,595	5,790	5,996	5,699	5,422	5,146	5,083	5,166	5,215	5,255	5,310

Source; World Economic Outlook Database, October 2020

(5) WTO: Trade Policy Review Report

The February 2013 edition seems to be a little bit old but it is the latest version of the World Trade Organization (WTO) report to analyze Nicaragua's export promotion policies, FTAs, foreign investment policies, and major sectors. As the industrial structure of Nicaragua itself has not evolved significantly, it seems reasonable to refer to it. Policy for export industry: Based on PNDH, it aims to develop overseas markets, diversify export industry items centered on non-traditional products, and attract foreign investment. Nicaragua's industry consists of related industries centered on the agriculture, agricultural processing and fisheries sectors. It aims to support domestic industries, especially small and medium-sized enterprises, for industrial diversification. It advocates the use of Quota allocated by WTO and FTA partner countries, profitability, competitiveness, value enhancement, regional development and research for that purpose. In 2011, the industrial sector accounted for 17.4% of GDP, second only to the agricultural sector, but no detail information was found.

(6) BCIE Nicaragua Country Strategy 2018-2022

BCIE's support for Nicaragua refers to Axes PNDH 2018-2021 and the SDGs in line with national priority development policies. In addition to supporting financial stability, in terms of economy, BCIE is implementing the following projects as projects that contribute to social development, transportation, energy, and highly productive infrastructure development;

- Renewable Energy Sector,
- Managua City Urban Development Master Plan,
- Master Plan for Investment Projects and Trinational Economic Development for the Gulf of Fonseca,
- Project to Improve the Technical Capacities of Puerto Corinto 2018-2032,
- Project to connect the Caribbean Coast with the Pacific in the city of Bluefields.

(7) Important Items in Industrial Policy Inferred from Trade Statistics [8]

Nicaragua exports in 2019 increased by 16% from 2012 in total. There was a 9% year-on-year decline in 2016, but it has been steadily recovering since then. Agriculture-related items are traditionally important items and constantly account for more than 30% of export items. On the other hand, apparel sales increased from 0.1% in 2010 to 25.6% in 2012, reflecting the initiation of production in the free zone. Apparel has increased since 2012, reaching 29.6% in 2019. Food and beverages decreased by -12% from 2012, but the combined agricultural products and food and beverages accounted for 45.3%, demonstrating the importance of the agricultural sector in Nicaragua. However, traditional products such as coffee and sugar have been almost flat or slightly decreased in the last 10 years, although there are seasonal factors. The mineral field is an important field with a composition ratio of 11.5% in 2019, an increase of 15% from 2012 (composition ratio is almost the same). Chemical and pharmaceutical products accounted for only 1.0% of the composition in Nicaragua in 2019, but it may be a strategic field due to the rapid increase in the last 10 years. By referring the success of neighboring Costa Rica and El Salvador, this sector might be recognized as the strategic sector in Nicaragua. The manufacturing industry has been on a flat or declining trend with a slight increase of 4% compared to 2012 and a composition ratio of 11.3%, but this is an area that has increased due to the establishment of free zones. There are many target items, and a more detailed analysis is required in view of the policy of diversifying industries other than agriculture. Above all mentioned, from the export statistics, it can be confirmed that the traditional agriculture and livestock / fishery and food / beverage, the apparel textile industry and manufacturing industry, which have been increasing in recent years, and the mineral sector are considered to be the important export sectors.

(8) Evolution of the Monthly Index of Economic Activity (IMAE)

The Central Bank of Nicaragua makes available to the general public the Monthly Index of Economic Activity (IMAE) with the new base year 1994, consistent with the new System of National Accounts of

[8] ITC (International Trade Center) Trade Statistics; https://www.intracen.org/

Nicaragua. The IMAE has been conceived as a timely indicator that makes it possible to measure the short-term evolution of economic activity. Since the IMAE provides timely and reliable information, it constitutes an important input for government decision-makers, businessmen, and civil society in general.

In July 2020, the IMAE continued to reflect the economic effects of the global COVID pandemic. After the reduction in May, June and July the IMAE showed a less negative growth rate, reflecting signs of recovery. The seasonally adjusted series of IMAE showed a growth of 2.0 percent compared to the month above and a decrease of 3.6 percent compared to July 2019. In the cycle trend series, IMAE decreased 0.6 percent compared to July 2019 and 0.3 percent compared to the previous month.

In the original series, the IMAE showed a decrease of 3.6 percent in relation to July 2019, of 3.2 percent in the accumulated January-July, and of 2.4 percent in annual average. The activities with the highest growth were agriculture, 9.7 percent; trade, 5.5 percent; livestock, 4.6 percent; and public administration and defense, 1.7 percent; among others. Meanwhile, there were decreases in the activities of hotels and restaurants, -51.2 percent; energy and water, -25.2 percent; financial intermediation and related services, -16.4 percent; transportation and communications, -12.9 percent; construction, - 5.2 percent; among others. In primary activities, the growth of agriculture and livestock was attenuated by the decline in fishing and aquaculture, mining and quarrying, forestry and timber extraction. In the manufacturing industry there was growth in the activities of other foods, tobacco, petroleum derivatives, and non-metallic, among others. However, there was a decrease in machinery and equipment, textiles, meat and fish products, beverages, among others. In services, the growth observed in commerce, public administration and defense, health and education was offset by decreases in hotels and restaurants, energy and water, transportation and communications, financial intermediation and related services, among others[9].

3.3.5 Costa Rica

Costa Rica took its first steps towards the national planning process in 1963, when through Law No. 3087 it created the Planning Office (OFIPLAN) as a direct dependency of the Presidency of the Republic, in charge of coordinating the State planning action, the preparation and promotion of policies and the definition of actions in order to achieve greater efficiency in the services provided by the Public Administration, with the aim of guiding national development.

As OFIPLAN positioned itself in the institutional structure of the country and its capacities for coordination and definition of strategic policies were strengthened, there was also the need to expand its competencies and areas of action, so that ten years later Law N . ° 5525 "National Planning Law" that converts OFIPLAN into the Ministry of National Planning and Economic Policy (MIDEPLAN).

MIDEPLAN, therefore, constitutes the advisory and technical support body of the Presidency of the Republic and is the body in charge of formulating, coordinating, monitoring and evaluating the strategies and priorities of the Government; that is, it defines the vision and medium and long-term goals that inspire the actions of the Executive[10].

Some of the main functions of the Ministry are: Define a development strategy for the country, which includes medium and long-term goals.

- Prepare the National Development Plan (PND), which must translate the Government's strategy into priorities, policies, programs and actions.
- Coordinate, evaluate and follow up on those actions, programs and policies.
- Maintain an updated and prospective diagnosis of the evolution of national development, as a vital input to strengthen decision-making processes and evaluate the impact of government programs and actions.
- Promote a permanent evaluation and renewal of the services provided by the State (modernization of the Public Administration).

[9] IMAE Julio 2020, BCN, October 2020, https://www.bcn.gob.ni/publicaciones/periodicidad/mensual/imae/informe.pdf
[10] https://www.mideplan.go.cr/que-es-mideplan

- Ensure the application of the Government's priorities in the allocation of the budget, public investment and international cooperation.

In the process of direction and coordination of the National Planning System (SNP), the Technical Secretariat of the National Planning System is established under the responsibility of MIDEPLAN, to articulate the functions that the Minister is responsible for implementing as political and technical rector of the System.

(1) PNDIP (Plan Nacional de Desarrollo y de Inversion Publica) 2019-2022:

What was previously planned separately as the National Development Plan (PND) and the Public Investment Plan (PIP), to incorporate public investment, strict definition, SDGs goals and inter-sectoral and more regional integrated as PNDIP for the purpose of taking advantage of its characteristics, traceability, and close discussions with civil society[11]. PNDIP has specified goals for each of the five national goals and seven sector goals. The 5 national goals are:

- economic growth,
- unemployment,
- multidimensional poverty,
- inequality,
- decarbonization

7 sector goals are:

- Infrastructure, mobility, regional planning
- Economy for stability and growth
- Education for sustainable development and coexistence
- Territorial development
- Human security
- Health and social security
- Innovation, competitiveness, productivity



Source: Sustainable development goals Costa Rica 2020, MIDEPLAN, DS Technical Secretary

Figure 3.3.8 Strategic Areas of Articulation of the PNDIP 2019-2022

The “economic growth” target is set in consideration of the scenario and estimated value by Midplan and

[11] Lineamientos técnicos y metodológicos para la planificación, programación presupuestaria, seguimiento y la evaluación estratégica en el Sector Público en Costa Rica 2021, MIEDEPLAN, Ministerio de Hacienda

the growth forecast by BCCR. "Economy for Stability and Growth" includes maintaining inflation close to that of the country's major trading partners, promoting fiscal consolidation, promoting reductions in living costs, reducing public debt and increasing productivity, and improving the efficiency of the financial system. It claims to contribute to the country's economic growth by improving stability and improving access to financial services. One of the main aspects affecting GDP is investing in infrastructure. According to the World Economic Forum's Global Competitiveness Index (GCI), Costa Rica ranks 110th out of 137 countries, calling for improved infrastructure quality. It is necessary to allocate 4-8% of GDP, but currently the investment is limited to about 4%.

Challenge

1. Apply measures to reduce budget deficits aimed at curbing the expansion of public spending, promote rationalization and efficiency of allocation of financial resources, promote tax advancement, and stimulate profitability creating a source of economy and employment that improves the recovery of public income by implementing certain public spending projects.
2. It is imperative for the Treasury and BCCR that the government procure resources obtained at the lowest possible cost within a cautious risk range so that the level of public debt is sustainable and stable.
3. Keeping inflation low and stable is essential, increasing currency totals in line with inflation and economic activity goals, gradually applying policy adjustments to moderate fluctuations in business cycles, and addressing other macroeconomic variables. In this sense, the risks that BCCR pays attention to are:

- Vulnerabilities in national macroeconomic scenarios. This is due to public financial problems in favor of rising interest rates and the sustainability of national risk perceptions by international rating agencies.
- Risks arising from the slow growth of the global economy, which reduces external demand in Costa Rica due to increased geopolitical uncertainty, worsening economic conditions in developed countries and protection policies in various regions.
- Political tensions on domestic prices could raise international prices for raw materials.
- Financial market volatility increases in response to the policies of central banks in developed countries, which limit financial conditions and affect capital flows, exchange rates and interest rates.
- Upward pressure on exchange rates that can affect exchange rate fluctuations and inflation expectations.
- Effective management of monetary policy implementation and dollarization to mitigate the risks that it has on controlling inflation. Also, in financial activities, the risks posed by granting credits in foreign currencies to debtors who have income in Colon (credit defaults, exchange rate and liquidity risk due to unexpected exchange fluctuations or reductions in external funds).

(2) CPCI (Presidential Council for Competitiveness and Innovation):

The Presidential Council for Competitiveness and Innovation (CPCI) was established in 2010 with the aim of strengthening Costa Rica's competitiveness and innovation (Executive Order No. 36024). Due to its importance, CPCI is at the highest level of enforcement in the government structure, chaired by the President and two Vice Presidents. CPCI has set five priority areas below, which, to varying degrees, influence the movement of goods and goods for domestic consumption and foreign trade, which is the focus of freight logistics. Therefore, it can be said that CPCI has been appointed to lead the efforts to develop Costa Rica's national freight logistics plan.

- Human capital and innovation,
- Foreign trade and foreign investment,
- Financing and capital markets,
- Infrastructure development,
- Regulations and procedures

(3) CINDE：The Costa Rican Investment Promotion Agency

Costa Rica has put in place a framework to actively attract foreign investment, especially promoting the attraction of high-tech companies. CINDE is a private, non-profit, non-political organization jointly established by the Costa Rican government, a private company, and USAID in 1983. CINDE provides technical assistance, marketing guidance, quality control, and technical assistance to customs officers. In the 1990s, the textile industry, which had been a leading export industry in Costa Rica until then, lost its competitiveness due to rising labor costs, and it was also attracting large companies in the electronics industry as an alternative industry centered on CINDE. In 1996, Intel was looking for a location for an assembly / test factory (A & T plant) to meet the increasing demand for semiconductors, so it took an enthusiastic approach. At that time, Intel already had A & T plants in Malaysia, China, and the Philippines, so from the perspective of geographical dispersion, with a view to Latin America, Brazil, Chile, and Mexico were other candidates, but Intel centered on CINDE. During the last 35 years, CINDE has attracted more than 280 high-tech companies to Costa Rica, including worldwide leaders such as: Intel, Procter and Gamble, ICU Medical, Baxter, St. Jude Medical, Western Union and many others.

Strategic Plan for 2015-2018 based on 7 Strategic Pillars

In order for Costa Rica to remain successful in attracting foreign investment among leading countries, it should improve its investment climate and competitiveness. Thus, each key strategic pillar is equally important to achieve the proposed goals and many of them propose priority actions that are reflected in other pillars.



Source: Strategic Plan 2015-2018, CINDE

Figure 3.3.9 Strategic Pillars

(4) PROCOMER（La Promotora del Comercio Exterior de Costa Rica）:

The Costa Rican Foreign Trade Promoter（PROCOMER）was created in 1996 through the Law of the Republic number 7638. In accordance with the founding law, they are responsible for:

- Designing and coordinating programs related to exports.
- Technical and financing support for the Ministry of Foreign Commerce (COMEX), to administer the special exportation regimes.
- Promoting and protecting the country's commercial interests abroad.
- Centralizing and streamlining the importation and exportation processes.
- Following foreign commerce statistics.

At the time of investment, with a total investment of $500 million, Intel plans to build four factories and create 3,500 jobs, with annual revenues of US $20 billion, twice the GDP of Costa Rica at the time. There were various effects of entering Intel, but the development of supporting industries and the signal effect as an investment environment in the high-tech field was important. An electronic industry cluster was formed, and companies that supply intermediate goods to Intel, related companies such as transportation and packaging of precision equipment, and many companies that are upstream and downstream have entered

the market. Inward investment by large global companies in new strategic sectors such as medical / health products and space development industry was realized by aggressive attraction activities involving the president at that time.

Intel's semiconductor manufacturing process in Costa Rica was a "post-process" in which intermediate goods (silicon plates) were imported and processed, and the import value of intermediate goods was large. For this reason, the structure will be further enhanced by the "Costa Rica Provee: CRP" policy, which actively fosters local companies in the intermediate goods supply sector and links high-tech multinational companies with local companies, and technical support from the Ministry of Economy, Industry and Commerce (MEIC). CRP was launched by IDB and the government agency FunCeNAT[12] , but this function was transferred to the Costa Rica Trade Corporation (PROCOMER) in 2004.

Although the high-tech industry has a large effect of earning foreign currency, the following precautions are required in its evaluation.

- In cases such as Costa Rica, where the share of semiconductor exports is large, it is easily affected by economic fluctuations called the silicon cycle, which is about a four-year cycle, and is a cause of instability in the macro economy and trade balance.
- Many high-tech companies are located in free zones, and many of them are concentrated in Central Province, which has well-equipped infrastructure facilities, which is a factor in widening regional disparities.
- Corporate tax is exempted in the free zone, and there are no restrictions on the transfer of profits overseas, so tax revenue for income redistribution must be limited.

Hospira, the largest exporter in the medical device and pharmaceutical sector, had an infusion pump factory in La Aurora Freethorn, but in November 2012, the US Food and Drug Administration (FDA) imposed an import ban due to a defect in infusion pump products manufactured in Costa Rica, which was subsequently acquired and integrated by Pfizer Inc. of the United States in September 2015. After that, in 2019, there was an article that Pfizer was considering selling the hospiller infusion pump business, but the circumstances after that have not been confirmed. In 2015, sales in the electrical equipment subsector in Costa Rica's export sector plummeted 70% year-on-year ($ 1,800 mil), which was the closure of the manufacturing parts division by Intel in 2014 (research and development division continued) as the main cause, but it may be related to the trend of Hospira.

(5) Four Key Areas of FDI Policy (WTO Trade Policy Review 2019):

WTO Trade Policy Review 2019 mentions the following four areas as the key FDI policies;

1) Services,

2) Advanced manufacturing,

3) Life sciences,

4) Clean technology

(6) OECD Economic Surveys: Costa Rica 2020

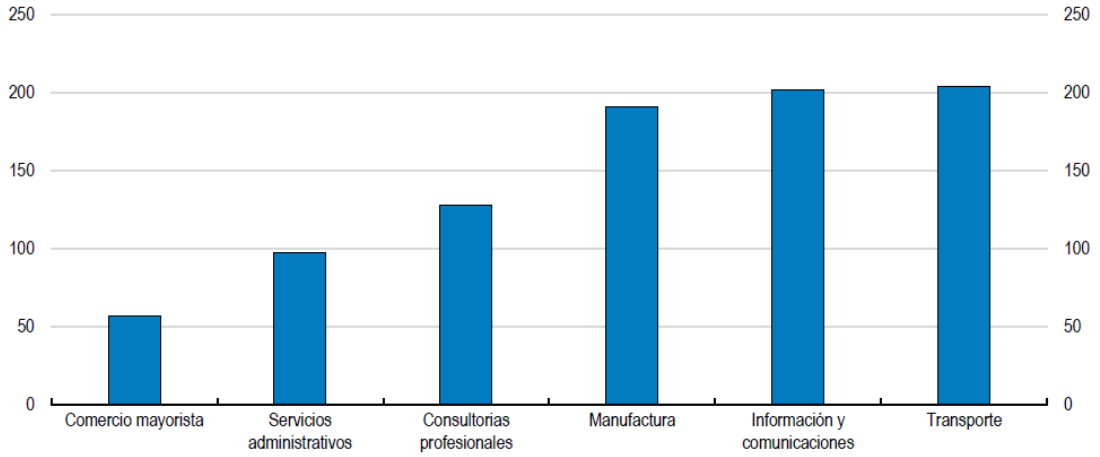
Costa Rica’s social and economic progress has been remarkable. Over the last 30 years, growth has been steady and GDP per capita has tripled. A strong commitment towards trade openness has been key to attract foreign direct investment and move Costa Rica up in the global value chain. Costa Rica faces substantial challenges to retain achieved successes and to continue converging towards higher living standards. The fiscal situation remains a critical vulnerability. Large deficits and rapidly rising public debt threaten Costa Rica’s achievements. The fiscal reform approved in December 2018 was a historic step to restore fiscal sustainability. Boosting growth is also a key priority, as the gap in GDP per capita with advanced economies

[12] The Fundación Centro Alta Tecnología (CeNAT Foundation -FunCeNAT), http://provisional.cenat.ac.cr/en/ CeNAT is a specialized body, which promotes -through high-technology- spaces for linkages between academia, government and the productive sectors of the country in different fields of high technology, for research, innovation and entrepreneurship.

remains large and unemployment is high. Inequality and informality remain also high. The COVID-19 pandemic has significantly impacted Costa Rica, with the global economic slowdown and the necessary containment measures hampering growth prospects and fiscal accounts. Responding successfully to these substantial challenges will hinge on buttressing the fiscal framework and implementing reforms to foster inclusive growth. Further advances on living standards will hinge on raising productivity by setting the right conditions for domestic companies to thrive and maintaining and reinforcing the commitment to foreign direct investment and trade. Maintaining the commitment to preserving natural resources and biodiversity and with the decarbonisation plan will pay off in terms of growth and jobs.

(7) The Issue of the Dual Economy

Costa Rica continues to be a dual economy. Highly productive export companies in high value-added sectors, which are located mostly in free trade zones, coexist with a non-export sector, composed mainly of local SMEs, which clearly lag behind in terms of productivity (Figure below) . As a consequence, in general, Costa Rica has a lower labor productivity than most emerging economies, including China, or regional peers like Chile and Mexico.



Nota: Las barras muestran la diferencia porcentual en la mediana de la productividad laboral (expresada como valor agregado por trabajador). De algunos sectores no se registra información debido a que la cantidad de empresas que operan en zonas de libre comercio es muy baja o nula.
Fuente: Estimaciones de la OCDE y del Banco Central de Costa Rica.

(Percentage difference in median labor productivity between firms within free trade zones and the non-export sector)

Figure 3.3.10 Companies Outside Free Trade Zones Lag Behind

There are two factors that help explain the productivity gap in Costa Rica. On the one hand, a large proportion of the resources are used in companies with lower productivity, such as micro and informal companies. On the other hand, even the average and typical company is less efficient than the average company in other economies. The lower productivity of typical companies may be linked to lower growth over the life cycle, as few Costa Rican companies grow over time. This makes investment, employment, knowledge spillovers and employee specialization difficult.

(8) Important Items in Industrial Policy Inferred from Trade Statistics[13]

Exports in 2019 increased by 27% compared to 2010, and exports are expanding almost constantly, except 2015, when the machine manufacturing sector decreased (-$1,778mil) due to the closure of the manufacturing parts division by Intel in the previous year consequently the total export value has also recorded a decrease of 15% from the previous year. In response to the strong increase in exports of the precision equipment and medical equipment sectors including 2016, it showed a steady increase again from the following 2017, and in 2018 it recovered to exceed the 2014 level.

[13] ITC (International Trade Center) Trade Statistics; https://www.intracen.org/

55% of export items are export products (45% are service exports), and the export of industrial products is driven by precision equipment and medical equipment, with an average growth rate of 16.7% from 2013 to 2018, and the share of product exports has increased from 18% (2013) to 29% (2018). Other fast-growing sub-sectors include chemical, electricity, and engineering. In addition, agriculture in the primary industry maintains a constant share, accounting for about 25% on average for six years. Bananas, pineapples, coffee, and yams are the main agricultural products (bananas, pineapples, and coffee are about 80% of the exported agricultural products). Palm oil is also an important export product.

It is necessary to understand that the government's urgent issue is to improve its financial position, and that public works are being cautiously made in line with the goal of keeping annual losses within 3.5% of GDP by 2022.

Costa Rica's industrial structural transformation is characterized by 1) promoting investment in the apparel textile industry as an export industry to shift from the structures that depended on agricultural products (especially coffee and bananas) similar to other Central American countries, and 2) the quick conversion from apparel textile industry to a high-tech product exporter. Since then, because of the decline in the machinery manufacturing sector the agricultural and service sectors have not changed significantly in terms of market share in export. In agriculture sector, production of coffee and banana have declined while the production of pineapple and the number of processed products such as meat and dairy products are increasing, and the overall composition ratio is a slight decrease of 24%. Costa Rica aims to diversify its economy and is working on programs to promote reforms in each sector, centered on PROCOMER. Regarding agriculture, the government has launched a program called DESCUBRE with COMEX, MAG, CINDE, and Sistema de Banca para el Desarrollo to diversify agricultural exports and promote investment and regional development[14]. At DESCUBRE, 6 values such as 1) international efforts, 2) comparative advantage, 3) food security, 4) efficient use of public resources, 5) agricultural dignity, and 6) sustainable development are listed as shared values with the goal of promoting the development of smart agriculture that enhances productivity by utilizing various technologies such as precision technology, internet, and data science, identifying 40 new export products in the next 4 years. Although some items related to apparel sector have increased, the overall number has decreased (-13%) compared to 2010, and the sector ratio to the total is only about 3%.

The increase of chemical, pharmaceutical products and medical services remained at 10% compared to 2010, but the quantity have increased significantly compared to around year 2000. When looking at changes in the structure of manufacturing industry as a whole, especially after the withdrawal of Intel in 2014, there seems to be more strategic importance that cannot be simply shown by comparison.

(9) Free Trade Agreement (FTA)

As of December 2019, the Free Trade Agreement (FTA) consists of 10 countries (Canada, Mexico, Panama, Chile, Peru, China, Singapore, Colombia, Dominican Republic, South Korea) and 4 regional communities, CAFTA-DR (US, Central America, Dominican Republic), CARICOM (the Caribbean Community), EU (the European Union) and EFTA (the European Free Trade Association) have been put into effect.

With the signing of an FTA between South Korea and Central American Integration System in March 2019, Costa Rica has become the third ratifying country in Central America. As a result, 80% of Costa Rica's exports can now receive tariff exemption benefits to the Korean market. Major export items: coffee, sugar, non-alcoholic beverages, medical devices, pharmaceuticals, plastic supplies, iron and glassware.

3.3.6 Panama

"Strategic Government Plan 2019-2024 of Panama", developed by MEF (Ministry of Economy and Finance), identifies the five priority areas:

[14] https://www.procomer.com/noticia/programa-descubre-productividad-y-oportunidades-para-la-agricultura-y-la-pesca/ 30 April, 2019 http://www.descubre.cr/

i) Good governance,
ii) Rule of law,
iii) A competitive economy that generates jobs,
iv) Fighting poverty and inequality, and
v) Education, science, technology and culture.

In order to achieve a competitive economy that generates jobs, the following main tasks were announced in each sector. Although the specific measures in each industrial sectors were not described, modernization and establishment of regulations were proposed.

Table 3.3.8 Main Sectors and Tasks in"Strategic Government Plan 2019-2024 of Panama"

Sector	Main tasks
Industry	• Improve the conditions and processing in the Law for the Promotion of Industry. • Strengthen the Directorate of Treaty Administration to effectively protect both consumers and domestic producers by combating unfair trade practices and dumping, and by implementing safeguards against the threat of excessive imports that undermine agricultural production. • Promote a Value Added Hub, including a processing center for food, medicines, industrial and technological goods. • Promote industrial activities in the Canal.
Trade	• To modernize the regulations in the field of e-commerce. • Expand the use of the electronic purse recently implemented by the National Bank. • Promote legislation to facilitate the use of electronic payments in the private sector.
Foreign trade and export	• Establish and implement a National Strategy to take advantage of the current Free Trade Agreements (FTA) for access to international markets and strengthening its competitiveness and actions for the benefit of Panamanian consumers. • Support public-private investments in the network of regional competitiveness centers.
FTZ	• Establish the necessary parameters and regulations to eliminate the obstacles that do not allow the development of Special Economic Zones, such as those derived from poor infrastructure planning, lack of maintenance, lack of coordination and planning for their development, among others. • Modernize the Administration of the Colon FTZ
Maritime, Logistics and Port Cluster	• Modernize the Panama Maritime Authority not only in terms of technology, but also in terms of customer service • Implement the National Logistics Strategy 20-30. • Review the regulations governing the Panamanian Registry of Ships and modernize it to make it more efficient and competitive with other registries.
Public infrastructure	• Strategic planning in public investments, in accordance with the pillars of economic and social development of the country. • Modernize the system of public procurement and approval of public and private projects, through the implementation of Digital Government tools. • Establish a regulatory framework for PPPs, to ensure greater efficiency in public investments, seeking to reduce the financial risk of the State. • To attend approximately 3,000 kilometers of the national road network, both in new projects and in maintenance and rehabilitation of existing projects, including bridges. • Initiate the execution of the Drainage Project.

Source: "Strategic Government Plan 2019-2024 of Panama"

3.4 National Transport and Logistics Plan

3.4.1 Outline

National cargo logistics plans (PNLOG) were formulated in each country with support from IDB. There are some national plans related to transport besides the PNLOG. It should be noted that PENLOGs for Panama and Costa Rica were officially approved but they were formulated in 2014, slightly outdated. On the other hand, PNLOGs in other countries were not officially approved. However, those plans are well integrated the industrial activities with transport sectors. Key contents are summarized in this section by country. Details of each plan are shown in Appendix.

Table 3.4.1 National Transport and Logistics Plans

Country	National Transport and Logistics Plans
Guatemala	National Strategic Plan on Cargo Logistics (PENLOG:2016)
El Salvador	National Cargo Logistics Plan (PNLOG:2018)
	Integrated Mobility and Logistics Policy for Productive Development and Trade Facilitation(2017)
	Infrastructure Master Plan (2020)
Honduras	National Cargo Logistics Plan (PNLOG:2019)
Nicaragua	National Cargo Logistics Plan (PNLOG:2018)
	National Transport Plan (PNT:2014)
Costa Rica	National Cargo Logistics Plan (PNLog:2014)
	National Transport Plan(PNT:2011)
Panama	National Cargo Logistics Plan (PNLog:2014)
	National Logistic Strategy(2017)

Source:JST

Table 3.4.2 Status of PNLOG in each Country

Country	GTM	SLV	HND	NIC	CRC	PNM
Planning Horizon	2015-2030	2018-2032	2019-2030	2018-2032	2014-2024	2014-2024
Planning Coordinator	PRONACOM	MOP	INSEP	INE/TSP/CNI	INE/TSP	Logistics Council
Official Approval	No	No	No	No	Yes	Yes
Updated	2016	2019	2019	2018	2014	2014

Source:JST

3.4.2 Guatemala

National Strategic Plan on Cargo Logistics (PENLOG) for Guatemala was formulated by PRONACOM in 2016. The PENLOG describes the review of upstream policy, general description of the country (industry and logistics), Strategic Agenda, Action Plan and Immediate Action Plan (IAP).

(1) General Description

The PENLOG emphasizes that agriculture is the key sector of Guatemala. In addition to the traditional export products such as coffee, banana and sugar, non-traditional products such as fruits and vegetables are focused as high added-value products. Manufacturing is a growing industry and shares 20% of national GDP. Guatemala city metropolitan area, Escuintla and Coban are major industry centers. Quetzaltenango is a center of textile production and liquor. Free Zones (ZEDEs) are developed Masagua, Escuntlia, Guastatoya, Zapcapa and El Progreso.

The PENLOG pointed out that the key issues on the logistic sector in Guatemala is that there are no exclusive logistic centers. Free trade zones (maquila) spread all over the country with individual logistic facilities. Also, it is pointed out that MAGA has built several distribution centers. However, those distribution centers don't have paved access roads. Untrustworthy buyers, sellers and brokers prevent to use those distribution centers.

The PENLOG listed up the issues on each transport subsectors. As for highway sector, the unpaved road in suburban areas and the low density of roads in the northwest region are key issues. Also, to relieve the traffic congestion in Guatemala city metropolitan area,a ring road is proposed.

(2) Strategic Agenda

The PENLOG holds up the following vision statement. Strategies are set accordingly.

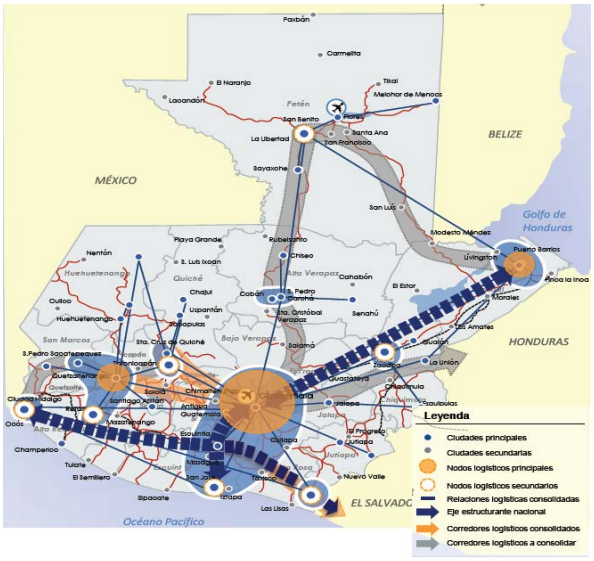
> *To become a regional leader in transportation and cargo logistics by means of a robust offer of value-added logistics services that: Will contribute to the harmonic territorial development, Will facilitate connectivity and access to regional and extra-regional markets. Will promote the growth of the national productive apparatus. Will contribute to the continuous improvement of the country's competitiveness.*

(3) Functional Structure of Logistics

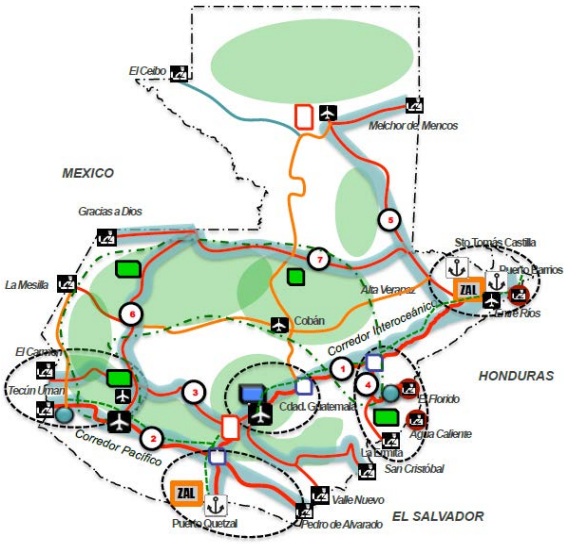
Functional structure of current logistics of Guatemala is identified, namely 3 principal Nodes: Guatemala city, Barios Port & Santo Tomas de Castilla, Quetzaltenango and 2 Axis: Bio-oceanic Corridor, Tecún-Umán-Pedro Alvarado (SV) Corridor (see Figure 3.4.1).

(4) Action Plan

To achieve the strategic agenda, an action plan including the investment plan for 10 - 15 years is formulated. In the action plan, 5 functional logistics conglomerates and 7 priority logistic corridors are proposed. Road improvement projects including ring road along with the logistics conglomarates and the development of Logistics Support Zones (ZAL) are proposed along those corridors.



Source:PENLOG



Source:PENLOG

Figure 3.4.1 Fuctional Structure of Logistics of Guatemala

Figure 3.4.2 National Logistics System in Action Plan of Guatemala

(5) Immediate Action Plan (IAP)

The following projects are proposed as an Immediate Action Plan (IAP). Total cost of the IAP is estmated at 67 million USD.

Logistics Improvement for Agricultural Family

- Infrastructure needed for centralization, collection centers, cross-docking structures, transfer centers, etc.

Modernization of Land Borders

- Pedro Alvarado border Improvement

Logistics Priority Corridor

- Road improvement.
- Truck center development.

Improvement and eEpansion of La Aurora

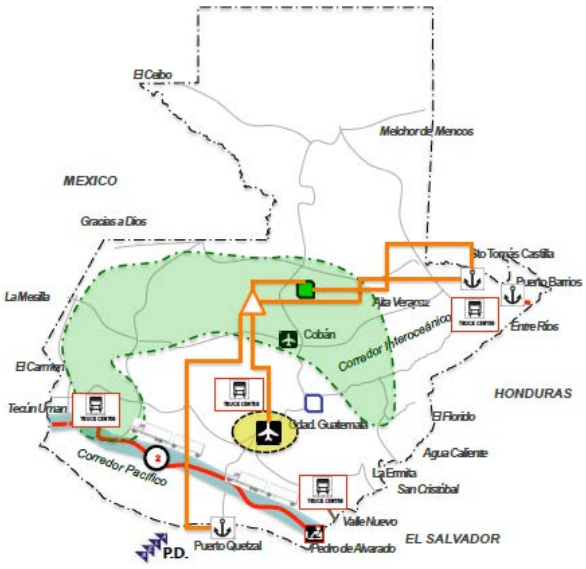
- Modernization and expansion of current cargo area, improve access roads.

Puerto Quetzal Digital Port Project:

- Implementation of the digital ports and port communities project (SELA model), including the truck appointments in Puerto Quetzal.

Institutional Strengthening

- Logistics Cabinet, the logistics technical unit, and the Observatory.



Source:PENLOG

Figure 3.4.3 IAP of Guatemala

3.4.3 El Salvador

National Plan on Cargo Logistics (PNLOG) for El Salvador was formulated by MOP in 2019. The structure

of the PNLOG is similar to other PNLOGs and contains the review of upstream policy, general description of the country (industry and logistics), Strategic Agenda, Action Plan and IAP.

(1) General Description

The Salvadoran manufacturing industry represents 23.3% of total GDP, including contributions from food and beverage products. In 2016, the primary sector accounted for 12% of GDP, mainly livestock, staple grains and poultry. The agricultural sector plays an important role in the Salvadoran economy, representing 17.8% of the total workforce, 39% of rural employment (2017). Agricultural and livestock use occupy a good portion of the country's total territory. The agricultural subsector generates 56% of agricultural GDP (2016), especially staple grain crops; 27% of production is traded while the rest is used for subsistence. Maize, coffee and sugar cane represent 40%, 19% and 11% of cultivated areas respectively.

The PNLOG pointed out that industrial free zones are designed for production activity and not for logistics. Also, it is pointed out that agricultural collection centers are spread out but access roads to them are limited.

The PNLOG listed up the issues on each transport subsector. As for the highway sector, the low quality of access roads to La Union port and borders and the lack of truck centers are pointed out.

(2) Strategic Agenda

The PNLOG holds up the following vision statement. Strategies are set accordingly.

> *To be a country with a mobility of people and logistics of products and services of quality, organized, accessible, safe and with diversified commercial flows of high added value in the value chain and regionally integrated productive apparatus that contributes to sustainable, inclusive, balanced and resilient human development.*

(3) Functional Structure of Logistics

The functional structure of current logistics of El Salvador is idenfified, namely 7 principal Nodes: San Salvador Metropolitan Area (SMA), San Miguel, Santa Ana (important industrial area), Acajutla, Comalapa, Usulutan, La Union and 3 Axis: SMA – Acajutla, SMA - San Miguel - El Amatillo, SMA - Santa Ana - Anguiatu (see Figure 3.4.1).

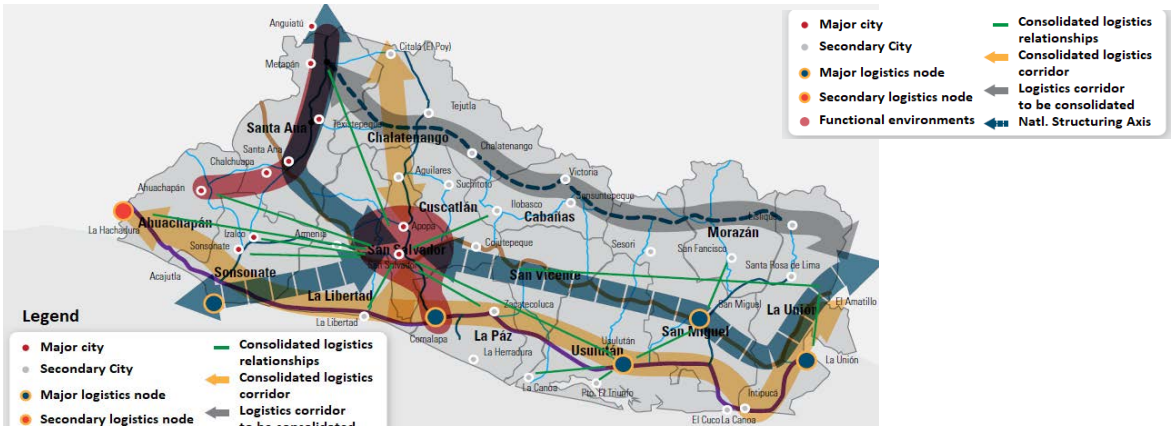
(4) Action Plan

To achieve the strategic agenda, an action plan including the investment plan for 10 - 15 years is formulated. In the action plan, 5 functional logistics conglomerates and 5 priority logistic corridors are proposed. A distribution center in the airport free zone, truck centers at land borders, logistics activity zones and ring roads at major cities are proposed along those corridors.

(5) Immediate Action Plan (IAP)

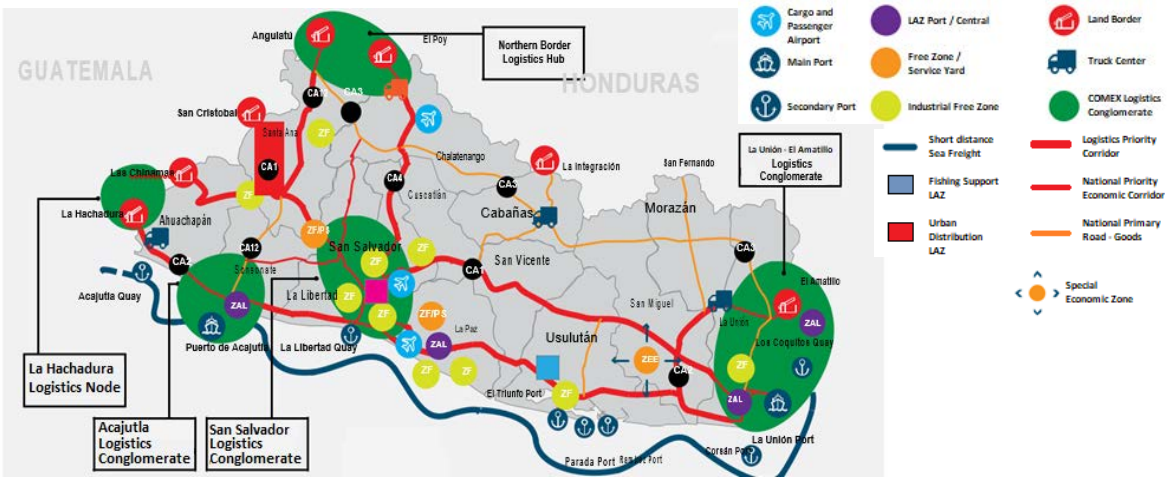
Total cost of Immediate Action Plan (IAP) is estmated at 363 million USD.

- San Salvador-logistic conglomerate: Air Hub in El Salvador International Airport.
- Acajutla Logistics Conglomerate: Logistics and port system optimization.
- Logistics Conglomerate of La Unión: Port system optimization.
- Consolidation of the main national road network.
- Optimization of the pilot logistics family: Artisan Fisheries and Fish Farmed Products.
- Transversal actions (logistics service information, national weight control program,etc)



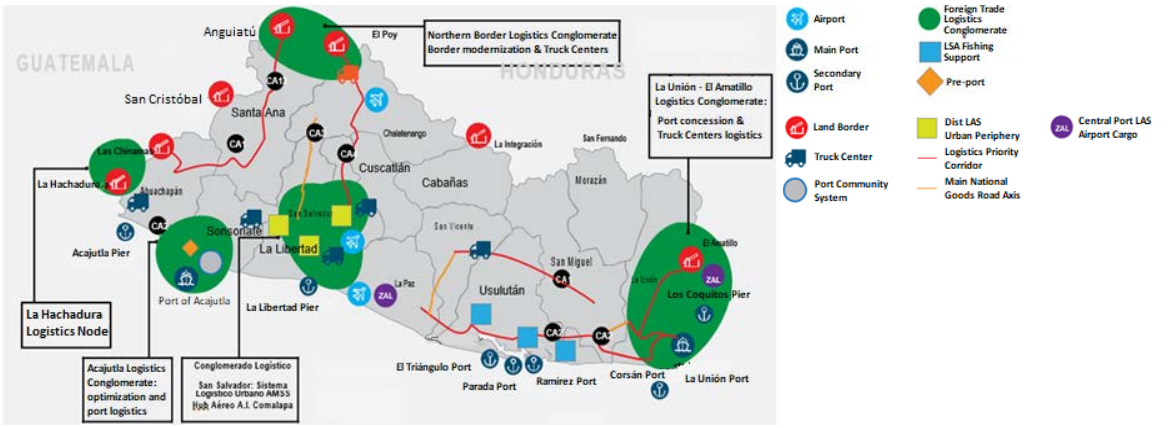
Source:PNLOG

Figure 3.4.4 Fuctional Structure of Logistics of El Salvador



Source:PNLOG

Figure 3.4.5 National Logistics System in Action Plan of El Salvador



Source:PNLOG

Figure 3.4.6 IAP of El Salvador

3.4.4 Honduras

INSEP formulated the National Plan on Cargo Logistics (PNLOG) for Honduras in 2019. The PNLOG consists of the review of upstream policy, general description of the country (industry and logistics), Strategic Agenda, Action Plan and Immediate Action Plan (IAP).

(1) General Description

Similar to other countries in Central America, agriculture is the key sector of Honduras. The primary sector shares 15.8 % of the national GDP. Major export products are coffee, banana, palm oil, shrimp and vegetables. The manufacturing sector shares 19.3% of GDP. Food products and bevarages are major products. There are many maquiladors for textiles in the north area. The tourism sector is also an important industry and earns 710 million US$. Bay Islands in northern coastal area and archaeological sites such as Copan Ruins are major tourism spots.

Besides the existing maquiladors and free zones, Zone for Employment and Economic Development: Zona de Empleo y Desarrollo Economíco (ZEDE), has been planned at 14 locations in Honduras. Corresponding law and regulations were enacted. The ZEDE in the Gulf of Fonseca is prioritized. The master plan for ZEDE in the Gulf of Fonseca was already established by COICA and logistics, agricultural industry, aquaculture and maquila industry were proposed in the master plan.

It is pointed out that overloaded trucks have damaged roads in Honduras since there is no weights and dimensions control system. Also, there is no system for the registration of logistic carriers, except for international transport. There is no mandatory liability insurance nor a driver certification system.

(2) Strategic Agenda

The PNLOG holds up the following vision statement. Strategies are set accordingly.

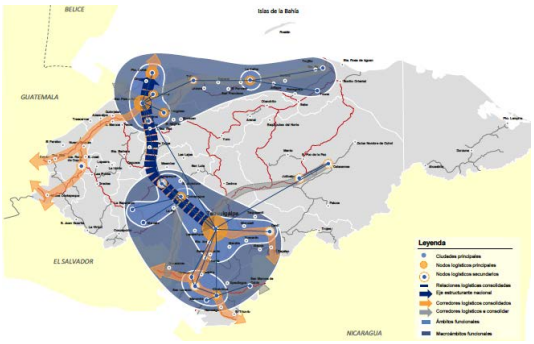
> *To effectively and efficiently cover the demand for logistics services created by domestic productive sectors, domestic consumption and the country's foreign trade, by means of: 1) A comprehensive logistics offering, 2) Maximum efficiency in operations and security for cargo and 3) World Class Infrastructure and equipment*

(3) Functional Structure of Logistics

North-south axis connects Cortés port, San Lorenzo, San Pedro Sula and Tegucigalpa and is the main logistic axis in Honduras. Also, PNLOG identified 7 Principal Nodes: Tegucigalpa, San Pedro Sula, Cortes Port, Comayagua, La Ceiba, Choloma, El Progreso. (see Figure 3.4.1).

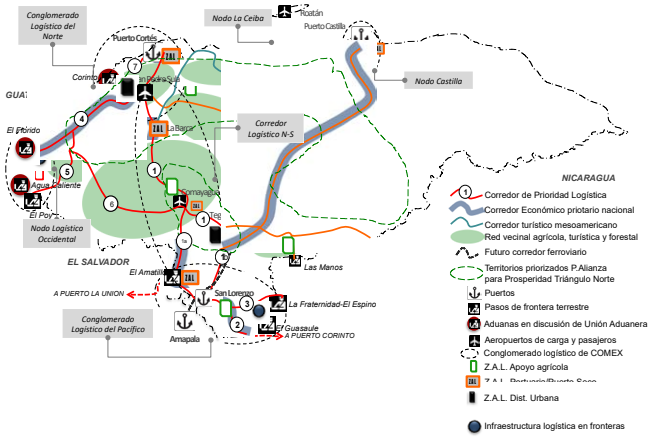
(4) Action Plan

To achieve the strategic agenda, an action plan including the investment plan for 10 - 15 years is formulated. The total amount of the investment plan is 4.8 billion US$. In the action plan, 6 functional logistics conglomerates and 3 priority logistic corridors are proposed. Road improvement projects including bypass roads at logistics conglomarates and the development of Logistics Support Zones (ZAL) are proposed along those corridors.



Source:PNLOG

Figure 3.4.7 Fuctional Structure of Logistics of Honduras



Source:PNLOG

Figure 3.4.8 National Logistics System in Action Plan of Honduras

(5) Immediate Action Plan (IAP)

Following projects are proposed as a Immediate Action Plan (IAP). Total cost of the IAP is estimated at 800 million USD.

North Conglomerate and North-South Logistics Corridor

- Puerto Cortés: improvements to the port, port LAZ (Logistic Activity Zone), logistics infrastructure to support perishables, San Pedro Sula bypass, etc.

Pacific Logistics Conglomerate

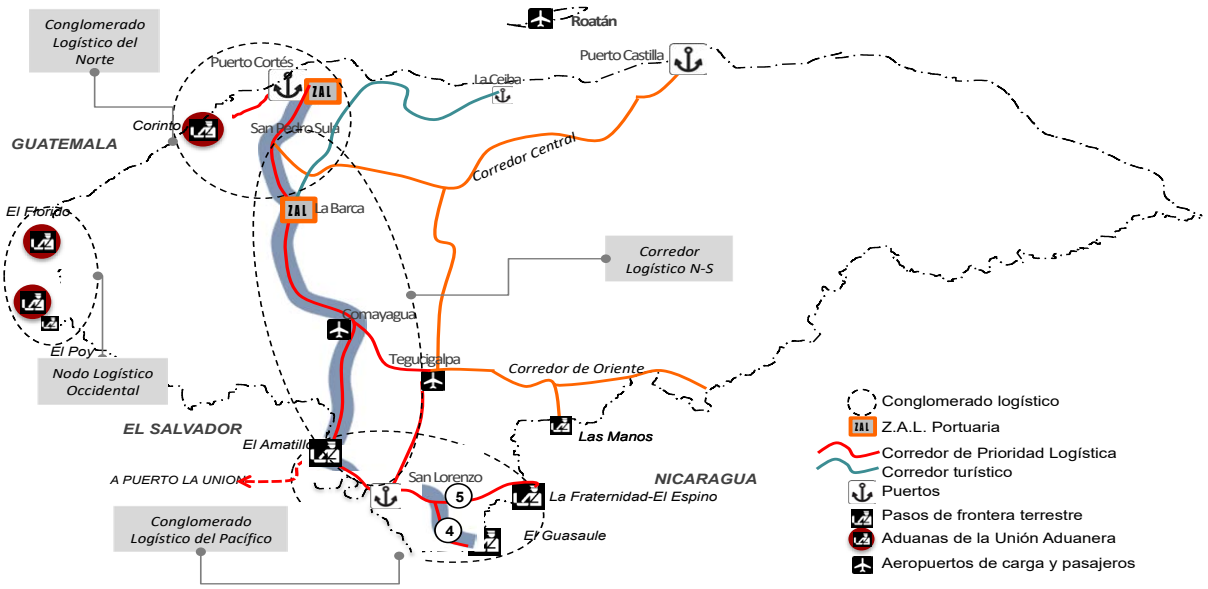
- Improvements and equipment for the corridor, border crossings with SV and NI, and GCF, LAZ Alliance (ZEDE),etc.

Other Priority Corridors and Borders

- East Corridor, Central Corridor, border crossings with SV and GT.

Cross-sectional Actions

- Customs improvements, truck-centers and permanent weight control stations, etc.



Source:PNLOG

Figure 3.4.9 IAP of Honduras

3.4.5 Nicaragua

National Plan on Cargo Logistics (PNLOG) was for Nicaragua was formulated in 2018. The PNLOG consists of the review of upstream policy, general description of the country (industry and logistics), Strategic Agenda, Action Plan and Immediate Action Plan (IAP).

(1) General Description

The tertiary sector is the dominant sector in Nicaragua's economic structure; where trade and services have a 51% share of GDP (2017).The secondary and primary sectors are also important, in which the role of the manufacturing industry (13.7% of GDP), agriculture (9.9%) and the livestock sector stands out in the Nicaraguan economy (8%). This composition has remained relatively stable.

Coffee, sugar cane, peanuts and beans are major agriculture projects. Livestock is also important industry in Nicaragua. Meat and dairy products are exported to other countries. Major cities such as Managua and Leon have free zones and textile and auto parts are producted from those zones.

The eastern area is wetland and undeveloped. Road density is low in the area. There are two public truck terminals in Punta lcaco 1 and 2 which is located near the Corinto Port.

(2) Strategic Agenda

Vision statement of the PNLOG is as below. Strategies are set accordingly.

Nicaragua will have a competitive, efficient, reliable, regionally integrated national logistics system that will offer value-added logistics services:

- it will contribute to sustainable and well-balanced economic and territorial development, and
- it will enhance the growth of national productive sectors, national and international trade, and national and foreign investment.

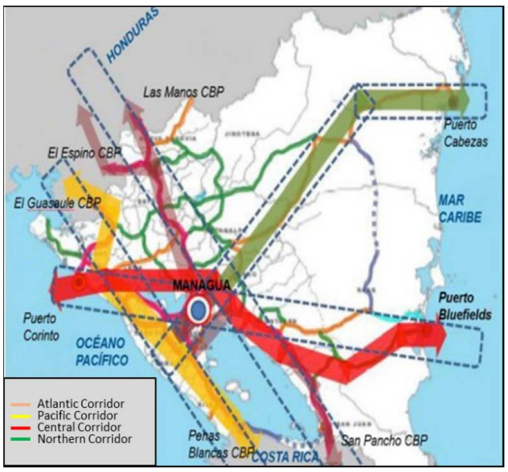
(3) Functional Structure of Logistics

The PNLOG and the National Transport Master Plan in Nicaragua identified the following functional structure of logistics system in Nicaragua (see Figure 3.4.1);

- 4 Axis: 2 longitudinal north-south and 2 transversal corridors and
- 3 Principal Nodes: Managua, Corinto Port and Matagalpa.

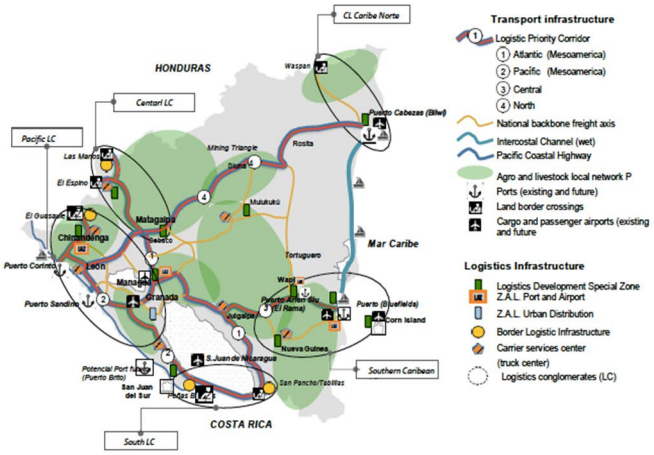
(4) Action Plan

To achieve the strategic agenda, an action plan including the investment plan for 10 - 15 years is formulated. Total amount of the investment plan is 5.7 billion US$. In the action plan, 5 functional logistics conglomerates and 4 priority logistic corridors, same routes as 4 axis in the above mentioned functional structure, are proposed. Road improvement projects including bypass roads at logistics conglomarates are proposed along those corridors.



Source:PNLOG

Figure 3.4.10 Fuctional Structure of Logistics of Nicaragua



Source:PNLOG

Figure 3.4.11 National Logistics System in Action Plan of Nicaragua

(5) Immediate Action Plan (IAP)

The following projects are proposed as a Immediate Action Plan (IAP). Total cost of the IAP is estmated at 18 billion USD.

<u>Pacific Logistics Corridor</u>

- Road improvements between Rancherías-MalIAPsillo
- Improvements of the Corinto Port system including SEZ and Managua Airport, studies of a new airport in Punta Huete, Guasaule border
- Service center for transport carriers in Chinandega

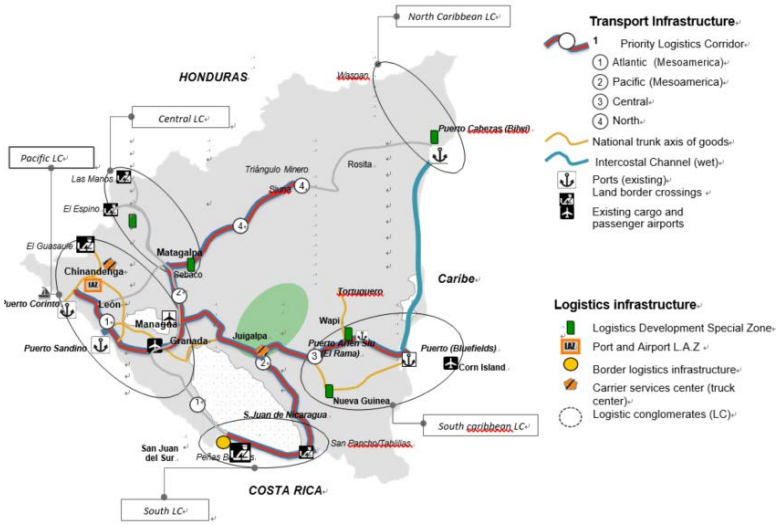
<u>Southern Logistics Corridor</u>

- Road improvements between Peñas Blancas - new San Pancho / Tablillas border, San Pancho / Tablillas-Juigalpa-Managua section

<u>Central Logistic Corridor</u>

- Improvements to a section of the Matagalpa Puerto Cabezas corridor
- Special logistics development zones to support the agricultural sector

<u>Southern Caribbean Logistic Corridor, Northern Caribbean Logistics Corridor and Transversal Actions</u>



Source:PNLOG

Figure 3.4.12 IAP of Nicaragua

3.4.6 Costa Rica

The National Plan on Cargo Logistics (PNLog) for Costa Rica was formulated by the Presidential Council for Competitiveness and Innovation (CPCI) in 2014. The plan is officially approved. The PNLog contains the review of upstream policy, general description of the country (industry and logistics), Strategic Agenda and Action Plan.

(1) General Description

The economic structure of Costa Rica is heavily dependent on the tertiary or services sector, whose weight in total GDP amounts to 70%. Although the primary sector has the highest volume of production in the country, it only represents about 6% of national GDP. Banana, pineapple, coffee and palm oil is the major export products. Manufacturing sector shares 17% of national GDP. Electric equipment, integrated circuits, and medical equipment are major products.

The PNLog pointed out that heavy rains interrupt cargo transport frequuently. Also, major road capacity is limited. Industrial free zones are located in San Jose, Alajuela, Heredia and Cartago. As for the maritime sector, APM Teminals was awarded the concession of Moin container terminal. However, there are no plans to develop a logistic area there. To export fresh fruits, a cold storage warehouse is important. There is a freight railway system in Costa Rica. However, it is deteriorated.

(2) Strategic Agenda

The PNLOG holds up the following vision statement. Strategies are set accordingly.

Costa Rica will have a robust offer of value-added logistics services to the load that meets the needs of the national productive sectors and contributes to the continuous improvement of the country's competitiveness.

- facilitating the opening and development of new markets,
- allowing maximum use of the potential of existing markets, and
- guaranteeing the attraction and retention of foreign investments.

(3) Functional Structure of Logistics

The functional structure of current logistics of Guatemala is idenfified, namely 4 principal Nodes: GAM, Limón-Moín port complex, Caldera and Peñas Blancas and single axis: Penas Blancas - Liberia - Caldera

Port - San Jose - Guapiles - Limon Port (see Figure 3.4.1).

(4) Action Plan

To achieve the strategic agenda, priority action plan including the investment plan for 10 - 15 years is formulated. In the action plan, 5 functional logistics conglomerates and 4 priority logistic corridors are proposed. A distribution center in the airport free zone, truck centers at land borders, logistics activitie zones and ring roads at major cities are proposed along those corridors.

Total cost of the Priority Action Plan is 0.67 billion USD.



Source:PNLOG

Figure 3.4.13 Fuctional Structure of Logistics of Costa Rica



Source:PNLOG

Figure 3.4.14 National Logistics System in Action Plan of Costa Rica

3.4.7 Panama

National Plan on Cargo Logistics (PNLog) for Panama was formulated by the Logistics Council Panama in 2014. The plan is officially approved. The PNLog contains the review of upstream policy, general description of the country (industry and logistics), Strategic Agenda and Action Plan.

(1) General Description

The economic structure of Panama is heavily dependent on the tertiary or services sector, whose weight in total GDP amounts to 80%. The economic activity related to the Panama Canal shares 24% of national GDP. The primary sector represents about 3% of national GDP. Sugar cane, vegetables, rice, banana, shrimp and pineapple are the major export products. The manufacturing sector shares 5.3% of national GDP. The Copper Panama project is on-going in Donors District in Colom Province. Copper is produced there at 255,000 tons per year.

The PNLog pointed out that heavy traffic congestion is observed at the Colon Free Zone (CFZ). It is also pointed out that it's difficult for foreign carriers to pick up cargo from CFZ. (Frequent arguments for non-compliance of trade agreement. Retaliatory measures to Panamanian carriers.)

Primary roads are in good condition, most of the secondary and tertiary networks are unpaved. Panama-Colon Corridor and the access roads to the Panama city that link the national territory with the two crossing borders located in Paso Canoas and Guabito. Physically, road isn't connected to Colombia.

There areTrans-panama pipeline, 131km (Chiriqui Grande, Bocas del Toro on the Caribbean coast to the port of Charco Azul on the Pacific coast). The pipeline transport 800 million barrels per day.

(2) Strategic Agenda

The PNLog holds up the following vision statement. Strategies are set accordingly.

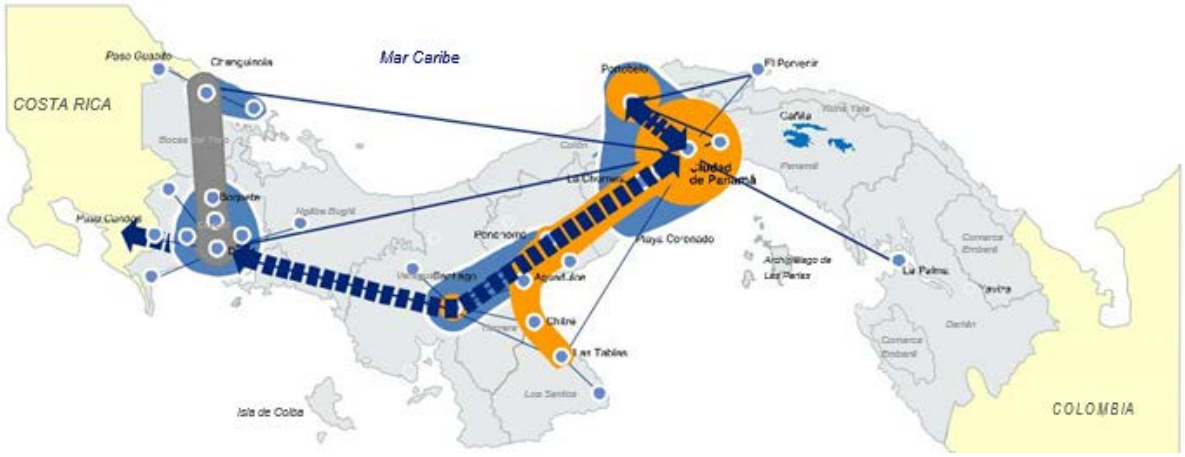
> *Serve effectively and efficiently the logistics demand generated by international users, national productive sectors, domestic consumption and foreign trade of the country, creating conditions for sustainable development and continuous improvement of the country's competitiveness.*

(3) Functional Structure of Logistics

Functional structure of current logistics of Panama is idenfified, namely 3 principal Nodes: Panama city, Colon and David and 2 axis: Colon - Panama city and Paso Canoas – David - Panama City (see Figure 3.4.1).

(4) Action Plan

To achieve the strategic agenda, a priority action plan including the investment plan for 10 - 15 years is formulated. In the action plan, 3 functional logistics conglomerates and 2 priority logistic corridors are proposed. Several projects are proposed along those corridors, namely, logistic activity zones, truck center, pacific corridor road project, border infrastructure improvement such as scanner, agriculture chains study, secondary road to mining zone,etc. Total cost of the Priority Action Plan is 0.97 billion USD.



Source:PNLOG

Figure 3.4.15 Fuctional Structure of Logistics of Panama



Source:PNLOG

Figure 3.4.16 National Logistics System in Action Plan of Panama

3.4.8 Summary

(1) Vision Statement

Each PNLOGs have a unique vision statement. However, some words are commonly used in some plans such as; “Robust offer of value-added logistics”, “Harmonized”, “National productive apparatus”, “Efficient”, “Sustainable”. Those key words can be considered as common words to be used for regional vision statements.

Table 3.4.3 Vision Statements of PNLOG in each Country

Country	Vision Statement
GTM	To become a regional leader in transportation and cargo logistics by means of a robust offer of value-added logistics services that: Will contribute to the harmonic territorial development, will facilitate connectivity and access to regional and extra-regional market, will promote the growth of the national productive apparatus. Will contribute to the continuous improvement of the country’s competitiveness.
SLV	To be a country with a mobility of people and logistics of products and services of quality, organized, accessible, safe and with diversified commercial flows of high added value in the value chain and regionally integrated productive apparatus that contributes to sustainable, inclusive, balanced and resilient human development.
HND	To effectively and efficiently cover the demand for logistics services created by domestic productive sectors, domestic consumption and the country’s foreign trade, by means of: 1) A comprehensive logistics offering, 2) Maximum efficiency in operations and security for cargo and 3) World Class Infrastructure and equipment
NIC	Nicaragua will have a competitive, efficient, reliable, regionally integrated national logistics system that will offer value-added logistics services: -it will contribute to sustainable and well-balanced economic and territorial development, and -it will enhance the growth of national productive sectors, national and international trade, and national and foreign investment.
CRC	Costa Rica will have a robust offer of value-added logistics services to the load that meets the needs of the national productive sectors and contributes to the continuous improvement of the country's competitiveness. -facilitating the opening and development of new markets, -allowing maximum use of the potential of existing markets, and -guaranteeing the attraction and retention of foreign investments

Country	Vision Statement
PNM	Serve effectively and efficiently the logistics demand generated by international users, national productive sectors, domestic consumption and foreign trade of the country, creating conditions for sustainable development and continuous improvement of the country's competitiveness

Source: PNLOG of each country

(2) Functional Structures

In Central America, 27 principal logistic nodes and 24 secondary logistic nodes are identified in each PNLOG. Besides major cities, special functional cities, and international gateways, are selected as principal logistics nodes. The following tables shows the list of nodes and characteristics.

Table 3.4.4 List of Principal Logistic Nodes in PNLOGs

	Municipality	National Capital	Prefectural Capital	Population (1000)	Number of SEZ	Int. Airport	Dom. Airport	Port	Land Border
GTM	Guatemala city	✓	✓	923	7	✓			
	Quetzaltenango		✓	181			✓		
	Puerto Barrios		✓	101	3		✓	✓✓	✓
SLV	San Luis Talpa			22		✓			
	San Salvador	✓	✓	316					
	Acajutla			52				✓	
	La Unión		✓	34	1			✓	
	Santa Ana		✓	245	2				
	Usulután		✓	73					
	San Miguel		✓	218					
HND	La Ceiba		✓	200		✓		✓	
	San Pedro Sula		✓	726	3	✓			
	Choloma			243	4				
	Puerto Cortés			127				✓	
	El Progreso			190	1				
	Comayagua		✓	154					
	Tegucigalpa	✓	✓	1,166		✓			
NIC	Matagalpa		✓	162					
	Corinto			18				✓	
	Managua	✓	✓	1,049	11	✓			
CRC	San José	✓	✓	342		✓			
	La Cruz			26					✓
	Esparza			37				✓	
	Limón		✓	99	1	✓		✓	
PNM	Colón		✓	242	4			✓✓	
	Panamá	✓	✓	1,120	15	✓✓		✓	
	David		✓	167		✓		✓	

Source: Cities are selected in PNLOG of each country. Charactaristics are summarized by JST

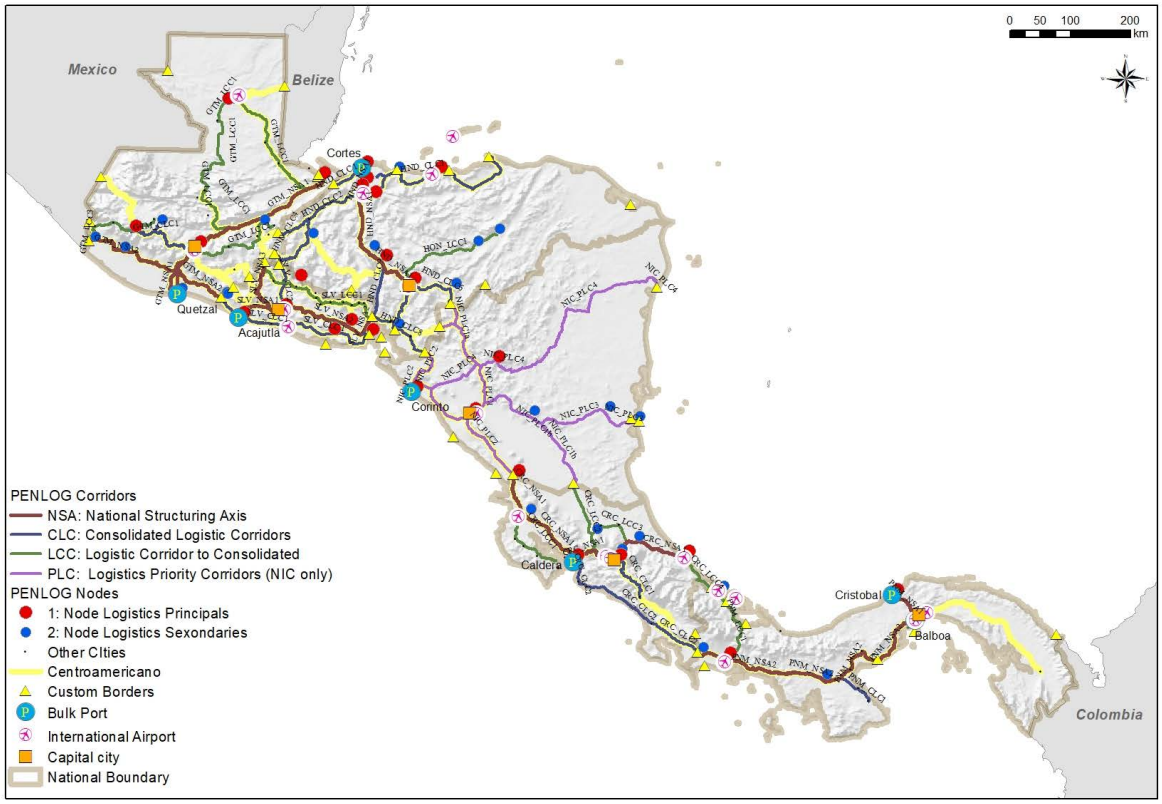
Table 3.4.5 List of Secondaly Logistic Nodes in PNLOGs

	Municipality	Prefectural Capital	Population (1000)	Number of SEZ	Int. Airport	Dom. Airport	Port	Land Border
GTM	San José		63	1		✓	✓	
	Moyuta		40					✓
	Ayutla		37	2				✓
	Zacapa	✓	60					

	Municipality	Prefectural Capital	Population (1000)	Number of SEZ	Int. Airport	Dom. Airport	Port	Land Border
	Retalhuleu	✓	91					
	S. Tomás Chichicastenango		142					
	La Libertad		72					✓
SLV	San Francisco Menéndez		43					✓
HND	San lorenzo		43				✓	
	Siguatepeque		99					
	Tela		101				✓	
	Santa rosa de copán	✓	64					
	Danlí		201					
NIC	El Rama		58					
	Bluefields	✓	57			✓	✓	
	Puerto Cabezas (Bilwi)	✓	120			✓	✓	
	Juigalpa	✓	61					
CRC	Liberia	✓	74	1	✓			
	Pérez Zeledón		143					
	San Carlos		194					
	Corredores		51					✓
	Pococí		146					
PNM	Changuinola		98		✓			✓
	Santiago	✓	98					

Source: Cities are selected in PNLOG of each country. Characteristics are summarized by JST

The following figure summarizes the principal logistics nodes, secondary logistics nodes and corresponding corridors in PNLOGs.



Source: JST with information in PNLOGs

Figure 3.4.17 Functional Structures in PNLOGs

(3) Functional Logistics Conglomerates and Priority Logistic Corridors in Action Plans in PNLOGs

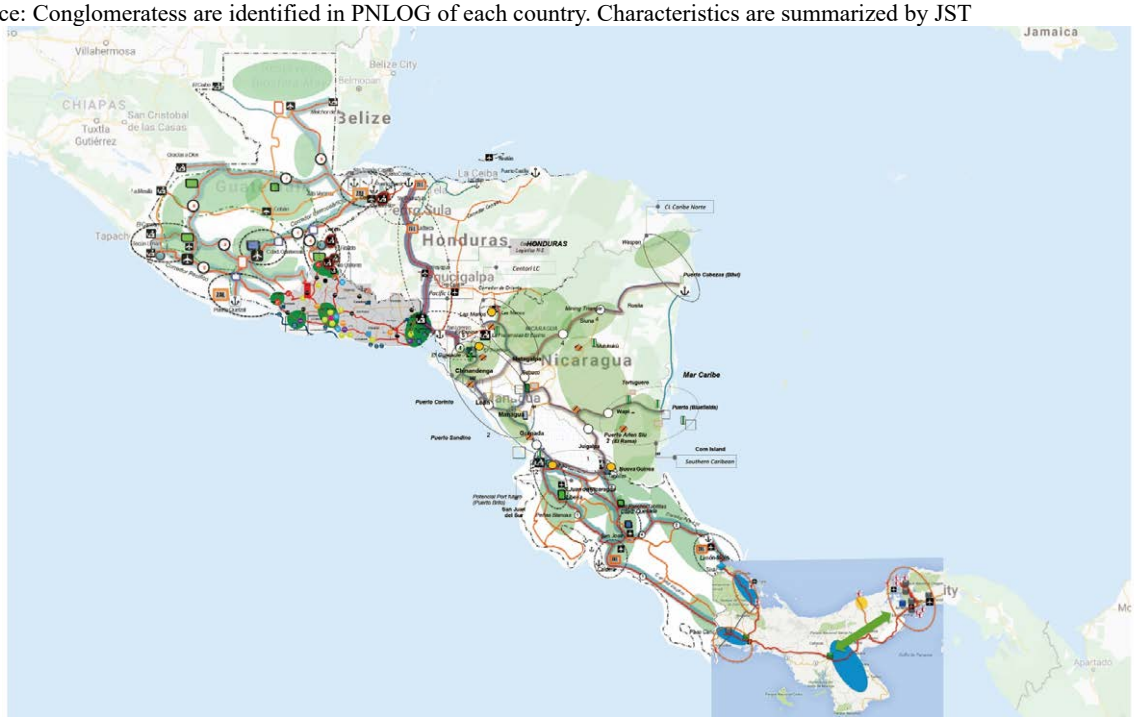
The following table and figure summarize the functional logistics conglomerates and priority logistics corridors in Action Plans in PENLOGs. Most of the conglomerates are capital cities and special functional cities on transportations such as border, airport and port.

Table 3.4.6 List of Functional Logistics Conglomerates in PNLOGs

Logistics Conglomerates	Major cities	Population (1000)	Int. Airport	Dom. Airport	Port	Land Border
Guatemala Metropolitan Area	Guatemala city, Mixco, Amatitlán, Villa Nueva	3,557	✓			
Quetzal Port/ Pedro de Alvarado Border	San José, Moyuta	278		✓	✓	✓
Quetzaltenango / Tecun Uman Border	Quetzaltenango, Malacatán, Ayutla	392		✓		✓✓
Barrios Port / St. Tomas Castilla Port	Puerto Barrios	101		✓	✓✓	✓
Zacapa / El Florido Border	Zacapa, Camotán, Esquipulas, Concepción Las Minas	276				✓✓✓
San Salvador Metropolitan Area	San Salvador, Ilopango	2,298	✓			
La Hachadura Border	Ahuachapán, San Francisco Menéndez	183				✓✓
Acajutra Border	Acajutla	72			✓	
Northern Borders	Metapán, Citalá	5				✓✓

Logistics Conglomerates	Major cities	Population (1000)	Int. Airport	Dom. Airport	Port	Land Border
La Union Port / El Amattillo Border	La Unión, Pasaquina	76			✓	✓
Castilla	Trujillo, Copán ruinas	65			✓	✓
La Ceiba	La Ceiba	200	✓		✓	
North Area	San Pedro sula, Choloma, Puerto cortés, El progreso	1,251	✓		✓	
Occidental	Ocotepeque, Santa fe	46				✓✓
Pacific Area	Amapala, San lorenzo	87			✓	✓✓✓
North-South Area	Comayagua, Siguatepeque, Tegucigalpa	1,511	✓			
Central Area	San Lucas, Matagalpa	543				✓
Pacific Area	Somotillo, Corinto, Managua	2,103	✓		✓	✓
Southern Caribean	El Rama, Bluefields	194		✓	✓	
North Caribe	Puerto Cabezas (Bilwi)	120		✓	✓	
South Area	Cárdenas, San Carlos	64				✓✓
San Jose Metropolitan Area	San José	1,892	✓			
Las Tablillas Border	Los Chiles	32				✓
Liberia / Penas Blancas Border	Liberia, La Cruz	100	✓			✓
Caldera Port	Esparza	37			✓	
Limon Port	Limón	15	✓		✓	
Panama City / Clon	Colón, Panamá	1,649	✓✓		✓✓✓	
David / Paso Canoas Border	Bugaba, David	283	✓		✓	✓
Sixaola Border	Changuinola	98	✓			✓

Source: Conglomeratess are identified in PNLOG of each country. Characteristics are summarized by JST



Source: JST with information in PNLOGs

Figure 3.4.18 Functional Logistics Conglomerates in PNLOGs

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 4

Strategic Environmental Assessment

November 2023

Japan International Cooperation Agency
Oriental Consultants Global Co., Ltd.
Nippon Koei Co., Ltd.
ALMEC Corporation
Overseas Coastal Area Development Institute of Japan
International Development Center of Japan Inc.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

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Strategic Environmental Assessment

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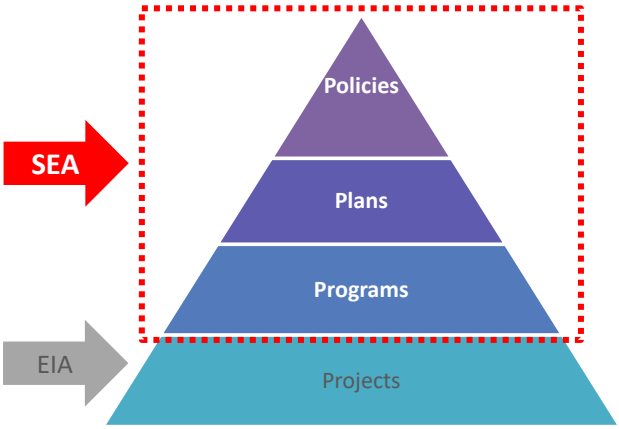
Appendix 4 Strategic Environmental Assessment

4.1 Outline of SEA

4.1.1 Purpose of SEA

(1) Understanding of SEA

The Strategic Environmental Assessment (SEA) is applied at an earlier stage of the decision-making process to allow decision-makers to proactively determine the most suitable development options. Environmental Impact Assessment (EIA), on the other hand, focuses on the environmental impacts of a specific development project once it has been designed. The application of SEA and EIA in the planning level is shown in Figure 4.1.1 and the difference between the two is summarized in Table 4.1.1.



Source: JST

Figure 4.1.1 Application of SEA to the Planning Structure

Table 4.1.1 Differences between SEA and EIA

SEA	EIA
• At earlier stage of decision making cycle	• At the end of decision making cycle
• Proactive approach	• Reacts to specific proposal
• Wide range of alternatives	• Limited range of alternatives
• Gives early warning of cumulative impacts	• Limited opportunity to address cumulative impacts
• Emphasis on meeting goals and safeguards	• Emphasis on mitigation and minimizing impacts
• Focus on 'do most good'	• Focus on 'do no/least harm'

Source: JST

(2) Purpose of SEA

The purpose of SEA in this Master Plan is to integrate environmental and socio-economic aspects in the preparation and adoption of the plan to facilitate the plan to contribute to sustainable development. It can be achieved by the comprehensive contribution from different sectors and different planning aspects. The following benefits are some of the benefits that SEA can bring to the planning process.

- to identify development opportunities and potentials
- to ensure critical resources and assets are protected
- to facilitate integrated planning and encourage cross-sector coordination
- to facilitate regional and transboundary cooperation
- to promote transparency and build confidence in decision-making through stakeholder meetings

(3) Legal Requirement

SEA is mentioned in laws and regulations in each country, however the methodology is not clearly defined as of now. Furthermore, the requirement of legal approval and legal procedure on SEA is not mentioned for plans that have a multi-country regional scope. Therefore, SEA in this Master Plan will be carried out not as a legal procedure but used as a planning tool in the planning processes. The summary of laws and regulations concerning SEA is described in Table 4.1.2 below.

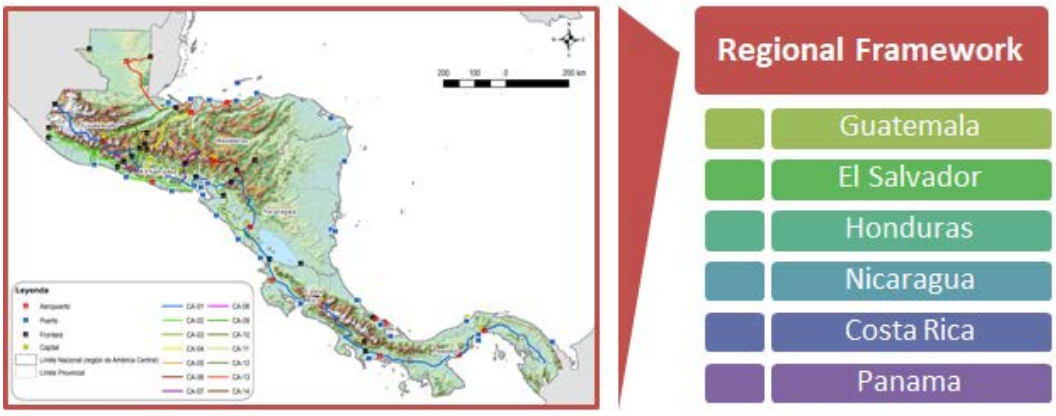
Table 4.1.2 Law and Regulations related to SEA in each Country

Country	Law	Description
Guatemala	Government Agreement No. 137-2016	N/A
El Salvador	Decree No. 233	SEA Report content Approval process
Honduras	Ministerial Agreement No. 008-2015	SEA Process
Nicaragua	Decree No.20-2017	N/A
Costa Rica	Decree No.31849-2004	Specification mentioned only for land use plan
Panama	Decree No. 4-2017	SEA Process SEA Report content Approval process

Source: JST

(4) Scope of SEA

The scope of the SEA is to firm up the regional framework for the Master Plan covering 6 countries in Central America. The regional framework provides the development direction. It must be agreed upon by constituent countries so that each country can follow the same direction. For this purpose, SEA is applied to the Regional Master Plan level as opposed to carrying it out in each country in a separate manner.



Source: JST

Figure 4.1.2 Application of SEA at Regional Level

4.1.2 SEA Process

The SEA for this Master Plan will be carried out in four main stages as shown below.

(1) Scoping Work

- Review upstream policies to confirm key directions of this Master Plan
- Review existing conditions to identify key areas of consideration for this Master Plan
- Develop SEA policies and indicators based on the identified key areas of consideration

(2) Policy Level SEA

- Integrate SEA policies into the transport policy and strategy development process

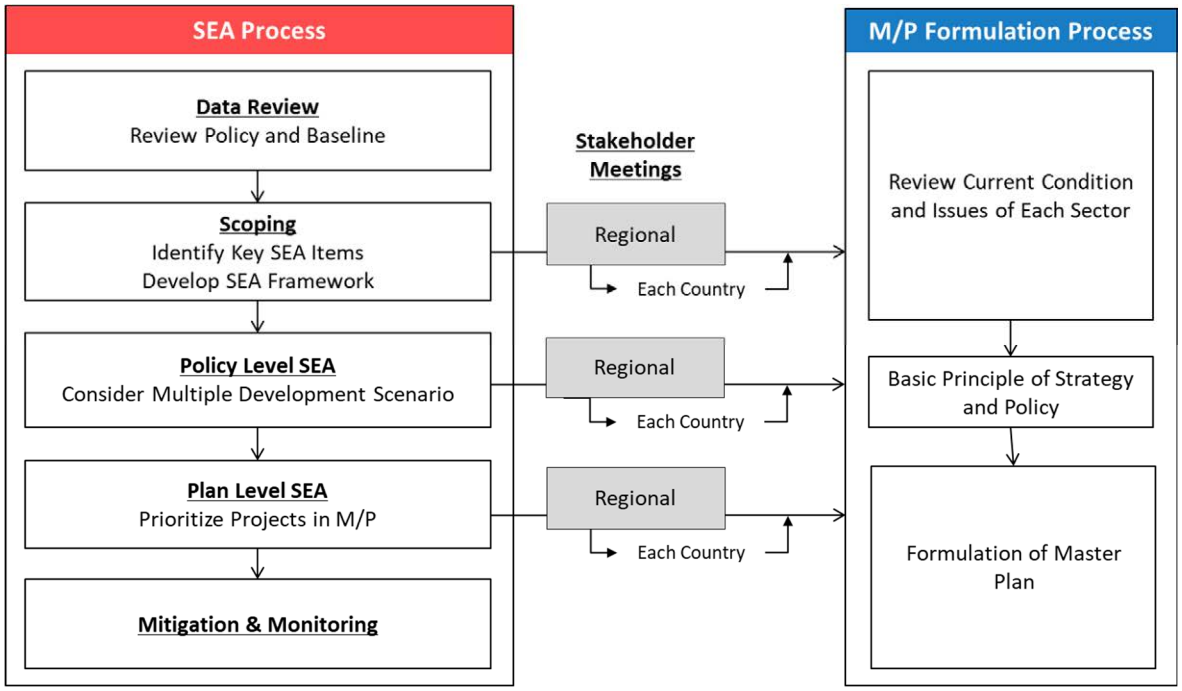
(3) Plan Level SEA

- Carry out a rapid assessment of the proposed projects
- Consider mitigation measures

(4) Recommendation

- Consider recommendation and monitoring items

The interaction of the SEA process and this Master Plan planning process is shown in Figure 4.1.3. The integration of SEA starts from the beginning of this Master Plan planning exercise and at each stage of the SEA; scoping stage, policy level, and plan level. The first SEA meeting was organized to introduce the SEA framework prepared in the scoping work in February 2021. The second SEA meeting was held online in May 2022 to explain the assessment of alternative options analysis. The third SEA meetings were held in each country from February to March 2023 to discuss rapid assessment of the proposed projects and mitigation measures. Opinions and recommendations raised in those SEA meetings will be reflected at each stage of this Master Plan planning process.



Source: JST

Figure 4.1.3 SEA Process and Master Plan Planning Process

4.1.3 Stakeholder Engagement

The purpose of stakeholder engagement is to incorporate comments from the concerned parties in the planning process. Understanding that this Master Plan involves various aspects related to SDGs, the stakeholders of SEA include not only the environment and social experts but also different sector experts such as transport, logistics, and socio-economic development. Furthermore, stakeholder engagement from both the regional level and country-level is indispensable to preparing this Master Plan that is contributed to not only the socio-economic development in each county but also the regional economic integration in Central America.

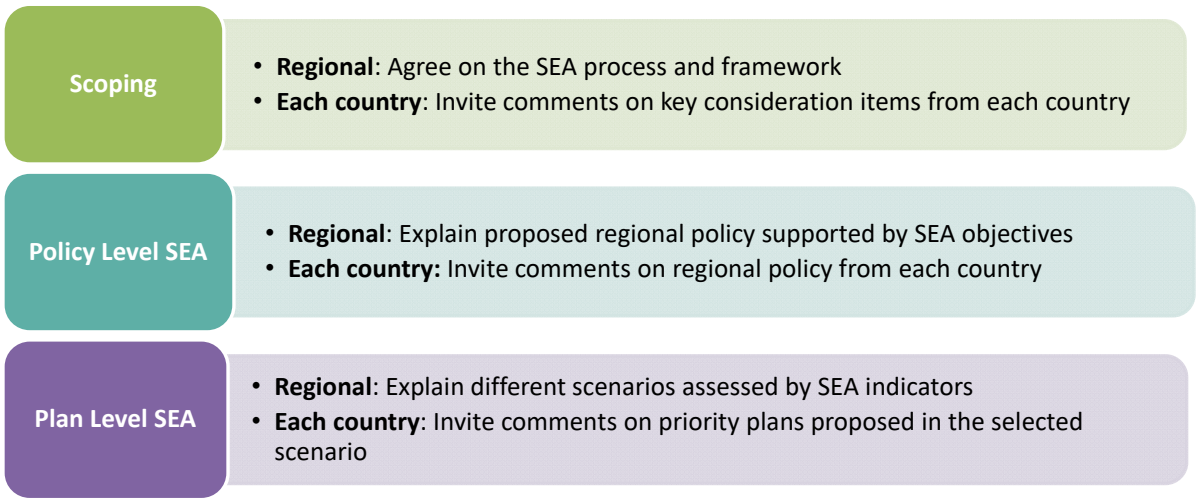
The list of the main stakeholders for the SEA is shown in Table 4.1.3. Additional agencies were invited to the meeting when considered necessary.

Table 4.1.3 List of the Main Stakeholders

	Main Agencies
Regional	• The Secretariat for Central American Economic Integration (SIECA) - Chairman • Central American Commission for Environment and Development (CCAD) • Regional Commission for Risk Management and Adaptation to Climate Change (CR GRACC) • Sectorial Council of Ministers of Transport of Central America (COMITRAN) • Comisión Centroamericana de Transporte Marítimo (COCATRAM)
Country	• Ministries of Public Works and Transport of each country • Ministries of Environment and Natural Resources of each country • Ministries of Planning of each country

Source: JST

The roles and purpose of the stakeholder meetings at each stage are shown in Figure 4.1.4. In principle, stakeholder meetings are held at the regional level which aims to discuss the planning direction. The content of the stakeholder meeting will be shared with concerned agencies in each country to invite comments and those comments are consolidated and reported to SIECA for integration into the plan. The main discussion topics for each stage are the proposed SEA process and framework at the scoping stage, the proposed regional policy supported by SEA objectives at the policy level, and the draft scenario assessment using SEA indicators at the plan level.



Source: JST

Figure 4.1.4 Stages and Roles of Stakeholder Engagement

4.2 Development Suitability Analysis

4.2.1 Purpose of Development Suitability Analysis

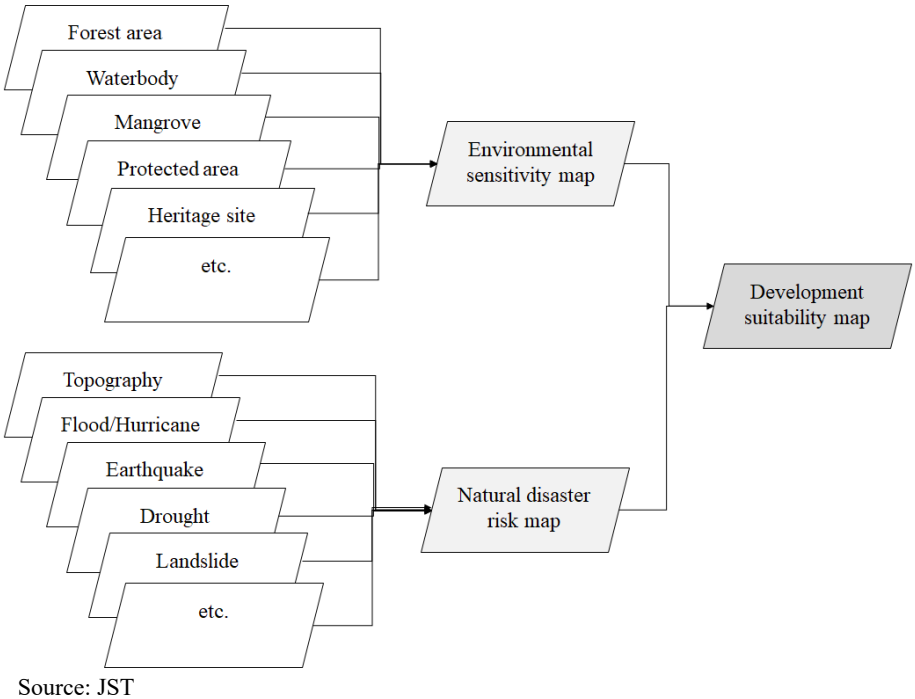
As explained above, SEA is a planning and decision-making supporting tool to ensure that policies, plans, and programs are consistent with the principles of sustainable development throughout the planning process. During the process, the SEA addresses the protection of natural resources, disaster risk mitigation, and climate change adaptation that provides opportunities for planners and decision-makers to consider the most suitable options to minimize negative impact.

As a part of SEA, development suitability analysis is carried out to establish the future spatial framework of the planning area. It identifies environmentally, socially, and ecologically sensitive areas and natural disaster risk areas that recommend the future spatial framework for the proposed logistics and transport infrastructure projects. It provides the basis for a sustainable and resilient logistics and transport infrastructure plan.

4.2.2 Methodology

GIS-based spatial analysis is used to carry out the development suitability analysis. As mentioned above, a development suitable area considers environmentally sensitive areas including protected areas, water bodies, forest areas, heritage sites, indigenous people's lands, etc., and natural disaster risk areas such as floods, cyclones, earthquakes, landslides, etc. The selection of the items used for this analysis is based on a comprehensive review of environment-related policies, plans, legislation, and also the availability of the data.

Each of those selected items is evaluated by the degree of environmental sensitivity and the degree of disaster risks using the scoring and weighting system. Scored items are aggregated and visualized as environmental sensitivity maps and natural disaster risk maps. Finally, the two maps are integrated into the development suitability map which indicates development suitable areas, the developable area with proper measures, and the unsuitable area for development. The overall image of the preparation of the development suitability map is shown in Figure 4.2.1.



Source: JST

Figure 4.2.1 Overall Image of Development Suitability Analysis

Table 4.2.1 shows the input data layers used for the environmental sensitivity analysis. Items selected for the analysis have ecological, environmental, and social value in the region. Each item is rated in three levels; low, medium, and high (score from 1 to 3) depending on the importance and sensitivity of the area. Higher weightage is given to those items that are protected by the laws and regulations and those having regional importance. The digitized map of the indigenous people's land was not collected as of now, therefore it is not included in the analysis at this time.

Table 4.2.1 Scoring System for Environmental Sensitivity Analysis (Draft)

Items	Score			Weight
	Low: 1	Medium: 2	High: 3	
Terrestrial sensitive area (forest area, vegetation, waterbody)*1	Bare area	Grassland, Scrub or Shrub, Sparse, Flooded vegetation	Forest, Cropland, Surface Water	1
Coastal sensitive area (mangrove, coral)*2	-	-	Mangrove area, Coral distribution	1
Protected areas*3	Unclassified	Buffer zone	All	2
Biological corridor*3	-	-	All	2
Indigenous people's land	Digitized data not available			

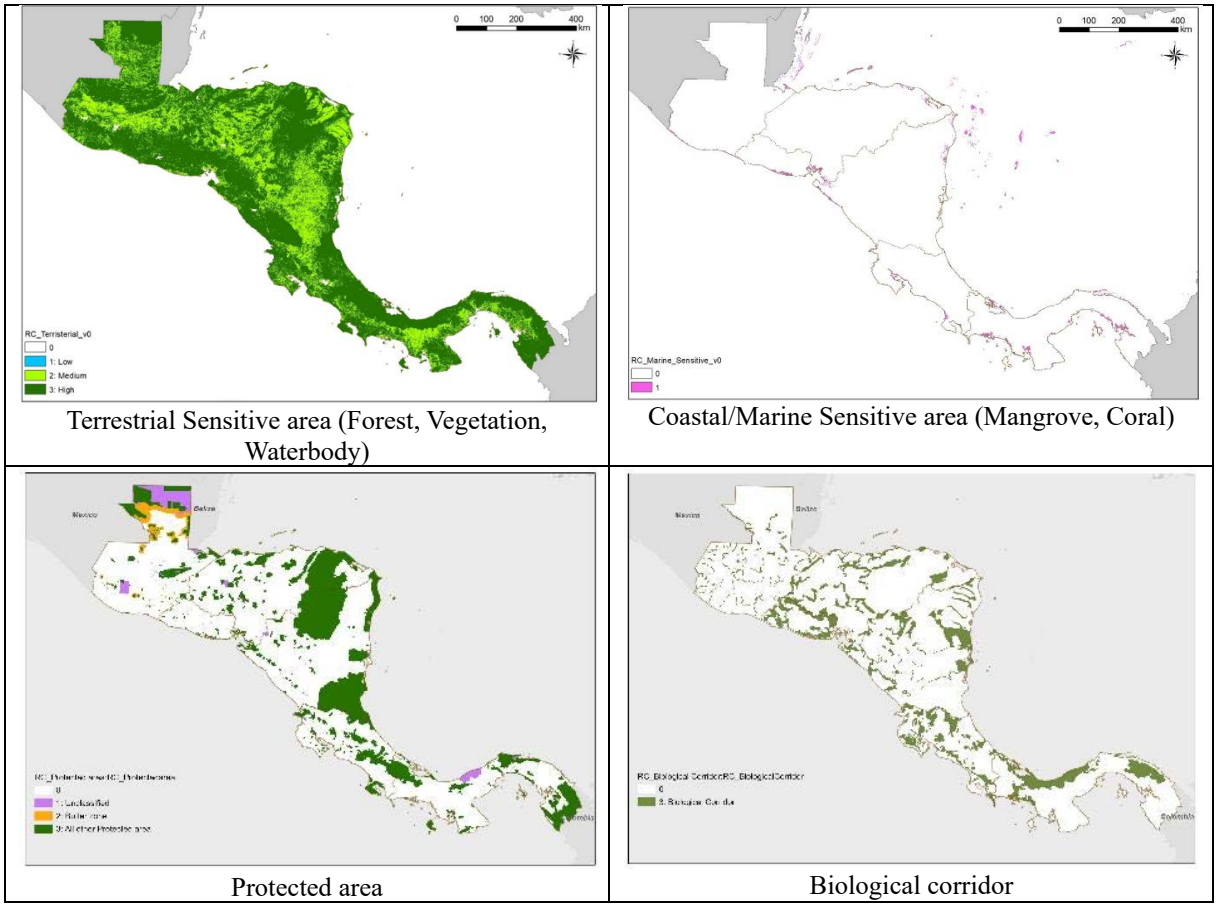
Source: JST

*1 Forest area/Vegetation area/Waterbody: ESA Landcover data 2018

*2 Mangrove/Coral: UNEP World Conservation Monitoring Centre

*3 Protected areas/Biological corridor: SICA

The followings are the input data layers used for the analysis.



Terrestrial Sensitive area (Forest, Vegetation, Waterbody)

Coastal/Marine Sensitive area (Mangrove, Coral)

Protected area

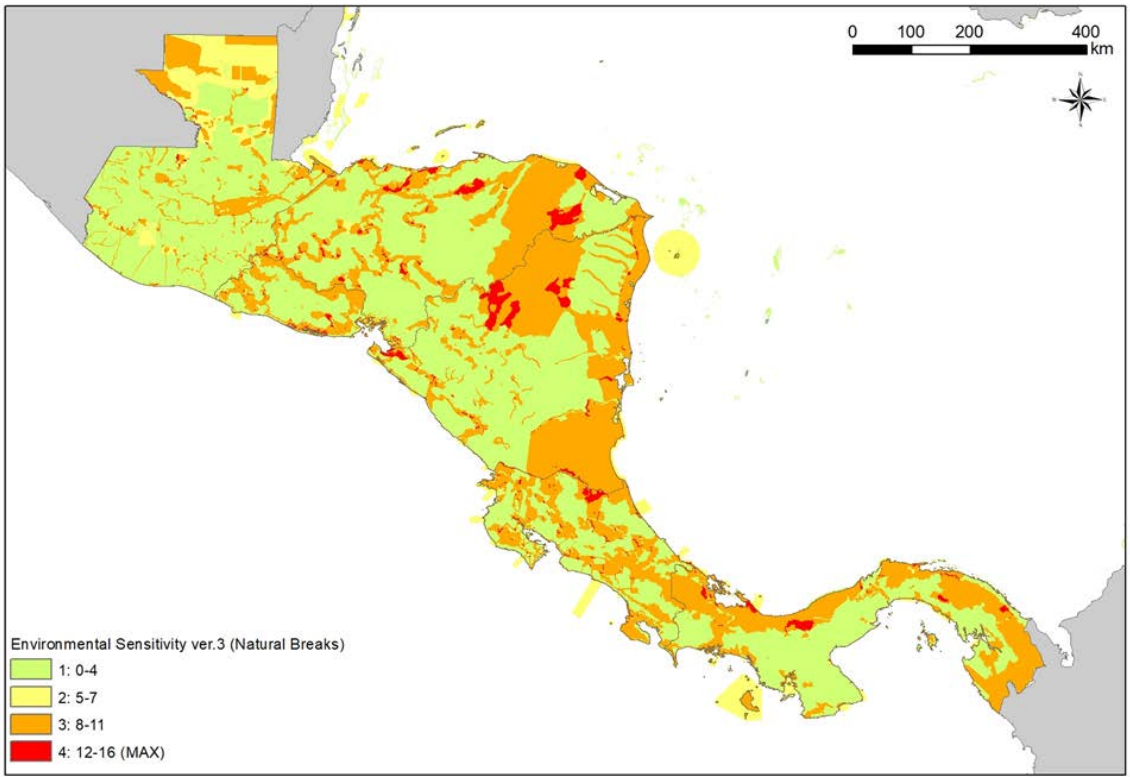
Biological corridor

Source: JST

Figure 4.2.2 Input Data Layers for Environmental Sensitivity Analysis

4.2.3 Result of Development Suitability Analysis

The analysis result of the environmentally sensitive area is presented in Figure 4.2.3. The level of environmental sensitivity is categorized into 4 levels by applying the natural breaks classification. This classification is data-specific and for which classes are based on natural groupings inherent in the data. It groups similar values and maximizes the differences between classes. The area indicated in red are highly sensitive areas, the orange color shows sensitive areas, the areas in yellow suggest low sensitive areas, and the green shows very low sensitive areas. Highly sensitive and sensitive areas coincide with the location of the protected areas.



Source: JST

Figure 4.2.3 Result of Environmental Sensitivity Analysis (Draft)

The same method was applied to analyze the natural disaster risk of the region. Each natural disaster risk item is evaluated in 3 levels (low, medium, and high) as shown in Table 4.2.2. Selected items for this analysis are based on the type of natural disaster events that have occurred in the region in the past. Higher weightage is given to potential sea-level rise risks based on the frequency of the natural disaster events in the region during 1900-2020.

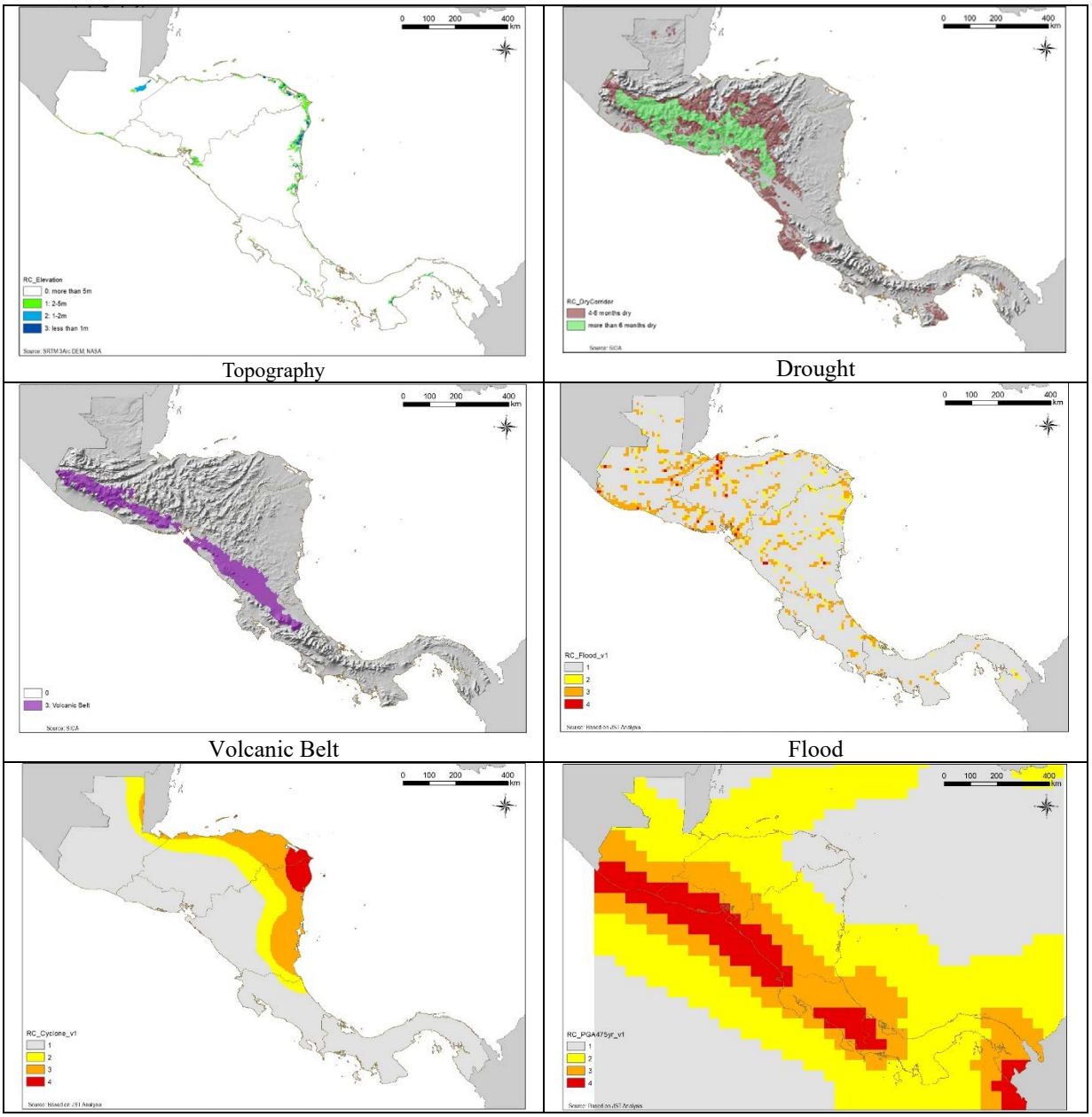
Table 4.2.2 Scoring System for Disaster Risk Analysis (Draft)

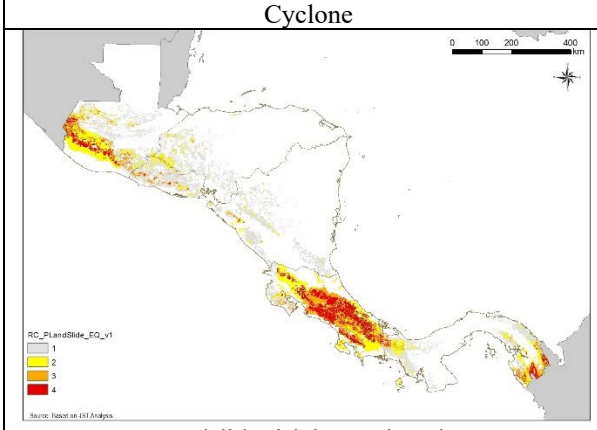
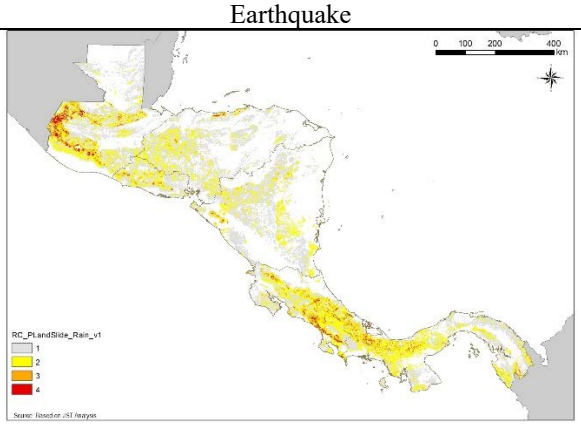
Items	Description	Score			Weight
		Low	Medium	High	
Topography*1		2-5m	＜2m	＜1m	2
Volcanic activity*2		-	-	Volcanic belt area	1
Drought*2	Dry area	-	Dry Corridor (4-6 months)	Dry Corridor (over 6 months)	1
Flood*3	Global estimated risk index for flood hazard	Low(1)	Moderate(2)& Medium(3)	High(4)& Extreme(5)	2

Items	Description	Score			Weight
		Low	Medium	High	
Cyclone*3	Tropical cyclones windspeed buffers footprint 1970-2009	1	2&3	4&5	2
Earthquake*3	Peak Ground Acceleration (PGA) 475 years (cm/s2)	90-177& 177-334	334/638	638-	1
Landslide*3	Frequency of landslides triggered by earthquakes	15	50	210/900/3600/15000	0.5
	Frequency of landslides triggered by precipitation	15	50	210/900/3600/15000	0.5

Source: JST
*1 Topography: SRTM3arc DEM, NASA
*2 Volcanic activity/Drought: SICA
*3 Multiple hazards: UNEP/DEWA/GRID-Europe

The input layers used for natural disaster risk analysis are shown below.

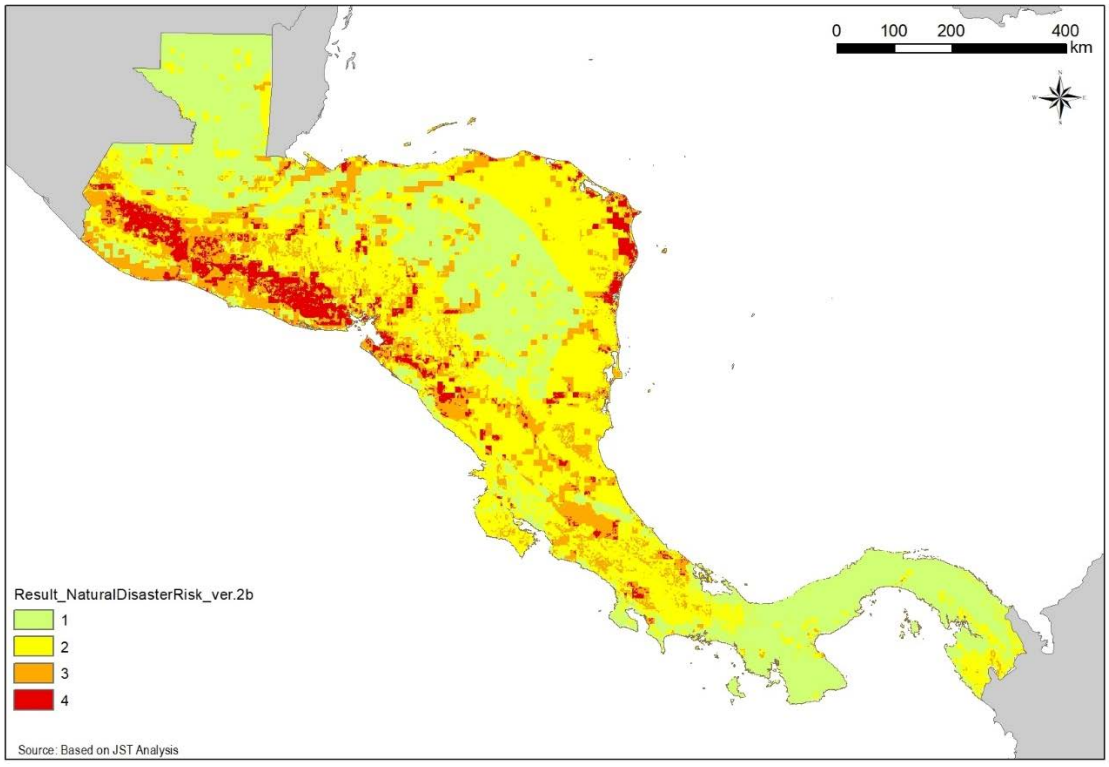


Cyclone	Earthquake
	
Landslide risk by earthquake	Landslide risk by precipitation

Source: JST

Figure 4.2.4 Input Layers for Natural Disaster Risk Analysis

For the analysis of the natural disaster risk, which is the same as the environmental sensitivity analysis, a natural break classification was applied where the degree of the risks is classified into 4 levels: high risk, moderate risk, low risk, and very low-risk areas. The analysis result is shown in Figure 4.2.5. The map shows that the coastal area of the Atlantic Ocean is indicated as a high-risk area mainly due to tropical cyclone-related hazards. Whereas on the Pacific Ocean side, the coastal area of Guatemala and El Salvador in particular is categorized as a high-risk area due to earthquake and volcanic activities.



Source: JST

Figure 4.2.5 Result of Disaster Risk Analysis

The development suitability area is assessed by combining the results of the environmental sensitivity analysis and natural disaster risk analysis. The consolidated result is reclassified into four categories: suitable for development, developable with proper measures, unsuitable for development, and highly

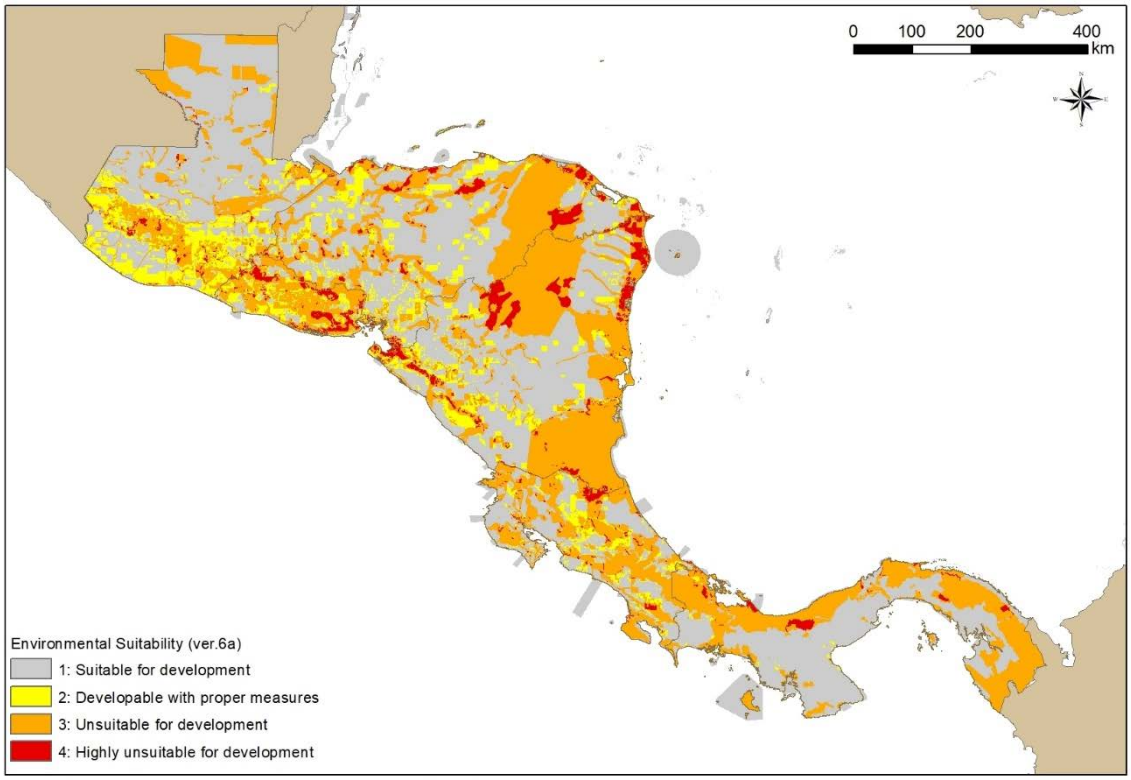
unsuitable for development as shown in Table 4.2.3. Since the environmentally sensitive area includes protected areas, the high and medium sensitive areas are classified as highly unsuitable and unsuitable for development. Whereas for the disaster risk area, the high-risk area is classified as unsuitable for development but given that technical measures can minimize the risks ti a certain degree, the medium-risk area is categorized as developable with proper measures.

Table 4.2.3 Reclassification of Development Suitability Analysis (Draft)

		Environmental sensitivity			
		Very Low	**Low**	**Medium**	**High**
Disaster risk	**Very Low**				
	Low				
	Medium				
	High				

Source: JST
Gray: Suitable for development
Yellow: Developable with proper measures
Orange: Unsuitable for development
Red: Highly unsuitable for development

The result of the development suitability analysis is shown in Figure 4.2.6. The development of transport infrastructure and networks shall avoid the areas identified as highly unsuitable and unsuitable for development and appropriate mitigation measures shall be considered in the area identified as developable with proper measures.



Source: JST

Figure 4.2.6 Development Suitability Analysis Result

4.3 Scoping work

The scoping work was conducted in the first SEA meeting in coordination with C/P, SIECA, related agencies of each country, and the JICA Project Team on 4 February 2021 in the virtual seminar. The purpose of the meeting was to share the proposed SEA framework for this Master Plan and invite comments from the participants.

4.3.1 Relevant Laws and Policies

In terms of the legal requirement of SEA, relevant laws and regulations were confirmed. As confirmed in Interim Report I, the requirement of legal approval and legal procedure on SEA are not mentioned for plans that have a multi-country regional scope. The use of SEA as a planning tool was confirmed with the responsible agencies in each country including El Salvador, Honduras, and Panama while it is being confirmed in Guatemala, Nicaragua, and Costa Rica. The main content of the SEA report required by the related laws in each country is similar to the proposed SEA process so there shall be no discrepancies. The confirmation of the SEA process is being reviewed by the responsible agencies in each country.

Table 4.3.1 Laws related SEA and Comments on Proposed SEA Process

Items	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama
Related law	Government Agreement No.137-2016	Decree No.233	Ministerial Agreement No.008-2015	Decree No.20-2017	Decree No.31849-2004	Decree No.4-2017
Application to the regional plan	Not mentioned	Not mentioned	Not mentioned	Not mentioned	SEA required only for land use plan	Not mentioned
Required main content of the SEA report	Not mentioned	-Environment condition -Anticipated impacts - Mitigation - Monitoring	-Consistency of policies -Alternative analysis -Environment scoping -Monitoring indicator	Not mentioned	Not mentioned	-Methodology -Framework -Environment condition -Important decision factors -Option analysis -Selection of priority option
Comments on SEA process	Need confirmation	Confirmed by MARN *(SEA data needs to be submitted to MARN)*	Confirmed by DECA	Need confirmation	Need confirmation	Confirmed by MiAmbiente *(Civic participation may be required)*

Source: JST

The comments received in and after the 1st SEA meeting include the issues of resilience to climate change, disaster risk management, green mobility, and regional coordination. The proposed additional documents were reviewed and implications from those references are summarized in Table 4.3.2. Especially the aspects of disaster risk management, investment in disaster risk mitigation and effective response will be taken into account in the planning process.

Table 4.3.2 Literature Review

Main literature reviewed	Implications
Policy Framework for Regional Transport and Logistics (PMRML)	This framework will be the basis of the policy framework for this Master Plan and also for this SEA-SDGs framework.
Regional Environmental Strategy Framework 2015-2020	The strategy framework includes climate change and the management of risks, preservation of forests, seas and biodiversity,

Main literature reviewed	Implications
	environmental quality, water resource management, and compliance with standards. These aspects will be incorporated in the SEA-SDGs framework.
Regional Strategy of Climate Change 2018-2022 (ERCC)	The strategy aims to reduce vulnerability and promote the adaption of the population to climate change and to reduce GHG emissions and the transition of low carbon economies. These aspects will be also incorporated in the SEA-SDGs framework.
Sustainable Development Goals (SDGs)	Economic aspects, environmental and social aspects related to mobility and logistics sector will be included in the SEA-SDGs framework.
Environmental Strategy of each country	Confirm the consistency with the regional framework
Proposed additional references	**Implications**
Central American Policy for Comprehensive Risk Management (PCGIR)	Emphasis on territorial planning, investment, and governance to reduce disaster risks and increase preparedness for effective response to disasters. Refer to disaster impact on the socioeconomic aspect (urbanization and inequality).
International Strategy for Disaster Reduction (ISDR) by United Nations	Refer to the unified terminology related to disaster risk for easy understanding and coordination among countries
"Green Book" for Environmental Code of Conduct for Port Management (COCATRAM)	Refer to the environmental issues related to port management for easy understanding and coordination in Central America

Source: JST

The key identified issues for the preparation of the Master Plan are summarized below. Out of which, the environmentally sensitive area and disaster risk area were integrated into the development suitability map that regulates the future spatial framework for the proposed logistics and transport infrastructure projects. The details are described in the Interim Report I Chapter 5.

Table 4.3.3 Identified Key Issues

Economic aspects	Environment aspects	Disaster risk aspects	Social aspects
• Efficiency • Economic development • Regional competitiveness • Job opportunities	• Protected areas • Biological corridor • Vegetation • Waterbody • Mangrove • Coral • Pollution	• Climate change • Volcanic activity • Drought • Flood • Cyclone • Earthquake • Landslide	• Indigenous people's land • Equitable access • Safety • Health

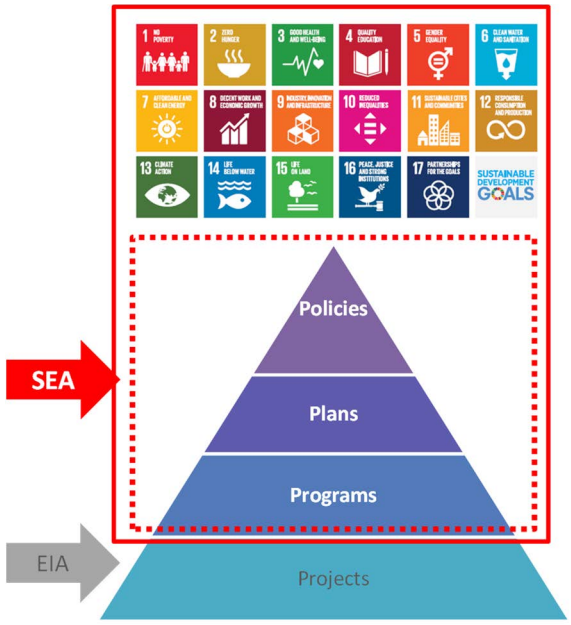
Source: JST

4.3.2 Development of SEA Framework

(1) Concept of SEA Framework

The Sustainable Development Goals (SDGs) are the globally agreed upon development goals. To make sure that the Master Plan is prepared to be consistent with the principle of sustainable development, SDGs will be used as the overarching framework for this SEA. This SDGs-SEA framework is expected to contribute to the following:

- confirm that the policy direction is guided by the idea of sustainable development
- ensure the robustness of the regional master plan

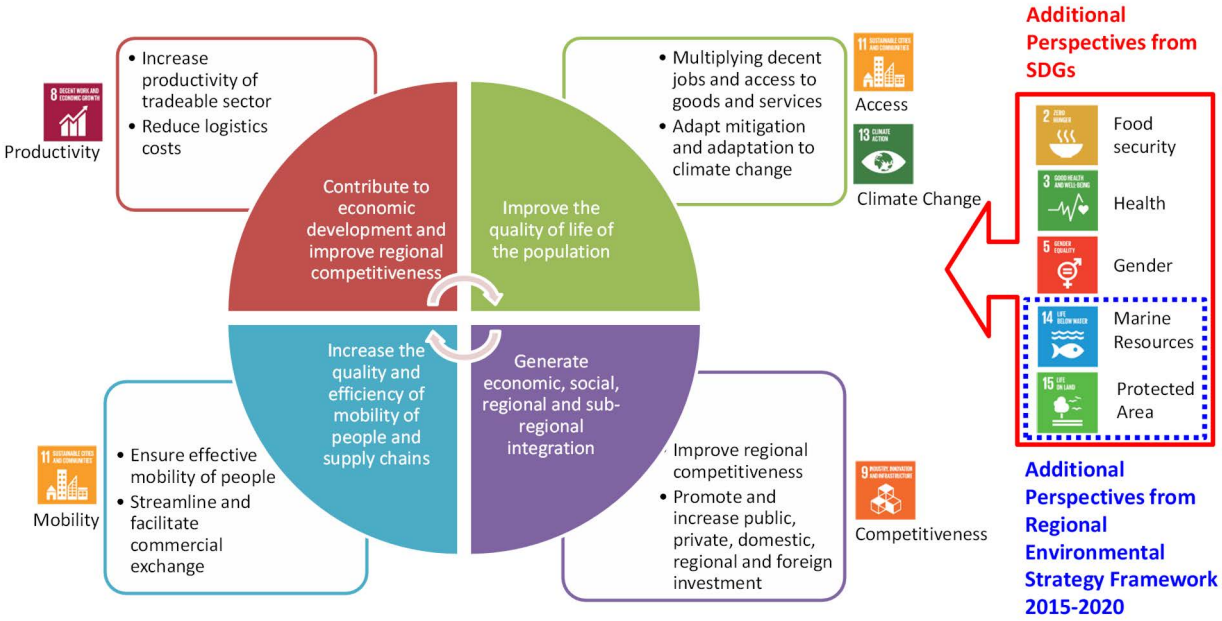


Source: JST

Figure 4.3.1 Concept of SDGs-SEA Framework

(2) PMRML and SDGs

The existing upstream policy for this Regional Master Plan is the Policy Framework for Regional Transport and Logistics (PMRML). Therefore, the strategic objectives of the PMRML are the basis of developing the SDGs-SEA framework. The relationship between PMRML and SDGs is summarized in Figure 4.3.2 below. PMRML encompasses the objectives related to productivity, access, climate change, competitiveness, and mobility. To enhance the comprehensiveness and robustness of this Master Plan, additional perspective from SDGs is included such as food security, health, gender, marine resources, and protected areas. Furthermore, the perspectives from the Regional Environmental Strategy Framework were also reflected which are climate change and environmental conservation challenges.



Source: JST

Figure 4.3.2 PMRML and SDGs

(3) SEA Objectives with Reference to SDGs

Using the above-mentioned framework, tentative SEA objectives for the Master Plan were prepared with reference to SDGs. While regional economic integration is the important objective of the Master Plan, other issues such as environmental conservation, disaster management, and climate change mitigation should be also taken into account. In this way, SEA objectives are prepared to encompass comprehensive perspectives that guide the policy direction. The relationship between SEA objectives and the specific goals of SDGs is also shown below.

- SEA-1: Increase productivity by integrating value chains and promoting value addition, including the interconnection of production centers with the market
- SEA-2: Promote regional integration by increasing the efficiency and competitiveness of the region's transportation and logistics sector
- SEA-3: Strengthen links between urban and rural areas and ensure equitable access to all transport services
- SEA-4: Build resilient transport routes and system that ensures continuous food delivery in extreme events, including securing alternative routes
- SEA-5: Ensure the safe transportation of goods and minimize accidents, pollution risks, and health impact
- SEA-6: Avoid protected and conservation areas to maintain rich biodiversity and resource-based livelihoods of the people
- SEA-7: Reduce climate change by adopting clean and efficient modes and systems to reduce CO_2 emissions



(4) SEA Indicators with Reference to SDGs

Considering the available data and information, a set of tentative SEA indicators are developed corresponding to the SDGs-SEA objectives as follows. These indicators will be used to assess the development options to be prepared in the planning process. For the assessment, GIS and the transport network model will be used as tools to assess the plan in a quantitative manner.

- SDG-8: Number of logistic conglomerates along major corridors (number)
- SDG-9: Number of maritime transportation gateways (ton-km)
- SDG-11: The population along the major corridors (people)
- SDG-2: Number of alternative routes/modes of transport (no.)
- SDG-3: Length of the major corridors in transport networks (km)
- SDG-14,15: Impact on environmentally and socially sensitive areas (ha)
- SDG-13: Available multi-modal transport (CO_2/year)



4.4 Policy Level SEA

4.4.1 Assessment of the Vision

At the level of Policy SEA, a draft vision for Sustainable and Integrated Mobility and Logistics was reviewed based on the seven SEA-SDGs objectives mentioned in section 4.3.2 (3). The purpose of this assessment is to confirm whether the proposed vision is in line with the SEA-SDGs objectives. The table below summarizes the assessment result. It shows that the concept of protecting natural environmental assets, which is the concept of SEA-6 (SDG-14,15), is not explicitly stated in the draft vision, however, it

was confirmed that sustainable development includes the notion of protecting the natural environment and the planning process will ensure to minimize the impact on the environment. The inclusion of the environmental conservation concept was proposed as below.

Table 4.4.1 Assessment of the Vision by SEA-SDGs Objectives

	Vision	Assessment by SEA-SDGs Objectives
Draft version	*Central America will be a more integrated and competitive region that mobilizes its population and its supply chain more effectively,*	SEA-2 (SDG-9) Integration can enhance the competitiveness of the region.
	increases and diversifies its trade enhances complementarity and regional productive transformation (value chains), promotes sustainable, balanced and resilient spatial development	SEA-1 (SDG-8) Improvement of regional productive value chain contributes to value addition of the product. SEA-3 (SDG-2,9) Diversification of trade and complementarity leads to a sustainable and resilient supply chain of food and necessities. SEA-4 (SDG-11,5) Balanced development contributes to equal access in rural and urban and also different groups of society
	and improves the quality of life of its population	SEA-3 (SDG-7) Improvement of quality of life covers health aspect SEA-7 (SDG-13) Improvement of quality of life covers clear air quality which is a similar concept to reducing CO2 emission.
	N/A	SEA-6 (SDG-14,15) The loss of environmentally and socially sensitive areas should be minimized. This concept is not included in the draft vision.
Proposed Revision	*Central America will be a more integrated and competitive region that mobilizes its population and its supply chain more effectively, increases and diversifies its trade, enhances complementarity and regional productive transformation (value chains), promotes sustainable, balanced and resilient spatial development and improves the quality of life of its population*	Include the concept of protecting and conserving the natural environment represented in the concept of SEA-6 (SDG-14,15).

Source: JST

4.4.2 Assessment of the Guidelines

Proposed general guidelines for the Master Plan were reviewed by SEA-SDGs objectives to confirm the consistency and to identify missing concepts. This assessment is important because other sector guidelines are prepared based on these general guidelines. The assessment results show that the proposed general guidelines cover all the SEA-SDGs objectives as summarized in the table below. It also informs that the General Guidelines 3, 4, 5, 7, 8, 9 are closely related to SEA-SDGs objectives.

Table 4.4.2 Relationship between General Guidelines and SEA-SDGs Objectives

Strategic Goals	General Guidelines	Assessment by SEA-SDGs Objectives
Optimizing the Regional Transport System	1. Ensure the consistency between regional plan and national plans	-
Developing the Efficient and Resilient Multimodal Transport System	2. Establish a monitoring and evaluation system	-
	3. Reduce cost and time of logistics and mobility	SEA-2 (SDG-9) Enhance efficiency and competitiveness

Strategic Goals	General Guidelines	Assessment by SEA-SDGs Objectives
	4. Improve the availability and quality of infrastructure and facilities	SEA-3 (SDG-5,11) Ensure equitable access
	5. Reduce negative impacts on environment and society	SEA-5 (SDG-3) Minimize accident, pollution and health impact SEA-6 (SDG-14,15) Avoid protected and conservation area SEA-7 (SDG-13) Reduce CO_2 emission
	6. Achieve sustainable modal integration	-
	7. Improve the efficiency of logistics with advanced technologies and Digital Transformation	SEA-2 (SDG-9) Enhance efficiency and competitiveness
	8. Reducing uncertainty in logistics	SEA-4 (SDG-2,9) Build resilient transport routes and system SEA-5 (SDG-3) Ensure safety SEA-7 (SDG-13) Climate change adaptation, mitigation
Establishing a Supply Chain Integrated with Economic Activities	9. Sustainable integration with economic activities	SEA-1 (SDG-8) Integrate the value chain connecting production sites to the market
Strengthen the Institutional Connectivity among Public, Private, Regional and Local Government	10. Secure integrated and coherent regulatory and institutional framework	-
	11. Coordination with sectorial policy and plan	-
Ensuring Mobility	12. Strengthen the logistics industry, human resources, and regional institutions related to the logistics sector	-

Source: JST

4.4.3 Assessment of Alternative Scenarios

During the development of the future transport network development scenarios, three alternative scenarios were assessed from SDGs' perspective. The main objective of this scenario assessment was to highlight the pros and cons of each scenario and provide recommendations for the further consideration of the optimal network for this master plan. This assessment was applied to a regional context, not to a specific country or specific site. The degree of the contribution was quantified in comparison to the current situation.

For this assessment, 7 criteria were used that were prepared in the SEA-SDGs framework. The following table shows the items of criteria, the description of criteria, and corresponding indicators for the assessment. The indicators were selected that can be quantitatively measured with the available data at this stage of planning.

Table 4.4.3 SEA-SDGs Criteria and Indicators

SEA-SDGs Criteria		Description	Indicator
	1. Economic development	Connecting production area to logistic centers	Number of logistic conglomerates along major corridors
	2. Regional connectivity	Having maritime transportation gateways	Number of maritime transportation gateway
	3. Equitable Access	The population along the major corridors	Number of populations

SEA-SDGs Criteria		Description	Indicator
	4. Resiliency	Port to the access road for food delivery to the major cities / Alternative route/mode of transport to the major cities	Number of alternative routes/modes of transport
	5. Safety&Health	Having safety measures to reduce accident risks	Length of the road network
	6. Environmental Soundness	Avoid impact on environmentally and socially sensitive area	Impact on sensitive areas
	7. CO2 emission	Adopt a clean and efficient mode of transport	Available multi-modal transport

Source: JST

Below are the evaluation results for each scenario for each criteria. For the assessment, GIS analysis was used specifically for criteria 1. Economic development, 3. Equitable Access, 5. Safety&Health, and 6. Environmental Soundness.

Criteria 1. Economic Development (Indicator: Number of logistic conglomerates along major corridors)

"Economic Development" can be promoted by efficiently connecting the production area to logistics centers. Therefore, an indicator for this criteria is set as a number of existing logistics nodes and planned logistics conglomerates along major corridors. The number of logistics conglomerates was the highest for "Equitable Growth" followed by "New Growth Trend" and "Minimum Investment" in this order. Accordingly, the degree of contribution is in the same order.

Table 4.4.4 Scenario Assessment of Economic Development

Items	Minimum Investment	New Growth Trend	Equitable Growth
Assessment	65 units	73 units	104 units
The degree of contribution	Low	Medium	High

Source: JST

Criteria 2. Regional Connectivity (Indicator: Number of maritime transportation gateway)

"Regional connectivity" in this assessment will consider having connectivity outside of Central America so the indicator is having maritime transportation gateways. "Equitable Growth" has the highest number of maritime gateways including proposed ports in Nicaragua and the "New Growth Trend" and "Minimum Investment" networks have the same number of ports. Considering that the "New Growth Trend" aims to strengthen ports in the Gulf of Fonseca as Asia and US gateway, contribution to regional connectivity can be considered higher compared to "Minimum Investment".

Table 4.4.5 Scenario Assessment of Regional Connectivity

Items	Minimum Investment	New Growth Trend	Equitable Growth
Assessment	25 ports	25 ports (strengthen Asia&US gateway)	32 ports
The degree of contribution	Low	Medium	High

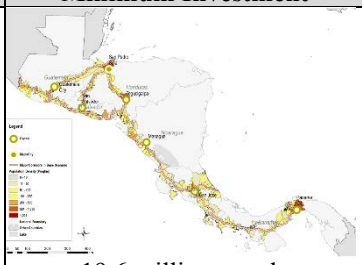
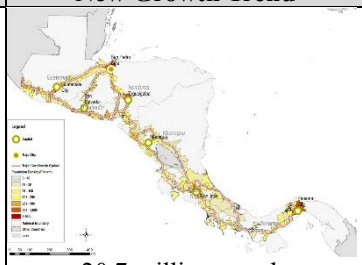
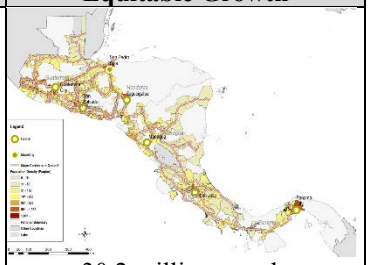
Source: JST

Criteria 3. Equitable Access (Indicator: Population)

"Equitable Access" can be measured as coverage of population along the major corridors that ensures efficient delivery of goods. As the "Minimum Investment" network focuses on strengthening existing major corridors, the coverage of the population along those strategic corridors is limited compared to other scenarios. "New Growth Trend" covers additional population with the Atlantic corridor, and "Equitable

Growth" adds road network in Guatemala, El Salvador, and Honduras and further extends to the rural area of Nicaragua. In this aspect, the "Equitable Growth" network has the highest contribution towards the "Equitable Access" criteria, followed by "New Growth Trend" and "Minimum Investment", in this order.

Table 4.4.6 Scenario Assessment of Equitable Access

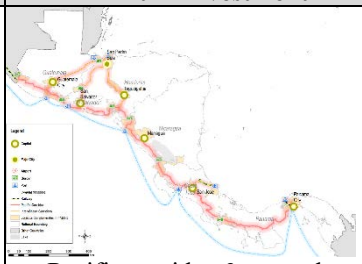
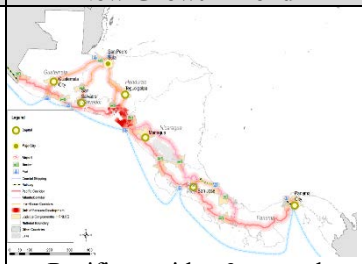
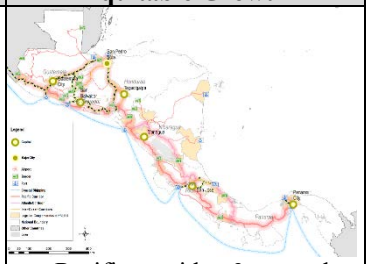
Items	Minimum Investment	New Growth Trend	Equitable Growth
Assessment			
	19.6 million people	20.7 million people	30.2 million people
The degree of contribution	Low	Medium	High

*Number of nodes (existing) and logistics conglomerates (plan) in PENLOG along 5km buffer from corridors
Source: JST

Criteria 4. Resiliency (Indicator: Number of alternative routes/modes of transport)

"Resiliency" can be considered as having alternative routes/modes of transport to the major cities so that damage or stoppage in some sections can be covered by the other route or another mode of transport in case of emergencies or extreme events. As the maps show, the "Minimum Investment" network has a Pacific corridor and coastal shipping, and the "New Growth Trend" network adds an Atlantic corridor in Nicaragua, Costa Rica, and Panama, whereas "Equitable Growth" further adds railway options in Guatemala, El Salvador, and Honduras. Therefore, in terms of resiliency, the "Equitable Growth" network is rated as high, "New Growth Trend" as a medium, and "Minimum Investment" as low.

Table 4.4.7 Scenario Assessment of Resiliency

Items	Minimum Investment	New Growth Trend	Equitable Growth
Assessment			
	Pacific corridor & coastal shipping	Pacific corridor & coastal shipping & Atlantic corridor	Pacific corridor & coastal shipping & Atlantic corridor & railway
The degree of contribution	Low	Medium	High

Source: JST

Criteria 5. Safety&Health (Indicator: Length of the network)

One of the major issues of the "Safety&Health" aspect of logistics and transport projects is the accident risks. It can be considered that the longer the network is the higher the risk of accidents, and it can also interpret as a concentration of safety measures in main corridors that can decrease accident risks. From this understanding, the shorter the main corridor network is, the safer the network can be. With the indicator of this criteria being the length of the main corridors, "Minimum Investment" contributes to the safety and health criteria the most, followed by "New Growth Trend" and "Equitable Growth".

Table 4.4.8 Scenario Assessment of Safety&Health

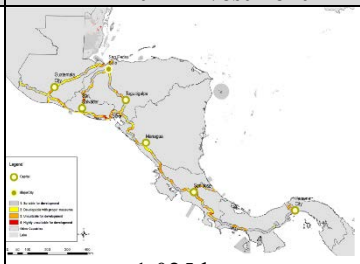
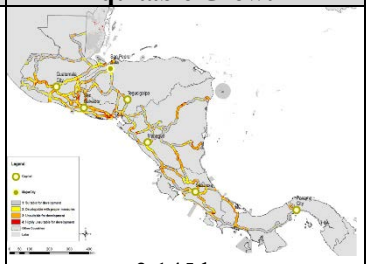
Items	Minimum Investment	New Growth Trend	Equitable Growth
Assessment	3,911 km	4,899 km	10,629 km
The degree of contribution	High	Medium	Low

Source: JST

Criteria 6. Environmental Soundness (Indicator: Impact on sensitive areas)

For the assessment of the "Environmental Soundness" of the network, the SEA development suitability analysis map was used which identified the areas that are unsuitable for development analyzed by environmental constraints area and natural disaster risk areas. The length of the corridor that has potential impacts on the unsuitable area is the lowest for "Minimum Investment" and highest for "Equitable Growth". Especially, development along the network inside the protected areas is a concern. In terms of environmental soundness, the most environmentally friendly scenario is the "Minimum Investment".

Table 4.4.9 Scenario Assessment of Environmental Soundness

Items	Minimum Investment	New Growth Trend	Equitable Growth
Assessment	 1,025 km	 1,424 km	 3,145 km
The degree of contribution	High	Medium	Low

*Length of corridor overlap with area assessed as unsuitable for development (Orange) and highly unsuitable for development (Red)
Source: JST

Criteria 7. CO_2 emission (Indicator: Available multi-modal transport)

The volume of "CO_2 emission" can be reduced by adopting a clean and efficient mode of transport. For this assessment, the indicator for this criteria is the availability of multi-modal transport aside from road transport. The "Minimum Investment" network and "New Growth Trend" network heavily rely on the road network and some coastal shipping whereas the "Equitable Growth" network revitalizes the railway network in Guatemala, El Salvador, and Honduras which can promote a modal shift of the cargo transport from road to rail transport. Therefore, in terms of the CO_2 emission reduction perspective, the "Equitable Growth" network contributes the highest among others.

Table 4.4.10 Scenario Assessment of CO_2 Emission

Items	Minimum Investment	New Growth Trend	Equitable Growth
Assessment	Road & Shipping	Road & Shipping	Road & Shipping & Railway
The degree of contribution	Medium	Medium	High

Source: JST

The assessment results of the degree of contribution of each scenario against each SEA-SDGs criteria are summarized in Table 4.4.11.

In the Minimum Investment scenario, the contribution to "1. Economic development", "3. Equitable Access", and "4. Resiliency" are considered rather low. On the other hand, because the number of strategic corridors is limited, it would be easier to apply safety measures in those corridors, for which criteria "5. Safety &

Health" will improve. For the same reason, there will be minimal impact on environmental and socially sensitive areas, which means criteria "6. Environmentally soundness" is high.

The New Growth Trend scenario will encourage economic and industrial activities along the additional strategic network and the gateway. From this aspect, the network contribution will be high for "1. Economic development" and it also improves "2. Regional connectivity". Adding the Atlantic corridor in Nicaragua, Costa Rica, and Panama as strategic corridors provides a dual road network to the Pacific corridor, which means alternative routes will be available in those regions. This contributes to strengthening the network's resiliency, which is reflected in "4. Resiliency".

Equitable Growth includes the reactivation of railways in Guatemala, Honduras, and El Salvador, and the strengthening of Road & Port in Nicaragua. By providing those additional networks, this scenario has a high contribution for "1. Economic development" "2. Regional Connectivity" and "3. Equitable Access". In addition, having multiple routes and modes of transport contributes to "4. Resiliency", and having a railway expects a modal shift from road transport which contributes to reducing "7. CO2 emission". On the other hand, because the designated strategic network will increase, safety aspects "5. Safety & Health" is rated low. Similarly, the impact on the sensitive area will be a concern, especially in protected areas, so "6, Environmental Soundness" for this scenario is also low.

Table 4.4.11 Summary of the Assessment Results

SEA-SDGs Criteria		Minimum Investment	New Growth Trend	Equitable Growth
	1. Economic development	Low	Medium	**High**
	2. Regional connectivity	Low	Medium	**High**
	3. Equitable Access	Low	Medium	**High**
	4. Resiliency	Low	Medium	**High**
	5. Safety&Health	**High**	Medium	Low
	6. Environmental Soundness	**High**	Medium	Low
	7. CO2 emission	Medium	Medium	**High**

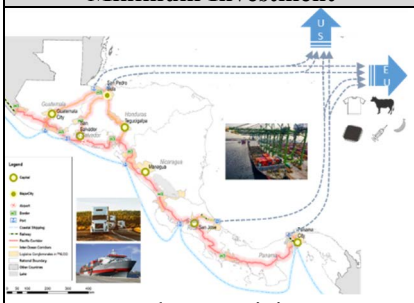
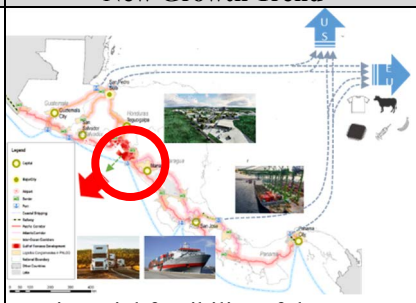
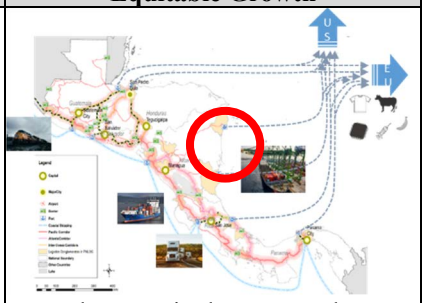
Source: JST

The assessment results and key recommendations for each network were shared in the stakeholder meeting at the Policy level SEA held in May 2022. The recommendation included the following.

- In the "Minimum Investment" scenario, the existing primary road network and ports can be fully used by establishing strategic logistic centers. However, rural inland areas need to be covered by a secondary road network in each country. Also, because the network is heavily dependent on the road network, measures to promote cleaner transport such as the increase of low-carbon vehicles, elimination of congestion, etc. should be promoted.
- For the "New Growth Trend" scenario, higher economic growth can be expected thanks to new regional gateway ports, however, their financial sustainability needs to be verified. Same as the "Minimum Investment" scenario, a secondary road network shall be maintained or developed in rural areas in each country, and cleaner transport shall be promoted.
- Strengthening the road transport network, railway, and port development in the "Equitable Growth" will lead to improved and equitable accessibility and mobility to and from wider areas. However, the necessity of and alignment and location of proposed ports and roads in the protected area needs to be

revisited. Considering that the heavy investment is expected to develop the railway network, the benefit from the investment should be extended to other countries outside the network by positioning and utilizing strategic logistic centers.

Table 4.4.12 Key Concerned Areas of Each Scenario

Minimum Investment	New Growth Trend	Equitable Growth
		
Rural connectivity	Financial feasibility of the port	Development in the protected area

Source: JST

The assessment results were well received by the participants in the stakeholder's meeting. From Panama, the issue of climate change-induced floods on the road network was raised, and it was expressed that the contribution from each country would be crucial once the proposed projects were identified. Therefore, inputs from the stakeholders in each country were invited and discussed in the Plan level SEA stage as described in the next section.

4.5 Plan Level SEA

4.5.1 Rapid assessment

At the Plan Level SEA, a rapid assessment was carried out for the projects proposed in this Master Plan. The main purpose of this rapid assessment is to discuss the potential impacts anticipated from those projects and consider mitigation measures with concerned agencies in each country. To cover possible impacts from those projects, representative projects were selected from different sectors having different characteristics in terms of location and size. The SEA meetings were organized as working sessions in each country inviting stakeholders responsible for transport planning and environment.

For the rapid assessment, 9 criteria were used as shown in the table below. Each criterion was assessed with 4 levels of impact such as significantly negative, negative, positive, and no impact.

Table 4.5.1 Rapid Assessment Criteria

Category	Criteria	Description
Pollution	1. Air pollution	Air pollution risk (air, noise)
	2. Water quality	Water pollution risk
	3. Soil pollution	Soil pollution risk
Natural Environment	4. Ecosystem	Environmental sensitive area (protected area)
	5. Disaster/Climate change	Natural disaster risk map
Social	6. Safety	Safety and health risks
	7. Resettlement	Land acquisition and resettlement
Cultural	8. Cultural	Cultural and heritage sites
Economic	9. Local economy	Economic, employment opportunities

Legend:

	Significantly negative		Negative		Positive		No impact

Source: JST

The main discussion points for these workshops are summarized by each country below.

(1) Guatemala

The resettlement issue was raised in highway expansion and railway development projects. In the maritime sector, dredged soil disposal, and the management of solid waste and oil spills from the port activities and vessels will be the main concerns, especially for Santo Tomás de Castilla Port located in the protected area. Major issues of airport expansion projects are solid and liquid waste management. Improvement of customs is expected to reduce congestion thus a positive impact on air pollution as well as economic benefit.

Table 4.5.2 Rapid Assessment Results of Selected Projects in Guatemala

Code	Sector	Project Name	Air	Water	Soil	Ecosystem	Disaster	Safety	Resettlement	Cultural	Economic
VG06	Highway	CA09N: El Rancho - Puerto S.T. Castilla Road Improvement									
VG16	Highway	C-50 road development to 4 lanes (Dry Corridor)									
MG02	Maritime	Quetzal Port: Deepening of Port Waters									
MG07	Maritime	Santo Tomás de Castilla Port: Construction of Cruise Terminal									
AG02	Aviation	San Jose Domestic Airport: Airport expansion (airside and terminal facility and equipment)									
AG04	Aviation	La Aurora Airport: Rehabilitation of equipment/procedure of cargo warehouse									
RG05	Railway	Rehabilitation of Railway (Escuintra - Guatemala City)									
RG09	Railway	Development of Railway (Escuintra - Pedro de Alvarado Customs)									
UG01	Urban Logistics	Guatemala City: Truck Terminal Development									
UG03	Urban Logistics	S.T.Castilla Port/Barrios Port: Development of LAZ (Logistics Activity Zone)									
CG04	Custom	Tecún Umán (GTM-MEX): Border Modernization									
CGS01	Custom	Pedro Alvarado (GTM)/ La Hachadura (SLV): Border Modernization (OSBP)									

Source: JST

(2) El Salvador

Bypass road construction may face land acquisition and resettlement issues. Similarly, resettlement will be a concern for railway rehabilitation projects especially informal settlements along the existing railway. For the port expansion projects which include dredging, installation of breakwaters, etc. the loss of mangroves and contamination from vessels, and disposal of dredged soil shall be properly managed. Although emission control is under the responsibility of airlines, the issue of noise and congestion from the increased cargo volume shall be mitigated.

Table 4.5.3 Rapid Assessment Results of Selected Projects in El Salvador

Code	Sector	Project Name	Air	Water	Soil	Ecosystem	Disaster	Safety	Resettlement	Cultural	Economic
VS04	Highway	CA2: Reconstruction of Melara Bridge (damaged by Hurricane Ida in 2009)									
VS10	Highway	CA2 Eastern section road: La Libertad By-pass									
MS01	Maritime	Acajutla Port Expansion *(ongoing)*									
MS02	Maritime	La Union Port Expansion *(ongoing)*									
AS02	Aviation	La Union: New airport construction, administration, operation, and maintenance									
AS06	Aviation	Comalapa Airport: Cargo Terminal modernization and operation									
RS02	Railway	Rehabilitation of Railway (San Salvador - San Juan Opico - Sonsonate - Acajutla)									
RS05	Railway	Development of Railway (Acajutla - Pedro de Alvarado Customs)									
US01	Urban Logistics	San Salvador: Truck Terminal Development									
US04	Urban Logistics	Acajutla Port: Development of LAZ									
CGS01	Custom	Pedro Alvarado(GTM)/ La Hachadura (SLV): Border Modernization (OSBP)									

Source: JST

(3) Honduras

Bridge, port, and railway improvement shall consider the water pollution, waste management, and impact on the ecosystems in the Ramsar sites such as Laguna de Alvarado and Laguna de Guaymoreto. It was also pointed out that ethnic groups are present in the Castilla port area, therefore those communities shall be consulted for the potential impact and gain an understanding of the projects. In terms of the Ramón Villeda Morales International Airport, the is prone to floods and had major damage from the hurricane in the past, mitigation measures are considered necessary.

Table 4.5.4 Rapid Assessment Results of Selected Projects in Honduras

Code	Sector	Project Name	Air	Water	Soil	Ecosystem	Disaster	Safety	Resettlement	Cultural	Economic
VH10	Highway	CA13: Rehabilitation and Construction of Puerto Cortes Access and Exit Bridges									
VH11	Highway	CA5: Development of San Pedro Sula Bypass									
MH01	Maritime	San Lorenzo: Improvement									
MH04	Maritime	Castilla Port: Rehabilitation and Improvement of port									
AH02	Aviation	Ramón Villeda Morales International Airport: Runway extension, passenger and cargo terminal expansion *(ongoing)*									
RH01	Railway	Container Port (dry port) at Potrerillos.									
RH03	Railway	Development of Railway (Puerto Cortes - Corinto Customs)									
UH02	Urban	Tegucigalpa: Truck Terminal Development									

	Logistics										
UH07	Urban Logistics	La Alianza - Goascorán: Development of LAZ									
CSH02	Custom	El Poy: Border Modernization									
CHN02	Custom	El Espino (HND-NIC): Border Modernization									

Source: JST

(4) Nicaragua

Although improvement and expansion of the existing highway may not have significant impacts, some highways are crossing the protected area. Especially the improvement of the road network in Rio San Juan Biosphere Reserve will require an impact study. Port improvement needs attention for possible water pollution and Bluefield port construction may have issues of sedimentation and hurricane risk. In the aviation sector, noise from increasing flights is the main concern. The customs located in a mountainous area may have a risk of landslide in case of heavy rain.

Table 4.5.5 Rapid Assessment Result of Selected Projects in Nicaragua

Code	Sector	Project Name	Air	Water	Soil	Ecosystem	Disaster	Safety	Resettlement	Cultural	Economic
VN13	Highway	IR: Road Rehabilitation: Lovago - Pajaro Negro									
VN25	Highway	The ring road of the city of Rivas									
MN03	Maritime	Corinto Port: Capacity Improvement									
MN05	Maritime	Bulefields Port: New Port Development									
AN03	Aviation	Augusto Cesar Sandino International Airport: Expansion Phase 2 (New cargo terminal, apron, and taxiway to new cargo area)									
AN09	Aviation	Bluefield's and Corn Island airports: D/D and Construction									
UN01	Urban Logistics	Managua: Truck Terminal Development									
UN02	Urban Logistics	Bluefields: Development of LAZ									
CHN02	Custom	El Espino (HND-NIC): Border Modernization									
CNC02	Custom	San Panchos (NIC-CRC): Border Modernization									

Source: JST

(5) Costa Rica

Proposed highways run in the vicinity of a national park and national wildlife refuge biological corridor including the Ramsar site so the possible impact and mitigation measures shall be considered in the implementation stages. In the case of the port expansion, the impact of changing tidal dynamics and impact on artisanal fishing activities are raised for the point of consideration. The increase in airport capacity expects to have an impact on the traffic congestion of the road connecting to the airport. In addition, there may be a high cost of land acquisition and resettlement for the truck terminal development.

Table 4.5.6 Rapid Assessment Result of Selected Projects in Costa Rica

Code	Sector	Project Name	Air	Water	Soil	Ecosystem	Disaster	Safety	Resettlement	Cultural	Economic
VC02	Highway	N2: Road Development: Palmar Norte-Paso Canoas									
VC09	Highway	N35: Road Development: Tablillas-Florencia									
MC01	Maritime	Caldera Port: Expansion									
MC07	Maritime	Limon Port: Program for de-concentration of Logistics Zones									
AC01	Aviation	Juan Santamaria Airport: Expansion Phase 1 (Expansion of the international terminal, relocation of firefighting station, etc.)									
AC11	Aviation	Cargo Terminal Development in Liberia Daniel Oduber Quirós International Airport									
UC01	Urban Logistics	San Jose: Truck Terminal Development									
UC03	Urban Logistics	Penas Blancas: Development of LAZ (Logistics Activity Zone)									
CNC02	Custom	San Panchos (NIC-CRC): Border Modernization									
CCP02	Custom	Sixaola (CRC-PNM): Border Modernization									

Source: JST

(6) Panama

There may be landslide risk on the mountainous road and hurricane risk on the roads along the Carribean coast. The port expansion project may have an impact on water quality, mangroves, and also the impact from sea level rise. The main issues for the airport expansion projects are air and noise pollution as well as increased congestion surrounding the area. Truck terminal development may face land acquisition and resettlement problems, especially in the vicinity of the city.

Table 4.5.7 Rapid Assessment Result of Selected Projects in Panama

Code	Sector	Project Name	Air	Water	Soil	Ecosystem	Disaster	Safety	Resettlement	Cultural	Economic
VP01	Highway	N21/10/11: Road Development: Chiriqui - Bocas del Toro *(ongoing)*									
VP05	Highway	Atlantic/Interior Corridor Road Rehabilitation: Miguel de la Borda - Gatun *(ongoing)*									
MP03	Maritime	PSA Container Terminal: Expansion									
AP01	Aviation	Tocumen International Airport: Development of terminal 2, cargo warehouse, and free trade zone *(ongoing)*									
AP02	Aviation	Tocumen International Airport: Development of the 3rd runway, Passenger Terminal 3 and 4 *(ongoing)*									
UP01	Urban Logistics	Panama City: Truck Terminal Development									
UP03	Urban Logistics	Paso Canoas: Development of LAZ									
CCP1	Custom	Paso Canoas (CRC-PNM): Border integration (one-stop-shop) *(ongoing)*									
CCP2	Custom	Sixaola (CRC-PNM): Border Modernization									

Source: JST

4.5.2 Sector-level Mitigation

Based on the rapid assessment, mitigation measures were considered for each sector and summarized below.

(1) Highway

To mitigate implementation risk, prepare a resettlement plan and if the projects go through indigenous people's territory, prior consultation will be required. During the construction stage, pollution of air, water, soil pollution, and traffic congestion should be managed. Possible disaster risks such as a hurricane, flooding, and landslide need to be evaluated based on geographical conditions and historical occurrence data. For those projects proposed in the vicinity of protected areas, possible impact on the ecosystem should be assessed and proper mitigation measures should be considered in consultation with CICA and the Ministry of Environment.

(2) Maritime

In preparing the port infrastructure projects, bathymetric, tidal, and current studies should be conducted to minimize erosion and port operational risk. Impact on mangrove and protected areas should be evaluated and proper mitigation measures should be considered in consultation with the Ministry of Environment. In addition, the location of dredged soil disposal shall be approved by the Ministry of Environment and the application of environmentally friendly dredging technology shall be explored. To mitigate water pollution, a contingency plan shall be prepared in case of an oil spill and possible contamination from the vessel.

(3) Aviation

Mitigation measures for air pollution and noise shall be prepared. Waste management should also be implemented and monitored to minimize the impact on water and soil at the airport including oil and hazardous wastes. In addition, traffic congestion connecting to the airport must be properly managed to accommodate the expected increase in cargo and passengers.

(4) Railway

Similar to the highway sector, a resettlement plan including informal settlement and a financing plan shall be prepared. Water and soil contamination from the projects should be properly managed. Furthermore, while the impacts of the rehabilitation project are expected to be limited, potential impacts on protected areas should be assessed and mitigation measures should be considered in consultation with CICA and the Ministry of Environment.

(5) Urban Logistics

Prepare land acquisition and resettlement plans for the truck terminal development. Mitigation measures should be prepared for air pollution and soil pollution from increasing cargo traffic in the case of Logistics Activity Zone (LAZ) development.

(6) Customs

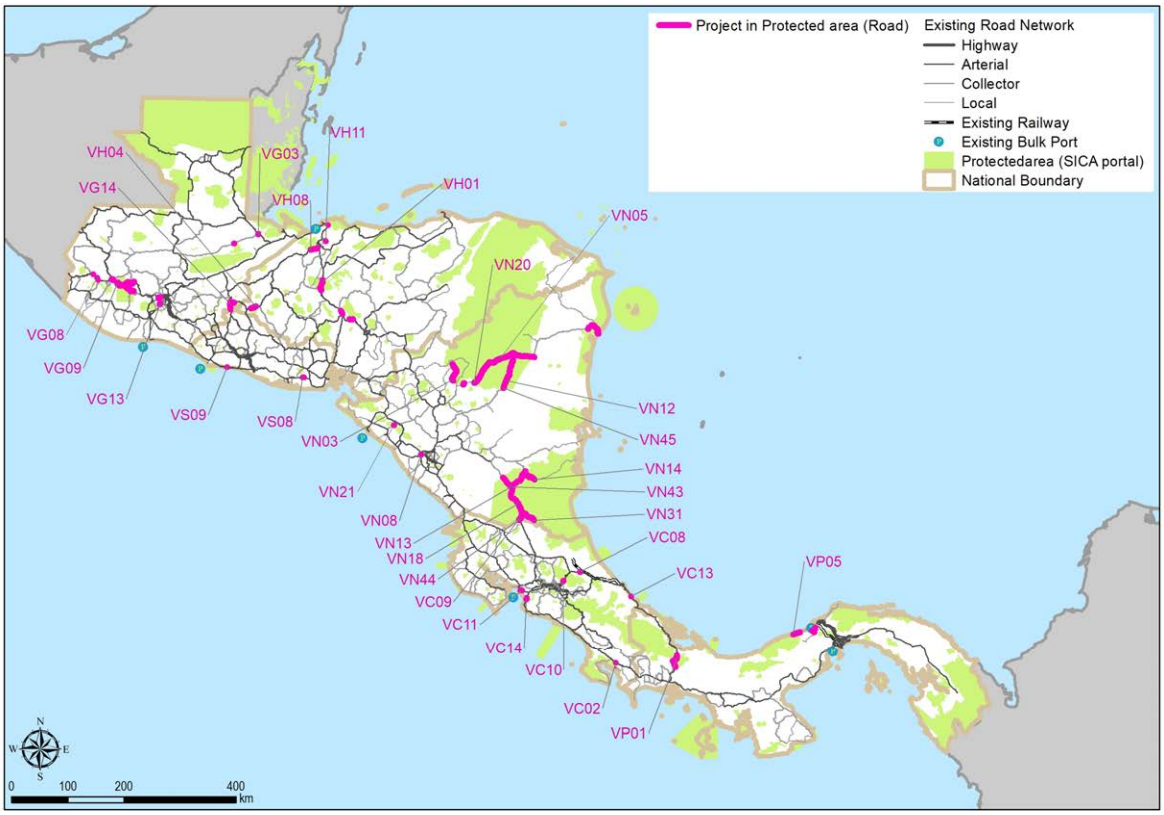
The negative impact of custom development is considered limited. However, considering that many of the locations are in the mountainous area, landslide risk should be managed and also forest resources should be protected and compensated in case of tree cutting.

4.5.3 Location-level Mitigation

One of the main concerns of proposed projects is the impact on the protected areas. Considering that there are many protected areas in the region, special attention shall be made to avoid any significant impacts on those areas. Expansion and rehabilitation of the existing infrastructure may not have significant impacts on

the protected area but the newly planned projects require a thorough survey during the planning and implementation stage of the projects.

To identify potential risk areas, protected areas, and overlapping projects are highlighted in the map and table below. There are some projects in wildlife refuges and biological corridors in Honduras, Nicaragua, and Costa Rica so the continuous passage between ecosystems and natural habitats shall be protected. The continuous passage between ecosystems and natural habitats shall be protected. For those projects that target multiple countries, special task forces can be formed to coordinate the necessary measures and monitoring activities.



Source: JST

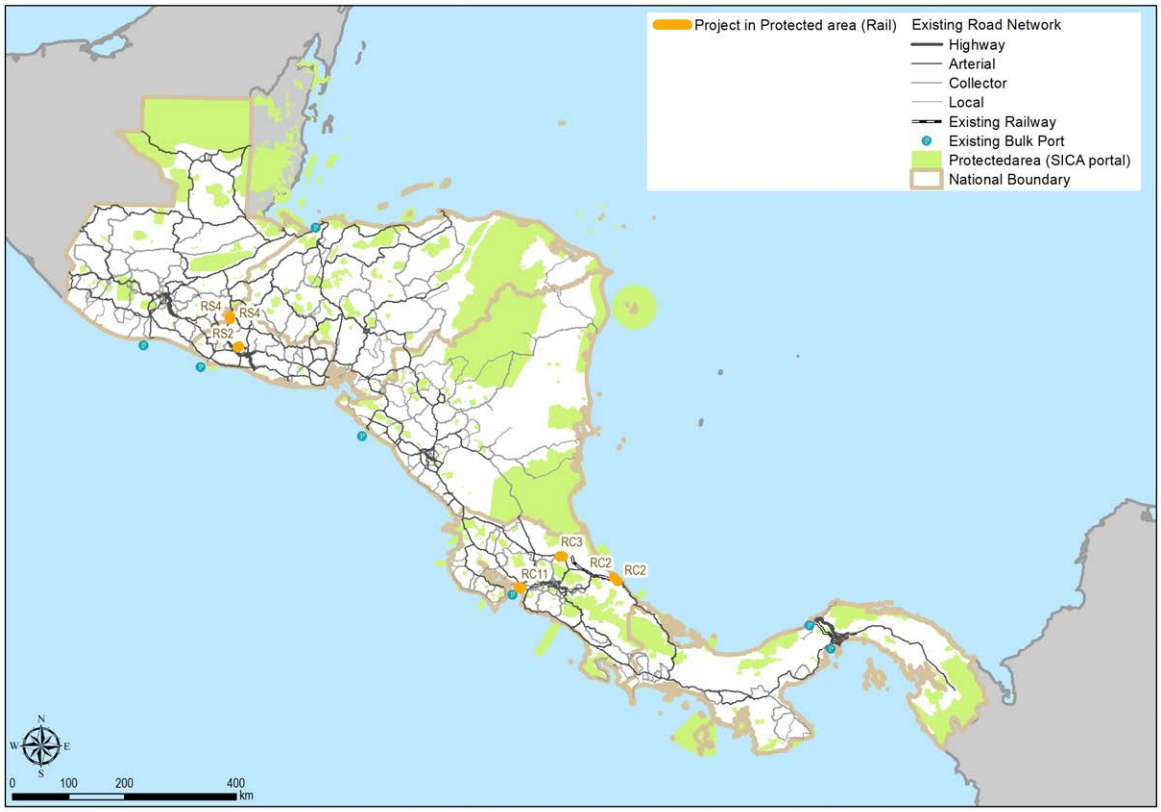
Figure 4.5.1 Section of Highway Projects in the Protected Areas

Table 4.5.8 List of Highway Projects in the Protected Areas

Code	Country	Sector	Project	Name of Protected Area
VG08	GTM	Highway	RN01: El Carmen border - Quetzaltenango Road Improvement	Volcán San Antonio / El Caracol - Los Espinos - Mirasol y Tizate
VS08	SLV	Highway	CA2: Full expansion of corridor to 4 lanes (or segments with a third lane): Zacatecoluca to La Unión segment, 70 Km approx. (East)	Laguna El Jocotal
VS09	SLV	Highway	CA2: Expansion of corridor to 4 lanes or third lane, Comalapa - Acajutla section (56 Km)	Taquillo
VH11	HND	Highway	CA5: Development of San Pedro Sula Bypass	Laguna Ticamaya
VN08	NIC	Highway	R_PR1: Road Construction: Nejapa - Ticuantepe - Tipitapa	Laguna de Nejapa
VN13	NIC	Highway	R_IR: Road Rehabilitation: Lovago - Pajaro Negro	Límite Reserva de Biosfera Río San Juan
VN14	NIC	Highway	R_IR2: Rehabilitation (Re-classification): La Curva - Nueva Guinea (NIC-71)	Límite Reserva de Biosfera Río San Juan

Code	Country	Sector	Project	Name of Protected Area
VN18	NIC	Highway	Rehabilitation of the Acoyapa-San Pancho section	Límite Reserva de Biosfera Río San Juan
VC02	CRC	Highway	N2: Road Development: Palmar Norte-Paso Canoas	Piedras Blancas
VC08	CRC	Highway	N32: Road Development: Y Griega Guápiles (Entr. R 4 y R 32)-Limón	Acuíferos Guácimo y Pococí
VC09	CRC	Highway	N35: Road Development: Tablillas-Florencia	Corredor fronterizo (estatal)
VC10	CRC	Highway	N32: Tunnel Redevelopment: Sección Zurquí - Río Sucio	Braulio Carrillo
VC11	CRC	Highway	N27: Road Widening: San José-Caldera	Tivives

Source: JST



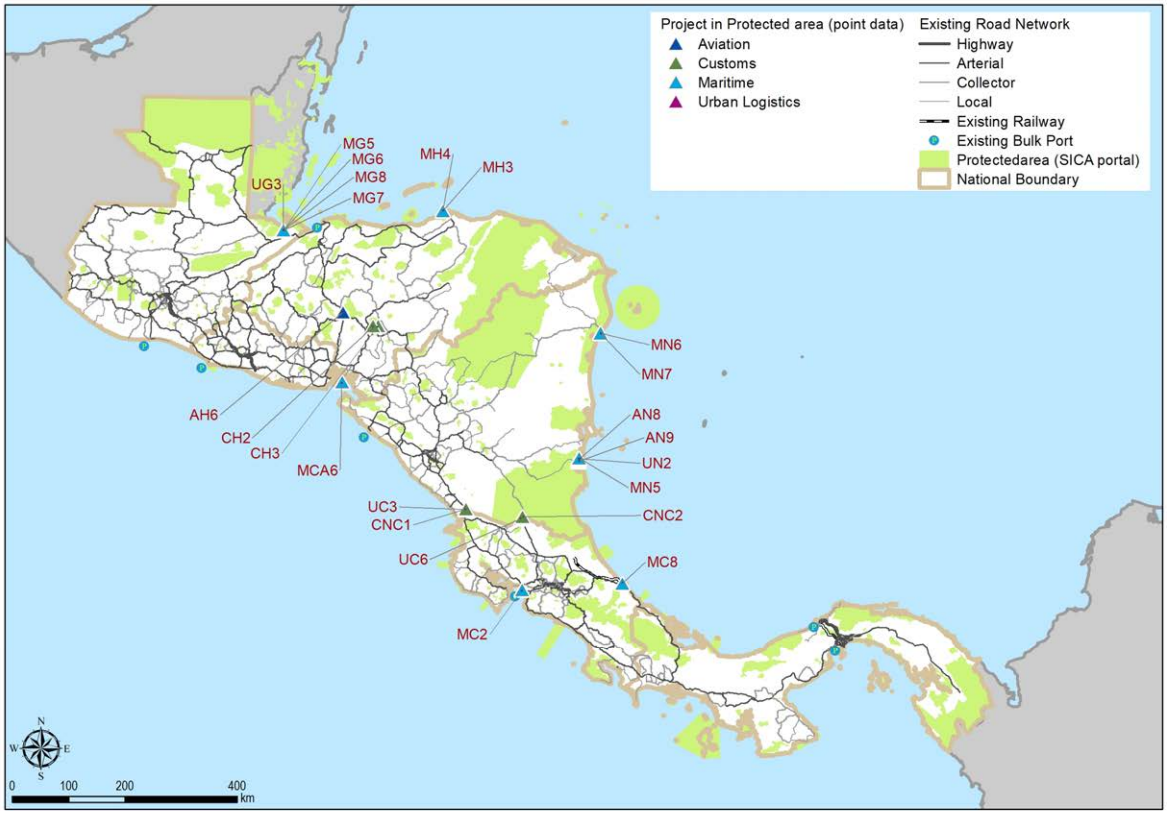
Source: JST

Figure 4.5.2 Section of Railway Projects in the Protected Areas

Table 4.5.9 List of Railway Projects in the Protected Areas

Code	Country	Sector	Project	Name of Protected Area
RS2	SLV	Railway	Rehabilitation of Railway (San Salvador - San Juan Opico - Sonsonate - Acajutla)	Finca Chanmico (Bosque) / La Argentina / San Juan Quezaltepeque
RS4	SLV	Railway	Rehabilitation of Railway (San Juan Opico - Santa Ana - Anguiatu Customs)	El Chaparron o San Cayetano
RC2	CRC	Railway	TELCA Project Phase 1 (Moin - TCM Japteva - Siquirres - Rio Frio (Patio GAM Zona Norte))	Nacional Cariari
RC3	CRC	Railway	TELCA Project Phase 2 (Rio-Frio - Chilamate)	Braulio Carrillo / La Selva
RC11	CRC	Railway	Pacific Train Project (Puntarenas - Puerto Cardera - Ciruelas)	Tivives

Source: JST



Source: JST

Figure 4.5.3 Section of Port, Airport, Custom, Urban Logistics Projects in the Protected Areas

Table 4.5.10 List of Port, Airport, Custom, Urban Logistics Projects in the Protected Areas

Code	Country	Sector	Project	Name of Protected Area
MG6	GTM	Maritime	Santo Tomás de Castilla Port: Development of Liquid & Solid BulkTerminals	Bahía de Santo Tomás
MG7	GTM	Maritime	Santo Tomás de Castilla Port: Construction of Cruise Terminal	Bahía de Santo Tomás
MG8	GTM	Maritime	Santo Tomás de Castilla Port: Improvement of Access Navigation Channel and Basin	Bahía de Santo Tomás
UG3	GTM	Urban Logistics	S.T.Castilla Port/Barrios Port: Development of LAZ (Logistics Activity Zone)	Bahía de Santo Tomás
MH3	HND	Maritime	Castilla Port: Improvement of Terminal	Laguna de Guaymoreto
MH4	HND	Maritime	Castilla Port: Rehabilitation and Improvement of port	Laguna de Guaymoreto
AN9	NIC	Aviation	Bluefields and Corn Island airports: D/D and Construction	Límite Reserva de Biosfera Río San Juan
MN5	NIC	Maritime	Bluefields Port: New Port Development	Límite Reserva de Biosfera Río San Juan
MN6	NIC	Maritime	Puerto Cabezas (Bilwi): Improvements	Cayos Miskitos y Franja Costera Inmediat
MN7	NIC	Maritime	Puerto Cabezas (Bilwi): Enhancement Inland water Transport	Cayos Miskitos y Franja Costera Inmediat
UN2	NIC	Urban Logistics	Bluefields: Development of LAZ	Límite Reserva de Biosfera Río San Juan
CNC2	NIC/CRC	Customs	San Panchos (NIC-CRC): Border Modenization	Límite Reserva de Biosfera Río San Juan

Code	Country	Sector	Project	Name of Protected Area
UC3	CRC	Urban Logistics	Penas Blancas: Development of LAZ (Logistics Activity Zone)	Corredor fronterizo (estatal)
UC6	CRC	Urban Logistics	Tablillass: Development of LAZ	Corredor fronterizo (estatal)

Source: JST

4.6 Recommendation

4.6.1 Recommendation for Each Agency

To ensure the environmental sustainability of the Master Plan, the following are the recommendations for SIECA and CICA, and responsible departments in each country.

(1) SIECA

- Establish an environmental department in SIECA to promote sustainable transport planning. Consult with the environmental and transport department in each country as necessary.
- In planning and implementation, emphasize reducing the use of fossil fuel and mitigating public health issues including epidemiologic impact.
- Update regional technical manuals that include the environmental variable, risk management, and adaptation to climate change in transportation infrastructure.
- SIECA should be responsible for monitoring the progress of the Master Plan with CCAD providing supervision.

(2) CCAD

- Ensure the use of standardized sectoral environmental guidelines in Central America, for example, the Environmental Code of Conduct for Port Management in Central America.
- Promote the application of international environmental regulations for air and rail transport, in coordination with COMITRAN / SIECA.
- Promote standard environmental guidelines in the Ministries of Environment of each country.

(3) Ministry of Transport in each country

- Capacity building of the Department of Environment of the Ministry of Transport to carry out SEA.
- Strengthen the intersectoral relationships between the Ministry of Environment and the Department of Environment of the Ministry of Transport.
- Establish a unit such as DACGER (Dirección de Adaptación al Cambio Climático y Gestión Estratégica del Riesgo) in the Ministry of Transport of each country

4.6.2 Monitoring items

Overall monitoring indicators of the Master Plan are proposed which are composed of six kinds of indicators, 1) status of the proposed projects, including budget and progress of the work (feasibility study, detailed design, tendering, construction, and operation), 2) traffic data, including cargo and passenger volume and travel speed by mode of transport, 3) condition of transport infrastructure, such as road surface condition, 4) health, safety & security, including the status of Business Continuity Plan (BCP) in case of a pandemic, traffic accident, robbery, and 5) socio-economic indicators, including population, land use

(agricultural and industrial areas, SEZs) along the 11 development corridors, 6) environment, based on the concept of SDGs, to monitor and evaluate the effectiveness of the master plan implementation.

The proposed monitoring indicators from the SEA-SDGs perspective are listed in Table 4.6.1. Among those indicators, 6) environment-related indicators are the following.

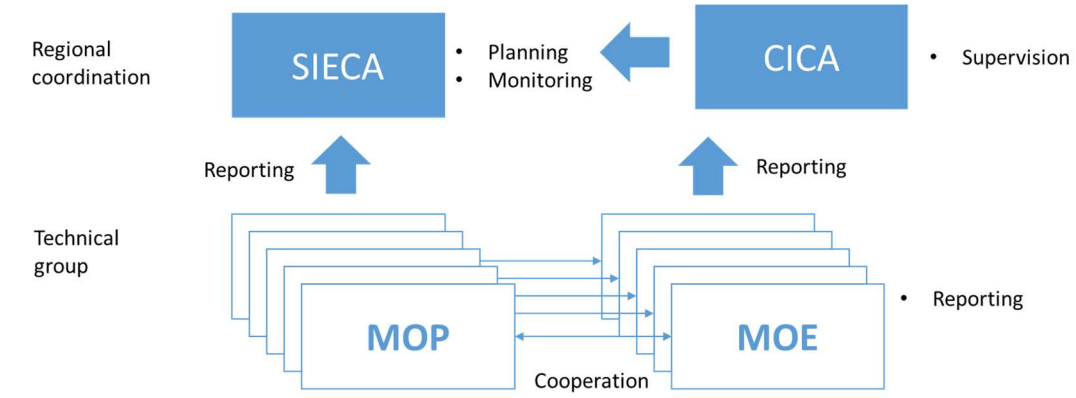
- Resiliency: Number of alternative routes in case of disasters (no.)
- Environmental Soundness: Impact on sensitive areas (ha)
- CO2 emission: GHG emission per year (CO_2/year)

Table 4.6.1 Proposed Monitoring Indicators

SEA-SDGs Criteria		Monitoring Indicators
1. Economic development		SEA-1/SDG-8: Production area to major logistics center (km)
2. Regional connectivity		SEA-2/SDG-9: Freight volume by mode of transport (ton-km)
3. Equitable Access		SEA-3/SDG-11: Population coverage of transportation network (people)
4. Resiliency		SEA-4/SDG-2: Number of alternative routes in case of disasters (no.)
5. Safety&Health		SEA-5/SDG-3: Number of accidents (km)
6. Environmental Soundness		SEA-6/SDG-14,15: Impact on sensitive areas (ha)
7. CO2 emission		SEA-7/SDG-13: GHG emission per year (CO_2/year)

Source: JST

While conventional environmental indicators, such as air quality, noise and vibration, water quality, and soil condition, will be monitored by a responsible agency of each country, SIECA will be responsible for monitoring the environment of corridors. The monitoring will be supported by the information from the Ministry of Transport and Ministry of Environment of each country and supervised by CICA at the regional level. Proposed monitoring structure is as shown below.



Source: JST

Figure 4.6.1 Institutional Arrangement of Monitoring

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 5

Road Infrastrucuture and Land Transport Sector

August 2023

Japan International Cooperation Agency
Oriental Consultants Global Co., Ltd.
Nippon Koei Co., Ltd.
ALMEC Corporation
Overseas Coastal Area Development Institute of Japan
International Development Center of Japan Inc.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

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Road Infrastrucuture and Land Transport Sector

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Appendix 5 Road Infrastrucuture and Land Transport Sector

5.1 Regulation and Organization

5.1.1 Regulation and Technical Standards

(1) Road Design and Vehicle Standards

For the road design standard, SIECA has the Central American Standards Manual for Geometric Road Design of the Regional Roads *(Normas Para el Diseño Geométrico de las Carreteras Regionales)*. Some standards in accordance with the Standards Manual for Geometric Road Design of the Regional Roads are shown in Table 5.1.1 below:

Table 5.1.1 Minimum Width of Shoulder Road and Sidewalks

Road Type		Type of Surface	Shoulder width (m)		Sidewalks (m)
Symbol	Type		Internal	External	
AA	Highway	High	1.0 – 1.5	2.5 – 3.0	
AR	Rural Arterial	High	1.0 – 1.5	2.5 – 3.0	2.0
AU	Urban Arterial	High	1.0 – 1.5	2.5 – 3.0	2.0
AMR	Rural Minor Arterial	High		1.2 – 1.6	1.0 – 1.2
AMU	Urban Minor Arterial	High		1.2 – 1.6	1.0 – 1.2
CMR	Rural Major Collector	High	1.0 – 1.5	2.5 – 3.0	1.2 – 2.0
CMU	Urban Major Collector	High	0.5 – 1.0	1.2 – 1.8	1.2 – 1.5
CR	Rural Minor Collector	Intermediate		1.2 – 1.6	1.0 – 1.2
CS	Collectors Minor Urban	Intermediate		1.2 – 1.6	1.0 – 1.2
LR	Local Rural	Intermediate		0.75 – 1.6	1.0 – 1.2
LU	Local Urban	Intermediate		0.75 – 1.6	1.0 – 1.2
R	Rural	Under			

Source: Central American Standards Manual for Geometric Road Design of the Regional Roads

These twelve classes can be further subdivided: for instance, if the range of Annual Average Daily Traffic (AADT) for the Rural Minor Collector road class (CR) is considered to be very broad (500 to 3,000 vehicles), it can be subdivided into smaller ranges – for example from 500 to 900, from 900 to 1,500 and from 1,500 to 3,000 with the denomination CR-3, CR-2 and CR-1 respectively – while still belonging to the Rural Minor Collector. There are four general vehicle types for road design, as follows:

1. Light vehicles: cars, jeeps, farm trucks, sport vehicles, van, minivans and pickups,
2. Buses including articulated buses,
3. Truck: single unit trucks (2 or 3 axles), and
4. Recreational vehicle: cars with boat trailers.

However, there is an absence of local information about the dimension of these four types of vehicle. As a result, the following vehicle dimensions have been adopted and been used widely in Central America roads, as summarized in Table 5.1.2.

Table 5.1.2 Design Vehicle Dimensions (in meters)

Vehicle	Height	Width	Length
Light vehicle	1.3	2.1	5.8
Truck	4.1	2.4	9.2
Bus	3.7	2.6	12.2

Vehicle	Height	Width	Length
Articulated Bus	3.4	2.6	18.3
Truck (head with semitrailer)	4.1	2.6	20.9

Source: A Policy on Geometric Design of Highways and Streets, 2004.

The freight transport sector contributes to Central American economic integration through its logistic system. For maintenance standards of vehicles including freight transport, there is the Central America Manual of Rules for the Mechanical Overhaul of Vehicles by SIECA in 2009. According to the manual, RTV (*La Revisión Técnica Integral de Vehículos/Comprehensive Technical Review of Vehicles*) shall be in charge in the inspection system. Overall, they verify the general condition, safety elements of the vehicle, comply with minimum conditions of maintenance, operation and safety in order to make sure that the vehicle is acceptable to continue driving without representing a danger to its occupants, and any other person or element that is in the public based on the pertinent legal regulations. The items that they inspect are as follows: vehicle registration, vehicle body, vehicle interior, signaling, lighting, brakes, wheel, axle and suspension, chassis, engine and transmission.

The competent authorities of the country are obliged to give sanction where the violation is detected based on the stated manual by SIECA. The sanctions of each country consist of fines, suspension and cancellation of license plates, license, registration, operations, and retention of vehicles.

(2) Freight Vehicle Weight Management System

Regarding the management and regulation of freight vehicles in the six countries in Central America, with the exception of Panama, where the institution in charge is the Transit Authority and Land Transport (ATTT), the Ministries are in charge of planning and constructing the road network and controlling the weight and length of freight vehicles in each country. However, the actual operation and contents of the regulations vary in each country. For example, the current freight and vehicle weight and length regulation in Honduras are SIECA's 2014 edition of the Central American Agreement on Road Traffic Regarding Freight Vehicle Weight and Dimensions ("*Acuerdo Centroamericano sobre Circulación por Carreteras, en Materia de Pesos y Dimensiones de Vehículos de Carga, Versión 2014*", hereinafter the "Central America Agreement on Road Traffic in 2014"). However, due to the limitation of freight vehicle weigh station, it is impossible to implement the penalty in line with the Agreement. In Costa Rica, the maximum allowable weight for almost all types of vehicles is higher than stated in the Agreement. The Ministry of Public Works and Transport (MOPT), the ministry in charge, tries to lower these values, but the regulation has not been modified yet. In Panama, as mentioned above, the ATTT, which is an independent organization under the Ministry of Public Works (MOP), applies conventional Panama specific regulation (the allowed maximum weight for each type of vehicle is heavier than SIECA regulations).

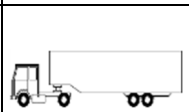
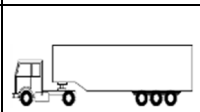
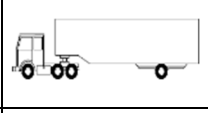
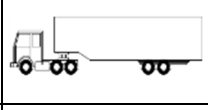
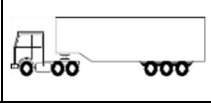
Table 5.1.3 shows the content of the weight regulation of each type of freight vehicle in the Central American Agreement on Road Traffic of SIECA in 2014 and its comparison with similar regulations in Europe and the United States and also with those of Central American countries. The contents are as follows:

- In general, the content of the weight regulation for various freight vehicles in the EU are stricter than in the United States. However, the weight regulation in the Central American Agreement is even stricter than regulations in the EU.
- The weight regulation in El Salvador and Nicaragua fully coincides with the weight regulations of the Agreement.
- In Guatemala, the maximum allowable weight in some type of vehicles somewhat exceeds what is mentioned in the Agreement.
- In Honduras, the existing maximum allowable weight is inconsistent with what is mentioned in the Agreement, and some weights above or below the value in the Agreement depend on the vehicle type.
- In Costa Rica and Panama, the maximum allowable weights for almost all the types of vehicles exceed

those in the Agreement.

Table 5.1.3 List of Maximum Allowed Loads of Freight Vehicles in Each Central America

Unit: ton

Vehicle Type	Exterior View	Axial Load	USA	EU	Rules of the CA agreement	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panamá
C2		Steering Axle Load	10	5	**5**	5.5	5	(5)	5	6	4
		Drive Shaft Load	11.2	9	**10**	10	10	(10)	10	10	10
		Total	21.2	16	**15**	15.5	15	(15)	15	16	14
C2-R2		Steering Axle Load	10	5	**5**	5.5	5	(5)	5	6	4
		Drive Shaft Load	11.2	9	**10**	10	10	(10)	10	10	10
		Total	21.2	16	**15**	15.5	15	(15)	15	16	14
C3		Steering Axle Load	10	10	**5**	5.5	5	(5)	5	6	5.5
		Drive Shaft Load	18	15	**16.5**	16.5	16.5	(16.5)	16.5	16.5	16.4
		Total	28	25	**21.5**	22	21.5	(21.5)	21.5	22.5	21.9
C3-R2		Steering Axle Load	10	10	**5**	5.5	5	(5)	5	6	5.5
		Drive Shaft Load	18	15	**16.5**	16.5	16.5	(16.5)	16.5	16.5	16.4
		Total	28	25	**21.5**	22	21.5	(21.5)	21.5	22.5	21.9
C3-R3		Steering Axle Load	10	10	**5**	5.5	5	(5)	5	6	5.5
		Drive Shaft Load	18	15	**16.5**	16.5	16.5	(16.5)	16.5	16.5	16.4
		Total	28	25	**21.5**	22	21.5	(21.5)	21.5	22.5	21.9
C4		Steering Axle Load	10	10	**5**	5	5	(5)	5	6	5.5
		Drive Shaft Load	27	16	**20**	20	20	(20)	20	2. 3	22
		Total	37	26	**25**	25	25	(25)	25	29	27.5
T2-S1		Steering Axle Load	10	16	**5**	5	5	(5)	5	6	5.5
		Drive Shaft Load	11.2		**9**	9	9	(9)	9	10	10
		Rear axle load	11.2	10	**9**	9	9	(9)	9	10	10
		Total	32.4	26	**2. 3**	2. 3	2. 3	(2. 3)	2. 3	26	25.5
T2-S2		Steering Axle Load	10	16	**5**	5	5	(5)	5	6	5.5
		Drive Shaft Load	11.2		**9**	9	9	(9)	9	10	10
		Rear 2-Axle load	18	19	**16**	16	16	(16)	16	16.5	16.4
		Total	39.2	35	**30**	30	30	(30)	30	32.5	31.9
T2-S3		Steering Axle Load	10	16	**5**	5	5	(5)	5	6	5.5
		Drive Shaft Load	10		**9**	9	9	(9)	9	10	10
		Rear 3-Axle Load	27	24	**20**	20	20	(20)	20	2. 3	22
		Total	47	40	**3. 4**	3. 4	3. 4	(3. 4)	3. 4	39	37.5
T3-S1		Steering Axle Load	10	25	**5**	5	5	(5)	5	6	5.5
		Drive Shaft Load	18		**16**	16	16	(16)	16	16.5	16.4
		Rear Axle load	11.2	10	**9**	9	9	(9)	9	10	10
		Total	39.2	35	**30**	30	30	(30)	30	32.5	31.9
T3-S2		Steering Axle Load	10	25	**5**	5	5	(5)	5	6	5.5
		Drive Shaft Load	18		**16**	16	16	(16)	16	16.5	16.4
		Rear 2-Axle load	18	15	**16**	16	16	(16)	16	16.5	16.4
		Total	46	40	**37**	37	37	(37)	37	39	38.3
T3-S3		Steering Axle Load	10	25	**5**	5	5	(5)	5	6	5.5
		Drive Shaft Load	17		**16**	16	16	(16)	16	16.5	16.4
		Rear 3-Axle load	21.25	19	**20**	20	20	(20)	20	2. 3	22
		Total	48.25	44	**41**	41	41	(41)	41	45.5	43.9

*Although Honduras agreed to the rules of the Central American Agreement, they have not been legislated yet.

Legend: Above the Central America Agreement Provision
Below the Central America Agreement Provision

Source: Prepared by the JST based on the following documentation
Guatemala: CIV (2010), Regulation for the Control of Weights and Dimensions of Motor Cargo Vehicles and their Combinations (Government Agreement 379-2010).
El Salvador: Legislative Assembly - Republic of El Salvador, Special Law on Freight Transportation by Road (Decree No. 367).
Nicaragua and Costa Rica: WB and SIECA (2013), PROJECT: Strengthening Institutions for Regional Integration in Central America, Grant Agreement (TF097748 SIECA-BANCO MUNDIAL).
Panama: ATTT (2007), Modernization of the Weights and Dimensions Control System and Traffic Monitoring System, Final Report (CONTRACT No. 02-06-ATTT).
USA: Federal Highway Administration (FHWA: Federal Highway Administration)
EU: Directive 96/53 / EC, European Modular System (EMS: European Modular System)

(3) Freight Vehicle Dimension Management System

The allowable length of freight vehicles based on SIECA's Central America Agreement on Road Traffic in 2014 and its comparison with similar regulations in Europe and the United States and also with those of Central American countries are shown in Table 5.1.4. In particular, for vehicles (trailers) larger than T2-S1, the maximum allowable freight vehicle length regulation in each country is actually below the Central America agreement provision except for Honduras, where the vehicle length regulation is not legalized. In some countries, the weight regulation exceeds what is mentioned in the Agreement. Thus, there is a concern about the possibility of damaged road due to heavier loads caused by denser freight vehicles. There are containers with more than 40 feet in the world and El Salvador and Costa Rica have adopted vehicle length standards that allow that containers. Thus, unification of the regulation in the Agreement is also required.

Table 5.1.4 List of Allowable Freight Vehicle Lengths in Central America

[Unit: m]

Vehicle Type	USA	EU	Rules in Central America Agreement	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panamá
C2	12.80	12.00	12.00	12.00	12.00	(12.00)	12.00	12.00	11.00
C2-R2	12.80	12.00	18.30	18.30	18.30	(18.30)	16.75	18.30	16.70
C3	12.80	12.00	12.00	12.00	12.00	(12.00)	12.00	12.00	12.00
C3-R2	12.80	12.00	18.30	18.30	18.30	(18.30)	16.75	18.30	16.70
C3-R3	12.80	12.00	18.30	18.30	18.30	(18.30)	16.75	18.30	16.70
C4	12.80	16.50	16.75	16.75	16.75	(16.75)	16.75	12.00	12.00
T2-S1	16.76	16.50	22.40	16.75	16.75	(22.40)	16.75	21.00	16.70
T2-S2	16.76	16.50	22.40	17.50	17.50	(22.40)	17.50	21.00	16.70
T2-S3	16.76	16.50	22.40	17.50	17.50	(22.40)	17.50	21.00	16.70
T3-S1	19.81	18.75	22.40	17.50	20.30	(22.40)	17.50	21.00	16.70
T3-S2	19.81	18.75	22.40	17.50	20.30	(22.40)	17.50	21.00	16.70
T3-S3	19.81	18.75	22.40	17.50	20.30	(22.40)	17.50	21.00	16.70

*Although Honduras agreed to the rules of the Central American Agreement, they have not been legislated yet.

Legend: Above the Central America Agreement Provision
Below the Central America Agreement Provision

Source: Prepared by the JST according to the following data
Six Central American countries: World Bank and SIECA (2014), PROJECT: Strengthening Institutions for Regional Integration in Central America, Grant Agreement (TF097748 SIECA-BANCO MUNDIAL).
Guatemala: CIV (2010), Regulation for the Control of Weights and Dimensions of Motor Cargo Vehicles and their Combinations (Government Agreement 379-2010).
Panama: AATT (2007), Modernization of the Weights and Dimensions Control System and Traffic Monitoring System, Final Report (CONTRACT No. 02-06-ATTT).
USA: Federal Highway Administration (FHWA)
EU: Direction 96/53 / EC, European Modular System (EMS).

Regarding not only the maximum allowable weight and length but also the vehicle type classification, there are types of vehicles in each country that are not included in the vehicle classification according to the Central American Agreement on Road Traffic of 2014 of SIECA, although it is only a few units as seen in Table 5.1.5. Although these vehicles are categorized as common in some countries, they are not mentioned in the Agreement. Thus, the maximum allowable value differs from country to country or there may be a type whose weight and length regulations do not exist in other countries. It is necessary to add these vehicles to the Agreement to unify and standardize them.

Table 5.1.5 List of Freight Vehicles not Stipulated in the CA Agreement on Road Traffic of 2014

Country	Vehicle Type	Total Number of Types
Guatemala	T3-S4, T2-S1-R2, T3-S1-R2, T3-S2-R2, T3-S2-R3, T3-S1-R4, T3-S2-R4	7
El Salvador	T3-S4, T3-S2-R4, T3-S2-R6, T3-S3-R4, T3-S3-R5, T3-S3-R6, T3-S4-R6, T4-S4-R6	8
Honduras	C2-R3, T3-S4	2
Nicaragua		0
Costa Rica	CS, C4-R2, C4-R3	3
Panamá	C2-R3, T2-S1-R2, T2-S2-R2, T3-S1-R2, T3-S2-R3	5

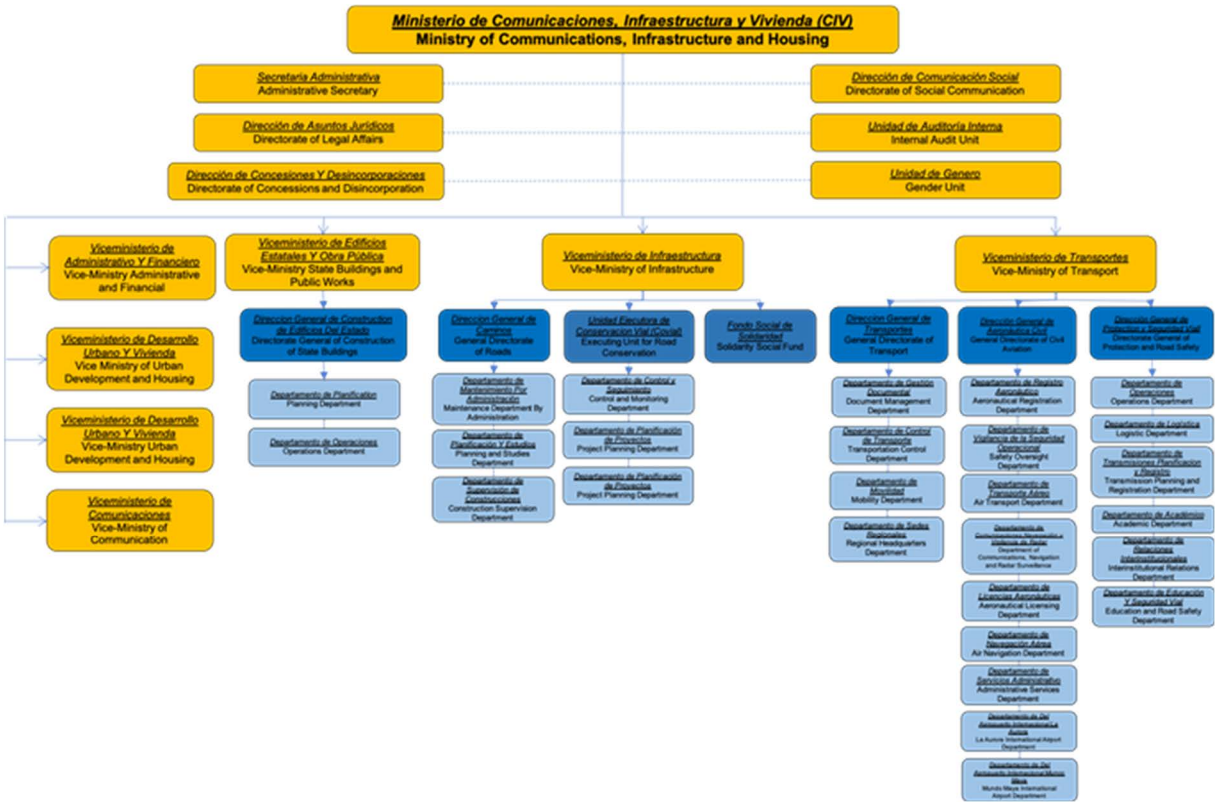
Source: Prepared by the JICA Study Team based on the following documentation
Six Central America countries: World Bank and SIECA (2013), PROJECT: Strengthening Institutions for Regional Integration in Central America, Grant Agreement (TF097748 SIECA-BANCO MUNDIAL).
Guatemala: CIV (2010), Regulation for the Control of Weights and Dimensions of Freight Vehicles and their Combinations (Government Agreement 379-2010).
Panama: AATT (2007), Modernization of the Control System of Weights and Dimensions and Traffic Monitoring System, Final Report (CONTRACT No. 02-06-ATTT)
El Salvador: Legislative Assembly - Republic of El Salvador, Special Law on Freight Transportation by Road (Decree No. 367).
Honduras, Nicaragua, and Costa Rica: World Ba and SIECA (2013), PROJECT: Strengthening Institutions for Regional Integration in Central America, Grant Agreement (TF097748 SIECA-BANCO MUNDIAL).
Panama: AATT (2007), Modernization of the Weights and Dimensions Control System and Traffic Monitoring System, Final Report (CONTRACT No. 02-06-ATTT).

5.1.2 Organization and Human Resources

Guatemala

The CIV (*Ministerio de Comunicaciones, Infraestructura y Vivienda,* or Ministry of Communication, Infrastructure and Housing) is in charge of formulating policies and exercising legal authority for development and maintenance in communication, infrastructure and transportation system in Guatemala. According to The Congress of the Republic of Guatemala Decree 114-97 Article 30, the CIV is an authority for managing the contract and concession related to design, construction, maintenance and supervision for public works. In addition, the CIV is responsible for supervising the execution of works. Besides the infrastructure, the CIV also works on the tasks related to the communication infrastructure, centered information on meteorology, volcanology, seismology and hydrology, and airport services. For the road sector, there is a DGC (Dirección General de Caminos, or General Directorate of Roads) that is responsible for everything related to road infrastructure including plan, design, execution and supervision of the construction, improvement, expansion, reconstruction and maintenance works of the road in Guatemala. The functions of the DGC are as follows:

- To carry out, maintain, update and execute regional plans for the construction, rehabilitation, improvement and maintenance of highways and related works in accordance with the corresponding programs and policies established by the Minister.
- To evaluate the national needs of road transport infrastructure in coordination with other State agencies that are related to the transport sector, applying economic and technical criteria that allow it to establish priorities within its execution programs.
- To maintain the roads in optimal traffic conditions at all times of the year and provide adequate maintenance to the bridges of the country's road network that are under their responsibility.
- To study, analyze and evaluate applications for projects for the construction, rehabilitation and improvement of roads, bridges and related works to consider the possibility of their inclusion in social investment programs.



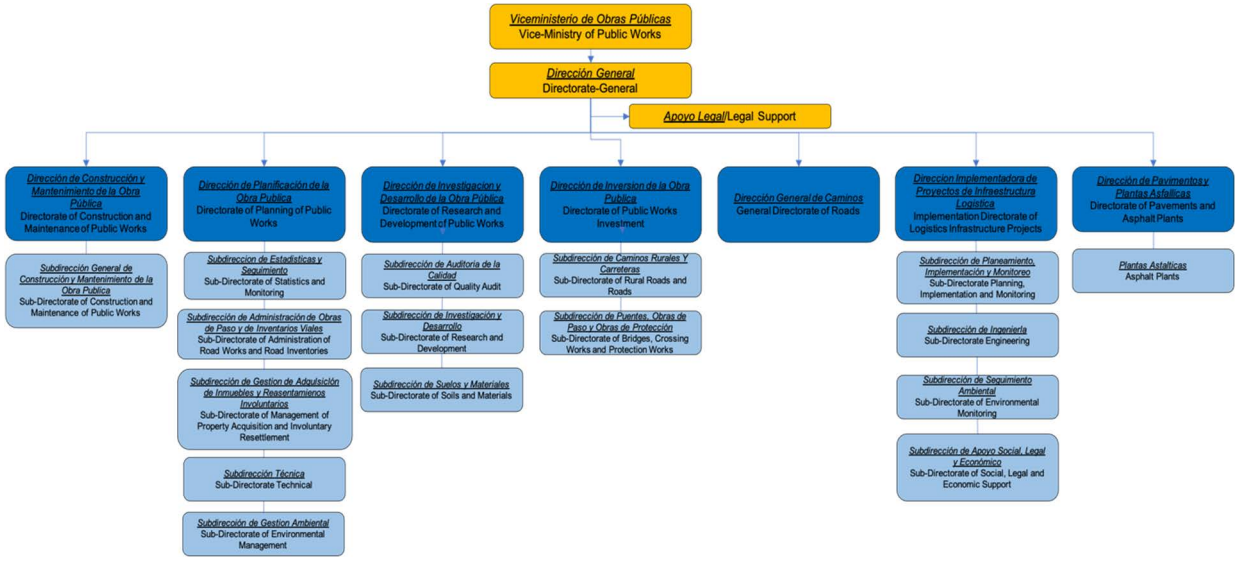
Source: Approved Government Agreement No. 311-2019 and Its Amendments Government Agreement No. 120 - 2020

Figure 5.1.1 Organization Structure: Ministry of Communication, Infrastructure and Housing of Guatemala

Meanwhile, the Road Maintenance Implementation Unit (*Unidad Ejecutora de Conservación Vial* (COVIAL)), was founded in 1995 for the maintenance of roads as an independent organization and COVIAL makes an annual contract with the private sectors. COVIAL's financial resources are mainly from gasoline tax.

El Salvador

The MOPT (*Ministerio de Obras Públicas y Transportes*, or Ministry of Public Works and Transport) is responsible for the planning, expansion and rehabilitation of El Salvador's road infrastructure. The MOPT relies on FOVIAL (*Fondo de Conservación Vial*, or Road Conservation Fund) for maintaining the priority national road. In El Salvador, it is claimed that there is a lack of definition in the allocation of network responsibilities between MOPT, FOVIAL and the municipal administrations. Therefore, a single entity must specialize in maintenance to prevent the road network from deteriorating due to ambiguity of competencies. Thus, Inter-America Development Bank in its recent studies in 2020 about El Salvador Infrastructure Master Plan 2019-2030 recommended creating an institution that is fully responsible for economies development and maintaining the priority road network at the national level exclusively to FOVIAL. The organization is now in charge of administrating and maintaining most of roads in the country with about 6,400 km (excluding rural roads, which are unpaved roads among urban, special, primary, secondary, tertiary and rural roads) in El Salvador. The financial resources for management and maintenance are obtained from 90% of gasoline taxes and the rest is obtained from vehicle registration taxes and fines for infractions, etc.



Source: Official Website of MOPT El Salvador, 2017

Figure 5.1.2 Organization Structure: Ministry of Public Works and Transport of El Salvador

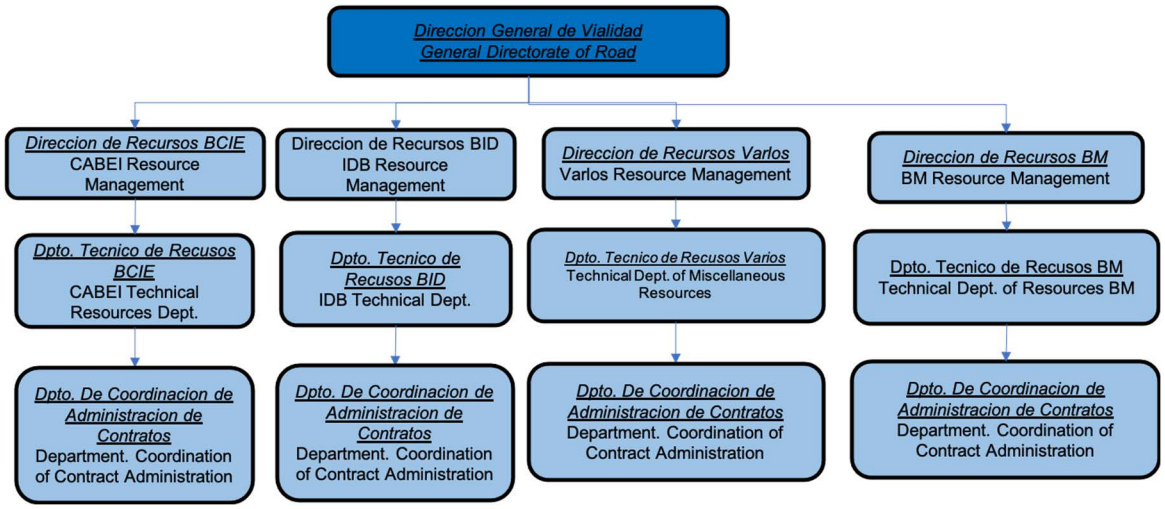
Honduras

SIT(*Secretaría de Infraestructura y Transporte*, Secretariat of Infrastracture and Transport) is assigned to plan, execute and maintenance the public infrastructure works, the road system, urban planning and transportation. In addition, the Secretariat also works on the policy and regulation development including preparing the technical guideline, which will be used in the design of infrastructure project in Honduras.

Meanwhile, the management and maintenance of roads is the handled by another institution, the Road Fund (*Fondo de Vial* (FOVIAL)). Most of the road maintenance works including resurface and partial reconstruction are conducted by the Road Fund, which has an annual budget of 8 million Lempiras, which is clearly insufficient. Gasoline taxes go directly to the General Treasury, so it cannot be utilized as a funding source for highways. On the other hand, some roads in municipalities are operated and maintained by an organization called *Ahprocafé*.

Nicaragua

Dirección General de Vialidad, or the General Directorate of Road, under *Ministerio de Transporte e Infraestructura*, or Minister of Infrastructure and Transport (MTI), is the organization in Nicaragua for managing road infrastructure including the planning, execution and maintenance. Some approvals are made by the General Directorate of Road such as certificate for approval, renewal and delivery services of truck weight and dimension in Nicaragua. In case some violations are made by road users, the fine will be imposed by this Directorate.



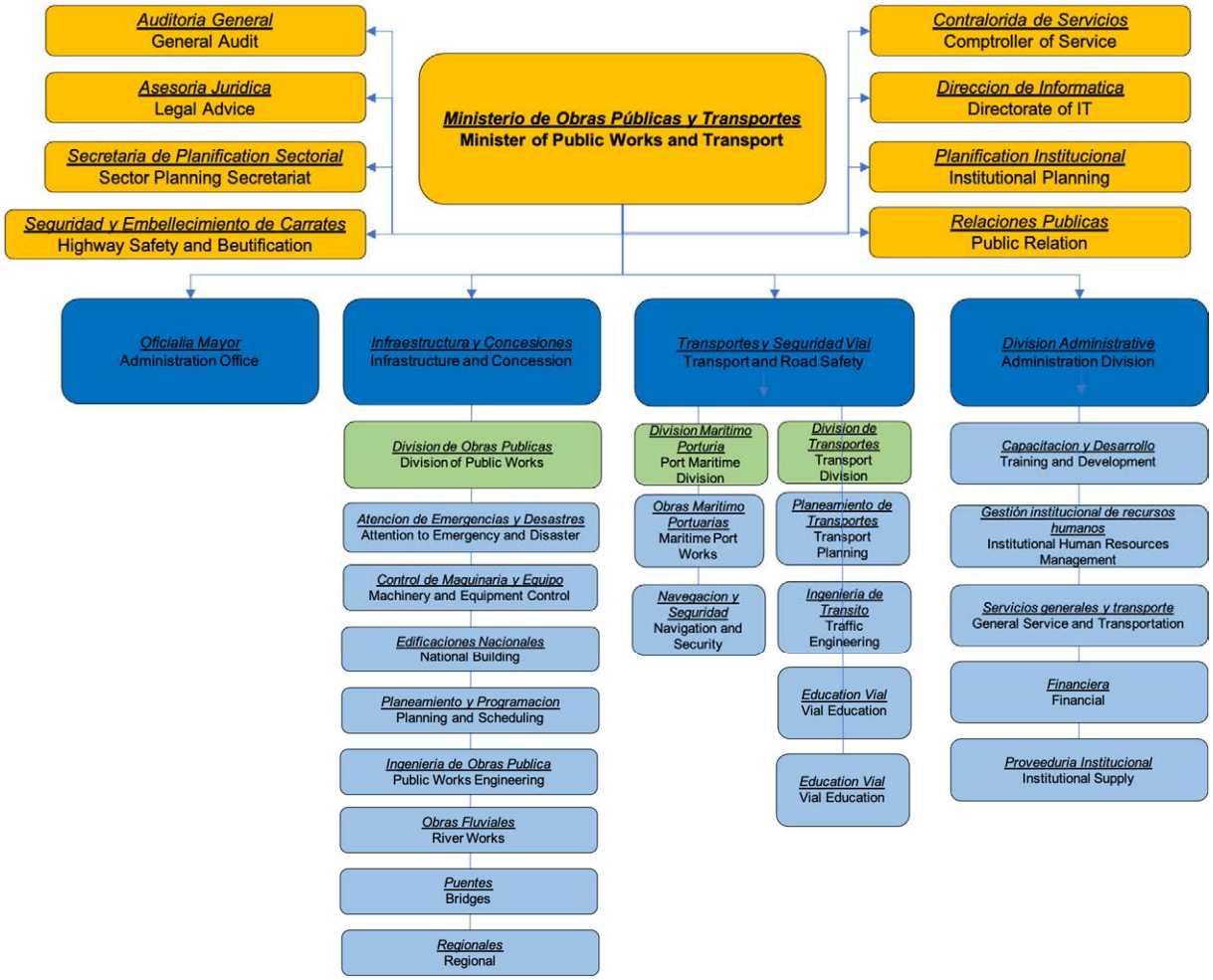
Source: Official Website of Ministry of Transport and Infrastructure of Nicaragua

Figure 5.1.3 Organization Structure: General Directorate of Road of Nicaragua

On the other hand, the Road Maintenance Fund (*Fondo de Mantenimiento Vial* (FMV)) is a new organization that is responsible for administration, maintenance, security control, traffic lights of national and departmental highways and research on the impact of overloaded vehicles on roads. The budget consists of three sources: fuel tax revenue, funds from donor countries, and loans.

Costa Rica

The MOPT (*Ministerio de Obras Públicas y Transportes*, or Ministry of Public Works and Transport) should be in charge in road sector development. In addition, there are dependent agencies under the MOPT, which are CONAVI *(Consejo Nacional de Vialidad*, or The National Highway Council) and CNC (*Consejo Nacional de Concesiones*, or The National Council of Concessions). Overall, the MOPT is in charge of formulating basic policies and executing the construction and maintenance of the National Road Network and it should be done by prior coordination between CNC and CONAVI.



Source: Official Website of Ministry of Public Works and Transport of Costa Rica

Figure 5.1.4 Organization Structure: Ministry of Public Works and Transport of Costa Rica

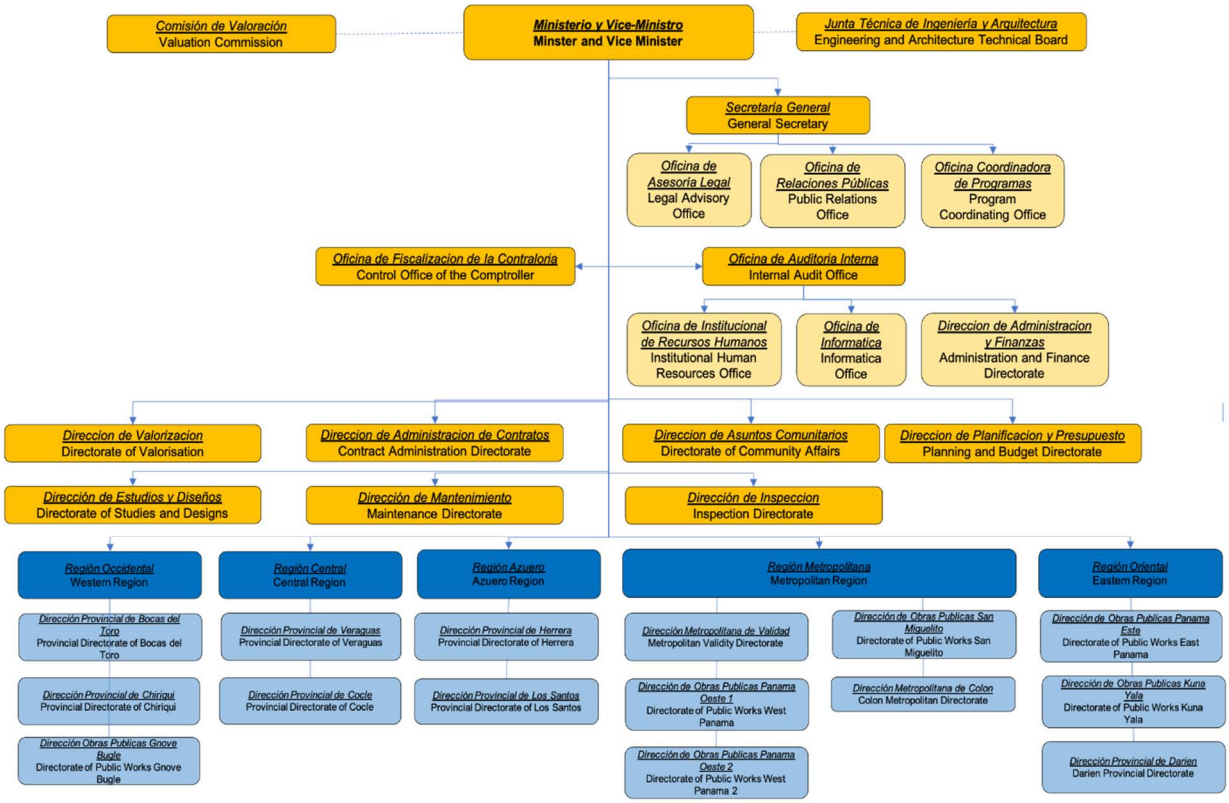
CONAVI is in charge of the improvement and maintenance of the existing National Road Network that includes bridges, while the CNC promotes plans for new concessions for highways and bridges. The project that are carried out by CONAVI are road infrastructure program (PIV-1), National Route No. 32, Road Infrastructure Strategic Work Program, Binational Bridge Project over the Sixola River and San Jose – San Ramon Road Corridor. CNC as the legal entity for administrating the contract for public works concession projects has several projects in Road Corridor National Route 32, San Jose Section – Route 4 Intersection, Expansion of National Route No. 27 San Jose – Caldera Corridor and San Jose Caldera Road Corridor Route 27.

Panama

The MOP (*Ministerio de Obras Publicas*, or Ministry of Public Works) has divisions of *Dirección Provincial* (Provincial Directorate). The Provincial Directorate should coordinate with the Directorate of Community Affairs and corresponding Authorities. Several works that should be done by the Provincial Directorate in the related road sectors are:

- To prepare and plan for construction and maintenance of roads, streets, bridges, storm drains and other public works;
- To coordinate, execute and control the work programs according to the assigned items, through the investment budget or official contracts of the Ministry of Public Works with related agencies;

- To work on the preliminary draft of the budget of the Provincial Directorate according to the activities plan; and
- To present to the Minister work programs and reports of actions carried out in the Provincial Directorate.



Source: Official Website of Ministry of Public Works of Panama

Figure 5.1.5 Organization Structure: Ministry of Public Works of Panama

5.2 Budget

The following section provides information as last approved (2021) in the respective national budgets. Each of the budgets differ in how they are organized and the level of detail provided (salaries, equipment, public vs. private funding, etc.); the following analysis is the JST's attempt to normalize the various data points as much as possible for the current year. Table 5.2.1 below summarizes the total budget allocations for construction and for operations and maintenance (O&M) by country as well as a total for the region. Based on this, it is estimated that approx. $45.40/person is allocated on the road sector by the public sector throughout the region. A further analysis reveals that El Salvador is essentially in line with the regional road sector expenditure per capita; Guatemala, Honduras, and Nicaragua are underfunded, while Costa Rica and Panama allocate significantly more per capita when compared to the region.

Table 5.2.1 Road Sector Approved Budget Allocations for 2021 (USD)

	Construction	Operations and Maintenance	Total	Total per Capita
Guatemala	$513,509,448	$44,176,871	$557,686,320	$33.08
El Salvador	$165,231,166	$133,809,541	$299,040,707	$46.10
Honduras	$190,320,819	$118,341,799	$308,662,617	$31.16
Nicaragua	$164,892,555	$40,428,263	$205,320,818	$30.99
Costa Rica	$167,403,259	$119,573,757	$286,977,016	$56.33
Panamá	$442,700,149	$150,920,505	$593,620,654	$137.58
Central America Total	**$1,644,057,395**	**$607,250,736**	**$2,251,308,132**	**$45.68**

Source: JST

5.2.1 Construction and Maintenance Budget

Guatemala

Directorate General of Road (Dirección General De Caminos) under the Ministry of Communications, Infrastructure, and Housing on the Annual Operating Plan (POA for Plan Operativo Anual) for 2021 allocates Q5,937 million (USD 778,1 million). Table 5.2.2 below shows the budget detail of Directorate General of Road.

Table 5.2.2 Road Construction and Maintenance Budget: Guatemala

Description	2021 (GTQ)	2021 (USD)[1]
Human Resources	Q 287,642,811	$37,926,794
Maintenance of the Road Network	Q 335,044,384	$44,176,871
Current Projects	Q 2,014,199,436	$265,579,826
New Projects	Q 1,434,777,500	$189,180,849
Pre-Investment Studies	Q 445,560,000	$58,748,774
Debt registered	Q 1,419,164,460	$187,122,210
Judicial Judgment	Q 956,300	$126,092
Sub-Program Sub-total	***Q 5,937,344,891***	***$782,861,416***

Source: Plan Operativo Anual 2021 Dirección General De Caminos

[1] Average rate for July 2021: GTQ 1 = USD 0.131853788

El Salvador

The Ministry of Public Work and Transportation has a total budget $357,181,194[2] with road construction is allocated on infrastructure investment budget, meanwhile Road Conservation Fund (*FOVIAL: Fondo de Conservación Vial*) also under Ministry of Public Work and Transportation is responsible for the conservation of the assigned road network, through activities aimed at preserving in a continuous and sustained manner the good condition of land communication routes, so as to guarantee optimal service to the user. The MOPT infrastructure investment budget (code 4300) allocates $164,223,376 for sixty (60) road infrastructure projects nationwide, while the FOVIAL budget for maintenance includes in Table 5.2.3 below.

Table 5.2.3 Road Maintenance Budget: El Salvador

U.P. 02 (Road Maintenance Total Budget)	**$132,993,400**
01 Periodic Maintenance Program	$44,164,090
02 Routine Maintenance, Unpaved Roads	$21,423,965
03 Signaling and Road Safety	$2,669,800
04 Bridges and Crossings Works	$7,674,495
05 Routine Maintenance, Paved Roads	$52,061,050
06 Right of Way Maintenance	$5,000,000

Source: FOVIAL Presupuesto 2021

Honduras

According to the Government of Honduras's 2021 Public Investment Plan[3], L4,583.6 million ($193.94 million USD[4]) was earmarked for the execution of 12 highway construction projects in 2021 (31.52 km) including the Logistics Corridor executed through INVEST-H and INSEP, which represents 19% of public investment and an estimated 25,352 jobs created. Meanwhile, the Road Infrastructure Plan prioritizes L2,850.0 million ($120.59 million USD) for the rehabilitation and maintenance of 659.5 km of the Paved and Unpaved Road Network, with intervention in all regions of the country for the connectivity of primary, secondary and tertiary roads.

Nicaragua

The 2021 Public Investment Program (PIP for *Programa de Inversión Pública*) represents C$14,354.9 million córdobas to assigned to infrastructure projects by Central Government[5], a 3.58% decrease from the 2020 General Budget of the Republic (PGR for Presupuesto General de la República). The sector that received the largest cut in its budget for 2021 was indeed the Ministry of Transportation and Infrastructure (MTI), which went from being allocated C$6,543.1 million in 2020, to C$5,684 million ($163.14 million USD[6]) budgeted for 2021.The MTI strategy for 2021 includes the completion of 98 road infrastructure projects including the completion of 19 projects with 325 new kilometers of paved roads and starting 13 new projects that will mean 348 new km of road in Nicaragua. Meanwhile, the Road Maintenance Fund (FOMAV for *Fondo de Mantenimiento Vial*), the autonomous entity of the State to autonomously manage state resources that are destined solely and exclusively to the maintenance activities of the road network,[7] is allocated C$1,393.6 million ($39.40 million USD) for 2021. The budget line items are not further detailed in the corresponding budgets.

[2] MOPT Presupuesto 2021
[3] Presupuesto General de Ingresos y Egresos de la Republica, Ejercicio Fiscal 2021, Plan de Inversion Publica, p.28 & 31.
[4] Average rate for July 2021: HNL 1= USD 0.042311763
[5] http://www.snip.gob.ni/Portada/PipAnual
[6] Average rate for July 2021: NIO 1= USD 0.028701697
[7] https://www.dgi.gob.ni/FAQ/index.html?imp__especial_p_financiamiento.htm

Costa Rica

The 2021 Public Budget for Ministry of Public Works and Transport within the amount of 444,148,000,000 CRC (USD 724.33 million) or 3.9 % of total national budget is mostly spent for National Highway Council (CONAVI: *Consejo Nacional de Vialidad*), road infrastructure attention, and land transportation.[8] Table 5.2.4 below shows summary of expenses by activity for National Highway Council.

Table 5.2.4 Road Construction and Maintenance Budget: Costa Rica

	2021 (CRC)	2021 (USD)[9]
Activity 1: Administration	5,353,096,00	$8,802,064
Activity 2: Road Maintenance	71,361,280,000	$117,338,931
Activity 3: Road Construction	99,905,792,000	$164,274,503
Activity 4: Toll Administration	1,784,032,000	$2,933,473
Total	**₡178,403,200,000**	**$293,347,327**

Source: MOPT

Panama

A dedicated road maintenance fund (FOMAVI for *Fondo de Mantenimiento Vial*) was only created in 2019, with a stated annual budget of $150 million USD[10] for maintaining Panama's road network of 16,000 km of urban highways and 5,000 interurban km. Furthermore, MOP has previously identified 18 road infrastructure projects totaling $450 million USD slated to be built between 2020 and 2022; this was further clarified in the 2021 MOP budget in allocating $440 million USD for the year[11], with a heavy reliance on PPP.

5.2.2 Investment by Private Sector

The following table summarizes the total infrastructure projects funded through public-private partnerships (PPPs) in the region as tracked by the World Bank and IADB; note that this includes various sectors including utilities (electricity, water and sanitation) and tourism/industrial development in addition to road infrastructure.

Table 5.2.5 PPP Projects in Infrastructure since 1990[12] (USD)

	Total PPP Projects	Total Investment in PPP
Guatemala	41	$5,194,000,000
El Salvador	24	$2,841,000,000
Honduras	38	$4,794,000,000
Nicaragua	19	$1,734,000,000
Costa Rica	37	$3,167,000,000
Panamá	35	$7,940,000,000
Total	**194**	**$25,670,000,000**

Source: JST

[8] Presupuestos Públicos 2021, Ministerio De Obras Públicas Y Transportes, p.113
[9] Average rate for July 2021: CRC 1= USD 0.001644294
[10] https://www.panamaamerica.com.pa/economia/mop-pagara-unos-220-millones-contratistas-por-deudas-heredadas-de-juan-carlos-varela
[11] https://ginabuendia.com/mop-y-metro-acaparan-el-48-del-presupuesto-de-inversion-para-2021/
[12] World Bank Group, PPP Knowledge Lab

Guatemala

In the period 1990 – 2020, the PPP in Guatemala is dominated by the electricity sector with a total of 35 projects. Although it is dominated by the electricity sector, the project with the largest value is in the ICT sector, named Telgua in 1988, which was worth US$940 million. With Decree 16-2010, the Congress of the Republic enacted the Law of Alliances for the development of Economic Infrastructure. The specialized institution of the State responsible for ensuring compliance with the Alliance Law and its regulations is the National Agency of Alliances for the Development of Economic Infrastructure (ANDIE), whose current portfolio contains six PPP projects in different phases of development. Altogether, these projects are estimated to have received an initial investment of US$1.51 billion and encompass public building construction, transportation, and road, port, and airport infrastructure. In particular, the Escuintla-Puerto Quetzal Highway project, which will lead to one of the country's major ports, will include highway rehabilitation, administration, operation, and maintenance along a 60 km toll road.

As of early 2021, the Giammattei administration has pledged to reform the PPP law to boost investment. This is due to the Guatemalan decree requiring Congress to approve all PPP projects, and as a result, none of the PPP-funded infrastructure project proposals by ANADIE has moved forward since 2010. The law regulates PPPs for the manufacture, construction, development, use, utilization, maintenance, modernization, and expansion of infrastructure, roads, highways, ports, airports, power generation projects, transmission, and commercialization of electricity and railways, including provision of equipment and provision of related and free services. Municipalities can also use this regulatory framework to engage in PPPs with authorization from Congress.

El Salvador

The Public-Private Partnerships Special Law was passed by the Legislative Assembly in 2013, amended in 2014, and its regulations approved and published in 2015. After another amendment in 2017, the law allows PPPs in the health, education, public safety and water sectors, which were previously prohibited. Its secondary laws and regulations establish two institutions related to PPPs: namely, the Agency for the Promotion of Exports and Investments of El Salvador (PROESA), a government agency tasked with promoting and drafting PPPs; and a technical oversight body for PPP projects called the Audit Office for Public Private Partnerships (OFAPP), which oversees PPPs in sectors without sector-specific regulators.

The country's first PPP project was awarded in October 2020 (the San Óscar Arnulfo Romero y Galdámez international airport cargo terminal), and according to the investment and exports promotion agency PROESA, El Salvador has 14 PPP projects in the pipeline covering various sectors, including road, logistics, health and education. However, during an international webinar in November 2020, Canada's ambassador to El Salvador, Carolina Guay, and other officials said the country's portfolio was made up of 17 projects worth US$545 million. The administration of President Nayib Bukele is betting on PPPs to fill the estimated $7.5 billion infrastructure gap in the country. The second PPP project is expected to be for the installation of lighting and video surveillance equipment on 140 km of highways in the metropolitan area of the capital San Salvador, estimated to cost $14 million. A larger PPP road project is a $1 billion highway to connect San Salvador's Masferrer and Apopa districts, for which the feasibility study is scheduled to be completed by the end of 2021.

Honduras

In 2010, Honduras approved the Law for the Promotion of PPPs that establishes the conditions under which PPPs can be developed in the country, empowering the Commission for the Promotion of the Public-Private Partnership (COALIANZA) to structure a broad range of projects through PPPs. Since 2010, COALIANZA has been in charge of PPP project development, while the Public-Private Partnership Supervisory (SAPP) oversees compliance with PPP laws and contractual obligations. An important characteristic of the Honduran PPP model is the structuring of projects and the development of pre-feasibility studies through agreements between COALIANZA and trusts managed by private banks.

The framework has been effective in that 23 PPP projects have been implemented, valued at approx. US$3.1 billion. These include two port terminals (Terminal de Contenedores y Carga and Terminal de Graneles

Sólidos) and four highways (Corredor Logísitico, Corredor Turístico, Corredor Lenca and Siglo XXI). In 2017, Honduras led the region with PPP investments, representing 2 percent of GDP. However, the country does not have a standardized approach to conduct value-for-money analysis to evaluate the suitability of PPP operations, which has resulted in questions about transparency in the bidding processes.

According to various media outlets including La Prensa and Bnamericas as of April 2021, INVEST-H is set to lose control over the road infrastructure fund over a COVID-funding corruption scandal, with a works executive unit to be formed and controlled by a bank. The bank will evaluate, design, contract and supervise projects, but details have yet to be made public as of this writing. About L12,000 million ($495 million USD) will be transferred from INVEST-H to a new account.

Nicaragua

Nicaragua's PPP law was enacted in 2016 to improve the investment environment, when the central government also presented a list of projects prioritized for investment worth US$5.2 billion, the Development Policies and Projects for Fostering Investment 2017-2021, with the majority of the listed projects related to the infrastructure, transport and water sectors. The project listed first in order of importance/priority was the Costanera del Pacífico road project. This strategy was presented to local and international investors, foreign governments, as well as financial institutions in order to secure economic and political support, according to press reports. However, the strategy document contains neither additional details nor the expected economic and employment impact of those projects' execution.

In 2017, the regulation of the PPP law was approved. This legal framework establishes that the Ministry of Finance, through the Department of Public Investment, oversees the implementation of the law, while the Agency for the Promotion of Investments and Exports (PRONicaragua) is responsible for facilitating the coordination of institutions and alliances among the public and private sectors, civil society and academia. . The objective of the PPP legal framework is to regulate private sector participation in the formulation, contracting, financing, implementation, operation and finalization of PPP projects. The government has also developed a series of manuals and guidelines to facilitate the application and selection process for PPP projects. To date, three PPP projects have reached financial closure, with a total PPP investment of US$130 million.

In 2019, the Ortega administration presented an $11 billion portfolio with 128 projects and programs to boost investment through 2021, using diverse financial instruments and divided into i) ongoing projects, ii) projects with confirmed financing, and iii) projects open to financing. In April 2020, transport minister Oscar Mojica boldly claimed that "We are the only country, probably in Latin America, that has not stopped a single project due to the effects of COVID-19," adding that the highway projects are vital to fighting the crisis and connect municipalities.

Costa Rica

Costa Rica has a downward trend in already low levels of public spending on transport infrastructure, which fell from 1.5% of GDP in 2008 to 0.95% in 2017, resulting in substandard quality of roads, rail and ports. This is due to a long history of general resistance to concessions, particularly in road projects, as well as a complex legal and institutional framework. In late 2018, the government launched the four-year National Development and Public Investment Plan 2019-2022, which includes $4.6 billion in infrastructure investment.

The General Law of Concession of Public Works with Public Services is the main concession law in the country. However, since its passage and changes, few projects have been materialized. The Government of Costa Rica issued the Statute for Public-Private Partnership Contracts in 2016 (Decision No. 39965), the first regulation to specifically address PPPs. Moreover, at the start of 2018, the Executive Decree "Regulations for Development, Promotion and Management of Public-Private Partnerships for Development in the Public Sector" was signed with the objective of supplementing the existing framework applicable to the public sector to facilitate the development, promotion and management of PPPs and their proper formalization.

PPP experience in the road infrastructure sector has been limited to the concession of the San José-Caldera

(Route 27) toll road. The agreement is between Costa Rica's National Concessions Council (*Consejo Nacional de Concesiones*) and private concessionaire Globalvía for the design, planning, financing, construction, expansion, repair, maintenance and conservation of the toll road for a maximum duration of 25 years, renewable for another 25 years, and with an optional Guaranteed Minimum Income (GMI) mechanism for the first 13 years, where Globalvía guarantees certain yearly minimum incomes.

Panama

Between 1990 and 2018 private participation in Infrastructure for Panama totaled 35 projects, and the electricity sector has the most sector with total 22 projects worth $ 4.3 billion. The other sector of PPP project are information and communications technology with total two projects worth $1.66 billion, five port infrastructure projects worth $1.37 billion, one railway project worth $75 million, two road projects worth $507 million, and three water and sanitation projects worth $25 million. The Panamanian government will kick off construction works on at least three transportation projects in 2020 with an estimated investment of USD 2 billion for the public transport sector, such as the $360 million road development of La Costanera Highway, the $1 billion rehabilitation of Pan-American Highway, and the development of San Miguelito Metrocable.

Panama does not yet have a specific legal framework for promotion of PPPs, although the government is working on a new PPP law. However, PPP is considered a modality in public procurement and is regulated by many sector-specific laws. In addition, Panama uses public procurement laws to incorporate private capital into large infrastructure projects. Panama has proposed the Puebla Panama Plan (PPP1) Multiphase Road Infrastructure Program (PMIV) to Enhance Competitiveness, with IADB support via a US$70 million loan. The overall objective of the program is to sustainably improve land transport freight and passengers in the priority corridors of the Panamanian road network in order to increase competitiveness. In addition, it seeks to promote the sustainability of the road system through the implementation of permanent arrangements for maintenance, and consolidate the process of modernizing the MOP. In addition, the program will include the first major component of rural roads managed by the MOP.

5.3 Existing Conditions of Roads and Bridges

5.3.1 Central American Road Network by Country

Each of the six countries classify their roads by function, into some equivalent of primary, secondary, and tertiary per international best practice. According to the World Bank road functional classification:

- Primary roads are those that constitute the higher network and that are located outside an urban area. These roads link the national capital to major provincial cities, or to agglomerations playing a major economic or social role, or to crucial agglomerations in the transportation system to terminals, such as ports. This level also includes major roads to neighboring countries.
- Secondary roads are collector segments to primary roads. They can be constituted by regional roads or by classified rural roads. These roads connect to major department cities, or to cities playing a relevant economic, social or tourist role. The mobility level is lower than a primary road since these roads are designed for lower speed and shorter distances.
- Tertiary roads are local or rural segments with low traffic. Their construction requires lower design standards, since they are used to connect residential areas to commercial zones and to upper road levels.

Table 5.3.1 below shows the total length of each country's road network for which data was readily available. Based on this, there are approx. 148,176.5 km of road throughout the region, with 11.5% being designated and designed as primary expressways and highways. Of particular note is Costa Rica having the most developed road network with nearly 48,000 km, or almost a third of the region's total, despite having the 2nd lowest population out of the six countries.

Table 5.3.1 Road Network Length, By Country and Classification (km)

	Primary		Secondary		Tertiary and Other		Total
Guatemala	7,021.9	19.9%	6,665.9	18.9%	21,587.1	61.2%	**35,274.90**
El Salvador	1,588.2	13.1%	713.3	5.9%	9,798.7	81.0%	**12,100.20**
Honduras	3,391.0	19.6%	2,953.8	17.1%	10,931.8	63.3%	**17,276.60**
Nicaragua	2,371.8	9.4%	4,037.7	16.0%	18,787.5	74.6%	**25,197.00**
Costa Rica	1,813.9	3.8%	2,577.3	5.4%	43,517.9	90.8%	**47,909.10**
Panamá	851.3	8,2%	3,705.4	35.6%	5,862.0	56.3%	**10,418.70**
Total	**17,038.10**	**11.5%**	**20,653.40**	**13.9%**	**110,485.00**	**74.6%**	**148,176.50**

Source: JST with data from each country



The primary road network in particular must safely accommodate existing and anticipated freight traffic demand. The United Nations' Global SDG Database compiles data relevant to various indicators for each of the 17 SDGs; most relevant to this section is Goal 9 (Industry, Innovation and Infrastructure) / Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all / Indicator 9.1.2: Passenger and Freight Volumes. Table 5.3.2 below summarizes the freight volume by road in Central America as reported in the Global SDG Database, for the last two years for which data is available, which the JST notes does not include the impacts from the COVID pandemic. However, it is still worth noting that all countries in the region except Nicaragua experienced an increase in freight volume by road, with the region as a whole having an increase of such traffic by almost 20% from 2018 to 2019.

Table 5.3.2 Freight Volume by Road (million ton-kilometers)

	2018	2019	Change
Guatemala	7,499	**9,463**	**+26.2%**
El Salvador	3,443	**3,818**	**+10.9%**
Honduras	4,399	**4,716**	**_+7.2%**
Nicaragua	3,509	**3,118**	**-11.1%**
Costa Rica	7,780	**9,793**	**+25.9%**
Panamá	7,371	**9,565**	**+29.8%**
Total	34,001	**40,473**	**_+19.0%**

Source: United Nations Global SDG Database



There is also the human safety component of accommodating freight traffic demand: another relevant indicator from the Global SDG Database is Goal 3 (Good Health and Well-Being) / Target 3.6: Halve the number of global deaths and injuries from road traffic accidents / Indicator 3.6.1: Death Rate Due to Road Traffic Injuries. Table 5.3.3 below summarizes the freight volume by road in Central America as reported in the Global SDG Database, for the last two years for which data is available, which the JST notes the four year gap. While Costa Rica experienced a commendable 10% decrease from 2015 to 2019, Guatemala's 63.6% increase may be cause for alarm necessitating significant investment in road safety projects. While El Salvador remained essentially the same over the four years, it maintained a concerning rate of over 20 road traffic deaths per 100,000 inhabitants.

Table 5.3.3 Death Rate Due to Road Traffic Injuries (per 100,000 population)

	2015	2019	Change
Guatemala	14.0	**22.9**	**63.6%**
El Salvador	20.8	**20.9**	**0.5%**
Honduras	16.0	**16.1**	**0.6%**
Nicaragua	16.1	**16.9**	**5.0%**
Costa Rica	16.5	**14.8**	**-10.3%**
Panamá	14.2	**13.9**	**-2.1%**

Source: United Nations Global SDG Database

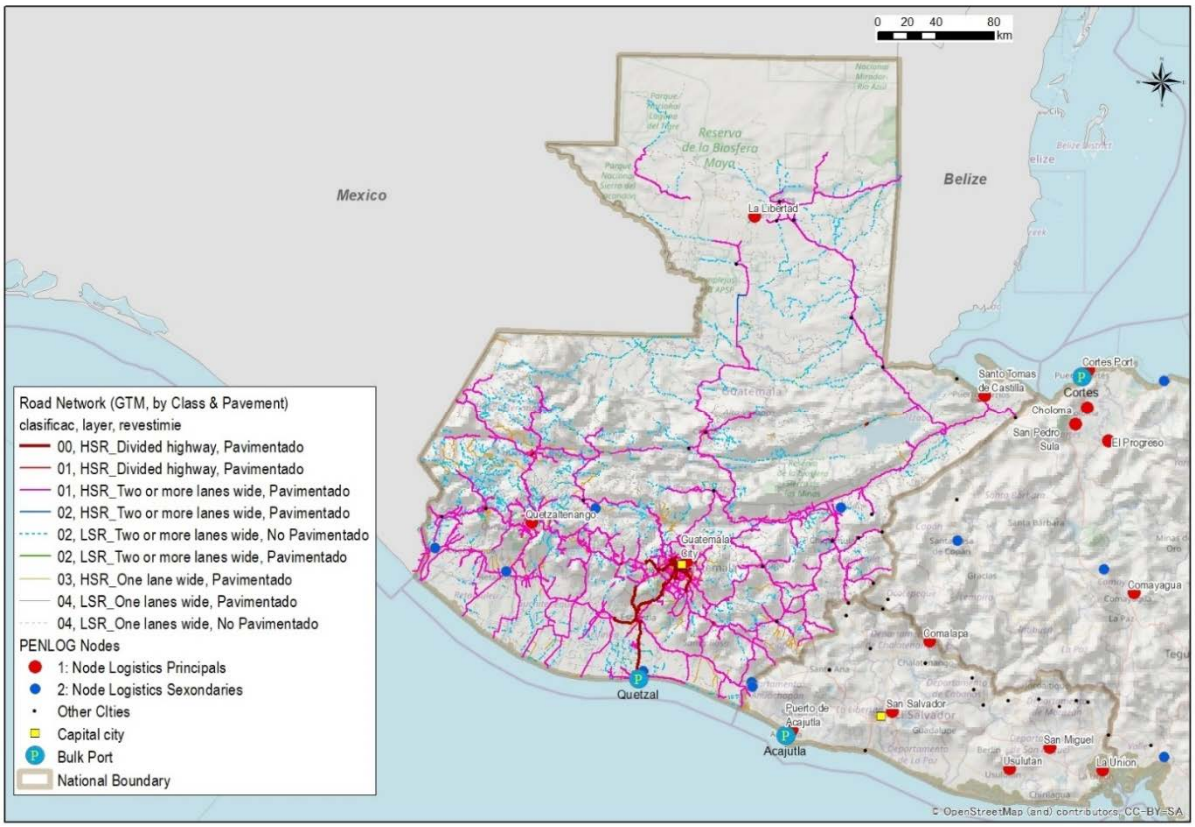
For the following country summaries, please note that the following maps (Figure 5.3.1 to Figure 5.3.6) show the extent of the respective road networks based on the GIS data available and collected, with the colors denoting the road classification and pavement type. The JST will continue evaluating this data to confirm whether the assigned classifications are accurate and applied consistently across all countries, especially the primary roads most significant for freight traffic.

Guatemala

The road network is a logistic corridor on Central America (CA: *Centroamérica*) roads and being developed in-line with following the logistic corridor development plan in the Mesoamerica Project (PM: *Proyecto Mesoamérica*) including neighboring Mexico through cooperation between regions. In particular, the CA-2 road is the main freight corridor to Mexico connecting the Eastern region, where 60-65% of GDP is concentrated. Many of the primary highways, which are mostly CA roads, have 4 lanes, but 2-lane highways still remain and are in the expansion process. As outstanding problems, there are roads with deteriorated pavement and many obsolete bridges.

It is important to develop detours to prevent trucks from entering Guatemala City and there is a plan to build Metropolitan Ring through public-private partnership (PPP) to finance it. However, it was claimed that construction would be difficult, and construction of a partial outer road that connects CA-9N and CA-1E will be promoted by ANADIE and converted to a toll road. In other local cities, the urban area spreads along the main road and the traffic volume increases. However, in some cities, it is impossible to widen the

roads. Some cities such as Santa Lucia Cotzumalguapa, Siquinala (CA-2) and Chimaltenango (CA-1) have developed alternative roads, while the problem remains in other cities.



Source: JST

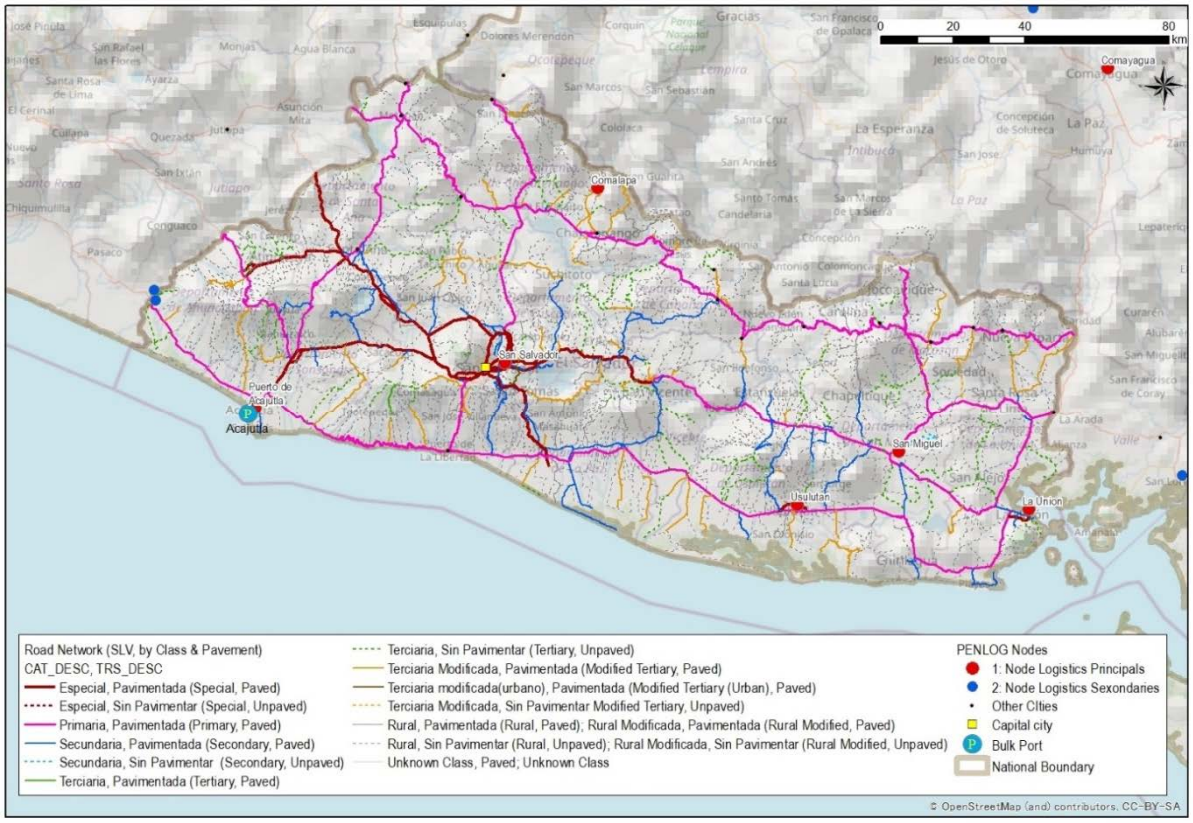
Figure 5.3.1 Road Network by Class and Pavement, Guatemala

El Salvador

The main highways in El Salvador are as follows.

- Route CA-1: Pan-American Highway, which connects San Cristóbal (Guatemala border) and El Amatillo (Honduras border) and bypasses the north of the capital, San Salvador.
- Route CA-2: A corridor along the Pacific Ocean that connects La Hachadura (Guatemala border) and La Unión Port (it will join with CA-1). Road improvements to the La Hachadura border are ongoing.
- Route CA-3: A parallel corridor to the north of CA-1 that connects Metapán and Anamorós (it will join with CA1). Although it is positioned as CA3 in El Salvador, it is treated as a branch line in the Mesoamerican Project (PM). The development of this route has not been included in the short- to long-term projects and the neighboring countries have not started anything yet, but it is expected that there is potential in the future (no funds yet).
- Route CA-4: It connects El Poy (Honduras border) - El Salvador - La Libertad port from north to south.
- Route CA-8: It connects east to west between Valle Nuevo (Guatemala border) - San Salvador (Classified as special).
- Route CA-12: It connects north to south Anguiatú (Guatemala border) – Metapán - Santa Ana (El Salvador's second largest city) – Acajutla Port.

Currently, there are no toll roads and bridges in El Salvador. Many transit vehicles such as trucks come from neighboring countries by using roads and they damage them. However, they are not involved in paying for the repair because they do not buy gasoline in El Salvador since gasoline's price in El Salvador is relatively high compared to neighboring countries. Thus, it is necessary to increase financial resources (gasoline tax) for sustainable road maintenance; however, it is actually difficult to achieve.



Source: JST

Figure 5.3.2 Road Network by Class and Pavement, El Salvador

Honduras

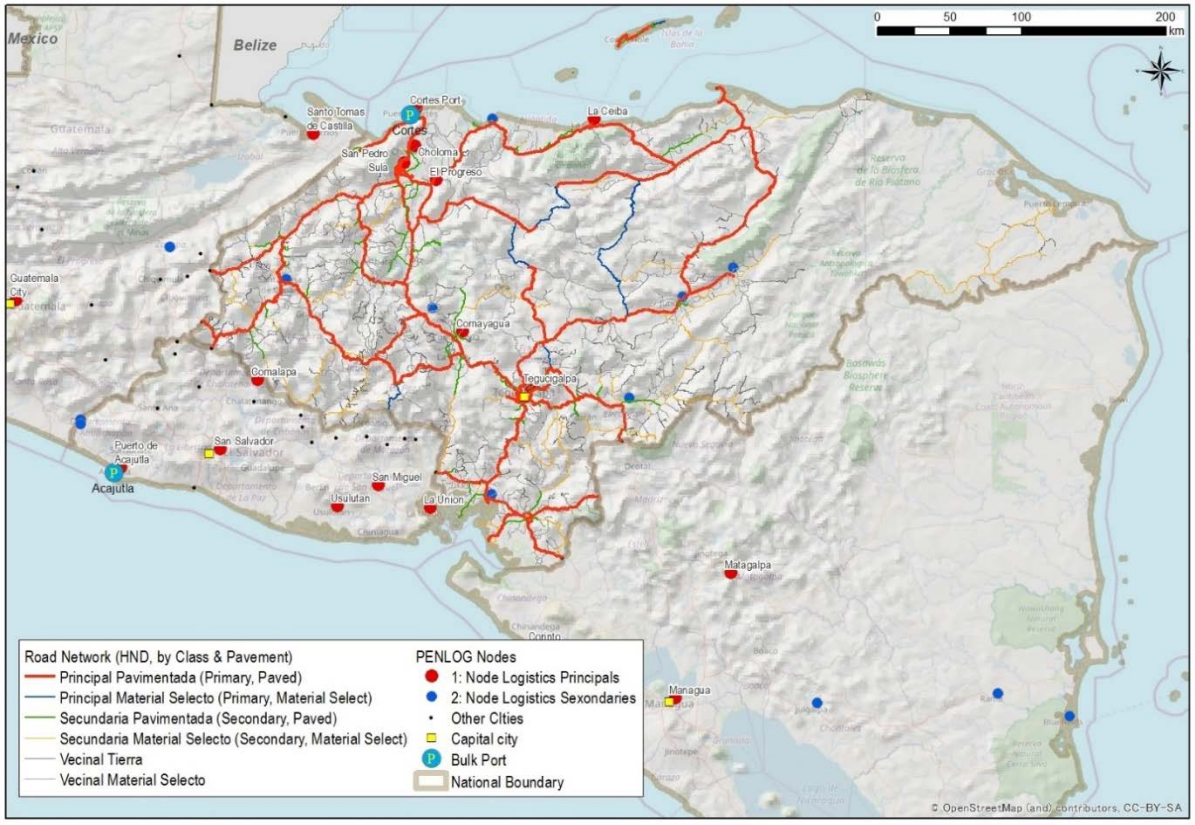
CA-5, which is considered to be the most important trunk line connecting Tegucigalpa (the capital city of the country), San Pedro Sula and Cortes Port as an important port on the Atlantic side, are in good condition. On the CA-5N road, the sections between Comayagua (KM 40) - Santa Cruz de Yojoa (KM 120) (operated by the private company COVI) and between Villanueva - Puerto Cortés (operated by the municipality) are toll roads with four lanes. The toll roads in Honduras are managed under a system whereby the concession is supervised by an independent organization namely the Public-Private Association (APP), which reports to INSEP. The Choluteca - Tegucigalpa section, although it is in poor condition and full of curves, has an improvement project from CABEI funds (90 million US dollars). Meanwhile, the rest of the CA roads are in good condition. The sections in poor condition are as follows.

- Section to El Espino (Nicaragua border) (66 km) on CA-1. Although there is a study conducted by a local consultant (CONASH), there are no funding for its improvement. The Jícaro Galán - Amatillo section was rehabilitated in 2004.
- Section towards Guasaule (Nicaragua border) on the extension of CA-3 and the section is considered as the Pacific Corridor in the Mesoamerica Project (PM). There is a study done by a local consultant (ACI). The road condition is not as poor as CA-1, but these two sections are considered as the most important sections that require road improvements.

- Section between Agua Caliente – Castilla Port on CA-13E. The PM considers it as a Caribbean Tourist Corridor, but four bridges are in poor condition and located halfway through the Taujica Colon. There is an oil refinery in Castilla Port, so it is also important in the logistic aspect. Currently, there is no particular study and no funding for any improvement.
- The route from San Pedro Sula - Santa Rosa de Copán - Frontera El Poy and Frontera Agua Caliente on CA-4W and CA-10 is about 250 km, and the road is fully in poor condition. (It is used only for transport to Guatemala).
- Tegucigalpa - Danlí section on CA-6. Although it is an important route that leads to Las Manos (Nicaragua border), it has been 30 years without any improvement and there is no funding for that purpose.

According to truck associations, shipping companies, and chambers of commerce, there are total 11 geological faults in the country and many roads are topographically curved. Road conditions are particularly poor from San Pedro Sula through Ocotepeque Department to the El Poy border. Overall, road conditions in Honduras are the worst among the six Central American countries. Among the three borders of Nicaragua, Las Manos (El Paraíso), El Espino and Guasaule, Guasaule is rarely used for freight transport due to poor road conditions on the Honduran side (Las Manos and El Espino together represent 98%). Above all, the route that passes through Las Manos is the preferred one.

Tegucigalpa has something like an outer ring road, the area is always congested due to the urban expansion and is no longer functioning as a bypass. However, in the freight terminal plan, there is a suitable location near the police station near the intersection with CA-5. Meanwhile, San Pedro Sula has a ring road. Since the terrain is flat, it is relatively easy to plan the outer ring road.



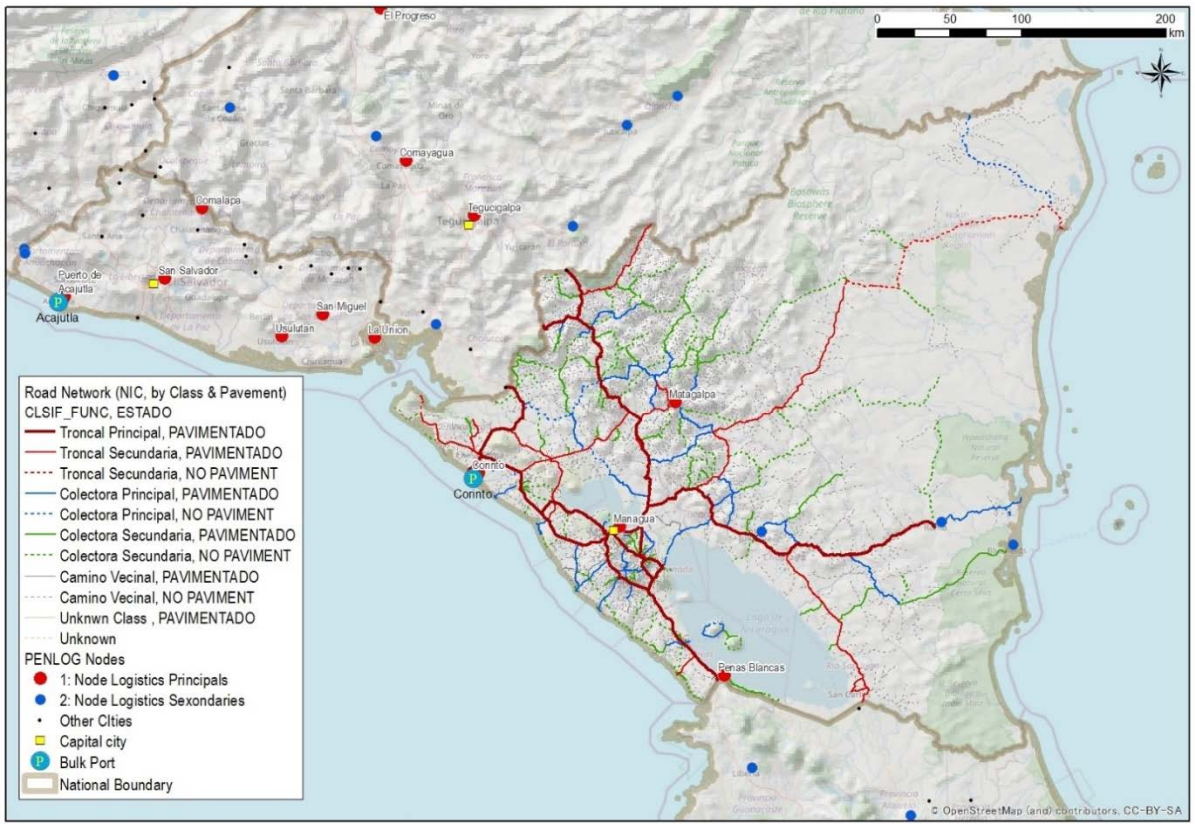
Source: JST

Figure 5.3.3 Road Network by Class and Pavement, Honduras

Nicaragua

The road surface pavement of national roads including CA roads is maintained with asphalt pavement except for part of NIC-12A and NIC-2, which are in good condition and located in the western region. Although there are problems with the network related to road surface and bridge conditions on secondary roads at the department road level, there seems to be no particular problem with the maintenance status at the regional highway level, such as CA and national roads.

According to trucking associations in other countries, road conditions in Nicaragua are good, for example the Pan-American (CA-1). According to the previous JICA survey "Project for the Study of the National Transport Plan in the Republic of Nicaragua," the average travel speed is 60 km/h or more on most of road's network. However, there are some sections where it is impossible to travel at more than 20 km/h due to poor road conditions on the main roads to the Atlantic coast, which are not included in the Central America road network.



Source: JST

Figure 5.3.4 Road Network by Class and Pavement, Nicaragua

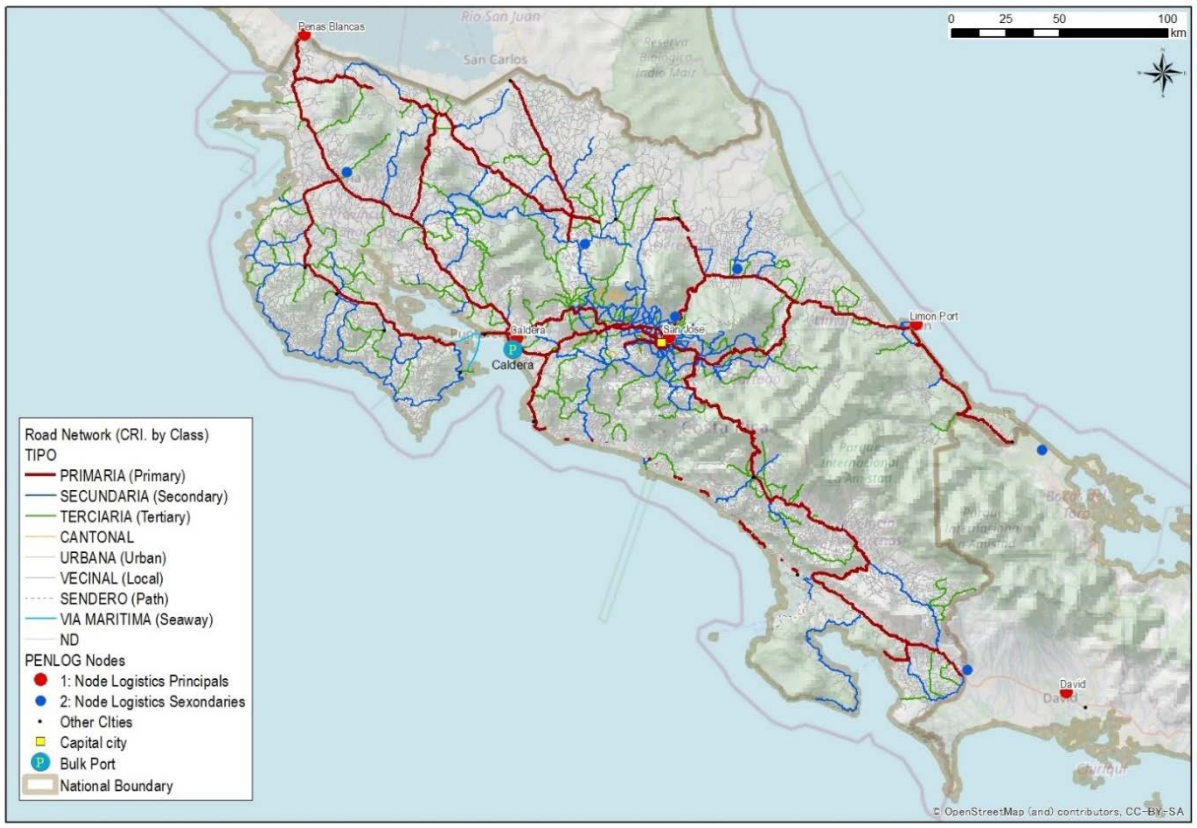
Costa Rica

In Costa Rica, there is only one CA road, namely CA-1, so the CA road itself is not well recognized. In addition, the main highway in only the national highway network. The Mesoamerican international highway network (*Red Internacional de Carreteras Mesoamericanas* (RICAM)) in the Mesoamerica Project (PM) is more common within government including MOPT. The highways as form of RICAM in Costa Rica are National Highways No. 1, No. 2, No. 27, No. 32, and No. 34. The network that connects Limon Port is being developed by planning a route that goes northwest on Route 4 instead of passing through the mountains on Route 32 and passing through the capital San Jose.

As one of several toll roads around the capital city of San José, National Highway No. 27 (Caldera Highway) is a newly built toll highway and is managed under concession of private sector (2010-2035). On

the other hand, National Highways No. 2, No. 32, and No. 1 are operated by CONAVI itself. The San Ramon Road (National Highway No. 1) will have eight lanes and is scheduled to be constructed by a private concession. Chronic traffic congestion in San José has become a problem. The southern half of the outer ring road has been improved, but the construction in the northern section that has been planned since long before has a problem of illegal occupants.

According to Costa Rica truck transport associations, the condition of roads in Costa is the worst after Honduras among the six Central America countries. The infrastructures have been built between the 1960s and 1970s, many of their standards are old and most of the main roads are narrow with just two-lanes. Floods and landslides often occur during the rainy season, disrupting roads.



Source: JST

Figure 5.3.5 Road Network by Class, Costa Rica

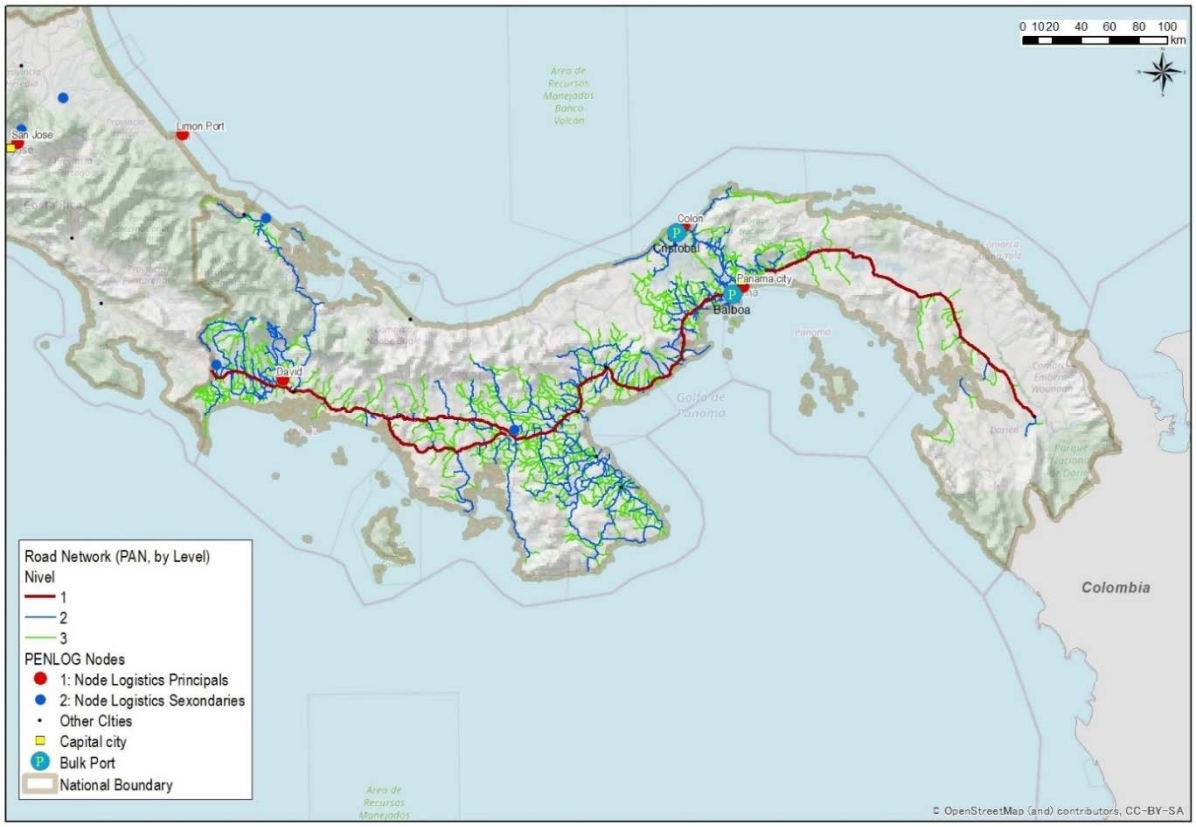
Panama

Panama is a geographically very elongated country from east to west, with three parallel corridors: namely, the Pan-American Highway Corridor, the Atlantic Corridor and the Coastal Corridor (Pacific). Among these corridors, the Pan-American Highway Corridor is recognized as the most important from the viewpoint of international mobility, but it was not until 2012 that Panama joined SIECA. The level of recognition of CA highways is low (there is only one route in the country) and there are only two routes in the RICAM road network. Therefore, the level of awareness about this international transport network is low.

According to Panama Truck Transport Association, there are two bridges that cross the Panama Canal: namely, Las Américas Bridge and Centenario Bridge. The Las Américas bridge is deteriorated and since 2004 it is not passable for trucks of more than 10 tons. In addition, the access road (Gaillard Highway) to the Centennial Bridge is in poor condition, and the distance between the railway and the intersection is not sufficient. As for the Pan-American Highway, which is also CA1 highway, though it has four lanes up to Santiago de Veraguas, the traffic is not smooth because it has to go through cities such as Chorrera, Santiago,

Chiriqui, and David. In addition, since the section from Chorrera to Santa Clara is in a tourist area, vehicles get caught up in the weekend traffic congestion.

Since the freight vehicle weight regulation has not been fully enforced, roads are often damaged, resulting in speed reduction.



Source: JST

Figure 5.3.6 Road Network by Class, Panama

5.3.2 Road Surface Conditions in Central American Road Network

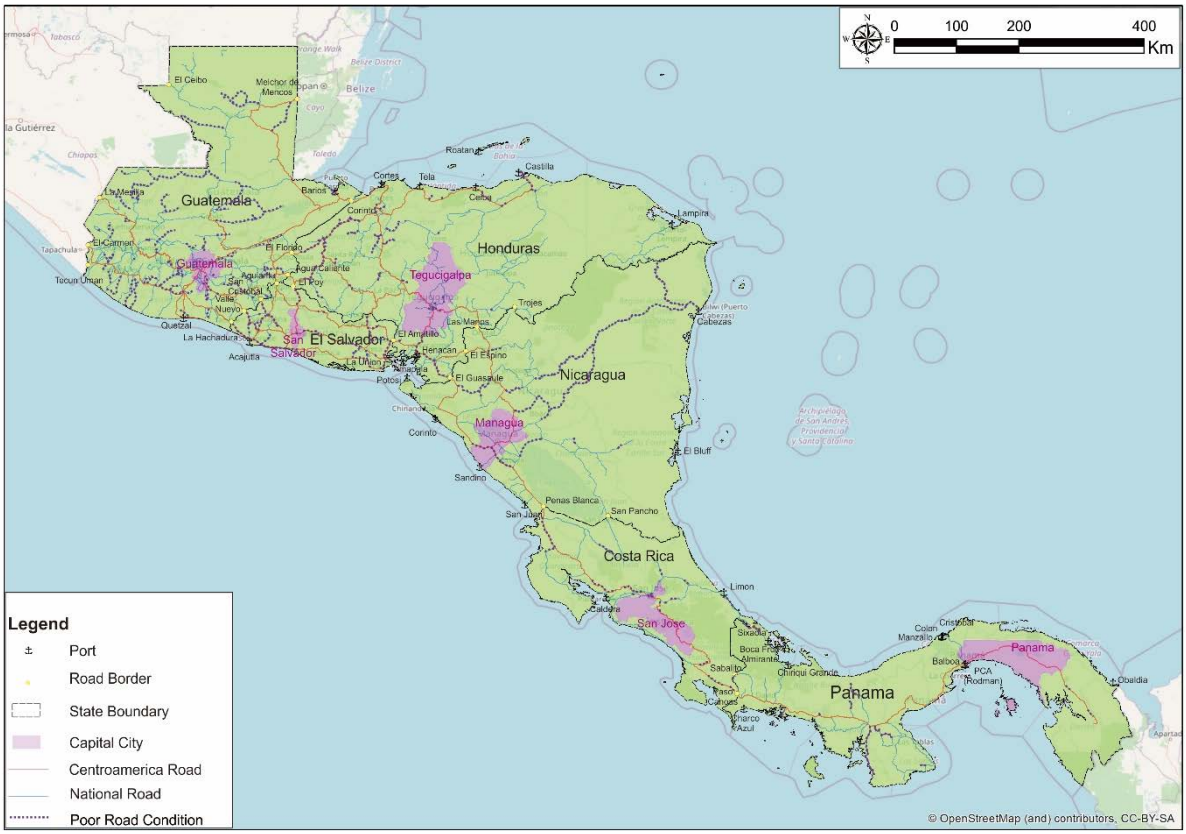
Unlike the road inventory data such as road dimensions and the number of lanes, road conditions data vary over time and are subject to change as there should be road repair works upon necessity as well as regular road maintenance works. Thus, it is important to update the road conditions to ensure smooth flow of cars and trucks. As shown in Table 5.3.4, the Study Team has collected various sources to evaluate the surface condition of the road network that consists of Central American roads and national roads. Based on those latest available data, the poor road surface sections on the Central American roads and the national roads are presented in Figure 5.3.7.

Table 5.3.4 Source Data to Evaluate the Road Surface Conditions

Country	File Name	Title of the Data
Guatemala	EST_COND_RED_VIAL_2016.ppt	SITUACIÓN DE LAS CARRETERAS EN GUATEMALA MINISTERIO DE COMUNICACIONES, INFRAESTRUCTURA Y VIVIENDA –CIV – DIRECCIÓN GENERAL DE CAMINOS –DGC – ABRIL2016

Country	File Name	Title of the Data
El Salvador	Estado Condición Centroamericanas_RutasNacionales_ polyline.shp	SIGESVIES (Sistema de Gestión Vial de El Salvador)
Honduras	Estado RV por IRI v2.pdf	ESTADO DE LA RED VIAL PAVIMENTADA SEGUN RUGOSIDADES 2015
Nicaragua	ITR2 Chap8.3 Road Sector RK063 EG V20131029.doc	The Project for the Study of National Transport Plan in the Republic of Nicaragua, Interim Report No 2 Japan International Cooperation Agency (JICA)
Costa Rica	01 RVN_0316.xlsx Red_Vial_Nacional_2016_09_UV.shp	MINISTERIO DE OBRAS PÚBLICAS Y TRANSPORTES DIRECCIÓN DE PLANIFICACIÓN SECTORIAL MEDIOS DE TRANSPORTES RED VIAL NACIONAL POR RUTA Y CONDICIÓN RUTAS DE TRAVESÍA
Panama	006 INF RED VIAL INTERURB ENERO 2016 ABRIL 06 2016 FINAL FINAL.xlsx	MINISTERIO DE OBRAS PÚBLICAS DIRECCIÓN NACIONAL DE MANTENIMIENTO RED VIAL NACIONAL INTER URBANA POR DISTRITO ENERO 2016

Source: JST based on each country organization



Source: JST with data from the above table

Figure 5.3.7 Identified Sections of Poor Surface Conditions on Central American/National Roads

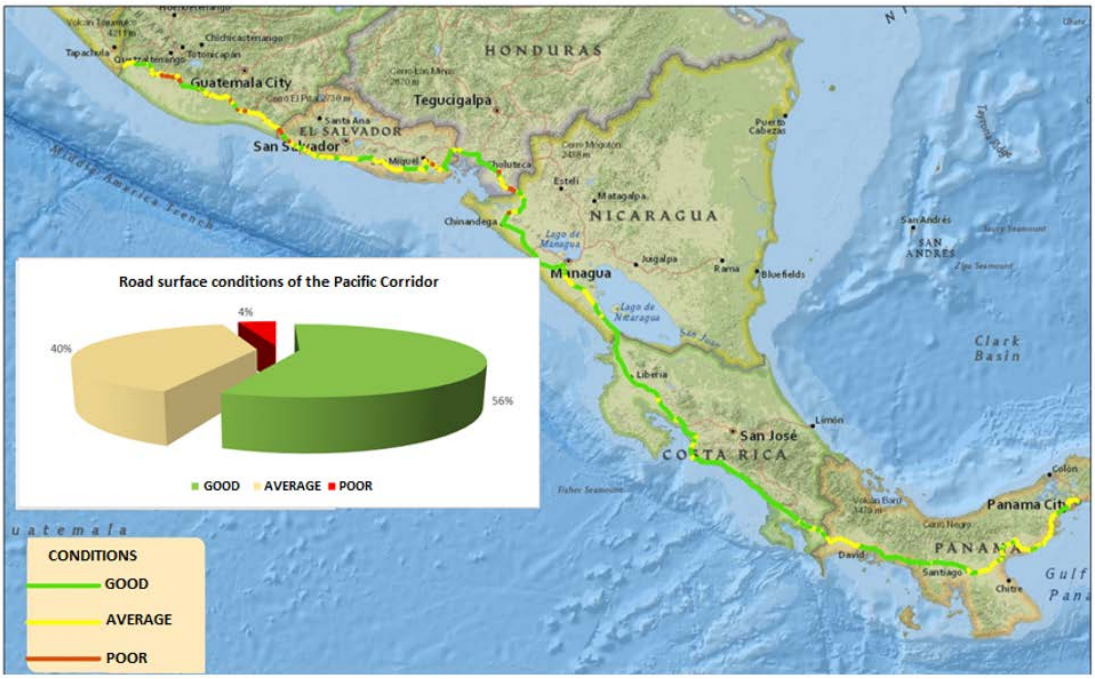
5.3.3 Road Surface Conditions in Central American Road Network: Pacific Corridor

The IADB's "Study of the Mesoamerican Integration Corridor" further details road surface conditions along the Pacific Corridor/Pan-American Highway through georeferenced video capture.



Source: IDB

Figure 5.3.8 Georeferenced Video Capture Example in Pacific Corridor



Source: JST with data from each country

Figure 5.3.9 Road Surface Conditions of the Pacific Corridor

5.4 On-going and Planned Projects

For the road and bridge sector, the JICA Study Team has listed a total of 270 projects from the PENLOG and other development plans of the six Central American countries, and sorted them out by major source of funding. While over half of the projects have no clear source of funding yet, there are significant number of projects funded through PPP or the national budget. In terms of the international donors, the majority are IADB, CABEI, and Fomilenio II (i.e., the U.S.).

Table 5.4.1 Number of Road and Bridge Projects by Funding Source

Country	Total Projects	PPP	IADB	CABEI	Fomilenio II	JICA	BNDES	Other Donors	National Fund	TBD/ Unknown
Guatemala	26	4	1	3	0	1	1	5	5	2
El Salvador	56	0	3	1	8	0	0	5	3	37
Honduras	52	8	4	12	0	6	4	6	3	20
Nicaragua	84	0	2	1	0	0	0	10	12	63
Costa Rica	45	1	10	1	0	0	0	5	0	23
Panama	7	0	0	0	0	0	0	1	6	0
Total	**270**	**13**	**20**	**18**	**8**	**7**	**5**	**32**	**29**	**145**

Source: Prepared by the JICA Study Team based on the information from PENLOG and other road development plans.

Guatemala

The following highways projects are underway, yet private investment is being sought after to complete, through PPP agency ANADIE.

- Escuintla-Quetzal port highway

  The project requires an estimated 600 million quetzals, and involves constructing a four-lane highway to connect Champerico port in Retalhuleu department with Quetzal port located further down in Escuintla department. The 100 km highway would run along the southwest coast of Guatemala, reducing travel time between the ports by more than half. Communications, Infrastructure and Housing (CIV) Minister Josué Lemus Cifuentes told Congress in October 2020 that the project would boost tourism and development along the route with the reactivation of both ports and the Escuintla cargo airport – the first of its kind in Central America – that President Giammattei pledged to open in 2020. In 2019, Congress rejected an US$80 million proposal to build the same project, arguing it would affect the country's economy. Following the rejection, an appeal was filed against Congress but a constitutional court rejected it, according to BNamericas.

- Nor-Oriente expressway

  Needing 112 million quetzales, the government plans to begin construction of the 30 km urban highway that would reduce travel time between the northern and southern areas of Guatemala City by half, and link the Atlantic route in the north and the El Salvador route in the south. However, the project's total cost has been estimated before at more than US$200 million, even as high as US$300 million, and it is possible that the government will make another attempt to carry out the project with help from the private sector. Past proposals have included a 25-year contract to build, operate and maintain the highway.

- Second Belize bridge

  CIV is also requesting 190 million quetzales to build a second bridge linking its eastern neighbor. However, the project's cost could double to 380 million quetzals, based on a previous study.

- C-50 beltway widening

  The project requires almost 1.6 billion quetzales to widen the southern segment of the capital's beltway to four lanes. The CIV minister said the works would help connect Sanarate with Sansare, Jalapa,

Mataquescuintla and Escuintla, in addition to alleviating congestion in Guatemala City.

El Salvador

In El Salvador's 2018 budget, public investment totaled $1.1 billion, with $163 million set aside for the construction and maintenance of roads and highways, $118 million for the electricity sector, $110 million for ports and airports, and $80 million for water and sanitation. These include the project of a highway connection to the port of La Libertad, the repair of the El Amatillo border crossing, and the renovation and upgrading of the Monseñor scar Arnulfo Romero International Airport. MOPT has currently 37 road projects, of which economic analysis is studied at present.

Honduras

On January 2020, INVEST-H presented the president and other government ministries with the infrastructure projects that the agency planned to carry out in 2020-21, of which US$1.7 billion (73.7% of the $2.3 billion total budgeted amount) would go to highway projects: six road corridors that will require about 3,500 km of new roadway to be built and the rehabilitation of around 1,500 km of existing highways. These projects included:

- widening the 5.5 km logistics highway corridor in San Pedro Sula;
- the 137 km Pacific highway corridor that crosses over six municipalities and links to Nicaragua and El Salvador;
- the eastern highway corridor in El Paraíso;
- the 123 km tourism highway corridor that connects the northern departments of Yoro, Cortés and Atlántida; and
- the 138 km western highway corridor that links to Guatemala on which significant progress was made last year.

INVEST-H also earmarked funds for the road heritage program, which focuses on paving works for municipalities and other unpaved highways. Funding would come from a mix of federal and international funds.: the national government covered 45% of the agency's 2020-21 infrastructure plan, 18% comes from the Central American Bank for Economic Integration (BCIE/CABEI) and BAC trust, 16.2% from the World Bank, 13.4% from the Inter-American Development Bank (IADB) and the remainder from the United States Agency for International Development (USAID).

Some of the highway projects including the tourist corridor were previously under the purview of PPP investment promoter Coalianza, which was dissolved in 2019 by the federal government due to the uncertainty that the agency created among investors. As previously explained, INVEST-H may soon face a similar fate due to a COVID funding scandal; what will happen with the projects in the 2020-21 infrastructure plan remains uncertain as of this writing.

Nicaragua

Since 2016, the government has executed a budget of $1.4 billion for public investment projects, $477.8 million for electricity, $461.3 million for transportation, $198.7 million for water and sanitation, and $157 million for telecommunications. In addition, major road infrastructure projects including the construction of the road from Muy Muy to Matiguas to Rio Blanco, the road from Pantasma to Wiwili and the road from La Esperanza to Wapi, and the planned Costanera road construction are also budgeted.

Road infrastructure strategy includes 4590 kilometers of paved road projects in 2019, showing a significant increase compared to only 2544 kilometers represented in 2016. The Bluefields Port Highway is funded 70% by the IADB.

Regarding the development of roads to the border crossings, there is an expansion plan from two to four lanes in Peñas Blancas. In Guasaule – Las Manos, there is a four-lane expansion; however due to some difficulties, it is going to be expanded to three lanes only. At the Santa Fe Bridge near Tabillas, there was a

Japanese ODA project. The Nadaine – Rivas expansion has been finished from two to four lanes. The section of Managua – South West will be widened from two to four lanes as part of the Managua Bypass Ring project. The Pacific littoral development of Naranjo – Costa Rica Border is under study.

Costa Rica

Costa Rica's PNLog is a long term planning project during the period 2014-2024 that involves the public and private sectors. The country is currently involved in the Project Mesoamerica, to improve internal and external connectivity of the region's economies. Thus, they plan to expand all the RICAM network roads to four lanes.

The Logistics National System (LNS) mobilizes cargo and commodities from and to the productive sectors of the country with geographical and functional distribution patterns. The LNS aims to offer a robust logistics system, that is, road infrastructure that offers capacity, quality, connectivity, and segregated movement. Within the LNS, CA1 Road, in the section of San José Arraigan Road, IADB has a contribution of 9% in the border integration project.

There are ongoing projects in the sections of Tablillas – Muelle, San Carlos – Tablillas, and some others in the national roads. Furthermore, there is currently a project from IADB and MOPT about borders, that is, a Border Integration Program for Costa Rica and Panamá at La Julieta border crossing. There is a 40 km section of La Julieta under concession. However, Costa Rica is not expanding the road network, but they prioritize to work on improvement of the existing road pavement condition.

Panama

There is no primary plan for road planning in Panama; instead, there is a five-year plan, which allocates investments to hundreds of road projects. The last five-year plan corresponds to the period 2016 to 2020, to be renewed or updated every 5 years, regardless of the presidential mandates.

There are rehabilitation projects for the Chorrera trench, Colón-Panama, and Chiriquí-Camila on the Pan-American Highway since there was no proper care of the traffic or situation. There is an expansion project in the section of Santiago – David – Paso Canoa from two to four lanes. There is also a four-lane expansion project for the Pan-American Highway, of which 12 kilometers will be expanded to six lanes.

The IDB, CAF and the Ministry of Economy are in the process of allocating funds for the Atlantic corridor development of Miguel de la Borda, which has not been implemented yet. There is also a binational project under construction which will become the main consortium for four bridges: MECO, Sixaola, Colón and Las Américas, which also needs to be repaired.

5.5 Issues and Recommendations on Highway Sector

5.5.1 Situation of Central American Road Network

The CA (Central America) road network that is agreed by SIECA may have different focuses based on the socioeconomic and topographic conditions of each country as well as location of main ports, as shown in the map presented in the earlier section and in Table 5.3.1. It is clearly shown that the northern countries (Guatemala, El Salvador, and Honduras) have the densest CA road network. In addition, most CA roads are consistent with the Mesoamerican International Road Network (RICAM), as established by the Mesoamerican Project (PM: Proyecto Mesoamerica) consisting of the six Central America countries as well as Mexico, Colombia, Belize, and the Dominican Republic. However, there are some RICAM roads that are not included in CA Road Network, especially in Nicaragua, Costa Rica, and Panama. Those should be added as part of Pacific, Atlantic, and Interocean Corridors, since the regional imbalance in the road network may be alleviated to some extent.

The JST has noted that the PENLOGs identify the following current issues:

Guatemala

- About half (50%) of the country's road network is unpaved.
- Main corridor: Puerto Barrios and Santo Tomas de Castilla - Puerto Quetzal, Pacific corridor.
- Secondary corridor: Belize – Paten- Puerto Barios.
- Low road density in the northwest area.
- Congestion in the Guatemala City metropolitan area.

El Salvador

- Approx. 44% of the road network is unpaved.
- Lack of complementary corridor between Coastal-Marine Strip and Northern Zone limits accessibility to agricultural areas. Lack of truck-centers offer safety to carriers at night.
- Low quality of access to La Union and borders to the north of the country.
- Roads do not follow weight by axis regulations.
- Time restrictions for urban cargo, and congestion in the San Salvador metropolitan area.

Honduras

- Design and capacity deficiencies: No rest areas, drive assistance and bypass roads.
- Low density of road network and unpaved secondary roads.
- Weaknesses in maintenance management due to budgetary constraints.
- Weaknesses in weights and dimensions control system due to lack of weight stations.
- Network vulnerable to natural disasters, especially during the rainy season.

Nicaragua

- Approx. 13.2% of the road network is unpaved.
- Main corridor: Pacific corridor and Atlantic corridor.
- Low density in the east area.

Costa Rica

- Limited capacity for cargo volumes.
- Road network in poor maintenance conditions (share of paved road in good, average and poor condition was 40%, 40% and 20%, respectively).
- Heavy rains and fog frequently impede traffic flow due to road closures.

Panama

- Primary roads are in good condition, while most of the secondary and tertiary networks are unpaved.
- Panama-Colon Corridor and the access roads to the Panama City that link the national territory with the two crossing borders located in Paso Canoas and Guabito.
- No physical road connection to Colombia.

5.5.2 Identification of Road Improvement Projects

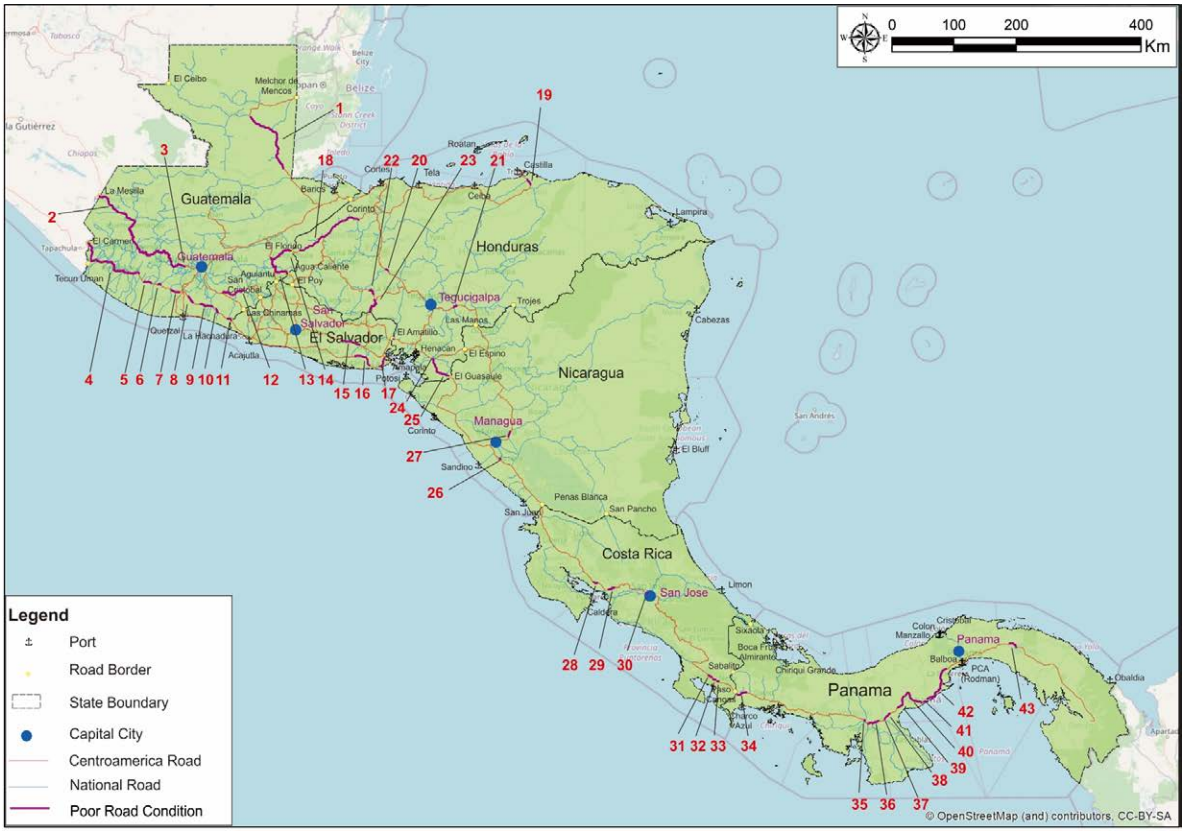
Focusing on the Central American road network, 40 sections of poor surface conditions are identified as proposed road improvement projects that need to be implemented urgently for the Central American road network, as presented in Table 5.5.1and Figure 5.5.1. However, according to the data on road development projects collected by the JST, it is known that 16 out of the total 40 projects have already been implemented or completed. As a result, a total of 14 road improvement projects have finally been recommended for road surface improvement.

Table 5.5.1 List of Proposed Road Improvement Projects on Central American Roads

No.	Road	Section	Length (km)	Country
1	CA-13	Secoyob - Santa Ana	118.02	Guatemala
2	CA-01	Frontera Comalapa - Chimaltenango	285.88	Guatemala
3	CA-01	Chimaltenango, El Tejar - Cerro Cichulin, Sumpango	4.41	Guatemala
4	CA-02	El Carmen - San Antonio Suchitepequez	130.52	Guatemala
5	CA-02	Rio Bravo - Aldea San Fernando Chipo	11.83	Guatemala
6	CA-02	Iglesia Centroamericana Getsemani, Patulul - Rancho fortaleza, Santa Lucía Cotzumalguapa	5.4	Guatemala
7	CA-02	Taller Lubisa, Siquinalá - ENTRADA INGENIO SANTA ANA, Escuintla	14.06	Guatemala
8	CA-02	Brito, Escuintla - Rancho Maria Linda,Taxisco	12.47	Guatemala
9	CA-02	El Jobo, Taxisco - Planta Fotovoltaica Horus Energy, Chiquimulilla	23.58	Guatemala
10	CA-02	Los Cerritos, Chiquimulilla - Pasaco, Jutiapa	5.99	Guatemala
11	CA-02	Ciudad Pedro de Alvarado, Moyuta - Puente La Hachadura	7.27	Guatemala
12	CA-01	Aldea El Molino, San José Acatempa - NUEVA TERMINAL DE BUSES JUTIAPA	42.49	Guatemala
13	CA-10	Centro Ecoturístico La Granja, Chiquimula - Aguas Calientes	59.44	Guatemala
14	CA-11	Aldea Vado Hondo, Chiquimula - El Florido Frontera, Caserio El Florido	41.76	Guatemala
15	CA-01	San Vicente Department - San Lorenzo	29.5	El Salvador
16	CA-02	El Transito - Intipuca	31.1	El Salvador
17	CA-02	Loma Larga - Caserío La Paz	20.1	El Salvador
18	CA-11	Quimistan - El Florido	107	Honduras
19	CA-13	SALA EVANGÉLICA ALDEA LUZ DEL VALLE, TRUJILLO, Aguan - Bridge of Rio Aguan River in CA 13	95.64	Honduras
20	CA-05	pulperia meza, Siguatepeque - TEXACO • Valeriano, Siguatepeque	38.08	Honduras
21	CA-06	EDS YUSCARAN Gas Station, Las Joyas - Intersection between CA - 06 and V-275, Desvio hacia Moroceli	7.11	Honduras
22	CA-11	Cabañas San Miguel, San Pedro - Intersection between CA 11A and C. Vieja Marcala-La Esperanza	15.63	Honduras
23	CA - 07	Parque San Miguel Arcangel City Park, Marcala - Control de Migracion Pasamono, Marcala	38.12	Honduras
24	CA - 01	CHOLUPLAZA, Choluteca - Bonillantas, Choluteca	0.49	Honduras
25	CA - 03	Bridge of Rio Sampile River, Choluteca - Aduana Guasaule, Guasaule	42.37	Honduras
26	CA-01	Diriamba - Jinotepe ring road	15	Nicaragua
27	CA-01	Tipitapa - Punda del Plancha	8.36	Nicaragua
28	CA-01	Guacimal River, Pitahaya, Puntarenas Province - Rancho Grande,Pitahaya, Puntarenas Province	6.82	Costa Rica
29	CA-01	Espíritu Santo, Puntarenas Province - Angostura, Puntarenas Province, Macacona	11.69	Costa Rica

No.	Road	Section	Length (km)	Country
30	CA-01	Best Western Irazu, Jardines Autopista,San José, San José Province - Museum of Costa Rican Art, Mántica, San José,	2.21	Costa Rica
31	CA-01	Escuela La Florida, Provincia de Puntarenas, Piedras Blancas - Escuela km 40, Valle Bonito, Puntarenas Province	6.02	Costa Rica
32	CA-01	Guaycara, Guaria, Puntarenas Province - El Alto, Puntarenas Province	4.11	Costa Rica
33	CA-01	Kilometro 29, Puntarenas Province - Cementario de Rio Claro, Los Angeles, Puntarenas Province	2.72	Costa Rica
34	CA-01	Pan-American Hwy 57-232, Aserrio - Av. Interamericana 2, La Estrella	16.68	Panama
35	CA-01	Via el Ulvito, Pan-American Hwy 63-116, Canto del Llano - IFARHU, Av. Interamericana 40, Santiago	1.76	Panama
36	CA-01	Av. Interamericana, San Antonio, Panama - Conaca, Chupampa, Panama	17.71	Panama
37	CA-01	Ministerio de Ambiente Divisa, Los Canelos - Santa Maria River, Llano, Panama	1.01	Panama
38	CA-01	El Roble, Panama - El Estera, El Cristo, Panama	10.27	Panama
39	CA-01	Nata, Panama - Cocle, Panama	23.24	Panama
40	CA-01	Lago, Cocle, Panama - Cementario de Rio Hato, Panama	36.92	Panama
41	CA-01	Scarlet Martinez Airport, Rio Hato, Panama - Cantera de Arena, Rio Hato, Panama	3.14	Panama
42	CA-01	Las Guias Oriente, Rio Hato, Panama - Autop. Panamá - La Chorrera, La Chorrera, Panama	65.77	Panama
43	CA-01	Ministerio Evangélico El Aposento Alto, Cañita, Chepo, Panama - Puente Sobre El Bayano, Babita de Perro, Panama	14.03	Panama

Source: JST with data from each country



Source: JST with latest data and interviews from each country

Figure 5.5.1 Sections of Poor Surface Conditions on Central American Roads

The total length and ratio of CA roads with poor surface condition are shown in Table 5.5.2 below. Although some roads and countries data were not fully obtained, ratios of CA roads with poor road surface condition are currently higher especially in Costa Rica, El Salvador, and Honduras.

Table 5.5.2 Number and Length of CA Roads (with Poor Road Surface Conditions) by Country

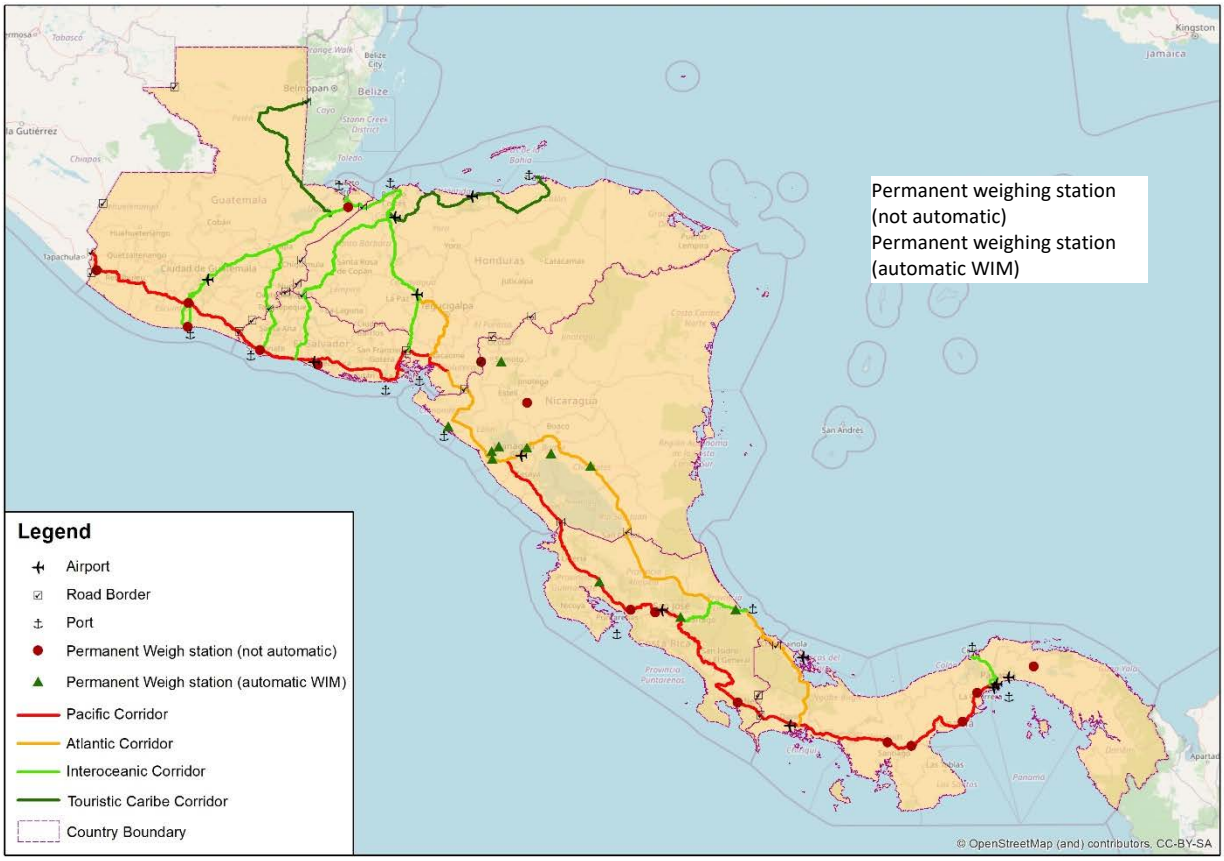
Country	Number of CA Roads	Total CA Road Length (km)	CA Roads with Poor Road Surface Conditions	
			(km)	(%)
Guatemala	9	2,145	763.1	35.6
El Salvador	7	1,477	80.7	5.5
Honduras	7	1,519	344.4	22.7
Nicaragua	3	620	23.4	3.8
Costa Rica	1	526	33.6	6.4
Panama	1	709	190.5	26.9

Source: Prepared by the JICA Study Team based on the latest information and confirmation from each country.

5.5.3 Location of Freight Vehicle Weigh Stations

Currently, Honduras is a country with no freight vehicle weight station except for container weighing at ports, while Costa Rica is taking an initiative and has an automated system of weighing freight vehicles. While it is necessary to see the freight traffic and topography conditions, the road maintenance systems have a significant difference in each country. At least for CA roads, which comprise an international logistic network, each country should invest for weigh stations and intensive maintenance to have unified standards for achieving good surface road condition and to ensure that the road maintenance system should meet these standards.

The location of freight vehicle weigh stations in six Central America countries and the list of freight vehicle weigh stations according to type and operated in each country as shown in Figure 5.5.2 and Table 5.5.3, respectively. As mentioned above, the issue of proper installation and operation of freight vehicle weigh stations applies not only to Honduras but also to other countries. The operated freight vehicle weigh stations in each Central American country are mostly non-automated, and each vehicle is stopped, weighed, and the license plate is manually inputted. However, in reality, all freight vehicles are not weighed. Thus, by doing so, not only the number of freight vehicle weigh stations in each country, but also weigh stations with an automated system (WIM: Weigh in Motion), which are operated in Costa Rica as a pioneer, become an issue.



Source: Prepared by JST based on the information obtained from the interviews with CIV (Guatemala), MOP (El Salvador), INSEP (Honduras), MOPT (Costa Rica) and ATTT (Panama) and the "National Plan of Nicaraguan Transportation" (JICA, 2014).

Figure 5.5.2 Location of Freight Vehicle Weigh Stations in Central America

Table 5.5.3 Number of Freight Vehicle Weigh Stations by Type in Central America

Country	Permanent Automated Weigh Stations (WIM)	Permanent Weigh Stations (Not automated)	Mobile Weigh Stations	Total Weigh Stations
Guatemala	0	- Tecún Umán - Surroundings of Puerto Quetzal (exit and entry routes) - Surroundings of Puerto Barrios Total: 4 places	0	4
El Salvador	(Recently acquired 2 WIM sensors)	- Around the port of Acajutla - Zacatecoluca Total: 2 places	11	13
Honduras	0	0	0	0
Nicaragua	- Mateare I - Mateare II - Los Cedros (Nandayosi) -Paso Caballos - Chilamatillo - Masapa - San Pedro de Lóvago - Palacagüina Total: 8 places	- El Espino - Sébaco (currently remodeled to be automated) Total: 2 places	0	10

Country	Permanent Automated Weigh Stations (WIM)	Permanent Weigh Stations (Not automated)	Mobile Weigh Stations	Total Weigh Stations
Costa Rica	- Búfalo - Cañas - Esparza (exit and entry routes) - La Julieta 35 (Río Claro) - Ochomogo - Ruta 27 (exit and entry routes, under construction) Total: 8 places	0	0	8
Panama	0	- The Oak - El Espinal - Gualaca - La Chorrera - The Embalsadero - Chepo Total: 6 places	3	9

Source: Prepared by the JST based on the information from interviews with CIV (Guatemala), MOP (El Salvador), INSEP (Honduras), MOPT (Costa Rica) and ATTT (Panama) and in accordance with the "National Plan of Transportation of Nicaragua" (JICA, 2014).

5.5.4 Pacific Corridor Improvements

The IDB has previously and concurrently undertaken several Pacific Corridor studies as the key mobility and logistics facilitator of the region, including the "Study of the Mesoamerican Integration Corridor" for which the study objective is to develop an operational plan contemplating a strategy which addresses domestic and regional actions to transform the Pacific Corridor into a structuring logistics corridor of the Meso American region. The output will be to provide the necessary elements to promote investments on the Pacific Corridor and surrounding areas, whether using public funds or private sector participation; although not an investment grade study, the data should promote well-informed discussions to be used in decision making processes by high-ranking authorities.

In late 2017 and early 2018, IDB collected data in each country, including traffic volumes and road surface conditions, through georeferenced video capture. This combined with an origin-destination cargo survey resulted in an intervention analysis conducted with the HDM-4 model, to then propose a list of recommended interventions for the Pacific Corridor: 14 total projects estimated at US$1,211.37 million. Those 14 projects are all covered by this regional Master Plan of Central America.

Table 5.5.4 Proposed Investment Amounts for Pacific Corridor by Country

Country	Road Length (km)	Road Interventions (US$)	Road Conservation (US$)	Road Safety (US$)	Logistics Infrastructure (US$)	Total (US$)
Guatemala	303	591.3	134.3	78.9	9.4	**813.9**
El Salvador	359	104.0	145.8	45.3	9.6	**304.7**
Honduras	137	0	55.8	0.5	4.3	**60.6**
Nicaragua	335	75.5	149.8	6.6	9.7	**241.6**
Costa Rica	521	315.4	287.8	71.5	15.0	**689.7**
Panama	497	0	327.3	84.8	12.6	**424.7**
Total	**2,152**	**1,086.2**	**1,100.8**	**287.7**	**60.7**	**2,535.4**

Source: IDB



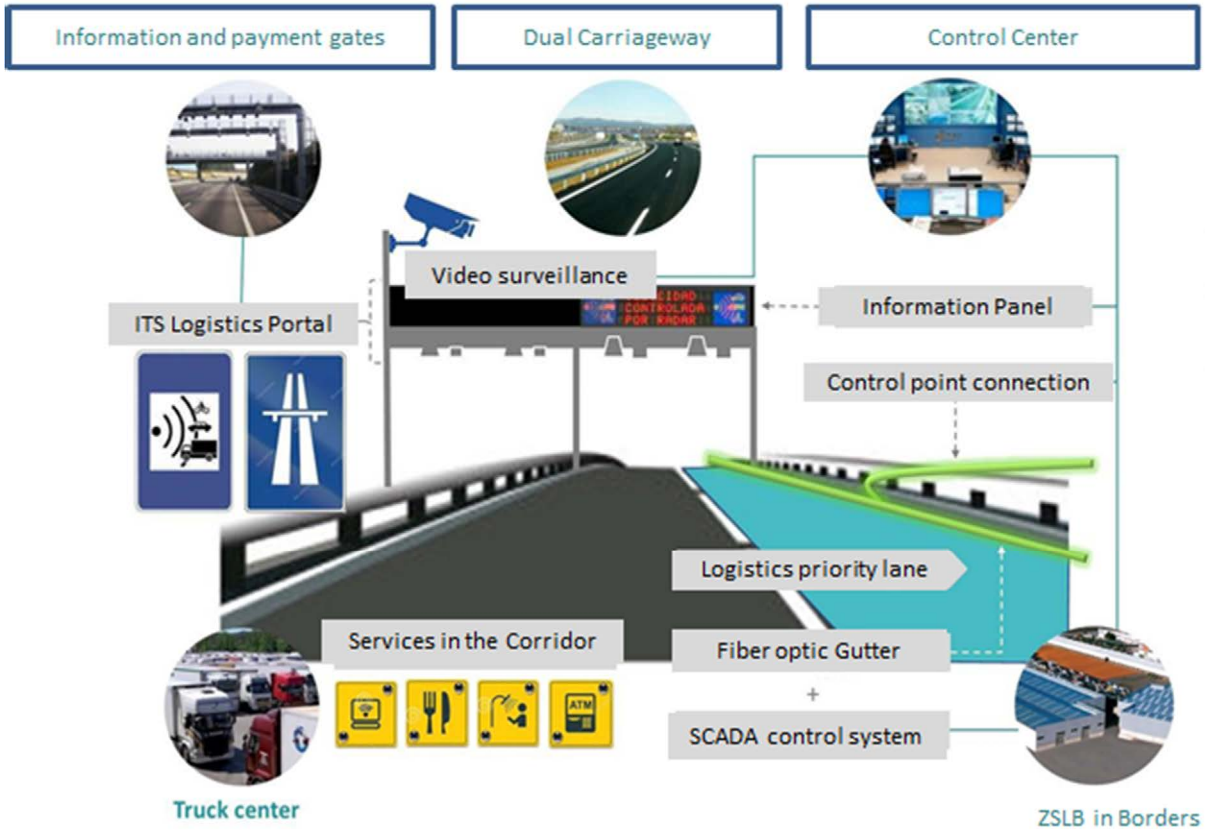
Source: IDB

Figure 5.5.3 Recommended Interventions for Pacific Corridor

5.5.5 Sector Recommendations

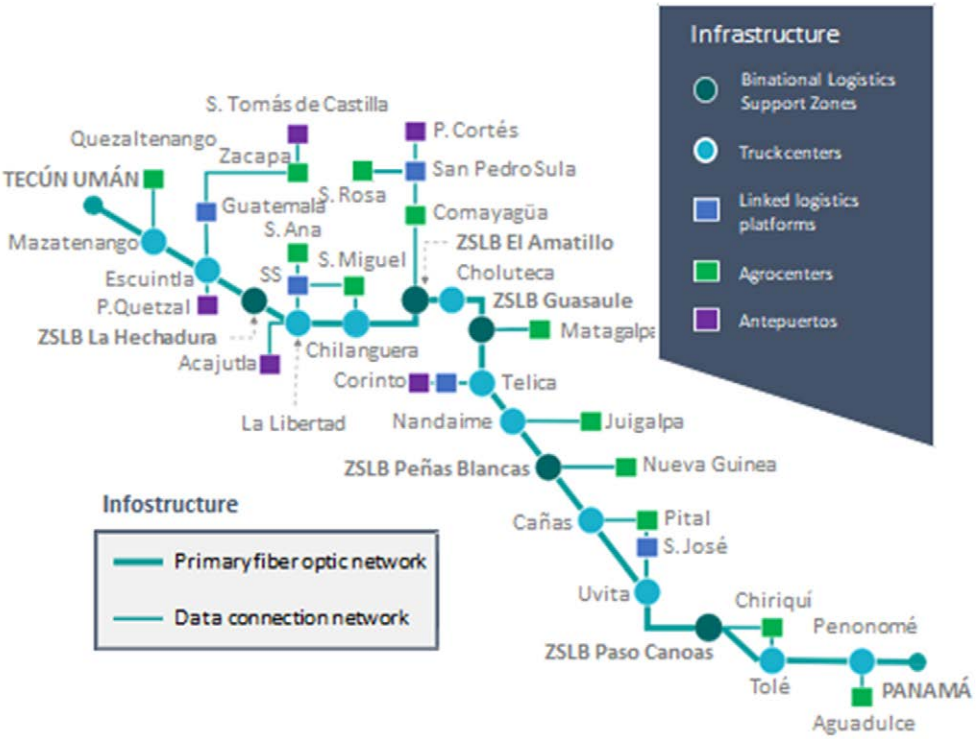
Regional freight movement by road continues to be hampered by relatively high travel time costs, both within each country due to urban congestion and between countries due to lengthy border crossings, as well as deteriorating pavement conditions exacerbated by severe weather including torrential rains and sea level rise. To address this, the JST recommends the following improvements:

- Continue further development and integration of Regional Corridors to accommodate logistics/freight traffic, i) along the Pacific coast, ii) along the Atlantic coast, and iii) various Interoceanic/Bioceanic/Intercoastal/Interconnection connecting the two coasts.



Source: IDB

Figure 5.5.4 Logistics Infrastructure Improvements to Support the Logistics Corridor



Source: IDB

Figure 5.5.5 Sensorized (sic) Network Support for the Pacific Corridor

- Continue establishing and improving road access to existing and proposed seaports, including those in Belize. The level of investment and maintenance should reflect the freight traffic demand to/from the busiest ports:

Table 5.5.5 Central American Ports Ranked by Throughput

Country	Port		2018 TEU
Panamá	1.	Colón (MIT, Evergreen y Panamá Port)	4,324,478
	2.	Panamá Pacifico	2,520,587
Costa Rica	3.	Limón-Moin	1,187,760
Honduras	4.	Puerto Cortes	670,979
Guatemala	5.	Santo Tomas de Castilla	554,432
	6.	Puerto Barrios	489,665
	7.	Puerto Quetzal	486,499
Costa Rica	8.	Caldera	305,031
El Salvador	9.	Acajutla	230,989
Nicaragua	10.	Corinto	169,969
Honduras	11.	Puerto Castilla	109,272
Belize	12.	Belize	47,729

Source: UN Economic Commission for Latin America and the Caribbean, CEPALSTAT

- Continue developing bypasses and widenings to mitigate urban congestion, especially around the various capital cities and economic centers (e.g., San Pedro Sula).
- Continue modernizing and improving the Ports of Entry (POEs) for cross-border traffic, to address the identified reasons for delays at the border crossings.

Border	Customs	Roads/Tracks	Que/Line	Congestion	Controls	Officers	Operators	Other	Road Security	Systems	Paperwork
El Amatillo	8.28%	1.81%	25.45%	0.15%	0.45%	0.90%	2.11%	0.45%		2.11%	58.28%
El Guasaule	6.98%	4.65%	20.93%				2.33%			2.33%	62.79%
El Paso	11.11%						66.67%				22.22%
La Hachadura	3.03%	0.29%	38.10%			0.43%	0.43%	0.29%		0.58%	56.85%
Paso Canoas	15.07%	6.85%	5.94%	1.37%	2.28%	4.57%	4.57%		2.74%	6.39%	50.23%
Peñas Blancas	27.11%	9.34%	17.47%		0.90%	3.01%	4.82%	1.20%	2.71%	3.92%	29.52%
Tecún Umán	23.18%	0.66%	1.32%		0.66%		35.76%	1.99%		11.92%	24.50%
Total	**11.27%**	**2.98%**	**24.40%**	**0.19%**	**0.57%**	**1.37%**	**4.93%**	**0.57%**	**0.71%**	**3.03%**	**49.98%**

Source: IDB

Figure 5.5.6 Causes of Delay at Select Border Crossings

- Provide designated rest areas with amenities for long-distance truck drivers.
- Provide detailed cost estimates and further delineate the role of the private sector for encouraging PPP investment, along with addressing concerns (actual and perceived) of corruption and lack of transparency in funding such large-scale infrastructure.

The JST understands that BCIE/CABEI is to conduct a Regional Logistics Corridors study, which will include a road condition assessment per AASHTO (USA), propose a regional network with alternate route recommendations, and provide cost estimations.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 6

Maritime and Port Sector

November 2023

Japan International Cooperation Agency
Oriental Consultants Global Co., Ltd.
Nippon Koei Co., Ltd.
ALMEC Corporation
Overseas Coastal Area Development Institute of Japan
International Development Center of Japan Inc.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

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Maritime and Port Sector

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Appendix 6 Maritime and Port Sector

6.1 Regulation and Organization

6.1.1 Regulation and Technical Standards

(1) Basic Laws on Port of each Country

In the Central American region, El Salvador, Honduras, Nicaragua and Panama have introduced legislation related to overall port affairs of the country. On the other hand, in Guatemala and Costa Rica, there is no law that stipulates basic matters on the management and operation of national ports. El Salvador enacted the Port Maritime Law in 2002, which stipulates overall matters related to ports and maritime affaires. Honduras enacted the Organic Law of the National Port Company in 1965, which stipulates the establishment of port companies which have jurisdiction over ports in the country. Nicaragua enacted the General Law of Ports of Nicaragua in 2013, which stipulates overall matters of ports, including the establishment of port companies that have jurisdiction over the whole country. In Panama, Decree Law on Creating the Maritime Authority of Panama was established in 1998. In Guatemala and Costa Rica, efforts for introducing legislation on a national port system are ongoing. (Table 6.1.1) In addition, laws regarding the establishment of maritime regulatory agencies have been stipulated in Guatemala and Honduras.

Table 6.1.1 Basic Laws on Ports

Country	Law
Guatemala	-
El Salvador	Ley General Marítimo Portuaria (Port Maritime General Law)
Honduras	Ley Orgánica de la Empresa Nacional Portuaria (Organic Law of the National Port Company)
Nicaragua	Ley General de Puertos de Nicaragua (General Law of Ports of Nicaragua)
Costa Rica	-
Panama	Decreto Ley crea la Autoridad Marítima de Panamá (Decree Law on Creating the Maritime Authority of Panama)

Source: JST

a) Guatemala

A port system which covers all ports in Guatemala does not exist. Public ports have been developed, managed and operated under each port company of the port. National Port Commission（CPN）was established and conducts it duties under the Board of Directors which is composed of relevant organizations related to ports in Guatemala, however, CPN is not vested with administrative powers and functions.

b) El Salvador

The Port Maritime General Law regulates all activities related to the promotion, development, and defense of maritime interests, control and surveillance of issues related to the sea and the exercise of sovereignty and jurisdiction in the maritime territory and inland waters of El Salvador. It also regulates the use of national maritime spaces, including inland aquatic spaces, regarding the supply and development of water transport services. It also establishes regulations related to the construction, rehabilitation, administration, operation, and maintenance of national ports in general.

c) Honduras

The National Port Company is a decentralized Institution of the Government of the Republic created by the Organic Law of The National Port Company, Decree No. 40 of October 14, 1965.

d) Nicaragua

In Nicaragua, General Law of Ports of Nicaragua was enforced in August 2013. The purpose of the law is to regulate:

- the development, administration and operation of ports, maritime, river and lake terminals, and port facilities;
- their construction, use, operation, forms of administration, way of providing port services and activities related to them; and
- public and private participation.

This law defines the function of the public and private entities in order to contribute to the development of transportation and international trade in the country.

e) Costa Rica

The National Port Council is created, as a body attached to the Ministry of Public Works and Transport, of which main objective is to serve as a coordinating body of higher level between the executive power, the decentralized and deconcentrated bodies of the State who have competence in port and maritime matters, and the business sector that are exporters, importers, carriers and other users or clients of port services.

f) Panama

Administration of ports in Panama had been carried out by several ministries/authorities. In 1998, the Maritime Authority of Panama was established by Decree Law No.7 in order to integrate port administration. The law stipulates basic matters concerning ports and maritime affairs in Panama, such as ships, ports and related industries, marine and coastal resources, seafarers, and maritime research institutes in addition to the management organization.

(2) Maritime

a) Laws and Regulations

Regarding maritime administration in Central American countries, basic matters are stipulated in the Port Maritime Law shown in (1), the Law for Establishment of Independent Organizations that have jurisdiction over maritime affairs or the Organization Law for the competent ministries and government agencies (Table 6.1.2): the Port and Maritime Law in El Salvador and Nicaragua; the Law for the Establishment of Maritime Regulatory Agencies in Guatemala and Honduras; and organization laws on relevant ministry/agency in Costa Rica and Panama.

Table 6.1.2 Laws and Regulations on Maritime Affairs

Country	Laws/Regulations
Guatemala	-
El Salvador	Ley General Marítimo Portuaria
Honduras	Ley Organica de la Marina Mercante Nacional
Nicaragua	Ley General de Puertos de Nicaragua (General Law of Ports of Nicaragua)
Costa Rica	Ley-3155 y crea el Ministerio de Obras Públicas y Transportes
Panama	Decreto Ley crea la Autoridad Marítima de Panamá (Decree Law on Creating the Maritime Authority of Panama)

Source: JST

b) IMO Conventions

Ratification of Main IMO Conventions

The International Maritime Organization (IMO) was established in 1958 as a specialized agency of the United Nations to promote international cooperation on maritime issues such as ship safety and prevention of marine pollution from ships. As of January 2016, 171 countries / regions have officially joined, and 3 regions have become associate members. All six Central American countries are members.

According to the homepage of IMO, there are three key conventions: International Convention for the Safety of Life at Sea (SOLAS); International Convention for the Prevention of Pollution from Ships (MARPOL73/78); and International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). In addition, Convention on Facilitation of International Maritime Traffic (FAL), 1965, is closely related to logistics. Ratification status of these conventions by each country is shown in Table 6.1.3.

Table 6.1.3 Ratification status of IMO Conventions by Country

At 05/01/2021	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama
IMO Convention 48	x	x	x	x	x	x
SOLAS Convention 74	x		x	x	x	x
SOLAS Protocol 78			x		x	x
SOLAS Protocol 88	x		x	x	x	x
SOLAS Agreement 96						
STCW Convention 78	x	x	x	x	x	x
MARPOL 73/78 (Annex I/II)	x	x	x	x		x
MARPOL 73/78 (Annex III)	x	x	x	x		x
MARPOL 73/78 (Annex IV)	x	x	x	x		x
MARPOL 73/78 (Annex V)	X	x	x	x		x
MARPOL Protocol 97 (Annex VI)	x		x			x
FACILITATION Convention 65		x	x	x	x	x

Source: IMO (https://www.imo.org/en/About/Conventions/Pages/StatusOfConventions.asp)

The FAL Convention contains standards and recommended practices and rules for simplifying formalities, documentary requirements and procedures on arrival, stay and departure of vessels which are engaged in international maritime transport at/in/from ports.

The Convention stipulates that public authorities can request twelve kinds of documents from a ship. Under the FAL Committee, IMO has developed standardized FAL documentation (FAL Forms) of seven documents (Table 6.1.4), The revised forms were updated and have been effective since 1 January 2018. Two other documents may be required under the Universal Postal Convention and the International Health Regulations. Three additional declarations entered into force on 1 January 2018:

- Security-related information as required under SOLAS regulation XI-2/9.2.2
- Advance electronic cargo information for customs risk assessment purposes
- Advanced Notification Form for Waste Delivery to Port Reception Facilities

Table 6.1.4 Documents submitted to Public Authorities

Standardized FAL documentation	Other documents
- IMO General Declaration (FAL form 1) - Cargo Declaration (FAL form 2) - Ship's Stores Declaration (FAL form 3) - Crew's Effects Declaration (FAL form 4) - Crew List (FAL form 5) - Passenger List (FAL form 6) - Dangerous Goods (FAL form 7)	- Universal Postal Convention -International Health Regulations. (enforced on 1 January 2018) - Security-related information （SOLAS） - Cargo information for customs risk assessment purposes - Form for Waste Delivery to Port Reception Facilities

Source: JST

6.1.2 Organization and Human Resources

(1) Port Administration

Administration systems on ports differ from country to country. The responsible ministries or governmental agencies which are responsible for nationwide port affairs of the Central American countries are: Commission Portuaria Nacional (CPN) in Guatemala; Ministerio de Obras Públicas, Transporte (MOPT) in El Salvador; Secretaria de Infraestructura y Servicios Públicos (INSEP) in Honduras; Ministerio de Transporte e Infraestructura (MTI) in Nicaragua; Ministerio de Obras Públicas y Transportes (MOPT) in Costa Rica, and Panama Maritime Authority (APM) in Panama.

Responsibility for controlling safe navigation and preventing marine pollution including port waters belongs to the government in general. Dirección General de Asuntos Marítimos (Ministerio de la Defensa Nacional de Guatemala) in Guatemala, Autoridad Maritima Portuaria (AMP) in El Salvador, and General Directorate of the Merchant Marine Honduras (DGMM) in Honduras, Nicaragua execute these duties as regulatory bodies. The responsible organizations are listed in Table 6.1.5.

Table 6.1.5 Responsible Organization for Port and Maritime Administration

	Responsible Ministry	Maritime Authority
Guatemala	Commission Portuaria Nacional (CPN)（*1）	(*2)
El Salvador	Ministerio de Obras Públicas, Transporte (MOPT)	Autoridad Maritima Portuaria (AMP)
Honduras	Secretaria de Infraestructura y Servicios Públicos (INSEP)	Dirección General de la Marina Mercante/General Directorate of the Merchant Marine (DGMM)
Nicaragua	Ministerio de Transporte e Infraestructura (MTI)	Dirección General de Transporte Acuático/General Directorate of Aquatic Transportation (DGMT)
Costa Rica	Ministerio de Obras Públicas y Transportes (MOPT)	MOPT
Panama	Autoridad Marítima de Panamá(AMP)	AMP
(*1) CPN is an advisory, consultant and technical body of the Executive Branch, whose Functions lie in defending national interests in all matters related to port activities and representing the Nation before National and International Organizations (*2）As for the maritime authority, it is the responsibility of the Ministry of National Defense through the Vice Ministry of the Navy.		

Source: JST

a) Guatemala

The Ministerio de Comunicaciones, Infraestructura y Vivienda is responsible for transport affairs in Guatemala but the responsible organization for port administration is not definitely decided. CPN is the

advisory, technical and representative entity of the Executive Organism, which interacts with the Port Community and coordinates efforts for the defense of national port interests. The composition of the Board of Directors is shown Table 6.1.6.

Table 6.1.6 Composition of Board of Directors

• Ministerio de Finanzas Públicas (Presidencia), • Ministerio de Comunicaciones, Infraestructura y Vivienda. • Empresa Portuaria Quetzal. • Empresa Portuaria Nacional Santo Tomás de Castilla. • Empresa Portuaria Nacional de Champerico. • Ministerio de Economía. • Ferrocarriles de Guatemala. • Terminal Ferroviaria Puerto Barrios. • Comité Coordinador de Asociaciones Agrícolas, Comerciales, Industriales y Financieras. • Superintendencia de Administración Tributaria.

Note : As per Government Agreement dated March 10th, 1972, and its reforms 1972, 1983 and 2014
Source: https://cpn.gob.gt/organigrama/

b) El Salvador

MOPT has two vice-ministers for Transportation and Public Works. The vice minister for transportation is in charge of maritime affaires. A department/division in charge of port administration has not been established.

c) Honduras

INCEP is an organization provided by Article 74 of the Regulation of Organization, Functioning and Competences of the Executive Power Executive Decree No. PCM-008-97. The responsibilities of the Secretary of Infrastructure and Public Services are:

- The formulation, coordination, execution and evaluation of policies related to housing, public infrastructure works, the road system, urban planning and transportation including:
- The public works concession regime including the concession award procedures. The regulation of the activities of the concessionaire in accordance with the contracts and laws on the matter and the advice to the Municipalities that require it, when dealing with the concession of municipal public works.
- Matters regarding the geodetic and cartographic services of the State; and
- Other matters provided by current legislation.

d) Nicaragua

MTI is to contribute to the economic and social development of the country, building highways, roads and bridges that guarantee permanent connectivity in all the country's communities and safe, comfortable and efficient transport service.

General Directorate of Aquatic Transport is in charge of ports and the maritime sector. It exercises the functions related to the regulation and control of water transport, navigation and the national port system, as well as acts, events and goods related to maritime trade; ensuring the protection of the marine environment and comprehensive security, through compliance with National Laws and the different International Conventions, ratified by Nicaragua, inherent to the maritime-port area.

e) Costa Rica

MOPT manages, regulates and controls the public infrastructure works and promotes efficient, safe and resilient transport services in order to contribute to the sustainable development of the country. Maritime and Port Division (División Marítimo Portuaria) is in charge of port and maritime affaires under the vice minister for transportation and safety. Maritime and Port Division consists of three offices of Management,

Infrastructure and Navigation and Security.

f) Panama

AMP was created by Decree Law 7 of February 10, 199

8 as an autonomous government agency with legal personality, its own assets, and independence in its internal arrangements, subject only to the policies, guidance and supervision of the Executive and to the controls of the Office of the Controller-General of the Republic. For the purposes of this Decree Law, the Executive shall exercise its powers through the Ministry whose Minister presides over the Authority's Board of Directors.

(2) Port management Body

a) Port Management Bodies of Central America

Major ports in Central American countries are developed and managed by port management bodies which are independent from the government. The income for operation is appropriated for construction and operation cost. In the ports where private companies conduct terminal operation under concession contract, the investment and maintenance costs are basically borne by the company based on the concession contract. In some countries the government is responsible for the construction of breakwaters and channel dredging. National budget will be allocated for that purpose although the costs of some works are borne by port management entities or concession companies.

In El Salvador, Honduras, Nicaragua and Panama, the organizations which cover nationwide ports have been established: the Comision Ejecutiva Portuaria Autonoma (CEPA) in El Salvador; the Empresa Nacional Portuaria (ENP) in Honduras; and the Empresa Portuaria Nacional (EPN) in Nicaragua; and Panama Maritime Authority (APM) in Panama.

In Guatemala and Costa Rica, the organizations which manage individual ports or ports located in particular regions have been established. In Guatemala, Empresa Portuaria Quetzal (EPQ) is the management body of Puerto Quetzal, Empresa Portuaria Nacional Santo Tomas de Castilla (EMPORNAC) is the management body of Santo Tomas de Castilla port, and Terminal Ferroviaria Puerto Barrios is the management body of Barrios port. In the case of Costa Rica, ports on the Pacific coast are managed by Instituto Costarricense de Puertos del Pacífico (INCOP) and ports on the Caribbean coast are managed by Junta de Administracion Portaria y de Desarrollo Economica de la Vertiente Atiantica (JAPDEVA). Responsible bodies for port management are shown in Table 6.1.7.

Table 6.1.7 Port Management Body/Port Company

Country	Port	Port Management Body/Port Company
Guatemala	Quetzal Port	Empresa Portuaria Quetzal (EPQ)
	SANTOCAS Port	Empresa Portuaria Nacional Santo Tomas de Castilla (EMPORNAC)
	Barrios Port	Terminal Ferroviaria Puerto Barrios
El Salvador	Acajutla Port	Comision Ejecutiva Portuaria Autonoma (CEPA)
Honduras	Cortes Port, San Lorenzo Port and others	Empresa Nacional Portuaria (ENP)
Nicaragua	Corinto Port, Other Ports	Empresa Nacional Portuaria (EPN)
Costa Rica	Caldera Port, Ports on Pacific Coast	Instituto Costarricense de Puertos del Pacífico (INCOP)
	Limon/Moin Port, Moin Container Terminal	Junta de Administracion Portaria y de Desarrollo Economica de la Vertiente Atiantica (JAPDEVA)
Panama	Balboa Port, PAS Terminal, Cristobal Port, MIT, CCT, Other ports	Panama Maritime Authority (APM)

Source: JST

b) Quetzal Port

Empresa Portuaria Quetzal (EPQ) was created as a state entity which is responsible for management of Quetzal Port under the Ley Organica De La Empresa Portuaria Quetzal in 1985. It is a decentralized and autonomous body with its own legal personality and capacity to acquire rights and contract obligations under the Ministry of Communications, Transportation and Public Works.

c) Santo Tomas de Castilla Port

Empresa Portuaria Nacional Santo Tomas de Castilla (EMPORNAC) is a state entity with autonomy to operate in accordance with its nature and its purposes. It is a decentralized company, endowed with its own legal personality. The Matías de Gálvez National Port Company which was created as a port management body of Santo Tomas de Castilla Port by Decree-Law number 177 in 1964 was replaced by Empresa Portuaria Nacional Santo Tomas de Castilla after a new Decree Law was established in response the changing circumstances of the port.

d) Barrios Port

Terminal Ferroviaria Puerto Barrios is responsible for management of the port while Chiquita Guatemala, Sociedad Anónima is the operator of the terminal. Chiquita is committed to the development of Puerto Barrios, so the projects it undertakes respond to the long-term vision and sustainable development.

e) Ports of El Salvador

Comision Ejecutiva Portuaria Autonoma (CEPA) is an independent entity from the government, which is responsible for developing the infrastructure of Ports, Airports and Railways and providing safe, efficient and regionally competitive services.

According to the provisions of Port Maritime Law, CEPA is deemed to be the port authority with powers in respect of administration, operation, maintenance and conservation.

f) Ports of Honduras

Empresa Nacional Portuaria (ENP) is a decentralized Institution of the Government of the Republic created by decree No. 40 of October 14, 1965 issued by the National Congress. It has jurisdiction in all the country's maritime ports, aiming at the economic development of the country, providing adequate and efficient services and facilities in maritime ports. ENP is responsible for port planning, construction, management, coordination and offering advice to the government.

g) Ports of Nicaragua

Empresa Portuaria Nacional (EPN) is a self-governing body established as a decentralized public corporation based on DECRETO EJECUTIVO N °. 35-95 (1995). ENP is responsible for Nicaragua's maritime affairs, seaports and river and lake ports.

h) Ports on the Pacific Coast of Costa Rica

The Costa Rican Institute of Pacific Ports (INCOP) was established as an autonomous body with the establishment of public law by Law No. 1721 (revised by Law No. 4964 of 1972) on December 28, 1953. It conducts the business as a port management organization on the Pacific coast of Costa Rica. Under Law No. 8461 of 2005, INCOP supervises concessions granted by the Concession Supervision Secretariat through coordinating with the Ministry of Public Works and Transport.

i) Ports on the Caribbean Coast of Costa Rica

Junta de Administracion Portaria y de Desarrollo Economica de la Vertiente Atiantica (JAPDEVA) is an autonomous organization established by Law No. 3091 in 1963, which was amended by Law No. 5337 in 1973. As a public entity, it is engaged in the construction, management, preservation and operation of

Limon Port, Moin Port and other seaports and riverports in the Atlantic coastal region.

j) Ports of Panama

The Panama Maritime Authority (APM) is responsible for formulating the development plans and conducting port management for all ports in Panama. Ports in Panama are developed and operated by private companies through concessions in principle and APM supervises concessions.

(3) Maritime Authority

On El Salvador and Honduras, maritime authorities are established as independent governmental agencies.

Autoridad Maritima Portuaria (AMP) is vested with functions to regulate and control maritime and port activities in the technical, economic and administrative aspects; as well as to represent El Salvador in duties related to maritime-port issues in international organizations, contributing to the development of the country. DGMM is a regulatory body and responsible for offering ship registration services, training and certification of seafarers, maritime safety and marine environment protection, managing and giving full compliance to laws and international conventions, contributing to the country´s development.

In Nicaragua and Costa Rica, departments of the competent ministries have responsibilities as a maritime authority. In Panama, Panama Maritime Authority has a function of a maritime authority. Regarding Maritime Authority in Guatemala, there is an initiative to enact a law in the Congress of the Republic of Guatemala, whose aim is to declare a port authority. However, the law has not been approved by the legislative power.Budget of Port Development and Operation

6.1.3 Port Operation/Investment

(1) Terminal Operatotion

The governments of Central America have introduced or intend to introduce private sector participation in the development and operation of infrastructure. In the port sector, most of the major ports or terminals in Costa Rica and Panama are invested and operated by private companies under concession contracts. In addition, operations of the terminals in Guatemala and Honduras have begun. (Table 6.1.8)

In Guatemala, the container terminal at Quetzal Port was built by means of usufruct and operated by APM Terminals Quetzal. In El Salvador, CEPA launched a tender for the operation of La Union Port but did not attract any bidders. In Honduras, the Superintendencia de Alianza Publico-Privada (SAPP), a government agency which manages and supervises public-private partnerships has been established to promote private participation. The container/general cargo terminal at Cortes Port is operated by Operadora Portuaria Centroamericana (OPC), and the bulk terminal is operated by Terminal Especializada de Honduras (THE). In Panama, the Panama Port Company (PCC) operates the port of Balboa on the Pacific coast of the Panama Canal and the port of Cristobal on the Caribbean coast. Panama PSA operates PSA terminal on the Pacific coast. Manzanillo International Terminal operates the Manzanillo International Terminal and Colon Container Terminal operates the Colon Container Terminal.

Table 6.1.8 Concession of Operation of Ports

Country	Port	Concessionaire	Operation
Guatemala	Quetzal Port	APM Terminals Quetzal	Container Terminal
	Barrios Port	Chiquita	Multi-purpose Terminal
Honduras	Cortes Port	Operadora Portuaria Centroamericana (OPC)	Container Terminal/General Cargo Terminal
		Terminal Especializada de Honduras (THE)	Solid Bulk Terminal

Country	Port	Concessionaire	Operation
Costa Rica	Caldera Port	Sociedad Portuaria de Caldera (SPC)	Terminal Operation
		Sociedad Portuaria Granelera de Caldera (SPGC).	Bulk terminal
		Sudamericana Agencias Aereas y Maritimas S.A (SAAM)	Marine Service
	Moin	APM Moin	Container Terminal
Panama	Balboa Port	Panama Port Company (PPC)	Container Terminal/ General Cargo Terminal/Bulk Terminal
	PAS Terminal	PSA Terminal	Container Terminal
	Cristobal Port	Panama Port Company (PPC)	Container Terminal General Cargo Terminal/Bulk Terminal
	Manzanillo International Terminal	Manzanillo International Terminal	Container Terminal/RORO Terminal
	Colon Container Terminal	Colon Container Terminal	Container Terminal

Source: JST

(2) Concessionaire

a) APM Terminals Quetzal

The container terminal at Quetzal Port is operated by APM Terminals Quetzal. The terminal was constructed by BOT scheme and started operation in 2017. The terminal was built with 85% funding from APM Terminals and 15% funding from the World Bank International Finance Corporation. APM Terminals Quetzal has invested US $ 180 million in terminal modernization and enhancements. APM Terminals Quetzal has announced an additional $ 145 million investment over the next 19 years.

b) Chiquita

The terminal at the port of Barrios is operated by Chiquita, taking over the operation based on the lease agreement between Compañía Desarrolladora Ferroviaria and Compañía Bananera Guatemalteca Independiente, S.A. (COBIGUA). Chiquita has an expansion plan of the terminal.

c) Operadora Portuaria Centroamericana SA de CV (OPC)

The general cargo and container terminals at Cortez Port are operated by International Container Terminal Services, Inc. (ICTSI). On February 1, 2013, ICTSI acquired the rights to a 30-year concession covering terminal design, financing, construction, maintenance, operation and research. ICTSI is a Philippines-based multinational company that develops, manages and operates container terminals around the world and has established Operadora Portuaria Centroamericana SA de CV (OPC) as a terminal operator at the Port of Cortez. The management bank is FICOHS.

d) Especializada de Honduras（TEH）

The solid bulk terminal at Cortez Port is operated by Terminal Especializada de Honduras (TEH) which is an affiliated company of the Largo Group. TEH obtained the operating right in the concession, expanded the bulk carrier berth, strengthened the cargo handling facility, and operated the terminal. Funds are managed by ATLANTIDA Trust Bank

e) Sociedad Portuaria de Caldera (SPC)

The terminal at the port of Caldera is operated by the Socialedad Portuaria de Caldera (SPC) under a concession agreement which became effective on March 27, 2006. The concession includes services for

loading, unloading, transporting and storing general cargo, containers, vehicles and all other types of cargo by all vessels using berths 1, 2 and 3. The concession period is 20 years and the concession fee is 15% of the total income.

f) Sociedad Portuaria Granelera de Caldera (SPGC)

The bulk terminal at Caldera Port is operated by the Socialedad Portuaria Granelera de Caldera (SPGC) under a concession agreement which became effective on April 7, 2006. The concession will include the design, planning, financing, construction, maintenance and operation of the new bulk terminal. The period is 20 years and the concession fee is 5% of the total income.

g) Sudamericana Agencias Aereas y Maritimas S.A (SAAM)

The tugboat service at the port of Caldera is provided by Sudamericana Agencias Aereas y Maritimas S.A (SAAM) under a concession agreement reached on August 11, 2006. Concessions include tugboat services at Punta Morales Port, Puntarenas Port, Caldera Port and Fertikabui. The period is 20 years and the concession fee is 5% of the total income.

h) The Moín Container Terminal (MCT)

The development of a newly constructed artificial island-type container terminal near the existing Moin Port was approved by the comptroller in March 2012. APM Terminals Moín received a concession to build The Moín Container Terminal and started operation in 2017. The concession includes an investment of US $ 992 million and period of 33 years.

i) Panama Port Company (PPC)

The ports of Balboa on the Pacific side of the Panama Canal and the port of Cristobal on the Caribbean side are operated by the Panama Port Company (PPC), which obtained concession rights in 1997. PCC is a member of the Hutchison Port Group under the umbrella of CK Hutchison Holdings Limited (CK Hutchison). The concession period is 25 years, and the contract can be extended.

j) PSA Panama: a subsidiary of PSA International

The PSA Panama Terminal was developed and is operated by PSA Panama, a subsidiary of Singapore-based PSA International based on a concession contract signed on June 19, 2008. The terminal started operation in 2010 and the terminal expansion project commenced in 2015.

k) Manzanillo International Terminal (MIT)

Manzanillo International Terminal (MIT) is operated by Manzanillo International Terminal-Panama S.A. under concession, which is a U.S.-Panamanian private capital enterprise affiliated with Carrix, Inc., the main division of which is SSA Marine, the largest stevedoring, marine, and intermodal rail operator in the United States.

l) Colon Container Terminal (CCT)

Colon Container Terminal (CCT) is operated by Colon Container Terminal, SA, which belongs to the Evergreen Group. The terminal started operation in 1997 and the phase 3 project was put into service in 2015.

6.2 Existing Conditions of Ports and Facilities

6.2.1 Present situation of Main Ports

(1) Main Ports of Each Country

Various types of ports and terminals are located on the Pacific and Caribbean Coasts in Central America. Among them、twelve (12) ports have multiple functions to handle container cargo, miscellaneous cargo, solid bulk cargo and liquid bulk cargo (In this report, ports with such multiple functions are called as Main Ports): One (1) port on the Pacific coast and two (2) ports on the Caribbean coast in Guatemala; One (1) port on the Pacific coast in El Salvador; One (1) port on the Pacific coast and two (2) ports on the Caribbean side in Honduras; One (1) port on the Pacific coast in Nicaragua; One (1) port on the Pacific coast and the Caribbean coast in Costa Rica and Panama respectively.（See Figure 6.2.1）



Source: JST

Figure 6.2.1 Location of Ports with Multiple Functions in Central American Countries

Layout and detailed condition of each port are summarized below.

a) Guatemala

Quetzal Port







Port Waters			
Breakwater	West Breakwater: 1,140m, East Breakwater: 307m, width of entrance: appx.300m		
Channel	Width: 210 m., Minimum depth: 15.0 m. (HWS), Draft: 14.5 m, Western basin access channel max. draft: 12.9 m.		
Basin	Diameter 400 m., Minimum depth: 15.0 m. (HWS).		
Quay			
No	Length (m)	Depth (m)	Cargo
TEMSA	10.6	12.0	Coal, chemicals, petroleum products
Zeta	58.0	13.0	LPG
Cruise	75.0	13.0	Passengers
1-4	810	11.0	Containers, passengers, Ro-Ro, bulk grain, sugar, alcohol, chemicals, passengers, petroleum products
Container3	355	-	Containers

Source: JST by using Google Map
Source: Presentation at visit

Figure 6.2.2 Layout of Quetzal Port

Santo Tomas de Castilla



Port Waters			
Breakwater	-		
Channel	Length: 9,500 m, Width: 90.0 m, Depth: 11.0 m		
Basin	(Turning Basin), Total area: 67,640 m2, Depth: 8.50–9.75 m		
Quay			
No	Length(m)	Depth(m)	Cargo
1	153	9.8	Passenger, general, military
2	153	9.8	Passenger, general, military, Ro-Ro
3	153	9.8	Liquid bulk, container, Ro-Ro
4	153	9.8	Ro-Ro, container, general, multipurpose
5	153	9.8	Container, general, multipurpose, reefer, Ro-Ro
6	153	9.8	Petroleum products, chemicals, caustic soda, containers,

Source: JST by using Google Map

Figure 6.2.3 Layout of Santo Tomas de Castilla

Puerto Barrios



Port Waters			
Breakwater	-		
Channel	Depth: 9.75 m .		
Basin	-		
Quay			
No (NAME)	Length(m)	Depth(m)	Cargo
North side	200	9.5	Multipurpose
	70	9.5	Multipurpose
South side	288	9.5	Multipurpose

Source: JST by using Google Map

Figure 6.2.4 Layout of Puerto Barrios

b) El Salvador

Acajutla Port



Port Waters			
Breakwater	Length: over 500 feet		
Channel	entrance channel: over 15 m		
Basin	-		
Quay			
No (NAME)	Length(m)	Depth(m)	Cargo
A-1–2	321	9.0-10.0	Liquid bulk, solid bulk, general
B-3–4	318	9.0-10.0	Solid bulk, general
B-5–6	348	8.0-10.0	Solid bulk, general
C-7–8	280	12.0	Liquid bulk, solid bulk, general, containers

Source: JST by using Google Map

Figure 6.2.5 Layout of Acajutla

La Union Port



Port Waters			
	Outer channel: 20 km in length and 10m in depth at present Inner channel: 5 km in length and 7 m in depth at present		
Quay			
NAME	Length	Depth	Cargo
West	240	14.0	Breakbulk, containers, general, bulk liquids
East	340	14.0	Breakbulk, containers, general, bulk liquids
North	330	-	Port craft

Source: JST by using Google Map

Figure 6.2.6 Layout of Puerto La Union

c) Honduras

San Lorenzo Port



Port Waters			
Breakwater	-		
Channel	The approach channel is approx. 18 n.m. long and has depths of 9.0 m. (MLLW) and 10.6 m. (MHW) and is subject to silting.		
Basin	-		
Quay			
No	Length(m)	Depth(m)	Cargo
1	157.0	10.67	Multipurpose
2	139.0	10.67	Multipurpose
3	116.4	6.70	-
4	134.0	6.70	-

Source: JST by using Google Map

Figure 6.2.7 Layout of San Lorenzo

Puerto Cortes



Port Waters			
Breakwater	-		
Channel	North Length: 400 m, Depth: 14.0 m. (MLW)/Max draft 12.0m		
Basin	-		
Quay			
NAME	Length(m)	Depth(m)	Cargo
1	-	11.5	LPG, fuel oil, products
1A	-	9.7	Molasses, palm oil, chemicals
3A	195	11.5	Breakbulk, bulk, containers, products
3B	200	12.0	Breakbulk, bulk, containers, products
4	323	9.2	Breakbulk, bulk, containers
5	478	10.4	Containers, Ro-Ro
Cabotaje	121	-	Domestic

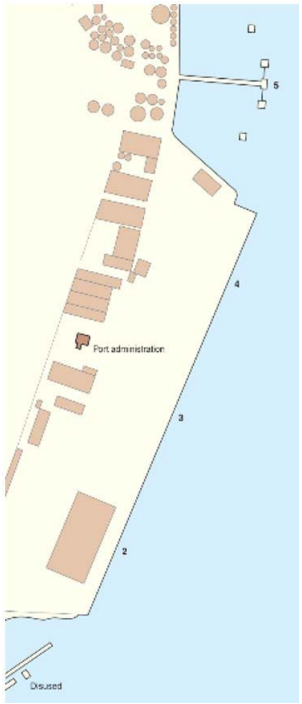
Source: JST by using Google Map

Figure 6.2.8 Layout of Puerto Cortes

d) Nicaragua

Corinto





Port Waters			
Breakwater	Channel to Pier Number 1: Length: 110m, Width: 10 m, Draft: 10.6 m, Channel to Pier Number 5: Length: 115 m		
Channel	Outer channel: Length: 3,300 m, Width 150 m, Depth 14.6 m. (MSL) Inner channel: Length: 2,780 m, Width: 115 m, Depth 13.35 m. (MSL)		
Basin	Turning basin 1,000 m 366 m. 13.35 m. (MSL)		
Quay			
NAME	Length(m)	Depth(m)	Cargo
1	-	-	Out of service
2-3	370	12.6	Breakbulk
4	240	13.252	Container
5	-	-	Tankers

Source: JST by using Google Map

Figure 6.2.9 Layout of Corinto

e) Costa Rica

Puerto Caldera



Port Waters			
Breakwater	new breakwater: 594 m		
Channel	Length: 4,630 m, , Depth: 13.0 m		
Basin	-		
Quay			
NAME	Length(m)	Depth(m)	Cargo
1	210	11.0	Containers, dry bulk, liquid bulk, passengers, general
2	150	10.0	Containers, dry bulk, liquid bulk, passengers, general
3	130	7.5	Dry bulk, liquid bulk, project
4	180	13.0	Containers, dry bulk, liquid bulk, general

Source: JST by using Google Map

Figure 6.2.10 Layout of Caldera

Limon・Moin



Port Waters					
Breakwater	-				
Channel	Depth: 18 m				
Basin	-				
Terminal					
Quay	NAME	Length(m)	Depth(m)	ApronW(m)	Cargo
	4-3	210	10.5	-	Project, containers
	4-2	210	9.5	-	Project, containers
	3-1	250	9.5	-	Ro-Ro
	3-2	250	9.5	-	Cruise, bulk
	3-3	250	10.5	-	Cruise, bulk

Source: JST by using Google Map

Figure 6.2.11 Layout of Limon



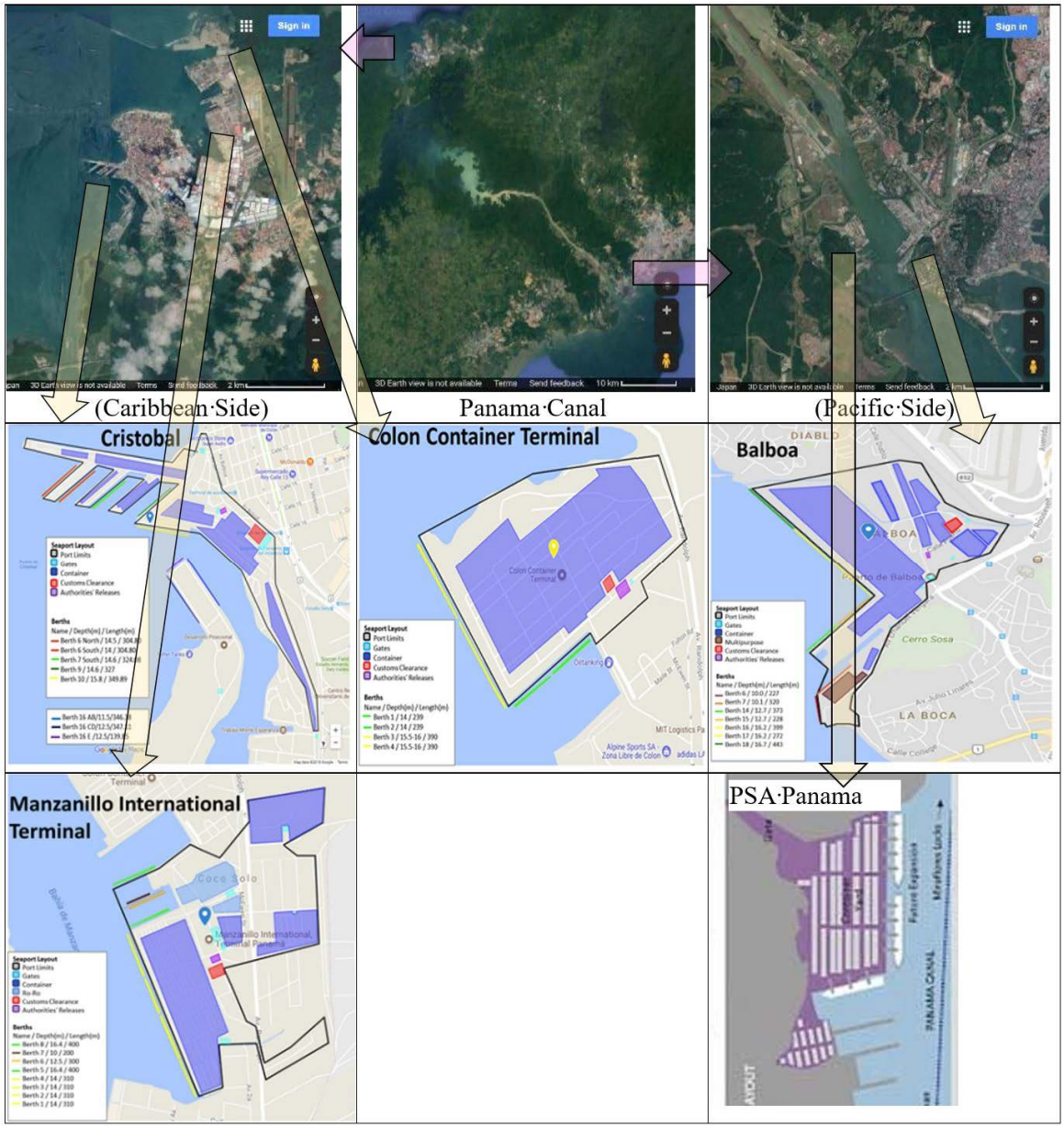
Port Waters				
Breakwater	-			
Channel	Approach channel 1,100 m (L)/200 m(W)/14.0 m(Max15.0 m) (D) Channel of APM 18 m (D)			
Basin	-			
Terminal				
Quay	NAME	Length(m)	Depth(m)	Cargo
	1-2	218	10.0-13.0	Products, LPG, Ro-Ro
	3-5	525	10.0-10.5	Containers, breakbulk
	6	250	11.0	Containers, breakbulk
	APM Terminal	650	14.5	Containers

Source: JST by using Google Map

Figure 6.2.12 Layout of Moin

f) Panama

Ports in the vicinity of the Panama Canal



Source: JST

Figure 6.2.13 Terminals Located near the Panama Canal

Table 6.2.1 Port Facilities of Ports along Panama Canal

Pacific

Balboa Port				
The Panama Canal approach channel		Depth: 12.92 m		
Quay	6 (length Depth)	226	10.3	Ro-Ro, breakbulk, bulk, products
	7	320	10.1	Ro-Ro, breakbulk, bulk, products
	8	143	6.9	Repairs
	13-15(PPC Ter.)	600	13.3	Containers, Ro-Ro, breakbulk
	16-18(PPC Ter.)	1,100	16.0	Containers
PSA Panama				
The Panama Canal approach channel		Depth: 12.92 m		
Quay	1AB (length Depth)	215	13.0	Products
	1CD	215	12.6	Products
	2AB	215	9.2	Products
	2CD	215	12.1	Products
	PPIT	340	14.5	Containers

Caribbean

Cristobal Port				
The Panama Canal approach channel		Length: 3,000 m, Draft: 13.5 m. Breakwater opening is 305 m. wide		
Quay	6 A-B (length Depth)	314	12.0	Containers
	6 C-D	314	12.5	Containers
	7 A-B	298	11.0	Containers
	7 C-D	305	14.0	Containers
	8 A-B	302	10.0	Containers
	8 C-D	308	11.0	Containers
	9 A-B	325	14.0	Containers
	10	350	14.0	Containers
	14	140	10.4	Repairs
	15	274	10.4	Repairs
	16 A-B	326	11.5	Dry bulk, breakbulk
	16 C-D	326	12.5	Dry bulk, breakbulk, LPG, bunkers
	17 A-B	270	12.5	Bunkers
	17 C-D	270	11.8	Bunkers
	AES Colon	420	10.2	LNG
CCT				
The Panama Canal approach channel		Length: 5,100 m, Depth: 14.0 m (MLW)		
Quay	1-2 (length Depth)	612	14.0	Containers, cruise
	3	370	16.0	Containers, cruise
	4	276	16.5	Containers, cruise
	North	200	5.0	Cruise, breakbulk
	South	390	10.6	Cruise, breakbulk
MIT				
Channel of Bahia Manzanillo		length: 600 m, Depth: 14.0 m (MLW), Length: 3,000 m, Entrance width: 200 m		
Quay	2-3 (length Depth)	400	14.0	Containers, Ro-Ro
	4	300	14.0	Containers
	5	300	14.0	Containers
	6	300	14.0	Containers
	7	300	14.0	Containers
	8	340	14.0	Containers
		400	16.5	Containers
	Ro-Ro	130	12.0	Breakbulk, Ro-Ro

Source: JST

Table 6.2.2 shows the volume by cargo type (average for the five years from 2014 to 2019) handled at these ports. Quetzal Port, Cortes Port and Limon/Moin Port handle more than 10 million tons of cargo per year. Container cargo is dominant at Balboa and Cristobal ports in Panama.

Table 6.2.2 Ports with Multiple Functions by Cargo Type

Means (2015-2019) Thousand ton	Containerized	General	Solid Bulk	Liquid Bulk	Ro-Ro	Others	Total
Guatemala							
Quetzal	3,357	975	6,693	1,128	63	78	12,294
SANTOCAS	3,623	474	2,497	1,553	0	0	8,148
Barrios	3,321	154	6	220	0	0	3,701
El Salvador							
Acajutla	1,457	347	2,064	678	21	6	4,573
Honduras							
San Lorenzo	158	147	180	697	7	47	1,236
Cortes	4,416	330	3,397	2,305	0	883	11,332
Castilla	691	2	0	323	0	165	1,181
Nicaragua							
Corinto	1,256	132	1,184	1,070	23	0	3,665
Costa Rica							
Caldera	2,015	532	2,331	24	73	0	4,976
Limón Moín	8,345	492	125	2,582	7	8	11,561
Panama							
Balboa	16,756	33	161	299	107	0	17,356
Cristobal	7,746	8	792	583	0	0	9,129

Note: ☐ On the Pacific Coast ☐ On the Caribbean Coast
Source: COCATRAM Statistics

(2) Guatemala

a) Location

There are four ports in Guatemala: Quetzal Port Company; National Port Company Santo Tomás de Castilla; National Port Company Champerico; and Puerto Barrios Railway Terminal. Three of them are trade ports: Quetzal Port is a gateway port on the Pacific coast; and Santo Tomas de Castilla Port and Barrios Port are located on the Caribbean coast (See Figure 7.3.2). In addition, Boyas San José Terminal is located next to Quetzal Port.



Boyas San José Terminal
Puerto Quetzal
Puerto Santo Tomas De Castilla
Puerto Barrios
Puerto Champerico

Note: Ports underlined are listed in COCATRAM statistics and the port activities of these ports are included data in (2).
Source: JST by using Google Map

Figure 6.2.14 Location of Main Ports of Guatemala

b) Port Activity

The cargo volume of each port is shown in Table 6.2.3. They are steadily increasing. Quetzal Port handles 13,485,000 tons which is 54% of the total cargo volume. Unloaded cargo volume exceeds loaded cargo volume at Quetzal Port. There is no significant difference in the amounts of loaded and unloaded cargo at the other ports.

Table 6.2.3 Cargo Volume of Main Ports of Guatemala

(Unit: 1000MT)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GUATEMALA	**14,274**	**13,741**	**13,511**	**14,944**	**16,232**	**16,718**	**18,588**	**21,802**	**23,426**	**23,518**	**24,511**	**24,371**	**24,886**
PUERTO QUETZAL													
Load	2,131	2,043	2,153	2,239	2,586	2,698	3,012	3,426	3,370	3,406	3,360	3,013	3,353
Unload	5,395	4,937	4,477	5,244	5,797	5,797	6,379	6,976	8,237	8,625	8,716	9,257	10,133
Total	**7,526**	**6,979**	**6,630**	**7,483**	**8,383**	**8,495**	**9,391**	**10,402**	**11,606**	**12,031**	**12,076**	**12,269**	**13,485**
PUERTO SANTO TOMAS DE CASTILLA													
Load	2,203	2,416	2,294	2,444	2,703	2,860	3,449	5,376	5,667	5,232	5,653	4,866	4,095
Unload	2,511	2,261	2,075	2,301	2,546	2,635	2,498	2,695	2,654	2,800	3,125	3,206	3,442
Total	**4,714**	**4,677**	**4,369**	**4,745**	**5,249**	**5,495**	**5,947**	**8,071**	**8,321**	**8,031**	**8,778**	**8,072**	**7,537**
PUERTO BARRIOS	2,035	2,085	2,512	2,715	2,600	2,729	3,250	3,330	3,498	3,456	3,657	4,030	3,864
Load	1,061	1,103	1,475	1,386	1,384	1,475	1,810	1,821	1,991	1,953	2,054	2,107	1,997
Unload	974	982	1,037	1,329	1,216	1,254	1,440	1,509	1,508	1,503	1,604	1,922	1,867
Total	**2,035**	**2,085**	**2,512**	**2,715**	**2,600**	**2,729**	**3,250**	**3,330**	**3,498**	**3,456**	**3,657**	**4,030**	**3,864**

Note: Main Ports in this table means ports with multiple functions.
Source: JST based on COCATRAM Statistics

c) Main Ports

Quetzal Port

The port is composed of a container terminal, a multi-purpose terminal and a liquid bulk terminal. The approach channel is 14.5m in depth and 210 m in width. The diameter of the turning basin is 400m with 15 m in depth. Maximum depth of quays is 13.0m and the total length is 1,165m.

Santo Tomas de Castilla

The port is composed of a multi-purpose terminal and a liquid bulk terminal. The approach channel is 9.5

km in length, 11.0m in depth and 90 m in width. Maximum depth of quays is 9.8m and the total berth length (six berths) is 918m.

Puerto Barrios

The port is composed of I shape pier and a container yard. The same approach channel as SANTOCAS port is used. Maximum depth of quays is 9.5m and the total berth length (three berths) is 558m.

(3) El Salvador

a) Location

El Salvador faces only the Pacific Ocean. Puerto Acajutla, Terminal Boyas Alba Petróleo, Terminal Boyas Cenergica, Terminal Boyas Rasa and Puerto Libertado are located on the Pacific coast. Puerto Corsain and Puerto La Unión are located in Fonseca Bay. Puerto Acajutla is a main port of El Salvador at which container vessels call at present. Puerto La Union was developed in the Eastern Region of El Salvador and is expected to be a full-fledged international port (See Figure 6.2.15).

Puerto Acajutla is 88 km away from San Salvador via CA8. It takes about 2 hours by road. Puerto La Union is located 185 km away from San Salvador via CA2. It takes about 3 hours by road.



Note: Ports underlined are listed in COCATRAM statistics and the port activities of these ports are included data in (2).
Source: JST by using Google Map

Figure 6.2.15 Location of Main Ports of El Salvador

b) Port Activity

The cargo volume of Puerto Acajutla is shown in Table 6.2.4. It is steadily increasing. Unloaded cargo volume is about four times the loaded cargo volume in 2019. Regarding Puerto La Union, container cargo was handled in 2012. Only a few bulk vessels have called in recent years.

Table 6.2.4 Cargo Volume of Acajutla Port

(Unit: 1000MT)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Load	1,068	1,208	980	1,196	630	797	1,210	1,090	1,180	1,024	1,141	1,011	1,048
Unload	4,896	4,648	3,850	4,147	2,403	2,280	2,291	2,906	3,175	3,434	3,405	3,576	3,869
Total	**5,964**	**5,857**	**4,830**	**5,343**	**3,034**	**3,076**	**3,501**	**3,996**	**4,355**	**4,458**	**4,546**	**4,587**	**4,916**

Source: JST based on COCATRAM Statistics

c) Main Port

Acajutla Port

The port is a finger type terminal with land areas connected by a trestle. The port faces the Pacific Ocean and vessels can approach a quay directly. Maximum depth of quays is 12.0 m and the total berth length (eight berths) is 1,267 m.

La Union Port

The port is a reclaimed type terminal with a multi-purpose terminal, a container terminal and a passenger terminal. The outer approach channel is 20 km in length and 10m in depth at present, and the inner channel is 5 km in length and 7 m in depth at present. Maximum design depth of quays is 14.0m and the total berth length (spanning three berths) is 910m.

(4) Honduras

a) Locations

On the Pacific Ocean side, Puerto Amapala, Puerto San Lorenzo and El Guapinol are located in the bay of Fonseca. On the Caribbean side, Omoa, Puerto Cortes, Puerto Tela, La Ceiba, Puerto Castilla, Brus Laguna and Puerto Lempira are located on the Caribbean coast. Small ports are found on Utila, Roatan and Guanaja Islands offshore of La Ceiba (See Figure 6.2.16).

Puerto Sa Lorenzo is 120 km away from the capital city, Tegcigalpa via CA5 and 360 km away from the economic center city, San Pedro Sula via CA5. It takes about 2 hours and 7 hours by road. Puerto Cortes is 400 km away from Tegcigalpa via CA5 and 79 km away from San Pedro Sula via CA13. It takes about 6 hours and 2 hours by road. Puerto Castilla is 415 km away from Tegcigalpa via RN15, RN39 and 390 km away from San Pedro Sula via CA13. It takes about 6 hours and 7 hours by road.



Note: Ports underlined are listed in COCATRAM statistics
Source: JST by using Google Map

Figure 6.2.16 Location of Main Ports of Honduras

b) Port Activity

Cargo volumes of main ports are shown in Table 6.2.5. Cargo volume of Puerto Cortes has been steadily increasing, reaching 11,556 thousand tons in 2019. That of Puerto San Lorenzo increased until 2013 but decreased in 2014. It has been almost flat, ranging from 1,100 to 1,300 thousand tons, in recent years. That of Puerto Castilla has also decreased since 2014 and the annual handling volume in recent years is about 1,100 thousand tons. Puerto Cortes handles more than 80 % of total cargo.

Table 6.2.5 Cargo Volume of Main Ports of Honduras

(Unit: 1000MT)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
HONDURAS	**9,666**	**10,259**	**9,127**	**10,275**	**11,821**	**12,790**	**13,841**	**13,677**	**13,538**	**13,537**	**13,803**	**13,835**	**14,032**
PUERTO SAN LORENZO													
Load	142	123	112	360	822	1,508	1,889	745	215	225	269	213	195
Unload	761	793	807	815	829	880	888	869	971	923	1,061	968	1,140
Total	903	916	918	1,174	1,651	2,388	2,776	1,615	1,186	1,149	1,329	1,181	1,335
PUERTO CORTES													
Load	2,499	2,779	2,462	2,904	3,433	3,501	3,834	4,245	4,135	4,032	4,077	3,852	3,933
Unload	5,512	5,748	4,904	5,479	5,930	6,057	6,169	6,364	7,057	7,136	7,162	7,651	7,622
Total	**8,011**	**8,527**	**7,366**	**8,383**	**9,364**	**9,558**	**10,004**	**10,609**	**11,193**	**11,168**	**11,240**	**11,503**	**11,556**
PUERTO CASTILLA													
Load	547	576	583	509	586	615	850	1,233	877	927	928	912	890
Unload	206	239	259	209	220	228	211	220	282	293	306	239	252
Total	**753**	**815**	**842**	**718**	**806**	**843**	**1,061**	**1,453**	**1,159**	**1,220**	**1,234**	**1,151**	**1,141**

Note: Main Ports in this table means ports with multiple functions.
Source: JST based on COCATRAM Statistics

c) Main Ports

San Lorenzo Port

The port is a T type pier with land areas connected by a trestle. The approach channel is 33 km in length and 9 m in depth. Maximum depth of quays is 10.67m and the total berth length (spanning four berths) is 550m.

Puerto Cortes

The port is composed of a multipurpose terminal and a bulk terminal. The approach channel is 33 km in length and 9 m in depth. Maximum depth of quays is 10.67m and the total berth length (spanning five berths) is 550m.

(5) Nicaragua

a) Location

Puerto Corinto、Puerto Sandino and Puerto San Juan del Sur are located on the Pacific coast. Muelle de Potosi, Muelle Sta. Julia, Muelle Puerto Morazanand Muelle Los Loriosare located in the bay of Fonseca. Puerto Cabezas and Puerto Bluff-Bluefields are located on the Caribbean coast and Puerto El Rama (Arlen Siú Port) is located 80 km upstream of the Escondido River. In addition, Puerto Patricia Argello Ryan, Puerto Carlos Fonseca and Puerto Salvador Allenda are found in Managua Lake and Puerto Granada, Puerto San Jorge, Moyogalpa, Altagracia, Morrito, San Miguelitoand San Carlos are found in Nicaragua Lake (See Figure 6.2.17).

Puerto Corinto is a main port of Nicaragua. It is 160 km away from Managua via NIC28. It takes about 2.5 hours by road.



Sea Port		
	Pacific Coast	
		Puerto Corinto
		Puerto Sandino
		Puerto San Juan del Sur
	Fonseca Bay	
		Muelle de Potosi, Muelle Sta. Julia, Muelle Puerto Morazan, Muelle Los Lorios
	Caribbean Coast	
		Puerto Cabezas.
		Puerto Bluff-Bluefields
River Port		
	Escondido River	
		Arlen Siú Port (El Rama)
Lake Port		
	Lake Cocibolca	
		Puerto Granada, Puerto San Jorge, Moyogalpa, Altagracia, Morrito, San Miguelito, San Carlos
	Lake Xolotlán	
		Puerto Patricia Argello Ryan, Puerto Carlos Fonseca, Puerto Salvador Allenda

Note: Ports underlined are listed in COCATRAM statistics and the port activities of these ports are included data in (2).
Source: JST by using Google Map

Figure 6.2.17 Location of Main Ports of Nicaragua

b) Port Activity

Almost all cargo is handled at Puerto Corinto. The handling volume has been increasing in recent years, reaching 4,067 thousand tons in 2019 (Table 6.2.6).

Table 6.2.6 Cargo Volume of Puerto Corinto in Nicaragua

(Unit: 1000MT)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Load	482	442	466	667	631	689	827	1,027	965	1,005	1,248	1,361	1,406
Unload	1,502	1,476	1,482	1,424	1,807	2,014	1,858	1,922	2,290	2,579	2,559	2,252	2,662
Total	**1,984**	**1,918**	**1,948**	**2,091**	**2,438**	**2,702**	**2,686**	**2,950**	**3,256**	**3,584**	**3,808**	**3,612**	**4,067**

Source: JST based on COCATRAM Statistics

c) Main Port

Corinto

The port is composed of a multipurpose terminal and a liquid bulk terminal. The outer channel is 3.3 km in length, 150 m in width and 14.6 m in depth and the inner channel is 2.8 km in length, 115m in width and 13.35 m in depth. Maximum depth of quays is 10.67m and the total berth length (spanning three berths) is 610m.

(6) Costa Rica

a) Location

Puerto Puntamorales、Puerto Puntarenas、Terminal Fertica、Puerto Caldera、Barrio El Carmen、Playa Naranjo and Paquera are located in Nicoya Bay. Puerto Golfito and Puerto Jiménez are located in a bay near the border with Panama. Cuajiniqui is located on the Pacific coast near the border with Nicaragua. Limon Puerto Lion and Moin is located on the Caribbean coast (See Figure 6.2.18).

Puerto Caldera and Puerto Lion/Moin are main ports which handle containers in Costa Rica. APM container terminal was developed near the existing Puerto Moin. Puerto Caldera is 80 km away from San Jose via R27. It takes about 1.5 hours by road. Puerto Limon/Moin is about 160 km away from San Jose via R32.



Puerto Puntamorales
Puerto Puntarenas,
Terminal Fertica
Puerto Caldera
Puerto Quepos
Puerto Golfito
Barrio El Carmen
Playa Naranjo
Paquera
Puerto Jiménez
Cuajiniquil
Moín Container Terminal/APMs
Complejo Portuario Limón Moín

Note: Ports underlined (the location is shown in the map) are listed in COCATRAM statistics and the port activities of these ports are included data in (2).
Source: Google Map

Figure 6.2.18 Location of Main Ports of Costa Rica

b) Port Activity

Cargo volumes of main ports are shown in Table 6.2.7. Cargo volume of Puerto Caldera in 2019 is smaller than in 2018. However, cargo volume has shown an increasing tendency in recent years. The cargo volume of Puerto Moin is small but the data may not be accurate. Cargo volume on the Caribbean coast also shows an increasing tendency.

Table 6.2.7 Cargo Volume of Main Ports of Costa Rica

(Unit: 1000MT)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
PUERTO CALDERA													
Load	368	432	450	509	629	700	699	782	689	817	1,050	959	862
Unload	2,974	3,033	2,440	2,766	3,264	3,241	3,279	3,504	3,731	4,068	4,168	4,363	4,171
Total	**3,342**	**3,465**	**2,890**	**3,275**	**3,893**	**3,941**	**3,979**	**4,286**	**4,421**	**4,885**	**5,218**	**5,321**	**5,033**
LIMÓN MOÍN PORT													
Load	5,192	5,112	4,724	5,336	5,535	5,769	6,009	6,167	5,651	6,316	6,210	6,576	1,453
Unload	4,739	4,992	4,242	4,607	4,461	4,556	4,502	4,645	4,826	5,120	5,325	5,180	5,369
Total	**9,931**	**10,104**	**8,966**	**9,943**	**9,996**	**10,326**	**10,511**	**10,813**	**10,477**	**11,436**	**11,536**	**11,756**	**6,823**

Note: Main Ports in this table means ports with multiple functions.
Source: JST based on COCATRAM Statistics

c) Main Ports

Puerto Caldera

The port is composed of a multipurpose terminal and a solid bulk terminal. The approach channel is 4.6 km in length, 400m in width and 13 m (MLW) in depth. Maximum depth of quays is 12.0m and the total berth length (spanning five berths) is 670m.

Limon / Moin

Limon port is composed of a reclaimed-type terminal and piers. Maximum depth of quays is 10.5m and the total length of five berths is 1,170 m. The existing Moin port is composed of a marginal type reclaimed and an oil receiving pier. The approach channel is 1.1 km in length, 200m in width and 14 m in depth. Maximum depth of quays is 13.0m and the total length of six berths is 1,000m. Regarding APM terminal, maximum depth of the approach channel is 18 m, maximum depth and total length of quays are 14.5 m and 650m.

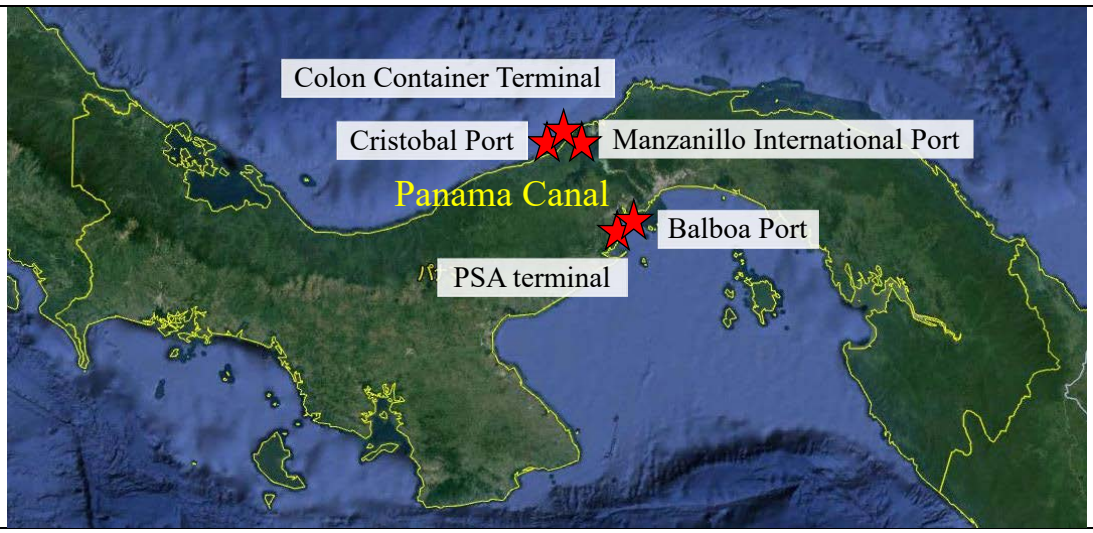
(7) Panama

a) Location

Ports in Panama are divided into ports and terminals located near the entrance of the Panama Canal and other ports/terminals.

Balboa Port and PSA Container Terminal are located near the Pacific side entrance of the Panama Canal. On the other hand, Cristobal Port, Manzanillo International Terminal and Colon Container Terminal are located near the Caribbean side entrance. The main function of these ports is the international transshipment of containers. The distance between the Pacific coast and the Caribbean coast is about 60 km and container boxes are transported via motorways and railroads.

There are many ports and terminals in other areas of the county. Panama products are exported and consumer goods are imported through the ports. There are many facilities for oil handling (see Figure 6.2.19).



Pedregal, Armuelles, PTP Charco Azul, Mutis, Mensabé, Boca Parita, Aguadulce, Taboga, Puerto de Panamá (Muelle Fiscal), Puerto de Panamá (Mercado del Marisco), Coquira, Balboa, Vacamonte, Terminal DECAL, Taboguilla, PetroAmerica Terminal, S.A. (PATSA) Rodman, Fuerte Amador Resort y Marina, S. A., PSA Panama International Terminal, Melones Oil Terminal,Inc., La Palma, Terminal Samba Bonita, Cristobal, Colón Port Terminal (CPT), Terminal Petrolera Bahía Las Minas (Refineria Panamá), Manzanillo International Terminal (MIT), Colón 2000 Terminal Cruceros, Telfer Tanks, Colon Oil and Service S.A., Isla Bocas, Chiriquí Grande (Muelle Fiscal), Almirante, PTP (Rambala) Chiriquí Grande, Bocas Fruit Co. Almirante, Shelter Bay Marine, Puerto Punta Rincon, Coral Minera, Payard Terminal Company, Termini Financing Group

Note: Ports underlined are listed in COCATRAM statistics and the port activities of these ports are included data in (2).
Source: JST by using Google Map

Figure 6.2.19 Location of Main Ports of Panama

b) Port Activity

Cargo volumes of main container terminals are shown n Table 6.2.8. Container throughputs of Balboa. Cristobal and CCT decreased in 2018 and 2019. On the other hand, those of MIT and PSA Terminal steadily increased.

Table 6.2.8 Cargo Volume of Each Terminal

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
PANAMA	31,331	33,320	32,437	39,954	48,028	48,642	47,298	48,222	47,351	43,947	47,776	48,738	50,706
PSA PANAMA INTERNATIONAL TERMINAL						343	1,123	1,668	1,401	1,252	628	4,261	6,784
Load						117	504	750	579	531	304	1,999	3,187
Unload						226	619	918	821	721	324	2,262	3,597
PANAMA PORT COMPANY-BALBOA	15,038	15,726	15,525	20,138	23,719	24,130	22,242	22,937	21,248	19,790	19,325	13,530	12,884
Load	5,928	6,424	6,932	8,843	10,290	10,357	9,684	9,720	8,872	8,081	8,559	6,498	6,038
Unload	9,110	9,302	8,593	11,295	13,428	13,773	12,559	13,218	12,376	11,709	10,766	7,033	6,846
PANAMA PORT COMPANY-CRISTOBAL	2,564	3,045	4,502	5,647	7,729	6,041	6,292	6,230	7,469	7,349	11,298	10,737	8,794
Load	1,220	1,538	1,874	2,920	4,320	3,241	2,970	2,968	3,512	3,089	5,105	4,977	4,336
Unload	1,345	1,507	2,628	2,728	3,408	2,800	3,323	3,262	3,957	4,260	6,193	5,760	4,458
MANZANILLO INTERNATIONAL TERMINAL	8,558	10,320	9,448	10,809	13,307	13,983	13,836	14,316	12,559	11,776	12,347	15,234	17,998
Load	4,477	5,748	4,931	5,397	6,710	7,245	7,270	7,542	6,880	6,430	6,329	7,802	9,355
Unload	4,081	4,572	4,516	5,411	6,597	6,738	6,566	6,774	5,678	5,346	6,018	7,432	8,643
COLON CONTAINER TERMINAL	5,170	4,230	2,962	3,360	3,274	4,145	3,805	3,071	4,674	3,780	4,178	4,976	4,245
Load	4,111	3,539	2,495	2,622	2,627	3,317	2,977	2,212	2,026	1,595	1,661	2,143	1,753
Unload	1,059	691	467	738	646	828	828	860	2,649	2,185	2,516	2,833	2,492

Source: JST (based on COCATRAM Statistics)

c) Port Facility

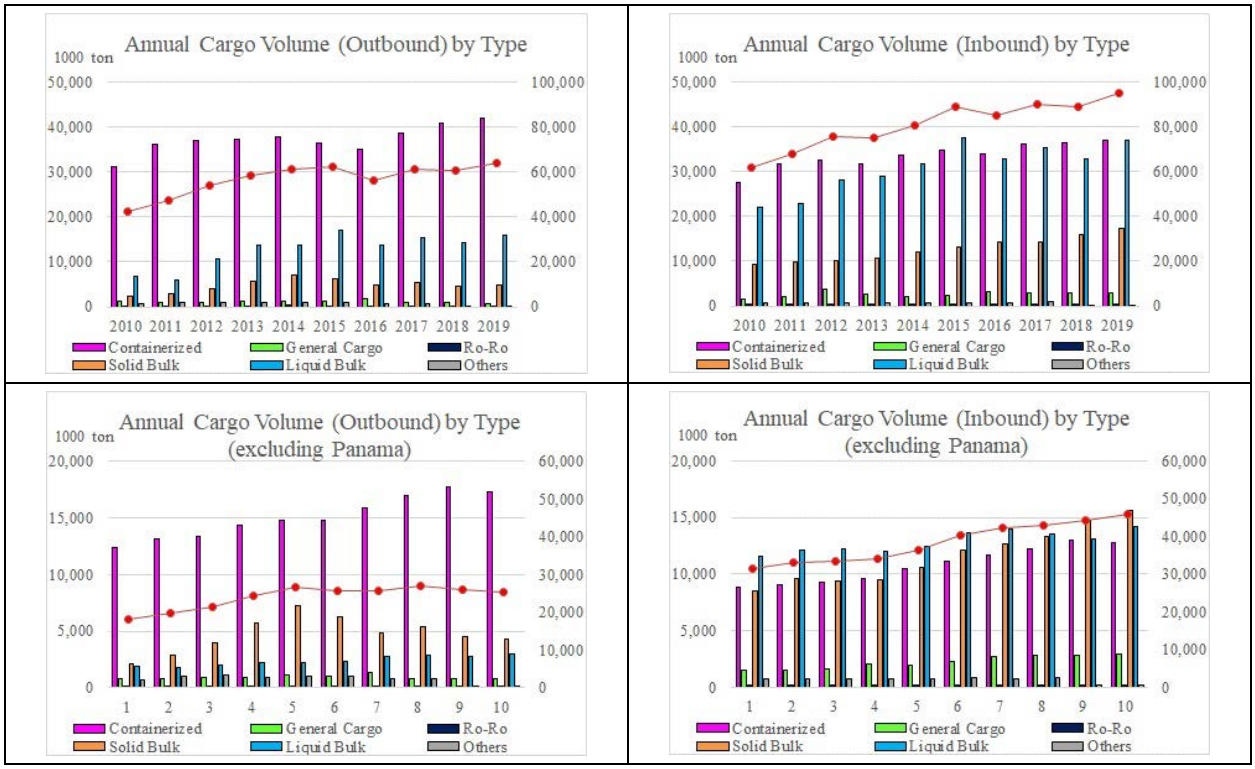
The maximum water depth of the ports and terminals on the Pacific side is 16.0m at Balboa Port Container Wharf, the total number of berths is 14, and the total length of the quay is 3,589m. The maximum water depth of ports and terminals on the Caribbean side is 16.5 m for CCT and MIT container terminals, the total number of berths is 28, and the total length of the quay is 8,860m.

6.2.2 Maritime Transport

(1) Seaborne Cargo in Central America

a) Cargo Volume Trends

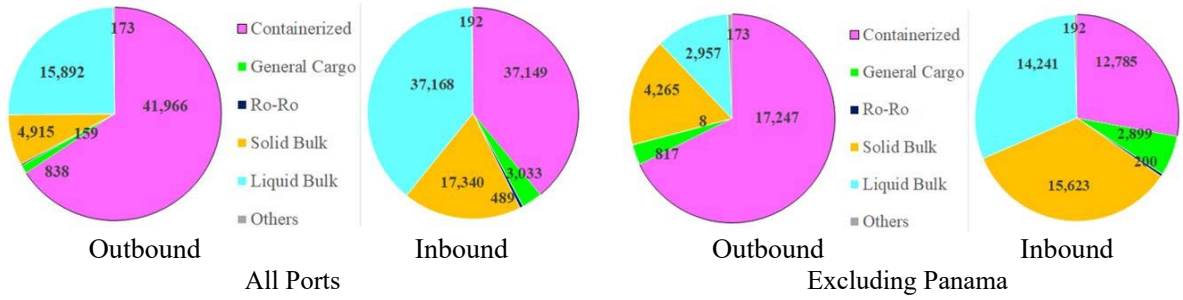
Cargo volume trends by type of cargo handled at the ports in Central American countries are shown in Figure 6.2.20 and Figure 6.2.21. Both loaded and unloaded cargo volumes have been increasing in a recent ten-year period. Volume and increasing rate of unloaded cargo is larger than those of loaded cargo. This situation has not changed in these ten years.



Note: ton means MT (metric ton)
Source: COCATRAM

Figure 6.2.20 Trend of Seaborne Cargo Volume

Cargo volume by cargo type which is loaded and unloaded at the ports in 2019 is shown in Figure 6.2.21. Containerized cargo accounts for the largest share of both unloaded cargo and loaded cargo followed by liquid bulk cargo. Unloaded volume of containerized cargo is almost the same as that of liquid bulk cargo.



Note: ton means MT (metric ton)
Source: COCATRAM

Figure 6.2.21 Cargo Volume by Type

b) Cargo by Coast

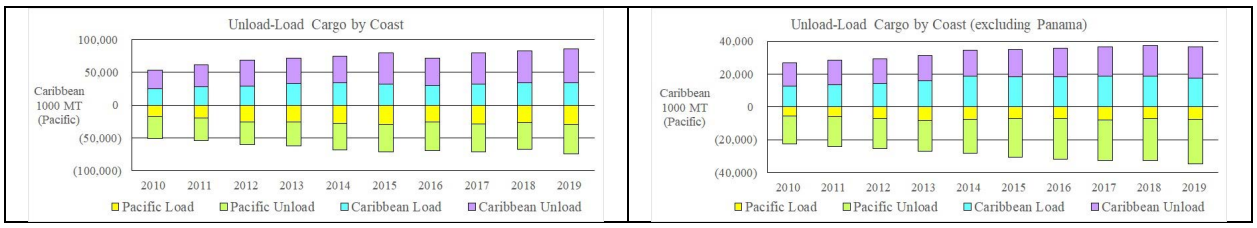
Cargo volumes handled at ports on the Pacific coast and Caribbean coast of Central America in 2017, 2018 and 2019 are shown in Table 6.2.9. The cargo volume in 2019 was 159,315,000 tons. Forty-five (45) % of the total volume is loaded or unloaded at ports on the Pacific coast and 55% at ports on the Caribbean coast. The volume of unloaded cargo is larger than that of loaded cargo on both coasts. In 2018, both loading and unloading cargo volume decreased compared to 2017, but both recovered in 2019.

Figure 6.2.22 shows the trend over the last 10 years. Cargo handling trends have remained unchanged during this period.

Table 6.2.9 Handling Cargo at Ports in Central America

Load (MT)	Unload	2017	(1000MT)		2018	(1000MT)		2019	(1000MT)
	Load	**Unload**	**Total**	**Load**	**Unload**	**Total**	**Load**	**Unload**	**Total**
Pacific	29,068	42,604	71,672	26,779	40,713	67,492	29,652	44,334	73,985
Caribbean	32,484	47,619	80,103	34,193	48,239	82,433	34,292	51,038	85,330
Total	**61,552**	**90,223**	**151,775**	**60,973**	**88,952**	**149,925**	**63,943**	**95,372**	**159,315**
<Excluding Ports in Panama>									
(MT)	Load	Unload	Total	Load	Unload	Total	Load	Unload	Total
Pacific	7,876	24,959	32,835	7,267	25,422	32,689	7,719	27,047	34,766
Caribbean	18,948	17,886	36,834	18,663	18,630	37,293	17,748	18,892	36,640
Total	**26,824**	**42,846**	**69,669**	**25,930**	**44,052**	**69,982**	**25,467**	**45,939**	**71,406**

Source: JST based on Statistics of COCATRAM

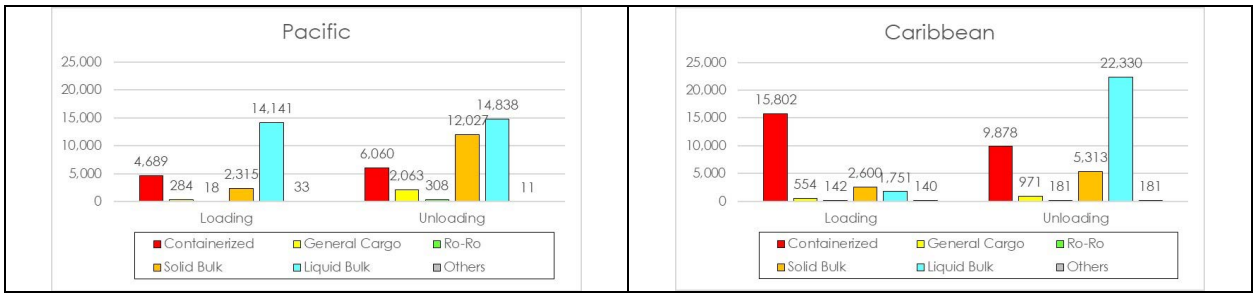


Source: JST based on Statistics of COCATRAM

Figure 6.2.22 Unloaded and Loaded Cargo by Coast

c) Cargo Type

Cargo volume by type handled at ports on each coast is shown in Figure 6.2.23. On the Pacific coast, volume of liquid bulk cargo is dominant in both loading and unloading. Volume of unloaded solid bulk cargo is large but that of loaded cargo is small. On the Caribbean coast, volume of unloaded liquid bulk cargo is large but that of loaded cargo is small. Regarding containerized cargo, loaded volume is larger than unloaded volume.



Note: Unit/ 1000 MT
Source: JST based on data of 2019 in Statistics of COCATRAM

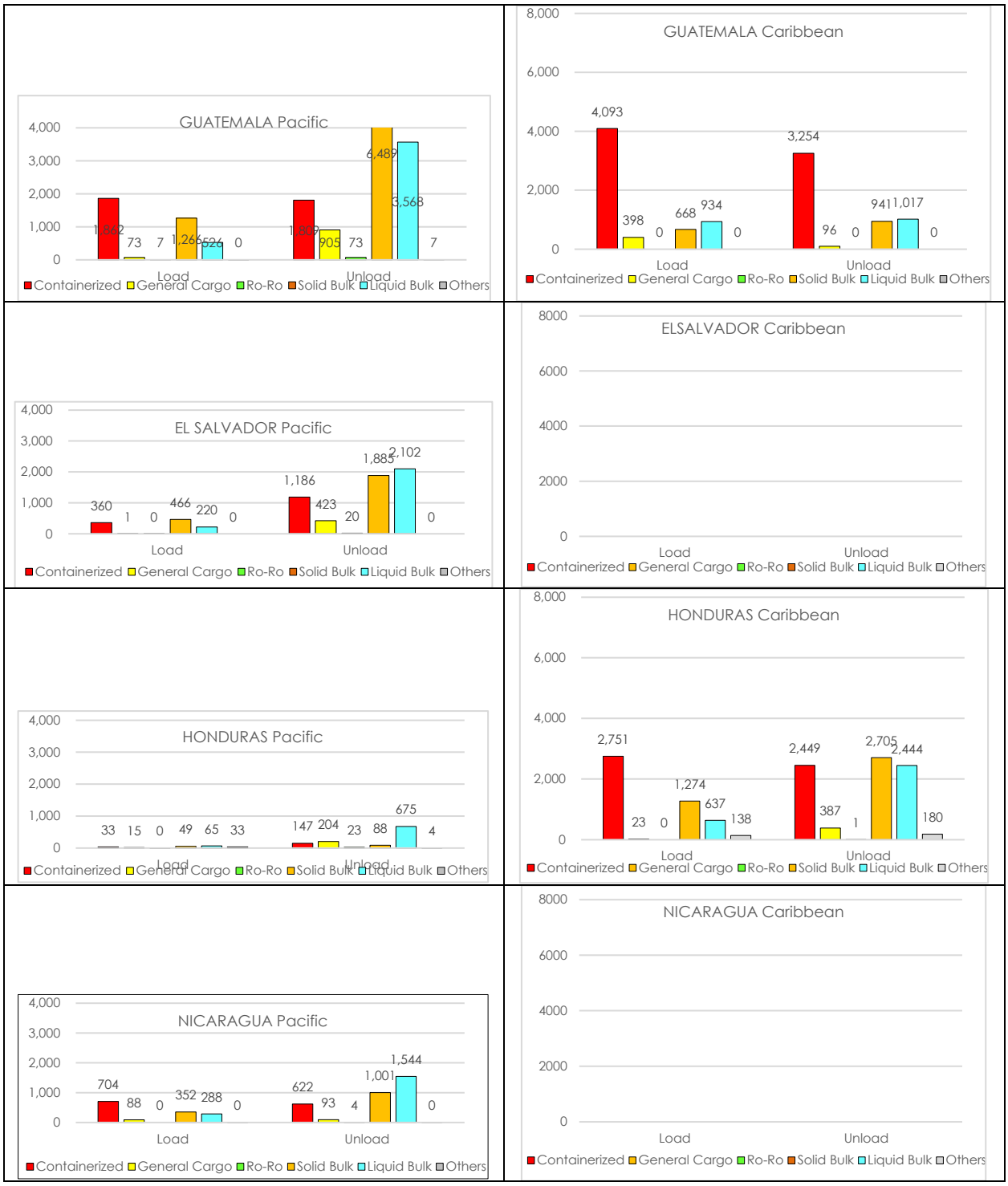
Figure 6.2.23 Cargo Volume by Cargo Type (Except for Transshipment in Panama)

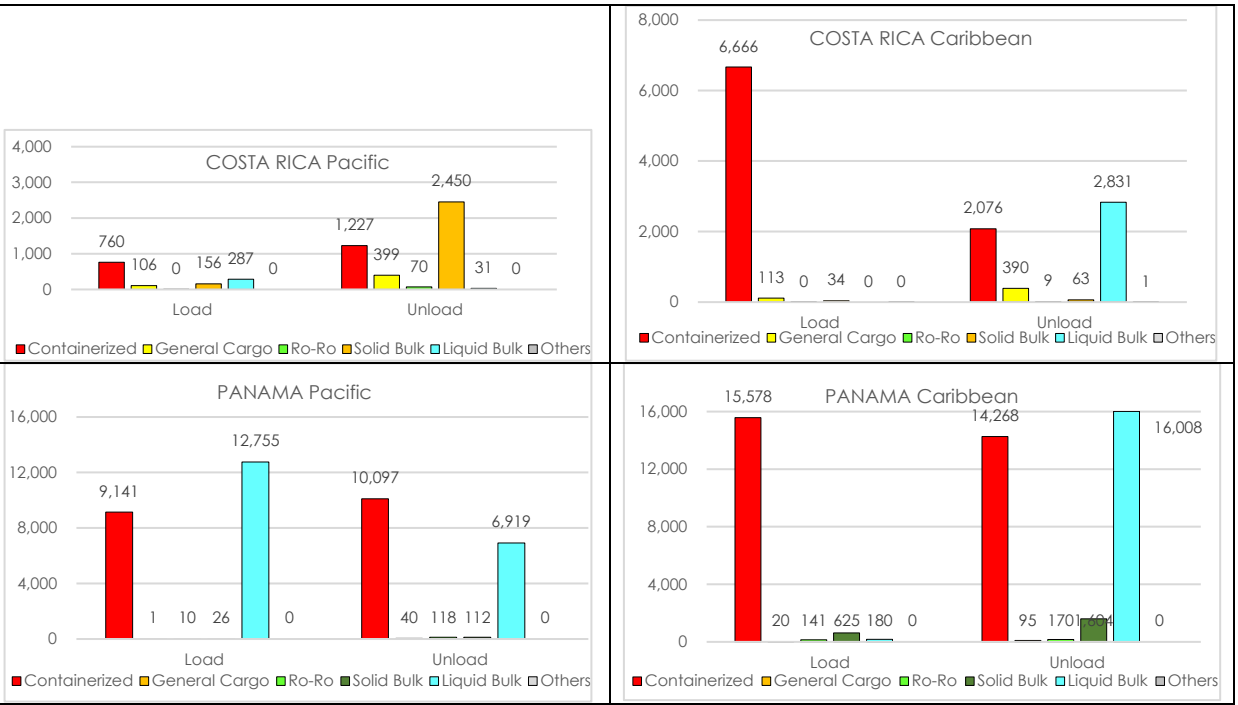
d) Cargo by Country

In Guatemala, cargo volume except containerized cargo on the Pacific coast exceeds that on the Caribbean coast. In Honduras, cargo volume on the Caribbean coast exceeds that on the Pacific coast (See Figure 6.2.24). In Nicaragua, cargo volume on the Pacific coast exceeds that on the Caribbean coast. In Costa Rica, large volumes of containerized cargo and liquid bulk cargo are loaded onto ships. In Panama, large volumes of containerized cargo are handled on both coasts while large volumes of liquid bulk cargo are handled on the Caribbean coast. Large volumes of liquid bulk cargo are unloaded on the Pacific coast. Containerized cargo volume on the Caribbean coat exceeds that on the Pacific coast in every country. El Salvador does not face the Caribbean Sea and thus all cargo is handled on the Pacific coast.

On the Pacific coast, unloaded and loaded containerized cargo volumes are almost the same but in other countries except Panama unloaded cargo volumes are larger than loaded volumes. Many solid and liquid bulk cargoes are unloaded at the ports in the northern region. A certain amount of liquid bulk is unloaded in Nicaragua, and a certain amount of solid bulk cargo is unloaded in Costa Rica.

On the Caribbean coast of Costa Rica, the loading volume of containerized cargo is more than three times the loading volume. A large amount of liquid bulk is unloaded in Costa Rica and Panama. In Honduras, a certain amount of solid bulk cargo is loaded.





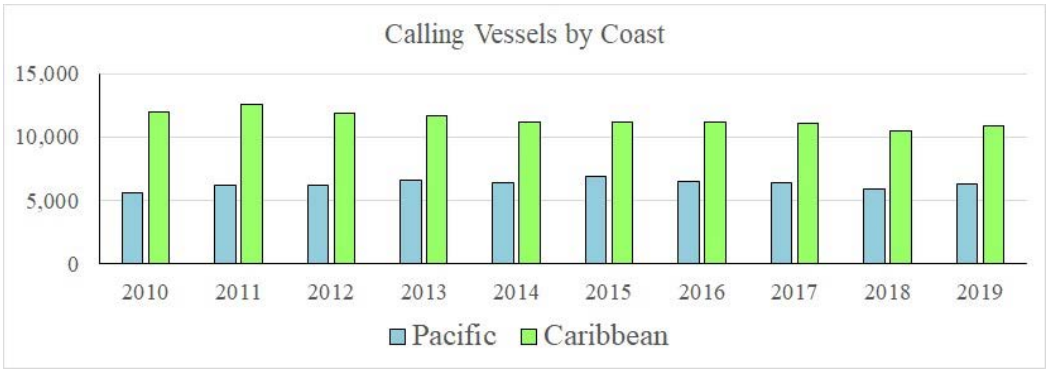
Note: Some data are over the scale. Unit/ 1000 MT
Source: JST based on data of 2019 in Statistics of COCATRAM

Figure 6.2.24 Cargo Volume by Cargo Type and Coast in Each Country

(2) Vessels

a) Trends of Ship Calls

About 70% of the vessels calling at ports in Central America are on the Caribbean side and about 30% on the Pacific side as shown in Figure 6.2.25. Over the last decade, it has been flat on the Pacific side and declining on the Caribbean side.

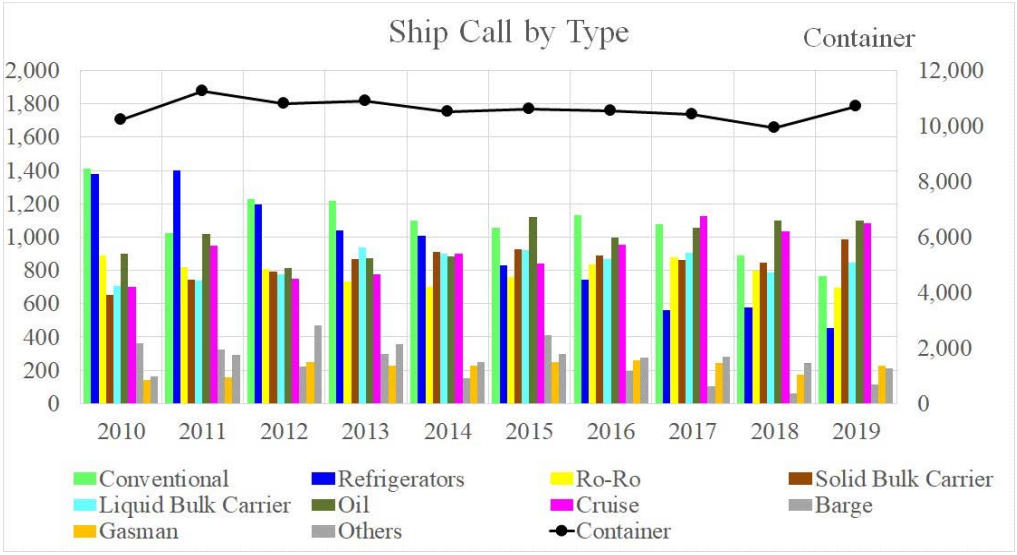


Source: COCATRAM

Figure 6.2.25 Calling Vessels by Coast

b) Type of Ships

Container vessels are the predominant ship type as more than 10,000 container ships called at ports in the Central American countries in 2019 (see Figure 6.2.26). Oil carriers, cruise ships, solid bulk carriers, liquid bulk carriers, and miscellaneous vessels also called in lesser numbers. In the last 10 years, the number of refrigerated ships has decreased significantly to about 1/3, and the number of conventional ships has also decreased. On the other hand, the number of cruise ships is increasing.



Source: COCATRAM

Figure 6.2.26 Ship Call by Type

A total of 6,338 vessels called on the Pacific side in 2019 while 10,860 vessels called on the Caribbean side. Compared to 2010, the number of calling vessels on the Pacific side has increased but the that on the Caribbean side has decreased. Total number has increased. Container vessels, solid bulk carriers, oil tankers and cruise vessels have increased while conventional vessels, RORO vessels, refrigerated vessels, and barges have decreased. In particular, the number of refrigerating vessels has decreased to about 1/3 of previous levels. On the Caribbean side, the number of container vessels is increasing, conventional vessels and refrigerating vessels have decreased, and on the Pacific side, refrigerating vessels are decreasing while bulk vessels have increased. (See Table 6.2.10)

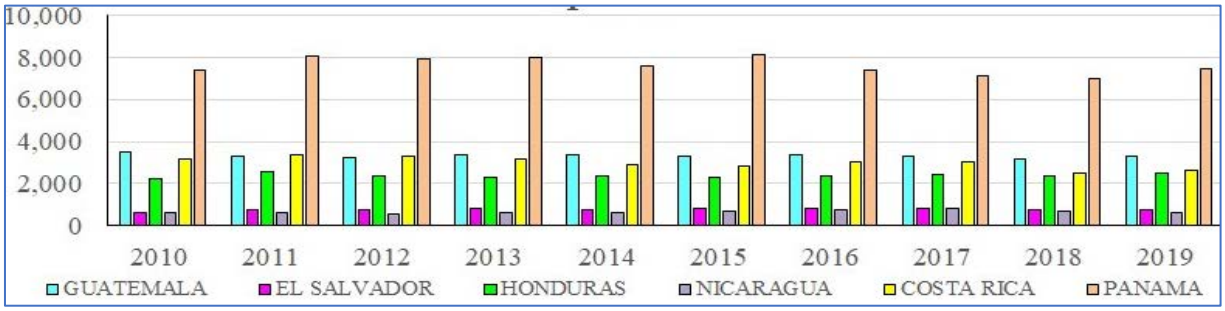
Table 6.2.10 Type of Calling Vessel

	2019						2010					
	Pacific				Caribbean				Total			
Container	3,119	49.21%	7,599	69.97%	10,718	62.32%	3,036	54.39%	7,195	60.19%	10,231	58.34%
Conventional	294	4.64%	470	4.33%	764	4.44%	292	5.23%	1119	9.36%	1,411	8.05%
Refrigerators	55	0.87%	398	3.66%	453	2.63%	238	4.26%	1139	9.53%	1377	7.85%
Ro-Ro	434	6.85%	260	2.39%	694	4.04%	314	5.63%	577	4.83%	891	5.08%
Solid Bulk Carrier	657	10.37%	329	3.03%	986	5.73%	444	7.95%	209	1.75%	653	3.72%
Liquid Bulk Carrier	504	7.95%	343	3.16%	847	4.92%	360	6.45%	347	2.90%	707	4.03%
Oil	648	10.22%	452	4.16%	1,100	6.40%	486	8.71%	413	3.45%	899	5.13%
Cruise	398	6.28%	686	6.32%	1084	6.30%	276	4.94%	427	3.57%	703	4.01%
Barge	102	1.61%	13	0.12%	115	0.67%	28	0.50%	333	2.79%	361	2.06%
Gasman	24	0.38%	203	1.87%	227	1.32%	7	0.13%	133	1.11%	140	0.80%
Others	103	1.63%	107	0.99%	210	1.22%	101	1.81%	62	0.52%	163	0.93%
Total	6338	100.00%	10,860	100.00%	17,198	100.00%	5,582	100.00%	11,954	100.00%	17,536	100.00%

Source: JST based on data of 2019 in Statistics of COCATRAM

c) Ship Calls by Country

Trend in the number of calling ships by country is shown in Figure 6.2.27. Approximately 8,000 vessels called at ports in Panama, 3,000 vessels at ports of Guatemala, Honduras and Costa Rica, and less than 1,000 vessels at ports of El Salvador and Nicaragua. The situation has not changed in the recent 10-year period.



Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Guatemala	3,501	3,328	3,208	3,334	3,339	3,273	3,349	3,324	3,182	3,298
El Salvador	620	725	743	810	766	823	801	841	746	778
Honduras	2252	2,570	2,333	2,283	2,361	2,292	2,389	2,417	2,382	2,460
Nicaragua	640	642	569	642	585	668	721	794	653	612
Costa Rica	3136	3,373	3,322	3,196	2,912	2,860	3,021	3,006	2,519	2,607
Panama	7387	8,089	7,923	7,968	7,563	8,117	7,422	7,150	6,974	7,443
Total	**17,536**	**18,727**	**18,098**	**18,233**	**17,526**	**18,033**	**17,703**	**17,532**	**16,456**	**17,198**

Source: JST based on data of 2019 in Statistics of COCATRAM

Figure 6.2.27 Ship Call by Country

(3) Digitization of Formalities

Since April 2019, the FAL Convention makes it mandatory for ships and ports to exchange FAL data electronically and encourages the use of the so-called “single window” concept, in which all the many agencies and authorities involved exchange data via a single point of contact. Digitization of procedures for entering and leaving ports of vessels is requested internationally and ports in some Central American countries plan to introduce or operate an electronic procedure system. Although the actual status of operation in each country could not be confirmed in detail, the measures taken in each country are shown in Table 6.2.11 and Source: JST

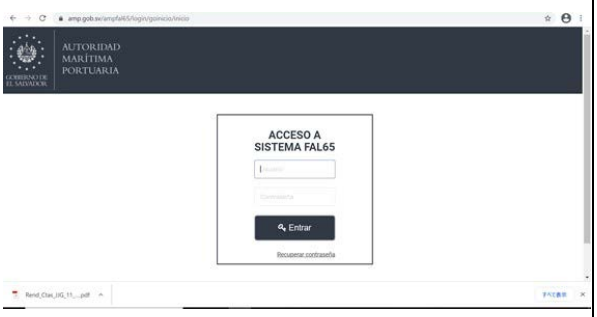
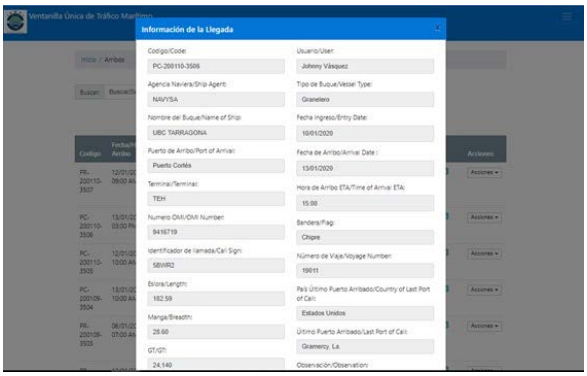
Figure 6.2.28.

In addition to responding to IMO = FAL, players related to ports make efforts to promote computerization in each country and port. Some examples are shown below.

Table 6.2.11 Systems Related to FAL 65/Maritime Single Window

Country	Organization	System
Guatemala	GDAM	-
El Salvador	AMP	Systema FAL 65
Honduras	DGMM	The Single Window for International Maritime Traffic
Nicaragua	-	-
Costa Rica	MOPT	SIGEMAP (Sistema de Gestión Marítima Portuaria)
Panama	VUMPA/ (AMP)	Maritime Single Window of Panama/Panama Canal Maritime Service Portal

Note: status of operation/development of the system could not be confirmed
Source: JST based on website of relevant authorities

<table>
<tr><th>Guatemala</th><th>El Salvador</th></tr>
<tr><td>Not available</td><td>Display of FAL 65 Website (AMP)
ACCESO A SISTEMA FAL65
 
</td></tr>
<tr><th>Honduras</th><th>Nicaragua</th></tr>
<tr><td>Display of Maritime Single Window (DGMM)
 
</td><td>Políticas Específicas para el Desarrollo Portuario 2018 – 2027

Consolidación del Sistema Estadístico Portuario, mediante su automatización e impulsar del desarrollo de sistemas de información que integre telemáticamente la cadena portuaria y reduzca al mínimo el uso de documentación física o en correo electrónico.

Información requerida por Ministerio de Transporte e Infraestructura (MTI) para Plan Maestro Regional de Movilidad y Logística Enero 2020 EPN</td></tr>
<tr><th>Costa Rica</th><th>Panama</th></tr>
<tr><td>Plan Nacional de Transportes de Costa Rica 2011-2035
HORIZONTE 2035
Facilitación: Port Community Systems en Moín y Caldera, procedimientos telemáticos, nuevos sistemas y aplicaciones informáticas de gestión.

PLAN NACIONAL DE TRANSPORTES 2011-2035 Una visión integrada para la modernización del sistema de transportes Marzo, 2018 (MOPT)</td><td>Panama Maritime Single Window (VUMPA – Ventanilla Única Marítima de Panamá)
 

http://www.sela.org/media/3211886/bloque-2-1-comunidades-portuaria-s-cartagena-vumpa.pdf</td></tr>
</table>

Source: JST

Figure 6.2.28 Samples of Measures for Informatization of Each Country

(4) COVID-19

The COVID-19 pandemic has had a large impact on economies and the lives of people throughout the world as well as supply chains. Against the situation, the port sector has taken various measures to ensure logistics such as prioritizing the handling of essential cargo, reorganizing business styles and complying with sanitary protocols to prevent the spread of infection.

Table 6.2.12 shows a comparison between the number of calling vessels at ports in Central America in 2019 and 2020. In general, calling vessels in 2020 decreased compared with 2019. In the second quarter, a

decrease in calling vessels was seen at almost all ports.

COCATRAM conducted the survey on IMPACT OF COVID-19 ON PORT OPERATIONS IN CENTRAL AMERICA AND DOMINICAN REPUBLIC twice and prepared reports in May 2020 and September 2020.

The report of the second survey concluded that in general, the regional port system has managed to effectively respond to the COVID-19 crisis even though it was not well prepared for this unforeseeable event. Consequently, ports have taken part of this stakeholder's links that allow a proper supply of products and goods in their countries, in extreme conditions.

It is considered that the ports in Central America have not been significantly affected by the COVID-19 pandemic. However, we have learned that ports need to be prepared for unforeseen circumstances in order to maintain logistics under any circumstances.

Table 6.2.12 Variation rate of Ship Calls by Quarter in 2020 Compared with Those in 2019

2020/2019	Coast	1st Qr	2nd Qr	3rd Qr	4th Qr	Year
Guatemala		**101.8%**	**82.2%**	**93.1%**	**97.1%**	**93.6%**
Quetzal	P	101.6%	81.2%	93.9%	98.7%	93.7%
SANTOCAS	C	102.6%	72.8%	77.6%	84.9%	84.8%
Barrios	C	98.0%	104.3%	121.4%	121.0%	111.0%
Boyas San José	P	107.8%	90.2%	114.3%	100.0%	102.8%
El Salvador		**92.3%**	**76.9%**	**75.5%**	**95.4%**	**85.1%**
Acajutla	P	95.9%	87.9%	89.4%	94.0%	91.8%
Corsain	P	112.5%	100.0%	63.6%	111.1%	94.6%
La Unión	P		50.0%	100.0%	33.3%	50.0%
Alba Petróleo Buoy	P	0.0%				0.0%
Cenergic Buoy	P	75.0%	20.0%	0.0%	200.0%	40.0%
Rasa Buoy	P	77.1%		30.3%	100.0%	60.6%
Honduras		**93.8%**	**71.6%**	**76.3%**	**73.8%**	**79.5%**
San Lorenzo	P	83.6%	97.8%	83.3%	93.5%	89.2%
Cortes	C	97.8%	79.7%	85.6%	86.6%	87.5%
Castilla	C	76.7%	105.9%	116.7%	105.6%	100.0%
Port Tela	C	100.0%	100.0%	66.7%	100.0%	91.7%
Roatan T. Coxen Hole	C	94.7%	0.0%		0.0%	35.6%
Roatan T. Mahogany Bay	C	85.5%	0.0%	0.0%	0.0%	27.5%
Nicaragua		**107.0%**	**92.3%**	**91.8%**	**80.6%**	**92.2%**
Corinto	P	116.0%	103.4%	98.1%	91.1%	101.5%
Sandino	P	100.0%	137.5%	100.0%	128.6%	115.2%
San Juan Del Sur	P	71.4%	0.0%	0.0%	0.0%	14.3%
Cabeza	C	0.0%	0.0%	0.0%	0.0%	0.0%
Arlen Siu	C	144.4%	86.7%	100.0%	100.0%	103.9%
El Bluff	C	0.0%	0.0%	0.0%	0.0%	0.0%
Costa Rica		**93.5%**	**88.4%**	**99.5%**	**85.6%**	**91.5%**
Caldera	P	100.0%	88.4%	90.1%	85.0%	90.8%
Limón Moín	C	49.0%	78.9%	98.4%	82.6%	70.1%
Moín, APM Terminals	C	212.6%	105.1%	99.6%	109.7%	119.5%
Puntarenas	P	51.7%	55.6%	300.0%	3.6%	47.1%
Golfito	P	91.2%	19.4%	141.2%	50.0%	70.1%
Puntamorales	P	33.3%	175.0%	100.0%		122.2%
Quepos	P	106.1%	0.0%	50.0%	0.0%	56.3%
Panama		**103.2%**	**98.2%**	**87.3%**	**89.9%**	**94.4%**
Balboa	P	108.8%	91.6%	89.3%	84.6%	93.0%
PSA Panama Terminal	P	108.5%	107.1%	121.1%	110.5%	111.8%
Cristobal	C	95.6%	89.4%	93.0%	98.7%	94.0%
Colon Terminal	C	115.6%	99.4%	95.5%	87.6%	98.8%
Manzanillo	C	95.9%	130.4%	80.3%	86.6%	94.8%
Decal Panama	P	83.9%	88.6%		75.8%	76.6%
Fuerte Amador Resort Marina	P	61.1%	0.0%	0.0%	0.0%	28.2%
Terminal Oil Melons	P	157.1%	36.4%	125.0%	64.5%	69.3%
Petroamerica	P			70.4%	89.5%	82.8%
Ptp Puddle Blue	P		66.7%	93.9%	194.7%	105.5%
Bocas Fruit Co.	C	129.4%	192.3%	207.7%	250.0%	189.1%

2020/2019	Coast	1st Qr	2nd Qr	3rd Qr	4th Qr	Year
Colon Oil and Service	C	155.6%	111.1%	55.6%	133.3%	112.1%
Payardi Terminal	C	124.1%	63.0%	62.1%	92.3%	85.6%
Port Colon 2000	C	83.9%	0.0%		0.0%	41.3%
Port Colon 2000	C	95.8%	0.0%	0.0%	0.0%	31.9%
Ptp Chiriqui Grande	C	159.3%	106.7%	84.6%		110.8%
Puerto Punta Rincon	C	170.0%	0.0%	54.5%	90.5%	58.7%
Bahia Las Minas Bulk	C	77.8%	0.0%	0.0%	25.0%	22.7%
Termini Financing Group	C	50.0%	0.0%	40.0%		

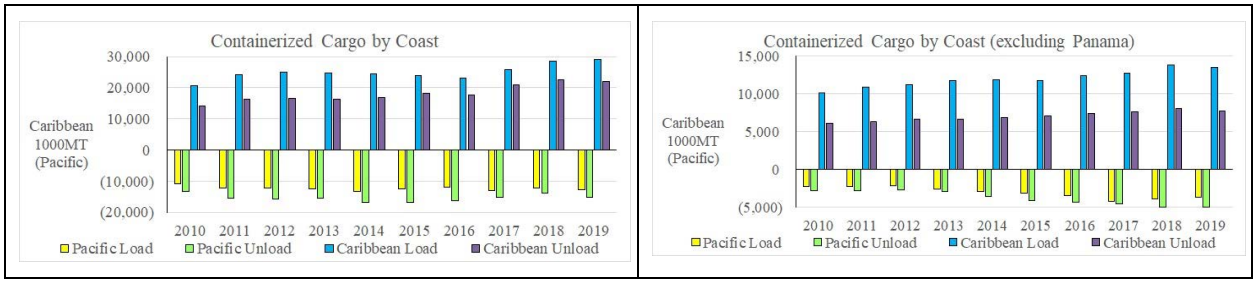
Note: Decrease Increase Red line: Main ports
Source：COCATRAM

6.2.3 Container Cargo

(1) Containerized Cargo

a) Container Cargo Volume Trends

Trends in the loading and unloading of container cargo passing through ports in Central America by coast are shown in Figure 6.2.29. Both loading and unloading volumes are increasing. The amount of loaded container cargo volume is larger than that of unloaded container cargo and the growth ratio is also larger. The volume of containerized cargo volume through the ports on the Caribbean coast is larger than that on the Pacific coast. Most of the containerized cargo handled at ports in Panama are international transportation containers. The figure shows the containerized cargo volume excluding those of the ports in Panama.



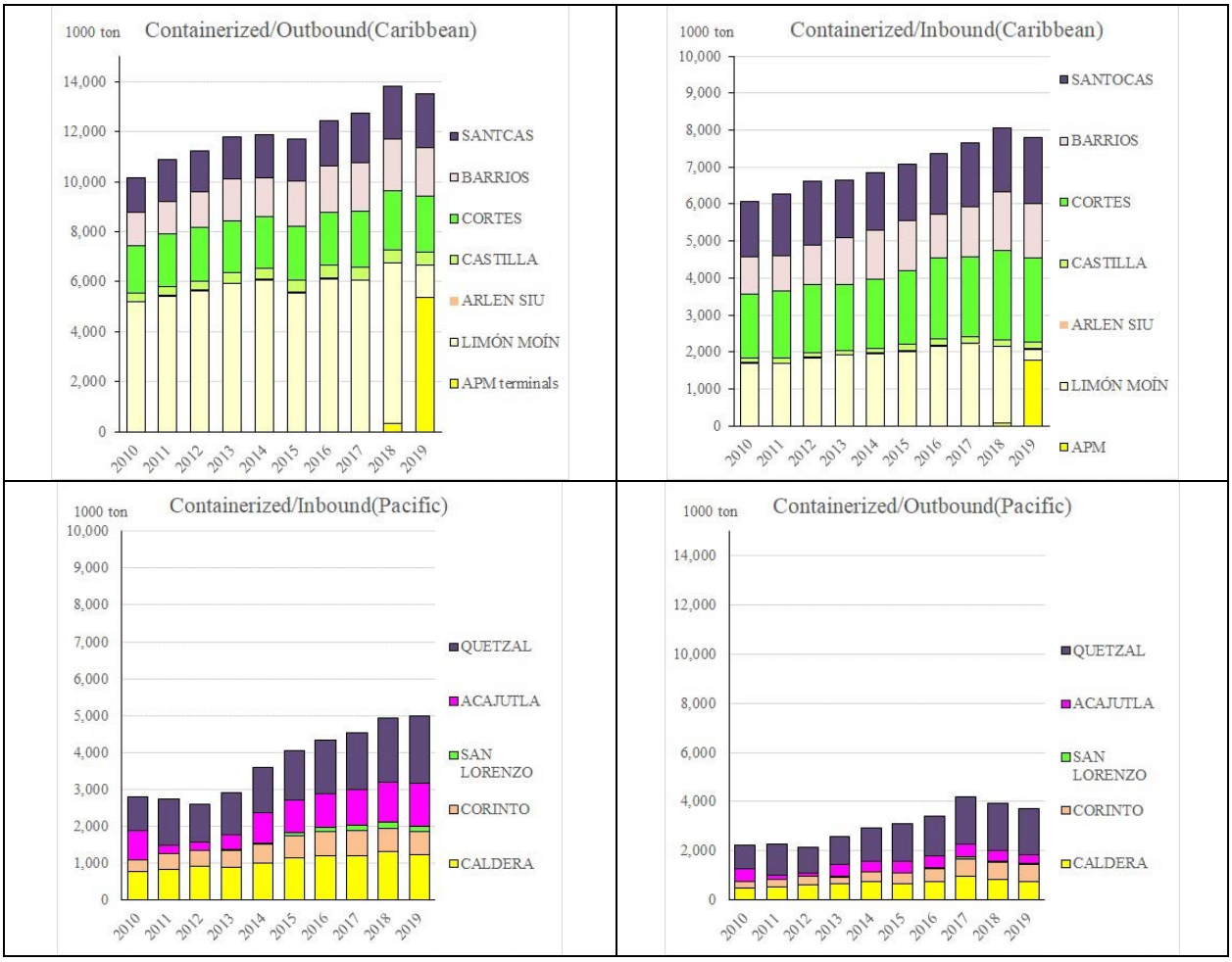
Source: COCATRAM Statistics

Figure 6.2.29 Trend of Containerized Cargo Volume by Coast

b) Containerized Cargo Volume by Coast by Port

Figure 6.2.30 shows the amount of containerized cargo loaded and unloaded at the ports on the Caribbean and Pacific coasts (excluding Panamanian ports). There is basically no significant change in the share of the volume handled at ports on both coasts. On the Caribbean side, cargo handled at Limon/Moin Port has shifted to Moin Port APM Terminal in 2019. Quetzal Port handles a large number of containers among ports on the Pacific coast.

The container cargo loaded and unloaded at ports includes cargo to be transferred to other countries. About 7% of container boxes handled at the ports in Guatemalan ports, 90% at the ports in Panama and about 0.1-1.5% at other ports are transferred to the other countries.



Note: ton indicates MT
Source: COCATRAM

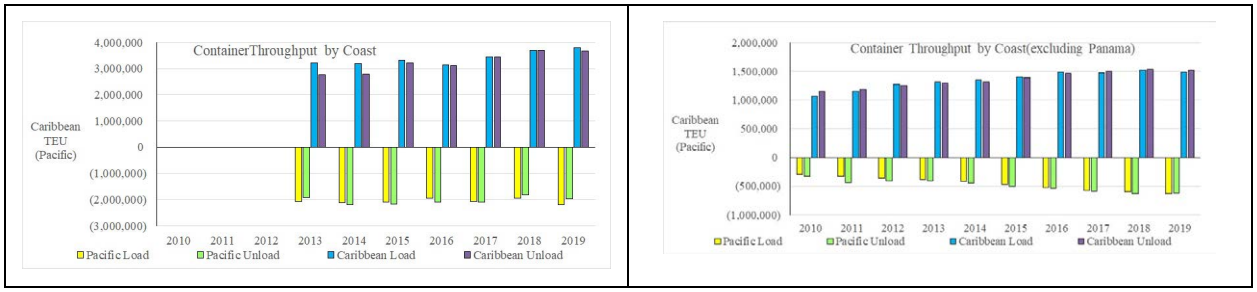
Figure 6.2.30 Containerized Cargo from/to the Central American Countries through Ports

(2) Container Boxes handled at Ports

a) Container Throughput

Containers by Coast

The trend of the loading and unloading container (TEU) passing through ports in Central America by coast are shown in Figure 6.2.31. The tendency is similar to that of containerized cargo. Data for ports on the Caribbean side before 2012 are incomplete and are not displayed.

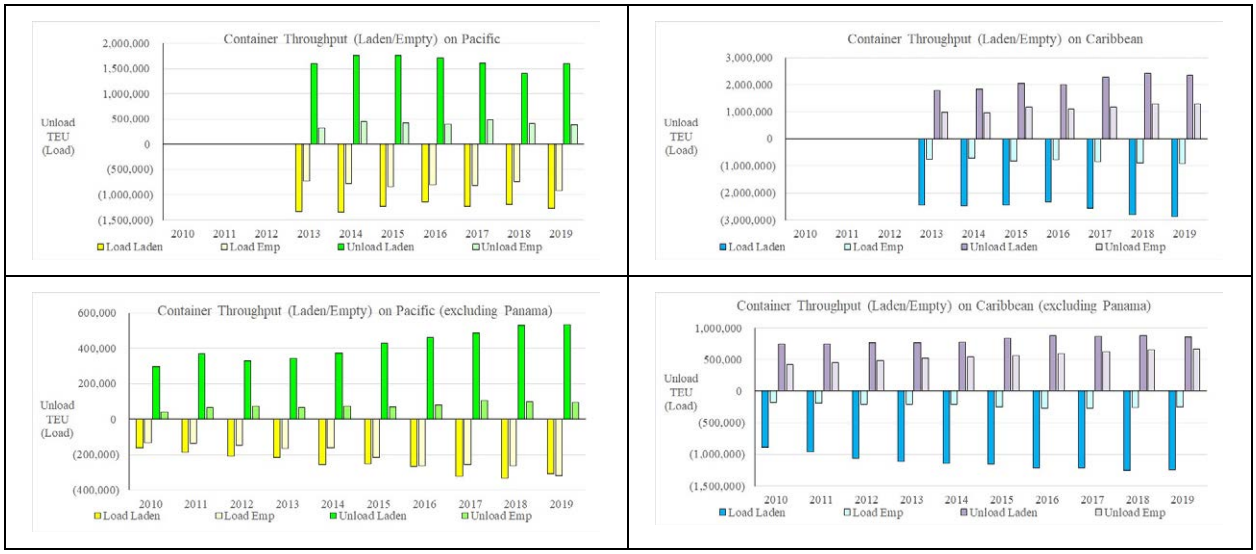


Source: COCATRAM Statistics

Figure 6.2.31 Containers by Coast

Laden/Empty Containers

Figure 6.2.32 shows laden and empty containers by loading and unloading by coast. In all cases, the number of laden containers exceeds those of empty containers. There is a large difference between laden and empty containers loaded on the Caribbean coast and containers unloaded on the Pacific coast. The graphs below show the results of calculation excluding the ports in Panama.



Source: COCATRAM Statistics

Figure 6.2.32 Laden and Empty Containers

b) Transfer of Containers

Some containers are transferred to other countries across the border after being unloaded at a port and some containers are transferred from other counties for loading at a port. In some cases, containers are transshipped at a port. Loaded and unloaded containers are classified into local, transshipment and transit containers. Volumes of these three types of containers on the Pacific coast and the Caribbean coast excluding those of Panama are summarized in Table 6.2.13.

Transit containers on the Pacific coast account for less than 1% of loaded containers and 1.3% of unloaded containers. Transit containers on the Caribbean coast account for 1.1% of loaded containers and 3.2% of unloaded containers. Number of transit containers on the Caribbean coast is larger than that of the Pacific coast by about 50,000 TEU.

Table 6.2.13 Characteristics (Local/Transhipment/Transit) of Container Cargo (excluding Panama)

Container TEU	Pacific Coast			Caribbean Coast			Total		
	Outbound	Inbound	Total	Outbound	Inbound	Total	Outbound	Inbound	Total
Local	623,823	614,372	1,238,195	1,447,781	1,412,372	2,860,153	2,071,604	2,026,744	4,098,348
Trans-shipment	3,541	4,390	7,931	28,816	62,019	90,835	32,357	66,409	98,766
Transit	5,769	8,213	13,982	15,757	48,194	63,951	21,526	56,407	77,933
Total	**633,133**	**626,975**	**1,260,108**	**1,492,354**	**1,522,585**	**3,014,939**	**2,125,487**	**2,149,560**	**4,275,047**

Note: Some data are over the scale.
Source: JST based on data of 2019 in Statistics of COCATRAM

The number of containers handled at ports of Panama was calculated and shown in Table 6.2.14. A lot of containers are transshipped at both ports on the Pacific coast and the Caribbean coast. Transshipment ratio at ports on the Pacific coast and the Caribbean coast is 89.4 % and 85.4%, respectively.

Table 6.2.14 Transshipment Container Cargo at Ports in Panama

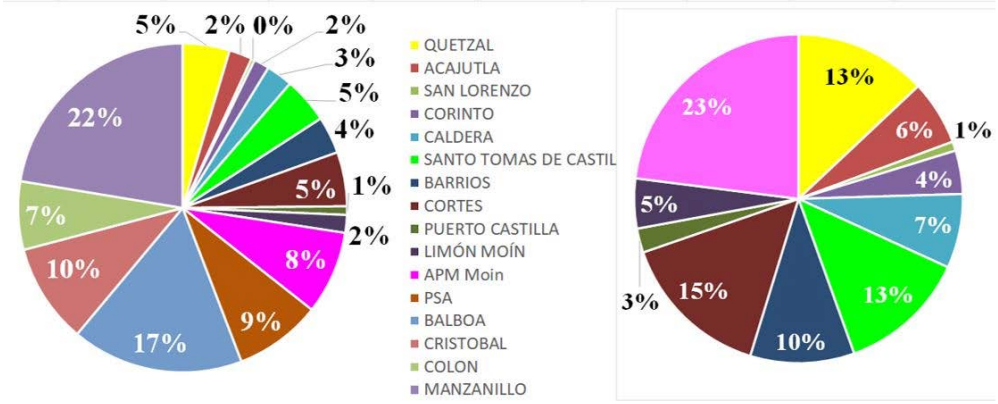
Container TEU	Pacific Coast			Caribbean Coast			Total		
	Outbound	Inbound	Total	Outbound	Inbound	Total	Outbound	Inbound	Total
Local	168,194	138,439	306,633	319,807	327,401	647,208	488,001	465,840	953,841
Trans-shipment	1,386,396	1,205,811	2,592,207	1,993,502	1,815,441	3,808,943	3,379,898	3,021,252	6,401,150
Transit	0	0	0	0	0	0	0	0	0
Total	**1,554,590**	**1,344,250**	**2,898,840**	**2,313,309**	**2,142,842**	**4,456,151**	**3,867,899**	**3,487,092**	**7,354,991**

Note: Some data are over the scale.

Source: JST based on data of 2019 in Statistics of COCATRAM

c) Container Throughput by Port

Figure 6.2.33 shows the container throughput in 2019. Throughput at five ports in Panama, Balboa, PSA, Cristobal, COLON and MANZANILLO, accounts for more than half. Excluding Panama, APM Moin handles about a quarter of the total while shares of Quetzal Port, Santo Thomas De Castilla Port, and Cortez Port range from 13-15 %.



All ports Excluding Ports in Panama

Source: COCATRAM Statistics

Figure 6.2.33 Container Throughput (TEU/2019)

Details of container throughput of each port is shown below.

Table 6.2.15 Trend of Container Throughput of Each Port

Quetzal Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	121,401	130,894	152,331	157,840	175,296	189,495	209,331	221,979	237,478	253,825
Inbound	143,756	219,478	172,176	164,850	183,058	199,834	218,045	229,711	249,022	253,986
Total	265,157	350,372	324,507	322,690	358,354	389,329	427,376	451,690	486,500	507,811

Acajutla Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	72,613	76,313	76,940	87,212	85,867	94,697	100,060	104,382	110,884	127,947
Inbound	74,595	84,912	85,041	93,423	93,389	95,947	102,105	105,523	120,101	121,526
Total	265,157	350,372	324,507	322,690	358,354	389,329	427,376	451,690	486,500	507,811

San Lorenzo Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	0	30	0	1,805	2,942	7,991	12,365	17,092	16,418	18,718
Inbound	0	141	0	1,816	3,718	8,105	13,096	18,732	16,496	18,133
Total	0	171	0	3,621	6,660	16,096	25,461	35,824	32,914	36,851

Corinto Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	30,929	38,013	42,991	43,648	51,684	65,667	76,053	92,742	84,586	85,149
Inbound	33,989	42,106	46,547	48,216	58,414	72,339	73,955	90,957	85,383	82,649
Total	64,918	80,119	89,538	91,864	110,098	138,006	150,008	183,699	169,969	167,798

Caldera Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	72,671	79,315	87,105	93,075	101,435	110,784	131,226	141,865	146,878	147,494
Inbound	82,636	88,676	97,210	100,020	107,626	124,484	133,145	147,717	158,153	150,681
Total	155,307	167,991	184,315	193,095	209,061	235,268	264,371	289,582	305,031	298,175

SANTOCAS Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	202,657	228,128	234,239	252,875	266,523	261,382	304,096	278,069	277,347	283,459
Inbound	202,146	203,109	234,497	246,888	258,933	268,070	310,367	288,471	277,086	281,930
Total	404,803	431,237	468,736	499,763	525,456	529,452	614,463	566,540	554,433	565,389

Barrios Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	116,503	118,937	174,251	194,376	190,599	216,501	213,035	232,279	240,074	223,161
Inbound	210,332	198,866	168,068	194,735	189,067	215,641	215,228	223,694	249,592	232,652
Total	326,835	317,803	342,319	389,111	379,666	432,142	428,263	455,973	489,666	455,813

Cortes Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	266,422	292,254	287,858	287,889	292,774	312,926	323,892	319,654	339,700	325,419
Inbound	265,408	284,357	285,465	283,518	285,787	311,376	297,928	322,565	331,278	318,436
Total	531,830	576,611	573,323	571,407	578,561	624,302	621,820	642,219	670,978	643,855

Castilla Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	39,552	44,928	46,812	49,062	49,310	52,234	56,448	55,694	55,356	55,476
Inbound	41,462	40,964	43,774	47,376	48,326	51,054	53,544	56,808	53,916	54,524
Total	81,014	85,892	90,586	96,438	97,636	103,288	109,992	112,502	109,272	110,000

Moin Limon Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	443,821	467,937	529,984	536,152	552,032	558,886	588,993	595,945	604,681	601,013
Inbound	437,087	459,513	515,230	517,582	537,485	549,687	588,393	603,684	618,379	631,297
Total	880,908	927,450	1,045,214	1,053,734	1,089,517	1,108,573	1,177,386	1,199,629	1,223,060	1,232,310

Balboa Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	79,545	104,239	119,568	1,623,553	1,591,340	1,515,250	1,350,167	1,436,714	1,041,183	1,073,043
Inbound	2,678,961	3,128,030	3,131,573	1,440,038	1,645,014	1,562,854	1,481,547	1,469,337	870,376	851,232
Total	2,758,506	3,232,269	3,251,141	3,063,591	3,236,354	3,078,104	2,831,714	2,906,051	1,911,559	1,924,275

PSA Terminal Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound			1,653	59,539	114,556	100,725	72,430	47,473	297,125	481,547
Inbound			51,806	64,270	113,410	115,283	81,094	34,090	311,905	493,018
Total	0	0	53,459	123,809	227,966	216,008	153,524	81,563	609,030	974,565

Cristobal Port Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	63,672	59,807	58,879	387,947	386,409	431,514	389,656	663,373	673,263	617,260
Inbound	625,390	920,932	791,164	333,868	326,279	381,111	404,289	647,861	609,785	443,735
Total	689,062	980,739	850,043	721,815	712,688	812,625	793,945	1,311,234	1,283,048	1,060,995

Colon Container Terminal Container Throughput

Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	92,774	87,797	208,713	496,874	412,072	536,982	310,710	332,092	397,630	379,084
Inbound	419,217	403,272	526,601	88,247	90,634	525,547	322,325	369,424	418,748	405,168
Total	511,991	491,069	735,314	585,121	502,706	1,062,529	633,035	701,516	816,378	784,252

Manzanillo International Terminal Container Throughput

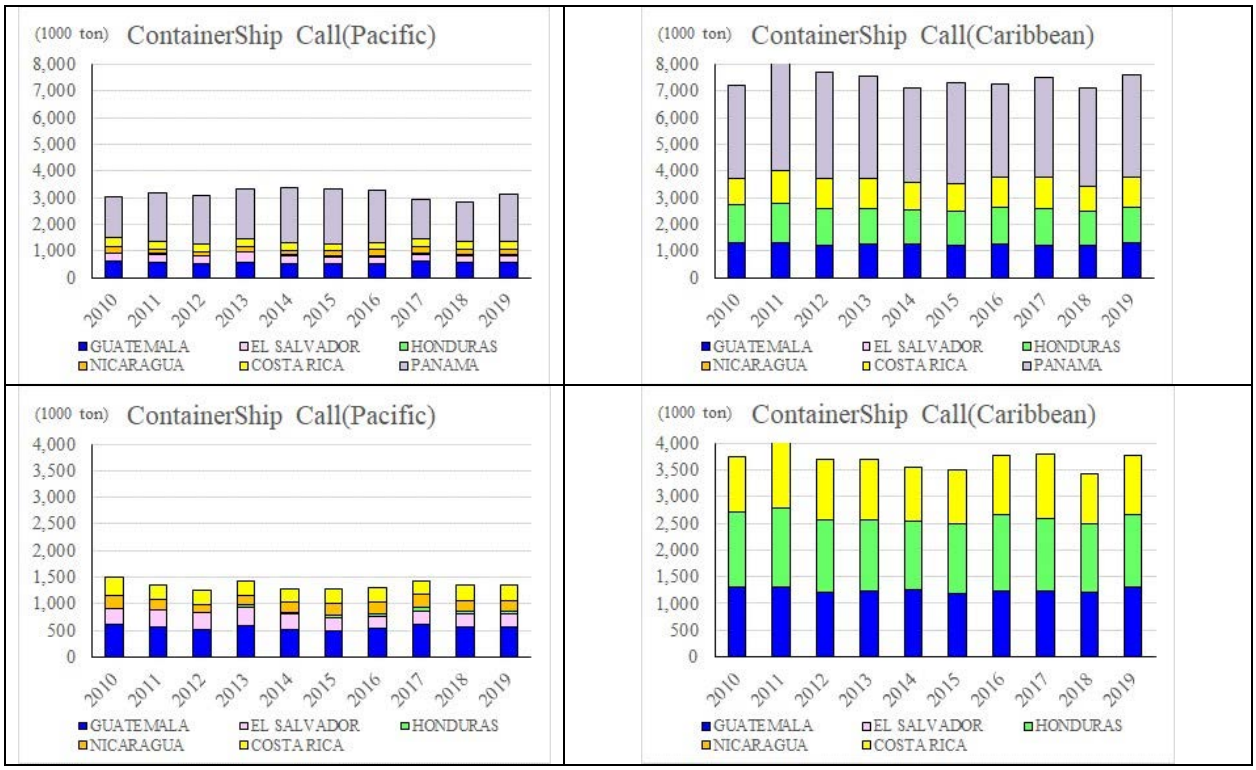
Unit: TEU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	157,011	185,969	168,265	989,264	1,034,037	925,035	935,674	949,883	1,095,324	1,283,653
Inbound	1,442,633	1,714,031	1,891,498	1,036,530	1,037,308	896,105	905,532	928,591	1,129,728	1,260,687
Total	1,599,644	1,900,000	2,059,763	2,025,794	2,071,345	1,821,140	1,841,206	1,878,474	2,225,052	2,544,340

Source: COCATRAM Statistics

(3) Container Vessel

a) Trend of Container Vessel Calls

Figure 6.2.34 shows the number of container ships which called at ports in Central America by coast. The number of calls on the Caribbean coast is larger than that on the Pacific coast. The total number of calls shows a slight decreasing tendency. Since the number of containers is increasing, the size of container vessels is also thought to be increasing. Graphs below are attached for reference (ports of Panama are excluded).



Container Ship Call	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
(Pacific)	3,036	3,188	3,082	3,326	3,359	3,321	3,271	2,936	2,848	3,119
GUATEMALA	619	578	517	591	519	498	532	609	574	563
EL SALVADOR	303	310	316	350	283	247	227	255	229	246
HONDURAS	0	1	0	37	47	55	48	61	47	52
NICARAGUA	224	196	150	189	186	210	239	259	220	203
COSTA RICA	355	273	284	268	251	270	258	253	284	291
PANAMA	1,535	1,830	1,815	1,891	2,073	2,041	1,967	1,499	1,494	1,764
(Caribbean)	**7,195**	**8,076**	**7,714**	**7,566**	**7,142**	**7,300**	**7,279**	**7,492**	**7,101**	**7,599**
GUATEMALA	1,319	1,314	1,218	1,240	1,246	1,186	1,242	1,227	1,220	1,313
EL SALVADOR										
HONDURAS	1,392	1,460	1,351	1,332	1,299	1,306	1,418	1,359	1,273	1,338
NICARAGUA	0	0	0	0	3	0	0	0	0	0
COSTA RICA	1,030	1,236	1,131	1,134	1,005	1,009	1,099	1,199	942	1,110
PANAMA	3,454	4,066	4,014	3,860	3,589	3,799	3,520	3,707	3,666	3,838
Total	**10,231**	**11,264**	**10,796**	**10,892**	**10,501**	**10,621**	**10,550**	**10,428**	**9,949**	**10,718**

Source: COCATRAM

Figure 6.2.34 Container Vessel Call by Country

b) Size of Calling Vessels

Capacity of Calling Container Vessels

The capacity (maximum volume of containers in TEU) of container vessels which called at the ports in Central American countries is summarized in Table 6.2.16 based on MDS data/August 2020.

Container ships with a capacity of 8,000 TEU called at Quetzal Port while ships with capacities ranging from 2,500-2,900 TEU called at other ports on the Pacific coast. Container ships with a capacity of 7,000

TEU called at Moin/Limon Port while ships with capacities ranging from 2,000-2,800TEU called at other ports at ports on the Caribbean coast. Large container ships with capacities exceeding 10,000 TEU called at ports at Panama.

Table 6.2.16 Max Capacity (TEU) of Deployed Vessels

Quetzal	Acajutla	San Lorenzo	Corinto	Caldera	Balboa			
8,880	2,840	2,500	2,840	2,840	23,964			
SANTOCAS	**Barrios**	**Cortes**	**Castilla**	**Moin**	**Limon**	**Cristobal**	**Colon**	**MIT**
2,790	2,790	2,020	2,046	6,900	4,112	11,000	13,800	11,800

Source: MDS data on Aug.2020

Source: MDS data on Aug.2020

Figure 6.2.35 shows the capacity (in TEU) of container ships which have called each port since 2013 It can be seen that vessel size has been increasing.



Source: MDS data on Aug.2020

Figure 6.2.35 Change of Capacity of Calling Container Vessels

Length of Calling Container Vessels

The maximum LOA of container vessels which called at ports in the Central American countries since 2013 is summarized in Table 6.2.17 based on MDS data/August 2020. Container ships with a LOA of 335 m called at Quetzal Port and while ships with a LOA of 210 m called at other ports on the Pacific coast.

Container ships with a LOA of 280-290 m called at Moin/Limon Port while ships with a LOA of 225m called at other ports on the Caribbean coast. Large container ships with a LOA of 350-369m called at ports in Panama.

Figure 6.2.36 shows the maximum LOA of container ships which called at each port since 2013. It can be seen that the LOA of calling container ships has been increasing.



Source: MDS data on Aug.2020

Figure 6.2.36 Change in Length of Calling Container Vessels

Table 6.2.17 Max LOA of Deployed Vessels

Quetzal	Acajutla	San Lorenzo	Corinto	Caldera	Balboa			
335	210	209	210	210	351			
SANTOCAS	**Barrios**	**Cortes**	**Castilla**	**Moin**	**Limon**	**Cristobal**	**Colon**	**MIT**
225	225	225	205	294	281	353	369	369

Source: MDS data on Aug.2020

Draft of Calling Container Vessels

The draft of container vessels which called at ports is summarized in Table 6.2.18 based on MDS data/August 2020. Container ships with a draft of 14.6m called at Quetzal Port while ships with a draft of 11.6 m called at other ports on the Pacific coast. Container ships with a draft of 14.6 m called at Moin Port while ships with a draft of 12.2m called other ports on the Caribbean side. Large container ships with a draft of 16.0m called at the ports in Panama.

Table 6.2.18 Max Draft of Deployed Vessels

Quetzal	Acajutla	San Lorenzo	Corinto	Caldera	Balboa			
14.6	11.6	11.6	11.6	11.6	16.0			
SANTOCAS	**Barrios**	**Cortes**	**Castilla**	**Moin**	**Limon**	**Cristobal**	**Colon**	**MIT**
12.2	12.2	12.2	10.2	14.6	12.5	16.0	16.0	16.0

Source: MDS data on Aug.2020

Source: MDS data on Aug.2020

Figure 6.2.37 shows the maximum draft of container ships which called at each port since 2013 It can be seen that the draft of calling vessels is increasing.



Source: MDS data on Aug.2020

Figure 6.2.37 Change in Draft of Calling Container Vessels

(4) Container Ports

a) Outline

The major container ports in Central American countries are shown in Table 6.2.19. Dedicated container terminals have been developed at Moin Port and Quetzal Port and are operated under a concession contract. Balboa port, Cristobal port, PSA Terminal, Manzanillo International Terminal, Colon Container Terminal in Panama are operated by concession.

Table 6.2.19 Container Ports in Central America

Country	Pacific Coast	Caribbean Coast
Guatemala	Puerto Quetzal	Santo Tomas de Castilla, Puerto Barrios
El Salvador	Acajutla	
Honduras	San Lorenzo	Puerto Cortes, Puerto Castilla
Nicaragua	Corinto	—
Costa Rica	Caldera	Limon/Moin Port (*1)
Panama	Balboa Port, PSA Terminal	Cristobal Port, Manzanillo International terminal, Colon Container Terminal

Note: (*1): Terminals which are located in Limon and Moin are treated as one unit in this table.
Source: JST

b) Container Terminal Facilities at Each Port/Terminal

Type, capacity, quay, yard and equipment of Quetzal Port, Acajutla Port, San Lorenzo Port, Corinto Port, Caldera Port, Santo Tomas de Castilla, port, Barrios Port, Cortes Port, Castilla Port Limon/Moin Port, Balboa Port, PSA Terminal, Cristobal Port, Manzanillo International terminal and Colon Container Terminal are summarized below.

Table 6.2.20 Container Terminal Facilities

Quetzal Port

Type	**Reclaimed Type**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	11.0	Total Length (m)	400
Crane	Type	Mobile Cranes	Number	4
Yard	Area(m^2)	100,110	Storage Cap. (TEU)	1,974
Equipment	Type	Reach-stackers	Number	6

APM terminal Quetzal

Type	**Pier type**			
Annual Capacity (TEU)		340,000		
Quay	Max Depth (m)	14.5	Total Length (m)	350
Crane	Type	Ship-to-Shore cranes	Number	2
Yard	Area(m^2)	100,110	Storage Cap. (TEU)	9,000
Equipment	Type	Ship-to-Shore cranes	Number	2

Acajutla Port

Type	**Finger type pier**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	12.0	Total Length (m)	949
Crane	Type	Mobile Cranes	Number	3
Yard	Area(m^2)	26,300	Storage Cap. (TEU)	-
Equipment	Type	straddle carriers	Number	3

San Lorenzo Port

Type	**T-shaped type**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	10.67	Total Length (m)	546.4
Crane	Type	-	Number	-
Yard	Area(m^2)	32,913	Storage Cap. (TEU)	-
Equipment	Type	-	Number	-

Corinto Port

Type	**Pier type**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	13.525	Total Length (m)	240
Crane	Type	-	Number	-
Yard	Area(m^2)	23,000	Storage Cap. (TEU)	1,500
Equipment	Type	forklifts	Number	2

Caldera Port

Type	**Pier type**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	13.0	Total Length (m)	540
Crane	Type	Liebherr mobile crane, Sany crane	Number	3
Yard	Area(m^2)	71,400	Storage Cap. (TEU)	700
Equipment	Type	reach stacker	Number	9

SANTOCAS port

Type	**Pier type**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	9.8	Total Length (m)	612
Crane	Type	mobile crane	Number	3
Yard	Area(m^2)	97,200	Storage Cap. (TEU)	1,408
Equipment	Type	straddle carrier	Number	14

Barrios Port

Type	**Finger type Pier**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	9.5	Total Length (m)	558
Crane	Type	-	Number	-
Yard	Area(m^2)	-	Storage Cap. (TEU)	-
Equipment	Type	banana loading conveyor	Number	4

Cortes Port

Type	**Pier type**			
Annual Capacity (TEU)		1.8 million		
Quay	Max Depth (m)	15.9	Total Length (m)	820
Crane	Type	gantry crane, mobile crane	Number	7
Yard	Area(m^2)	-	Storage Cap. (TEU)	-
Equipment	Type	reach-stacker	Number	18

Castilla Port

Type	**Pier type**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	16.0	Total Length (m)	225
Crane	Type	-	Number	0
Yard	Area(m^2)	3,000	Storage Cap. (TEU)	-
Equipment	Type	-	Number	-

Moin Port

Type	**Finger type Pier**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	10.5	Total Length (m)	420
Crane	Type	gantry crane, Mobile crane	Number	5
Yard	Area(m^2)	-	Storage Cap. (TEU)	-
Equipment	Type	straddle carrier	Number	4

APM MOIN Terminal

Type	**Finger type Pier**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	14.5	Total Length (m)	650
Crane	Type	gantry crane	Number	2
Yard	Area(m^2)	800,000	Storage Cap. (TEU)	1,200
Equipment	Type	reach-stacker	Number	2

Balboa Port

Type	**Pier type**			
Annual Capacity (TEU)		2,000,000		
Quay	Max Depth (m)	16.0	Total Length (m)	1,700
Crane	Type	gantry crane, modern quay crane	Number	25
Yard	Area(m^2)	37,607	Storage Cap. (TEU)	63,932
Equipment	Type	RTG	Number	83

f PSA Panama Terminal

Type	**Pier type**			
Annual Capacity (TEU)		2,000,000		
Quay	Max Depth (m)	14.5	Total Length (m)	340
Crane	Type	gantry crane	Number	3
Yard	Area(m^2)	140,000	Storage Cap. (TEU)	450,000/year
Equipment	Type	RTG	Number	9

Cristobal Port

Type	**Pier type**			
Annual Capacity (TEU)		2 million		
Quay	Max Depth (m)	14.0	Total Length (m)	2,516
Crane	Type	gantry crane	Number	13
Yard	Area(m^2)	54,400,000	Storage Cap. (TEU)	3,300
Equipment	Type	RTG	Number	37

Colon Container terminal

Type	**Pier type**			
Annual Capacity (TEU)		3,300,000		
Quay	Max Depth (m)	16.5	Total Length (m)	1,258
Crane	Type	gantry crane	Number	13
Yard	Area(m^2)	743,300	Storage Cap. (TEU)	400
Equipment	Type	RTG	Number	30

Manzanillo International Terminal

Type	**Pier type**			
Annual Capacity (TEU)		-		
Quay	Max Depth (m)	16.5	Total Length (m)	2,340
Crane	Type	gantry crane	Number	19
Yard	Area(m^2)	520,000	Storage Cap. (TEU)	66,100
Equipment	Type	RTG	Number	24

Source: Findaport, etc.

(5) Container Service Route

a) Container Service to Each Port

Based on the MDS database (August 2019), the container service routes calling at ports in the Central American countries (excluding routes that call only Panama ports in Central America) are shown in Table 6.2.21.

There were two service routes connecting Central America with the Far East, seven routes with Europe, four routes with the Mediterranean, nine routes with the west coast of North America, 22 routes with the east coast of North America, and three routes within Central America. On the Caribbean coast, there are many routes connecting to the east coast of North America. On the other hand, there are only two routes to the Asian region. Many containers are transshipped at ports on the east coast of North America.

Table 6.2.21 Regions connected by Container Network

Region of Origin/Destination	Number of routes	Regions of calling ports on the route
Far East	2	Central America, Far East, West Coast of South America
Europe	7	Central America, Carib, Europe, East Coast of North America
Mediterranean	4	Central America, Carib, Mediterranean Sea, Mexico, Gulf
West Coast of North America	9	Central America, West Coast of South America, West Coast of Notrth America, Mexico
East Coast of North America	22	Gulf, East Coast of North America, Carib, East of South America
In Central America and Carib	3	Central America, Carib

Note: Services which call at only ports in Panama are not included.
The routes for Far East extend to South America.
Two of nine routes for West Coast of North America extend to South America.

Source: JST based on MDS container database (Aug. 2019)

b) Regions connected by Container Service

Table 6.2.22 shows the calling ports of the above-mentioned routes. On the Pacific coast side, Quetzal port is included on nine service routes while Caldera Port, Acajutla Port and Corinth Port receive fewer calls. The ports of Acajutla, Corinth, and Caldera are feeder service ports connected with the ports on the west coast of North America.

On the Caribbean coast, Cortez Port receives vessels of 16 routes while Santo Thomas de Castilla Port, Limon Port, and Moin Port receive fewer calls. There are many connections to the east coast of the United States. In addition, Barrios Port, Cortez Port, Moin Port, and Limon Port have direct routes to Europe and the Mediterranean Sea.

Table 6.2.22 Regions connected by Container Network

Route	Number of Service	Puerto Quetzal	Acajutla	San Lorenzo	Corinto	Caldera	Santo Tomas de Castilla	Puerto Barrios	Puerto Cortes	Puerto Castilla	Rama (Arlen Siu)	Moin	Limon	Panama
1. Far East	2	2												1
2. Europe	7							1	1			3	4	4
3. Mediterranean	4	1										2	1	3
4. West Coast of North America	9	6	5	1	3	6								2
5. East Coast of North America	22						10	8	13	1	1	4	7	7
6. In Central America and Carib	3						2		2				1	1
Total	**47**	**9**	**5**	**1**	**3**	**6**	**12**	**9**	**16**	**1**	**1**	**9**	**13**	**18**

Source: JST based on MDS container database (Aug 2019)

(6) Port Use by Container Ship

a) Port Staying Time

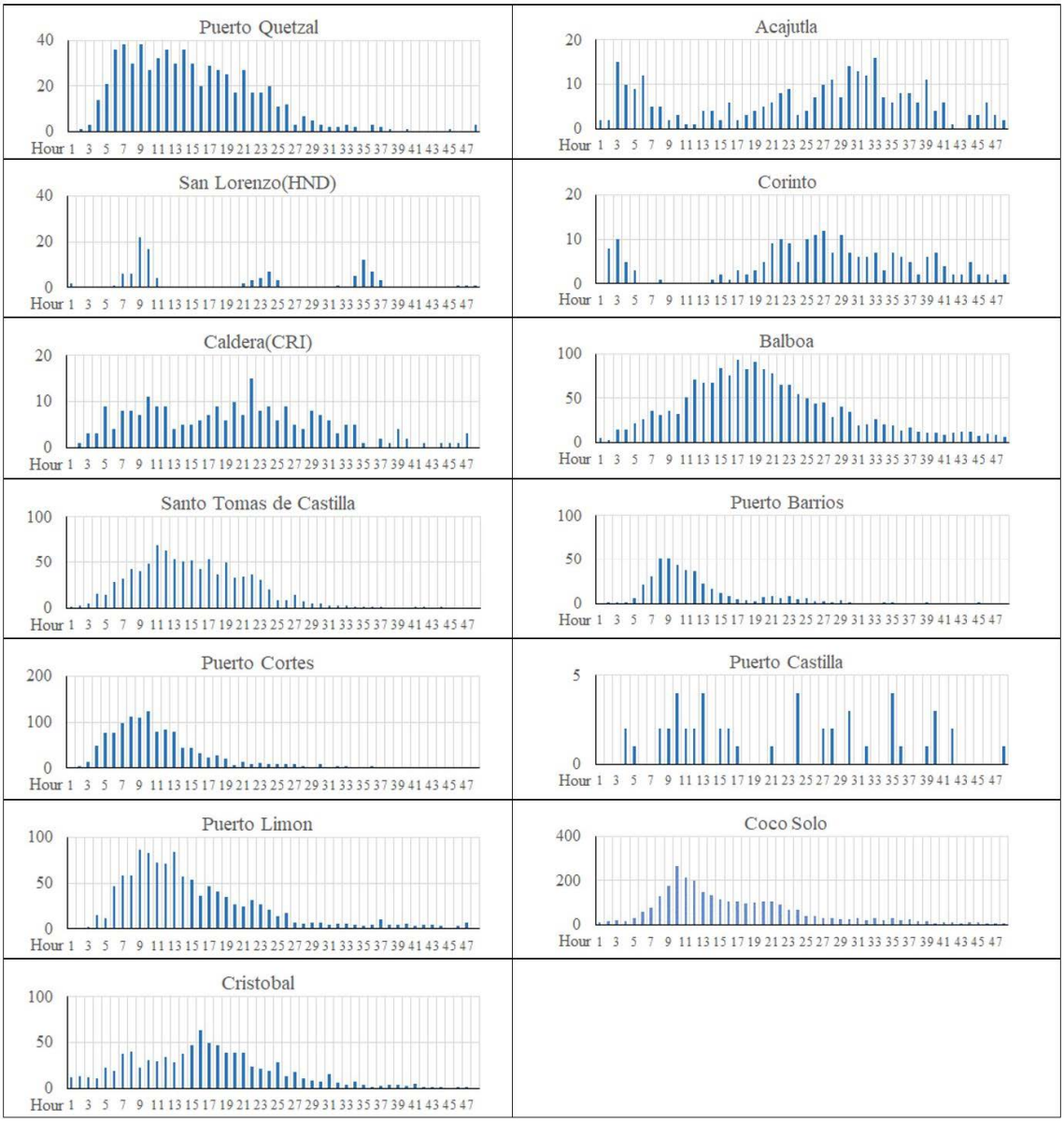
The port staying time of container ships is estimated based on AIS data in 2019. It is estimated that container vessels stay 15.6 hours at Quetzal Port, about 20 hours at San Lorenzo port and Caldera port, 27 hours at Acajutla port, and about 30 hours at Corinto port. On the Caribbean coast, it is estimated that container vessels stay approximately 12-15 hours except for the port of Castilla where the staying time is 24 hours. Staying time at the ports of Panama is calculated to be 17-20 hours (see Table 6.2.23). It should be noted that staying times of less than 6 hours and more than 48 hours have been excluded from calculations.

Table 6.2.23 Port Staying Time (hour) of Container Ship

Pacific	**Quetzal**	**Acajutla**	**San Lorenzo**	**Corinto**	**Caldera**
	15.6	26.9	19.6	29.5	21.1
Caribbean	**SANTOCAS**	**Barrios**	**Cortes**	**Castilla**	**Limon**
	15.6	12.5	12.7	24.2	15.7
Panama		**Balboa**	**Cristobal**	**Coco Solo**	
		20.8	17.5	18	

Source: JST

The distribution of time spent at each port is as shown in Figure 6.2.38.



Source: JST

Figure 6.2.38 Distribution of Vessel Staying Time at Port

b) Estimated Containerized Cargo Volume and Container Boxes per Call

Table 6.2.24 shows the average unloaded and loaded container cargo volume (tons) per port call. On the Pacific side, more than 4,000 tons of containerized cargo are unloaded at Acajutla Ports and Caldera Port, while 1.500 tons and 2,600 tons are loaded. At Quetzal Port and Corinto Port, unloaded and loaded container volumes range from 3,000-3,500 tons.

At the ports on the Caribbean coast, loaded container cargo volume exceeds that of unloaded volume. At the ports of Barrios, Castilla, Moin and APM Moin, loaded volume amounts to 4,500 to 7,000 tons, while unloaded volume ranges from 1,500 – 3,400 ton. Unloaded and loaded containerized cargo volume is almost the same (2,000 tons) at the ports of SANTOCAS and Cortez.

Table 6.2.24 Container Cargo per Ship Call (2019) Unit :1000MT

PACIFIC	QUETZAL	ACAJUTLA	SAN LORENZO	CORINTO	CALDERA	
Loaded	3.31	1.46	0.63	3.47	2.61	
Unloaded	3.21	4.82	2.83	3.06	4.22	
CARIBBEAN	**SANTOCAS**	**BARRIOS**	**CORTES**	**CASTILLA**	**LIMÓN MOÍN**	**APM**
Loaded	2.45	4.48	1.82	4.76	6.98	5.81
Unloaded	2.02	3.41	1.85	1.65	1.58	1.93
PANAMA	**PSA**	**BALBOA**	**CRISTOBAL**	**COLON**	**MIT**	
Loaded	4.53	5.62	5.46	2.36	4.00	
Unloaded	5.11	6.13	4.13	3.35	3.68	

Source: COCATRAM

Table 6.2.25 shows the average number of handling container boxes per call. Those of ports on the Pacific coast handled 400 to 600 boxes, while those of the ports on the Caribbean coast handled 280 to 600 boxes. At ports in Panama, the number containers per call ranged from 600 to 1000.

Table 6.2.25 Loaded/Unloaded Container Boxes per Ship Call (2019)

PACIFIC	QUETZAL	ACAJUTLA	SAN LORENZO	CORINTO	CALDERA	
	535	599	406	487	582	
CARIBBEAN	**SANTOCAS**	**BARRIOS**	**CORTES**	**CASTILLA**	**LIMÓN MOÍN**	**APM**
	334	549	282	505	608	578
PANAMA	**PSA**	**BALBOA**	**CRISTOBAL**	**COLON**	**MANZANILLO**	
	791	1,038	809	588	632	

Source: COCATRAM Statistics

Values of loaded or unloaded container cargo/container boxes per ship call may reflects the characteristics of maritime transport conditions such as deployed ship sizes or cargo handling works at the ports.

The tables indicate that container terminals in Panama and APM Moin Terminals are large size active container terminals. The big volume of loading cargo at the ports of Barrios, Castilla and Limon/Moin indicates the functions as export ports of fruits which are main export products in Central America.

Loading and unloading volumes at the ports of Quetzal, Corinto, SANTCAS and Cortes are balanced, which is desirable situations for shipping operators and ports.

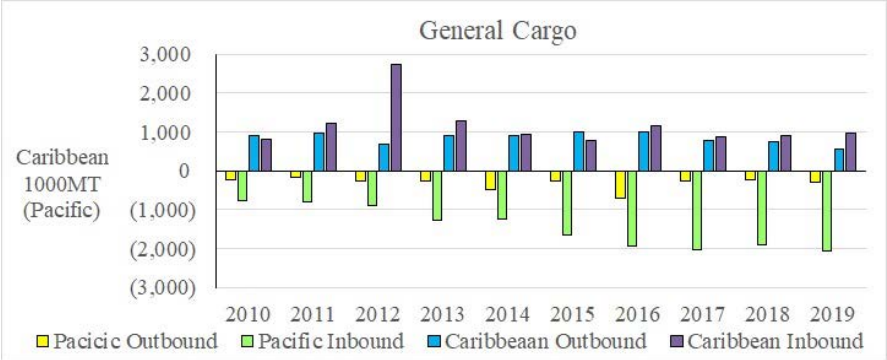
The values of the ports of Quetzal, SANTOCAS and Cortes seem to be small considering the size of these ports, but it is thought to reflect that the ports are the first or last ports of feeder service routes in Central America or receive many regular services.

6.2.4 General Cargo

(1) Trend of General Cargo

The trend of the loading and unloading cargo volumes of general cargo vessels at the ports in Central America by coast is shown in Figure 6.2.39

Unloaded cargo volume handled at the ports on the Pacific coast is increasing.



Source: COCATRAM Statistics

Figure 6.2.39 Trend of General Cargo Volume by Coast

(2) Ports for General Cargo

a) Outline

The ports where general cargo is loaded or unloaded in three years from 2017 to 2019 are listed in Table 7.3.23. Average annual cargo volumes in the three years are shown in the table. On the Pacific coast, 907 thousand tons of general cargo was handled annually at Quetzal Port in average in these three years. Caldera Port, Acajutla Port, and San Lorenzo Port handled smaller volumes of cargo. On the Caribbean coast, 520 thousand tons was handled at Limon-Moin Port while Santo Thomas de Castilla and Cortez follow in terms of handling volume.

Table 6.2.26 Ports Handling General Cargo and Handling Volumes

	Pacific	1000ton[1)]	Caribbean	1000ton[1)]
Guatemala	Quetzal	907	SANTOCAS	391
			Barrios	130
El Salvador	Acajutla	376		
	Corsain	29		
Honduras	San Lorenzo	177	Cortes	374
			Castilla	2
Nicaragua	Corinto	85	Arlen Siu	5
	Sandino	100		
Costa Rica	Caldera	552	Limón Moín	520
	Golfito	5		
	Quepos	1		
	Puntarenas	1		
Panama	Psa Terminal	2	Cristobal	7
	Balboa	26	Manzanillo	18
			Ptp Chiriqui Grande	1
			Punta Rincon	24
			Bocas Fruit Co.	112
			Granelera Bahia Las Minas	4
			Termini Financing Group	3
			Port Colon 2000	18

Note: 1) Average annual cargo volume of General Cargo from 2017 to 2019
Source: COCATRAM Statistics

b) Multi-purpose Terminal of Each Port

General cargo is usually handled at a multipurpose wharf. Other types of cargo are also handled at the wharves.

Types of handling cargo, maximum water depth and length of the quay, equipment and storage facilities of each multipurpose terminal at ports on the Pacific coast, ports on the Caribbean coast and the ports of Balboa and Cristobal in Panama are summarized in below.

Table 6.2.27 Multipurpose Terminal Facilities of each Port

Quetzal Port

Handled Cargo	Coal, chemicals, petroleum products, LPG, containers, passengers, Ro-Ro, bulk grain, sugar, alcohol,					
Quay	Max Depth	13.0	Total Length	953.6	No of Berth	8
Equipment	Mobile Cranes, Elevators					
Storage Facility	Weighbridge: 16 platform scales equipped with computer and pneumatic system, storage for general cargo: 8,000 m2, consolidation storage: 5,600 m2, Discharge capacity dry bulk: 18,000 tons/day, Silo storage: over 20,000 m2					

Acajutla Port

Handled Cargo	Import: Grains, fertiliser, soda ash, phosphoric rock sulphur, soy flour, etc., Export: Raw sugar cane, cotton seed meal and flour, grains, etc.					
Quay	Max Depth	12.0	Total Length	1,267	No of Berth	8
Equipment	Clamshell handling: 350 tons/hr, Front loaders: 15 (1.25–5.9cu.yd.), Clamshells: 24 (1.0–3.5cu.yd., 5×7.0cu.yd.), Buckets for discharging bulk cargo: 7×20cu.yd., Chain conveyors: 10×80 tonne, Trucks: 41×30–50 tonne					
Storage Facility	Storage capacity of export silo: 2,400m2, 12,000 tons, Storage capacity of import silo 2,500m2, 18,000 tons (6×1,000 tons, 6×2,000 tons).					

San Lorenzo Port

Handled Cargo	Resin, Coffee, Lumber, Timber, Cotton, Bulk cargo, Bagged cargo, Coal/Clinker, Molasses, Sugar, Meat, Cars, Cement, Wire/iron bars					
Quay	Max Depth	10.67	Total Length	546.4	No of Berth	4
Equipment	-					
Storage Facility	General cargo warehouse: 2,408m2, Lumber shed: 1,204m2, Piling sugar warehouse: 3,072m2, Open side warehouse for cotton: 1,806m2, Molasses tanks: 2 (capacity one million gallons), Open storage: 32,913m2					

Corinto Port

Handled Cargo	Exports: Raw sugar in bulk, Imports: Wire rolls, Bulk cargo (discharged by clamp shells), Fertiliser (insecticides in 45 kg. bags), Fertiliser (insecticides in 1.2-ton bags), Vehicles (units), Paper rolls, Wheat (by Buhler), Other breakbulk					
Quay	Max Depth	12.6	Total Length	Over 370	No of Berth	3
Equipment	Forklifts: 1×12-ton, 1×7-ton, Clamp shells: 2×5cu.m., 4×2.5cu.m., Hoppers: 3×17.5cu.m., 2×8.7cu.m., Buhler: 1×100t.p.h.					
Storage Facility	Covered storage: 1×2,437m2, For breakbulk cargo: 2,437m2, For fruit: 30,000m2, Open storage for breakbulk cargo: 23,000m2					

Caldera Port

Handled Cargo	dry bulk, liquid bulk, passengers, breakbulk, project and general cargo.					
Quay	Max Depth	13.0	Total Length	670	No of Berth	4
Equipment	Grabs: 8×10cu.m, 2×5cu.m, Hoppers: 2×70cu.m, 6×35cu.m					
Storage Facility	Warehousing totalling: 12,600m2, Open stockyards totalling: 71,400m2					

Santo Tomas de Castilla Port

Handled Cargo	Passenger, general, military, Ro-Ro, multipurpose, reefer, chemicals, caustic soda					
Quay	Max Depth	9.8	Total Length	918	No of Berth	6
Equipment	Forklifts: 39×3–25ton, Electrical pallet jacks: 12, Mechanical pallet jacks: 5, Lift trucks for handling paper rolls: 11×4–5-ton					
Storage Facility	Covered storage: 28,738m2, Truck yard: 30,021m2, Vehicle storage yards: 17,323m2, General cargo storage area: 8,895m2					

Barrios Port

Handled Cargo	Bananas, grain, fertilisers and oil					
Quay	Max Depth	9.5	Total Length	558	No of Berth	7
Equipment	-					
Storage Facility	Adequate covered and open storage					

Cortes Port

Handled Cargo	Breakbulk, bulk, products, LPG, fuel oil, Ro-Ro					
Quay	Max Depth	12.0	Total Length	1,196	No of Berth	6
Equipment	-					
Storage Facility	Limited covered storage for bulk and general cargoes: 65,000 tonnes					

Castilla Port

Handled Cargo	Bananas, palm oil, products					
Quay	Max Depth	16.0	Total Length	225	No of Berth	1
Equipment	-					
Storage Facility	Cars and breakbulk cargo: Limited warehouse and outside storage areas available for containers					

Moin Port

Handled Cargo	Products, LPG, Ro-Ro, breakbulk					
Quay	Max Depth	13.0	Total Length	993	No of Berth	6
Equipment	-					
Storage Facility	Open sided cargo handling sheds for reefer cargoes: 4, (1×129.5×15.7 m., 1×70×12.0 m., 1×70×15.0 m., 1×101×15.0 m.)					

Limon Port

Handled Cargo	Project, Ro-Ro, Cruise, bulk					
Quay	Max Depth	10.5	Total Length	1,170	No of Berth	5
Equipment	Forklifts: 2×2.5ton, Straddle carriers: 4, Trucks: 9					
Storage Facility	-					

Balboa Port

Handled Cargo	Ro-Ro, breakbulk, bulk, products					
Quay	Max Depth	13.3	Total Length	2,006	No of Berth	13
Equipment	-					
Storage Facility	37,607m^2					

Cristobal Port

Handled Cargo	Dry bulk, breakbulk, LPG, bunkers					
Quay	Max Depth	12.5	Total Length	1,192	No of Berth	8
Equipment	Quayside gantry cranes: 13, RTGs: 37, reach-stackers: 10×4,, Empty container handlers: 16×7, Top loaders: 6×5, Forklifts: 32, Trucks: 89					
Storage Facility	-					

Source: Findaport, etc

(3) General Cargo Vessel Called at Ports in the Central American Countries

Table 6.2.28 shows the number of ship calls, Maximum LOA, maximum draft (design draft /actual draft at call), port staying time of general cargo vessels which called at the port in Central America in 2019 based on AIS data (Lloyd's Intelligence).

Regarding the ports in the Central America, maximum LOA of general cargo vessels is approximately 200 m, maximum draft is 11-12 m and port staying time is approximately 2- 3 days.

Table 6.2.28 Calling General Cargo Vessel at Ports in Central America (2019)

General Cargo Ship	Number	MAX LOA	MAX Draft	Max actual Draft	Port Stay
Puerto Quetzal	60	204	13.3	11.3	49.7
Acajutla	21	200	12.6	11.2	68.1
Corinto	30	209	12.6	11.1	64.8
Caldera	39	204	12.7	12.0	60.0
Puerto Limon	125	193	11.2	10.2	49.9
Balboa	18	200	11.3	9.6	81.3

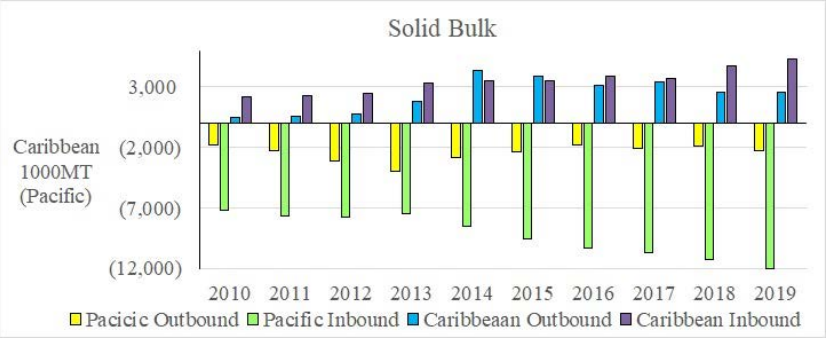
General Cargo Ship	Number	MAX LOA	MAX Draft	Max actual Draft	Port Stay
SANTOC AS	37	200	11.2	10.2	43.1
Puerto Cortes	160	204	12.6	11.8	97.5
Roatan Is.	50	100	5.8	5.6	37.7
Puerto Limon	125	193	11.2	10.2	49.9
Cristobal	270	209	12.6	11.7	247.8
Coco Solo	184	179	10.8	10.2	14.9
Las Minas Bay	19	75	3.8	3.7	270.4
Punta Rincon	51	161	9.9	8.2	71.1

Note 1:he table is prepared based on data of General Cargo and General Cargo with container Capacity of vessel type in AIS data (Lloyd's Intelligence).
2: Ports which ship calls are less than ten (10) in 2019 are not listed.
Source: Lloyd's AIS data 2019

6.2.5 Solid Bulk Cargo

(1) Solid Bulk Cargo Handled at Ports

The trend of the loading and unloading cargo volume of solid bulk at the ports in Central America by coast are shown in Figure 6.2.40. Unloaded cargo volume handled at the ports on the Pacific coast is increasing.



Source: COCATRAM Statistics

Figure 6.2.40 Trend of Solid Bulk Cargo Volume by Coast

(2) Ports for Solid Bulk Vessels

Figure 6.2.29 shows the ports where solid bulk cargo is loaded and unloaded and handling volumes in 2019. On the Pacific coast, the largest volume of solid bulk cargo (6,988 thousand tons) was handled at Quetzal Port in 2019, followed by Caldera Port, Acajutla Port, and Corinto Port. On the Caribbean coast, the largest volume of solid bulk cargo (3,591 thousand tons) was handled at Cortes Port, followed by Santo Thomas de Castilla and Cristobal port. The ports where solid bulk cargo is loaded or unloaded in three years from 2017 to 2019 are listed in Table 7.3.25. Average annual cargo volumes in the three years are shown in the table. On the Pacific coast, the largest volume of solid bulk cargo (6,988 thousand tons) was handled at Quetzal Port in average in the three years, followed by Caldera Port, Acajutla Port, and Corinto Port. On the Caribbean coast, the largest volume of solid bulk cargo (3,591 thousand tons) was handled at Cortes Port, followed by Santo Thomas de Castilla and Cristobal port.

Table 6.2.29 Ports for Solid Bulk Cargo and Handling Volumes

	Pacific	1000 ton	Caribbean	1000 ton
Guatemala	Quetzal	6,988	SANTOCAS	2,285
El Salvador	Acajutla	2,099		
Honduras	San Lorenzo	216	Cortes	3,591
Nicaragua	CORINTO	1,292		
	SANDINO	39		
Costa Rica	Caldera	2,454	Limon/Moin	126
	PUNTAMORALES	168		
Panama	Balboa	172	Cristobal	813
			Ptp Chiriqui Grande	5
			Punta Rincon	445
			Granelera Bahia Las Minas	146
			Bulk Bahia Las Minas	38

Note: Average annual cargo volume of Solid Bulk Cargo from 2017 to 2019
Source: COCATRAM Statistic

(3) Bulk Carrier Calls at Ports in Central American Countries

Table 6.2.30 shows the number of ship calls, Maximum LOA, maximum draft (design draft /actual draft at call), port staying time of bulk carriers which called the ports in Central America in 2019 based on AIS data (Lloyd's Intelligence).

The maximum LOA of bulk carriers is approximately 200 m, the maximum draft is 13-14 m and port staying time is approximately 2.5- 5 days.

Table 6.2.30 Solid Bulk Vessel Which Called at Ports in Central America (2019)

2019	Number	MAX LOA	MAX Draft	Max Draft actual	Port Stay	DAY
Quetzal	475	229	14.4	12.9	66.1	2.75
Acajutla	283	210	13.8	12.9	66.6	2.77
San Lorenzo	46	200	13.4	10.1	127.4	5.31
Corinto	121	200	13.5	12.0	105.9	4.41
Sandino	29	200	13.3	10.8	84.0	3.50

2019	Number	MAX LOA	MAX Draft	Max Draft actual	Port Stay	DAY
SANTO CAS	118	200	13.4	10.5	57.3	2.39
Cortes	205	230	14.4	12.8	154.8	6.45
Limon	61	200	13.4	10.1	77.1	3.21
Cristobal	338	292	18.3	15.2	63.2	2.63
Coco Solo	14	229	14.9	14.3	77.1	3.21

2019	Number	MAX LOA	MAX Draft	Max Draft actual	Port Stay	DAY
Caldera	284	210	13.8	13.5	109.7	4.57
Balboa	256	292	18.3	18.5	71.3	2.97
Las Minas Bay	25	180	10.9	10.2	109.1	4.54
Punta Rincon	14	229	13.5	13.4	51.6	2.15

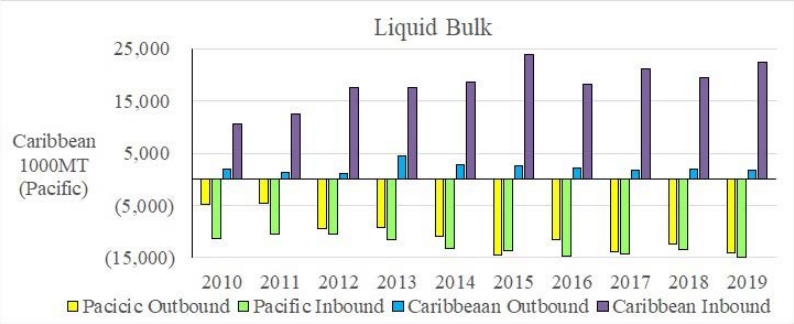
Note 1: The table is prepared based on data of Bulk Carrier of vessel type in AIS data (Lloyd's Intelligence).
2:: Ports which ship calls are less than ten (10) in 2019 are not listed.
Source: AIS data (Lloyd's Intelligence) for 2019

6.2.6 Liquid Bulk Cargo

(1) Trend of Liquid Bulk Cargo

In 2019, the volume of liquid bulk cargo handled at the ports in the Central America is 53,000 tons (loading volume: 16 million tons, unloading volume: 37 million tons). The loading and unloading cargo volume of liquid bulk cargo at the ports from 2010 to 2019 in Central America by coast is shown in Figure 6.2.41.

On the Caribbean side, the unloading volume is larger than loading volume. On the Pacific side, the volume of unloading and loading cargo is almost the same. It has not leveled off and has been on the rise for the past 10 years.



Source: COCATRAM Statistics

Figure 6.2.41 Trend of Liquid Bulk Cargo Volume by Coast

(2) Liquid Bulk Cargo Terminal

The ports where liquid bulk cargo is loaded or unloaded in three years from 2017 to 2019 are listed in Table 7.3.27. Average annual cargo volumes in the three years are shown in the table. Liquid bulk is unloaded or loaded by dedicated port facilities such as buoys. These terminals are located on the Pacific coasts of Guatemala, El Salvador, Costa Rica, the Caribbean coast of Honduras, and Panama.

Table 6.2.31 Ports/Terminal for Liquid bulk Cargo and Handling Volume

	Pacific	1000ton[1)]	Caribbean	1000ton[1)]
GUATEMALA	Boyas San José Terminal	1,936	Puerto Barrios	265
	Puerto Quetzal	1,030	Puerto Santo Tomas De Castilla	1,625
EL SALVADOR	Alba Oil Buoys Terminal	87		
	Puerto Acajutla	665		
	Puerto Corsain	256		
	Rasa Buoys Terminal	1,218		
	Terminal Buoys Cenergica	162		

	Pacific	1000ton[1)]	Caribbean	1000ton[1)]
HONDURAS	Puerto San Lorenzo	648	Puerto Castilla	353
			Puerto Cortes	2,304
			Puerto Tela	292
NICARAGUA	Puerto Corinto	1,978	Puerto Cabeza	20
	Puerto Sandino	677	Puerto El Bluff	16
COSTA RICA	Puerto Golfito	225	Limón Moín Port Complex	2,666
	Puerto Caldera	16		
	Puerto Puntamorales	29		
	Puerto Puntarenas	1		
	Puerto Quepos	2		
PANAMA	Decal Panama	2,340	Colon Oil and Service	578
	Melones Oil Terminal	691	Panama Port Company-Cristobal	523
	Panama Port Company-Balboa	242	Payardi Terminal Company	3,143
	Ptp Charco Azul	13,238	Ptp Chiriqui Grande	11,000
	Terminal Petroamerica	1,056	Terminal Granelera Bahia Las Minas	7
			Puerto Punta Rincon	17

Note: 1) Average annual cargo volume of Liquid Bulk Cargo from 2017 to 2019
Source: COCATRAM Statistics

(3) Liquid Bulk Carrier

Table 6.2.32 shows the number of ship calls, Maximum LOA, maximum draft (design draft /actual draft at call), port Staying time of product tankers which called at the ports in Central America in 2019 based on AIS data (Lloyd's Intelligence). The maximum LOA of product tankers is approximately 229 m, the maximum draft is approximately 14.5 m and port staying time is approximately 1.5 days to less than 2 days.

Table 6.2.32 Product Tanker Which Called at Ports in Central America (2019)

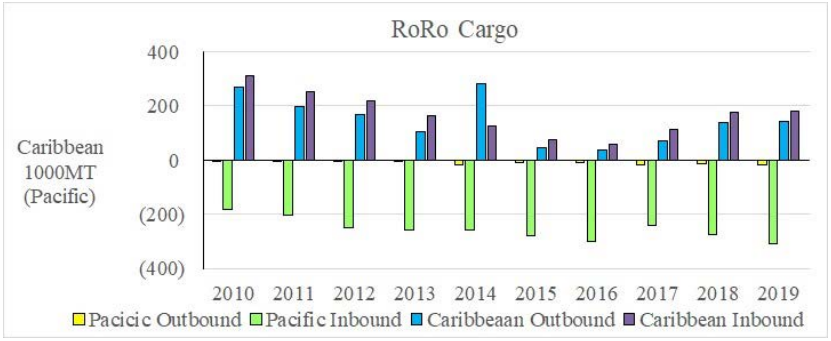
2019	Number	MAX LOA	MAX Draft	Max Draft actual	Port Stay	DAY
Quetzal	91	229	14.5	12.2	31.1	1.29
San Jose	89	229	14.6	13.0	32.4	1.35
Acajutla	152	229	14.6	13.0	40.1	1.67
San Lorenzo	38	229	14.5	11.7	35.3	1.47
Corinto	54	229	14.3	11.0	34.8	1.45
Sandino	12	229	14.5	12.0	119.2	4.97
Caldera	14	176	10.5	9.2	50.3	2.09
SANTOCAS	62	229	14.5	11.5	27.0	1.13
Barrios	21	183	13.3	11.5	30.0	1.25
Cortes	51	229	14.5	11.5	66.4	2.77
Limon	42	186	13.3	12.0	78.7	3.28
Cristobal	601	229	14.5	14.8	24.3	1.01
Coco Solo	460	229	14.5	12.5	13.8	0.57
Las Minas Bay	57	229	14.5	12.4	35.5	1.48
Melones Island Terminal	103	229	14.5	13.1	33.8	1.41
Charco Azul	83	229	14.5	14.5	36.4	1.52

Note 1: The table is prepared based on data of Bulk Carrier of vessel type in AIS data (Lloyd's Intelligence).
2: Ports which ship calls are less than ten (10) in 2019 are not listed.
Source: AIS data (Lloyd's Intelligence) for 2019

6.2.7 RORO Cargo

(1) Trend of RORO Cargo

The trend of the loading and unloading volume of RORO cargo at the ports in Central America by coast is shown in Figure 6.2.42. On the Caribbean side, volume had been on a downward trend until 2016 but both loading and unloading volumes have been increasing since 2017. On the Pacific side, the unloading volume has been maintained at 200 tons or more.



Source: COCATRAM Statistics

Figure 6.2.42 Trend of RORO Cargo Volume by Coast

(2) Ports of RORO Ship Calls

The ports where RORO cargo is loaded or unloaded in three years from 2017 to 2019 are listed in Table 7.3.29. Average annual cargo volumes in the three years are shown in the table. On the Pacific coast, RORO cargo is unloaded at all main ports of each country. On the Caribbean side, a lot of RORO cargo is handled at Manzanillo International Terminal, but very little cargo is handled at other ports. (See Table 6.2.33)

Table 6.2.33 Ports where Liquide Bulk Cargo is Handled

	Pacific	Cargo	Caribbean	1000MT
Guatemala	Quetzal	65		
El Salvador	Acajutla	22		
Honduras	San Lorenzo	12	Cortes	1
Nicaragua	Corinto	16		
Costa Rica	Caldera	68	Limon/Moin	8
Panama	Balboa	107	Manzanillo	266

Note: Average annual cargo volume of Solid Bulk Cargo from 2017 to 2019
Source: COCATRAM Statistics

(3) Vehicle Carrier

Figure 6.2.34 shows the number of ship calls, Maximum LOA, maximum draft (design draft /actual draft at call), port Staying time of Car Carrier bulk carrier which called at the ports in Central America in 2019 based on AIS data.

The maximum LOA of Car Carriers is approximately 230 m, maximum draft is 11-12 m and port staying time is less than 1 day in general.

Table 6.2.34 Car Carrier Which Called at Ports in Central America (2019)

2019	Number	MAX LOA	MAX Draft	Max Draft actual	Port Stay	DAY
Quetzal	173	230	11.7	10.4	7.8	0.32
Acajutla	120	230	11.2	10.4	7.6	0.32
San Lorenzo	118	230	10.6	9.7	11.1	0.46
Corinto	94	230	11.7	9.9	10.0	0.42
Caldera	155	230	11.2	9.9	47.1	1.96
Balboa	207	232	11.7	10.1	19.8	0.82

2019	Number	MAX LOA	MAX Draft	Max Draft actual	Port Stay	DAY
SANTOCAS	26	200	10.3	9.4	10.8	0.45
Puerto Limon	40	200	10.3	9.3	46.1	1.92
Balboa	207	232	11.7	10.1	19.8	0.82
Cristobal	111	232	11.7	10.6	8.6	0.36
Coco Solo	588	265	12.3	11.2	16.1	0.67

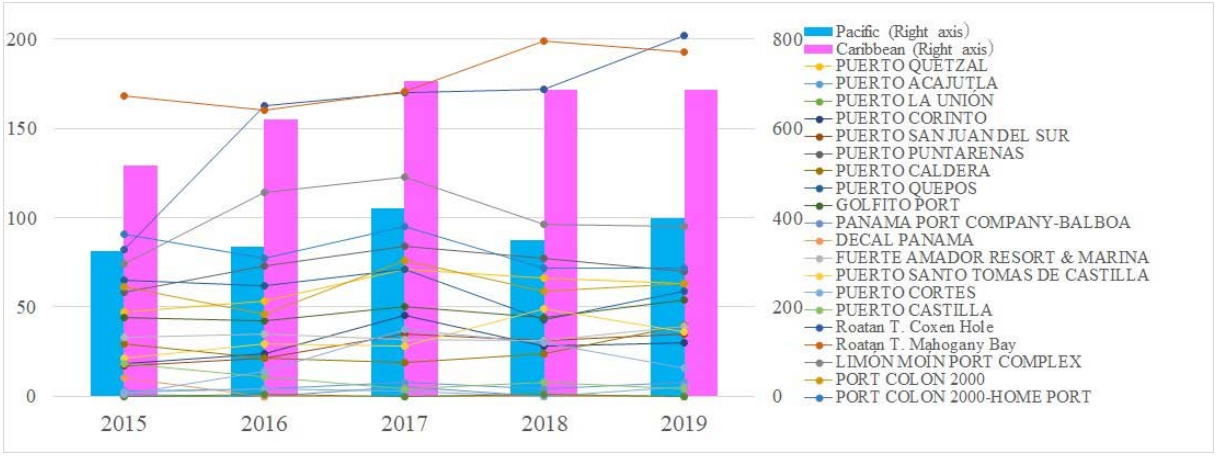
Note 1: The table is prepared based on data of Vehicle Carrier of vessel type in AIS data (Lloyd's Intelligence).
2: Ports which ship calls are less than ten (10) in 2019 are not listed.
Source: Lloyd's AIS data (Lloyd's Intelligence) for 2019

6.2.8 Cruise Terminal

(1) Trend of Cruise Ship Calls

According to the statistics of COCATRAM, the ship calls per year at the ports on the Pacific coast in these five years are 325, 335, 420, 349 and 398, and those at the ports on the Caribbean Coat are 518, 619, 707, 686 and 686. The number of ships call at ports on the Caribbean coast is twice that on the Pacific coast (see Figure 6.2.43).

Cruise ships called at twelve (12) ports on the Pacific coast: Puerto Quetzal; Puerto Acajutla; Puerto La Unión; Puerto Corinto; Puerto San Juan Del Sur; Puerto Puntarenas; Puerto Caldera; Puerto Quepos; Golfito Port; Panama Port Company-Balboa; Decal Panama; and Fuerte Amador Resort & Marina. On Caribbean coast, ten (10) ports of Puerto Santo Tomas De Castilla, Puerto Cortes, Puerto Castilla, Roatan T. Coxen Hole, Roatan T. Mahogany Bay, Limón Moín Port Complex, Port Colon 2000, Port Colon 2000-Home Port, Colon Container Terminal and Panama Port Company-Cristobal received cruise ships in these five years.



Source: JST based on COCATRAM statistics

Figure 6.2.43 Ship Calls at Ports of Six (6) Central American Countries

On the Pacific coast, Puerto Quetzal, Puerto Puntarenas or Puerto Quepos receive more than fifty (50) cruise ships in a year on average. On the Caribbean coast, Roatan T. Coxen Hole, Roatan T. Mahogany Bay and Limón Moín Port Complex receive more than one hundred (100) cruise ships in a year on average (See Table 6.2.35).

Table 6.2.35 Average Number of Ships Calls per Year in Five Years (2015-2019)

Port on the Pacific Coast		Ports on the Caribbean Coast	
Puerto Quetzal	60	Puerto Santo Tomas De Astilla	33
Puerto Acajutla	5	Puerto Cortes	3
Puerto La Unión	0	Puerto Castilla	9
Puerto Corinto	29	Roatan T. Coxen Hole	158
Puerto San Juan Del Sur	28	Roatan T. Mahogany Bay	178
Puerto Puntarenas	72	Limón Moín Port Complex	100
Puerto Caldera	27	Port Colon 2000	61
Puerto Quepos	60	Port Colon 2000-Home Port	81
Golfito Port	47	Colon Container Terminal	0
Panama Port Company-Balboa	1	Panama Port Company-Cristobal	20
Decal Panama	2		
Fuerte Amador Resort & Marina	34		

Note 1: The table is prepared based on data of Passenger (Cruise) of vessel type in AIS data (Lloyd's Intelligence).
2: Ports which ship calls are less than ten (10) in 2019 are not listed.
Source: Lloyd's AIS data (Lloyd's Intelligence) 2019

Many cruise companies provide cruise services in the Central American area. The companies shown below operated cruise vessels which called at the ports in CA in recent years.

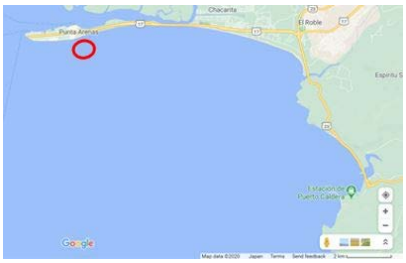
AIDA Cruises, Azamara Cruises, Carnival Cruise Lines, Celebrity Cruises, Costa Cruises, Crystal Cruises, Cunard Line, Disney Cruise Line, Fred Olsen Cruise Lines, Hapag-Lloyd Cruises, Holland America Line, Holland American Lines, MSC Cruises, National Geographic Cruises, N, ippon Yusen Kaisha, Noble Caledonia, Norwegian Cruise Line (NCL), Oceania Cruises, P&O Cruises, Phoenix Reisen, Ponant, Premicon, Princess Cruises, Pullmantur Cruises, Regent Seven Seas Cruises, Residen Sea. Royal Caribbean International, Sea Cloud Cruises, Seabourn Cruise Line, Silversea Cruises, Star Clippers, Swan Hellenic, TUI Cruises, UnCruise Adventures, Viking Ocean Cruises, Windstar Cruises

(2) Dedicated Cruise Terminal in Central America

Puntarenas port and Limón Moín Port Complex in Costar Rica, Port Colon 2000 in Panama, Port of Roatan and Mahogany Bay in Roatan Island of Honduras are famous cruise terminals in the Central American region. These ports provide dedicated wharves for cruise ships. In other ports, cruise vessels use non-dedicated berths, but many ports give cruise vessels priority berthing. Cruise terminals of four (4) ports are shown in Figure 6.2.44, Figure 6.2.45 and Figure 6.2.46.

Puntarenas pier



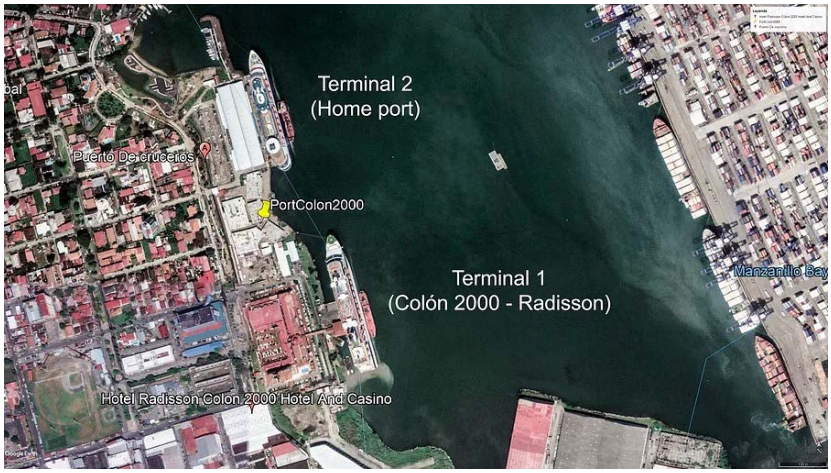


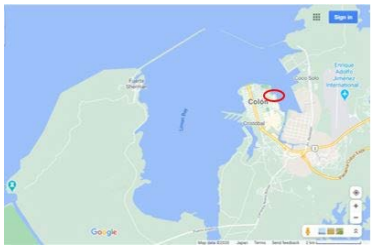
Berth No.4, No. 5
Draft 10.5m
Length 553.44m

Source; PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO Planes Maestros Otros Puertos Ministerio de Obras Públicas y Transportes de Costa Rica 23 ENERO 2020

Figure 6.2.44 Puntarenas Cruise Terminal

Port Colon 2000





Terminal	Length	Depth
No.1	100m	9.0 m
No.2	200 m	

Source: Google Map, Port Colon 2000 https://www.portcolon2000.com/

Figure 6.2.45 Port Colon 2000

Roatan Island



https://roatantourismbureau.com/port-of-roatan https://discoverroatan.net/mahogany-bay-cruise-ship-port/
Source: Google Map

Figure 6.2.46 Cruise terminals at Roatan Island

(3) Passenger (Cruise) Ships

Table 6.2.36 shows the number of ship calls, maximum LOA, maximum draft (design draft /actual draft at call), port staying time of crise vessels which called at the ports in Central America in 2019 based on AIS data.

The maximum LOA of cruise vessels is 300 m, maximum draft is 8-9 m and port staying time is less than one day.

Table 6.2.36 Cruise Vessel Which Called at Ports in Central America

2019	Number	MAX LOA	MAX Draft	Max Draft actual	Port Stay	DAY
Quetzal	124	333	8.7	8.8	16.3	0.68
Corinto	63	294	8.6	8.8	9.6	0.40
Caldera	77	333	8.7	8.8	14.4	0.60
Puntarenas	112	294	8.6	8.8	35.7	1.49
Golfito	59	181	7.5	7.5	44.7	1.86
Quepos	27	219	7.7	7.7	16.6	0.69
Balboa	130	333	8.7	8.8	25.1	1.05

2019	Number	MAX LOA	MAX Draft	Max Draft actual	Port Stay	DAY
SANTOCAS	94	294	8.6	9.0	28.9	1.21
Roatan Is.	141	339	9.0	9.3	73.2	3.05
Limon	186	333	8.6	9.0	16.8	0.70
Cristobal	367	333	8.6	9.0	10.8	0.45

Note : The table is prepared based on data of Passenger (Cruise) of vessel type in AIS data (Lloyd's Intelligence).
: Ports which ship calls are less than ten (10) in 2019 are not listed.
Source: Lloyd's AIS data (Lloyd's Intelligence) 2019

6.3 On-going and Planned Projects

6.3.1 Guatemala

(1) National Port Policy/Master Plan

Puerto Quetzal, Santo Tomas de Castilla Port and Barrios Port are characterized as important transport infrastructures in PENLOG Guatemala, 2015-2030. A National Port Master Plan has not been formulated because there is no responsible organization for formulating a national master plan.

(2) Puerto Quetzal

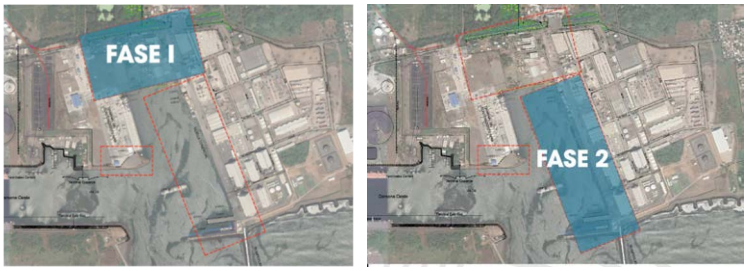
EPQ is updating the master plan at present August 2022). The projects of Quetzal Port were introduced at the seminar of REPICA 2021 hosted by COCATRAM. The projects of Quetzal Port are sumarized below based on the presentation and other materials.

a) Improvement of Commercial Terminal

Purpose
- To increase capacity of cargo handling at commercial berth
- To accommodate larger size (deeper draft) vessels

Project
- Improveent of Wharf etc.

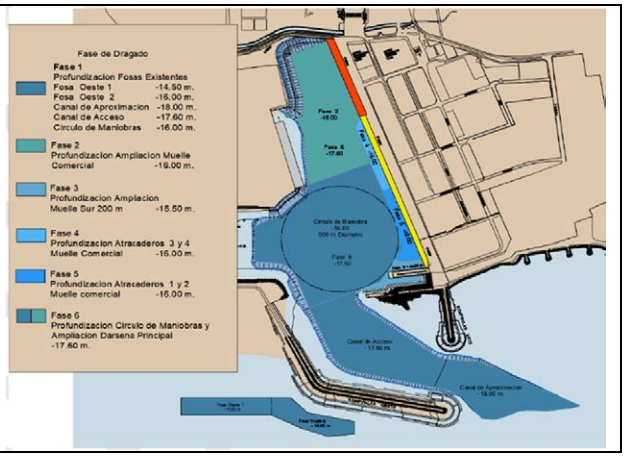
Phase Plan
- Phase 1:north berth
- Phase 2:south berth



Source: EMPRESA PORTUARIA QUETZAL (presentation paper in REPICA 2021

Figure 6.3.1 Improvement of Commercial Terminal

b) Deepening of Port Waters (Basin)

Purpose • To accommodate larger size (deeper draft) vessels Project • Dredging port waters • Total volume is 5,230,275,000 m3. • Berth depth: 16.m • Basin Depth: 17.5-m. Phase Plan • Implementation under six (6) phased plan.	

Source: EMPRESA PORTUARIA QUETZAL (presentation paper in REPICA 2021

Figure 6.3.2 Deepening of Port Waters

c) Development of Container Terminal (Phase II)

Purpose • Enhancement of the function as a container port with international standards Project • Extension of Quay length • Deepening of the quay depth • Expansion of Yard Note: The project is pending at present.	

Source: TCB website (Old)

Figure 6.3.3 Development of Container Terminal (Phase II)

d) Development of Land behind the Port Area

Purpose • Development of the port complex (835.15 ha) composed of ten (10) zones for commercial purposes Project • Constriction of Perimeter wall • Attracting enterprises	

Source: EPQ homepage

Figure 6.3.4 Development of Land behind the Port Area

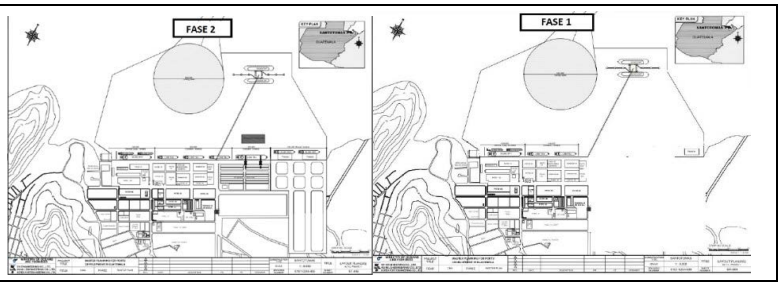
(3) Santo Tomas De Castilla Port

EMPORNAC has not prepared the master plan. The projects of Santo Tomas de Castrilla port were introduced in Plan Estategico Institucional 2018-2020 (SANTOCAS). It includes expansion of wharves as a container terminal, construction of a liquid bulk terminal, improvement of solid bulk terminal, construction of a cruise terminal, improvement of the channel and basin and improvement of access road. The layout plans of Puerto Santo Tomas de Castilla are shown in Figure 6.3.5.

a) Expansion/Improvement of port facilities

b) Development of Liquid & Solid Bulk Terminals

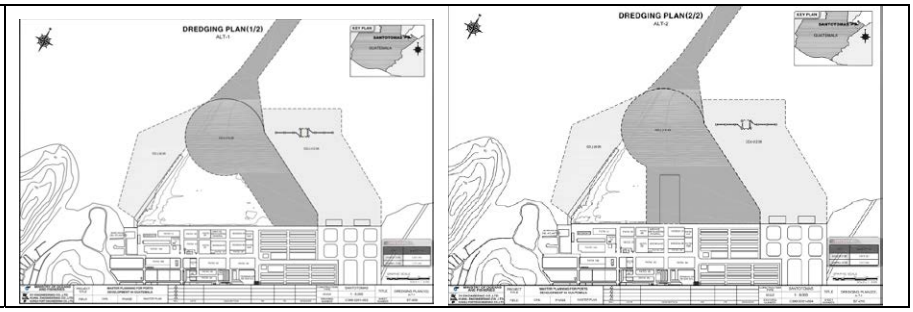
c) SANTOCAS Port: Construction of Cruise Terminal

Project • Expansion/Improvement of the existing wharves. • Development of dedicated use terminals • Liquid bulk • Solid Bulk Terminals, Cruise Terminal	

Source: Plan Estategico Institucional 2018-2020

Figure 6.3.5 Layout Plan of Development of Santo Tomas de Castilla Port

d) Improvement of Access Navigation Channel and Basin

Deepening/widening • Channel • Basin	

Source: PLAN ESTRATEGICO INSTITUTIONAL2018-2022 (EMPORNAC)

Figure 6.3.6 Expansion/Improvement of water facilities

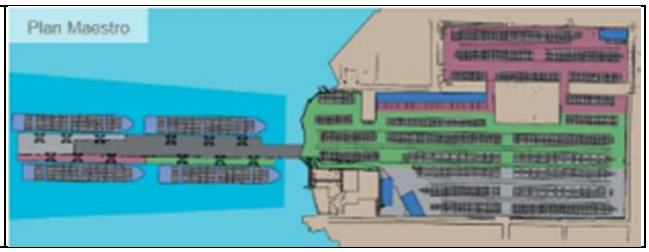
(4) Barrios Port

Chiquita, a terminal operator of Puerto Barrios, has a master plan shown in Figure 6.3.7. The plan is divided into three phases based on expected increases in container throughput.

a) Capacity Expansion of Barrios Port

Phased Plan

	Actual	Phase 1	Phase 2	Phase 3
Capacity (TEU/year)	450,000	630,000	850,000	1,000,000
Quay Depth (m)	10.5	14	14	15
Quay Length (m)	580	760	875	875
Yard Area(ha)	8	10	12	13
Mobile Crane (Post PANAMAX)	3	6	9	9
Crane (RTG)	0	8	13	18



Source: Terminal Ferroviaria Puerto Barrios/ Website of Chiquita

Figure 6.3.7 Capacity Expansion Plan of Port Barrios

6.3.2 El Salvador

(1) National Port Policy/Master Plan

Puerto Acajutla and Puerto La Union Port are categorized as primary ports and Muelle Acajutla, Muelle de La Libertado Puerto El Triant, Puerto Parada, Puerto Ramires and Puerto Corsan are categorized as secondary ports in Plan Nacional de Logística de Cargas PNLOG El Salvador 2018-2032. CEPA is drafting a national port master plan of El Salvador.

The Master Plan for the Development of the Ports in El Salvador (2020-2030) was formulated under assistance by UNDP in June 2021. In this Master Plan, both Acajutla and La Union should be operated in a complementary manner.

(2) Acajutla Port

CEPA has a long-term plan of Acajutla with the target year of 2030, which was prepared with assistance from the South Korean Government. .On the other hand, CEPA prepared the Master Plan for the Development of the Ports in El Salvador (2020-2030), Acajutla Port is planned to be a commercial port with a 14-m-deep quay. It is specialized in the operation of each type of cargo being handled to increase the competitiveness of El Salvador's international trade. CEPA will continue to be the port manager and operator.

a) Port Development of Acajutla Port

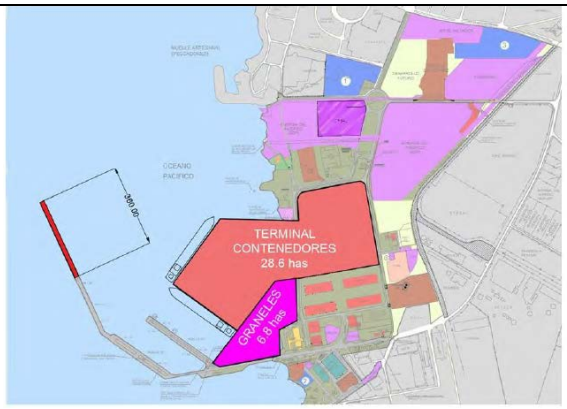
Project Description	
• Program to improve the use and expansion of current and future infrastructure. port operation optimization • Promoting the development of 2 offshore zones to the private sector • Dredging of port and esplanade Pier B • Extension of the harbor breakwater • Construction of the New Specialized Container Terminal • Equipping and commissioning of the New Container Terminal	
Source: The Master Plan for the Development of Ports of El Salvador 2020-2030 (2021.1)	

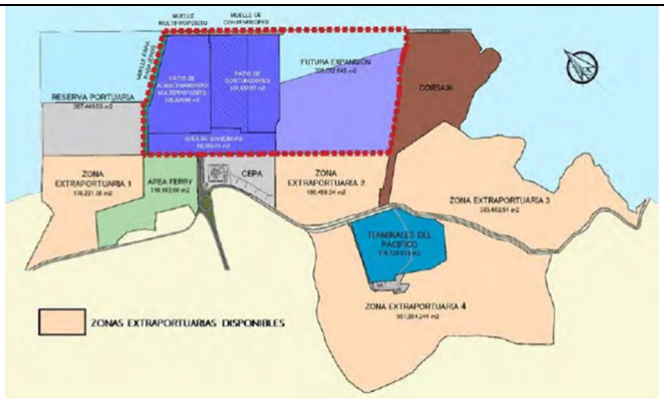
Figure 6.3.8 Acajutla Port Master Plan

(3) La Union Port

In the Master Plan for the Development of the Ports in El Salvador (2020-2030), La Union Port is planned to be a mixed port (commercial, industrial, recreational, and fishing) with a 10-m-deep quay for the economic development of the Eastern Region of El Salvador. The port is administered/operated as a land load port: CEPA will be a Port Administrator and operation will be carried by a private concessionaire.

CEPA conducted the survey of Port Activation Plan in La Union Port assisted by JICA in 2020-2022.

a) Development of La Union Port

Project Description	
• Redefinition of port navigation lanes dimensions and dredging system • Recovery of the operation of the Passenger Dock and RoRo • Concession process for the port's multi-Purpose Terminal • Initial dredging of the port • La Union Services & Industrial Park Developer Selection Process • Development of "La Union Services & Industrial Park". • Port-city linkage projects	

Source: The Master Plan for the Development of Ports of El Salvador 2020-2030)

Figure 6.3.9 Development Plan of La Union Port

6.3.3 Honduras

(1) National Port Policy/Master Plan

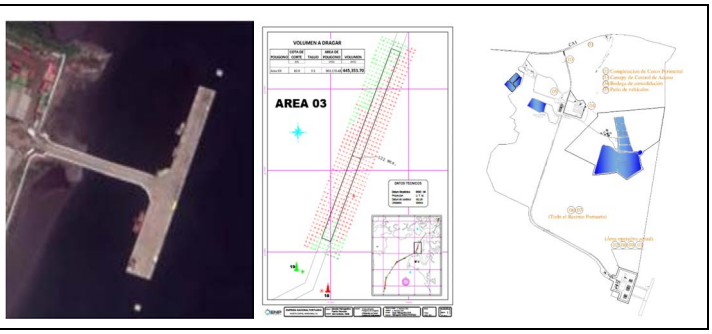
According to PNLOG Honduras 2019-2030. Puerto Cortes is characterized as an origin/destination port on the Caribbean Coast and Puerto San Lorenzo is a port on the Pacific Coast on the priority logistics corridor and priority national economic corridor. Puerto La Ceiba is an origin/destination port of Meso America Tourism Corridor. Puerto Castilla is an origin/destination port of Central Logistics Corridor. Puerto San Lorenzo and a new Puerto Amapala is characterized as a complex logistics base for the Pacific Ocean.

EPN plans to prepare a Cortes Port Development Master Plan Study.

(2) San Lorenzo Port

A long-term plan has not been prepared. In National Freight Logistics plan – PNLOG Honduras, 2019-2030, improvement of the port including channel dredging is listed as a priority project related to Economic Corridor Puerto Cortés sub-SP. Sula-Tegucigalpa-San Lorenzo.
CEPA has a plan for immediate projects such as deepening a channel, Expansion of Primary Zone etc.

a) Expansion of San Lorenzo Port

Purpose To remove the bottleneck of the port Project Bridge to the berth -Repair of the existing bridge/ construction of a new bridge Dredging -Maintenance dredging of access channel -Expansion of basin Land area -Expansion/Improvement of the back area	

Source: ENP

Figure 6.3.10 Development Plan of Cortes Container Terminal

(3) Cortes Port

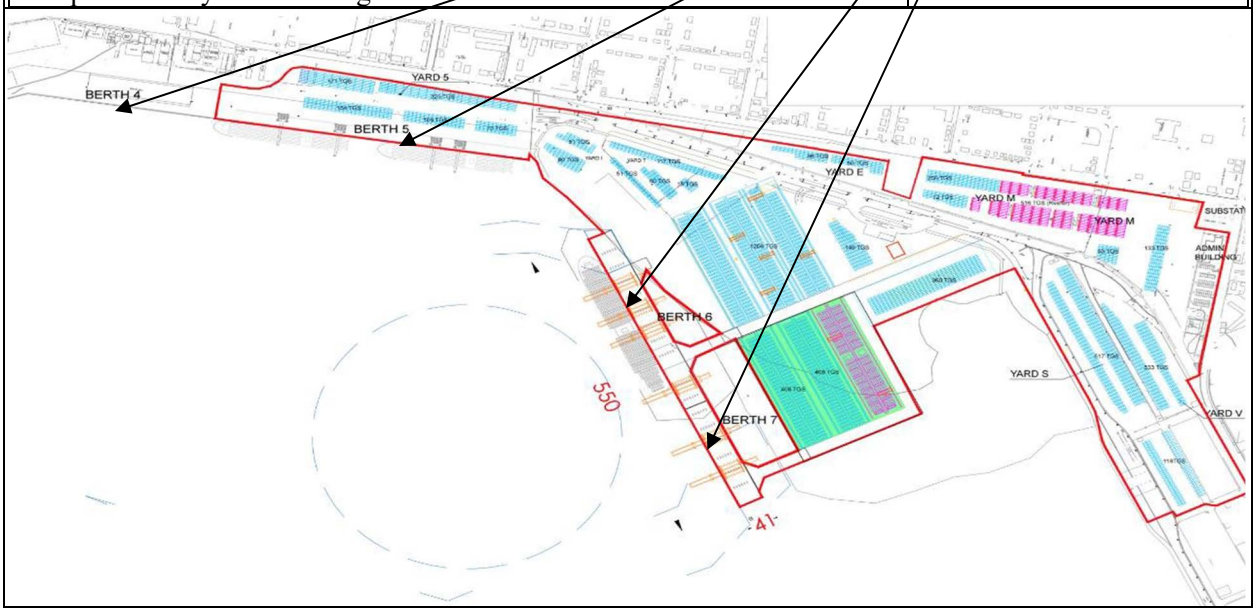
The container terminal and general cargo of Puerto Cortés is operated and expanded by Central American Port Operator (OPC) under a 30 year-concession contract awarded on 30 March 2012. The Solid Bulk Terminal of Puerto Cortés is operated and improved by GRUPO LOGRA and TEH (Specialized Terminals of Honduras) under the 20 year-concession contract awarded on 31 May 2013.

a) Expansion of Container Terminal

Future Investment
Capacity
1.8 million TEUs in future (1 million TEUs at present)
Investment
A 200-m extension of the quay for 550 m quay in total
6 super Post Panamax Cranes
4 Post Panamax Mobile Cranes
11 RTG Cranes
Expansion of yard including land reclamation

Existing Berth and Extension

Berth4	400m/10.5m
Berth5	400m/10.5m
Berth6	350m/14m
extension	200m/14m



Source: OPERADORA PORTUARIA CENTROAMERICANA (OPC)

Figure 6.3.11 Development Plan of Cortes Container Terminal

b) Improvement of Bulk Terminal

Rehabilitation of Berth-3
Extension of a 215m-long quay of 14m in depth

c) Improvement and Expansion

Rehabilitation and construction of New liquid bulk terminal

d) Facility of natural gas power generation plant

Construction of a 200 MW natural gas based Power Generation Plant in Puerto Cortés.

(4) Castilla Port

Improvement of Castilla Port is planned as a PPP project in collaboration with road improvement projects of CA5, Logistic Corridor, Tourist Corridor and CA-13 which connect the Pacific Ocean and the Caribbean Sea. A private company has submitted the proposal for the improvement of Castilla Port including a container terminal, a multipurpose terminal and a cruise terminal to COALIANZA. However, the proposal has not yet been approved.

a) Rehabilitation Project

Dredging and enlargement of the maneuvering dock, Dock maintenance and repair works, Expansion of

paved yards, Rehabilitation of warehouses for storage of general cargo and others.

b) Improvement of Terminal

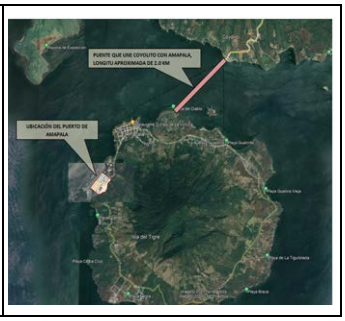
Purpose -Enhancement of port functions as a Tourism port and a gateway port at the south-east region of Honduras Project Container terminal, Multipurpose terminal Cruise terminal Note: -A private company had prepared to propose the project to COALLIAZNZA some years ago, but situation at present is unknown due to the dismantlement of COALLIANZA.	

Source: Source: Mejorando la Transparencia y Rendicion de Cuentas en las Alianzas Publico-Privadas <Informe de Diagnostico de Divulgacion Honduras (PPAF and others)

Figure 6.3.12 Improvement of Terminal of Castilla PortAmapala Port

A new Amapala port is planned in Tiger island. The study was conducted by assisted by South Korea. -A bridge connecting with Tiger Island has been financed by CABEI

c) Construction of New Port

Purpose To develop a new port which has functions of import/export base and regional development base Project Construction of Quays Development of port land by reclamation Dredging for creating an approach channel	

Source: ENP

Figure 6.3.13 New Amapala Port

6.3.4 Nicaragua

(1) National Port Policy/Master Plan

EPN aims to implement projects for enhancing the competitiveness of ports. However, EPN does not have a nationwide port master plan.

(2) Corinto Port

EPN has a plan to modernize Puerto Corinto. The plan will include strengthening of general cargo terminals and containers, construction of a bulk terminal and the San Isidro logistics center, spatial rearrangement of the site, dredging works, construction of inter-institutional infrastructure and acquisition of land and nautical port equipment. Modernization of operational processes will also be achieved through the introduction of an automated system and improvement of the electrical system.

a) Improvement of Corinto Port Capacity

Purpose
- Strengthening of physical and operational functions of the terminal
- Improvement of accessibility to the port
- Modernization of operational processes

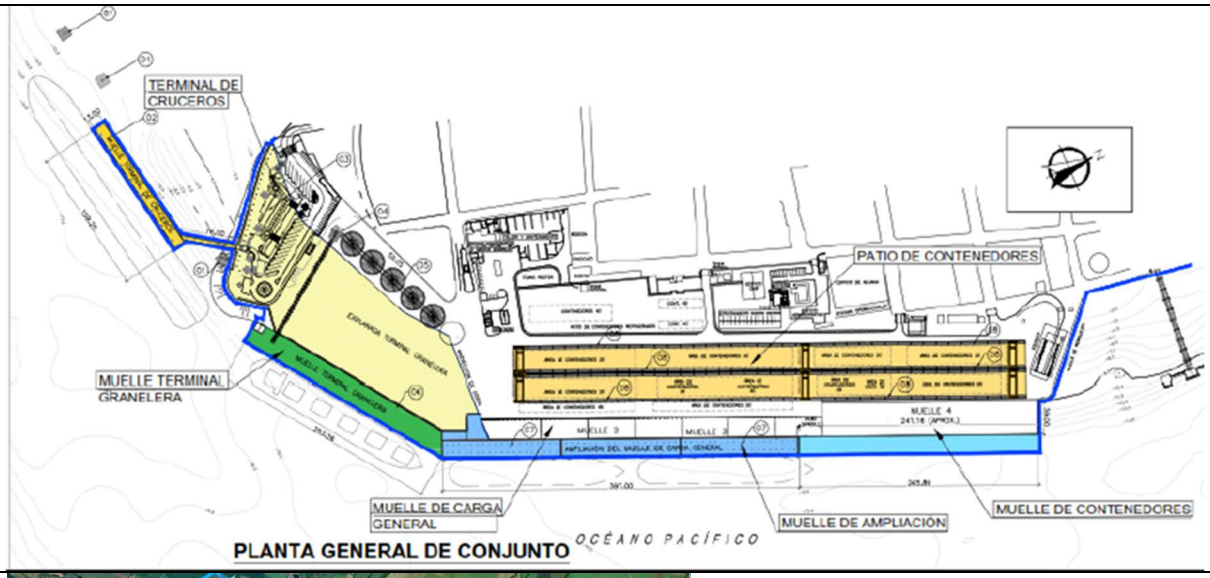
Target Year; 2020-2023

Project
- Strengthening of general cargo terminals and containers
- Construction of a bulk terminal
- San Isidro logistics center,
- Development of partial rearrangement of the site
- Dredging works
- Construction of inter-institutional infrastructure
- Acquisition of land and nautical port equipment.
- Introduction of an automated system and improvement of the electrical system.

Project Cost; USD163.2 million

Financial Arrangement;
- 15-year loan with the Central American Bank for Economic Integration.

Status : in action







Source: Challenges, Challenges and actions for the Modernization of Puerto Corinto and Ports on the Caribbean Coast of NICARAGUA

Figure 6.3.14 Capacity Improvement Project

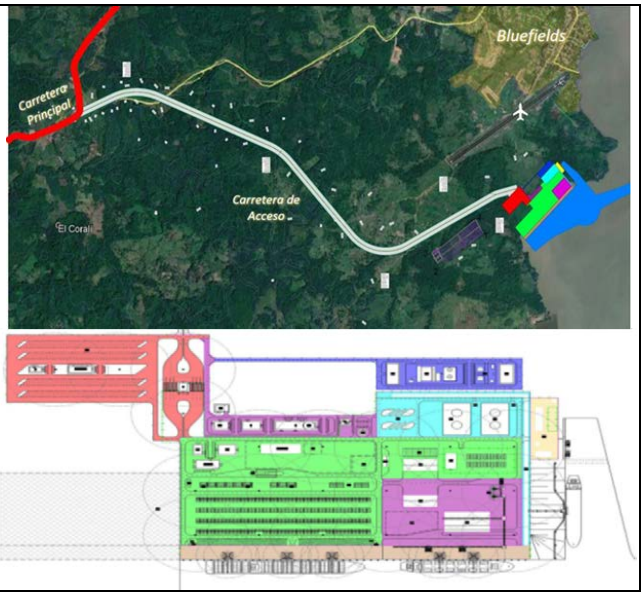
(3) New Port on Caribbean Coast

MTI intends to develop a deep seaport on the Caribbean coast of Nicaragua. MTI conducted a feasibility study on the development of a new port as a Bluefields project, Based on the result, MIT is searching fund resources,

a) New Port Development at Bluefields

Initial Phase		
	Cost (Mil-USD)	335
	Channel/Basin(m)	14.3-12.7/12.3
	Quay	Multi-purpose L:335m/D:13m Liquid Bulk
Phase 1		
	Cost (Mil-USD)	87
	Channel/Basin(m)	
	Quay	Extension for CT
Phase 2		
	Cost (Mil-USD)	152
	Channel/Basin (m)	15.6-14.0/13.8
	Quay	(Deepening CT)
Total Cost (Mil-USD)		**574**

Phased Plan
Three phased plan is prepared.



Source: Challenges, Challenges and actions for the Modernization of Puerto Corinto and Ports on the Caribbean Coast of NICARAGUA

Figure 6.3.15 Capacity Improvement Project

(4) Puerto Sandino

Projects such as the acquisition of port equipment, infrastructure improvement (storage areas and internal roads), maintenance dredging works in access channels, docks and docking area and improvement of dry dock are being examined at Puerto Sandino.

a) Improvement of Sandino Port

Table 6.3.1 Outline of Pre Feasibility Study of Puerto Sandino

Name	Improvement of technical and operational capacities of Puerto Sandino
Project Cost	USD60.5 million
Financial Arrangement	In search of financial resources
Target Year	-
Contents	The main investment components correspond to the acquisition of port equipment, infrastructure improvement (storage areas and internal roads), maintenance dredging works in access channels, docks and docking area and improvement of dry dock.
Status	In search of financial resources

Source: EPN

(5) Other Projects

Feasibility study on developing cruise terminals at Puerto Sandino, Puerto San Juan del Sur and Fonseca Bay is being implemented. A study on port tourism projects to promote tourism is being conducted. EPN is examining an integrated information system which connects to the Single Window Platform for Foreign

Trade of Nicaragua／VUCEN.

a) Improvements of Puerto Cabezas (Bilwi)

Construction new pier about 1500 m offshore which handles 1.0 million tons of cargo a year and the distance between the coast and berth is almost 1,500 m.

b) Enhancement Inland water Transport of Puerto Cabezas (Bilwi)

The projects for improving terminal along the Escondido River terminals and its stabilization.

c) Cruise Terminal Development

Study of Cruise terminal development plan in Port of Sandino, Port of San Juan del Sur and Ports in the Fonseca Bay are conducted.

d) Integrated information system which connects to VUCEN

VUCEN which is a Single Window Platform for Foreign Trade of Nicaragua is planned to be introduced to the ports in Nicaragua.

6.3.5 Costa Rica

(1) National Port Policy/Master Plan

Puerto Caldera and Puerto Limon-Moin are characterized as ports on the Priority Logistics Corridor in PNLog Costa Rica MPOT 2014-2024. The development projects of ports shown in PLAN NACIONAL DE TRANSPORTES 2011-2035 are listed in Table 6.3.2.

Table 6.3.2 Port Project in PLAN NACIONAL DE TRANSPORTES 2011-2035

Moín expansion	TCM, RECOPE Terminal, Taiwan Dock Expansion and Cold Terminal.
Limón Restructuring	City-Port Integration and Cruise Terminal.
Caldera Port Expansion	Bulk Terminal (grains and others), Multipurpose Terminal, RECOPE Terminal, Container Terminal, Cold Terminal, Cruise Terminal, Ferry Terminal and concentration of all traffic on the Pacific side.
-Que ra Paquera	New Ferry Terminal (cabotage).
Quepos and other locations.	New sports marinas
Traffic:	Radar stations, AIS network, VTS in Moín and Caldera, Traffic Control Centers and Maritime Salvage.
Itación Facilitation	Port Community Systems in Moín and Caldera, telematic procedures, new systems and management software applications.

Source:JST

(2) Caldera Port

MOPT prepared a master plan of Caldera Port in the report of PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO (Planes Maestros, Puerto Caldera) in January 2020. According to the report, current Caldera Port is blessed with an advantageous location close to the capital. Revenue can be maximized if the existing facilities are used efficiently. In addition, the present port has sufficient space for the demand in 2042 to 2045.Therefore, the expansion of Caldera Port should be planned at the present location (See Figure 6.3.16). The plan is divided into three phases: Phase A is from 2020 to 2031, Phase B is from 2031 to 2042, and Phase C is after 2042. Phase A includes the extension of berth 4 with 1a water depth of 5m, reform of current berths 1, 2 and 3 to new berth 1 and 2. pavement of yards, removal of a warehouse, development of a bulk cargo handling facility, quayside cranes (STS) and procurement of yard cranes (RTG).

a) Caldera Port Expansion Plan

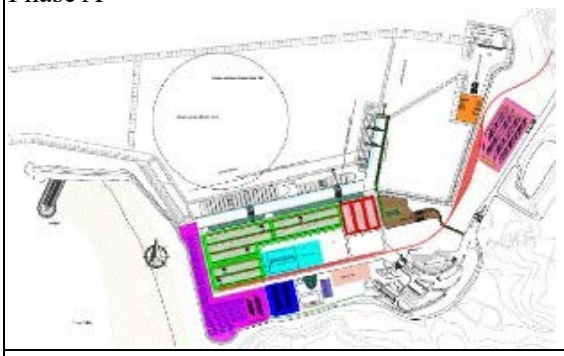
Future Demand

	2017	2020	200	2040
Cargo Volume (1000 ton)	5.219	6.115	7.422	9.223
Container (TEU)	290	324	419	577
Ship Call	589	753	858	1.053

Port Facility

	Wharf	Location	Length	Depth	Basin	Yard
Berth 1	Container	The exsiting Berth 1, 2 and 3	570m	14.0m		CT yard 13ha
Berth 2						
Berth 3	RORO, Ferry	Behind a Breakwater	210m	11.0m(14m in the futue)	RORO3ha Ferry1ha	
Berth 4	Bulk	The existing facility				
Berth 5						
Berth 6	General cargo	New reclmation	250 m	11.0m		2ha(reclamation)

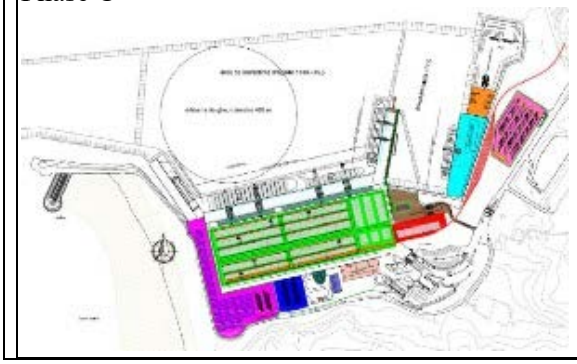
Phase A



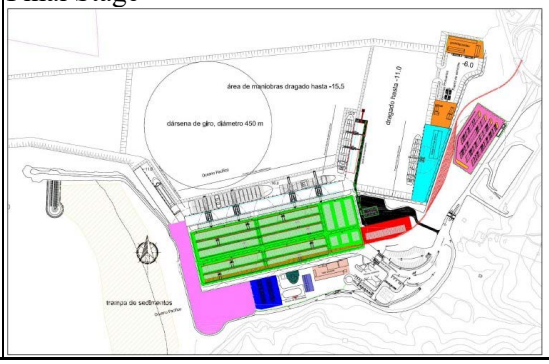
Phase B

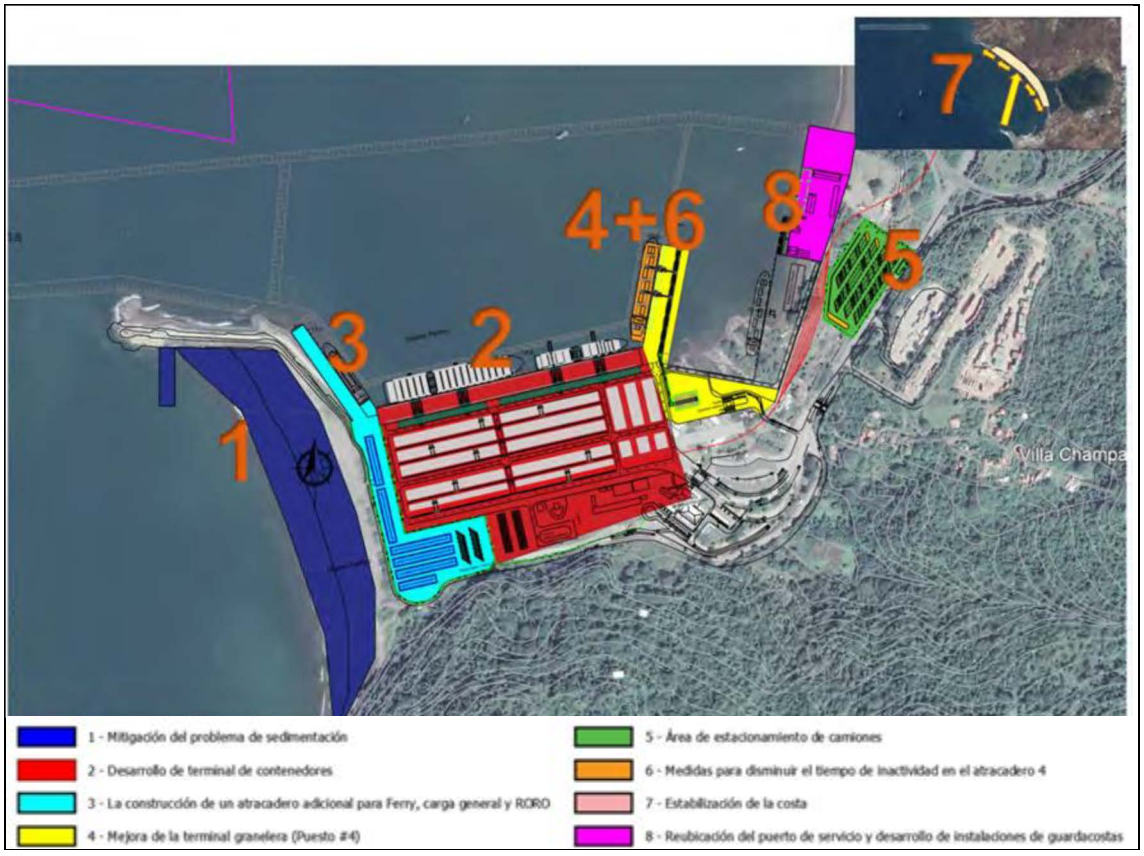


Phase C



Final Stage





Source: PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO Planes Maestros, Puerto Caldera Ministerio de Obras Públicas y Transportes de Costa Rica 23 ENERO 2020

Figure 6.3.16 Master Plan of Puerto Caldera

b) Breakwater Reinforcement of Caldera Port:

Rehabilitation against damage by wave

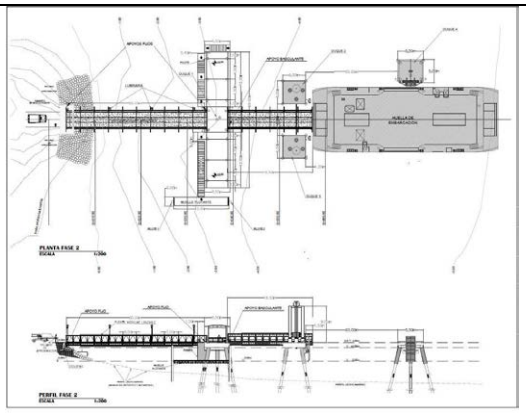
Purpose Measure to mitigate the risk that a sediment trap with a larger volume of sediment could be created. Design characteristics • Wn50 = 3,346 kg • Assumed reinforcing rock gradation: 3-6t • Recession of berm = 1.36 m • Width of berm = 3.9 m • Crest level = NMBS + 6.8m • Berm level = NMBS + 4.75m	

Source: PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO Planes Maestros, Puerto Caldera Ministerio de Obras Públicas y Transportes de Costa Rica 23 ENERO 2020

(3) Other Ports on the Pacific Coast

Ports on the Pacific coast under management of INCOP are classified into main ports, small ports and marinas. Master plans of Puerto Golfito, Puerto Quepos, Puerto Puntarenas, Puerto Punta Morales, Puerto Barrio El Carmen, Puerto Playa Naranjo and Puerto Paqueras are summarized in PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO(Planes Maestros Otros Puertos).

a) Golfito Port: Improvement

Project -Cruise Terminal -A customs and immigration office for people entering or leaving the country. -Parking area for imported cars.	

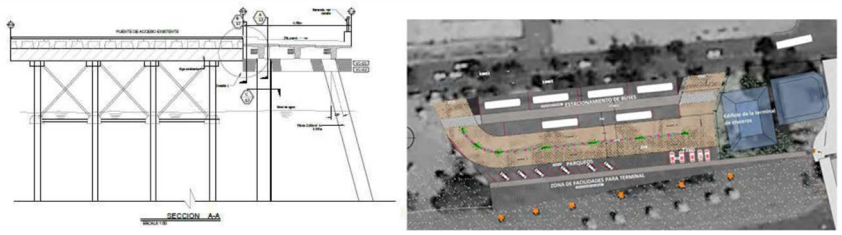
Source: PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO Planes Maestros, Puerto Caldera Ministerio de Obras Públicas y Transportes de Costa Rica 23 ENERO 2020

b) Quepos Port: Improvement

Purpose -For "tender" to transfer passengers from cruise ships to/from the pier -In addition, tourist boats, fishermen also use. Plan Two alternative plans	

Source: PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO Planes Maestros, Puerto Caldera Ministerio de Obras Públicas y Transportes de Costa Rica 23 ENERO 2020

c) Puntarenas Port: Improvement

Purpose -To improve cruise ship facilities Project -Build a Cruise Terminal -Rehabilitate and reinforce the pier	

Source: PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO Planes Maestros, Puerto Caldera Ministerio de Obras Públicas y Transportes de Costa Rica 23 ENERO 2020

d) Improvement Of Pequera Terminal

Purpose Facilities for cabotage Project New Ferry Terminals	

Source: PLAN MAESTRO PORTUARIO DEL LITORAL PACÍFICO Planes Maestros, Puerto Caldera Ministerio de Obras Públicas y Transportes de Costa Rica 23 ENERO 2020

Figure 6.3.17 Master Plan of Puerto Caldera

(4) Lmion/Moin Port

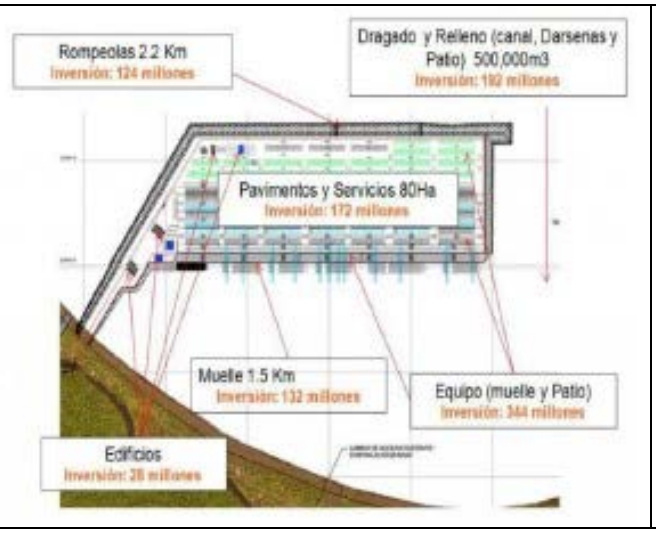
Master plan of Puerto Moin and Limon was issued in 2008 by JAPDEVA. This is the latest plan of both ports. The master plan includes the development plan of Puerto Limon, Moin and a new port.

Puerto Limon is planned to be redeveloped as a tourism port with cruise terminals, marina and facilities for tourists. The existing German Pier will be changed to a cruise terminal with 460 m in length and 10m in depth.

It is necessary for Puerto Moin to increase its capacity to handle cargo which will shift from Puerto Limon corresponding to the redevelopment of Puerto Limon. Four plans were proposed: JAPDEVA Plan, APS Plan, Americas Gateway Development Corporation/AMEGA Plan and A new terminal Plan. The master plan report concluded that the best option is the development of a new terminal which will be constructed and operated by an International Terminal Operator. APM Moin terminal which opened in 2019 was developed based on the concept of the new terminal plan.

APM Moin terminal project was developed under a concession contract with the Government of Costa Rica. The concession contract was signed in 2011 for a period of thirty-three years. Phase 1 project valued at USD 670 million was completed in 2019 and a new container terminal with 650 m in length and 14,5 m in depth has commenced operation. After completion of Phase 2 and Phase 3 projects, the container terminal will be a 1,500 m long with a water depth of 18 m and an area of 80 ha with a capacity of 2.7 million TEU as shown in Figure 6.3.18.

a) Moin Port: Construction of Container Terminal



	Phase 1	Final (after Phase 2 and 3)
Capacity	1.3 million TEU	2.7 Million TEU
Chunnel	16m	18m
Area	40ha	80ha
Quay	650m	1500m/5berth
Depth	14.5m	
Crane	6 units	

Source: The Seaports of Central America: The ministry of Foreign Affairs/Netherland
https://www.rvo.nl/sites/default/files/2018/03/the-seaports-of-central-america.pdf Web-steof Apm terminal

Figure 6.3.18 Future Plan of APM Moin Terminal

6.3.6 Panama

(1) National Port Policy/Master Plan

STRATEGIC MARITIME AND PORT DEVELOPMENT OF THE REPÚBLICA DE PANAMÁ VISIÓN 2040 was prepared by MC VALNERA,SL on behalf of CAF-Development Bank of Latin America and coordinated by the Panama Maritime Authority in April 2019. The strategy is aligned with the Panama National Logistics Strategy to 2030. The strategy shows the structure of logistics networks connecting ports in Pamana. Future prospects concerning the port and maritime sector in Panama are analyzed and future demand and functional allotments of international and local ports are examined. According to AMP, a national port and maritime master plan will be prepared in June 2020 by revising the above-mentioned plan.

On the other hand, AMP prepared ROADMAP BY PORT PREMISES in which the port facilities within each logistics area are classified according to the horizon in which the main proposed actions must be carried out. (https://www.amp.gob.pa/iniciativas/planes-estrategicos/hoja-de-ruta/)

Internationaal container terminals located at both mouths of the Panama Canal are operated by private concessionaires under the contract with AMP. Each company develop the terminal according to the business plans.

(2) Development of ports and surrounding areas

a) Road map of Development of Ports

Port Area	Investment 1000$
PORTUARIO DE COLON	973,200
PUERTO VACAMONTE	1,404,300
PORTUARIO DE **BALBOA**	39,100
PUERTO DE **TABOGA**	37,600
PUERTO **DE PANAMA**	24,800
PUERTO **JUAN DIAZ**	13,400
PUERTO **COQUIRA**	19,000
PORTUARIO DE **PUNTA RINCON**	66,900
PORTUARIO DE **AGUADULCE**	28,100
PUERTO EL **SALADO**	
PUERTO DE **BOCA PARITA**	5,200
PUERTO EL **AGALLITO**	8,700
PUERTO LA **ENEA**	2,300
PUERTO DE **MENSABE**	2,100
PUERTO DE **PEDASI**	2,800
PUERTO **VIDAL**	2,400
PUERTO **MUTIS**	3,400
PUERTO DE **ISLA COLON**	1,500
PUERTO DE **ALMIRANTE**	11,500
PUERTO DE CHIRIQUI GRANDE	159,900
PUERTO DE **PEDREGAL**	12,900
PUERTO DE **REMEDIOS**	7,400
PUERTO ARMUELLES	126,500
PUERTO **YAVIZA**	1,600
PUERTO DE **QUIMBA**	2,500
PUERTO **LA PALMA**	4,200

Port	Containers	Liquid bulk	Solid bulk	LNG	Shipyard	Port-Ciudad	Marine Sports	Car carrier	Ro-Ro	Cruises	Passengers	Fishing/Aquaculture	Livestock	General Merchandise
PORTUARIO DE COLON	✓	✓	✓	✓			✓	✓		✓				✓
PUERTO VACAMONTE	✓	✓	✓	✓				✓				✓		✓
PORTUARIO DE **BALBOA**						✓	✓							
PUERTO DE **TABOGA**							✓				✓	✓		✓
PUERTO **DE PANAMA**						✓	✓							✓
PUERTO **JUAN DIAZ**			✓		✓							✓		✓
PUERTO **COQUIRA**					✓						✓	✓	✓	✓
PORTUARIO DE **PUNTA RINCON**	✓		✓											✓
PORTUARIO DE **AGUADULCE**	✓	✓	✓									✓		✓
PUERTO EL **SALADO**												✓		
PUERTO DE **BOCA PARITA**														
PUERTO EL **AGALLITO**												✓		
PUERTO LA **ENEA**												✓		
PUERTO DE **MENSABE**											✓	✓		
PUERTO DE **PEDASI**											✓	✓		
PUERTO **VIDAL**												✓	✓	✓
PUERTO **MUTIS**											✓	✓		
PUERTO DE **ISLA COLON**							✓		✓		✓			
PUERTO DE **ALMIRANTE**					✓				✓		✓	✓		✓
PUERTO DE CHIRIQUI GRANDE	✓	✓	✓											✓
PUERTO DE **PEDREGAL**							✓				✓	✓		
PUERTO DE **REMEDIOS**	✓	✓	✓				✓			✓		✓		✓
PUERTO ARMUELLES	✓	✓	✓				✓			✓		✓		✓
PUERTO **YAVIZA**											✓	✓		✓
PUERTO DE **QUIMBA**									✓		✓	✓	✓	✓
PUERTO **LA PALMA**											✓	✓		✓

Source: AMP

Figure 6.3.19 Development Plan of the Panama Canal West Bank

b) Panama Colon Container Terminal: Development

Purpose Development a new container terminal with the capacity of 5 million TEUS at Margarita Island Private Company -Mediterranean Shipping Company (MSC) and NMG (transferred from PCCT)	

Source: AMP Home Page

Figure 6.3.20 Development Plan of the Panama Canal West Bank

6.3.7 TMCD

In Europe and other regions, various efforts to promote a modal shift from land transportation to a sea transportation have been made to lessen the burden on the environment. In Central America, studies on TMCD (Transporte Maritimo de Corta Distancia: Short Sea Shipping) have been conducted. In 2001 COCATRAM compiled a pre-feasibility study report on TMCD.

Following the report, a study on TMCD was conducted as part of the Mesoamerican Integrated Development Project in 2013 (see Table 6.3.3).

Table 6.3.3 Summary of the TMCD Report

1. Regional cargo movement analysis	The total cargo movement in the region is 13.2 million tons (7.7 million by sea, 5.5 million by land). The potential cargo for TMCD, represented in container equivalent unit, is 121,720 TEU on the Pacific Ocean side, 55,365 TEU in Caribbean side.
2. Consideration of TMCD operation route	Operation routes were examined based on three scenarios. • Focus on profits and losses of shipping companies • Focus on benefits to local communities • Focus on covering the whole area
A sample of routes shown in the Report 	
3. Examining the management and governance model of the TMCD scheme	TMCD will be promoted mainly by existing government agencies related to transport in each country. Operations will be self-supported by private companies and will not be subsidized by the government. Coexist with existing land truck transport.
4.Examination of port facilities at the port of call	Each port in the area has almost all the port facilities required by the TMCD project, thus no additional investment is required.

Source: Estudio de Factibilidad del Desarrollo del Transporte Marítimo de Corta Distancia en Mesoamérica Junio de 2013: INECON, Ingenieros y Economistas Consultores S.A.

The report concluded:

There is a market, the project could be implemented;
It can start in the Pacific and then extend to the Caribbean;
The Mesoamerica Project Institutional Framework is recommended;
No additional investment is required in ports established for the service; and
An Activities Plan is established for the implementation of the TMCD.

Conclusions and recommendations compiled based on the results of previous studies on short-sea shipping in Central America (known as TMCD) were reported to COMITRAN in 2019. The report recommends that each country prepares an action plan for realizing short-sea shipping and takes necessary measures by giving priority to services on the Pacific coast.

A project to launch international ferry service between La Union Port and Caldera Port is being promoted by the governments of El Salvador and Costa Rica and is expected to be the first example of short-sea shipping in Central America. It has significance from the viewpoint of building a new logistics system of intermodal transportation and strengthening the resilience of logistics in this region.

Operation of TMCD between Puerto Chiapas in Mexico and -Puerto Quetzal was planned to start in 2020 before COVID 19 pandemic in compliance with the agreements established in various meetings and as part of an inter-institutional work. Due to COVID 19 pandemic the project is late in commencement. SSS routes between ports of Mexico and Guatemala not only on the Pacific coast but on the Caribbean coast are also planned.

Table 6.3.4 Final Conclusions and Recommendation on TMCD

Conclusion
1. A certain volume of cargo would potentially shift from land transportation to maritime transportation through the TMCD. 2. The Pacific coast has advantageous conditions for starting the development of the TMCD in central America. 3. The implementation of TMCD initiative must be approached from a commercial standpoint and the private sector should develop a sustainable business plan which meets the requirements of the cargo owner. 4. The volumes of potential cargo in the Central American region do not support the operation of a dedicated or specialized TMCD service with weekly service. 5. The most feasible alternative is to carry out services through VSA or NVOCC by using the existing services in the region. High initial costs for purchase of ships or chartering are not required. 6. The National Action Plans and the corresponding TMCD Regional Action Plan will be a good reference for the development of this initiative. 7. The Interinstitutional Committee on TMCD in Guatemala is an effective way of promoting the National Plans. Similar committees should be set up in other countries. 8. Coordinating with the implementation of the Action Plans at the national level, it is necessary to simultaneously promote the Regional Action Plan from the institutional sphere of the Integration System. 9. The region does not have a foreign trade information platform with detailed information for load analysis on the establishment of a pilot service.
Recommendations
1. To promote initiatives on the Pacific coast. 2. To promote the implementation of the TMCD National Plans in the countries through a public institution that leads this process. 3. To implement the Regional Action Plan from the institutional framework of SICA. 4. To boost the VSA and/or NVOCC system. 5. To create Interinstitutional Committees in Costa Rica, El Salvador, Honduras, Nicaragua and Panama. 6. To include Mexico which will import products from the countries of Central America. 7. To carry out the workshop meetings with the public sector at first, and subsequently with the private sector (cargo owners, shipping companies, logistics operators and land carriers and ports) to update the action plan and establish the roadmap for implementing TMCD. 8. To develop a foreign trade information platform with the detailed information necessary for achieving the goals.

Source: RESUMEN EJECUTIVO DE LOS AVANCES PARA EL DESARROLLO DEL TRANSPORTE MARÍTIMO DE CORTA DISTANCIA EN CENTROAMÉRICA TMCD 2019

6.4 Challenges and Recommendations

6.4.1 Port System

Port administration and management systems differ from country to country. Competent ministries and responsible governmental agencies, as well as port management bodies/port authorities in Central American countries are summarized in Table 6.4.1.

Ports are basically developed and managed by the port management body. However, the development and utilization of the port are closely related to land transportation infrastructure, border administration that includes Customs control, as well as industrial development in the hinterland. This means that port development needs to be integrated with other relevant sectors in line with the national policy. Notably, there are few Central American countries which have a national port policy or national port master plan. In some countries, however, the mechanism for formulating national port policy or national strategies for port development does not function fully.

Table 6.4.1 Responsible Organizations for Maritime/Port Administration and Port Management

Country	Responsible Ministry	Maritime Authority	Port Management Body (Port Authority) (*1)
Guatemala	Ministry of Communications, Infrastructure and Housing (* 2) Ministerio de Comunicaciones, Infraestructura y Vivienda - CIV-	(* 3)	- Empresa Portuaria Quetzal (EPQ)/Quetzal Port - Empresa Portuaria Nacional Santo Tomas de Castilla (EMPORNAC)/SANTOCAS Port - Terminal Ferroviaria Puerto Barrios/Puerto Barrios
El Salvador	Ministerio de Obras Públicas, Transporte, Vivienda y Desarrollo Urbano (MOP)	Autoridad Maritima Portuaria (AMP)	Comision Ejecutiva Portuaria Autonoma (CEPA)
Honduras	Secretaria de Infraestructura y Servicios Públicos (INSEP)	Dirección General de la Marina Mercante/General Directorate of the Merchant Marine (DGMM)	Empresa Nacional Portuaria (ENP)
Nicaragua	Ministerio de Transporte e Infraestructura (MTI)	Dirección General de Transporte Acuático/General Directorate of Aquatic Transportation (DGTA)	Empresa Portuaria Nacional (EPN)
Costa Rica	Ministerio de Obras Públicas y Transportes (MOPT)	División Marítima Portuaria del MOPT	Instituto Costarricense de Puertos del Pacífico (INCOP)/Pacific coast Junta de Administracion Portaria y de Desarrollo Economica de la Vertiente Atiantica (JAPDEVA)/Caribbean Coast
Panama	Autoridad Marítima de Panamá(AMP)	AMP	AMP

* 1: Responsible Body for management of the port is named as port authority or port management body. In general, it is a public body.
* 2: Comisión Portuaria Nacional (CPN) is advisory, consultant and technical body of the Executive Branch, whose Functions lie in defending national interests in all matters related to port activities and representing the Nation before National and International Organizations
* 3: As for the maritime authority, it is the responsibility of the Ministry of National Defense through the Vice Ministry of the Navy.

Source: JST

6.4.2 Development Plan of Each Port

In Central American logistics, ports function as bases for loading and unloading cargo from outside the region. Cargo transported by sea between Central American countries and the east coast of North America and Europe is basically carried out/in via ports located on the Caribbean coast while cargo to/from the Asian region is via ports located on the Pacific coast. With the exception of El Salvador, which does not face the Caribbean Sea, all countries have ports on both coasts. However, Nicaragua does not have a deep-water port on the Caribbean coast.

There are six (6) major ports along the Caribbean coast which stretches approximately 2,100 km (measured roughly on Google Map) and six (6) ports along the Pacific coast which measures approximately 2,900 km. On the Caribbean coast, no deep seaport exists between Moin Port in Costa Rica and Castilla Port in Honduras (see Table 6.4.2).

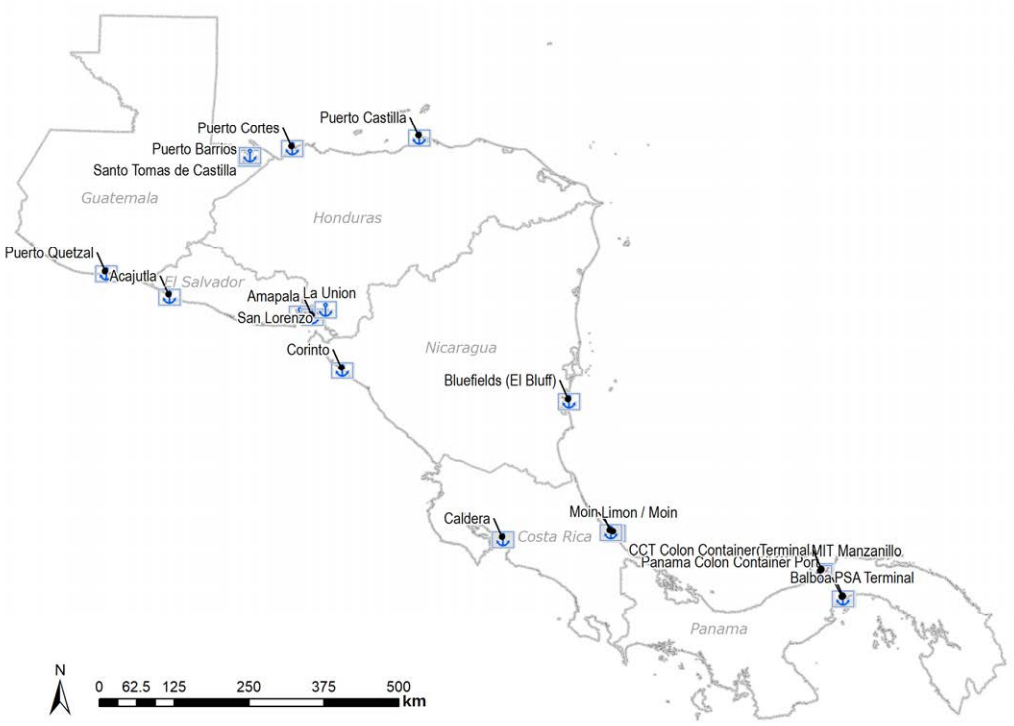
Table 6.4.2 Location of Ports

Ports on Caribbean	**SANTOCAS**		**Barrios**		**Cortes**		**Castilla**		**Moin Limon**		**Cristobal**
Coast		4km		110km		220km		1,100km		350km	
Ports on Pacific	**Quetzal**		**Acajutla**		**San Lorenzo**		**Corinto**		**Caldera**		**Balboa**
Coast		110km		270km		130km		500km		920km	

Source：Distances area measured roughly on Google Map

A variety of needs regarding port infrastructure and port operation have risen due to changes in the socioeconomic conditions of the country and the hinterland, and changes in international maritime transportation. In response to these needs, the government of each country and port management body of each port have formulated or are currently drafting a port development plan, which will include the development of new ports. In planning, issues on the ports such as insufficient capacity, shortage of facilities, inefficiency in terminal operation, inconvenient road access to ports and others are identified, and necessary measures are examined.

Based on the analysis, the development plans to enable coping with issues and future demands of the ports have been prepared or still in the preparation stage.



Note: La Union is a modern port but not active at present. Amapala and Bluefields are under planning as deep seaports.
Source: JST

Figure 6.4.1 Location Map for Major Ports

Against this background, the governments of each country and port management bodies have formulated port development plans including the development of new ports based on the challenges of each port, requests of port users, future demand and other factors. Each port is expected to implement required projects according to the demand based on the port plans (see Table 6.4.3).

Table 6.4.3 Development Plan of Main Ports and New Ports

Country	Port	
Guatemala	Puerto Quetzal	EPQ has an expansion plan of port facilities and a land use plan as a free zone. A master plan will be prepared in June 2020. The Phase 2 project of the Container Terminal is pending.
	SANTOCAS	EMPORNAC has a master plan based on the report prepared with the assistance of Korea.
	Puerto Barrios	A terminal operator (Chiquita) plans to expand the terminal to increase capacity to one million TEUs.
El Salvador	Nationwide	CEPA has formulated the Port Master Plan for the Development of El Salvador's Ports and Harbors 2020-2030.
	Acajutla	CEPA has a three-phased Master Plan with a target year of 2040 prepared with the assistance of Korea, called the Feasibility Study for the Port Development of Acajutla in El Salvador.
	La Union	CEPA is conducting a study on the activation of La union Port with assistance from JICA. In addition, the studies are carried out by CEPA through PNUD, related to Shipyard, Fishing and Aquaculture, and Tourism.
Honduras	San Lorenzo	ENP plans to develop the port as a multipurpose terminal by enhancement of container, solid bulk and liquid bulk handling.
	Puerto Cortes	Terminal Operator has an expansion plan n with the capacity of 1.8 million TEU.
	Puerto Castilla	A private company submitted a proposal on port development under a PPP scheme previously.
	Amapala New Port	A new Amapala port is planned in Fonceca Bay.
Nicaragua	Corinto	Project for Improvement of Technical and Operative Capacities of the Port of Corinto" is currently underway financed by CABEI (USD 194 million).

Country	Port	
	Blue Fields New Port	Pre-feasibility and feasibility studies for the future deep-water port in Bluefields are finished.
Costa Rica	Caldera	Master plan has been prepared by INCOP.
	Limon/Moin Port	Master Plan was prepared in 2008 by JAPDEVA.
	Moin APM	APM plans expansion works in Phase II and III.
Panama	Balboa/Cristobal	New plan will be prepared after 2022 when the concession contract with PCC ends.
	PSA Terminal	Phase II project has been completed. The yard will be expanded as necessary.
	MIT	Phase IV project
	CCT	Phase 3 project was completed in 2015. A logistics park will be developed in a concession area.
	Panamá-Colón Container Port	A new container terminal with a capacity of 2.5 million TEU is under construction at Isla Margarita Colón under a 20 year-concession. MSC-TILplans to replace the former concession of PCCP.

Source: prepared based on several sources such as information obtained during on-site surveys, websites of relevant organizations and existing reports.

The master plan of ports should be reviewed in a certain interval and revised as necessary. Then, it is necessary for the government to have a national vision for the development of the ports because the ports are essential infrastructures for each country. The projects for construction and /or improvement of port facilities, shall be implemented under the master plan according to the policy of the port management body at the appropriate time. The projects should be implemented based on prospective cargo volume and project feasibility in line with the policies of the government. Natural conditions such as waves and ground conditions, industries in the region and relationships with the hinterland ports in Central American countries as well as environmental impacts also need to be taken into account. In implementing the project, it is desirable to address new policy issues surrounding ports, such as digital transformation, smart ports, green ports, etc.

In addition, it is recommended that each port management body creates a port business continuity plan (Port BCP). In parallel, an integrated port business continuity plan of Central America which includes how to collaborate among ports, or supplement lack of shortage of functions/capacity of neighboring ports shall be created. Then, the supply chain redundancy of the entire Central America region shall be taken into account by designating an alternative port which performs functions of the port which is damaged or closed due to disasters or pandemic etc., with available road networks and other measures.

Finally, it is required that a basic framework of port administration of each country be established in order to promote port development strategically under an appropriate mechanism for port development and management.

6.4.3 Development of an Integrated Port Facility Ledger for Central American Ports

The layout and scale of port facilities, and the capacity of port facilities of the individual ports are provided on the homepages of port management bodies and/or terminal operators. In addition, materials and databases provided by international organizations or private companies related to trade and logistics also contain information on the physical conditions of ports.

However, there are many cases when the specifications of port facilities, the description method regarding the physical conditions for using the facilities, or the standards of written numerical values may differ or may not be the latest information.

The latest and reliable information on the physical condition of ports in Central America in a unified format are basic information required by port users and potential port users. These are also useful for governments, port management bodies and terminal operators to understand the characteristics of their own ports based on comparisons with neighboring ports. Finally, such information is vital for asset management of port facilities when considering port redevelopment and repairing aging facilities.

It is recommended that each port create a port facility ledger, and this will be integrated into an overall port facility ledger of Central American ports by reference to the contents and process in preparing the manual

de Puertos de Centroamerica which was issued by COCATRAM in 2010-2011.

A port facility ledger includes an outline of the port, specifications of the facility, layout of the facility, and the structure of the facility of each major port located in the Central American region which can be shared with relevant parties. It is necessary for the parties concerned to agree on the management system of the port ledger, including an update mechanism to account for newly constructed facilities, improved or restored facilities, and facilities not in use and demolished facilities. Details to be described in the port ledger will be decided based on the actual conditions of ports in Central America and the opinions of the parties concerned.

The ledger will be composed of the items shown in the Table 6.4.4.

Table 6.4.4 Composition of Port Facility Ledger (Example)

Outline of the port	Country, Name of Port, Port Management Body, port area, natural conditions of the port
Individual facilities	Type, name, owner or manager, dimensions/Capacity, time of construction, construction cost and others
Area ground plan	This shows the location of the facilities.
Cross-sections	Standard/Representative cross-section of facilities
Surrounding Conditions	Roles of the ports, important economic activities in hinterland, Road/railway network in hinterland, Main partner country/region
Glossary	Technical terms and others

Source: JST

6.4.4 Enhancement of the Functions of COCATRAM Statistics System

Central America Maritime and Port Statistical Information System (SIEMPCA), which has been developed by COCATRAM, provides statistics on cargo handling, number of containers and number of vessels in the ports in Central American countries. COCATRAM aggregates data entered online by government agencies and port management bodies of Central American countries, and uploads these in the COCATRAM website. Some ports have set up a link to this website together with their own statistics on their homepage.

The agencies which enter data on port activities and the target ports of COCATRAM statistics are shown in the table below. Numbers of target ports for COCATRAM statistics are four (4) for Guatemala, six (6) for El Salvador, seven (7) for Honduras, six (6) for Nicaragua, seven (7) for Costa Rica and twenty-three (23) for Panama.

Table 6.4.5 Relevant Organizations and Ports under COCATRAM Statistics

Guatemala • Empresa Portuaria Santo Tomas de Castilla • Terminal Ferroviaria Puerto Barrios • Empresa Portuaria Quetzal	Puerto Quetzal, Terminal Boyas San José, Puerto Barrios, Puerto Santo Tomas De Castilla
El Salvador • Puerto La Union, Puerto Acajutla (CEPA) • Puerto CORSAIN	Puerto Acajutla, Terminal Boyas Rasa, Terminal Boyas Alba Petróleo, Terminal Boyas Cenergica, Puerto Corsain, Puerto La Union
Honduras • Empresa Nacional Portuaria	Puerto San Lorenzo, Puerto Cortes, Puerto Castilla, Puerto Tela, Puerto La Ceiba, Roatan T. Coxen Hole, Roatan T. Mahogany Bay
Nicaragua Empresa Portuaria Nacional	Puerto Corinto, Puerto Sandino, Puerto San Juan Del Sur, Puerto Arlen Siu, Puerto Cabeza, Puerto El Bluff
Costa Rica JAPDEVA INCOP	Puerto Caldera, Puerto Golfito, Puerto Puntamorales, Puerto Puntarenas, Puerto Quepos, Complejo Portuario Limón Moín, Terminal De Contenedores Moin (APM Terminal)
Panama Autoridad Marítima de Panamá	Decal Panama, Melones Oil Terminal , Panama Port Company-Balboa, Petroamerica Terminal, PSA Panama International Terminal, PTP Charco Azul, Pedregal, Puerto Aguadulce, Manzanillo International Terminal, Bocas Fruit Co., Colon Container Terminal , Colon Oil And Service , Fuerte Amador Resort & Marina , Panama Port Company-Cristobal, Payardi Terminal Company, Port Colon 2000-Home Port, Port Colon 2000, PTP Chiriqui Grande, Puerto Armuelles, Terminal Granelera Bahia Las Minas, Termini Financing Group, Puerto Punta Rincon, Coral Minera

Source: COCATRAM

Data Items for statistics are:

- Cargo Throughput (Origin/Destination, Commodity);
- Container Throughput (TEU/box, Disembarked-Embarked/Transit/Transshipment, Laden/empty, size);
- Calling Vessel (Type: Conventional, Reefer, Container Ship, Ro-Ro, Solid Bulk, Liquid Bulk, LNG Tanker, Oil Tanker, Barge, Cruise Ship);
- Passenger: Number); and
- Cargo Volume (Type: General Cargo/Containerized/Ro-Ro/Liquid Bulk/Solid Bulk).

Data entered is compiled into the tables on Cargo throughput (loading/unloading), Vessel traffic (call), Vessel calls per type, Cargo throughput per handling type, Container and box trailers throughput, and Cruise ship and passengers by country/port and coast. Data is uploaded to the website monthly(see Figure 6.4.2).

Summary Table- Central America: Port Throughput, Year

COUNTRY/PORT	SEABOARD	Cargo	Vessels	Containers and Box Trailers	
		Thousand MT	Units	Units	TEU
GUATEMALA		-	-	-	-
PUERTO QUETZAL	P				

Table No. 1. Central America: Cargo throughput by country, quarterly, (Thousand MT), year

COUNTRY/PORT	SEABOARD	FIRST QUARTER			SECOND QUARTER			THIRD QUARTER			FOURTH QUARTER			TOTAL YEAR		
		DESEMBARK	EMBARK	TOTAL	DESEMBARK	EMBARK	TOTAL	DESEMBARK	EMBARK	TOTAL	DESEMBARK	EMBARK	TOTAL	DESEMBARK	EMBARK	TOTAL
Guatemala		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TERMINAL BOYAS SAN JOSÉ	P			-			-			-			-	-	-	-

Table No. 2. Central America: Vessel traffic quarterly, year

COUNTRY/PORT	I quarter	II quarter	III quarter	IV quarter	Total year
Guatemala	-	-	-	-	-
PUERTO QUETZAL					-

Table No. 3. Central America: Number of vessels calls per type, (Units), year

COUNTRY/PORT	SEABOARD	CONVEN-TIONAL	REEFER	CONTAINER SHIP	RO-RO	SOLID BULK	LIQUID BULK	LNG TANKER	OIL TANKER	BARGE	CRUISE SHIP	OTHERS	TOTAL
Guatemala		-	-	-	-	-	-	-	-	-	-	-	-
PUERTO QUETZAL	P												-

Table No.4. Central America: Cargo throughput per handling type, (Thousands of MT), Year

COUNTRY/PORT	SEABOARD	GENERAL CARGO	CONTAIN ERIZED	RO-RO	LIQUID BULK	SOLID BULK	OTHERS	TOTAL
Guatemala		-	-		-	-	-	-
TERMINAL BOYAS SAN JOSÉ	P							-

Table No.5. Central America: Container and box trailers throughput per port, (Units), year

Ports / Modules	S	Disembarked		Embarked		Transit disembarked		Transit embarked		Transshipment disembarked		Transshipment embarked		Total modules		Total
		Laden	Empty	Laden	Empty	Laden	Empty	Laden	Empty	Laden	Empty	Laden	Empty	Laden	Empty	
GUATEMALA		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PUERTO QUETZAL	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

COUNTRY/ PORTS	S	Disembarked		Embarked		Transit		Transit		Transshipment		Transshipment		Medules Total		Total
		Laden	Empty	Laden	Empty	Laden	Empty	Laden	Empty	Laden	Empty	Laden	Empty	Laden	Empty	
GUATEMALA		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PUERTO QUETZAL	P													0	0	0

Table No. 6. Central America: Cruise ship, cruisers and crew traffic, Year

Country/Ports	Vessel Calls	Passengers			Crew
	Cruise	On Arrival	Disembarked	Embarked	
GUATEMALA					
PUERTO SANTOCAS					

Source: COCATRAM

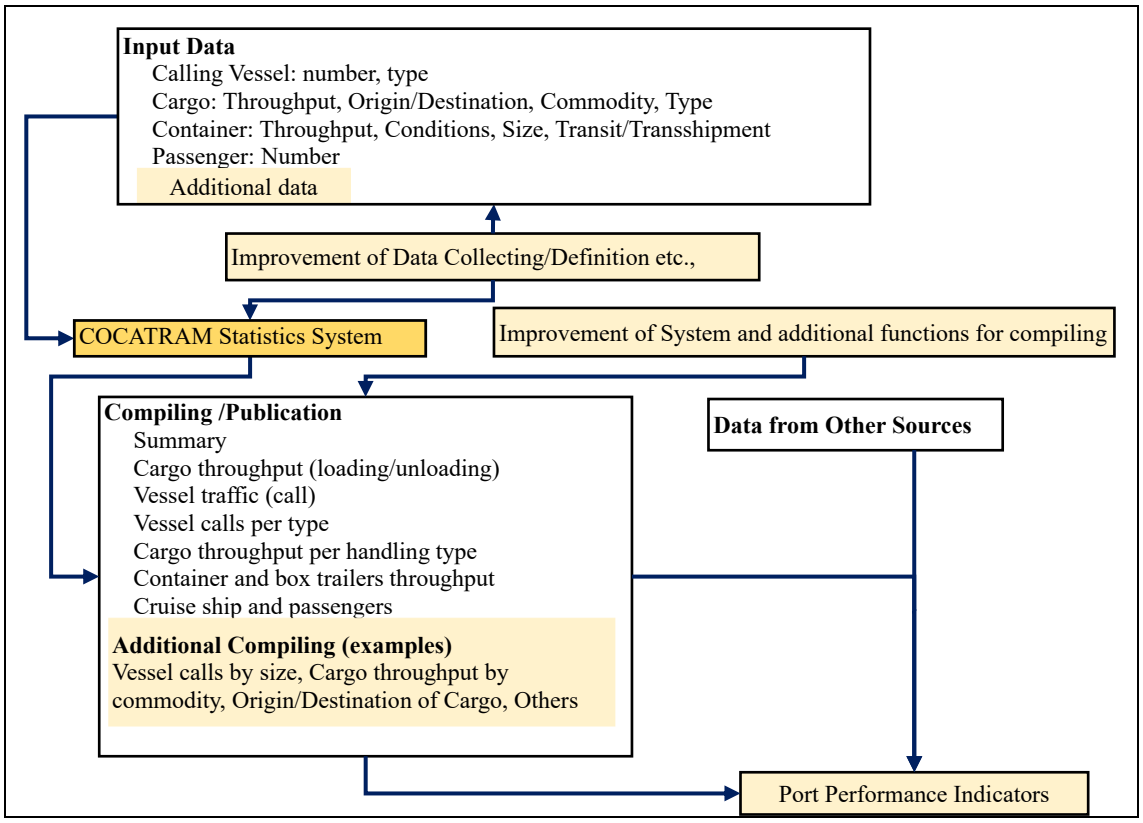
Figure 6.4.2 COCATRAM Statistics

According to COCATRAM the following issues need to be addressed:

- Data are not inputted according to standard term definitions; and
- Cargo OD analysis is not conducted.

COCATRAM has been making continuous efforts to improve the system. Through making full use of the assets and experience of COCATRAM, the functional enhancement of port statistics is expected by realizing more efficient and less labor-intensive data provision and acquisition. In order to obtain wider-range and advanced information on port activities in Central America, it is recommended that functions of COCATRAM Statistics System be enhanced by improving the function of the existing IT system and the statistic work implementation structure including regular updating of rules under the cooperation of each port/country and sharing among stakeholders as necessary.

Many port management bodies in the world analyze port activities and evaluate performance/productivity based on port performance indicators which are set up by the port, the country, or the international organization. By using statistical data managed by COCATRAM, information described in the port ledgers and data handled in the gateway system, port performance of ports in Central America can be calculated and evaluated without significantly increasing the workload. It is recommended that port performance indicators appropriate for ports in Central America be set up and that the efforts to achieve the target values of the indicators in each port will result in improvement of efficiency and competitiveness of ports in Central America as a whole.



Source: JST
Note: Colored parts indicate functions be added or enhanced

Figure 6.4.3 Conceptual Image of Enhancement of COCATRAM Statistics

6.4.5 Construction of a Common Gateway System for Ship Entry/Departure Procedures

Government agencies for maritime affairs in Central American countries have developed or are making efforts to build digital systems for ship entry/departure procedures to/from ports. The systems of each

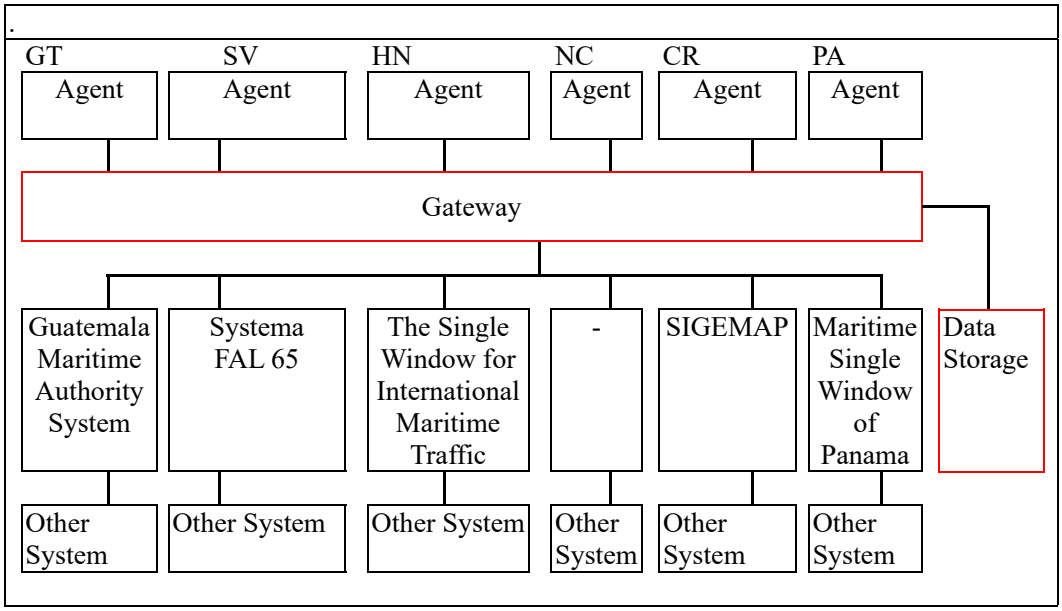
country are designed, built, and operated based on the circumstances of each country. It is assumed that application data items are based on the IMO FAL standards and are basically the same as those of the systems in each country.

The systems of each country are not fully developed at present and need to be improved hereafter. The systems should be improved step-by-step even after they are placed in operation. In order to increase the convenience of system users and improve functions, the systems are required to be continuously improved.

It is recommended that a common platform system as a gateway to the systems of each country be established. The system may be equipped with a function of application data entry by ship side and delivery to the systems of each country and vice versa. In addition, data through the system shall be saved and shared among countries. The concept is shown in Figure 6.4.4. Data managed by the system need to be strictly controlled from viewpoint of accessibility and security.

It is expected that data shall be exchanged or/and connected with other systems of the country such as the custom clearance system and integrated into a national single window for trade facilitation. The efforts shall result in creating a comprehensive regional single window for trade facilitation.

In this connection, it is desirable that every country shall ratify the FAL convention.



Source: JST

Figure 6.4.4 Conceptual Image of Integrated Gateway for Vessel Entry/Departure Procedures

6.4.6 Short-Sea Shipping

SSS can be implemented in various modalities depending on the type of cargo to be transported. To carry out it, it is necessary for not only the port/maritime sector but also the land transport (road/rail) sector to tackle the project together. In addition, the competent administration authorities at land border crossing points and ports (customs/quarantine/government/immigration sector) have to play their role with the awareness in the implementation and operation of this new international transport and trade system. Road or rail connectivity infrastructure for port access is important because one of the advantages of SSS is seamless transportation from land to sea. Improved customs clearance is very necessary because getting through a port in a short time is essential to shorten the time ships and goods spend in port. In this regard, the application of DUCA to maritime transport will be a very effective measure. The creation of a digital platform in the relevant ports to which all stakeholders can easily access and share the necessary information is essential, as well as the standardization of procedures in each of the regulatory and operational areas to be developed in the ports involved.

The government of each country should endeavor to improve the business environment for implementing Short-Sea- Shipping services which is expected as one component of the regional logistics system in the Central America region. Similarly, inter-institutional work teams should be created to formulate an action plan to promote Short Sea Shipping, which should be prepared on the basis of the results of the previous studies and the work meetings organized by the binational committees. The particularities of each SSS service shall be discussed and decided by taking into account base cargoes, vessel specifications, equipment for cargo handling, infrastructure, service frequency, preferential rates, sustainability, governance, etc. The governments of El Salvador, Costa Rica, Guatemala and Mexico shall take more forceful measures such as efforts for attracting cargo, supports to ferry service providers, construction/installation of facilities/equipment as necessary, establishment of an efficient ferry operation system under collaboration among public and private stakeholders for realizing the project to introduce a new logistics system international ferry service in the Central America region.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 7

Aeronautical - Airport Sector

November 2023

Japan International Cooperation Agency
Oriental Consultants Global Co., Ltd.
Nippon Koei Co., Ltd.
ALMEC Corporation
Overseas Coastal Area Development Institute of Japan
International Development Center of Japan Inc.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

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Appendix 7 Aeronautical - Airport Sector

7.1 Regulation and Organization

7.1.1 Regulation and Technical Standards

(1) All of Central America

Unlike trade agreements, international aviation agreements are separately negotiated by each Central American country. There is consensus among the countries to associate; however, progress has mainly focused on trade.

For example, the European Union (EU) and the Central American region concluded a new Association Agreement, signed on 29 June 2012. The Association Agreement relies on three complementary and equally important pillars, namely: political dialogue, cooperation, and trade, which reinforce each other and their effects. These are the right tools to support economic growth, democracy, and political stability in Central America. The trade pillar of the Association Agreement has been provisionally applied since 1 August 2013 with Honduras, Nicaragua, and Panama; since 1 October 2013 with Costa Rica and El Salvador; and since 1 December 2013 with Guatemala.

Likewise, since 2005, there is a successful Central America Free Trade Agreement (CAFTA) that is a North America Free Trade Agreement (NAFTA)-style deal with five Central American nations (Guatemala, El Salvador, Honduras, Costa Rica, and Nicaragua), and the Dominican Republic.

(2) Guatemala

The Dirección General de Aeronáutica Civil (DGAC) has no open sky agreement with any Central American country. However, DGAC has concluded bilateral agreement with El Salvador and Honduras; whereby cross border flights operate as “domestic”, for example, flight from La Aurora International Airport to Roatan Island Domestic Airport in Honduras. Special immigration counter for passengers who visit these countries as “domestic” will be installed in La Aurora International Airport.

(3) El Salvador

El Salvador is the smallest and most densely populated country in Central America. There are no regular scheduled domestic services in El Salvador. The Civil Aviation Authority of El Salvador (AAC) is the regulatory body for aviation in the country and is also responsible for accident investigation.

(4) Honduras

According to the Agencia Hondureña de Aeronáutica Civil (AHAC), they have concluded liberalized Bilateral Air Transport Agreements with Canada and Mexico. There is no open sky agreement with Central American countries. However, there is a plan to conclude agreement between Honduras and Guatemala, the same as recently announced between El Salvador and Guatemala; whereby cross border flights operate as “domestic”.

(5) Nicaragua

INAC has concluded the open sky agreement with the USA and Spain. The latter includes the EU clause allowing other EU carriers. They also have open sky agreements with Cuba, Peru, and Panama. Other than Panama, there are no open skies within Central America. Bilateral Air Transport Agreement has also been concluded with Qatar, Kuwait, UAE, Mexico, and Canada. The Memorandum of Understanding (MoU) for air transport has been concluded with Turkey.

(6) Costa Rica

DGAC has no open sky agreement with any Central American country. However, DGAC has an open sky agreement with USA, Chile, Columbia, and Canada. Passengers from USA account for 90% and tourists from Europe are increasing.

(7) Panama

There is no open sky agreement with Central American countries. AAC has an open sky agreement with the USA and liberalized Bilateral Air Transport Agreements concluded with Chile, Qatar, and others.

7.1.2 Organization and Human Resources

(1) Guatemala

All civil airports in Guatemala are covered by DGAC, which is responsible for operation, regulation, planning, and air navigation. There is a plan to divide authority into regulator and operator same as the system in other countries in Central America. However, it may take time for implementation.

The airlines operated in La Aurora International Airport are shown in Table 7.1.1.

Table 7.1.1 Airlines for Passenger in La Aurora International Airport

No.	Name of Airline for Passenger	No.	Name of Airline for Cargo
1	Aero Mexico	1	Aero Mexico Cargo
2	American Airlines	2	American Airlines
3	Avianca	3	Copa
4	Volaris	4	Delta
5	Copa Airlines	5	DHL Aviation
6	Delta	6	Fedex
7	IBERIA	7	IBERIA
8	Interjet	8	LATAM Cargo
9	Spirit Airlines	9	United
10	United	10	UPS
11	TAG Airlines	11	KLM
		12	Amerijet International

Source: DGAC

(2) El Salvador

The Autoridad de Aviación Civil (AAC) is responsible for regulation, audit, and control related to civil aviation. On the other hand, the Executive Commission of the Port of Acajutla (CEPA) is responsible for operation of Comalapa International Airport, the country's main international gateway.

The airlines operated in Comalapa International Airport are shown in Table 7.1.2.

Table 7.1.2 Airlines for Passenger and Cargo in Comalapa International Airport

No.	Name of Airline	No.	Name of Airline
1	AMERICAN AIRLINES INC	12	Aeromexico
2	COPA	13	Aerorepublica
3	Delta	14	Amerijet International
4	Iberia	15	Consecionaria Vuela
5	Spirit	16	DHL Aero Expreso S.A

No.	Name of Airline	No.	Name of Airline
6	United	17	DHL De Guatemala
7	Avianca	18	Interjet
8	Aviateca S.A	19	TAG
9	LACSA	20	UPS
10	TACA Peru	21	Vuela Aviacion S.A
11	Aereo Ruta Maya S.A	22	TACA International Airlines

Source: AAC

(3) Honduras

All international airports in Honduras are covered by InterAirports S.A., which is a private company with a 20-year operations and maintenance (O&M) concession for four international airports from 2000. The company is responsible for both airside and landside except for air navigation operated by AHAC. Their O&M concession agreement with the government has expired in September 2020. By law, the government plans to re-tender later this year and it will bid out only three airports except for Toncontin International Airport. The government will continue to manage Toncontin International Airport (TGU) thereafter by themselves.

For the replacement of Toncontin International Airport, the government has developed a new airport in Palmerola, which is situated on a US air base under a DBOT concession. Latest information is that construction will be completed and the new airport is expected to open in Q4 2021. The government has concluded a concession contract with the Palmerola International Airport (PIA) and its airport operating partner, Munich Airport. As the new capital city airport, this international airport is expected to handle air cargo around central Honduras such as fruits and vegetables, in addition to San Pedro Sula Airport, which currently is the country's main international airport for air cargo shipments.

The airlines operated in Toncontín International Airport and Ramon Villeda Morales International Airport are shown in Table 7.1.3.

Table 7.1.3 Airlines for Passenger and Cargo in Toncontín International Airport and Ramon Villeda Morales International Airport

Toncontín International Airport	
No.	**Name of Airline**
1	Avianca
2	La Costena
3	CM Airlines
4	Aerolinea SOSA
5	LANHSA
6	Copa Airlines
7	United Airlines
8	Delta Airlines
9	American Airlines
10	Aviatsa

Ramon Villeda Morales International Airport	
No.	**Name of Airline**
1	Sprit Airlines
2	Avianca
3	Air Europa
4	CM Airlines
5	Aerolinea SOSA
6	Delta Airlines
7	United Airlines
8	AeroMexico
9	American Airlines
10	Copa Airlines

Source: InterAirports S.A.

(4) Nicaragua

All 16 airports in Nicaragua are operated by Empresa Administradora de Aeropuertos Internacionales (EAAI). On the other hand, Instituo Nicaraguense de Aeronautica Civil (INAC) is the regulator of commercial civil aviation and general aviation, and ensuring aviation safety and security in Nicaragua. If EAAI desires to develop an airport, they will submit proposal and master plan to INAC and INAC will

audit whether EAAI's proposal complies with ICAO rule or not. Further, EAAI will supervise at the time of construction.

La Costena, which is the only national airline in Nicaragua, operates Cessna 208B and ATR72 aircraft. This airline has routes of freighter to San Jose and passenger flight to Tegucigalpa. Furthermore, La Costena operates a domestic terminal in Augusto C. Sandino International Airport. UPS and Amerijet are the only freighter operators in Augusto C. Sandino International Airport. Although DHL has no freighter in Nicaragua, they bring air cargo using passenger flights.

The airlines operated in Augusto C. Sandino International Airport are shown in Table 7.1.4.

Table 7.1.4 Airlines for Passenger and Cargo in Augusto C. Sandino International Airport

No.	Name of Airline	Type
1	American Airlines	International
2	United Airlines	International
3	Delta Airlines	International
4	Spirit Airlines	International
5	Copa Airlines	International
6	Avianca Airlines	International
7	Aeromexico	International
8	La Costena	Domestic

Source: EAAI

(5) Costa Rica

All four international airports in Costa Rica are covered by DGAC, which is responsible for regulation, audit, planning, and air navigation. AERIS is the operator of Juan Santamaría International Airport from 2010, which is responsible for both airside and landside except for air navigation operated by DGAC. The contract between DGAC and AERIS is a joint venture with the government and will expire in 2026. The parties are currently negotiating an extension of the agreement to 2036 and will include additional airport CAPEX investment by AERIS. Further, CORIPORT is the concessionaire for Costa Rica's second largest airport, Liberia Daniel Oduber Quirós International Airport, which has a 20-year concession to design, finance, construct, and operate landside facilities from 2010 and included the construction of a new 23,000 sqm terminal, inaugurated in early 2012. Airside facilities are operated by DGAC continuously.

The airlines operated in Juan Santamaría International Airport are shown in Table 7.1.5 and Table 7.1.6.

Table 7.1.5 Airlines for Passenger in Juan Santamaría International Airport

No.	Name of Airline	No.	Name of Airline
1	AEROMÉXICO	16	INTERJET
2	AEROREPUBLICA (WINGO)	17	JETBLUE AIRWAYS CORP
3	AIR CANADA	18	KLM
4	AIR FRANCE	19	LATAM AIRLINES PERÚ
5	ALASKA AIRLINES	20	LUFTHANSA
6	ALBATROS	21	PARSA
7	AMERICAN AIRLINES	22	SANSA
8	AVIANCA COSTA RICA	23	SOUTHWEST
9	BRITISH	24	SPIRIT
10	CONDOR	25	SKYWAY
11	COPA AIRLINES	26	UNITED AIRLINES INC
12	COSTA RICA GREEN AIRWAYS	27	VIVA AEROBUS

No.	Name of Airline	No.	Name of Airline
13	DELTA AIRLINES INC	28	VOLARIS
14	EDELWEISS	29	VUELA AVIACIÓN (VOLARIS COSTA RICA)
15	IBERIA	30	WEST JET

Source: DGAC

Table 7.1.6 Airlines for Cargo in Juan Santamaría International Airport

No.	Name of Airline
1	AEROTAXI LA COSTEÑA
2	AEROLINEA DEL CARIBE (AERCARIBE)
3	DHL GUATEMALA S.A
4	DHL AEROEXPRESO
5	FEDERAL EXPRESS CORP

Source: DGAC

(6) Panama

AAC is responsible for regulation, audit, planning, and air navigation for 2 international and 20 domestic airports in Panama. AAC is also responsible for air navigation control in 5 international airports (Tocumen International Airport, Panamá Pacífico International Airport, Enrique Adolfo Jiménez Airport, David "Enrique Malek" International Airport, Scarlett Martínez International Airport) operated by Tocumen S.A. Tocumen S.A. is a state-owned enterprise which operates Tocumen International Airport from 2003 and other 4 international airports from 2013. The company is responsible for both airside and landside except for air navigation operated by AAC.

The airlines operated in Tocumen International Airport are shown in Table 7.1.7 and Table 7.1.8.

Table 7.1.7 Airlines for Passenger and Cargo in Tocumen International Airport

No.	Name of Airline	Type
1	Compañía Panameña de Aviación, S.A. (COPA)	International
2	Aerogal	International
3	Aero República (R.P.B.)	International
4	Aerovías Nacionales de Colombia, S.A. (AVIANCA)	International
5	Aeroméxico	International
6	Air Canada	International
7	Air France	International
8	American Airlines, Inc.	International
9	Avior Airlines	International
10	China Air	International
11	Conviasa	International
12	Delta Airlines, Inc.	International
13	KLM	International
14	L. A. Servicio Regional (LASER)	International
15	Líneas Aéreas de Costarricenses, S.A.	International
16	Líneas Aéreas de España, S.A. (IBERIA)	International
17	Lot	International
18	Lufthansa	International
19	Ravsa Venezolana	International
20	Spirit Airlines	International

No.	Name of Airline	Type
21	T.A.M.E.	International
22	Taca International Airlines, S.A.	International
23	Turkish Airlines	International
24	Turpial	International
25	United Airlines	International
26	Parsa, S. A. (Air Panama)	Domestic

Source: AAC

Table 7.1.8 Airlines for Cargo in Tocumen International Airport

No.	Name of Airline	Type
1	DHL Aero Expreso, S.A.	International
2	Uniworld air Cargo	International
3	Aerosucre, S.A.	International
4	Aero Unión	International
5	Airbone Express	International
6	Amerijet	International
7	DHL de Guatemala, S.A.	International
8	Empresa Consolidada Cubana de Aviación, S.A.	International
9	Federal Express Corporation	International
10	Líneas Aéreas Suramericanas, LTD	International
11	Tampa	International
12	Tiaca	International
13	Trans Am Compañía, LTD	International
14	United Parces Services (UPS)	International
15	Vensecar	International

Source: AAC

7.2 Financial and Investment Data

7.2.1 Financial Data

(1) Guatemala

DGAC's expenditure and revenue data in 2019 are listed as shown in Table 7.2.1. According to these financial data, it can be found that the amount of expenditure exceeds the amount of revenue.

Table 7.2.1 DGAC's Annual Financial Data in 2019

Item	Sub-Item	Amount (GTQ)	Amount (USD)	Ratio
Expenditure	Personnel service	91,716,258	12,093,136	56%
	Non-personnel service	53,871,596	7,103,174	33%
	Materials and supplies	5,527,918	728,877	3%
	Property, plant, equipment, and intangibles	1,592,113	209,926	1%
	Current transfers	1,418,861	187,082	1%
	Global allocation	8,612,756	1,135,625	5%
	Expenditure Total	**162,739,503**	**21,457,820**	**100%**
Revenue	Air transport fee	42,341,576	5,582,897	35%
	Miscellaneous fees and licenses	32,204,913	4,246,340	27%

Item	Sub-Item	Amount (GTQ)	Amount (USD)	Ratio
	Leasing of buildings, equipment, and installations	45,941,117	6,057,510	38%
	Revenue Total	**120,487,606**	**15,886,747**	**100%**

Source: DGAC

(2) El Salvador

AAC's financial data for the June 2019 to May 2020 period are tabulated in Table 7.2.2. During the year 2019, expenditures were recorded at a total of USD 3,595,886.34, of which the largest percentage of use corresponds to the payment of remunerations (salaries, employer's contributions, holidays, indemnities, etc.) with 72% of total expenditures. The amount of total revenue is USD 3,468,506.90. This revenue comes mainly from transfers for aircraft boarding, landing and parking fees, which represent 87.05% of the total revenue.

Table 7.2.2 AAC's Annual Financial Data from July 2019 to May 2020

Item	Sub-Item	Amount (USD)	Ratio
Expenditure	Remunerations	2,606,464.22	72%
	Procurement of goods and services	617,603.63	17%
	Financial and other expenses	211,974.93	6%
	Current transfers	47,671.50	1%
	Investments in fixed assets	112,172.06	3%
	Expenditure Total	**3,595,886.34**	**100%**
Revenue	Fees and charges	385,488.39	11%
	Financial income and other	63,719.32	2%
	Current transfers	3,019,299.19	87%
	Revenue Total	**3,468,506.90**	**100%**

Source: AAC

(3) Honduras

InterAirport's annual revenue data by each airport operated by InterAirport in 2017 are tabulated in Table 7.2.3. The breakdown of revenue item and expenditure is not collected. According to the revenue data, the revenue amount of Ramón Villeda Morales Airport, which is the busiest airport in Honduras, is the highest.

Table 7.2.3 InterAirports's Annual Revenue Data in 2017

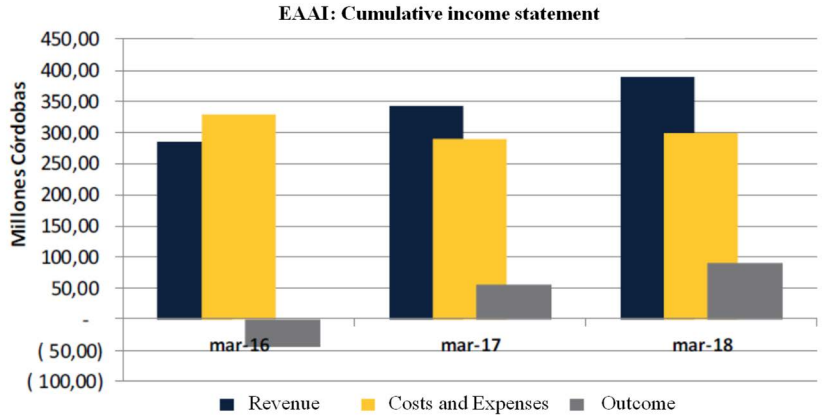
Unit: Lempira

Month	Toncontin Airport	Ramón Villeda Morales Airport	Goloson Airport	Juan Manuel Gálvez Airport	Total	Total (USD)
1	29,214,515	40,391,775	2,445,605	10,951,617	83,003,511	3,486,147
2	22,358,949	29,502,744	1,674,805	9,314,670	62,851,168	2,639,749
3	24,522,746	34,340,675	1,607,726	11,255,136	71,726,283	3,012,504
4	28,619,797	38,448,871	1,766,528	11,902,132	80,737,327	3,390,968
5	28,353,477	35,377,449	1,448,622	7,049,298	72,228,846	3,033,612
6	31,604,872	42,834,576	1,497,966	7,851,954	83,789,367	3,519,153
7	32,293,326	47,861,739	1,684,166	10,780,829	92,620,061	3,890,043
8	29,273,667	45,236,767	1,744,281	8,092,342	84,347,058	3,542,576
9	25,601,530	36,326,597	1,597,963	5,281,139	68,807,230	2,889,904
10	28,696,022	35,191,441	1,424,838	4,436,473	69,748,775	2,929,449
11	26,886,698	36,456,413	1,278,321	5,852,428	70,473,861	2,959,902
12	27,868,626	35,712,080	1,912,007	8,469,095	73,961,809	3,106,396
Total	**335,294,226**	**457,681,127**	**20,082,828**	**101,237,114**	**914,295,295**	**38,400,402**

Source: InterAirport

(4) Nicaragua

EAAI's annual financial data from 2016 to 2018 are shown in Figure 7.2.1. At the end of March 2018, accumulated revenue amount of EAAI is NIO 388.43 million (USD 11.15 million) composed of 81% for airport services, 9% for auxiliary services, and financial income of 10%. On the other hand, the accumulated expenses at the end of March 2018 total NIO 299.49 million (USD 8.60 million) composed of service costs at 34%, followed by financial expenses at 33%, administrative at 15%, and depreciation at 8%.



Source: Risk Report EAAI in 2018, SCRIESGO

Figure 7.2.1 EAAI's Financial Data from 2016 to 2018

(5) Costa Rica

DGAC's financial data in 2019 are tabulated in Table 7.2.4. Expenditures were recorded at a total of CRC 84.2 billion, of which the largest percentage of use corresponds to the payment of Durable Goods (construction, equipment, etc.) with 51% of total expenditures. The amount of total revenue is same as the amount of total expenditure. This revenue comes mainly from current transfers which represent 66% of the total revenue.

Table 7.2.4 DGAC's Annual Financial Data in 2019

Item	Sub Item	Amount (CRC)	Amount (USD)	Ratio
Expenditure	Remuneration	10,761,102,395	17,694,417	12.78%
	Services	7,735,900,374	12,720,095	9.19%
	Materials and Supplies	261,971,459	430,758	0.31%
	Durable Goods	43,334,210,208	71,254,186	51.47%
	Current Transfer	22,106,815,564	36,350,106	26.26%
	Expenditure Total	**84,200,000,000**	**138,449,562**	**100%**
Revenue	Airport Transport Services	4,792,002	7,879	0.01%
	Administrative rights to airport transport services	3,813,431,149	6,270,402	4.53%
	Property income	889,134,319	1,461,998	1.06%
	Current transfer from the central government	23,576,400,000	38,766,535	28.00%
	Current transfers from decentralized bodies	32,621,906,746	53,640,008	38.74%
	Current transfers to decentralized institutions	240,677,435	395,744	0.29%
	Capital transfer from the Public Sector	1,834,700,000	3,016,786	2.18%
	Free surplus	4,073,958,349	6,698,786	4.84%
	Specific Surplus	17,145,000,000	28,191,422	20.36%
	Revenue Total	**84,200,000,000**	**138,449,562**	**100%**

Source: DGAC

(6) Panama

Tocumen S.A.'s financial data in 2019 are tabulated in Table 7.2.5. According to these financial data, it can be found that the amount of revenue exceeds the amount of expenditure. The profit will approximately be USD 112 million.

Table 7.2.5 Tocumen S.A.'s Annual Financial Data in 2019

Item	Sub-Item	Amount (USD)	Ratio
Expenditure	Depreciation	18,213,758	12%
	Personnel costs	39,787,741	27%
	Repairs and maintenance	8,358,534	6%
	Utilities	8,320,645	6%
	Special Fund for the Development of the National Aeronautics Infrastructure	15,000,000	10%
	International Civil Aviation Organization fees and other related expenses	7,389,613	5%
	Payment for Panama Pacific concession	2,500,000	2%
	Other expenses	17,873,387	12%
	Financial costs, net	29,012,196	20%
	Expenditure Total	**146,455,874**	**100%**
Revenue	Airport operations services	165,998,778	64%
	Rentals	87,709,909	34%
	Others	5,181,587	2%
	Revenue Total	**258,890,274**	**100%**

Source: Financial Statement of Aeropuerto Internacional de Tocumen, S.A. in 2020 by Deloitte

7.2.2 Investment of Private Sector

2020 was a year in which the development of many (although not all) airports came to a sudden stop, with CAPEX being replaced instead by OPEX in most cases – and in many, simply by survival measures. In terms of international airline seat capacity in 2019 (pre-COVID-19), Panama was the largest airport, closely followed by Costa Rica, El Salvador, and Guatemala in descending order. Honduras and Nicaragua have the least commercial air carrier services.

In parallel, private sector investment is most prevalent in Costa Rica. Meanwhile, the government-backed Panama Tocumen S.A. International Airport invested over USD 1 billion in facility developments, along with other government-led initiatives in El Salvador, Guatemala, and Honduras seeking to attract private sector investment for greenfield airport projects.

(1) Guatemala

In January 2020, Guatemala's President Alejandro Giammattei outlined plans to commence development of a new cargo airport at Puerto San José in Escuintla as a substitute to La Aurora International Airport. The proposed all-cargo airport would be associated with a free trade zone and would enable multi-modal logistics operations, in combination with the Puerto Quetzal Seaport. However, belly cargo would continue to be handled at La Aurora. DHL, the largest cargo operator at La Aurora, would be a good candidate to discuss potential cooperation for the project.

A major hurdle to the new airport plan is that air cargo is most efficient where operators can divide shipments between commercial passenger aircraft (belly cargo) and full-freighter aircraft as is done today at La Aurora Airport. Alternatively, the new airport strategy might focus on creating a distribution hub for a major integrator, such as DHL, as a new cargo consolidation and operations center.

The plan of a new cargo airport has been modified to refurbish the existing San Jose Airport (GSJ) with construction or expansion of: a) Passenger Terminal Building, b) Air Traffic Control Tower, c) Taxiway, d) Runway, e) Perimeter Fence and f) Firefighting Station. After the refurbishment at the end of 2023, it is

expected that GSJ accommodate small and middle size aircraft while operation of large size aircraft remains flying to La Aurora International Airport.

(2) El Salvador

In August 2020, El Salvador's Autonomous Ports Executive Committee (CEPA) announced 30 consortia pre-qualified for the tender process for the construction of the greenfield Pacific International Airport (Pacifico Airport) located in El Salvador's eastern area. Subsequently, the government launched a commercial tender to carry out feasibility studies for the new airport late last year. The COVID-19 pandemic has delayed issuing the RFP operator tender for the proposed new airport. The Goverment expect construction of that the Pacifico Airport will be begun in 2024 and be operated in 2029.

In addition, the Export and Investment Promotion Agency of El Salvador (PROESA: *Organismo Promotor de Exportaciones e Inversiones de El Salvador*) had commenced the process to operate the cargo terminal building in Comalapa International Airport as a public-private partnership (PPP). ADIMEX consisted of Honduras and German company has been selected to conduct of its operation, maintenance and development of the cargo terminal since 9th May 2022. Development plan to install new equipment and expansion at the amount of 14 million USD has been commitment by ADIMEX. The handling capacity of the cargo terminal will be increased to 52,000 ton per year from 32,000 ton after the development.

(3) Honduras

In 2020, as part of the concession agreement for the new Palmerola International Airport, EMCO which is United based compant has been awarded 35 years concession period to operate and maintain Toncontin's facilities and operations in collaboration with Munich Airport International (MAI) as a strategic airport operator partner. The new airport being planned to open in late 2021 has an apron capacity to handle 13 aircrafts and the terminal will have a capacity for 1.7 million passengers p/a.

New cargo warehouse with 3000 square metrer was constructed by Palmerola International Airport in August 2022 and has been waiting for government approval for commencment of its operation.

Also in 2020, Honduras' Airport Infrastructure Company (EHISA) signed a one-year contract with HAS Development Corporation (HASDC), where HASDC will provide advisory services on the management of San Pedro Sula, La Ceiba, and Roatan international airports since EHISA began managing these airports effective 29 September 2020.

(4) Nicaragua

Augusto C. Sandino International Airport is the main joint civil-military public international airport in Managua. No reported private investment is known at this time.

(5) Costa Rica

San Jose Juan Santamaría International Airport, the main gateway airport, is operated under concession by Aeris Holdings Costa Rica that expires in 2026. It is Central America's second busiest airport after Panama City Tocumen International Airport that is also under concession. In January 2021, the Ministry announced it had paused plans for the construction of Orotina San Jose International Airport "for a few years" to focus instead on Juan Santamaria International Airport. Feasibility studies that was carried out pre-pandemic found that Santamaria Airport's lifespan could exceed beyond 2040.

(6) Panama

Panama City Tocumen International Airport serves as a major hub and crossroads for flights heading to and from the Caribbean, South America, North America, and Central America. It is the home base for Copa Airlines. The USD 918 million construction of Terminal 2 inaugurated in February 2020 will increase airport capacity from 12 million to 25 million passengers p/a. The airport plans to invest a further USD 500 million in construction over the next five years, including expanded cargo village and a third runway

construction project.

Until 31 May 2003, the administration of the airport was under the Directorate of Civil Aeronautics (present-day Civil Aviation Authority). As of 1 June 2003, a new administrative organization was created by Law No. 23 of 29 January 2003, allowing the creation of a company called Tocumen S.A. International Airport that currently manages the airport and is a wholly-owned subsidiary of the State of Panama.

7.3 Existing Condition of Airport and Facilities

7.3.1 Guatemala

In Guatemala, there are two international airports, one is La Aurora International Airport, and another is Mundo Maya International Airport, which is the airport for tourist who visits Tikal. This report is mainly concerned with La Aurora International Airport since this airport is the main cargo airport in Guatemala.

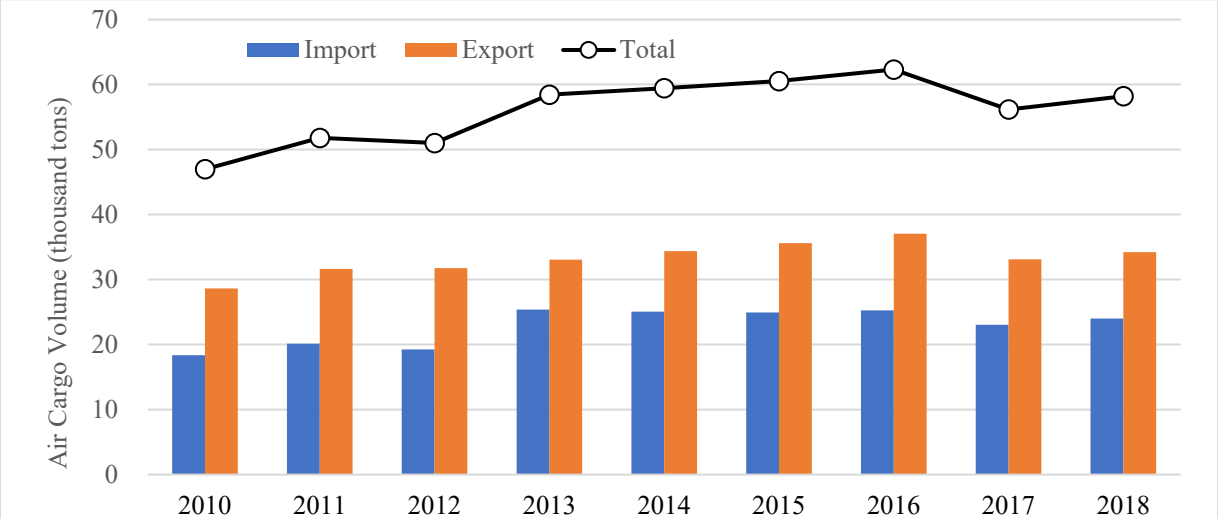
(1) La Aurora International Airport

a) General

La Aurora International Airport is the main airport for both passenger and cargo in Guatemala. The airport is located in the center of Guatemala City; therefore, no space is available for the runway extension. The main commodities of air cargo are flowers, vegetables, and textile (fabric inbound and finished goods outbound made by Maquiladora). No electrical products are included in the air cargo commodity. KLM and Martin Air Cargo freighters operate to Amsterdam. COMBEX is an operator of cargo warehouse, which is used by DHL, UPS, etc. The airport treats the largest volume of general aviation in Central America for travelers engaged in agricultural business who use general aviation due to poor road access.

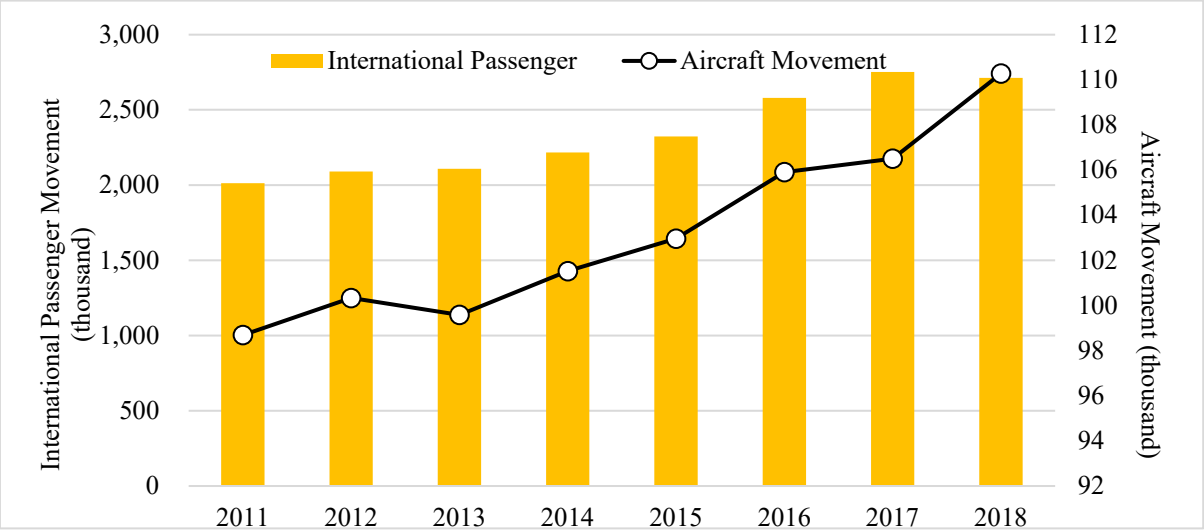
b) Air Traffic Data

Air cargo volume, international annual passengers, and annual aircraft movements by DGAC are shown in Figure 7.3.1 and Figure 7.3.2. As for the cargo volume, while it had been slightly increasing till 2016, the volume decreased in 2017 and total volume was 5.8 thousand tons in 2018. Annual international passengers also increased until 2018. The number of international passengers in 2018 was 2.7 million. On the other hand, annual aircraft movements are increasing steadily and the number of aircraft movements as of 2018 was around one hundred ten thousand.



Source: JST based on the data by DGAC

Figure 7.3.1 Air Cargo Volume in La Aurora International Airport



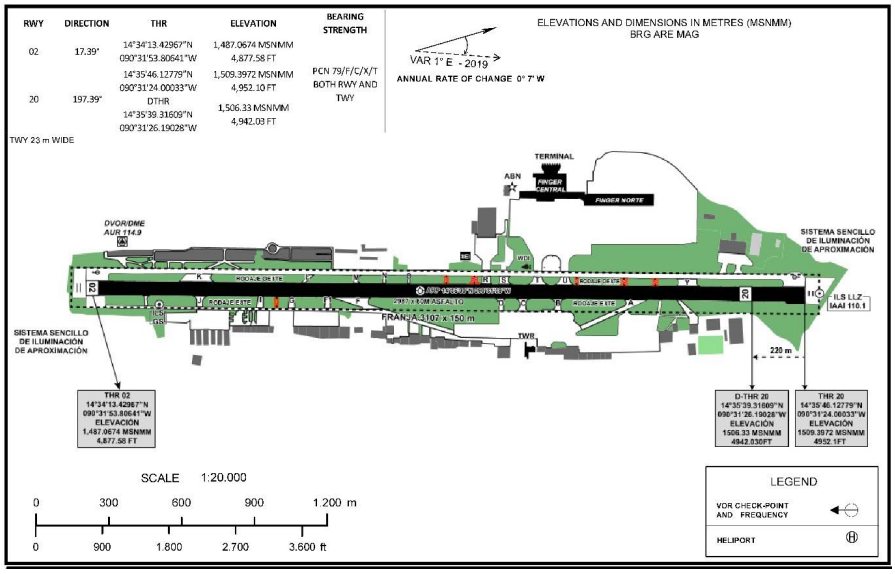
Source: JST based on the data by DGAC

Figure 7.3.2 International Passenger and Aircraft Movement in La Aurora International Airport

c) Airport Facility

Main facilities consisting the airport are single runway (2,987 x 60 m), passenger terminal building, cargo warehouse, hangar used for cargo warehouse, and hangar used for general aviation. The main aircraft serviced in the airport is B737, A319/320, and E190. There is a freighter B747-800 (Cargo Lux) once per week to the USA with 80% weight restriction in case of departure due to runway length.

The airport is located on a plateau in the center of Guatemala City; therefore, no space is available for the runway extension. In addition, the runway end in the north side is set back by 220 m to the south side since there is an obstruction which is the historical tower that cannot be relocated. There is Runway End Safety Area (hereinafter called "RESA") on both sides of the runway end and DGAC planned the installation of RESA with Engineered Materials Arrestor System (hereinafter called "EMAS") for compliance with ICAO standard.



Source: AIP

Figure 7.3.3 La Aurora International Airport Layout

d) Airport Cargo Facility

Cargo warehouse is located in the west side of the airport. This warehouse is operated by COMBEX and they also provide space for customs.

There are hangars, which are operated by each airline such as Avianca, DHL, TAG, etc. DHL operates a hangar used as cargo warehouse for its B757F operation.

	
Cargo Warehouse Operated by COMBEX	DHL Hangar Used as Cargo Warehouse

Source: JST

Figure 7.3.4 Cargo Warehouse Photo in La Aurora International Airport

Cargo terminal warehouse consists of buildings as shown in Figure 7.3.5. These facilities were constructed approximately 30 years ago. Current aircraft apron in the cargo warehouse can only accommodate a single B747/A300Fs (Code E), or up to two B737/A320Fs (Code C). In peak hour, two B747 and one B737 for cargo arrive simultaneously. At that time, aircraft cannot park in front of the cargo warehouse and therefore park at the apron to the north in front of the passenger terminal building.

In the import cargo warehouse, workers from SAT are deployed for customs inspection. They mainly conduct inspection for COPA cargo from Colombia and other air cargos in a random manner. All import cargo goes through X-ray machine and it takes an average of 1 to 3 days for documentation such as tax clearance. Maximum of 20 days can be stored in the warehouse. All import cargo is controlled by barcode system.

In the export cargo warehouse, there are 7 X-ray machines, and one of them is for large size and the others are for middle or small size. COMBEX conducts preliminary inspection of cargo by X-ray machine and they inform SAT if there is any concern. Based on the information by COMBEX, SAT staff will open the concerned cargo item. All forwarders must submit their documents related to customs to the SAT office located in the export warehouse. The target export cargo storage period in the warehouse is six to eight hours.



Source: JST modified COMBEX photo

Figure 7.3.5 COMBEX Warehouse Layout Photo

7.3.2 El Salvador

In El Salvador, there are two international airports, one is Comalapa International Airport, and another is Ilopango International Airport, which is the airport for both military and civil aviation. This report is mainly concerned with Comalapa International Airport since this airport is the main cargo airport in El Salvador.

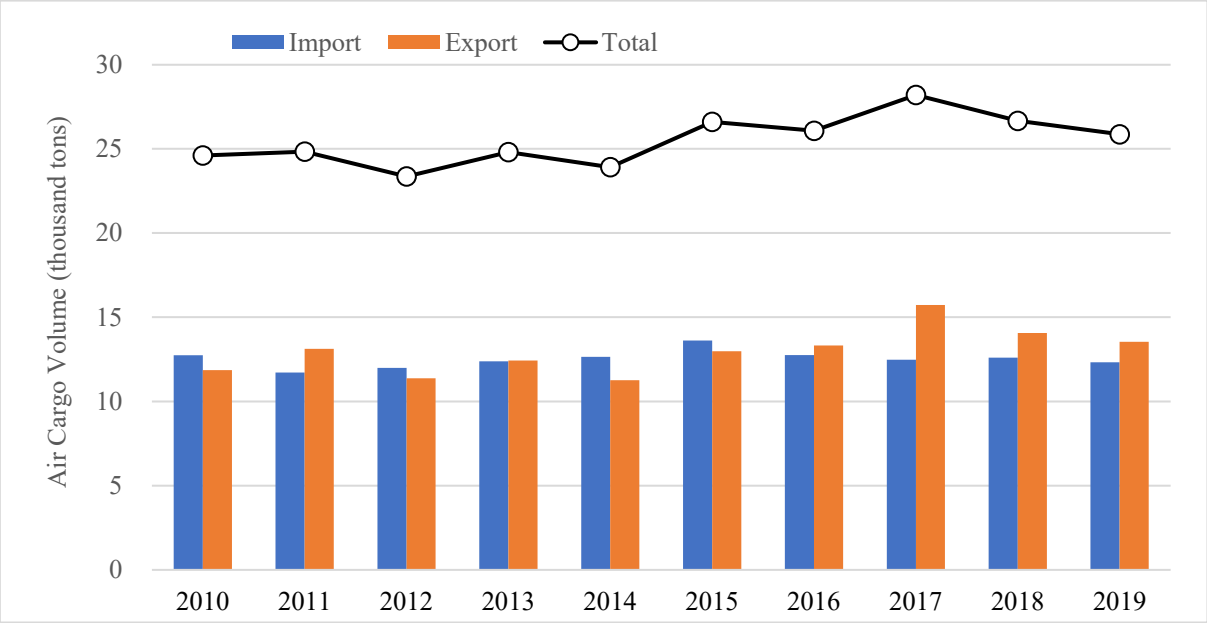
(1) Comalapa International airport (Saint Oscar Arnulfo Romero y Galdámez International Airport)

a) General

Comalapa International Airport is the main airport for both passenger and cargo in El Salvador. The airport is located on the Pacific Ocean side and around 50 km from the center of San Salvador City. The main commodity of import air cargo is Maquiladora and export air cargo is electronics.

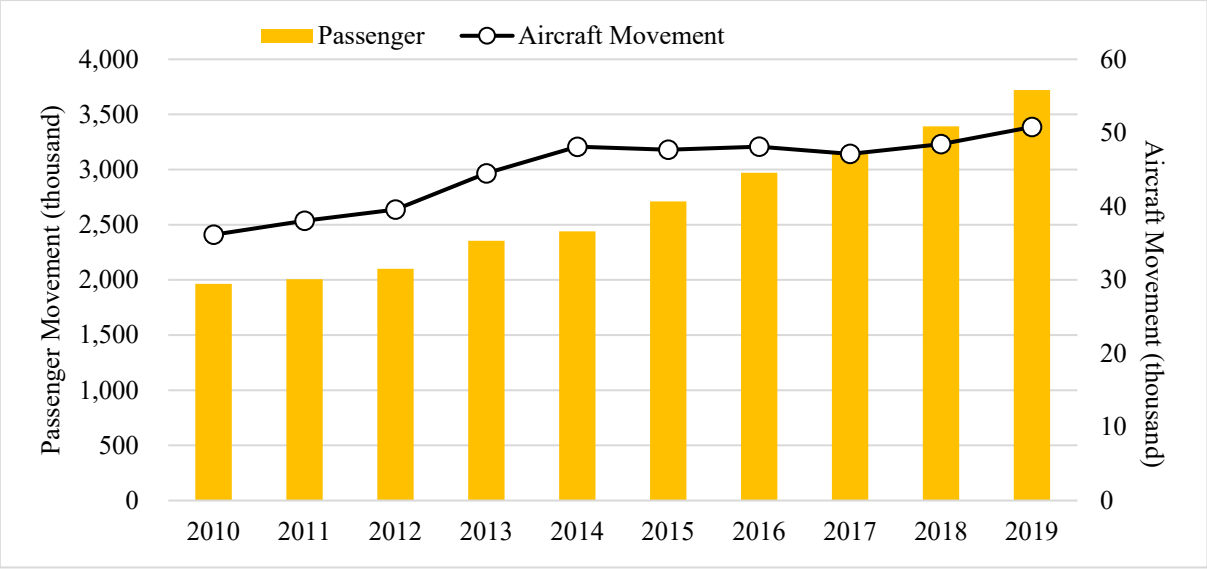
b) Air Traffic Data

Air cargo volume, annual passengers, and aircraft movement from 2010 to 2019 are shown in Figure 7.3.6 and Figure 7.3.7. As for air cargo, the total volume was decreased from 27 thousand in 2018 to 26 thousand tons in 2019. The number of annual passengers has increased and 3.7 million passengers used this airport in 2019.



Source: JST based on the data by AAC

Figure 7.3.6 Air Cargo Volume in Comalapa International Airport



Source: JST based on the data by AAC

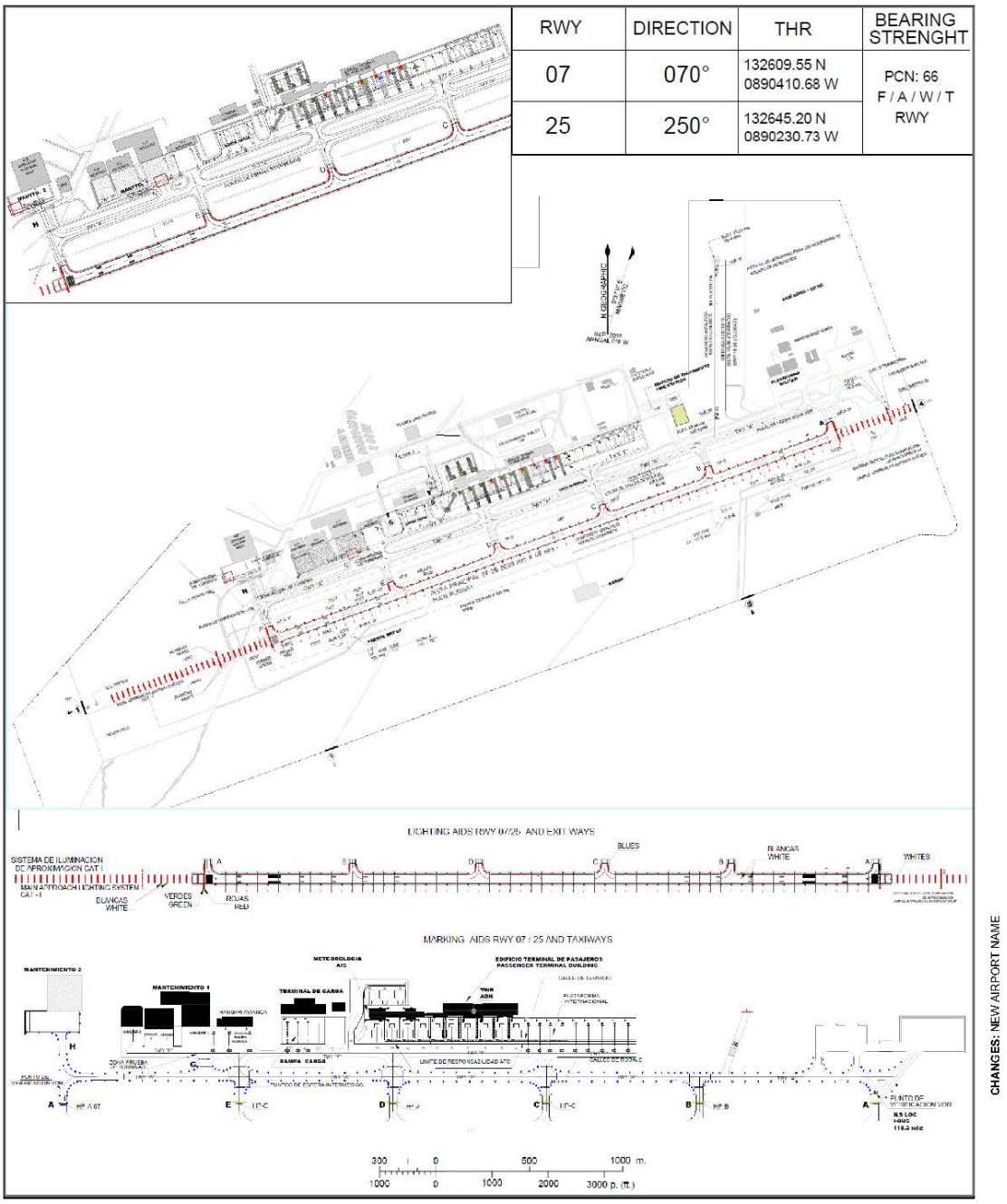
Figure 7.3.7 Passenger and Aircraft Movement in Comalapa International Airport

c) Airport Facility

In the first survey trip, the JICA Study Team (JST) was unable to arrange with CEPA a field survey at Comalapa International Airport. Therefore, the existing condition of the airport is based on the information obtained from the Data Collection Survey Report for Central American Logistic conducted by the Japan International Cooperation Agency (JICA) in 2017.

The main facilities of the airport consist of: (1) single runway (3,200 x 45 m); (2) passenger terminal building (total floor area: approximately 60,000 m^2); (3) cargo warehouse (total floor area: approximately 10,000 m^2); and (4) maintenance hangar operated by Aeroman, which is a private aircraft maintenance company.

According to the CEPA-issued press release in March 2021, the program for new terminal construction had reached 91% completion. The terminal expansion features 23,000 sqm and will increase the airport's design capacity to around five million passengers p/a.



Source: AIP

Figure 7.3.8 Comalapa International Airport Layout

d) Airport Cargo Facility

The cargo warehouse is located on the west side of the passenger terminal building. This cargo terminal building is operated by ADMIX.

7.3.3 Honduras

In Honduras, there are four international airports which are Toncontín International Airport, Ramón Villeda Morales International Airport, Juan Manuel Gálvez International Airport, and Golosón International Airport. Toncontin International Airport is the metropolitan airport for political passenger or tourist in Tegucigalpa. Ramón Villeda Morales International Airport located in San Pedro Sula is the busiest airport in Honduras. The other two international airports are located in the north coast of Honduras and mainly for passengers. This report is mainly concerned with Toncontín International Airport and Ramón Villeda Morales International Airport since these airports are the main cargo airports in Honduras.

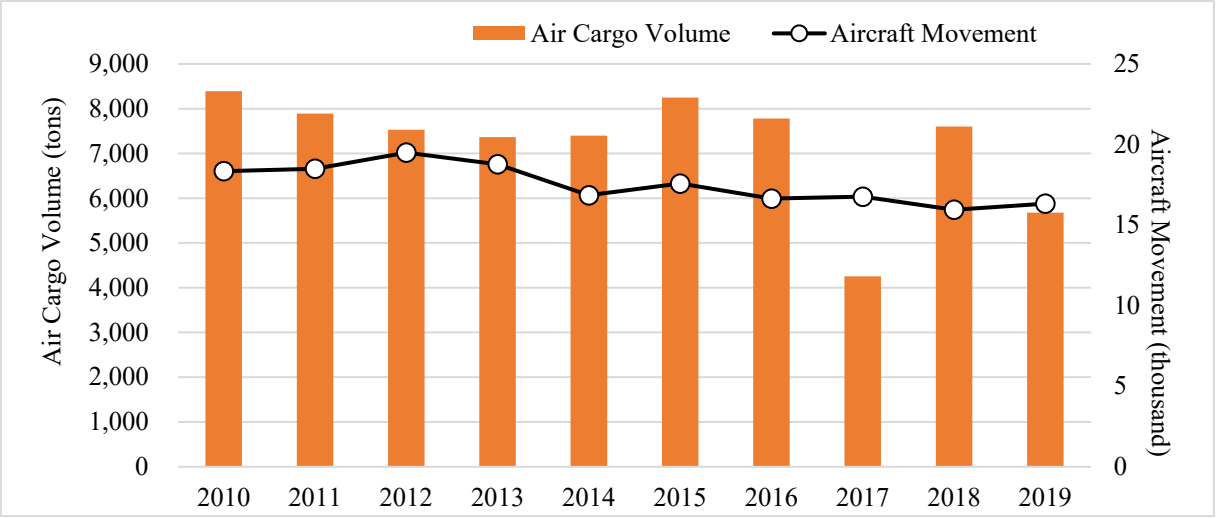
(1) Toncontin International Airport

a) General

Toncontin International Airport is the metropolitan airport for political passenger or tourist in Tegucigalpa. After commencement of new airport operations at Palmerola, with design capacity for 1.7 million passengers p/a, all international flights will shift. Toncontin will remain open only for general aviation and domestic passenger flights using smaller turboprop (Code A-B) aircraft. In 2019, Toncontin International Airport handled about 600,000 international passengers and 161,970 domestic passengers, and the total is about 750,000 passengers annually.

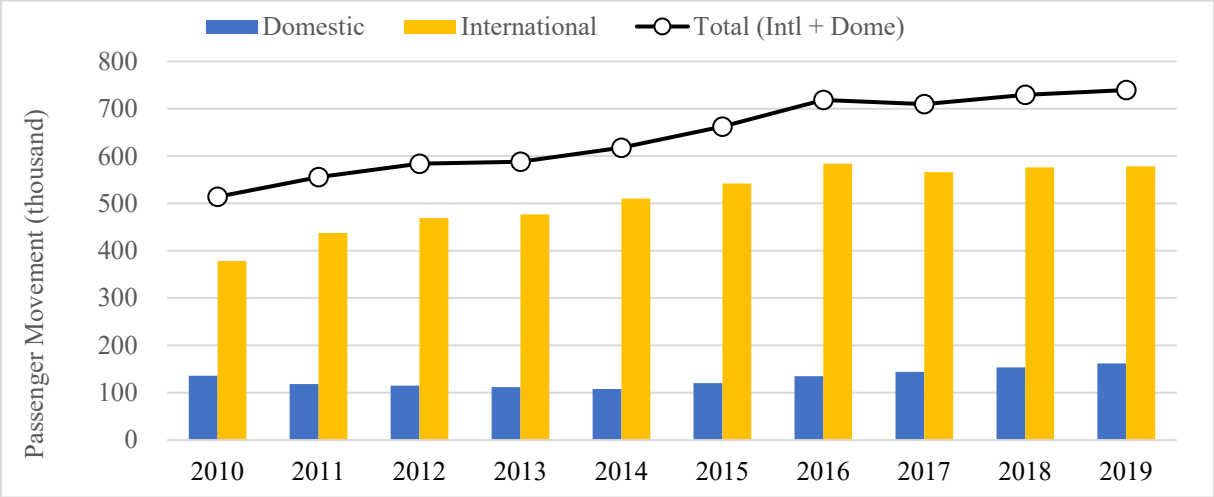
b) Air Traffic Data

Air traffic data, which contain air cargo volume, aircraft movement, and passenger movement, from 2010 to 2019 obtained by InterAirport S.A. are shown in Figure 7.3.9 and Figure 7.3.10. There has been no increase in cargo volume and aircraft movements since 2010 to 2019. The number of passenger movement has increased from around 0.5 million in 2010 to around 0.7 million in 2016, but has remained stable since 2016 to 2019.



Source: JST based on the data by InterAirport S.A.

Figure 7.3.9 Air Cargo Volume and Aircraft Movement in Toncontin International Airport

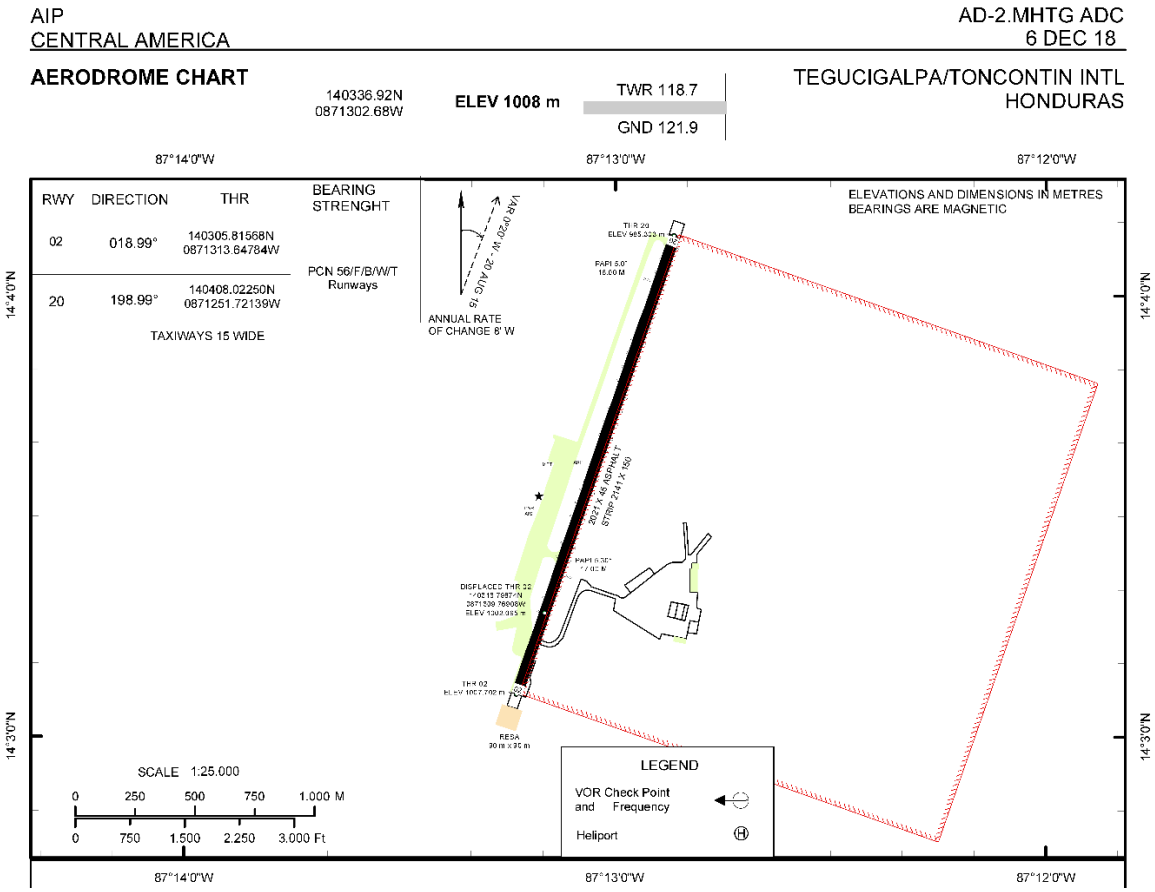


Source: JST based on the data by InterAirport S.A.

Figure 7.3.10 Passenger Movement in Toncontin International Airport

c) Airport Facility

Main facilities consisting the airport are single runway (2,021 x 45 m), passenger terminal building, and land transport cargo area. Largest aircraft in service is Code C (B737), with limited belly hold air cargo operated at this airport.



Source: AIP

Figure 7.3.11 Toncontin International Airport Layout

d) Airport Cargo Facility

There is a cargo area for mainly land cargo, which includes customs facility. Although this cargo warehouse is located beside the airport, limited air cargo is treated in this cargo area since the airport cannot handle any aircraft larger than B737-800 (C-class).

(2) Ramón Villeda Morales International Airport

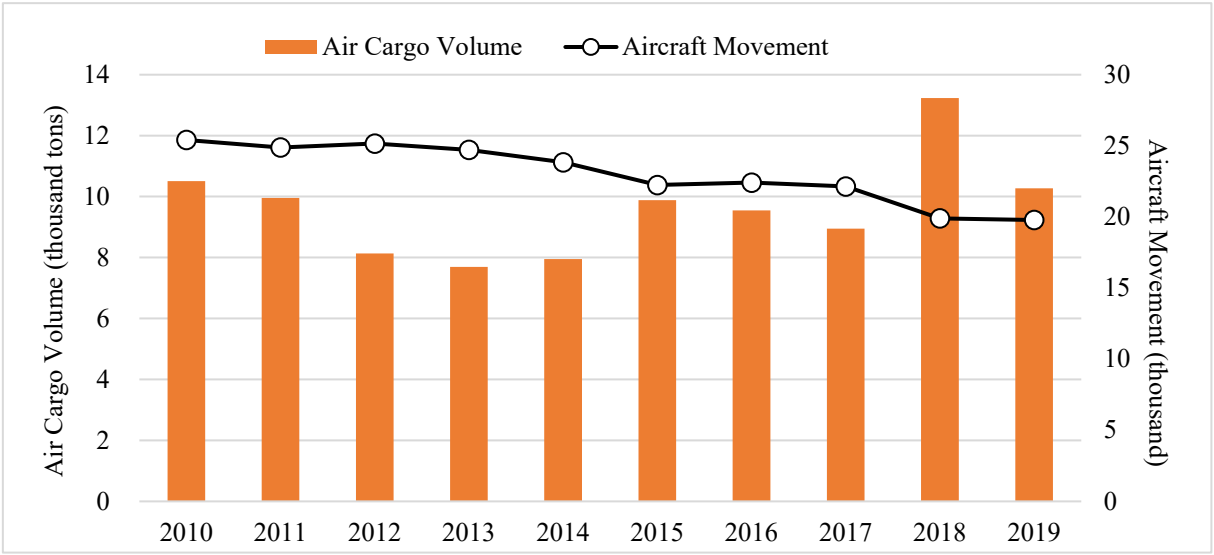
a) General

Ramón Villeda Morales International Airport located in San Pedro Sula is the busiest airport in Honduras. In 2019, the international passenger total was 1,119,288. There is a cargo warehouse with refrigerator operated by Swissport. The main commodity of import cargo is textile, and export cargos are tilapia, vegetables (okra), and fruits (rambutan). American and Spirit Airlines are currently the two largest operating air carriers of the USA flights in terms of both passenger and cargo.

EHISA which is invested by both public and private sector has taken over airport operation and maintenance including cargo terminal from Inter Airports. S.A since June 2022.

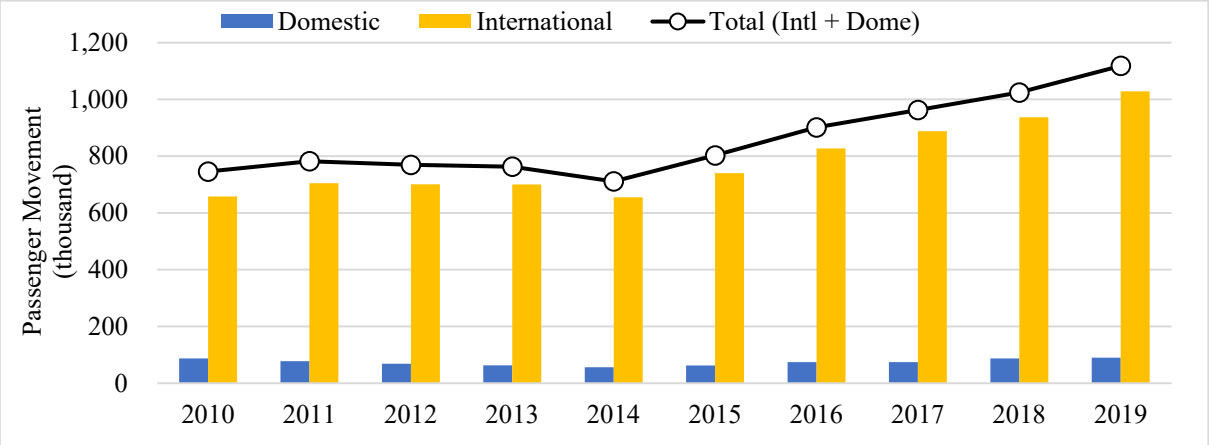
b) Air Traffic Data

Air traffic data, which contain air cargo volume, aircraft movement, and passenger movement, from 2010 to 2019 obtained by InterAirport S.A. are shown in Figure 7.3.12 and Figure 7.3.13. Although there have been increases and decreases in the cargo volume, the volume of cargo in 2010 and 2019 is almost the same (approximately 10,000 tonnes). The number of passenger movement has been on the rise from 2014 to 2019.



Source: JST based on the data by InterAirport S.A.

Figure 7.3.12 Air Cargo Volume and Aircraft Movement in Ramón Villeda Morales International Airport

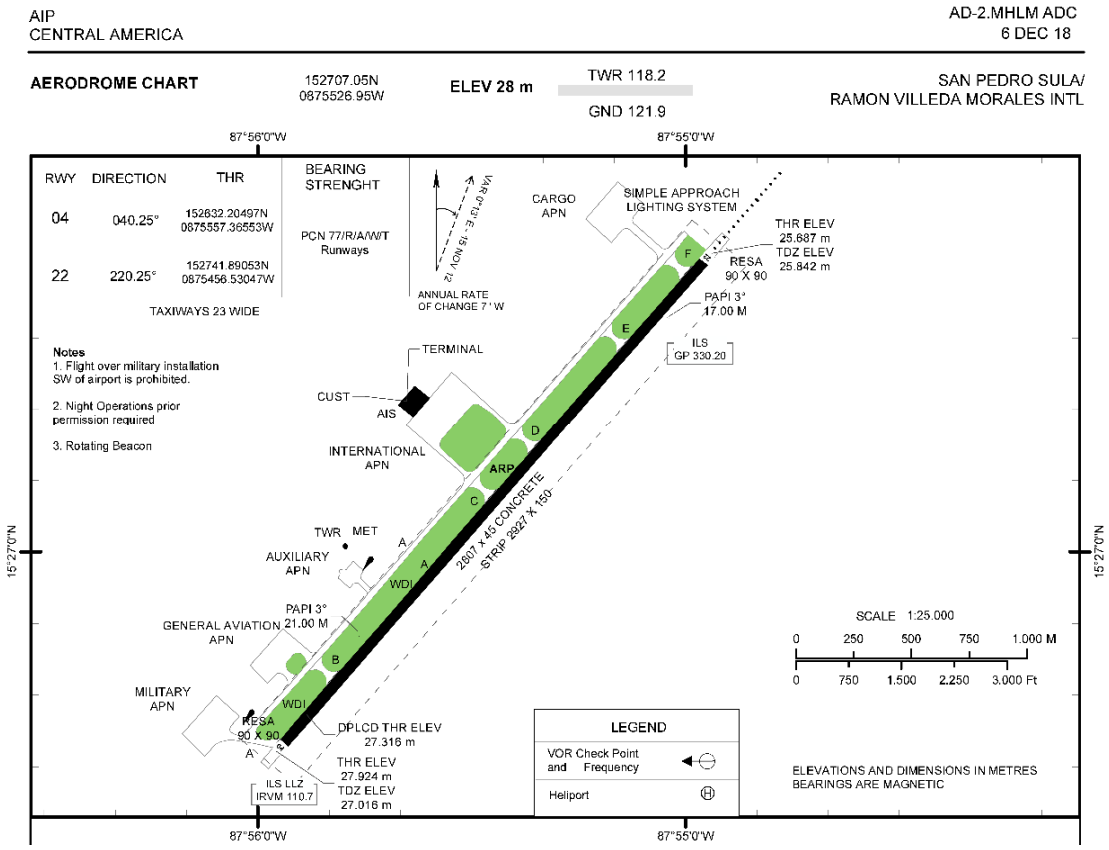


Source: JST based on the data by InterAirport S.A.

Figure 7.3.13 Passenger Movement in Ramón Villeda Morales International Airport

c) Airport Facility

Main facilities consisting the airport are single runway (2,806 x 45 m), passenger terminal building, and cargo terminal building. The main aircraft for passenger is Code C, and Air Europe operates A330 two times per week flight to Madrid. The main aircraft for air cargo is B767 or B757, and ATLAS Air had operated B747-200. The altitude of airport is 28 m and it is almost the same as the sea level. There are four apron spots with contact gates and six remote spots. In the contact gates, three spots are for Code C aircraft and one spot for Code E aircraft, Air Europa A330, twice weekly.



Source: AIP

Figure 7.3.14 Ramón Villeda Morales International Airport Layout



Apron Spot



Remote Apron Spot

Source: JST

Figure 7.3.15 Apron Spot Photo in Ramón Villeda Morales International Airport

d) Airport Cargo Facility

The cargo warehouse constructed 25 years ago is located on the north side of the airport. This warehouse is operated by EHISA in coordination with customs. There are three apron spots in front of the cargo warehouse for freighter. Export cargo warehouse and import cargo warehouse are mixed in one warehouse, and these types of cargo are separated by a fence.

In case of import cargo, the forwarder enters the necessary information into the customs system two hours before the arrival of import cargo. Swissport conducts preliminary inspection of import cargo with their own system, "SILOG", based on the information entered by forwarder. If the information is wrong, customs will conduct detailed customs inspection. Average storage period is one week and minimum is one day.

In case of export cargo, the forwarders enter the necessary information into the customs system by themselves. All cargo items go through the security check to load onto the aircraft. Due to the limited storage space for export cargo, the maximum storage period for export cargo is one day.

In peak hour, two B747 and one B737 for cargo arrive simultaneously. At that time, aircraft cannot park in front of the cargo warehouse and therefore park at the apron to the north, in front of the passenger terminal building.



Import Cargo Warehouse



Import Cargo Refrigerator Room



Export Cargo X-ray



Cargo Apron

Source: JST

Figure 7.3.16 Cargo Facility Photo in Ramón Villeda Morales International Airport

7.3.4 Nicaragua

In Nicaragua, there is one international airport which is Augusto C. Sandino International Airport and 15 domestic airports. This report is mainly concerned with Augusto C. Sandino International Airport since this airport is the main cargo airport in Nicaragua.

(1) Augusto C. Sandino International Airport

a) General

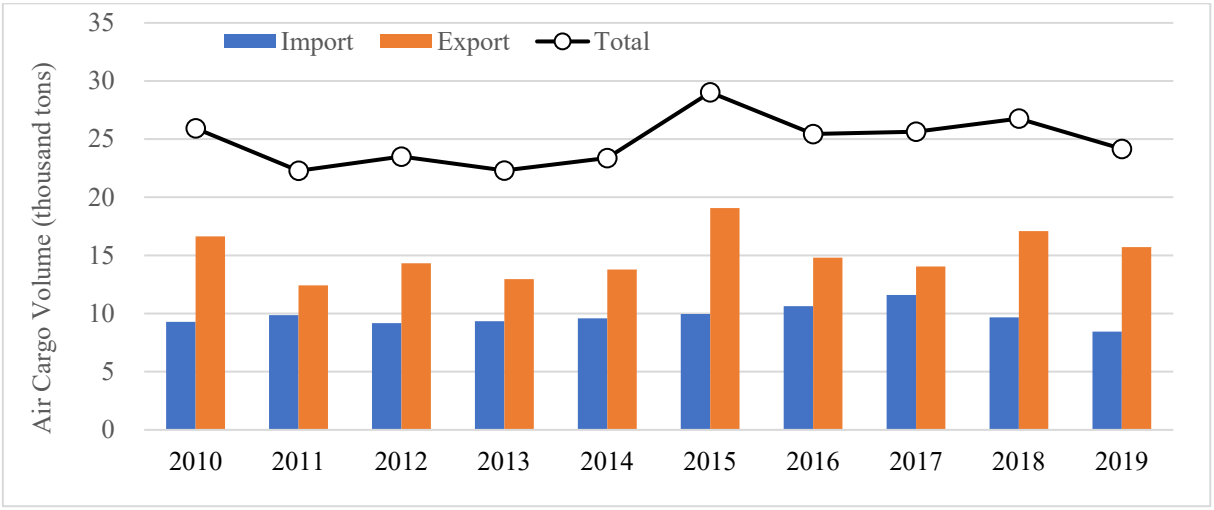
Augusto C. Sandino International Airport is the main airport for both passenger and cargo in Nicaragua. The airport is located in the capital city of Managua. Main commodity of air cargo consists of perishable goods, e.g., fresh seafood, textiles, car spare parts, and cigarettes. The most common destination for air cargo is Miami in the USA. The most common passenger destination is Panama operated by Copa. The peak hours in Augusto C. Sandino International Airport are 10 am and 2 pm.

b) Air Traffic Data

Air traffic data, which contain air cargo volume, aircraft movement, and passenger movement, from 2010 to 2019 obtained by EAAI are shown in Figure 7.3.17, Figure 7.3.18 and Figure 7.3.19.

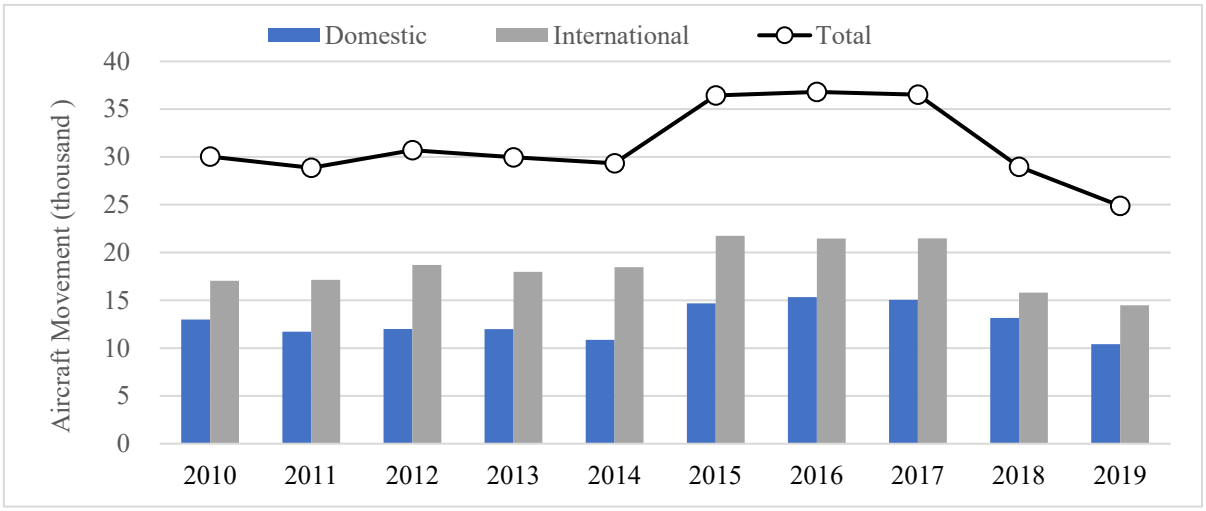
Although there have been increases and decreases in the cargo volume, the volumes of cargo in 2010 and 2019 are almost the same (approximately 25,000 tonnes). The volume of export cargo is larger than import cargo volume in all years. Both aircraft movement and passenger movement have increased up to 2017;

however, both have decreased from 2017 to 2019.



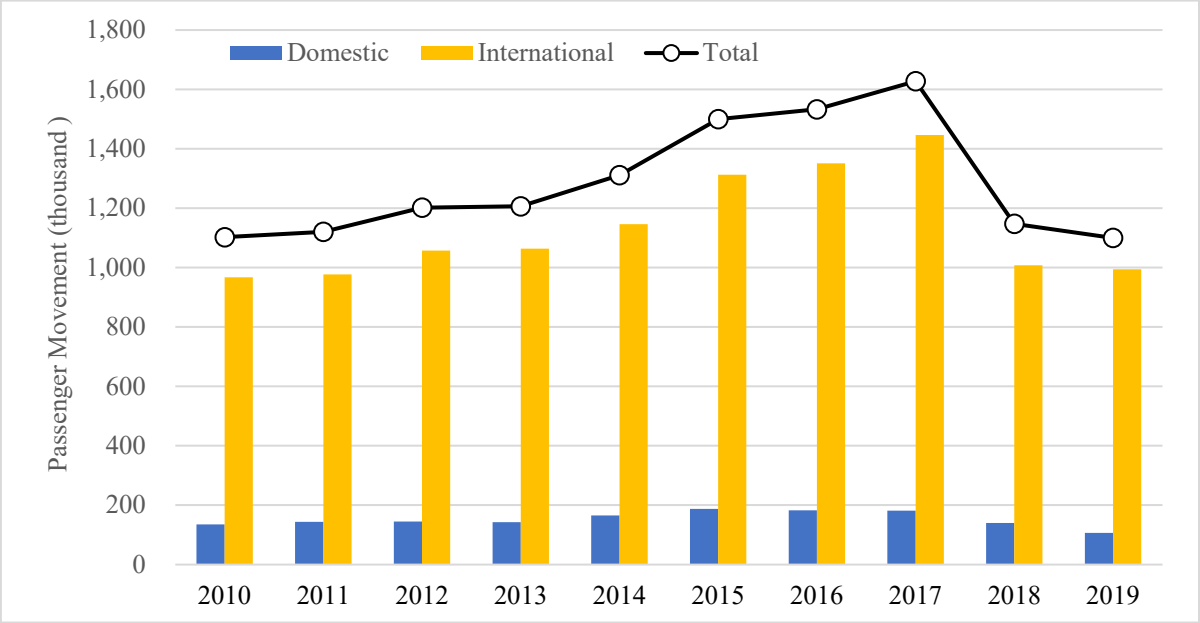
Source: JST based on the data by EAAI

Figure 7.3.17 Air Cargo Volume in Augusto C. Sandino International Airport



Source: JST based on the data by EAAI

Figure 7.3.18 Aircraft Movement in Augusto C. Sandino International Airport



Source: JST based on the data by EAAI

Figure 7.3.19 Passenger Movement in Augusto C. Sandino International Airport

c) Airport Facility

Main facilities consisting the airport are single runway (2,442 x 45 m), international passenger terminal building, domestic passenger terminal building, and cargo terminal building. There are seven spots with boarding bridge and two remote spots in the apron. There are many cracks observed in the asphalt pavement, and will be necessary to be repaired.



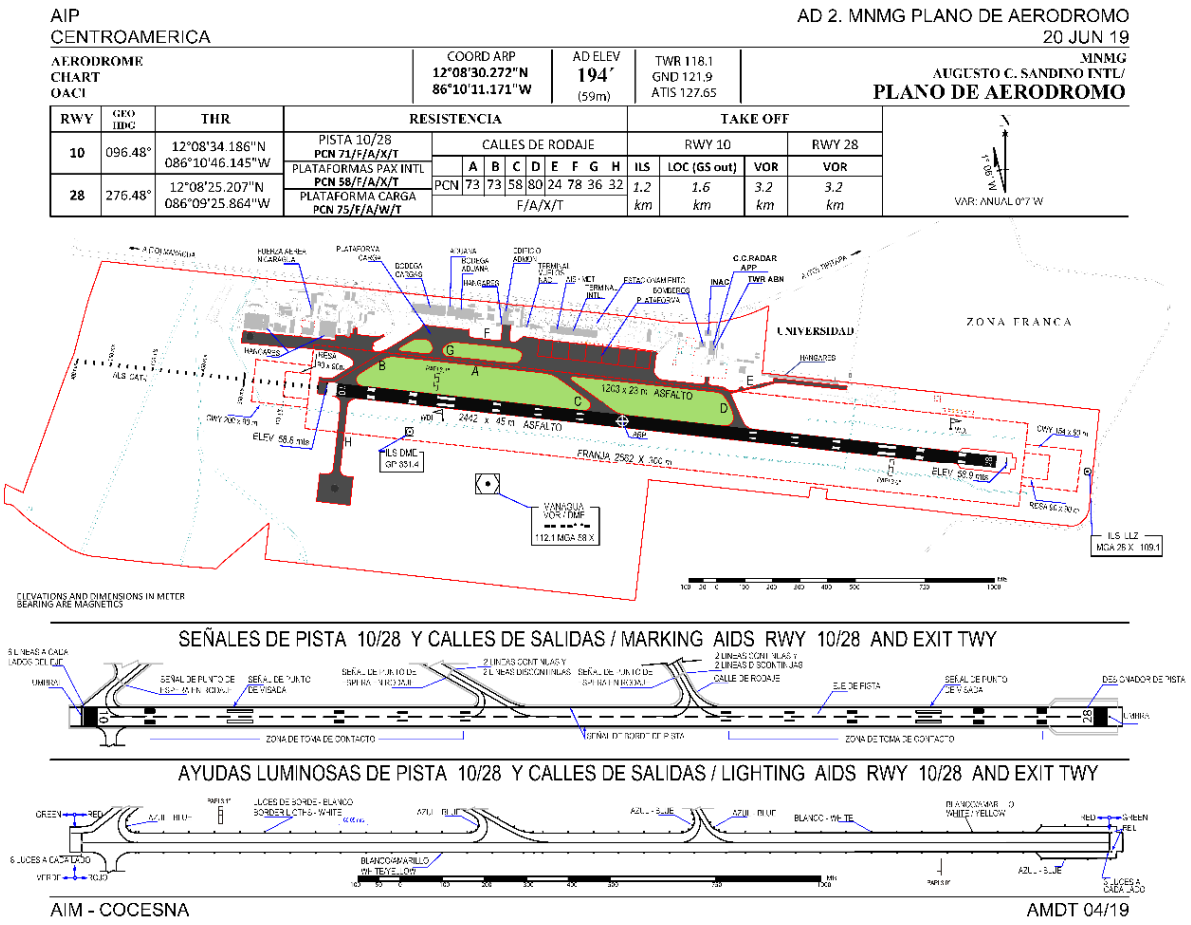
Apron Spot



Cracks in Asphalt Pavement

Source: JST

Figure 7.3.20 Apron Spot Photo in Augusto C. Sandino International Airport



Source: AIP

Figure 7.3.21 Augusto C. Sandino International Airport Layout

d) Airport Cargo Facility

There are export and import cargo terminals side by side on the west side of the airport area. In front of these terminals, there is an apron for freighter, which can accommodate one jet freighter aircraft. The export cargo terminal has a refrigerator room for perishable goods and medical kits. The capacity of this refrigerator room is for 20 numbers of Unit Load Device. This refrigerator room is operated by APEN Frigorificos, which is a private company. The export cargo terminal, except for the refrigerator room, is separated between UPS and Amerijet. All export cargos undergo security inspection by X-ray before being stored in the terminal. Conduct of field survey was restricted in the import cargo terminal since it relates to customs. A new cargo terminal, apron, and taxiway to the new cargo area in the southwest side of the airport are planned to be developed.

	
Export Cargo Terminal	Import Cargo Terminal
	
Inside of Refrigerator Room	Security Inspection Room
	
Freighter for Export Cargo	Export Cargo Stored in front of Freighter

Source: JST

Figure 7.3.22 Cargo Facilities Photo in Augusto C. Sandino International Airport

7.3.5 Costa Rica

(1) Juan Santamaría International Airport

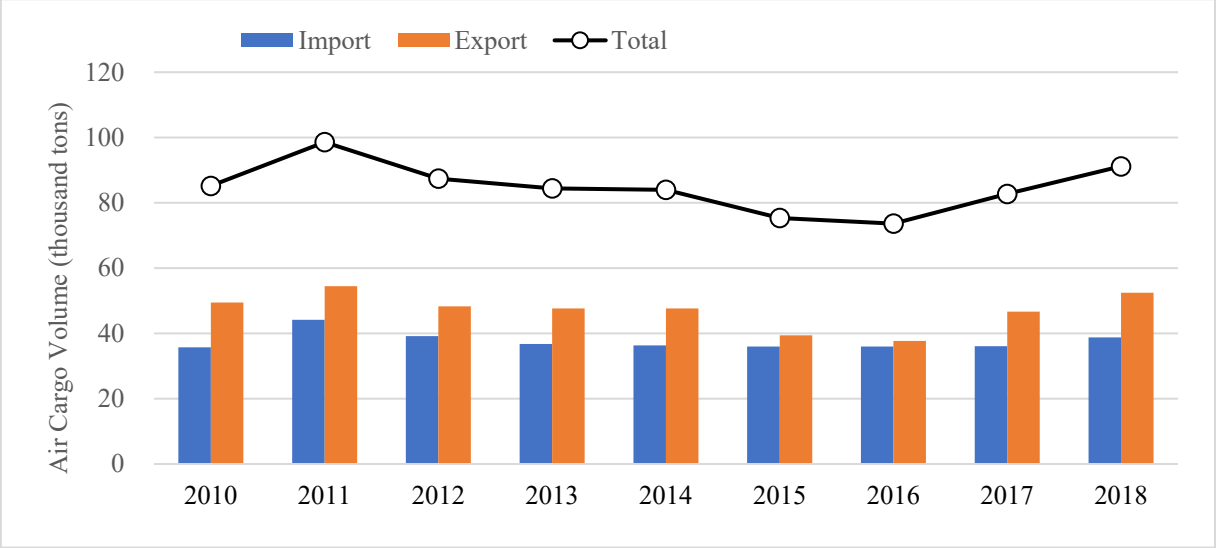
a) General

Juan Santamaría International Airport is the main airport which operates the only cargo terminal in Costa Rica. Air cargo operators in this airport are DHL, UPS, Aero Union, Run Cargo, FedEx, etc. There is no

domestic air cargo transport in Costa Rica since the main air cargo items such as microchip and medical kits are fabricated in the metropolitan area close to Juan Santamaría International Airport. Peak season of this airport is from December to January and from July to August. Annual passenger in 2018 was 5,211,104 of which only 150,000 were domestic passengers.

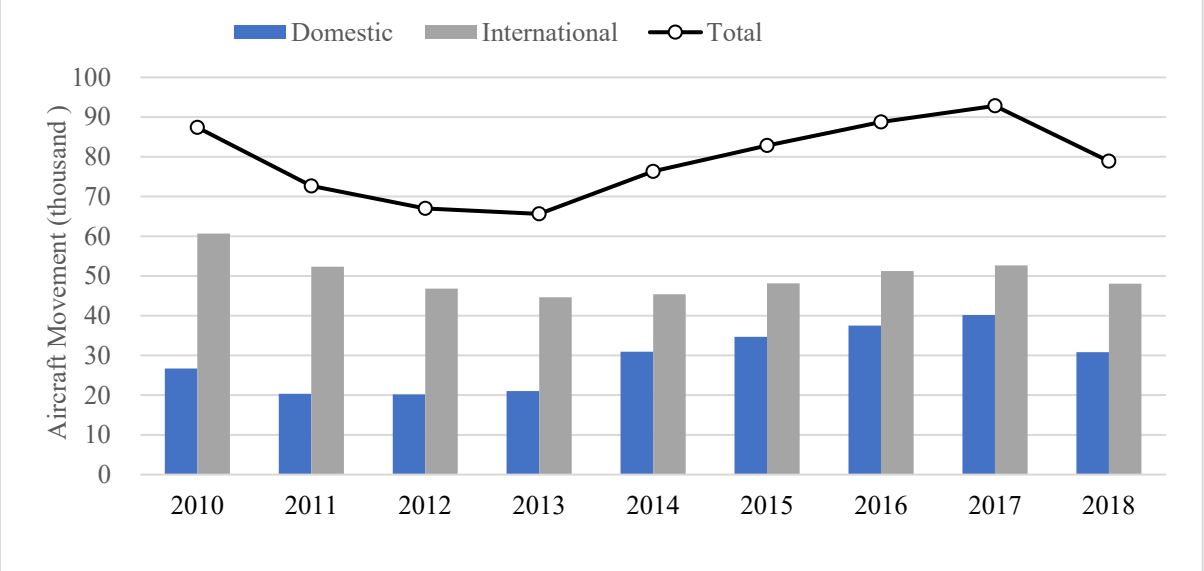
b) Air Traffic Data

Air cargo volume and annual passenger/aircraft movements are shown in Figure 7.3.23, Figure 7.3.24 and Figure 7.3.25. Regarding the cargo volume, the volume has been slightly decreasing till 2015 but started increasing after 2016; and the volume in 2018 was recorded as 91 thousand tons. As shown in Figure 7.3.25, the number of annual passengers is increasing. International passengers have accounted for almost all passengers, and 5.2 million was recorded as the total number in 2018.



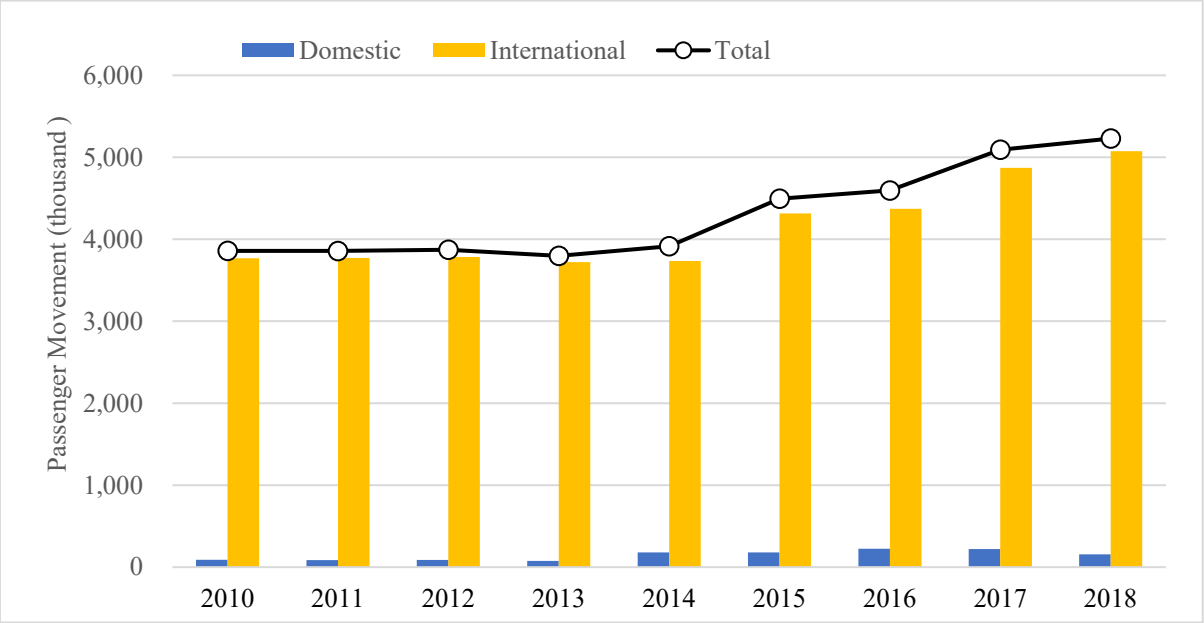
Source: JST based on the data by DGAC

Figure 7.3.23 Air Cargo Volume in Juan Santamaría International Airport



Source: JST based on the data by DGAC

Figure 7.3.24 Aircraft Movement in Juan Santamaría International Airport



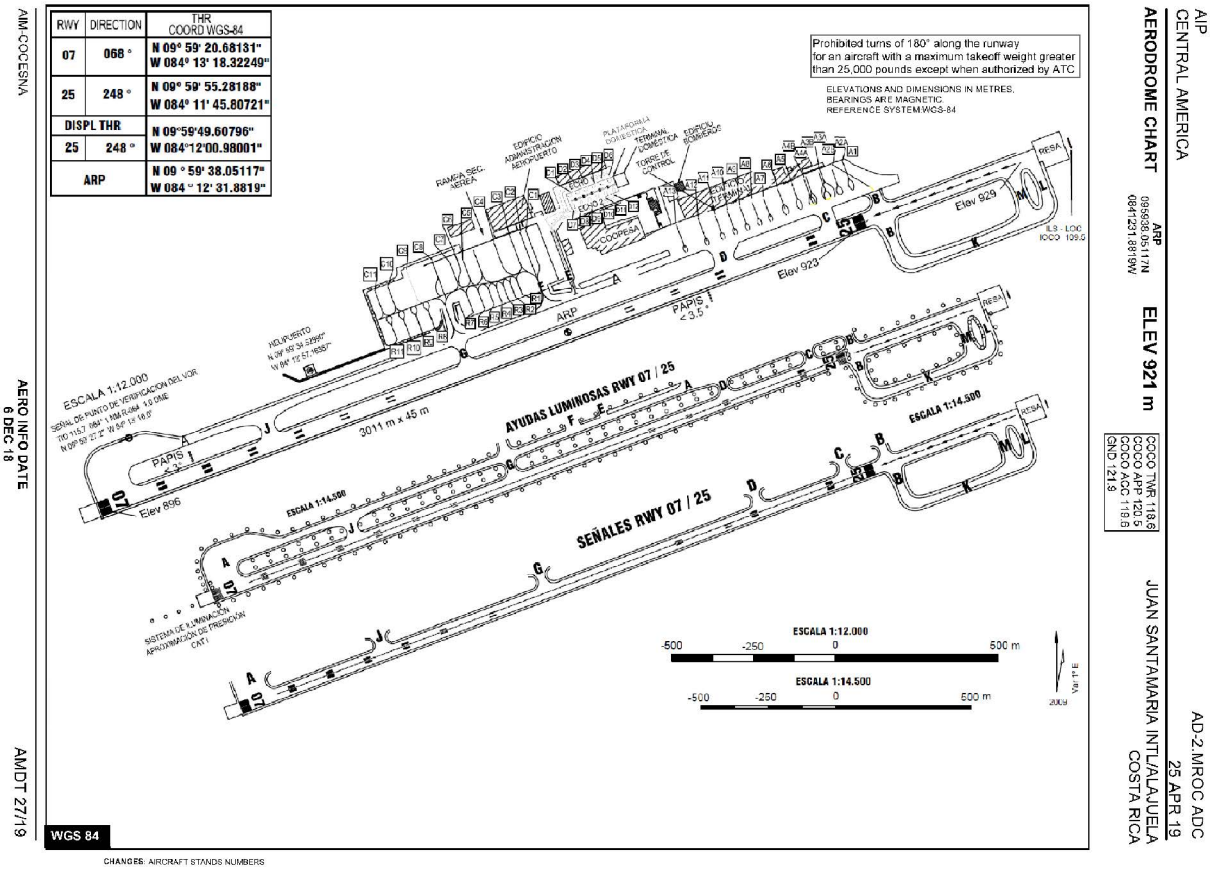
Source: JST based on the data by DGAC

Figure 7.3.25 Passenger Movement in Juan Santamaría International Airport

c) Airport Facility

Main facilities consisting the airport are single runway (3,011 x 45 m), international passenger terminal building, domestic passenger terminal building, and cargo terminal building. There are 12 apron spots with contact gates, one remote spot, and eight overnight spots. Further, there are 12 apron spots for domestic flights. Expansion of apron for Code E aircraft is planned since the tail of Code E aircraft parked in the existing apron located in front of the international terminal conflicts with the transitional surface.

Due to the COVID-19 pandemic and traffic downturn, it was announced in October 2020 that the master plan development for the airport, including its new four-story terminal building, expanded customs area, relocation of the aviation rescue firefighting station, and installation of an additional baggage carousel, was placed on hold.



Source: AIP

Figure 7.3.26 Juan Santamaría International Airport Layout

d) Airport Cargo Facility

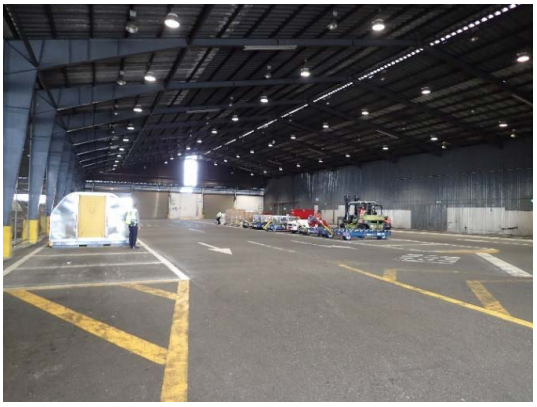
In Juan Santamaría International Airport, a simple air cargo warehouse is located only for the loading and unloading process of air cargo, and this work process is the responsibility of AERIS. The customs and warehouse of each forwarder, such as DHL, are located outside of the airport, which is called the Santamaria Terminal. AERIS seeks to expand cargo handling business with planned new cargo terminal and is under discussions with the government. No refrigerator is installed in the cargo warehouse, and AERIS plans to install a refrigerator system in the new cargo terminal. Both import and export cargo must be removed from the cargo warehouse to outside within 24 hours. The customs is located beside the cargo warehouse, which is operated by Aduana Santamaria. An average of seven freighters are operated per day.

13.100 m2 (área de manejo de carga) 31.500 m2 (área total)	
Terminales Santamaría (almacenamiento, depósito fiscal, reempaque, recepción, distribución)	**Terminal de Carga CTRM** (importación, exportación, procesamiento, almacenamiento temporal)
7.500 m2 (área de manejo) 12.500 m2 (área total, incluye accesos, estacionamientos y oficinas)	5.600 m2 (área de manejo) 19.000 m2 (área total, incluye accesos, estacionamientos y oficinas)



Source: NAIMCR Site Study and Master Plan, COCESNA, May 2017

Figure 7.3.27 Cargo Area in Juan Santamaría International Airport



Export Cargo Terminal



Loading Export Cargo to Aircraft



Import Cargo Terminal



Import Cargo Loading Dock

Source: JST

Figure 7.3.28 Cargo Facilities Photo in Juan Santamaría International Airport

7.3.6 Panama

(1) Tocumen International Airport

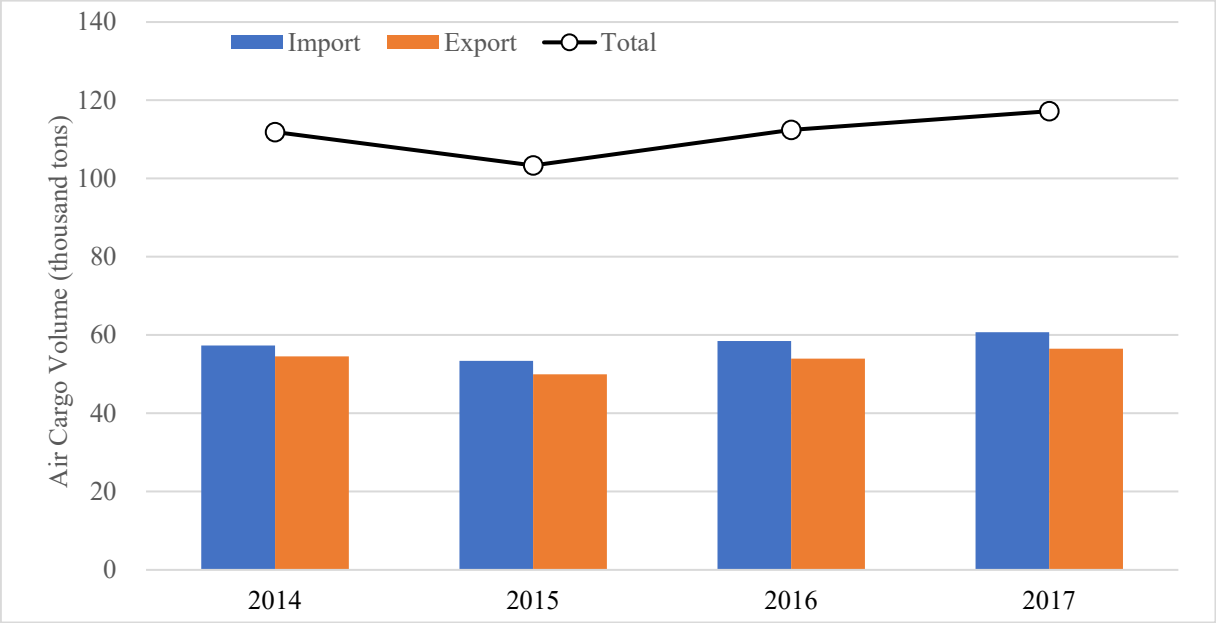
a) General

Tocumen International Airport is the main airport which operates the only cargo terminal in Panama. Air cargo operators in this airport are DHL, UPS, etc. The main commodities of air cargo are flower, perishable, cosmetics, and electronics. In addition to existing commodities, Tocumen S.A. has proceeded to develop a new Logistics Zone located on the landside and adjacent to the air cargo terminal and will offer opportunities for value-added commodities in various markets.

Annual passenger in 2019 in Tocumen Airport was 16.58 mppa of which 76% are transfer passengers. Most of the transfers in Tocumen Airport use Copa Airline and they can transit within two hours due to convenient time schedule operated by Copa. Over 99% of Tocumen traffic is international.

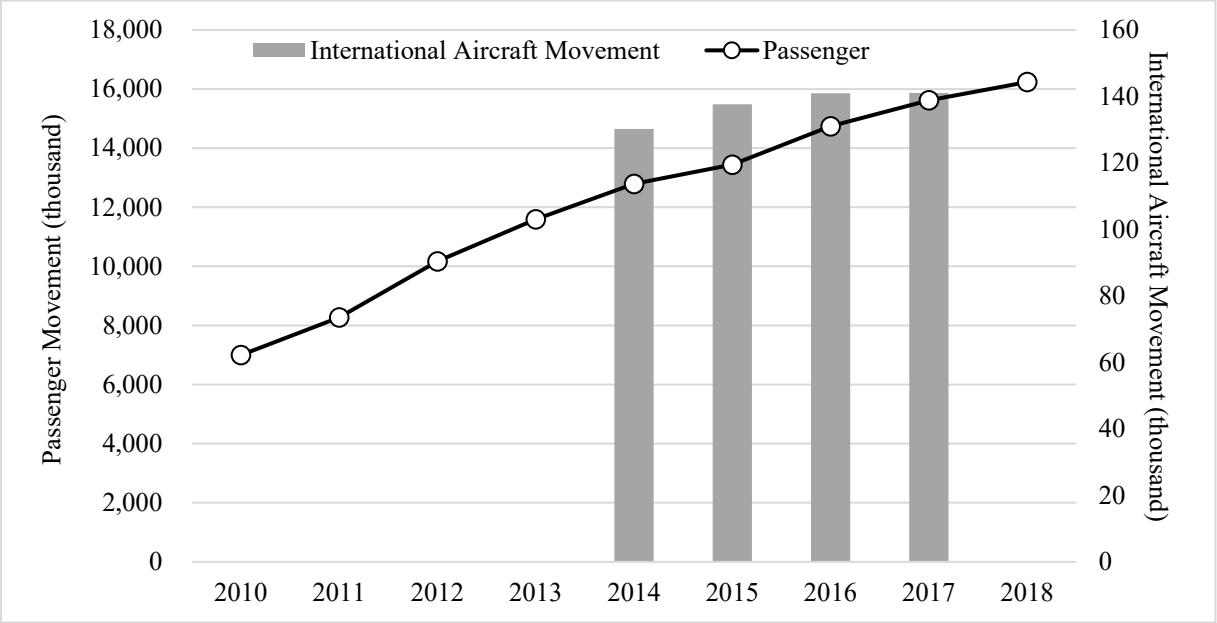
b) Air Traffic Data

Air cargo volume, annual passenger, and aircraft movements are shown in Figure 7.3.29 and Figure 7.3.30. Air cargo volume has shifted to flat and the total volume of air cargo in 2018 was around 120 thousand tons. The number of annual international passenger was 16 million in 2018. The number of international flights is increasing slightly.



Source: JST based on the data by Tocumen S.A.

Figure 7.3.29 Air Cargo Volume in Juan Santamaría International Airport



Source: JST based on the data by Tocumen S.A.

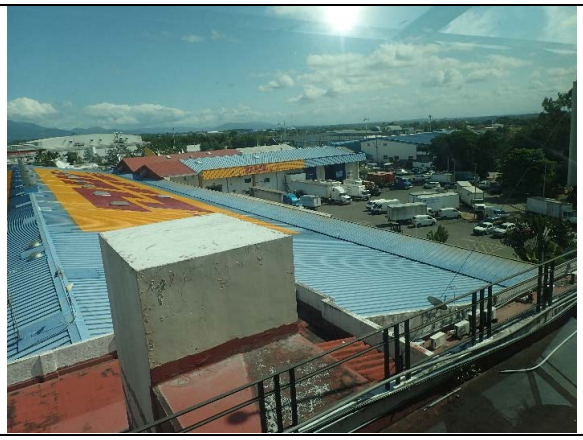
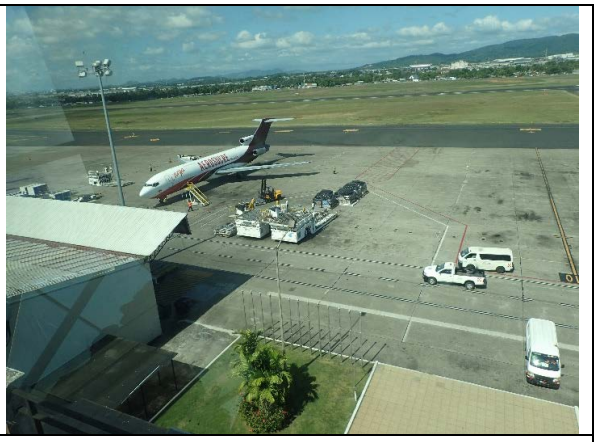
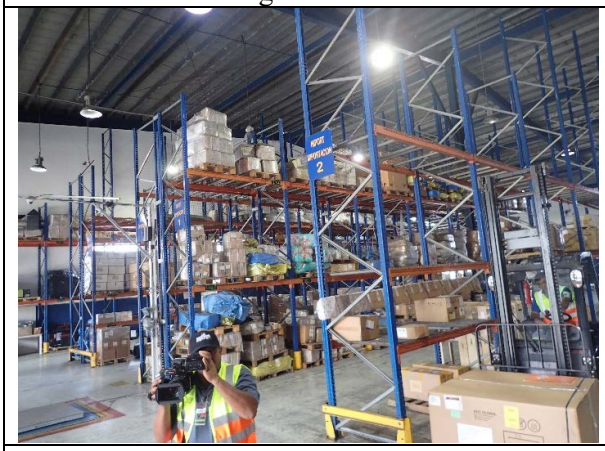
Figure 7.3.30 International Aircraft Movement and Passenger in Juan Santamaría International Airport

c) Airport Facility

Main facilities consisting the airport are two runways (2,682 x 45 m and 3,050 x 45 m), which are operated as open parallel, passenger terminal building, and cargo terminal building. The construction of New Terminal 2, which has 20 gates financed by Tocumen S.A., has been almost completed, and five gates are partially opened currently. It will be fully opened by November 2020. There are 34 apron spots with contact gates in Terminal 1, 20 spots in Terminal 2, and ten remote spots.

d) Airport Cargo Facility

The cargo terminal is located on the northeast side of the airport. In Panama, an airport operator is only allowed to operate the handling of loading and unloading of air cargo to the aircraft since there is a law to restrict them. Therefore, the warehouse and customs are located outside of the airport. Tocumen S.A. has a lease contract with each forwarder such as DHL, Copa Cargo, GIRAG, FedEx, and UPS, which operate cargo warehouses. In the warehouse operated by the handler, breakdown and buildup of cargo are operated, and information for customs is filled in SIGA, which is the integrated system in Central America. For example, the warehouse operated by GIRAG has two kinds of refrigerator, one is 2 to 8°C, another is 15 to 25°C. Cargo can be stored for a maximum of three months, and it takes a minimum of one hour for the import cargo process. Import and export cargos are mixed in each warehouse. Transit cargo item is 65% in Tocumen Airport.

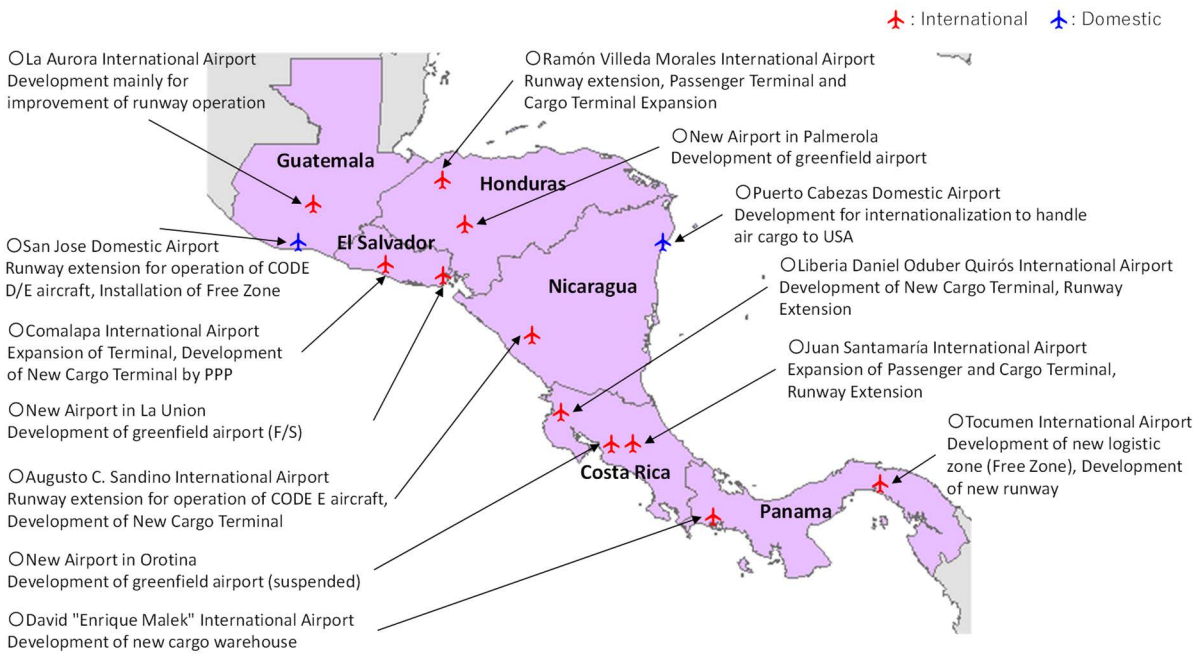
	
Cargo Terminal	Cargo Apron
	
Inside of Warehouse	Refrigerator in Warehouse

Source: JST

Figure 7.3.31 Cargo Facilities Photo in Tocumen International Airport

7.4 Ongoing and Planned Projects

Ongoing and planned projects in the aviation sector for each country are described in this chapter. The overview of airport development projects in Central America is shown in Figure 7.4.1.



Source: JST

Figure 7.4.1 Airport Development Projects in Central America

7.4.1 Guatemala

(1) La Aurora International Airport

There are two master plans for La Aurora International Airport, one was formulated by ICAO with local consultant in 2007 and another one was formulated by ANADIE in 2017.

The scope of the master plan formulated by ICAO is installation of new rapid exit taxiway and RESA with EMAS, terminal expansion to south side, and cargo terminal expansion.

The scope of master plan formulated by ANADIE is installation of rapid exit taxiway, hangar relocation, and building for meeter and greeter. The CAPEX of these developments is USD 118 million.



Source: ANADIE

Figure 7.4.2 La Aurora International Airport Master Plan

(2) Other Airport

In San Jose Airport, which is located on the Pacific Ocean side and 105 km far from Guatemala City, runway extension of 300 m for operation of large aircraft (Code D-E) is planned. Total runway length after

development will be 2,400 m and additional 175m runway extension is planed subject to acceptance by land owner who has not been found. In addition to the runway extension, construction or refurbishment of a) Passenger Terminal Building, b) Air Traffic Control Tower, c) Taxiway, d) Perimeter Fence and f) Firefighting Station has been started since September 2022. DGAC and government have explored to develop this airport as logistic hub since the Puerto Quetzal Port is located nearby. Road connection with Guatemala City is a key success factor.

New airport feasibility study was conducted by JICA around 1995. The location of the new airport is in Masagua, where the distance from Guatemala City is about 90 km, and the drive time would be around 60 minutes with a new highway to support the development. This new airport plan is suspended currently.

7.4.2 El Salvador

(1) Comalapa International airport (Saint Oscar Arnulfo Romero y Galdámez International Airport)

In the first survey trip, the JICA Study Team was unable to arrange a field survey at Comalapa International Airport with CEPA. Instead, the team relied on the existing condition of the airport which is described below based on the information obtained from the "El Salvador Infrastructure Master Plan 2019 – 2030" conducted by Inter-American Development Bank in 2020.

According to the "El Salvador Infrastructure Master Plan 2019 - 2030", the expansion of Comalapa International Airport was raised in a four-phase plan to be implemented between 2013 and 2032. To meet the future demand, the expansion master plan intends to add 64,500 m^2 to the passenger terminal once the project is completed in 2032, bringing the total area to 124,000 m^2.

Based on the latest publicly-available information from CEPA (press release in March 2021), new terminal construction reached 91% completion. The terminal features 23,000 m^2 and will increase the airport's capacity to around five million passengers p/a. In addition, according to the expansion plan, the cargo terminal does not require further development since the current capacity is sufficient to meet the demand projected to 2032.

With regard to the airside, the plan envisages interventions focused on increasing the number of apron spots and in the area of apron for passenger aircraft. The phasing of apron expansion is shown in Table 7.4.1.

Table 7.4.1 Apron Expansion Plan in Comalapa Airport

	Step 0	Phase 1	Phase 2	Phase 3	Phase 4
Total area (m^2)	167,650	190,330	239,470	276,448	327,751
Apron spot	20	27	32	36	40

Source: El Salvador Infrastructure Master Plan 2019 – 2030, IDB, 2020

PPP Scheme was introduced to operate and maintain the cargo terminal at Comalapa International Airport and ADIMEX was awarded as a consessionare who has responsibility for its operation, maintenance and development. ADIMX committed to implement 14 Million USD development that enable the capacity to handle 52,000 ton per year with new equipment and expansion. The development plan was scheduled to begin at the end of November 2022 for a period of 15 months.

(2) Other Airport

CEPA announced that they are working on pre-feasibility, design, and economic studies to see which way the new airport in La Union is going to take. What they want is to have an airport that is part of the entire connectivity system of the country. As a result of the pre-feasibility study, subsequenly, two phase development is expected. Although decision has not been made, CEPA has 3 options for construction and Operationa and Maintenance, which are CEPA sololey, Joint Venture (CEPA and Partner) and PPP.

7.4.3 Honduras

(1) Toncontin International Airport

There is no information related to the development plan of Toncontin International Airport.

(2) Ramón Villeda Morales International Airport

InterAirports S.A. has formulated the next ten year's master plan for Ramón Villeda Morales International Airport (RVM) as shown below with development cost of USD 28 million.

- 500 m runway extension for long flight to Europe by A330
- Passenger terminal expansion (Boarding Bridge 3 to 5)
- Cargo terminal expansion, including additional 5,200 m for offices and 2,000 m warehouse
- Installation of new firefighting vehicle, etc.

(3) New Palmerola International Airport

For the replacement of Toncontin Airport, the government has been developing a new airport in Palmerola (PIA), which is an improvement of the existing US air base. Construction is estimated to be completed by the end of 2021. The government has concluded a DBOT concession contract with the Palmerola International Airport (PIA) consisting of ENCO and Munich International Airport for 35 years from December 2016 (2051).

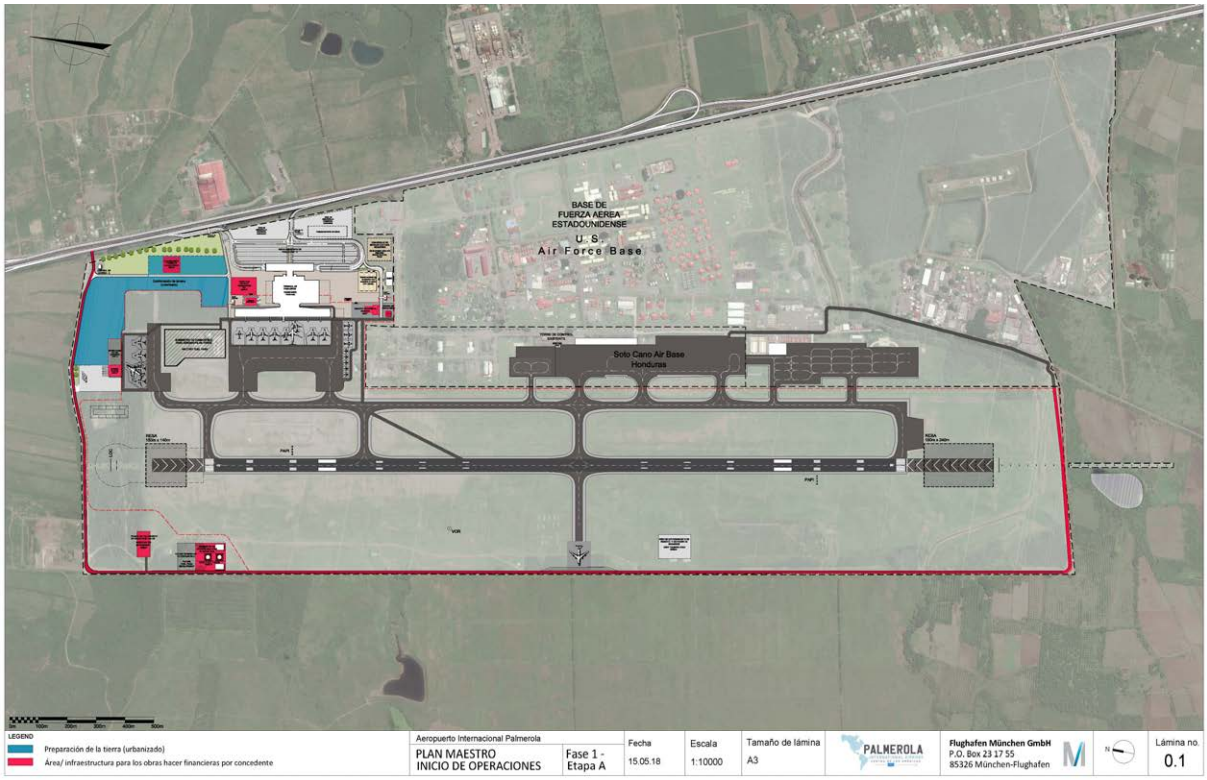
Total construction cost is USD 210 million, and one third is debt from Spain for the scope of electrical system in the new terminal, control tower, etc. The part of debt from Spain is earmarked for a Spanish contractor and bidding for contractor is ongoing. The remaining two thirds is shared between PIA and the Government of Honduras, and the construction is supervised by CINSA FOA FIS JV from Mexico and Honduras.

There are three phases of development. Phase I will be completed in 2021, and the cargo area is located in the north side of the airport. In the ultimate Phase 3 (TBD), the cargo area will be relocated to the west side of the airport and the passenger terminal is extended into the Phase I cargo area.

PIA is expected to grow to become the largest airport in the country for both passenger and freight. The facility of the new airport to be developed in Phase I is as follows:

Runway: 2,440 x 45 m; Passenger terminal area: 39,000 m^2; Boarding bridge: 7; Cargo terminal area: 3,000 m^2; and maximum target aircraft is B777. Terminal design capacity is 1.2 million passengers; Phase II expansion is 2 million annual passengers; and Phase III is 3 million annual passengers and a total of 26 gates.

INSEP has a plan to utilize this cargo area as a cargo hub since Palmerola is located in the center of Honduras. This area will be used as relay point of "Dry Canal" which is the connection between Pacific Ocean and Caribbean Sea. Amazon is mentioned to take a warehouse in this area, but this is just a plan.



Source: PIA

Figure 7.4.3 New Palmerola International Airport Master Plan (Phase I)

7.4.4 Nicaragua

(1) Augusto C. Sandino International Airport

EAAI formulated the master development plan of Augusto C. Sandino International Airport, which consists of four phases as follows:

- Phase 1: Runway extension of 800 m in the east side of the runway and taxiway extension accompanying the runway extension. The purpose of runway extension is to adapt the future ICAO Code E service aircraft such as B767 (Existing mainly is ICAO Code C service aircraft such as B737).
- Phase 2: New cargo terminal, apron, and taxiway to new cargo area in the southwest side of the airport.
- Phase 3: New domestic passenger terminal and apron in existing cargo terminal area.
- Phase 4: International terminal expansion to west side (The number of boarding bridges will be increased from seven to ten) and FBO in the east side of the international passenger terminal.

(2) Other Airports

EAAI has a plan to develop Bluefields Airport and Corn Island Airport located in the Caribbean seaside this year. The scope of development is runway, apron, and terminal improvement. RFP for development of these airports is published on the internet. Main purpose of these developments is to handle domestic passenger demand and air cargo demand consisting mainly of marine products. Subsequently, EAAI has desicded to expand the 2 airports by the end of 2024 financed by CABEI and operate by themselveth.

EAAI also has a plan to develop cargo terminal in Puerto Cabezas Airport which is located along the Caribbean Sea for exportation of marine products to the USA directly. It will be necessary to conduct feasibility study for this development since it seems to be difficult to attract operators (passenger or all-freight services) in case of direct flight from Puerto Cabezas to USA.

7.4.5 Costa Rica

(1) Juan Santamaría International Airport

AERIS has formulated the Juan Santamaría International Airport Master Plan in cooperation with DGAC. To proceed with the airport development according to this master plan, AERIS has continued to discuss with the Government of Costa Rica regarding the extension of the contract between AERIS and DGCA which will expire in 2026. The target year of this master plan is from 2020 to 2040, with SJO Airport capacity improvements expected to circumvent the requirement for building Greenfield Orotina International Airport. The scope of each phase is as follows:

- Period from 2020 to 2022:
  - Expansion of the international terminal to the west side, which includes additional boarding bridge, additional baggage carousel, and fire sprinkler system in the baggage claim area.
  - Relocation of firefighting station to the southeast side (earthworks have begun).
  - Relocation of aircraft MRO hangars operated by Coopesa to the southeast side to allow apron expansion for passenger jets
  - Ground transportation center, relocation of the main substation, and expansion and reconditioning of the water treatment plant.
  - CAPEX of these developments is USD 44 million, and it is borne by AERIS.

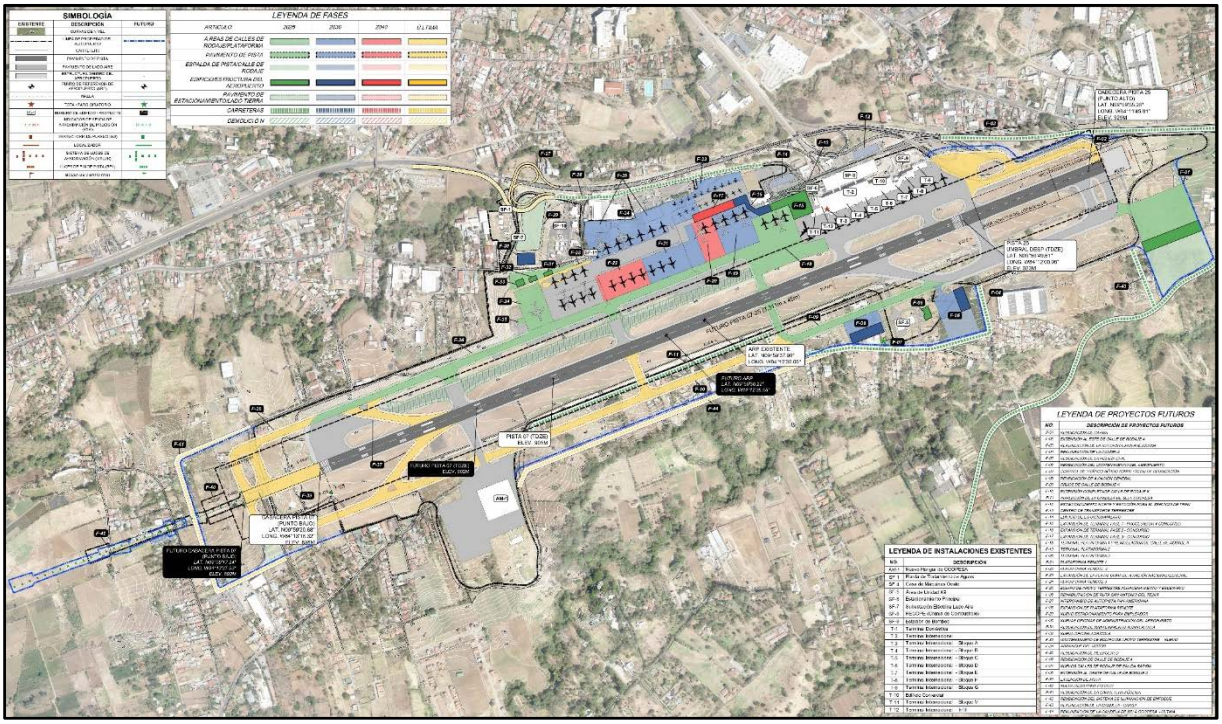
- Period from 2023 to 2025:
  - Set back of west side parallel taxiway for compliance with ICAO standard since existing west side parallel taxiway is too close to the runway for simultaneous Code E aircraft operations.
  - Extension of east side parallel taxiway for improving runway operation capacity.
  - Expansion of apron for Code E aircraft since the tail of Code E aircraft parked in the existing apron located in front of the international terminal conflicts with the transitional surface.
  - Relocation of cargo warehouse and handling expansion to the southeast side, and others.

- Period from 2026 to 2030:
  - Expansion of the international terminal and apron to the west side.
  - RESA in RWY07 side

- Period from 2031 to 2035:
  - Expansion of the international terminal and apron to the west side.

- Period from 2036 to 2040:
  - 300 m extension of the runway and parallel taxiway to the west side. This runway extension can accommodate the operation of B777-300ER with reduction of weight limitation for flight to East Europe.
  - High landfilling of almost 20 m will be required in this extension since lowland is spread in the west side. This is a main driver of the construction cost.

The construction cost of these developments is about USD 600 million in case of including the runway extension, and about USD 500 million in case of excluding the runway extension. AERIS will assume these costs assuming the joint venture contract is extended for ten years further.

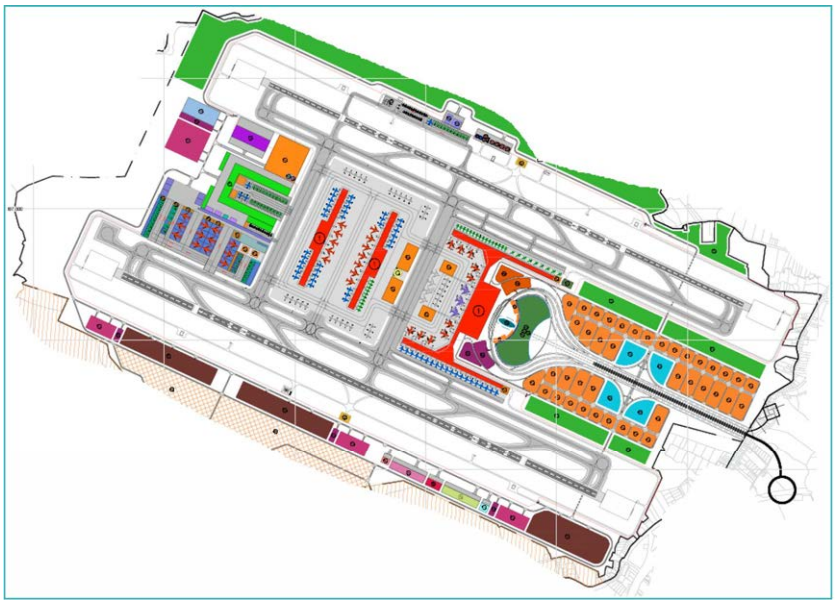


Source: AERIS

Figure 7.4.4 Juan Santamaría International Airport Master Plan (Target Year 2040)

(2) New Orotina International Airport

New airport feasibility study including site selection was conducted for the New Orotina International Airport; however, the new airport development plan has been suspended currently due to lack of justification to replace the Juan Santamaría International Airport. The master plan layout of this new airport is shown in the Figure 7.4.5.



Source: NAIMCR Site Study and Master Plan, COCESNA, May 2017

Figure 7.4.5 New Orotina International Airport Layout at Maximum Development 50 mppa

(3) Other Airports

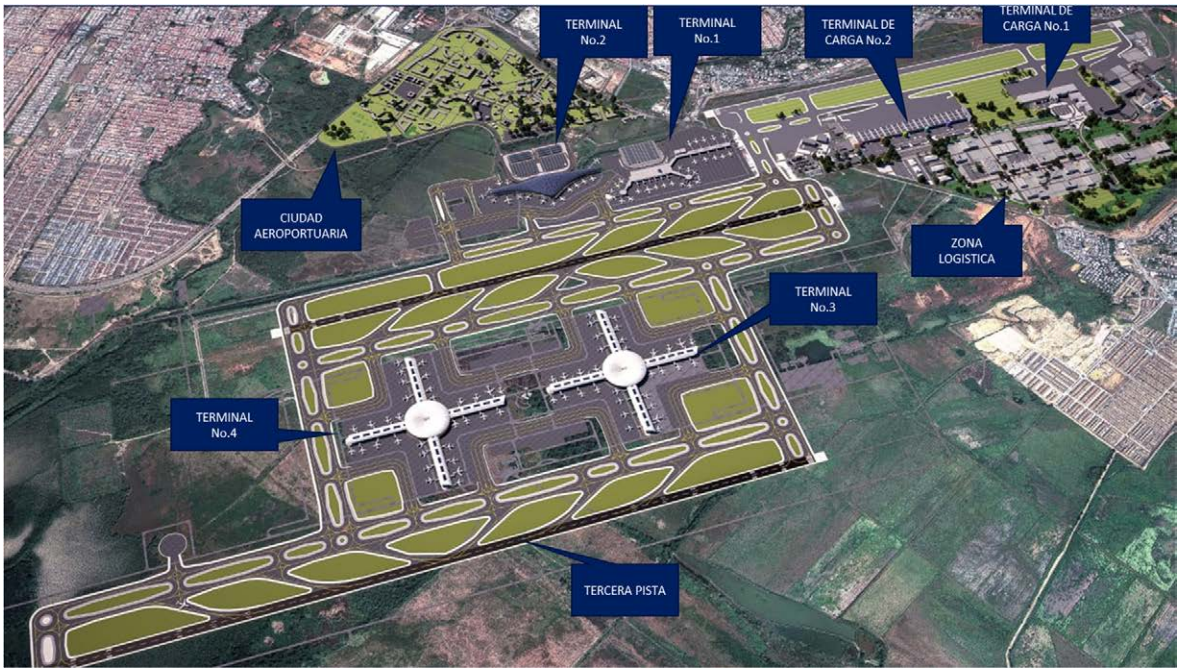
DGAC plans to conduct other two master plan projects in 2020 as follows:

- Master Plan 1: National Airport Development Master Plan
  - The objective of this master plan is to develop a comprehensive master plan for all four international airports in addition to the potential need for new airport development.
  - In this master plan, necessity and timing of new airport construction will be considered depending on the demand forecast.
- Master Plan 2: Liberia Daniel Oduber Quirós International Airport Master Plan
  - The objective of this master plan is to update the previous master plan of Daniel Oduber Quirós International Airport in response to the increase of passengers.
  - In Daniel Oduber Quirós International Airport, there is a plan to develop cargo terminal for exportation of tilapia to Juan Santamaría International Airport.
  - Before the update of this master plan, runway extension will be commenced this year with financing of USD 100 million.

7.4.6 Panama

(1) Tocumen International Airport

Tocumen S.A. has formulated the Tocumen International Airport Master Plan. The third runway in the southeast side and midfield terminal have been planned to be developed in response to the future demand in 2035. Land acquisition for the third runway area must be proceeded by Tocumen S.A. Development of the south side of the cargo terminal is under consideration in response to the future demand of air cargo. However, construction cost for landfilling is necessary since the land for the development area is lower than the surrounding area.

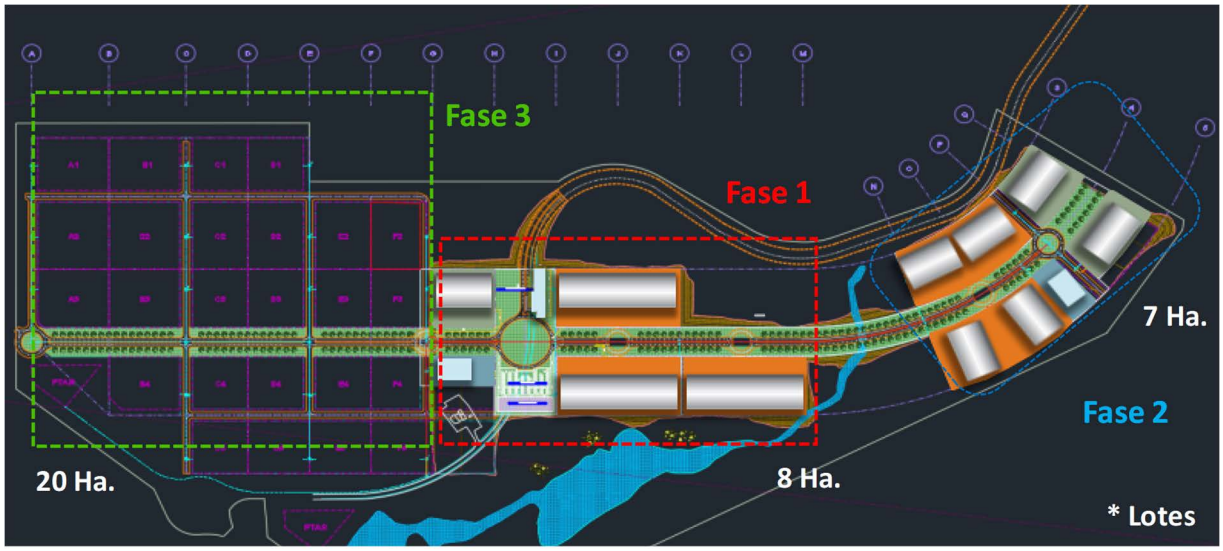


Source: Tocumen S.A.

Figure 7.4.6 Tocumen International Airport Master Plan (Target Year 2035)

The new Logistic Zone located in the northeast side of the airport is planned under three phase development. Phase 1 financed by Tocumen S.A. is almost 86% completed. This area is Free Zone where forwarders have no responsibility to pay any tax and cargo does not need to go through customs. Phase 1 plots, which are

mainly for warehouse, will be developed by each forwarder such as DHL with 20 years concession. However, the actual development scheme is still under consideration by Tocumen S.A. The remaining Phase 2 and Phase 3 are also planned.



Source: Tocumen S.A.

Figure 7.4.7 Tocumen International Airport New Logistic Master Plan

(2) Other Airports

In David "Enrique Malek" International Airport, the development of new cargo warehouse for vegetables and fruits is just planned since the transportation cost by truck from David to Panama City is expensive.

Tocumen S.A. feels the potential of Enrique Adolfo Jiménez Airport in Colon; however, they have no idea how to develop this airport and they need to conduct a feasibility study for the utilization of this airport.

7.5 Issues and Recommendations on the Aviation Sector

Issues and recommendations on the aviation sector in Central America are identified from the following four aspects:

1) Consistency with high-level policies,
2) Traffic volume and capacity,
3) Institutions, and
4) Market of transport industry.

The issues and recommendations for each of the four aspects are described in this sub-chapter.

7.5.1 Issues and Recommendations on Consistency with High-level Policies

In 1) Consistency with High-level policies, the consistency between the Central America Regional Mobility and Logistics Policy Framework (PMRML) and the National Strategic Plan on Cargo Logistics–PNLOG formulated in each country is evaluated. If there are any discrepancies between them, it will be identified as an issue.

(1) Description of PMRML on Aviation Sector

According to PMRML, the Central American aeronautical sector faces a series of issues that restrict them from expanding air cargo and passenger transport services to meet development needs in the region and the

demands of foreign trade. Among its main challenges are:

a) Limitation for Existing Airport Expansion

Increasing the capacity of handling passengers and air cargo means improving the location and infrastructure of airports, which are located in residential, industrial, or inappropriate topography areas, facing serious limitations for their physical expansion. Urban growth in these countries has caused cities to surround airports, leading in some cases to the closure and underutilization of installed capacity for cargo movement. As a result of this situation, the size of aircraft that can land at Central American airports is relatively small, since the extension of runways does not allow for the arrival of larger aircraft, limiting the flow of cargo and passengers through the region.

b) Capacity Limitation of Cargo Facilities

The cargo facilities at the airports should also be extended and modernized, as they present capacity problems for air cargo of all kinds. There are no cold rooms or adequate storage and handling facilities.

c) Insufficient Cargo Control Process

Cargo control processes are inefficient due to both the protocols used in customs inspection and the lack of adequate technology to perform the inspection. In general, X-ray and scanner equipment do not have the minimum specifications to efficiently perform non-intrusive cargo screening. The physical review and documentation process are more time-consuming than that observed at airports in other countries, as the procedures for processing cargo manifests are inadequate.

d) Slow Implementation of Project Due to Fiscal Limitation

In the area of airport administration, which is generally carried out by autonomous state institutions, the implementation of plans to expand and modernize airport facilities must be accelerated, as these improvements are made very slowly and investments to increase cargo areas are expected to take 20 to 30 years. This is due to the fiscal limitations faced by most countries, which force airport administrations to resort to financing mechanisms such as loans from foreign governments, regional banks, debt issuance, etc., requiring the approval of their respective congresses and delaying the implementation of the aforementioned modernization and expansion plans.

In this context, the Central American Commission on Maritime Transport (COMITRAN: *Comisión Centroamericana de Transporte Marítimo*), through the Central American Agency for Aviation Safety (COCESNA: *Corporación Centroamericana de Servicios de Navegación Aérea*), has formulated the following strategic guidelines for the development of the aviation sector:

Vision

Central America will provide high quality airport services since it will have modern terminal areas with first level infrastructure, processes, personnel, and equipment, that will allow adequate management of passenger and goods flows; and will have logistics activities areas integrated to the airports that will provide storage, distribution, and effective cargo management services.

Strategic Objective

To increase the quality of airport services, for passenger transport as well as cargo management of value added, in a way, that the region is constituted of an international trade importance logistics platform, in which aeronautical clusters are developed, regional exports are promoted, to encourage the establishment of logistical activities areas and to strengthen tourism in the region, contributing to increase competitiveness in Central American and social region development.

To comply with this objective, COMITRAN has defined five intervention areas, which have to orient its action towards the strengthening of the aeronautical sector in the Central American region:

1. Airport operation
2. Improvement of "Logistic Support Areas" in airports
3. Airport processes and procedures
4. Work productivity in airports
5. Strengthening of markets

The items shown in Table 7.5.1 below are the guidelines to be followed to meet the specific objectives in each of these areas.

Table 7.5.1 Aeronautical Sector Guideline in PMRML

Category		Guideline	
1	Airport Operation	a	Plan the construction of new airports in geographic zones adequate to the requirements for safety landing, expansion potential, space availability for logistics activities zone development, conditions of connectivity and road network access, among other aspects.
		b	Expand and modernize facilities that currently operate in Central America, so there are enough terminals to address passenger and cargo reception.
		c	Invest in equipment acquisition to improve airports operations: bridges, radars, radio aids, control centers, cargo inspection equipment (scanners, X-rays), surveillance and communication equipment, etc.
		d	Promote the usage of information and communication technologies in the airports of the region.
		e	Maintain and improve computing control systems of the processes carried out by the Civil Aviation Authorities of the Member States of COCESNA.
		f	Promote specialization and complementarity of the main airports in the region.
		g	Enhance strategic alliances with the private sector, through public-private associations, to speed and make more efficient the modernization and expansion of airports.
2	Improvements to “Zones of Logistics Support” in Airports	a	An adequate infrastructure has to be built for storage, consolidation and de-consolidation of cargo, cold chain maintenance, bulk product treatment, perishable products management, etc.
		b	Complementary operation services have to be provided in such logistic zones, such as drinkable water, electric energy, connectivity, safety, accommodation of personnel, etc.
		c	Special areas have to be design, in order to adjust to the different cargo transport modes: refrigerated, calorific, isotherms containers, cisterns for liquids and gas, funnels, etc.
3	Airport Processes and Procedures	a	Validate and speed up migratory procedures to facilitate the entrance and circulation of people in the region.
		b	Modernize customs protocols for goods revision, as well as plant health certification processes, to expedite cargo passing in airports.
		c	To make more efficient security mechanisms in airports, through implementation of standards on prevention of crimes, such as attacks, drug or human trafficking, goods contraband, etc.
		d	Maintain balance between security and efficiency in airports in such a way that not even flow facilitation (passenger and cargo) undermines facility security, not even prevention measures of illegal acts that make traffic inefficient.
		e	Increase levels of compliance of Member States in audits of International Organisms in aeronautical security matters.
		f	Improve security and efficiency of air navigation operations in routes of different “Flight Information Region” (under and over 24,500 feet of height: FIR /UIR).

Category		Guideline	
4	Airport Work Productivity	a	That work performed by ICCAE, Central American Aeronautical Training, has to be strengthened, which is part of the Central American Corporation of Air Navigation Services, and has as main objective to manage information and technical, operational and personnel management training in airports and airlines. Such strengthening includes, among other aspects, strategic alliances consolidation with specialized centers and universities in other countries, to expand the database of professors and researchers in transport and logistics matters.
		b	ICCAE will expand its supply of specialized courses to leverage the usage of installed capacity on regional institutions like SIECA, to address the Central American market, as well as the extra-regional demand.
		c	To improve academic excellence in aeronautic education.
		d	To improve in prevention and work risk mitigation and workplace health.
		e	To promote certification of processes performed in aeronautic operations, as the people that execute them.
5	Market Strengthening	a	Expand regional routes and frequencies among Central American airports, through spaces expansion policies.
		b	Enhance new airlines entrance in the region, allowing the use of air terminals in competitive schedules and conditions, with the objective of maintaining affordable prices for clients.
		c	Extend open skies policy in the region, stimulating the creation of bilateral or regional agreements with other countries, in such a way that Central American tourism is promoted.

Source: PMRML

(2) Issues and Recommendations on Consistency with High-level Policies in Guatemala

According to the "National Strategic Plan on Cargo Logistics–PENLOG 2015-2030" in Guatemala, the Improvement and Expansion of La Aurora International Airport Cargo Area is listed as the Immediate Action Plan. This plan consists of detailed components, which are the modernization and expansion of current cargo area, studies to develop a second line of cargo in the industrial zone of the airport, improvement of access roads, adjustment of the master plan of the airport, and finally, the legal and institutional framework for the creation of an airport authority. This plan is consistent with the Aeronautical Sector Guideline in PMRML, Category 1. Airport Operation and Category 2. Improvements to "Zones of Logistics Support" in Airports. Therefore, no issue is raised in view of "Consistency with High-level Policies".

Table 7.5.2 PENLOG's Immediate Action Plan in Guatemala

Aspect	Description
Objective	To improve, in the short term, the cargo capacity of La Aurora International Airport and order the flows to optimize the operations on the first and second line of cargo.
Description	The project contemplates the modernization and expansion, in the short term, of the current cargo area; beginning of the studies to develop a second line of cargo in the industrial zone of the airport; improvement of access roads; adjustment of the master plan of the airport; and actions aimed at improving the expansion of the current cargo area. Finally, the project includes the legal and institutional framework analyses that lead to the creation of an airport authority that drives the development of the sub-sector.
Project Phases and Components	• Optimizing the existing first line cargo area. • Location and feasibility study of the second line cargo area in the industrial area and access roads to the airport. • Investment in the current cargo area. • Investment on the second line of cargo. • Institutional design of the airport authority.
Implementation timeline	• Optimization study: 6 months. • Location and feasibility study of the second line of cargo: 10 months.

Aspect	Description
	• Investments on the first line: 12 months. • Investment on the second line and access roads: 36 months. • Institutional design: 6 months.
Costs	• Optimization study: USD 80,000 • Location and feasibility study of the second line of cargo and access roads: USD 150,000 • Investment on the first line: USD 3 million • Investment on the second line and road access: USD 25 million • Institutional design: USD 50,000

Source: National Strategic Plan on Cargo Logistics– PENLOG 2015-2030

(3) Issues and Recommendations on Consistency with High-level Policies in El Salvador

According to the "National Plan on Cargo Logistics–PNLOG 2018-2032" in El Salvador, the Modernization of Comalapa International Airport and Expansion of Main Cargo Terminal of Comalapa International Airport (cold storage facilities, handling equipment) is listed as the Immediate Action Plan. This plan consists of detailed components, which are the modernization and expansion of current cargo area, development of second and third lines of cargo, improvement of access roads, and adjustment of the master plan of the airport. This plan is consistent with the Aeronautical Sector Guideline in PMRML, Category 1. Airport Operation and Category 2. Improvements to "Zones of Logistics Support" in Airports. Therefore, no issue is raised in view of "Consistency with High-level Policies".

Table 7.5.3 PNLOG's Immediate Action Plan in El Salvador

Description	Sub-system	Progress	Term	Responsible
Modernization of Comalapa International Airport and Expansion of Main Cargo Terminal of Comalapa International Airport (cold storage facilities, handling equipment)	FISHING, TEXTILES, PHARMACEUTICALS, OTHERS	Various	Medium	CEPA
Phase I: Expansion of Current Terminal	PERISHABLE	FOMILENIO II	Short	CEPA
Phase II: New Terminal	ALL	To be defined. To be developed upon reaching 55,000 tonnes of cargo.	Long	CEPA
Development of Airport Main Cargo Terminal (second and third line)	FISHING, TEXTILES, PHARMACEUTICALS, OTHER	FOMILENIO II through PPP mechanism	Medium-Long	CEPA
Comalapa International Airport Promotion Program	FISHING, TEXTILES, PHARMACEUTICALS, OTHER	Financing to be defined	Short-Medium	CEPA
Comalapa International Airport Development Plan (cargo and passengers): runway, boarding area.	FISHING, TEXTILES, PHARMACEUTICALS, OTHER	Financing to be defined	Short	CEPA
Connection to Golden Road (airport access)	FISHING, TEXTILES, PHARMACEUTICALS, OTHER	Financing to be defined	Short-Medium	CEPA
Modernization of Ilopango International Airport including storage facilities	FISHING, TEXTILES, PHARMACEUTICALS, OTHER	Financing to be defined		CEPA

Source: National Plan on Cargo Logistics– PENLOG 2018-2032

(4) Issues and Recommendations on Consistency with High-level Policies in Honduras

According to "National Cargo Logistics Plan-PNLOG Honduras, 2019-2030" in Honduras, the Development of New Palmerola Airport as Cargo Hub is listed as the Immediate Action Plan. This plan is consistent with the Aeronautical Sector Guideline in PMRML, Category 1. Airport Operation and Category 2. Improvements to "Zones of Logistics Support" in Airports. Therefore, no issue is raised in view of "Consistency with High-level Policies".

Table 7.5.4 PNLOG's Immediate Action Plan in Honduras

Component and Project	Duration (month)	Beginning
New Palmerola Airport as Cargo Hub		
Feasibility study	12	July 2019
Execution of the work	24	June 2020
System for the Management and Maintenance of Tourist Airfields	12	January 2018
Modernization of Cargo Zones (inspection areas, technology, refrigerator loading zones)	18	July 2019
Civil Aeronautics Regulation for Logistics Corridors	6	January 2019

Source: National Cargo Logistics Plan-PNLOG Honduras, 2019-2030

(5) Issues and Recommendations on Consistency with High-level Policies in Nicaragua

According to the "National Plan on Cargo Logistics–PNLOG 2018-2032" in Nicaragua, the Improvement of Managua Airport is listed as the Immediate Action Plan. In this plan, the priority actions are the expansion of the cargo area including the inspection areas and dry and cold warehouses, the acquisition of equipment for cargo handling, expansion of the runway to 3,100 meters, and the equipment and security actions aimed at the upgrading of the primary airport area in order to protect it from theft and potential illicit customs. Another is the feasibility study for Punta Huete Airport development to focus on its adaptation, access, and the creation of a cargo area as alternative to Managua Airport.

These plans are consistent with the Aeronautical Sector Guideline in PMRML, Category 1. Airport Operation and Category 2. Improvements to "Zones of Logistics Support" in Airports. Therefore, no issue is raised in view of "Consistency with High-level Policies".

Table 7.5.5 PENLOG's Immediate Action Plan in Nicaragua

Component and Project	Term	Duration (month)	Beginning	Amount (USD)	
				Pre-investment	Investment
Improvement of Managua Airport					
Expansion of the cargo area	Medium	12	Jan-19	2,000,000	20,000,000
Equipment for cargo handling	High	6	Dec-19		800,000
Equipment and safety for sterilization of the primary area	High	12	Jan-19		600,000
Extension of R/W to 3,100 m	Medium	18	Jan-21	4,500,000	45,000,000
Cold storage	High	12	Jan-19	700,000	7,000,000
Feasibility Study of Punta Huete Airport: adequacy, cargo center, and access	Medium	12	Jan-20	7 000 000	70 000 000

Source: National Cargo Logistics Plan-PNLOG Nicaragua, 2019-2030

(6) Issues and Recommendations on Consistency with High-level Policies in Costa Rica

According to the "National Cargo Logistics Plan-PNLOG Costa Rica, 2014-2024", the Immediate Action Plan in airport infrastructure includes the Upgrading of Juan Santamaria International Airport with the Air Cargo Center and Future Investments at New Orotina International Airport including Road Access. It is

envisaged to modernize Liberia Airport and build the cargo area, potentially to develop together with the Logistics Activity Zone to support the agricultural sector in this production center. Finally, actions are aimed at generating infrastructure to accommodate logistics to support the agricultural sector and other infrastructure required to secure the cold chain. In addition, revision of air fare structure and updating of the civil aviation law are listed as service and process improvement.

These plans are consistent with the Aeronautical Sector Guideline in PMRML, Category 1. Airport Operation, Category 2. Improvements to "Zones of Logistics Support" in Airports, and Category 5. Market Strengthening. Therefore, no issue is raised in view of "Consistency with High-level Policies".

Table 7.5.6 PENLOG's Immediate Action Plan in Costa Rica

Component and Project	Term	Priority
Update of Development Master Plan of Juan Santamaría International Airport	Short	High
Air Cargo Center for Great Metropolitan Area of San Jose	Short	High
Update of Development Master Plan of Liberia Airport	Short	High
Modernization of Cargo Terminal in Liberia Airport	Medium	High
New Orotina International Airport	Long	High
Revision of the Fare Structure in the Air Sector	Short	High
Update on Civil Aviation Law	Short	High

Source: National Cargo Logistics Plan-PNLOG Costa Rica, 2014-2024

(7) Issues and Recommendations on Consistency with High-level Policies in Panama

According to the "National Cargo Logistics Plan-PNLOG Panama, 2014-2024", the formulation of airport development strategy is listed as the main actions in the aviation sector. This plan is consistent with the Aeronautical Sector Guideline in PMRML, Category 1. Airport Operation. Therefore, no issue is raised in view of "Consistency with High-level Policies".

7.5.2 Issues and Recommendations on Traffic Volume and Capacity

In 2) Traffic Volume and Capacity, the capacity of existing facilities consisting of runway, cargo terminal, and passenger terminal in each airport is evaluated in view of the sufficiency against the demand in 2035. The guideline to evaluate capacity of each facility in an airport is stipulated in Table 7.5.7.

. The general runway capacity is 195,000 air traffic movements per annum for single runway configuration according to ICAO standard. If the capacity of the runway has already been analyzed in each airport authority, that value will be utilized for evaluation. The capacity of cargo terminal is estimated based on the ratio stipulated in the IATA Airport Development Reference Manual 11th Ed. The required space for cargo terminal depends on a facility's processing capacity identified from the following three functions: Low Automation (Mostly Manual), Automated (Average), and Highly Automated. Most airports in Central America are not automated, therefore, the ratio of "Low Automation (mostly manual)" can be applied for capacity evaluation. The capacity of passenger terminal is also estimated based on the ratio stipulated in the IATA Airport Development Reference Manual 11th Ed. According to the IATA manual, the Level of Service parameter is described as Overdesign, Optimum, and Sub-Optimum. To evaluate the capacity of passenger terminal building, the required space guideline for a Level of Service of Optimum is adopted. This required space is based on the number of peak hour passengers.

Table 7.5.7 Guideline for Capacity Evaluation of Airport Facilities

No.	Category	Item	Capacity	Unit	Source
1	Runway	Single Runway	195,000	ATM/year	ICAO 1987 Airport Planning Manual

No.	Category	Item	Capacity	Unit	Source
2	Cargo Terminal	Low Automation (Mostly Manual)	5	ton/m^2	IATA Airport Development Reference Manual 11th Ed.
		Automated (Average)	10	ton/m^2	
		Highly Automated	17	ton/m^2	
3	Passenger Terminal	Peak hour passenger	16.7	sqm/pax	

Source: JST

(1) Issues and Recommendations on Traffic Volume and Capacity in Guatemala

According to the "La Aurora International Airport Modernization, Efficiency and Safety Study Report in June 2019", the current runway capacity has been estimated at 16 air traffic movements/hour in consideration of the limiting factors. Based on this hourly runway capacity, the annual runway capacity is estimated as 140,000 movements/year. In addition, the capacity of the current passenger terminal building is estimated up to 7.5 million annual passengers in the report.

The cargo terminal operated by COMBEX is separated into import warehouse and export warehouse. The area of import warehouse is 6,000 m^2 and the area of export warehouse is 6,400 m^2.

With the above understanding regarding the existing capacity of each facility in La Aurora International Airport, the required capacities of each facility in 2019 and 2035 are evaluated, respectively. The capacities of the existing runway and the existing passenger terminal building are sufficient for both of the demands in 2019 and 2035. However, the capacity of the existing cargo terminal building will not be enough for the demand in 2035. The existing total area of the import warehouse and export warehouse is 12,400 m^2; however, the required capacity in 2035 will be 16,000 m^2 in accordance with the forecasted demand. Therefore, it is recommended to expand the existing cargo terminal building in response to the future air cargo demand. If the expansion area will not be ensured around the existing COMBEX cargo warehouse area, the new air cargo hub airport have to be settled in Guatemala.

Table 7.5.8 Comparison of Existing and Required Capacity in La Aurora International Airport

Facility		Existing Condition	Required Capacity	
			in 2019	in 2035
Runway	Configuration	Single Runway (140,000 movements/year)	Single Runway	Single Runway (132,000 movements/year)
	Length (m)	2,987	2,987	2,987
	Width (m)	60	60	60
Cargo Terminal Building	Import Area (m^2)	6,000	4,702 (23,509 t)	-
	Export Area (m^2)	6,400	6,058 (30,291 t)	-
	Total (m^2)	12,400	10,760 (53,800 t)	16,000 (80,000 t)
Passenger Terminal Building	Area (m^2)	47,000	17,640 (2,700,000 pax/year)	33,689 (5,200,000 pax/year)

Source: JST

(2) Issues and Recommendations on Traffic Volume and Capacity in El Salvador

Comalapa International Airport has a single runway (3,200 x 45 m) and aircraft movement in 2019 is approximately 50,000 operations per annum. The area of the passenger terminal is around 60,000 m^2, which is the original area, and an additional 23,000 m^2 is under construction. In addition, the area of the cargo terminal operated by CEPA is around 10,000 m^2, which includes the import and export areas.

With the above understanding regarding the existing capacity of each facility in the airport, the required capacity of each facility in 2019 is evaluated respectively based on actual aviation statistical data. The capacities of the existing runway, passenger terminal, and cargo terminal are sufficient for the demand in 2019. The data of future demand in 2035 in this airport could not be obtained in this survey; however, according to the "El Salvador Infrastructure Master Plan 2019 - 2030", the cargo terminal does not require further development since the current capacity is sufficient to meet the demand projected until 2032.

Table 7.5.9 Comparison of Existing and Required Capacity in Comalapa International Airport

Facility		Existing Condition	Required Capacity	
			in 2019	in 2035
Runway	Configuration	Single Runway	Single Runway (50,806 movements/year)	N/A
	Length (m)	3,200	3,200	N/A
	Width (m)	45	45	N/A
Cargo Terminal Building	Import Area (m^2)	N/A	2,464 (12,322 t)	N/A
	Export Area (m^2)	N/A	2,709 (13,544 t)	N/A
	Total (m^2)	10,155	5,173 (25,866 t)	N/A
Passenger Terminal Building	Area (m^2)	60,000	24,893 (3,400,000 pax/year)	N/A

Source: JST

(3) Issues and Recommendations on Traffic Volume and Capacity in Honduras

a) Ramón Villeda Morales International Airport

Ramón Villeda Morales International Airport has a single runway (2,806 x 45 m) and aircraft movement in 2019 is 19,783 operations per annum. The area of the passenger terminal is around 16,000 m^2. In addition, the area of the cargo terminal operated by Swissport is around 16,000 m^2, which includes the import and export areas.

With the above understanding regarding the existing capacity of each facility in the airport, the required capacity of each facility in 2019 is evaluated respectively based on actual aviation statistical data. The capacities of the existing runway, passenger terminal, and cargo terminal are sufficient for the demand in 2019. The data of future demand in 2035 in this airport could not be obtained in this survey, so that the required capacity in 2035 is not available.

Table 7.5.10 Comparison of Existing and Required Capacity in Ramón Villeda Morales International Airport

Facility		Existing Condition	Required Capacity	
			in 2019	in 2035
Runway	Configuration	Single Runway	Single Runway (19,783 movements/year)	N/A
	Length (m)	2,806	2,806	N/A
	Width (m)	45	45	N/A
Cargo Terminal Building	Import Area (m^2)	N/A	1,841 (9,205 t)	N/A
	Export Area (m^2)	N/A	213 (1,067 t)	N/A
	Total (m^2)	7,000	2,054 (10,272 t)	N/A

Facility		Existing Condition	Required Capacity	
			in 2019	in 2035
Passenger Terminal Building	Area (m^2)	16,000	8,083 (1,118,664 pax/year)	N/A

Source: JST

b) New Palmerola International Airport

New Palmerola International Airport, which will commence operation in 2021, has a single runway (2,440 x 45 m). The area of the passenger terminal is around 39,236 m^2. In addition, the area of the cargo terminal is around 3,000 m^2 which includes the import and export areas.

With the above understanding regarding the existing capacity of each facility in the airport, the required capacity of each facility in 2035 is evaluated respectively based on future demand statistical data provided by the Department of Infrastructure and Public Services in Honduras. The capacity of the runway, passenger terminal, and cargo terminal are sufficient for the demand in 2035.

Table 7.5.11 Comparison of Existing and Required Capacity in New Palmerola International Airport

Facility		Existing Condition	Required Capacity	
			in 2019	in 2035
Runway	Configuration	Single Runway	N/A	Single Runway (26,540 movements/year)
	Length (m)	2,440	N/A	2,440
	Width (m)	45	N/A	45
Cargo Terminal Building	Import Area (m^2)	N/A	N/A	N/A
	Export Area (m^2)	N/A	N/A	N/A
	Total (m^2)	3,000	N/A	1,200 (6,000 t)
Passenger Terminal Building	Area (m^2)	39,236	N/A	13,727 (1,960,000 pax/year)

Source: JST

(4) Issues and Recommendations on Traffic Volume and Capacity in Nicaragua

Augusto C. Sandino International Airport has a single runway (2,442 x 45 m). The area of the passenger terminal is around 17,141 m^2. In addition, the area of the cargo terminal is around 3,230 m^2 which includes the import and export areas.

With the above understanding regarding the existing capacity of each facility in the airport, the required capacity of each facility in 2035 is evaluated respectively based on the future demand statistical data provided by the Department of Infrastructure and Public Services in Honduras. The capacities of the existing runway and the existing passenger terminal building are sufficient for both of the demands in 2019 and 2035. However, the capacity of the existing cargo terminal building is not enough for the demands in 2019 and 2035. Therefore, it is recommended to expand the existing cargo terminal building or develop new cargo terminal in response to the existing and future air cargo demand.

Table 7.5.12 Comparison of Existing and Required Capacity in Augusto C. Sandino International Airport

Facility		Existing Condition	Required Capacity	
			in 2019	in 2035
Runway	Configuration	Single Runway	Single Runway (24,886 movements/year)	Single Runway (53,446 movements/year)
	Length (m)	2,442	2,442	2,442
	Width (m)	45	45	45
Cargo Terminal Building	Import Area (m^2)	N/A	N/A	N/A
	Export Area (m^2)	N/A	N/A	N/A
	Total (m^2)	3,230	4,831 (24,157 t)	6,304 (31,521 t)
Passenger Terminal Building	Area (m^2)	17,141	7,749 (1,099,974 pax/year)	14,743 (2,208,991 pax/year)

Source: JST

(5) Issues and Recommendations on Traffic Volume and Capacity in Costa Rica

Juan Santamaría International Airport has a single runway (3,011 x 45 m). The area of the passenger terminal is approximately 30,207 m^2. In addition, the area of the cargo terminal is approximately 13,100 m^2 which includes the cargo terminal operated by AERIS and another Santamaria Terminal.

With the above understanding regarding the existing capacity of each facility in the airport, the required capacity of each facility in 2018 and 2035 is evaluated, respectively, based on actual aviation data provided by the Ministry of Public Works and Transport and future demand statistical data which can be obtained in the report of "NAIMCR Site Study and Master Plan, COCESNA, May 2017". According to the presentation material "Update of the Master Plan of Juan Santamaría International Airport prepared by L&B in 2019", the maximum practical capacity of the existing runway is estimated to be approximately 440 operations per day. In this regard, the annual runway capacity can be estimated at approximately 160,600 operations. The capacity of the existing runway is sufficient for both of the demands in 2018 and 2035. However, the capacities of the existing cargo terminal building and the passenger terminal are not enough for the demands in 2018 and 2035. Therefore, it is recommended to expand the existing cargo terminal building and the passenger terminal building in response to the existing and future demands. It should be mentioned that the capacity of the cargo terminal is evaluated in case of Low Automation defined in IATA ADRM 11, using a factor of 5 ton/m^2. By upgrading this factor to "Automated" or "Highly Automated", it is possible to reduce the required area of the cargo terminal.

Table 7.5.13 Comparison of Existing and Required Capacity in Juan Santamaría International Airport

Facility		Existing Condition	Required Capacity	
			in 2018	in 2035
Runway	Configuration	Single Runway	Single Runway	Single Runway
	Length (m)	3,011	3,011	3,011
	Width (m)	45	45	45
Cargo Terminal Building	Import Area (m^2)	N/A	N/A	N/A
	Export Area (m^2)	N/A	N/A	N/A
	Total (m^2)	13,100	18,230 (91,152 t)	30,200 (151,000 t)

Facility		Existing Condition	Required Capacity	
			in 2018	in 2035
Passenger Terminal Building	Area (m^2)	30,207	34,352 (5,230,382 pax/year)	64,713 (10,000,000 pax/year)

Source: JST

(6) Issues and Recommendations on Traffic Volume and Capacity in Panama

The necessary data for the analysis of the issue on traffic volume and capacity could not be obtained in this survey for Tocumen International Airport. However, according to the Tocumen International Airport Master Plan formulated by Tocumen S.A., the third runway in the southeast side and midfield terminal have been planned to be developed in response to the future demand in 2035. In addition, the development of the south side of the cargo terminal is under consideration in response to the future demand of air cargo.

7.5.3 Issues and Recommendations on Institutions

In 3) Institutional Reforms, that will help drive the benefits of aviation connectivity to new heights, it is recommended that Central American countries steer their aviation policies around three main criteria:

1. Seeks to align aviation regulatory frameworks with global best practice, e.g., environmental sustainability, at the forefront of post-COVID-19 recovery as the shutdown highlighted the relative reduction of aviation-related carbon emission pollution effects;
2. Promotes competitive costs and efficient administration of airports in partnership with the private sector; and
3. Ensures institutional transparency and promotes participation of industry stakeholders to profitably increase air services connectivity operated across Central America.

The Table 7.5.14 ranks (in descending order) on airport quality, visa openness (for passengers), and overall facility cost competitiveness. In all these scores and ranks, higher is better – where based on the rankings, Costa Rica, followed by El Salvador, ranks the highest on quality of facilities, while Guatemala and Nicaragua are the most cost competitive but have aging facilities. Honduras ranks in the middle (prior to expected boost from the new Palmerola Airport opening). While Panama is comparatively the largest airport, it ranks fairly low among larger LATAM airport peers.

Based on initial observations and the quantity and choice of flight services and facility quality, Costa Rica ranks highest, with El Salvador a close second using these two measurements. (Details for each country follow.)

Table 7.5.14 Ranks on Airport Quality, Visa Openness and Cost Competitiveness

Country	Quality		Visa Openness	Cost Competitiveness
	Latin America	Global		
Costa Rica	7/24	59	16/24	9
El Salvador	10/24	74	6/24	12
Honduras	14/24	83	14/24	15
Guatemala	18/24	97	13/24	2
Nicaragua	19/24	108	7/24	7
Panama	Below average (3.8 vs. 4.1)	n/a	51/136 (Low)	81/136 (Upper)

Source: The World Economic Forum Global Competitiveness Report, 2019

Unfortunately, there are too many examples where institutional reform criteria are not being followed. In Guatemala, for example, airlines face potential tax penalties owing to the tax authority's non-recognition of the use of globally-accepted cost allocation formulas to calculate the taxable amount corresponding to the airlines' operations in Guatemala. IATA and other stakeholders are now working with the government and the industry to resolve this issue to ensure Guatemala follows globally-accepted best practices and

principles related to taxation of aviation.

While governments generally understand the importance of aviation as a catalyst for economic growth, there are opportunities to do more. In Panama, a court awarded more than USD 1 million in damages on a cargo claim brought against an airline. This far exceeds the liability limits for cargo claims contained within the Montreal Convention and industry norms, to which Panama has fully acceded. IATA has intervened in the case, which was later appealed. This is an example of inadequate transparency among industry stakeholders.

Still, countries within Central America have began in earnest to prepare to accommodate an additional 421 million passengers forecast across the Latin American region by 2036[1]. Tegucigalpa (Honduras) will have a new capital city Palmerola International Airport, while Panama Tocumen plans a third runway, as well as the much-needed airspace modernization that the government is undertaking. In El Salvador, the passenger terminal at San Salvador is undergoing expansion and a new airport has been proposed on its east coast. In Guatemala, a new all-cargo airport is being studied near the coast and west of the capital to relieve congestion at La Aurora. Many of these facility and infrastructure improvements have increasingly relied on private sector participation.

Looking towards the future, the COVID-19 crisis has changed everything for the airline industry - including attitudes toward the sector's contribution to climate change. As the recovery gets underway, airlines know they will need to do more than simply carry on with sustainability plans initiated before the pandemic. More environmental sustainability and related innovation are much more evident post-COVID-19. Air transport connects the world, bringing people and goods together. But the benefits of aviation also have an environmental downside. Therefore, government and institutional reforms are needed to support reductions in emissions, noise, industrial processes, and waste managed by industry stakeholders, and where possible eliminated.

In addition, aviation and government alike have an enforcement role to play in tackling the increasingly global issue of wildlife trafficking - exploiting the increasingly interconnected air transport system to traffic illegal flora and fauna transported as air cargo. Government authorities and international conservation organizations are working together to identify ways the air cargo sector can break the chain between suppliers and consumers. This has, and will be a critical area for Central American governments to focus where an abundance of pristine wildlife areas are prevalent in every country.

IATA's Sustainability and Environment Advisory Council (SEAC) advises IATA on sustainability and environmental policies and strategy that Central American governments consider for a robust aviation industry:

- Support for the development of environmental standards and recommended practices together with ICAO
- Coordinating with airlines and other stakeholders to implement national policies to mitigate the sector's environmental impact
- Streamlining regulatory processes and increase trade through robust international negotiations
- Maintaining alignment between policy-makers and industry stakeholders about environmental solutions

(1) Issues and Recommendations on Institutions in Guatemala

Three measurement criteria are adopted:

1. Align aviation regulatory framework with global best practices
2. Ensure competitive costs and efficient administration in airports through open communication with the industry
3. Ensure transparency and participation of the industry in infrastructure planning and development across Central America

[1] IATA, 2018 market report

Current situation: DGAC has concluded bilateral agreement with El Salvador and Honduras whereby cross border flights operate as "domestic" to promote regional cooperation and air connectivity. Executives surveyed by the World Economic Forum suggest that Guatemala's overburdened and aging air transport infrastructure quality ranks 18th out of 24 countries included in the survey in Latin America and the Caribbean and 97th globally. Guatemala ranks 13th out of 24 in Latin America and the Caribbean for visa openness and 2nd for cost competitiveness.[2] Extreme road congestion in Guatemala is a major impediment affecting the air cargo road feeder industry business model. The proposed new all-cargo airport needs further study and possibly a "free trade zone" logistics area similar to Panama's Tocumen should be examined.

(2) Issues and Recommendations on Institutions in El Salvador

Three measurement criteria are adopted:

1. Align aviation regulatory framework with global best practices
2. Ensure competitive costs and efficient administration in airports through open communication with the industry
3. Ensure transparency and participation of the industry in infrastructure planning and development across Central America

Current situation: Executives surveyed by the World Economic Forum suggest that El Salvador's air transport infrastructure quality ranks 10th out of 24 countries included in the survey in Latin America and the Caribbean and 74th globally. El Salvador ranks 6th out of 24 in Latin America and the Caribbean for visa openness and 12th for cost competitiveness.[3] El Salvador has expanded its passenger terminal to improve air service connectivity as a base for Avianca. The airport also has a vibrant MRO repair facility for Jet Blue and others. The government has announced a possible second airport on the eastern side of the country and progressively promotes air transport. It is important for both AAC and CEPA to closely coordinate on the vision and implementation of the country's air sector.

(3) Issues and Recommendations on Institutions in Honduras

Three measurement criteria are adopted:

1. Align aviation regulatory framework with global best practices
2. Ensure competitive costs and efficient administration in airports through open communication with the industry
3. Ensure transparency and participation of the industry in infrastructure planning and development across Central America

Current situation: Executives surveyed by the World Economic Forum suggest that Honduras's air transport infrastructure quality ranks 14th out of 24 countries included in the survey in Latin America and the Caribbean and 83rd globally. Honduras ranks 14th out of 24 in Latin America and the Caribbean for visa openness and 15th for cost competitiveness.[4] Honduras holds a "middle" position in the rankings with a new Palmerola Airport (Tegucigalpa) that will open by the end of 2021. The country's largest international airport and only air cargo facility is located in San Pedro Sula, while the airport at Roatan Island round out the country's main international airports.

Honduras has been known as one of the most violent countries in the world – organized criminal groups like gangs and drug traffickers pay off police, prosecutors, and judges to get away with their crimes. This corrupts the criminal justice system. Without a functioning justice system, impunity runs rampant for criminals and murderers: they are rarely held accountable for their actions. This, of course, leads to more violence and crime. In recent years, the country has made remarkable strides in working towards peace. It

[2] The World Economic Forum Global Competitiveness Report, 2019
[3] The World Economic Forum Global Competitiveness Report, 2019
[4] The World Economic Forum Global Competitiveness Report, 2019

must continue to address crime in order to attract international air cargo growth and balance national air connectivity.

(4) Issues and Recommendations on Institutions in Nicaragua

Three measurement criteria are adopted:

1. Align aviation regulatory framework with global best practices
2. Ensure competitive costs and efficient administration in airports through open communication with the industry
3. Ensure transparency and participation of the industry in infrastructure planning and development across Central America

Current situation: Executives surveyed by the World Economic Forum suggest that Nicaragua's air transport infrastructure quality ranks 19th out of 24 countries included in the survey in Latin America and the Caribbean and 108th globally. Nicaragua ranks 7th out of 24 in Latin America and the Caribbean for visa openness and 7th for cost competitiveness.[5] INAC has concluded an open sky agreement with the USA and Spain. The latter includes the EU clause allowing other EU carriers. They also have open sky agreement with Cuba, Peru, and Panama. As a small country and no home carriers, Nicaragua actively promotes aviation open market principles.

(5) Issues and Recommendations on Institutions in Costa Rica

Three measurement criteria are adopted:

1. Align aviation regulatory framework with global best practices
2. Ensure competitive costs and efficient administration in airports through open communication with the industry
3. Ensure transparency and participation of the industry in infrastructure planning and development across Central America

Current situation: Executives surveyed by the World Economic Forum suggest that Costa Rica's air transport infrastructure quality ranks 7th out of 24 countries included in the survey in Latin America and the Caribbean and 59th globally. Costa Rica ranks 16th out of 24 in Latin America and the Caribbean for visa openness and 9th for cost competitiveness.[6] Santamaria is the second largest airport in the Central American region behind Panama. Under privatization, the airport has high quality passenger facilities, but limited air cargo facilities that is being addressed. The DGAC has an open sky agreement with the USA, Chile, Colombia, and Canada. Passengers from the USA account for 90% and tourists from Europe are increasing.

(6) Issues and Recommendations on Institutions in Panama

Three measurement criteria are adopted:

1. Align aviation regulatory framework with global best practices
2. Ensure competitive costs and efficient administration in airports through open communication with the industry
3. Ensure transparency and participation of the industry in infrastructure planning and development across Central America

Current situation: Satisfaction surveys suggest that Panama's passenger facilitation (3.8/10) scores below the Latin American average (4.1/10). On the World Economic Forum's Travel and Tourism Competitiveness Index, the country ranks 51st for visa openness and 81st out of 136 countries for cost competitiveness. Panama's facilitation of air cargo through its customs and borders regulations ranks 84th out of 124 countries in terms of the Air Trade Facilitation Index (ATFI) and 56th out of 135 countries in terms of the eFreight Friendliness Index (EFFI) globally. The Enabling Trade Index (ETI) ranks Panama 58th out of 136 countries

[5] The World Economic Forum Global Competitiveness Report, 2019

[6] The World Economic Forum Global Competitiveness Report, 2019

globally for the facilitation of the free flow of goods over borders and to their destination.[7] In all these scores and ranks, higher is better. In general, Panama's aviation sector is regarded as one of the highly developed within the region. The Tocumen International Airport is the most important airport of the country and is considered as the de facto hub of Central America. Together with the flag carrier Copa Airlines, Tocumen has the ambition to become the hub of the entire Latin American region.

A prime example of this ambition is the construction by the government of the second passenger terminal. This is a project that costs over USD 1 billion and will add 20 gates to the already 34 existing gates, including a new baggage transport system with capacity to transport more than 6,500 bags per hour, allowing very effective connection between flights arriving at Terminal 1 or Terminal 2 and reduced hold time between international flights. As the aviation sector is expected to grow continuously in the coming years, further investments are already set in motion or projected, including a 3rd runway and air cargo free trade zone area discussed in other sections of this report.

To promote flight connectivity, AAC has an open sky agreement with the USA and liberalized Bilateral Air Transport Agreements have been concluded with Chile, Qatar, and others. Despite a rocky past full of corruption and excessive US influence, Panama's current democratic government has enjoyed over a decade of peaceful elections and increasing transparency, and is one of the most stable governments in Latin America. In April 2021, Panama became the first country in the region to accept the IATA Travel Pass as a digital travel credential for passengers to store their COVID-19 test result, which is a current requirement for entry into the country. In parallel to the Panamanian government's acceptance of the IATA Travel Pass, Copa Airlines will run a live trial of the tool in late May. Once concluded, the airline aims to make IATA Travel Pass available to its passengers as a one-stop shop for checking compliance with the travel rules and storing the applicable certificates, while providing governments with full assurance of passenger identity and the authenticity of the credentials being presented.

7.5.4 Issues and Recommendations on Market of Transport Industry

In 4) Market of Transport Industry, governments across Central America are urged to work with the industry to maximize the benefits that aviation can bring to the region. Owing to its geographic location, Central America is well-positioned to increase the economic gains that aviation can deliver. From delivering life-saving medicine to family members, to bringing the performers at an awe-inspiring concert event, aviation helps people live better lives and is a catalyst for prosperity.

The path towards success is not complicated but it requires all stakeholders working together in partnership. We see differing approaches as to how governments approach aviation. This presents an opportunity to learn from the true success stories (or failures) in the region.

According to IATA, aviation supports over 850,000 jobs and makes a USD 17.9 billion contribution in gross value added to the combined gross domestic product (GDP) of the seven Central American countries. The contribution of aviation is not divided equally. Some countries in the region are having greater success unlocking aviation's benefits to support economic and social development.

In Panama, for example, 14% of GDP and 238,000 jobs are supported by air transport and foreign arrivals, while in Belize, aviation fully supports 33% of the country's GDP. By contrast, in Guatemala, just 1% of GDP is supported by air transport, while in Honduras, the figure is 3%. Open markets always lead to increased economic growth and create the possibility to introduce new goods and services from which aviation demand is derived. IATA, the industry trade group, promotes four key pillars that underpin the benefits aviation brings in support of new market growth initiatives:

1. Aviation liberates us from the constraints of geography, distance, and time. In doing so, it enables us to lead better lives, and makes the world a better place;
2. Aviation empowers us to explore the world, to do business globally, and to enrich our lives;

[7] IATA Economics Report, 2018

3. Aviation reunites families and loved ones and creates opportunities for greater understanding among cultures; and
4. Aviation connectivity gets goods to markets and vital aid to those in need. By value, a third of the goods traded internationally travel by air.

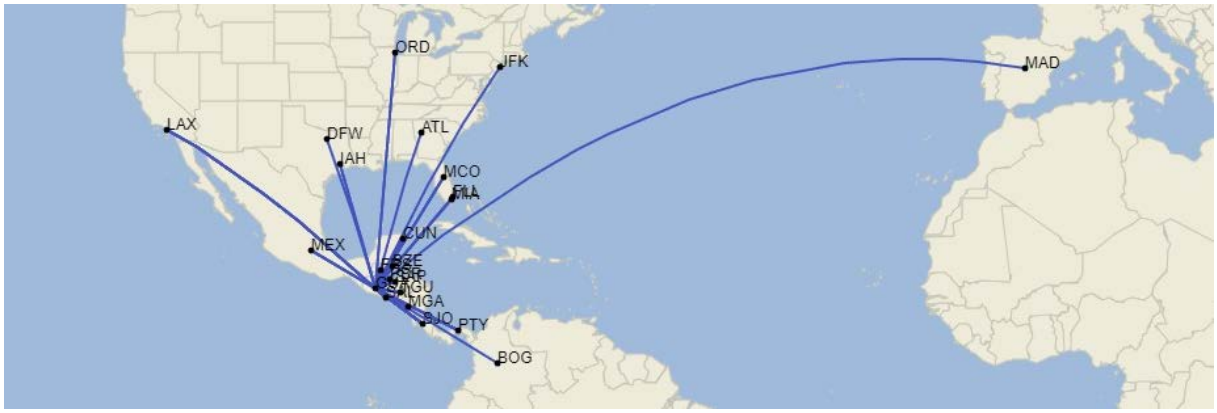
And, according to IATA, in general one-third of goods traded internationally are brought to market through air transport and 57% of world tourists arrive by air.

The long-term trend clearly points to the vast majority of countries operating under an open sky philosophy, in terms of both traffic rights and airline/airport ownership rules, which will enable, first, higher competition between airlines, and then faster consolidation of the industry. However, certainty is not a given in that area because countries' vital economic interests are the prevailing factor in terms of sovereign deregulation. A reverse or slower trend in economically underdeveloped regions, such as Central America, cannot be ruled out when looking 20 years ahead.

Airline consolidation is now picking up on each continent, with industry specialists forecasting the emergence of three to four main players per global region/large market (on the basis of the trend happening in the US or the situation of the Chinese market). In case of full deregulation of ownership rules, airlines could even consolidate worldwide to around six to seven main players and a range of smaller niche players. As a result, airport infrastructure providers will see fundamental changes in their operating models to cope with anticipated growth and price pressures as COVID-19 recovery ensues. The demand for cargo movements and the growth of low-cost carriers in Central America will be a major driver for the revival of the aviation market in the region. Pre-COVID-19, the four busiest airports by passenger numbers (in descending order) are Panama Tocumen, Costa Rica Santamaria, El Salvador Comalapa, and Guatemala La Aurora International Airports. Commercial passenger flight connectivity provides a leading indicator for market conditions and growth potential and is examined for each country. May 2019 is selected as a representative month of pre-COVID-19 nonstop passenger flight activity.

(1) Issues and Recommendations on Market of Transport Industry in Guatemala

In May 2019 (pre-COVID-19), the majority of Guatemala flights are to/from destinations in the US and Mexico and there is also a flight to/from Madrid, Spain. Regionally, the largest Central American air market is Costa Rica and the remaining market is split fairly evenly among Honduras, Panama, and El Salvador. Bogota is also a market in South America.



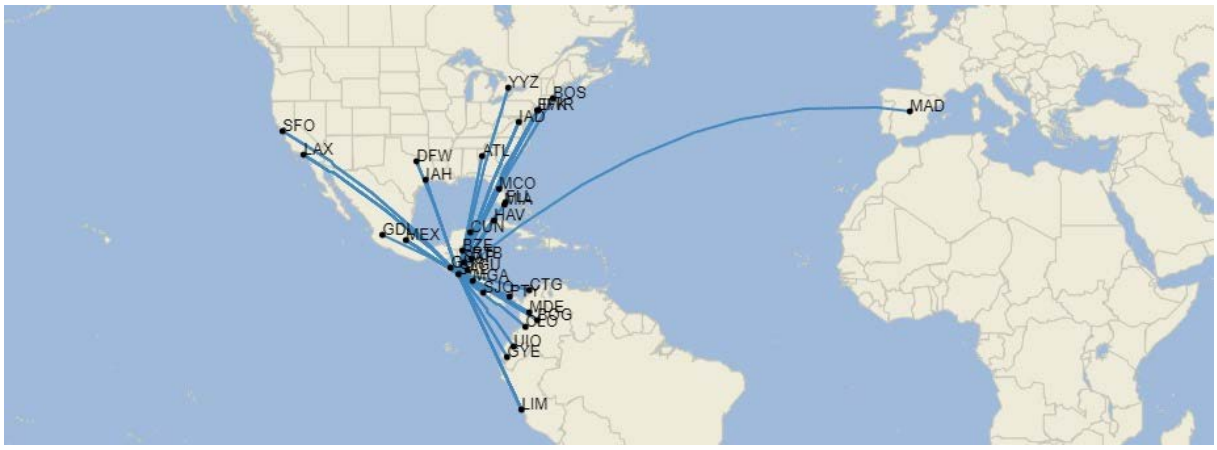
Source: Diio (Innovata) Schedules Database (May 2019)

Figure 7.5.1 La Aurora International Airport Nonstop Flight Route

As one of Central America's busiest commercial airports, La Aurora facilities require immediate investment and upgrades. It is recommended for World Bank, or a similar sponsor, to undertake an independent cost/benefit regional feasibility study and government-backed initiative for proposed new all-cargo airport. It is required to study the potential to create an air cargo integrator base of operations, e.g., expanded DHL operations, that underpins the logistics growth strategy in tandem with La Aurora.

(2) Issues and Recommendations on Market of Transport Industry in El Salvador

In May 2019 (pre-COVID-19), the majority of El Salvador flights are to/from destinations in the US and there is also a flight to/from Madrid, Spain. With a significant hub operated by Avianca at San Salvador, direct flights are fairly evenly distributed to/from Honduras, Costa Rica, Mexico, Guatemala, Nicaragua, and Panama, as well as South America.



Source: Diio (Innovata) Schedules Database (May 2019)

Figure 7.5.2 Comalapa International Airport Nonstop Flight Route

An on-site survey at El Salvador Comalapa was not possible during the January 2020 JICA Study Team visit; however, the master plan states that the cargo terminal does not require further development since the current capacity is sufficient to meet the demand projected until 2032. Nonetheless, CEPA announced in 2019 a cargo facility expansion program where Phase I refers to improvements to the current cargo terminal, while Phase II of the project refers to constructing a new cargo terminal.

It is necessary to showcase the success of El Salvador Comalapa Aeroman MRO facility as a means to attract additional private sector investment in the CEPA cargo facility improvements and potential for related air cargo logistics free trade zone and value-added services.

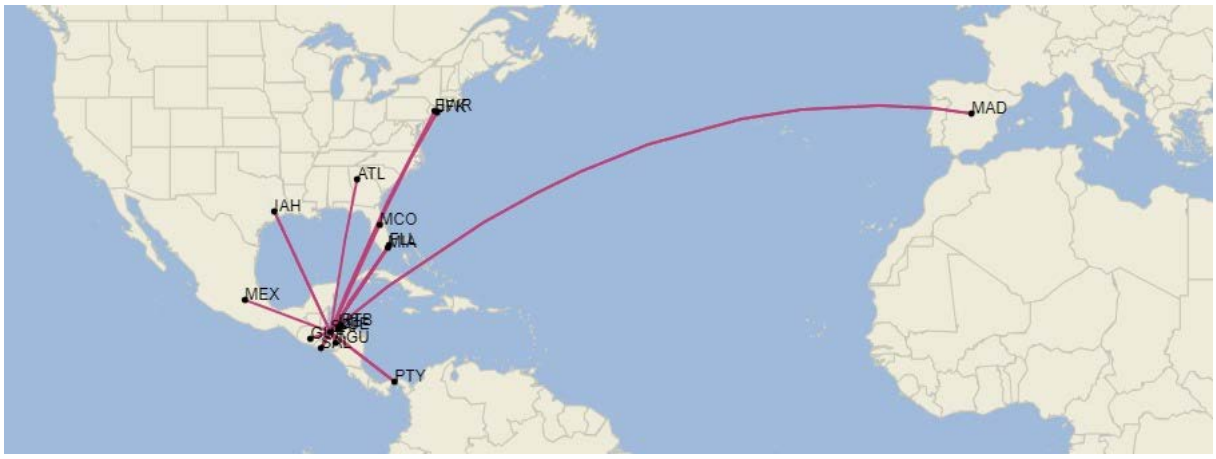
(3) Issues and Recommendations on Market of Transport Industry in Honduras

In May 2019 (pre-COVID-19), the majority of Honduras flights are to/from destinations in the US. Regionally, its largest Central American air markets form the golden triangle connecting Honduras with El Salvador and Guatemala. On a smaller scale, direct flights to/from Costa Rica, Panama, and Mexico are then split fairly evenly. There are no nonstop flights to South America.



Source: Diio (Innovata) Schedules Database (May 2019)

Figure 7.5.3 Toncontin International Airport Nonstop Flight Route



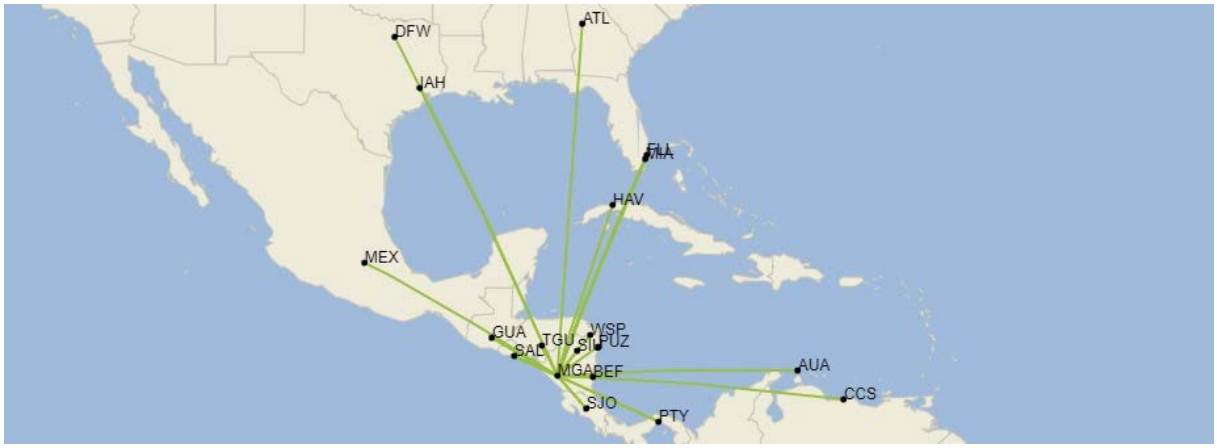
Source: Diio (Innovata) Schedules Database (May 2019)

Figure 7.5.4 Ramón Villeda Morales International Airport Nonstop Flight Route

It is important to foster cooperation between the country's two main full-service international airports' planning and air service marketing to attract more airlines in line with the investment in Palmerola that will replace Toncontín for international flights by the end of 2021. Currently, San Pedro Sula International Airport is the larger airport and the only air cargo facility in Honduras.

(4) Issues and Recommendations on Market of Transport Industry in Nicaragua

In May 2019 (pre-COVID-19), the majority of Nicaragua's flights are to/from destinations in the US. Regionally, its largest Central American air markets are Costa Rica, followed by El Salvador and Panama. On a smaller scale, direct flights to/from Cuba, Guatemala, and Mexico are split fairly evenly.



Source: Diio (Innovata) Schedules Database (May, 2019)

Figure 7.5.5 Augusto C. Sandino International Airport Nonstop Flight Route

Nicaragua Augusto C. Sandino International Airport has comparatively limited, mostly regional, air connectivity and a small air cargo facility. As a priority, it is recommended to develop a feasibility and business plan and seek private investment for a larger new air cargo facility to be located on a site earmarked on the southwest side of the airport. The new air cargo facility will provide an uplift for improving Nicaragua's air connectivity.

(5) Issues and Recommendations on Market of Transport Industry in Costa Rica

In May 2019 (pre-COVID-19), the majority of Costa Rica's flights are to/from destinations in the US and Panama. Within the region, other large Central American air markets are Mexico, Guatemala, El Salvador and Nicaragua – all on a similarly large scale. Far less are direct flights to/from Costa Rica and Honduras. In addition, Costa Rica has nonstop flights to Europe, as well as South America.



Source: Diio (Innovata) Schedules Database (May 2019)

Figure 7.5.6 Juan Santamaría International Airport Nonstop Flight Route

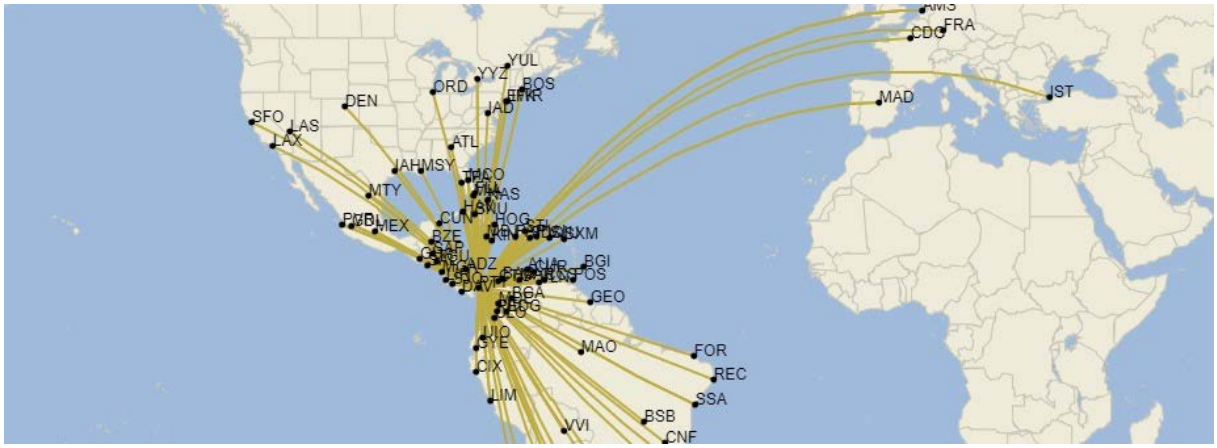
Santamaria is the second largest airport in the region behind Panama's Tocumen International Airport and has a good base of air connectivity to build upon. It is recommended to sustain the paused plans for the construction of a greenfield Orotina San Jose International Airport – instead, keep the focus to maximize Santamaria Airport's lifespan that can easily exceed beyond 2040 serving as Costa Rica's main aviation gateway. DHL is a key Santamaria stakeholder to coordinate with on a potential logistics free trade zone.

(6) Issues and Recommendations on Market of Transport Industry in Panama

Overall, Panama is a far larger and much more diverse airport market as compared with other Central American airports. As a major hub for Copa, South America is the largest market for flights to/from Panama, followed by direct flights to/from North America and Europe. The five largest passenger routes (in descending order) are: USA, Costa Rica, Colombia, Mexico, and Brazil.

The five busiest cargo routes (in descending order) are: Colombia, Nicaragua, USA, The Netherlands, and Mexico.

In May 2019 (pre-COVID-19), Panama's Tocumen International Airport's nonstop flights are shown in the figure below.



Source: Diio (Innovata) Schedules Database (May, 2019)

Figure 7.5.7 Tocumen International Airport Nonstop Flight Route

Panama's Tocumen air connectivity clearly is superior to other Central American countries in this study. It is recommended that a much needed 3rd runway is a high priority. The strategic imperative for the new landside Logistics Free Trade Zone area adjacent to the air cargo terminal will serve to promote growth opportunities through value-added business activities. DHL is a key Tocumen stakeholder for the Logistics Free Trade Zone.

7.5.5 Summary of Issues and Recommendations in the Aviation Sector

The summary of issues and recommendations which are analyzed in view of 1) Consistency with High-level Policies, 2) Traffic Volume and Capacity, 3) Institutions, and 4) Market of Transport Industry is shown in Table 7.5.15.

Table 7.5.15 Summary of Issues and Recommendations in the Aviation Sector

Aspect	Country	Issue	Recommendation
1) Consistency with High-level Policies	Guatemala	No issue since PENLOG is consistent with PMRML. In PMRML, Improvement and Expansion of La Aurora International Airport Cargo Area is listed as Immediate Action Plan.	Following the immediate action plan listed in PENLOG.

Aspect	Country	Issue	Recommendation
	El Salvador	No issue since PNLOG is consistent with PMRML. Modernization of Comalapa International Airport and Expansion of Main Cargo Terminal of Comalapa International Airport (cold storage facilities, handling equipment) are listed as Immediate Action Plan.	Following the immediate action plan listed in PNLOG.
	Honduras	No issue since PNLOG is consistent with PMRML. Development of New Palmerola Airport as Cargo Hub is listed as Immediate Action Plan.	Following the immediate action plan listed in PNLOG.
	Nicaragua	No issue since PNLOG is consistent with PMRML. Improvement of Managua Airport which includes the Expansion of Cargo Area is listed as Immediate Action Plan.	Following the immediate action plan listed in PNLOG.
	Costa Rica	No issue since PNLOG is consistent with PMRML. Upgrade of Juan Santamaria International Airport with the Air Cargo Center and Future Investments at New Orotina International Airport including Road Access are listed as Immediate Action Plan.	Following the immediate action plan listed in PNLOG.
	Panama	No issue since PNLOG is consistent with PMRML. Formulation of Airport Development Strategy is listed as main actions.	Following the action plan listed in PNLOG.
2) Traffic Volume and Capacity	Guatemala	The capacity of existing cargo terminal building in La Aurora International Airport will not be enough for the demand in 2035.	It is recommended to expand the existing cargo terminal building in response to the future air cargo demand. If the expansion area will not be ensured around the existing COMBEX cargo warehouse area, the new air cargo hub airport has to be settled in Guatemala.
	El Salvador	The cargo terminal does not require further development since the current capacity is sufficient to meet the future demand according to the "El Salvador Infrastructure Master Plan 2019 - 2030".	-
	Honduras	The capacity of the cargo terminal in New Palmerola International Airport is sufficient for the demand in 2035.	-
	Nicaragua	The capacity of the existing cargo terminal building in Augusto C. Sandino International Airport is not enough for the demands in 2019 and 2035.	It is recommended to expand the existing cargo terminal building or develop new cargo terminal in response to the existing and future air cargo demands.

Aspect	Country	Issue	Recommendation
	Costa Rica	The capacity of the existing cargo terminal building is not enough for the demands in 2018 and 2035.	It is recommended to expand the existing cargo terminal building in response to the existing and future demands. It should be mentioned that the capacity of the cargo terminal is evaluated in case of "Low Automation" defined in IATA ADRM 11, using a factor of 5 ton/m^2. By upgrading this factor to "Automated" or "Highly Automated", it is possible to reduce the required area of the cargo terminal.
	Panama	-	-
3) Institutions	All of Central America	There is a need to increase further the benefits of aviation connectivity across the region.	Central American countries steer aviation policies around three main criteria: 1. Seeks to align aviation regulatory frameworks with global best practice, e.g., environmental sustainability is at the forefront of post-COVID-19 industry recovery as the shutdown highlighted the relative impact of aviation-related pollution effects; 2. Promotes competitive costs and efficient administration of airports in partnership with the private sector; and 3. Ensures institutional transparency and promotes participation of industry stakeholders to profitably increase air services connectivity across the Central American region
	Guatemala	DGAC has concluded bilateral agreement with El Salvador and Honduras whereby cross border flights operate as "domestic".	Monitor implementation to showcase as a potential bilateral model for greater regional cooperation among cooperating states.
	El Salvador	While AAC is responsible for regulation, audit, and control related to civil aviation. CEPA is responsible for the operation of Comalapa International Airport, the country's main international gateway.	Promote close cooperation between the two agencies with emphasis on transparency for the strategic vision and its implementation, e.g., fully vet the cost/benefit and feasibility for a proposed second international airport against prioritized improvements planned at Comalapa International Airport.
	Honduras	For the replacement of Toncontin Airport, the government has developed through a DBOT Concession the new Palmerola Airport situated on a US air base.	The government should monitor and strive for a national approach and a balanced traffic growth strategy attracting new services to maximize new improvements in the airport infrastructure capacity.
	Nicaragua	INAC has concluded an open sky agreement with the USA and Spain. The latter includes the EU clause allowing other EU carriers. They also have open sky agreement with Cuba, Peru, and Panama.	As the Nicaraguan economy recovers, continue to promote benefits for the open skies approach.

Aspect	Country	Issue	Recommendation
	Costa Rica	DGAC has an open sky agreement with USA, Chile, Colombia, and Canada. Passengers from the USA account for 90% and tourists from Europe are increasing.	Continue to promote benefits for the open skies approach and efficiency of Juan Santamaria International Airport.
	Panama	AAC has an open sky agreement with the USA and liberalized Bilateral Air Transport Agreements concluded with Chile, Qatar, and others. In April 2021, Panama became the first country in the region to accept the IATA Travel Pass as a digital travel credential for passengers to store their COVID-19 test result.	Continue to promote benefits for the open skies approach and showcase the Panamanian government's pro aviation sector stance.
4) Market of Transport Industry	All of Central America	Owing to its geographic location, Central America is well-positioned to increase the economic gains that the aviation sector can deliver.	Regional stakeholders must work together in partnership with how governments approach aviation on the national level. This presents an opportunity to learn from the market success stories (or failures) in the region that builds on the former.
	Guatemala	Aging airport facilities require immediate investment and planning.	Prioritize much-needed La Aurora facility and CAPEX investment. Consider the World Bank, or similar to sponsor, to do an independent cost/benefit regional feasibility study for government-backed initiative for new all-cargo airport. Study potential to create air cargo integrator base of operations, e.g., expanded DHL operations, that underpins the logistics growth strategy in tandem with La Aurora.
	El Salvador	The master plan states that the cargo terminal does not require further development since the current capacity is sufficient to meet the demand projected up to 2032. In 2019, CEPA announced a tender to improve and expand Comalapa air cargo facilities	Showcase success of the Aeroman MRO facility as a means to attract additional private sector investment in air cargo facility expansion and feasibility for creating a Logistics Free Trade Zone for value-added services.
	Honduras	There is a need for a joint national air transport strategy.	Support cooperation between the country's two main full-service international airports' planning and air service marketing to attract more airlines in line with the investment in Palmerola. San Pedro Sula International Airport is currently the only air cargo airport in Honduras.
	Nicaragua	It has limited, mostly regional, air connectivity and small air cargo facility.	Develop feasibility business plan for private investment in the new air cargo facility planned for the southwest side of the airport. The new air cargo facility will provide an uplift for improving Nicaragua's air connectivity.

Aspect	Country	Issue	Recommendation
	Costa Rica	Santamaria is the second largest airport in the region behind Panama.	Sustain suspended plans for the construction of greenfield Orotina San Jose International Airport - keep the focus to maximize Santamaria Airport's lifespan that can easily exceed beyond 2040 as the country's main regional gateway. DHL is a key Santamaria stakeholder to coordinate with.
	Panama	By any measure, Tocumen is the largest airport in the region and an airport hub.	Develop the much-needed 3rd runway. Maintain strategic imperative for the new landside Logistics Free Trade Zone area adjacent to the air cargo terminal and promote growth opportunities through value-added business activities. DHL is a key Tocumen stakeholder to coordinate with.

Source: JST

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 8

Railway Transport Sector

November 2023

Japan International Cooperation Agency
Oriental Consultants Global Co., Ltd.
Nippon Koei Co., Ltd.
ALMEC Corporation
Overseas Coastal Area Development Institute of Japan
International Development Center of Japan Inc.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

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Appendix 8 Railway Transport Sector

8.1 Outline of Railway Sector in Central America

This chapter analyzes the current situation of the railway sector in Central America. Based on the review of the current situation, issues to be addressed are identified, and recommendations for the future development of the railway sector are suggested.

The outline of the railway sector in each country of Central America is tabulated below.

Table 8.1.1 Overview of Railway Sector in Central America

Item	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama
Railway Operator	FEGUA, Ferrovias	FENA DESAL	FNH	N/A	INOCFER	PCRC
Regulating Entity	MCIV	CEPA	INSEP	MTI/ Railway Company of Nicaragua (in the past)	MOPT	AMP
Related Law	Ley orgánica de la empresa de ferrocarriles de Guatemala	Legislative Decree No. 269, May 1975	National Railroad Constitutive Law (Decree 48, 1958)	Decree No. 710	Law 7001, Sep. 1985	Contract law 15 of Feb. 17, 1998
Staff Number	11 (FEGUA)	16	23	N/A	55	185
Length of Track*	780 km (N/A)	471.0 km (N/A)	199 km (12 km)	430 km (N/A)	537 km (168.5 km)	76 km (76 km)
Technical Standards	AREMA	N/A	N/A	N/A	AREMA	FRA
Gauge	914 mm	914 mm	1,067 mm	914 mm	1,067 mm	1,435 mm
Current Situation	Railway is not operated.	Railway is not operated.	Railway is not regularly operated.	Railway is not operated.	Cargo and passenger trains are operated	Cargo and passenger trains are operated

Note: *: Track length under operation is shown in parenthesis
FEGUA: Ferrocariles de Guatemala FNH: Ferrocaril Nacional de Honduras
INCOFER: Instituto Costarricense de Ferrocarriles PCRC: Panama Canal Railway Company
AREMA: American Railway Engineering and Maintenance-of-way Association
FRA: Federal Railway Association

Source: JST

8.2 Current Situation of the Railway Sector in Guatemala

8.2.1 History of the Railway in Guatemala

In Guatemala, railway had been developed and operated by private companies since the 1880s. In 1968, the railway in the country was nationalized and Ferrocarriles de Guatemala (hereinafter referred to as "FEGUA") was established. Banana and coffee were transported by railway. In 1996, however, both cargo and passenger services were suspended due to the poor condition of the railway and the shortage of financial resource.

In 1998, an onerous usufruct[1] contract was signed between FEGUA and Compañía Desarrolladora Ferroviaria, S.A., also known as Ferrovías Guatemala (hereinafter referred to as "Ferrovías"). In this contract, FEGUA has a role of administrative and legal procedure and control of movable and immovable railway assets while Ferrovías is in charge of the rehabilitation of the railway and the operation of trains on repaired track.

8.2.2 Law and Regulation on Railway Sector

FEGUA is an autonomous entity established under Decree No. 60-72, or "Ley Orgánica de la Empresa de Ferrocarriles de Guatemala (Organic Law of the Company of Ferrocarriles de Guatemala)", which was enacted in 1972. The summary of this law is tabulated below. The mandate of FEGUA is "to provide the public services of rail transport, auxiliary services" (Article 3).

With respect to regulation and technical standards, as far as JST has collected data, such information were not found. In the project in Tecún Umán, the technical standards used in the U.S. and Mexico were applied (See Section 8.8.4).

Table 8.2.1 Contents of the Organic Law of the Company of Ferrocarriles de Guatemala

Title	Chapter	Articles	Example of the Article
I. Constitution, nature, duration and domicile		1-6	1: Constitution of FEGUA 3: Mandate of FEGUA
II. Organization	I. Administrative structure	7-8	7: Organization of FEGUA
	II. Board of Directors	9-20	9: Position of the Board of Directors 10: Members of the Board of Directors 19: Authority of the Board of Directors
	III. Management	21-26	21: Position of the management team 26: Responsibilities of the management team
III. *	I. Economic system	27-29	27: Assets of FEGUA 29: Treatment of the profit
	II. Financing system	30-37	32: Guarantee by the state 34, 35: Preparation of fiscal reports 37: Tax exemption
IV. Control and inspection		38-41	38: Internal audit of FEGUA
V. Final and transitory provisions, repeal, and validity		42-47	43: General and special regulations 45: Communication body between FEGUA and the Executive Organization

Note: *Title III has no title unlike the other titles
Source: JST (Based on "Ley Orgánica de la Empresa de Ferrocarriles de Guatemala")

[1] "Usufruct" means a legal right to use someone else's property temporarily and to keep any profit made from it (Cambridge Dictionary)

8.2.3 Railway Network and Current Situation

The following figure shows the railway network of Guatemala. As aforementioned, trains are not operated in the country, and the railway infrastructure, rolling stock and equipment have been deteriorated. Originally, the railway network with a length of approximately 800 km was spread nationwide including the capital city, Guatemala City, and was connected with Puerto Quetzal and Puerto Barrios, both of which are the major ports in the country on the Pacific and the Atlantic (the Caribbean) coasts, respectively, and with Tecún Umán, which is in the border with Mexico. In Mexico, the railway network stretches a city named Hidalgo, which is by the border with Guatemala.

The gauge is 914 mm, i.e., narrow gauge, and the width of the right of way is 30.48 m.

Depots for rolling stock were located in seven cities: Guatemala City, Escuintla, Mazatenango, Coatepeque, Tecún Umán, Zacapa and Puerto Barrios. Workshops were located in Guatemala City and terminal stations.



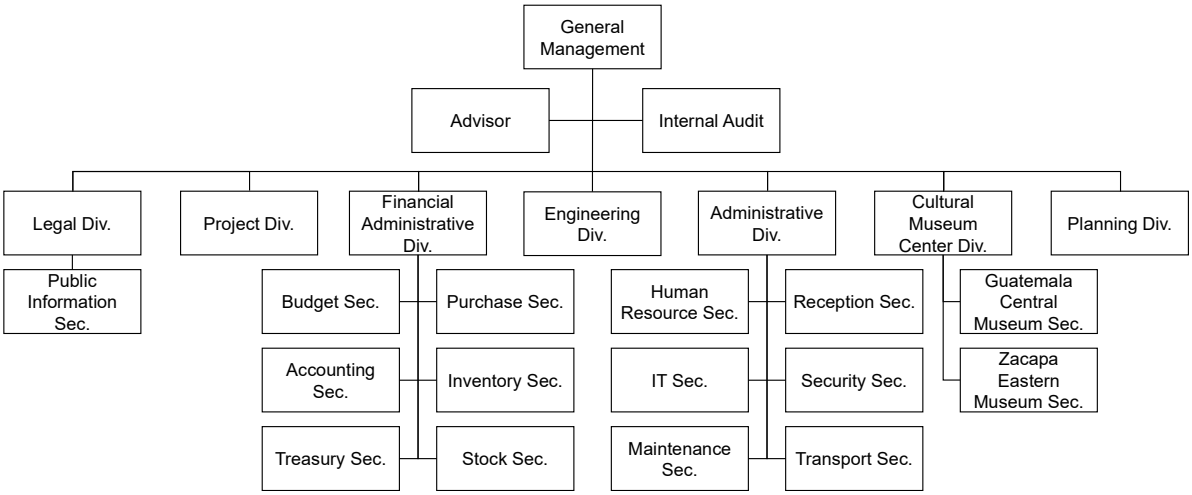
Source: JST

Figure 8.2.1 Railway Network in Guatemala

8.2.4 FEGUA's Activities and Financial Status

(1) Organization Structure of FEGUA

As of 2020, FEGUA has 174 staff, 11 of which are regular staff and the others are temporary staff. The organogram of FEGUA is shown below. Although FEGUA has divisions in charge of planning, engineering, and projects, these divisions are not subdivided into sections.



Source: FEGUA (Translated into English by JST)

Figure 8.2.2 Organogram of FEGUA

(2) FEGUA's Activities

FEGUA is currently preparing the institutional, legal and financial documents, etc. necessary for the revitalization of the railway in the country. Furthermore, FEGUA also plans to perform a series of actions for the rehabilitation of railway as listed in the table below.

Actually, in 2019, FEGUA conducted 30 site visits around the country (see the tables below). It is, however, noteworthy that these activities by FEGUA are limited to site inspection or small works in order to secure the right of way because FEGUA's right is limited due to the contract with Ferrovías, which owns the right to perform reactivation work of the railway.

Under the said situation, FEGUA is trying to rehabilitate a diesel locomotive and the railway between Guatemala City Central Station to La Ermita Station, whose length is approximately 2 km. In addition, the rehabilitation work of the railway museums is also in progress (see the photographs below). FEGUA's reports explain that the development of the museums aims at enhancing the public interest and understanding on railway and its importance as well as preserving machinery in the museums.

Table 8.2.2 Example of FEGUA's Activities in 2019

Venue	Municipality of Guatemala, Department of Guatemala	Municipality of Morales, Department of Izabal.
Activity	• Inspection of the southern section in conjunction with other government and municipal agencies.	• Inspection for construction work on the right of way.
Image		

Source: JST (Based on FEGUA, Memoria de Labores 2019)



Source: FEGUA, Memoria de Labores 2019

Figure 8.2.3 Recovered 900 Series Diesel Locomotive



Source: FEGUA, Memoria de Labores 2019

Figure 8.2.4 Rehabilitation Work between Central Station and La Ermita



Source: FEGUA, Memoria de Labores 2019

Figure 8.2.5 Railway Museum in Guatemala City

(3) Financial Status of FEGUA

The initial annual budget of FEGUA in 2018 was GTQ 4.85 million, and the breakdown of both income and expense is tabulated below. Since train is not operated at all, the budget is small and limited. Major sources of the income are payment from Ferrovías, land leasing, and a subsidy from the government. FEGUA invests most of the revenue in the control and conservation of the railway assets. According to "Memoria de Labores 2018 (Work Record 2018)" of FEGUA, an additional budget of GTQ 9.65 million was approved in 2018, but its breakdown was not clear as per the existing information provided by FEGUA.

Table 8.2.3 FEGUA's Income in 2018

ID	Description	Amount (GTQ)	(in USD)	Ratio
1	Payment from Ferrovías	1,600,000	211,000	33.0%
2	Leasement of Right of Way	192,000	25,000	4.0%
3	Land Leasing	1,548,000	204,000	31.9%
4	House Leasing	15,000	2,000	0.3%
5	Entrance Fees to the Railway Museum	135,000	18,000	2.8%
6	Subsidy from CIV	750,000	99,000	15.5%
7	Interests	110,000	15,000	2.3%
8	Decrease in Other Financial Assets	500,000	66,000	10.3%
Total		**4,850,000**	**640,000**	**100%**

Source: JST (Based on FEGUA's report)

Table 8.2.4 FEGUA's Expense in 2018

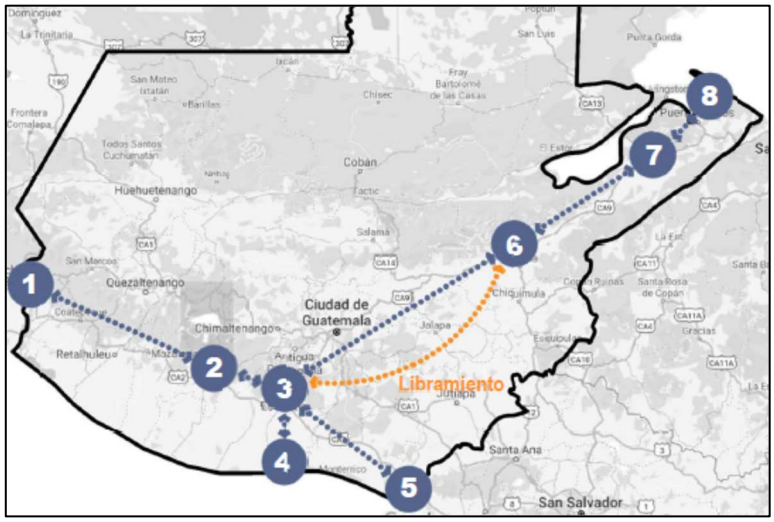
ID	Description	Amount (GTQ)	(in USD)	Ratio
1	Control and Conservation of Railway Assets	3,429,778	452,000	70.7%
2	Supervision of Railway and Lawsuits against Thefts	628,722	83,000	13.0%
3	Conservation of Historic Heritages and Railway	699,500	92,000	14.4%
4	Items Not Assignable	92,000	12,000	1.9%
Total		**4,850,000**	**639,000**	**100%**

Source: FEGUA, Annual Operative Plan Fiscal Year 2021

8.2.5 Ferrovías's Activities

At present, Ferrovías exclusively possesses a usufruct of the railway assets in the country, which are owned by FEGUA. According to the website of Ferrovías, its mission is to reactivate the railway system in Guatemala through the provision of railway transport services, complementary services, and other economic activities.

Ferrovías plans the reactivation of the railway, dividing the railway network into several sections shown in the figure below. Among these sections, the projects in Tecún Umán, Puerto Quetzal, and ports on the Atlantic coast seem to have priority since there are plans related to these three sections as illustrated in Section 8.8.4.



Legend

No.	Section
1	Tecún Umán – Mexico
2	Tecún Umán – Santa Lucía Cotzumalaguapa
3	Santa Lucía Cotzumalaguapa - Escuintla
4	Escuintla – Puerto Quetzal
5	Logistic Hub – Transfer Terminal on the border with El Salvador
6	Escuintla – Sanarate
7	Entre Ríos Intermodal Terminal
8	Ports on the Atlantic coast

Source: Ferrovías

Figure 8.2.6 Ferrovías's Plan of the Reactivation of Railway

8.2.6 Role of Railway in National Plans

This section reviews how the railway sector is ranked in the national plans.

(1) National Development Plan

In the National Development Plan (Plan Nacional de Desarrollo, "K'atun Nuestra Guatemala 2032"), which was formulated in 2014, there are few descriptions regarding railway. While this plan mentions FEGUA, neither specific projects nor plans are proposed there.

(2) National Strategic Plan of Logistics and Cargo (PENLOG)

In PENLOG ,which was prepared in 2016, as one of the actions to integrate a strategic national logistic system, it is proposed to develop a railway network and to rehabilitate the "sugar railway" (railway between Tecún Umán and Puerto Quetzal, which runs through sugar-producing area). This concept is illustrated as some projects (see Figure 8.2.5).

As the sections are prioritized in the table below, it is proposed to rehabilitate the railway from the west, Tecún Umán, to the east. This means that the government attaches great importance to the connectivity with Mexico or the US. Following table lists the actions proposed in PENLOG. Although cost is estimated, this amount seems to be insufficient for the rehabilitation of railway in a long distance. Furthermore, the detail of action, e.g. necessity of change of gauge, is not mentioned in PENLOG. The proposed actions need to be elaborated in further stage.

Table 8.2.5 Actions for the Development of Railway Proposed in PENLOG

Project Name / Section	Priority	Estimated Cost	Time Frame	Remark
Pacific Cargo Railroad		**GTQ 250,000,000 (USD 33,000,000)**		**In total**
Rehabilitation of National Railway (Sugar Transport)	Medium	GTQ 1,000,000 (USD 132,000)	4-10 years	Pre-investment stage
Section 1: Tecún-Umán Puerto Quetzal	High	-	1-10 years	
Section 2: Puerto Quetzal - Puerto Santo Tomás de Castilla	Medium	-	10-15 years	
Section: Santa María Station - Pedro Alvarado Border	Low	-	10-15 years	

Source: JST (Based on PENLOG)

8.3 Current Situation of the Railway Sector in El Salvador

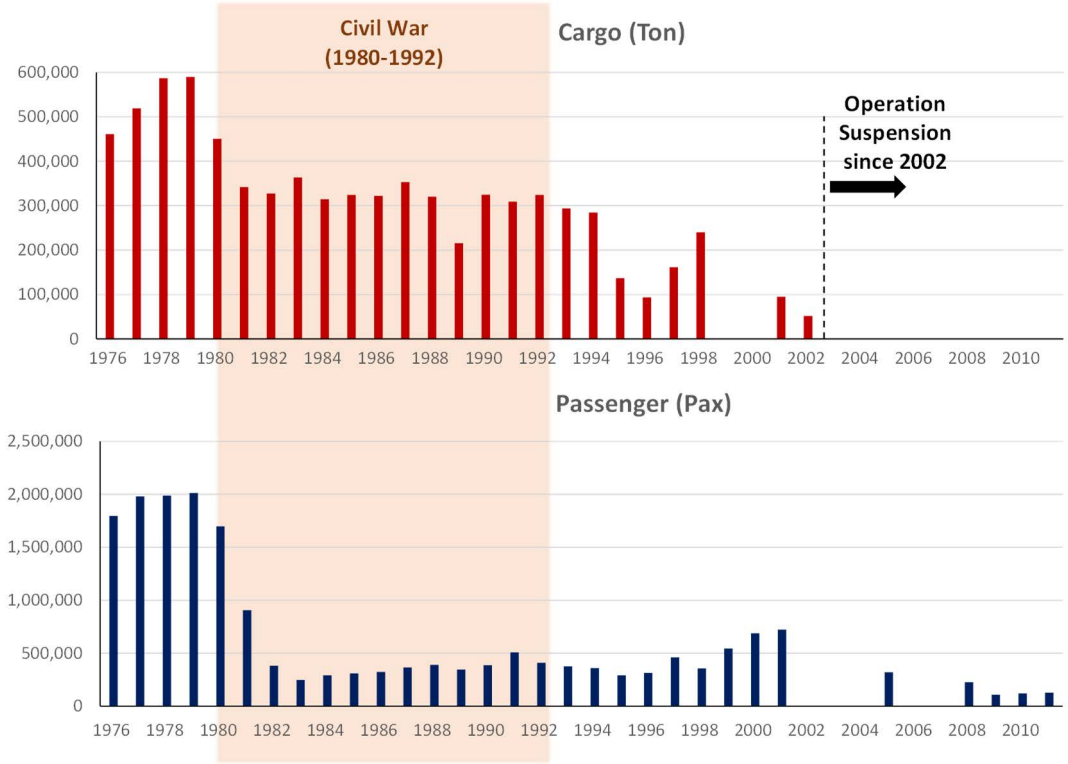
8.3.1 History of the Railway in El Salvador

In El Salvador, the first railway began to operate between Sonsonate and Acajutla in 1882, under a contract between the government and a company named Compaña del Ferrocarril de Acajutla. This railway was used for the transportation of coffee beans. Then the railway was extended to San Salvador and Santa Ana while the operator was sometimes changed.

In the eastern area of the country, on the other hand, a railway was opened by the International Railways of Central America (hereinafter referred to as "IRCA"), which was a subsidiary of a banana company, United Fruit Company, in 1912 between San Miguel and La Unión. After the inauguration, the railway was extended to San Salvador in 1920, passing through Usulután, Zacatecoluca and Cojutepeque. Furthermore, in 1929, the railway reached Metapán and the border of Guatemala, where IRCA owned the railway network to Puerto Barrios.

Through some changes of the operator of the railway, Ferrocarriles Nacionales de El Salvador (hereinafter referred to as "FENADESAL") was established under Comisión Ejecutiva Portuaria Autónoma (hereinafter referred to as "CEPA") in 1974, and became both the owner and the operator of the entire railway of the country pursuant to Legislative Decree No. 269, May 1975. The foundation of FENADESAL meant the merging of two railway operators of the western and the eastern part of the country.

The movement of cargo and passenger, however, had been decreased gradually, due to the damage brought about by the civil war from 1980 to 1992 (see the figure below). In 2002, the operation of trains was suspended except for short-distance trains between San Salvador and Apopá. Meanwhile, the most employees of FENADESAL were laid off. Finally, the train operation between San Salvador and Apopá was terminated in 2012 too.



Note: The data of cargo volume around 2000 and passenger volume around 2001-2007 are missing.
Source: JST (Based on the report of CEPA and Ciudad Real et al.)

Figure 8.3.1 Transition of Passenger and Cargo Volume of FENADESAL

8.3.2 Law and Regulation on Railway Sector

Legislative Decree No. 269, which was enacted in May 1975, stipulates the establishment of FENADESAL. This decree, however, mainly refers to the treatment of personnel and scarcely mentions general affairs of FENADESAL such as its roles and objectives.

Apart from the law, the Manual of Organization of FENADESAL (Manual de Organización de Ferrocarriles Nacionales de El Salvador) was prepared by CEPA in 2011. The table of contents of the manual is listed below. Although the functions of each department are defined in this manual, any technical information such as standards are not provided.

Table 8.3.1 Table of Contents of the Manual of Organization of FENADESAL

Section	Contents	Section	Contents
1	Background of the creation of FENADESAL	8	Objectives and function of FENADESAL
		8.1	Railway management
2	Objectives of the manual	8.2	Legal advisory unit
3	Area of application	8.3	Security section
4	Rules for its use and updating of the manual	8.4	Railway maintenance department
		8.5	Track and structures maintenance section
5	Organization structure	8.6	Administrative department
6	Overall objective	8.7	Finance section
7	General functions of FENADESAL	8.8	Materials and supplies warehouse section
		8.9	IT section
		8.10	General services section
		8.11	Railway operation department

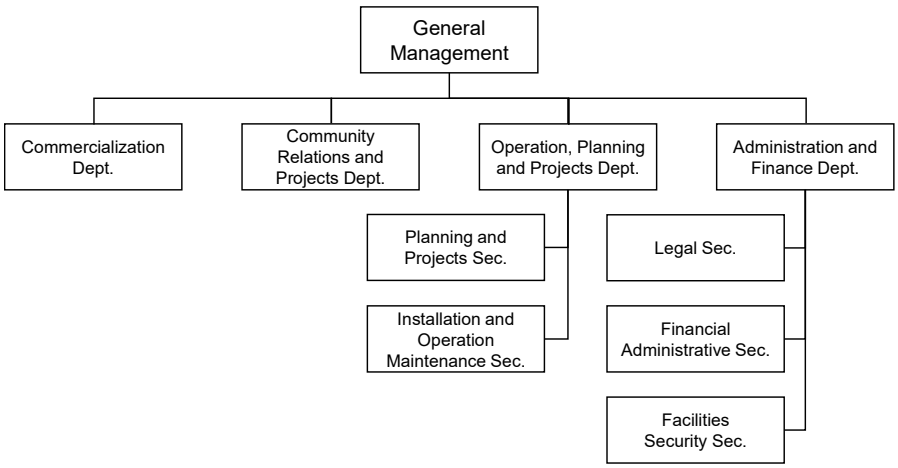
Source: Manual of Organization of FENADESAL

8.3.3 Railway Network and Current Situation

(1) Ferrocarriles Nacionales de El Salvador (FENADESAL)

FENADESAL is a state-owned company and has 16 permanent employees as of 2020. The organogram of FENADESAL is shown below.

The actual functions of FENADESAL are limited to the maintenance of the central station of San Salvador, the surveillance of the stations and rights of way of the country, and the administration of the lands and the railroad yards. According to CEPA, FENADESAL has no staff in charge of the operation of the railways at present.



Source: CEPA

Figure 8.3.2 Organogram of FEGUA

(2) Railway Network in El Salvador

In El Salvador, the railway network consisting of three districts spreads nationwide with a length of 471 km. The lengths of each section are tabulated below. However, the railway is not operated at present because of the deterioration of the infrastructure etc. The right of way of the railway, whose width is 17 -30.5 m, is occupied by local people in many sections throughout the route. The geometric characteristics of the railway are summarized below.

Table 8.3.2 Railway Network of FENADESAL

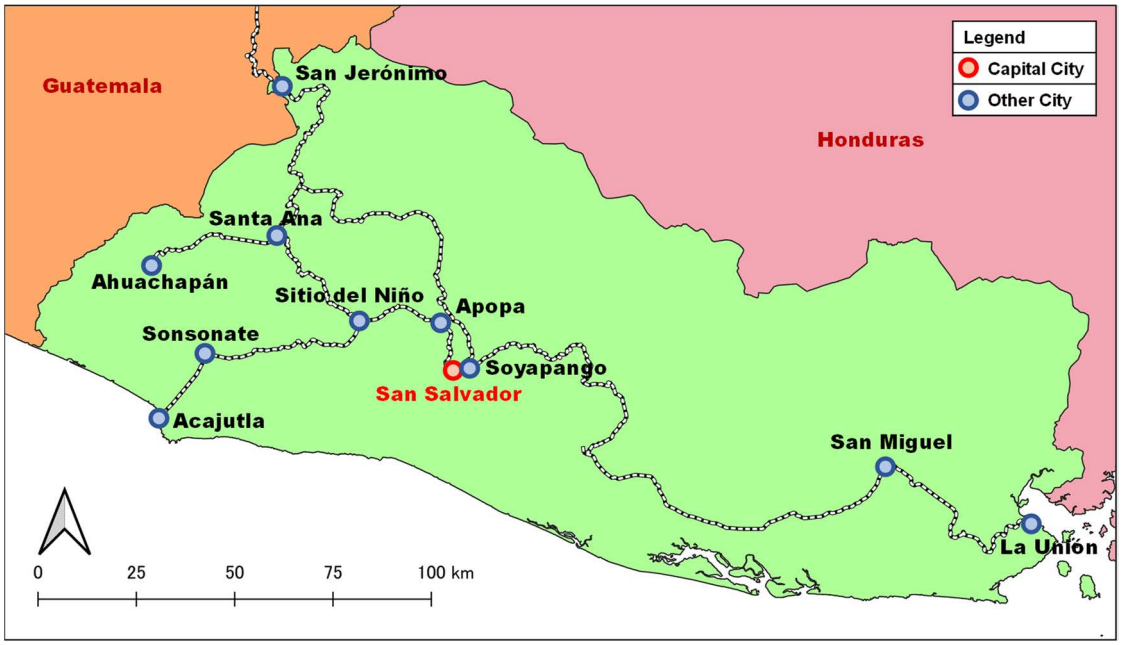
District	Section			Length
District No. 1	La Unión	-	San Salvador	201.2 km
District No. 2	Soyapango	-	Frontera-San Jerónimo	126.7 km
District No. 3	San Salvador	-	Puerto de Acajutla	100.5 km
	Sitio del Niño	-	Santa Ana	40.0 km
	Branch in Acajutla			2.6 km
Total				**471.0 km**

Source: CEPA

Table 8.3.3 Geometric Characteristics of the Railway in El Salvador

Item	Description
Gauge	914 mm (narrow gauge) is applied because of economic and technical reasons.
Rail	30 kg rail (60 lb per yd.)
Vertical gradient	1-3.8%
Minimum curve radius	109 m

Source: JST (Based on the questionnaire to CEPA)



Note: Section between Santa Ana and Ahuachapán is shown in the map although it is not listed in the Table 8.3.2.
Source: CEPA

Figure 8.3.3 Railway Network of El Salvador



Source: JST

Figure 8.3.4 Rolling Stock at the Railway Museum in San Salvador



Source: JST

Figure 8.3.5 Workshop at the Railway Museum in San Salvador

(3) Rolling Stock and Equipment

The rolling stock which was purchased 85 years ago or more, and equipment are in poor condition although they are repaired at the workshop at the Central Station in San Salvador.

The Central Station including depot and workshop is opened to the public as a railway museum. According to a guide of the museum, a train is operated inside the depot for the visitors of the museum.

8.3.4 Financial Status of FENADESAL

The annual income and expense of FENADESAL are illustrated below. As the table and the graph shows, the annual expense is approximately USD 1 million while the annual income is approximately USD 0.5 million except for 2018. Since the railway operation is suspended, the budget of FENADESAL is small and does not include investments and maintenance work.

Table 8.3.4 Annual Income and Expense of FENADESAL (2015 – 2018)

Item	2015	2016	2017	2018
Income	**385,357**	**415,157**	**580,079**	**1,700,721**
Financial Income and Others	350,466	228,171	420,626	343,846
Income from Current Transfer	0	17,492	1,401	0
Income from Sale of Goods and Services	12,278	95,542	140,944	1,340,311
Updates and Adjustments	22,612	73,952	17,109	16,563
Expenses	**1,197,567**	**1,092,736**	**1,011,730**	**973,243**
Personnel Expenses	528,999	550,165	589,771	565,888
Expense on Consumer Goods and Services	416,848	455,475	312,002	315,895
Capitalizable Assets Expenses	29,649	6,501	6,111	4,342
Financial Expenses and Others	24,727	23,466	39,711	37,683
Cost of Sales and Calculated Charges	195,401	57,129	58,839	42,395
Updates and Adjustments	1,942	0	0	7,040
Expenses on Transfers Granted	0	0	5,295	0
Balance	**-812,210**	**-677,580**	**-431,651**	**727,477**

Unit: USD
Source: JST (Based on the reports of CEPA)

8.3.5 Role of Railway in National Plans

(1) National Plan of Territorial Coordination and Development (PNODT)

In the National Plan of Territorial Coordination and Development (Plan Nacional de Ordenamiento y Desarrollo Territorial, hereinafter referred to as "PNODT"), a future road network is proposed along with spatial distribution of industries. On the other hand, the development of the railway network is not mentioned there.

(2) National Cargo Logistics Plan (PNLOG)

In contrast to PNODT, in the National Cargo Logistics Plan (Plan Nacional de Logística de Cargas, hereinafter referred to as "PNLOG"), the revitalization of railway is clearly suggested in order to improve the current situation of the absence of the railway. Referring to PMRML and IDB's study (see Section 8.8.1 and 8.8.2), PNLOG explains some activities and plans as shown in the table below.

Table 8.3.5 Railway Corridors Proposed in PNLOG

Route	Remark
Sitio del Niño-San Salvador	Under the support of CABEI, the feasibility study on these routes including the master plan of the railway system is planned. Both passenger and cargo transport are included in the scope of the study.
San Salvador- El Salvador International Airport	
Escuintla (Guatemala) – Santa María – Puerto de Acajutla – San Salvador	These routes are identified in the IDB's study "Situación y Perspectivas de la Actividad Ferroviaria en Mesoamérica (Situation and Prospects of Rail Activity in Mesoamerica)"
Zacapa – Anguiatú – San Salvador	
Puerto La Unión – Aeropuerto – San Salvador	
Puerto La Unión – San Pedro Sula – Puerto Cortés	

Source: JST (Based on PNLOG)

8.4 Current Situation of the Railway Sector in Honduras

8.4.1 History of the Railway in Honduras

In Honduras, the history of the railway dates back to 1870. The operation of the railway was started between Puerto Cortés and San Pedro Sula by the Standard Fruit Company and Tela Railroad, which was delegated to both by the Government of Honduras. The major goods transported were bananas, lumber, and ore.

In 1983, an autonomous institution, Ferrocaril Nacional de Honduras (hereinafter referred to as "FNH"), was established, succeeding the Standard Fruits Company for its railway. In addition, the railway of Tela Railroad was handed over to FNH in 1983.

FNH operated the railway since its foundations. In 1998, however, FNH's railway infrastructure and equipment were severely damaged by the Hurricane Mitch. Eventually, the operation of the railway was forced to be suspended in 2004.

8.4.2 Law and Regulation on Railway Sector

(1) The National Railroad Constitutive Law (Decree 48, 1958)

The National Railroad Constitutive Law (Decree 48, 1958), which was enacted in 1958, regulates the activity of FNH. This law was amended three times: Decree 36 in 1961, Decree 54 in 1965, and Decree 132-89 in 1989. Above all, Decree 132-89 in 1989 stipulates in Article 1 that the repair and maintenance of the national railway network shall be paid by the Secretariat of Communication, Public Works and Transportation (Secretaría de Comunicaciones, Obras Públicas y Transporte), which is also in charge of carrying out the study and construction of the extension of the railway to the port.

The contents of this law are summarized in the following table. It is interesting that the law clearly refers to the development of "an interoceanic railway" in Article 7, stipulating "FNH will plan and carry out, to the extent of its availability, the extension of its main line until the interoceanic railway is completed".

Table 8.4.1 Summary of the National Railroad Constitutive Law (Decree 48, 1958)

Chapter	Article	Example of Articles
I: Company	1-5	1: Constitution of FNH 2: Related ministry
II: Objectives of the company	6-13	7: Extension of the railway 9: Fare of railway service 11: Scope of the services of FNH
III: Railway heritage	14-15	14: Assets of FNH (main route, stations, right of way etc.)
IV: Financial structure	16-20	16: Income of FNH
V: Administration	21-22	21: Administration by the Board of Directors
VI: Board of Directors	23-	23: Member of the Board of Directors
VII: Session of the Board of Directors	26-31	26: Duties and powers of the Board of Directors
VIII: Management	32-33	33: Power of the managers
IX: Audit	34	34: Power of the auditor
X: Internal organization	35-40	36: Company regulations
XI: Benefits that the company will enjoy	41	41: Benefits that the company will enjoy (exemption of taxes and duties)
XII: Transitory disposition	42-44	44: Enforcement of the law

Source: JST (Based on Decree 48, 1958)

(2) Design Standard

The information regarding design standard is listed below. As far as studied by JST, it is not clear whether FNH uses an original or a foreign design standard.

Table 8.4.2 Information on Design Standard

Item	Description
Gauge	3 ft 6 in (1,067 mm)
Rail length	30 ft (9.14 m), 33 ft (10.06 m) and 39 ft (11.89 m)
Sleepers	7.0 ft * 8.0 cm * 7.0 cm (6.0 ft * 8.0 cm * 8.0 cm for bridge)

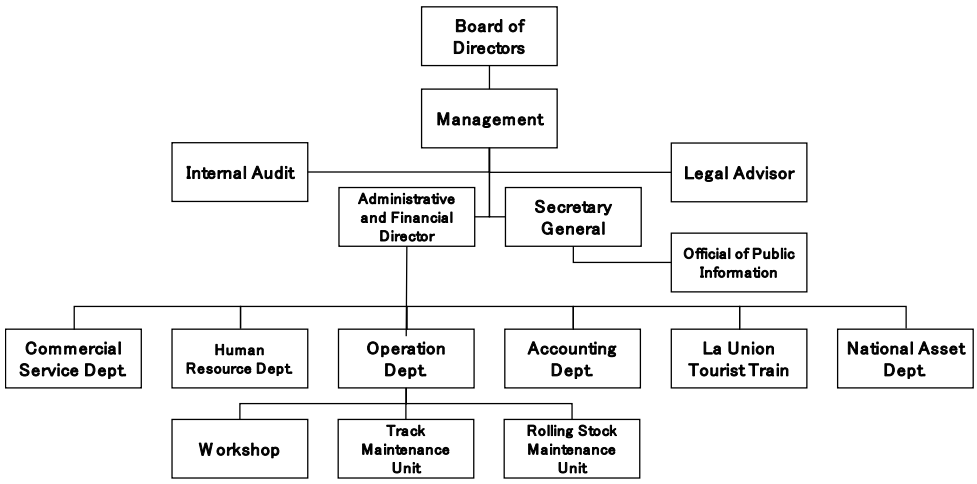
Source: FNH

8.4.3 Railway Network and Current Situation

(1) Ferrocaril Nacional de Honduras (National Railway of Honduras, FNH)

FNH is an autonomous institution established under the National Railroad Constitutive Law (Decree 48, 1958) and has 23 staff as of 2020. The organogram of FNH is shown below. Considering the number of staff, the human resource of each department is limited.

FNH operated passenger trains recently as illustrated later while cargo trains are not operated at present.



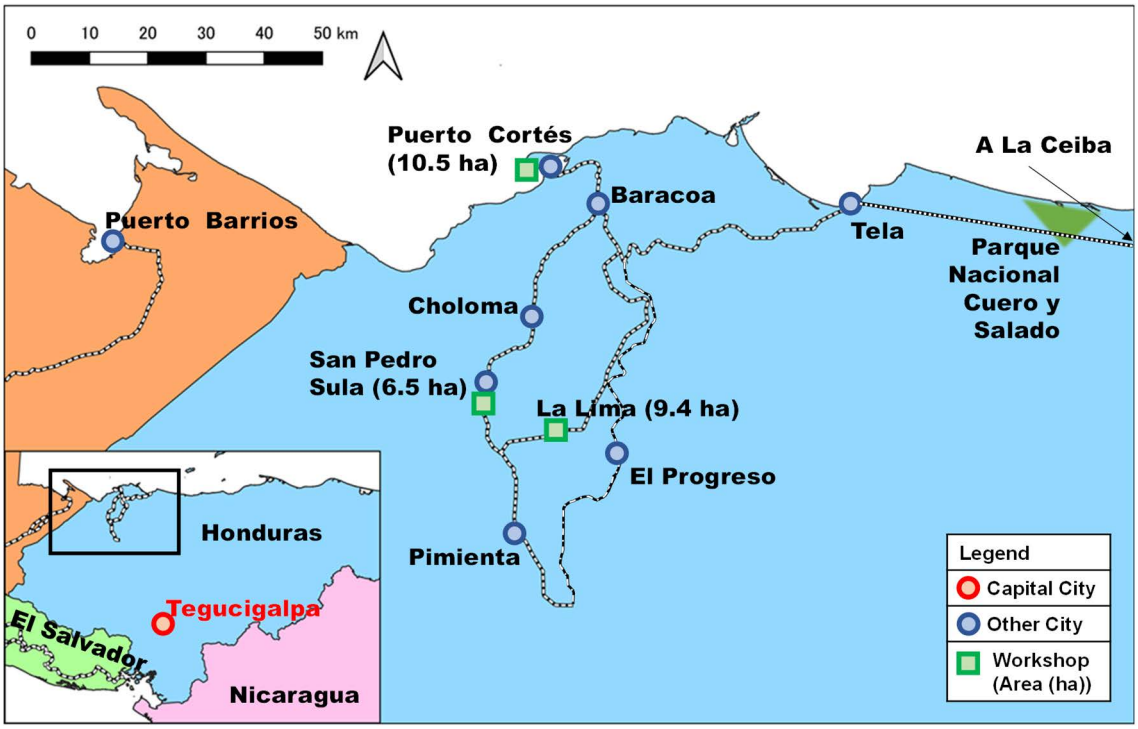
Source: FNH

Figure 8.4.1 Organogram of FNH

(2) Railway Network in Honduras

Originally, FNH had a railway network with a length of 199 km (see the figure below) from Puerto Cortés to San Pedro Sula and to La Ceiba. Along the route, there were five stations and three workshops. The railway network covered only the northwest region of the country, and the railway was not developed in Tegucigalpa, the capital city.

As aforementioned, the infrastructure of railway is in poor condition due to the obsolescence and natural disasters. Furthermore, it is noteworthy that the railway was damaged by two hurricanes, Iota and Eta, which attacked Central American countries in November 2020.



Note: The exact alignment between Tela and La Ceiba is not clear since this was not shown in the map provided by FNH
Source: JST (Based on the map provided by FNH)

Figure 8.4.2 Railway Network in Honduras

(3) Current Situation of Train Operation

Until COVID-19 pandemic, passenger trains had been operated in two areas. One was a passenger train in San Pedro Sula with a length of approximately 3 km. The train was operated between San Pedro Sula Station and the bus terminal. The other train was operated between La Unión and Cuero y Salado Wildlife Refuge in the Department of Atlántida and its operational distance was 9 km. This train was used by not only tourists visiting the wildlife refuge but also local villagers. Compared to the original length of the railway, the operation of the railway was quite limited. According to FNH, both operations have been suspended since COVID-19 pandemic.

The fare and the number of passengers are shown in the following two tables respectively. In 2019, out of 31,551 passengers, 13,276 were the passengers of the train in San Pedro Sula while 18,275 were the passengers of the train between La Unión and Cuero y Salado Wildlife Refuge.

Table 8.4.3 Fare of Passenger Train

Route	Type of Passenger	Fare (HNL : Lempira)	(Equivalent to USD)
Service in San Pedro Sula	Passenger	HNL 5	0.21
	School Tour	HNL 25	1.06
Service in Cuero y Salado Wildlife Refuge	Local Passenger	HNL 20	0.85
	National Tourist	HNL 50	2.12
	Foreign Tourist	HNL 125	5.29

Source: FNH

Table 8.4.4 Annual Ridership of FNH

Year	2016	2017	2018	2019
Annual Ridership (pax)	45,051	17,025	18,699	31,551

Source: FNH

(4) Rolling Stock

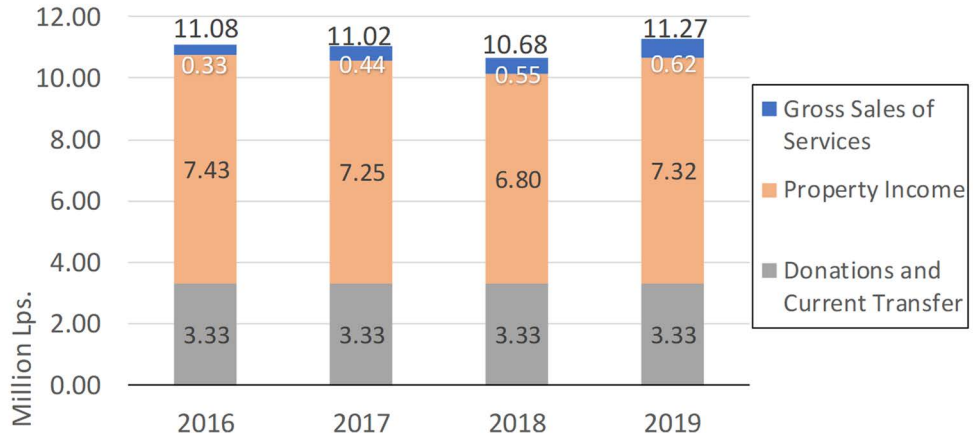
FNH possesses two diesel electric locomotives and three wagons. They have no longer purchased rolling stock since 1971. The locomotives were manufactured by General Electrics and have 120 horsepower. The capacity of the passenger wagon is 60 people/car.

8.4.4 Financial Status of FNH

The financial status of FNH is illustrated in the graphs below. The income of FNH consists of the following three items:

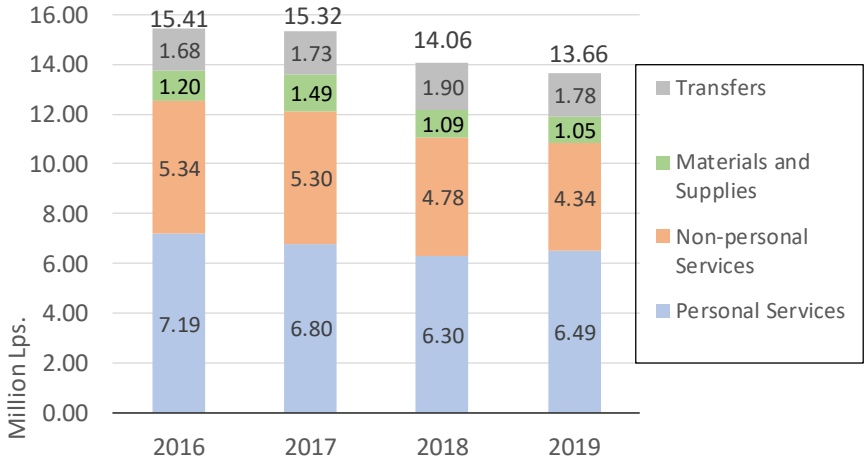
- Gross Sales of Services: Passenger services in San Pedro Sula and Cuero y Salado Wildlife Refuge
- Property Income: Rental fee of FNH's land, building and equipment and interest of fixed deposit
- Donations and Current Transfer: Governmental fund received from the national treasury via INSEP

As these graphs show, the annual income and expense of FNH are approximately HNL 11 million and HNL 14-15 million respectively. Thus, the financial status of FNH is in deficit.



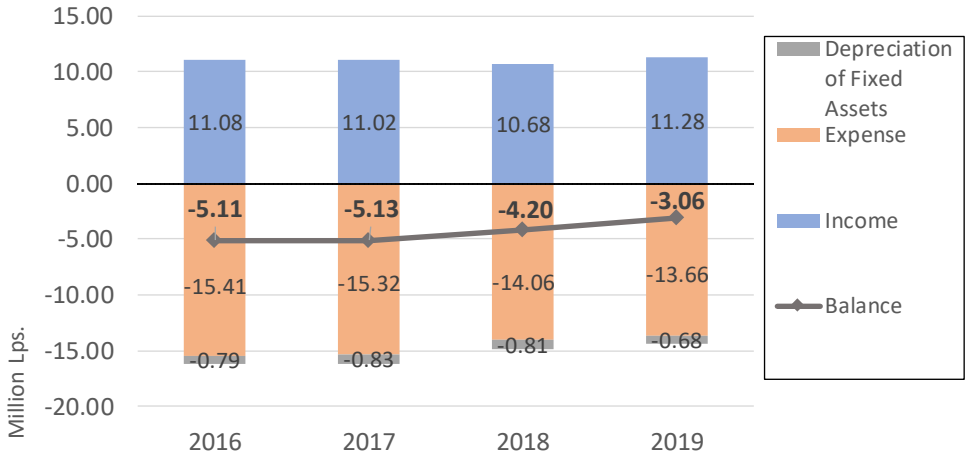
Source: JST (Based on the annual financial reports of FNH)

Figure 8.4.3 Annual Income of FNH



Source: JST (Based on the annual financial reports of FNH)

Figure 8.4.4 Annual Expense of FNH



Source: JST (Based on the annual financial reports of FNH)

Figure 8.4.5 Financial Status of FNH

8.4.5 Role of Railway in National Plans

(1) Country Vision 2010 – 2038 and National Plan 2010 - 2022

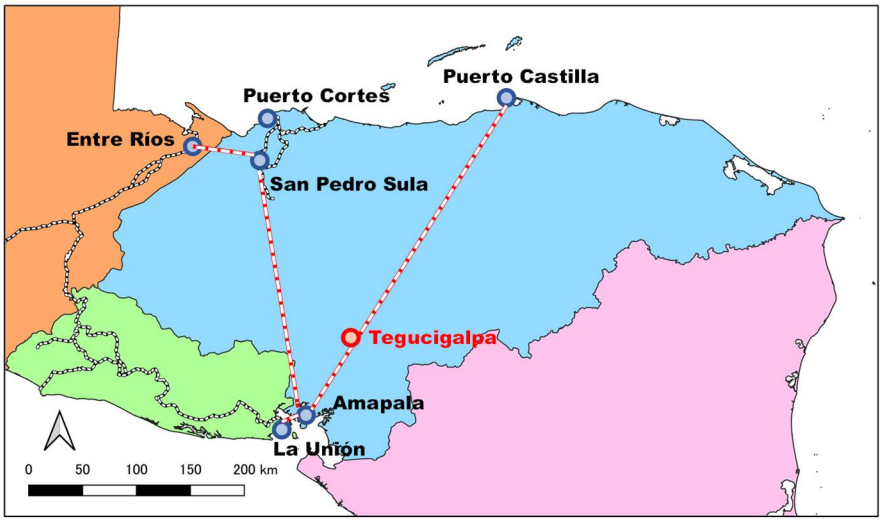
In the national development plan named "Visión de País 2010−2038 y Plan de Nación 2010-2022 (Country Vision 2010−2038 and National Plan 2010−2022)", which was formulated in 2010, the importance of a productive infrastructure is stated. In this plan, it is proposed to develop wide range of infrastructure sectors such as road, port, and irrigation as engines of economic activities. However, the development of railway is not mentioned there.

(2) National Cargo Logistics Plan (PNLOG)

In the National Cargo Logistics Plan (Plan Nacional de Logística de Cargas, hereinafter referred to as "PNLOG"), which was updated in 2019, the development of a railway corridor is regarded as one of the actions for the "Creation of a strategic national logistics system" strategy. In addition, PNLOG refers to several plans including those proposed in IDB's study as shown in the table below. However, it was not mentioned in PNLOG which section is to be prioritized.

Table 8.4.5 Railway Corridor Proposed in PNLOG

Route	Remark
Amapala in Tigre Island - Puerto Castilla*	In July 2015, a memorandum of understanding was signed with a Chinese company, China Harbor Engineering Company Ltd. (CHEC) to begin a feasibility study.
Port of La Unión (El Salvador) - San Pedro Sula - Puerto Cortes	These routes are identified in the IDB's study "Situación y Perspectivas de la Actividad Ferroviaria en Mesoamérica (Situation and Prospects of Rail Activity in Mesoamerica)"
Port of Amapala - Puerto Castilla (Trujillo)*	
Entre Ríos (Guatemala) - San Pedro Sula - Puerto Cortes	



Note*: Both railways seem to take the same route, judging from the figures in PNLOG
Note: The route shown in the map is image.
Source: JST (Based on PNLOG)

8.5 Current Situation of the Railway Sector in Nicaragua

8.5.1 History and Current Situation of the Railway in Nicaragua

Currently, railway is not operated in Nicaragua at all. In the past, however, there was a railway with a length of 430 km and its route was Puerto Corinto – Leon – Managua – Masaya – Granada with a branch line starting from Leon. In addition, there was short-distance railways in the northern and southern Caribbean regions of the country.

The railway was managed by an organization under MTI. In the 1990s, the railway facility was sold and then the track no longer remains. Meanwhile, the organization in charge of the railway was dissolved.

8.5.2 Role of Railway in National Plans

(1) National Development Plan

In the National Human Development Program 2018-2021 (Ejes del Programa Nacional de Desarrollo Humano 2018-2021), which was formulated in 2017, nineteen axes are proposed to foster not only social development but also facilitation of investments and urban development. Among these axes, the axis of "infrastructure" proposes the development of transport infrastructure including railway in order to integrate the national territory. However, neither specific projects nor concrete strategy are described there.

(2) National Transport Plan Prepared by JICA

In 2014, the National Transport Plan was prepared with the support of JICA. This plan proposes several projects to improve the transportation sector in the country. Although roadway, port and airport projects are mentioned there, the railway sector is not described.

(3) National Cargo Logistics Plan (PNLOG)

In Nicaragua, the National Cargo Logistics Plan (Plan Estratégico Nacional de Logística de Cargas, hereinafter referred to as "PNLOG"), was formulated in 2018. In PNLOG, as one of the actions to strengthen the transport network, the investment in a railway network is proposed. Furthermore, PNLOG cites the concept of PMRML that the railway constitutes the sectoral axes of transport of passengers and cargo.

On the other hand, it is proposed to develop an access road to Puerto Corinto by using the right of way of the railway. If this idea is realized, the right of way of the railway will not be able to be used for the future revitalization of the railway.

8.6 Current Situation of the Railway Sector in Costa Rica

8.6.1 History of the Railway

In Costa Rica, railway had been developed since 1871 and was used for the transportation of banana and coffee beans. After several times of reorganization, the Instituto Costarricense de Ferrocarriles (hereinafter referred to as "INCOFER") was established under the Law 7001 in 1985 as a sole railway operator.

The operation of the railway was, however, suspended between 1995 and 1998 due to the huge debt. As a result, the railway infrastructure, rolling stock etc. were deteriorated. After the resumption of the operation of the railway in 1998, INCOFER Institutional Strategic Framework and Law 9366 "Fortalecimiento del Instituto Costarricense de Ferrocarriles (INCOFER) y Promoción del Tren Eléctrico Interurbano de la Gran Área Metropolitana" were approved in 2012 and 2016 respectively in order to strengthen the railway sector.

8.6.2 Law and Regulation on Railway Sector

(1) Laws Concerning Railway

As aforementioned, the laws concerning the railway in the country are Law 7001 and Law 9366 which were enacted in 1985 and 2016, respectively. The composition of Law 7001 is shown in the table below.

Table 8.6.1 Composition of Law 7001, 1985

Chapter	Article	Example of Article
I: Constitution	1-2	1: Constitution of INCOFER
II: Objectives	3	3: Objectives of INCOFER
III: Duties and powers	4	4: Duties and powers of INCOFER
IV: The Board of Directors	5-16	16: Duties and powers of the Board of Directors
V: Executive chairman	17-19	19: Duties and powers of the executive chairman
VI: Managers	20-22	20: Appointment of managers
VII: Audit	23-29	27: Duties and powers of the internal audit
VIII: Tariff	30-31	30: Regulations necessary for the establishment of tariffs
IX: Responsibilities	32-34	32-34: Indemnity of INCOFER
X: Arbitration	35	35: Arbitration
XI: Heritage	36-38	36: Heritage of INCOFER
XII: General provision	39-45	44: Tax exemption
XIII: Transitional provisions	-	Transitional provisions

Source: JST (Based on Law 7001)

The objectives of Law 9366 are to enhance the powers of INCOFER by amending and supplementing Law 7001 so that it is able to promote railway development projects by itself as summarized below.

Table 8.6.2 Outline of Law 9366, 2016

Major Points of Amendment	Target Projects
• Supplements to the objectives of INCOFER • Supplements to the duties and powers of the Board of Directors	• Intercity electric train in the metropolitan area • Electric train from La Cruz to Moín • Railway between Turrialba and Siquirres

Source: JST (Based on the law 9366)

(2) Technical Standards

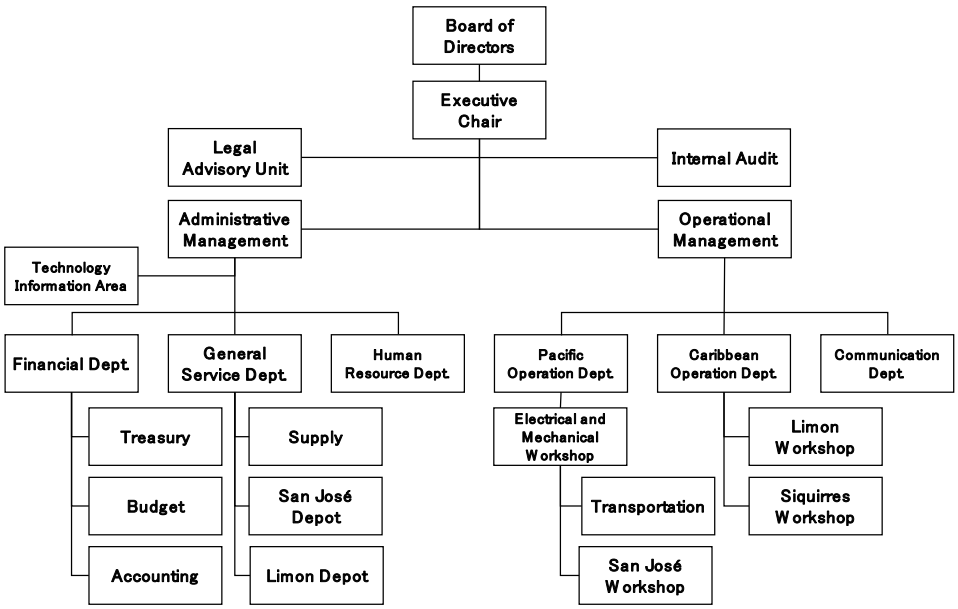
In INCOFER, American Railway Engineering and Maintenance-of-way Association (AREMA) Standards are applied as the technical standards. According to INCOFER, sleepers and ballast are based on AREMA Standards.

8.6.3 Railway Network and Current Situation

(1) INCOFER

INCOFER is an autonomous institute with 55 employees as of 2020 and operates both cargo and passenger trains. The organogram of INCOFER is shown below.

Although INCOFER is an autonomous organization, the tariff of both passenger and cargo transport is regulated by Autoridad Reguladora de Los Servicios Públicos (ARESEP), which regulates public services such as electricity.



Source: INCOFER

Figure 8.6.1 Organogram of INCOFER

(2) Railway Network in Costa Rica

INCOFER has a railway network with a length of 537 km from Puntarenas in the Pacific side to Limón in the Caribbean side via San Jóse including some branch lines. The railway is single track with some sidings. Because of the deterioration of the infrastructure, however, only 168.5 km out of 537 km is under operation: 72.5 km in the San Jóse Metropolitan Area called Gran Área Metropolitana (hereinafter referred to as

"GAM") and 96 km in Limón Province. The map of the railway network and the geometric features are illustrated below.



Source: JST

Figure 8.6.2 Railway Network of INCOFER

Table 8.6.3 Geometric Features of INCOFER's Railway

Item	Description
Track	Narrow gauge (1,067 mm)
Minimum Curve Radius	70 m (In GAM)
Maximum	4% (In GAM)
Axle Load	16 ton/axle
Effective Length in Station, etc.	50-150 m
Number of Bridge	46 (from Paraíso (near Cartago) to Puntarenas) 220 (in the Caribbean region. 50 bridges are longer than 15 m)

Source: JST (Based on the questionnaire to INCOFER)

(3) Cargo Transport

INCOFER basically operates cargo trains in Limón Province, and the major goods are banana, steel ingot and paper carton, which are transported from/to the port. The route map is shown below. There are fifteen sidings along the single-track railway. In the Pacific area including GAM, cargo trains were previously operated from San José to Puntarenas via Caldera. Nevertheless, they were not operated at present.

The transition of the transported volume is tabulated below. Cargo trains are operated based on the demand. Then, the timetable is not set. On average, trains are operated five times a day while ten trains can be operated at most. The trainset consists of twelve flat wagons in maximum including a locomotive.

Banana boxes were transported from three farms in Monte Verde, Bananito and Valle la Estrella. In 2016, however, the transportation from Valle de Estrella was suspended due to the poor condition of the track and the shortage of rolling stock. That is why the transport volume of banana box has decreased significantly since 2017. With regard to steel ingots, they are transported from the Moín Port to a plant of ArcelorMittal[2] in Leesville, Guacimo. The transport volume of steel ingot has gradually increased on average. Cardboard is also transported from the Moín Port to Leesville, Guacimo.

The Caribbean region including Limón Province is a major fruit-producing district such as banana and

[2] ArcelorMittal and its subsidy in Brazil acquired the share of Laminadora Costarricense S/A in 2008. (https://www.businesswire.com/news/home/20080203005101/en/ArcelorMittal-Announces-Acquisition-Remaining-50-Stake-Laminadora)

pineapple, both of which are important exports of the country. Although such goods are produced in the region and then exported from the Moín Port, the use of railway transport is quite limited. This can be attributed to the deteriorated infrastructure and obsolete equipment including rolling stock.



Source: JST (Based on "INCOFER, Rehabilitación del Tren Eléctrico de Carga en las Regiones Huetar Caribe y Huetar Norte (TELCA), "Identificación del Proyecto", 2019")

Figure 8.6.3 Railway Network in Limón Province

Table 8.6.4 Transition of Cargo Transport Volume

Item (Unit)	2014	2015	2016	2017	2018
Banana (1,000 box)	4,877	3,901	4,176	2,664	1,879
Steel Ingot (1,000 ton)	56	66	70	95	80
Cardboard (40-feet container)	654	607	239	308	1,197

Source: JST (Based on "INCOFER, Informe Final de Gestion 2018" and "INCOFER, Identificacion del Proyecto, 2019")



Source: JST

Figure 8.6.4 Track near Siquirres



Source: JST

Figure 8.6.5 Steel Bridge over the Reventazon River



Source: JST

Figure 8.6.6 Workshop in Limón

The connectivity between railway and maritime transport in ports is not advanced so much. Firstly, in the Moín Port, there is a yard for cargo train, but this yard is separated from the port by a road. Thus, steel ingots need to be transported by truck from the yard to the pier. A new container terminal in the Moín Port operated by APM Terminals does not connect with the railway although the track passes near the terminal.

Secondly, in the Limón Port, which is basically used for cruise ships and not used for cargo transport these days, track is installed, and railway connects with the port physically. The track is, however, paved and thus not used regularly. According to INCOFER, in the special case such as loading/unloading of goods at the port, cargo train is operated on the track by removing the pavement temporarily.



Source: JST

Figure 8.6.7 New Container Terminal in the Moín Port



Source: JST

Figure 8.6.8 Ingot Yard in the Moín Port



Source: JST

Figure 8.6.9 Track Covered with Pavement in the Limón Port

(4) Passenger Transport

INCOFER operates two types of passenger train: one is commuter train operated in GAM and the other is cruise train for tourists in both the Pacific coast and Limón Province. The rolling stock of both trains are shown below.

In GAM, commuter trains connect San José with its satellite cities. The railway network can be roughly divided into three routes: San José – Heredia – Alajuela, San José – Cartago and San José – San Antonio de Belén.

The transition of passenger volume of commuter train in GAM is shown in the graph below. The total number of passengers had gradually increased from 2014 to 2017. In 2018, however, the number of passengers rapidly decreased because of a significant damage of rolling stock and train collision accidents.

In Limón Province, cruise trains for tourists are operated three times a day during the high season (dry season from November to May). This cruise train runs 12 km from the coast to a town named Saborío, where banana plantation is spread.

The transition of passengers of cruise train is shown in the graph below. The figures in the graph are estimates based on the capacity of the cargo operated since INCOFER only operates the train and thus does not know the actual number of passengers.



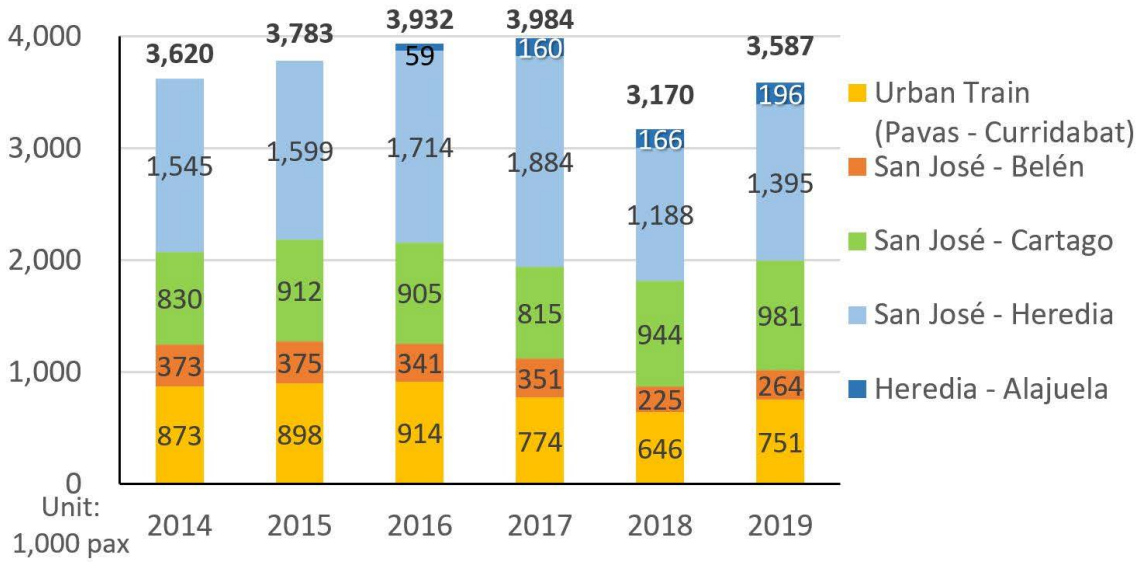
Source: JST

Figure 8.6.10 Commuter Train in GAM



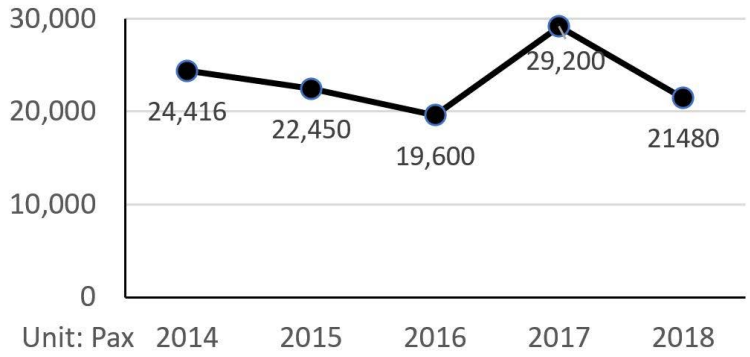
Source: JST

Figure 8.6.11 Wagon for Cruise Train



Source: JST (Based on "INCOFER, Informe Final de Gestion 2018" and questionnaire to INCOFER)

Figure 8.6.12 Transition of Passenger Volume in GAM



Source: INCOFER, Informe Final de Gestion 2018

Figure 8.6.13 Transition of Estimated Passenger Volume of Cruise Train

(5) Rolling Stock of INCOFER

The rolling stock owned by INCOFER as of 2020 is listed in the table below.

For the cargo transport in Limón Province, six locomotives and 115 wagons are used. In GAM, three locomotives are used for passenger transport and each trainset consists of four to five wagons besides locomotives. In addition, eight trainsets of two-car diesel multiple units are also operated there.

Table 8.6.5 Rolling Stock of INCOFER

Type	Quantity	Depot Location	Remark
Locomotive	15	San José, Caldera and Limón	Horsepower: 240-1100 hp
Diesel Multiple Unit	19	San José	Capacity: 90 pax.
Motor Car	8	San José and Limón	For inspection and maintenance
Caboose	5	Caldera and Limón	
Passenger Wagon	27	San José, Caldera and Limón	Capacity: 80-90 pax.
Water Wagon	15	San José, Caldera and Limón	Capacity: 25 ton
Flat Wagon	134	San José, Caldera and Limón	Capacity: 30 ton
Other Wagon	107	San José, Caldera and Limón	

Source: JST (Based on the questionnaire to INCOFER)

(6) Railway System

The railway system applied to INCOFER's railway is summarized below. The Atlantic sector (freight train in Limón Province) and the Pacific sector (passenger train in GAM) are operated separately.

Table 8.6.6 Railway System Applied in INCOFER's Railway

Item	System Applied	Remark
Train dispatching system	Direct train control	Train dispatchers issue orders to train drivers
Blocking system	Manual track change	ASFA, PZB/Indusi and CBTC are not used
Telecommunication system	Analogue radio communication	Frequency: 163 – 168 MHz
Electrification	Not electrified	Electrified in the past

Note: ASFA: Anuncio de Señales y Frenado Automático (Announcement of Signals and Automatic Braking)
PZB: Punktförmige Zugbeeinflussung
CBCT: Communication Based Train Control

Source: JST (Based on the answer to the questionnaire to INCOFER)

8.6.4 Financial Status of INCOFER

The following table illustrates INCOFER's status of both income and expense from 2016 to 2018. As this table shows, expense exceeds income every year, i.e., the financial status is in deficit. This deficit is covered by the capital transfer from the Ministry of Finance and public bond. Due to the increase in the expense related to train operation services, and materials and supplies, the total expense increases and so does the deficit.

The breakdown of the income of cargo transport is tabulated in the next table. The income increases and decreases depending on the volume of cargo.

Table 8.6.7 INCOFER's Status of Income and Expense

Item	2016		2017		2018	
Income						
Cargo Transport	N/A		608	(1.0)	542	(0.9)
Passenger Transport	N/A		1,845	(3.0)	1,521	(2.5)
Subtotal Transport	2,366	(3.9)	2,453	(4.0)	2,063	(3.4)
Rentals	1,281	(2.1)	1,542	(2.5)	1,272	(2.1)
Other Incomes	80	(0.1)	124	(0.2)	554	(0.9)
Total Income	**3,727**	**(6.1)**	**4,119**	**(6.8)**	**3,889**	**(6.4)**
Expense						
Personnel Expense	913	(1.5)	919	(1.5)	983	(1.6)
Services of Train Operation, etc.	3,489	(5.7)	4,110	(6.8)	4,425	(7.3)
Materials and Supplies	841	(1.4)	2,151	(3.5)	2,249	(3.7)
Consumption of Goods Other than Inventories	2,313	(3.8)	2,361	(3.9)	2,500	(4.1)
Other Expenses	118	(0.2)	237	(0.4)	326	(0.5)
Total Expense	**7,673**	**(12.6)**	**9,777**	**(16.1)**	**10,484**	**(17.2)**
Balance	**-3,946**	**(-6.5)**	**-5,658**	**(-9.3)**	**-6,595**	**(-10.8)**

Unit: Million CRC (million USD in parenthesis)
Source: JST (Based on INCOFER's financial reports)

Table 8.6.8 Breakdown of Income from Transportation of Goods

Commodity	2017		2018	
Banana	205	(337)	144	(237)
Steel Ingot	379	(623)	277	(455)
Cardboard	24	(39)	121	(199)
Total	608	(1,000)	542	(891)

Unit: Million CRC (Thousand USD in parenthesis)
Source: INCOFER

8.6.5 Role of Railway in National Plans

(1) National Development Plan

The National Development Plan 2015-2018 (Plan Nacional de Desarrollo, hereinafter referred to as "PND") ranks the railway sector as follows:

- Transport and infrastructure sector including railway sector is of great importance for the national economy, since it not only fosters foreign economic activities such as tourism, but also improves the quality of life of the citizens by providing more safe and efficient means of mobility.
- Deficiency in infrastructure and equipment of transport sector including railway negatively affects the country's competitiveness.
- It is proposed to implement an action program for the development of the railway network of both cargo and passenger transport in order to improve the competitiveness.
- To improve the mobility in GAM and the nationwide transport of goods, the development of Transporte Rápido de Pasajeros project and the rehabilitation of cargo railway network are proposed with quantitative targets.

As abovementioned, PND proposes to promote the country's economy and enhance the competitiveness by developing both passenger and cargo railway.

(2) National Transport Plan

The National Transport Plan 2011-2035 (Plan Nacional de Transporte, hereinafter referred to as "PNT") aims at the improvement of transport system, setting its horizon to 2035. In PNT, which consists of seven action programs, the "creation of new competitive railway system" is ranked as the sixth action program. In addition, the seventh action program, "development and strengthening of intermodality and logistics", refers to the connection of railway with the other transportation modes such as maritime transportation, proposing the development of railway logistic platform.

In the sixth and seventh action programs, a wide range of projects are proposed as listed in the table below. As the table shows, the existing railway in the Caribbean region is planned to be extended up to La Cruz, a major city in the Pacific side. However, there is no large port near La Cruz. Thus, this railway will not be interoceanic railway without the development of a port or the further extension to a neighbor port.

Table 8.6.9 Proposed Projects in the National Transport Plan

Axis 6: Creation of New Competitive Railway System		Axis 7: Development and Strengthening of Intermodality and Logistics
Section	Length (Inc. Branch Line)	
Río Frío – Moín – Limón	157 km	**Location of Railway Logistic Platform**
Limón - Penshurt	41 km	• Río Frío
Penshurt - Hone Creek	15 km	• Muelle San Carlos
Muelle San Carlos - Río Frío	64 km	**Services of Railway Logistic Platform**

Axis 6: Creation of New Competitive Railway System		Axis 7: Development and Strengthening of Intermodality and Logistics
Section	**Length (Inc. Branch Line)**	
La Cruz - Muelle San Carlos	150 km	• Railway terminal of loading and unloading • Warehouse • Truck parking • Offices for public organization etc.
Valle Central (Ciruelas) - Pto. Caldera	80 km	
Metropolitan Railway Network for Passengers	120 km	
Total	**627 km**	

Source: JST (Based on PNT)

(3) National Cargo Logistics Plan (PNLog)

The National Cargo Logistic Plan 2014-2024 (Plan Nacional en Logística de Cargas, hereinafter referred to as "PNLog") describes the railway sector as follows:

- The share of railway in transportation of goods is quite limited.
- The railway infrastructure is in poor condition.
- The quality of railway infrastructure and reliable transport should be secured in order to reduce transport cost and to maintain the quality of goods.
- The accessibility to railway under operation is one of the strengths of the Limón and Moín Port, especially in view of the transport of agricultural products.

On the other hand, PNLog concludes with five strategic logistic subsystems enumerated below:

- Logistic and port system in Limón-Moín and support to traditional foreign trade
- Logistics to support manufacture of high value-added products
- Logistics to support agricultural exports
- Logistics of supplies for the tourism sector
- Logistics to support regional trade (Road trade with Central America)

In spite of the above observation on the railway sector, it is not expressly mentioned in the five strategic logistic subsystems. This attitude is different from that of PND and PNT, both of which propose several railway projects.

8.7 Current Situation of the Railway Sector in Panama

8.7.1 History of the Railway

In Panama, the construction of railway was started by a U.S. enterprise named Panama Railroad in 1850. After 5-year construction work, the railway connecting two oceans was completed in 1855. The railway was used for the transportation of both passengers and cargo. In the beginning of the 20th century, the railway was relocated because of the construction of the Panama Canal.

In 1977, the Panama Railroad was turned over to the Government of Panama under the terms of the Carter-Torrijos Treaty, which guaranteed that Panama would obtain the control of the Panama Canal after 1999. In 1998, however, under the governmental policy to privatize state-run facilities, the 50-year concession of the railway was granted to the Panama Canal Railway Company (hereinafter referred to as "PCRC"), a joint venture between Kansas City Southern, a U.S. railway operator, and Mi-Jack Products, a North American intermodal terminal operator.

This concession contract granted PCRC the exclusive right to construct, operate, renovate, and manage the railway and its infrastructure. PCRC rehabilitated the railway with an investment of USD 80 million and resumed the operation of the railway in 2001.

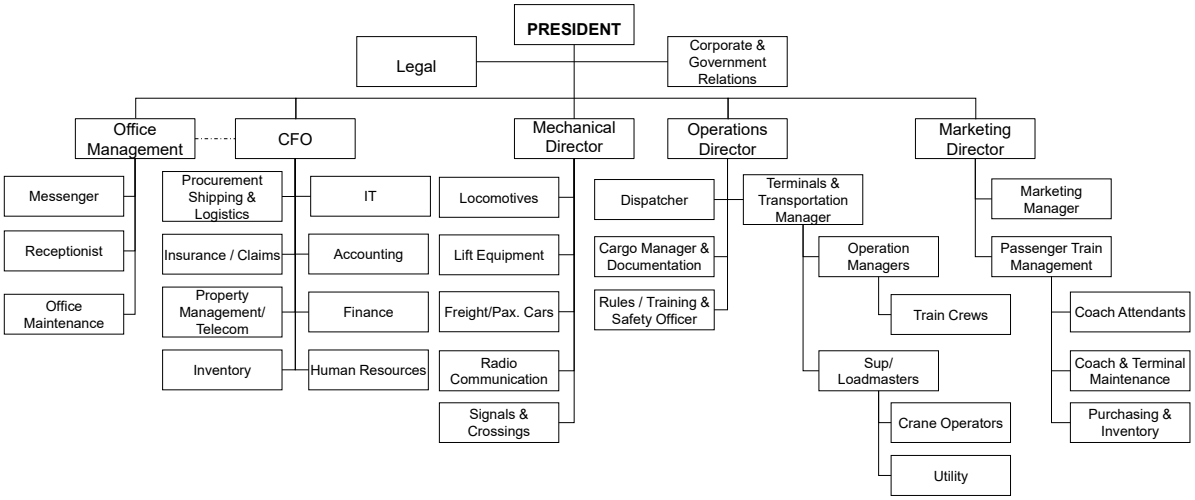
8.7.2 Laws and Regulation on Railway Sector

As far as JST collected information, there is no law concerning railway in Panama. PCRC operates trains in accordance with its own technical standard and Federal Railway Association (FRA) Standards of the US.

8.7.3 Railway Network and Current Situation

(1) Panama Canal Railway Company (PCRC)

PCRC was established in 1998 under a concession contract with the Panama Maritime Authority (Autoridad Maritima de Panamá, hereinafter referred to as "AMP") pursuant to Contract Law 15, 1998. PCRC has 185 employees as of 2020 and operates both cargo and passenger trains between Panama City and Colón. The organogram of PCRC is shown below.



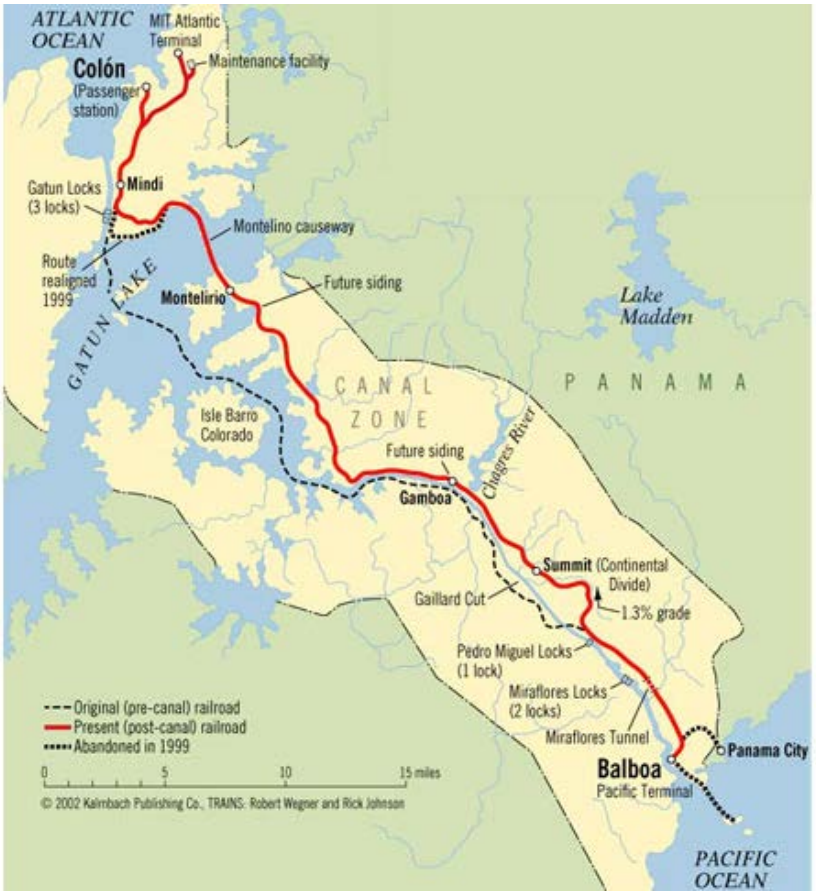
Source: PCRC

Figure 8.7.1 Organogram of PCRC

(2) Railway Network in Panama

The track of PCRC runs along the Panama Canal, connecting the Pacific and the Atlantic oceans. In the Pacific side, PCRC has Pacific Intermodal Terminal beside the Balboa Port and Corozal Passenger Station near Albrook, Panama City. In the Atlantic side, there are Atlantic Intermodal Terminal near Manzanillo Port and Atlantic Passenger Station in Colón. The major geometric specifications of PCRC are tabulated below.

Apart from PCRC, urban railway is operated in Panama City. Two lines are under operation while monorail is under construction as Line 3.



Source: Website of PCRC

Figure 8.7.2 PCRC's Railway Network



Source: Website of PCRC

Figure 8.7.3 Pacific Intermodal Terminal



Source: JST

Figure 8.7.4 Corozal Passenger Station



Source: Website of PCRC

Figure 8.7.5 Atlantic Intermodal Terminal



Source: JST

Figure 8.7.6 Atlantic Passenger Station

Table 8.7.1 Major Geometric Specifications of PCRC

Item	Value	Description
Route Length	Approx. 76 km (47 miles)	
Gauge	1,435 mm	Standard gauge
Track	Single track	Three sidings
Rail	136 lb. per yard	65.5 kg per meter
Maximum Gradient	1.24%	
Maximum Speed	96.5 km/h (60 mph)	
Bridge	11 bridges	Maximum length is 35.7 m
Tunnel	1 tunnel	Length is not clear

Source: JST

(3) Cargo Transport

At both cargo terminals in Panama City and Colón, three tracks with a length of approximately 900 m are installed. Typical train sets comprise six freight cars and convey 75 containers on average (60 forty-feet containers and 15 twenty-feet containers). The estimated handling capacity is 700,000 containers per year. The total cargo volume transported in 2011 was 7.89 million tons while that transported by vehicles was 0.97 million ton[3]. This preference toward railway can be attributed to the transportation cost of railway, which is almost half of that of vehicles[4].

In PCRC, transportation in bond is admitted by law, i.e., cargo can be transported duty-free between two ports. According to an interview with PCRC, most cargo transported by PCRC has its origin or destination in the Caribbean countries. For example, goods shipped from Jamaica are unloaded at the Colón Port, and transported by PCRC and loaded at the Balboa Port, and then shipped to Asian countries.

Furthermore, PCRC stated that its revenue fell down by 30% compared to previous year after the expansion work of the Panama Canal was completed in 2016. After the expansion, more shippers tend to choose Panama Canal rather than PCRC.

(4) Passenger Transport

Passenger trains are operated in one round-trip a day between Panama City and Colón from Monday to Friday. Train departs from Panama City in the morning while leaving Colón in the evening, and traveling time is one hour. Commuters as well as tourists use this train. The following table shows the tariff.

Table 8.7.2 Fare of PCRC

Type of Passenger	Fare (One-way)
Adults	USD 25.0
Children (2-12 years old)	USD 15.0
Retired/Senior Citizens	USD 17.5

Source: website of PCRC

(5) Rolling Stock and Other Equipment

Rolling stock owned by PCRC is listed below. In addition to the rolling stock, PCRC possesses maintenance equipment such as tamper, ballast regulator and container handling equipment such as gantry cranes and top loaders.

[3] PNLog,2014
[4] PNLog,2014

Table 8.7.3 Rolling Stock Owned by PCRC

Type		Quantity	Specification/ Description
Locomotive		11	Push-pull is applied for passenger train
Freight car	Double-stack freight car	22	Articulated 5 well bulkhead-type car
	Flat car	6	
	Open top hopper car	10	
Passenger car	Normal passenger car	5	Capacity: 50 people
	Dome car	1	Capacity: 60 people

Source: JST (Based on the website of PCRC)



Source: JST

Figure 8.7.7 Locomotive of PCRC



Source: JST

Figure 8.7.8 Freight Car of PCRC

8.7.4 Financial Status of PCRC

As of June 2021, the financial data of PCRC has not been disclosed to JST due to the concession contract between PCRC and AMP.

8.7.5 Role of Railway in National Plans

(1) Government Strategic Plan 2019–2024

In the Government Strategic Plan 2019–2024 which was established in 2019, there is no description related to the utilization and development of the railway.

(2) National Cargo Logistics Plan (PNLog)

The National Cargo Logistics Plan (Plan Nacional de Logística de Cargas, hereinafter referred to as "PNLog") was prepared in 2014 with the support of IDB.

In PNLog, the railway connecting two oceans is regarded as the strength of the logistic system of Panama. On the other hand, several issues of the railway are pointed out as follows:

- The transshipment demand is concentrated in weekends
- The trains are not occasionally operated on Wednesday and Thursday
- The cargo volume transported between two terminals is not balanced: there is a larger demand of the transportation of goods from Panama City to Colón
- The lack of personnel, efficient cargo equipment and sidings in the ports hinders punctual departure of trains
- Loading of cargo to wagons in the ports is prone to delay
- Therefore, the railway is not used to its full capacity

In order to improve the logistics in Panama, the following plans and ideas are introduced.

- Direct connection of the railway with Corozal area, where ACP (Panama Canal Authority) plans to

acquire a new naval port
- Modernization of the existing railway
- Feasibility study on the development of an east-west railway

8.8 On-going and Planned Projects

8.8.1 Role of Railway in PMRML

In PMRML, the railway sector constitutes six axes along with border integration, aviation, port and maritime, road infrastructure, and urban logistics. PMRML insists on the importance of the development of railway in light of the following purposes:

- To alleviate the many issues of road traffic such as deterioration of road condition and traffic congestion
- To activate the economy in the region and facilitate the export
- To preserve the natural environment including biodiversity

In order to fulfill the said purposes, the following five actions are defined:

- Development of the infrastructure of the railway transportation system and of the intermodal facilities
- Strengthening of the railway administrative system
- Training of personnel in the railway sector
- Resettlement of habitants occupying the right of way
- Definition of sustainable financial mechanisms

Regarding the development of the infrastructure, above all, it is noteworthy that PMRML puts an emphasis on the replacement of the existing narrow gauge (914 mm or 1,067 mm) with standard gauge (1,435 mm) which is applied in the US and Mexico since it enables the smooth connection with these giant markets.

8.8.2 IDB's Study on Railway Sector in Latin America

A study was conducted by IDB about the current situation of railway in Central America in 2014. This study identified ten projects as the projects proposed or promoted by each country (see the figure and the table below). It is noteworthy that among the ten projects, eight projects are connected to each other or to the Mexican railway network. Besides, this study also recommends changing the gauge from current narrow gauge to standard gauge and to conform with the standards and regulations applied in the US and Mexico.

In addition, the financial feasibility of the development of railway in Central America was analyzed in this study. The necessary cargo volume was calculated for the achievement of an internal rate of return of 10-15% under various scenarios. In this analysis, however, the priority of the development of the route and the economic impact (i.e., economic internal rate of return) were not considered.

In the report, it is proposed to carry out demand forecast as a next step to be taken.



Source: IDB, Situación Actual de los Sistemas Ferroviarios como parte de los Proyectos de Integración de Mesoamérica, 2014

Figure 8.8.1 Principal Railway Projects Identified in IDB's Study

Table 8.8.1 Route of the Principal Railway Projects Identified in IDB's Study

No	Country	Route
1	GT, MX	Intermodal Terminal in Tecún Umán and connection to Mexico
2	GT	Tecún Umán – Santa Maria – Escuintla
3	GT	Puerto Quetzal – Guatemala City - Puerto de Santo Tomás de Castilla - Puerto Barrios
4	GT, SV	Escuintla/Santa María - Puerto de Acajutla - San Salvador
5	GT, HN	Entre Ríos - San Pedro Sula - Puerto Cortes
6	GT, SV	Zacapa – Anguiatú - San Salvador
7	SV	Puerto La Unión-Aeropuerto-San Salvador
8	SV, HN	Puerto La Unión – San Pedro Sula - Puerto Cortes
9	HN	Puerto de Amapala - Puerto Castilla (Trujillo)
10	CR	La Cruz – Muelle San Carlos – Puerto El Limón
Note: GT: Guatemala, MX: Mexico, SV: El Salvador, HN: Honduras, CR: Costa Rica The numbers in the left column refer to those in the map above.		

Source: JST (Based on IDB, Situación Actual de los Sistemas Ferroviarios como parte de los Proyectos de Integración de Mesoamérica, 2014)

8.8.3 CABEI's Plan to Redevelop Railway in Central America

(1) International Railway Network

In the COMITRAN meeting held on 18 March 2020, CABEI announced the idea of the regional railway network shown in the figure below. Nevertheless, some routes shown in this map are not mentioned in any plans of each country. On the other hand, some routes proposed in each country's plan are not included in this map. Furthermore, this network is different from the one shown in IDB's study report aforementioned. For example, route No. 4 (Escuintla – Acajutla) and route No. 9 (Puerto de Amapala - Puerto Castilla), both of which are shown in IDB study are not included in the plan of CABEI.

Despite several gaps, this CABEI's announcement shows the high expectation on the redevelopment of the

railway in Central America. As this announcement did not include any analysis such as demand forecast, further study is required in order to elaborate this idea.



Source: Presentation of CABEI

Figure 8.8.2 Railway Network Proposed by CABEI in the COMITRAN Meeting

(2) Common Technical Railway Standard

CABEI supports the preparation of a common technical standard for the railway in Central America. In March 2022, CABEI announced that the non-reimbursable fund of USD 740,000 was approved for the technical cooperation for the preparation of the standards.

8.8.4 On-going and Planned Projects in Guatemala

(1) Railway Interconnection with Mexico

In Tecún Umán, a city on the border with Mexico, a container terminal is being developed at customs named Tecún Umán I. The outline of the project is illustrated in the table below. A Ferrovías's report stated that through the development of the railway, it is expected that the 5% to 10% of cargo passing the border will be transported by railway.

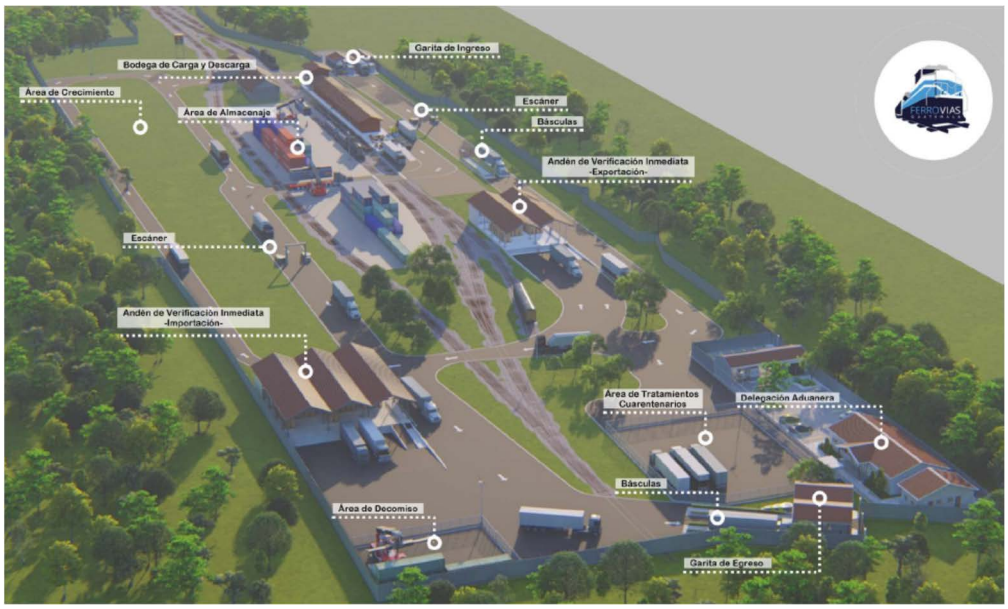
As of 2020, most of the construction work has been completed in the container terminal including the bridge on the border named the Doctor Rodolfo Robles Bridge with a length of 390 m.



Source: Ferrovías

Figure 8.8.3 Location of Tecún Umán Container Terminal

Table 8.8.2 Project Outline of Tecún Umán Container Terminal

Item	Description
Objective	• To rehabilitate and recover the railway system in Guatemala • To reactivate the commercial exchange of Central America including Guatemala with Mexico through railway transport • To develop the gateway which streamlines and facilitates trade among the countries in Central America
Major Goods Transported by Railway	• Palm oil, palm kernel, babassu oil and sugar • Natural rubber latex including pre-vulcanized, corrugated cardboard and paper boxes • Tiles, glazed tiles, Portland cements, additives for cements, mortars, and concretes
Services Provided	• Platform for loading and unloading • Entry and exit checkpoints • Customs office (Both Guatemala and Mexico) • Weighing and fumigation machine • Scanning equipment • Immediate verification platforms for export and import
Specifications	• Total Area: 63,147.6 m^2 • Total Floor Area of Buildings: 4,095 m^2 • Area for Storage: 8,000 m^2 • Total Length of Railway Track: 1,760 m • Track Gauge: Standard gauge (1,435 mm) same as that of Mexico • Technical Standards: AREMA 2017 and ARTF (Asociación Reguladora del Transporte Ferroviario de México (Mexican Rail Transport Regulatory Association)) Standards
Estimated Cost	• Approx. GTQ 70 million (For buildings, facilities, fences, and utility) (Equivalent to approx. USD 9.3 million)
Image	

Source: JST (Based on the report and presentation of Ferrovías)



Source: JST

Figure 8.8.4 Doctor Rodolfo Robles Bridge on the Border between Guatemala and Mexico



Source: JST

Figure 8.8.5 Container Terminal in Tecún Umán

(2) Railway Reactivation between Puerto Barrios and Morales, Izabela

In the section between Zacapa and Puerto Barrios, 90% of the rail is missing due to theft, and the remaining rail has been worn down, deformed, or fatigued because of obsolescence. Besides, there are 31 bridges between Puerto Barrios and Morales, Izabela, most of which are in poor condition for railway operation. This project aims to rehabilitate the abandoned railway and to enhance the efficiency of the cargo transportation. The outline of the project is tabulated below.

In order to implement the project, companies named TRN Ingenieria and CIFI LATAM, S.A. were awarded for a study.

Table 8.8.3 Project Outline of Railway Reactivation between Puerto Barrios and Morales

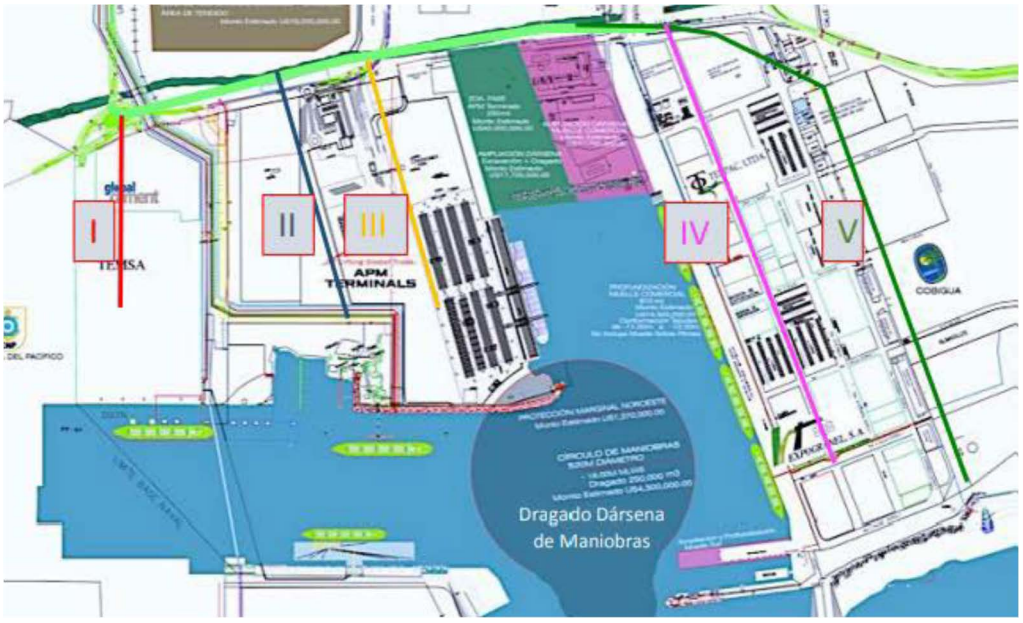
Item	Description
Route Length	• Puerto Barrios – Morales, Izabel: 57.3 km • Branch Line to Santo Tomás de Castilla: 6.44 km • Branch Line to Puerto Barrios Airport: 0.85 km
Major Goods Transported	• Minerals, cardboard, fruits, and vehicles
Image	

Source: JST (Based on the report of Ferrovías)

(3) Railway Reactivation between Puerto Quetzal and Santa Lucía Cotzumalguapa

The outline of the project is tabulated below. In order to implement the project, it is proposed to perform a survey on geotechnical conditions, demand, financial structure as well as resettlement of occupants on the right of way.

Table 8.8.4 Project Outline of Railway Reactivation between Pt. Quetzal and Sta. Lucía Cotzumalguapa

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Route Length</td><td colspan="3">• Puerto Quetzal - Santa Lucía Cotzumalguapa: 62 km</td></tr>
<tr><td>Project Component</td><td colspan="3">• Rehabilitation of 62 km railway track
• Construction and operation of intermodal terminal in Santa Lucía Cotzumalguapa</td></tr>
<tr><td rowspan="4">Image (Layout at the Puerto Quetzal)</td><td colspan="3"> 
</td></tr>
<tr><td colspan="3">Legend of Figure</td></tr>
<tr><td>Track I: Solid bulk</td><td>Track II: Liquid bulk</td><td>Track III: Container cargo</td></tr>
<tr><td colspan="2">Track IV: General cargo, container cargo and bulk</td><td>Track V: Container and reefer</td></tr>
</table>

Source: JST (Based on the report of Ferrovías)

(4) Freight Train between Puerto Quetzal and Puerto Barrios Supported by CABEI and Korea

Apart from the two projects abovementioned, CABEI is supporting a freight railway project. According to a local news in April 2020[5], CABEI's fund for a feasibility study of USD 600,000 was ready through the financial support of Korea. This freight railway covers the section from Puerto Quetzal, Escuintla, to Puerto Barrios.

(5) Preliminary Study on Freight Train Supported by CABEI and Korea

In February 2021, CABEI announced that a pre-feasibility study would be carried out with the support of Korea[6]. This study is implemented under a program named Knowledge Exchange Program and the budget for the study of USD 466,900 is partially financed by The Export-Import Bank of Korea (Korea Eximbank).

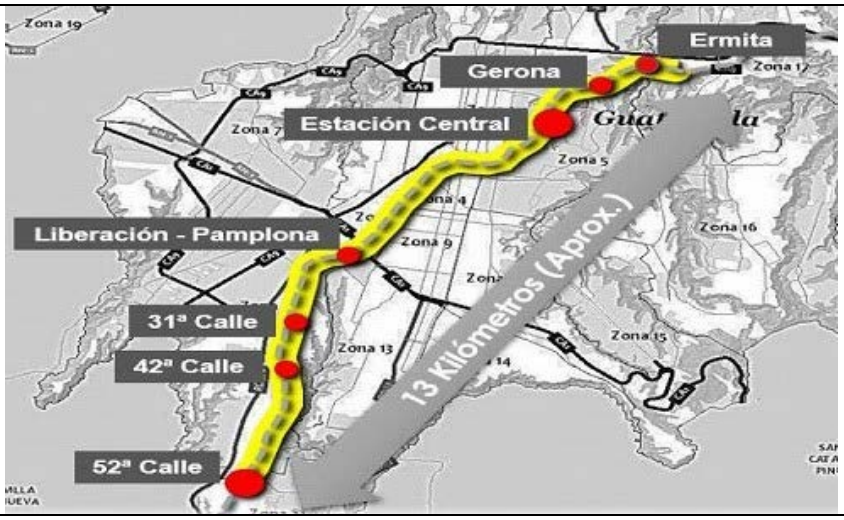
In the press release, no specific section was mentioned. Thus, the relationship with the abovementioned freight railway project is not clear so far.

[5] El Periodico, 4th December 2020, "BCIE: avanza proceso estudio de prefactibilidad de tren de carga"
[6] CABEI, 2nd February 2021, "Guatemala inicia ejecución de estudios del tren de carga"

(6) Urban Train in Guatemala

The outline of the project is tabulated below. In this project, the existing railway infrastructure needs to be rehabilitated so that it can be used for this project. In 2020, a study on three bridges in the target section and a geotechnical study were conducted.

Table 8.8.5 Project Outline of Urban Train in Guatemala City

Item	Description
Route	• Length: 13 km • No. of Stations: 7 stations
Image (Route Map)	

Source: JST (Based on the report of Ferrovías)

(7) Metro Riel Project in Guatemala City

The project called "Metro Riel" is a project to reactivate the existing railway and to provide light rail transit (hereinafter referred to as "LRT") in Guatemala City. The outline of the project is tabulated below. According to the report of Ferrovías, the authorization to carry out surveys has not been obtained so far. In the report, the relationship between this project and the urban train abovementioned was not explained.

Table 8.8.6 Project Outline of Metro Riel

Item	Description
Route	• Length: 21 km • No. of Stations: 12 stations • The right of way of the existing railway is used
Passenger Volume	• 250,000 pax/day
Rolling Stock	• LRT type (Electrified)

Source: JST (Based on the report of Ferrovías)

(8) Other Urban Railway Projects

In addition to the two projects abovementioned, the Municipality of Guatemala (Municipalidad de Guatemala, hereinafter referred to as "MuniGuate") plans subway and AeroMetro (cable car). According to the local news in February 2020[7], the study on the subway had already begun, and the route will be along Calzada San Juan Road, which crosses Guatemala City transversally, while AeroMetro will be developed in the area of Mixco, which is located in the west of Guatemala City.

[7] La Hora, 10 Feb. 2020, https://lahora.gt/muniguate-confirma-estudios-para-metro-subterraneo-en-calzada-san-juan/

8.8.5 On-going and Planned Projects in El Salvador

(1) Preliminary Study for the Rehabilitation by a Spanish Company

In 2013, CEPA hired a Spanish firm named TRAMRAIL S.A. in order to conduct a preliminary study on the rehabilitation and modernization of the railway system. According to a newspaper[8], although the terms of references for the elaboration of a master plan and a feasibility study had been prepared, this preliminary study resulted in failure because of the miscommunication between CEPA and the consultants.

(2) Study on Passenger Trains Conducted by a Chinese Company

In 2016, CEPA' s board of directors authorized a disbursement of USD 42,900 to finance a study on the rehabilitation of a short-distance passenger train in San Salvador – Apopa – Nejapa – Quezaltepeque - Sitio del Niño section (39 km). China Railway Construction Corporation International Limited (hereinafter referred to as "CRCCI") was hired as a consultant, and the delegates were dispatched to El Salvador. The study report has not been disclosed yet as per the contract between both parties.

(3) Pacific Train Supported by CABEI and Korea

In March 2021, the Government of El Salvador[9] announced the launch of an international tender for the preparation of the feasibility study on the Pacific Train. CABEI will finance USD 450,000 for this feasibility study under the framework of the Korea-CABEI Partnership Single Donor Trust Fund.

In this study, according to this announcement and related news, the feasibility of the development of both cargo and passenger railway will be studied. The target route is the section between San Salvador and the Port of Acajutla as well as the possibility of expansion to La Hachadura near the border with Guatemala.

8.8.6 On-going and Planned Projects in Honduras (Cargo Train)

According to a press release of CABEI published in March 2020[10], CABEI will finance a feasibility study to implement a cargo train project in Honduras. This cargo train consists of two routes: Puerto Castilla to Isla de Amapala and Puerto Cortés to Isla de Amapala.

In this press release, the outline of alignment was not published. However, these two routes seem to refer to the routes proposed in PNLOG or the IDB's study (see Section 8.4.5).

8.8.7 On-going and Planned Projects in Nicaragua

(1) Government's Plan to Redevelop the Railway

According to MTI, the Government of Nicaragua has an interest in redeveloping the railway in the country. For example, there are some studies on the development of the railway with a length of approximately 60 km between Managua, Masaya and Granada.

(2) Master Plan Study in Managua

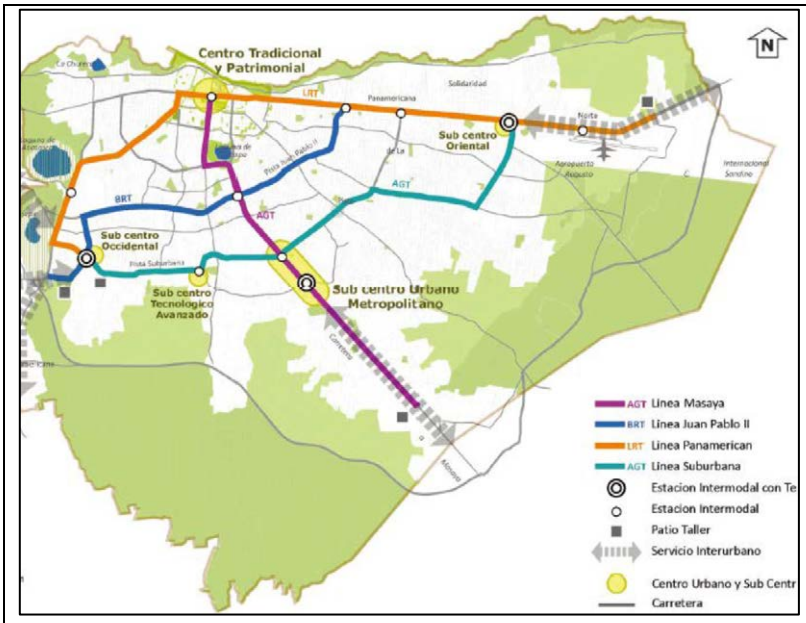
In 2017, a master plan study for the urban development of Managua City was conducted by JICA. In the master plan, the development of public transport system including an urban railway was proposed (see

[8] El Economista, 23 September 2019, https://www.eleconomista.net/actualidad/Tres-intentos-por-revivir-el-tren-en-El-Salvador-en-los-ultimos-seis-anos-20190923-0009.html

[9] The Government of El Salvador, "Gobierno del Presidente Nayib Bukele anuncia lanzamiento de concurso público internacional para elaborar estudio de factibilidad del Tren del Pacífico" https://www.presidencia.gob.sv/gobierno-del-presidente-nayib-bukele-anuncia-lanzamiento-de-concurso-publico-internacional-para-elaborar-estudio-de-factibilidad-del-tren-del-pacifico/

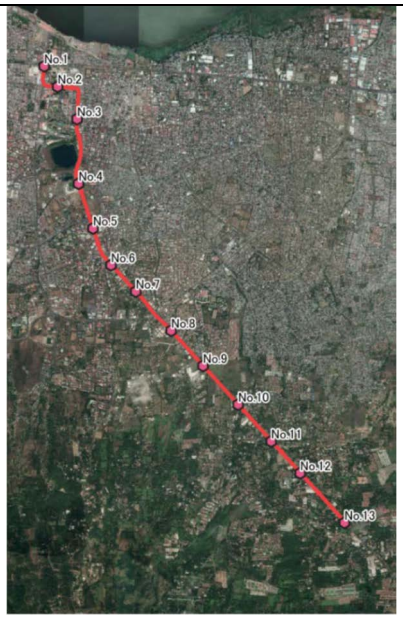
[10] CABEI, "BCIE financiará estudio para tren de carga en Hon", https://www.bcie.org/novedades/noticias/articulo/bcie-financiara-estudio-para-tren-de-carga-en-honduras

Figure 8.8.6. After this master plan study, a pre-feasibility study on the development of urban railway was implemented by the Ministry of Economy, Trade and Industry of Japan (hereinafter referred to as "METI") in 2019 (Figure 8.8.7). As the proposed transportation mode was not railway, but Automated Guideway Transit (AGT), in which rubber tire is used, this urban railway is not able to be used for cargo transport.



Source: JICA, Project for Urban Development Master Plan for Managua City in Republic of Nicaragua, 2017

Figure 8.8.6 Public Transport Network Proposed in JICA Master Plan



Source: METI, 2019

Figure 8.8.7 Alignment of Urban Train Proposed in Pre-Feasibility Study

8.8.8 On-going and Planned Projects in Costa Rica

(1) INCOFER's Recent Activities to Vitalize the Railway

In order to vitalize both passenger and cargo transport by railway, various projects have been proposed, planned, and implemented nationwide as below. The breakdown of these investments in infrastructure and equipment is shown in the following table.

- Recovery of the right of way in GAM and extension of the operation of commuter train
- Rehabilitation and upgrade of depot and workshop in Siquirres, Limón and San José
- Maintenance of track in GAM
- Rehabilitation and purchase of rolling stock
- Construction and reconstruction of bridges

Table 8.8.7 Amount of Investment between 2014 and 2018

Item	Investment		Item	Investment	
Siquirres Workshop	295	(485)	Office Furniture and Equipment	21	(35)
Limón Diesel Tank	3	(5)	Computer Equipment	30	(49)
Maintenance Machinery	56	(92)	Vehicles	63	(104)
Tools	22	(36)	Railway	4,222	(6,942)
Rolling Stock	377	(620)			
			Total	**5,088**	**(8,366)**

Unit: million CRC (Thousand USD in parenthesis)
Source: INCOFER, Informe Final de Gestión 2014-2018

(2) Railway Master Plan of Costa Rica

In October 2022, a new rail master plan was announced with the technical assistance of Korea. The master plan proposes eight integrated lines (rail corridors) throughout the country.



Source: INCOFER

Figure 8.8.8 Railway Master Plan of Cosa Rica Announced in 2022

(3) TELCA (Rehabilitation of the Electric Cargo Train)

Besides the regular rehabilitation and improvement work abovementioned, two large railway development projects are being implemented: one is TELCA project and the other is TRP project.

The project name is “Rehabilitación del Tren Eléctrico de Carga en las Regiones Huetar Caribe y Huetar Norte (Rehabilitation of the electric train of cargo in the Caribbean and north region)” and this project is called “TELCA”, which stands for “Tren Eléctorico Limonense de Carga”. The objectives of TELCA are listed below.

- To rehabilitate and upgrade the railway
- To meet the growing demand of cargo transport in the region
- To contribute to the development of the industry and the economy including in the region

Furthermore, TELCA aims at electrification in order to reduce the emission of greenhouse gas.

A pre-feasibility study of TELCA was conducted with the support of CABEI in 2019. In the report of the study, the outline of TELCA is illustrated as the following figure and table show. In the study, in addition to the possibility of electrification, the extension to Bajos de Chilamate with a length of 30 km, and track gauge conversion from narrow gauge (1,067 mm) to standard gauge (1,435 mm) were proposed. The study estimated the project cost at approximately USD 435 million in case of narrow gauge without the extension and approximately USD 1,730 million in case of the standard gauge without the extension. If the gauge is converted to standard gauge, bridges need to be replaced and this replacement may lead to the increase in the project cost.



Source: INCOFER, Rehabilitación del Tren Eléctrico de Carga en las Regiones Huetar Caribe y Huetar Norte (TELCA) Identificación del Proyecto, 2019

Figure 8.8.9 Location Map of TELCA

Table 8.8.8 Expected Outcomes of TELCA

Item	Current Situation	Expected Outcome	
Length of Railway	107 km	179 km	• Limón – San Cristóbal: 109 km • Valle de la Estrella branch line: 60 km • Río Frío branch line: 10 km
Maximum Speed	N/A	140 km/h	
Commercial Speed	15–40 km/h	60-75 km/h	
Load Capacity	N/A	1,500,000 ton	
CO_2 Emission	100 units	50 units	
Direct Employment	40 people	400 people	

Source: JST (Based on "INCOFER, Rehabilitación del Tren Eléctrico de Carga en las Regiones Huetar Caribe y Huetar Norte (TELCA) Identificación del Proyecto, 2019")

(4) TRP (Rapid Passenger Train)

In order to improve the urban transport in GAM, a project named "Tren Rapido de Pasajeros (Rapid Passenger Train, hereinafter referred to as "TRP")" is planned. TRP aims at the modernization of the existing commuter train by replacing current single track with double track and introducing new electric multiple unit (hereinafter referred to as "EMU").

A pre-feasibility study on TRP was conducted in 2016 with the finance of CABEI, followed by a value engineering study performed by INCOFER and MIDEPLAN in 2018. The outline and the image of the TRP project are shown below. TRP is going to be implemented with the scheme of PPP, where CABEI will finance and the planned amount of loan will be USD 550 million[11].

Table 8.8.9 Outline of TRP

Item	Proposed Figure	Remark
General Indices		
Route Length	74.39 km	At grade: 62.1 km, Elevated: 12.29 km
Gauge	1,435 mm	Existing narrow gauge will be converted
No. of Stations	42	At grade: 37, Elevated: 5
Estimated Project Cost	USD 1,241 million	Including contingency etc.
Geometric Indices		
Maximum Speed	80 km/h in suburban	50 km/h in urban

[11] https://www.bcie.org/en/electric-train-of-costa-rica

Item	Proposed Figure	Remark
Rolling Stock and Railway System		
Capacity	600 pax	Light Rail Transit (LRT) type is applied
Electrification	Electrified	DC 750 V

Source: JST (Based on INCOFER, "Construcción, Equipamiento y Puesta en Operación de un Sistema de Tren Rapido de Pasajeros (TRP) en la Gran Area Metropolitana", 2019)



Source: INCOFER

Figure 8.8.10 Image of TRP

As the table shows, TRP is a project dedicated to passenger transport, and LRT-type EMU will be used as rolling stock. Thus, the specifications of the railway infrastructure and system are based on the LRT system. It will be difficult for cargo train to pass the section in GAM for many reasons including:

- Sharp curve (minimum curve radius is 50 m)
- Keen slope (maximum gradient is 6%)
- Restriction of axle load, rolling stock gauge etc. due to the use of LRT-type EMU

Needless to say, TRP is expected to bring wide range of benefits to urban transport, inter alia, mitigation of traffic congestion. Eventually, this may lead to the improvement of urban logistics.

This project is being reviewed by the new administration.

(5) Procurement of New Diesel Multiple Unit for GAM

In December 2018, INCOFER procured eight two-car diesel multiple units from CRRC Qingdao Sifang at a cost of USD 32.7 million. Given that the TRP project is planned, this rolling stock is to be used until the TRP project, namely, electrification is completed.



Source: INCOFER's website

Figure 8.8.11 New Diesel Multiple Unit

(6) Train between Puntarenas and Alajuela

Following TELCA and TRP, it is planned to reactivate the railway between GAM and the Pacific coast. According to the press release by MIDEPLAN on 13 May 2020[12], MIDEPLAN and INCOFER signed an agreement on a study about the railway between Puntarenas and Alajuela. MIDEPLAN's pre-investment fund will transfer CRC 314 million to INCOFER for the pre-feasibility and the feasibility studies for the project. In this project, the railway is to be reactivated from Puerto Caldera (Purruja) to Ciruelas in Alajuela (70.7 km) and branch line to Puntarenas (27.6 km), that is, the total length of the railway is 98.3 km. Both cargo and passenger transport are planned in this section.

In February 2021, a contract on a feasibility study was signed between INCOFER and a consortium led by Korea National Railway[13].

By this plan, cargo can be transported between Puerto Cardera and Ciruelas by railway, while it is difficult for cargo train to run in GAM due to TRP. Thus, it is of quite importance to develop an intermodal container terminal in Alajuela in order to connect railway transport with urban logistic by truck although such plan is not expressly mentioned in the PNT.

8.8.9 On-going and Planned Projects in Panama

(1) Possibility of Further Development of PCRC

According to an interview with PCRC, no development project is planned in PCRC so far. In view of capacity and demand, PCRC's existing single-track railway is able to deal with the demand with three sidings on the route. Thus, PCRC stated that they do not consider converting their track into double-track. Also, PCRC explained that the problem lies not in the main line but in the cargo handling at Balboa Port. While there are three ports in Colon, there is only one port in Balboa and this monopoly causes inefficiency in Balboa Port.

(2) Railway Development Plan by the Government

Since the railway is operated by PCRC, a private concessionaire, and the Maritime Authority of Panama (Autoridad Marítima de Panamá, hereinafter referred to as "AMP") is a counterpart authority of this concession contract, MOP does not oversee the railway at all. As per the discussion with MOP, no plan or project for the development of railway is considered except for the urban railway in Panama City.

(3) Urban Railway in Panama

As aforementioned, monorail is under construction in Panama City, which connects the downtown with the west suburban area over the canal. Metro de Panama plans to expand its urban railway network in the future.

[12] MIDELAN, https://www.mideplan.go.cr/mideplan-e-incofer-firman-convenio-para-estudios-del-tren-entre-puntarenas-y-alajuela (Visited on 20 Aug. 2020)
[13] Railway Technology, "KR to conduct feasibility study on Costa Rica rail project", https://www.railway-technology.com/news/kr-costa-rica-rail-project/



Source: Metro de Panama's website

Figure 8.8.12 Future Network of Metro de Panama

8.9 Issues and Recommendations on the Railway Sector

The following issues and recommendations were proposed based on the information as of 2020.

8.9.1 Issues and Recommendations on the Railway Sector in Central America

(1) Issues Identified

Based on the analysis of the current situation and planned projects, the issues of the railway sector in Central America can be summarized as follows. The issues of each country are illustrated in the following sections.

- Deterioration of the railway and suspension of the service in many sections
- Absence of strategy for the redevelopment of the railway including priority
- Absence of common railway standards aiming at regional railway network connected with Mexico and the US

(2) Recommendations about the Railway Sector in Central America

In order to deal with the foregoing issues, the following actions are recommended to be taken.

- To study and implement the redevelopment of the railway
- To prepare common technical railway standards in Central America

Firstly, with respect to the first item, generally speaking, railway transport can be profitable if it is operated in a long distance and massive goods are transported. Hence, the connectivity with neighboring countries, especially Mexico and the US is of quite importance for the redevelopment and utilization of railway in Central America. Furthermore, given that most major cities in Central America are located in inland areas, the connectivity with the port should be considered as well. Thus, the following two aspects need to be considered when the priority of the redevelopment of the railway is evaluated.

- Access to the Mexican border
- Connectivity of the metropolises with ports

In addition to these two aspects, demand is also an important factor. In this study, the visions and strategies

will be scrutinized taking into account the result of demand forecast which is underway.

Secondly, regarding the common standards, CABEI has a plan to prepare the common railway standard as mentioned in Section 8.8.3. Since the standards need to be applied to the projects which each country plans, the standards should be prepared as soon as possible.

In preparation of the standards, gauge is an important component. In view of the connectivity with Mexico and the cost of procurement of rolling stock, standard gauge (1,435 mm) is most recommendable. However, in Costa Rica and Honduras, the railway of narrow gauge is operated. Moreover, in Guatemala and El Salvador where railway used to be operated, narrow gauge was applied and then restored rolling stock is for narrow gauge. It should be carefully considered whether the gauge will be uniformed in standard gauge in entire Central America.

8.9.2 Issues and Recommendations on the Railway Sector in Guatemala

(1) Analysis Conducted by FEGUA

According to the "Institutional Strategic Plan 2021-2025", FEGUA analyzed its current situation through SWOT analysis, which is used for the analysis of the current situation by classifying into four categories: strengths (S), weaknesses (W), opportunities (O), and threats (T). The result is summarized below.

Judging from this result, FEGUA regards the contract with Ferrovías, abandonment of the railway and its limited capacity as FEGUA's issues.

Table 8.9.1 Summary of SWOT Analysis Conducted by FEGUA

Strengths	Opportunities
• Historical value of FEGUA • Existence of railway assets including railway museum • Existence of technicians who transfer knowledge	• Creation of tourist attraction • Creation of activities to generate private funds
Weaknesses	**Threats**
• Obsolete organic law • Little monitoring and safeguarding of the assets • Little capacity to manage inter-institutional and/or international projects • Little technical capacity for the management, the design, and the implementation of projects	• Limited functions of FEGUA under the current contract with Ferrovías • Invasion of lands of FEGUA

Source: JST (Based on FEGUA, "Institutional Strategic Plan 2021-2025")

(2) Issues Identified

Taking into account the result of FEGUA's analysis abovementioned, literature review, site survey and the interview with FEGUA and Ferrovías, the following issues were identified.

Table 8.9.2 Identified Challenges of the Railway Sector in Guatemala

Item		Challenges	
A)	Institution and Finance	A-1:	Task allocation between FEGUA and Ferrovías under the onerous usufruct contract
		A-2:	Limited human resources and capacity of the personnel
		A-3:	Shortage of the budget
B)	Cargo Transport	B-1:	Absence of cargo transport by railway
		B-2:	Rehabilitation and upgrading of infrastructure
		B-3:	Rehabilitation and upgradingof rolling stock and equipment
		B-4:	Disconnection with Mexico at the border

Item		Challenges	
C)	Passenger Transport	C-1:	Absence of passenger transport by railway across the country including Guatemala City

Source: JST

(3) Recommendations about the Railway Sector in Guatemala

Among the issues abovementioned, institutional issues such as the shortage of the budget and human resource can be attributed to the current situation of the abandonment of railway and the suspension of the operation in the country. Therefore, these issues should be solved in the course of the implementation of a specific project for the redevelopment of railway infrastructure and operation. In other words, addressing issues B-1 to B-3 and C-1 listed in the table above can be a solution to issues A-1 to A-3.

At the same time, the contractual issue between FEGUA and Ferrovías needs to be clarified.

In conclusion, the recommendations about the railway sector in Guatemala are summarized as follows: (The issues related to each recommendation are shown in parenthesis. (The same shall apply hereafter.))

- To clarify the task allocation between FEGUA and Ferrovías under the onerous usufruct contract (A-1)
- To redevelop cargo transport beginning from Tecún Umán, the border with Mexico (A-2, A-3, B-1, B-2, B-3, B-4)
- To redevelop passenger transport in Guatemala City, where urbanization continues (A-2, A-3, C-1)

Given that the container terminal is being developed in Tecún Umán, it is recommended to redevelop the railway from the border with Mexico to the east. Then, the connection with Guatemala City and Puerto Quetzal by railway needs to be considered.

8.9.3 Issues and Recommendations on the Railway Sector in El Salvador

(1) Questionnaire to CEPA

According to the questionnaire to CEPA, the following items are regarded as major problems of the railway sector in El Salvador:

- Serious obsolescence and loss of railway facilities
- Damage of wooden sleepers
- Disappearance of bed
- Absence of drainage system
- Shortage of maintenance
- Deterioration of bridges
- Obsolescence of rolling stock (85 years or more)

In summary, CEPA recognizes that the deterioration of infrastructure, rolling stock, etc. is the most critical issue of the railway sector in El Salvador.

(2) Issues Identified

Through site visit, literature review and the questionnaire to CEPA, the following issues were identified.

Table 8.9.3 Identified Issues of the Railway Sector in El Salvador

Item		Issues Identified	
A)	Institution and Finance	A-1:	Limited human resources and capacity of the personnel
		A-2:	Shortage of the budget
B)	Cargo Transport	B-1:	Absence of cargo transport by railway
		B-2:	Rehabilitation and upgrading of infrastructure
		B-3:	Rehabilitation and upgrading of rolling stock and equipment

Item		Issues Identified	
		B-4:	Disconnection with neighboring countries, especially Guatemala
C)	Passenger Transport	C-1:	Absence of passenger transport by railway across the country including San Salvador

Source: JST

(3) Recommendations about the Railway Sector in El Salvador

In order to address the issues identified, the following actions are recommended to be executed:

- To redevelop cargo transport taking into consideration the connectivity with neighboring countries and the major ports (A-1, A-2, B-1, B-2, B-3, B-4)
- To redevelop passenger transport using the abandoned railway in San Salvador metropolitan area, where urbanization continues (A-1, A-2, C-1)

Regarding the first item, among the neighboring countries, the connection with Guatemala is most important given the access to Mexico and the US. Originally, the railways of El Salvador and Guatemala connected each other in San Jerónimo, the northwest part of El Salvador. As shown in Section 8.8.2 and 8.8.5), however, there is a plan to develop a railway connecting with Guatemala in La Hachadura, a city in the west El Salvador. It is required to study which section should be developed.

8.9.4 Issues and Recommendation on the Railway Sector in Honduras

(1) Issues Identified

Through literature review and the questionnaire to FNH, the following issues were identified.

Table 8.9.4 Identified Issues of the Railway Sector in Honduras

Item		Issues Identified	
A)	Institution and Finance	A-1:	Limited human resources and capacity of the personnel
		A-2:	Shortage of the budget
B)	Cargo Transport	B-1:	Absence of cargo transport by railway
		B-2:	Rehabilitation and upgrading of infrastructure
		B-3:	Rehabilitation and upgrading of rolling stock and equipment
		B-4:	Limited railway network developed only in the north-west region of the country
C)	Passenger Transport	C-1:	Absence of passenger transport especially in Tegucigalpa
		C-2:	Limited operation of passenger railway in San Pedro Sula

Source: JST

(2) Recommendations about the Railway Sector in Honduras

In order to address the issues identified, the following actions are recommended to be executed:

- To redevelop cargo transport by rehabilitating the abandoned railway in the north-west region of the country especially between Puerto Barrios and San Pedro Sula (A-1, A-2, B-1, B-2, B-3)
- To develop the railway between San Pedro Sula and Puerto Barrios in Guatemala (A-1, A-2, B-1)
- To develop the railway connecting two oceans (A-1, A-2, B-4)
- To develop passenger transport in Tegucigalpa metropolitan area, where urbanization continues (A-1, A-2, C-1)
- To improve and expand passenger railway in San Pedro Sula using the existing or abandoned railway (A-1, A-2, B-2, B-3, C-2)

Since it is expected that it takes a long time and seems to be more costly to develop the railway in the southern part of the country (i.e. Tegucigalpa and Isla de Amapala), the development of the railway in the northwest part of the country is recommended to be promoted at first. Especially, the connection with Puerto

Barrios in Guatemala is important in the aspect of the possibility of the connection with Guatemala City and Mexico.

8.9.5 Issues and Recommendations on the Railway Sector in Nicaragua

(1) Issues Identified

Through literature review and interview with the related authority, the following issues were identified:

Table 8.9.5 Identified Issues of the Railway Sector in Nicaragua

Item		Issues Identified	
A)	Institution and Finance	A-1:	Absence of plan or strategy to develop railway

Source: JST

(2) Recommendations about the Railway Sector in Nicaragua

In order to address the issues identified, the following actions are recommended to be executed:

- To study the necessity of developing the railway (A-1)

8.9.6 Issues and Recommendations on the Railway Sector in Costa Rica

(1) Analysis Conducted by INCOFER

According to the "Final Management Report 2014-2018", INCOFER analyzes the current status of the railway sector using "SWOT analysis", and the result is summarized in the following table. From this table, the major issues are the deterioration of the infrastructure and equipment and the shortage of the human resource and the budget.

Table 8.9.6 Evaluation of the Current Situation of the Railway Sector by SWOT Analysis

Strengths	Opportunities
• Friendliness with nature • Right of way almost free from illegal occupation • Punctual operation • Authorization by the government	• Developing markets including increasing demand for passenger transport in GAM • High cost of fuels used by road freight • Favorable opinion at national level
Weaknesses	**Threats**
• Poor condition of infrastructure and equipment • Shortage of the budget • Limited human resources and capacity of the personnel	• Competition with road transport • Impact of climate change especially in the Caribbean region

Source: JST (Based on "Informe Final de Gestión 2014-2018" by INCOFER)

(2) Issues Identified

In addition to INCOFER's analysis, several challenges were identified through the interview with INCOFER and the site survey. Especially, according to the staff of INCOFER, the poor condition of track and the collision between train and automobiles are major problems. In GAM, track is installed on the carriageway in some sections and level crossings are not developed well, both of which lead to the accidents.

The issues of the railway sector in Costa Rica are summarized in the table below.

Table 8.9.7 Identified Issues of the Railway Sector in Costa Rica

Item		Issues Identified	
A)	Institution and Finance	A-1:	Limited human resources and capacity of the personnel
		A-2:	Shortage of the budget

Item		Issues Identified	
B)	Cargo Transport (Caribbean Region)	B-1:	Rehabilitation and upgrading of infrastructure
		B-2:	Rehabilitation and upgrading of rolling stock and equipment
		B-3:	Obsolescence of railway system
		B-4:	Low connectivity with the other transportation mode including maritime transport
		B-5:	Limited coverage of cargo transport in the country
C)	Passenger Transport (GAM)	C-1:	Rehabilitation and upgrading of infrastructure
		C-2:	Rehabilitation and upgrading of rolling stock and equipment
		C-3:	Obsolescence of railway system
		C-4:	Frequent occurrence of accidents

Source: JST

(3) Recommendations about the Railway Sector in Costa Rica

In order to address the issues identified, the following actions are recommended to be executed:

- To promote the TELCA project (A-1, A-2, B-1, B-2, B-3)
- To promote the TRP project (A-1, A-2, C-1, C-2, C-3, C-4)
- To promote the project between GAM and Puntarenas (A-1, A-2, B-1, B-2, B-3)
- To develop a cargo yard in the Limón-Moín Port (B-4)
- To study the future cargo railway network considering the access from/to GAM (B-5)

In case of Costa Rica, it takes much longer time to connect with Mexico with railway. It is recommended to consider the connectivity between the capital city and the major ports for the vitalization of the railway, rather than connectivity with Mexico.

8.9.7 Issues and Recommendations on the Railway Sector in Panama

(1) Issues Identified

Through literature review and discussion with PCRC, the following issues were identified.

Table 8.9.8 Identified Issues of the Railway Sector in Panama

Item		Issues Identified	
A)	Institution and Finance	A-1:	Absence of institution in charge of railway under the government
		A-2:	Absence of plan or strategy to develop railway
B)	Cargo Transport	B-1:	Unbalanced demand of cargo which is concentrated in weekend
		B-2:	Occasional suspension of operation on Wednesday and Thursday
		B-3:	Inefficient cargo handling at the Balboa Port
		B-4:	Absence of railway network connecting with the other Central American countries

Source: JST

(2) Recommendations about the Railway Sector in Panama

In order to address the issues identified, the following actions are recommended to be executed:

- To study the necessity of developing a railway other than the Panama Canal Railway (A-1, A-2, B-4)
- To improve the operation and maintenance plan of PCRC (B-1, B-2)
- To make coordination with the port authority or the port operator so that the cargo handling in the Balboa Port is improved (B-3)

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

Appendix 9

Coordinated Border Management Sector

November 2023

Japan International Cooperation Agency
Oriental Consultants Global Co., Ltd.
Nippon Koei Co., Ltd.
ALMEC Corporation
Overseas Coastal Area Development Institute of Japan
International Development Center of Japan Inc.

Project to Strengthen Capacities in the Elaboration of Regional Master Plan for Mobility and Logistics for Sustainable Regional Development in the Framework of Central American Economic Integration

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Coordinated Border Management Sector

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Appendix 9 Coordinated Border Management Sector

9.1 Regional Framework

9.1.1 Central American Strategy for Trade Facilitation and Competitiveness Focusing on Coordinated Border Management (ECFCC)

(1) Outline

The Central American Strategy for Trade Facilitation and Competitiveness focusing on Coordinated Border Management (ECFCC) represents a valuable regional instrument for advancing Central American economic integration, using a common objective such as Coordinated Border Management (CBM), primarily in terms of streamlining border procedures and inter-institutional and bilateral coordination. The agreement on ECFCC, COMIECO LXXIII, was approved in 2015.

This endeavor represents an important strategy to align the trade facilitation objectives of all Central American countries, which are part of the Central American Economic Integration Agreement.

(2) Short-term Priority Measures

Based on the ECFCC, the following 5 actions have been made as short-term priority measures.

Table 9.1.1 Short-term Priority Measures in ECFCC

Measures	Goals
1. Advanced Transmission of Cargo Documents	To abolish or simplify procedures at border control points
2. Streamlining and Coordination of Immigration Controls	To simplify imigration procedures for truck drivers
3. Electronic System for the Emission and Transmission of Phyto and Zoo Sanitary Certificates	To facilitate and simplify sanitary controls
4. Registry of Cargo Units with Radio Frequency (RFID) Devices	To provide reliable information on the time required to cross the border
5. Installation of Cameras at Border Crossings	To provide visual information of transparency in border control

Source: JST based on ECFCC

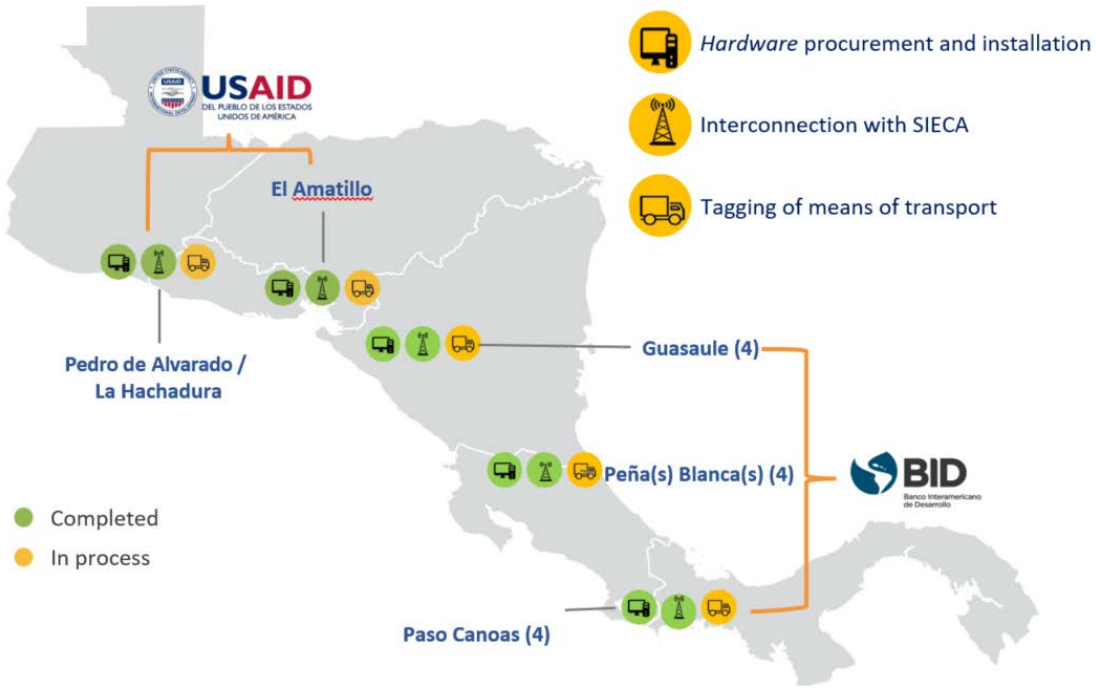
The following table shows the current status of short-term priority measures in ECFCC and some of the implementation strategies for each measure, which are suggested by the JICA study team:

Table 9.1.2 Current Status and Suggestions for Short-term Priority Measures in ECFCC

Current Status	Suggestions by JST
1. Advanced Transmission of Cargo Documents	
• Some countries (El Salvador, Nicaragua and Costa Rica) have adopted it in a unilateral manner. • Versions differ conceptually and in scope, there is no homologation. • Several regulatory frameworks to standardize it • Guatemala and Honduras have implemented a first phase at the Corinto Border Crossing Point, only for DUCA-F, under the framework of the Ministerial Resolution number 59-2019 of the In-depth Integration.	• The storage and administration of DUCA and its supporting documents are carried out through the Central American Digital Trade Platform (PDCC, for its Spanish acronym), in a digitalized or electronic form that allows the administration and use of the documents. • Promote the amendment of CAUCA and its regulations, to consolidate all data from the Bill of Lading and the Land Freight Document into a single document. Also, its transfer into an electronic format for electronic transmission. • Extend the regulatory framework for the advanced declaration of goods, so that it covers the entire Central American region, through a Central American regulation on advanced declarations.
2. Streamlining and Coordination of Immigration Controls	
• A technical guide on the submission of immigration data and minimum data for the electronic exchange was approved. Some data for transmission through the DUCA platform are pending consensus, as well as some necessary IT developments.	• Establish a Central American immigration regulation, which would allow for the expansion of the scope and participation of immigration functions on a regional basis. In a first phase, a single immigration inspection by a single authority, allowing the electronic exchange of information with neighboring countries. In a second phase, eliminate border checkpoints and leave only migration inspections at peripheral customs offices. • Implement a plan for road controls for the detection of persons who do not comply with the immigration laws of territories.
3. Electronic System for the Emission and Transmission of Phyto and Zoo Sanitary Certificates	
• A technical guide has been developed and approved for the exchange of information on sanitary and phytosanitary certificates, pending IT developments. • The Sanitary and Phytosanitary Measures Committee has begun meetings to modify the annex of certificates established in the Central American Sanitary Guideline, Resolution 338-2014 of COMIECO, in order to standardize the sanitary and phytosanitary certificate for all countries.	• Considering that the implementation of this measure has been delayed, it is strongly recommended that a mandate be established as a result of the Presidents' Summit, so that this measure can be implemented within a specific time frame.
4. Registry of Cargo Units with Radio Frequency (RFID) Devices	
• RFID equipment has been installed in Pedro de Alvarado GT, La Hachadura SV, El Amatillo HN and SV, El Guasaule HN and NI; Peñas Blancas CR; and Paso Canoas CR and PA. A portion of this equipment needs reactivating since, for various reasons, it is not transmitting data. Also, several documents related to the RFID system have been approved, which provide guidance for the operation of the system and the enrollment	• Restore the operation of the RFID system and the equipment installed at border crossings that are no longer functioning, with the support of international cooperation. • Automate the clearance processes of goods that are carried out manually at the borders, taking advantage of RFID technology, such as, for instance: migratory control, phytosanitary control,

Current Status	Suggestions by JST
process of the means of transport. The documents are as follows: - The RFID Platform Technical Guide - The User's Manual of the Regional RFID Enrolment Platform; and, - The RFID Technology Implementation Plan. • The enrollment of different means of cargo transportation registered at the regional level has been developed in order to enter them into the system and provide them with an RFID tag for identification purposes. • As part of the transportation enrollment plan, estimated 25,829 transportation units have been tagged and enrolled throughout Central America, representing approximately 34% of the total number of tags available.	initiation and closing of transits, selectivity checks, confirming operations, etc. • Establish an exclusive lane for cargo units that have the RFID tag installed
5. Installation of Cameras at Border Crossings	
• Dome-type webcam systems have been installed, with their respective active transmission system, at the border posts of: - Pedro de Alvarado-Guatemala - El Amatillo-Honduras - Guasaule-Honduras • Camera systems have been installed, but the transmission system for viewing them online is pending implementation, at the following border crossing posts: - La Hachadura-El Salvador - Guasaule and Peña Blanca-Nicaragua - Paso Canoas Costa Rica and Panamá - Peñas Blancas-Costa Rica (pending relocation of cameras)	• No new strategy is recommended. Although implementation has been delayed, it is on the right track.

Source: JST



Source: SIECA

Figure 9.1.1 Progress of RFID Facility Installation

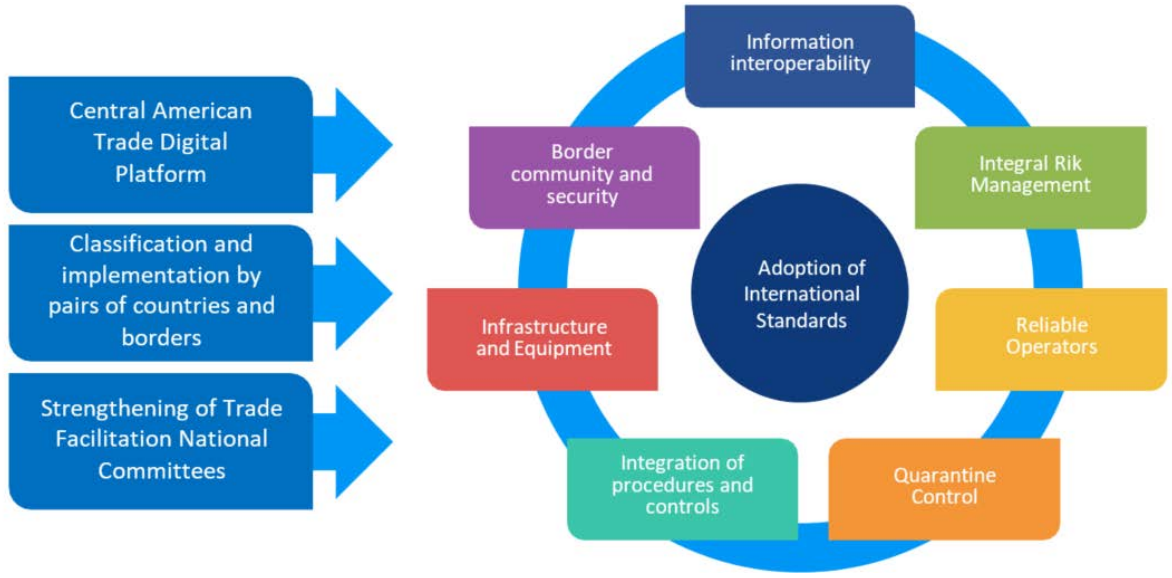
(3) Medium and Long-Term Priority Measures

The second major component of the Central American Strategy for Trade Facilitation and Competitiveness incorporates 8 medium and long-term measures, which are intended to be implemented gradually, after the short-term measures have been achieved. These medium and long-term measures seek to establish a Coordinated Border Management Model (CBM).

Each Member State has made progress in each of the actions, but has done so unilaterally, according to their annual operational plans. On a few occasions it has been carried out as a binational approach.

On the other hand, the development and integration of the Central American Digital Trade Platform (PDCC) is underway, through SIECA, which is a catalogue of services or processes related to intra- and extra-regional trade operations, which will be accessed through a web environment that will allow users to interact from the PDCC and interoperate with existing national platforms and systems, or those being developed by the institutions involved in trade processes. This tool will be part of the Regional Information Platform of the Central American Economic Integration Subsystem administered by SIECA.

The main objective of the PDCC is to ensure regional interoperability, transparency, and traceability among the sanitary, immigration, customs and the Single Window for Foreign Trade (VUCE) systems of the beneficiary countries, and to facilitate intra- and extra-regional trade processes.



Source: SIECA

Figure 9.1.2 Coordinated Border Management Model

In view of the delays and the work that still must be done regarding the implementation of these measures, the following strategy is recommended:

Table 9.1.3 Suggestions for Medium and Long-term Measures in ECFCC

Measures	Suggestions by JST
1. Adoption of international standards	Establish a regional regulatory framework to provide a single mandatory data model for all types of messages related to international trade operations, which incorporates all border control institutions.
2. Information interoperability	Establish a single unique regional window for trade, focusing it on the Central American Digital Trade Platform (PDCC).
3. Integrated risk management	Strengthen the Regional Cooperation Commission so that it does not only focus on establishing guidelines or policies, but also carries out operational actions.
	Establish a work plan for the formation of an operational team, identifying the necessary resources for its implementation and its funding source.
	Establish a computer platform for regional risk analysis, incorporating the policies, provisions, elements, and variables established by the Regional Cooperation Commission, which should be interconnected with the national platforms of the each of the countries involved.
4. Authorized Economic Operators (AEO)	Strengthen the regional regulatory framework for authorized economic operators.
	Reliable operators, with the purpose of standardizing the current programs of each Member State, or those that need to be established under the same regulations.
	The same regulations should validate the mutual recognition of the programs and their reliable operators, as it is done with the Central American carriers and pilots (motorists).
	Establish regulations and operationalize the incorporation of other border agencies, so that they become part of the mutual recognition of companies and AEO programs.
5. Quarantine control	Develop a regional information technology platform that will allow the use of a single medium for the registration, issuance and transmission of permits and certificates. It is essential to seek funds through international cooperation.

Measures	Suggestions by JST
6. Integration of procedures and control	Establish regulatory provisions that require one-stop border controls, thus allowing the concentration of controls by binational authorities at a single point. With the participation of customs, phytosanitary and police authorities.
	Establish computer systems that allow the payment of services and goods (not taxes) electronically, through electronic banking, for example: security checks (seals), parking, non-intrusive inspection services, etc.
7. Infrastructure and equipment	Design a model of integrated customs or border posts that incorporate all the elements of the processes under the framework of coordinated border management, trade facilitation and customs unification. The development of infrastructure projects in the countries should be similarly aligned.
	Establish exclusive lanes for empty means of transport, perishable goods, international transits (when they are passing through customs) and for companies accredited as authorized economic operators.
	Establishment of customs offices to handle operations according to their infrastructure conditions, logistical facilities, and nature of operations. For example, customs which exclusively serve perishables, empty means of transport and international transits; and others which serve imports and exports.
8. Border community and security	Establish a regional work plan for the development of the strategies and actions proposed in the ECFCC, with the respective sources of financing, including international cooperation.

Source: JST

9.1.2 Customs Union

(1) Outline

The Customs Union process in Central America followed a long path, full of good intentions and at times with significant progress, but at a slow pace. These good intentions date back to the establishment of the General Treaty of the Central American Economic Integration in 1960 and ratified in the Protocol of Guatemala in 1993.

These instruments have been very important, as they set out the horizon for equitable and sustainable economic and social development of the Central American countries; mainly, the well-being of the population and the growth of all member countries, through a process that enables the transformation and modernization of their productive, social and technological structures, as well as increasing competitiveness and achieving an efficient and dynamic reintegration of Central America into the international economy.

Under the Protocol of Guatemala, a commitment was made to establish a Customs Union among member states, in order to provide freedom of transit for goods, regardless of their origin, provided that products from third countries are nationalized in one of the member states. This Protocol also states that the Customs Union will be achieved gradually and progressively, on the basis of programs adopted by consensus, which will be established for this purpose. Furthermore, it states the commitment to establish a common customs service, implementing standardized procedures, administrative systems and guidelines.

The coordination and harmonization of policies to eliminate any differences, mainly in the field of taxes, fees and other charges that affect intra-regional trade, is another important aspect of the agreement.

Thus, in 2007, the Central American countries signed the "Framework Agreement for the Establishment of the Central American Customs Union", where they reiterate their willingness to form a Customs Union among their territories. This agreement states that it will be based on the objectives and principles of the regional integration instruments in effect and in accordance with the provisions set forth in Article XXIV 8.a of the General Agreement on Tariffs and Trade, GATT, 1994, which is part of the World Trade Organization Agreement, WTO.

In this same agreement, it was stated that the establishment of the Customs Union shall be the result of the development of the following three stages:

- Promotion of the free movement of goods and trade facilitation,
- Modernization and regulatory convergence; and
- Institutional development.

There has been no major progress in these stages at the Central American level; however, Guatemala, Honduras and El Salvador, making use of the provisions under the Protocol of Guatemala, regarding the fact that the progress will be made through mutual agreement of member states, thus giving guidelines that all or some members to move forward as fast as they decide to advance in this process. To this end, they constituted the legal instrument: "Enabling Protocol for the Process of Deep Integration towards the Free Transit of Goods and Individuals between the Republics of Guatemala, Honduras and El Salvador", which has been implemented by Guatemala and Honduras, and El Salvador's incorporation is still pending.

The decision to continue advancing along this path has allowed significant steps to be taken in terms of free movement of goods, persons and means of transport, since they use a single form to make transfers and acquisitions of goods that are exchanged in the territories that benefit from free movement, which represents 75%[1] of the goods, which has been called: "Invoice and Single Central American Declaration (FYDUCA)"; as well as, the incorporation of electronic notifications of Sanitary and Phytosanitary Measures (MSF, for its Spanish acronym); this has enabled very expeditious border transactions, without congestion or queues for the means of transport.

It should be noted that the objective of free circulation of goods will be achieved when the exempted goods are included. However, complete success will be reached when all of the Central American countries benefit from this free movement of goods and people.

(2) Current Status and Proposed Strategies by JST

The referential framework previously presented, requires reconsidering some strategies for the implementation of each measure, set forth for the establishment of a Central American Customs Union, which are suggested by JICA study team as below:

Table 9.1.4 Current Status and Proposed Strategies on Cutoms Union

Current Status	Proposed Strategies by JST
Stage 1: Promotion of the Free Movement of Goods and Trade Facilitation	
Objective 1: to establish and guarantee compliance with trade facilitation measures aimed at improving intraregional free trade and expediting the movement of originating and non-originating goods within the customs territory	
• A single goods declaration form has been prepared, called the Unified Customs Declaration -DUCA-, which integrates intra-regional operations of originating goods, international land transit and trade with third countries outside the region, each with its own modality. • 99.9% of the goods of the Central American tariff system originating in Central America enjoy free trade, fulfilling their tax and customs obligations through a DUCA F; 0.01% are declared through a DUCA D form. • Originating and non-originating goods may transit freely through the Central American territory, through a DUCA T. • Non-originating goods comply with their tax and customs obligations by means of a DUCA D.	• Finalize negotiations to incorporate all originating goods into free trade. • Establish a single declaration form for originating and non-originating goods, electronically incorporating the declaration of value and documents that support the declaration. • Establish a regulatory framework for the use of the Declaration, so that the procedure for its presentation and use is standardized and uniform. • Incorporate pilot and pilot's assistant's data to the goods declaration, with the purpose of incorporating a migratory pre-check. • Establish a mechanism for the payment of taxes upon entry into the territory and the distribution of import duties for all member states, to avoid double taxation.

[1] https://www.sica.int/iniciativas/aduanas

Current Status	Proposed Strategies by JST
• In some countries, it is necessary to file two declarations for original goods, using DUCA F only as a certificate of origin, and using DUCA D to fulfill the customs obligations. • As mentioned in section 3.1.2, the adoption of an advance declaration has begun under the framework of the Deep Integration of Guatemala and Honduras, which seeks to digitize all documents supporting the declaration prior to the arrival of the means of transport at the border crossing post. • Pilots and assistants must comply with the corresponding immigration registration at border crossings in each country of departure and entry, with the exception of some countries that have enter into a Bilateral Agreement for a single immigration control.	
Objective2: to establish and guarantee the functioning of legal mechanisms, IT improvements, logistics and infrastructure that will enable each Member State to administer and collect import duties, taxes, and other charges on foreign trade efficiently and effectively.	
• Negotiations are underway to establish a new Central American Standard Customs Code - CAUCA- and its Regulations. • The construction of the Central American Digital Trade Platform is underway, which will integrate communications of the IT systems of the Central American Customs Services.	• Establish a Central American Community Code, incorporating principles and elements of common territory, free transit of goods and persons, as well as a single sanctioning regime applicable to all member countries. • Establish a single Central American electronic platform for the preparation and transmission of the Declarations of Goods or incorporate them into the Central American Digital Trade Platform (PDCC, for its Spanish Acronym). • Establish a single integrated border crossing infrastructure model, under a Customs Union perspective. Incorporate an infrastructure development plan and obtain the corresponding sources of funding.
Objective 3: to ensure that intra-border customs between the states involved continue to operate and gradually promote, in a coordinated manner, the facilitation and streamlining of trade and the collection of the corresponding taxes.	
• Except for the border crossings posts between Guatemala and Honduras, the rest of the Central American border crossings operate under a traditional customs control mechanism. On some occasions, integrated controls are undertaken.	• Establish IT systems that allow the payment of services and goods (not taxes) electronically, through electronic banking, for example: custom seals, parking lots, non-intrusive inspection services, etc. • Re-establish the operation of the RFID system and the equipment installed at border crossing posts. Also, take advantage of it to automate processes such as: migratory control, phytosanitary control, initiation and closure of transits, application of selectivity, confirmation of operations, etc. • Establish mechanisms for coordinated border management between all national and binational authorities, through regulatory provisions that require one-stop border controls, thus allowing the concentration of controls by binational authorities at a single point. With the

Current Status	Proposed Strategies by JST
	participation of customs, phytosanitary and police authorities.
Stage 2: Modernization and Regulatory Convergence	
Achieve Harmonization of the Entire Common External Tariff	
• Panama's incorporation of the COMIECO resolutions has been very slow, which has made it possible to successfully achieve total harmonization of the common external tariff. Also, but to a lesser extent, Nicaragua has not adopted all of the COMIECO resolutions.	• Promote at the Meeting of Presidents that a specific deadline shall be set per country for the adoption of COMIECO resolutions.
Establish Peripheral Customs Offices	
• Two peripheral customs offices have been implemented under the framework of deep integration between Guatemala and Honduras, Puerto Cortes, Tecún Uman II and Guasaule.	• Establish a regulatory framework to further develop the functions and benefits of performing operations in peripheral customs offices, within the framework of the Customs Union of Central America. • Extend the functions of the customs authorities of the country of entry, so that it may exercise control functions on behalf of the authorities of the country of destination. • Implement at least one Peripheral Customs Office in each Member State.
Standardize Regional Regulations in All Areas Contained Under the Customs Union Framework Convention, Taking into Consideration International Trade Commitments	
• Each member country adopts its own national sanctioning system. • Each country adopts its own operating procedures. • Each country has its own regulatory and tax laws. For example, Guatemala has a first registration tax for vehicles and a zero-import customs duty (DAI, for its Spanish acronym); the rest of the countries do apply DAI to vehicle imports.	• Establish a Central American Community Code, incorporating principles and elements of common territory, free transit of goods and persons, as well as a single sanctioning regime applicable to all member countries.
Gradual Convergence of the Various Free Trade Agreements and Partial Scope Agreements Current Status	
• Each country manages its own international trade policies, negotiating its own free trade agreements. • There are no initiatives that seek the convergence of free trade agreements and partial scope agreements. •	• Establish a high-level dialogue round table to reach a consensus on an agenda to develop a road map for the alignment of international trade policies for the establishment of free trade agreements, as well as to establish commitments that will allow for the convergence of the various treaties already in place.
Tariff Regime	
• There is a Unique Central American Tariff System.	• None
Customs Regime	
• Although there are regional legal regulations that can contribute to the harmonization of procedures, deadlines, controls, actions, documents, etc., each country still adopts its own procedures.	• It is suggested that a Central American Community Code be established, incorporating principles and elements of common territory, free transit of goods and persons, as well as a single sanctioning regime applicable to all member countries.
Tax Regime	
• In 2006, the Framework Agreement for the Compatibility of Internal Taxes was established	• Establish an internal tax round table to establish a road map and a work plan for the development

Current Status	Proposed Strategies by JST
with the purpose of making the internal taxes applicable and compatible to the trade of movable goods and services within the single customs territory. The provisions contained in this instrument have been partially implemented.	of actions to fully implement the Framework Agreement for the Compatibility of Internal Taxes.
Sanitary and Phytosanitary Measures and Technical Barriers to Trade	
• A technical guide has been prepared and approved for the exchange of information on sanitary and phytosanitary certificates, with pending IT developments. • Meetings have begun at the roundtable of sanitary and phytosanitary measures to modify the annex of certificates established in the Central American Sanitary Guideline, Resolution 338-2014 of COMIECO, in order to standardize the sanitary and phytosanitary certificate of all countries.	• As mentioned in section 10.1.1, considering the delay in the implementation of the measure, it is recommended that a mandate be established as a result of the Meeting of Presidents, so that the measure can be implemented within a specific period of time. • Continue with the process of enabling the electronic transmission module for sanitary and phytosanitary certificates, associated with the transmission system of the Central American Digital Trade Platform (PDCC, for its Spanish acronym).
Stage 3: Institutional Development	
• The governance and institutional framework established to develop the negotiations, planning, arrangements, and execution of actions necessary to advance the customs union process has been adequately developed; however, it is very slow and requires more pragmatic actions that allow for more precise decision making and that responds to the dynamics for obtaining immediate results.	• Establish a Council for planning, development, monitoring, and follow up, which responds to the Meeting of Presidents. This Council should follow up on the compliance of the presidential decisions and the legal provisions that regulate the Central American Economic Integration and the Customs Union.

Source: JST

9.2 Regulation and Organization

9.2.1 Regulation and Technical Standards

Toward the economic integration, several efforts have been made in customs sector in Central America. In general, customs procedures in Central America are harmonized by the regulations of the Central American Uniform Customs Code (CAUCA) and its Regulations (RECAUCA). To improve the custom procedures, legal framework in each country has been improved such as the introduction of Authorized Economic Operator (AEO). Costa Rica enacted a law in 2013 that allows collecting a specific tax for the improvement of land border crossing including infrastructure and equipment.

Table 9.2.1 Laws and Regulation Related to the Customs Sector in Central America

Country	Instrument	Situation
CA	Resolution 223-2008 (COMIECO-XLIX), Resolution 224-2008 (COMIECO-XLIX)	Customs procedures in Central America are harmonized by the regulations of the Central American Uniform Customs Code (CAUCA) and its Regulations (RECAUCA).
GTM	Customs Law	There was a legal reform but it was approved without the agreement of the Integrity Pact, hence its Na validity is limited. Private sector has objections as well as for the procedures that link the transportation unit to the cargo.
	Animal and Vegetable Sanitation Law	The law that establishes inspection procedures must be revised and modernized.
	Law for the acknowledgement of electronic authorizations and signatures	Enacted in 2008, it empowers the State and its institutions to use electronic communications and signatures.
	SAT Directory Agreement 14-2010 14-2010 OAS	Establishes requirements to qualify for the Authorized Economic Operator (AEO) certificate.
	Decree 5-2021, Law for the Simplification of Administrative Requirements and Procedures	In August 2021, a new law will come into effect that will enable all state agencies to adopt measures to automate their services, eliminate unnecessary steps and allow electronic payment of services.
SLV	Customs Simplification Law (Decree No: 529)	Basic legal framework for the adoption of simplification, facilitation and control mechanisms of customs operations, through the use of automatic information exchange systems.
HND	Customs Law (Decree 212-87)	Establishes organization and competencies of the customs service, defines customs regimes, customs tax obligations and other provisions.
	Law on Simplification of Tax Administration (Decree 110-93)	Establishes new tax administrative procedures and controls related to productive activity.
	Customs Agreement 050-2020	Content of the administrative provisions applicable to the Authorized Economic Operator (AEO) in Honduras
NIC	Law for Creation of the General Directorate of Customs Services and Reform of the Creation Law of the Income General Directorate (Law 339, Gaceta No. 69, 04/06/2000)	Defines the nature, roles and extent of the competency of the DGI and DGA as de-centralized institutions under the direction of the Ministry of Finance and Public Credit.
CRC	General Customs Law (passed in 1995) and its regulations (passed in 1996)	Creates the National Customs Service. Establishes scope, regulates incoming and outgoing goods, vehicles and transport units, and customs clearance. Modified in 2012, it introduces provisions that allow compliance with CAUCA III.
	Decree 32481-H (published on 06/29/2005)	Establishes the organic structure of the General Directorate of Customs (DGA).

Country	Instrument	Situation
	Presidential Decree (1988) and Law 7,638 of 11/13/1996	Creates the Single Window of Foreign Trade (VUCE). Decree 33452 (07/12/2006) defines the elements of the organizational structure of VUCE
	Decree 35802-H (published on 03/08/2010)	Establishes requirements to qualify for the Authorized Economic Operator (AEO) certificate.
	Law No.9154	Approves agreement establishing association between Central America and the European Union and its Member States. It includes the specific tax for the improvement of land border crossings.
PNM	National Customs Authority (ANA) Law (Decree 1 2008)	Creating the ANA and dictates provisions concerning the customs regime.
	ANA Resolution 195-2016	Establishes requirements to qualify for the Authorized Economic Operator (AEO) certificate.
	Cabinet Decree Sept 27, 2011	Integrated Customs Management System (SIGA), custom system, is created.

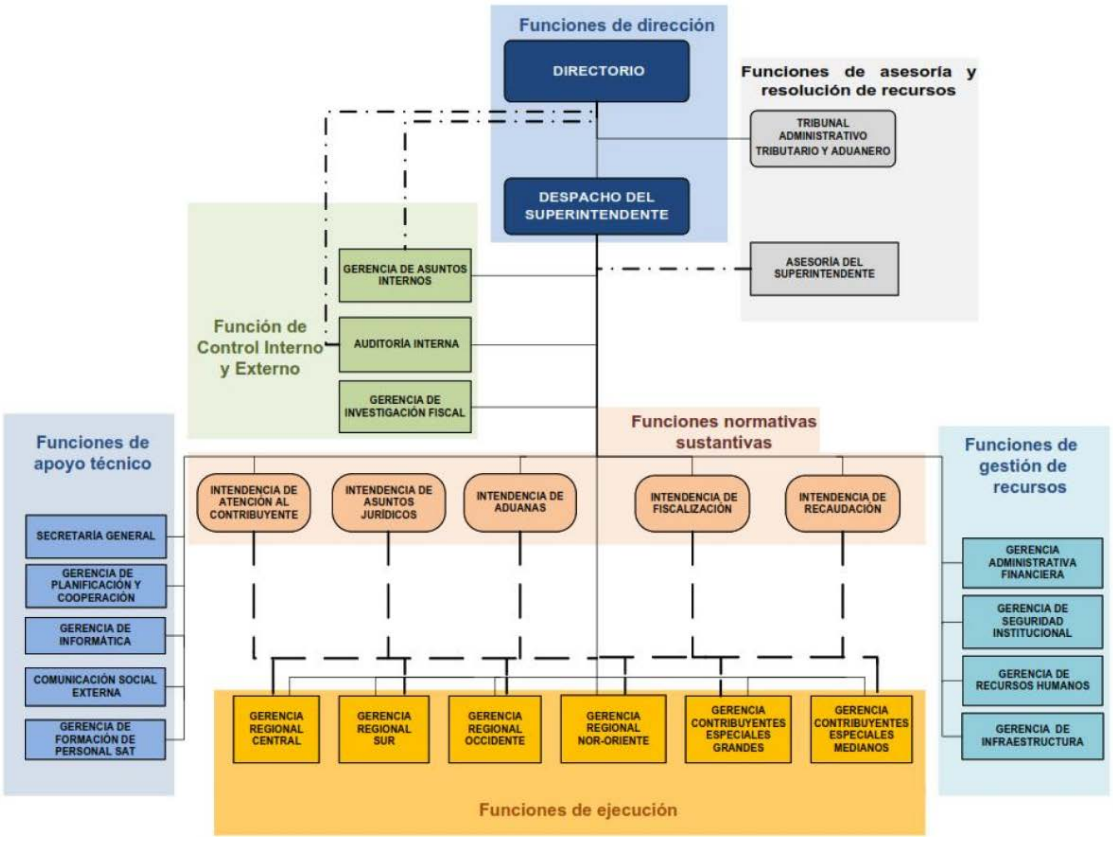
Source: JST

9.2.2 Organization and Human Resources

(1) Guatemala

The SAT (*Superintendencia de Administración Tributaria*, Superintendency of Tax Administration) is a decentralized state entity, with competence and jurisdiction throughout the national territory of Guatemala, to exclusively exercise the functions of tax administration, contained in the legislation. Its powers include the administration of domestic and foreign trade taxes.

Total number of employees in SAT is 5,891. Out of those, 3,522 employees are operational staff and 2,369 employees are administrative staff. 1,184 employees work at customs office. 273 employees work at Puerto Quetzal port cutoms and 132 employees work at Puerto Barrios port customs, 140 in Santo Tomas de Castilla customs, 105 in Express Aereo customs, 121 in Tecun Uman II customs, which are the main customs offices in the country; the rest of the staff is distributed among the other customs offices in the territory. Its organizational structure is shown in Figure 9.2.1.



Source: Operation Plan 2019

Figure 9.2.1 Organization Structure: Superintendency of Tax Administration of Guatemala

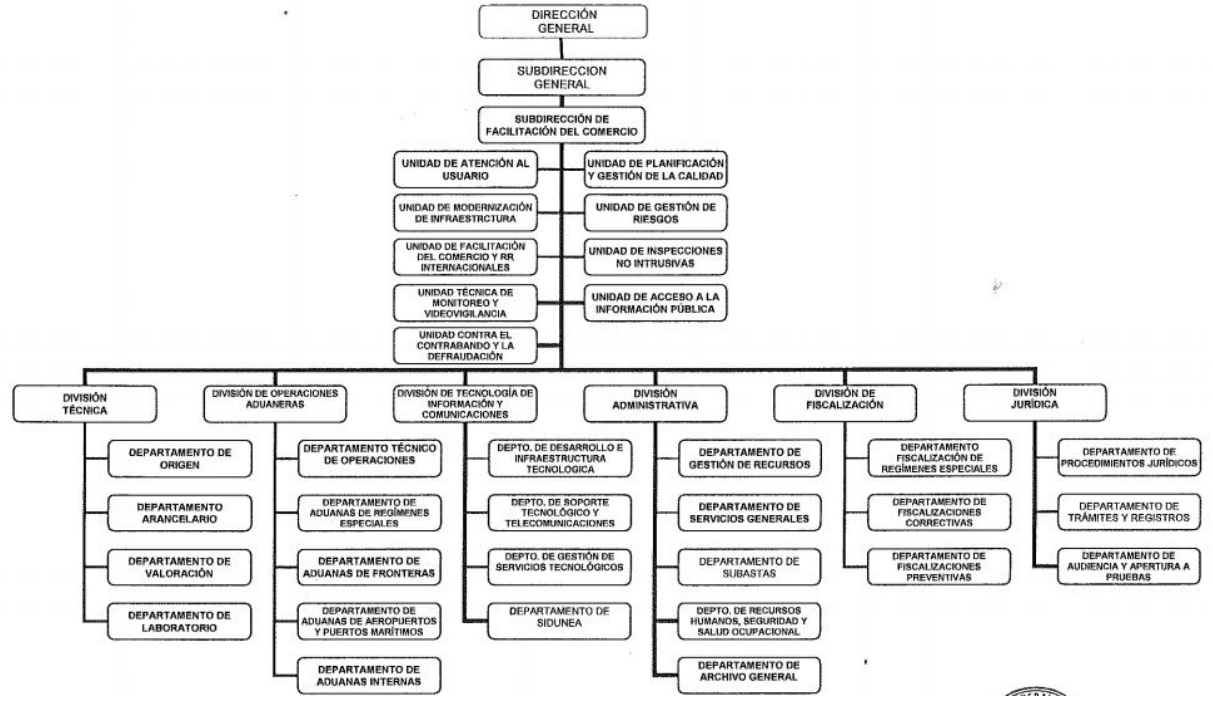
Something important to point out is the academic level of its staff, 46% of them have a university degree, 49% are not graduated, but have university studies and only 5% do not have or have not started a university education yet.

SAT has a staff turnover rate of 3% on annual average, related to resignations or dismissals. This can be considered quite acceptable for an organization as large as SAT, reflecting a high level of job stability for its employees.

The working hours in maritime and ground customs are 7 days working shifts with 7 days off, with the exception of El Ceibo customs office, which has 15 days working shifts with 15 days off. This is beneficial for employess who are not from the local area, as it allows more time to travel and share with their families, creating an organizational climate that is appropriate for this type of work.

(2) El Salvador

The DGA (*Dirección General de Aduanas*, General Directorate of Customs) was created by Legislative Decree No. 43, dated May 7, 1936, as a specialized agency of the MoH (*Ministerio de Hacienda*, Ministry of Finance), to guarantee the law enforcement that govern the international trade. Its power is limited only to the administration of taxes resulting from foreign trade.



Source: Operation Plan 2020

Figure 9.2.2 Organization Structure: General Directrotate of Customs of El Salvador

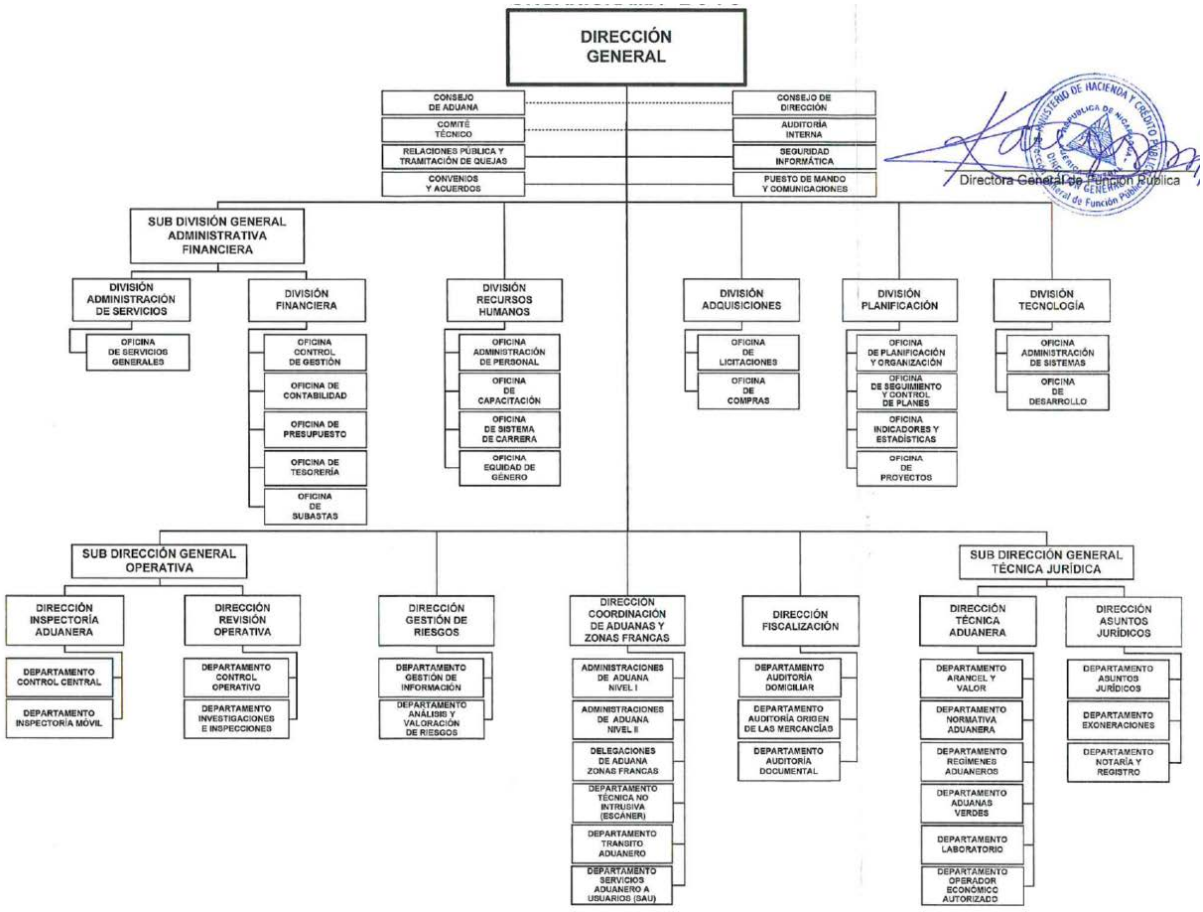
(3) Honduras

In 2020, the ADUANAS (*Administración Aduanera de Honduras*, Honduran Customs Administration) was established, whose mission is stipulated in the Tax Code directed by professionals of height and a group of trained collaborators who will be the pioneers in fulfilling the function of being facilitators, inspectors and exercising cutoms control of merchandise. Its power is limited only to the administration of taxes resulting from foreign trade.

The DARA (*Dirección Adjunta de Rentas Aduaneras*, Adjunct Directorate of Customs Revenues) was in charge of tax administration before the ADUANAS was established.

(4) Nicaragua

The agency in charge of foreign trade operations in Nicaraga is the DGA (*Dirección General de Servicios Aduaneros*, General Directorate of Customs Services). This institution is governed by Law No. 339 , approved on March 9, 2000. Its power is limited only to the administration of taxes resulting from foreign trade.

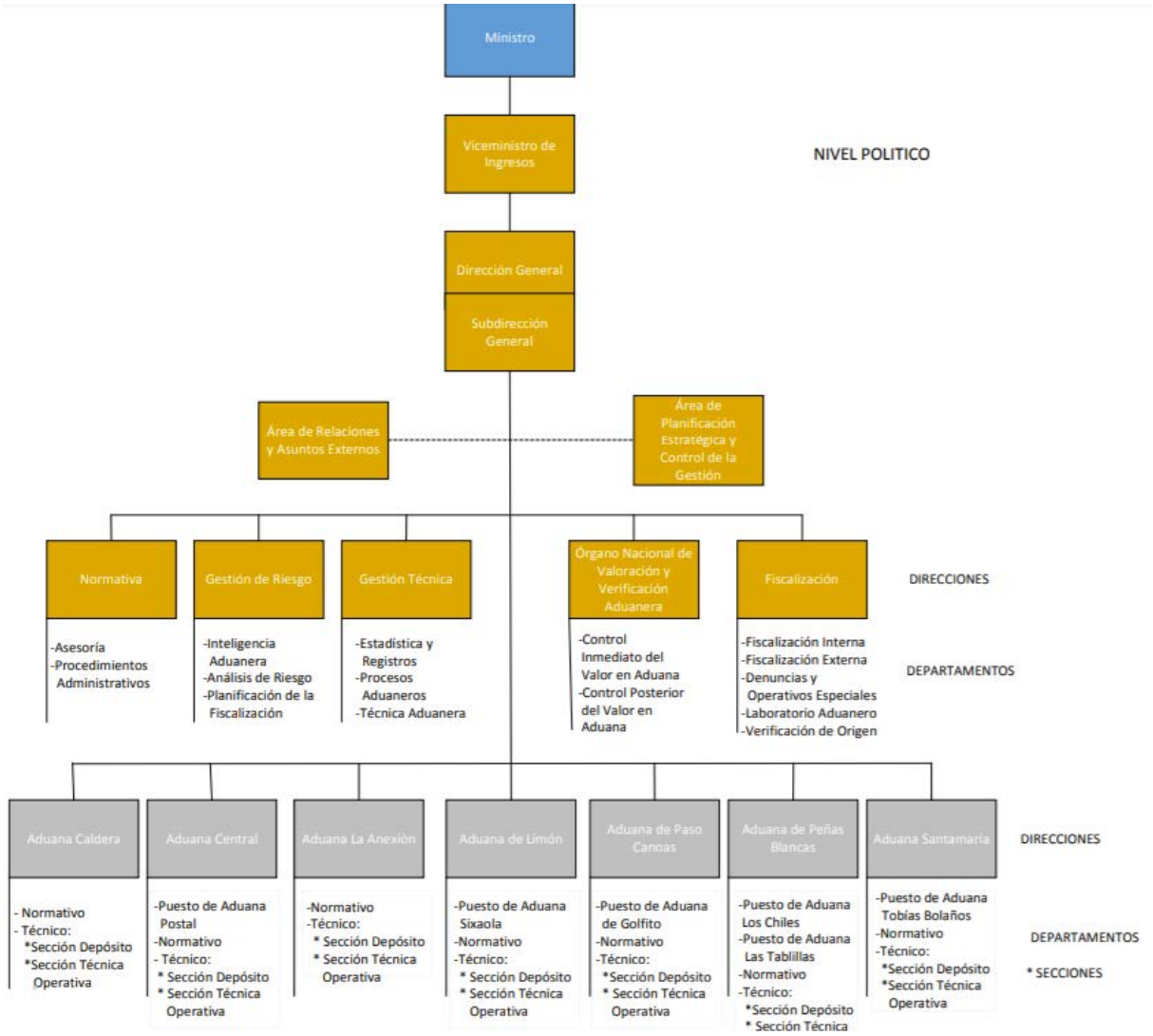


Source: Website of DGA

Figure 9.2.3 Organization Structure: General Directrotate of Customs Services of Nicaragua

(5) Costa Rica

The SNA (*Servicio Nacional de Aduanas*, National Customs Services) under the MoH (*Haciendas, Ministry of Finance*), is in charge of guaranteeing a correct collection of duties and taxes, facilitating trade and exerting customs control of merchandise, protecting the superior interests of the community.

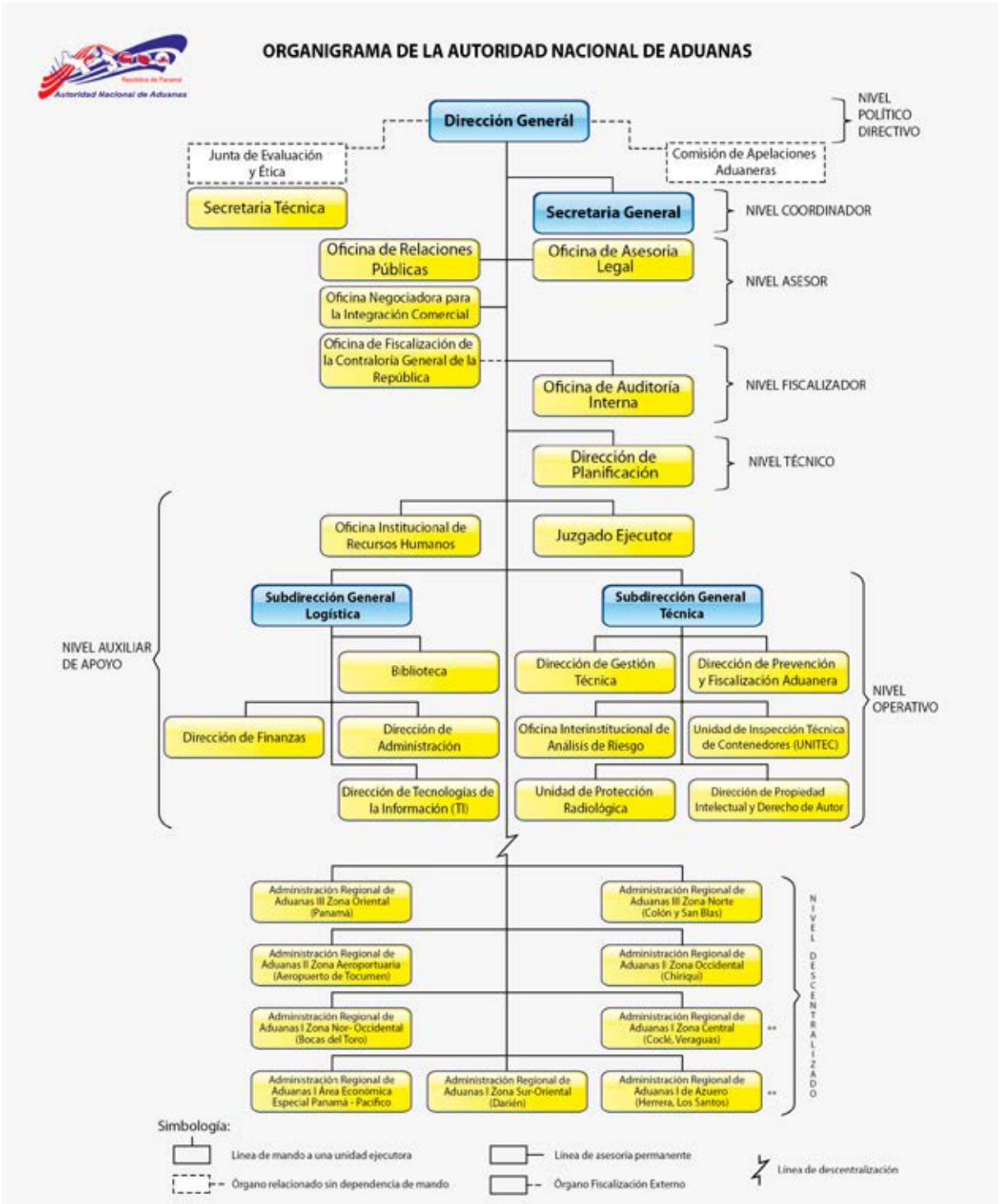


Source: Website of SNA

Figure 9.2.4 Organization Structure: National Customs Services of Costa Rica

(6) Panama

The agency in charge of foreign trade operations in Panama is the ANA (Autoridad Nacional de Aduanas, National Customs Authority).



Source: Website of ANA

Figure 9.2.5 Organization Structure: National Customs Authority of Panama

9.3 Existing Condition of Customs System and Border Facilities

Following figure shows the borders in Central America. It should be noted that trucks loading cargo are not allowed to pass some of the borders. For example, loaded trucks are not allowed to cross the border at Las Chinamas (El Salvador) and Valle Nuevo (Guatemala) due to the insufficient seismic resistance of bridge. Most of borders in northern three countries are located at riverside or mountainous area. Therefore, it's difficult to expand the border with passing lanes for transit and green light cargo.



Source: SIECA

Figure 9.3.1 Land Borders in Central America



Source: JST

Figure 9.3.2 Las Chinamas Border



Source: JST

Figure 9.3.3 Small Shops and Houses near San Crisobal Border

Most border crossings (customs facilities) are old or have not undergone a major upgrade in their infrastructure to adapt to the evolving trade dynamics, growth in the volume of transactions and traffic flow; they also lack the facilitation vision and the Central American economic integration approach. Among the few facilities that meet these characteristics is the one built in Nicaragua in 2019, with the support of the IDB, which modernized the Peñas Blancas border crossing, considered a benchmark for all of Central America. On the other hand, El Salvador is modernizing the Anguiatu border crossing, with the assistance of Fomilenio II.



Source: DGA

Figure 9.3.4 New customs facilities in Nicaragua at Peñas Blancas Customs.



Source: DGA

Figure 9.3.5 Design of new customs facilities at Anguiatu Customs

Electronic custom declaration is applied in all six countries. However, customs IT system isn't unified. El Salvador and Nicaragua are using the Automated System for Customs Data (ASYCUDA- World) World which is provided by United Nations Conference on Trade and Development (UNCTAD). Other four counties are using unique system.

On the other hand, in relation to SAT's revenue budget, there are different types and sources of revenue that are used each year. SAT's income for fiscal year 2021 was estimated based on the income received during 2018 and 2019, as well as the behavior of income collection in 2020 and the estimate of what the Ministry of Finance would allocate from the 2% of the collection for fiscal year 2021. Its allocated budget for the

year 2021 amounts to Q1,810,873,000.00, obtaining a small increase of 3% compared to the year 2020 of Q1,763,337,000.00. The 91% of the budget is allocated for operations, the remainder for investment.

Table 9.3.1 Customs Management System in Each Country

Country	Name of Customs Management System
Guatemala	SAQB'E (Sistema de gestión aduanera)
El Salvador	SIDUNEA mundial (Sistema Aduanero Automatizado mundial)
Honduras	SARAH (Sistema Aduanero Automatizado de Rentas Aduaneras de Honduras)
Nicaragua	SIDUNEA mundial (Sistema Aduanero Automatizado mundial)
Costa Rica	TICA (Tecnología de la Información para el Control Aduanero)
Panamá	SIGA (Sistema Integrado de Gestión Aduanera)

Source:WCO (World Customs Organization)

Regarding the operations automation carried out in the Guatemalan customs, 97 % of operations are semi-automateOrganization operations are carried out manually[2]. Among its IT projects are: a new document manager with cloud storage, new electronic signature, as well as projects developed with new technologies in Angular, Alfresco and Cloud. It also has other IT projects such as:

- Improved model of the dispatch process (Bulk)
- Auction automation
- Implementation of an application for abandoned goods.
- Permitted activities and operations
- Improvements to the application of withholding and release of goods,
- Phase 1: Anticipated declaration GT-SV.
- Reasonable doubt.
- Simplification of computer processing of selective and confirmation of DUCA-T,
- Registration of digitized documents,
- Improvements to the electronic signature process in the transmission of declarations.

The PDCC seeks to interconnect the current IT systems of the Central American countries; however, this is still not enough to achieve the standardization of systems and customs procedures. Ideally, the PDCC should have a wider scope, so that it becomes the single IT platform used by all countries.

[2] Information provided by the Intendant of Customs of Guatemala.

9.4 On-going and Planned Projects

Table 9.4.1 shows the development projects in the customs sector, which was listed up in the PENLOG of each country. Most of the countries have border modernization projects. However, the details of projects are still not clear.

Table 9.4.1 Development Projects on the Customs Sector

Country	Project	Responsible Organizations	Project Cost (Mil. USD)
GTM	Pedro Alvarado (GT)/ La Hachadura (SV): Border Modernization	CIV	16.6
	Tecún Umán (MX): Border Modernization	CIV	16.2
	Anguiatu (SV): Border Modernization:	CIV	8.5
	San Cristóbal (SV): Border Modernization	CIV	8.5
	Agua Caliante (HN): Border Integration and Modenization	CIV	8.5
	Melchor de Mencos (BZ): Border Modernization	FEGUA, ANADIE	8.5
	La Mesilla (MX): Border Modernization	DGA / DGME	N/A
	Valle Nuevo (SV): Border Modernization	DGA / DGME	N/A
	El Carmen (MX): Border Modernization	DGA / DGME	8.5
SLV	Modernization of Pedro Alvarado - La Hachadura GU-SV border crossings (Customs Union)	MOPVDU, DGA	N/A
	Modernization of La Ermita-Anguiatú border crossings (Customs Union)	MOPVDU, DGA	N/A
	Modernization of El Amatillo border crossing (Customs Union)	MOPVDU, DGA	N/A
	Modernization of El Poy border crossing (Customs Union)	MOPVDU, DGA	N/A
	Border Integration (HN): Enable cargo crossings	MOPVDU, DGA	N/A
	Modernization of San Cristóbal border crossing (Customs Union)	MOPVDU, DGA	N/A
	Modernization of Las Chimanas border crossing (El Salvador - Guatemala) (Customs Union). Enable cargo crossings	MOPVDU, DGA	N/A
HND	Modernization of SARAH border management system	N/A	5.0
	Puerto Cortés	N/A	8.0
	Border Crossings	N/A	8.0
	Implementation of VUCE	N/A	5.1
	Cargo Protection System at LPC (E-Road CP) and traceability of goods	N/A	3.2
	Customs Monitoring and Control Center CEMA	N/A	7.2
	Modernization of SENASA processes	N/A	0.2
	Modernization of LANAR/CENTREX laboratory	N/A	1.1
	Central American Regional Trade Support Sub-system: El Amatillo	N/A	13.0
	Central American Regional Trade Support Sub-system: El Guasaule	N/A	13.0
	Central American Regional Trade Support Sub-system: El Poy	N/A	12.5
	Central American Regional Trade Support Sub-system: El Florido	N/A	12.5
	Central American Regional Trade Support Sub-system: Las Manos	N/A	12.5
	Central American Regional Trade Support Sub-system: El Guasaule (NI) Border Crossing LAZ	N/A	5.2
	Central American Regional Trade Support Sub-system: La Fraternidad - El Espino (NI) Border Crossing LAZ	N/A	5.2

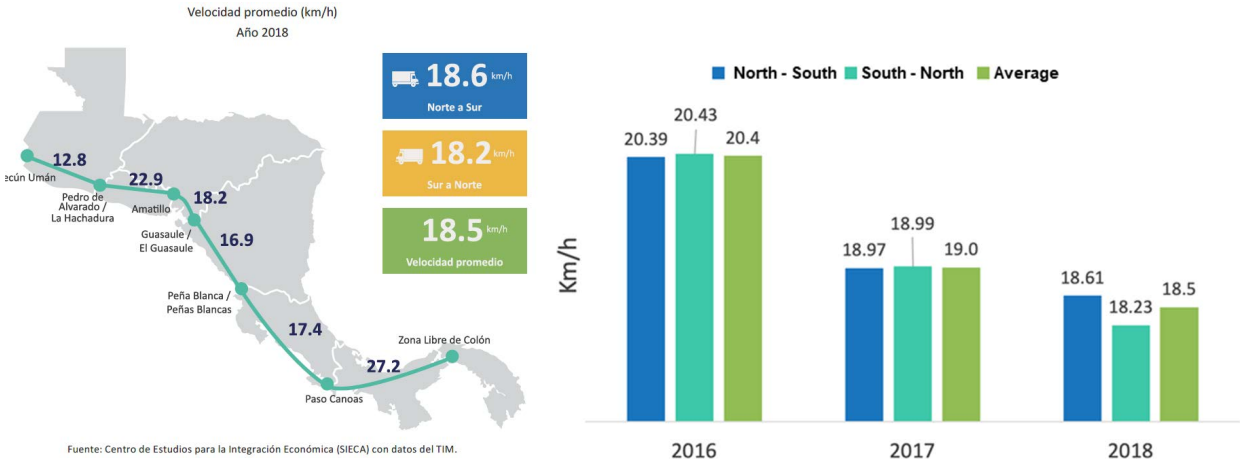
Country	Project	Responsible Organizations	Project Cost (Mil. USD)
NIC	Guasaule: Border Intergration	MTI	57.7
	El Espino: Border Modernization	MTI	2.0
	Las Manos: Border Modernization	MTI	2.0
	Penas Blancas: Border Modernization	MTI	10.0
	San Panchos: Border Modernization	MTI	10.0
	Pacific Logistics Conglomerate: Guasaule Border Crossing	DGA	13.0
	Pacific Logistics Conglomerate: Guasaule border support logistics area	Private Sector	5.0
	Southern Logistics Conglomerate: Peñas Blancas border crossing	DGA	15.0
	Southern Logistics Conglomerate: Peñas Blancas support logistics area	Sector Privado	5.0
	Southern Logistics Conglomerate: San Pancho / Tablillas border crossing	DGA	8.0
	Southern Logistics Conglomerate: San Pancho support logistics area	Sector Privado	5.0
	Southern Logistics Conglomerate: SDZ Logístico Rivas / Agrocentro Rivas	Sector Privado	8.0
	North Caribbean Logistics Conglomerate: Waspan border crossing	DGA	4.0
CRC	Peñas Blancas, San Panchos, Paso Canoas, Sixaola: Border Modernization	N/A	100.0
	Penas Blancas and Paso Canoas: Development of Logistic Activities Platforms (LAZ)	N/A	N/A
	Las Tablillas and Sixaola: Development of Logistic Activities Platforms (LAZ)	N/A	N/A
	Peñas Blancas Border Crossing, LAZ and Shared Transit Zone Project: Border Facilities	COMEX/MH	15.0
	Peñas Blancas Border Crossing, LAZ and Shared Transit Zone Project: LAZ	MOPT	5.0
	Paso Canoas Border Crossing, LAZ and Shared Transit Zone Project: Border Facilities	COMEX/MH	15.0
	Paso Canoas Border Crossing, LAZ and Shared Transit Zone Project: LAZ	MOPT	5.0
	Sixaola Border Crossing Project: Border Facilities	COMEX/MH	8.0
	Sixaola Border Crossing Project: Bridge to Panama	MOPT	8.0
	Sixaola Border Crossing Project: LAZ	MOPT	3.0
	Tablillas Border Crossing Project: Border Facilities	COMEX/MH	8.0
	Tablillas Border Crossing Project: LAZ	N/A	3.0
PNM	Paso Canoas Border Crossing Point (including expropriation)	N/A	N/A
	Scanner in Border	N/A	N/A

Source: Compiled by JST from PNLOG each country

9.5 Issues and Recommendation on Custom and Border Sector

9.5.1 Customs and Border Crossing Time

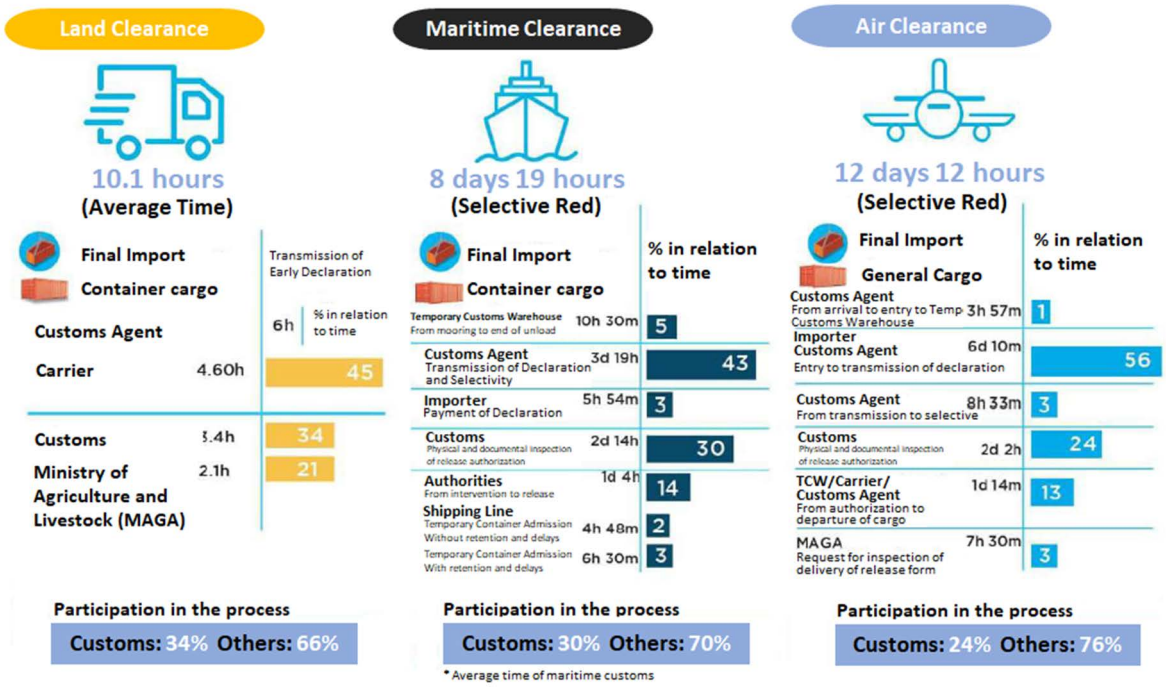
Center for Economic Integration Studies (CEIE) of SIECA conducted a study on travel time of transit cargo with the records of the International Transit of Goods System (TIM) in 2019. In total 1.7 millions of Single Transit Declaration (DUT) records from 2016 to 2018 were used for the study. The exercise determines that the average speed of transit operations carried out in 2018 in the Central American region was 18.5 km / h, which is lower than the speed reported in previous years. It should be noted that the average speed includes actual travel speed on the road in each country and the border crossing time.



Source: Speed measurement method for land transit of goods in the Pacific Corridor of Central America Results for 2016-2018 (SIECA)

Figure 9.5.1 Time Release Study (TRS)

Another Time Release Study was conducted in Guatemala with support from the World Customs Organizations (WCO). SAT decided to implement the study in the main four Customs offices based on the number of duties collected and operational volumes: Express Aéreo Customs Office, Santo Tomás de Castilla, Puerto Quetzal and Tecún Umán II. Sampling took place for 7 days between the 8th and 14th of July 2019. The result concluded that the border crossing at Tecun Uman II is reasonable. Maritime and air cargo clearance time is required to be improved.



Note: For "Selective Red", the time spent in physical and document inspections are added to the total time.
Source: Time Relearse Study (SAT 2019)

Figure 9.5.2 Average Release Time by Actors by Mode

9.5.2 Land Border Facilities

Limited capacity of land border facilities is the one of the reason of land border issues. Following issues are observed mainly at the borders in the 3 northern countries;

- There are no passing lanes for transit cargo,
- Customs are invaded by population,
- Trucks that hinder entry to customs, due to lack of customs clearance documents or those of other institutions,
- Limited parking and inspection area and,
- Limited area for expansion.

Central America counties have making efforts to improve the customs procedure such as transit cargo system, electrification of duty payments. To maximize the impact of those efforts, it is required to physically separate the trucks, which required custom procedure at borders and the trucks, which isn't, required the procedure such as transit cargo.

Also, to shorten the inspection time for cargo, it is required to improve the inspection procedure. X-ray divide is installed at the border of Antiguatu. Similar efforts are required.



Source: JST

Figure 9.5.3 X-ray Scanner at Antiguatu



Source: El Salvador Diario

Figure 9.5.4 Border Facility Improvement at El Amatillo (El Salvador)

9.5.3 Training for Truck Drivers

Based on the interview survey result by USAID in 2016, one of the major reasons of congestions at border is lack of required document. As shown in Table 9.5.1, more than 90% of truck drivers who are waiting at Paso Canoas and La Hachadura didn't have required documents for customs procedures. To improve the border crossing, training programs on documentation knowledge for truck drivers are required.

Table 9.5.1 Share of Truck Drivers who Don't Carry Customs Declaration Documents

Land Borders	Share (%)
ElAmatio (SLV)	29
Guasaule (HNR)	39
La Hachadura (SLV)	93
Paso Canoas (CRI)	97

Source: Study Report on Dispatch tims at La Hachadura – Pedro de Alvarado Border and El Poy (USAID 2016)