Feasibility study for the construction of the Multipurpose Deep-Water Terminal in the Port of Manta – Ecuador

By

Luis Esteban Ulloa Valdivieso
Student Number: 120341180

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School of Marine Science and Technology

Supervisor: Dr Chandra Lalwani
Newcastle upon Tyne, August 9th, 2013
The work in this dissertation has been supervised by

Dr Chandra Lalwani
School of Marine Science and Technology
Newcastle University

August 9th, 2013
Newcastle upon Tyne, United Kingdom
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Abstract

Since ancient times maritime transportation and ports have played an important role in the development of societies. Through the years, seaports have become the most essential link in order to distribute cargo to different parts of the world. Additionally, the improvements in logistic systems, technological advances, new ships’ size and design, economic and legal changes and environment responsibility have made seaports increase their efficiency and competitiveness in order to augment profits and customers. This is the case for ports in Shanghai, Singapore and Hong Kong which currently are the top three ports worldwide due to their strategic logistic expansions and modifications.

The investigation of the construction of a Multipurpose Deep-Water Terminal in the Port of Manta is based on PESTLE, SWOT and Trend Analysis that provide information about the feasibility of this project, which is an important component in the creation of a new transportation network in South America, the Multimodal Corridor Manta – Manaus. The data collected reflects all the factors that can have a positive and negative impact in the development of this new terminal. Moreover, it suggests the possible outcomes that can be achieved from this plan for the Ecuadorian and regional economy.

It is expected that the Multipurpose Deep-Water Terminal in the Port of Manta will become a new transhipment hub for cargo that is transported between Ecuador, Brazil, Asia and other markets. The reason for this is due to the short transit time and distance of this route in comparison with the Panama Canal and the strategic geographic location of Manta. However, this project cannot be crystalized unless substantial changes are brought about in the Ecuadorian port-juridical and political system, which is the main disadvantage of this logistic project. Therefore, it is indispensable that the Ecuadorian Government and Manta’s Port Authority develop an efficient port-management plan and restructure all of the barriers that could influence the creation of the new terminal.
Acknowledgments

I want to express my utmost gratitude to my supervisor, Dr. Chandra Lalwani for guiding and helping me to develop this academic research.

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My immense gratitude also goes to my sponsor, the SENESCYT (National Secretariat of Higher Education, Science, Technology and Innovation of Ecuador), whose support and the scholarship that they awarded to me, permit me to continue my academic and professional development in Newcastle University.

Lastly, I dedicate this academic research to my parents, brother, sister in law, nieces and friends for their continuous guidance and motivation which enables me to finish this project and complete another important part of my life.
CHAPTER 1: Introduction

Maritime Transport is an important aspect of the worldwide economy, because 90% of international trade is mobilized by sea (Pérez, 2012). Therefore, the marine industry plays a key role in generating employment and increasing revenue.

Ecuadorian exportations and importations are mostly performed by maritime transportation. The exportations, in terms of national economic growth, have been positive during the last 15 years. Mercantile incomes increased from US$ 4,203.1 million to US$ 23,852 million, which is a variation of 467.5% (Tomalá, 2013b). The main products traded were crude oil, product oil, banana, shrimps, flowers, cacao, coffee, tuna and other fish. Over the same period the importations augmented by 370%, from US$ 5,110 million in 1998 to US$ 24,018 million in 2012 (Tomalá, 2013c). The purchased products were consumer goods, oil and lubricants, raw materials and capital goods. Currently, Ecuador apart from its biggest commercial partners, the United States and the European Union, has diversified its commercial offers to new markets such as Brazil, Argentina, Russia, China, Japan and others. Therefore, Ecuador is constantly creating new logistic strategies in order to expand its international trade flow, promote productivity and increase competitiveness.

Consequently, the construction of the Multipurpose Deep-Water Terminal in the Port of Manta will improve the logistic and supply chain activities for the region and could attract new investments from national and international companies. Therefore, it is important to analyse in detail this project in order to understand the economic, social, commercial, environmental and logistical impact that it will have on the development of the country and the region.

1.1. Background

The Port of Manta, situated in the Province of Manabí, Republic of Ecuador, is a natural open deep-water port that has 12 metres of draft. It is located 25 nautical miles from the international maritime traffic route, 24 hours of travel from the Panama Canal, and is the nearest port from the South American West Coast to Asia (Ubicación Geo-estratégica, 2013) (Geo-strategic location). Due to its attractive geographical and port condition in the South American – Pacific area, a Multipurpose Deep-Water Terminal is being developed in the region. The reason for establishing the terminal in the Port of Manta is because it is part of the National Plan of Logistic Infrastructure of Ecuador, which is a governmental programme to create a logistic central platform and corridor in order to reactivate productivity and expand national and international trade. This strategic State industrial, socio-
economic and trade plan involves the establishment of the following mega-logistic projects (*Process of Delegation under the Grant Method for the Port of Manta, 2012*):

- Multipurpose Deep-Water Terminal in the Port of Manta.
- International Airport of Cargo and Passengers ‘Eloy Alfaro’ of Manta (located 10 minutes from the port).
- Construction of the Pacific Petrochemical Refinery in El Aromo – Manta.
- Creation of Zonas Especiales de Desarrollo Económico (ZEDE) (Special Economic Development Zone (SEDE)) in Montecristi (15km from Manta).
- Portoviejo’s Multipurpose Agribusiness Centre.
- Regional Commercial Distribution Centre of Quevedo.
- Dry Port in Santo Domingo de los Colorados.
- International Cargo and Passenger Airport of Latacunga.
- Tena’s Passenger Airport.
- Providencia, Nuevo Rocafuerte and Pebas – Pijuayal Waterways Ports.

Furthermore, this project is part of the future Multimodal Corridor Manta – Manaus, which is the creation of a new transportation route between Asia and South America. This plan is being developed due to the emerging trade between Ecuador, Brazil and Eastern Asia. This logistics and transportation Inland Passage will integrate the Pacific with the Atlantic Ocean using roads from Manta to Francisco de Orellana in Ecuador, then by ships across the Napo and Amazon Rivers passing through Peru, to the city of Manaus in Brazil. This is considered an alternative route, because it has an average transit time of 10 days, while through the Panama Canal it takes almost 37 days (*Process of Delegation under the Grant Method for the Port of Manta, 2012*).

1.2. Aim and Objectives

The aim of this academic research is to:

*Promote and analyse the socio-economical and mercantile feasibilities for the construction of the Multipurpose Deep-Water Terminal in the Port of Manta – Ecuador.*

The objectives of this academic research are to:
- Demonstrate the comparative and competitive advantages and disadvantages that this project offers in order to establish an alternative cargo-logistic centre and transportation route in the American continent.

- Determine the main role of the Multipurpose Deep-Water Terminal in the Port of Manta within the creation of the future Multimodal Corridor Manta – Manaus.

- Improve the competitiveness, efficiency, trading and development of the Ecuadorian Logistic System.

1.3. Methodology

Today, international logistic and port distribution are imperative factors for all companies. Additionally, these two areas have an important influence on the economic performance of countries and their mercantile business. Therefore, this academic research is focused on practical, theoretical and methodological aspects that will allow increasing the importations and exportations between Ecuador, Brazil and Eastern Asia.

The methodology of this academic research is based on PESTLE, SWOT and Trend Analysis. These tools will allow the stating of possible outcomes that can be achieved from the implementation of the Multipurpose Deep-Water Terminal in the Port of Manta.

1.4. Project Structure

In order to analyse this academic research in detail, the chapters of this investigation include the following topics:

- Literature Review

This section discusses the main subjects that are related to the Multipurpose Deep-Water Terminal in the Port of Manta. The areas to be examined are port roles and functions, growth in international trade and logistic influencers, the commercial and maritime-logistic situation between East Asia and the Amazon Basin Countries involved in this plan and a description of the Multimodal Corridor Manta – Manaus Project.
- Methodology

Specifically, this chapter is concentrated on PESTLE, SWOT and Trend Analysis. These resources were chosen in order to deduce which are the advantages, opportunities and risks of this project.

- Analysis & Discussion

In this chapter, it is applied the business analysis tools mentioned in the methodology section. Once all of the variables and features that affect the feasibility of the Multipurpose Deep-Water Terminal are examined, it is discussed all of the factors that are important in the performance of this project.

- Project Outcomes

Here will be stated the role and benefits of this alternative transhipment port in the North Western South American Coast and how it will influence the economic growth of Ecuador.

- Conclusions & Recommendations

Finally, it is indicated the improvements, new strategies and further research that could be developed and applied in order to perform the efficient management of this logistic and port project.
CHAPTER 2: Literature Review

This chapter describes the background and framework of this project. Therefore, this academic research indicates the different aspects that play an important role in the construction of the Multipurpose Deep-Water Terminal in the Port of Manta.

Firstly is analysed from a general point of view the port’s roles, functions and developments, then the concept and objectives of an international transhipment port and a multipurpose deep-water terminal.

Secondly is explained the growth in worldwide international trade and its logistic influencers such as globalization, containerization, logistic service providers and the development of new and alternative transportation routes.

Thirdly is examined the commercial and maritime logistic situation between the two major regions that support the creation of this project, which are located in Eastern Asia (China, Japan and South Korea) and in the Amazon Basin area (Brazil and Ecuador). Additionally, this investigation studies the conditions of international trade in these two regions and the features of their port systems. On the other hand, the Panama Canal is a potential competitor for this plan; therefore, it is very important to mention briefly the characteristics of the construction of the third set of locks in Central America.

Fourthly is explicated in general about the project Multimodal Corridor Manta – Manaus Project, where the construction of a Multipurpose Deep-Water Terminal in the Port of Manta is one its most important components. Also described are the structure of the National Plan of Logistic Infrastructure of Ecuador and the National Port System. Likewise, the condition of the Port of Manta and the current international public contest for the concession of this plan is presented. Besides, briefly expounded are the features of the Brazilian port system and the characteristics of the Port of Manaus.

Finally, this chapter summarizes the main points that are found in this literature review and the aspects that will be described in more detail in forthcoming chapters.

2.1. Port Roles and Functions

The first aspect to understand in this academic research is what it is a port. In a simple definition, “seaports are areas where there are facilities for berthing or anchoring ships and where there is equipment for the transfer of goods from ship to shore or ship to ship” (Alderton, 2008, p. 1). Another definition is that a port is the gateway to trade, and institutions such as governments and international agencies concentrate their attention on the development of these maritime terminals, particularly in regards to efficiency, technology and strategic geographical location development (Branch, 2007, p.
Nowadays, a port’s main role is to be the connexion in the supply chain with other transport modes, customs departments, logistical services and customers.

Having said this, for a port, it is important to comply with the 8R’s definition of logistics: Getting, in the right way, the right product, in the right quantity and right quality, in the right place at the right time, for the right customer at the right cost (Mangan et al., 2012, p. 9). Due to its essential role in supply chain management, a port must be capable of satisfying and stimulating the correct and efficient flow of goods between different regions. So, in order to achieve this goal, a port’s operational purposes must be according to the necessities and characteristics of the international market. It is therefore suggested by Majumdar (2012b) that its essential functions are:

- Interaction with other transportation systems.
- Accurate transmission of cargo information.
- Efficient cargo handling and distribution.
- Performance of other logistic activities (formation of terminals, distribution centres, etc.).
- Application of new technologies and know-how.
- Promotion of the development of a logistics network.
- Exchanging agreements and experiences with other ports.
- Solving bottlenecks.
- Developing a clean, safe and secure environment for operations.

2.1.1. Port Developments

Port developments and new maritime trends are affected by efficiency and productivity gains, which also include the ability to receive better, faster and larger vessels, and improvements in cargo handling in order to fulfil customer requirements (Mangan et al., 2008). Moreover, any new configuration in port infrastructure will need to be linked to the different distribution channels that goods will use for their potential markets. In other words, ports are constantly trying to maximize time and operational agility.

As suggested by Alderton (2011, pp. 500 - 501), many factors can cause ports to change, evolve or die such as:

- Changes in the inland transport infrastructure.
- Changes in trade patterns.
- Changes in financial and logistical thinking.
- Changes in ship size, cargo handling and turnaround times.
In summary, ports play a key role in international logistics operations, and in many cases they move from being reactive businesses which respond to changes in the market to those offering a proactive environment where innovative services that interface with a complex transport and logistics environment take place (Pettit and Beresford, 2009).

Likewise, Notteboom and Rodrigue (2005) state that port development in a regional context becomes a port-located distribution centre. Therefore, they become port-centric logistics, distriparks, transhipment ports or free trade zones, which are areas where different logistic activities such as distribution channel are performed at the port instead on inland locations. They help to decrease transport congestion between the port and distribution centres or the faster repositioning of containers to other ports. Having said this, today, ports become places of opportunity in order to develop and add new and valuable logistic activities and integrate efficiently all the components of the supply chain. In other words, they act as import/export nodes (Potter et al., 2003), and their success depends on the effectiveness of their marketing plan and the conditions of the worldwide economy.

### 2.1.2. International Transhipment Ports

Transhipment ports are those locations where goods are transported by a vessel to an intermediate port and then the merchandise is loaded on another vessel or mode of transportation in order to arrive at its final destination. These areas are in high demand due to their efficient connectivity with other geographical regions, reducing the number of journeys and costs.

Additionally, there are individual ports that are highly specialised in the pure transhipment of containers, thus operating primarily as hubs for global and regional container shipping and handling with relatively little local traffic (Heymann, 2011). Table 1 indicates the top 20 container ports that operate as transhipment hubs.
<table>
<thead>
<tr>
<th>Transhipment Port</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shanghai</td>
<td>China</td>
</tr>
<tr>
<td>2. Singapore</td>
<td>Singapore</td>
</tr>
<tr>
<td>3. Hong Kong</td>
<td>China</td>
</tr>
<tr>
<td>4. Shenzhen</td>
<td>China</td>
</tr>
<tr>
<td>5. Busan</td>
<td>South Korea</td>
</tr>
<tr>
<td>6. Ningbo</td>
<td>China</td>
</tr>
<tr>
<td>7. Guangzhou</td>
<td>China</td>
</tr>
<tr>
<td>8. Qingdao</td>
<td>China</td>
</tr>
<tr>
<td>9. Dubai</td>
<td>United Arab Emirates</td>
</tr>
<tr>
<td>10. Rotterdam</td>
<td>Netherlands</td>
</tr>
<tr>
<td>11. Tianjin</td>
<td>China</td>
</tr>
<tr>
<td>12. Kaohsiung</td>
<td>Taiwan</td>
</tr>
<tr>
<td>13. Port Klang</td>
<td>Malaysia</td>
</tr>
<tr>
<td>14. Hamburg</td>
<td>Germany</td>
</tr>
<tr>
<td>15. Antwerp</td>
<td>Belgium</td>
</tr>
<tr>
<td>16. Los Angeles</td>
<td>United States</td>
</tr>
<tr>
<td>17. Port Tanjung Pelepas</td>
<td>Malaysia</td>
</tr>
<tr>
<td>18. Xiamen</td>
<td>China</td>
</tr>
<tr>
<td>19. Dalian</td>
<td>China</td>
</tr>
<tr>
<td>20. Long Beach</td>
<td>United States</td>
</tr>
</tbody>
</table>

Source: (‘Top 100 Ports 2012,’ 2012)

Nowadays, these ports have been constituted in important cargo transhipment areas where goods are mobilized and distributed rapidly to their final destination or other transportation modes.

However, due to the growing traffic concentration in some ports, many mid-sized ports work as feeder connections for large ports. Therefore, their success depends on the route strategies developed by the shipping lines in accordance with their profitability analysis of the demand. According to Mangan et al. (2008) an efficient shipping lines route network for large and mid-sized ports will depend on:

- Good geographical positions relative to other ports of call for the best vessel transit/steaming time and port rotation.
- Closeness to marketplace.
- Having the necessary facilities, services and infrastructure.
- Being sufficiently flexible to allow service to be maintained if ships are out of schedule.
2.1.3. Multipurpose Deep-Water Terminals

A Multipurpose Deep-Water Terminal is an area of the port which has more than 12 meters of draft and is specialized in the handling of different types of cargo (containers, dry bulk, liquid bulk and others). Additionally, this section is a complex of infrastructure, equipment and services which offers a combined and flexible response to the servicing demands of certain types of vessel and cargo, permitting the optimum utilization of manpower and equipment (Enríquez, 1991).

On the other hand, Majumdar (2012b) states that the terminal’s services are:

- Vessel tie-up services.
- Container handling and transfers.
- Traditional break-bulk and neobulk cargo handling.
- Dry and liquid bulk cargo handling.
- Container stuffing and stripping.
- Bagging and packaging.
- Cargo storage.

Nevertheless, this type of terminal is more focused in the handling of general cargo transported by containers, which accounts for about 60% of the value of goods shipped by sea (Stopford, 2009). These units are mainly mobilized by containerships, multi-purpose vessels, tweendeckers, general cargo liners, ro-ros and barge carriers.

As suggested by Villagrán (2006), due to the strategic location of Multipurpose Deep-Water Terminals and constant changes in international trade patterns, port authorities need to concentrate their operational and logistics offers on the arrival of ships of more than 4,999 TEU such as Post-Panamax, Emma Maersk and in the future the Maersk Triple E class. Therefore, a Multipurpose Deep-Water Terminal must ensure it complies with the basic principles of the international maritime industry: minimize costs and maximize cargo transportation.

Additionally, another characteristic of this type of terminal is flexibility. This means that its construction should be planned in order to accommodate different type of cargoes and handle merchandise accurately and efficiently.

2.2. Growth in International Trade and Logistic Influencers

Trade is the act of transferring goods or services between persons, enterprises and/or institutions by using different methods of payment. At the international level, trade is identified as the flow of
commodities between the external market (exportations) and the internal market (importations). This transactional flow is known as international trade. According to the World Trade Organization (WTO), worldwide commerce in 2007 was US$ 13.5 billion and increased to US$ 18.3 billion in 2012, which is a variation of 35.6% (Tomáš, 2013d). However, this growth could have been higher, if it were not affected by the US and European economic crisis.

During the last three years, different factors have contributed to the recuperation and decline of international trade. For example in 2010, world merchandise exports increased by 14% in volume terms, therefore, GDP expanded by 3.5% (International Trade Statistics 2011, 2011). The main factors that influenced this recovery were the resilience of the dynamic growth in emerging countries, especially China and India, the effective countercyclical response of the developed and developing countries and the effect of bailout packages in the United States of America.

In 2011, the worldwide economy was still damaged by the crisis, which is mainly reflected in the collapse of the Greek and Spanish economy. Nevertheless, international trade presents positive outcomes; the variation augmented to 5% in that year (International Trade Statistics 2012, 2012). The United States is still the major trader in merchandise, followed by China and Germany.

Finally, in 2012 the variation of international trade was just 0.2% comparing it to 2011. This commerce slowdown was due to the sluggish growth of the developing countries economy and the repetitive uncertainty of the performance of the Eurozone. Additionally, the low production and high unemployment in the developed countries reduced worldwide importations and exportations (Tomáš, 2013d). According to Lamy (2012), the volume of trade growth in 2013 will be about 4.5%, still below the long-term annual average of 5.4% for the last 20 years.

Additionally, some countries are adopting different commercial measures in order to reduce the effect of the economic crisis, such as decreasing or eliminating import tariffs or streamlining customs procedures (Lamy, 2012). However, Governments need to commit and revitalize their global trading system in order to restore and improve international trade.

On the other hand, logistics is the process of planning, implementing and controlling procedures for the efficient and effective transportation and storage of goods including services, and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements, also this definition includes inbound, outbound, internal and external movements (Mangan et al., 2012, p. 9).

Currently, new technologies, legislation, documents, information systems and transport problems allow logistics to perform an important role in the development of the supply chain; especially in one
of its key points such as the port terminals. Once the cargo arrives at the port, it will be mobilized to another transportation mode, warehouse, factory or its final destination.

Logistics is an even more refined transport concept and can be defined as an optimisation process of the location, movement and storage of resources from the point of origin, through various economic activities, to the final consumer (Alderton, 2011, p. 390). Not all logistic processes are completely integrated in order to be optimised, and there are some strategic tools that help to maximise the performance of different parts of this chain such as JIT (Just in Time), vertical and horizontal integration, outsourcing, inventory management and others.

Furthermore, some countries have benefited from the advantages of logistics strategies. Therefore, their customs, infrastructure, international shipment, logistic competence, timeliness, tracking, tracing and reputation make them attractive for new mercantile investments. Having stated this, the World Bank has developed a tool to measure logistic performance by country, which is the Global Logistics Performance Index (LPI) (Mangan et al., 2012, p. 26). Table 2 shows the LPI top 20 countries.

Table 2: Top 20 Countries Logistic Performance Index

<table>
<thead>
<tr>
<th>Country</th>
<th>LPI Score</th>
</tr>
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<tbody>
<tr>
<td>1. Singapore</td>
<td>4.13</td>
</tr>
<tr>
<td>2. Hong Kong</td>
<td>4.12</td>
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<tr>
<td>3. Finland</td>
<td>4.05</td>
</tr>
<tr>
<td>4. Germany</td>
<td>4.03</td>
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<tr>
<td>5. Netherlands</td>
<td>4.02</td>
</tr>
<tr>
<td>6. Denmark</td>
<td>4.02</td>
</tr>
<tr>
<td>7. Belgium</td>
<td>3.98</td>
</tr>
<tr>
<td>8. Japan</td>
<td>3.93</td>
</tr>
<tr>
<td>9. United States</td>
<td>3.93</td>
</tr>
<tr>
<td>10. United Kingdom</td>
<td>3.90</td>
</tr>
<tr>
<td>11. Austria</td>
<td>3.89</td>
</tr>
<tr>
<td>12. France</td>
<td>3.85</td>
</tr>
<tr>
<td>13. Sweden</td>
<td>3.85</td>
</tr>
<tr>
<td>14. Canada</td>
<td>3.85</td>
</tr>
<tr>
<td>15. Luxembourg</td>
<td>3.82</td>
</tr>
<tr>
<td>16. Switzerland</td>
<td>3.80</td>
</tr>
<tr>
<td>17. United Arab Emirates</td>
<td>3.78</td>
</tr>
<tr>
<td>18. Australia</td>
<td>3.73</td>
</tr>
<tr>
<td>19. Taiwan</td>
<td>3.71</td>
</tr>
<tr>
<td>20. Spain</td>
<td>3.70</td>
</tr>
</tbody>
</table>

Source: (Logistic Performance Index - LPI Results 2012, 2013)
The rationale of this index is to analyse the logistic performance of 155 countries and evaluate their global market connection.

Finally, logistics is driving port expansion (Branch, 2007, p. 384), allowing the connection of this area with distribution centres or other modes of transportation. For example:

- Rail connection for containers between Darwin – Adelaide in Australia, Shanghai – Beijing in China, Panama City – Colon in Panama.
- Waterway port links for dry and liquid bulk such in Duisburg, Germany or the canal route between Le Havre and Gennevilliers in France.
- Road connections for different types of cargo, such as between US Ports and National Highway System in United States, or the future Corridor Manta – Manaus, which will join the Port of Manta with Manaus in the Central Brazilian Amazon Region.

2.2.1. Globalization

Globalization is an umbrella term for a complex series of economic, social, technological, cultural and political changes which continue to take place throughout the world (Mangan et al., 2012, p. 403). Talking about globalization implies that economies have opened to the international market. Many countries have adopted free-market systems which allow them to expand their production and have new opportunities of investment and growth for their population. As suggested by Mangan (2012, p. 24), globalizations has facilitated the reduction of trade barriers between countries and regions, hence, more freight is moving all around the world and logistic systems have an increasingly important role in the global economy. Therefore, globalization is a worldwide connection of different mercantile subjects.

Additionally, the globalization of production and the geographic dispersion of economic activity have elevated the importance of the transportation and logistics sectors of the economy, particularly in the expansion of maritime transport and container shipping (Jaffee, 2010).

Maritime transport is definitely necessary for globalization due to its role in the global economy and in the worldwide geographical structure. Furthermore, marine transport is a derived demand; it follows the patterns of international trade and configures the shipping network according to market requirements. However, in this scenario, it is important to evaluate the respective influence of technological factors (carriers and infrastructure, industry changes) and territorial factors (geographic and trade proximities, socio-economic developments) in the formation of shipping networks, port hierarchies and maritime regions (Ducruet and Notteboom, 2012) in order to link different markets.
Consequently, globalization in maritime transportation is ensuring that all of the operational, financial and logistic resources available are used efficiently, nimbly and accurately.

2.2.2. Containerization

Containerization is a method of distributing merchandise in a unitized form thereby permitting an intermodal transport system to be developed providing a possible combination of rail, road, canal and maritime transport (Branch, 2007, p. 346). It is responsible for the globalization of trade.

The story of this revolutionary invention began in 1956 when the iconoclastic entrepreneur Malcolm McLean put 58 aluminium truck bodies aboard an ageing tanker ship (called the Ideal X) which set sail from Newark, New Jersey to Houston, Texas in the United States (Mangan et al., 2012, p. 6). This event changed completely the transportation industry and created a new tool of mobilization that still today is used.

Additionally, containerisation greatly reduced transportation costs in the maritime business and improved logistic systems. Due to its flexibility, container volumes are calculated in twenty-foot-equivalent units (TEU), which means that a 40 ft. container is equivalent to 2 TEU (Mangan et al., 2012, p. 21). Currently, there are different types of containers available in the market such as dry freight, insulated, refrigerated, bulk, ventilated, flat rack and platform flats, open top, tank, sea cell, military, hanger and swapbodies (Branch, 2007, pp. 361-372). Consequently, shipping lines need to follow the demands of their customers. In the future, new types of containers will appear due to trends that are managed by the strategies developed in global logistics and international supply chain management. Therefore, the use of containers will increase productivity and competitiveness and reduce cost.

Furthermore, due to the changing attitude of shippers favouring container shipment, shipping lines need to continuously remodel their container network, which leads to expansion through new tonnage and growth in port modernization and its infrastructure (Branch, 2007, p. 347). For example, the banana industry in Ecuador created a high impact in the configuration of the container and national port system. DOLE Food Company developed a complete logistic network in order to serve efficiently their markets. They constructed the port of Bananapuerto located in Guayaquil, which is operated by NAPORTEC (DOLE’s port operator), and PORMAR Transportation S.A. is their shipping agent. Their service route for the US West Coast market has a frequency of eight days leaving from Guayaquil in Ecuador and calling at the ports of Paita in Peru, Caldera in Costa Rica, Quetzal in Guatemala and San Diego in the United States (DOLE - Service Routes).
Finally, containerization was made possible by developments in communication and information technology (controlling movement of containers, taking bookings, printing out bills of lading and invoices and transmitting advice and information) (Stopford, 2009). These characteristics allow controlling the position, situation and destination of containers, thus, gaining efficiency in distribution and decreasing logistic costs.

2.2.3. Logistic Service Providers

Currently, it is essential for a competitive enterprise to integrate its supply chain, from the supplier, manufacturing, distribution, retailers to the final consumer. Some companies perform their own transportation of products, other have specialized their mission in being efficient and agile transport and logistics servers. The latter are known as logistic service providers (LSP). They bill millions of dollars worldwide, and each year expand their operations and strategies in order to attract new markets.

Logistic service providers can offer different activities for their clients. According to Mangan et al. (2012, pp. 154 - 155), this can be:

- Freight carriers (hauliers, trucking companies, train companies, airlines, shipping companies).
- Freight forwarders (make transportation arrangements).
- Couriers (immediate delivery of products).
- Integrators (offer a seamless integrated end-to-end service from consignor to consignee).
- Agencies (companies that combine buying power to gain reduced freight transport rates).

On the other hand, as suggested by Mangan et al. (2012, p. 161), in order to know which Logistic Service Provider to choose, customers need to consider the following aspects:

- Services to be provided (geographical areas, volumes including fluctuations, time frame, etc.).
- Costs and costing approach (open book, gain share, penalties, inflation/cost increases, etc.).
- Terms of carriage, applicable incoterms, insurance (responsibility for damage and shrinkage).
- Speed/transit time.
- Performance metrics and service levels, reliability.
- Information systems (especially with regard to systems integration), other technology issues (e.g. capability to ‘track and trace’ freight and requirement to use advanced technologies such as radio frequency identification – RFID), and documentation requirements.
- Core versus value-adding services required.
- Staffing issues (e.g. transfer of undertakings with respect to previous employees, legal responsibilities, image and responsibility, union recognition, disruptions).
- Reverse logistics issues (packaging, returns – damaged and faulty goods, failed deliveries, etc.).
- Implementation/termination/ability to alter conditions.
- Details on the logistics services provider’s history, client references, etc.

2.2.4. New and Alternative Routes

Transportation and logistics companies have different goals such as increasing market share, maximizing revenues, minimizing unnecessary cost, attracting new customers and other aspects. Therefore, in order to improve their competitive advantage and service coverage, these enterprises need to use new and alternative routes for their clients. Currently, in different parts of the world are being developed new logistics and transportation routes in order to interconnect markets and distribute commodities.

The following paragraphs will describe some of the proposed and developed projects for improving the worldwide logistic system:

- **South Stream Pipeline**

The South Stream Pipeline project aims to diversify the gas supply routes to Europe. This plan will ensure a direct connection between hydrocarbons suppliers and consumers thus raising significantly the energy supply security on the entire European continent (*Project Significance*, 2013). The South Stream Pipeline project will be constructed from 2016-18. The route will be Russia, the Black Sea, Greece, Bulgaria, Serbia, Bosnia & Herzegovina, Croatia, Hungary, Slovenia, Italy and Austria.

- **Etihad Rail Network**

Etihad Rail’s 1200 km network will extend across the United Arab Emirates, from the border of Saudi Arabia to the border of Oman (*Etihad Rail Network Map*, 2009 - 2013). This project will include freight terminals, distribution centres and depots close the major transport hubs and storage facilities including Mussafah, Khalifa Port, Jebal Ali Free Zone, Port of Fujairah and Saqr Port. Additionally, it is planned to connect this infrastructure with the rail network of the neighbouring countries of Bahrain, Kuwait, Oman, Qatar and Saudi Arabia.
- **Lamu Port and New Transport Corridor Development to Southern Sudan and Ethiopia (LAPSSET)**

This project involves the development of a new transport corridor from the new port of Lamu through Garissa, Isiolo, Mararal, Lodwar and Lokichoggio in Kenya to branch at Isiolo to Ethiopia and Southern Sudan *(Lamu Port and New Transport Corridor Development to Southern Sudan and Ethiopia (LAPSSET), 2013)*. The transport corridor will include a road network, railway line, oil refinery at Lamu, oil pipeline, Isiolo and Lamu Airports and a free port at Lamu (Manda Bay). The main objective of this plan is to develop Northern Kenya and integrate it into the national economy program.

- **Multimodal Corridor Manta – Manaus**

The Multimodal Corridor Manta – Manaus is a new logistic route-project that combines the utilization of maritime, air, road and fluvial transport modes. The main objective of this project is to maximize and integrate the transportation system and international trade in the Amazon Basin Region (Ecuador, Peru and Brazil). This plan has 997 km of road and about 3,200 km of waterways, of which 170 km are in Ecuadorian territory *(Conforme, 2012)*.

- **Enfield Intermodal Terminal**

Hutchinson Logistics Australia is developing a new inland road/rail freight intermodal terminal at Enfield, in metropolitan Sydney’s Inner West, to offer importers and exporters a dispatch and reception facility with premium access to Port Botany and the State’s rail and road network *(Flynn, 2012)*. This new project is due to begin operations in 2014 and will have the capacity to handle 300,000 TEU port – rail per year.

- **Northern Sea Route and Northwest Passage**

Global warming is expected to open new sea routes through the Artic by 2050. These routes will be the Northern Sea Route (North Scandinavian coasts, Russian North Sea and Asia) and the Northwest Passage (North of Canada, Russia and Asia). According to projections of global warming and Artic ice loss, the Northwest Passage will be sufficiently navigable to make trips from the North American
east coast to the Bering Strait in 15 days and 23 days for the Northern Sea Route from Scandinavia to Asia and vice versa (Zabarenko, 2013).

2.3. Commercial and Maritime Logistic Situation between the Amazon Basin Countries and East Asia

China, Japan, Mongolia, North Korea, South Korea and Taiwan form East Asia. Meanwhile, the Amazon Basin Countries are Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru and Venezuela.

Nevertheless, for this academic report, the analysis of the commercial and maritime logistic situation between these two regions will only focus on the East Asian states that have more mercantile relations with the countries involved in the Multimodal Corridor Manta – Manaus. These are China, Japan, South Korea, Brazil and Ecuador. Peru is also part of the Multimodal Corridor Manta – Manaus, however it will not be considered for this academic research, because most of its commercial activities are performed on the Pacific Coast and not in its Amazon region.

Furthermore, this analysis will involve the current situation of international trade between the countries mentioned previously, the logistic connection of the Eastern Asian ports and the North-western South American and Panamanian ports and the implications of the construction of the third set of locks in the Panama Canal.

2.3.1. International Trade between East Asia and the Amazon Basin countries

International Trade between countries can be measured by the analysis of the Balance of Trade. According to Holden (2011, p. 58) the Balance of Trade is the difference between a country’s total export and import over one year. If its exports are greater than its imports, it has a trade surplus. If its imports are greater than its exports, then it has a trade deficit.

According to 'Boletín Estadístico América Latina - Asia - Pacífico' (2012) (Statistic Bulletin Latin America – Asia – Pacific), during January – December 2012, the amount of product exportations from Latin America and the Caribbean to Asia – Pacific increased to 5.9% compared to the previous year. The dynamism of these exports was higher than for the rest of the world. Likewise, the importations of commodities from Asia – Pacific also augmented in 2012. Therefore, Latin America and the Caribbean accumulated a commercial deficit with Asia of about US$ 83,000 million. Importations from China and Japan had a higher growth in comparison with the other Asian countries.
During the last decade, China has become one of the most important commercial partners of Brazil and Ecuador. The rapid Chinese mercantile growth is influenced by the active demand for raw materials and natural resources from these South American countries (Rosales et al., 2012). Therefore, commerce with China has been growing constantly and has been converted into one of the main figures in the international trade of the region, which had favoured the economic performance of the raw material exporting countries in the region.

Other East Asian countries also have an important impact on the economic growth of Brazil and Ecuador, such as South Korea and Japan, who had gained a remarkable worldwide leadership due to their sustainable development and environmental social responsibility (SaKong and Koh, 2012).

On the other hand, Brazil is still the main exporter of the region to China (’Boletín Estadístico América Latina - Asia - Pacifico,’ 2012) (Statistic Bulletin Latin America – Asia – Pacific), especially in iron ore, crude oil, steel and soy. In the case of Ecuador, Japan is one of its most important markets. During 2012, Ecuadorian exportations to Japan increased to 61% (’Bilateral Trade between Ecuador and Japan,’ 2012).

2.3.2. Eastern Asian Ports

Most of the Eastern Asian Ports are in the Top 20 Worldwide ports, due to their efficiency, agility and strategic logistic performance in the handling of different types of cargoes. The following paragraphs examine briefly the situation of these ports.

- **China**

China’s main ports are within the Top 20 Worldwide Transhipment Ports and these are Hong Kong, Shanghai, Shenzhen, Ningbo, Guangzhou, Qingdao, Tianjin, Xiamen and Dalian. As indicated by (Ports, 2012), China’s success is due to its concentration on the strength of the container transport system, especially in the construction of a group of deep-water container wharves at the ports mentioned previously. Furthermore, the Chinese government is investing in the construction and expansion of new wharves for coal, crude oil and iron ore imports.
- **Japan**

Tokyo Bay (six harbours, including Yokohama and Tokyo), Osaka Bay (five harbours including Kobe and Osaka) and Ise Bay (five harbours including Nagoya) are known as the Three Major Bays, which handle approximately 35% of all port cargo in Japan ('Ports and Harbours in Japan,' 2012). Currently, the Japanese government is driving the development of the super hub port project, the goal of which is to reduce port costs and shorten lead-time. The plan consists of constructing three or more berths dedicated to the handling of containers.

- **South Korea**

Busan, Incheon, Yeosu, Ulsan, Daesan, Pyeongtaek, Mokpo, Gunsan, Masan, Pohang and Donghae form the South Korean Port System. According to 'Top 100 Ports 2012' (2012), Busan is in fifth place of importance as a transhipment port. Currently, this port is equipped with quay wall facilities of 26.8 km for simultaneous berthing of 169 vessels and cargo-working capacities that permit the processing of 91 million tons per annum (*Introduction - Overview*, 2011).

### 2.3.3. North-Western South American Ports

The growth rate of port movements on the West Coast of South America has been higher than the East Coast during the last years (Sánchez and Perrotti, 2011). For this analysis, will be only examined the ports located in the North-Western of South America (Colombian Pacific Coast, Ecuador and Peru).

- **Colombia**

Colombian ports are used as transhipment areas for commodities to be distributed in the Caribbean and South America. On the Atlantic Coast are located the Ports of Santa Marta, Barranquilla and Cartagena, while on the Pacific Coast are Buenaventura and Tumaco. At these ports are handled more than 80% of exported and imported cargo, which mainly consist of hydrocarbons, coal, oil, dry bulk and general cargo (containers) (Paredes Morato, 2010).
- **Ecuador**

The Ecuadorian Port System is constituted of four international traffic public ports: Esmeraldas, Manta, Guayaquil and Puerto Bolívar, 16 private terminals and the 3 special ports of Balao, La Libertad and El Salitral which are dedicated to the oil industry. As stated by 'Estadisticas Portuarias y de Transporte Marítimo 2011' (2011) (Port and Maritime Transport Statistics) Guayaquil handles 62% of the total containerized cargo and Balao handles 49% of the total Ecuadorian export and import. However, the latter is only used for the reception and dispatch of liquid cargo.

- **Peru**

The Peruvian Port System is divided in International and National Ports. International Ports are Paita, Salaverry, Callao, General San Martín, Matarani, Ilo, Arica, Iquitos and Yurimaguas. National Ports are Chicama, Chimbote, Supe, Huacho and Puerto Maldonado. The Peruvian ports are considered as the most dynamic in Latin America due to their constant operational and logistic expansion. For example, container movement in Callao increased to 12.5% and in Paita to 11.2% in 2011, *(Puertos peruanos están entre los más dinámicos de América Latina, 2013) (Peruvian ports are among the most dynamic in Latin America)* two of the highest in the region.

### 2.3.4. Panama Canal: The Third Set of Locks

The Panama Canal began its operations on August 15th, 1914 *(Sabonge et al., 2009)*. Originally, it was managed by the United States of America. Nevertheless, on December 31st, 1999 and in accordance with the Torrijos – Carter Treaties, 1977 *(Tratado del Canal de Panamá,' 1977) (Panama Canal Treaty)*, the administration of this strategic marine zone was totally transferred to the Republic of Panama. Today, this area has been constituted as the main logistical and mercantile point that connects the Atlantic and Pacific Ocean routes. The primary effects that it has had on international commerce were the reduction of time and distance in maritime trade and improvements in the economic relationships between different countries and businesses that use this Canal.

Currently is being developed the construction of the third set of locks in the Panama Canal, which was first negotiated and agreed in Art. 12, point 3 of the 1977 treaty between Panama and United States *(Ulloa Almanza, 1981)*. Only in 1999 was the proposal started, being developed by the Panama Canal Authority (ACP). The project costs could be approximately $5250 million, and, according to the ACP, the new system of locks is profitable with an internal rate of return of 12% *(Brown, 2011)*. Subsequently, this plan was approved by a National Referendum held in Panama on October, 22nd,
2006. This modern engineering project focuses on three main components (‘Relevant Information on the Third Set of Locks Project,’ 2006):

- The construction of two lock facilities (one in the Atlantic: to the east of Gatun Locks, and another on the Pacific side: to the southwest of Miraflores Locks), each with water reutilization basins.
- The construction of access channels for the new locks.
- The widening of existing channels and the elevation of Gatun Lake’s maximum operating level.

The potential demand on the third set of locks in the Panama Canal is the new traffic volume that will be transported through it during the next 20 years. Therefore, it will allow the transit of bigger vessels with beams of up to 160 feet, up to 1200 feet in length, and a maximum draft of 50 feet such as containerships of up to 12600 TEU, dry bulkers and tankers within the tonnage range of 150000 DWT and LNG carriers of up to approximately 180000m3 (de Marucci, 2012). Consequently, the expansion will create economies of scale for the Canal and the maritime international transport industry, operational cost reductions, and it will attract new customers.

Containerships will dramatically increase their usage of the Panama Canal. According to different studies, the cargo volume of containers to the United States will increase from 12.6 to 36.8 million TEU during 2002 – 2025. From this amount, Asia represents 60% of the US imports, Europe 18%, West South American Coast 2% and rest of the world 20% (‘Pronostico de Demanda del Canal de Panama,’ 2004) (Panama Canal Demand Forecast). Additionally, ACP concluded that the typical containership capacity used between Asia and US East Coast will be about 8 to 10 thousand TEU and in 2025 this amount can be tripled due to the expansion of the Canal (Sabonge, 2009).

Likewise, coal shipments from Colombia to China are expected to increase by more than 200 million tons in the next ten years (Dengo, 2007). Additionally, another commodity such as Venezuelan and Northern Brazilian iron ore will benefit from an expanded canal by the utilization of larger ship sizes for their shipments to the Eastern Asian market.

2.4. Multimodal Corridor Manta – Manaus

Notteboom and Rodrigue (2005) state that a new phase in port development is to extend beyond the port perimeter and involve, inter alia, market strategies and policies linking it more closely to inland freight distribution centres. Therefore, the Multipurpose Deep-Water Terminal in the Port of Manta is
a key component in the Multimodal Corridor Manta – Manaus, because it will be the first point of entry in the supply of commodities to different national and international markets.

The Multimodal Corridor Manta – Manaus means the creation of a passage for commerce and sustainable development linking the Pacific with the Atlantic Ocean through the Amazon Basin. The benefit of this integration is the opportunity to create new national and international mercantile activities and increase the exportation and importation of commodities, especially from Asia to South America and vice-versa. The estimated investment on the Ecuadorian side (from the Multipurpose Deep-Water Terminal in the Port of Manta to the Waterway Port of Nuevo Rocafuerte) is approximately US$ 650 million (‘Pacific-Atlantic Multimodal Bi-Oceanic Axis Manta-Manaus-Belem,’ 2007).

The Multipurpose Deep-Water Terminal, Zonas Especiales de Desarrollo Económico (ZEDE) (Special Economic Development Zones), Agribusiness Development Centres, Road Axis, Waterway Ports and International Airports form this logistic network. Additionally, the Multimodal Corridor Manta – Manaus has three strategic components (Process of Delegation under the Grant Method for the Port of Manta, 2012):

- Port and Logistic Infrastructure in Ecuador, Peru and Brazil.
- Promotion and facilitation of the project.

As suggested by the Process of Delegation under the Grant Method for the Port of Manta (2012), the main strengths of the Multimodal Corridor Manta – Manaus are:

- The reduced transit time (10 days) compared to the traditional maritime route through the Panama Canal (37 days) at a similar cost.
- Important alternative in order to strengthen the Amazon market.
- Potential traffic load in the first year: 40,000 containers.

2.4.1. National Plan of Logistic Infrastructure of Ecuador

The Ecuadorian Government has developed a strategic plan of integrated logistic platforms and corridors in order to improve the competitiveness of the national economy. The objective of this plan is to offer added-value logistic services through distribution nodes that can generate economies of scale. Moreover, the importance of this infrastructure is due to Ecuador’s position as an oil producer; the exportations of this commodity increased from US$ 11,799,973 million in 2011 to US$ 12,715,552 million in 2012 (‘List of importing markets for a product exported by Ecuador,’ 2012).
Ecuador has the fourth most important oil reserves in Latin America and it is an essential crude oil supplier to different countries. It is one of the few countries that can increase its production capacity before the reserves decline. Therefore, the Ecuadorian Government wants to expand its international offer and production. Due to this, is being developed the Pacific Petrochemical Refinery ‘Eloy Alfaro’ (Glas, 2013) one of the most important plans for the petroleum industry in Western South America.

According to the Plan Nacional de Infraestructura Logística (2011) (National Plan of Logistic Infrastructure), the logistic platforms will allow the development of functional relationships among strategic productive areas and the main distribution and consumer centres. Additionally, it will be specialized in different activities in order to serve to national, regional and international markets. Table 3, Table 4 and Table 5 show how these logistic platforms will be divided.

Table 3: Local Service Logistic Platform of Ecuador

<table>
<thead>
<tr>
<th>Logistic Platform</th>
<th>City</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multipurpose Agrocenters</td>
<td>Portoviejo</td>
<td>Central Coast</td>
</tr>
<tr>
<td>Quevedo</td>
<td>Central Coast</td>
<td></td>
</tr>
<tr>
<td>Babahoyo</td>
<td>Central Coast</td>
<td></td>
</tr>
<tr>
<td>Latacunga</td>
<td>Mid-Highlands</td>
<td></td>
</tr>
<tr>
<td>Ambato</td>
<td>Mid-Highlands</td>
<td></td>
</tr>
</tbody>
</table>

Source: (Plan de Plataformas Logísticas de Ecuador, 2011) (Ecuador’s Logistic Platform Plan)
Table 4: National – Regional Service Logistic Platform of Ecuador

<table>
<thead>
<tr>
<th>Logistic Platform</th>
<th>City</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidated Regional Cargo Platform</td>
<td>Cuenca</td>
<td>South Highlands</td>
</tr>
<tr>
<td>Container Freight Station</td>
<td>Machala</td>
<td>South Coast</td>
</tr>
</tbody>
</table>

Source: (Plan de Plataformas Logísticas de Ecuador, 2011) (Ecuador’s Logistic Platform Plan)

Table 5: International Service Logistic Platform of Ecuador

<table>
<thead>
<tr>
<th>Logistic Platform</th>
<th>City</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Logistic Activities Zone</td>
<td>Manta</td>
<td>Mid-Coast</td>
</tr>
<tr>
<td></td>
<td>Guayaquil</td>
<td>South Coast</td>
</tr>
<tr>
<td></td>
<td>Providencia</td>
<td>Mid-Amazon</td>
</tr>
<tr>
<td></td>
<td>Puerto Morona</td>
<td>South Amazon</td>
</tr>
<tr>
<td>Border Logistic Zone</td>
<td>Túcán</td>
<td>North Highlands</td>
</tr>
<tr>
<td></td>
<td>Huaquillas</td>
<td>South Coast</td>
</tr>
<tr>
<td>Multimodal Dry Ports</td>
<td>Santo Domingo</td>
<td>Mid-Coast</td>
</tr>
<tr>
<td>Air Cargo Centre</td>
<td>Quito</td>
<td>North Highlands</td>
</tr>
<tr>
<td></td>
<td>Guayaquil</td>
<td>South Coast</td>
</tr>
</tbody>
</table>

Source: (Plan de Plataformas Logísticas de Ecuador, 2011) (Ecuador’s Logistic Platform Plan)

This plan was structured in order to connect these platform with other South American logistic-distribution centres located in Colombia and Peru, and to support the development of the Multimodal Corridor – Manta Manaus.

2.4.2. Ecuadorian Port System

According to official maritime information, from January to September 2011 were mobilized more than 32.5 million metric tons in Ecuadorian national ports (‘Estadísticas Portuarias y de Transporte Marítimo 2011,’ 2011) (Port and Maritime Transport Statistics).

The Ecuadorian Law of Maritime Activities defines a port as a ‘geographical area of coast or shore whose jurisdiction has been determined by the National Council of the Merchant Marine and Ports and it contains a set of physical elements that includes works, access channels, facilities and services that allow the operation and transfer of cargo and passengers’ (‘Reglamento de la Actividad Marítima - Decreto No. 168,’ 1997) (Maritime Activity Regulation – Decree No. 168). The same law defines a port terminal as ‘a public or private port installation authorized by the National Council of the
Merchant Marine and Ports that has works and facilities that allow the performance of different port operations’.

On the other hand, the Ecuadorian Ministry of Transport and Public Works states that the National Port System is composed of Public Ports, Private Terminals and Special Ports (‘Estadisticas Portuarias y de Transporte Marítimo 2011,’ 2011) (Port and Maritime Transport Statistics).

The International Traffic Public Ports use the landlord port model and are located in the cities of Esmeraldas, Manta, Guayaquil and Puerto Bolívar.

The Private Terminals are mainly situated in the Provinces of Manabí and Guayas and are utilised for the importation and exportation of different commodities such as frozen tuna, seafood products, oil, fertilizers, banana and other fruits, dry and liquid bulk, general containerized cargo, scrap, iron ore, coal and other products.

Finally, there are three Special Ports in the cities of Balao, La Libertad and El Salitral dedicated for the reception of crude oil and its derivate.

The Ecuadorian National Port System is formed by the General Law of Ports, which was issued in 1976 and states the following (‘Ley General de Puertos,’ 1976) (Port’s General Law):

‘Article 2.- The planning, direction, coordination, orientation and control functions of the maritime policy and national ports will be executed by the following entities, the:

- Coast and Marine Merchant Directorate.
- Port Authorities.

2.4.3. Port of Manta

From the point of view of globalization, the Port of Manta is a link among transport services, traffic and social-economic development centres in Ecuador. This maritime area supports the development of the country (Fernández de De Genna, 2007). Due to its condition as an open seaport, the Government of President Rafael Correa Delgado has declared this area as a priority centre for the development of a transshipment cargoes hub that will help the development of the port-logistic infrastructure for Ecuador and the continent (‘Ley de Desarrollo del Puerto de Manta,’ 1997) (Port of Manta Development Law).
The port is located in the city of Manta, Province of Manabí and is one of the most important ports in Ecuador. It is mainly dedicated to the arrival of cruise ships, fishing vessels, containers, dry bulk carriers and car-carriers.

According to the *Ventajas Comparativas y Competitivas* (2013) (*Comparative and Competitive Advantage*), the principal advantages of this port are:

- Direct entry of ships without access channels.
- Natural draft of 12 metres and a dock of 110 hectares.
- Geo-strategic location near to the equidistant ports and main maritime routes.
- Nearest Western South America port to Asia.
- Logistic cluster (international airport, two free trade zones and shipyards).

On the other hand, the Port of Manta has the following installations (*Instalaciones*, 2013) (*Installations*):

- Two wharfs of 400 metres each that can handle four vessels at the same time (containerships, dry bulk carriers, car-carriers, fishing ships and cruise ships).
- Both wharfs have a platform width of 45 metres each and 12 metres of draft.
- A marginal wharf of 618 metres with a draft of 6.5 metres, dedicated for the discharge of fish and cabotage service.
- A storage area of 119,012 m$^2$ and 2 bascules.

### 2.4.4. International Public Contest for the Concession of the Multipurpose Deep-Water Terminal in the Port of Manta

The necessity of establishing a Multipurpose Deep-Water Terminal in South America is a strategic objective for the Asian companies in order to expand and develop their participation in the Latin American market. For this reason, Manta’s Port Authority is searching for important financial support in order to build this project in accordance with National and International Maritime Regulations.

Moreover, with the execution of this concession, Manta will become the principal axis of transhipment cargo between Asia and South America, allowing a fast connection through the Amazon Basin. This logistic plan will improve international trade, add-value through new logistic services and generate new incomes for the Ecuadorian economy (Cantos *et al.*, 2009).
International public contest for the concession of the Multipurpose Deep-Water Terminal in the Port of Manta will involve the following constructions (*Process of Delegation under the Grant Method for the Port of Manta*, 2012):

- Expansion of the International Quay.
- Construction of a second International Quay.
- New breakwater.
- Construction of a Deep-Water Quay (length of 350 meters and a depth of 16 meters).
- Installation of four Post-Panamax gantry cranes.
- 25 Ha for a container yard and services.
- Installation of other new equipment.

Figure 2: Port of Manta
Source: (Ortíz, 2013)

### 2.4.5. Brazilian Port System and Port of Manaus

The Brazilian coastline is about 8,500 navigable km and has a port sector that moves approximately 700 million tons annually of different merchandise. The Brazilian Port System consists of 34 public sea and waterway ports and 42 private terminals. From this, 16 are operated by State or Local Governments, three are privatized and the rest are managed by the National Government (*Sistema Portuário Nacional*) (*National Port System*).

These ports are:
The Port of Manaus is the main entrance to the State of Amazonas and is located on the left bank of the Río Negro. During the nineteenth century due to increasing commerce in rubber, the port started its construction in 1902 under a contract with the British company Manaos Harbour Limited (Apresentação) (Presentation). Currently, the port is operated by Sierra do Brasil.

There are two ways to access to the port ('Porto de Manaus,' (Port of Manaus). These are:

- Road: from Itacoatiara to Manaus.
- Maritime/Waterway: from the Rivers Río Negro and Amazons.

Finally, the port has a total area of 94,423.53 m²; the depth of the access channel is 13.5 m, wharfs of 300 metres, warehouses, container terminals and other features.
2.5. Summary

Ports are considered as the central aspect of this study, which currently play the role of being the connexion or node of the supply chain network. Therefore, these areas depend on efficiency and productivity in order to perform logistic activities and maximise time and operational procedures. Thus, ports have become in port-centric logistics, transhipment ports, free trade zone, etc.

Additionally, transhipment ports have had an important growth in different countries, where cargo is mobilized through diverse transportation modes. These areas are known for their efficient connectivity, time and cost reduction. Likewise, a Multipurpose Deep-Water Terminal is a complex joining of infrastructure, equipment and services located in the port, where the draft is usually more than 12 metres. Their main characteristic is flexibility in port operations. On the other hand, due to the condition of the port and maritime industry as a derived demand, this can be affected by economic crisis. However, it depends on the market situation and how the country is able to manage and diversify its production offer. Hence, international trade has had different recuperations, decline and growth worldwide. Otherwise, logistics has had an important role in the development of different business strategies. It has optimised processes, storage, resources administration and other aspects in order to maintain the correct flow of the components in the distribution channels. Having said this, logistics has led to the ports’ expansion and is developed by the new improvements obtained from globalization. Furthermore, containerization is one of the most innovative inventions that allows the transporting of cargo to different customers. This logistic and distribution tool has been developed through new communicational and information technologies, which has led to the evolving of some companies to current logistic service providers.

Another aspect analysed was international trade between East Asia (China, Japan and South Korea) and the Amazon Basin countries (Brazil and Ecuador), which indicated that East Asia is an important consumer of South American raw materials, meanwhile Brazil and Ecuador import capital goods. Likewise, it is stated that the Asian ports are more developed in different logistic infrastructure, while the South American West Coast ports still need to grow and expand their operations.

Finally, the Multimodal Corridor Manta – Manaus is a strategic commerce passage aiming to link the Pacific and Atlantic Ocean through the Amazon jungle. The objective of this plan is to offer an alternative distribution route in the American continent. The main ports involved in this plan are Manta in Ecuador and Manaus in Brazil. Therefore, the Ecuadorean port is in process of a concession contest in order to construct a new port infrastructure than can serve larger vessels and more cargo. Likewise, the Port of Manaus is an important logistic centre located in the heart of the Brazilian Amazon Region that aims to focus its operation on attracting more customers, especially from Asia.
CHAPTER 3: Methodology

As indicated previously, the methodology of this academic research is based on PESTLE, SWOT, and Trend Analysis. Additionally it is important to state that all of the information collected is secondary statistical data from private and public entities. In the following paragraphs are explained the definitions and main characteristics of these investigative business tools.

3.1. PESTLE Analysis

Through this analysis, it is evaluated the political, economic, social, technological, legal and environment aspects that could affect the construction of the Multipurpose Deep-Water Terminal in the Port of Manta. The analysis helps this academic research to identify and state future strategic decisions that can be executed for the correct logistic-operation of this plan. From the PESTLE Analysis can be understood the current market situation in order to maximise the opportunities and minimise the short and long term threats that can influence the aforementioned project.

As suggested by Majumdar (2012a), the ‘market environment’ is a marketing term that refers to all of the forces outside of marketing that affect a company’s ability to build and maintain a successful relationship with target customers. The market environment is divided in the macro-environment and the micro-environment. For this academic research, the market environment is focused on the macro-environment. Galavan (2004) states that a macro-environment analysis is performed to identify forces in the business environment that are likely to have a significant influence on the industry. Therefore, its objective is to detect the forces that will have a significant impact on the industry.

For this reason, PESTLE Analysis is an important tool in analysing the macro-environmental situation of a project. This tool identifies and studies the following aspects:
Table 6: PESTLE Analysis components

<table>
<thead>
<tr>
<th>Political</th>
<th>Economic</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Governmental stability and initiatives.</td>
<td>- Business and economic cycles.</td>
<td>- Attitudes to work.</td>
</tr>
<tr>
<td>- Taxation policies.</td>
<td>- GNP trends.</td>
<td>- Lifestyles.</td>
</tr>
<tr>
<td>- Privatisation policies.</td>
<td>- Interest rates.</td>
<td>- Demographics.</td>
</tr>
<tr>
<td>- Regulation policies.</td>
<td>- Unemployment.</td>
<td>- Education.</td>
</tr>
<tr>
<td>- Social welfare policies.</td>
<td>- Inflation.</td>
<td>- Social mobility.</td>
</tr>
<tr>
<td></td>
<td>- Disposable income.</td>
<td></td>
</tr>
<tr>
<td>Technological</td>
<td>Legal</td>
<td>Environmental</td>
</tr>
<tr>
<td>- Improvements and developments.</td>
<td>- Employment law.</td>
<td>- Pollution control.</td>
</tr>
<tr>
<td>- Basic research investment.</td>
<td>- Trade restrictions.</td>
<td>- Energy supply.</td>
</tr>
<tr>
<td>- Technology transfers.</td>
<td></td>
<td>- Spatial planning</td>
</tr>
</tbody>
</table>

Source: (Galavan, 2004)

The features indicated in Table 6 are some examples of what can be analysed using this strategic tool. Thus, Galavan (2004) indicates that when conducting a PESTLE Analysis, the objective should be to include only those issues that will materially influence the industry and to identify how the changes will differentially affect the project and organisation.

Hence, the PESTLE Analysis will seek to answer two important questions:

- In the future, what macro-environmental changes will be particularly important to the industry?
- Will these changes differentially influence the organisation?

Galavan (2004) suggests that the first question is answered more or less directly through the analysis and the second question requires an understanding of the structure of the industry and the organisation’s position within that industry.

In the case of the port industry, Majumdar (2012a) states that the port operator attempts to match the port’s capabilities with its users’ needs and wants, while operating in a wider marketing environment where competitors are competing for those same users. Having said this, the matching of the capabilities of the port with the customer needs is managed by the port operator and consists of
controllable variables, but in the wider marketing environment the variables are uncontrollable (Majumdar, 2012a). Additionally, the task of the terminal manager in administrating these variables is completely different:

- Controllable environment: the port manager has to manage his or her own organisations in order to ensure that it meets the customer’s expectations, needs and wants at a mainly operational level.
- Uncontrollable environment: needs to be identified and their impact on the business understood.

3.2. SWOT Analysis

A SWOT Analysis is applied in order to assess the strengths, weaknesses, opportunities and threats involved in the construction of the Multipurpose Deep-Water Terminal in the Port of Manta. Moreover, in this study is examined the internal and external factors that are favourable and unfavourable for the constitution of this plan and especially for the implementation of the additional logistic services.

In every company or business project it is important to analyse internal and external conditions. Therefore, the outcomes achieved from examining these factors will allow the enterprise or the team involved in a commercial project to develop an efficient and accurate strategic plan for its target market.

The most popular market tool that will indicate the environment factors that will influence the operations of the company or the business project is the SWOT Analysis.

SWOT means Strengths, Weaknesses, Opportunities and Threats. Assen et al. (2008) states that strengths and weaknesses are internal factors, they are skills and assets (or lack of them) that affect the value of the company, relative to other competitive factors. On the other hand, the same author indicates that the opportunities and threats are external factors, which are not created by the company itself, but they are the result of fluctuations in market dynamics or the activities of competitors. (Widjaja, 2012) suggests that in port management, SWOT factors can be the followings:
Table 7: SWOT Analysis components

<table>
<thead>
<tr>
<th>Strengths and Weaknesses</th>
<th>Opportunities and Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Location.</td>
<td>- Market identifications.</td>
</tr>
<tr>
<td>- Nautical constraints.</td>
<td>- Assessment of customer’s value chain.</td>
</tr>
<tr>
<td>- Hinterland transport connections.</td>
<td>- Technological assessment.</td>
</tr>
<tr>
<td>- Physical assets.</td>
<td>- Legal and regulatory assessment.</td>
</tr>
<tr>
<td>- Port and distribution costs.</td>
<td></td>
</tr>
<tr>
<td>- Performance and efficiency.</td>
<td></td>
</tr>
<tr>
<td>- Experience, know-how and manpower.</td>
<td></td>
</tr>
<tr>
<td>- Performance, adaptability and resourcefulness.</td>
<td></td>
</tr>
<tr>
<td>- Value added services.</td>
<td></td>
</tr>
</tbody>
</table>

Source: (Widjaja, 2012)

According to these factors, Majumdar (2012a) implies that a SWOT Analysis denotes a widely used approach for auditing the overall strategic position of a business or project and its environment.

3.3. Trend Analysis

Statistical data developed by Trade Map, which is a database developed by the International Trade Centre UNCTAD/WTO (ITC) (About Trade Map 1999 - 2008), where is gathered all the International Trade performance of the countries, is utilized in this research. These sources indicate the amount of operational movements (imports and exports) performed over the last years between Ecuador, Brazil, China, Japan and South Korea. This information allows for a comparison of the economic and commercial situation of the countries analysed.

According to Lehman and McMillan (2010, p. 184), the concept of trend is absolutely essential in the technical approach to market analysis. Trends are defined by a single trend or regression line, multiple trend lines, moving averages or curvilinear bands.

Additionally, a common characteristic of most trend types is that they can be viewed in different time periods, with shorter trends frequently ‘nesting’ inside longer ones, but the time period differs with the technique employed (Lehman and McMillan, 2010, p. 185). Furthermore, the period can be daily, weekly, monthly, quarterly or yearly.

Moreover, trend studies provide information about the aggregate net change only (Hagenaars, 1990). In the case of this academic research, it will tell how much the exportation and importation between
the countries analysed have declined or increased. Kotler and Keller (2006) state that a trend reveals the shape of the future and provides many opportunities and expectations about market behaviour.

Conversely, Lind et al. (2010) indicate that trends can be:

- Secular trend - The smooth long-term direction of a time series.
- Cyclical variation - The rise and fall of a time series over periods longer than one year.
- Seasonal variation - Patterns of change in a time series within a year. These patterns tend to repeat themselves each year.
- Irregular variation - This can be episodic and residual variations. Episodic fluctuations are unpredictable and can be identified. Residual fluctuations are unpredictable, and they cannot be identified.
CHAPTER 4: Analysis & Discussion

As indicated before, the objective of this academic research is to analyse the economic and mercantile feasibilities for the construction of the Multipurpose Deep-Water Terminal in the Port of Manta. Therefore, it is important to show the comparative, competitive advantages and disadvantages that this project offers in the creation of a new cargo-logistic centre and transportation route in the American Continent. Likewise, this terminal is a key component in the Multimodal Corridor Manta – Manaus, which is a new alternative route that will improve the supply chain network in the region. For this reason, this investigation states the importance of this project for the improvement of the Ecuadorian logistic role and performance.

In this chapter, secondary data was collected in order to apply PESTLE, SWOT and Trend Analysis. These business tools will help to demonstrate the benefits, possible outcomes and difficulties in the construction of the Multipurpose Deep-Water Terminal in the Port of Manta.

4.1. PESTLE Analysis Discussion

This section shows the results of the PESTLE Analysis performed for the feasibility study of the construction of the Multipurpose Deep-Water Terminal in the Port of Manta. This strategic-business tool studies the macro-environmental situation of the project and identifies the aspects that can have an important impact on the constitution of this logistic project. Each one of the analysis’ components is indicated separately in Tables 9-16 in order to understand the characteristics examined.

Table 8: Political Factors

<table>
<thead>
<tr>
<th>POLITICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Port of Manta a 'National Priority' for the development of the Ecuadorian Logistic Network.</td>
</tr>
<tr>
<td>Integration of the Ecuadorian Port Policy and the Economic Policy.</td>
</tr>
<tr>
<td>Development of the National Plan of Logistic Infrastructure of Ecuador.</td>
</tr>
<tr>
<td>Development of the Regional Project of Multimodal Corridor Manta - Manaus.</td>
</tr>
</tbody>
</table>
During 1996 to 2006, Ecuador had seven presidents, which reflected that the South American country lived in constant economic, political and social instability over that period. Nevertheless, since Rafael Correa Delgado was elected official President of the Republic of Ecuador in 2007, the nation has enjoyed one of the most stable governments, and economic and social developments. The current Ecuadorian administration has applied stable public and private investment policies, diversified its production supply to new markets and financed educational, scientific, health and logistic projects.

Consequently, President Rafael Correa Delgado has declared the Port of Manta as a ‘National Priority’ in order to improve the Ecuadorian port infrastructure and position the country as a transhipment hub for cargo that comes from Eastern Asia to the Amazon Basin Region and vice versa (Ruta multimodal Manta - Manaos es de interés regional 2011) (Multimodal Corridor Manta – Manaus is a regional interest). Therefore, with the purpose of achieving this goal, the Special Agency Commission for the Port of Manta and Manta’s Port Authority are in charge in restructuring the port and developing the following aspects (‘Codigo Orgánico de la Producción, Comercio e Inversiones,’ 2010) (Organic Code of Production, Commerce and Investment):

- Investing in studies and complementary projects of promotion for the port’s development.
- Creating a logistic service centre in the city of Manta.
- Financing port works.
- Planning, organizing and executing the construction of the Multipurpose Deep-Water Terminal in the Port of Manta.

Therefore, with this initiative, the Ecuadorian Government is trying to integrate port policy with economic policy, specifically in the development of the Port of Manta as the transhipment cargo hub for South America. This is reflected in the ‘Codigo Orgánico de la Producción, Comercio e Inversiones’ (2010) (Organic Code of Production, Commerce and Investment), which states the rules that stimulate the economic development of Ecuador. Article 1 of this law informs that:

‘The scope of this law covers all the production process, from the use of the different production tools, product transformation, distribution and commercial trade and consumption. In addition, this law stimulate all the national production activities in all its levels and characteristics and the production of goods and services recognized by the Constitution of the Republic of Ecuador. Likewise, this rule states the principles that allow the international strategic union of Ecuador that facilitates the International Trade of the country, through modern logistic, transportation and custom regimes’.

For this reason, in order to unite Ecuadorian port and economic policy according to the article indicated above, the Government is stimulating the port offer through the construction of a Multipurpose Deep-Water Terminal in the Port of Manta and the development of the National Plan of
Logistic Infrastructure of Ecuador (creation of strategic productive and distribution platform zones) that can diversify and maximise the worldwide intermodal connection. In the long term, the main objective of these logistic plans is to offer added-value logistic services, improve the competitiveness of the country’s economy and interconnect this system with Colombia, Peru and the Multimodal Corridor Manta – Manaus in order to promote the regional integration.

Figure 4 depicts the main projects of the National Plan of Logistic Infrastructure of Ecuador:

On the other hand, the Multimodal Corridor Manta – Manaus is a Logistic and Transportation Network that is not new; it has been promoted previously. However, it has received more attention since Rafael Correa became President of Ecuador and during the Government of the ex-Brazilian President Luiz Inácio Lula Da Silva. President Da Silva indicated that the Multimodal Corridor Manta – Manaus is a key component for the regional logistic integration promoted by USAN (Union of South American Nations) and the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA) (Durán Aguillón, 2011), which is a development plan that aims to link South America’s economies through transportation, energy and telecommunication networks. Likewise, President Correa indicated that this project follows the objectives stated in Art. 423 of the 'Constitución del Ecuador' (2008) (Constitution of Ecuador); that the integration, especially with the
Latin American and Caribbean countries, will be a strategic goal for the State, and the Ecuadorean Government will stimulate the consolidation of organizations, treaties and other international instruments that support Regional Integration.

Table 9: Economic Factors

<table>
<thead>
<tr>
<th>ECONOMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worldwide economic crisis.</td>
</tr>
<tr>
<td>Economic developments in other Latin American countries.</td>
</tr>
<tr>
<td>Market diversification policy.</td>
</tr>
<tr>
<td>Current and new business investments in Manta.</td>
</tr>
</tbody>
</table>

The US economy was, and still is, facing very difficult times due to the worldwide economic crisis, and given the national and international linkages of its financial system, it did not take long for the effects to spread to other financial markets jeopardising for example the monetary union in Europe (Morales and Andreosso-O'Callaghan, 2010).

In 2001, due to the Ecuadorean economic, politic and social crisis, the country eliminated its national currency, which was the Sucre, and officially adopted the US dollar. However, after that period, the national economic growth average was about 5% due to the effects of the global crisis and the GDP declined to 1% in 2009. Nevertheless, in 2010 the economy began to recover, with a growth rate of 3.3% and reaching 8% in 2011, the third highest rate in Latin America (World Bank: Ecuador Overview, 2013). Currently, there is an increasing public investment in infrastructure, employment, production and standard of life. This is mainly influenced by oil prices, which led to an augmentation in public investment from 21% of GDP in 2006 to almost 40% in 2011 ('Pese a la Crisis Internacional, 2012 fue un buen año económico para Ecuador,' 2012) (Despite the International Crisis, 2012 was a good economic year for Ecuador). Ecuador is one the Latin American countries where the poverty
rate appreciably decreased (-3.7 points) (‘Panorama Social de América Latina,’ 2012) (Social Panorama of Latin America).

Even with these results, significant challenges remain in terms of sustainability, reducing poverty, inequality, ensuring sustainable and inclusive growth. More than half of the Ecuadorian population continues to live in poverty or is vulnerable to again fall below the poverty line (World Bank: Ecuador Overview, 2013).

On the other hand, some Latin American economies are more competitive than others. The reason for this is that different market aspects influence the development of their economy, such as geographical location, laws, culture, safety, social system, logistical and transportation network, etc.

According to Fuente et al. (2012), Bolivia (5.1%), Chile (5.4%), Costa Rica (5.7%) and Peru (6.1%) had during the last trimester of 2012 a rate of economic expansion above 5%, while Panama (9%) is still considered the fastest growing economy in the region.

Additionally, Fuente et al. (2012) suggest that if it is considered the Latin American region, Mexico and Central America present a more stable economic growth than South America, due to the augmented exportations to the United States and the continuous increase of immigrant remittances that come from the United States. Likewise, Mexico and Panama are the countries that have sustained growth in public and private investment. In the case of Mexico, investment is mainly in the production of new industrial machinery and equipment, and in Panama, due to increased building activities.

In order to be competitive, Ecuador expanded its policy of market diversification. Figure 5 shows how Ecuadorian exportations changed by region:

![Figure 5: Market diversification. Non-petroleum exportations by geographic region](Diversificación de mercados. Exportaciones no petroleras por regiones geográficas. 2012)
Exportations to the European Union and North America decreased in 2012, but increased in other non-traditional markets such as Latin America and the Caribbean, the Rest of Europe, Asia and others.

Additionally, Table 10 demonstrates the top 10 countries for Ecuadorian exportation growth in percentage per annum during the last 5 years and the increase between 2011 and 2012:

Table 10: List of importing markets for the products exported by Ecuador in 2012

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>1434</td>
<td>Libya</td>
<td>4556</td>
</tr>
<tr>
<td>Tunisia</td>
<td>463</td>
<td>Malaysia</td>
<td>4512</td>
</tr>
<tr>
<td>Georgia</td>
<td>282</td>
<td>Swaziland</td>
<td>2771</td>
</tr>
<tr>
<td>Egypt</td>
<td>257</td>
<td>Côte d'Ivoire</td>
<td>1529</td>
</tr>
<tr>
<td>Lithuania</td>
<td>202</td>
<td>Ethiopia</td>
<td>772</td>
</tr>
<tr>
<td>Jordan</td>
<td>151</td>
<td>Uzbekistan</td>
<td>594</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>150</td>
<td>North Korea</td>
<td>511</td>
</tr>
<tr>
<td>United States Minor Outlying Islands</td>
<td>149</td>
<td>Kyrgyzstan</td>
<td>470</td>
</tr>
<tr>
<td>Iraq</td>
<td>144</td>
<td>Iraq</td>
<td>431</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>134</td>
<td>Guinea</td>
<td>422</td>
</tr>
</tbody>
</table>

Source: (‘List of importing markets for the product exported by Ecuador in 2012,’ 2012)

According to Padilla (2013b), since 2008, Ecuador had 26 commercial negotiations, signed a memorandum of understanding and economic cooperation and promoted new tariff agreements with different countries. The new tariff agreements were celebrated with Azerbaijan and Iraq, in the case of the former, exportations increased 150% during the last 5 years and for the latter, the exports augmented by 144%. Furthermore, Ecuador is negotiating additional terms in the MOU and Economic Cooperation with Turkey, Malaysia (exportations increased to 4512% in 2011 – 2012), Thailand, Singapore, Vietnam, Saudi Arabia, Kuwait and the United Arab Emirates. On the other hand, currently, are being developed negotiation meetings with the Dominican Republic, Switzerland, Canada, Russia, China and South Korea, where Ecuador wants to increase its market participation in forthcoming years.

Finally, it is important to mention the new business investments held in Manta, where will be located the Multipurpose Deep-Water Terminal. Currently, in the industrial area of this city is constructed a distribution centre for different automotive companies. For example, the expansion of the vehicle yards and the truck assembly plant of the South Korean enterprise Hyundai. Likewise, investments in
new tuna and fish processing centres and the development of the real estate industry (Ulloa Valdivieso, 2011).

Table 11: Social Factors

<table>
<thead>
<tr>
<th>SOCIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical Location and Tourism.</td>
</tr>
<tr>
<td>Production and Employment Generation.</td>
</tr>
</tbody>
</table>

As indicated previously, the open sea Port of Manta is situated in the Province of Manabí. It is located 25 nautical miles from the international shipping maritime traffic route. It has 12 metres draft and is only 600 miles from the Panama Canal.

Additionally, the port is situated 10 minutes by road from the International Airport ‘Eloy Alfaro’, 20 minutes from the future Pacific Petrochemical Refinery and 15km from the Montecristi’s Zona Especial de Desarrollo Económico (ZEDE) (Special Economic Development Zone) (Tomalá, 2013c). Thus, the focus in this area is to create a conglomerate of logistic services for the national and international market.

Another important characteristic of this port is that almost 25% of its capacity is used for the reception of cruise ships. According to the ‘Estadísticas Portuarias y de Transporte Marítimo 2011’ (2011) (Port and Maritime Transport Statistics), in Ecuador during 2011, 66% of cruise-ships arrived to the Port of Manta. Therefore, it is considered as the Touristic Gateway of Ecuador. For this reason, in addition to the Multipurpose Deep-Water Terminal, is also being developed a Cruise Terminal and a Touristic-
Cultural Area, which is a project that will complement the competitive advantages offered (Leira and Moreno, 2008).

Additionally, the direct link between port operations and enterprises activities establish a beneficial outcome among the port and the city’s population. Therefore, the mercantile area developed in this area constitutes Manta as one of the locations that has better employment conditions and quality of life in Ecuador (Mena Ureta, 2009).

The main productive business sectors of Manta use this port in order to perform international trade operations. The manufacture and industrial production of this city is concentrated on transformation-extraction activities. Nine of the ten biggest companies of the Province of Manabí are located in Manta and these companies annually bill approximately US$ 405 million and generate more than 3500 jobs (Chiriboga et al., 2011).

The principal industries located in Manta are for the transformation of tuna and fish products, and oil and vegetal fats production. It is estimated that these businesses generate more than 25000 jobs (Chiriboga et al., 2011), and the growth of this commercial sector is due to its location near the port, where rapid export of products can take place and where imported supplies are nearby. In the case of the tuna and fish industry, Manta has become the first fishing port for the disembarkation of tuna in Ecuador and the South American Eastern Pacific Coast, with 75% of the Ecuadorian tuna fishing fleet concentrated in Manta (Chiriboga et al., 2011).

Table 12: Technological Factors

<table>
<thead>
<tr>
<th>TECHNOLOGICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Plan of Logistic Infrastructure of Ecuador.</td>
</tr>
<tr>
<td>Infraestructure in the Port of Manta.</td>
</tr>
<tr>
<td>Third Set of Locks in the Panama Canal.</td>
</tr>
</tbody>
</table>

The current National Plan of Logistic Platforms of Ecuador is a strategic project of logistic platforms in order to improve the competitiveness of the national industry and promote new logistic services in the country (Plan de Plataformas Logísticas de Ecuador, 2011) (Platform Logistic Plan of Ecuador).
This plan is based on creating economies of scale through specific logistic nodes in different parts of the country. Therefore, in order to constitute these logistic nodes, the Ecuadorian Government has identified important distribution, consumption, manufacturing and oil production clusters for the establishment of Ecuadorian logistic platforms. Figure 7 shows that there are ten logistic platforms identified in the country. Table 13 shows the cities and regions in which they are located.

Figure 7: Logistic nodes of Ecuador
Source: (Plan de Plataformas Logísticas de Ecuador, 2011)

Table 13: Ecuadorian Logistic Platforms

<table>
<thead>
<tr>
<th>CITIES:</th>
<th>REGION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esmeraldas</td>
<td>North – Pacific Coast</td>
</tr>
<tr>
<td>Tulcán and Ibarra</td>
<td>North – Highlands</td>
</tr>
<tr>
<td>Santo Domingo</td>
<td>North – Highlands</td>
</tr>
<tr>
<td>Quito</td>
<td>North – Highlands</td>
</tr>
<tr>
<td>Manta and Portoviejo</td>
<td>Central – Pacific Coast</td>
</tr>
<tr>
<td>Guayaquil</td>
<td>Central – Pacific Coast</td>
</tr>
<tr>
<td>Latacunga, Ambato and Riobamba</td>
<td>Central – Highlands</td>
</tr>
<tr>
<td>Machala and Huaquillas</td>
<td>South – Pacific Coast</td>
</tr>
<tr>
<td>Cuenca</td>
<td>South – Highlands</td>
</tr>
<tr>
<td>Loja</td>
<td>South – Highlands</td>
</tr>
</tbody>
</table>

Source: (Plan de Plataformas Logísticas de Ecuador, 2011) (Platform Logistic Plan of Ecuador)
Therefore, in these areas are constituted the specialized logistic services that were described in section 2.4.1. It is important to mention that these logistic platforms interconnect through the national road network, which was reconstructed in 2007 and by the specialization according to the cargo types of the four international traffic public ports: Esmeraldas (oil industry), Manta and Guayaquil (general cargo) and Puerto Bolívar (banana industry).

On the other hand, currently, the Port of Manta has the following infrastructure (Instalaciones, 2013) (Installations):

- Two docks of 400 meters, each one capable of serving four types of ships at the same time (containerships, bulk carriers, car-carriers, fishing vessels and cruise-ships); both jetties have a platform width of 45 meters each and a draft of 12 metres.
- One marginal wharf of 618 metres and 6.50 metres of draft, which is used for the discharge of tuna and fish and cabotage services.
- Two bascules used for weighing service and an area of 119.012 m² for storage.
- Administrative office installations.

Finally, the construction of the third set of locks in the Panama Canal will have also a significant impact in the development of the Multipurpose Deep-Water Terminal in the Port of Manta. Therefore, it is necessary that the improvements to this port should happen at the same pace as the Panama Canal restructuration.

Scheduled to be in operation in the second trimester of 2015, the third set of locks in the Panama Canal had, as of March 31st, 2013 an investment of US$ 4,330,725,901.93 (Avance de los Contratos del Programa de Ampliación, 2013) (Contracts’ Situation of the Canal Expansion Program). This project is forecasted at a total investment of US$ 5,250 million, which will allow the transit of Postpanamax vessel and therefore, improve the economy of the country and the region.

The last update received from the Panama Canal Authority informs that the manufacture of valves and dampers for the locks continues without delay in the facilities of the Hyundai Samho Heavy Industries Company in South Korea and Cimolai SpA in Italy (Avance de los Contratos del Programa de Ampliación, 2013) (Contracts’ Situation of the Canal Expansion Program). It is expected that in the first trimester of 2013 will arrive in Panama, four dampers and at the end of that year the remaining ones will arrive (Construcción de compuertas de nuevas esclusas tienen un avance del 15%, 2012) (Construction of the new gate locks have a progress of 15%).
On the other hand, as of March 31st, 2013 the construction of the third set of locks in the Panama Canal had an advance of 44.5% (Herrera, 2012). Table 14 indicates the progress percentage of different activities performed in this project:

Table 14: Progress of the construction of the third set of locks in the Panama Canal

<table>
<thead>
<tr>
<th>Activities</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and construction of the Locks</td>
<td>31%</td>
</tr>
<tr>
<td>Access channel in the Pacific entrance – Phase 1</td>
<td>100%</td>
</tr>
<tr>
<td>Access channel in the Pacific entrance – Phase 2</td>
<td>100%</td>
</tr>
<tr>
<td>Access channel in the Pacific entrance – Phase 3</td>
<td>100%</td>
</tr>
<tr>
<td>Access channel in the Pacific entrance – Phase 4</td>
<td>67%</td>
</tr>
<tr>
<td>Dredging in the Pacific entrance</td>
<td>92%</td>
</tr>
<tr>
<td>Deepening and widening of Gatún Lake and widening of Culebra Cut</td>
<td>76%</td>
</tr>
<tr>
<td>Dredging in the Atlantic entrance</td>
<td>98%</td>
</tr>
<tr>
<td>Increment of the maximum operation level of Gatún Lake</td>
<td>8%</td>
</tr>
</tbody>
</table>

Source: (Herrera, 2012)

Table 15: Legal Factors

From 2009-2013 the Ecuadorian Government established the National Plan for Good Living strategic project. One of its main goals was to invest in important areas that developed the production matrix of Ecuador such as the efficient generation of electric energy, the production of bioenergy,

Additionally, the National Constitution of Ecuador ('Constitución del Ecuador,' 2008) stipulates in article 284 numeral 2 that Ecuadorian economic policy shall have the following objective, to: 'encourage national production, systemic productivity and competitiveness, the accumulation of scientific and technological knowledge, strategic insertion into the world economy, and complementary productive activities within regional integration'.

On the other hand, numeral 8 of the same article indicates that it ‘will foster the fair and complementary exchange of goods and services on transparent and efficient market’. Likewise, article 304 states that the trade policy shall have the following objectives:

- To develop, strengthen and give impetus to domestic markets based on the strategic objectives set out in the National Development Plan.
- To regulate, promote and implement actions conductive to boosting the country’s strategic insertion in the global economy.
- To bolster the domestic productive system and production.
- To foster the development of economies of scale and fair trade.

Furthermore, the 'Código Orgánico de la Producción, Comercio e Inversiones' (2010) (Organic Code of Production, Commerce and Investment) regulates the production, distribution, interchange, commerce, consumption and management of resources available in the country. As informed in article 4 of this law, its objectives are:

- To foster the national production, commerce and consumption.
- To incentivise and regulate any kind of private investment in production and service activities.
- To regulate the production investment in strategic economic sectors in accordance to the National Plan of Good Living.
- To foster and diversify the Ecuadorian exportations.
- To facilitate the International Trade operations.
- To promote the Ecuadorian production offer in the worldwide market.
- To incentivise innovative and technological project.

Furthermore, this Code establishes different logistic services that will be oriented to maximise the physical installations of ports, airports and border areas, that allow the increase the Ecuadorian
international trade and boost the national supply chain (‘Código Orgánico de la Producción, Comercio e Inversiones,’ 2010) (Organic Code of Production, Commerce and Investment). In the case of the Port of Manta are the construction of the Multipurpose Deep-Water Terminal and the constitution of other logistic areas such as the Pacific Petrochemical Refinery in El Aromo – Manta and the Zonas Especiales de Desarrollo Económico (ZEDE) (Special Economic Development Zone) in Montecristi.

However, one of the main disadvantages that the construction of the new terminal has is the General Law of Ecuadorian Ports, which is old and has not been actualized since 1976. Therefore, the ports and terminals that operate in the maritime Ecuadorian system need updated jurisdictional regulations in order to accomplish the requirements of international trade and maritime businesses. Only in 2000 was approved a general regulation which allows and states the rules for concessions and modernizing terminals (‘Reglamento General de la Actividad Portuaria en el Ecuador - Decreto No. 467,’ 2000) (General Regulation of the Port Activity in Ecuador – Decree No. 467). The first example of this application was in the Contecon Terminal located in the Port of Guayaquil.

On the other hand, the Ecuadorian Port Model is defined in Article 4 of the ‘Reglamento de la Actividad Marítima - Decreto No. 168’ (1997) (Maritime Activity Regulation – Decree No. 168), which indicates that commercial public ports are State owned and will be managed in the port model of Landlord. The Port Authority has the power to decide any issue concerning land use, reservation of space for the port areas and construction and use of public works. Furthermore, it will grant short or long-term leases or concessions to individual public or private operators for different types of services based on contracts that specify the obligation regarding the use of the site. Thus, according to this port model Manta’s Port Authority is developing a concession for the construction of the Multipurpose Deep-Water Terminal. However, the port model applies also to fully private ports, which are owned and run by public limited companies in the private sector, who are the owners of the land, infrastructure and superstructure. This type of model administration is used in the private terminals located in the Provinces of Manabí and Guayas.

Finally, the ‘Ley de Desarrollo del Puerto de Manta’ (1997) (Law of Development of the Port of Manta) states in article 1 that the Port of Manta will be an International Cargo Transhipment Port. Hence, in order to be constituted as an International Cargo Transhipment Port, this project and its components can be designed, executed and developed by private investment through a concession process, whose regulations are indicated in the State Modernization, Privatizations and Public/Private Service Delivery Law. Furthermore, in order to complete this project, the ‘Ley de Desarrollo del Puerto de Manta’ (1997) (Law of Development of the Port of Manta) informs that it is important to foster competitiveness in international trade through the construction of a Deep-Water Terminal that allows the entrance of large ships, and due to the strategic location of the Port of Manta, it is selected...
as the most efficient alternative for this terminal. This means that it will allow a reduction of transportation costs for international trade, concentrate cargo from Asia and the North Eastern Pacific that will be distributed in the South Western Pacific Coast and is a key feature of the International Cargo Transhipment Port in Manta.

Table 16: Environmental Factors

<table>
<thead>
<tr>
<th>ENVIRONMENTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval of the Ecuadorian Ministry of Environment.</td>
</tr>
</tbody>
</table>

Due to the existence of the Port of Manta and its geographical location, and the condition of maritime transport as an environmentally friendly industry for the mobilization of different and large amount of cargo, the Ecuadorian Ministry of Environment approved the Impact Assessment and Environmental Management Plan for the Development of the Multipurpose Deep-Water Terminal in the Port of Manta (APM obtiene dictamen de prioridad, 2012) (APM obtaines a priority opinion). Therefore, Manta’s Port Authority is allowed to obtain an environmental license in order to begin the construction and operation of this project. According to Rendición de Cuentas 2012 (2012) (Annual Information), the Ecuadorian Ministry of Environment, through their representative in the Province of Manabí, this study held that Manta’s Port Authority falls in line with article 17 of Book VI from the Unified Text of the Environmental Ministry Secondary Law, meaning that the project is not a pollution, flora and fauna risk for the correct environmental development of the city of Manta.

4.2. SWOT Analysis Discussion

The second business strategic tool utilized in order to analyse the feasibility of the construction of the Multipurpose Deep-Water Terminal is the SWOT Analysis, as shown in Table 17.
Table 17: SWOT Analysis

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Government support.</td>
<td>- General Law of Ecuadorian Ports in old and has not been updated since 1976.</td>
</tr>
<tr>
<td>- Key component of the Multimodal Corridor Manta – Manaus.</td>
<td>- Fail in the concession contest process.</td>
</tr>
<tr>
<td>- Important industrial cluster in Manta (tuna and fishing, oil and vegetal fats, automotive and tourism).</td>
<td>- Lack of cargo demand.</td>
</tr>
<tr>
<td>- Strategic geographic location and natural open deep-water port that has 12 metres of draft.</td>
<td>- Elevated port tariffs (no flexibility).</td>
</tr>
<tr>
<td>- Part of the Ecuadorian National Plan of Logistic Infrastructure of Ecuador.</td>
<td>- Regional discrepancies between the Ports of Manta and Guayaquil.</td>
</tr>
<tr>
<td>- Eco-friendly project.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- New alternative transhipment hub.</td>
<td>- Future political, economic and social instability.</td>
</tr>
<tr>
<td>- New potential clients due to the diversification of market policy.</td>
<td>- Competition from other national and international ports.</td>
</tr>
<tr>
<td>- Increase Port of Manta's efficiency, operation, modernization and expansion of port infrastructure.</td>
<td></td>
</tr>
<tr>
<td>- Conglomerate of new logistic project (Multipurpose Deep-Water Terminal, Pacific Refinery, ZEDE).</td>
<td></td>
</tr>
</tbody>
</table>

The SWOT Analysis indicates that there are different factors that can affect the Multipurpose Deep-Water Terminal in the Port of Manta.

In the case of strengths, these were already described in the PESTLE Analysis. Therefore, this section will focus on examining the opportunities, weaknesses and threats of this logistic project.

The *opportunities* achieved from the Multipurpose Deep-Water Terminal in the Port of Manta can lead to the development of a new and alternative hub for the distribution of cargoes. During 2011, the Port of Manta handled 5% of Ecuadorian importations and 0% of exportations (‘Estadísticas Portuarias y de Transporte Marítimo 2011,’ 2011) (Port and Maritime Transport Statistics). Therefore, it is one of the less exploited ports in Ecuador. For this reason, the Ecuadorian Government indicated that this port is a National Priority in order to boost international trade and economy. The main objective of this plan is that the area will serve as a link in national distribution and for the Multimodal Corridor Manta – Manaus. Nevertheless, in the long term this new terminal can be used in order to mobilize cargo to other regional cities located in Colombia, Peru, Brazil, Bolivia and Venezuela.
Additionally, due to its condition as an alternative hub to distribute cargo, this terminal can attract new potential clients that want to export and import to different markets. For this reason and with a strategic and efficient port marketing and management plan, this port constitutes one of the factors that can improve the Ecuadorian economy and international trade. However, it will be important that Ecuador negotiates and subscribes to new and more commercial agreements with strategic partners that can allow it to expand its production offer.

On the other hand, the Port of Manta could increase its efficiency, operation, modernization and expansion in infrastructure with accurate and effective rules for the concession of the Multipurpose Deep-Water Terminal in the Port of Manta. Consequently, President Rafael Correa expects that with the construction of the new terminal, Manta will be able to handle at least 600,000 containers and receive Post-Panamax ships in its quays (Pazmiño, 2013).

Finally, the Multipurpose Deep-Water Terminal, the Pacific Petrochemical Refinery, the ZEDE and other projects developed in the city of Manta will create a Conglomerate Centre of Logistic Services which will be available to different customers.

The main weaknesses of the Multipurpose Deep-Water Terminal in the Port of Manta are in the juridical aspect, where port laws and rules are scattered, not harmonized nor systematized. For example, the main rule that regulates port operations is the General Law of Ecuadorian Ports that was approved on April 15th, 1976, and which is no longer functional due to multiple changes in the worldwide economy, shipping commerce and international port activities. Only a few changes have occurred to the Maritime Activity Regulation – Decree No. 467 that allows the contractual negotiation, concession or delegation of port administration to private operators. Therefore, this law does not support and is not in accordance with Article 304 of the ‘Constitución del Ecuador’ (2008) (Constitution of Ecuador), that Ecuadorian commercial policy is to regulate, promote and execute correspondent actions in order to stimulate the strategic insertion of the country in the worldwide economy. Since 1992 Ecuador has been a member of the United Nations Convention on Contracts for the International Sale of Goods (CISG – Vienna 1980); it is not part of the United Nations Convention on International Multimodal Transport of Goods (Geneva 1980) and only in 2012 ratified the United Nations Convention on the Law of the Sea.

Likewise, problems in the concession contest process or adjudication can have repercussions in the development of the Multipurpose Deep-Water Terminal in the Port of Manta. On September 6th, 2006, Hutchinson Port Holdings obtained the concession of building the new terminal. However, after three years the Chinese company cancelled its contract. The main cause for the withdrawal of this enterprise was due to the non-compliance of the delivery times agreed in the construction of the port.
infrastructures. Currently, there is international competition for the second concession of the Port of Manta.

Another factor that affects the development of the Multipurpose Deep-Water Terminal in the Port of Manta is the lack of cargo. The Port of Manta is one of the less developed and exploited in the Ecuadorian Port System. This area is mainly focused on the reception of vehicle importations and tuna-fishing and vegetal oil exportations. Therefore, even though Article 1 of the 'Ley de Desarrollo del Puerto de Manta' (1997) (Law of Development of the Port of Manta) states that the Port of Manta is declared as an International Transhipment Cargo Port, it still has weaknesses in infrastructure and competitiveness (Tomalá, 2010). Furthermore, this mainly can be generated if the Ecuadorian and international economy collapses or with an inefficient promotion strategy or poor management development by the port administration.

Additionally, according to Medranda (2012) one of the biggest problems that the new terminal could face is the elevated port tariffs, suggesting that Manta’s Port Authority has not defined a strategic price plan in order to attract more customers and cargo. This author mentions that there is uncertainty about this topic, especially when the President of Manta’s Port Authority Roberto Salazar indicated that the tariffs will be the same after the port’s concession. However, this is not possible, because once the port is in concession, the tariffs will need to be more flexible and negotiated with the shipping lines in order to be competitive in the market (Medranda, 2012).

An important weakness in the development of the Port of Manta is the discrepancies with the Port of Guayaquil, which is one of the main obstacles that does not allow the correct development of the city (Ávila, 2010). Guayaquil is the second most important city of Ecuador and is considered as the economical capital of the country. This port handles 62,61% of the national importations and 61,16% of exportations (‘Estadísticas Portuarias y de Transporte Marítimo 2011,’ 2011) (Port and Maritime Transport Statistics). Since the creation of the Port of Manta there has existed an economic rivalry with Guayaquil, and this is attributed to the Port of Guayaquil considering Manta as a threat because it has the advantage of being an open-sea water port, while Guayaquil has difficult entrances through channels. However, due to regional factors Guayaquil has been able to develop important industrial and commercial activities, and therefore, to overshadow and slow down the progress of the Port of Manta. It is expected that with the new Governmental Policy of declaring Manta a ‘National Priority’, the Multipurpose Deep-Water Terminal will eliminate the regionalism problem and be a support area for the cargo decongestion of Guayaquil.

Finally, the main threats for the Multipurpose Deep-Water Terminal in the Port of Manta are the national and international environment. In the national environment, political, economic and social
instability can lead to the project being delayed or cancelled. Currently Ecuador is one of the most stable countries in Latin America, but there are future potential problems in terms of governability. Political power struggles, corruption, and political negligence are some of the factors that South America faces, which do not allow for a cohesive and transparent environment.

Additionally, competition from other ports in Ecuador, Colombia, Peru or Panama can be considered as important threats in the case that Manta is not able to provide a strategic management and marketing plan in order to offer its services. Likewise, the regionalism problem between Manta and Guayaquil is a constraint that can lead to a lack of efficiency and a lack of competitiveness for the new terminal. Moreover, Ecuadorian neighbouring countries such as Colombia, Peru and Panama have been characterized as more open market economies than Ecuador. Therefore, their port infrastructure and investment is more developed and handles more cargoes than Ecuadorian ports.

Finally, worldwide economic crises influence shipping cyclicality. In the case of ports, when the world industry goes into recession, fewer goods are manufactured or consumed, therefore, the exportation and importation of products decreases, which means that international trade and port operations are harmed. But, countries’ economies are different, suggesting that it is better to diversify the production offers to new markets in order not to be affected by the domino effects of economic crisis.

4.3. Trend Analysis Discussion

Finally, this academic research presents some basic statistical analysis through the method of Trend Analysis.

In the following paragraphs will be analysed the situation and tendencies in international trade between the countries that will benefit from the Multipurpose Deep-Water Terminal in the Port of Manta.

The comparison of data considers the amount of exportation and importation per thousand US Dollars during the last ten years (2003 – 2012). It is important to consider that in the Balance of Trade of each State will be only examined the exportation and importation of products. Services will not be included. The information was collected from Trademap, which is a database, where is recorded all the worldwide commercial information obtained from Ministries, the Central Bank and other agencies of different countries (About Trade Map 1999 - 2008). Moreover, Minitab was used for this investigation in order to graph the exportations and importations trends of the last ten years.
In the next paragraphs is presented the situation of the Balance of Trade between Ecuador, Brazil and China, Japan and South Korea:

- **Bilateral Trade between Ecuador and China**

Table 18: Bilateral Trade between Ecuador and China

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exports</strong></td>
<td>13,578</td>
<td>49,510</td>
<td>7,205</td>
<td>194,728</td>
<td>36,550</td>
<td>387,466</td>
<td>124,208</td>
<td>328,738</td>
<td>191,850</td>
<td>388,714</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td>481,802</td>
<td>703,747</td>
<td>621,733</td>
<td>828,182</td>
<td>1,121,735</td>
<td>1,636,363</td>
<td>1,100,283</td>
<td>1,606,562</td>
<td>3,326,991</td>
<td>2,810,684</td>
</tr>
<tr>
<td><strong>Balance of Trade</strong></td>
<td>-468,224</td>
<td>-654,237</td>
<td>-614,528</td>
<td>-633,454</td>
<td>-1,085,185</td>
<td>-1,248,897</td>
<td>-976,075</td>
<td>-1,277,824</td>
<td>-3,135,141</td>
<td>-2,421,970</td>
</tr>
</tbody>
</table>

Exportation/Importation values are presented in US$ Thousand.
Source: (‘Bilateral trade between Ecuador and China’, 2012)

Since 2008, Ecuadorian exportations to China have increased by 5% (‘Bilateral trade between Ecuador and China’, 2012). As suggested by Tomalá (2013a) the bilateral trade between Ecuador and China has been developed in accordance to the rules used by the World Trade Organization (WTO), which means that there is not a bilateral trade treaty between the two countries.

As shown in Figure 8, the trend in Ecuadorian exportations to China is positive with fluctuations in some years. During 2003 – 2012 the main commodities that Ecuador exported to China were:

- Crude petroleum oils.
- Copper waste and scrap.
- Fresh or dried bananas and plantains.
- Sliced or peeled wood sawn/chipped lengthwise.
- Aluminium waste and scrap.
- Crustaceans.
- Buttons, press & snap fasteners and button moulds.

According to Villagrán *et al.* (2011), there are some Ecuadorian products such as shrimps, wood, copper-tin and zinc that have potential to increase sales in the Chinese market. Recently, Ecuadorian frozen butterfish has been one of the commodities that has more participation in Chinese exportations, from January to April 2013. Ecuador is the first exporter of this product, which represents 30% of total Chinese imports (Molina, 2013). Additionally, Molina (2013) indicates that the preference of this Ecuadorian product in China is due to its competitive price, quality and changes in feeding behaviours in China. However, the greatest trend from Chinese importers is to buy value-added products, where the Ecuadorian products until now had not had a significant contribution in the Chinese market.
Therefore, the Ecuadorian trade balance with China is negative and as indicated by Tomalá (2013a), in order to be competitive in upcoming years, it is necessary to export to China other products apart of bananas, (which enters the market with an elevated tariff of 10%), such as elaborated food products obtained from mangoes or cacao (chocolates).

Currently, Ecuadorian importations from China are US$ 2,810,684. As informed previously, Ecuador imports more than it exports to the China. The main products demanded from China during 2003 – 2012 were:

- Electrical and electronic equipment.
- Machinery, nuclear reactors and boilers.
- Iron, steel and its articles.
- Toys, games and other equipment.
- Vehicles other than railway or tramway.

These commodities reflect that Ecuador highly demands capital goods from China, which represents more than 59.5% of total importations (Tomalá, 2013c). Additionally, it is forecast that this tendency will continue as long as Ecuador is not capable of producing capital goods and needs to import them in order to use in its productive activities (Tomalá, 2013c).
Figure 9: Trend Line for the Ecuadorian importations from China, 2003 – 2012
Source: ('Bilateral trade between Ecuador and China ', 2012)

- **Bilateral Trade between Ecuador and Japan**

Table 19: Bilateral Trade between Ecuador and Japan

<table>
<thead>
<tr>
<th></th>
<th>ECUADOR – JAPAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exports</strong></td>
<td>86,117</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td>310,970</td>
</tr>
</tbody>
</table>

Exportation/Importation values are presented in US$ Thousand.
Source: ('Bilateral Trade between Ecuador and Japan,' 2012)

Ecuadorian exportations to Japan increased by 61%, one of the highest rates between Ecuador and a developed country ('Bilateral Trade between Ecuador and Japan,' 2012). Therefore, Japan is its most important market in Asia due to increasing exportations during the last years.

The Balance of Trade has been negative for Ecuador; the exportations have a positive trend. In the last ten years, the main products exported were:

- Flour of meat, meat offal, fish, crust unfit for human consumption.
- Fresh or dried bananas and plantains.
- Crude petroleum oils.
- Whole or broken / raw or roasted cocoa beans.
- Crustaceans and frozen fish.
- Fresh or chilled cabbages and cauliflowers.

The commodities mentioned previously represent 91% of the total exportations to Japan (Peña Hurtado, 2012). However, Ecuadorian crude petroleum oil exportations have increased considerably during the last two years. During 2012, it augmented 135% more than the previous year (‘Bilateral Trade between Ecuador and Japan,’ 2012). On the other hand, some traditional products are decreasing in the Japanese market and it is expected that this tendency will continue due to low demand from Japanese consumers. These products are cocoa paste not defatted, tuna, albacores and flowers (‘Guía Comercial de Japón,’ 2010) (Japan’s Commercial Guide). Additionally, in the case of Ecuadorian flowers, negotiations exist in order to increase the market share in Japan, but Ecuador still has serious logistic difficulties (‘Dificultad logistica impide que flores lleguen a la China y Japón,’ 2010) (Logistic difficulties impede flowers to arrive to China and Japan) that do not allow the transport of this commodity to cities such as Tokyo, Osaka or Yokohama.

Ecuadorian importations from Japan have a positive trend and are higher than exportations (surplus). As was the case with China, Ecuador demands from Japan capital goods. During the last ten years, these were the main commodities imported:

- Vehicles other than railway or tramway.
- Machinery, nuclear reactors and boilers.
- Rubber and articles thereof.
- Iron and steel.
- Electrical and electronic equipment.

It is important to highlight that the main commodities that Ecuador imports from Japan are vehicles other than railway or tramway. The importations of this product from 2003 to 2012 are US$ 4,063,014, which represents 18.4% of total Ecuadorian importations. However, since 2012 there has been a decline in the importations of these goods due to the Governmental policy of setting quotas (measures for restricting automobile imports), which affects Japanese vehicles mainly. Therefore, some businessmen from the automotive industry indicate that in upcoming years they will prefer to import vehicles from the United States, because Japanese vehicles are more expensive due to their technology and the type of currency changes that are negotiated (Comercio automotriz con baja al fin de 2012, 2012) (Automobile commerce decreases at the end of 2012).

Figure 11: Trend Line for the Ecuadorian importations from Japan, 2003 – 2012
Source: ('Bilateral Trade between Ecuador and Japan,' 2012)
Bilateral Trade between Ecuador and South Korea

Table 20: Bilateral Trade between Ecuador and South Korea

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Exports</strong></td>
<td>241,890</td>
<td>146,909</td>
<td>3,382</td>
<td>6,108</td>
<td>59,196</td>
<td>20,797</td>
<td>6,492</td>
<td>9,213</td>
<td>28,941</td>
<td>39,228</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td>252,289</td>
<td>272,246</td>
<td>399,756</td>
<td>477,972</td>
<td>404,720</td>
<td>669,680</td>
<td>522,316</td>
<td>896,907</td>
<td>946,701</td>
<td>789,883</td>
</tr>
</tbody>
</table>

Exportation/Importation values are presented in US$ Thousand.
Source: (‘Bilateral Trade between Ecuador and South Korea,’ 2012)

During the last five years, Ecuadorian exportations to South Korea increased by 10% (‘Bilateral Trade between Ecuador and South Korea,’ 2012). Currently, Ecuador and South Korea have a signed Memorandum of Understanding Cooperation in order to interchange political experiences and commercial activities (‘Ecuador y Corea impulsan una economía del conocimiento,’ 2013) (Ecuador and Korea impulse the knowledge economy). Additionally, Ecuador is beginning negotiations with South Korea in order to have a commercial agreement that will help to increase international trade between them (Padilla, 2013a).

Ecuadorian exportations to South Korea present a different outcome in comparison with China and Japan. The exports have a negative trend, especially between 2004 – 2010. Therefore, the Ecuadorian Government is trying to stimulate the commercial interchange with South Korea by subscribing to mercantile agreements and promoting investments. Over the last ten years the main exported commodities were:

- Crustaceans and fish fillets.
- Copper waste and scrap.
- Buttons, press & snap fasteners and button moulds.
- Aluminium waste and scrap.
- Extracts essences & concentrates of coffee and tea.
- Ferrous waste and scrap.
- Flour of meat, meat offal, crust unfit for human consumption.
- Waste and scrap of paper or paperboard.

On the other side, products such as shrimps, bananas, fish, cacao, concentrates of fruits, coffee, tuna and others have the potential to increase their demand in the South Korean market and this can be achieved through the subscription of a commercial agreement between the two (‘Bilateral Trade between Ecuador and South Korea,’ 2012). Nevertheless, the main disadvantage that Ecuador has is that Peru already has a Commercial Treaty with South Korea, where the products (Ecuador’s products...
that want to increase its offer in the upcoming year) can enter each market without tariffs (Acuerdo de Libre Comercio entre la República del Perú y la República de Corea 2011) (Free Trade Agreement between the Republic of Peru and the Republic of Korea).

Figure 12: Trend Line for the Ecuadorian exportations to South Korea, 2003 – 2012
Source: (‘Bilateral Trade between Ecuador and South Korea,’ 2012)

Ecuadorian importations from South Korea during the last year were US$ 5,632,470. Therefore, Ecuador presents a negative trade balance in comparison with South Korea. The main products imported were:

- Vehicles other than railway or tramway.
- Machinery, nuclear reactors and boilers.
- Petroleum oils, not crude.
- Electrical and electronic equipment.
- Plastics and articles thereof.

As with China and Japan, Ecuador demands from South Korea capital goods. However, even though Ecuador produces oil, the importation of petroleum (not crude) has increased considerably. South Korea is in the top 15 countries that supply petroleum oils to Ecuador (US$ 1,365 in 2012). According to Tomalá (2013c), there are two reasons for these importations:
- Ecuador does not have a high-technology infrastructure that allows processing of crude oil at a lower cost.
- The Refinery of Esmeraldas (the most important in the country) is already obsolete and the Government will need to invest a lot in order for it to become efficient.

Therefore, it is expected in the future that the construction of the new Pacific Refinery in the Province of Manabí will decrease the importation of oil products.

**Figure 13: Trend Line for the Ecuadorian importations from South Korea, 2003 – 2012**
Source: ('Bilateral Trade between Ecuador and South Korea,' 2012)

- **Bilateral Trade between Brazil and China**

Table 21: Bilateral Trade between Brazil and China

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exports</strong></td>
<td>4,533,363</td>
<td>5,441,746</td>
<td>6,834,997</td>
<td>8,402,369</td>
<td>10,748,814</td>
<td>16,403,039</td>
<td>20,190,831</td>
<td>30,752,356</td>
<td>44,314,595</td>
<td>41,227,540</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td>2,147,799</td>
<td>3,710,477</td>
<td>5,354,519</td>
<td>7,989,343</td>
<td>12,617,755</td>
<td>20,040,022</td>
<td>15,911,145</td>
<td>25,535,684</td>
<td>32,788,425</td>
<td>34,248,498</td>
</tr>
<tr>
<td><strong>Balance of Trade</strong></td>
<td>2,385,564</td>
<td>1,731,269</td>
<td>1,480,478</td>
<td>413,026</td>
<td>-1,868,941</td>
<td>-3,636,983</td>
<td>4,279,686</td>
<td>5,216,672</td>
<td>11,526,170</td>
<td>6,979,042</td>
</tr>
</tbody>
</table>

Exportation/Importation values are presented in US$ Thousand.
Source: ('Bilateral Trade between Brazil and China,' 2012)

Over the last 5 years, Brazilian exportations to China increased by 30% (‘Bilateral Trade between Brazil and China,' 2012), generally transported through the Panama Canal. Currently, China is the
main commercial and investor partner of Brazil and both countries have the same objective in the long term: to be international powers and fortify their cooperation agreements (Neghme, 2010).

The Balance of Trade is positive for Brazil with exceptions in 2007 and 2008. Moreover, the tendency in Brazilian exportations to China is positive with a small decline during 2012. In the last ten years the principal commodities exported to the China were:

- Soya beans, whether or not broken.
- Ores, slag and ash.
- Crude petroleum oils.
- Iron and steel.
- Animal, vegetal fats and oils, cleavage products.

As demonstrated above, the main products exported from Brazil to China are raw materials. According to Cardoso (2013), during Hu Jintao’s rule (2003 – 2013), China intensified its commercial relationships with developing countries because they are seen as crucial sources of raw materials, commodities and natural resources, as well as important markets to sell products. In the particular case of Brazil, the intensification to improve mercantile relations with China was a decision aimed at creating conditions to cope with the growing demand of China’s society and economy for raw materials (Cardoso, 2013). In 2009, China and Brazil signed their most important tool of cooperation, a Joint Action Plan that framed their cooperation until 2014 in more than 13 areas across the development interest in economy, culture and science (Cardoso, 2013).

Finally, it is expected that the exportations between Brazil and China will be maintained or increase in future years. For example, one of the main products exported to China is soya beans, which are forecasted to augment their export between 70% and 90% by 2020 (Brown-Lima et al., 2012). Likewise, it is prognosticated that the total trade between these two nations will continue to strengthen, with China accounting for around 30% of exports by 2030 (Emmett, 2013).
Brazilian importations from China have a positive tendency representing in total US$ 160,343,667. The imported products are:

- Electrical and electronic equipment.
- Machinery, nuclear reactors and boilers.
- Organic chemicals.
- Mineral fuels, oils, distillation products, etc.
- Optical, photo, technical, medical, apparatus etc.

As indicated previously, Brazil is an exporter of raw materials and importer of manufactured goods from China. The forecast is expected to be maintained in the future as a recent study by the Brazilian National Development Bank (BNDES) shows that Brazil will continue importing technology-intensive goods from China (Pereira and De Castro Neves, 2011).
- *Bilateral Trade between Brazil and Japan*

Table 22: Bilateral Trade between Brazil and Japan

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>2,315,632</td>
<td>2,520,542</td>
</tr>
<tr>
<td>2004</td>
<td>2,774,247</td>
<td>2,868,677</td>
</tr>
<tr>
<td>2005</td>
<td>3,482,616</td>
<td>3,405,021</td>
</tr>
<tr>
<td>2006</td>
<td>3,894,521</td>
<td>3,839,523</td>
</tr>
<tr>
<td>2007</td>
<td>4,321,335</td>
<td>4,609,583</td>
</tr>
<tr>
<td>2008</td>
<td>6,114,520</td>
<td>6,806,892</td>
</tr>
<tr>
<td>2009</td>
<td>4,269,695</td>
<td>5,367,570</td>
</tr>
<tr>
<td>2010</td>
<td>7,123,436</td>
<td>6,970,198</td>
</tr>
<tr>
<td>2011</td>
<td>9,473,096</td>
<td>7,871,809</td>
</tr>
<tr>
<td>2012</td>
<td>7,955,713</td>
<td>7,734,742</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>2,520,542</td>
<td>2,315,632</td>
</tr>
<tr>
<td>2004</td>
<td>2,868,677</td>
<td>2,774,247</td>
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<td>3,405,021</td>
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<td>6,806,892</td>
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<td>2010</td>
<td>6,970,198</td>
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<tr>
<td>2011</td>
<td>7,871,809</td>
<td>9,473,096</td>
</tr>
<tr>
<td>2012</td>
<td>7,734,742</td>
<td>7,955,713</td>
</tr>
<tr>
<td><strong>Balance of Trade</strong></td>
<td>-204,910</td>
<td>-94,430</td>
</tr>
<tr>
<td>2003</td>
<td>77,595</td>
<td>54,998</td>
</tr>
<tr>
<td>2005</td>
<td>-1,097,875</td>
<td>153,238</td>
</tr>
<tr>
<td>2006</td>
<td>1,601,287</td>
<td>220,971</td>
</tr>
</tbody>
</table>

Exportation/Importation values are presented in US$ Thousand.
Source: ('Bilateral Trade between Brazil and Japan,' 2012)

The annual growth in values of Brazilian exportations to Japan during 2008 – 2012 is 14% ('Bilateral Trade between Brazil and Japan,' 2012). In comparison to China, Brazil has a more balanced trade with Japan, where in 2005, 2006, 2010, 2011 and 2012 there was surplus, while in 2003, 2004, 2007, 2008 and 2009 there was deficit for Brazil.

The trend of Brazilian exportations to Japan is positive. The main commodities exported during the last ten years were:

- Iron ores & concentrates; including roasted iron pyrites.
- Meat and edible meat offal.
- Aluminium and articles thereof.
- Coffee, tea, mate and spices.
- Cereals

According to the Brazilian Association of International Trade, the exportations of this country will decline by 5% (Câmara de Comércio e Indústria Japonesa do Brasil: Associação prevê queda de 5% das exportações em 2013 2013) (Japanese Commerce and Industrial Chamber of Brazil: Association predicts 5% drop in the exportations for 2013). One of the main reasons for this reduction is due to the low competitiveness and the subsidies for agricultural products especially in Japan, which forecast that Brazil would lose its opportunities to expand its offer in the Japanese market (Furlan, 2007). Nevertheless, one of the biggest opportunities in the future for Brazil is to increase its participation in the biofuel industry, where Japan bought during 2012 US$ 485,266 million of Brazilian undenatured ethyl alcohol (used for the production of biodiesel) (‘Bilateral Trade between Brazil and Japan,’ 2012).

It is estimated that by 2025, the global demand for gasoline in eco-friendly vehicles will reach 2 trillion litres and Japan will be one of the main consumers. Hence, Brazil is planning to increase its production of ethanol in order to supply it to Japan, its most important market in this industry (Furlan, 2007).

![Trend Line for Brazilian exportations to Japan, 2003 - 2012](image)

Figure 16: Trend Line for the Brazilian exportations to Japan, 2003 – 2012
Source: (‘Bilateral Trade between Brazil and Japan,’ 2012)
The annual growth of Brazilian importations from Japan is 7% from 2008 to 2012. The main commodities imported over the last ten years are mainly concentrated in capital goods:

- Machinery, nuclear reactors and boilers.
- Electrical and electronic equipment.
- Vehicles other than railway or tramway.

In the case of Japanese exportations of vehicles other than railway or tramway to Brazil, Japan is recovering its sales and production due to recovery from the earthquake disaster (Karasawa, 2013). The disadvantage that Japan has in the Brazilian market is that the importation of vehicles has less growth annually (7%) compared with other countries such as Mexico (31%), Thailand (29%) or South Korea (28%) ('Bilateral Trade between Brazil and Japan,' 2012). However, it is expected that in upcoming years the importations of vehicles from Japan to Brazil will increase due to import restrictions imposed on Mexico and the low prices and good quality of cars that Japan is offering to Brazil (Karasawa, 2013).

![Figure 17: Trend Line for the Brazilian importations from Japan, 2003 – 2012](source: 'Bilateral Trade between Brazil and Japan,' 2012)
Bilateral Trade between Brazil and South Korea

Table 23: Bilateral Trade between Brazil and South Korea

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports</th>
<th>Imports</th>
<th>Balance of Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>1,223,282</td>
<td>1,078,838</td>
<td>144,444</td>
</tr>
<tr>
<td>2004</td>
<td>1,429,554</td>
<td>1,729,910</td>
<td>-300,356</td>
</tr>
<tr>
<td>2005</td>
<td>1,896,607</td>
<td>2,326,778</td>
<td>-430,171</td>
</tr>
<tr>
<td>2006</td>
<td>1,962,514</td>
<td>3,106,306</td>
<td>-1,143,792</td>
</tr>
<tr>
<td>2007</td>
<td>2,046,636</td>
<td>3,391,063</td>
<td>-1,344,427</td>
</tr>
<tr>
<td>2008</td>
<td>3,118,568</td>
<td>5,412,420</td>
<td>-2,293,852</td>
</tr>
<tr>
<td>2009</td>
<td>2,622,285</td>
<td>4,818,447</td>
<td>-2,196,162</td>
</tr>
<tr>
<td>2010</td>
<td>3,755,341</td>
<td>8,417,970</td>
<td>-4,662,629</td>
</tr>
<tr>
<td>2011</td>
<td>4,693,868</td>
<td>10,096,972</td>
<td>-5,403,104</td>
</tr>
<tr>
<td>2012</td>
<td>4,501,090</td>
<td>9,097,658</td>
<td>-4,596,568</td>
</tr>
</tbody>
</table>

Exportation/Importation values are presented in US$ Thousand.
Source: ('Bilateral Trade between Brazil and South Korea,' 2012)

Brazilian exportations to South Korea have been increasing annually by 14% over the last 5 years ('Bilateral Trade between Brazil and South Korea,' 2012). However, the Balance of Trade is negative for Brazil as indicated in Table 23. Currently, South Korea is in 13th position in Brazilian exportations and represents a share in Brazil’s exportations of 1.9% ('Bilateral Trade between Brazil and South Korea,' 2012).

The trend of the Brazilian exportations to South Korea is positive. During 2003 – 2012 the main commodities exported were:

- Iron and steel.
- Ores, slag and ash.
- Residues, wastes of food industry, animal fodder.
- Maize (corn).
- Crude petroleum oils.
- Soya bean, whether or not broke.

Similarly to countries analysed previously, South Korea mainly demands from Brazil raw materials. In fact, it is one of the nations that less imports Brazilian manufactured goods along with China, Russia, Egypt and Japan (Radiografia do Comércio Exterior Brasileiro: Passado, Presente e Futuro, 2012) (Radiography of the Brazilian International Trade: Past, Present and Future). On the other hand, it is forecasted that one of the products that will increase its exportations to South Korea is cotton. This product had an annual growth from 2008 – 2012 of 29%. Therefore, the Brazilian Government sent a commercial mission and businesspersons in order to increase its consumption (50% of Brazilian cotton is consumed in South Korea), and promote and negotiate cotton production in Asia, especially in South Korea. (Mesquita and Ferraresi, 2012)
On the other hand, Brazilian importations from South Korea grew annually 19%. During the last ten years the main commodities imported were:

- Electrical and electronic equipment.
- Machinery, nuclear reactors and boilers.
- Vehicles other than railway or tramway.
- Optical, photo, technical, medical, apparatus etc.
- Petroleum oils, not crude.

South Korean exportations to Brazil represent 75% of high-technology products. From this, the annual growth (2008 – 2012) of the importation of electrical and electronic equipment was 13%, machinery, nuclear reactors and boilers 24%, and vehicles other than railway or tramway 28% ('Bilateral Trade between Brazil and South Korea,' 2012). The importation of optical, photo, technical and medical apparatus declined by 25%. The reason for this decline is that Brazil augmented the importation of these products from the United States, Germany, Belgium and Malaysia.
4.4. Summary

The construction of the Multipurpose Deep-Water Terminal in the Port of Manta has been declared by the Ecuadorian Government as a ‘National Priority’. Therefore, its main objective is to consolidate a transhipment hub port and improve the port system.

Additionally, this project is a key component of the National Plan of Logistic Infrastructure of Ecuador and the Multimodal Corridor Manta – Manaus, which will integrate the logistic transportation system in South America.

The main strengths of this plan are Ecuadorian economic and political stability, the market diversification policy, the conglomerate of logistic services that are to be developed and it is an eco-friendly project approved by the Ministry of Environment of Ecuador; all of which help the construction of this new mega-port.

However, Ecuador still faces important problems that can affect the construction of the new terminal such as growth economy in other Latin American countries, an outdated and confusing port legal situation, previous concession problems, lack of a strategic plan on price tariffs, regionalism discrepancies with Guayaquil, future political, social and economic instability and worldwide crisis.
Finally, from the Trend analysis was concluded that Brazil and Ecuador are countries that still demand capital goods from China, Japan and South Korea. Therefore, they are still not able to produce manufactured products that can be exported or compete in the Asian market, while the three Asian countries analysed import raw materials, suggesting that there is still an increasing demand for this products.
CHAPTER 5: Project Outcomes

Port systems in many countries have been constituted as important national and international investment attractions and competitive development areas. Usually, ports help to increase international trade through factors such as globalization progress, market demands and supplies or new logistic services. All of these factors are essential in order to set the different components of the distribution channels.

The construction of a Multipurpose Deep-Water Terminal in the Port of Manta will create a new logistic service that could attract more business and incomes to the Ecuadorian economy. This project will also improve the efficiency, agility and competitiveness of the National Port System.

Moreover, this terminal will bring employment, technological developments, improvements in production and trade cycles, and other advantages that will be complemented by the additional logistic components of the future Multimodal Corridor Manta – Manaus. Likewise, this project will be a new logistic hub for different industries that want to distribute their cargoes to Asian, South American and other markets.

In the following paragraphs are stated the possible outcomes that can be achieved from the implementation of the Multipurpose Deep-Water Terminal in the Port of Manta.

5.1. National and International Mercantile Benefits

With the intention of achieving the desired outcomes from the Multipurpose Deep-Water Terminal system in the Port of Manta, this project needs the support of the governments of the countries involved. Therefore, it is important to have political and economic stability, technological investment, juridical facilities and eco-friendly studies in order to maintain the sustainability of this plan.

Competition between national and international ports will be another outcome achieved from this project. Therefore, this terminal will be a new option in order to distribute proficiently goods in Ecuador and in neighbouring countries. The potential products that can enter Eastern Asia, the governmental policy of market diversification and the construction of the Pacific Petrochemical Refinery are some of the factors that can influence the development of the Multipurpose Deep-Water Terminal. Nevertheless, in order to achieve this objective, the port will need to offer competitive port-operation prices, efficient handling operations and a solid logistic chain infrastructure for new clients.
Consequently, if the project is developed in a risk free environment, it will provide economic-mercantile benefits for Ecuador and the American Continent. The main outcomes are discussed in sections 5.1.1 -5.1.4.

5.1.1. New Clients and Improvements in International Trade

The Multipurpose Deep-Water Terminal in the Port of Manta will promote new business investment and improve the operation-financial activities of the industries already settled in Ecuador.

According to the techno-economic studies mentioned in the previous chapter, it is suggested that the exportation of shrimps, wood, copper-tin, zinc, frozen butterfish, bananas, fish, cacao, concentrates of fruits and tuna have the potential of increased consumption in Eastern Asia, especially in China and South Korea. Therefore, the Multipurpose Deep-Water Terminal in the Port of Manta will be an important connection in order to distribute these products in the Asian market. Specifically, partnered and organized Ecuadorian merchants such as ASOEXPEBLA (fish industry), COFENAC (coffee industry) and ANECACAO (cacao industry) amongst others will benefit by using the installations of the new terminal where larger vessels will call.

In the case of importations, due to the economic situation of Ecuador, the country still will demand capital goods from Eastern Asia and other regions. Currently, the Port of Manta has been constituted as the main entrance for vehicles and machinery (receiving 65% of total importations) (‘Estadísticas Portuarias y de Transporte Marítimo 2011,’ 2011) (Port and Maritime Transportation Statistics). It is expected that with the development of the new terminal the importation of these commodities from automotive companies such as Hyundai, Toyota, Nissan and others will increase in the near future.

Likewise, and through the development of the Multimodal Corridor Manta – Manaus, the Multipurpose Deep-Terminal will enhance and be another option for the distribution of commodities through the Amazon region for the goods that come from Eastern Asia to Brazil. As indicated previously, China and Brazil are constantly fortifying their commercial relations. Therefore, the terminal in the Port of Manta will be a new and rapid entrance for Chinese and Brazilian exportations and importations. Moreover, it can be an important component in distributing the products that Brazil wants to increase within Asia, such as biofuels in Japan and cotton in South Korea.

Nevertheless, it is important that Ecuador expands its commercial relations within different markets. This will allow improvements in its exportation offer and a boost to its national industries.
5.1.2. Impulse for the Development of Additional Logistic Services

During the last decades different technological advances have been experimented with in the marine transport industry. Some of these changes provoked transportation cost reductions, improvements in cargo handling, the comfort for passengers in the case of cruise-ships, new vessel design in order to increase productivity and competitiveness, speed control and other features that have led to the maritime transport industry becoming one of the most efficient business areas worldwide.

Additionally, these modifications occur due to the condition of the marine transport industry as a derive demand. Therefore, any changes in clients’ necessities, preferences, behaviours or financial aspects will affect this sector. The marine transport industry is a complete network that affects and creates new logistic services. That is the reason why currently, worldwide, there exists important Conglomerates of Logistic Services such as in the Netherlands, Singapore, Panama and Australia.

In the case of Ecuador, there is a strategic and integrated vision to be developed. Apart from the Multipurpose Deep-Water Terminal, the International Airport ‘Eloy Alfaro’, the Pacific Petrochemical Refinery and supplementary projects, it is expected that other private and public logistic companies will be created or increase their operation in the Ecuadorian market.

Due to the increasing operations in the port, the presence of new and current exporters and importers and cargo quantity, it is suggested that more warehouses, trucking companies, storage centres for the cold chain and other services will be needed in order to maintain the performance of national and international distribution channels.

Furthermore, these features in the Ecuadorian Logistic System can lead to the development of additional global standard logistic services that will be beneficial for the local and international economy, such as the creation of:

- Dry ports.
- Multimodal transportation centres.
- Business centres.
- Specialized distribution clusters.
- Provincial railway network (transfer of cargo and passengers).
- International Bank Service System.
5.1.3. Reactivation of Ecuadorian Productivity and the National Port System

In the reactivation or changes in national production and the port operation system can be applied the concept of Business Process Reengineering, developed by Hammer and Champy (1993). They state that reengineering is defined as the fundamental rethink and radical redesign of business processes to generate dramatic improvements in critical performance measures – such as cost, quality, service and speed. It is focused in plan and controls different changes, which need to be in accordance with the new requirements of the business environment. Therefore, in the case of the improvements of Ecuadorian productivity and the National Port System should be taken into account the following aspects:

- **Clients**- The clients of the Multipurpose Deep-Water Terminal in the Port of Manta are the exporters and importers. For example, in order to increase or maintain the exportations of crude petroleum oils to Japan, it will be indispensable for Ecuador to improve the logistic network between the new terminal and the Pacific Petrochemical Refinery in order to maximise the sales of this commodity. Likewise, a restructuration of the Ecuadorian port juridical system will define and clarify the rules that govern maritime and port activities.

- **Competition**- The Port of Manta will need to become more competitive in order to survive in a changeable and demanding environment and maintain its market segment. Its main national competitors are the Ports of Guayaquil, Esmeraldas and Puerto Bolivar, and internationally, the ports located in Colombia, Peru and Panama. Therefore, it is important that the Port of Manta has affordable prices, efficient cargo handling, security, good infrastructure and other aspects that allow it to be the first option for customers. Ecuadorian and Latin American ports are mainly importer ports, which means it is more difficult for them to increase the annual volume of containers, terminals and infrastructure (Castro et al., 2010). The reason for this is that they depend on the demand of goods and the logistic network available (highways, warehouses, etc.). As explained in the PESTLE Analysis (political factor), the Port of Manta has been designated as a ‘National Priority’ in order to improve the Ecuadorian port system due to its strategic geographic location. Having said this, if the Multipurpose Deep-Water Terminal works in synergy with the other...
components of the Ecuadorian National Logistic Platforms, this port will have a competitive advantage and offer for existent and future clients.

- **Change**- In this aspect what is needed is the effectiveness of the system. One of the biggest differences between the Asian and Latin American ports is that the latter have a relatively low investment in infrastructure (2% from the GDP), while the former invest approximately 4 – 6% from the GDP ('Un estudio de CEPAL manifiesta que la eficiencia de puertos latinoamericanos debe mejorar,' 2006) (ECLAC study states that the efficiency of the Latin American ports should be improved). Therefore, in the Asian ports is a sustainable growth in container traffic due to this investment. In the case of the Multipurpose Deep-Water Terminal in the Port of Manta, it will have investment in the construction of new quays, gantry cranes, container yards and others. However, it is expected that the productivity of the new terminal can be improved through the use of modern technology such as automation and software to increase traffic flow, storage and documentation, waiting time decongestion at docks, availability of cranes and equipment. All of these factors are crucial for efficiency.

On the other hand, Ecuador can benefit and boost its resources in order to be competitive worldwide. Internationally, this terminal will be the first step for a new Inland Passage that will be a new transportation option for different clients and an important transhipment hub for the Pacific Coast of South America. As indicated previously, the Multipurpose Deep-Water Terminal in the Port of Manta is part of the Ecuadorian National Plan of Logistic Infrastructure and a key component of the future Multimodal Corridor Manta – Manaus. In the area of Manta will be concentrated five important points of this supply chain, the:

- Multipurpose Deep-Water Terminal in the Port of Manta.
- International Airport of Cargo and Passenger ‘Eloy Alfaro’ of Manta (already in operations).
- Pacific Petrochemical Refinery.
- Special Economic Development Zone (SEDZ).
- Portoviejo’s Multipurpose Agribusiness Centre.

Therefore, this region can be constituted in the principal logistic-transportation hub for Ecuador that will boost the Ecuadorian economy. In order to be competitive and sustainable, this logistic area needs to have efficient and transparent management and juridical rules that will allow the correct flow of
materials, resources, work force and information. As an example of how these logistic areas will interact each other, from the ZEDE or Portoviejo’s Multipurpose Agribusiness Centre will be exported different commodities through the International Airport ‘Eloy Alfaro’ or the Multipurpose Deep-Water Terminal. Likewise, oil products obtained from the Pacific Petrochemical Refinery will be distributed worldwide through tanker ships that will arrive at the Port of Manta.

5.1.4. Employment Generation

Ports and the maritime industry have been characterised as sectors that generate multiple employment opportunities. Currently, the Port of Manta employs 227 persons for different activities (Terán, 2013). However, it is suggested that this amount will increase due to the Multipurpose Deep-Water Terminal in the Port of Manta. In addition, and according to the ‘Estadisticas’ (2013) (Statistics), during 2013 the University Eloy Alfaro of Manabí (the most important in the province) has the following numbers of students in academic programs related to the project of the new terminal:

Table 24: Number of student in academic programs related to port studies

<table>
<thead>
<tr>
<th>Program</th>
<th>Number of Students</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting and Finance</td>
<td>1173</td>
<td>27%</td>
</tr>
<tr>
<td>Business Management</td>
<td>1090</td>
<td>25%</td>
</tr>
<tr>
<td>Computer Science</td>
<td>775</td>
<td>18%</td>
</tr>
<tr>
<td>International Trade and Business</td>
<td>588</td>
<td>14%</td>
</tr>
<tr>
<td>Economy</td>
<td>494</td>
<td>12%</td>
</tr>
<tr>
<td>Naval Engineering and Architecture</td>
<td>159</td>
<td>4%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4279</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: (‘Estadisticas,’ 2013)

According to the ‘Estadisticas’ (2013) (Statistics), 25% of enrolled students (4,279) study academic programs related to the port and maritime activities. However, in previous years, of the students that finish their academic programs, more than 50% do not work in their field or are unemployed (Ulloa Valdivieso, 2011).

Therefore, it is expected that with the development of the Multipurpose Deep-Water Terminal in the Port of Manta will be required skilled labours and as an example of the future professionals available from the University Eloy Alfaro of Manabí, this new terminal will generate jobs for current and future Ecuadorian and Foreigner specialists.
Nevertheless, as different from the Panamanian, Chilean or Brazilian Universities that have a wide range of specific academic programs related to port, logistic, supply chain and maritime studies, Ecuador still lacks professionals who have graduated from these academic fields. Only the Escuela Superior Politécnica del Litoral (the most important university in Ecuador) offers some studies in logistic areas \textit{(Programas Académicos, 2013)} \textit{(Academic Programs)}. Having said this, it is predicted that if the Multipurpose Deep-Water Terminal in the Port of Manta, the Ecuadorian National Plan of Logistic Infrastructure and the future Multimodal Corridor Manta – Manaus are developed, this will be an opportunity to study on degrees in programs associated with these logistic projects.

\section*{5.2. Summary}

Competition will be an important factor that will result from the construction of the Multipurpose Deep-Water Terminal in the Port of Manta. Therefore, customers will have a new option to evaluate when they decide to export or import products.

Additionally, the performance of the new terminal will depend on the strategies and rules implemented. One of these strategies is to create a conglomerate of Logistic Services in Manta that will allow increasing the production and transportation system in Ecuador. In addition, the Multipurpose Deep-Water Terminal will be a transhipment hub that distributes different goods in the Ecuadorian and other South American markets.

Finally, other potential outcomes achieved from this project will be the restructuration of port facilities and the boosting operation of the Multimodal Corridor Manta – Manaus, resulting in employment generation.
CHAPTER 6: Conclusions & Recommendations

In relation to port competition, the winner will be the one that has adequate infrastructure, maritime and road communications, additional logistic services, a quality service, affordable prices and port operations efficiency. Therefore, the Multipurpose Deep-Water Terminal in the Port of Manta will be a new competitor on the American Continent Pacific Coast for the reception of larger vessels and handling of more cargo. This project is a national objective that will influence improvements in the Ecuadorian International Trade and Logistic system. Furthermore, in the long-term the purpose of this new terminal is to be a link in order to integrate commercially South America and a new transshipment hub in the region.

The PESTLE Analysis outlined that the Port of Manta is a ‘National Priority’ in order to develop the logistic system in Ecuador. Additionally, the constitution of the National Plan of Logistic Infrastructure of Ecuador and the Multimodal Corridor Manta – Manaus are two important factors that contribute to the feasibility of this project. The Port of Manta will gain a new infrastructure, investments and customers that can boost the economic situation of the city and the country.

Likewise, the current policy of market diversification, a stable political, social and economic situation, investment in new logistic projects and subscription to commercial agreements, suggest that the country is trying to increase its competitiveness, efficiency and provide a new option in order to serve the international market. This is reflected in the Organic Code of Production, Commerce and Investment that sets the rules in order to stimulate the strategic insertion of Ecuador into worldwide economic activities.

On the other hand, the strategic geographical location of the Port of Manta is one of its main advantages that allows the construction of the new terminal and creation of a conglomerate of logistic services such as the Zonas Especiales de Desarrollo Economico (ZEDE) (Special Economic Development Zones), Pacific Petrochemical Refinery, Agribusiness Centre of Portoviejo and others. Therefore, it is expected that Manta will become the logistic-distribution centre of Ecuador.

Nevertheless, from the SWOT Analysis was indicated that Ecuador still has to change important aspects in order to maintain the sustainability of the project. The outdated General Law of Ecuadorian Ports 1976 is old and does not guarantee a safe and modern juridical environment for the construction, development and operation of the Multipurpose Deep-Water Terminal in the Port of Manta. Additionally, challenges in economic terms, the failure of the first concession of the port, elevated port prices, regionalism fights between Manta and Guayaquil and lack of cargo demand are some of the aspects that could affect seriously the construction of the new terminal. This means, that the
Ecuadorian Government needs to restructure and eliminate barriers in order to develop this project in a cohesive, transparent and synergic environment.

Likewise, since 2007 Ecuador has been a stable country in the region but it has the potential for future political, economic and social instability. The reason for this is because Ecuador still does not have a solid political system. It is based on a series of historic and social conditions such as populism, religion, racial and cultural contrasts, political manipulation of the public services and State institutions, which are some of the factors likely to stop the construction of the Multipurpose Deep-Water Terminal in the Port of Manta if the next Presidential period in 2017 does not support and incentivise the creation of this project. Likewise, competition and logistic improvements in other ports such as Guayaquil (Ecuador), Callao (Peru), Buenaventura (Colombia), Balboa (Panama) and others can affect the feasibility of the Port of Manta if it is not able to manage a strategic port-marketing plan in order to increase its operations and attract more customers. Furthermore, regional or worldwide economic crisis can affect the correct performance of the terminal in Manta.

Despite the fact that the number of strengths and opportunities in the SWOT Analysis outweighs the weaknesses and threats, the latter can have an important impact on the profitability of the Multipurpose Deep-Water Terminal in the Port of Manta. Therefore, the Port of Manta needs to improve its advantages in order to have a competitive position which will allow it to increase its market share.

On the other hand, international trade between Ecuador and Eastern Asian countries (China, Japan and South Korea) reflects that the Balance of Trade is favourable for the latter. Having said this, the Ecuadorian economy is still small and is not able to produce manufactured goods in order to sell in the Asian market. Ecuador supplies raw materials and has the potential to increase the exportations of some products. However, some factors such as commercial agreements, competition, and the economic growth of other Latin American countries are just some of the aspects that affect the competitiveness of Ecuadorian products. As indicated previously, Ecuadorian commercial policy is not a complete open market as in Colombia, Peru or Panama.

In the case of Brazil, this is an emerging economy and currently is an important international market. The Balance of Trade of this country with Asia is favourable during some periods and it has the potential to increase its exportation of raw materials and in the future manufactured goods. Therefore, Brazil will benefit from the construction of the Multipurpose Deep-Water Terminal in the Port of Manta, because it is the first component of the Multimodal Corridor Manta – Manaus, which aims to create a shorter transportation route through the Amazon and rapidly distribute and mobilize goods to the Central – North Brazilian States. Nowadays, most Brazilian trade between China, Japan and South
Korea goes through the Panama Canal representing more time for the cargo that arrived at the biggest Brazilian ports such as Santos or Itajai located in the south part of the country.

On the other hand, the outcomes achieved from the Multipurpose Deep-Water Terminal in the Port of Manta reflect that this area is able to attract more business and generate income in the Ecuadorian economy. Additionally, it is expected that this terminal will improve the efficiency, agility and competitiveness of the National Port System and generate employment in the country.

However, the first step that Ecuador should take in order to increase the feasibility of this project is to actualize its port laws as if there is no juridical safety and clear rules for the development of the new terminal, the profitability of the Multipurpose Deep-Water Terminal in the Port of Manta may decline and therefore, will not be attractive to customers or investors. Likewise, the subscription to a commercial agreement with strategic commercial partners, creation of added-value manufacture and the production of quality products will help Ecuador to increase its exportation and therefore, the operational activities of the Port of Manta.

Additionally, it is recommended and helpful if the Ecuadorian Government and Manta’s Port Authority develop a strategic port marketing and management plan in order to detect which are the parts of the plan that can be improved. Some of the strategies that can be implemented are:

- Negotiate accessible port prices for the shipping lines.
- Construct installations in accordance with new developments in the maritime industry.
- Create a product / market strategy in order to understand customer’s needs.
- Evaluate the efficiency of the port.
- Develop and exploit the resources and advantages of the port (geographical location, new logistic services, and local industries).
- Use the benchmarking tool in order to assess the situation of the port in regards to competition.
- Subscribe to conventions and agreements with other ports or logistic services, where there can be exchanged information, experiences and port operations.
- Create a training program in order to prepare future port professionals that can work in the operations and management of the terminal.

The success of this plan will depend on how the Ecuadorian Government and Manta’s Port Authority is able to handle its financial resources, negotiate in good terms the concession of the terminal and update port laws and regulations. If the changes are done correctly and in accordance with the requirements and improvements in the worldwide market, this project is feasible and will constitute one of the most important transhipment hubs in the American continent and Pacific Ocean region.
6.1. Suggestions for Further Research

Due to the outdated situation of Ecuador’s port laws and rules, it will be interesting to undertake further research in this field. The focus should be on the improvements and changes required in order to comply with the requirements of the juridical international maritime industry.

Moreover, research into the construction of the National Plan of Logistic Infrastructure of Ecuador can help to define the feasibility of this project. This study can reflect the implications, benefits and disadvantages that the construction of the Zonas Especiales de Desarrollo Economico (ZEDE) (Special Economic Development Zones), Pacific Petrochemical Refinery, Portoviejos’s Agribusiness Centres and other components of the Multimodal Corridor Manta – Manaus can have on the Ecuadorian economy.

Finally, another topic to be analysed should be the Multimodal Corridor Manta – Manaus, which is considered a new distribution network that will connect the Pacific and Atlantic Ocean through the Amazon River. In this case, environmental, social, economic, technological aspects and support from the Ecuadorian, Peruvian and Brazilian Governments will help to define if this new transportation route is profitable and can be a strong competitor to the Panama Canal.
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Appendices

Figure 20: Geographic Location of Ecuador, Brazil, China, Japan and South Korea
Source: (Geographic Location of Ecuador, Brazil, China, Japan and South Korea, 2013)
Figure 21: Characteristics of the Multipurpose Deep-Water Terminal in the Port of Manta
Source: (Process of Delegation under the Grant Method for the Port of Manta, 2012)

Figure 22: Route of the Multimodal Corridor Manta – Manaus
Source: (Easterling, 2012)