2016

A Review of the Dominican Cocoa Industry: Determining Advantages and Factors to Improve

Glorianni Viviana Estrella
Louisiana State University and Agricultural and Mechanical College

A REVIEW OF THE DOMINICAN COCOA INDUSTRY: DETERMINING ADVANTAGES AND FACTORS TO IMPROVE

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural & Mechanical College
in partial fulfillment of the
requirements for the degree of
Masters of Sciences

in

The Department of Agricultural Economics & Agribusiness

by
Glorianni Viviana Estrella Espinosa
B.S., Pontificia Universidad Católica Madre y Maestra (PUCMM), 2013
August 2016

ACKNOWLEDGEMENTS

I would like to express my gratitude and appreciation to the people who have supported, guided, and helped me throughout the journey to complete this master's degree program.

The committee members of my thesis research are one group of these people. I sincerely want to thank Dr. Philip Lynn Kennedy, my major professor who has guided me along the way. I will always be thankful for his patience and determination, and for telling me I was going to make it, even when all my hopes were lost. I express my gratitude to Dr. Robert Wes Harrison, graduate committee member. His honesty and ideas for the research are extremely appreciated. I also express my warm thanks to Dr. Jeffrey Gillespie, graduate committee member, who was the first professor I took a class with at LSU. He saw me rise from a very difficult time in my life, even if he was not aware of it at the time.

A special thanks to Mrs. Ivana Tregenza, Coordinator of International Programs at the LSU AgCenter. Since the very first day, she has been like a second mother to me, from helping me with any issue related to my scholarship, to staying with me at the hospital when I was ill, to checking up on me every step of this process. I will never be able to repay this woman for everything she has made for me. A word of thanks also goes to my office mate and friend Katherine Ramírez, who has been the best companion in this journey, always helping me with academic and non-academic situations and sharing numerous fun moments with me.

Furthermore, I would like to express my deepest appreciation and gratitude to my parents, for always supporting me in my decisions and for giving the best gift I could ever get: attend my graduation ceremony. I especially thank my boyfriend, Brian Ward, for being an unexpected blessing originated from this experience and for encouraging me and putting a smile on my face every time I was feeling stressed or overwhelmed by academic topics. Lastly, a special thanks to

the Ministry of Superior Education of the Dominican Republic (MESCyT) for funding my tuition and to the LSU AgCenter for funding my graduate assistantship.

TABLE OF CONTENTS

LIST OF ACRONYMS

BID: Banco Interamericano de Desarrollo (Interamerican Bank of Development)

CEDAF: Centro para el Desarrollo Agropecuario y Forestal (Agriculture and Forest Development Centre)

CEI-RD: Centro de Exportación e Inversión de la República Dominicana (Dominican Republic's Exports and Investments Centre)

CEPAL: Comisión Económica para América Latina y el Caribe (Latin American and Caribbean Economic Committee)

DR-CAFTA: Dominican Republic – Central American Free Trade Agreement.

FAO: Food and Agriculture Organization (United Nations)

FOB: Free on Board

ICCO: International Cocoa Organization

IDIAF: Instituto Dominicano de Investigaciones Agropecuarias y Forestales (Dominican Institute of Agriculture and Forest Investigations)

JAD: Junta Agroempresarial Dominicana (Agribusiness Dominican Committee)

MA: Ministerio de Agricultura (Ministry of Agriculture of the Dominican Republic)

SPR: Special Drawing Rights

ABSTRACT

Cocoa is one of the commodities with great tradition and consumption around the world. According to the International Cocoa Organization (2011), the cocoa industry produces billions of dollars at the global level and contributes significantly to the employment of thousands of people in the countries that have acquired relevant consumption habits as well as in developing countries that produce cocoa. The Dominican Republic has been blessed and belongs to the latter group. It is the top eighth producing country worldwide and the second of the Americas (International Cocoa Organization, 2013). According to the Food and Agriculture Organization (2013), the DR has been exporting over 50,000 metric tons of cocoa per year for the past twelve years, which is destined to be used as raw material for industries in other countries. This has been one of the main generators of foreign exchange for years for the Dominican economy (Department of Cocoa of the Dominican Republic, 2011).

In order for cocoa to reach the consumers of products like desserts, dressings, beauty products, etc., it has to go through several stages of the production process (Ministry of Agriculture of the Dominican Republic, 2011). The primary production of cocoa is just the beginning of this process, where the export supply chain has its origin.

There is not a very diverse cocoa consumption within the Dominican Republic. According to the Department of Cocoa of the Dominican Republic (2011), the local industry has been left behind, and it is characterized by the production of mostly chocolate tablets for the preparation of beverages. However, the purpose of this study is not to determine what causes local consumption of cocoa to be so low in the Dominican Republic.

More than 50% of the cocoa producers in the Dominican Republic have an average family income that is lower than US $2.00 (Berlan and Bergés, 2013), which locates them below the line of poverty according by international organisms.

The harvesting of cocoa is extremely important for the preservation and conservation of the environment in the Dominican Republic thanks to the forest cover and the water that originate from the plantations (Inter-American Development Bank, 2015). This is why, although much has been done for the improvement of the industry over the past decades, it is still a necessity that the major stakeholders bring more assistance and investments to contribute to the development of the industry as a way of assuring the steady preservation of the island.

The local supply chain in the Dominican Republic is composed of three major agents: producers, exporters, and industrials (Ministry of Agriculture, 2011). These are responsible for the employment of thousands of workers that work either directly or indirectly with the main marketers of the cocoa beans (Department of Cocoa of the Dominican Republic, 211).

The Dominican cocoa industry has not paid much attention to the primary stage of the supply chain, in terms of life conditions and business and agricultural practices (Berlan and Bergés, 2013). This means that although it has become stronger and better positioned in international markets, further efforts and investments need to made to achieve the maximization of benefits of all the stages of the chain and ultimately, the industry in general.

CHAPTER 1: INTRODUCTION

Over the past few decades, international trade and markets have skyrocketed. As a result of this, competition among producers and merchants has naturally increased. Although competition is good for the development of commerce and trade, in the case of the cocoa industry this competition has caused major stress and difficulties for small producers in developing countries, like the Dominican Republic (Duke, 2012). Some of the main obstacles that cocoa producers encounter is the constant fluctuation in cocoa prices that originate from the behavior of supply and demand and general imperfections in the market due to the greater influence that wholesale and financing companies have over it (Inter-American Development Bank, 2015).

Given this situation, it is imperative for cocoa producers to take advantages of opportunities and assume actions that lead them to achieve greater productive and cost efficiency, with the purpose of being able to compete both internally and externally. The pressure that comes from the global market has to be handled through the improvement of all of the stages of the supply chain of cocoa (Duke, 2012).

For these reasons, the production stage of the supply chain acquires great importance, since it can be used to explain the competitiveness levels, as well as to determine the viability of the cocoa industry in economic and social terms.

A good international trade strategy can help determine and measure business success. As of now, internal strategies for the production of cocoa have been made up as things go, after observing the way international trade has been carried out (Batista, 2009). Although this practice represents one of the biggest weaknesses for the industry, it has at least helped change the way the main stakeholders of the industry think and act.

This and the following chapters will be dedicated to describing the constitutive elements of the cocoa supply chain and the different stages that comprise it.

1.1 General Information

There are several exporting companies in the Dominican Republic. Some of them are Aprocaci, Conacado, Inc., Coopcanor, Cooproagro, Cortés Hermanos, Idepac, José Paiewonsky and Sons, CxA., Munné & Cía., Nazario Rizek, Roig Agro Cacao (Department of Cocoa of the Dominican Republic, 2012), among others that have entered the industry to buy directly from producers, who in previous years would harvest, ferment, and dry the beans and then sell them to intermediaries (Ministry of Agriculture of the Dominican Republic, 2012).

In the past years, Dominican cocoa has gained great popularity in international markets, causing supply and demand to increase significantly (Department of Cocoa of the Dominican Republic, 2011). This strength has helped change the way cocoa was commercialized. In the present, those that purchase cocoa from producers have created organizations that all combined compose the supply chain. Unlike in the past, producers now only plant and harvest the cocoa; they then sell it unprocessed to these new cooperatives, associations, and private enterprises who are in charge of processing the beans (CONACADO, 2015).

Dominican cocoa has been traded internationally for centuries. In fact, there is evidence of transactions between the Dominican Republic and Spain from the sixteenth century. But it was not until 1864 that cocoa became a relevant export commodity in the country (CEI-RD, 2007)

There are three types of cocoa produced in the country: Nativo (Native), Forastero (outsider or alien), and Trinitario (Trinitarian) which can be classified as Sánchez- if unfermented- and

Hispaniola- if fermented. This is the basis of the cocoa market that is currently handled by the aforementioned private enterprises (IDIAF, 2004).

1.2 Problem Approach

There are seasons in which the players that comprise the cocoa supply chain of the Dominican Republic show little interest in trading (Inter-American Development Bank, 2015). This can be explained by many factors that can be both endogenous and exogenous (UKessays, 2013). Examples of endogenous factors are low productivity, lack of access to financing and scarce resources. Some exogenous factors are fluctuations on cocoa prices and the weather (International Cocoa Organization, 1998).

According to CONACADO authorities (2015), the information flow along the Dominican cocoa industry can be defined as average since there are still some elements that slow down and sometimes block communication between players, mainly in the production stage. In spite of this weakness, all the players in general have a fairly efficient communication system with their customers in all of the cocoa producing areas of the country (Duke, 2012). This is excluding producers and merchants that are located in remote places and do not have access to the appropriate technology that facilitates communication (Duke, 2012).

If we talk specifically about producers and farmers, the communication is not very efficient (CONACADO, 2015). The main reason for this is that most producers are small scale farmers and they limit themselves to do their basic duties, which do not include communication (Duke, 2012).

These deficiencies in the information flow have resulted in many cases in which buyers have to look for other producers to purchase from at the very last minute (CONACADO, 2015). Also, the main motivation for buyers is the profitability that a given producer can assure for him.

This relationship is then directly proportional; if the volume of cocoa produced by a given producer is small, so is the relationship between such producer and its buyer. The same happens for producers that have a high volume of output. However, this latter group represents a small percentage of the cocoa producers' population (Department of Cocoa of the Dominican Republic, 2012).

The cocoa exports supply chain has been suffering over a few decades from many limitations and economic, technologic, and investigation weaknesses which are crucial variables of this industry (Inter-American Development Bank, 2015). This is why concrete actions should be taken to help reduce the economic, social, and environmental woes that have been caused by external and internal factors that influence the local production.

Among the external factors, we find that prices in international cocoa markets have recently experienced large fluctuations (International Cocoa Organization, 1998). Also, there is the continuous growth of the land destined to the harvest of cocoa in many of the producing countries, and the growth in production in the major cocoa producing countries like Cote D'Ivoire, Ghana, Indonesia, Nigeria, etc., which results in an oversupply that causes price to fall drastically (Batista, 2009).

One of the most important internal factors is that, according to Tejeda (2013), 50 percent of Dominican cocoa exports come from plantations of cloned and native varieties of trees with low productivity. In addition, most trees in these plantations are over 50 years old, which is past the age in which the degenerative process starts (Tejeda, 2013). The average yield for these trees is of 40 to 45 pounds of dry beans per hectare (Inter-American Development Bank, 2015). The other 50 percent of the land used for cocoa is planted with a hybrid type of tree that yields 75 pounds of dry beans per hectare in average (Batista, 2009).

1.3 Research Questions

1) What has been the behavior of the Dominican cocoa exports supply chain for the past years, after the first efforts to renovate the industry started?

2) Are the economic benefits perceived equal to all the agents that compose the chain?

3) What are the main strengths found within the production stage of the industry?

4) Where do the main obstacles for improvement of the industry lie?

5) What factors represent threats for the industry and could affect maximization of benefits?

1.4 Problem Description

Cocoa in the Dominican Republic is characterized by being harvested in small production units, where this crop is not the only alternative source of income for the families, although it is the most important (Berlan and Bergés, 2013).

The main issues of the chain are presented in the production stage due to the fact that most of the investments made for labor are mostly for tasks like harvesting, pruning, and weed control; when they should be destined to more important activities like fertilization, irrigation, draining, and pest control (IDIAF, 2004). This, along with the aging of the majority of the cocoa trees, the lack of replacements, and the low payments received by plantation workers has affected overall yield and profitability (Berlan and Bergés, 2013).

The cocoa production in the Dominican Republic has increased significantly over the past two decades due to the great demand that this commodity has in international markets, especially in North America, but this is a very demanding market that constantly increases its quality requirements (CONACADO, 2015).

Due to the challenges that the Dominican economy faces nowadays as a result of the Free Trade Agreement "DR-CAFTA" and its participation in other international trade patterns (García, 2009) it is of interest to analyze the supply exporting chain from its foundation, in order to obtain an idea of how production costs and profit margins affect the cocoa industry which is one of the most important elements that support the export economy. Also, both the external and internal factors that influence these elements need to be examined. However, not many recent studies have been developed to analyze such effects and that can contribute to the determination of ways to improve the economic benefits of all the players that compose the chain.

1.5 Problem Justification

Cocoa has had an acceptable performance among the traditional crops in the Dominican Republic, not only because of its contribution to national agricultural production in general but also due to the positive impact that it has on the economic, social, and ecological aspect (National Cocoa Forum, 2001). The cocoa industry helps support over forty thousand families in the country, not to mention over three hundred thousand actors that get direct and indirect benefits from this crop (Current Situation of the Dominican Cocoa Market. Head of the Department of Cocoa at the National Cocoa Forum, 2011).

Cocoa production also helps keep farmers from migrating to urban areas so it supports rural economies (Berlan and Begés, 2013). Furthermore, it contributes to the conservation of the environment, since it helps in reforestation, improves the flora and fights drying rivers. Lastly, it is a crop that can easily coexist with other crops which broadens producers' sources of income (Batista, 2009). This means that such crop is a great sustainability alternative for the environment.

When it comes to international prices of cocoa, alternate cycles are registered due to exogenous factors that are presented in a periodic way. On the other hand, international demand

has a positive rate thanks to the growth in world population and the high preference for this product and its derivatives (International Cocoa Organization, 1998).

The cocoa market and its derivatives are characterized by the presence of several agents that intervene in the production, transport, processing, distribution, and commercialization processes (Department of Cocoa of the Dominican Republic, 2011). All of these stages require study with sufficient rigor to determine how to make production and productivity of this market more efficient.

1.6 Problem Background

According to CONACADO (2012), cocoa was introduced to the Dominican Republic during the last half of the 16th century. It had a slow start due to the low level of development of the country and political instability that characterized the 17th, 18th, and 19th centuries (CONACADO, 2013). However, by 1865, cocoa constituted one of the so called traditional exportable crops, along with tobacco, coffee, and sugar cane (CONACADO, 2013). These crops were foreign exchange generators and basically served as the foundation for the Dominican economy (Department of Cocoa of the Dominican Republic, 2011).

The boom in the American chocolate industry turned Dominican cocoa into a highly demanded product by the U.S (CONACADO, 2013). This served as an incentive to develop the production and harvesting of the crop which increased exports from 2,420 quintals in the year 1880 to 11,777 quintals in 1889 (Hernández, 2005). In figure 1, it is shown the growth in the production of cocoa for a period after the industry had reached stability (FAOSTAT, 2013). This growth remained constant for most of the period, except for two major falls, one in 1998 and the other in 2004. We believe that the cause of the fall of 1998 was a hurricane –Georges- that hit the island

that year, and that of 2004 was triggered by a bankruptcy crisis that was reflected in the Dominican economy in general.

The origin of Agribusiness and the Agro-industry in the past century brought new challenges to the Dominican cocoa system related to aspects such as international trade and food safety (Siegel and Alwang, 2004). In this same order, and according Welch and Luostarien (1988), globalization implies an intensification of commercial relations that are often affected by a series of protectionist barriers to imports and distortions in the functioning of the local market. These factors represent major obstacles for such a fragile and developing industry in a country like the Dominican Republic.

The food system in general has gone through many different phases over the course of history. It was around the second half of the 20th century when business experts started playing with the idea of a global perspective for the industry that was mainly focused on agriculture. Some contributions to this change of paths include the book *The Concept of Agribusiness* by Goldberg (1957) in which he names and describes the players that interact in the practice of agribusiness and the value that such players have along the supply chain, from the farmer to the final consumer.

1.7 Objectives

1.7.1 General Objective

The objective of the study is to describe the Dominican cocoa exports supply chain in terms of its added value, quality of the produce, acceptance in international markets, and social and environmental characteristics. This is in order to identify the specific areas that have the most advantages and those that still need to be improved to guarantee the maximization of benefits for all the players that compose the industry, from producers to exporting companies.

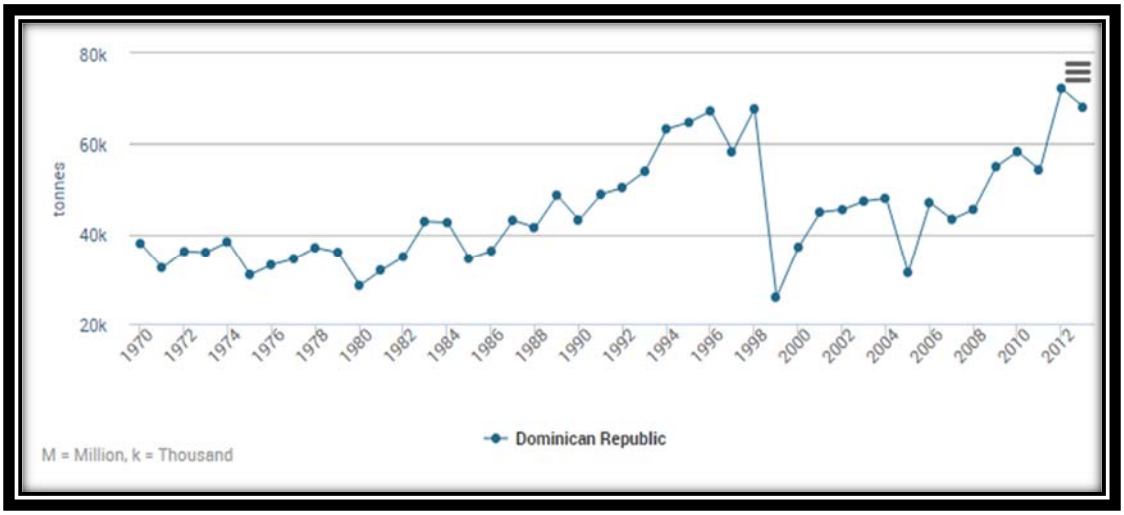


Figure 1. Production of cocoa in the Dominican Republic over the period 1970-2013.
Source: FAOSTAT webpage.

1.7.2 Specific Objectives

The specific objectives include providing a description of each of the stages of the supply chain, to determine the benefits each player obtains, or could obtain. Also, this research seeks to measure the productivity and impact of prices on the profitability and competitiveness of the Dominican cocoa, determine added value, quality of cocoa, and its acceptance in international markets, and identify the external factors that have an effect on prices and production. With this, we intend to identify the location of the specific sources that present the most obstacles within the industry since such obstacles ultimately affect international trade and relations. We also seek to locate the main strengths, weaknesses, opportunities and threats within the production stage, which has proven to be the one that needs the most attention to guarantee an efficient and permanent improvement of the industry as a whole.

CHAPTER 2: LITERATURE REVIEW

2.1 Origin, History, and Distribution of Cocoa.

Cocoa originated in the Americas, more specifically in the area that today corresponds to Brazil (Livingstone, et al. 2012; Wood and Lass, 2008; Knapp, 1920; Gianfagna and Cooper; 2012; CNUCED/OMC, 2001; Chery, 2015). However, it was first discovered when Spanish explorers came to the Americas in the XVI century and arrived at the areas that are now Mexico and Central America (Trujillo, 2010). Ancient cultures like the Mayans and the Aztecs used cocoa to prepare diverse types of foods and beverages (Trujillo, 2010). Back then, the only people that consumed cocoa and its derivatives where the governors or "caciques", who were also considered gods, which is why the scientific name of cocoa *Theobroma* (Theo = god and broma = food) means "the food of the gods" (Origin and History of Cocoa in the Dominican Republic, Cocoa Department, 2002). Also, these cultures used to produce cocoa for the elaboration of drinks and to use its beans as a currency (*SSI Review.* 131, 2014).

Since cocoa originated in Amazonia but was discovered in Central America, one could deduce that the tree propagated quite efficiently in both South and Central America, as well as many other countries that are located along the equator or in tropical areas (Chery, 2015). According to Wood (1961) cocoa most likely spread in South America and the Caribbean – including the Dominican Republic- during the 16th century.

2.2 Exogenous and Endogenous Factors Influencing the Dominican Cocoa Market and its Exports

Exogenous factors are those located outside a given market –in this case the Dominican market- but that still affect this market (Nicholson and Snyder, 2015). Some of these factors are

international prices, global supply and demand, international competition, etc. (International Cocoa Organization, 1998).

According to Nicholson and Snyder (2015), endogenous factors are those within the market and that influence it in terms of production, yield, marketing, productivity, and exports (International Cocoa Organization, 1998). Some of these factors are presented in figure 2. They greatly influence the booms and recessions of a given cocoa market and they work as a cycle because as one factor occurs it causes a reaction that translates into another factor and they are all interconnected. The arrows show the outcome that a factor has on cocoa supply and demand. For example, a market supply surplus causes prices to fall, when prices fall, demand decreases which causes a cocoa recession, and the result of this recession is an increase in prices (Ruf and Siswoputranto, 1995).

2.3 Relationship between Endogenous factors and Internationalization Theories

Endogenous factors are those determined within an economic system and affect the business cycle (UK Essays Website, 2013).

Internationalization was defined by Welch and Luostarien (1988) as the “process of increasing involvement in international operations”. Internationalization theories are based on the idea that the lack of trade of a nation cannot always be explained at the macro-economic level (Hayes and Abernathy, 1980). This means that sometimes the factors that intervene with trade come from within the industry. Some of these factors affect production and productivity levels and result in being obstacles for trade.

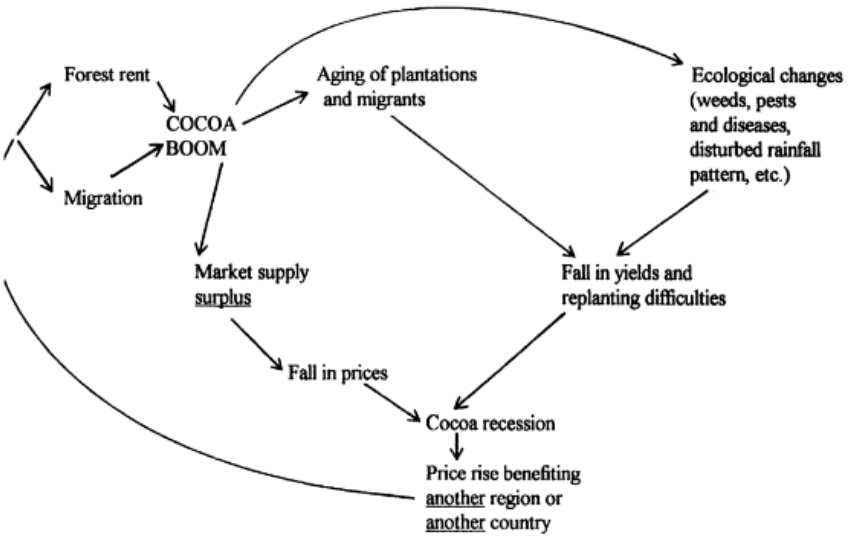


Figure 2. Endogenous model of cocoa cycles. Source: "Cocoa Cycles: The Economics of Cocoa Supply". Ruf and Siswoputranto (1995).

The studies that have been carried out on internationalization try to determine the factors that compose the path of an industry or firm towards international relations and trade, also the different steps that a firm has to follow during the exporting process and the characteristics of export activities of a given firm (Morgan and Katsikeas, 1997). Perhaps, in the Dominican Republic the factors mentioned before come from the producers' level, where the lack of proper education in trade patterns, along with weak communication with other players within the industry, and the low income levels, among other elements, block the efficiency of the export supply chain in each of its stages which ends up affecting overall exports of cocoa (Siegel and Alwang, 2004).

2.4 Social Factors

Although the Dominican cocoa industry has experienced an overall tremendous growth, its farmer population growth has not been directly proportional (Berlan and Bergés, 2013). According to the Dominican 1993-1994 population census, there were around 36,000 cocoa farmers in the country and the last census from 2010 showed this population to be between 36,000 – 40,000

farmers (ONE, 1994 and 2011), which means that not many individuals have joined the cocoa industry as farmers or producers.

The cocoa farmer population in the Dominican Republic is composed of males around the age of 58 or older (Berlan and Bergés, 2013). Most of them own a small portion of land dedicated to the harvest of cocoa and other crops; in 1998 more than 50% of the farmers owned less than 5 hectares (SEA, 1998) and usually have a very low quality of life. Many farmers obtain their total income by combining the production of cocoa with other agricultural goods, because cocoa itself is not sufficient to cover all of their expenses. They also have to rely on the income generated by to their spouses (Berlan and Bergés, 2013). These farmers cannot take full advantage of the production of cocoa on their land because they lack the resources to invest in the improvement of their harvests. Furthermore, they can't find personnel to help them with the chores of their farms (Inter-American Development Bank, 2015).

Other important factors must be taken into account. Farmers often see such factors as risks that counteract their efforts on the production of cocoa. One of these factors is the weather (Berlan and Bergés, 2013). The Dominican Republic is located in a tropical area, where storms and hurricanes are very common. The country has been hit by several hurricanes that ended up affecting agriculture in general. However, crops like cocoa, that for many years were not considered a priority had difficulty recovering from the damage since not many relief funds were targeted to cocoa rehabilitation (Siegel and Alwang, 2004). According to a survey carried out by Siegel and Alwang (2004), producers that had the most damage from the last hurricane that hit the Island, hurricane *Georges* in 1998, were less likely to risk producing cocoa than were other producers that did not have as much damage.

Another point of concern for cocoa farmers are pests and diseases (Berlan and Bergés, 2013). In fact, more than 50% of the farmers that were interviewed by Siegel and Alwang in their survey (2004) stated that pests and diseases was one of their biggest concerns, hence they perceive these as risks.

Lastly, an additional critical factor is the instability that exists with respect to financial loans for cocoa farmers (Siegel and Alwang, 2004). Since cocoa is a seasonal crop, and because most farmers lack land titles for their farms, not many institutions are willing to offer credit since they are uncertain whether farmers will be able to make sufficient profit in order to repay these loans. As of 2004, most of the credit farmers obtained came directly from exporters (Siegel and Alwang, 2004).

These difficulties are major weaknesses that, although affect directly the production stage of the industry, are reflected throughout the rest of the supply chain and block process of continuous growth that is expected by all the players that comprise the industry.

2.5 Public Sector

The Dominican cocoa industry has not received substantial attention from the Dominican government. Cocoa was not considered a relevant crop by any of the Dominican mandates before the 1970s (Siegel and Alwang, 2004) and although many improvements have been made, that culture has not quite been completely abandoned. Most of the help and financial investments that this industry has obtained over the years come from exporters, international organizations, and NGOs (CONACADO, 2015). The governmental institution in charge of the management of the Dominican cocoa sector was the Department of Cocoa in the Ministry of Agriculture of the Dominican Republic (Ministry of Agriculture, 2011). In January, 2004, the Department of Cocoa

became a separate institution from the Ministry of Agriculture when the Dominican Senate promulgated a new measure for the creation of a new institution named CODOCADO, “Consejo Dominicano del Cacao” (Dominican Cocoa Counsil) (Ministry of Agriculture, 2011). This institution has been working as an autonomous and decentralized State agency whose function is to protect and guarantee the interests of all the members of the cocoa subsector. It works in direct coordination with the Ministry of Agriculture and the rest of the institutions in the Agricultural Sector in order to achieve the comprehensive development of the crop, the industrialization and marketing of the bean allowing access to new markets, consolidation of existing markets, and diversification and processing of finished products (Cámara de Diputados de la República Dominicana, 2004).

CHAPTER 3: REVIEW OF COMPETITIVE FACTORS IN THE COCOA INDUSTRY

3.1 Historical Review

The first variety of cocoa introduced to the Dominican Republic around the 1600s was native to the Amazonia, both the species with pink and white beans. Then, other varieties native to Trinidad were introduced during the past century (Batista, 2009). Cocoa started to be planted along the riverside of the rivers Nizao and Ozama, in the borders and slopes of the rivers Yuna and Camú, and in other communities like San Cristóbal, Santo Domingo, La Vega, and Cotuí (Origin & History of Cocoa in the Dominican Republic, 2002).

By the year 1650, cocoa was already being harvested and exported (Batista, 2009). However, it did not last long since in the year 1666, a storm ruined the vast majority of the plantations in the country and those that survived succumbed to an earthquake and several plagues that came later on (Batista, 2009). As a result, the cocoa industry almost disappeared until the year 1720, when the crop started to be developed again with the purpose of starting exports to Spain. This blossoming lasted until 1795 when the Haitians invaded the Dominican territory (CONACADO Website, 2013).

Cocoa trees are normally two to three feet tall and they are grown in the shade, which is why they are planted next to taller trees like cedar, mango, and plantain (Batista, 2009). The average cocoa tree has between twenty to thirty five fruits; however some trees produce over eighty fruits (Batista, 2009). The history and evolution of the cocoa industry in the Americas has been characterized by periods of prosperity followed by depressions, often caused by low prices in international markets or pests and diseases, or a combination of both (Inter-American Development Bank, 2015).

According to CONACADO (2013), when cocoa was introduced to the Dominican Republic, the island was considered a strategic spot since it served as a bridge for the trade between the Americas, Europe, and Asia. The country became the place where travelers would stop when transporting the cocoa fruit that came from Venezuela and other countries (CONACADO Website, 2013).

The introduction of the crop started on the East side of the country and then spread to the South. At first, cocoa was planted on small portions of land but it was still not meant to be exported (CONACADO Website, 2013). The first exports of cocoa from the Dominican Republic to Spain date from the year 1650 (Batista, 2009). The first shipment had six thousand loads of seventy five pounds each. Later on, the Spanish Court ordered that the island had to focus on the production of livestock, which had a negative impact on the cocoa industry. This remained unchanged until the end of the eighteenth century (CONACADO Website, 2013). The national cocoa beans production increased as a result of new plantations and exports rose from 2,420 quintals in 1880 to 11,777 quintals in 1889 (Hernández, 2005)

3.2 Geographic Distribution of the Crop

The Dominican Republic has 2,436,185 tareas dedicated to cocoa plantations (Batista, 2009). These plantations are located in the North Central, North, Northeastern, Eastern, and Central regions (Highlighted in orange in Figure 3) (Batista, 2009). The lands that are planted with cocoa are considered to be the highest quality within the country (Dominguez and Fernández, year unkown). The Northeastern region has the largest production with 61% of the land planted with cocoa; it is followed by the East with 13%, Central (10%), North (9%), and the North Central region (7%) (Department of Cocoa, 1998).

3.3 Distribution Channels of the Dominican Cocoa

The marketing structure of the Dominican cocoa industry is comprised of producers, intermediaries, collectors, brokers, cooperatives, firms, and exporters (shown in figure 4) (Department of Cocoa of the Dominican Republic, 2002). The combined work of all of these players facilitates the delivery of the final product to consumers.

Figure 3. Regional breakdown of cocoa producing areas (highlighted in orange). Source: Batista (2009).

The first stage corresponds to producers. It is comprised mostly by farmers who grow, harvest and store the cocoa beans to sell them to intermediaries, collectors and brokers, which belong to the second stage, these players are in charge of bargaining with farmers to purchase their beans and with exporting and manufacturing firms to sell such beans (Department of Cocoa of the Dominican Republic, 2002). The aforementioned firms handle exports and manufacturing of cocoa based products, that are sold either locally or in international markets. Importers are international

companies who purchase Dominican cocoa for the elaboration of chocolate products (Department of Cocoa of the Dominican Republic, 2002).

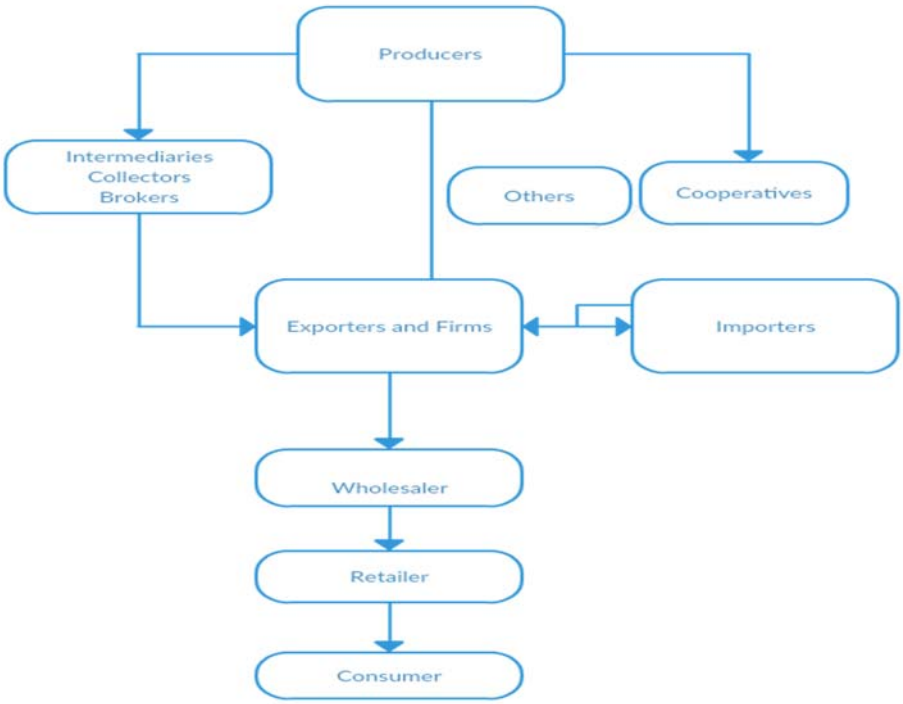


Figure 4. Distribution channels of Dominican Cocoa. Source: Department of Cocoa, 2002.

Since there are no domestically guaranteed prices, the cocoa trading system is a free market. Prices are determined according to the behavior of the Intercontinental Exchange (ICE) (CONACADO, 2013). Thanks to this, the Dominican Republic has been able to sell the majority of its cocoa at higher prices than the average price in the stock market (CONACADO, 2013).

3.4 Economic Importance

This study will help the groups that comprise the Dominican cocoa supply chain to better organize, improve technology and capacity of players, and bring attention to the first stage of the process and raise concern for the life conditions of producers. It will also provide a more in depth

understanding of the level of resource management required for the production of the crop, in order to improve the sustainability of the Dominican cocoa market. Also, the results obtained from the study will allow the direct comparison of the management practices, coordination, and communication within the value chain of principal cocoa producing regions.

Around 36,000 producers harvest an average of 50,000 quintals of cocoa per year (National Cocoa Poll, 1998). This is a major generator of foreign exchange in the country (Department of Cocoa of the Dominican Republic, 2011). In fact, according to the Ministry of Agriculture (2011), the past few years have been characterized by a sustainable growth in the revenue generated by the exports of cocoa. The income corresponding the exports of cocoa in 2005 was US$ 61,955,839.34 and that corresponding to the year 2011 was US$ 188,455,261; as Table 1 shows (Department of Cocoa of the Dominican Republic, 2011). This translates into a total growth in the value of exports of cocoa for this period of 204.17%. In that same order, the volume of exports was 40,615.66 Metric Tonnes in 2005 and 54,683.21 Metric Tonnes in 2011, as shown in Table 2 (Department of Cocoa of the Dominican Republic, 2011). This is a growth of 34.64%, not as much as revenue but still presenting a satisfactory performance. This disparity in growth between revenue and volume of exports is a result of price increases in the international markets, especially Dominican cocoa that has an additional premium with respect to the daily price fixed in the ICE (CONACADO, 2013).

It is important to note that this overall growth has happened in spite of adverse weather conditions that have threatened production. Long periods of drought have directly affected cocoa plantations during times that were critical for the development of the trees (CONACADO, 2013). Luckily, producers have been paying closer attention to their plantations, applying better agricultural practices and a periodic collection of the fruits, which helps controlling and reducing

plagues and diseases (Batista, 2009). Such measures have also helped regulate rats and woodpeckers which are responsible for post-harvest losses (Batista, 2009).

Table 1/Graph 1: Income (US$) generated by exports of Dominican cocoa for the years 2005-2011. Source: Department of Cocoa of the Dominican Republic, 2011.

Years	Income in US Dollars	Annual Growth (Percentage)
2005/2006	61,955,839.34	
2006/2007	86,440,042.49	39.5
2007/2008	99,437,403.23	15.04
2008/2009	162,347,706.96	63.27
2009/2010	174,175,489.58	7.29
2010/2011	188,455,261.56	8.2

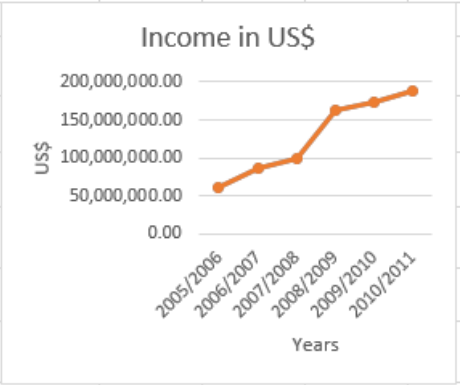
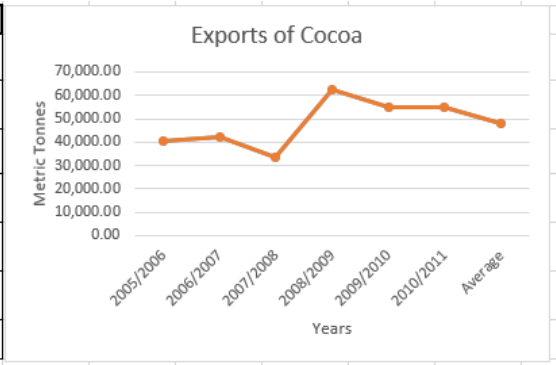


Table 2/Graph 2: Volume (Metric Tonnes) of exports of Dominican cocoa for the years 2005-2011. Source: Department of Cocoa of the Dominican Republic, 2011.

Years	Exports	Annual Changes (+,-)
2005/2006	40,615.66	
2006/2007	42,340.29	4.25
2007/2008	33,602.17	-20.64
2008/2009	62,385.11	85.66
2009/2010	54,756.83	-12.23
2010/2011	54,683.60	
Average	48,063.94	



Among the traditional exporting products, cocoa brings the greatest contributions to the Dominican economy, with approximately 6% of agricultural gross domestic product by the year 2009 as observed in Table 3 (Department of Cocoa of the Dominican Republic, 2011). Its contribution to the agricultural gross domestic product has experienced sudden changes (for

example, from 2.64% in 2006 to 6% in 2009, as shown in Table 3) that are mostly dependent on the nature of the crop. Some of these changes are conditioned to factors including international prices and the weather (Batista, 2009).

3.5 Contribution of the Dominican Cocoa Industry to the Gross Agricultural Domestic Product.

Table 3. Contribution (in percentage and absolute) of the Dominican Cocoa Industry to the Gross Domestic Product and Agricultural Gross Domestic Product of the Country for the Years 2005-2011. This is in Millions of Dominican Pesos (DOP), based on prices corresponding to the year 1991. Source: Department of Cocoa of the Dominican Republic, 2011.

Years	GDP of the DR	AGDP	Foreign Exchange Generated by the Cocoa Industry	Contribution to the GDP	Contribution to the AGDP
2005/2006	1,189,801.90	77,702.70	2,050.12	0.17	2.64
2006/2007	1,364,210.30	81,161.70	2,846.47	0.21	3.51
2007/2008	1,576,162.80	92,297.40	3,375.90	0.29	3.66
2008/2009	1,678,762.70	96,366.80	5,780.89	0.34	6.00
2009/2010	1,901,896.70	109,084.90	6,345.21	0.33	5.82
2010/2011	2,119,301.80	118,040.30	6,948.80	0.33	5.89

3.6 International Prices of Cocoa

The international prices of cocoa are determined according to the prices of the New York and the London Futures Markets (ICCO Website, 2013). These prices are determined through contracts known as “forward contracts” to agree on prices, quantities, and quality of the beans. The final merchandise must be delivered by the contract’s expiration date. It is important to highlight that in the case of futures contracts, sometimes delivery is not necessary. For example, if a seller sells a given amount of cocoa when prices where high, and later these prices decrease, the seller would prefer to buy the cocoa back and not deliver it.

These prices fluctuate in response to factors related to supply and demand such as new plantations, increase in inventory, economic conditions of consumers, income elasticities, etc. (International Cocoa Organization, 1998). Also, prices follow a long-run pattern that relies on the cycle of production of the cocoa that has an average duration of approximately fifteen and twenty years (Flores, year unknown). Something to be noted is that the finest types of cocoa beans are traded in secondary markets and have higher prices than ordinary beans (International Cocoa Organization, 1998). The former type receives a premium price depending on the quality of the bean. This premium decreases when the international quotation of cocoa increases (International Cocoa Organization, 1998).

Although only 3 percent of the Dominican cocoa production corresponded to fine cocoa by the year 2001 (Commerce and Development United Nations Conference, 2001), nowadays this cocoa is among the international cocoas that receive premiums in the New York Stock Market as mentioned before. The reason for this is thanks to the effective positioning strategies that have been applied in recent years. As a result, the Dominican Republic is known for having 40 percent of fine cocoa produced out of its total national produce (Inter-American Development Bank, 2015).

International cocoa prices published by the International Cocoa Organization have experienced constant fluctuations over the last decade. The International Cocoa Organization (1998) establishes that the daily price of cocoa will be the calculated average of the quotations of cocoa futures corresponding to the three nearest active months in the London International Futures Exchange or in the Board of Trade of the City of New York after the London Exchange has closed. The average of the prices of London and New York expressed in US Dollars is converted to its SDRs (Special Drawing Rights) at the appropriate daily official exchange rate between the US dollar and the SDR published by the International Monetary Fund (International Cocoa

Agreement, 2001). The Council decides the calculation method to be used in the case of having only one out the two quotations used available or if the London Exchange has closed. The next three-month period starts the fifteenth of the month prior to the nearest active month in which contracts expire (International Cocoa Agreement, 2001).

3.7 Main Factors that Affect the Prices of Cocoa Beans

Since cocoa is a commodity with prices that are determined on a daily basis in the stock market (International Cocoa Agreement, 2001), such prices are dependent on two main factors: the first one is simply oversupply of the commodity and the second one is of social nature and has to do with the markets in general and diminishing purchasing power of the consumers (International Cocoa Organization, 1998). The economic crisis that has affected developed countries in the last few years has caused great damage to the price of cocoa. When these two factors occur simultaneously, the imminent result is a decrease in prices (CONACADO, 2013).

A good example is the global cocoa production for the period 2010-2011 that surpassed 4,000,000 metric tons, which resulted in a generalized fall in cocoa prices worldwide (Geography Interconnections, 2013). The countries that had the greatest contribution to this oversupply were Cote D'Ivoire and Ghana together, with approximately 60 percent of the world production, as observed in Figure 7 (Geography Interconnections, 2013).

3.8 Social Relevance

The cocoa farmers' population in the Dominican Republic is composed of 36,000 producers who own 40,000 plantations distributed throughout the country (Batista, 2009). Around 300,000 people obtain their income from working either directly or indirectly with the cocoa market (Inter-American Development Bank, 2015). These people work along the chain in the areas

of farming, as intermediaries, exporting, transportation, shipping, and processing (National Cocoa Poll, 1998).

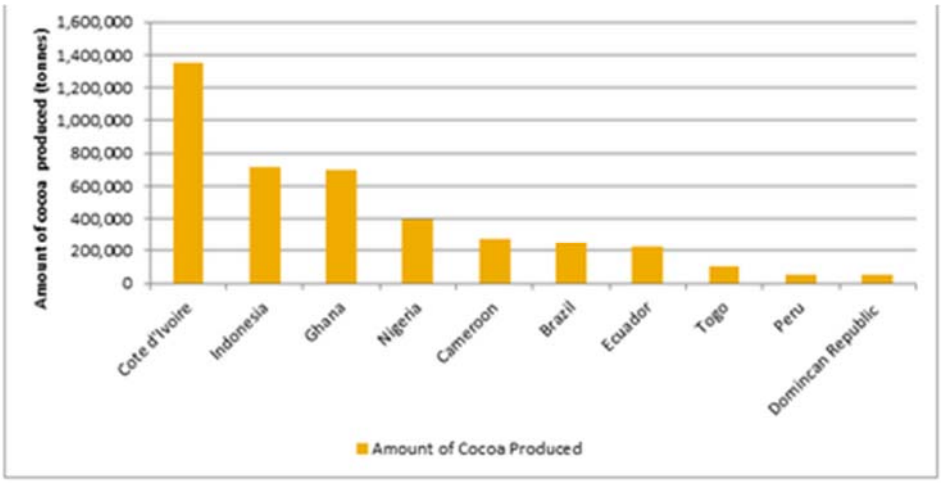


Figure 7: Top 10 Cocoa Producing Countries in 2011. Source: Website "Geography Interconnections: Cocoa", (2013).

Also, and as mentioned before, cocoa farmers in the DR are usually males around the age of 58 or older (Berlan and Bergés, 2013). In Table 1 it is presented the average age distribution of farmers for small (less than 4 hectares), medium (4.1-6.3 hectares), and large farms (more than 6.35 hectares) according to a survey carried out by Berlan and Bergés (2013) among key players within the Dominican cocoa industry. Most of them own a small portion of land dedicated to the harvest of cocoa and other crops –more than 50% owned less than 5 hectares by 1998 (SEA, 1998). According to Siegel and Alwang (2004), many farmers obtain their total income by combining the production of cocoa and other agricultural goods, because cocoa itself is not sufficient to cover all of their expenses. They also have to rely on the income obtained by their spouses (Berlan and Bergés, 2013). These farmers cannot take full advantage of the production of cocoa in their land because they have insufficient money to invest in the improvement of their harvests.

The low productivity and profit levels mentioned above, along with other difficulties, such as the lack of access to farm credit (Siegel and Alwang (2004) represent weaknesses for the production stage of the Dominican cocoa supply chain that have had serious consequences that could permanently harm the industry if further measures are not taken. For example, the children of current cocoa farmers find no interest in joining the business and the fear of having such a low quality of life has made many of them prefer to leave their families' farms and migrate to urban areas to work in non-agriculture-related industries (Berlan and Bergés, 2013).

Table 4: Average age of farmers (in years) by region and farm size. Source: Berlan and Bergés, 2013.

Region	Small Producers	Medium farms	Large farms	Workers
Central	57	52	63	33
East	61	47	52	40
North-East	60	56	58	35

Something that could help mitigate the low productivity and inefficiency in management of the cocoa farms is the inclusion of females in the business. Nonetheless, Berlan and Bergés (2013) confirmed with their study that the mentality that it is not the women's place to work on the farm is still very strong in the country. This is despite the fact that women tend to have higher levels of education than males in the population of cocoa farmers, as shown in Table 2 (Berlan and Bergés, 2013). If this mentality could be changed throughout the development of campaigns provided by experienced specialists of the crop, in which they explain the positive effects of involving women in the production process, it would represent a good opportunity to contribute to the improvement and growth of this stage of the Dominican cocoa supply chain.

The fundamental issue is that, although this industry brings millions of pesos yearly to the country, small producers lack enough resources to cover their basic day-to-day needs. The estimated daily income for the average small producer barely approaches US$2.00 per day (Berlan and Bergés, 2013). This situation is not limited to the Dominican Republic, but affects other cocoa producing countries in the world.

Table 5. Number of women related directly or indirectly to the Dominican cocoa production stage according to level of education (Berlan and Bergés, 2013).

Educational level	Female Producers	Spouses of Producers	Female Workers	Spouses of Workers
No formal schooling	2	9	0	16
Pre-primary	1	5	0	0
Lower Primary	7	18	0	8
Upper Primary	6	21	0	14
Lower Secondary	1	3	0	1
Upper Secondary	0	5	2	0
University	0	5	0	0
Total	17	66	2	38
Missing System	0	17	0	19

3.9 Ecologic Relevance

Cocoa cultivation is part of an agro-forestry system. It is planted with other plant species like coffee, plantains, fruit trees, and wood-producing trees (Batista, 2009). This has a dual purpose; it not only provides cocoa trees with sufficient shade to grow healthy, but it also allows farmers to have alternative sources of income (Inter-American Development Bank, 2015). Systems of this type are characterized by preserving the soil and atmosphere since they are large biomass generators with the capacity of capturing carbon dioxide and efficiently releasing oxygen (Inter-American Development Bank, 2015).

Along with the benefits that the production of cocoa provides to the environment, it is also a traditional crop that demands a great amount of farmers' labor. Its plantations are generally located in areas that have a high agricultural potential. Other benefits include employment and income generation (Berlan and Bergés, 2013). Also, the decomposition of plant material such as twigs, stems, leaves, and roots produce a natural fertilizer and a protective layer of soil (Batista, 2009). As a result, cocoa has become one of the most favored products with alternative development programs (CONACADO, 2013).

There are approximately 2,400,000 hectares of cocoa planted throughout the Dominican territory (Batista, 2009). This means that cocoa represents thirteen percent of the forest cover in the country. Cocoa is planted in the wettest regions that have over 1,800 millimeters of rain per year (Batista, 2009). It is in these regions where most national rivers are born. In fact, cocoa plantations protect forty two river basins (Inter-American Development Bank, 2015).

The shade provided by cocoa trees is a great protector of the soil. Thanks to this, rain does not hit directly on the ground (Batista, 2009). The effect is the formation of an extensive root system that not only fixes the soil to the bedrock, but also retains liquid that is slowly released to feed rivers and streams (Batista, 2009). These events make cocoa plantations the natural habitat of many plant and animal species, helping conserve the fauna and flora of the area (CONACADO Website, 2014).

3.10 Health Benefits

In terms of human health, cocoa is an important source of minerals like iron, magnesium, zinc, and phosphorus (Tremblay, Year Unkown). It provides carbohydrates and fats which makes it a good source of energy. Also, cocoa contains stimulants of brain activity like theobromine,

caffeine, phenylethylamine and anandamide that improve concentration and memory helping human beings feel less fatigue and more relaxation (Club del Chocolate Website, Year Unknown). In that same manner, cocoa contains phenols that act as antioxidants in the blood vessels, helping prevent the formation of clots in the arteries and reducing the risk of cardiovascular incidents or diseases (European Food Information Council, 2006).

3.11 Commercialization

The commercialization of cocoa generates over five billion dollars per year (Organización Mundial del Cacao, 2011). It is produced in countries that have a low per capita income and is sold as raw material to fulfill the demand of developed countries.

On the other hand, the chocolate industry in well-developed countries constitutes one of the most profitable businesses of the world. Asian and European countries, as well as the United States are the greatest chocolate consumers worldwide, generating over ten billion dollars per year (La Ciencia es Noticia Website, 2015).

As shown in Table 3 the Dominican Republic is a part of the top ten cocoa producing countries worldwide (International Cocoa Organization, 2013). This is a remarkable achievement, especially when it competes with some of the greater cocoa producing countries in the world, like the African countries, Brazil, and Ecuador, which are recognized worldwide by the quality of their cocoa (International Cocoa Organization, 2013).

3.12 Commercialization costs

Costs corresponding to the supply chain cannot be seen as a whole. They are the combination of the costs of each of the stages that comprise the chain. The stage that has the greatest variety of costs due to the amount of technical factors that comprise it is the producing

stage (Inter-American Development Bank, 2015). This, along with the fact that it is the first stage and that without it the whole chain would not exist, make it the most important of all.

It is important to note that there are simultaneous production costs that depend on the nature of the activity to be carried out. Some of the categories of production costs are: Development Costs, Renovation Costs, Rehabilitation Costs, and Maintenance Costs (Inter-American Development Bank, 2015). Among these, the higher costs correspond to those of the development stage (Department of Cocoa of the Dominican Republic, 2010). Development includes weeding, ground trace, digging, planting, final shade planting, transporting, application of pesticides and fertilizers, and planting of fruit and wood producing trees (Inter-American Development Bank, 2015).

Table 6. Share of cocoa produced by countries; in metric tonnes and percentage. Source: International Cocoa Organization, Quarterly Bulletin corresponding to the months July to October. Last updated in 2013.

Country	Volume in Metric Tonnes	Percentage
Cote D' Ivoire	1,511,000	35.05
Ghana	1,025,000	23.78
Indonesia	440,000	10.21
Nigeria	240,000	5.57
Cameroon	229,000	5.31
Brasil	200,000	4.64
Ecuador	161,000	3.37
Dominican Republic	54,000	1.25
Peru	54,000	1.25
Papua New Guinea	47,000	1.09
Others	404,000	9.37
World Production	**4,311,000**	100.00

The first year of production is the one in which most costs are incurred on since this is when the majority of necessary inputs to implement the project are acquired (Department of Cocoa

of the Dominican Republic, 2010). Such inputs include materials and supplies, purchase of cocoa seedlings, fertilizers, insecticides, fungicides, fruit trees, and other types of trees that provide the appropriate shading (Department of Cocoa of the Dominican Republic, 2010). Although the second and third years are not as demanding, costs remain relatively high during this period. This is when costs regarding maintenance and substitution of those seedlings that did not mature during the first year come into play (Batista, 2009). Costs are reduced when the three-year cycle is completed. By then the process of assuring the life cycle of future plantations is supposed to be exhausted (Inter-American Development Bank, 2015).

3.13 Development Costs

Table 7.1. Production Cost for the First Year of Development of a Cocoa Tarea under Musaceae (Shade Providing Trees), in Dominican Pesos (DOP). Source: Deparment of Cocoa of the Dominican Republic, 2010.

First Year				
Description	**Unit**	**Quantity**	**Price per Unit**	**Total**
I) Labor				
a) Weed Control	Men/day	3	300.00	900.00
b) Sowing	Plants	40	5.00	200.00
c) Sowing of Gliricidia	Plants	10	5.00	50.00
d) Sowing of permanent shadow	Tareas	1	20.00	20.00
e) Transportation of cocoa trees	Plants	40	1.50	60.00
f) Application of pesticides	Tareas	0.10	300.00	30.00
g)Application of fertilizers	Tareas	0.10	300.00	30.00
h) Sowing of Musaceae	Strains	100	5.00	500.00
i) Sowing of fruit trees	Plants	2	20.00	40.00
First Total				**1,830.00**

*Tarea is a unit of land measure used in the Dominican Republic. 1 Tarea = 0.06288 Hectares.

In Tables 7.1, 7.2, and 7.3 are displayed the costs corresponding to the first three years of the cocoa cycle. The first year presents the necessary inputs to begin the project (Department of Cocoa of the Dominican Republic, 2010). These are materials that include purchase of cocoa seedlings, fertilizers, insecticides, fungicides, fruit trees, Gliricidia (a type of tree used for provisional shade), and plantain and yam strains. (Department of Cocoa of the Dominican Republic, 2010).

Table 7.2. Production Cost for the Second Year of Development of a Cocoa Tarea under Musaceae (Shade Providing Trees), in Dominican Pesos (DOP). Source: Deparment of Cocoa of the Dominican Republic, 2010.

Second Year				
I) Labor				
a) Weed Control	Men/day	3	300.00	900.00
b) Application of Fertilizers	QQ	0.55	1500.00	825.00
c) Re-sowing of Cocoa Trees	Plants	5	5.00	25.00
d) Application of Pesticides	Tareas	0.1	300.00	60.00
First Total				**1,810.00**
II) Input Materials				
a)Purchase of Cocoa	Plants	5	1.00	5.00
b)Purchase of Fertilizer	QQ	0.8	950.00	760.00
c)Purchase of Insecticides	Liter	0.1	500.00	50.00
d) Purchase of Fungicides	Kilo	0.1	250.00	25.00
Second Total				**840.00**
Second Year Total				**2,650.00**

In Tables 7.1, 7.2, and 7.3 are displayed the costs corresponding to the first three years of the cocoa cycle. The first year presents the necessary inputs to begin the project (Department of Cocoa of the Dominican Republic, 2010). These are materials that include purchase of cocoa seedlings, fertilizers, insecticides, fungicides, fruit trees, Gliricidia (a type of tree used for

provisional shade), and plantain and yam strains. (Department of Cocoa of the Dominican Republic, 2010).

Table 7.3. Production Cost for the Third Year and Total of the Three years of Development of a Cocoa Tarea under Musaceae (Shade Providing Trees), in Dominican Pesos (DOP). Source: Deparment of Cocoa of the Dominican Republic, 2010.

Third Year				
I) Labor				
a) Weed Control	Men/day	2	300.00	600.00
b) Application of Fertilizers	QQ	0.84	1,500.00	1,260.00
c) Application of Pesticides	Tareas	0.1	300.00	60.00
d) Prunning	Tareas	0.1	300.00	60.00
First Total				**1,980.00**
II) Input Materials				
a)Purchase of Fertilizer	QQ	1.2	950.00	1,140.00
b)Purchase of Insecticides	Liter	0.1	500.00	50.00
c) Purchase of Fungicides	Kilo	0.1	250.00	25.00
Second Total				**1,215.00**
Third Year Total				**3,195.00**
Sub-Total for Three Years				**9,517.50**
Incidentals (10%)				**951.75**
General Total				**10,469.25**

During the second and third years, cocoa plantations receive a treatment that includes the maintenance and substitution of the seedlings that could not properly grow during the first year (Batista, 2009). Costs remain high until the completion of the three-year cycle. This is because during these first three years plantations require many nutrients and control of the land, to strengthen and assure the sustainability and yield of these plantations in the future (Department of Cocooa of the Dominican Republic, 2010).

3.14 Rehabilitation and Maintenance Costs

Given that the activities corresponding to development costs were included in the previous section, the costs corresponding to the second stage will be commented on this section.

Although rehabilitation and maintenance are not the most costly activities of the production stage, these are the most common since they need to be done periodically. It is important to provide continuity to plantations after the first three years in order to guarantee a successful production volume (Batista, 2009).

Production costs become lower as long as the project is handled with proper technical criteria. In order to assure lower or at least constant costs, maintenance must be continuous (Batista, 2009). When this happens plantations are assured to have a positive outcome in terms of yield and overall productivity, not only for cocoa, but also for the other crops with which the cocoa is planted (Batista, 2009).

3.15 Renovation Costs

There comes a time when it is necessary to rehabilitate cocoa plantations. Such time usually comes when the lifespan of these plantations starts depleting. Some of the main factors that cause deterioration are the age of the trees, genetic behavior, and damage of hurricane winds (Corven and Villanueva, 1991). Although renovation costs are relatively high, they are still lower than those corresponding to the development of the plantations (Batista, 2009).

Among the rehabilitation activities, one can find the pruning and thinning of the cocoa trees and of the shade trees that surround them (Department of Cocoa of the Dominican Republic, 2010). Also, in some cases, it is imperative to substitute most of the old trees for new trees with the purpose of assuring better productivity (Batista, 2009). Hence, just like during the development process, a good amount of labor to restore the plantations is needed throughout the rehabilitation process (Batista, 2009). The costs of these activities corresponding to 0.06288 hectares of land are shown in Tables 8.1, 8.2, and 8.3. (Department of Cocoa of the Dominican Republic, 2010).

3.16 Commercialization Systems

There are three main types of commercialization systems used in the cocoa markets of the producing countries: Commerce Board, Stabilization Fund, and Free Market (Lastra, 2004).

3.16.1 Commerce Board

According to Lastra (2004), this system is characteristic of the African countries of English influence like Ghana and Nigeria. Here, the estate is in charge of managing a monopoly over the local and international cocoa markets. So there are basically two players in this type of system: the producers and the government (Lastra, 2004). Once the product is purchased from the producers, the Board is in charge of all the other stages the crop has to go through to be traded. Prices are fixed by the board and remain the same throughout a given season (Lastra, 2004). This measure is beneficial for producers since they are not affected by the fluctuations of international cocoa prices (Lastra, 2004).

3.16.2 Stabilization Fund

Although this system presents some similarities with the Commerce Board, there is less government intervention along the process. The product is handled by private agents of the Fund, from the production to the exports stages. African countries with French influence use this system (Lastra, 2004).

The Fund uses a system called barème which translates to “scale”. The system is based on fixing guaranteed prices for producers and reference prices for exports (Lastra, 2004). For example, when the international exports price is higher than the reference price established by the Fund, the exporter has to compensate the Fund with the difference between the prices. Likewise, if the international exports price is lower than the reference price, the Fund has to compensate the exporter for the difference between prices.

Table 8.1. Renovation Cost for One Tarea of Cocoa for the First Year (0.06288 hectares) in Dominican Pesos (DOP). Source: Department of Cocoa of the Dominican Republic, 2010.

First Year				
Description	**Unit**	**Quantity**	**Price per Unit**	**Total**
I) Labor				
a) Weed Control	Tareas	3	200.00	600.00
b) Shade Control	Tareas	0.25	200.00	50.00
c) Heavy Pruning	Tareas	1	200.00	200.00
d) Sowing	Plants	70	5.00	350.00
e) Sowing and Shade	Tareas	1	22.50	22.50
f) Transportation of Plants	Plants	70	1.00	70.00
g)Application of Organic fertilizers	Jornal	0.25	200.00	50.00
h) Transportation of Organic fertilizers	Jornal	0.5	100.00	50.00
First Total				**1,392.50**
II) Input Materials				
a)Purchase of Cocoa Trees	Plants	70	15.00	1050.00
b)Purchase of Organic Fertilizer	QQ	35.00	1.2	42.00
c)Purchase of Pesticides	Liter	4.50	9.00	40.50
Second Total				**1,132.50**
First Year Total				**2,525.00**

3.16.3 Free Trade

This system is composed by a diversity of private agents that participate in the exports supply chain. There is no direct intervention from the government in the trade activities and prices are determined according to international prices of cocoa (International Cocoa Organization, 2013) In fact, the government intervenes to the extent of quality assurance, taxes, and supervision (Lastra, 2004). Since there is so much competition and the government does not play an active role in the market, producers in this system usually receive a price higher than the Free on Board price (Lastra, 2004).

The Dominican Republic is one of the countries that implements Free Trade. Some other countries that also use this system are Brazil, Indonesia, and Malaysia (Lastra, 2004).

Table 8.2. Renovation Cost for One Tarea of Cocoa for the Second Year (0.06288 hectares) in Dominican Pesos (DOP). Source: Department of Cocoa of the Dominican Republic, 2010.

Second Year				
I) Labor				
a) Weed Control	Tareas	3	200.00	600.00
b) Thinning of Old Plants	Tareas	1	200.00	200.00
c) Transportation of Organic fertilizers	Lbs.	0.5	100.00	50.00
d)Application of Organic fertilizers	Lbs.	0.5	100.00	50.00
e) Transportation of Plants	Plants	70	1.00	70.00
d) Prunning	Tareas	1	22.50	22.50
First Total				**992.50**
II) Input Materials				
a)Purchase of Plants	Plants	10	15.00	150.00
b)Purchase of Organic Fertilizer	Lbs.	52.5	1.20	63.00
c)Purchase of Pesticides	Liter	4.5	9.00	40.50
Second Total				**253.50**
Second Year Total				**1,246.00**

3.17 Producers

The most important stage of the trade process corresponds to production. Without it, none of the following stages would exist. So, most of the responsibility of the primary productive process relies on the small and medium sized plantations scattered throughout the cocoa producing regions in the country (Batista, 2009).

National production relies on approximately 40,000 small, medium-sized, and large producers (ONE, 1994 and 2011). Around 157,000 hectares of land are planted with cocoa trees and the average resulting yield is fifty thousand metric tonnes per year (Batista, 2009). Ninety percent of the national production is exported in the form of beans; the rest is half exported in

cocoa based products and the other half is consumed locally (Inter-American Development Bank, 2015).

Table 8.3. Renovation Cost for One Tarea of Cocoa for the Third Year (0.06288 hectares) in Dominican Pesos (DOP). Source: Department of Cocoa of the Dominican Republic, 2010.

Third Year				
I) Labor				
a) Weed Control	Tareas	2	200.00	400.00
b) Thinning of Old Plants	Tareas	1	200.00	200.00
c) Transportation of Organic fertilizers	Lbs.	0.5	100.00	50.00
d)Application of Organic fertilizers	Lbs.	0.5	100.00	50.00
e) Transportation of Plants	Plants	10	1.00	10.00
f) Re-sowing of cocoa trees	Plants	10	15	150.00
g)Prunning	Tareas	0.5	100.00	50.00
First Total				**910.00**
a)Purchase of Organic Fertilizer	Lbs.	70	1.20	84.00
b)Purchase of Pesticides	Liter	4.50	9.00	40.50
Second Total				**124.50**
Third Year Total				**1,034.50**
Sub-Total for Three Years				**4,805.50**
Incidentals (10%)				**480.55**
General Total				**5,286.05**

The producers' population is composed by mostly smallholders that own no more than 3 hectares of land which represents an obstacle for the assurance of economic sustainability (Inter-American Development Bank, 2015). This is, since they own such small portions of land they are forced to do some transformations in their plantations that end up affecting national productivity indices.

3.18 Intermediaries

Cocoa intermediaries in the Dominican Republic are located all over the different cocoa producing regions in the country (Berlan and Bergés, 2013). Firms often choose individuals that know most of the producers and that have leadership and credibility in that environment. There are also intermediaries who work independently (Batista, 2009). The latter type establishes relationships with producers and offers them credit, so producers have to usually pay them with the cocoa they produce during the year (Berlan and Bergés, 2013)

Intermediaries become cocoa experts and they have the ability of identifying the conditions of the product they receive from producers (Batista, 2009). The principal requirements these agents have are impurity-free beans, low moisture, decent sized beans, and broken beans (CONACADO, 2013). The years of practice have made it very easy for intermediaries to make their inspections by merely looking at the product (Batista, 2009).

According to Berlan and Bergés (2013) the population of intermediaries has become smaller over the years since now most exporters prefer to purchase directly from the producers. In that same order, producers have found more profitability in making business with exporters due to new benefits offered by the latter. Such benefits include technical assistance and financing for their farming and even personal expenses (Batista, 2009).

3.18.1 Broker Intermediaries

These intermediaries work as agents of exporters or as independent agents. Their task is purely commercial and they make sure that the greatest quantity of cocoa can be collected from the harvest peak (the moment where the most cocoa is harvested) (Batista, 2009). They do this by comparing the yield with the goals that are set at the beginning of each cocoa season (Ministry of Agriculture of the Dominican Republic, 2014).

3.18.2 Storekeeper Intermediaries

Storekeepers have their own warehouses to store the cocoa that is purchased. This modality has lost popularity because the majority of warehouses do not have the required optimal conditions for the preservation of the cocoa. This is, keeping the product free of contamination by odors and insects (Department of Cocoa, 2011).

3.19 Exporters

There are approximately twenty exporting firms that have leadership in terms of trading and positioning of the Dominican cocoa in international markets. Over 90% of the cocoa exported by these firms is in the form of raw beans; the rest is semi-processed (Department of Cocoa of the Dominican Republic, 2011). The top five exporting companies, which are shown in Table 9, are Rizek Cocoa with a share of 18.33%, Conacado with 17.99%, Roig Agro-cocoa with 16.45%, Coopcanor with 9.28%, and Biocafcao with a share of 7.50% of total exports of cocoa (Department of Cocoa of the Dominican Republic, 2012). The most experienced exporters are able to obtain prices above those of the Coffee, Sugar, and Cocoa Stock Market of the City of New York. This allows them to pass a portion of this price along to producers, as a way of keeping them motivated and maintain the sustainability of the industry (Inter-American Development Bank, 2015).

Nonetheless, the exporting sector of the industry has not been able to overcome one big weakness. The vast majority of the cocoa exported from the Dominican Republic constitutes raw material and very little cocoa is sold in the form of finished products (CONACADO, 2013). This makes the industry miss many opportunities that come with selling higher priced finished products to developed countries. Another weakness is that the twenty exporters mentioned before are not permanent in every cycle. Many of them disappear between harvests or just succumb due to high competition in the market (Department of Cocoa of the Dominican Republic, 2012).

There are two export modalities in the market. These modalities are measured in terms of their productive activities. The first modality corresponds to the exclusive exports of cocoa beans, while the second one is the chocolate manufacturing industry (Department of Cocoa of the Dominican Republic, 2012). The latter has remained stagnated for years due to obstacles presented in the local market and the bankruptcy of the state chocolate factory that for many years kept the industry in constant growth (Department of Cocoa of the Dominican Republic, 2012).

3.20 Local Market

The local market for cocoa is composed of around 40,000 producers that sell their output to exporters and also by a few processing firms (Batista, 2009). These two combined yield an average of fifty thousand metric tonnes of product per year (Cocoa Department, Ministry of Agriculture of the Dominican Republic, 2012). Processing firms offer a supply of traditional cocoa based products like chocolate tablets –to make beverages-, cocoa powder, and chocolate candy bars which are often enhanced with nuts and cereals (CONACADO, 2013).

The local market consumes a considerable amount of imported chocolate derived products. In the majority of supermarket chains and candy retailers stores, one can observe imported chocolate candy bars from companies like Nestlé, Mars, and Hershey's, among others. In spite of the efforts, this market is quite unattractive and has a very low consumption level (CONACADO, 2013). The actual consumption is 0.36 kilograms per capita which is nothing compared to the 0.61 per capita global consumption (Department of Cocoa of the Dominican Republic, 2012). However, this could change in the next few years since new development programs for the local consumption have started to be implemented by both the government and private sector (CONACADO, 2013).

Table 9. Share of Total Exports Corresponding to Cocoa Exporting Companies in the Dominican Republic, Corresponding to the Year 2011. Source: Department of Cocoa of the Dominican Republic, 2012.

Exporters	Percentage (%)
Rizek Cacao	18.33
CONACADO INC.	17.99
Roig Agrocacao	16.45
COOPCANOR INC.	9.28
BIOCAFCAO	7.50
Munne & Co.	5.87
COOPAGRO	5.60
Cortes Hermanos	4.29
Yacao	3.38
Trillablu	2.50
Jose Paiewonsky	2.64
Garcia & Mejia	1.66
D & P Comercial S.I.	1.40
Humaria	0.98
APROCACI	1.11
IDEPAC	0.37
Oko Caribe	0.44
Red Guaconejo	0.11
Marbel Farms	0.07
Florencio Ortega	0.00
Chocolate Antillano	0.04
Total	**100.01**

3.20.1 Supply

The Dominican cocoa supply is seasonal. There are two well-defined seasons for the harvest of cocoa beans; these are winter and spring. Although cocoa is produced all year round, from April to June is where the largest supply is produced (Batista, 2009). The yearly supply ranges from 42,000 to 72,000 metric tonnes (Ministry of Agriculture of the Dominican Republic, 2012) depending on weather conditions throughout the growth period of the cocoa.

Exporters assure their supply through agreements and contracts with producers (CONACADO, 2013). They make these commitments for the most productive season of the year in order to be able to supply the right amounts to their international buyers. This way they make sure not to be penalized for not meeting mandatory international requirements.

3.20.2 Demand

Over ninety percent of the cocoa obtained from Dominican producers is sold internationally. Some of the bigger international buyers of Dominican cocoa are Cargil Japan, General Cocoa Company, Mars, Nestlé, Atlantic Cocoa Co., and Barry Callebaut (Department of Cocoa of the Dominican Republic, 2011). The volume of cocoa imported by these firms and 42 other firms can be observed in Table 10 (Centre of Exports of the Dominican Republic, 2011).

The cocoa that is processed in the country represents 10% percent of the total production. A portion of this cocoa is used for local consumption and the rest is exported in the form of several cocoa based products like cocoa butter, liquor, and candy bars (Ministry of Agriculture of the Dominican Republic, 2012). The volume in Metric Tonnes and value in US dollars of exports for cocoa beans and cocoa based products for the year 2011 are shown in Table 11 (Department of Cocoa of the Dominican Republic, 2011).

Table 10. Demand of Cocoa Beans (in Metric Tonnes) by Importing Firms for the Year 2011. Source: Centre of Exports of the Dominican Republic (CEI-RD), 2011.

Buyers	Volume	Percentage (%)
Cargil Japan Limited	7,832.25	14.95
General Cocoa Company	6,509.21	12.42
Mars Snackfoods	5,603.71	10.69
Sitos Commodities & Logistics	2,911.60	5.56
ICAM S.P.A	2,658.46	5.07

Table 10 (continued)

Nestle (Mexico)	2,946.30	5.62
PRONATEG AG	2,691.78	5.14
Atlantic Cocoa Company	2,579.85	4.92
Barry Callebaut	2,485.12	4.74
OLAM Americas, INC.	2,469.20	4.71
Schwartauer Werke GMBH	1,512.07	2.89
Molenbernatie N.V.	1,411.20	2.69
ADM Cocoa	1,486.80	2.84
Nestle (USA)	1,396.50	2.67
Mazapan De La Rosa	1,104.18	2.11
Chocolate Valrhona	676.45	1.29
Natra Cacao	604.80	1.15
Mitsubishi International	532.70	1.02
Trading Organic Agric, BV.	524.74	1.00
KAOKA	453.60	0.87
Rapumzel Naturkost	302.40	0.58
Daarnhouer Werke	314.65	0.60
Transmar Commodity G.	350.00	0.67
Agroindustria Unida	320.95	0.61
August Storek KG	277.20	0.53
Dutch Cocoa B.V.	229.60	0.44
GEPA M B H	240.40	0.46
Consorcio Independiente	226.80	0.43
Blommer Choc.	216.30	0.41
PPC GRYF. SE	189.00	0.36
Chocolate de Jalisco	198.80	0.38
Fortunare So American	200.34	0.38
Kokoa del Istmo	151.20	0.29
Int. Mexicano de Comercio	126.00	0.24
Consorzio CTM	100.20	0.19
United Cocoa Comp.	100.52	0.19
Huyser Moller BV	100.40	0.19
KVB Flottensr	75.60	0.14
COFIDERECT PLE	63.00	0.12
JHB International Traders	50.40	0.10
Brenen S.A.	50.40	0.10
Cluzel Chocolate	37.80	0.07
Max Felchlin	28.42	0.05
Demori	25.20	0.05
Noi Del Sucre	25.20	0.05

Table 10 (continued)

Walter Matter	3.50	0.01
Vestri Ciocolato	2.24	0.00
Total	**52,397.04**	**99.99**

3.20.3 Local Consumption

The local consumption has remained quasi stagnant for the past few decades. The government neglected the opportunity to develop and increase the consumption in the local market for many years (CONACADO, 2013). This started when the national chocolate factory disappeared after the end of the dictatorship of Rafael Leonidas Trujillo in 1961 (Department of Cocoa of the Dominican Republic, 2011).

The factory used to produce large volumes of cocoa that was distributed mostly in schools (Department of Cocoa of the Dominican Republic, 2011). The students represented future potential buyers since the product was highly welcomed and accepted among them. When the factory closed and the government cancelled the program of providing hot cocoa in schools, the youth population started the process of detachment with the product. This was the point where the declining of local consumption had its origin (Department of Cocoa of the Dominican Republic, 2011).

For the year 2011, the average local consumption was approximately 2,800 metric tonnes (as observed in Table 12) which is below the global per capita consumption (Department of Cocoa of the Dominican Republic, 2012). However, in the past couple of years there have been small attempts to revive the local consumption (Nazario Rizek Website, 2011). Development programs have taken measures like the construction of cocoa museums and tours to arise the interest of local consumers, as well as the elaboration of more diverse cocoa derived products (Sendero del Cacao Website, Year Unknown).

Table 11. Volume (Metric Tonnes) and Value (US dollars) of Exports of Cocoa Beans and Processed Cocoa for the Year 2011. Source: Department of Cocoa of the Dominican Republic, 2011.

Types of Cocoa	Volume	Value
1. Cocoa Beans	**52,412.24**	**179,713,388.49**
1.1. Sanchez	27,860.40	91,880,962.66
1.2. Organic Sanchez	3,112.63	10,136,376.10
1.3. Hispaniola	5,761.00	20,237,195.49
1.4. Organic Hispaniola	15,678.21	57,458,854.24
2. Processed Cocoa	**2,271.36**	**8,741,873.07**
2.1. Cocoa Butter	1,608.48	5,014,935.39
2.2. Organic Cocoa Butter	86.45	340,000.00
2.3. Cocoa Liquor	61.18	236,200.00
2.4. Organic Cocoa Liquor	87.51	356,547.50
2.5. Unsweetened Cocoa Powder	28.21	198,530.00
2.6. Organic Cocoa Powder	40.08	392,267.00
2.7. Sweetened Cocoa	237.40	1,193,115.57
2.8. Cocoa Cake	101.45	315,213.60
2.9. Chocolate Bars	20.60	533,424.19
General Total	**54,683.60**	**188,455,261.56**

Table 12. Local General and Per Capita Consumption of Cocoa in the Dominican Republic, Corresponding to the Years 2005-2011. Source: Department of Cocoa of the Dominican Republic.

Years	Local Consumption (Metric Tonnes)	Per Capita Consumption (Kilograms)
2005/2006	2,660.77	0.28
2006/2007	3,448.53	0.36
2007/2008	2,896.01	0.30
2008/2009	2,773.00	0.28
2009/2010	2,636.65	0.27
2010/2011	2,106.65	0.21
Average	2,753.60	0.28

3.21 Value and Structure of the Chain

Cocoa beans are the raw material used for some of the candy, cosmetics, and pharmaceutical factories. The supply chain is composed by three types of goods: the primary goods are the cocoa beans, the intermediate goods are cocoa butter, powder, and paste, and the final goods are chocolate bars for beverages and candy bars (Department of Cocoa of the Dominican Republic, 2011).

The cocoa supply chain involves the production and processing of the beans and the production of chocolate and candy. The majority of the cocoa is absorbed by processing firms that obtain it from authorized collecting agents who buy the beans from producers (Batista, 2009). The cocoa that is left is used by small processors or exported in marginal volumes. The industry is in charge of the processing and elaboration of cocoa derivatives (Department of Cocoa of the Dominican Republic, 2011).

Some other players that have not been mentioned before are the agricultural public institutions and non-governmental and governmental organizations like Conacado Inc., the Ministry of Agriculture of the Dominican Republic, and the National Commission of Cocoa. In that same order, the international cocoa market is regulated by the International Cocoa Organization. This organization is composed by thirty nine member countries, twelve as exporters and twenty seven as importers (International Cocoa Agreement, 2001).

3.21.1 Stages of the Cocoa Supply Chain

The cocoa supply chain is composed by three stages: the primary, commerce or marketing, and industrial stages (Department of Cocoa of the Dominican Republic, 2012).

The primary stage corresponds to planting, maintenance, and collection of the cocoa. The main players of this stage are farmers, producers, land owners, and producers of inputs used for the production of cocoa (Batista, 2009). The second stage is the internal and external commercialization or marketing of the cocoa beans. It includes the sale of cocoa to agents and intermediaries, the local processing of the beans, and the exports to purchasing countries (Batista, 2009). Lastly, the industrial stage is the processing of the beans to produce liquor, paste, butter, powder, chocolate, and chocolate candy bars (Department of Cocoa of the Dominican Republic, 2012).

3.21.1.1 Primary Stage

The cocoa tree is a tropical plant that grows in a mainly tropical geographical strip. It extends about 20 degrees latitude on both hemispheres (Inter-American Development Bank, 2015). There are three cocoa varieties in the Dominican Republic: Nativo or Criollo (Native), Forastero (stranger or foreigner), and Trinitario (Trinidadian) (Batista, 2009).

The Nativo variety is known as the finest cocoa, the fruit it produces is aromatic and sweeter. However, it has the disadvantage of producing low yields. It is mostly produced in Central and South America although its production has decreased considerably over the years (Inter-American Development Bank, 2015). On the other hand, the Forastero cocoa trees grow faster and produce larger yields. This type is harvested in Africa and Central and South America as well (Inter-American Development Bank, 2015). Lastly, the Trinitario cocoa is a hybrid resulting from the cross between Nativo and Forastero, this latter type has a spicy flavor and flowery smell (Inter-American Development Bank, 2015). Trinitario cocoa had its origins in Trinidad and Tobago and then spread to the rest of cocoa producing countries (Batista, 2009).

3.21.1.2 Commercialization or Marketing Stage

The commercialization is carried out by independent or associated producers, collectors, intermediaries that work by commission, and exporters (Department of Cocoa of the Dominican Republic, 2012). The first three players supply the local market while the latter is in charge of the international market (Inter-American Development Bank, 2015). One of the main factors that influences the trade of cocoa beans is the surplus in supply of the product within the local industry (Department of Cocoa of the Dominican Republic, 2012).

According to Batista (2009), collectors are located in rural areas where cocoa is planted. They have direct contact with producers and farmers and sell the cocoa beans to intermediaries. The latter are authorized buyers that supply the produce for processing companies (Batista, 2009). The price at which cocoa is sold depends on the size of the beans, number of beans per hundred grams, fermentation level, moisture, impurities, and contamination by plagues or diseases (Batista, 2009). Processing companies pay intermediaries a premium for the cocoa (Department of Cocoa of the Dominican Republic, 2012).

There is a constant exports flow of cocoa from the Dominican Republic for the majority of cocoa seasons, since there is usually excess cocoa produced (CEI-RD, 2013). However, the condition of attractive prices has to hold for trade to take place. This is, cocoa is exported when international prices are above national prices plus the transfer that exporters have to make to the Stabilization Fund of Prices of Cocoa (International Cocoa Agreement, 2001).

3.21.1.3 Industrial Stage

The two largest cocoa processing firms are Munné and Cortés Hermanos (Cortés Brothers). These firms process over ninety percent of the national cocoa (Department of Cocoa of the Dominican Republic, 2012). Among the factors that have put both firms on top of the market one

finds that they have modern technology that allows them process and commercialize cocoa throughout the national territory in an efficient manner (Batista, 2009). Also, they have a large variety of products, from the cocoa beans to semi-elaborated products like butter and liquor to final products like chocolate candy bars and chocolate hot and cold beverages (Department of Cocoa of the Dominican Republic, 2012).

CHAPTER 4: ANALYSIS OF THE FIVE COMPETITIVE FORCES THAT SHAPE STRATEGY

4.1 Introduction

After reviewing the Dominican Cocoa Supply Chain, with the purpose of identifying the stage or stages that present the most difficulties that interfere with the desired improvement of the industry at its full potential, and maximization of benefits for all of the players that comprise the chain, one has been able to detect that the majority of obstacles and issues are presented in the production or farming stage.

The purpose of this chapter is to analyze the production stage in terms of the Five Competitive Forces that Shape Strategy. This is to determine the principal threats that this stage is facing, and the magnitude of each of these threats. The ultimate objective for the identification of such threats is to determine the specific aspects that need to be addressed as well as to provide recommendations that if followed could help mitigate or solve the current issues that affect the production stage of the supply chain.

4.2 What are the Five Competitive Forces?

Michael Porter (1979) developed a holistic model for the purpose of analyzing any industry or economic sector in terms of its profitability. It is a useful tool that helps develop competitive advantages for a firm against its rivals. The model is based on the idea that there are five forces that determine long-run profitability of a market or a market segment.

These five forces are:

1. Threat of New Entrants.
2. Bargaining Power of Suppliers.

3. Bargaining Power of Buyers.
4. Threat of Substitute Products or Services.
5. Rivalry Among Existing Competitors.

Figure 11. The Five Competitive Forces that Shape Strategy.

4.2.1 Threat of New Entrants

The entrance of new firms into an industry represents a threat for those firms that are already established within the industry because it increases pressure on prices, costs, and the amount of money that needs to be destined to invest in new technologies, machinery or any other type of input that a given firm would need to compete with others (Harvard Business Review, 2008).

This threat depends greatly on barriers to entry. Some of these barriers include economies of scale, either from the supply or from the demand side, product differentiation, capital

investments, disadvantages in costs independent of the scale, access to distribution channels, and experience or “know-how”. (Paola, year unknown).

The market attractiveness for competitors depends on whether barriers to entry are easy or not to overcome by new participants (Harvard Business Review, 2008). If they happen to be easy, these new participants will have very little difficulties in entering with new resources and capabilities. Hence, they will automatically occupy a portion of the market causing competition to increase.

4.2.2 Bargaining Power of Suppliers

The power of suppliers refers to the extent that suppliers can afford to do things such as raising prices, limiting quality of their products or limiting services, or passing costs to other players within the industry (Harvard Business Review, 2008).

Some cases in which suppliers have this power are when the product sold has very few or no substitutes, when buying firms are not relevant customers for the suppliers, if the product sold by the supplier is so differentiated that it will be too expensive for buyers to change suppliers, when suppliers have the ability of vertically integrate and actually compete with their customers, and if customers lack the ability to vertically integrate to supply their own needs (Harvard Business Review, 2008).

4.2.3 Bargaining Power of Buyers

The power of buyers represents a threat when they have the ability to make suppliers lower their prices (Harvard Business Review, 2008). They can do this by assuming a more demanding and strict attitude in terms of quality and/or quantity of the product or service.

Some cases in which buyers have this power are when the supplying industry is composed of many small firms and very few buyers, when buyers buy in bulk, and when buyers can easily change suppliers looking for better prices, forcing them to compete directly and lower their prices (Harvard Business Review, 2008).

4.2.4 Threat of Substitute Products or Services

A given product is a substitute when it performs a similar function as other product or when it satisfies the same needs as that product (Hines, 2013).

Some cases in which a substitute represents a threat for an industry are when substitutes have similar prices, if it is easy to switch products in terms of costs and accessibility, and when there are real or potential substitutes that cause the market or market segment to not be so attractive (Hines, 2013).This is because it gets even more complicated when substitutes enter the market at lower prices which reduces the utility margins of the industry (Harvard Business Review, 2008).

4.2.5 Rivalry Among Existing Competitors

Rivalry among competitors occurs when, in order to increase market share, they incur in activities like discounts in prices, introduction of new products, aggressive advertising, and improvement or differentiation of products or services (Harvard Business Review, 2008).

Some of the characteristics of rivalry among existing competitors include the fact that this rivalry defines the profitability of the industry (Wilkinson, 2013). That is, the less competition there is, the more profitable the industry is, and vice versa. Also, it is very difficult for a firm to compete in an industry where competitors are very well-positioned, there is a great number of competitors, and fixed costs are too high (Wilkinson, 2013). This is because the firm will constantly have to deal with price wars, aggressive advertising campaigns, promotions, and entry

of new products (Harvard Business Review, 2008). Lastly, barriers to entry are usually very low and barriers to exit are very high. This explains why there are so many firms competing against each other (Wilkinson, 2013).

4.3 Application to the Production Stage of the Dominican Cocoa Industry

In this section, an analysis of the five forces of the production level (small cocoa farmers) in the Dominican cocoa industry will be provided.

4.3.1 Threat of New Entrants

1. As stated before during the description of the production stage, and according to Siegel and Alwang (2004), the production stage of the chain is composed mostly by many small producers. In fact, more than 50% owned less than 5 hectares by 1998 (SEA, 1998). All of these farmers produce the same output: cocoa beans. This means that there is not much product differentiation. So this is not a strong barrier to entry for the production stage of the Dominican cocoa supply chain.
2. Also, according to the Department of Cocoa of the Dominican Republic (2011), the majority of farmers have to incur in large costs relative to their income level and quality of life. When making a comparison between costs and income of farmers one can conclude that the level of revenue they obtain is not sufficient for the sustainability of their production units. Table 13 shows the costs, income, and revenue that correspond to the producing level of the Dominican cocoa industry (Department of Cocoa of the Dominican Republic, 2011).

Table 13. Costs and Income of Dominican Cocoa Farmers Corresponding to the Years 2005-2011. Volume: 50 Kilograms and Dominican Pesos (DOP). Source: Department of Cocoa of the Dominican Republic, 2011.

Years	Costs	Income	Revenue
2005/2006	1,671.78	1,325.18	(346.60)
2006/2007	1,671.78	1,624.45	(47.33)
2007/2008	1,755.37	2,978.48	1,223.11
2008/2009	1,755.37	2,700.30	944.93
2009/2010	1,857.53	4,198.92	2,341.39
2010/2011	1,857.53	4,920.63	3,063.10

Table 14. Costs of Production or Operation Vs. Added Value (Percentage %) of the Dominican Cocoa Supply Chain for the Year 2013. Source: Department of Cocoa of the Dominican Republic, and CEI-RD, 2013.

Agents	Production/Operation Costs	Added Value
Producers	50	15
Exporters	39	65
Intermediaries	6	10
Transporters	5	10
Total	**100%**	**100%**

In table 14 are presented the costs and added value of some of the main players of the Dominican cocoa supply chain. One can observe that the stage that has the higher costs is the production stage, not to mention that it is the only one that presents a negative difference between costs and added value (Department of Cocoa of the Dominican Republic and CEI-RD, 2013). This corroborates with the statement that the costs for cocoa farmers are too high and disincentive most of small farmers to join the industry.

Conclusion: The threat of new entrants at the production stage for this market is low, taking into account factors like the large number of small producers selling the same product with no differentiation and the high costs farmers face and the negative revenue obtained.

4.3.2 Bargaining Power of Suppliers

The main characteristics that shape this aspect for the production level of the Dominican cocoa supply chain are the following:

1. As mentioned in the previous force, a large number of cocoa farmers sell the same product: cocoa beans. This means that each farmer has to compete with substitute products (cocoa beans sold by other farmers). This reduces their power since they cannot afford taking risks with raising prices or limiting the quantity they sell, etc., since measures of this nature will result in a reduction of their market share.
2. Buying firms for these farmers (intermediaries and exporters) are necessary for their survival. Without these two other players farmers wouldn't be able to export their cocoa by themselves, since they lack the capital needed to vertically integrate and act as competitors for intermediaries and exporters.
3. Product differentiation at the production level is almost nonexistent. As mentioned in the first characteristic, all farmers sell the same product, which is cocoa beans. This translates into low costs of changing suppliers for intermediaries and exporters.

Conclusion: The bargaining power of suppliers at the production stage for this market is low, taking into account the fact that farmers have to compete with many other farmers that offer the same substitute product with similar price. Also, farmers lack the ability to vertically integrate and compete with their buyers (intermediaries and exporting firms). Lastly, at this

level of the supply chain, there is no product differentiation, since all farmers are selling the same product: raw cocoa beans to be used in the elaboration of cocoa based products.

4.3.3 Bargaining Power of Buyers

The characteristics that shape this force for the production stage of the Dominican cocoa exports supply chain are the following:

1. As mentioned in earlier sections of this study, more than 50% of the cocoa farmers in the Dominican Republic own less than 5 hectares of land dedicated to the production of this crop (SEA, 1998). This means that there are many small production units and fewer buyers for these units, which causes units to compete against each other through measures like offering lower prices. In this case buyers have the power of making suppliers settle for lower prices.
2. Buyers tend to buy the cocoa beans in large quantities. Farmers do not act as retailers. When intermediaries buy in bulk they have the power of demanding discounts, reducing the margin of benefits for farmers.
3. Continuing with the idea of characteristic number 1, since there are many small production units that offer the same product, the cost for buyers of changing suppliers is low. This increases the power of buyers related to causing an increase in pressure among suppliers.
4. Lastly, some of the biggest exporting firms within the supply chain are starting to invest in the creation of new cocoa plantation (CONACADO, 2013). This has been thanks to the availability of land with proper characteristics for the production of cocoa, and sufficient capital from these firms to make major investments in technologic inputs that guarantee exceptional yield and production of the crop (CONACADO). This means that exporting

firms (the current buyers of the cocoa farmers) will have the ability of vertically integrating and supply their own demand, creating competition against farmers.

Conclusion: The bargaining power of buyers at the production stage for this market is high. This is, taking into account that there are many small producers and fewer buyers for these producers, and the cost of switching suppliers is low. Also, buyers purchase in bulk. Finally, we have the ability of buyers to vertically integrate and supply their own demand which results in suppliers not being needed by the former.

4.3.4 Threat of Substitute Products or Services

The following characteristics shape this aspect of the Dominican cocoa supply chain at the production level:

1. As aforementioned, substitutes –cocoa produced by other farmers- at this level of the chain have similar prices, since there is not much difference in terms of quality of the cocoa from one producer to the other and since the volume produced and sold to intermediaries is very similar among all farmers. This characteristic also translates into low costs of switching suppliers from the part of intermediaries.
2. Farmers have to settle for lower prices that result in lower utility margins, which decreases attractiveness of the market at the farming level.

Conclusion: The threat of substitute products or services at the production stage for this market is high. This is taking into account that all small farmers produce similar amounts of output of the same product and that the cost of switching suppliers for buyers is significantly low.

4.3.5 Rivalry Among Existing Competitors

Barriers related to rivalry among competitors within the production level of the Dominican cocoa industry is an important aspect to be taken into account. This aspect summarizes all the others competitive forces that were previously discussed.

Rivalry among farmers and producers competitors involves two main characteristics:

1. The cost of switching firms for buyers is relatively low which is dangerous.
2. The number of small production units is high, relative to the number of buying intermediaries.

   Conclusion: The threat of rivalry among existing competitors at the production stage for this market is high, since all farmers have to compete aggressively if they do not want to disappear and increase their market share.

Competitive Force	Level of Power	
	Low	High
Threat of Entry	X	
Power of Suppliers	X	
Power of Buyers		X
Threat of Substitutes		X
Rivalry Among Competitors		X

Figure 12. Level of power for each of the Competitive Forces that Shape Strategy. Source: Elaborated by the author, 2016.

CHAPTER 5: SWOT ANALYSIS

5.1 Introduction

After reviewing the Dominican Cocoa Supply Chain, with the purpose of identifying the stage or stages that present the most difficulties that interfere with the desired improvement of the industry at its full potential, and maximization of benefits for all of the players that comprise the chain, one has been able to detect that the majority of obstacles and issues are presented in the production or farming stage.

The purpose of this chapter is to analyze the production stage in terms of its principal Strengths, Weaknesses, Opportunities, and Threats. This is in order to determine the positive aspects of this stage that need to be maintained and improved, the flaws that need to be addressed in order to change current issues, those factors that the stage could take advantage of and adopt as a way of maximizing benefits, as well as the factors that the production stage needs to protect itself from to avoid further losses or worsening of farmers' current conditions.

The ultimate objective for the identification of such Strengths, Weaknesses, Opportunities, and Threats is to be able to conclude which are the specific positive aspects that lie both within and outside the production stage, and that could be used to improve it, as well as the negative factors that characterize the production stage in the present and those that could impact the stage and cause harm. After drawing these conclusions, the intention is to complete the recommendations mentioned before, in order to help reach solutions to the issues that the stage is currently presenting.

5.2 What is the SWOT Analysis

The SWOT analysis is commonly used to study plans, projects, firms, or in this case industries, in terms of its Strengths, Weaknesses, Opportunities, and Threats. It was developed by Albert Humphrey between the 1960s and 1970s when he carried a research project to evaluate several top companies for Stanford University (Morrison, 2014). At first it was called SOFT analysis which stands for Satisfactory, Opportunity, Fault, and Threat. It was later changed to SWOT by Urick and Orr at a conference held in Zurich in 1964.

Both strengths and weaknesses are internal characteristics. Strengths refer to advantages of the industry and weaknesses underline disadvantages (Fallon, 2016). On the other hand, opportunities and threats are external characteristics. Opportunities are possibilities that come from external factors or situations (Fallon, 2016). If a firm or industry takes advantage of these opportunities it can ultimately help increase their profitability. Threats are external factors as well, but contrary to opportunity, the industry has to protect itself from them to avoid losses (Fallon, 2016).

5.3 Application to the Production Stage of the Dominican Cocoa Industry

In this section, a SWOT of the production level (small cocoa farmers) in the Dominican cocoa industry will be provided.

5.3.1 Strengths

- Suitable weather and soil conditions for the harvest of cocoa.
- Favorable conditions for the development of organic cocoa.
- Know-how of cocoa farmers.

- Availability of land to enlarge plantations.

- Cocoa production is an employment and income generator in rural communities.

Among the strengths within the production stage of the Dominican cocoa industry that were identified thorough the study one finds the suitable weather and soil conditions for the harvest of this crop (CONACADO, 2013). As mentioned before the Dominican Republic, like many of the other cocoa producing countries is located along the Ecuador, which means that its tropical weather and humidity of the soil provides the proper conditions for cocoa to grow easily. Also, the country has been favored with mostly pest and disease free plantations (Batista, 2009). This has as a result the minimal use of pesticides and other harsh chemical inputs on the trees, which provides one of the main requirements for the production of organic cocoa (Inter-American Development Bank, 2015). Another strength comes from the know-how asset of cocoa farmers. The majority of them have been in the plantations since they were children so they have a broad knowledge on the planting and harvesting techniques (Berlan and Bergés, 2013). Also, the Dominican Republic still has a large amount of available territory with the right conditions to be planted with more cocoa (CONACADO, 2013). Planting these lands with new trees could help mitigate the issue of aging trees that are past their productivity phase. Lastly, according to Berlan and Bergés, the production of cocoa is one of the main sources of employment and income for peasant farmers and workers in rural communities. This is something that could be further improved if the main issues within the stage are addressed.

5.3.2 Weaknesses

- Large number of small cocoa plantations.
- Producers are not organized and lack bargaining power.
- Aging producer population.
- The children of current cocoa farmers are not interested in joining the family business.
- Inadequate technical management of the harvest and inefficient post-harvest treatment of the crop.
- Farmers and producers lack education on how the market works.
- Lack of basic equipment and investments at the production level.
- Most commercialization at the production level is informal.
- The majority of farmers lack legal land titles.

Although the Dominican Republic has made many improvements within its cocoa industry, there are still many gaps that need to be addressed in order to avoid future major crises. Some of the main weaknesses found with the study of the industry in previous chapters include a large number of small cocoa plantations that produce small yields of cocoa (SEA, 1998). This results in low income and lack of resources for the improvement of productivity for small farmers. In that same order, producers are not organized and act independently (Siegel and Alwang, 2004). This, summed to the lack of experience they have in terms of how the market works results in lack of bargaining power from the farmers' side. It is important to highlight that the lack of resources aforementioned interferes with the possibility applying adequate technical management of the harvest process and efficient post-harvest treatment of the crop (Batista, 2009). In addition, the farmers' population is mostly aging, with the average age of a male cocoa farmer being 58 years old (Berlan and Bergés, 2013). To make this worse, the children of current cocoa farmers do not

want to join the business and are preferring to move to urban areas to work on more profitable jobs for them (Berlan and Bergés, 2013). Lastly, a major obstacle that blocks the access for farm credit for investments is the lack of legal land titles from farmers (Berlan and Bergés, 2013). This is since most credit institutions do not give credit without a warranty asset –like a land title.

5.3.3 Opportunities

- Increase in international demand.
- Increase in consumption of cocoa based products.
- New governmental programs to increase the development of alternative crops.
- Improvement in pest control.

Some conditions that can be used as advantages to improve the situation of the Dominican cocoa industry at the farming level were identified in previous chapters of this study: the increase in international demand of cocoa is an opportunity for Dominican cocoa to continue to well-position itself in international markets (International Cocoa Organization, 1998). The same happens with the increase in consumption of cocoa based products (International Cocoa Organization, 2011). In the past years many countries have increased efforts to trigger the consumption of cocoa products through advertising campaigns and the development of cocoa sustained programs that include cocoa tours, community development programs, etc. (CONACADO, 2013). These factors could have a positive impact into the improvement of the current cocoa plantations as a way to increase supply in order to satisfy the higher demand.

Also, the Dominican government has increased its interest on investing in alternative crops like cocoa in the past few years. Development programs have been carried out by governmental institutions with the purpose of improving the production of cocoa and the overall cocoa industry

in the country (Inter-American Development Bank, 2015). These programs include the control of pests and diseases which results in greater yield (Batista, 2009).

5.3.4 Threats

- General increase in worldwide supply.
- Social and political violence.
- Difficulty to participate in the international market due to measures related to bioterrorism.

Among the factors drawn from the study that represent threats for the production level of the Dominican cocoa industry one can find the increase in the international supply of cocoa (International Cocoa Organization, 2013) which will put the Dominican Republic in a bad position since the big producing countries will have most of the market share. This ultimately affects cocoa farmers since a decrease in exports will result in less cocoa being purchased from them. Social and political violence is another factor that threatens the industry at the production level. This is in terms of unfair living conditions for workers in the plantations and the fact that the government does not take direct measures to counteract this situation (Berlan and Bergés, 2013). Lastly, one of the most important threats for the industry is the difficulty to participate in the international market due to bioterrorism measures. Cocoa that is grown unsustainably and that does not meet proper quality standards might not be accepted as tradable in the international market (Berlan and Bergés, 2013), and the Dominican Republic has had issues at the farming level with the quality of its cocoa since, as mentioned in the weaknesses section, the age of the trees and post-harvest treatment are not optimal (Batista, 2009).

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This study has allowed us to describe and analyze the Dominican cocoa industry and all of its stages. The main conclusion that could be drawn throughout the evolution of this analysis is that the cocoa industry in the country has grown and improved considerably over the past decades and this has been mostly thanks to the investments and efforts made into the latter stages of the industry. However, the first and most important stage, the production stage has not received the adequate attention and this is the principal source of the current gaps that need to be filled to guarantee the maximization of benefits for all the players within the industry.

The Dominican cocoa supply chain has become more organized which has favored expected costs and revenue. In the past the exporter had the only interest of buying the cocoa beans from independent agents. The latter would buy the product directly from producers to sell it to exporters. This system was used for centuries until different producers associations started to emerge in the past years.

One of the organizations that resulted from this new structuration is CONACADO which was funded by the Department of Cocoa of the Ministry of Agriculture. Organizations like CONACADO received technical and economic support from the Dominican government and some other NGOs. After this, they have been putting their efforts into changing the old post-harvest practices.

One of the most difficult parts of the restructuring the industry has been changing the mind-set of many producers. They have had to learn that exports of higher quality cocoa is their best

plan for the future. This attitude triggered the production of fermented (Hispaniola) cocoa. In fact, the number of fermented cocoa producers increased significantly, regardless of the obstacles found along the way.

When traditional exporters saw the growth and acceptance of fermented cocoa, they decided to join the revolution. After the success of Dominican cocoa had in international markets started to bring tangible benefits to the nation, investments on infrastructure started to be made. Such improvements caught the attention of the European and American markets, who began to appreciate the value of the nation's traditional crop.

Some of the benefits these improvements have brought to the players that compose the Dominican cocoa supply chain include transparency in operations along the chain and easy-to-identify costs and revenues. The only players that do not fully benefit from the new system are producers at the individual level. This is mainly because many producers own small production units and do not provide proper maintenance to their plantations. So, even when prices are high and they receive a high percentage of income relative to their costs, the money is not enough to solve their problems. Hence, they have very low chances of investing on their plantations to increase their productivity levels. In general, some of the main problems producers have noted are high average production costs, low yield per hectare, insufficient income, no access to credit due to lack of land titles, and lack of funds and will to renovate aging cocoa trees.

On the other hand, the rest of the players within the industry do not have such difficulties thanks to better management and planning practices. This allows them to contribute to the development and maintenance of the industry through constant investments on the production process. Nonetheless, even bigger efforts are necessary to improve the first stage of the industry as much as possible.

It is important to note that in spite of the difficulties and weaknesses that the industry has, the Dominican cocoa industry has achieved an excellent position in the international market. The country has been able to compete with other supplying nations, and this is something that evidences the great efforts made both by producers and exporters which are the two most important players along the chain.

In conclusion, producers are the main players of the first stage of the chain. These players lack the ability to properly manage their costs and income mainly due to ignorance in terms of handling their plantations like businesses. This means the culture and customs they have lived with for centuries molded an attitude of neglecting the desire and will to improve their overall living conditions, including the land they use to bring food to the table.

6.2 Recommendations

The value chain of the Dominican cocoa sector is influenced by the dominance of the exporting firms over the rest of the players within the industry, especially over producers. Although this might seem contradictory, it has actually helped economically and financially sustain the production of cocoa for several years now. It might not be ideal, but has been the best solution producers have found to obtain income in a fast manner so far, in order to satisfy their basic needs. However, the industry is in need of changes that start at the production stage, as a way of assuring complete efficiency of the chain, including all of its stages.

In that sense, after studying the Five Competitive Forces that Shape Strategy and the SWOT analysis we have determined five potential measures that can help improve the existing weaknesses within the production stage of the industry and prevent possible threats:

1. The creation of a fund managed with public resources to provide credits for the production of cocoa. This could benefit all the players of the chain, including the government since it would receive yearly interest payments from agricultural loans.

This fund would be managed by the Agricultural Bank along with the Department of Cocoa and the Ministry of Agriculture of the Dominican Republic. These institutions will have the task of reaching out for farmers, since it is often difficult for the latter to find transportation to urban areas where such institutions are located.

The fund will consist on providing to all cocoa farmers that need it, including those who lack legal land titles. It will use a percentage of farmers yield as a warranty, in cases where the farmers are not able to take responsibility for their monthly payments. Also, the fund will be related to the following recommendation, which consists of a program for providing legal land titles for cocoa farmers, in order for them to have access to a broader variety of credit options in the future.

Providing credit for cocoa farmers could benefit the Dominican cocoa industry in terms of increasing production and quality of the product. This would allow the country to acquire a better position in the international cocoa market, which would increase the flow of foreign exchange in the Dominican Republic. Also, it would improve the social and political environments of the country by alleviating some of the main issues farmers face in terms of quality of life, as well as disagreements between many of the cocoa authorities and players within the industry with the Dominican government.

2. Development of a program for farmers to obtain their legal land titles. This measure is closely related to the aforementioned one, since the possession of titles will make it easier for farmers to obtain credit. This program will be funded by the government and will include the

establishment of temporary legal assistance stands in which professionals will help peasant farmers legalize their lands.

The program would consist on a campaign in which legal specialist and employees from the Land Court and Ministry of the Dominican Republic would visit the different cocoa communities throughout the Dominican territory. This personnel would establish temporarily in each community and make sure to properly market the campaign, in order to make sure every farmer visits their establishment and receives help and orientation to obtain his legal land title.

Similar programs have been carried out by the Dominican government with other purposes. For example, in 2008 the Dominican government funded a project to provide proper student ID's for the students of the only public university in the country, in all of the campuses (Sinergit S.A., 2008). This means, that a project like this, in spite of having a different purpose, is a viable measure that the government could take.

After the campaign is completed the expectations are a farmer population with legal titles for their land that will give them access to credit options with the purpose of investing in high quality inputs for the improvement of overall cocoa production.

3. Motivate producers with moral incentives to renew their cocoa trees in order to increase their production. Such renovations would allow them to obtain higher revenues. Also, at the national level it will result in an increase of exports and foreign exchange.

This measure also includes projects funded by the Dominican government. Along with the two first measures, it will have the purpose of guaranteeing that the financial assistance and credit received by farmers and producers is properly implemented and focused into the renovation and

improvement of cocoa plantations. This is in order to prevent the misuse of this funds in other activities not related to cocoa production.

The project will consist of organized talks or seminars in which specialists and technicians on the matter will explain the importance of having new cocoa trees to maximize production and the best practices and techniques that need to be implemented during the sowing and harvesting processes. This is since most farmers do not have formal tools to track their activities and necessary inputs.

4. Provide proper training for producers and their offspring, as a way of assuring someone who would take over the production in the future so that the business does not disappear. Producers tend to lose motivation when prices decrease, so they need professionals that push them to continue the process as well as provide them with the latest agricultural practices they should apply into their plantations.

This project will be similar to the one in measure number three. It will consist of providing seminars or short courses for farmers and their children on mainly efficient sowing and harvesting techniques that maximize the level of output of cocoa in their plantations. The purpose of this project is to make the children of cocoa farmers feel engaged with their families' plantations and carry on with the business once their parents are not present to manage it.

The aforementioned seminars or short courses will cover the main aspects of the management process of a cocoa plantation, from agricultural practices to business strategies and techniques. This way, both cocoa farmers and their children will learn the most effective ways of improving and sustaining a profitable business. Ultimately, this will result in increased cocoa production, exports and generation of foreign exchange.

It is important to note that both measures three and four will also be funded by the Dominican government along with other private and international institutions involved in the Dominican cocoa industry. The Dominican government authorities need to study and understand the benefits that such investments will bring to the economy of the country in general. Although tourism is currently the number one economic activity in the Dominican Republic, it is important to invest and develop important agricultural crops like cocoa, as a way of having a contingency plan in case the tourism industry is affected by external factors, which has been the case in previous years.

5. Establishment of a cocoa farmers' board or cooperative that allows them to act as a whole and organize methods, techniques, marketing strategies and prices. This is with the purpose of helping farmers and producers assure their bargaining power in order to improve their economic conditions and have a better quality of life, so that they feel motivated to continue the business and improving the production and harvest processes.

The establishment of this board would have to be encouraged by non-governmental organizations and some of the most influential cocoa firms within the Dominican cocoa industry, as a way of improving both the social welfare of farmers and producers and strengthen business relationships between farmers and producers and exporting and manufacturing firms of cocoa in the country. This will guarantee the sustainability of the industry, since the majority of the activities carried out by cocoa farmers and producers will be organized and synchronized along this population. It will also increase the formality of transactions between producers and exporting and manufacturing firms.

Lastly, it should be noted that producers and exporters have been increasing their connections. In the past years, exporters have beginning to get involved quality process of the

beans. This has allowed them to have control over the aspects that should be eliminated to assure the best final product. The recommendations provided combined with the aforementioned practice would help improve the position and prestige the Dominican cocoa has in the international market.

REFERENCES

Batista, Lépido. “Guía Técnica: El Cultivo de Cacao”. (2009): 10, 28, 43.

Berlan, Amanda, and Ame Bergés. “Cocoa Production in the Dominican Republic: Sustainability, Challenges, and Opportunities”. (2013).

CEI-RD. “Perfil Economico del Cacao”. (2007): 2. [Accessed 15 March 2016].

Chery, Wegbert. “Factors Influencing Sustainable Cocoa Production in Northern Haiti”. (2015): 50.

Club del Chocolate Website. “Qué nos aporta el chocolate”. (Year Unknown). [Accessed: March 2016].

Commerce & Development United Nations Conference, 2001.

CONACADO Website, 2013.

CONACADO Website, 2015.

Corven, James, and Guillermo Villanueva. “Rehabilitación de Cacao para Altos Rendimientos en Centro América”. (1991): 9.

Department of Cocoa of the Dominican Republic. (1987).

Department of Cocoa of the Dominican Republic. “Origin and History of Cocoa in Dominican Republic”. (2002).

Department of Cocoa of the Dominican Republic. “Commercialization Report, Year 2010/2011”. (2011).

Department of Cocoa of the Dominican Republic. “Commercialization Report, Year 2011/2012”. (2012).

Dominguez, Manuel E., and Bacilia Fernández. “International Diagnostic of the Soil of the Principal Cocoa Regions of the Dominican Republic.” El Cacaotero Magazine (2001): 18.

Duke Center on Globalization, Governance & Competitiveness. “Competitividad de Pequeños Productores de Cacao Orgánico de la Confederación Nacional de Cacaocultores Dominica Nos (CONACADO)”. (2012).

European Food Information Council Website. “Las Propiedades Beneficiosas de los Flavonoides del Cacao”. (2006). [Accessed: February 2016].

Fallon, Nicolle. “SWOT Analysis: What It Is and When to Use It”. (2016). [Accessed: April 2016].

Flores Saavedra, Dick. (Unknown): 9.

García Rojas, Danny J. “Dominican Republic-Central American Free Trade Agreement (DR-CAFTA): Understanding the Reasons why the Dominican Republic (DR) Joined the CAFTA Negotiations”. (2009): 27.

Gianfagna, Thomas J., and Raymond Cooper. “From Herbs to Medicine: Cocoa-Food and Medicine of the Gods”. Alternative and Complementary Therapies 18.2 (2012): 84-90.

Green Peace Website. “What Is Free Trade?”. (Year Unknown). [Accessed: March 2016].

Hayes and Abernathy. “Managing our Way to Economic Decline”. (1980).

Hernández Polanco, Juan Ricardo. “El Ferrocarril La Vega-Sánchez y los Cambios Urbanos en el Nordeste Dominicano”. (2005): 173.

Hines, Jacob. “Threat of Substitutes (One of Porter’s Five Forces)”. (2013). [Accessed: March 2016].

Ibrahim, Alhaji Ahmadu. “The Impact of Globalization on Africa”. Vol. 3 No. 15 (2013): 85.

IDIAF (Instituto Dominicano de Investigaciones Agropecuarias y Forestales). “Cacao: Resultado de Investigación”. (2004).

IDIAF (Instituto Dominicano de Investigaciones Agropecuarias y Forestales). “Resultados de Investigación en Cacao”. (2007): 73.

Inter-American Development Bank. “Plan de Acción Plataforma Nacional Para Una Producción Sostenible del Caca en República Dominicana 2015-2025”. (2015): 120, 123.

International Cocoa Agreement (2001).

International Cocoa Organization. “Factors Which Affect Productivity”. (1998).

International Cocoa Organization. Quarterly Bulletin (2013).

Knapp, Arthur William. “Cocoa and Chocolate: Their History from Plantation to Consumer”. Chapman and Hall, Limited (1920).

Larrea, Cristina, and Matthew Lynch. “A Brief Overview of the Sustainable Cocoa Sector in Latin America and The Caribbean”. Market Research for Sustainable Investment. (2012).

Lastra, Alexandra. “Caracterización del Circuito Orgánico de la Cadena de Cacao en el Ecuador”. (2004): 9.

Tejeda, Lilian. “Hay que estimular más a productores de cacao”. (2013). Listín Diario Digital Newspaper. [Accessed: February 2016].

Livingstone III, Donald S., Freeman Barbie, Montamayor Juan Carlos, Schnell J. Raymond, Royaert Stefan, Takrama Jemmy, Meerow W. Alan and Kuhn N. David. “Optimization of a SNP assay for genotyping Theobroma cacao under field conditions”. Molecular Breeding 30.1 (2012): 33-52.

Ministry of Agriculture of the Dominican Republic, 2014.

Morgan, Robert E., and Constantine S. Katsikeas. “Theories of International Trade, Foreign Direct Investment and Firm Internationalization: a critique”. (1997).

Morrison, Mike. “SWOT Analysis (TWOS Matrix) Made Simple”. (2014).

National Cocoa Forum. “Current Situation of the Cocoa Culture in Dominican Republic and its Perspective”. (2001).

National Cocoa Poll, June 1987.

Nazario Rizek Website, 2011.

Nicholson, Walter, and Christopher Snyder. “Intermediate Microeconomics and its Applications”. (2015): 42.

Oficina Nacional de Estadística de la República Dominicana. “Population Census”. (1994).

Oficina Nacional de Estadística de la República Dominicana. “Population Census”. (2010).

Paola, Jandy. “Análisis de la Competencia y Ventaja Competitiva”. (Year Unkown). [Accessed: March 2016].

Ruf, François and PS Siswoputranto. “Cocoa Cycles: The Economics of Cocoa Supply”. (1995): 2.

Sendero del Cacao Website. http://www.cacaotour.com. [Accessed: February 2016].

Siegel, Paul B., and Jeff Alwang. “Export Commodity Production and Broad-based Rural Development: Coffee and Cocoa in the Dominican Republic”. World Bank Policy Research Working Paper 3306 (2004).

SINC “La Ciencia es Noticia” Website. “El Negocio del Chocolate Está de Suerte”. (2015). [Accessed: March 2016].

Sinergit S.A. Website. (2008). [Accessed: April 2016].

"The Five Competitive Forces that Shape Strategy". Harvard Business Review. (2008).

Tremblay, Sylvie. "Cocoa Powder Nutrition Information". (Year Unknown). [Accessed: November 2015].

Trujillo, Juana. "Breve Historia del Cacao y del Chocolate". (2010). [Accessed: March 2016]

UKessays Website. "Stages and Causes of the Business Cycle". (2013).

Welch, L.S., and R. Luostarien. "Internationalisation: Evolution of a Concept". Journal of General Management 14.2 (1988): 34-55.

Welsh, Shannan. "Cocoa". Geography Interconnections Website (2013). [Accessed: 10 March 2016].

Wilkinson, Jim. "Intensity of Rivalry (One of Porter's Five Forces)". (2013). [Accessed: March 2016].

Wood, George Alan Ruskruge, and R. A. Lass. Cocoa. John Wiley & Sons (2008).

Wood, Harold A. "Physical influences on peasant agriculture in northern Haiti." Le Géographe Canadien 5.2 (1961): 10-18.

VITA

Glorianni Viviana Estrella Espinosa is native of the Dominican Republic. She received her bachelor's degree in Business Administration at Pontificia Universidad Católica Madre y Maestra (PUCMM) in 2013. During her years of college and after receiving her bachelor's degree. Ms. Estrella worked in administrative positions in academic fields, and retailing food enterprises in the Dominican Republic. Also, Ms. Estrella has collaborated as a voluntary with the Organization of the United Nations in the Dominican Republic, being able to participate in simulation models in academic conferences held in the country with participants from other Latin American countries. She decided to start a master's degree in Agricultural Economics in the Department of Agricultural Economics and Agribusiness at Louisiana State University in 2014. She expects to receive her master's degree in May 2016 and plans to find a job in the United States under the Academic Training Program to work for 18 months in the American territory. She intends to move back to either the Dominican Republic or another country that provides her good job opportunities and residency and eventually, citizenship.