



Incidence of International Logistics in the current Environmental Problems

**Juana Paula Gómez Toro**

**Estefany Mejía Valle**

**Jair Santiago Berrio Vanegas**

University Institution Esumer

International Studies Faculty

Medellín, Colombia

2016

**Incidence of International Logistics in the current Environmental Problems**

**Juana Paula Gómez Toro**

**Estefany Mejía Valle**

**Jair Santiago Berrio Vanegas**

Research paper presented to obtain the title of:

**International negotiator**

Director:

José Albán Londoño Arias. Mgr in Organizations Management

Research Line: Research into International Business

University Institution Esumer  
International Studies Faculty  
Medellín, Colombia  
2016

## Thanks

*Although it may seem a “cliché”, all the things we do in life we owe to God, so we must give thanks mainly to him. To Our family, which is our pillar and engine, we thank them for being the people who motivated and supported us to make our dream of being professionals in "International Business" a reality. Obviously we cannot forget our teachers and administrators of the Fundacion Universitaria Esimer, who were our guide and our leaders in our learning process, who guided our knowledge to excel in a competitive work sphere as it is ours.*

*Thanks to our partners, because in the space that we shared which was our classroom, we could learn valuable things from each one of them. We are grateful with all people who somehow were part of this new achievement in our lives; it is an honor for us to get a professional title from an excellent University like the Fundacion Universitaria Esimer.*

## Summary

This thesis covers different areas focused in the world economy; it is mainly based in the study of the incidence of the International Logistics in the current environmental problems.

Within these parameters is international trade and logistics, on the other hand, the effects and impacts produced by humans specifically the mining and petroleum industry which as is well known directly govern the world economy.

However, rather than talking about the effects that these areas have on the earth planet in a positive way, for though as we know they bring great benefits to the economy of producing and exporting countries, the aim is to present the effect that these have into the environment in negative aspects, taking into account the production processes used by both industries, as they are the main sources of environmental pollution.

To conclude, the purpose is to inform clearly and concisely how these studies are involved in the successful development of what is known as "international logistics", taking into account the possible collateral damage caused by the degradation in the environment.

### **Key words:**

Globalization, logistics, CSR (Corporate Social Responsibility), environment, international logistics, trade, mining industry, petroleum industry, Environmental impact.

## Summary

This thesis covers different areas focused in the world economy; it is mainly based in the study of the incidence of the International Logistics in the current environmental problems.

Within these parameters is international trade and logistics, on the other hand, the effects and impacts produced by humans specifically the mining and petroleum industry which as is well known directly govern the world economy.

However, rather than talking about the effects that these areas have on the earth planet in a positive way, for though as we know they bring great benefits to the economy of producing and exporting countries, the aim is to present the effect that these have into the environment in negative aspects, taking into account the production processes used by both industries, as they are the main sources of environmental pollution.

To conclude, the purpose is to inform clearly and concisely how these studies are involved in the successful development of what is known as "international logistics", taking into account the possible collateral damage caused by the degradation in the environment.

### **Key words:**

Globalization, logistics, CSR (Corporate Social Responsibility), environment, international logistics, trade, mining industry, petroleum industry, Environmental impact.

## Content

Summary .....	iv
Abstract.....	v
Figures List .....	viii; <b>Error!</b>
<b>Marcador no definido.</b>	
1. Symbols And Abbreviations List.....	ix
1.1. Symbols List.....	ix
1.2. Abbreviations List.....	ix
Glossary .....	ix
Introduction.....	xiii
2. Project Formulation.....	1
2.1. Background .....	1
2.1.1. Art State.....	3
2.2. Problem Statement.....	6
2.3. Justification.....	10
2.3.1. Theoretical Justification.....	10
2.3.2. Social Justification.....	11
2.3.3. Personal justification.....	12
2.4. Objectives.....	13
2.4.1. General Objectives.....	13
2.4.2. Specific Objectives.....	13
2.5. Methodological Framework .....	14
2.5.1. Deductive Framework.....	14; <b>Error! Marcador no definido.</b>
2.5.2. Methodology.....	14

2.6. Scopes.....	165
3. Project Execution.....	16; <b>Error! Marcador no definido.</b>
3.1. International Logistics Chain .....	17
3.1.1. links In The International Logistics Chain: .....	18
3.2. Customs Conventions Rules And Agreements aimed To The Environmental Protection..	27
3.3. Friendly Practices With The Environment.....	30
3.4. Current Environmental Problems .....	34
3.4.1. Corporate Responsibility Practices .....	38; <b>Error! Marcador no definido.</b>
4. Findings .....	41
5. Conclusions And Recommendations.....	42
5.2. Conclusions.....	42
5.1. Recommendations .....	; <b>Error! Marcador no definido.</b>
Bibliography .....	46

**Figures List****Pág.**

Figure 1. <b>Variation of CO<sub>2</sub> and temperature in the last one thousand years.</b> .....	<b>25</b>
Figure 2. <b>Degradation time of different materials</b> .....	<b>31.</b>
Figure 3. <b>Projecting demand for electricity generation</b> .....	<b>32</b>



## 1. Symbols And Abbreviations List

### 1.1. Symbols List

€. Indicates the Euro currency symbol.

(US) \$. Indicates the Dollar currency symbol.

(COP) \$. Indicates the Colombian Peso currency symbol.

### 1.2. Abbreviations List

CSR. Corporate social responsibility.

IPD. International physical distribution.

AMUMAS. Multilateral Environmental Agreements.

FTA. Free trade Agreement.

WHO World Health Organization

FID Financial Institutions Department

Admón.

Administration

cta. Account

Dr., Dra. Doctor

Dir., Dir. <sup>a</sup> Director

etc. Etcétera

Fdo. Signed.

Gral. General.

Ntro., Ntra. Our

n. ° o núm. Number

pag. Page

Ref. Reference

sec. Section

Ser. Service

Sr., Sra. Mr. Mrs

Ud. You

## Glossary

- **Globalization:** It is a historical process of global integration in political, economic, social, cultural and technological levels, which have turned the world into an increasingly interconnected place, in a global village. (Significados.com, S. F.)
- **Logistics:** It is a combined network of media, methods and infrastructure that ensure the storage, transport and delivery of goods and services (Definitions, S. F.)
- **CSR (Corporate Social Responsibility):** It is acquired commitment by companies dedicated to the pursuit of economic or commercial objectives; this commitment is voluntary and seeks for the social, economic and environmental betterment of society.
- **Environment:** is the surrounding where living beings live. The environment includes nature, society and culture within a particular place and time. It includes living things, materials and the established relationships between them.
- **International logistics:** It can be defined as the efficient management of all the variables involved in the supply chain, ensuring that each element fulfills its specific function and add value to the chain.
- **Commerce:** It called any negotiations involving the purchase, sale or exchange of products, goods or services. it comes from the Latin *commercĭum* that means "buying and selling of merchandise."
- **Mining:** is the selective extraction of minerals and other materials from the earth's crust which can obtain economic benefit, as well as the primary economic activity related to it.

- **Petroleum Industry:** It includes global processes of exploration, extraction, refining, transporting (often by oil tankers and pipelines), and marketing petroleum products. the Higher volume products in the industry are fuel (*fuel oil*) and gasoline. Oil is the raw material of many chemicals including pharmaceuticals, solvents, fertilizers, pesticides and plastics products.
- **Environmental impact:** it is a change or an alteration in the environment, being a cause or an effect due to human activity and intervention. This impact can be positive or negative; negative represents a breakdown in the ecological balance, causing serious damages to the environment and health of people and other living beings.

## Introduction

With the passage of time and the global social, political and economic development it is possible to note clearly the connection between the economy and technological and industrial development, starting from the industrial revolution to these times, different sources of income that have been achieved, thanks to globalization and high competition demand, by the progress that has been generated from one generation to another, truthfully from the past century to this (SIGLO XXI).

For international business, this development has influenced positively and negatively, since the increased competition creates jobs, but at the same time it can create losses in the manufacturing industry, however, the main focus of this work is aimed specifically to the existing relationship between the international economy and the current environmental problem.

As is entitled this project (*"Impact of international logistics in environmental problems"*), what the project mainly wants is to find how the environmental pollution (current problem) affects the lucrative development of industries nowadays, in this way will be seen various and different factors by which the environment is been affected.

## 2. Project Formulation

### 2.1. Background

*“Residential Solid Waste: Logistics, a modern tool to face this old problem.”*

In this article published in 2006 in the Journal *"Industrial Engineering"* by the authors Rojas Aguilera, Salazar Salazar, Sepulveda Ahumada, Sepulveda Conejeros & Santelices Malfanti, it is emphasized on the importance of environmental problems in the development of commercial activities, seeking a balance in the different processes so that there is a sustainable relationship between economic growth and environment, involving logistics directly as a fundamental tool to mitigate the current situation of pollution, promoting best practices, fostering the impact that the reverse logistics has with the environment and making known the good management of solid waste (Rojas Aguilera, 2006).

As it can be seen in an article published by Garcia Martinez (2009), in the Colombian Journal of International Law, the main purpose is to analyze the agreements that arise in relation to the environment; standards can be included in FTAs, looking well solutions to conflicts that arise. Also in this section are identified some of the commercial agreements that have been signed during the history of man with environmental objectives (A, 2009).

*"THE REVERSE LOGISTICS SYSTEM IN THE ENTERPRISE: ANALYSIS AND APPLICATIONS"*

It is a work made by Sergio Rubio Lakoba from the University of Extremadura, located in Badajoz Extremadura; Spain (2003). The author details how reverse logistics makes refers to the use of products out of use, the re-using of them and how they can contribute indirectly to the economy of the country and directly to the environment.

For the efficient recovery of these products it is essential to establish logistics systems able to put in the hands of the recover the discarded products by consumers. In this way the concept of reverse logistics is used to refer to the set of the logistic steps to recover and exploit economically residues found outside out of use.

In this investigation, from the academic point of view about the reverse logistics a mention is made for the writer Stock (1998). Mentioning the topic which makes reference to the aspects relating in all this process of environment care and contribution to the economy of the country.

Stock (1998) retrieves the subject of Reverse Logistics in what purports to be a white paper on this subject. The author analyzes the role of logistics in areas such as product returns, reduced waste generation, recycling, repair and remanufacturing through the developing of management models that combine the techniques of logistic engineering and models of business decision in order to capitalize the return flow of the products that are out of use.

### **2.1.1. Art State.**

The study of the development of economic activities is an issue that has been discussed for a long time, but began to take on more importance when the issue of economic development was expanded and surpassed borders, the man began to find new opportunities in the international market, looking to increase revenue with sales abroad and how to satisfy their needs by the acquiring products with which could not supply itself, this phenomenon is called and known as "*Globalization*" has generated undoubtedly controversy, since as evidenced most part of human beings perceive it as something positive, others might consider it as an invasion and threat to its national economy. There is also a topic that is linked to this event and is the environmental problems in which the world's population is exposed in these times.

*"Prospects for the Global Environment 4 Geo 4"*. It is a UN program published in 2007, based on the Brundtland report, which allows knowing the status of the current environmental problems, identifying their main causes and looking for possible solutions to the situation. The development of this report is made from ten chapters in which topics related to the Industrial revolution, globalization, population growth and consumption are treated, as these are critical factors for a sustainable economic development, the current state of the atmospheric layer, water, biodiversity conservation, poverty as the most vulnerable population, among others.



*"Reverse logistics, a process of environmental impact and productivity".*

It is an article made by Rodrigo Andrés Gómez Montoya, a researcher associated with the corporación universitaria lasallista published through Scielo in December of 2010.

In which the author presents how the reverse logistics and its processes at national and international level interferes with the logistics processes and the relationship brought in terms of environmental protection. This strategy seeks to protect the environment by raising awareness worldwide companies, generating social responsibility so that these operate in the most efficient manner managing properly their logistics processes (Montoya, 2010).

This article looks to describe and analyze the reverse logistics from a conceptual approach of process and application at national and international levels, including the relationship with the green supply chain management. The methodology used is the review and analysis of books, scientific papers and case studies related to the subject. The results allow identifying the importance of reverse logistics as a strategy for supply chains and companies in the national and international levels protect the environment and manage properly returns, in order to operate efficiently and recover value to products, through processes of recycling, reuse and disposal, among others. Moreover, the existence of decrees and regulations that regulate the waste management in Colombia is observed.

At present there has been variety of strategies, all in order to combat environmental pollution that is worldwide. Within these programs, which has had more relevance is the use of the products out of circulation looking for ways to reuse them.

Logistics plays a very important role regarding to this issue, companies must analyze each logistics process from the moment it acquires the inputs for the development of products until the moment when final products are finished and delivered to the end customer, all in order to get the most out of the residues that are used throughout this process, thus identify in whay part of the process spare parts are produced and how they can be reused as well, thus provide a major contribution to the economy of these companies, creating competitiveness in the country and contributing to environmental care, in which a country with environmental and social responsibility be shown.

## 2.2. Problem Statement

Currently one of the issues that has generated controversy in all media, is the environmental problem, the social impact that may have this problem facing the population, is how this affects different sectors and in turn international trade due to cargo handling, climate and even the same tools used for landings of these, it is important to consider this great problem that has been presented since in one way or another lengthens delivery times and affects the same cargo when it comes to perishable food, which is why normativities have been implemented in order to counter this phenomenon and in turn creating a more competitive country in the market, gaining advantage of this both exporters and importers.

In recent decades it has been seen as a man's hands pollution of the environment has been increasing significantly, and is the same man who has had to endure so far is the greatest exposure to environmental pollution which has had registry. According to the observatory of the World Health Organization (WHO), in recent decades has been an increase in deaths related associated with exposure to atmospheric pollution. The diversity of chemicals of human origin, present in the environment have increased the global contamination.

However, awareness of the influence of the environment on human health and life is growing day after day, and for this reason is that man has been researching and adopting practices aimed at protecting the environment in all its activities, task that while it is important, because it depends on the human and all the species that inhabit the planet earth life, it is not easy to carry out, as they have factors such as globalization and consumerism as main opposition.

In the economic factors, the outlook has changed, although the man perceives an environmental management as an act of environmental protection, also sees it as a something that can profit financially. Industrial management responsible and proper management of solid waste begins to be considered as profitable with the use of cleaner production processes in which the amount of raw materials used be reduced, less waste be generated, the use of energy sources be rationalized, etc., thus obtaining higher levels of environmental well-being. Certainly significant progresses in absolute terms have not gotten yet, due that from other perspectives the firm commitment by certain groups and organizations in dealing with good environmental behavior is affected.

One of the main reasons why successful results in this issue have not been achieved is because the management of waste treatment has very high costs, by which often are taken into account the value thereof instead of benefit that is being done to the environment, so the industries prefer to subsidize to third parties to avoid significant losses identified as unnecessary; certainly a very myopic view of the raised issue.

So it is not unreasonable to think that at current rates of production and consumption, where natural resources are increasingly scarce, waste generation is increasing and the possibilities of direct disposal is being reduced and it's possible that this situation reaches a no returning point.

The production industry is one of the key players when waste generation refers, in each one of its processes becomes in a pollutant detonator. Every industry needs an international logistics for the import of raw materials, machinery and finished products also for export and marketing, for this they need freight transportation such as ships, trains, planes, trucks, forklifts etc. highly polluting means due to the emission of CO<sub>2</sub>, mainly. Although the contribution from international logistics is not an absolute solution to this problem, it can be a determining factor in caring for the environment (Salud, 2014).

Implementing logistics in each one of the processes of import, export and marketing is an solution that in recent years has been strengthened in all countries, international and national governments have given more importance to this issue and seeks to enact and strengthen a culture of environmental care to the new generations in which basically is pulled out advantage of all that can be reused as packaging, packaging, hazardous waste as well as the process of return of excess inventory, customer returns, obsolete products and seasonal inventories. Even anticipates the end of life of the product, in order to give it out in markets with higher turnover.

Activities may include the following: Repair (lower quality than new products), Renovation (provide a specific quality), Recycling (Recovery to be used again), cannibalization (Recovery Part of reusable sets), Reuse Direct (without any important transformation), product destruction, alienation of a third, pouring (without reuse any way), Restoration (in which the identity of the product is retained), and re-manufacturing (manufacture the product using components Product Returned). Coinciding with the Authors Rojas Aguilera, Salazar Salazar, Sepulveda Ahumada, Sepulveda Conejeros and Santelices Malfanti 2006, according to its publication in the journal "*Industrial Engineering*" it could define logistics as: The process in which is define the entire supply chain, projecting the estimated of purchase, raw materials, process and finished product, from source to destination, seeking to optimize time and costs, defining also reverse logistics, seeking optimization and a better handling of solid waste from the destination place to the source. (Rojas Aguilera, 2006)

## **2.3. Justification**

### **2.3.1. Theoretical Justification.**

The purpose for which this research work is developed is to analyze the impact of international physical distribution in environmental pollution, with emphasis on processes with increased production of CO<sub>2</sub>, based on information acquired identifying the feasibility of adopting a logistic reverse in processes of international physical distribution that minimizes the negative impact generated in the international logistics.

The importance of this research is to know further polluting factors in logistics processes both in the international physical distribution as national, starting from the extraction of fossil fuels as the main ally of the international physical distribution to CO<sub>2</sub> emissions generated by ships and essential logistical equipment in the distribution process that affects the environment, and having tools to support the inclusion of a reverse logistics in all international logistics processes that take place in Colombia especially in the ports of greater rotation ok cargo and deepen in the comprehensive review that seeks to improve logistics processes increasingly in the DFI.

### **2.3.2. Social Justification.**

For the development of the internments business it is essential to speak of international logistics, which comprises the whole process from storage product in the origin company, internal transport at origin, international transport, internal transport at destination, including packing and packaging of goods.

Each of the links that make part of this chain generate somehow an impact on the environment, that is why the importance of the development in this work, identifying the link which most contributes to environmental degradation is important to take measures to mitigate the current problems and seeking to improve quality of life for all living beings.

Given the seriousness of the environmental damage and therefore the damage that human being is causing by the emission of gases generated by the combustion of hydrocarbons in industrial and logistic processes, especially in the processes used in the imports and exports are developed by transport means like sea, air and land, the geographical impact caused by the construction of roads used for transportation of cargo and people and ignorance of the people by the desire to grow apace as the economy grows, It seeks to argue the cause of environmental degradation and human deaths.



### **2.3.3. Personal Justification.**

The importance of the development of this research work is to consolidate the acquired knowledge during our learning process, selecting a topic according to the pillar of knowledge, international business and through the exploration of database to extract information from previous studies regarding our theme, "the incidence of the International Logistics in the current environmental problems" and based on this research to identify strategies that can be implemented in our labor sphere.

## **2.4. Objectives**

### **2.4.1. General Objective**

To determine the impact of international logistics processes that influence in the pollution of the environment.

### **2.4.2. Specific Objectives**

- To identify in the international physical distribution chain, the links or components of this process that most affect the environmental deterioration.
- To analyze the customs normativity and existing agreements aimed to the environmental protection.
- To propose Good Practices of Social Responsibility facing the IPD outside of the contamination

## **2.5. Methodological Framework**

### **2.5.1. Deductive Framework**

For the development of this work degree the deductive method was used, as through a scientific research information from different authors and related environmental problems studies was collected, the processes involved in international logistics, the impact generated by this these problems in the environment and practices of corporate social responsibility that aim to mitigate the current event, based on individual cases that highlight the issue so in that way to conclude that tools can be implemented to the international supply chain generates a plus, pointing to the improvement of the environmental conditions.

### **2.5.2. Methodology**

First, to develop the method was investigated stages of trade that are involved in the international logistic, from the beginning to the end of the supply chain. This information was collected from the theory regarding to the logistics in order to determine generally which one of these steps have contact or direct relationship with the environment. Subsequently the main techniques of international logistics stages that are related with the environment were investigated.

Similarly, the existing regulatory framework in Colombia regarding the protection and preservation of the environment was discussed. Then the official sources such as the Inter-American Development Bank (IDB), DANE, the Ministry of Environment, among others were consulted to establish a direct relationship between the techniques of international transport, storage and distribution of items of trade with the environment. In this way it could be determined which techniques are more risky for the environment and which are not.

Finally, a scanning of new techniques International Logistics which already are heading to protecting the environment and saving natural resources was conducted, in order to propose sound environmental practices regarding to the international physical distribution outside of the pollution.

## **2.6. Scopes.**

In this research the ongoing analysis of the impact of international logistics on the environmental impact will be made. Given that the current problems of environmental pollution, does not have an exact start date, it is possible to say that an indication of this was begun with the start of the industrial revolution, then there were several events that contributed to this negative impact to the environment, since the need of development and evolution took to the man to the invention of new techniques for exploitation of natural resources, unfortunately, at that time there was not a study that considers the possible consequences that all this "evolution" would bring.

Because of this, the scopes of this project reach the point where a balance between existing damage to the environment and how the international logistics can work proactively be found, even though this problem is and probably will be dormant for the next years.

### **3. Project Implementation**

#### **3.1. International Logistics Chain**

Logistics is a key to the successful development of international business process, the implementation of efficient chains supply, with an excellent road infrastructure, port and with transportation ideal means for moving different cargoes is vital to the success of the internationalization. Commercial trade between countries is linked to a step of a process that aims to reach the final consumer, a product or service that travels from one country to another.

The analysis of each one of the links that make part of the IPD allows to continue with improvements that make it possible to minimize costs, time, risks and contribute to sustainable economic development, identifying which link can generate greater impact in economic, social and environmental and what measures can be taken to address the different challenges that is facing daily international trade.

The supply chain is a continuous cycle in the development of industries, beginning in the planning of procurement of raw materials, which in many cases are imported, initially affecting the IPD for obtaining these inputs or raw materials through a second stage which is the production, continuing with packaging and storage, leaving as a result the finished product ready to cross borders and meet the overseas demand.

At this point in the logistics chain merchandise the cargo is prepared with all physical and documentary requirements that require customs to leave the country, in which the IPD meets the main role to ensure that the goods arrive in excellent state to the final consumer, through international freight forwarders goods are moved from the warehouse or store of the company of origin to a port, airport and finally moved to the country of destination.

### **3.1.1. International Supply Chain Links:**

-Planning and purchase of raw materials and packaging materials: Planning and material purchase either raw material or packaging material, requires a rigorous and overall planning costs and profit order, so that the above can take shape without mishap, it is required to control and meet the needs of raw production materials, inventory levels of raw materials, purchases of raw material, based on a detailed budget specifying the quantity and cost of needed materials, and a related budget of the raw material purchases (Osiris Almanzar, sf).

For a proper planning and buying it is necessary to have a budget commensurate with the price of materials and finished product, including the costs of packaging materials. Being clear about this, the excess of inventory of raw material or the lack of it is avoided, which in both cases are very expensive.

-Production: The production phase is one of the most important links, as it is where the product is to develop fully, besides of being the stage at which the materials or supplies that are used for the preparation of it, can generate damage to the person that is manufacturing it, as to the environment, due to various factors, may be the decomposition of hazardous chemicals at high temperatures, combination of elements, input processing, etc.

Similarly, production may be small, medium or large, depending on the demand of the product, since it is well known that it is not recommendable to fill the market with a product that lacks of demand, because it generates losses or damage to the product it, that is why the link above is necessary, because also in the purchase planning of materials, is where the market is analyzed in general pointing to sectors which the company want to dive and develop all marketing and sales phases.

-Packing, packaging and storage. (Documentary Preparation): This link is split into two, packing and packaging and storage, in order to a better explanation of everything about them. The packing consists in packing goods "in-pack", it means in intimate contact with the package that contains the product and also to dose and present it as required by the market, so it has an important purpose of "marketing" (Molins, 2011 -2012). The term of packaging is to place "on-bale", it means in a bundle or package to protect it during the transport (Molins 2011-2012).



The benefits of packing and perfectly packaging product or merchandise are several, among which are, protect the product during long transports, to facilitate its handling and reception by common or normal means, to obtain a balance between cost and quality protection, facilitate the identification of the goods with standardized labels or dangerous goods, facilitate customs inspection, reduce risks to people, among others that are necessary for an efficient transport.

According to the packing and packaging of the products will be the results in the delivery to the consumer, it is imperative that their physical condition will be optimal, according to the characteristics of the goods, equally it is necessary the knowledge of the potentials of the same product, for example, wood should be free of knots as far as possible on its packaging and should present a low degree of humidity; meanwhile the paper has as an essential feature, the "weight" is the weight in grams for themselves so in that way to establish barriers that can run against liquids or gases, each material has its specifications should that have to be considered for improvement in the process of packing and packaging of goods.

Storage, this is one of the phases can be performed at any stage of the transport, it may be necessary to store the goods either to large or short periods.

The Storage generates additional costs, making necessary the deliveries scheduling to the final consumer, on the other hand, if the storage is prolonged could generate damage to the goods, so it is necessary, schedule carefully and rigid deliveries and meeting the product specifications, it means whether it supports open storage, temperature specifications, lifetime, etc. To complement it is important to explain the most common types of stores, these are:

1. Of gravity: the rotation of the products is according to the FIFO system (“First in, first out”), it means, the first stored products are the first products in coming out.
2. Dynamic: it’s an evolved branch of the previous system in which are used separators and restraint systems.
3. Semiautomatic: it combines the interacting of motorized storage means like barrows and trans elevators with a control system operated by humans.
4. Automatic: these systems apply the most modern informatics and robotics development systems, they are guided from a control bases that recognizes available spaces, products characteristics, delivering priorities, purchase orders regulation, etc.

In order to establish the ideal storage it is required to take into account certain parameters: Headroom to the trusses, network systems against fire and fireproof bulkheads, tilting springs and protected from the weather, floor resistance, shelving system (compact, conventional), trilateral or self-supporting systems, barrows, beach area, preparation area, area returns, cold rooms, offices adaptation, information systems, security systems, switchyard. The correct evaluation of the product will indicate the required store in order to preserve its conditions (Molins 2011-2012).

The documentary preparation consist in to stipulate and declare all merchandise that will be transported abroad, for that is necessary to buy transport insurance policies, in order to protect the goods, in the same way it's necessary the legalization of all items or products with payment of customs duties of both the country of origin and the country that will receive the goods.

-Land transport to port, airport or origin country: The transport refers to transfer cargo from one place to another, transport itself can develop in different ways, by sea, road, rail and air, all these are used for transport of goods in the international physical distribution, the most used by factories and businesses to forward goods to ports or airports is the land by land, however there are cases where transport is given through railways which have more space, besides being fastest in delivery times.

This link impacts directly in a negative way on the environment, as 95% of the trucks, forklifts, trucks or cars driven with gasoline, diesel or compressed natural gas generate CO<sub>2</sub>, and other toxic gases that impact to general population and environment, these fossil fuels are responsible for much of the pollution in many cities worldwide. According to the above companies that implement DFI transport their goods almost daily, so the environmental impact is greater, as to the large emissions of CO<sub>2</sub> in the air; according to the natural cycle these toxic gases reach the atmospheric layer worsening the current contamination situation.

-Unload of cargo at port or airport in the destination country: This stage of the international supply chain is important and requires care, especially for those goods that require especial manipulation, so the packing and packaging of the product at shipper's warehouse play an important role, because in many circumstances, qualities and thermal, environmental and physical qualities do not match between the exporting country and the importing country; in addition the white paper specifications make the storage in yards or ports be consistent and appropriate to the needs of the goods.

-Land transportation at destination country: like the transport at origin country, it has a negative impact on the environment by the same reasons of fossil fuels, although worth clarify that in several countries, it is being developing freight transport using through vehicles that generate 70-75% less pollution in the environment, undoubtedly that is a significant reduction, contributing with agreements in many international conventions and protocols already agreed, but not yet showing tangible results.

-Unload of goods at customer's warehouse: it can be set as the link that defines the whole process of international supply chain, as it is where the customer or consumer tests all specifications and product features, it means that final client will evaluate all the features that the product or merchandise promises.

The importer is responsible for verifying that the product is in perfect condition to be marketed and also is responsible for giving the approval to the product. In this phase, is where the logistics ends and begins reverse logistics regarding to defective products, supplies, raw materials from the consumer to the producer, containers, packaging, goods with excess inventory, etc..

Based on the above explanation, it is remarkable that the links that most affect the environmental deterioration is basically the transport at the origin country, at the international section and at the destination country due to the high CO<sub>2</sub> emissions generated by vehicles used and powered by fossil fuels, on the other hand, they also generate a negative impact on the environment, when the process of production of goods uses chemicals exposed to high temperatures, toxic gases are emitted, also the combination of products or elements cause pollution and health damage to the people and the environment in general.

FIGURE

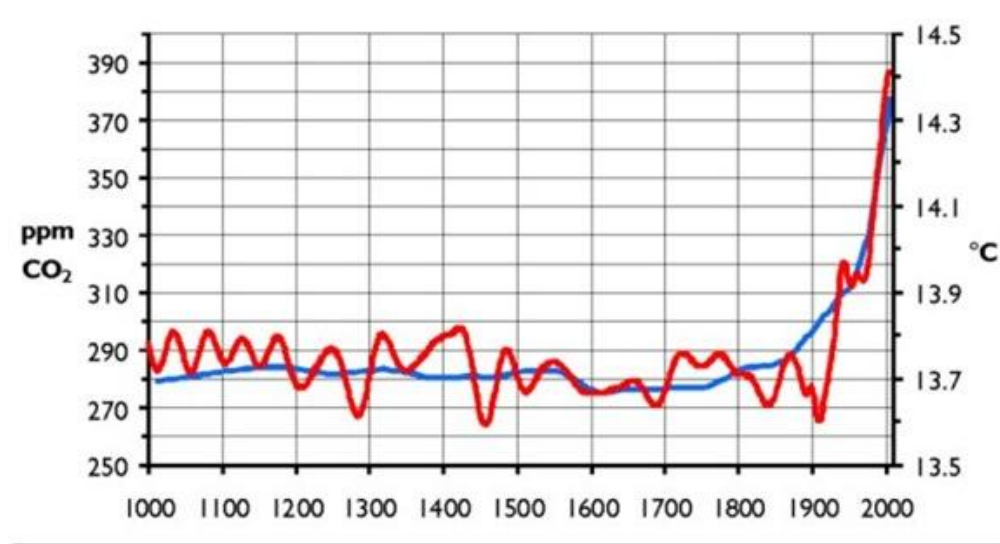


Figure 1. This graph shows the relationship between the concentration of CO<sub>2</sub> (blue) and temperature (red) during the last one thousand years. The relationship between them is evident. In the recent history of the planet there were no such high levels of CO<sub>2</sub> as the existing nowadays. Concienciaeco. (2012). Recovered from <http://www.concienciaeco.com/2012/02/20/que-es-el-co2/>

### **3.2. Customs Conventions Rules And Agreements Aimed To The Environmental Protection.**

- INTERNATIONAL.

- ❖ Law 24,051, through which it is legislated about hazardous waste generation, handling, transportation and treatment. This law is from the Argentine legal system, in which an articulated is introduced aimed at the preservation of the environment regarding to the hazardous waste. The law can remove the need for handling, transportation and treatment of hazardous waste in the Argentine country, it is required an environmental certificate ceilings and quantities of hazardous waste that can handle, transport or try to express themselves. Also in the third article of the same, importation, introduction and transportation of all types of waste from other countries is prohibited (Argentina, S. F.).
- ❖ Kyoto Protocol: The Kyoto Protocol allows operating the United Nations Convention on climate change issues; the protocol commits 37 industrialized countries and the European Union, to stabilize emissions of greenhouse gases, as these are the mainly responsible for the high levels of greenhouse gas emissions as a result of burning fossil fuels for more than 150 years.



The Protocol has prompted governments to establish laws and policies to meet their commitments, companies have the environment in mind in making decisions about their investments, and has also led to the creation of the carbon market (UNITED, sf) .

- ❖ International Convention on Liability for Damage Caused by sea water pollution with hydrocarbons (1969) and protocol "CLC 69/76 (1976): This agreement was ratified by the Colombian Congress, in this is expressed all the liability for damage caused by water pollution with hydrocarbons, in this sense, protects the environment from those carriage of goods by cargo ships (Colombia nd).
- ❖ Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal. Basel, 1989: Through this agreement, control of hazardous wastes and their subsequent disposal is limited, in order to reduce the quantities of such wastes because they directly affect people and the environment, just as is It limits the transport between these countries and is only possible, following a ruling of the country, whether to accept the import of wastes or not.

- NATIONAL.

- ❖ Law 9 of 1979, by which sanitary measures are dictated: In this law, the Colombian legislature exhibited different measures for situations that threaten the environment, similarly emphasis on solid and hazardous waste is done, restricting their use (Colombia, Senate of the Republic, nd).
- ❖ Law 430 of 1998, by which measures are issued on hazardous waste.
- ❖ Law 491 199, for which the ecological insurance is established, amending the Criminal Code and other provisions: The object of this law is to create ecological insurance as a mechanism to cover the quantifiable economic damages to persons determined as part or as a result of damage to the environment and natural resources and reform the Penal Code with regard to environmental crimes (Colombia, Senate of the Republic, nd).

### **3.3. Friendly Practices With The Environment.**

The IPD involves the implementation of practices that affect the environment in medium and large scale, threatening the biodiversity of the planet. It is necessary to clarified that through the globalization planet earth was joined in one world, and the implications that exist in an area of the planet will be reflected the opposite area, just as happens with the environment but obviously not because of globalization, nature is one area and if there is an environment damage at the European continent the consequences in America, Asia, Africa and Oceania will be seen.

In fact, the long periods of summer, winter are causing damage in populations, deaths, low economies of the countries that suffer, damage to biodiversity, and these consequences are the result of the damage to the environment.

It is a consequence of industrialization and globalization, high levels of contamination that exists globally, since the excessive consumerism, unbridled capitalism and the violent industrialization make the daily environment deteriorate, that is why through this work, some ideas that would improve the irresponsible practices executed by many industries, especially in the field of IPD are expressed.

One of the proposals mentioned in the work, is the propensity of a mind with social responsibility, everything starts from the minds of people and their desire to make wealth, in this way the economic growing has to be consequent and linked with friendly practices with the environment, it means that within the parameters of the industry will be a priority the environmental approach.

The development of biodegradable packing and packaging materials, so that when they been deposited in loading and unloading areas of waste, the decomposition be in less time on Earth and not like plastics packaging that last for many years. Of This way, the ground is not saturated with chemicals and toxics that make it later in a sterile ground. Another urgent clean practical for the many industries a Global Level, is the use of electric vehicles for the transport of goods by road, which is the link of the chain with more participation in the global contamination. Besides of automotive companies that are developing cars powered by clean energy, this kind of energy reduces the emissions of greenhouse gases and CO<sub>2</sub>, which are the main Atmospheric pollutants.

And In addition to electric cars it's necessary to develop in the Industry green areas using solar panels Eolic plants. so in that way the energy from the solar panels or Eolic plants can be used to charge the electric cars avoiding the consume of energy from the thermoelectric plants. Both area excellent options to reduce operating costs and reduce the impact associated with the use of thermoelectric for power generation.

On the other hand, everything related to the loading and unloading of goods, pallets and shelves are produced from recyclable material; either with cardboard or resistant polyethylene, in that way the deterioration of these is smaller and may have a longer life.

FIGURE

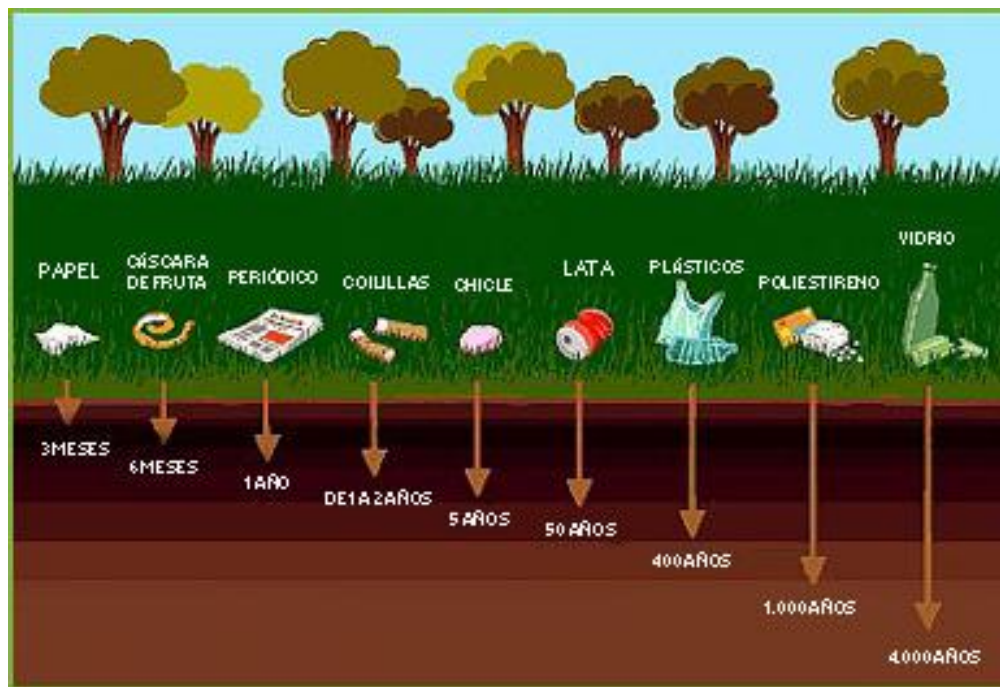


Figure 2. This figure shows the number of years needed to degrade different materials into the ground. Recovered <http://www.cienciapopular.com/ecologia/degradacion-de-la-basura>

FIGURE

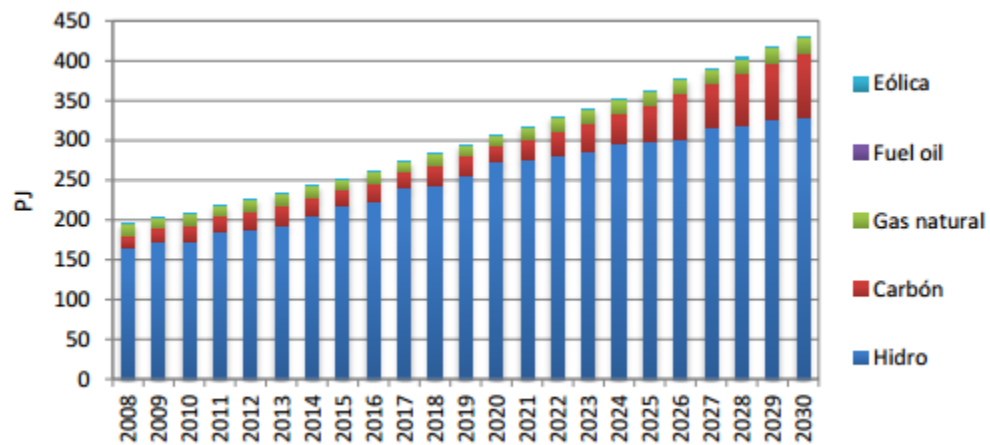


Figure 3. This figure makes a projection of demand for power generation by source the years 2008- 2030. FEDESARROLLO, 2011. Recovered [http://www.fedesarrollo.org.co/wp-content/uploads/2011/08/WWF\\_Analisis-costo-beneficio-energias-renovables-no-convencionales-en-Colombia.pdf](http://www.fedesarrollo.org.co/wp-content/uploads/2011/08/WWF_Analisis-costo-beneficio-energias-renovables-no-convencionales-en-Colombia.pdf)

### **3.4. Current Environmental Problems**

The environmental problem has persisted for decades, because of a number of committed acts without considering the consequences that would follow, affecting in general the whole planet earth and indirectly its various sources of revenue which holds the society. The global demand in the market and the excessive consumerism that does not take into account the relationship between offer and demand, and in turn the production practices of processing of products have measurable results that will impact the natural resources and culture of the countries worldwide.

The emissions related to the processes of international physical distribution apart from the climate change may exacerbate the effects of air pollution on the health of human beings, not only indirectly by the impact on weather phenomena but also immediately by the direct effects of pollutants on health. However, for too many years the efforts in most part of the world have been addressed to these problems separately. In fact, very often it is considered that the benefits of climate protection would be obtained health long term.

Opposite to this, what has been revealed in recent years is that actions to reduce greenhouse gas emissions would result in beneficial short-term effects due to reducing the impact of air pollutants on the health of citizens.

The possible risks of the pollutants most related to climate change, such as ozone or fine particles are present.

Given the uncertainty and unknown on the subject, in this paper, the main implications for policies on the issue are raised, as well as research needs. In this sense, both from the point of view of surveillance and research, the establishment of a system of epidemiological surveillance of the effects of air pollution and its relation to global changes is considered necessary (Ballester, S. F.).

One of the consequences of bad habits in the care of the planet is the melting of glaciers due to the high temperatures that are taking place day after day. On the other hand is mining, which causes ecological degradation affecting the productive land it lost its production capacity. Continuing with bad habits in caring for the planet, it is also the accumulation of radioactive waste.

Currently transnational corporations are increasing freight handling capacity worldwide in order to supply the high market demand, leading with this increase of products the increase of CO<sub>2</sub> emissions.



Another factor in this problem is the road infrastructure, which are building more lanes in order to optimize delivery times of goods or supplies, influencing the positive development of national market versus international market, thus bringing greater competitiveness and strengthening in the economy.

Operations of national and international physical distribution generate direct consequences on the environment, among which air emissions, liquid effluents and solid and hazardous waste, in addition to the abundant gas emissions, not only in the international physical distribution or transport processes but also in the adequacy of pathways.

In recent years industries have become concerned about environmental issues, seeking to minimize impacts on the environment, communities and people. Among the major proposed strategies are the Environmental Management Systems (EMS), its application allows to improve the environmental performance of enterprises and achieve their economic goals as it focuses on the pursuit of sustainable development under an eco-efficient scheme.

In this paper some environmental strategies adopted by companies considered leaders in the international arena are reviewed. It is concluded that only companies whose management or directors is committed to the proposals made in its policy have succeeded in implementing the proposed systems.

Not enough to make the decision to develop a certifiable system, also it must be assumed as a fundamental part of the business under strict control and constant improvement can become in the key to increase productivity and competitiveness of the company (Carolina Gederite Mozur).

Speaking of economics and development it cannot leave behind the issue of the production and extraction of petroleum and its role as the great ally of the impact on international physical distribution, not only throughout the production process is great environmental destroyer, but the current importance in the propulsion of much of the means of transport, this fossil fuel is being highly used by aircraft, marine, land ships and machines used in logistics, such as mobile cranes LHM400, reach Staker, LMT 109551-51, forklifts, feathers, container stacker Rubber Tired Gantry HTG, etc.

The petroleum industry is the main pollutant of the environment, due to the processes or methods developed for exploitation, transport, distribution and use, mainly by solid and hazardous waste produced in such operation (exploration, production, mining oil industry and international transport), generating a negative environmental impact, because although they have known many cases where well control where scanning is performed is lost, thus generating oil spill, and these hydrocarbons directly affect life, extraction area and local wildlife (Oil extraction and conservation of biodiversity, 1999)

In most cases, the ending of the removal process in normal conditions goes to the next step which is the transport industry; this industry put its grain of sand helping to contaminate the environment releasing CO<sub>2</sub> in the atmosphere, as it is used in sea, air, railway means powered by fossil fuel, needed to perform good logistics and international physical distribution.

Petroleum exploitation is given by different methods, taking into account the type of deposit to explode and the type of oil to be extracted, among other factors that should be studied for extraction thereof, at present there are processes worldwide known such "fracking" (hydraulic fracturing), this process has been used actively as it reduces costs and is more efficient, there are cases where it is done with artificial groundwater recharge, pumping stations, among others.

When cases of oil spill in sea areas are presented, not only dying fish and birds, but also affected all existing water sources, the communities that consume water connected with the areas of spill have not very positive affectations reactions on the health, on the other hand, societies that inhabit the coast and base their economies on maritime resources are also affected economically, as these resources decrease significantly by spillover effects being the case (M, 2004 ).

### **3.4.1. Corporate Responsibility Practices**

Companies engaged in international physical distribution and committed with the daily improvement on their processes aim their efforts toward a clean production, in order to gain participation in the global market, and most important to be accepted by market which is every day more conscious in the effects of environmental contamination ; in the same vein this market has begun to require cleaner processes or at least processes that guarantee that the purchased product was made following production techniques friendly with the environment or at least that the impact on environmental pollution in terms of used raw materials be the minimum, these principles must be ethical and of course welcomed by the law.

Friendly production techniques with the environment, responsible and committed show the part in which companies provide in order to solve the problems of the environment and thereby form credibility and consumer confidence.

Thanks to this, companies that meet the settled objectives will get a higher opening in different markets, acquiring greater sustainability in time and thanks to the reliability generated by implementing of such strategies.

Given the need for Colombian companies to get new markets through global expansion strategy, the relationship between business and society has become in a priority.

This new relationship with society includes concerns and actions related to sustainable development, the formation of social capital, and what is known as Corporate Social Responsibility -CSR- which include awareness by companies of a long term, considering not only building value for shareholders, known as shareholders-, but for all directly or indirectly related stakeholders with their influence environment. (Giovani Perez)

Currently, are being found ways to give continuous improvement to the companies processes to ensure success and in turn creating a bigger point of view concerning to the environmental protection. These processes must be measured; evaluated and consistent compliance with the standards required by the international protocols regarding to corporate social responsibility CSR. This seeks that suppliers and end consumers contribute with their functions to improve the quality of the environment and be proud of working within these organizations.

Thanks to the globalization not only economic liberalization occurred, but also was given the opportunity to form systems that generate a positive impact in the environment; the globalization also allows to demonstrate the improvement in the quality of life of citizens, and good practices environment in order to make good use of natural resources to promote their preservation, avoid excessive use of them and thus improve the quality of soil, air and water.

In this management model, the environmental issue arises; due that employers must design policies aimed to seek the protection of the global environment, and promoting the use of natural resources rationally, especially those nonrenewable becomes.

This corporate action is a result of aspects such as the pressures of different consumer groups, private institutions, NGOs, and governments, the new rules of respect to the environment including ISO 14000 and ISO 26000 and awareness of employers and employees to be responsible with the environment, which is materialized with the formulation of strategies for Corporate Social Responsibility. (Perez, Giovanni; Bedoya, David A, National University).

#### **4. Findings**

This chapter aims to clearly explain the findings in this project. The main finding is the environmental problem that exists on planet earth, as a result of various factors in industrial sectors, as: freight industry, tourism industry, aerospace industry, mining industry, technology industry, petroleum industry, among others.

When these industries perform their basic functions generate damage to the environment, either by the production of greenhouse gases, CO<sub>2</sub>, hazardous solid waste, radioactive waste or pollution and soil sterilization; this damage has direct consequences on the population, fauna and flora of the planet. Also, it is necessary to discuss the world economy, which in recent years has been controlled by petroleum; this last is an essential economic indicator for growth of the world's countries.

Similarly, another important finding was set the negative impact generated by certain links of the international supply chain on the environment. In the course of the investigation were found gaps and possible solutions to practices that are used today and which directly affect the nature, these problems can be solved using other methods that are as efficient as the previous methods and not adversely impact the environment planet.

## **5. Conclusions and Recommendations.**

### **5.2. Conclusions**

According to the carried out study and investigations, it was concluded that through the chain of international physical distribution damage occurs to the environment, because when some of the links that compose the chain are executed releases chemical particles in the air and water generating environmental damage.

Similarly, it could be analyzed that perpetrators of these damages are industries, which are the textiles industry, the mining industry, the oil industry, the automobile industry, the technology industry, the tourism industry, among many others; contributing to environmental degradation through its international physical distribution processes, and in most cases these industries have no conscience about the done damage to the environment.

Based on the above, it can be stated that for the improvement and environmental recovery should raise awareness in the industry and in the general population, and proposing that industrialized countries legislate and ratify international conventions aimed to practice corporate responsibility, because the increase of global warming and climate change are a direct consequence of the irresponsibility that exists in the world's industries.



As a result of global warming, the poles are being melt, the ozone layer is been destroyed and there is a greater aquifer contamination, which prevents the reproduction of many aquatic species, as well as the decrease in oxygen production because the marine plants are the largest producers of this resource.

It is also necessary to stress in both economic and environmental benefits that entails the implementation and use of alternative energy either solar or wind, which generate clean energy, positive impact on ecosystems, biodiversity, and of course on planet Earth.

It is also necessary to state that it has been emphasized in the creating of new and existing laws, agreements and protocols at national and international level, in which have been settled standards for environmental protection, standards and protocols in different aspects that can be developed in international physical distribution.

### **5.1. Recommendations**

To understand in a clear and substantial way this project is mainly known about albumin and concise concepts like "international logistics", "environmental current problems" to understand the existing relationship between them; what are the reasons by which the positive development of one of those affected the other one and what kind of parameters has to be taken into account for an effective and constant change during the time.

By last it is important to take into account what we know as "globalization" to understand that the success or failure of any business or industry depends directly on it.

## Bibliography

A, G. M. (2009). Relaciones entre el tratado de libre comercio de Colombia con Estados Unidos de America y los acuerdos multilaterales ambientales . *Revista colombiana de Derecho Internacional*, 7.

Argentino, C. (s.f.). *Derecho UBA*. Obtenido de <http://www.derecho.uba.ar/academica/derechoabierto/archivos/Ley-24051-Residuos-Peligrosos.pdf>

Ballester, F. (s.f.). *Gaceta Sanitaria*. Obtenido de <http://www.gacetasanitaria.org/es/cambio-climatico-salud-publica-escenarios/articulo-resumen/S0213911106715801/>

Carolina Guéder Mozur, D. D. (s.f.). Bogota, Colombia: Universidad Nacional de Colombia .

Colombia, C. d. (s.f.). Obtenido de [http://www.upme.gov.co/guia\\_ambiental/carbon/gestion/politica/normativ/normativ.htm#BM3\\_\\_Legislación\\_internacional\\_adaptada\\_](http://www.upme.gov.co/guia_ambiental/carbon/gestion/politica/normativ/normativ.htm#BM3__Legislación_internacional_adaptada_)

Colombia, C. d. (s.f.). *Senado de la Republica*. Obtenido de <http://www.redlactea.org/wp-content/uploads/decretos/L9.pdf>

Colombia, C. d. (s.f.). *Senado de la Republica* . Obtenido de [http://www.secretariasenado.gov.co/senado/basedoc/ley\\_0491\\_1999.html](http://www.secretariasenado.gov.co/senado/basedoc/ley_0491_1999.html)

Definiciones. (s.f.). <http://definicion.de/logistica/>.

Giovani Perez, D. B. (s.f.). Bogota, Colombia: Universidad Nacional .

M, C. (2004). Troubled waters. *Petroleum economist* .

Molins, A. (2011-2012). *Logistica Internacional* . Escuela Organizacional Industrial.

Montoya, R. A. (2010). *Scielo*.

Oil extraction and conservation of biodiversity . (1999). *Oilwatch*.

Osiris Almanzar, D. V. (s.f.). *Prezi*. Obtenido de [https://prezi.com/zwi4dc9w\\_a5o/planificacion-y-control-del-uso-y-compra-de-materiales/](https://prezi.com/zwi4dc9w_a5o/planificacion-y-control-del-uso-y-compra-de-materiales/)

Rojas Aguilera, S. S. (2006). Residuos solidos domiciliarios. *Revista Ingenieria Industrial* , 77-87.

Salud, O. M. (2014). *Media Center*. Obtenido de <http://www.who.int/mediacenter/factsheets/fs313/es>

Significados.com. (s.f.). <http://www.significados.com/globalizacion/>.

UNIDAS, O. D. (s.f.). *ORGANIZACION DE LAS NACIONES UNIDAS*. Obtenido de [http://unfccc.int/portal\\_espanol/informacion\\_basica/protocolo\\_de\\_kyoto/items/6215.php](http://unfccc.int/portal_espanol/informacion_basica/protocolo_de_kyoto/items/6215.php)