



**Analysis of the feasibility to build an interoceanic canal in
Colombia connecting the Atlantic Ocean with the Pacific
Ocean, in search of the revitalization of international trade.**

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Esumer University Institute

School of International Studies

Medellin, Colombia

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To God

For giving us the wisdom to get to this point and providing us with health and ability to successfully complete our objectives.

To our families

For their constant support with words of encouragement that motivated us to carry on.

To our teachers

For guiding our professional learning process. And above all, for helping us to be better people.

To our friends

For the moments that we shared which are accompanied by smiles, learning, anxiety, and sadness; but certainly they will be part of our good memories.

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Abstract

The rapid growth of international maritime trade and the needs that arise from this, make Colombia a geographically strategic position to take advantage of their access to the Atlantic and Pacific Oceans. Consequently, the feasibility of building an interoceanic canal in Colombia has not gone unnoticed by different actors that seek to boost international trade.

The identification of studies defined since 1960, the analysis of the behavior of the maritime industry, as well as the analysis of Colombia's competitiveness and its logistical shortcomings make this investigation the opportunity to return to a subject that is rarely discussed in Colombia.

Although different point of view have generated an obstacle to carry out the construction of this mega project, the results indicate that the economic impacts arising as a result of building an interoceanic canal in Colombia would represent - for the country- an opportunity to be ahead of the demands of international trade

Keywords: Studies, logistics competitiveness, interoceanic canal, maritime transport, international trade.

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List of symbols and abbreviations

SPRC	Sociedad Portuaria Regional de Cartagena (Cartagena Regional Port Society)
CONTECAR	Terminal de Contenedores de Cartagena (Cartagena Container Terminal)
SPRBUN	Sociedad Portuaria Regional de Buenaventura (Buenaventura Regional Port Society)
TCBUEN	Terminal de Contenedores de Buenaventura (Buenaventura Container Terminal)
SPRB	Sociedad Portuaria Regional de Barranquilla (Barranquilla Regional Port Society)
SPSM	Sociedad Portuaria Regional de Santa Marta (Santa Marta Regional Port Society)
TEU	Twenty-foot Equivalent Unit
DNP	Departamento Nacional de Planeación (National Planning Department)
IDP	International Physical Distribution
CPC	Consejo Privado de Competitividad (Private Council on Competitiveness)
LPI	Índice del Desempeño Logístico (Logistics Performance Index)
DANE	Departamento Administrativo Nacional de Estadística (National Administrative Department of Statistics)

Introduction

The proposal to build an interoceanic canal in Colombia has helped to address different feasibility studies that have been implemented as an initiative of governments and other stakeholders, for whom the execution of the work is the step towards economic and commercial development of an economy which for decades has been based on the production and export of primary goods without added value. This situation has put a disadvantage on the scientific and technological development needed to transform other products and generate competitiveness for them in other international markets.

Therefore, the present paper intends to illustrate those studies, reports, laws, and other publications defined since 1960. In addition, other variables such as Colombian Physical Distribution (IDP) and logistics competitiveness are reviewed since these have evolved and have become a determining factor of development and growth.

Notwithstanding the foregoing, the growth of international maritime trade and Colombia's geographical position, give to the shipping industry the possibility to leverage the considerable benefits that are emerging and which have been positioned as major differentiating components in regional and global competitiveness. As part of all these trends, Colombia has the opportunity to look for solutions that reduce the gap generated by countries in the region which have known how to take advantage of the opportunities and improve business processes by investing in infrastructure and government support to industrial strengthening.

Another factors discussed, equally important, are related to those impacts that emerge with the project implementation and construction of the canal. Such as

issues ranging from the construction's social impact on the country and the Choco region, since this is the strategic territory to link the Atlantic and Pacific oceans. Additionally, economic considerations originated on high maritime and commercial cargo flow are reviewed.

As it has been studied and it has been reflected in the various existing studies, the implementation of this mega engineering project should consider major investments for its development. This is the reason that it has been given the task to investigate and gather relevant information that will ultimately allow acquire a position of approval or rejection of this initiative as a likely solution to economic stagnation in the country.

1. Project Layout

1.1 Background

1.1.1 State of the Art

The construction of an interoceanic canal in Colombia would be the starting point for the promotion of economic and social development for the country and for other countries around the world. The starting point for a global development from the use of the waters of the Atlantic and Pacific Oceans will contribute to regional and national economy.

However, a construction at this kind of scale is both a challenge for Colombian engineering, biologists and other professionals who will participate in the planning, structuring, adaptation and exploitation of the area to carry out the construction of this mega project.

In the present state of the art, we review some studies and reports that have been presented, regarding the construction of an interoceanic canal in Colombia that would connect the Atlantic Ocean with the Pacific Ocean:

1.1.1.1 Route 25 Atrato- Truandó

In the first instance, there's a study named "*Route 25 Atrato-Truandó*" that emerges of the analysis and investigation of a North American Commission to find in America a route to connect both oceans in order to have an optional crossing point over to the current Panama Canal.

The construction of the interoceanic canal Atrato - Truandó responds to the global need to create a direct level canal between the two oceans (Atlantic and Pacific)

.Colombia offers the possibility to be on-level, since it is the only place in America where you can connect the two oceans without the need of locks. The project was named Route 25 after a study carried out in 1970.

1.1.1.2 The Atrato-Truandó interoceanic level canal and Atrato's hydroelectric can change the fate of the country

Secondly, it's described a report by the Geographical Society of Colombia, which is named "*The Atrato-Truandó interoceanic level canal and Atrato's hydroelectric can change the fate of the country*" (1985). This report roughly proposes the technical characteristics and considerations to be taken into account for the construction of the so called Level Canal [1] that doesn't require locks [2] for crossing of large capacity vessels:

The Central American isthmus has led to conduct feasibility studies, by analyzing different routes (30 routes in total) to connect the Atlantic Ocean with the Pacific Ocean. Among these routes it is called "Route 25 Atrato-Truandó" in Colombia, which was selected by the North American Commission, as one of four routes with greater feasibility to carry out the construction.

This route represents for Colombia taking advantage of the geographical position of the department of Choco, through the waters of the Atrato and Truandó rivers, and the Baudó Range. It also provides a diagonal alternative route that would 3 outputs to the Atlantic Ocean and 2 outputs to the Pacific Ocean:

Atlantic Ocean:

- *Colombia Bay*
- *Candelaria Bay*
- *Gloria Bay*

Pacific Ocean:

- *Humboldt Bay*
- *Octavia or Aguacate Bay*

Therefore, Colombia is considered one of the best places in America for the construction of a sea level canal (without the implementation of locks) to allow large ships crossing with high load capacity.

The report "*The Atrato-Truandó interoceanic level canal and Atrato's hydroelectric can change the fate of the country*", presented by the Geographical Society of Colombia also outlines the technical considerations for the construction of the canal and the characteristics of this so called Level Canal .Among the considerations referred by this report, it mentions the geographical benefits of Choco department and the resources that there exist. Thus, a hydropower could supply the energy needed for the development of various sectors and generate the resources required for the canal's grant and operation.

1.1.1.3 Interoceanic canal in Colombia: an alternate route to Panama Canal.

An article published in 2014 by elcolombiano.com emphasizes on the interoceanic canal proposal that came up as an idea engineer Roberto Maldonado. In this news the canal is considered as an additional option to the Panama Canal, which will allow the crossing of larger capacity ships that cannot pass through the canal of the neighboring country.

According to Engineer Roberto Maldonado, who proposes the interoceanic crossing, "the Suez canal allows the passage of ships with the greatest movement, with a capacity of around 200,000 tons. The proposed canal allows the biggest ships existing, without the use of tugs. "

The study required a team of nine professionals from different disciplines, which studied the field, took samples and performed calculations.

Construction would be carried out by the Fast Track system, which consists of develop studies until the objectives and systems are solved by 35% and

proceed with the construction of what is possible continuing with studies and designs while building what it's already studied. The system is used in USA by 40% of the major works. (Velásquez, 2014)

1.2 Problem description

In the history of mankind, sea and interoceanic canals have allowed to build the foundations of civilizations which for years have populated the planet, promoting cultural, religious, ethnic, political and economic exchanges necessary for survival and obtaining resources.

The dynamics of the world economy, the growing demand of supplies for production industries and the need to supply resources have made maritime transport the main mode for international trade, which according to recent data represents 80% of world trade. Thus this mode of transport has become a necessity, since it allows to ship large quantities of goods at a lower cost compared to other modes of transport.

Under this accelerated conception of capitalist economies, it can be seen how artificially interoceanic canals have been created to boost international trade. As example, it is mentioned two of the most important canals in the world, Suez Canal and Panama Canal.

The Suez Canal was created between 1859 and 1869, with the aim of opening a new sea route between Europe and the new Asian trading partners (Southwest Asia). Moreover, the Panama Canal was opened in 1914 and allowed to eliminate the route to cross the Strait of Magellan (southern South America) and thus not surround the entire South American continent to get from one coast of America to the other. Thus these canals can reduce distances and lower costs (freight [3]) for the transport of goods).

The global economic crisis of 2008 was a tough time for international shipping since it was characterized by oversupply, drop of ocean freight rates, high fuel prices and stagnation in the port expansion projects (Legiscomex, 2014).

However, there are good prospects for growth in this sector, where the transported goods will go from 9,000 million tons (2013) to 24,000 million tons in 2030, according to study by Lloyd's Register, Qnitiq and Strathclyde University.

It also argues that "it is expected that eight of the 10 largest cities in the world be ports, which will make the maritime industry to be unrecognizable due to the growth of emerging countries, the emergence of new consumer classes and increasing demand resource, showing its degree of urbanization and industrialization "(Legiscomex, 2014).

Taking as a basis the good prospects in the maritime sector, the increasing need to develop ships with greater capacity in TEUs [4] and larger artificial canals that allow the crossing of these ships. It is considered important that Colombia take advantage of these opportunities, in this case, the time to generate a boom in the economy by raising the feasibility of connecting the Atlantic and Pacific Ocean through a canal, which would have impacts on the economy such as increasing foreign trade activities and responsiveness to the needs of transport of the East Coast of the United States, Asia and Far East. Currently, those account for a greater number of net tons transported via the Panama Canal, without of course, belittle the other product flows from the rest of the world destined for Latin America.

1.3 Justification

The feasibility analysis on the construction of an interoceanic canal in Colombia not only allows to review how to boost and diversify the country's economy, but also identify the needs of international maritime trade and take advantage of this business opportunity through new commercial partners.

To this degree project, some variables such as the behavior of international trade and Colombian logistics competitiveness must be analyzed, because these help to give a clearer focus on whether it is feasible or not to build an interoceanic canal in Colombia.

Theoretical justification

For years the possibility of building an interoceanic canal in Colombia has been analyzed. This is what it is looked with the present work: to resume those studies that began about the 60s and bring them to current trends in international maritime trade so that this approach serves as an information tool for present and future analysis feasibility of the construction of this canal.

Social justification

The construction of an interoceanic canal is a high-impact project involving various stakeholders and the Colombian society in general. This is how it is also intended to determine the viability in the construction of an interoceanic canal in Colombia, highlight the different effects that it may lead to the development of this project in economic, security and strengthening of the business fabric of the country. Those issues will directly impact and change radically the life quality of people living in the vicinity of the river Atrato-Truandó, a place that for years has been studied as a possible scenario for the construction of the canal, seeing favored because the topography of the terrain make it optimal for their development and connection, not only geographically but commercially the Atlantic and Pacific oceans. The viability on the canal construction is not only a project that requires a large investment of resources, but also involves social and environmental aspects to be assessed with utmost care because of the potential impact posed to the country and society.

Personal justification

The realization of this project is justified having as foundation knowledge of the weaknesses in the country, related to the very poor logistics performance in transportation of goods in domestic and international routes, low investment in road infrastructure and equipment, trade deficit, rooted culture of corruption and smuggling, as well as the loss of operating profit product development that does not guarantee the effective implementation of a logistics chain that adds value to the marketing of goods and services. For this reason we intend to address the different

areas from the problem, to determine the feasibility of building an interoceanic canal not only able to connect geographically Colombia with the rest of the world; but also to generate a privileged position in trade competitiveness against other countries.

1.4 Objectives

1.4.1 *General objective*

To analyze the feasibility of building an interoceanic canal in Colombia to determine the advantages and disadvantages that it represents for the country in terms of improvement in the International Physical Distribution, global competitiveness and growth in international trade.

1.4.2 *Specific objectives*

- To review the various existing studies from the 60s to date, in relation to the feasibility of building an interoceanic canal in Colombia.
- To identify the characteristics of Colombian international physical distribution, the position regarding its logistics competitiveness and its behavior regarding international maritime trade.
- To compare the cost-effectiveness of the construction of the interoceanic canal, in relation to the prospects of international trade.

1.5 Methodological framework

1.5.1 *Method*

The method used to address this project is based on the research of information taken from secondary sources that allow analysis from a general framework, starting with the research studies that have been published to date regarding the construction of the interoceanic canal in Colombia: The logistics of the country, the behavior of maritime trade and competitiveness in these environments. Thus finally

it reaches more specific conjectures to determine advantages and disadvantages of the construction of this mega project and how it helps boost international trade.

1.5.2 Methodology

Secondary data collection: Internet is used as the main tool which allows a topic research, by reading and analyzing reports, news, university research papers, laws, studies, among others. Thus, you can determine who has worked on the issue of building an interoceanic canal and how much it has been said about it, taking into account economic, social and environmental aspects. Also, it is analyzed existing data to create an overview of the current needs of world trade and thus have criteria evaluation regarding the feasibility of carrying out the construction.

Primary data collection: It is possible to find laws and studies that are not on internet, so we visited libraries and searched books focused on the subject to obtain complete information on feasibility studies for the interoceanic canal that were written on the 1960s.

1.6 Scopes

This work is done to identify the feasibility of carrying out the construction of an interoceanic canal in Colombia, through research studies starting in the 1960s, logistics analysis and review of Colombian competitiveness statistical data on maritime trade behavior international to date, 2015.

Similarly, this study is based on determining advantages and disadvantages involved in the construction, based on various viewpoints that are based on economic, social, cultural and environmental variables.

2. Project execution

Chapter I

In this chapter are described some studies, reports and laws that seek to frame the feasibility of building a canal in Colombia. So much so that the purpose of this chapter is to develop the specific objective number one of this project, which is aimed at presenting information that to date has been mentioned in general terms by the various actors who have tried to carry out this megaproject.

Feasibility studies for an interoceanic canal:

In Colombia various actors have tried to connect the Atlantic Ocean with the Pacific Ocean through an interoceanic canal that would maximize the geographical position of the country and try to communicate to South America with the rest of the world. The construction of an interoceanic canal has been raised and discussed at various stages since the mid-60s, but until now it has not been a powerful symbol for its construction

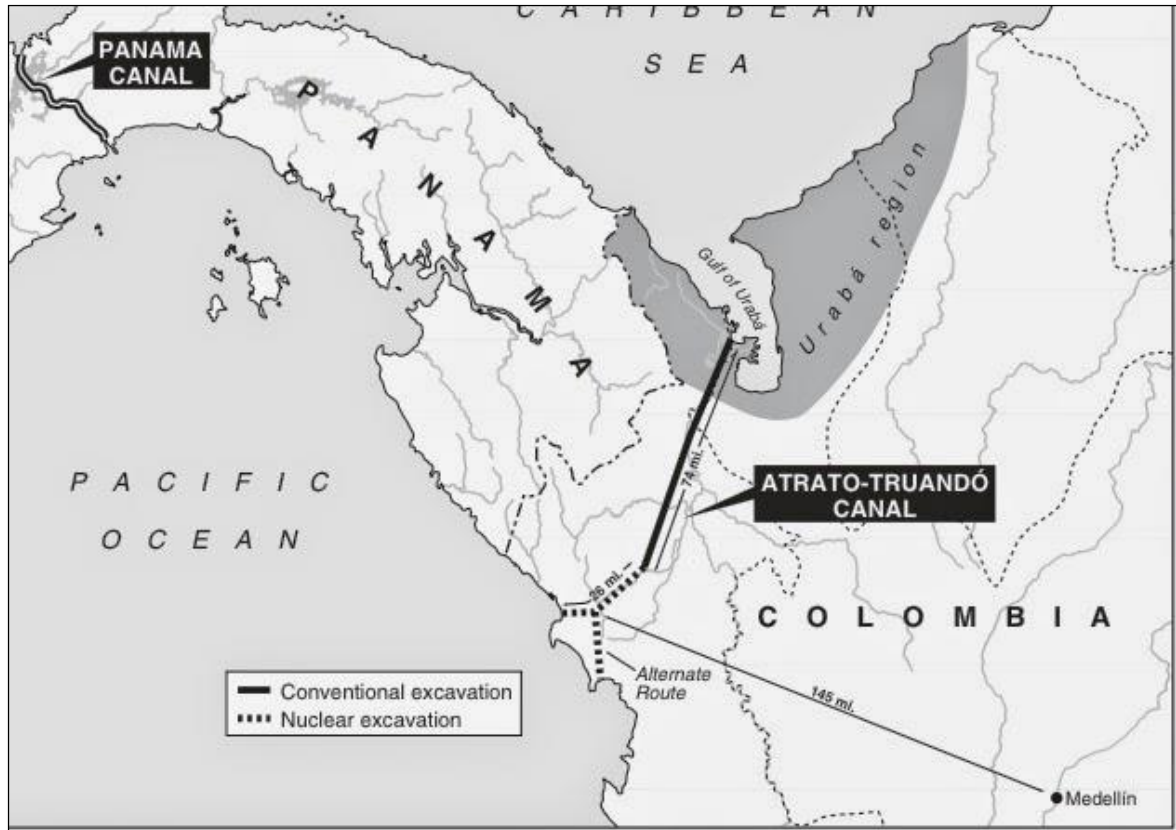
Thus there have been a number of studies, reports, publications and laws that are described in more detail below:

Routa #25 Atrato- Truandó:

In 1970 a commission of the United States of America to the Interoceanic Canal, studied thirty possible routes in America to join the Atlantic and Pacific oceans. Within the feasibility study it was determined that the only way to build a canal where locks are not required was in Colombia.

"Route # 25 Atrato-Truandó" Route 25, as it will be referred to throughout this project, is located in the northwestern part of Colombia, in the Choco department. In Figure 1 is shown the diagonal line with slope of 30 degrees to the meridians, where the construction of the canal is planned

Figure 1: Ruta #25 Atrato-Truandó



Source: Blog Nuevo Choco.

This diagonal will have 3 outputs route by the Atlantic Ocean and 2 outputs for the Pacific Ocean:

Atlantic Ocean:

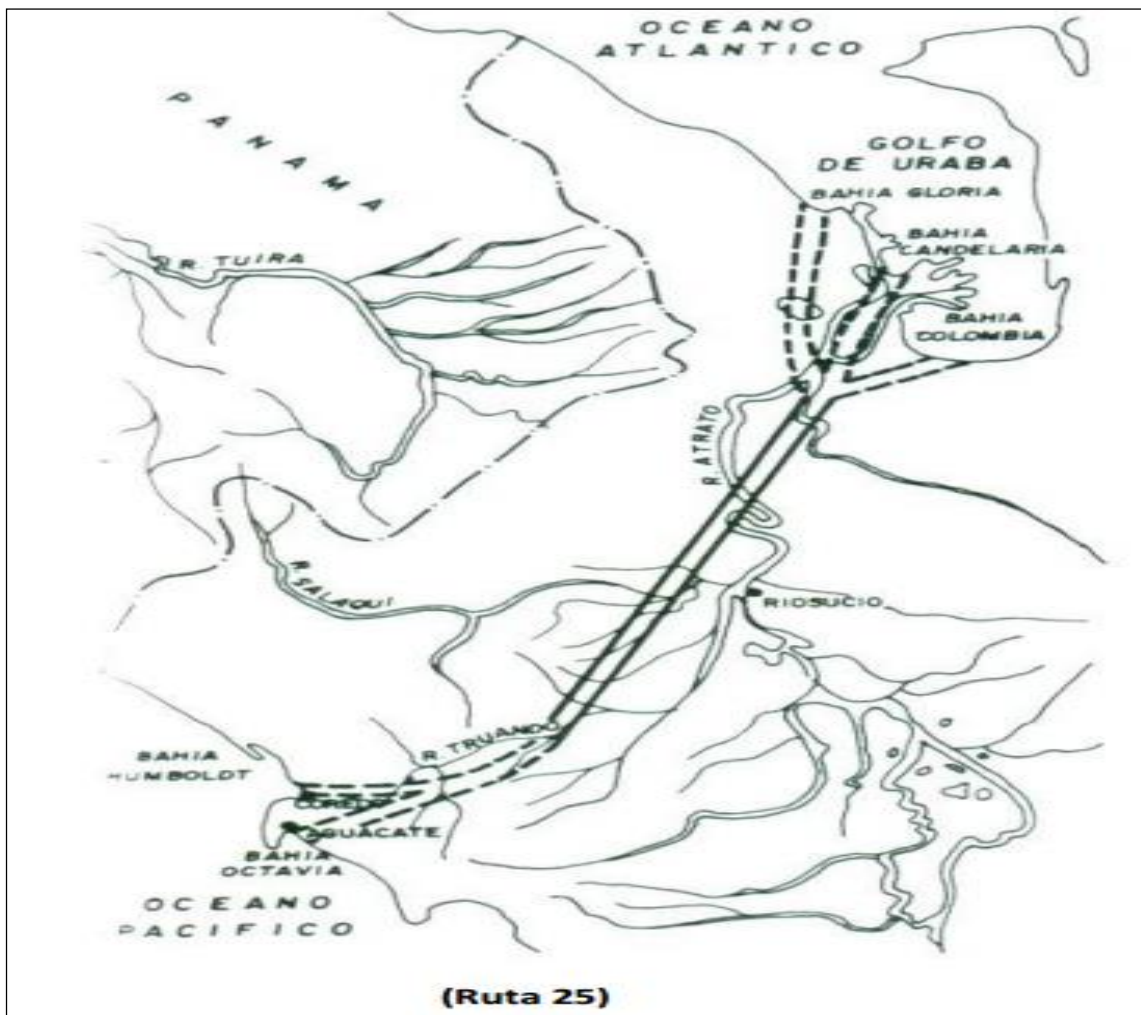
- Colombia Bay
- Candelaria Bay
- Gloria Bay

Pacific Ocean:

- Humboldt Bay
- Octavia or Aguacate Bay

In Figure 2 is shown the outputs envisaged in the study of Route 25 from the Gulf of Uraba in the Atlantic Ocean, to some of the bays in the Pacific Ocean.

Figure 2. Alternative access routes in the Atlantic and Pacific Oceans.



Source: (Morales, 1996)

In the same year (1970) the ground digging using nuclear explosion was ordered since, otherwise, it would be very expensive. This proposal was flatly denied by the

Commission and by the Colombian government, due to the environmental impacts that would arise following the nuclear explosion.

The feasibility study of Route 25 leads to a rigorous economic, environmental and social analysis, since achieving this interoceanic canal in Colombia would be the starting point for the promotion of economic and social development for the country and for other states worldwide. The starting point for a global development from the use of the waters of the Atlantic and Pacific Oceans will contribute to regional and national economy.

However, a construction at this kind of scale is both a challenge for Colombian engineering, biologists and other professionals who will participate in the planning, structuring, adaptation and exploitation of the area to carry out the construction of this mega project. The construction of the interoceanic canal Atrato - Truandó responds to the global need to create a direct level canal between the two oceans (Atlantic and Pacific). Colombia offers the possibility to be on-level, since it is the only place in America where you can connect the two oceans without the need of locks.

Act 53 of 1984, whereby the construction of canal Atrato-Truandó is approved.

In 1984, at the initiative of Mr. Daniel Palace Martinez, then Senator of the Republic of Colombia, it was implemented the Act 53 of 28th December, which approved construction of the interoceanic canal Atrato Truandó under the administration of President Belisario Betancur. This Act was valid for four years to accelerate the studies and execution of the work; it expired because it was not carried out the beginning of the construction.

The Act was published on 15th January 1985 by the Official Gazette No. 36,831 of the Chamber of Representatives of Colombia, namely:

ACT 53 OF 1984

(Diciembre 28)

Whereby it's ordered the construction of the interoceanic Atrato-Truandó canal and coated the President of the Republic of specific extraordinary powers

**THE CONGRESS OF COLOMBIA,
DECREES:**

ARTICLE 1st. To order the construction of the interoceanic Atrato-Truandó canal by Choco Department.

ARTICLE 2ndo. To grant to the President of the Republic specific extraordinary powers for a period of four years from the enactment of this Act, to take measures that may be required, for the sole purpose of laying the foundations for the construction of the interoceanic Atrato-Truandó canal by Choco Department .

ARTICLE 3rd. The President can create a mixed company or any other national entity whose corporate purpose is that of complying with the requirements of this Act.

ARTICLE 4th. They may be members of the organization created:

- a) The nation, departments, municipalities;*
- b) Persons of public right of every order and mixed companies;*
- c) Official or private lenders.*

PARAGRAPH. In no case may be partners or shareholders in the company's foreign individuals or corporations.

ARTICLE 5th. In development of the extraordinary powers granted by this Act, the President of the Republic may order the recruitment of internal and external loans, open credits order or make the necessary transfers and appropriations in the respective budgets of the next lifetimes.

ARTICLE 6th. Also the national government is empowered to grant concessions if deemed appropriate, to private entities it deems sufficiently trained, from the technical and economical point of view, for the contraction of the canal.

ARTICLE 7th. This law applies from its approval.

Source: (Chamber of Representatives of Colombia, 1984)

The Geographical Society of Colombia in 1985, with the coordination of Civil Engineer Colonel Rafael Convers Pinzon met the ***First Forum on the Atrato-Truandó canal*** that took place on 08 and August 9, 1985 in Bogota. The forum discussed the importance and the vital need for navigation that would occur in the future due to the high growth of international trade. After its completion, attendees were allowed to make the following PUBLIC STATEMENT: "The government of Colombia should initiate the development of the design and construction of the interoceanic Atrato-Truandó level canal, in accordance with Act No. 53 1984 "(M., 1994-1995).

Dry canal: Interoceanic railway in Colombia

The need to connect the two oceans in Colombia had led to the analysis of different ways to make true this "old dream". The so-called dry canal ', is a new proposal that was raised from a feasibility study published by the National University of Colombia in 2011. In this study is taken into account the possibility of building an interoceanic rail corridor between Tarena, on the western coast of the Gulf of Uraba, and Tribugá township, municipality of Nuquí in Chocó (Spectator, 2011) arises.

According to the study published by the National University, the railway would have a total of 385 kilometers (Spectator, 2011) and this would be the promotion of the Colombian economy, by taking advantage of the geographical position facing the country.

The six experts who participated in this study, from different universities, including the National University and by the Observatory of Logistics Mobility and Planning, Research Center for Development (CID) (Colombia, 2011), have considered various factors such and the impact it can have on environmental, economic, social, cultural fields, among others.

This is how President Juan Manuel Santos, in the same year (2011), presents the proposal and its interest in carrying out this mega project through an announcement to the financial newspaper, after a meeting with company officials from China Railway, who are considered one of the greatest creators of railways worldwide.

While it is clear that the interoceanic canal in Colombia would be an alternative route to the Panama Canal and would promote economic development of the country, taking advantage of the increase in international trade, interdependence of States and the need to supply the logistical needs that arise following the International Sale of Goods. However, in the present international trade the more movements a commodity has, the greater its logistics costs will be. Therefore, the approach of an interoceanic canal through railway will increase container movements, both in port of loading and port of discharge. Given this, it is important to consider that while transit times are relevant; the value of shipments for international freight, represents the major axis for making business decisions to undertake the freight.

Chapter II

This chapter is developed through research of various variables that identifies the features of the International Physical Distribution of Colombia; which in turn allows the analysis of logistics competitiveness and its position regarding in international maritime trade. Thus, this chapter seeks to develop the specific objective number two of this project.

Colombian International Physical Distribution

Seaports play a key role in business operations in Colombia.

Colombia has nine port areas, seven located on the Caribbean coast: La Guajira, Santa Marta, Ciénaga, Barranquilla, Cartagena, Morrosquillo Gulf of Urabá and San Andrés; and two in the Pacific Coast: Buenaventura and Tumaco. (Superintendence of Industry and Commerce)

The main seaports of the Atlantic Ocean are located in Cartagena, Barranquilla and Santa Marta; which they are made up of private terminals such as Sociedad Portuaria Regional de Cartagena (SPRC), Terminal de Contenedores de Cartagena (CONTECAR), Sociedad Portuaria Regional de Barranquilla (SPRB), Sociedad Portuaria de Santa Marta (SPSM), among others.

On the other hand, the Pacific coast has the port of Buenaventura, which is the main port for Colombia due to the amount of cargo that moves from China and other Far East countries. Their private terminals are mainly constituted by Sociedad Portuaria Regional de Buenaventura (SPRB UN) and Terminal de Contenedores de Buenaventura (TCBUEN).

Although it has been improving the quality of port services for the past 15 years, the sector requires improvements in certain areas, this in order to increase global competitiveness by lowering costs of port operations such as container loading and unloading. This because the amount of Gantry Cranes, which are used for container

loading and unloading from vessels are not enough for the demand in international trade.

Moreover, according to Departamento Nacional de Planeación (DNP), the port performance must be improved in terms of security and the rotation of the load, to meet the service reliability, the use and the potential capabilities of the facility.

Also in 2005, the company published the port expansion plan (Conpes 3342), in which a number of strategies and plans that are aimed at improving port infrastructure to arise:

"The Colombian marine terminals should promote the provision of efficient port services with a high level of quality, increase public use of installed capacity, promote competition in port services and encourage sustainable social investment," says the document. (Departamento Nacional de Planeación (DNP), 2007).

While it is clear that the International Physical Distribution (IFD) consists of all operations carried out for the transport of goods from a starting point (factory) to an endpoint (consumer). It's important to detail that the purpose of the IFD is to reduce costs, for example in transport; and minimize delivery times of goods. It is in this way that different actors [5] involved in the logistics chain are constantly looking for mechanisms that facilitate international trade of goods.

Colombia on the other hand has been improving its IFD; although you cannot disregard important factors such as port inefficiency that has been detailed in previous lines. It is also important to stress a major logistical problems of Colombia today, which can be called "Road inefficiency" and which is discussed in more detail in the course of this project.

Notwithstanding the foregoing, there are factors other than the port and logistics problems present in the IFD of Colombia that are of great relevance for analysis and interpretation:

Dependence of the economy, largely on the export of goods from the primary sector: Basing an economy on the export of goods or also known as Commodities [6] can generate stability and instability of the same.

To exemplify the volatility of the Colombian economy, based on dependence on oil exports, you can check the behavior of the TRM (Representati rate of Market).Currently (September 2015) the Colombian peso is devalued against the dollar; ie should be given more Colombian pesos for a dollar; This is because (among other things) to the fall in oil prices, since Colombia is receiving fewer dollars from the export of this fuel and therefore we are less dollars in the market (shortage) which involves paying more for the currency .

While the dollar devaluation favors exporters, the one hand, (since they will receive more Colombian pesos for dollars from the payment of its exports), consider that Colombia is not a country industrially developed, therefore, much of the raw materials for the manufacture of products for export are imported. In this context, when paying for imported raw materials it should do in currencies, which implies high costs to buy dollars by the aforementioned devaluation effect.This is how the exports, ultimately, are not as favored as discussed theoretically in the devaluation of the Colombian peso against the dollar.

Therefore, taking into account those already listed port shortcomings and problems arising from economic dependence on oil; Colombia should consider mechanisms and / or strategies that facilitate international trade, and its global competitiveness.

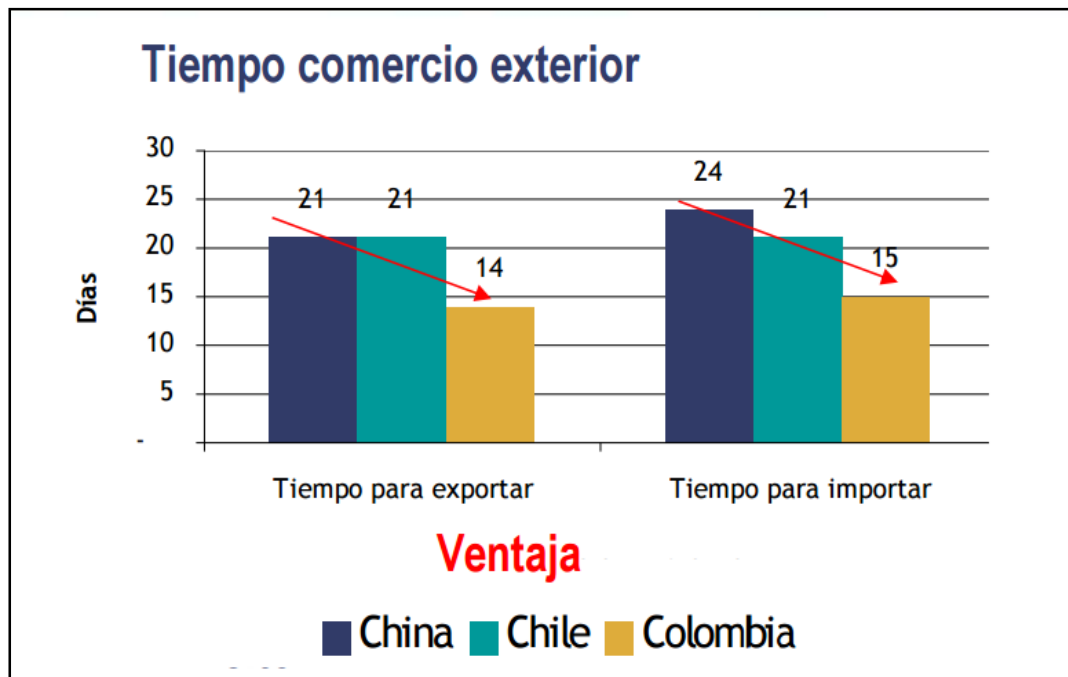
While it is clear that this project is aimed at determining the feasibility in building an interoceanic canal, it is important that the analysis of this mega construction could pose to Colombia the solution to several socio-economic problems, since this would help to diversify the economy or entering new markets. Choco department would clearly favored through employment generation and promotion of industry and other sectors in this Colombian department. These variables will be analyzed in greater depth in the development of Chapter III.

Colombia logistics competitiveness

According to statistics from the Ministry of Commerce, Industry and Tourism, until July of this year (2015) exports decreased by 40.5%, which clearly reflects the lack of competitiveness in international trade in Colombia. While several factors such as time implemented to export and import, documents required for these operations and costs incurred therein; Colombia should think of possible solutions to these obstacles notable finally mitigate the dynamism of trade and therefore the promotion of the economy.

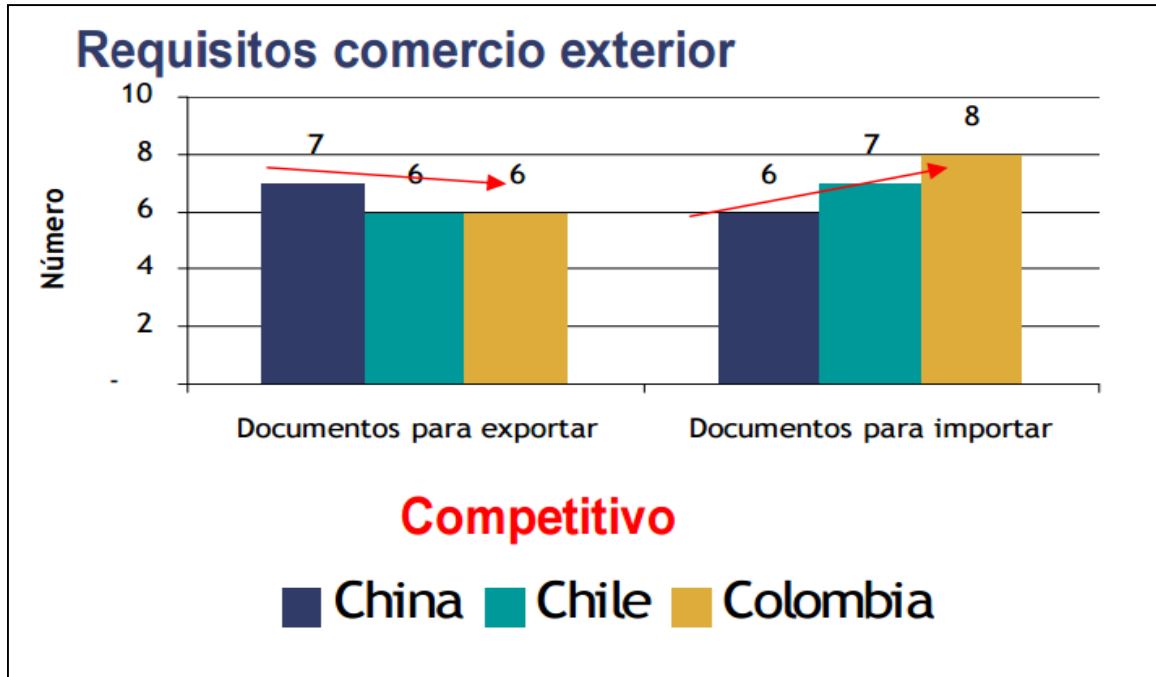
In the following figures: 3, 4 and 5, is compared the competitiveness of Colombia against countries like Chile and China in the areas mentioned above (time implemented to export and import, documents requested and internal transport costs. (Ministry of Transport, 2010)

Figure 3 Time lapse for foreign trade.



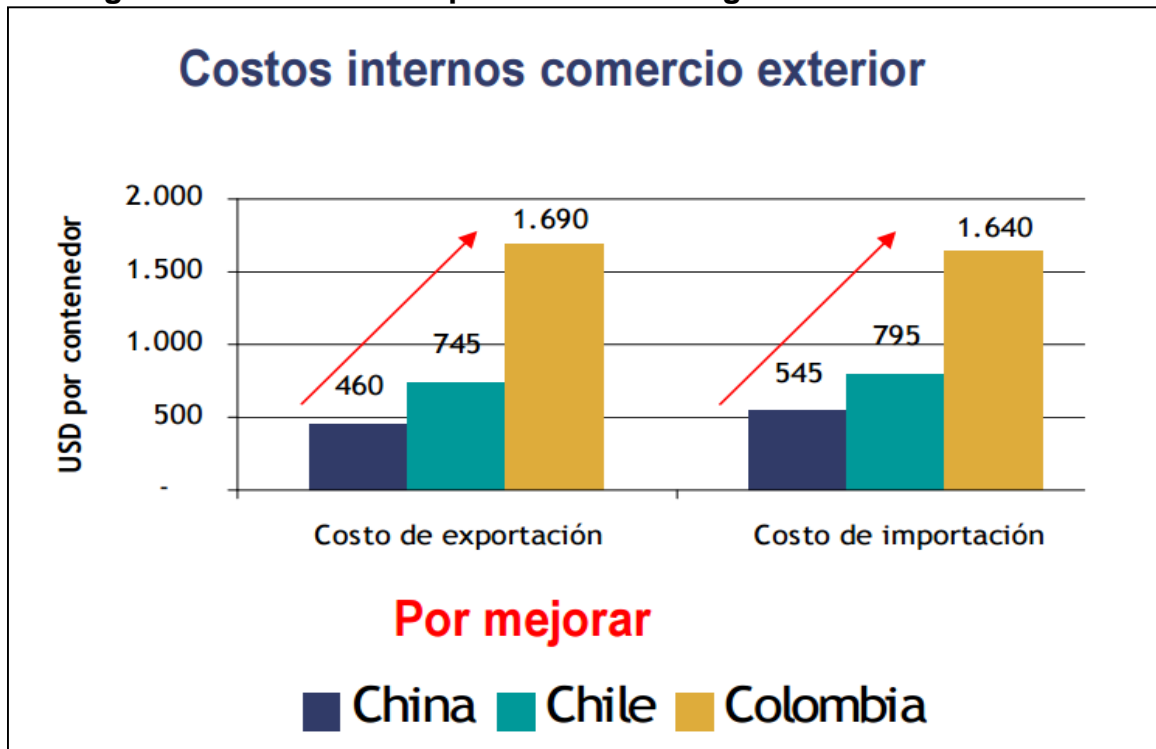
Source: (Ministry of Transport, 2010)

Figure 4 Colombian competitiveness: Foreign trade requirements



Source: (Ministry of Transport, 2010)

Figure 5 Colombian competitiveness: foreign trade domestic costs



Source: (Ministry of Transport, 2010)

Returning to Figure 3 (Time lapse for foreign trade) is evidente that Colombia has an advantage in the time required to export and import; in the first instance, this is because the time required to comply with all procedures required for these operations ranging between 14 and 16 days, meaning that times are low compared with the processes of other countries.

Moreover, the documents and / or requirements referred to in Figure 4, determine that Colombia is competitive in terms of facilities for international trade, since, according to the report Doing Business of the World Bank Group (2015), it is emphasizes that the documents required for each shipment destined for import or export by the competent authorities, are in considerable time for international trade.

However, as evidenced in Figure 5, Colombia has one big disadvantage in costs generated by the internal transport of goods. The high costs of transfers from industrialized cities, which are mostly in the center of the country, largely due to road and rail inefficiency of the country.

This last statistic (Figure 5), allows detailing one of the problems mentioned in Colombian IFD and that was called as "Road inefficiency". One of the main causes of the current road infrastructure problem of the country *is the corruption in the field of public procurement*. This variable has been for many years a socioeconomic problem that mitigates structural progress and development.

According to a report published in 2011 by Marcela Anzola who is a lawyer of Externado University of Colombia, corruption in public procurement is a problem that must be closely monitored by the state and by citizens; as the road infrastructure are essential public goods and are important for two reasons:

- *First because it is an essential public good, for use in the community and should be provided by the state. These goods are essential, because they depend on other key freedom rights such as mobility and security, to name a few. Apart from allowing access to other goods and services.*

- *And second, because its construction and maintenance involve projects running consume of large volumes of public investment and that are highly vulnerable to corruption due to their size, complexity and difficulty controlling.*

Corruption on the other hand has not been the only problem for the advancement of road infrastructure Colombia; the ways in disrepair generates 35% of cost overruns for transporter (El País, 2013) whose problem noticeably affects domestic freight, generating high costs for transporting these.

According to the news published by the newspaper El Pais, entitled "Poor condition of roads in Colombia generated 35% overruns to transporters" the poor state of road infrastructure affects freight transportation, reducing in turn, logistics competitiveness in the country (El País, 2013).

Given these assumptions and considering that Colombia has shortcomings, mainly in the development of routes within the country, it is pertinent to mention how the logistics performance in Colombia has held the position 97 of 160 countries measured in 2014 by the World Bank through the LPI Logistics Performance Index [7] (Sosa, 2014).

But what happened with Colombian logistics performance, if it had been presenting an appreciable progress from 2007 to 2012 ?, analyzes show that Colombia fell markedly in aspects such as punctuality, tracking and tracing; infrastructure, logistics quality and competence. These issues arise from the high cost of national inland transport, regulation for constant arrival and departure of goods from Colombian customs territory, the lack of transparency in customs procedures and the high number of pre-shipment inspections. (Sosa, 2014)

The lack of logistics competitiveness in Colombia, without any doubt and as mentioned above, is framed in the shortcomings of the national inland transport. It is for this reason that the national freight is even more expensive than the value of an international freight. Or at least so says the BBC daily through its publication

entitled "Why is cheaper to send a container from China to Colombia inside Colombia" which determines that poor logistics infrastructure of the country, the road, as well as railway and river are the key to understanding the remarkable Colombian problem (BBC, 2015).

Few roads are paved (11.8%, against 23.3% in Chile, for example); and that they are, over 50% are in poor condition. (BBC, 2015).

With these premises it can be determined that both the Colombian government and other logistical entities involved should seek ways to minimize costs in the supply chain for the transport of goods.

The search for international competitiveness should be an approach that cannot lose sight since this allows boost the economy through export industry; ensuring seize opportunities arising from the rise in international trade, the interdependence of states and signatures of Free Trade Agreements (FTA).

International Maritime Trade

In the field of international trade, maritime trade has experienced considerable expansion driven by the globalized economy of modern societies.

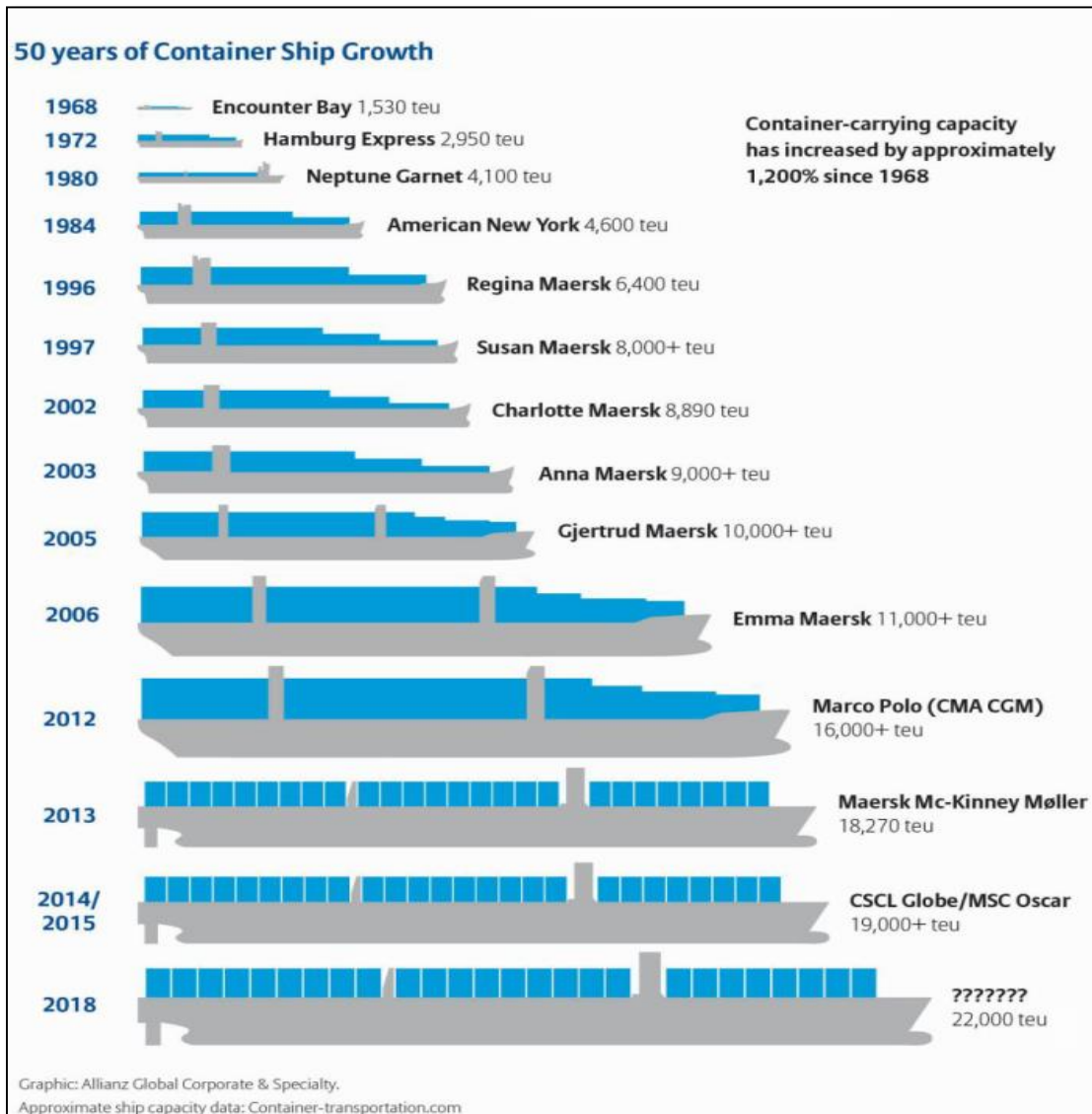
International freight transport expense has become for entrepreneurs one of the most influential factors when it comes to decide the mode of transport by which to export or import cargoes .Thus, in the modern era and because of interdependence of states, it increasingly requires systems to facilitate and minimize costs in the distribution chain of goods. Therefore, the search for mechanisms to achieve greater trade competitiveness depends largely on countries that have access to maritime transport services; since this allows to send large amount of merchandise at an economical cost.

Although maritime transport is considered as the backbone of international trade, it is pertinent to emphasize that the transit times in this mode of transport, are much

longer. Therefore, minimize transit time from one country to another has been a common problem that for years had been tried to solve by creating inter-oceanic canals and implementing direct routes by ship owners [8].

In this context, the significant increase in international maritime trade has led to the maritime industry be at the forefront of changes that result from these developments. A significant change that can be demonstrated is the impulsive construction, increasingly, of large capacity container ships. In previous years (2008-2009) one could speak of ships 8000-9000 TEUs capacity. Now it's known of ships of 19,000 TEUs capacity (See Figure 6 growth of the capacity of vessels).

Figure 6. Historical: Container Cargo Capacity



Source: (Maritime Cyprus, 2015)

It is difficult to predict when and to what capacity these ships will be built; well, as international maritime trade is growing fast and the maritime industry must keep pace with this growth.

It is perhaps the opportunity to mention that the Panama Canal can not meet the needs of international maritime trade; this because the capacity for the passage of vessels of large capacity is increasingly limited. The vessels known as Post-Panamax ships, which are so named because they can not make the crossing through this canal may only transit the Suez Canal, which means that the arrival of these ships to South American countries is almost zero.

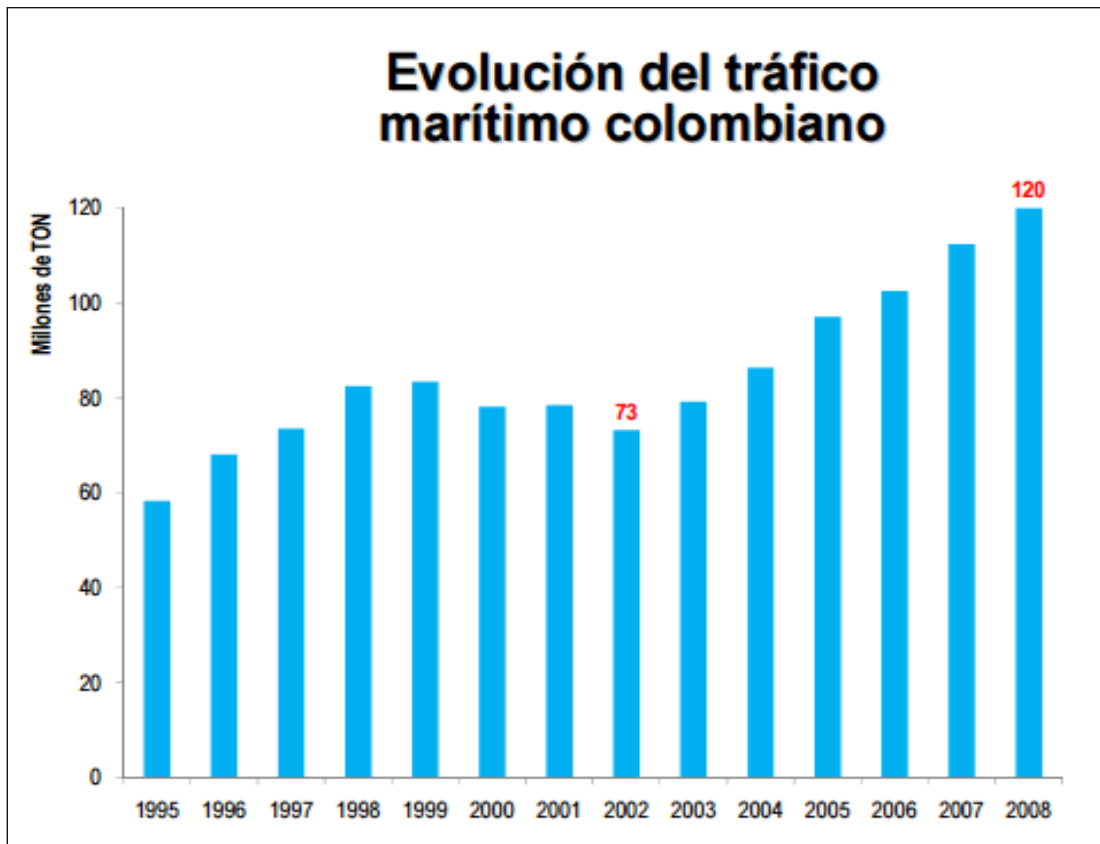
Notwithstanding the foregoing, the countries seek to boost its economy and one of the ways is the export of its industry, which implies to be constantly prepared to meet the demands and volatility of the trade.

For example, to meet the increasing cargo demand, mainly from Far East countries as China, Korea, Japan; and northern hemisphere countries like the United States and much of Europe, represents the perfect opportunity to take advantage of globalization.

In Colombia, these advantages can be exploited by signing free trade agreements, thus giving boost to the economy through export industry, tourism and services.

However, Colombia has been taking a significant share of international maritime trade. The figures listed in Figure 7, allows to graphically visualize the evolution of Colombian maritime traffic from 1995 to 2008 in millions of tons transported.

Figure 7 Colombian maritime traffic evolution.



Source: (Ministry of Transport, 2010)

Colombia has a privileged location, since its position enables the connection between North and South America and, Eastern and Western Coasts of USA and Asia. Additionally, main roads of world trade are located in that geographical area. (ProColombia, 2015).

Thus the maritime cargo transportation represents for Colombia the promotion of its economy and the possibility of increasing its global competitiveness.

According to ProColombia's annual report (2015), the following important data are presented for consideration:

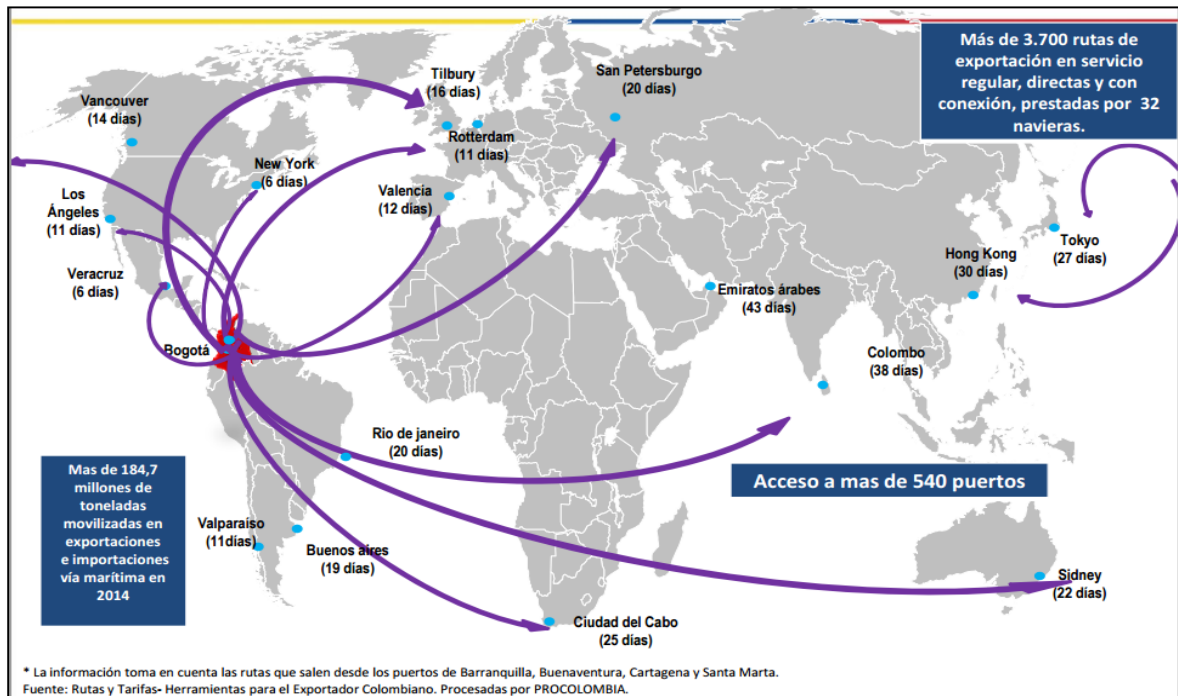
On Colombian maritime ports are connected over 3,700 regular and direct service export routes, which are offered by over 34 shipping lines and arriving to more than 670 ports around the world

In 2014, Colombia mobilized by sea via its port zones more than 184 million tons of cargo and received about 61,000 ships in the Atlantic and Pacific coasts, reaching 2 million containers a year. (ProColombia, 2015)

Therefore, Colombian maritime connections with the rest of the world, make commercial opportunities the possibility of turning Colombia into the logistics partner for the rest of the world, making its geostrategic position a platform to stimulate, encourage and drive its economy.

In Figure 8, you can view Colombia's maritime connections with transit times to different ports of the world.

Figure 8. World maritime connections - Transit time



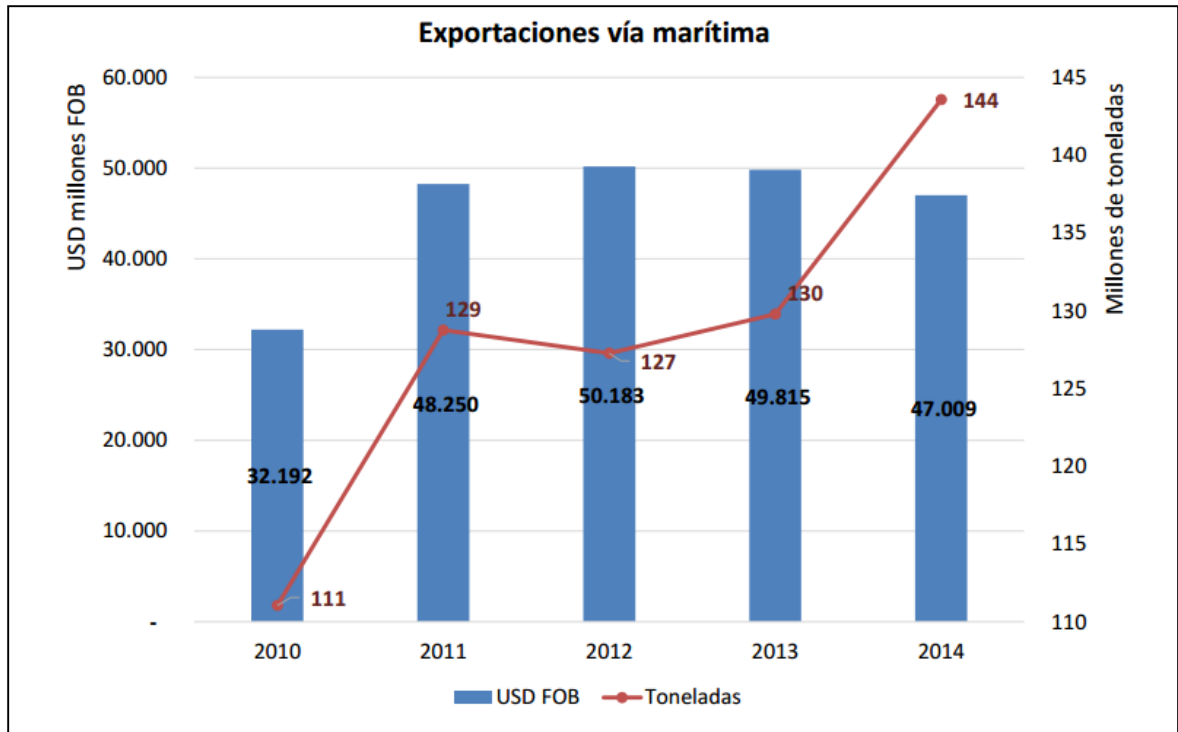
Source: (ProColombia, 2015)

This is why the maritime transport has been showing a considerable increase in recent years, because the current figures show that 98.2% of cargo for export from

Colombia occurs by sea. And this mode of transportation can not only reduce costs for shipping, but also one of the safest ways to transport goods.

In Figure 9, you can review the increase of exports by sea from 2010 to 2014, which showed an increase of 10.6% tons exported for the past year.

Figure 9. Sea freight from Colombia



Source: (DANE, 2015)

To finish this chapter, it's necessary to mention that the importance of maritime transport of goods is highlighted because for years this has been the mode of transport of goods with more influence in international trade, due to the low cost of transport is essential to increase competitiveness worldwide.

Chapter III

In this chapter, it's drawn a contrast between the advantages and disadvantages arising from the construction of the interoceanic canal in Colombia in order to capture the two opposite points derived from analysis of feasibility of this megaproject. Thus, it's developed the third specific objective in order to settle the different variables that are contemplated as a result of this construction.

Cost-benefit in building the Interoceanic Canal in Colombia.

The construction of an interoceanic canal in the country has not only divided the opinions between supporters and opponents of this mega piece of engineering, but it has also been the subject of recurring questions that one way or another have caused all dynamism aimed at the initiation of the construction process remains stalled. And the situation becomes complicated when all those stakeholders carefully analyzed from different perspectives costs and benefits arising from this initiative.

However, there are interesting positions and argued in support of spacious studios, the profits that bring the construction of a canal to Colombia; as expressed by the geologist Alberto Saenz Guerrero Lobo and his team (mining engineers, civil engineers, soil engineers, hydrologists, economists, lawyers, biologists and ecologists) who after overtaking studies for 20 years, defended the idea of a canal in the country although it would cost about 35 billion dollars (cost of designing and building the channel), also allow diversification of the economy substantially, because the economy is very tight Colombia in terms of its export products, making it heavily dependent on coal and oil; with the current price fluctuations cause large problems for the country internationally, which is not a different way to prospectively continue funding its bureaucracy and its operational plans (New Century, 2014).

It is further argued that this economic diversification not only depend on the canal as a sole purpose, but would be leveraged by associated industries, which will be active actors that generate wealth, employment and social welfare in constant

operation in the areas of actors with influence and interests associated with the project, which from now on will be called Stakeholders [9] .

With the implementation of the Atrato-Truandó canal not only generating employment of rural labor and diversification of the economy appear as the only arguments generators of confidence in its construction, but other benefits are also evident which may encourage employers to strengthen their industrial activity and turn the country into a competitive logistics platform, by reducing the costs reflected in the logistics chain and crossing large capacity vessels, the above with respect to the Panama Canal, as according to the planning of the work, it does not require the use of locks to allow ship traffic from one ocean to another, and because it is a channel built on the sea level, there would be no problem to feed nor limit traffic for this concept; making it an excellent alternative channel to boost international trade from Asia and the Far East, maritime routes with a final destination in Latin America, and nationally, enabling economic and cultural development of the Chocó region that for decades has been one of the departments most affected by the conflict and inequality.

While 37% of Colombians have unmet basic needs (drinking water, primary education), in Choco 81% of the population doesn't have it. (Semana Magazine, 2014)

Another relevant aspect to consider is related to the logistics time which will be favored commercial response from employers and the increased competitiveness of Colombian products in the world. However, amid viewed as good opportunities for the country with the construction of the Atrato-Truandó channel, Cost-benefit analysis also appears, externalizing all supporters and follower of this project, the launch of the channel, from another perspective, also passed their own collection to the environment, because the implementation of nuclear explosives is required to reduce costs, a situation that drastically affect those ecosystems and biodiversity of prevalent species of Chocó rainforest.

Another disadvantage is related to the generation of new routes for smuggling, sociocultural problem difficult to control by the government and has shown has a negative impact especially for the textile and garment sectors, agriculture, footwear, perfumery, etc; whose products have been entering the country illegally, at very low prices impossible to compete against national production costs (Dominguez, 2014). But the negative consequences do not stop, the known practices of corruption in the administration of public resources and the likely incursion of foreign capital and economic support in the execution of the work (companies or governments Investors) purposes looming geopolitical and the pursuit of maximizing profit to strengthen their industries and to ensure greater competitiveness in its products.

It is necessary to conclude and make way for the evaluation of each of these aspects, report that to finance the cost of construction work, it is necessary to use the revenue from tolls from ships passing through the canal He crashed during a period of four years, achieving paying this way the whole project; same period which is estimated construction should be finished beginning of zeros..

Diversification of Colombian economy

One of the main challenges in which Colombian economy is immersed, is related to the high dependence of the country has its traditional exports and lack of diversification of their supply chains in the search for greater competitiveness. And the situation may not be less worrisome because recent information published in the annual report of the Private Competitiveness Council (CPN), says that while in 2001 the exports of primary products meant for the country 60% of total exports by 2013 the field had grown so significantly, that by this time I represent the 80%. Similarly, it is necessary to indicate that 72% of the country's exports are to the same product offering "always", ie, coal, oil, flowers, coffee and gold; which no doubt he realizes how far behind the economy and unsophisticated productive apparatus of the country is. (El Espectador, 2014)

This situation has had negative results for the economy, entrepreneurs do not have the ability to offer value-added products nor highly technical industries to enable them to reach this goal, which becomes a clear bottleneck that prevents optimal system performance. For his part, the President of CPN, Rosario Cordoba says that not only the low diversification of the economy has been established as the only problem preventing progress, states that "No progress is possible unless we have an efficient state (...) a flexible relationship between the public and private sector to jointly we can achieve greater competitiveness in the country".

Clearly, under the consideration that the country needs to explore other international markets in its printing products higher levels of modernization by obtaining the maximum economic benefit; It considers that the implementation in the construction of a canal in the country, serve as a tool and means so that producers, entrepreneurs and State begin the search for new consumers for products produced nationally; that State accompanied by policies aimed at labor training and the adjustment of industries generate excellent results would help leverage the country's economy, not only depending on the product traditionally exported..

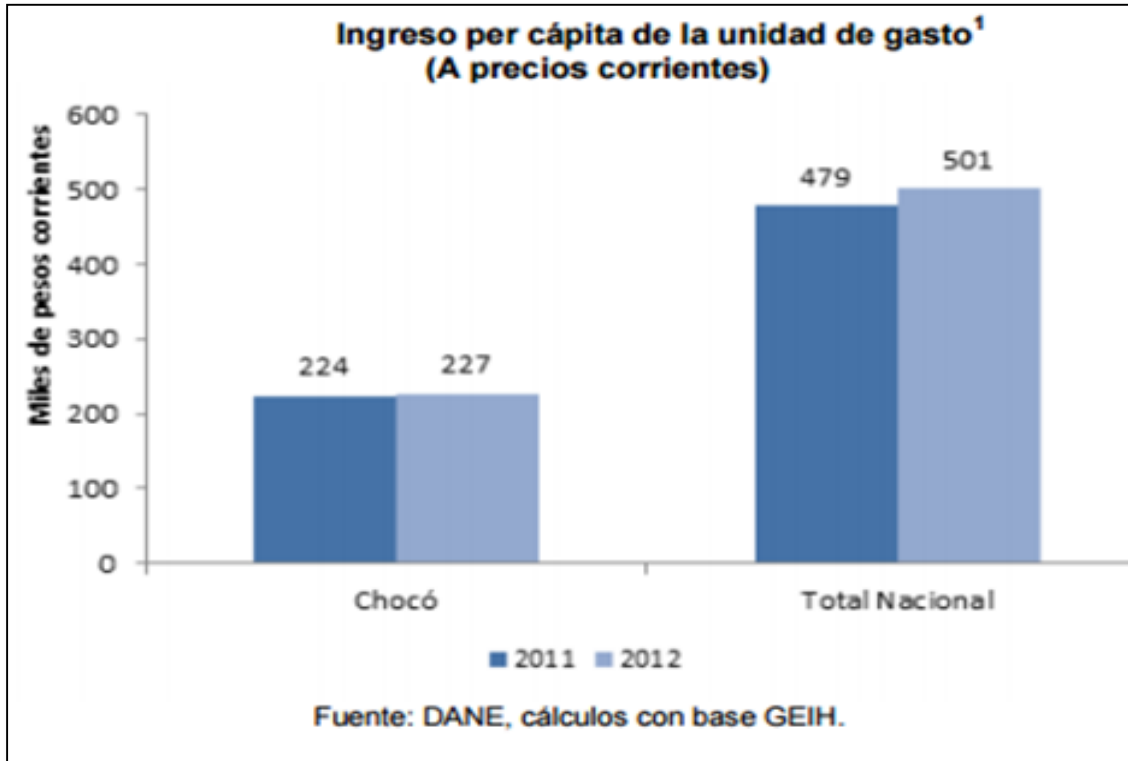
Interoceanic canal: a generator of wealth and welfare

The construction of the Interoceanic Canal and dynamics that this imbues the economy by promoting foreign trade activities are not the only perceptible benefits to the execution of the work. The Chocó region is seen as one of the most favored regions due to increased employment by utilizing local labor and generating social welfare for its inhabitants.

According to information disclosed by the DANE, by 2012 the proportion of people in poverty in this department was 68%, while the percentage of people in extreme poverty was 40.7%, disproportionate number compared with the levels achieved in the same period at the national level. The people of this region, has an average month income of \$ 227,493, indicating that a family consists of 4 people receives a gross income of \$ 909,972 a month. (DANE, 2012).In Figure 10, the per capita

income for the Choco population is graphically seen by comparing annual periods from 2011 to 2012.

Figure 10. Per capita income of Choco's population expenditure unit



Source: (DANE, 2012)

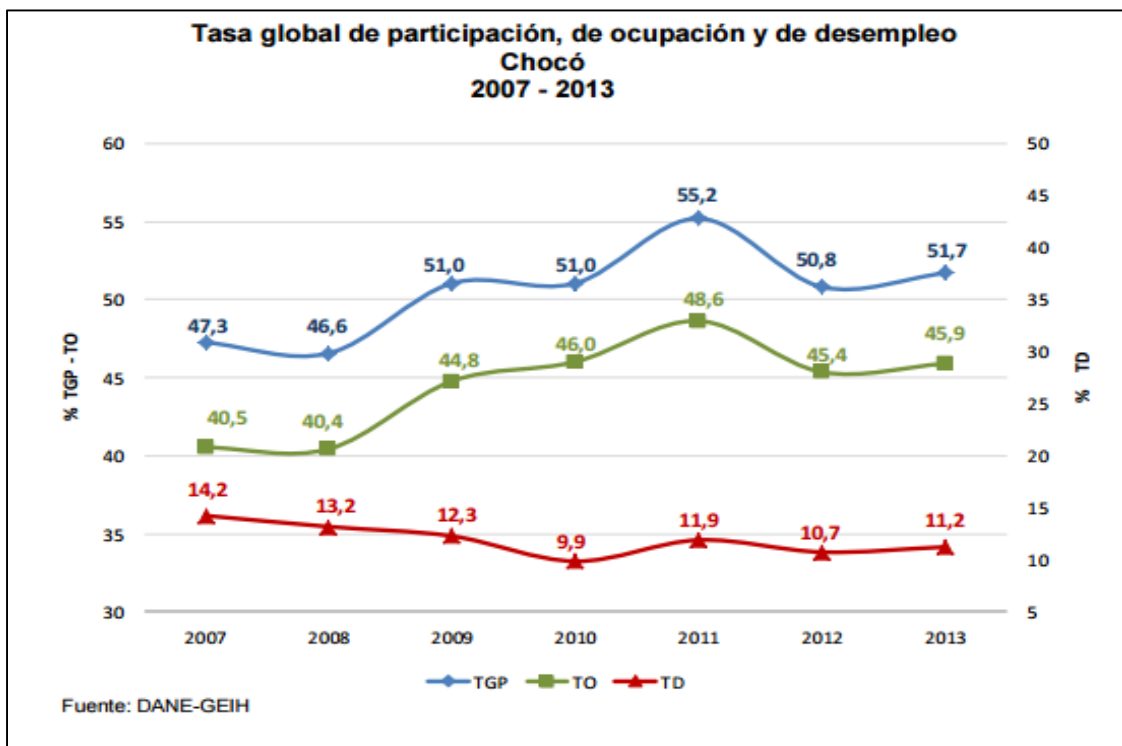
The region is currently experiencing a humanitarian crisis, displacement and conflict; making it one of the places most affected by inequality in the country. While 37% of Colombians do not have their basic needs met in this area 81% of the population have unmet basic such as primary education, drinking water and food security needs. (Semana Magazine, 2014)

Speaking of opportunities, implementation of the Canal would greatly remedy the social and economic gap that has prevailed for years in the region, the idea of job creation at such prevailing lack of job opportunities and indifference that the national government has had chocoanos the inhabitants, it could be remedied turning the country into a major logistical and commercial springboard for others. The economic

stimulation and strengthening security, probably would forge the way to a perceptible for each of its residents real social welfare.

In Figure 11, you can show statistics that show that the Choco introduced in 2013 an overall participation rate of 51.7% and an occupancy rate of 45.9%.The pass rate of 10.7% unemployment in 2012 to 11.2% in 2013, increasing 0.5 percentage points (DANE, 2014)

Figure 11. Choco's overall participation, employment and unemployment rate



Source: (DANE, 2014)

Environmental impact

For many years, it has become known the importance and need to develop a work similar to the Panama canal infrastructure in the country, in order to promote the development and more efficient exchange of goods between the Atlantic and

Pacific; so it has been proposed as an alternative on a recurring basis, the opportunity to allow the passage of ships through the Canal construction Atrato-Truandó; implementation that not only boost the economy, but that the country would trade in a competitive position globally. However, the implementation of the project for over 75 years has been stagnant, finding a major environmental dilemma high impact and large impact, which have been filed and prevented their advance.

Nuclear explosions necessary for its construction and large cuts of Serrania del Baudo, have been a big problem for the rulers who have believed in this initiative, which ultimately run out of arguments to defend this proposal to the health impacts of the product of nuclear radiation and serious damage to ecosystems and biodiversity in the Chocó forests that generate the implementation of this project population.

Geopolitical interests

From the approach of the proposed construction of a canal or dry port in Colombia, there has been a particular interest of China in invest heavily in the work, which undoubtedly corresponds to the prospective China as part of its National expansion strategy.

Manuel Felipe García, Head of Economic Research (Chief Investment Officer) of Old Mutual- Guodian Insurance in Beijing, "The Asian giant is the world eat and have the wallet to invest wherever and in whatever he wants" (Magazine Week, 2011).The implementation of a canal through Colombia, China strategy aims to facilitate the transit of natural resources from across the Atlantic, which must pass the Pacific (especially Venezuelan Oil and Coal obtained in Colombia), which all when required by this economy.The critical point, joins the desire of the Chinese to acquire a unique way that allows them to explore all those economies that historically have found it more complex and more expensive, which represents tension and uncertainty due to the construction of a dry canal Colombia, also have strong interests in the economies that have so far exercised dominion over the

Atlantic, Europe and the United States (Week Magazine, 2011), a situation that could benefit or hinder at some point, the Colombian initiative to improve infrastructure and fully open their doors to strengthening trade relations with other nations to maximize their large portfolio of products which so far do not represent a significant income due to their low competitiveness in other markets.

3. Findings

After developing each of the objectives of this study and in order to frame the major issues arising from previous research; allowed then relate the findings:

The possibility of constructing a canal in Colombia has been studied by various players, including presidents, since the early 60s. While research shows that the mega construction has not been carried out, either by lack of economic resources, further studies or action by persons and entities involved; Needless to say, the implementation of the construction has been and will be an "old dream" that is discussed from different points of view, which have been the biggest obstacle to begin the pursuit of the work.

But not enough to mention that different views have slowed the possibility of building the interoceanic canal in Colombia. According to previously made investigation departing from exponential trends of growth of international maritime trade, not only in Colombia but worldwide; the feasibility of building a canal is viable from an economic point of view. That is, the growth of international trade, it needs mechanisms that go hand in hand with its accelerated growth. That is why Colombia with its geostrategic location represents for international trade and boost the possibility of mitigating the transit times in the maritime mode; whose problem was a variable that for years has tried to solve.

And the geographic position of Colombia has been and will be a strategic opportunity to be seized by the constant search for new business partners. Thus the advantage of having the two output oceans (Atlantic and Pacific), the rise of exports by sea and more than 3700 routes to ports in other countries; Colombia account for the need to exploit its geographical advantages and overcome its internal disadvantages. Thus, the International Physical Distribution, which is well

detailed in this research will allow the reduction of costs and time in delivering the goods.

Now, from the logistical point of view, Colombia has problems in the internal transport of goods. Research shows that it is cheaper to send a cargo from Buenaventura to Far Eastern countries than ship cargo from Bogota to Cartagena. Therefore, the construction of the Interoceanic Canal, will exploit distances streamline logistics costs and therefore Colombian products will be more competitive in the international market applications. While it is clear that most industrialized cities are within the country, as is Medellin; it is more feasible to transfer the goods to one of the points of the canal; Urabá either the Atlantic Ocean or one of the bays in the Pacific Ocean.

That is why the feasibility of building the canal in Colombia, based on economic views, represents the solution to one of the biggest economic problems such as the dependence of the economy, in large part, by the production and export of goods from the primary sector (coal, oil, gold, emeralds, coffee, etc.). Therefore, this construction will diversify the economy in order to avoid problems such as the so-called Dutch Disease, which consists of the massive export of natural resources and as a result, income abundance of dollars in the market. This massive inflow of dollars, the local currency will be revalued against the dollar, thus generating other sectors lost revenue payment of its exports, since they will receive less Colombian pesos currency received.

Not least, the possibility of reducing the unemployment rate and the poverty rate in regions such as the Choco, which for years has been one of the places with the highest number of people in extreme poverty; the construction of the canal would be a generator of wealth and welfare. This through the promotion of labor related to international trade and increasing industrial activities will finally Choco department with tools to exploit their natural resources and thus boost its economy by generating more income for its inhabitants activities.

Another important factor found in the investigation, is the rapid growth of container ships. In recent years ships have been at the forefront of the booming international trade and hence the same growth.

The Panama Canal does not allow the passage of these larger vessels, since the use of locks and the channel width limits the crossing you look for. For this reason, the possibility for Colombia to create an alternative canal to the Panama Canal, as in the studies previously analyzed, it was determined that Colombia geographically has the possibility of building the so-called "Channel Level" indicating that not They require locks and therefore allows the crossing of ships cannot pass through the neighboring country.

Another significant variable is the only large container ships transiting the Suez Canal, because the channel dimensions and depth of the water, allow it. The ability to bring these large vessels to Colombia and countries in Central and South America, would be an opportunity to boost trade through new partners and more competitive products.

4. Conclusions and recommendations

4.1 Conclusions

At present (2015) outdated studies to define the feasibility of building a canal in Colombia are; event that complicates the analysis and research of carrying out this mega project. While studies and research being done on the issue have their beginnings in 1960; it is of utmost importance that these studies are framed in an updated scope, considering economic, environmental and social factors, in order to define more successful implementation of a construction of this magnitude.

As for the needs of international maritime trade and the rapid growth that this presents; the feasibility of building the canal in Colombia is feasible, based on indicators of exponential growth in trade, the growth of maritime cargo movement mode, the geostrategic position of Colombia and the remarkable growth in size of container ships.

With regard to the internal logistics of the country, high transportation costs for land transport mode for loads from industrialized cities (mostly within the country) bound for the ports of Buenaventura and/or Cartagena, make logistics a disadvantage for the country, which means that Colombian products lose competitiveness in international markets as a result of these high transport costs. Therefore, it is important that Colombia seek mechanisms to reduce costs in order to reach markets in other countries with highly competitive prices. Mechanisms such as the possibility of building this channel, since it is clear that shipping can carry lots of merchandise at more favorable costs.

It also concludes that as a result of high economic dependence on the export of goods from the primary sector, the state must find strategies to diversify the economy and promote industry, services and tourism in order to ensure economic security for all sectors of the country.

Regarding the social impacts that the construction of the Canal entail, mainly in the department of Choco, we conclude that the construction of the Canal, could be the solution to many of the problems of this department, as it is extreme poverty and hunger there is suffering. In addition it would work to promote through labor and management to achieve Interoceanic Canal.

The environmental impacts arising from the construction of the Interoceanic Canal are considerable; that they are not studied in depth. It is concluded that the limited analysis of this variable by the various stakeholders to unite the two oceans, not allowed to have a clear focus, generating diverse views that do not allow the progress of the implementation of this mega construction.

Finally concludes that, either through lack of interest or different points of view that this issue represents for the different actors or entities involved; the initiation of the canal in Colombia has gone from studies and laws; so the topic is always on "hold" and not much talk about this

4.2 Recommendations

It is recommended to conduct feasibility studies Interoceanic Canal taking into account current variables to obtain reliable samples for defining whether it is feasible or not to carry out the construction.

All actors involved in making more public this topic is also recommended, as it is little of what is spoken in Colombia and being enacted can get interest from new partners who may well provide analysis, studies and / or points of view that ultimately will make this "old dream" to acquire a clearer through considerations and variables contemporary approach.

It requires seeking investors interested in the subject, since the financing of the construction is an important factor to consider. While increased interest from Chinese investors must take into account that geopolitical interests play an important role, so we must have various options for possible investors.

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